
Beamex CMX Calibration Software

User Guide

By Beamex

© Copyright 2003 - 2018

BEAMEX OY AB
Ristisuonraitti 10
FIN - 68600 Pietarsaari
FINLAND

Tel: +358-10-5505000
Fax: +358-10-5505404
E-mail: sales@beamex.com
Internet: <https://www.beamex.com>

8835000 / CMXuEng / Version 2.11.2

Beamex is a registered trademark owned by Beamex Oy Ab
HART is a registered trademark of the HART Communication Foundation.
FOUNDATION Fieldbus is a trademark of Fieldbus Foundation.
PROFIBUS is a trademark of PROFIBUS International.
Windows, Microsoft Windows operating systems and Activesync are registered trademarks of Microsoft Corporation in the United States and other countries.
Other trademarks are property of their respective owners.

Contents

Software Registration	xi
Feedback	xiii
Introduction	1
General	1
CMX Family	2
SSA and Support.....	4
About This Document.....	5
Typographic conventions.....	5
A Short Presentation of the Sections in This Document	6
Other Documents	8
What's New	9
About Calibration.....	10
What is Calibrated?	10
The Three Steps.....	10
Starting CMX	11
About CMX's Installation	11
How to Start CMX	12
Opening a Database	13
User Interface Language	15
Starting CMX Using Startup Parameters	15
License Key	18
General Presentation of CMX	19
CMX and the Instrument Database	19
About CMX's User Interface.....	19
The Main Window.....	19
Other Windows	30
Multiple Users	31
Simultaneous Data Editing	31
Accessibility	31
Uncertainty Calculation	32

Common Features	32
Context Menus (Pop-up Menus).....	32
Drag and Drop Feature	32
Selection List Features.....	32
Activation/Deactivation	33
Check Out /Check In	33
Calibration Result Lock/Unlock.....	33
Document Links.....	34
User Fields	35
Software Options.....	36
Report Designer Option.....	36
Change Management and Audit Trail Option	36
Optional Drivers for Non-Beamex Calibrators	36
Pocket PC Interface Option	36
Weighing Instrument Calibration Option	36
Maintenance Inspection Option	37
Work Order Handling Option	37
History Trend Option	37
Mobile Security Plus Option	37
User Interface Configuration Option	37
LDAP Authentication Option.....	37

Basic Settings 39

General	39
The Options Window.....	40
General Settings.....	40
Function Due List Options	41
Calibrator Due List Options	41
ID Generation Options.....	41
Calibration Certificate Options.....	41
Calibration Options.....	42
Security Options	42
Mobile Security Options.....	42
LDAP Options.....	42
Change Management Options.....	43
Users and User Groups	44
About What to Do With Users and User Groups	44
Supervisors	45
Users	45
User Groups.....	47
Site User Maintenance.....	48
Working with Site User Maintenance.....	48
Plant Structure	52
Working With Plant Structure Nodes	52
Device Manufacturers	54
Working With Device Manufacturers	54
Working With Device Models.....	55
Calibrators.....	57
Working With Calibrator Data	58
Calibrator Manufacturers	63

Lists.....	67
What is a List?.....	67
Editing Lists.....	68
Function Templates.....	69
Editing Function Templates and Calibration Procedure Templates.....	69
Creating a New Function Template.....	70
Creating a New Calibration Procedure Template.....	70
Copying a Function Template.....	71
Deleting Function Templates and Calibration Procedure Templates.....	71
Editing the User Interface.....	72
Direct Editing of the User Interface.....	72
Customizing the User Interface.....	72
Adding Instruments to the Database	73
General.....	73
About Instruments, Positions and Devices.....	73
Maximum Amount of Positions, Devices and Functions.....	74
Using the Wizard.....	75
Step 1 of 5 - Position Data.....	75
Step 2 of 5 - Device Data.....	75
Step 3 of 5 – Function Template.....	76
Step 4 of 5 – Function Data.....	76
Step 5 of 5 – Calibration Procedure Data.....	76
Using the Main Window’s Tree Views.....	77
Adding Positions.....	77
Adding Devices.....	78
Adding Functions.....	79
Adding Procedures.....	84
Other Instrument Related Functions.....	85
Linking and Unlinking Devices.....	85
Assigning Spare Devices.....	89
Copying Positions and Devices.....	89
Editing Items Displayed in a Tree.....	90
Deleting Items Displayed in a Tree.....	90
Queries, Filters and Sets	91
General.....	91
What Is a Query.....	91
Available Queries.....	91
What Is a Filter.....	93
How to Filter Data.....	93
What Is a Set.....	98
Device and Position Sets.....	98

Check Out / Check In Feature	99
General	99
Check Out / Check In Characteristics	100
Automatic Check Out / Check In	101
Manual Check Out / Check In.....	102
Calibration	105
General	105
The Typical Calibration Procedure	106
Calibration Web Service Interface, CWSI	108
About CWSI.....	108
Starting CWSI.....	108
Using CWSI in CMX	109
Selecting Instruments for Calibration	110
Sending Instruments for Calibration	111
Receiving Calibration Result Data.....	113
Receiving Instrument History.....	115
Avoiding Duplicate Results.....	115
Manual Entry of Calibration Results	116
Selecting Functions for Manual Entry	117
Entering Calibration Results	118
Ending Manual Entry	120
Viewing the Results.....	121
Average Results and Expanded Uncertainty	122
Approving Calibration Results	122
Locking Calibration Results	123
Deleting Calibration Results	123
History Trend.....	124
Opening the History Trend Window.....	124
Calibration Certificates and Other Documents	125
General	125
Printing Certificates	126
Printing Reports	127
Printing Labels	128
Printing History Trend Graphs.....	128
Printing Audit Trail Reports	128
Importing/Exporting Document Layouts	129
Creating Your Own Certificates.....	130
Change Management and Audit Trail	131
General	131
The Audit Trail Window	132
Electronic Signature	134
Electronic Record	134

Pocket PC Interface	135
General	135
Recommended Hardware Specifications.....	135
Installing CMX for Pocket PC	136
Uninstalling CMX for Pocket PC.....	139
Sending Instrument Data to the Pocket PC.....	141
Using the Pocket PC Interface	142
Starting.....	142
Selecting Instruments for Calibration Data Entry.....	143
Entering Calibration Data	144
Saving Results	145
Calibrating Groups of Instruments.....	146
Receiving Data from the Pocket PC.....	149
Calibrating Weighing Instruments	151
General	151
Basic Settings for Weighing Instruments.....	152
Entering Weight Sets and Weights.....	152
Weighing Instrument Function Templates and Calibration Procedures.....	158
Adding Weighing Instruments to the Instrument Database	167
Calibrating Weighing Instruments	168
Terminology.....	168
Sending Weighing Instruments to Manual Entry Window or to a Pocket PC.....	170
Using Manual Entry	170
Using a Pocket PC	171
Maintenance Inspection	175
General	175
Maintenance Inspection in CMX.....	175
Function.....	176
Procedure.....	176
Sending Checklists to a Tablet.....	177
Receiving Checklist Results from a Tablet	177
Viewing Checklist Results	177
Checklist Reports	177
Maintenance Inspection in a Tablet.....	178
Installing bMobile software to a tablet	178
Working with a Tablet.....	178

Work Order Handling	181
General	181
CMX's Basic Work Order Handling.....	181
CMX's Enhanced Work Order Handling	182
Changes in CMX User Interface.....	184
Calibration Using Enhanced Work Order Handling	186
Special Situations.....	187
Cancelling a Work Order in CMX	187
Emergency Calibration	187
Pocket PC and Enhanced Work Order Handling.....	188
Mobile Security Plus	189
General	189
Terminology.....	190
Mobile Security Plus Option in CMX	190
Options Window	191
Users and Permissions Window	193
Manual Entry in CMX	195
Calibration Results in CMX.....	195
Mobile Security in Mobile Devices.....	196
CMX Database Manager	197
General	197
Starting CMX Database Manager	198
Server Connection	198
Backup and Restore a Database.....	198
Installing and Uninstalling a Database	200
Creating a New Database	201
Copying a Database	201
Deleting a Database	202
Moving a Database	202
Additional Information	203
General	203
Calibrators and USB Communication.....	203
Absolute Pressure Measurement and Uncertainty Calculation ...	207
Temperature Blocks and CMX	209
Specifications of Temperature Blocks	209
Specifications of Temperature Blocks in CMX.....	210
Third Party Licenses	214
General.....	214
Third-Party Licenses Used in CMX, CWSI Server and CWSI Client.....	214
Third-Party Licenses Used in CMX and CWSI Client	214
Third-Party Licenses Used in CWSI Server and CWSI Client	216
Third-Party Licenses Used in CWSI Server.....	217
Third-Party Licenses Used in CWSI Client.....	218

CMX Software License Agreement	219
Supplemental End User License Agreement For Microsoft Software	222
End-User License Agreement For Microsoft Software	224
Glossary of Terms	233
Index	236
Notes	243

Software Registration

IMPORTANT! For warranty service and access to technical support for your Beamex products, complete this form and return it to Oy Beamex Ab. All rights under the limited warranty come into force after receipt of your completed Registration.

License Key number(s): _____

Company: _____
Contact person: _____
Street Address: _____
City: _____
State: _____
Zip Code: _____
Country: _____
E-mail: _____
Telephone: _____
Fax: _____

Select Business branch:

- | | | |
|---|--|---------------------------------------|
| <input type="checkbox"/> Power & Energy (excl. Nuclear) | <input type="checkbox"/> Pharmaceutical | <input type="checkbox"/> Automotive |
| <input type="checkbox"/> Nuclear | <input type="checkbox"/> Food & Beverage | <input type="checkbox"/> Aviation |
| <input type="checkbox"/> Oil & Gas | <input type="checkbox"/> Manufacturing | <input type="checkbox"/> Marine |
| <input type="checkbox"/> Petrochemical & Chemical | <input type="checkbox"/> Metal & Mining | <input type="checkbox"/> Pulp & Paper |
| <input type="checkbox"/> Service | <input type="checkbox"/> Education | |
| <input type="checkbox"/> Other: _____ | | |

NOTE:

Upon receipt of the product registration Beamex will send you information on relevant Beamex products as they become available. If you would prefer not to receive information on relevant Beamex products please tick here.

Send your software registration to:

Oy Beamex Ab
Ristisuonraitti 10
FIN-68600 PIETARSAARI
FINLAND
E-mail: support@beamex.com
Phone: +358 10 550 5000
Fax: +358 10 550 5404
Internet: <https://www.beamex.com>

Feedback

We want to improve our products and services constantly. Therefore we'd like to know Your opinion of the product You use. Please spend a moment of Your valuable time in filling this form. All respondents will receive a surprise gift in return.

Certain questions can be answered immediately after receiving the product. Others require some use of the product before You are able to answer them. The best way to fill the form is to answer the items as it applies, and send the form to us when all items are answered. There are however no definite restrictions; fill in the form when you feel like it (all items need not be answered). Then send it to Beamex using one of the possibilities listed below.

Mail: Beamex Oy, Ab
Quality Feedback
Ristisuonraitti 10
FIN-68600 Pietarsaari
FINLAND

Fax +358 - 10 - 550 5404
Only the next page need to be faxed to us.

Internet: <https://www.beamex.com>
A similar form is available as a web page

E-mail: support@beamex.com
Refer to the numbered items on the next page in Your e-mail message.

1. Name of the product you give feedback of: _____

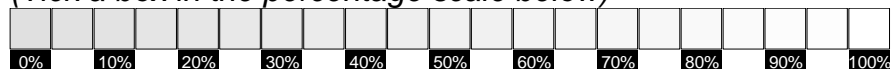
2. Serial number and software version number (if applicable) _____

3. Any comments when receiving the product. Did the package contain all required items and was it as expected?

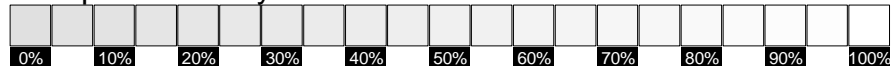
4. For how long have you been using the product? _____

5. How helpful was the manual in using the product?

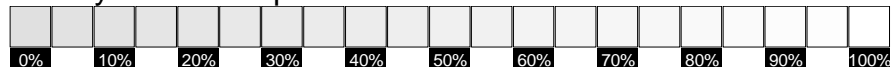
(Tick a box in the percentage scale below)



6. How well did the product suit your needs?



7. How satisfied are you with the product?



8. Did anything in the product exceed your expectations? In that case, what was it?

9. Did anything in the product disappoint you? In that case, please specify.

10. Any ideas You want to propose to Beamex so that we can improve our products, operations and/or services.

Title & Name:

Address:

Please contact me concerning the Feedback I have given.

I want to receive more information on Beamex products.

Introduction

General

Beamex was founded in 1975 by people with experience in calibration and quality maintenance of instruments. CMX is developed based on that knowledge. CMX also represents Beamex's 3rd generation of calibration management software.

CMX has an "Explorer-like" user interface. This enables the software to be simple to use by any operator familiar with Windows®.

CMX communicates with Beamex's communicating calibrators (excluding PC105). Several calibrators by other manufacturers also communicate with CMX.

The main features are:

- Automated calibration and documentation
- Versatile calibrator communication
- Support for several database platforms
- Security and change management control
- Pocket PC interface
- Extensive services and support

CMX Family

CMX software is tailor made for different needs. Therefore there are different CMX Family members (versions) available. The following list presents all members of CMX Family:

- **CMX Light**
Easy-to-use calibration software for single workstations.
Note that CMX Light is a legacy version, no longer developed. The last release is V2, revision 2.9.
- **CMX Professional**
Calibration software with wide customization possibilities.
CMX Professional has two installation options:
 - **Workstation** installation and
 - **Floating** installation on a network server.
- **CMX Enterprise**
All in one calibration solution for large companies.
One floating installation on the corporate server for sharing the same system in all locations world-wide.

See chapter **Feature Comparison** for more information of differences between members of CMX Family.

How to see/know which CMX version you have

The splash screen shown when CMX is started shows which version you have at hand. Another way to identify your CMX version is opening the About screen using menu commands **Help, About**.

How to know which features presented here apply to your CMX

Features presented in this manual have in the beginning of the topic, a paragraph explaining differences in functionality between members of CMX family. This, of course, only if the feature differs between CMX family members.

Symbols used for a feature's availability in different CMX versions:

- **Not** available/applicable
- **Optionally** available
- **Standard** feature

Feature Comparison

The following table presents the features available in CMX products:

CMX Feature	Light	Professional	Enterprise
Positions/tags in the database	300	1000	Unlimited
Optional 5000 Positions in the database	—	○	—
Optional 10 000 Positions in the database	—	○	—
Single workstation license	●	●	—
Floating server license	—	○	●
Networking / multi-user support	—	●	●
Position and Device database	●	●	●
Position and Device sets	●	●	●
Calibrator database	●	●	●
Wizard for database population	●	●	●
Communication with Beamex calibrators	●	●	●
Manual data entry	●	●	●
Average and uncertainty calculation	—	●	●
Plant structure	●	●	●
User accounts, groups and permissions	●	●	●
Pickup lists	●	●	●
Saveable database filters	—	●	●
Standard paper report templates	9	17	17
Importing/exporting report templates	●	●	●
Starting CMX using startup parameters.	—	●	●
User Defined Transfer Functions	—	●	●
User Defined PRT Sensors	—	●	●
User Defined Pressure Units	—	●	●
Site User Maintenance	—	●	●
CMX Database Manager tool	●	●	●
Oracle database support	—	○	●
Communication with 3 rd party calibrators	—	○	○
Configurable user interface	—	○	●
History trend	—	○	●
Report design	—	○	●
Pocket PC interface	—	○	●
Change management	—	○	●
Weighing instrument support	—	○	●
Lightweight Directory Access Protocol (LDAP)	—	○	●
Beamex Business Bridge - Asset Management Connection	—	○	○
Work Order Handling	—	○	●
Maintenance Inspection	—	○	●
CWSI, Calibration Web Service Interface	—	●	●
Mobile Security Plus	—	○	●
bMobile Communication option	—	○	○
Software service agreement (SSA) for 12 months	—	○	○

Symbols used: — **Not** available/applicable
 ○ **Optionally** available
 ● **Standard** feature

SSA and Support

A Software Service Agreement (SSA) can be included in CMX. SSA is highly recommended because all updates during the SSA's duration are free. Also: Customers with a valid SSA have “priority one” service when contacting CMX support.

Contact Information to Beamex Software Support:

Telephone: **+358 - 10 – 5505000** (Ask for Support)

Fax: **+358 - 10 – 5505404**

E-mail: **support@beamex.com**

Address: **Beamex Oy Ab
Ristisuonraitti 10
FIN-68600 Pietarsaari
Finland**

About This Document

The user of this document is expected to be familiar with the Windows® environment and such terms as **Clicking**, **Selecting**, **Double-clicking**, **Marking**, using the **secondary button** of the mouse, **Drag and drop**, **Resizing a window**, etc. If you are unsure of a term, please refer to a Windows® User Guide.

This document focuses on giving you advice on how to use CMX. For information concerning a device communicating with CMX, please consult the instruction manual of that particular device.

The installation media in which the software was shipped also includes this document in PDF format.

Typographic conventions

This document uses the following typographic conventions:

- All words related to a CMX window are shown using bold font style. Specifically:
 - Menu and submenu commands. A comma separates the menu and submenu command from each other.
Example: **File, Exit**.
 - Command buttons:
Example: Click **OK**.
 - Window names:
Example: the **Calibrators** window.
- File names and directories are in capital letters.
Example: D:\CMX\CMX.EXE.
- References to other parts in this guide are shown in bold.
Example: See the **Calibration** section in this guide.

A Short Presentation of the Sections in This Document

This chapter briefly presents all sections found in this document.

Introduction

Basic Information about CMX, this manual and calibration.

Starting CMX

A short section telling you how to start CMX and how to select a database.

General Presentation of CMX

Gives you a detailed description of CMX's user interface, menus common features etc. A good read before you start taking CMX into serious use.

Basic Settings

Contains information that should be reviewed when CMX is taken into use. Many of the settings described in this section are usually done only once, like the Plant Structure data. Certain parts, like the User and User Group settings are updated whenever changes occur.

Adding Instruments to the Database

Tells you how to add instruments to CMX's database using either the Wizard or entering Position, Device, Function and Calibration Procedure data one by one. This section also describes how to edit, link and unlink Positions/Devices.

Queries, Filters and Sets

A section for finding out what kind of tools CMX provides when you need to limit the displayed data somehow.

Check Out / Check In Feature

Check Out / Check In Feature is a tool for locking instruments chosen for calibration so no other user may edit the instrument data during calibration. After calibration is done, the instrument is unlocked. Locking instruments may be done manually or automatically depending on your settings.

Calibration

Here are the ways to utilize CMX for calibration presented. Communication with a calibrator as well as manual data entry. This section also includes a presentation on how to view the calibration results in CMX.

Calibration Certificates and Other Documents

Tells about the Documents types that are available in CMX: Calibration Certificates, Reports and Labels.

Change Management and Audit Trail

Availability:

- CMX Light
- CMX Professional
- CMX Enterprise

Change Management and Audit Trail makes it possible to log changes made to the database. The electronic signature feature is also presented here.

Pocket PC Interface

Availability:

- CMX Light
- CMX Professional
- CMX Enterprise

Pocket PC Interface allows you to send instrument data to a Pocket PC, manually enter calibration results and receive the results to CMX. In other words, the Pocket PC Interface is a "mobile manual entry utility".

Calibrating Weighing Instruments

Availability:

- CMX Light
- CMX Professional
- CMX Enterprise

Weighing Instrument Calibration allows you to calibrate Weighing Instruments using the Manual Entry window. If you also have the Pocket PC Interface, you will furthermore be able to calibrate Weighing Instruments using a Pocket PC.

Note that Weighing Instrument Calibration is not available in CMX Light, is an option in CMX Professional and is a standard feature in CMX Enterprise.

Maintenance Inspection

Availability:

- CMX Light
- CMX Professional
- CMX Enterprise

Maintenance Inspection allows you to perform check procedures according to IEC 60079-17 standard and also according to your own needs. The actual check procedure is done using a compatible tablet with **bMobile**[™] software.

Work Order Handling

Availability:

- CMX Light
- CMX Professional
- CMX Enterprise

Work Order Handling is a tool for handling work orders sent from asset and work management software. CMX receives the necessary data and after calibration using CMX, Pocket PC, a calibrator or a compatible tablet, updates and returns the work order data back to asset and work management software.

Mobile Security Plus

Availability:

- CMX Light
- CMX Professional
- CMX Enterprise

Mobile Security Plus enables users of CMX and supported Mobile Devices to secure data integrity when performing calibrations.

CMX Database Manager

Presents a tool for database experts. CMX Database Manager allows you to backup, restore and copy CMX databases.

Additional Information

Contains useful information of, e.g. calibrators communicating with CMX.

Other Documents

When CMX is installed, some additional Help files are also included:

- **CMX_Calculations.chm**
presents all the calculations that CMX performs. This Help file may be opened from CMX Main Windows' Help menu. Select option **CMX Calculations**.
- **CMX_Report_Variables.chm**
presents all variables available in the Report Designer. See chapter **Creating Your Own Certificates** in section **Calibration Certificates and Other Documents**. This Help file may be opened from CMX Main Windows' Help menu. Select option **CMX Report Variables**

Availability of document:

- CMX Light
- CMX Professional
- CMX Enterprise

Note.

These help files are also available pdf format in the **Documents** folder of the CMX installation media.

What's New

The following main additions have been included into CMX Professional and Enterprise, versions 2, revisions 2.11:

- **Mobile Security Plus** option, a feature for securing Data Integrity when performing calibrations.
- **bMobile Version 2**, a new tool for documenting calibrations and checklists is briefly presented in Maintenance Inspection section.

Other minor enhancements and additions have also been done.

For detailed information concerning CMX updates, including update history, see **Release Note** included in installation media.

About Calibration

A calibration procedure means measuring a process instrument's accuracy against another more accurate device, for example a calibrator. The calibrator normally contains measurement modules allowing the measurement of different engineering units at different ranges.

What is Calibrated?

The calibration may be carried out for a process Position (sometimes also called a "Tag") with an installed Device, or the calibration may be for an uninstalled Device; more precisely, the calibration is for a particular Function of the Position/Device.

The Three Steps

The calibration process is normally a three step event containing:

- ***As Found calibration***, done to verify the current state of the instrument before adjustment.
- ***Adjustment***, made to bring the instrument within the required specifications.
- ***As Left calibration***, the final calibration in order to establish the state of the instrument after the adjustment.

When entering the result manually to CMX there is no limitations in the amount of As Found and As Left calibrations or the number of calibration points. If you are sending instruments for calibration using communicating calibrator, refer to the calibrator manual to find out whether there are any limitations in either the amount of As Found and As Left calibrations or the number of calibration points.

Starting CMX

About CMX's Installation

When CMX was delivered, a separate installation booklet was included in the shipment. Refer to it when installing CMX.

Alternatively, if you have lost the installation booklet, the installation instructions of all CMX family members are included on the installation media.

Alternatively, the installation booklets are also available in the Downloads section of Beamex's web site:
<https://www.beamex.com/>.

Note.

When downloading the installation instructions, remember to select the instructions that suit the CMX version at hand.

How to Start CMX

When CMX is installed you can start using the software. Locate the CMX icon in your Start menu to start the software.



To use a fully functional CMX, the License Key must be in place. Without the License Key CMX starts up as a Limited Evaluation version. Detailed info of the License Key is in chapter **License Key** on page 18.

CMX automatically places the current Windows® User ID as the default user for logging into CMX. If you are logging in for the very first time you must use the Supervisor User ID and Password delivered with CMX. Change the Supervisor User ID and add other Users according to your needs. Adding Users is described in **Basic Settings** section's chapter **Users and User Groups**.

See also: **User Interface Language** on page 15.

Availability of LDAP:
-- CMX Light
○ CMX Professional
● CMX Enterprise

Note.

If Lightweight Directory Access Protocol (LDAP) is enabled in CMX, use your network user name and password to log into CMX. More of LDAP in section **Basic Settings**, chapter **LDAP Options**.

Opening a Database

The available databases depend on the installed CMX version.

In **CMX Light**:

- **CMX_Light_Database** is the database available **when the License Key is installed**. Other databases cannot be opened when CMX Light is running with the License key in place.
- **CMX_Light_Demo_Database** is a demo database available when the License Key is **not** in place. the amount of positions/devices are limited to 15. Other databases cannot be opened with CMX Light in demo mode (Limited Evaluation version).

In **CMX Professional** and **Enterprise**:

- **CMX_Demo_Database** is a demo database for getting acquainted with CMX. This is the default database when CMX is started for the first time after installation.
- **CMX_Database** is an empty database for creating your own database. When needed, you may switch to this database as described further on in this chapter.
Note.
*You may also use **CMX_Demo_Database** as the basis for your own database. When the demo positions/devices are no longer needed, just remove them from the database.*
- **Other databases.** You may create your own CMX databases using the tools available in **CMX Database Manager**. This however requires that you have experience in working with databases and database servers.

Notes.

All databases mentioned above have the same Supervisor User ID and Password (shipped with CMX installation media).

More info of CMX versions is in **Introduction** section's chapter **CMX Family**.

Availability:

- CMX Light
- CMX Professional
- CMX Enterprise

Switching between databases:

During login CMX offers to connect to the latest database used. To switch database, select another (host and) database from the login window.

Alternatively, when CMX is already running, use the main window's menu to select:

- **File, Log Off** in **CMX Enterprise** or **CMX Professional** with the floating server license option or
- **File, Database** in **CMX Professional** without the floating server license option.

Then enter required information to log into another database.

Note.

CMX includes a possibility to utilize either **SQL Server Authentication** (default) or **Windows Authentication**. Use the **Authentication** selection list to choose the one you want.

See also: **User Interface Language**.

User Interface Language

When starting CMX or switching between databases, the log-in window includes the possibility to select the user interface language from the **Language** combo. The available user interface language options depend on the selected user interface languages during installation.

Notes.

During the installation, the base database was also selected. Certain pick-up list options are displayed using the language of the base database.

Function Templates and their Calibration Procedures have the same language as the base database.

Availability:

- CMX Light
- CMX Professional
- CMX Enterprise

Starting CMX Using Startup Parameters

CMX may also be started using certain startup parameters in the command line.

In 32 bit Windows® operating systems:

```
"C:\Program Files\CMX\BxbMUIPD.exe" /DB:CMX_Demo_Database  
/LANG:ENGLISH /USER:123 /PWD:SECRET IP:"101DR-PI0014"
```

In 64 bit Windows® operating systems:

```
"C:\Program Files (x86)\CMX\BxbMUIPD.exe" /DB:CMX_Demo_Database  
/LANG:ENGLISH /USER:123 /PWD:SECRET IP:"101DR-PI0014"
```

Begin the command line entry with the path where your CMX is installed and the name of the CMX software (Bxb-MUIPD.exe) followed by the necessary parameters. Each parameter starts with a preceding space and a slash character.

The following command line parameters are available:

PARAMETER	DEFINITION
<i>/DB:DATABASE NAME</i>	The name of the database to be opened. <i>/DB:</i> parameter is mandatory
<i>/LANG:LANGUAGE</i>	The user interface language. Language name should be written as is it seen in language selection list during normal start/login, e.g. "FINNISH". If no <i>/LANG:</i> parameter is specified, CMX uses the language chosen in a previous start. If no <i>/LANG:</i> parameter is specified and no previous starts (with current version of CMX) have been made, English language is used.
<i>/USER:USER ID</i>	User ID to be used when opening the database. If no <i>/USER:</i> parameter is specified, CMX login dialog is displayed.
<i>/PWD:PASSWORD</i>	Password to be used when opening the database. If password is required and no <i>/PWD:</i> parameter is specified, CMX login dialog is displayed.
<i>/P:POSITION ID</i>	The Position Property window is opened and the data of the specified position is displayed. If the Position ID is invalid, the Position Property window is not opened.
<i>/D:DEVICE ID</i>	The Device Property window is opened and the data of the specified device is displayed. If the Device ID is invalid, the Device Property window is not opened.

If both a */P:* and a */D:* parameter is entered, the */P:* parameter takes precedence and the */D:* parameter is ignored.

Wildcards can also be used. For example "*/P:101%*" displays all positions that begin with "101". Wildcards used in a Microsoft SQL Server database are presented in section **Queries, Filters and Sets**, chapter **Wildcards**.

Notes!

Do not use the command line if there is a possibility that unauthorized people may get hold of User IDs and Passwords. The command line displays all text written in it, even the User ID and the Password.

Database settings must be set correctly before command line parameters can be used. Set the Provider, Server, Server Login and password settings to the database server where the wanted database is located. Set the parameters by opening the database manually before using the command line parameters.

Each time CMX is started with command line parameters, a new CMX instance will be started. So, to free CMX licenses, remember to close the CMX instance after use.

If your Position IDs and/or Device IDs contain space characters, include the ID inside quotes, e.g.:

... /P:"DEPT 714 - PT101.3".

License Key

The License Key must always be connected to the computer while you are using a fully functional CMX. Without the License Key, CMX starts up as a Limited Evaluation version. Most of the functionality is still available, but CMX uses a demo database with a limited amount of positions/devices. The maximum amount of positions/devices in the demo database is 15.

Where should the License Key be located?

- In **CMX Enterprise** and **CMX Professional with the floating server license option:**
The License Key must be installed into the server where CMX Application Server is running.
- In **CMX Light** and **CMX Professional without the floating server license option:**
The License Key must be installed into the workstation where CMX is running.

General Presentation of CMX

CMX and the Instrument Database

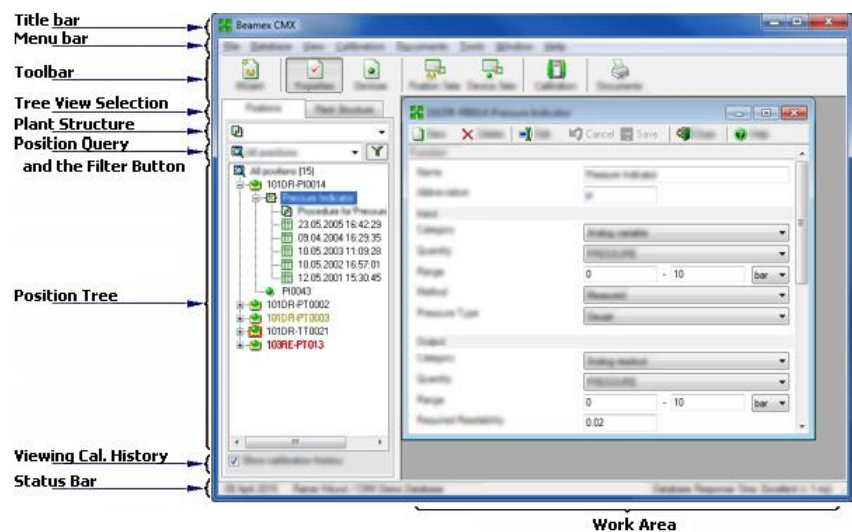
The relation between CMX and the Instrument Database is like the relation between a word processing software and the document you write. CMX, just like the word processor, is a tool for handling the information you create. With CMX you create a database instead of a document.

All instrument data as well as calibration history data is saved in the database. CMX is the tool for opening, viewing and editing the database.

About CMX's User Interface

A general description of CMX's user interface.

The Main Window



The Main Window is divided into following main parts:

1. **Title Bar.** Contains the Name of the software and sometimes also additional information depending on the selected item.
2. **Menu Bar.** The Menu structure is presented in a subsequent chapter.
3. **Toolbar.** The Toolbar structure is presented in a subsequent chapter.
4. **Tree View Selection Tabs.** Selects whether the Plant Structure Tree or the Position Tree is shown (Position Tree shown in the previous picture).
5. **Plant Structure List** (not shown when the Plant Structure Tree is shown instead of the Position Tree). This is the **primary** level filtering for the Positions shown in the Position Tree. More of the plant structure in a subsequent chapter.
6. **Position Query List** (not shown when the Plant Structure Tree is shown instead of the Position Tree). This is the **secondary** level filtering for the Positions shown in the Position Tree, i.e. the query is carried out to Positions located in the selected part of the plant structure. More of the queries in a subsequent chapter.
The **Filter Button** is the **tertiary** level filtering for the Positions shown in the Position Tree. More of the filter in a subsequent chapter.
7. **Position Tree.** Shows a list of Positions (all or part of them depending on the selections in the two lists and the Filter button above the Position Tree) and their contents in a tree like structure. More of the tree structure in a subsequent chapter.
8. **Viewing Calibration History Check Box.** If unchecked, only the latest calibration is shown in the Position Tree. When checked, all calibrations are shown in the Position Tree.
9. **Status Bar.** Shows the current date, the name of the currently logged user and the database response time.
Hints for increasing the response time can be found in **CMX Help**, topic **General Settings Fields**.
10. **The Work Area.** A place for an opened **property window**, **Devices** window, **Set** windows, **Print** window, **Send to Calibrator** and **Receive from Calibrator** windows.

The Tree

The Tree Structure on the left side of CMX's main window shows either a list of positions (all or part of them depending on the Plant Structure List, Position Query List and Filter settings) or the Plant Structure including all Positions.

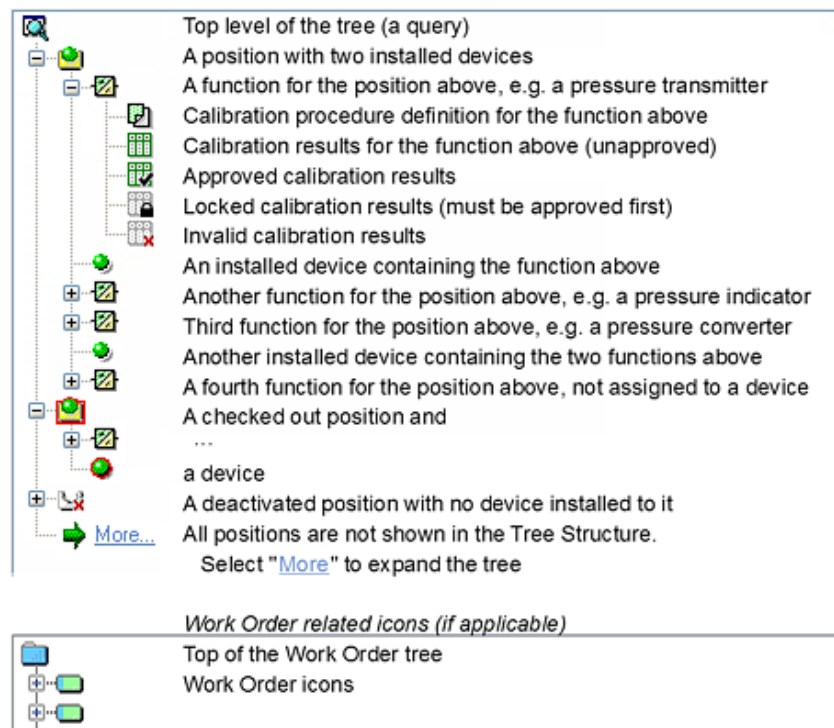
The color of the Position ID is:

- **Black** when the Position's calibration date is not due soon.
- **Yellow** when the Position is due for calibration but the next calibration date hasn't been exceeded yet. The time period when the Position ID is yellow is user defined. See the **Basic Settings** section's chapter **Function Due List Options**.
- **Red** when the Position's due date for the calibration has expired.

Note.

The same colors indicating the need of calibration are used for Calibrators, Devices, Calibrator Modules and Users in their respective trees.

The Tree Structure shows position data in the following hierarchical order:



When you double-click one of the items in the Tree Structure, a property window opens in the Work Area. There all item related data is displayed for viewing and possible editing.

When the property window is already open, a single click in the Tree Structure changes the contents of the property window to display the data of the clicked item.

Several other main functions of CMX may also be started from the **Context Menu** “popping up” above the Tree Structure, but they are covered later on in this manual. This is just a reminder to frequently use the context menu that opens by clicking the secondary mouse key.

Notes.

CMX supports deactivating items shown in the Tree Structure (not available in CMX Light). Deactivation means that a Position/Device etc. is no longer in use. A deactivated item has a small red “x” in the lower right corner of the icon.

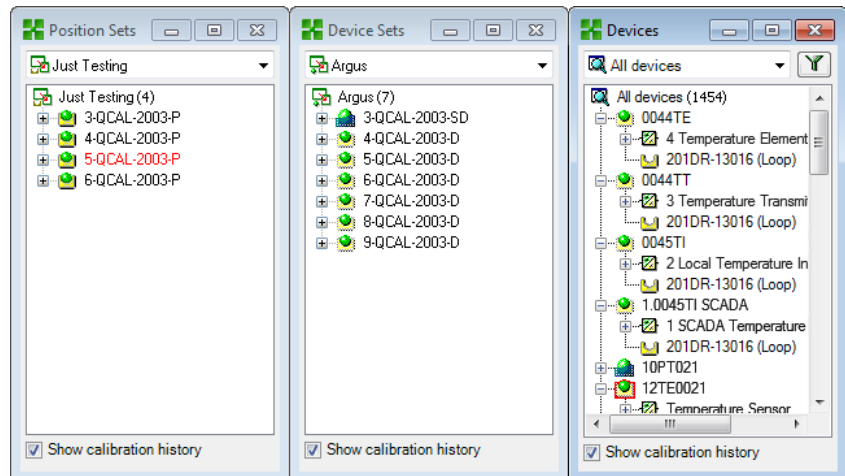
A checked out Position/Device has a red border surrounding the icon. More of checking out in section **Check Out /Check In**.

Work Order Handling is described in section **Work Order Handling**.

The Work Area

The work area is used for showing the following types of windows:

- The property window for displaying additional information of the item selected in the Tree Structure.
- **Send To Calibrator** and **Receive From Calibrator** windows while communicating with a calibrator
- **Print** window for printing Certificates, Reports and Labels.
- **Devices** window (rightmost window in the picture below).
- **Position Sets** and **Device Sets** windows (also shown in the picture below).



The **Devices** window, **Device Sets** window and **Position Sets** window all work like the Tree Structure except that they are “floating” in the work area. Sets are described in section **Queries, Filters and Sets**.

The Menu Structure

File

<i>Database ...</i>	<p>Opens a dialog for viewing/changing the database connection.</p> <p>Availability:</p> <ul style="list-style-type: none">-- CMX Light● CMX Professional*-- CMX Enterprise <p>*) with no floating server license option.</p>
<i>Log Off ...</i>	<p>Opens a dialog for viewing/changing the database host connection.</p> <p>Availability:</p> <ul style="list-style-type: none">-- CMX Light● CMX Professional⁺● CMX Enterprise <p>⁺) with floating server license option.</p>
<i>Import, Document Layouts...</i>	<p>A possibility to import Certificate, Report and Label layouts from another database/source.</p> <p>Availability:</p> <ul style="list-style-type: none">-- CMX Light● CMX Professional● CMX Enterprise
<i>Export, Document Layouts...</i>	<p>A possibility to export Certificate, Report and Label layouts to make them available for another database.</p> <p>Availability:</p> <ul style="list-style-type: none">-- CMX Light● CMX Professional● CMX Enterprise
<i>Exit</i>	<p>Closes CMX</p>

Database

<i>Wizard...</i>	Launches the Wizard that creates a new Position, a linked Device etc.
<i>Device Manufacturers...</i>	Opens the window for viewing/defining Device Manufacturers
<i>Calibrators...</i>	Opens the window for viewing/defining Calibrators (and further on the Calibrator Manufacturers)
<i>Lists...</i>	Opens the window for viewing/defining CMX lists, i.e. sets of predefined alternatives, available in several windows.
<i>Function Template...</i>	Opens the Function Template window where the Function Templates may edited and new Templates added.

View

<i>Properties</i>	Opens/closes the property window
<i>Devices</i>	Opens/closes the Devices window
<i>History Trend</i>	Opens/closes the History Trend window. Availability: -- CMX Light ○ CMX Professional ● CMX Enterprise
<i>Position Sets</i>	Opens/closes the Position Sets window
<i>Device Sets</i>	Opens/closes the Device Sets window
<i>Refresh</i>	Refreshes the active tree.

Calibration

<i>Send...</i>	Opens the window used for sending instruments/functions to the connected calibrator.
<i>Receive...</i>	Opens the window used for receiving calibration results of instruments/functions from the connected calibrator.
<i>Manual Entry...</i>	Opens the window used for entering calibration results. This is useful when a calibrator does not communicate with CMX.

Documents

<i>Certificates, Print...</i>	Opens a window where you can select instruments with calibration results and print calibration certificates.
<i>*) Certificates, Design...</i>	A possibility to create your own certificates.
<i>Reports, Print...</i>	Opens a window where you can select instruments and print reports.
<i>*) Reports, Design...</i>	A possibility to create your own reports.
<i>Labels, Print...</i>	Opens a window where you can select instruments and print calibration labels.
<i>*) Labels, Design...</i>	A possibility to create your own labels.
<i>*) History Trend, Print...</i>	Opens a window where you can select instruments and print history trend graphs.
<i>*) History Trend, Design...</i>	A possibility to create your own history trend graphs.

**) Availability:*

- CMX Light
- CMX Professional
- CMX Enterprise

Tools

<i>*) Audit Trail...</i>	Opens the Audit Trail window.
<i>Options...</i>	Opens the Options window. Here are all CMX's basic settings viewed/edited.
<i>Security, Users...</i>	Opens the window where Users and User Groups are maintained.
<i>Security, Change Password...</i>	Allows the current user to change one's CMX password. Note that this menu option is only available if passwords are required in the Security page of the Options window.
<i>*) Security, Change Mobile Password...</i>	Allows the current user to change one's Mobile Password. Note that this menu option is only available if Mobile Security Plus is activated in the General page of the Options window and Mobile Passwords are required.
<i>*) User Interface, Edit</i>	Activates the Direct Edit of CMX's user interface.
<i>*) User Interface, Save</i>	Saves the changes made to the User Interface during Direct Edit.
<i>*) User Interface, Cancel Changes</i>	Cancels the changes made to the User Interface during Direct Edit.
<i>*) User Interface, Customize...</i>	Opens the window used for customizing CMX's user interface.
<i>**) External links</i>	Allows you to add a quick link to any kind of file (including applications) recognized by the operating system. The linked files are listed in a submenu below the External Links menu option. The link may also be an internet link as long as the beginning (http://) is cut off.
<i>Beamex Tools</i>	Contains links to Beamex calibrator tools, e.g Picture Capturers, Device Description Senders, Demos etc.

**) Availability:*

- CMX Light
- CMX Professional
- CMX Enterprise

***) Availability:*

- CMX Light
- CMX Professional
- CMX Enterprise

Window

<i>Cascade</i>	Reorders the sub-windows found in the Work Area.
<i>Tile Horizontal</i>	Reorders the sub-windows found in the Work Area.
<i>Tile Vertical</i>	Reorders the sub-windows found in the Work Area.

Help

<i>CMX Help...</i>	Opens CMX's main help file.
<i>CMX Calculations...</i>	Opens CMX Calculations help file which describes the calculations that CMX performs.
<i>CMX Report Variables...</i>	Opens CMX Report Variables help file which describes CMX variables available in CMX's Report Design tool. Availability of this menu option: <ul style="list-style-type: none">-- CMX Light● CMX Professional● CMX Enterprise
<i>Index...</i>	Opens CMX help file's index tab.
<i>Search...</i>	Opens CMX help file's search tab.
<i>About CMX...</i>	Opens the window where CMX's license and copyright info is displayed.

The Toolbar

The main window toolbar comprises of the following tools:

<i>Wizard</i>	Opens a Wizard utility for creating a new Position (and a Device). This is the fastest way of creating an instrument. Only the most significant fields are shown.
<i>Properties</i>	Opens/closes the Properties window in the Work Area.
<i>Devices</i>	Opens/closes the Devices window in the Work Area.
<i>Position Sets</i>	Opens/closes the Position Sets window in the Work Area.
<i>Device Sets</i>	Opens/closes the Device Sets window in the Work Area.
<i>Calibration</i>	Contains a menu with calibration related functions, the same as in the main windows' Calibration menu.
<i>Documents</i>	Contains a menu with available types of documents (Certificates, Reports, Labels and History Trend ^{*)} . Selecting one of the items opens a window with the possibility to print the selected type of Document.

^{*)} No History Trend in CMX Light

Other Windows

There are three main types of windows in CMX.

1. The main window, described in the previous chapters.
2. Windows appearing in the work area of the main window, e.g. the item properties window. These windows are closely related to things presented in the main window. That's why they are located in the work area. Additionally, you may open several of this type of windows at the same time.
3. Windows that appear outside the CMX main window. More or less "stand-alone" windows available for a specific task, e.g. the **Calibrators** window. You can open only one of these windows at a time. Also, working in the main window is not possible as long as one of these windows are open. To return to the main window, close the "stand-alone" window. The **Manual Entry** window falls into this category with the following exceptions: You can open several **Manual Entry** windows and also use the main window while the **Manual Entry** window(s) is/are open.

The layout and functionality of the third and second type of windows vary a lot, so there are not many common features in them. The Toolbar is however relatively common:

<i>New</i>	Clears all fields in the window and allows data entry of a new item
<i>Delete</i>	Deletes the currently shown item.
<i>Edit</i>	Allows editing the fields of the currently shown item
<i>Cancel</i>	Active only when adding a new item or editing an existing item. Cancels the edited/added item.
<i>Save</i>	Active only when adding a new item or editing an existing item. Saves the edited/added item.
<i>Close</i>	Closes the window
<i>Help</i>	Opens the Help window displaying help for the task at hand.

Multiple Users

Availability:

- CMX Light
- CMX Professional
- CMX Enterprise

Simultaneous Data Editing

When multiple users are working on the same database and two or more users are simultaneously editing the same record, then the one who saves his edits first “wins”. This is called **optimistic concurrency control**.

The changes made by other users are rejected and a message informing of the situation is shown for them.

See also: **Manual Check Out / Check In**

Accessibility

Availability:

- CMX Light
- CMX Professional
- CMX Enterprise

CMX's Accessibility feature allows limiting access of data on user group level. Define users in groups according to the department/plant etc. The accessibility for the following database items may be defined:

- Plant Structure Nodes,
- Calibrators,
- Calibrator Modules,
- Positions,
- Devices and
- Saved Filters.

The accessibility setting is done for each item individually (available among the item's properties). The setting is hierarchical; if the access of a plant node is denied for certain user groups, access to all nodes, positions and devices below that node are also denied.

This feature is useful, e.g. when a single database contains data of several departments/plants etc. Then users arranged to groups according to their department/plant see only the database items that concern them.

Notes.

Only users with the proper authorization can view and/or edit accessibility settings.

The possibility to save filters is not available in CMX Light.

See also:

Users and User Groups and **Site User Maintenance** both in section **Basic Settings**.

Uncertainty Calculation

Availability:

- CMX Light
- CMX Professional
- CMX Enterprise

CMX's Uncertainty Calculation feature can be configured according to your own needs:

- The uncertainty of Beamex calibrator modules is automatically available, e.g. among calibration results.
- CMX supports up to eight user defined uncertainties (B type uncertainties). They may be activated via the user interface customization tool.
- In calibration options, you may select whether the expanded uncertainty of all uncertainty components is shown among results or not.

Common Features

This chapter and its subchapters describe some features/utilities that is used not just in one window but in several CMX windows.

Context Menus (Pop-up Menus)

A Context Menu (pop-up menu) is a menu that appears when you click on the secondary mouse key. The menu is called a Context Menu because it provides tools suited for the place where the Context Menu was invoked.

CMX is provided with a wealth of Context Menus. If you are not sure what you can do at a certain moment or with a certain item, try opening the Context Menu. Then you will see a list of common tasks.

Drag and Drop Feature

Many of CMX's windows support the drag and drop feature. It is a quick tool for doing certain tasks in CMX, like selecting instruments for calibrations, printing, sets as well as linking Devices and Positions.

Selection List Features

Many of CMX's lists allow you to add a new item to it, if none of the available alternatives suit your needs.

If the item to be added does not require any additional information, e.g. a process connection, just write the new connection type and it is added to the list of process connections.

If the item to be added does not require any additional information, e.g. a process connection, just write the new connection type and it is added to the list of process connections.

When the item to be added requires additional information, CMX shows an item titled “<New...>” in the list. Selecting this option opens a window where you can create an all new item for the list.

An example of the latter feature is when you add a new calibrator to the database. If the Calibrator Model you are adding is not listed among Calibrator Models found in the database, select “<New...>”. A window opens where you can add the new Model and its Manufacturer into the database. All this is done without opening the **Calibrator Manufacturers** window where Calibrator Model and Manufacturer data is viewed and maintained.

Activation/Deactivation

Availability:

- CMX Light
- CMX Professional
- CMX Enterprise

CMX's Activation/Deactivation feature allows activation and deactivation of Positions, Devices as well as most of the other items shown in a Tree Structure. Deactivation of, e.g. a Device means that the Device is no longer used. The deactivated item has a small red “x” in the lower right corner of the icon shown in the Tree Structure.

Deactivation is hierarchical. When you, e.g. deactivate a Plant Structure node, all Positions, Devices, Functions and Procedures below that node are also deactivated. Furthermore: (re)activation is also hierarchical.

Note.

Deactivation is not possible for a Device that is installed in a Position. Unlink the Device and then deactivate it.

Check Out /Check In

Check Out / Check In feature is a tool that locks Positions/Devices for other users than the one who did the Check Out. This feature is presented in section **Check Out /Check In**.

Calibration Result Lock/Unlock

Availability:

- CMX Light
- CMX Professional
- CMX Enterprise

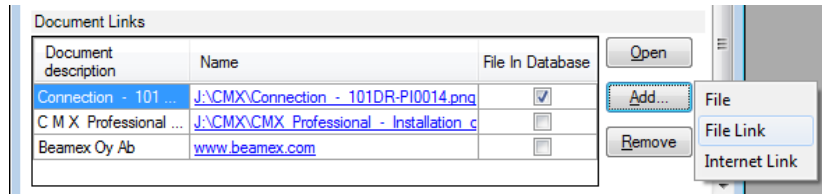
Calibration Result Lock/Unlock allows locking/unlocking approved calibration results. Locking prohibits any unintentional changes to the calibration results.

Note.

This "Common Feature" is available only when Mobile Security Plus Option is in use.

Document Links

Several items in CMX's database include a possibility to link documents to them.



CMX supports three kinds of document links:

- **File.** This embeds the document into the database. Because of the risk of increasing the database size, this option can be enabled/disabled in **CMX Options** windows' **General Settings**. For an embedded file, the check box in **File in Database** column is checked.
- **File Link.** This option adds a link to an external file. The file itself is not embedded in CMX's database, just the link. For a linked file, the check box in **File in Database** column is not checked.
- **Internet Link.** This adds an internet link to the list. When adding the link, omit the beginning (<http://>).

Note.

The number of links for each item is not limited. Additionally, there are no file type restrictions. Any file will do just as long as you have software suited to view the file.

User Fields

Availability:

- CMX Light
- CMX Professional (*)
- CMX Enterprise

*) Part of CMX Professional's Option: "Configurable User Interface"

User Fields may freely be used for whatever suits your needs. They are however not visible by default.

Free Field 1	<input type="text"/>
Free Field 2	<input type="text"/>
Free Field 3	<input type="text"/>
Free Field 4	<input type="text"/>
Free Field 5	<input type="text"/>
Free Check 1	<input type="checkbox"/>
Free Check 3	<input type="checkbox"/>
Free Check 5	<input type="checkbox"/>
	Free Check 2 <input type="checkbox"/>
	Free Check 4 <input type="checkbox"/>

To make the User Fields visible you must have the user rights to customize CMX's User Interface. Customizing is described in **Basic Settings** section's chapter **Customizing the User Interface**.

The text fields and check boxes may be freely used. The label text for the free field may be edited using either the User Interface customizing tools or the **Direct Editing of the User Interface** tool also described in the **Basic Settings** section.

Pocket PC option supports the use of all User Fields. Certain modern calibrators support calibration related User Fields and Checks. Any data entered into these fields are retrieved to CMX and can be seen among calibration results. To activate these fields in CMX (and compatible calibrators), customize the **Calibration Result Properties** window with **Customizing the User Interface**.

Software Options

This chapter presents available software options for CMX, i.e. additional features that are purchased either at the same time as CMX or later on to add CMX's functionality.

Note that most of the options presented further on are standard features in CMX Enterprise.

Availability:

- CMX Light
- CMX Professional
- CMX Enterprise

Report Designer Option

Allows you to create your own Calibration Certificate, Report, Label and History Trend Layouts.

More info in **Calibration Certificates and Other Documents** section's chapter **Creating Your Own Certificates**.

Availability:

- CMX Light
- CMX Professional
- CMX Enterprise

Change Management and Audit Trail Option

Change Management and Audit Trail option is a tool for keeping track of changes made to CMX's database.

More info in section **Change Management and Audit Trail**.

Availability:

- CMX Light
- CMX Professional
- CMX Enterprise

Optional Drivers for Non-Beamex Calibrators

Allows you to communicate with non-Beamex Calibrators. For more information contact Beamex or your local representative of Beamex products.

Availability:

- CMX Light
- CMX Professional
- CMX Enterprise

Pocket PC Interface Option

Makes it possible to send instrument data to a Pocket PC. Then the Pocket PC may be used as a portable manual calibration data entry tool. Entered results may then be transferred to CMX's main database.

More info in section **Pocket PC Interface**.

Availability:

- CMX Light
- CMX Professional
- CMX Enterprise

Weighing Instrument Calibration Option

Allows you to use CMX when calibrating Weighing Instruments.

More info in section **Calibrating Weighing Instruments**.

Availability:

- CMX Light
- CMX Professional
- CMX Enterprise

Maintenance Inspection Option

A tool for doing checks that yield answers "yes" or "no".

More info in section **Maintenance Inspection**

- Availability:*
- CMX Light
 - CMX Professional
 - CMX Enterprise

Work Order Handling Option

An enhanced utility for handling work orders sent from/to ERP (Enterprise Resource Planning) or CMMS (Computerized Maintenance Management System) software.

More info in section **Work Order Handling**.

History Trend Option

- Availability:*
- CMX Light
 - CMX Professional
 - CMX Enterprise

Allows you to view Calibration History data both numerically and graphically. The option makes it possible to evaluate calibrations and e.g. determine the instrument's drift between different calibrations.

More info in **Calibration** section's chapter **History Trend Option**.

Mobile Security Plus Option

- Availability:*
- CMX Light
 - CMX Professional
 - CMX Enterprise

CMX's tool that conforms to data integrity requirements.

More info in section **Mobile Security Plus**.

bMobile Communication Option

- Availability:*
- CMX Light
 - CMX Professional
 - CMX Enterprise

bMobile is a software for Android® and Windows® devices. It allows documenting calibration data for instruments sent from CMX, The results are then received to CMX for further analysis. **bMobile version 1** supports Maintenance Inspections only. **bMobile version 2** supports all instruments available in CMX's database.

User Interface Configuration Option

- Availability:*
- CMX Light
 - CMX Professional
 - CMX Enterprise

Allows you to edit the user interface to suit your needs.

More info in section **Basic Settings**, chapter **Editing the User Interface**.

LDAP Authentication Option

- Availability:*
- CMX Light
 - CMX Professional
 - CMX Enterprise

A possibility to use Lightweight Directory Access Protocol (LDAP) for user authentication.

More info in section **Basic Settings**, chapter **LDAP Options**.

Basic Settings

General

The Basic Settings section contains information of CMX's settings that should be checked/edited before taking CMX into full use. All settings can be changed later on too, but going through the settings at first makes the daily work more efficient.

Note.

If you utilize the Weighing Instrument Calibration feature, see chapter **Basic Settings for Weighing Instruments** in section **Calibrating Weighing Instruments**. It contains information of Weight Sets, Weights and other Weighing Instrument Calibration related Basic Settings.

The Options Window

The **Options** window can be opened from the main window's **Tools** menu. It allows you to define the following type of options:

- **General Settings.** What type of database queries are run at startup etc.
- **Function Due List.** Settings that define when CMX indicates that a Function is in need of calibration.
- **Calibrator Due List.** Settings that define when CMX indicates that a calibrator is in need of re-calibration.
- **ID Generation.** Needed if you want CMX to automatically generate Position/Device IDs.
- **Certificate.** Contains fields for defining how the calibration certificate number is generated.
- **Calibration.** Fields for defining calibration related settings.
- **Security.** Whether a password is required when logging in to CMX as well as other security matters.
- **Mobile Security.** Data Integrity settings for Mobile Security Plus option.
- **LDAP.** Lightweight Directory Access Protocol settings.
- **Change Management.** Different Audit Trail and Electronic Signature related settings.

*Availability of
Mobile Security, LDAP
and Change
Management:*
-- CMX Light
 CMX Professional
 CMX Enterprise

The subsequent chapters have additional information of each setting.

Note.

Certain option pages may also be opened directly from a configuration window, e.g. the **Security** page may be opened from the **Tools** menu of the **Users** window.

General Settings

As the name implies, the page contains settings that define what is done while starting up CMX (e.g. Position Query) or when opening certain windows, like the **Calibrator** window.

Field level information is available in the on-line help delivered with CMX.

Function Due List Options

In the Tree view, CMX uses yellow text color for the Position ID / Device ID to indicate that one or more of the Position's/Device's Functions need to be calibrated soon. Here you can define the time interval CMX uses for activating the "Function in need of calibration" color.

Notes.

Red text color for the Position ID / Device ID indicates that the calibration of one or more of the Position's/Device's Functions are overdue (the scheduled calibration date has expired).

The same colors indicating the need of recalibration are used for Calibrators and Calibrator Modules in their respective trees.

Field level information is available in the on-line help delivered with CMX.

Calibrator Due List Options

This page allows you to define the time interval CMX uses for activating the yellow "Calibrator in need of re-calibration" color.

Field level information is available in the on-line help delivered with CMX.

ID Generation Options

Each Position and Device need to have a unique ID. It is used for identifying Positions and Devices.

The Position ID and/or the Device ID can be manually entered or created automatically, if activated on this page. Also the format of the automatically created IDs (prefix-number-suffix) can be defined.

Field level information is available in the on-line help delivered with CMX.

Calibration Certificate Options

Each calibration is assigned with a unique certificate number. This number will appear on every calibration certificate which is produced for that calibration.

Field level information is available in the on-line help delivered with CMX.

Calibration Options

This page allows you to define calibration related settings, like is "**Save as Both**" allowed, i.e. the results of one calibration repeat is saved both as **As Found** and as **As Left** results when no adjustment was needed.

Field level information is available in the on-line help delivered with CMX.

Security Options

On this page you can define whether users need a password as well as various other password related settings.

Changing these settings is allowed to database administrators and users with the rights to change security options.

Field level information is available in the on-line help delivered with CMX.

Mobile Security Options

Mobile Security Plus is CMX's Data Integrity feature.

Field level information is available in the on-line help delivered with CMX.

Availability:

- CMX Professional
- CMX Enterprise

LDAP Options

Availability:

- CMX Light
- CMX Professional
- CMX Enterprise

LDAP is short for **Lightweight Directory Access Protocol**. It is a method used in networks to authenticate/identify users. When you try to log on to a network, an LDAP server approves (or disapproves) your login.

If LDAP is enabled in CMX, it supersedes CMX's password settings. Then, instead of checking users' passwords from CMX's database, they are checked from an LDAP server on the network. The network user name must however exist as a CMX **User ID** too.

Changing these settings is allowed to database administrators and users with the rights to maintain LDAP options. Additionally: Editing LDAP settings should be performed by, or with the help of, people with experience of LDAP and knowledge of company's Local Area Network settings. Preferably someone from company's IT support.

Field level information is available in the on-line help delivered with CMX.

Note.

You may override LDAP authentication by using CMX's License Key number as the User ID and Master Password as the password. Both the License Key number and the Master Password were shipped with the original delivery of CMX.

Availability:

- CMX Light
- CMX Professional
- CMX Enterprise

Change Management Options

If Change Management feature is part of your CMX, this page allows you to change settings concerning changes to the instrument database.

The uppermost check box determines whether **Audit Trail** used or not. Other fields refine how Audit Trail is utilized.

If required, activate the **Electronic Signature** feature using the check box with the same name.

Field level information is available in the on-line help delivered with CMX.

More information about the Audit Trail window and the Electronic Signature is available in section Change Management and Audit Trail.

Users and User Groups

The **Users** window can be opened from the main window's **Tools** menu. It is located in the **Security** submenu.

The left pane of the window displays either a Tree Structure list of Users or User Groups / Sites, depending on which tab is selected. The right pane displays property data for the User or User Group / Site, selected from the list on the left pane.

Actually, the tabs on the left pane do not reveal anything new (compared with each other). They display the same information but the viewpoint is different:

- When the **Users** tab is selected all users are shown and for each user the groups he/she belongs to can be seen on the next tree level.
- When the **User Groups** tab is selected, all User Groups / Sites are shown and for each group/site, the users belonging to it can be seen on the next tree level.

Availability of Site User Maintenance:
-- CMX Light
● CMX Professional
● CMX Enterprise

To streamline the use of large corporate databases in CMX, a possibility to define Sites and Site Managers is also available. More of **Site User Maintenance** is available in chapter **Site User Maintenance** on page 48.

Note.

Users entered into CMX's database need not be users that actually do calibrations. Users responsible for the calibration/maintenance duties may also be entered. They for instance sign calibrations and accept changes made to the database.

About What to Do With Users and User Groups

The easiest way to work with CMX is using only one user definition with the password security inactivated. The password security settings are easily available via the **Tools** menu in the **Users** window (as well as from the main window's **Tools** menu's **Options** window's **Security** page). The drawback for this easy method is that anyone with access to the computer where CMX is installed may start the software and do what they please.

When CMX is installed and started for the first time: The safe way is to change the administrator password from its default value (delivered in an envelope together with the software

installation kit), memorize the new administrator password and create a suitable set of **Users** and **User Groups**.

Each User must belong to at least one User Group. If the password security is enabled, a button for defining the user's password is available in the user's property data.

Define the permissions (what the group members are allowed to do with CMX) for each User Group.

Note.

CMX automatically places the current Windows® User ID as the default user for logging into CMX. For ease of use, enter the same User IDs into CMX.

Supervisors

Supervisors are by default allowed to do anything that can be done with CMX, e.g. add Users, reactivate a User account, define User Groups etc. A Supervisor need not be assigned to any Group, Supervisors have all rights anyhow.

Whether a user is a Supervisor or not, can be seen (or edited, if you have the permission) in the property data shown on the right hand side of the **Users** window.

There is no upper limit for the amount of supervisors but at least one Supervisor is required. CMX does not allow deleting the last Supervisor.

See also note in chapter **User Deactivation and Lock Out** on page 46.

Users

Each person using the database may be assigned a unique User ID (assigned by a Supervisor) and optionally a password. A User can belong to one or more User Groups depending on the duties of that particular User.

If **Mobile Security Plus** option is in use, define users of supported **Mobile Devices** as **Mobile Users** and, users who may have more permissions in the Mobile Devices, as a **Mobile Supervisor**. More of Mobile Security Plus in section **Mobile Security Plus**.

Field level information is available in the on-line help delivered with CMX.

Notes.

The permissions are defined for User Groups. Once a User is assigned to a Group, he/she gets the permissions defined for that Group.

If LDAP authentication is enabled, for all CMX users:

Enter the same CMX **User IDs** as is used as **User Names** in Windows network. See also **LDAP Options** on page 42.

At the **Users** window's bottom left corner is a check box:

Show only mobile users. When checked, all non-Mobile Users are temporarily hidden. This is of use especially when **Mobile Security Plus** option is used and some users have been defined as **Mobile Users**.

Changing the Password

Each user may change their own password. Changing the password is available in the main window's **Tools, Security** menu (provided that passwords are used).

Supervisors and Users belonging to a **User Groups** with the permission to maintain Users and User Groups may change the password of all users in the **Users** window which can be opened from the main window's **Tools, Security** menu.

Note.

If LDAP authentication is enabled, passwords are not changed in CMX. With LDAP, the handling of passwords is maintained in Windows. See **LDAP Options** on page 42.

For details on how to change Mobile User Password, see chapter **Options Window** in section **Mobile Security Plus**.

User Deactivation and Lock Out

CMX automatically defines users as **Inactive Users** if the User's Expiration Date has passed. A User may also be **Locked** if too many illegal attempts to log into the database was done using that particular User Name.

The Supervisor and a User belonging to a User Group with the permission to maintain Users and User Groups have the rights to activate and release locked Users.

To activate a user, edit the Expiration Date field.

To unlock a User, click the **Release User** button.

Note.

User's expiry date does not apply to Supervisors. A Supervisor can access the database as long as he/she has Supervisor rights.

User Groups

A Supervisor or a User belonging to a Group with permission to maintain Users and User Groups may add and remove User Groups as well as change the permissions of User Groups.

Field level information is available in the on-line help delivered with CMX.

Permissions

The permissions tab shown for User Groups contains a list of commands and tasks available in CMX.

A command or a task that is unchecked in the list may not be performed by users belonging to that group. They are disabled in CMX's menus and toolbars.

A list of available permissions is available in CMX on-line help.

See also:

Accessibility in section **General Presentation of CMX**.

Site User Maintenance

Availability of Site User Maintenance:

- CMX Light
- CMX Professional
- CMX Enterprise

CMX's Site User Maintenance makes it possible to organize the use of CMX in, e.g. large groups of companies.

Standard **Users** and **User Groups** are all managed by **Supervisors** or Users belonging to a User Group that have permissions to maintain Users and User Groups. However, when a CMX database is commonly managed for several sites, all Users with permissions to maintain Users and User Groups can see/edit all Users and User Groups.

When utilizing Site User Maintenance, Supervisors can create **Site Groups** and **Site Managers** who maintain Users in the site and groups they belong to only.

Note.

Site User Management affects **Accessibility**, **Owner Group** and **Owner** selection lists. More of this in chapter **Working with Site User Maintenance**.

Working with Site User Maintenance

First of all, you need to enable Site User Maintenance. This is done in **Tools, Options** Window's **Security** section. Make sure the **Enable Site User Maintenance** check box is checked. Note that this setting can be changed by **Supervisors** and **Users** having the permission to maintain security options. After Site User Maintenance is enabled, **Site Groups** and standard **User Groups** can be created by **Supervisors only**.

Here's how a Supervisor creates Site Groups and Site Managers and takes the feature into use:

1. Create new User Groups with **Site Group** check box checked. Each Site Group is a site/plant/company/sub-organization in the group of companies as defined by the Supervisor. Site Groups have special characteristics as presented further on.
2. Add a standard User Group with **User Maintain** permission, among other suitable permissions. You may name the User Group freely, but a descriptive one, like **Site Managers** is recommended.
3. If no standard User Groups with permissions for different tasks exist, create them.
4. Add all Users that you want to include as Site Managers to the Site Managers group, other applicable standard User Groups and applicable Site Group(s). **Note that after Site User Maintenance is enabled, all new non-supervisor users need to belong to a Site Group.**
5. Add/assign other Users to Site Groups and applicable standard User Groups, or give this task to a Site Manager.
6. Additionally, to fully utilize Site User Maintenance, the Accessibility settings should be set according to the current Site Group definitions. More of this further on.

Notes.

Adding standard User Groups is recommended, since they can be used to define different permissions for different Users. Each User is then assigned to (at least) one standard User Group that defines the User's permissions and also to a Site Group which defines the User's location in the organization.

Any non-supervisor Users added before Site User Maintenance was enabled may (inadvertently) be unassigned to a Site Group. Users not assigned to any Site Group are not able to log into CMX. Make sure all non-supervisor Users are assigned to at least one Site Group when Site User Maintenance is active.

About Site Managers:

- A Site Manager is allowed to maintain users belonging to the Site Groups and Standard User Groups the Site Manager belongs to.
- If a Site Manager adds Users to CMX, each User must be assigned to a Site Group and (preferably) also to a standard User Group.
- Only the Site Groups and standard User Groups the Site Manager belongs to are visible to him/her.
- Site Managers may view but not edit the permissions of any groups visible to him/her.
- Site Managers cannot create new Site Groups or standard User Groups.

About Site Groups:

- A **Site Group** is shown among standard **User Groups**. To distinguish a Site Group from a standard User Group, the group name for the Site Group is shown in blue in the tree structures. To more easily distinguish a Site Group from a User Group, the use of a prefix is recommended, e.g.: "**> Paper Mill, Finland**".
- Although permissions may be defined for a Site Group (by a Supervisor), it is not recommended. All Users assigned to a Site Group will inherit the permissions from the Site Group as well as the permissions from the standard User Group the User belongs to.

About Accessibility and Owner Settings

Accessibility, *Owner Group* and *Owner* are selection list fields available in several property windows. They define the visibility and ownership of the item currently viewed.

- *Accessibility* is available in:
Plant Structure Node, Position, Device, Calibrator, Module and Filter property windows.
- *Owner Group* is available in:
Plant Structure Node, Position and Device property windows.
- *Owner* is available in:
Plant Structure Node, Position, Device and Procedure property windows.

The contents of the selection lists vary depending on whether Site User Maintenance is enabled or not:

- When Site User Maintenance is **enabled**:
Accessibility and *Owner Group* selection lists contain Site Groups. Only the Site Groups the current User belongs to are shown. Supervisors have all Site Groups available.
Owner selection list contains Users that belong to the same Site Group(s) the current User belongs to.
- When Site User Maintenance is **disabled**:
Accessibility and *Owner Group* selection lists contains all User Groups.
Owner selection list contains all Users.

More of Accessibility in chapter **Accessibility** in section **General Presentation of CMX**.

Plant Structure

An example of a Plant Structure:



The **Plant Structure** is opened from by selecting **Plant Structure** from the main window's **Tree View Selection Tabs**.

The Plant Structure displays a hierarchical view of where the Positions (instruments) are located.

CMX's Plant Structure allows you to create as many levels as is needed for the Plant Structure. The green slanted squares in the example picture are "Plant Structure Nodes". A Node can be anything that somehow defines all or part of the plant.

Positions are at the end of a hierarchical chain of Nodes. Positions need not be located at a certain hierarchy level. They may be placed on any level.

Creating a Plant Structure is optional, but if you create one, we recommend creating it before you start adding Positions. Then, while adding Positions you are able to select its location in the readily made Plant Structure.

Working With Plant Structure Nodes

Adding Plant Structure Nodes

Adding a Plant Structure Node is done in the following manner:

1. Select an existing Node that is hierarchically just above the level of the intended new node (or the green folder on top of the Plant Structure).
2. Either click the secondary button on your mouse above the selected node or use the **New** button found in the Node Property window's toolbar. The new node is added hierarchically below the previously selected/viewed node.
3. Enter a **Name** for the Plant Node and make sure that the **Active Plant Node** Check box is checked. All other fields are optional.

Full field level information of the Node properties are available in the on-line help delivered with CMX.

Notes.

Adding a Node to a Position is not possible. A “chain of Nodes” ends in a Position.

You cannot add a Position to the Plant Structure’s top level (the green folder). The items just below the top level have to be Nodes.

A description of how to add Positions to CMX’s database is in section **Adding Instruments to the Database**.

Editing Plant Structure Nodes

Make sure you have the properties window opened in the Main Window’s Work Area. If not, click the **Properties** button in the Main Window toolbar.

To edit a Plant Structure Node, select it in the Tree Structure and click the **Edit** icon in the properties window’s toolbar.

Deleting Plant Structure Nodes

To delete a Plant Structure Node, open the Context Menu (Pop-up Menu) and select the **Delete** option.

Note.

Deleting a node also deletes all items hierarchically below the node to be deleted.

Device Manufacturers

The **Device Manufacturers** window can be opened from the main window's **Database** menu. Select the **Device Manufacturers** option.

The **Device Manufacturers** window is primarily meant for editing existing Manufacturer and Model data. Adding Manufacturers and Models can easily be done in the main window while adding Devices. There is of course the possibility to add Manufacturers and Models in the **Device Manufacturers** window too, if you want it.

Also: Entering Device Manufacturer and Model data is optional. If full device data (e.g. rangeability, wetted parts material process connection etc.) is entered for all instruments anyhow, this is a way of creating "device templates" that speed up the adding of Positions (instruments to be calibrated) later on.

Note.

There is a separate window for **Calibrator Manufacturers** presented on page 63, so only data for instruments to be calibrated should be entered here.

Working With Device Manufacturers

Adding Device Manufacturers

To add a Device Manufacturer to CMX's database, select either **File, New, Device Manufacturer**, use the Context Menu or click the **New** icon on the **Manufacturers** window's toolbar while a Manufacturer is selected in the Tree Structure.

Full field level information of the Device Manufacturer properties are available in the on-line help delivered with CMX.

Notes.

A Device Manufacturer is also added to the list of **Calibrator Manufacturers**. This minimizes the workload if a single manufacturer delivers both devices that need to be calibrated and calibrators.

Editing Device Manufacturers

To edit a Device Manufacturer in CMX's database, select it in the Tree Structure and choose either **File, Edit Record** or click the **Edit** icon on the **Manufacturers** window's toolbar.

Deleting Device Manufacturers

To delete a Device Manufacturer from CMX's database, select it and then choose either **File, Delete** or use the Context Menu or click the **Delete** icon on the **Manufacturers** window's toolbar.

Note.

Deleting a Device Manufacturer is not possible if there is a reference to the Manufacturer in the database.

Working With Device Models

Device Models are a kind of "templates" in CMX. Create a model of all types of Devices a Device Manufacturer produces (and is in use on your plant). Then each time a new item of that same model is bought, you only need to select the model from CMX's list and enter the serial number to add the instrument to the database.

Adding Device Models

To add a Device Model to CMX's database, select either **File, New, Device Model**, use the Context Menu or click the **New** icon on the **Manufacturers** window's toolbar while a Device Model is selected in the Tree Structure.

Full field level information of the Device Model properties are available in the on-line help delivered with CMX.

Notes.

The Device Model will be added to the selected Manufacturer on the Tree Structure. If a Device Model is selected, the new Device Model will be added to the same Device Manufacturer as the selected Device Model.

Currently there is no possibility to move a Device Model from one Manufacturer to another.

Editing Device Models

To edit a Device Model in CMX's database, select it in the Tree Structure and choose either **File, Edit Record** or click the **Edit** icon on the **Manufacturers** window's toolbar.

Deleting Device Models

To delete a Device Model from CMX's database, select it and then choose either **File, Delete**, use the Context Menu or click the **Delete** icon on the **Manufacturers** window's toolbar.

Note.

Deleting a Device Model is not possible if there is a reference to the Device Model in the database.

Calibrators

The **Calibrators** window can be opened from the main window's **Database** menu. Select the **Calibrators** option.

If you have purchased the Weighing Instrument Calibration option, see chapter **Basic Settings for Weighing Instruments** in section **Calibrating Weighing Instruments**. It contains information of Weight Sets, Weights and other Weighing Instrument Calibration related Basic Settings.

Here you can manage all the calibrators you use. Entering Calibrator, Calibrator Module and Module Range data is needed for the traceability of the performed calibrations. The Module Range is a quantity the module is capable of measuring or sourcing within a certain measurement range.

The left pane of the window contains a **Calibrators** and a **Modules** tab.

- The **Calibrators** tab displays a Tree Structure of all Calibrators with the installed Modules, suitable external Modules and the measurement Ranges of the Modules. The Tree Structure does however not show any free internal Modules.
- The **Modules** tab shows a Tree Structure of all modules. The Module's Ranges are shown and if the Module is installed in a Calibrator, the Calibrator is shown below the Module before the Ranges. The Tree Structure does however not show any Calibrators with no installed Modules.

To be able to use a Calibrator it has to have one or more Modules (with measurement Ranges) installed.

Notes.

If you have a Calibrator that is not modular (or has only one module), just repeat the Calibrator data for the module and then add the Module Range(s) for the calibrator.

Adding Calibrator Manufacturers and Models can be done while adding Calibrators. Just select the "<New...>" option from the list of Models/Manufacturers.

Working With Calibrator Data

Adding Calibrators

How to **add** a Calibrator to CMX's database depends on the Calibrator at hand:

- For communicating Beamex Calibrators: Use the **Detect Calibrator** button found in the lower left corner of the **Calibrators** window or the **Detect Calibrator** option found in the **Tools** menu. Then CMX will automatically add the connected Calibrator, its Modules and measurement Ranges to the database.

Note.

Modern calibrators utilizing USB communication require that a USB driver is installed before they communicate with CMX. For more details, see section **Additional Information**, chapter **Calibrators and USB Communication**.

- All other Calibrators (and their Modules and measurement Ranges) are manually added to the database. Select either **File, New, Calibrator**, use the Context Menu or click the **New** icon on the Calibrators window's toolbar while a Calibrator is selected on the Tree Structure on the left.

The required fields are Calibrator Model and Serial Number. The Serial Number field is required since it identifies the new Calibrator from others that are of the same Model. Entering a Calibration due date, allows CMX to indicate the need to recalibrate. Therefore the Due Date field is recommended.

Select the Calibrator Model from the list of pre-entered Models (see **Working With Calibrator Models**) or if you are adding a new Model, select the last item on the list: **<New...>** and enter new Calibrator Model data as described in **Working With Calibrator Models** on page 64.

Full field level information of Calibrator properties are available in the on-line help delivered with CMX.

To manually add Modules to a calibrator, see the chapters **Adding Modules** on page 59 and **Installing and Removing Modules to/from a Calibrator** on page 61.

Note.

Adding a Calibrator manually while viewing the Tree Structure of the **Modules** tab gives seemingly no results. Since the new calibrator has no installed modules it is only shown in the Tree Structure of the **Calibrators** tab.

Adding Modules

When adding modules, check first where the highlight is in the Tree Structure:

- If you are viewing the **Calibrators** tab and the highlight is on the query level (the uppermost row of the Tree Structure), the new Module will be a free Module not shown in the Tree Structure of the **Calibrators** tab. To view your newly created Module, switch to the **Modules** tab.
- If you are viewing the **Calibrators** tab and the highlight is on any other level than the query level, the new Module will automatically installed to the highlighted Calibrator. If a Module or a Range is highlighted, the new Module will be installed to the same Calibrator as the highlighted Module/Range.
- If you are viewing the **Modules** tab and the highlight is on a Calibrator level, a new internal Module will automatically installed to the highlighted Calibrator. In all other cases, the new Module will be a free Module.

The required fields are: Module, Model Manufacturer and Serial Number. The Serial Number field is required since it identifies the new Model from others that are of the same Model.

Select the Manufacturer from the provided list. Similarly, select the Module Model from the list of pre-entered Module Models (see **Working With Module Models**) or if you are adding a new Model, select the last item on the list:

<New...> and enter new Module Model data as described in **Working With Module Models** on page 65.

Full field level information of Calibrator Module properties are available in the on-line help delivered with CMX.

Adding Module Ranges

To add a measurement Range to a Module, select the Module or a Range that is already added to the Module. Then select either **File, New, Module Range**, use the Context Menu or click the **New** icon on the Calibrators window's toolbar while a measurement Range is selected on the Tree Structure on the left.

The primary required fields are: Range Name, Quantity, High Limit and Low Limit,

Pressure Type field is needed when the Quantity field is set to Pressure.

Temperature Scale and Sensor Type fields are needed when the Quantity field is set to Temperature.

Reference Junction and RJ Temperature fields are needed when the Sensor Type is a Thermocouple. If the RJ Mode field is set to "External", then also the External Sensor Type and External Wire field need values.

Wire is needed when the Sensor Type is a RTD-sensor or the unit for the Electrical quantity is "ohm" or "kohm".

Fields starting from Temp. Coefficient are needed for error calculation and uncertainty calculation. Leaving any of the fields unchecked may result in unpredictable error/uncertainty results.

Full field level information of Calibrator Module Range properties are available in the on-line help delivered with CMX.

Installing and Removing Modules to/from a Calibrator

If you add Modules to CMX's database using the CMX's possibilities efficiently (see chapters **Adding Calibrators** on page 58 and **Adding Modules** on page 59), the Modules are automatically installed to the Calibrators.

If you however for some reason need to install or remove Modules, select the Calibrator in the Tree Structure (no matter on which tab, Calibrators or Modules), From the properties window on the right, select the Installed Modules tab. Then you will see a list of free Modules and Modules installed to that calibrator. Click the **Edit** button on the Property window's Toolbar. Then the buttons between the two lists allow you to move Modules from one list to another.

Note.

This chapter explains how to "install and remove" Modules from a Calibrator in CMX software. Refer to the Manuals of the Calibrators on how to do it for the actual Calibrator (if it is allowed for calibrator users).

Editing Calibrators/Modules/Module Ranges

To edit a Calibrator/Module/Module Range in CMX's database, select it in the Tree Structure and click the **Edit** icon on the property window's toolbar or select **Edit Record** from the **File** menu.

Deleting Calibrators/Modules/Module Ranges

To delete a Calibrator/Module/Module Range from CMX's database, select it and then choose either **File, Delete**, use the Context Menu or click the **Delete** icon on the **Calibrators** window's toolbar.

Notes.

Deleting is not possible if there is a reference to the Calibrator/Module/Module Range in the database.

If a calibrator to be deleted is on a list of *Calibrators to Use*, CMX asks for confirmation before the calibrator is deleted.

Calibrators to Use field can be found among **Calibration Procedure** data.

When deleting a Calibrator/Module/Module Range, all items hierarchically below the item to be deleted will also be deleted.

Copying Calibrators

CMX includes a possibility to copy Calibrators together with its Modules and Module Ranges. This is useful when you have several similar calibrators in use. Add just one and copy the rest from the first one. All you need to do is add the serial numbers to the copied items.

When in **Calibrators** window, viewing Calibrators, click with mouse's secondary button (rightmost button for right handed users) on a Calibrator you want to copy. The pop-up menu includes a **Copy** option.

This pop-up menu option copies the calibrator, all modules and module ranges linked to it and prompts for serial numbers to the new Calibrator and its Modules.

The **Copy** option is also available in **Calibrators** window's **File** menu. The functionality is the same as for the option in the pop-up menu.

Note.

Possible document links are not copied.

Calibrator Manufacturers

The **Calibrator Manufacturers** window can be opened from the **Calibrators** window's **Database** menu. Select the **Calibrator Manufacturers** option.

Just as with Device Manufacturers, entering Calibrator Manufacturer and Model data is optional but makes it easier to add similar Calibrators and Calibrator Modules to the database. Full data is entered only once. Then only the unique data (e.g. the serial number) need to be entered for individual Calibrators and Calibrator Modules.

Note.

There is a separate window for entering **Device Manufacturers** presented on page 54, so only data of calibrators should be entered here.

Working With Calibrator Manufacturers

Adding Calibrator Manufacturers

To add a Calibrator Manufacturer to CMX's database, select **File, New, Calibrator Manufacturer**, the **New** button in the toolbar or use the Context Menu.

The only required field is the Manufacturer Name field. All other fields are optional.

Full field level information of the Calibrator Manufacturer properties are available in the on-line help delivered with CMX.

Note.

A Manufacturer of Calibrators is also added to the list of Device Manufacturers. This minimizes the workload if a single manufacturer delivers both calibrators and devices that need to be calibrated.

Editing Calibrator Manufacturers

To edit a Calibrator Manufacturer in CMX's database, select it in the Tree Structure and choose either **File, Edit Record** or click the **Edit** icon on the **Calibrator Manufacturers** window's toolbar.

Deleting Calibrator Manufacturers

To delete a Calibrator Manufacturer from CMX's database, select it and then choose either **File, Delete**, use the Context Menu or click the **Delete** icon on the **Calibrator Manufacturers** window's toolbar.

Note.

Deleting a Calibrator Manufacturer is not possible if there is a reference to the Manufacturer in the database.

Working With Calibrator Models

Adding Calibrator Models

To add a Calibrator Model to CMX's database, select either **File, New, Calibrator Model**, use the Context Menu or click the **New** icon on the **Calibrator Manufacturers** window's toolbar while a Calibrator Model is selected in the Tree Structure.

The only required field is the Model field. All other fields are optional.

Full field level information of Calibrator Model properties are available in the on-line help delivered with CMX.

Notes.

The Calibrator Model will be added to the selected Manufacturer on the Tree Structure. If a Calibrator Model or a Module Model is selected, the new Calibrator Model will be added to the same Calibrator Manufacturer as the selected Calibrator Model or Module Model.

Currently there is no possibility to move a Calibrator Model from one Manufacturer to another.

Editing Calibrator Models

To edit a Calibrator Model in CMX's database, select it in the Tree Structure and choose either **File, Edit Record** or click the **Edit** icon on the **Calibrator Manufacturers** window's toolbar.

Deleting Calibrator Models

To delete a Calibrator Model from CMX's database, select it and then choose either **File, Delete**, use the Context Menu or click the **Delete** icon on the **Calibrator Manufacturers** window's toolbar.

Note.

Deleting a Calibrator Model is not possible if there is a reference to the Model in the database.

Working With Module Models

Adding Module Models

To add a Module Model to CMX's database, select either **File, New, Module Model**, use the Context Menu or click the **New** icon on the **Calibrator Manufacturers** window's toolbar while a Module Model is selected in the Tree Structure.

The required fields are **Model**, **Manufacturer** and **Module Type**. In order to enable CMX to communicate with the calibrator in which the module is installed, a Communication Name must be defined. All other fields are optional.

Full field level information of the Module Model properties are available in the on-line help delivered with CMX.

Notes.

The Calibrator Module Model will be added to the selected Manufacturer on the Tree Structure. If a Calibrator Model or a Module Model is selected, the new Module Model will be added to the same Calibrator Manufacturer as the selected Calibrator Model or Module Model.

Currently there is no possibility to move a Calibrator Module Model from one Manufacturer to another.

Editing Module Models

To edit a Module Model in CMX's database, select it in the Tree Structure and choose either **File, Edit Record** or click the **Edit** icon on the **Calibrator Manufacturers** window's toolbar.

Deleting Module Models

To delete a Module Model from CMX's database, select it and then choose either **File, Delete**, use the Context Menu or click the **Delete** icon on the **Calibrator Manufacturers** window's toolbar.

Note.

Deleting a Module Model is not possible if there is a reference to the Model in the database.

Lists

What is a List?

Most devices have a process connection, e.g. a ¼" thread for that particular purpose. If you enter a lot of device data it will be an arduous work to write the same connection info over and over. To minimize the workload, CMX offers the Lists.

Enter the frequently repeated data into the lists. Then whenever the data is needed you just pick it from the list of pre-entered options. No need to write it over and over again.

The **Lists** window is primarily meant for editing existing list data. Adding list items can easily be done while selecting data from a list seen in other windows. There you just enter the missing item to the list. There is of course the possibility to add list items in the **Lists** window too, if you want it.

Currently CMX provides the following lists:

- Calibrator Hierarchy,
- Process Connection^{*},
- Process Medium^{*},
- Signature Status⁺,
- Audit Trail Description⁺ and
- User Defined Units.

^{*}) *Not available in CMX Light*

⁺) *Not available in CMX Light and optional in CMX Professional*

Editing Lists

The **Lists** window can be opened from the main window's **Database** menu. Select the **Lists** option.

Select one of the available lists and view the current list items in the table below.

Editing existing items in a list

Select **File, Edit**, click the **Edit** icon in the toolbar or use the Context Menu's **Edit** option.

Adding items to a list

Select **File, New**, click the **New** icon in the toolbar or use the Context Menu's **New** option.

Deleting items from a list

Select **File, Delete**, click the **Delete** icon in the toolbar or use the Context Menu's **Delete** option.

Note.

Adding User Defined Units is not done in **Lists** window. They can only be edited/deleted in **Lists** window.

A User Defined Unit is added using one of the following methods:

1. Create a new instrument and for its Function, select **Value** as **Input** and/or **Output Quantity**. Then enter the Range values and instead of selecting an existing User Defined Unit, just write your own unit.
2. Create a new Function Template. Set **Input** and/or **Output Quantity** as **Value** and enter a new User Defined Unit as part of the measurement/keyed **Range**.
3. Edit an existing Function with **Value** as **Input** and/or **Output Quantity**. Enter a new User Defined Unit as part of the measurement/keyed **Range**.

When a User Defined Unit is added using one of the above mentioned methods, the new unit is included in the list of User Defined Units shown in **Lists** window.

Function Templates

CMX's Function Templates help adding Functions to Devices and Positions. CMX is shipped with a pre-entered set of Function Templates. The pre-entered Function Templates may be edited and new templates may be created/copied according to your own needs.

Each Function typically has at least one Calibration Procedure. The procedure contains, among other things, the calibration points and error limits.

To maintain the existing Function Templates and their Calibration Procedures, select **Database, Function Template** in the main window's menu.

Function Template fields are similar to **Function Property Window Fields**.

Field level information for Calibration Procedures is available in the on-line help delivered with CMX.

Editing Function Templates and Calibration Procedure Templates

Select the item you want to edit in the **Function Template** window. Then either press the **Edit** button on the Toolbar or use the **File** menu's **Edit Record** option.

To save or cancel the edits, use either the option available in the toolbar or the corresponding options available in the **File** menu.

Creating a New Function Template

To create a new Function Template from scratch:

Make sure you have selected a Function Template in the Tree Structure. Click **New** on toolbar. The fields in the property window are cleared to allow you to create a new Function Template from scratch.

Another way to create a new Function Template is using the **New** option either in the **File** menu or in the pop-up menu of a Function Template.

A new Calibration Procedure Template is automatically created for the new Function Template. Please check its contents to make sure it suits your needs.

Function Template fields are similar to **Function Property Window Fields**.

See also **Copying a Function Template**. It allows you to make a new Function Template and Calibration Procedure Template(s) using an existing Function Template and its Calibration Procedure Template(s) as the sources for the new items.

Creating a New Calibration Procedure Template

To create a new Calibration Procedure Template from scratch:

Make sure you have selected a Calibration Procedure in the Tree Structure. Click **New** on toolbar. The fields in the property window are cleared to allow you to create a new Calibration Procedure from scratch.

Another way to create a new Calibration Procedure is using the **New** option either in the **File** menu or in the pop-up menu of a Calibration Procedure .

The new Calibration Procedure Template is automatically linked to the selected Function Template. If a Calibration Procedure Template was selected, the new Calibration Procedure Template is linked to the same Function Template that the selected Calibration Procedure Template is linked to. A Function Template may have several Calibration Procedure Templates or even no Calibration Procedure Template at all.

Calibration Procedure Template fields are similar to **Calibration Procedure Property Window Fields**.

See also **Copying a Function Template**. It allows you to make a new Function Template and Calibration Procedure Template(s) using an existing Function Template and its Calibration Procedure Template(s) as the sources for the new items.

Notes.

When adding Functions using the wizard:

The first active Calibration Procedure Template of a Function Template is always selected for use when creating a Position/Device/Function.

When adding Functions using the Tree Structure's pop-up menu:

The new Function contains all Procedures created for the selected Function Template.

Copying a Function Template

Copying allows you to create a new Function Template and Calibration Procedure Template based on existing ones.

To copy a Function Template and its Calibration Procedure Templates, select the **Copy** option from the pop-up menu appearing in the Tree Structure or use the corresponding option found in the **File** menu. Make sure you rename the new Templates according to your own needs.

The new Function Template inherits all the Calibration Procedure Templates of the original Function Template.

Deleting Function Templates and Calibration Procedure Templates

When deleting a Function Template or a Calibration Procedure Template, use one of the following methods:

- Select **Delete** from the toolbar
- Select **Delete** from the Tree Structure's Pop-up menu.
- Select **Delete** from the **File** menu.

Editing the User Interface

Availability:

- CMX Light
- CMX Professional
- CMX Enterprise

CMX has handy tools for editing the user interface according to your needs. All texts may be changed and fields that are of no interest to you may be hidden (does not apply to required fields). See also: **User Interface Language** on page 15.

Important!

If you have activated Window's UAC (User Account Control) feature do as follows:

Run CMX in **Run as administrator** mode when editing the User Interface. This is done, e.g. by clicking the secondary mouse button above CMX's icon and selecting **Run as administrator** from the pop-up menu. Otherwise you will lose all your edits.

Direct Editing of the User Interface

Availability:

- CMX Light
- CMX Professional
- CMX Enterprise

To use the Direct edit tool, select the main window's **Tools** menu's **User Interface** option. Choose the **Edit** option from the submenu. Now all fields in all CMX windows are available for editing.

Edit a field text by clicking on the secondary button of your mouse. Press Enter to stop editing the field text.

Remember to save the changes. The **Save** as well as the **Cancel Changes** options are in the menu where the editing was invoked.

Customizing the User Interface

Availability:

- CMX Light
- CMX Professional
- CMX Enterprise

User interface customizing is started from the main window's **Tools** menu's **User Interface** option. Choose the **Customize...** option from the submenu. Then a separate window for customizing the user interface is opened.

Select the window to be edited/customized from the list on the left side of the window. Press the **Edit** button and then edit/customize a field by clicking on the secondary button of your mouse.

The following editing/customizing utilities are available:

- **Editing** the field text
- Resetting the field to display the **default text**
- Defining a field as **hidden** or making a previously hidden field **visible**. This option is not available for required fields

Adding Instruments to the Database

General

CMX supports four ways of adding instruments to its database:

- Using the **Wizard** is the quick way of adding single Function Positions with an installed Device.
- Using the **Tree Views** seen in the main window. This method leaves all control to you. Positions, Devices, Functions and Calibration Procedure definitions are all added according to your own needs.
- **Copying** a Device and/or a Position. This possibility is found in the context menus of Tree Structures. More of this in chapter **Copying Positions and Devices**.
- **Receiving** new instruments from a calibrator supporting this feature (e.g. Beamex's communicating MC series calibrators do support this feature). More of this possibility in **Calibration** section's chapter **Receiving Calibration Result Data**.

About Instruments, Positions and Devices

For CMX an **Instrument** is anything that need to be calibrated or otherwise periodically checked. CMX adds the Instruments as Positions and Devices containing Functions and Calibration Procedures.

A **Position** (also called a "**Tag**") is the instrument's location seen in plans and drawings. Typically, it is the symbolic name for the Function(s) that is/are needed at a particular place of the plant (e.g. "TTIR" is the symbolic name used for a Temperature Transmitter, Indicator and Recorder found in instrumentation drawings).

A **Device** is the physical instrument installed into a Position. It realizes the Function(s) defined by the Position. Devices are occasionally removed from a Position (e.g. for maintenance), stored as Spare Devices and then reinstalled to either another Position or even the same Position it was installed in before.

CMX supports installation, removal and reinstallation of Devices. The chapters further on describe how to create and work with Positions and Devices.

Maximum Amount of Positions, Devices and Functions

The following table presents the amount of Positions, Devices and Functions that can be added to different CMX versions.

CMX version	Max. amount of Positions/Devices	Max. amount of Functions in Positions/Devices
<i>CMX Light</i>	300/300	400/400
<i>CMX Professional</i>	1.000/1.000, 5.000/5.000 10.000/10.000 or unlimited	1.300/1.300, 6.500/6.500 13.000/13.000 or unlimited
<i>CMX Enterprise</i>	Unlimited	Unlimited

The maximum amounts in CMX Professional are fixed when CMX Professional is purchased.

Using the Wizard

The **Wizard** can be started from the main window's toolbar or from the **Database** menu's **Wizard** option. It is the toolbar's leftmost button.

The Wizard is a fast tool for creating a new Position and an installed Device. You only need to fill in the fields required to create a Position (and a Device).

Notes.

The wizard creates a Position/Device with a single Function. To add more functions use the method described in chapter **Adding Functions** on page 79.

For maximum amount of Positions, Devices and Functions, see chapter **Maximum Amount of Positions, Devices and Functions** on page 74.

Step 1 of 5 - Position Data

Enter the basic Position data and its location in the **Plant Structure**. Either enter the plant path manually or select it by opening the Plant Structure Tree from the button on the right side.

Notes.

When entering the path manually, remember to use the path separator defined in the **General Settings**.

You cannot create the Plant Structure here, but select/enter the location of a previously added Plant Structure.

Field level information is available in the on-line help delivered with CMX.

Step 2 of 5 - Device Data

Enter the basic Device data.

Field level information is available in the on-line help delivered with CMX.

Step 3 of 5 – Function Template

Select one of the available Function Templates or use the last item on the list to create a User Defined Function.

All pre-entered templates are described in the on-line help delivered with CMX.

Note.

If a certain function need to be entered several times and there is no suitable Function Type available, consider creating a custom Function Type Template for it. See section **Basic Settings**, chapter **Function Templates**.

Step 4 of 5 – Function Data

Specify the input and output data for the Function. The fields shown vary depending on the selected Function Template.

Field level information is available in the on-line help delivered with CMX.

Step 5 of 5 – Calibration Procedure Data

Remember to add a Calibration Due Date to the new Instrument and either accept or edit the default calibration procedure data values on the other fields.

Field level information is available in the on-line help delivered with CMX.

Note.

When you have added an instrument using custom User Defined templates in the wizard, please check all Function and Procedure fields in the property window. The wizard may have omitted some fields. In that case, enter necessary data manually.

Using the Main Window's Tree Views

The Wizard is a shortcut for making a Position/Device with a single Function. This chapter together with its subchapters describes how to make any type of instrument, e.g. one with multiple Functions.

All instrument data located in CMX's Instrument Database are hierarchically arranged in the same order as the following chapters.

Adding Positions

There are three ways of adding a Position in CMX:

- Click the secondary button on the mouse in the uppermost row of the **Position** Tree.
- Click the secondary button on the mouse above a Plant Structure node in the **Plant Structure** Tree.
- When viewing the **properties** of an existing Position there is a button for creating a **New** Position in the property window.

Position ID is the only required field, all others are optional. The Position ID field may have a default value based on your database settings. If it is empty, you need to enter a unique ID.

Field level information for Positions is available in the on-line help delivered with CMX.

Notes.

A new position may also be created using the copy option of a context menu of a tree. Open the menu with your mouse pointer above a position icon and select the **Copy** option. For maximum amount of Positions, see chapter **Maximum Amount of Positions, Devices and Functions** on page 74.

Adding Devices

There are four ways of creating Devices in CMX:

- Click the secondary button on the mouse above a Position seen in the **Position** Tree.
- Click the secondary button on the mouse above a Position seen in the **Plant Structure** Tree.
- Click the secondary button on the mouse in the uppermost row of the **Device** Tree. Open the **Devices** window, if it is not visible.
- When viewing the **properties** of an existing Device there is a button for creating a **New** Device in the property window.

Note for the two first methods:

If the Position from which the adding of the Device was invoked has functions but no installed Devices, the new Device will be installed to the Position and automatically “inherits” the same functions as the Position.

Otherwise the device will be added to the Device Tree as a free Device. All other methods also add the Device to the Device Tree as a free Device.

Device ID is the only required field, all others are optional. The Device ID field may have a default value based on your database settings. If it is empty, you need to enter a unique ID.

Notes.

Adding Device Manufacturers and Models can be done while adding Devices. Just select the “<New...>” option from the list of Models/Manufacturers.

A new device may also be created using the copy option of a context menu of a tree. Open the menu with your mouse pointer above a device icon and select the **Copy** option. For maximum amount of Devices, see chapter **Maximum Amount of Positions, Devices and Functions** on page 74.

Field level information for Devices is available in the on-line help delivered with CMX.

Adding Functions

To add Functions you need to have an existing Position or a Device to add the Function to. There are four ways of creating Functions in CMX:

- Click the secondary button on the mouse above a Position seen in the **Position** Tree.
- Click the secondary button on the mouse above a Position seen in the **Plant Structure** Tree.
- To add a Function to a Device, open the **Devices** window and click the secondary button on the mouse above a Device.
- When viewing the **properties** of an existing Function there is a button for creating a **New** Function in the property window. The new Function will be added to the same Position and/or Device as the previously viewed Function.

Note.

Adding a Function to a Position with an installed Device automatically adds the new Function to the installed Device too. If the Position has several Devices installed to it, the new Function is added to the Position but not to any of the installed Devices.

The definition of a Function starts with selecting the Function Template. Field level information for Function Templates is available in the on-line help delivered with CMX.

The fields to be entered depend very much on the chosen template. CMX helps you out by adding default values to the fields that do require some entry.

Notes.

If a certain function need to be entered several times and there is no suitable Function Template available, consider creating a custom Function Template for it. See section **Basic Settings**, chapter **Function Templates**.

For maximum amount of Functions, see chapter **Maximum Amount of Positions, Devices and Functions** on page 74.

Field level information for Functions is available in the on-line help delivered with CMX.

Fieldbus Device Specifics

This chapter presents some fieldbus instrument specifics allowing faster creation of these types of instruments.

FOUNDATION™ Fieldbus and Profibus PA Devices

When adding a FOUNDATION™ Fieldbus or a Profibus PA instrument into CMX's database, the following settings should be used:

- Select **Digital variable** as the **Output Category**.
- When you have chosen the **Output Quantity**, select either **Foundation H1** or **Profibus PA** as the **Output Method**.

HART® Devices

When adding a HART instrument into CMX's database, the Analog Output (AO) and the Digital Output (PV) should be added as two Functions with the following settings:

- The Analog Output (AO) as a **transmitter** with the output category **analog variable** selected.
- The Digital Output (PV) as a **transmitter** with the output category **digital variable** selected. Select the same Quantity both for the input and the output. Select **HART** as the Output Method.

Availability:

- CMX Light
- CMX Professional
- CMX Enterprise

User Defined Transfer Function

Among Function data is a field for defining the instrument's **Transfer Function**, i.e. input/output correlation. In addition to standard Transfer Functions, an option called "**User Defined Transfer Function**" is also available.

This option is usable when CMX's standard Transfer Functions do not apply, but corresponding input/output pair values are known.

When **User Defined Transfer Function** is selected as the instrument's Transfer Function, a table for entering up input/output pairs appears. You need not enter exactly ten input and output pairs, although it is the default amount of rows in the table, but as many as is needed (minimum amount: 3 rows). Leave excess rows empty and they will be removed when you finish editing and reopen the function property window. To add more rows to the table, move to the current last row and press the **Enter** key.

IMPORTANT!

- **First input and output pair (point) must be same as input and output 0 % range values.**
 - **Enter absolute input and output values in increasing order (percentage of span point of view).**
 - **Last input and output values must be equal or greater than input and output 100 % range values.**
-

Notes.

CMX and calibrators supporting **User Defined Transfer Function** approximate the values between entered input/output pairs by calculating a curve between a pair of points that connects smoothly to the adjoining curve. The entered input/output pairs need to be points of a strictly increasing function.

User Defined Transfer Functions are supported in CMX's manual entry and in Pocket PC option, and also in modern calibrators, like Beamex[®] MC4 and later. When trying to send instruments with "User Defined Transfer Function" as the **Transfer Function** to a calibrator not supporting this feature, the following error message appears:

"Unsupported transfer function".

Availability:

- CMX Light
- CMX Professional
- CMX Enterprise

User Defined Pressure Units

CMX has a comprehensive set of pre-entered pressure units. If however they are not suited for your needs, you can create custom pressure units as follows:

1. Select the **Unit** list for a pressure input or output.
2. Scroll down to the bottom of the list and select option "**New**".
3. Enter required data in the opened window:
 - **Unit Name**. A free descriptive text. See note below.
 - **Reference Unit**. The pre-entered unit that is used as the basis for calculating the user defined pressure unit.
 - **Factor**. A factor for converting the measured pressure from the reference unit to the user defined pressure unit.
4. Select OK and you are ready.

Notes.

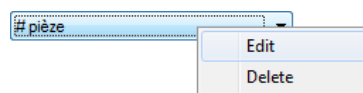
To minimize the risk of confusion that may lead to serious accidents, avoid using unit names that resemble "reserved names", i.e. names of standard units available in CMX.

Use some sort of prefix or suffix, e.g. "#", in the unit name. This is to indicate that this is a custom pressure unit, not to be confused with standard units available in CMX.

Currently this feature is available in CMX's Manual Entry window, in CMX for Pocket PC and modern calibrators.

Editing/Deleting Custom Pressure Units

To edit, check or even delete a custom pressure unit, select the unit and close the list. Click the secondary button on the mouse above the unit list. A pop-up menu opens with the options **Edit** and **Delete**. Select appropriate option,.



Availability:

- CMX Light
- CMX Professional
- CMX Enterprise

User Defined PRT Sensors

CMX supports entering custom **Callendar - van Dusen** equation coefficients for Platinum Resistance Temperature (PRT) type RTD sensors used, e.g. as reference sensors. Here's how to add a user defined PRT sensor:

1. Select the **Sensor Type** list for a temperature input or output.
2. Scroll down to the bottom of the list and select option "**New**".
3. Enter required data in the opened window:
 - **Sensor Name**. A free descriptive text. See note below.
 - **High & Low Limit**. Defines the temperature range in which the custom sensor is used.
 - **R0**, the custom sensor's resistance in Ohms at 0 °C
 - **A, B & C** are factors that customize the PRT sensor.
 - **Resolution**. The resolution of the custom sensor.
4. Select OK and you are ready.

Notes.

To minimize the risk of confusion that may lead to serious accidents, avoid using sensor names that resemble "re-served names", i.e. names of standard sensors available in CMX.

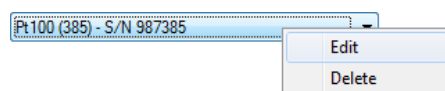
Use some sort of descriptive text, e.g. sensor's serial number, in the sensor name. This is to indicate that this is a custom PRT sensor, not to be confused with standard sensors available in CMX.

User defined PRT sensors are supported by modern calibrators, e.g. Beamex® MC4 Documenting Process Calibrator and later.

More of **Callendar - van Dusen** equation in a separate help file called **CMX_Calculations.chm**. Open it from CMX Main Windows' Help menu. Select option **CMX Calculations**. Look for main topic **PRT Sensor Calculations** and from there sub topic **Callendar - van Dusen Equation**.

Editing/Deleting Custom PRT Sensors

To edit, check or even delete a custom PRT sensor, select the sensor and close the list. Click the secondary button on the mouse above the sensor list. A pop-up menu opens with the options **Edit** and **Delete**. Select appropriate option.



Adding Procedures

CMX automatically creates a Procedure with default settings for new Functions except if the Function was created using the **New** button in the Function property window. Then the Procedure needs to be manually added.

Procedures may also be added if you need another Procedure for certain needs (e.g. there is a separate Procedure for quality related calibrations and another for less demanding calibrations).

There are four ways of creating Procedures in CMX:

- Click the secondary button on the mouse above a Function seen in the **Position** Tree.
- Click the secondary button on the mouse above a Function seen in the **Plant Structure** Tree.
- Click the secondary button on the mouse above a Function seen in the **Device** Tree.
- When viewing the **properties** of an existing Procedure there is a button for creating a **New** Procedure in the property window. The new Procedure will be added to the same Function as the previously viewed Procedure.

Enter a name for the Procedure and check the default values CMX have added to the fields that do require some entry.

Notes.

CMX always uses the first available Procedure for the Function (the uppermost active Procedure shown in the Tree). If a Function has several Procedures, deactivate all Procedures preceding the one you want to use for calibration.

There are no limitations for the amount of Calibration Procedures, except the available memory in the computer(s)/server(s) used to run CMX and store its database.

Field level information for Calibration Procedures is available in the on-line help delivered with CMX.

Other Instrument Related Functions

This section describes the following tasks:

- Linking and Unlinking Devices
- Assigning Spare Devices
- Copying Positions and Devices
- Editing Positions, Devices, Functions and Procedures
- Deleting Positions, Devices, Functions and Procedures

Linking and Unlinking Devices

When you link a Device to a Position you inform CMX that the physical Device is installed to that Position.

You may later produce a report detailing where a certain Device has been in the plant(s), or you may even see which Devices have been installed in a certain Position.

When you create a new Position and/or a Device, there is a simple possibility to link the Position and the Device. Existing Positions and Devices are linked by using another method. Both methods are described in the following subchapters.

Linking While Creating the Instrument Database

There are two ways to link a Device to a Position when creating (or adding a Device to) the database:

- Create a new Position using the **Wizard**. Then you also add a Device to the Position. This method requires that neither the Position nor the Device already exist in the database.
- Add a Device to an existing Position seen in the **Position Tree** (alternatively, the Plant Structure Tree). Open the Context Menu (pop-up menu) of the Position and add a Device. Then the new Device inherits all Functions and Procedures of the Position and is automatically linked to the Position. This method requires that the Device does not already exist in the database but the empty Position with Functions does exist.

Availability of the report:

- CMX Light
- CMX Professional
- CMX Enterprise

In both cases the new Device inherits all free Functions and Procedures of the Position and is automatically linked to the Position. Note that a Function and a Procedure added to the Position after the Device was created will only be the Position's Functions/Procedures, not the Device's. It's the creation order that determines what happens.

Keep in mind that these two last methods of linking are handy only when creating the instrument database (or adding a new Device). When both the Position and the Device already exist in instrument database, see chapter **Linking Existing Positions and Devices**.

Linking Several Devices to the Same Position

Out of the two methods presented above, the latter allows you to link several Devices to the same Position. If a Device is linked to a Position but the Position still has free Functions, A new device created to the Position "inherits" all free Functions. As a result, the Position now has two installed Devices.

Additionally: If you add more Functions to the Position and then add a yet another Device, the new Device "inherits" the free Functions.

Note.

This method of linking several Devices to a Position is not the only way. See the next chapter to find out how to link several already existing Devices to an existing Position. There you can also find out how to link a single Device to several Positions.

Linking Existing Positions and Devices

To link a Device to a Position, open the **Devices** window, select an uninstalled Device (a green circle without a yellow "cup") and drag-drop it to the desired Position seen in the Position Tree (alternatively, the Plant Structure Tree).

A dialog window opens. There you can either link the device as an installed one or as a spare device for the Position.

Another way to link a Device is unlinking an already linked Device and selecting a spare Device as the new linked Device. Both the unlinking and the linking are done using the Context Menu (pop-up menu) available in the Position Tree (alternatively, the Plant Structure Tree).

If CMX displays an error message stating that automatic linking is not possible, drag-drop the Device's **Functions** to the Position's corresponding **Functions** one by one. This method is needed when the Position/Device has several similar Functions or the amount of Functions is not the same in the Position and the Device.

Note.

When linking a Device with existing Function(s)/Procedure(s) to a Position, the Device will automatically inherit Position's Function/Procedure data with the following exceptions: **Initial Calibration Date**, **Initial Calibration Count** and **Total Calibrations** fields stay unique for Position and Device.

Linking Several Devices to the Same Position

If a Position has more Functions than the first linked Device, the free Functions of the Position may be linked to another Device with suitable Functions. To link: drag the Device's Functions to the Position's free Functions.

If the Position still has free Functions after linking the second Device's Functions, a third Device's Functions may be linked to the Position. The Position may have as many linked Devices as there are Functions and there is no limit to the amount of Functions in a Position.

Note.

This method of linking applies to situation when both the Devices and the Position already exist in the instrument database. See chapter **Linking While Creating the Instrument Database** on page 85 to learn how to add several **new** Devices to a Position.

Linking the Same Device to Several Positions

If a Device has more Functions than the Position it was first linked to, the remaining Functions may be linked to other Positions. Drag the free Functions to Functions in other Position.

The Device may be linked to as many Positions as there are Functions in the Device and there is no limit to the amount of Functions in a Device.

General Notes Concerning Linking

- In order to link a Device to a Position, the Functions' Input/Output Category, Input/Output Quantity and Transfer Function of the Position and the Device data must "match". Rest of the function data will be synchronized (Position Function data overwrites possibly conflicting Device Function data).
- A Device with a Function can not be linked to a Position without a "matching" Function.
- An inactive Device cannot be installed to a Position. Note that the active/inactive setting is not available in CMX Light.
- An already linked Device cannot be linked to another Position. The Device must be unlinked first.
- An unlinked Device can be a spare Device for many Positions, but as soon as it is installed into a Position, it can no longer be a spare for any Position. CMX automatically removes the spare Device definitions.
- A link leaves a "trace" in the CMX database only if the Device is calibrated while installed to a Position.
- Assigning a Device as a spare Device does not require that the Functions of the spare Device and the Position match.

Unlinking Devices

To unlink a Device open the Position Tree (alternatively, the Plant Structure Tree), expand the tree at the Position where the Device to be unlinked is located. Open the Device's Context Menu (pop-up menu) and select the **Unlink** option.

This method applies to both installed and Spare Devices.

Assigning Spare Devices

Assigning a Spare Device is quite similar to linking existing Positions and Devices.

To assign a Device as a Spare Device to a Position, open the Device Tree, select an uninstalled Device and drag-drop it to the desired Position seen in the Position Tree (alternatively, the Plant Structure Tree).

A dialog window opens. Make sure that the “Install as Spare Device” check box is selected. Then select **Ok**.

If you want to assign an already installed Device as a spare Device for the same Position, click the secondary button on the mouse. The context menu has an option to assign the linked Device as a spare Device.

Note.

Assigning a Device as a spare Device does not require that the Functions of the spare Device and the Position match.

Copying Positions and Devices

CMX's Position, Device and Plant Structure Trees have in their context menus the possibility to copy a Position and/or a Device.

Click your mouse's secondary button above either a Position or a Device. The context menu has a **Copy** option (provided you have the user privileges to create a Position and/or a Device).

- For an empty Position, a window opens where you can add the **Position ID**, **Name** and **Plant** path data. In CMX Professional and CMX Enterprise you may also set Position's **Accessibility**. This however, depends on your privileges to edit Accessibility data.
- For a free Device, a window opens where you can add the **Device ID**, **Serial Number** and **Model** data. In CMX Professional and CMX Enterprise you may also set Device's **Accessibility**. This however, depends on your privileges to edit Accessibility data.
- For a linked Position/Device, both previously mentioned windows are shown (one at a time).

Note.

Copying a Position/Device also copies all Functions and Calibration Procedures the original Position/Device had.

Editing Items Displayed in a Tree

When viewing the **properties** of an existing Position, Device, Function and Procedure there is a button for **Editing** the data in the property window.

Items shown in sub windows (**Manufacturers, Calibrators, Users, Lists** and **Function Template** Windows) also have an **Edit Record** option in the window's **File** Menu.

Note.

Editing linked Functions or Calibration Procedures of linked Positions and Devices always apply to the Procedure/Function of both the Position and Device.

Deleting Items Displayed in a Tree

The option to delete an item shown in a Tree is shown in the item's Context Menu (pop-up menu). The toolbar also contains a button for deleting items.

Items shown in sub windows (**Manufacturers, Calibrators, Users, Lists** and **Function Template** Windows) also have a **Delete** option in the window's **File** menu.

Queries, Filters and Sets

General

This section describes tools that help you sort, group and view the instrument data according to you own needs.

What Is a Query

A query is a tool found in all database software. It contains search criteria that select the data to be displayed.

Available Queries

CMX has queries available for Positions, Devices, Calibrators and Calibrator Modules. Queries are part of the software and therefore available at any time. Use filters for temporary filtering the instrument data.

The available queries are shown in a list just above the Tree. The following table describes all currently available queries.

Query Description	Position Queries	Device Queries	Calibrator/Module Queries
<i>Does not filter out anything. Everything is shown.</i>	All Positions	All Devices	All Calibrators/ Modules
<i>Shows only the items due (or overdue) for calibration.</i>	Due for Calibration	Due for Calibration	Due for Calibration
<i>Shows the items due within a specified period.</i>	Due within...	Due within...	Due within...
<i>Shows unlinked Positions/Devices only.</i>	Empty Positions	Free Devices	-
<i>Shows all currently added Positions. See also the note below.</i>	New Positions	-	-

Notes.

The “New Positions” query is not available in the list of Position Queries. It is automatically created when adding Positions and also disappears automatically when you choose another query from the list.

Keep in mind that the Position Query list is the **secondary** level query. The **Plant Structure List**, shown above the Position Query list, is the **primary** level filtering for the Positions shown in the Position Tree.

What Is a Filter

A filter is a handy tool for limiting the displayed data. You may define what to filter in the **Position Filter Conditions** window or **Device Filter Conditions** window.

In **CMX Light**:

Filter settings are only kept for as long as the filtering is active or until CMX is closed.

In **CMX Professional** and **CMX Enterprise**:

You also have the possibility to save useful filters for future needs and create more sophisticated searches using the SQL Editor. See subsequent chapters.

How to Filter Data

To open the **Position Filter Conditions** window, press the filtering button on the right side of the Main Windows' Position query list. The button has an icon that looks like a funnel. The same feature is in the **Devices** window that displays the Device Tree.

When you click either of the filtering buttons, a window with all filterable fields is presented. Then select suitable filtering parameters.

For text fields: Enter any amount of characters that suit your filtering needs. While searching for matches, all fields starting with the same characters are selected for display in the Tree with the filtered data. See also: **Wildcards**.

To activate a filter:

When all filter conditions are set, press the **Apply** button in the **Filter Conditions** window. Then the Position or Device Tree only shows the Positions/Devices that fit the filter parameters.

Notes.

Both the Position Tree and the Device Tree may have their own independent filters active.

Filters are not case sensitive. **TIRCA** and **Tirca** returns the same results.

You may also search for empty fields. Enter **IS NULL** as the search criteria. This is the exception to case sensitivity: **IS NULL** need to be written with capital letters.

For all error limit fields:

When entering numeric values, use the same decimal separator as is defined for your CMX database. Keep in mind that the decimal separator in your database may differ from the decimal separator used by the operating system. When in doubt, consult your IT specialist.

Check boxes have three possible states: **Checked**, **unchecked** or **mixed**. Mixed displays as a little green square in the check box. By default, all check boxes in Filter Conditions windows are displayed in mixed state. This means the value of the check box does not matter. If you change the check box's state to either checked or unchecked, the check box is part of the filter query.

To deactivate a filter, do one of the following:

- Double click the Filter icon seen in the Main Window.
- Open the **Filter Conditions** window again, press the **Clear Fields** button and then the **Apply** button.

Wildcards

Wildcard characters are special characters that represent one or more other characters. They help filtering data. The following table lists all supported wildcards and describes how they are used.

Wildcard character	Wildcard description	Filtering example
%	Any string of zero or more characters.	Setting, e.g. the Position ID filter criteria to “%CA” the following Position IDs are accepted: LIR CA Z100, L CA 101, P CA 102, T CA Z103
_ (underscore)	Any single character	Setting the Position ID filter criteria to “_CA” the following Position IDs are accepted (compared with the previous result): L CA 101, T CA Z103
[]	Any single character within the specified range ([a-f]) or set ([abcdef]).	Setting the Position ID filter criteria to “[A-L]CA” the following Position ID is accepted (compared with the previous results): L CA 101
[^]	Any single character not within the specified range ([^a-f]) or set ([^abcdef])	Setting the Position ID filter criteria to “[^A-L]CA” the following Position ID is accepted (compared with the previous results): T CA 101

Availability of
Oracle database:
-- CMX Light
○ CMX Professional
○ CMX Enterprise

Note.

The wildcards mentioned here apply for Microsoft SQL Server. If you are using Oracle database, refer to Oracle's own wildcard definitions.

Availability:

- CMX Light
- CMX Professional
- CMX Enterprise

Using Saved Filters

If you have already saved a useful filter, you may take it into use by choosing from the **Filter Name** list.

Saving Filters

Availability:

- CMX Light
- CMX Professional
- CMX Enterprise

You may give a name to a filter, set its accessibility and enter a description for it using the uppermost fields in the **Filter Conditions** window.

Note.

If no user group is selected in the filter's **Accessibility** list, CMX treats the filter as private, i.e. no other user has access to it. If you want other users to have access to a filter you created, check as many user groups as you want in the **Accessibility** list.

To save a new filter, click the **New** button in the toolbar and then enter a name for the filter. After all settings are as required, save the filter by clicking the **Save** button in the toolbar.

To edit an existing filter, click the **Edit** button in the toolbar. Then do the necessary edits and click the **Save** button in the toolbar.

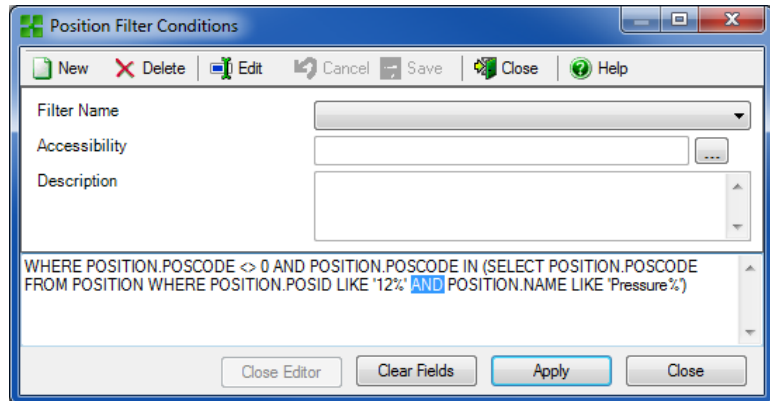
Availability:

- CMX Light
- CMX Professional
- CMX Enterprise

SQL Editor

The **SQL Editor** button found in the **Filter Conditions** window shows the current filtering settings as a standard SQL query.

The Filter Conditions windows' SQL Editor allows users with SQL knowledge to edit queries. E.g. all filter parameters in the normal filter window use the AND operator between all queried fields. In the SQL editor the operator may be changed to OR.



A more advanced SQL query cannot be displayed in the normal filter window. In that case the **Close Editor** button is disabled and that particular query may only be edited in the SQL Editor view.

Note.

Your edits may create a query that does not give any results at all. Make sure you type all SQL parameters correctly.

What Is a Set

Sets are groups of Devices or Positions that are selected as part of a collection. Usually a set contains items that are calibrated at the same time and/or are located e.g. in the same department.

Device and Position Sets

The **Device Sets** as well as the **Position Sets** window is opened (and closed) from the main window's toolbar or from the **View** menu. The upper part of the window contains a list of existing sets. The last item in the list includes a possibility to create a new set.

A set is saved with the database and remain available until it is deleted.

Editing a Set

To **add** an item to a set, drag-drop it from a Tree containing similar items as the set.

- Devices can only be dragged from the Device Tree seen in the **Devices** window. If the window is not visible, open it from the main window's toolbar or the **View** menu.
- Positions can be dragged from the Position Tree or the Plant Structure Tree. One of the Trees is always available on the left side of the main window.

Removing an item from the set is done from the item's Context Menu (pop-up menu). Similarly, the whole set is deleted from the Context Menu opening from the set name (the uppermost row in the set Tree).

Check Out / Check In Feature

General

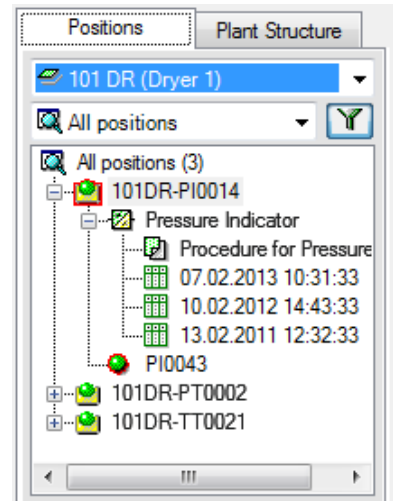
Check Out / Check In feature is a utility that allows you to "lock" the Positions/Devices currently under calibration (or being edited). The data of Positions/Devices that are Checked Out may not be calibrated/edited by other CMX users than the one who did the Check Out. When Checking In, the Position/Device is "unlocked" and may again be calibrated/edited by all CMX users.

Check Out / Check In feature is part of CMX's standard tools starting from CMX V2, revision 2.1.

Check Out / Check In Characteristics

This chapter presents the common characteristics of the Check Out / Check In feature. **Automatic Check Out / Check In** and **Manual Check Out / Check In** specifics are presented in their own subchapters.

- A Position/Device that is Checked Out, has a red frame around its icon (see adjacent picture).
- When a Position/Device is Checked Out, all data belonging to it:
Position, Device, Function(s), Procedure(s) and Calibration History is locked.
- The data of a locked Position/Device may be deleted/edited only by the user that did the Check Out.
- A locked Position/Device may be sent for calibration or chosen for Manual Entry only by the user that did the Check Out.
- The uppermost row of a locked item's property window displays the following information:
[Checked Out By <User Name> / <Date> <Time>]
- A locked item does not lock documents linked to it.
- A locked item does not lock pick-up lists it uses.
- You may use CMX's filtering utility to find/view locked items.
- If **Audit Trail** is part of your CMX package, all Check Outs and Check Ins are saved in the Audit Trail.



Availability of Audit Trail:

- CMX Light
- CMX Professional
- CMX Enterprise

Note.

You may still calibrate Positions/Devices without utilizing the Check Out / Check In feature.

Automatic Check Out / Check In

When activated, the Automatic Check Out / Check In feature automatically checks out a Position/Device sent for calibration or selected for Manual Entry. Similarly, when the calibration results are saved to CMX's database, the instrument is automatically Checked In.

By default, Automatic Check Out / Check In feature is not activated. You may activate it in the **Options** window's **General Settings** section (menu commands **Tools, Options**). Check the check box **Automatic Calibration Time Check Out / Check In** to activate Automatic Check Out / Check In feature

Notes.

Calibrating a single Function of a multi-function Position/Device locks the Position/Device and all its Functions until the single Function is calibrated and results are saved in the database.

When several Functions of a multi-function Position/Device are sent for calibration, the Position/Device is locked until the results of all Functions are saved in the database.

Manual Check Out / Check In

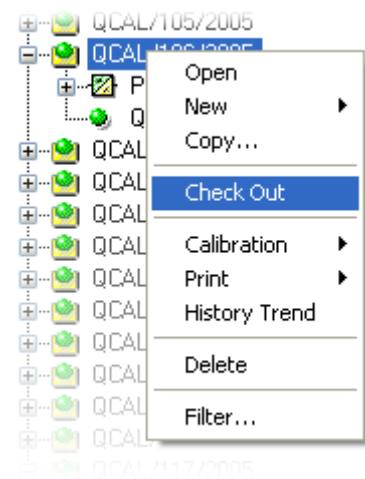
Manual Check Out / Check In can be used no matter if Automatic Check Out / Check In is activated or not. Additionally, a Position/Device Checked Out using automatic Check Out may be checked in using manual Check In.

Manual Check Out / Check In is more versatile than Automatic Check Out / Check In. It can be used, e.g. for locking an item that needs editing. Then, in a multi-user environment, no other users may simultaneously edit the same data and cause clashes. See also: **Simultaneous Data Editing**.

Checking Out a Single Instrument

An instrument may be manually Checked Out from any tree structure (**Position Tree, Device Tree, Plant Structure Tree, Position Set Tree, Device Set Tree**). Click on the mouse's secondary button to open a context menu above either a **Position** or a **Device**.

If the Position/device is not checked out, the context menu has a Check Out option.

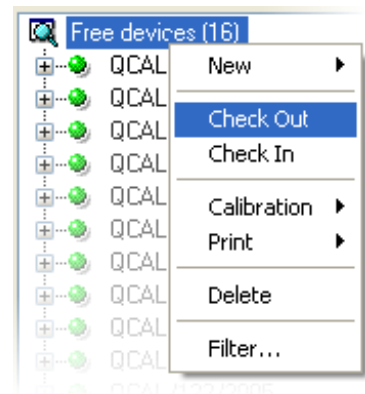


Note that the option is available only for users with permission to edit Position and Device data.

Checking Out Multiple Instruments

A group of instruments may be manually Checked Out from the **Query** level of a tree (the uppermost item in a tree, see adjacent picture).

This method locks all items belonging to the group except the items that were already locked. They stay locked for the user who originally checked them out.



Note.

When doing multiple Check Outs, CMX displays a dialog asking to confirm the operation.

Checking In a Single Instrument

An instrument may be manually Checked In from any tree structure. Click on the mouse's secondary button to open a context menu above a Checked Out **Position** or **Device**.

Notes.

The Check In option is available only for the user who Checked Out the instrument, for users with Supervisor privileges and the Database Administrator.

Users with the permission to manually Check In and Check Out instruments may Check In instruments Checked Out by another user.

Checking In Multiple Instruments

To Check In multiple items, click on the mouse's secondary button above a **Query** (the uppermost item in a tree as shown in one of the previous pictures). Select Check In from the context menu.

This method unlocks all items Checked Out by the logged in user. If the logged in user has Supervisor privileges or is the Database Administrator, all items will be Checked In.

Note.

When doing multiple Check Ins, CMX displays a dialog asking to confirm the operation.

Calibration

General

Calibrations can be done after the necessary instrument data is entered into the database.

A Position must have an installed Device (with Functions) before a calibration can be performed, but a Device (with Functions) can be calibrated before it is installed into a Position. If a Device is installed into a Position, then only a Position calibration may be carried out, not a Device calibration.

CMX supports the following methods of calibration data entry:

1. **Off-line Calibration** (sometimes also called Batch Calibration), where Instruments/Functions to be calibrated are sent from CMX to a Calibrator able to communicate with CMX. Then the calibrator is moved to the field/laboratory where the instrument is located. After the calibration is performed the calibrator is brought back and reconnected to CMX. The results of the calibration are then received to CMX.
For more information, see **Selecting Instruments for Calibration** on page 110 and **Receiving Calibration Result Data** on page 113.
2. **Manual Entry** is for situations, where a calibrator unable to communicate with CMX is used for calibration.
For more information, see **Manual Entry of Calibration Results** on page 115.

Manual Entry supports multiple As Found and As Left test. In Off-line Calibration, the amount of As Found and As Left repeats depends on the communicating calibrator. When in doubt, refer to the calibrator manual.

The communication cable used for calibrator communication is shipped with the calibrator.

Notes.

If you have the Weighing Instrument Calibration feature, some additional info on how to calibrate Weighing Instruments is presented in chapter **Calibrating Weighing Instruments** in section **Calibrating Weighing Instruments**.

Calibrators communicating via RS232-serial port:

Use only cables specifically done for communication between the calibrator and the computer.

Connecting and disconnecting the communication cable should be done when the power is off on both the computer and the calibrator.

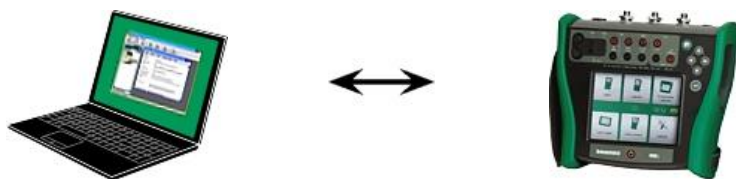
For more details concerning calibrators utilizing USB port for communication, see section **Additional Information**, chapter **Calibrators and USB Communication**

The Typical Calibration Procedure

The typical sequence of phases in a calibration procedure is as follows.

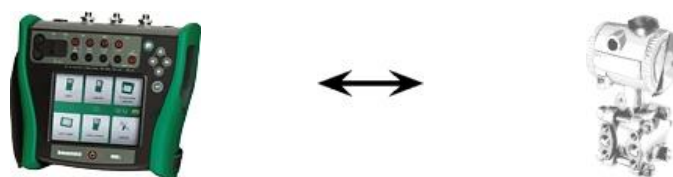
Selection of Functions and Downloading

The Functions due for calibration are selected from the database and sent to the appropriate calibrator. A query or a pre-defined set could be used to find the Functions due for calibration.



As Found Calibration

The calibrator is moved into the field, and an As Found calibration is performed using the setup information in the memory. The results are saved in the memory of the calibrator.



Instrument Adjustment

If needed, the instrument function is adjusted with the help of the calibrator measurement modules. The maximum error is reduced to the Adjust To limit.



As Left Calibration

The instrument function is calibrated again, to check that the maximum error is at the desired level. The results are stored in the calibrator memory, and another scheduled calibration can be performed.



Receiving of Calibration Results

After all calibrations have been performed, the calibrator is reconnected to the computer, and CMX will receive the calibration results, and save the calibration data for use in the future.



Printing of Results

CMX can then e.g. produce calibration certificates reports based on saved calibration data.



Calibration Web Service Interface, CWSI

Availability of CWSI:

- CMX Light
- CMX Professional
- CMX Enterprise

About CWSI

Calibration Web Service Interface, CWSI, is a tool for communication between calibrators and CMX in virtualized environments.

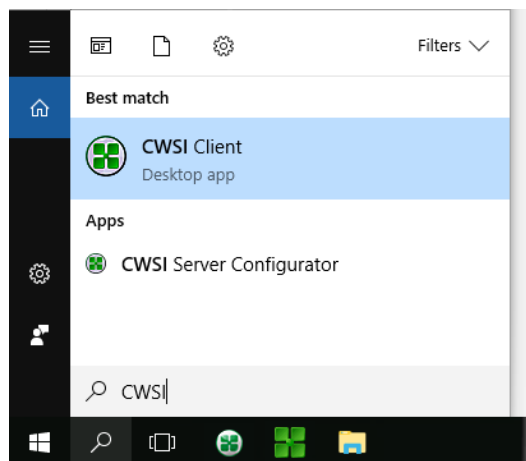
CWSI introduces two new components into CMX: **CWSI Server** and **CWSI Client**. **CWSI Server** is installed on a server, e.g. the same server as **CMX Server** is installed. **CWSI Client** is installed on all computers where CMX main software is run. More info of CWSI installation is in **CMX Installation Manual** and in CWSI Help file included in **CWSI Server** and **CWSI Client**. The help file is also available as a pdf file on CMX's installation disc.

bMobile Version 2 utilizes **CWSI Server** to communicate with CMX.

Starting CWSI

Before using CWSI, **CWSI Client** must be started and connected to **CWSI Server**.

Use Windows' search tool to locate **CWSI Client**. How to invoke the search tool depends on the operating system version. The picture below is from Windows® 10.



Ensure that the **CWSI Client** is found in the system tray:



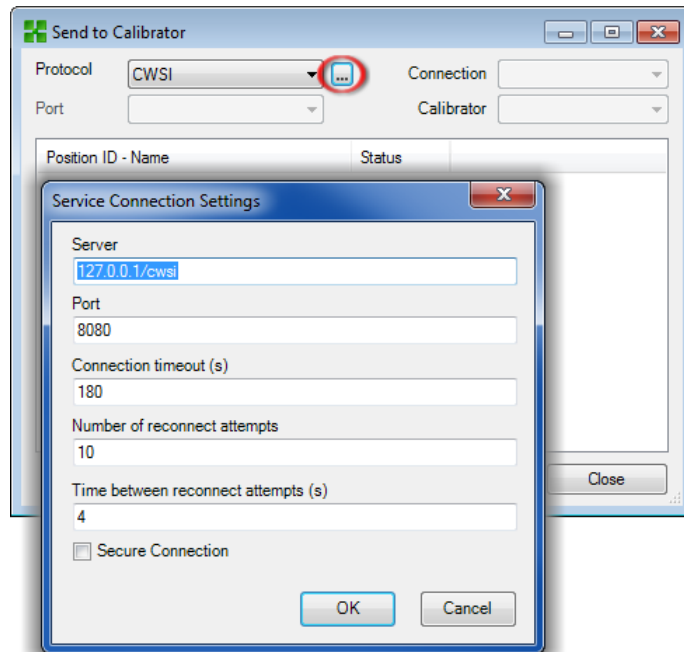
The context menu of the system tray icon allows you to configure the connection to **CWSI Server** and connect to **CWSI Server**.

Configuring **CMX Server** is done similarly, but on the computer it resides in, provided you have the rights to make

changes to the computer. The configuration software is called **CMX Server Configurator**.

Using CWSI in CMX

In CMX, CWSI is available in both **Send to Calibrator** and **Receive from Calibrator** windows. Select **CWSI** as your **Protocol**. The small button with three dots allows you to check/edit **CWSI Server** settings ensuring connection to **CWSI Server**. The picture below presents the default settings.



If CMX connects to CMX Server, then the **Connection** selection list shows all matching **CWSI Clients** where **CMX user id** (set in **CWSI Client's Options**) is the same as **User ID** in CMX. Each connected calibrator of the **CWSI Client** is listed in the Calibrator list. In any other manner both Send and Receive windows can be used normally.

Notes.

If your calibrator is missing from the **Calibrators** list, select **Connection** again. It refreshes the **Calibrators** list.

If CWSI is configured to require a "Secret" (a password unique to CWSI), The "Secret" has to be entered before sending and receiving commences.

Selecting Instruments for Calibration

Since a calibrator treats each Function in an instrument as a separate item to be calibrated, CMX sends Functions to the calibrator, not instruments.

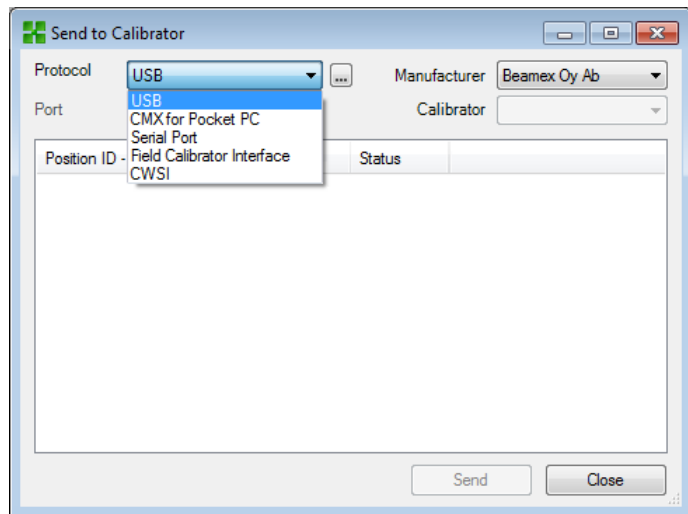
CMX has a separate window for collecting the Functions that will be sent to the calibrator. The window is opened using one of the following methods:

- Selecting **Send** from the main window's toolbar (found in a submenu that opens from the Calibration button).
- Selecting **Calibration, Send** from a suitable Context Menu (pop-up menu).
- Selecting the **Send** option from the main window's **Calibration** menu.

Adding Functions to be calibrated to the **Send to Calibrator** window is done using the following ways:

- Selecting **Calibration, Send to Calibrator** from a suitable Context Menu (pop-up menu). This option is available for the following items shown in one of CMX's Trees:
 - A Position with an installed Device. If the Position contains several Functions, all Functions are added to the list.
 - A Function in a Position with an installed Device.
 - An uninstalled Device (containing Functions). If the Device contains several Functions, all Functions are added to the list.
 - A Function in an uninstalled Device.
- Dragging Functions, Positions or Devices from a Tree to the **Send to Calibrator** window.
- Selecting the name of a query or a set (the uppermost row in a Tree) and dragging it to the **Send to Calibrator** window is also supported. Then all items included in the query/set are added to the list of Functions to be calibrated.
- Dragging a Plant Structure level from the Plant Structure Tree to the **Send to Calibrator** window. Then all Functions of Positions/Devices hierarchically below that Plant Structure level are added to the **Send to Calibrator** window.

Sending Instruments for Calibration



When you open the **Send to Calibrator** window, you first have to select the **Protocol**. The options are:

- **USB** for calibrators using USB port for communicating with the PC.
- **CMX for Pocket PC** for communicating with CMX's Pocket PC option.
- **Serial Port** for communicating with older calibrators using serial communication and Beamex's CALIBINT legacy protocol. Remember to select the **COM Port** too.
- **Field Calibrator Interface** is for communicating with calibrators supporting standard FCINTF protocol.
- **CWSI** is for communicating with calibrators and **bMobile** via Calibration Web Service Interface (CWSI). More of this in chapter **Calibration Web Service Interface, CWSI** on page 108.

Availability of CWSI:

- CMX Light
- CMX Professional
- CMX Enterprise

The calibrator may also be selected. Use the list of manufacturers and models to identify the calibrator.

When you press the **Send** button, the communication with the calibrator starts. The status column tells you how the communication advances.

Notes.

The “Auto Detect” option available for **Serial Port** protocol is fully compliant with Beamex calibrators. Other calibrator brands may not support auto detection.

CMX Light supports communication with Beamex calibrators only.

CMX remembers the Protocol, Port and Calibrator settings so the next time you open the **Send to Calibrator** window, the settings are already according to your needs.

Closing the **Send to Calibrator** window before pressing the **Send** button cancels the sending procedure. Next time you open the **Send to Calibrator** window, the list of functions to be sent is empty.

When sending instruments to certain newer calibrators, the instrument's Plant Structure path may also be included in sent data. To activate this feature, open CMX's Options window. See Calibration Options.

Modern calibrators using Universal Serial Bus (**USB**) for communication require that a USB driver is installed before they communicate with CMX. For more details, see section **Additional Information**, chapter **Calibrators and USB Communication**.

If the Calibration Options setting **Warn when Calibrator/Module is Overdue** is checked, CMX warns if you send instruments for calibration to a calibrator with an overdue calibration.

If **Mobile Security Plus** option is in use:

- Mobile User information is sent from CMX to supported Mobile Device.
 - If Site User Maintenance is used then only users belonging to the same site are sent to Mobile Device.
 - Any possible locked Mobile User accounts are released by sending an instrument to a Mobile Device.
 - Overwriting existing instruments containing calibration results in a supported Mobile Device is prohibited.
-

Receiving Calibration Result Data

To open the **Receive from Calibrator** window use one of the following methods:

- Select **Receive** from the main window's toolbar (found in a submenu that opens from the Calibration button).
- Select **Calibration, Receive** from a suitable Context Menu (pop-up menu).
- Selecting the **Receive** option from the main window's **Calibration** menu.

CMX remembers the latest Protocol and Port used as well as the latest manufacturer/calibrator settings, so normally you do not need to change the settings shown in the upper part of the **Receive from Calibrator** window. For available Protocol options, see **Sending Instruments for Calibration** on page 111.

Press the **Connect** button to see a list of Positions/Functions available in the calibrator's memory. The results column indicates whether a Position/Function contains calibration results or not.

Remember to check/uncheck the check boxes found at the bottom of the window according to your needs. We recommend that you select the **Delete Instruments After Receive From Calibrator** check box.

When you press the **Receive** button, the communication with the calibrator starts. The status column tells you how the communication advances.

See also: **Receiving Instrument History** on page 115 and **Avoiding Duplicate Results** on page 115.

Notes.

The **Receive from Calibrator** window has a **Confirm External References** check box. If it is checked, a window for entering external calibrator reference data opens for the following input/output methods:

- Input and/or Output Method is "**Keyed**".
- Input Method is set to "**Controlled and Measured**".

If the Instrument data of the instrument to be received differs from the data in CMX's database, CMX asks whether you want to receive the calibration results and update the instrument data in CMX or if you want to cancel the receiving of results.

When receiving calibration results of an instrument that is not in CMX's database, CMX asks if the new Device (Field Entry Device, a.k.a. **FED**) should be added to the database. Adding instrument data is only available in modern calibrator types supporting this feature. If unsure, check by receiving a new instrument created in the calibrator. CMX informs you if it finds a new instrument and asks if the instrument should be added to CMX's database.

Modern calibrators using Universal Serial Bus (**USB**) for communication require that a USB driver, shipped with the calibrator, is installed before they communicate with CMX. For more details, see section **Additional Information**, chapter **Calibrators and USB Communication**.

Modern communicating calibrators may support long Position ID and Device ID fields or even instruments without either or both ID fields. CMX does not support empty ID fields or ID fields longer than 65 characters. When Positions/Devices with missing or too long IDs are received, CMX informs the user about this and offers a possibility to give/change Position ID and/or Device ID. The information will also be updated in the calibrator.

If the Calibration Options setting **Warn when Calibrator/Module is Overdue** is checked, CMX warns if you receive calibrated instruments from a calibrator with an overdue calibration.

If the field **Reject if Calibrator is Overdue** in an instrument's Calibration Procedure is checked, you cannot receive calibration results for that instrument from a calibrator with an overdue calibration.

Hint.

If you have an instrument capable of communicating with other devices (e.g. a HART® or a fieldbus instrument) that you want to add to CMX's database, do as follows: Connect them to a calibrator with suitable communication capabilities, e.g. Beamex's MC5 Multifunction Calibrator. Read the instrument data into the Calibrator and connect the Calibrator to CMX. Receive the instrument data from MC5. This method enables you to build your database without retyping anything that is already available in the instrument's memory.

Receiving Instrument History

In **Receive from Calibrator** window:

If the Status column of the list of instruments contain data (e.g. "Current"), the instrument data has changed in the calibrator, e.g. the measurement span has been edited. If you want to save the instrument history and corresponding results, make sure you check the **Show Instrument History** check box below the list of instruments. The status may be:

- **Original**. In this calibration, the instrument is as they were during the earliest calibration.
- **Current**. In this calibration, the instrument is as it currently is in the calibrator.
- **Edited X** where X is a number starting from 1. These are intermediate versions between the "Original" and "Current"

This feature is available in modern calibrators.

Avoiding Duplicate Results

When receiving calibration results, CMX compares the calibration date of the results to be received with calibrations already received. If the dates and, when applicable, the errors match, CMX prompts you to confirm receiving these kind of results.

Receiving duplicates is easily avoided by deleting already received results from the calibrator. As mentioned earlier, this functionality is available with the **Delete Instruments After Receive From Calibrator** check box in **Receive from Calibrator** window.

Manual Entry of Calibration Results

If calibrations are carried out with a calibrator that is unable to communicate with CMX then Manual Entry is the solution. In Manual Entry calibration results and all calibration related data is typed into the database.

Notes.

CMX supports opening several Manual Entry windows. This allows you to, e.g. calibrate several temperature sensors at the same time, each sensor having its own Manual Entry window open.

If you have purchased the Weighing Instrument Calibration option, some additional info on how to calibrate Weighing Instruments is presented in chapter **Calibrating Weighing Instruments** in section **Calibrating Weighing Instruments**.

Selecting Functions for Manual Entry

There are several ways of selecting a Function for Manual Entry:

- Select the Position/Device/Function to be calibrated from a Position Tree, Plant Structure Tree or a Device Tree and then select **Manual Entry** from the toolbar (found in a submenu that opens from the Calibration button).
- Select the Position/Device/Function to be calibrated from a Position Tree, Plant Structure Tree or a Device Tree and then select **Manual Entry** from the main window's **Calibration** menu.
- Click the secondary button on the mouse above a Position or a Function seen in the **Position** Tree. Then select **Calibration, Manual Entry**.
- Click the secondary button on the mouse above a Position or a Function seen in the **Plant Structure** Tree. Then select **Calibration, Manual Entry**.
- Click the secondary button on the mouse above a Device or a Function seen in the **Device** Tree. Then select **Calibration, Manual Entry**.

Using any of the above mentioned methods opens the **Manual Entry** window ready for data entry.

Note.

When selecting a Position/Device and choosing **Calibration, Manual Entry**, only the first (the uppermost) Function of the Position/Device is sent to the **Manual Entry** window. This is because CMX's Manual Entry currently only supports the calibration of one Function at a time.

To select any other Function (as well as the first Function) in a Position/Device for Manual Entry, click the secondary button on the mouse above the Function instead of the Position/Device.

Reminder.

To be able to calibrate a Position, a Device (containing Functions) needs to be linked to it. A Device (containing Functions) may be calibrated although it is not linked to a Position. When a Device is linked to a Position, Manual Entry may be invoked for the Position only.

Entering Calibration Results

Enter the results in the grid shown on the **Results** tab. Also check the **Calibration Date** field and the **Calibrated By** fields shown in the same tab. You can select one or two users as the ones that carried out the calibration.

Enter calibration related data (e.g. the environment temperature) into the **Conditions** tab.

The **Procedure** tab contains read-only data about the calibration procedure, including possible instructions to guide you through the calibration.

Depending on your Calibration settings, you may have to select input and output calibrators and modules used in the calibration. More about this in **Basic Settings** section's chapter **Calibration Options**. Note that you may select multiple input/output calibrators and modules for each calibration point.

The way the Calibrators and Modules (references) are sorted in the **Manual Entry** window depends on settings defined in the **Options** window's **Calibration** section.

Field level information is available in the on-line help delivered with CMX.

Notes.

For unstable readings, you may add the “~” character (tilde) after or before the calibration point values, e.g. **12.045~**. If you enter the “~” character before the numbers, CMX moves the character at the end of the number. This is done to avoid mix-up between the minus sign and the “~” character. Input values outside the calibration point's *Max. Deviation* limit are indicated in red. This does however not affect any calculations.

If the Calibration Options setting **Warn when Calibrator/Module is Overdue** is checked, CMX warns if you select a calibrator or module with an overdue calibration.

If Calibration Options setting **Chronological Date/Time Validation** is checked, saving results having the same date and time stamp is not allowed for a single calibration event. Each repeat must have a unique time stamp in correct chronological order and using the same format throughout. Certain repeats may not, e.g. have just the date and others both date and time.

Also: No As Found results may be saved after the first As Left result.

Skipping calibration points may be prohibited or a skipped point may require a comment.

If Mobile Security Plus option is in use:

Editing the calibration date/time can be prohibited by a permission 'Manual entry - Calibration time edit'. More of Mobile Security Plus in section **Mobile Security Plus**.

New Repeat

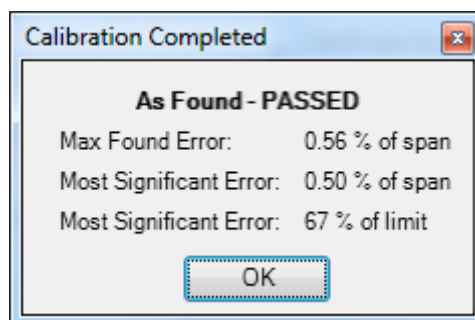
To start entering the results of the next calibration repeat, press the **New** button in the **Manual Entry** window's toolbar. If you have entered any data into the **Conditions** tab, CMX automatically copies them as part of the new repeat's data. Edit them, if needed.

To view previously entered results the click icons on the left side of the **Manual Entry** window.

Saving the Results

When you press the **Save** button in the **Manual Entry** window's toolbar, CMX saves the results in the database. If you continue entering results, they will be saved as a separate calibration saved on the same day.

While saving results CMX displays information of each repeat in a window similar to the one below:



Fields:

- **Max Found Error** is the repeat's found maximum error value.
- **Most Significant Error** (value) is the numeric value of the found error that is closest to corresponding error limit.
- **Most Significant Error** (percentage) indicates how close to the calibration point's error limit the most significant error value is. The percentage value is less than or equal to 100 % if the calibration passed and more than 100 % if the calibration failed.

When the relative component of the Reject if Error limit is used, the **Max Found Error** may differ from **Most Significant Error**. More of Error Limit Function's components in CMX's on-line Help. Another source for information of Error Limit Function is in **CMX Calculations** Help file. Open it from CMX Main Windows' Help menu. Select option **CMX Calculations**.

Note.

Depending on your calibration settings, results may be save "as both" (the results are saved both as As Found and as As Left results). This setting is among the **Calibration options** in the **Options window**.

If the field **Reject if Calibrator is Overdue** in an instrument's Calibration Procedure is checked, you cannot save calibration results if you have selected a calibrator or module with an overdue calibration.

Ending Manual Entry

To end Manual Entry, press the **Close** button in the **Manual Entry** window's toolbar or select **Close** from the **File** menu. If the results of the last repeat was not (fully) saved, CMX prompts you to save them first.

Viewing the Results

The result property window can be opened from the following Trees:

- The **Position** Tree,
- The **Plant Structure** Tree and the
- The **Device** Tree.
- The **Position Set** and **Device Set** Trees.

The results icon:



In all cases: Click on the tree to see the results icon. It is located below the Function icon. Either double click on the results icon or select the **Properties** button in the main window's toolbar.

The results are shown below in "latest repeat result first" order.

The **Valid Result** check box allows you to exclude somehow not usable results from calibration history analysis.

CMX uses the calibrator module specifications to calculate the input and output uncertainties shown in the result table.

The **Environmental Data** and the **Calibration Notes** found among the calibration results can be edited. Also the status of the **Valid Result** check box can be changed. To do it, click the **Edit** button found in the property window's toolbar.

Availability of
uncertainty data:

- CMX Light
- CMX Professional
- CMX Enterprise

Note.

If an input or output value ends in a "~" character (tilde), e.g. **12.045~**, the reading was unstable. Adding this character is possible in CMX's manual entry window, in CMX for Pocket PC and when appropriate, the character is automatically added in a reading when using certain modern calibrators.

Availability:

- CMX Light
- CMX Professional
- CMX Enterprise

Average Results and Expanded Uncertainty

Average results and uncertainties can be shown among calibration results. They are individually activated/deactivated in the **Options** window's **Calibration** page. To open the **Options** window, select **Tools, Options** from CMX's main window's menu.

If **Show Average Results** is checked, the calibration result window includes an additional table of average results for all calibrations with more than one As Found or As Left repeat. For Switches: Multiple switch cycles in a single calibration repeat is enough for CMX to calculate average results.

If **Show Expanded Uncertainty** is checked, the calibration result window includes an extra column of Expanded Uncertainty data among each calibration repeat. Also: the error graph displays uncertainty bars for each calibration point.

More info of average and uncertainty calculations in a separate help file entitled "**CMX Calculations**". Open it from CMX Main Windows' Help menu. Select option **CMX Calculations**.

Approving Calibration Results

Availability of

Change Management:

- CMX Light
- CMX Professional
- CMX Enterprise

The approval of calibration results vary depending on whether Change Management and its Electronic Signature feature is active or not.

- With the Change Management / Electronic Signature, a table of signatures and a **Sign** button is found at the bottom of the result window.
- Otherwise a table of approvals and an **Approval** button is found at the bottom of the result window.

To approve/sign results, press the **Approve** (or **Sign**) button and enter required information.

Note.

Approving/signing calibration results is allowed only if you have the appropriate user rights.

Locking Calibration Results

Approved calibration results may be locked, provided the user has appropriate rights. When the results have been locked, the results may not be changed in any way unless someone with appropriate rights unlocks the results.

To lock/unlock calibration results, position your mouse pointer above a calibration result icon in CMX's main window's **Positions, Plant Structure** or **Devices** tree structure. Click on the mouse's secondary button to open the pop-up menu and select **Lock** or **Unlock**.

Deleting Calibration Results

To delete calibration results, open the Context Menu and select the **Delete** option.

Note.

Deleting calibration results is allowed only if you have the appropriate user rights.

History Trend

Availability:

- CMX Light
- CMX Professional
- CMX Enterprise

History Trend is a utility for viewing calibration history data. It is available both for Positions and Devices. The data is displayed graphically and is also available in numeric format in a table.

The biggest difference between the standard Calibration Results window and the History Trend window is that you can view several calibration results simultaneously in the History Trend window. It allows you to evaluate the calibrations of a Position or a Device for a longer time period compared to the normal calibration result view.

Examples of how to utilize the History Trend feature:

- Get an overview of how a particular device drifts between calibrations and also whether the drift increases with time.
- How different devices are suited for use in a particular Position.

Note.

For Weighing Instrument, the History Trend is available for the actual Weighing Test only.

Opening the History Trend Window

Availability:

- CMX Light
- CMX Professional
- CMX Enterprise

The History Trend window is opened using one of the following methods:

- Click the secondary button on your mouse above a **Position, Function, Procedure** or a **Result** icon seen in a main window Tree Structure. Select **History Trend** from the opened pop-up menu.
- Click the secondary button on your mouse above a **Device, Function, Procedure** or a **Result** icon seen in the **Devices** window. Select **History Trend** from the opened pop-up menu.
- The **View** menu of the main window includes a **History Trend** option.

Calibration Certificates and Other Documents

General

CMX allows the printing of the following document types:

- Calibration Certificates,
- Reports,
- Labels and
- History Trend graphs* and
- Audit Trail reports*.

**) Not available in CMX Light.*

To print documentation from CMX, use the **Documents** button found in the main window's toolbar or select the document type to be printed from the **Documents** Menu. A third possibility is using the Context Menu. In all cases: A more detailed print selection window will be open for that document type.

Exception:

Audit Trail Reports are printed from the Audit Trail window. More of this in chapter **The Audit Trail Window**.

Printing Certificates

Select the certificate layout from the list available in the **Print Certificate** window. Then drag the Position, Device, Function or Result icon from a Tree to the print list. Note that a Position can only be dragged from a Position Tree, Position Set Tree and the Plant Structure Tree. A Device can only be dragged from a Device Tree and the Device Set Tree.

Use the **Preview** button to see on the screen how the printed certificate looks like.

Note.

Only Positions/Devices/Functions with saved calibration results may be dragged to the **Print Certificate** window.

Printing Reports

Select the report layout from the list available in the **Print Report** window. Then drag the Position from the Position Tree, Position Set Tree or the Plant Structure Tree and Devices from the Device Tree or the Device Set Tree.

About the check boxes:

If none of the check boxes are checked, the report contains data based on the latest repeat of the latest calibration.

- If only **All Repeats** is checked, the report contains data based on all repeats of the latest calibration.
- If **History** is checked, the report contains data based on all repeats of all calibrations for the selected items. In this case the **All Repeats** setting does not matter.
- If **Results** is checked, then the report includes data for all calibration points. Otherwise the data is presented on repeat level.
Example: If a 5 point up-down calibration is done, then the report includes either one row of data (**Results** unchecked) or nine rows of data (**Results** checked).
- If **AVG Only** is checked, then the report includes average results only, omitting the individual repeats. If only one repeat was done, i.e. no average results are available, then that single repeat is printed no matter if **AVG Only** is checked or unchecked.

Notes.

AVG Only is visible only when **Calibration Options** field **Show Average Results** is checked.

Then: **AVG Only** is available when either **History** or **All Repeats** check box is checked.

Use the **Preview** button to see on the screen how the printed report looks like.

Note.

One of the available reports is called **Manual Entry Form**. Print it to have a practical form for manually entering calibration results.

*Availability of
Results and
AVG Only check boxes:*

-- CMX Light

● CMX Professional

● CMX Enterprise

Printing Labels

Select the label layout from the list available in the **Print Label** window. Then drag the Position from the Position Tree, Position Set Tree or the Plant Structure Tree and Devices from the Device Tree or the Device Set Tree.

Use the **Preview** button to see on the screen how the printed labels look like.

Printing History Trend Graphs

Availability:

- CMX Light
- CMX Professional
- CMX Enterprise

Select the history trend layout from the list available in the **Print History Trend** window. Then drag the Position, Device or Function icon from a Tree to the print list. Note that a Position can only be dragged from a Position Tree, Position Set Tree and the Plant Structure Tree. A Device can only be dragged from a Device Tree and the Device Set Tree.

Use the **Preview** button to see on the screen how the printed certificate looks like.

Note.

Only Positions/Devices/Functions with saved calibration results may be dragged to the **Print History Trend** window.

Printing Audit Trail Reports

Availability:

- CMX Light
- CMX Professional
- CMX Enterprise

Audit Trail window has a toolbar button for printing a report of displayed Audit Trail data. More of this in chapter **The Audit Trail Window**.

Importing/Exporting Document Layouts

Sometimes you need to copy document layout from a CMX database to another. The tools for doing that are in the **File** menu. To copy the document layout, do as follows:

1. Open the database where the document layout to be copied exists. Then select **File, Export, Document Layouts**.
2. Select the **Layout Type** and press the corresponding **Export** button. A dialog for selecting the folder appears.
3. Select appropriate folder and press **Save**.
4. Open the database where you want to have a copy of the exported document layout. Then select **File, Import, Document Layouts**.
5. Select correct **Layout Type** and then **Browse** to the folder where the exported layout is.
6. If applicable, edit the **Layout Name** and **Description**.
7. Press the **Import** button.

Note.

If you receive a standalone document layout, sent by mail from, e.g. Beamex, start from phase 4 in the list above. Just replace the word "exported" with "standalone".

Creating Your Own Certificates

Availability:

- CMX Light
- CMX Professional
- CMX Enterprise

The Report Design tool allows you to make your own Certificate, Report etc. layouts.

Since the software module used for creating layouts for Certificates, Reports etc. is a third party software it has its own on-line help made available while creating the layouts.

Adding/editing e.g. a new Calibration Certificate layout is done using menu commands: **Documents, Certificates, Design**. Others are added/edited similarly. Just change the document type.

Exception:

Editing Audit Trail Reports is invoked in the Audit Trail window. More of this in section **The Audit Trail Window**. Also note that you can have only one Audit Trail Report Layout for each CMX database. You may however edit the existing one to suit your needs, provided you have the rights and tools to edit document layouts.

CMX is shipped with a Help file called **CMX_Report_Variables.chm**. It presents all variables available in the Report Designer. Open it from CMX Main Windows' Help menu. Select option **CMX Report Variables**.

Important!

If you have activated Window's UAC (User Account Control) feature, you'll need to run CMX as administrator to be able to save the edited documents. Otherwise you will get an error message and your edits are not saved.

Change Management and Audit Trail

General

Availability:

- CMX Light
- CMX Professional
- CMX Enterprise

Change Management and Audit Trail includes tools for keeping track of changes made to CMX's database. Additionally, whoever makes a change to the database may also be asked to give a description for the change.

Users with the proper authorization may review the change log (Audit Trail) and mark the changes reviewed.

The feature also includes a possibility to utilize electronic signatures

Briefly, CMX's Change management feature includes all the tools required to comply with regulations of which most important are GAMP4 (Good Automated Manufacturing Practices) and 21 CFR Part 11 (Electronic records; Electronic signatures).

How to Change or check your Change Management and Audit Trail settings is described in section **Basic Settings**, chapter **The Options Window**.

The Audit Trail Window

The **Audit Trail** window can be opened from the main window's **Tools** menu. Use the **Display** button in the toolbar to select the type of records you want to see.

Large Audit Trail databases (containing more than 50 000 rows) are opened showing the latest month only. Use the date fields below the toolbar to select another time period for viewing.

To mark events as reviewed (requires that you have the rights to do it), press the **Edit** button in the toolbar. Then you can use one of the following methods:

- Use the check box in the next to last column to mark a single event as reviewed.
- Use the **Review All** button in the toolbar to mark all events as reviewed.

Hints.

- To sort the Audit Trail data, click on the header of the column you want to sort by.
- To copy Audit Trail data to the clipboard (for pasting into, e.g. Excel), highlight the part you want to copy. Then use the Windows standard keyboard shortcut for copying (Ctrl C).
- To print Audit Trail data, use the **Documents** button in the toolbar. The **Print** and **Print Preview** options print/display the Audit Trail data for the selected date range.

The **Documents** button also has the **Design** option. It is active, provided the Report Design option is part of your CMX software. More of Reports and Calibration Certificates in **Calibration Certificates and Other Documents** section.

Notes.

Making changes that are recorded in Audit Trail may affect other items, dependent on the field that was changed, in the database. Changes in the dependent fields are not recorded in Audit Trail. Examples:

- A Function's span is changed from 100 mbar to 120 mbar.

The change is automatically recorded to Audit Trail.

If the Function is calibrated in three points (0%, 50 % and 100 %),

the original calibration points were 0 mbar, 50 mbar and 100 mbar.

After the span change, the points are 0 mbar, 60 mbar and 120 mbar.

The change of calibration points are not recorded in Audit Trail.

- A Weighing Instrument's d/e values are edited. The change is automatically recorded to Audit Trail.

However, the change in d/e values may affect the Maximum Permissible Error (MPE) limits.

The possible change is not recorded in Audit Trail.

If the same CMX database is contacted from several time zones, consider setting the time format in CMX **Options** windows' **General Settings** and **Change Management Options** to suit your needs.

Electronic Signature

Availability:

- CMX Light
- CMX Professional
- CMX Enterprise

If the Electronic Signature is activated, every time a change concerning Device, Position or Calibration data is made to the database, a window opens where the following fields are available:

- **Status.** A list of status values is presented. The following values are pre-entered in the database: **Approved, Draft, Rejected, Reviewed** and **Withdrawn**. The list is editable so you may also add your own status values.
- The master approval check box. Only user with permissions to approve may change this field.
- **User ID** and **Password.** The ID of the logged user is pre-entered, but any valid User ID may be entered. Remember to utilize password security!

The Electronic Signature history of a Position, Device or a Calibration is located as the last items in the Properties window. Use the **Sign** button to change the status of the Device/Position/Calibration.

Electronic Record

Electronic Record is the name used for the group of data that has been approved with the Electronic Signature. If anything that is part of a certain Electronic Record is changed after it was signed, the data requires a new approval using the Electronic Signature.

The following list describes what type of data belongs to the available Electronic Records:

Type	Data belonging to the Electronic Record
<i>Position</i>	Data shown in the following property windows: Position, Function and Procedure.
<i>Device</i>	Data shown in the following property windows: Device, Function and Procedure.
<i>Calibration</i>	Data shown in the Calibration results property window.

Pocket PC Interface

General

Availability:

- CMX Light
- CMX Professional
- CMX Enterprise

CMX's Pocket PC Interface consists of software installed into a Pocket PC and communication between CMX and the Pocket PC. Together they allow you to transfer data of instruments to be calibrated to a Pocket PC, perform the calibration wherever it is suitable for you, enter the calibration data into the Pocket PC and then reconnect to CMX and upload the results to CMX's database.

Thus CMX for Pocket PC is a "portable manual entry tool"

Recommended Hardware Specifications

Operating System	Memory ROM/RAM	Display	Compact Framework
Windows Mobile 6.5	64MB/128 MB	240×320, 480×640 or 240×400 color TFT Touch Screen	v. 3.5

CMX for Pocket PC will most likely also work with latest Service Pack and Security Updates.

Although not recommended, CMX for Pocket PC will most likely also run on older operating systems. However, CMX for Pocket PC does not run on all models running Windows Mobile 6.1.

Specification for the communicating Desktop/Laptop Computer:

- Windows Mobile Device Center installed

Microsoft .NET Compact Framework 3.5 or later has to be installed on the Pocket PC. Newer pocket PCs may include a version of .NET Compact Framework. Older Pocket PCs may not necessarily have a .NET Compact Framework or it is an older version. If you need to add or update the .NET Compact Framework, see notes on next page or download .NET Compact Framework 3.5 from here:

<https://www.microsoft.com/en-us/download/details.aspx?id=65>

Notes.

The CMX installation media's Pocket PC folder also contains a subfolder named **Compact Framework**. It contains the latest **.Net Compact Framework** Service Pack (valid when the installation media was done).

If you update the CMX main software and your Pocket PC software is no longer compatible with it, CMX recognizes the problem and prompts you to update the Pocket PC software. If you updated CMX from an installation media, it also contains new Pocket PC software.

Before updating either CMX main software or the Pocket PC software, make sure you upload all results from all your Pocket PCs to CMX.

Installing CMX for Pocket PC

If **CMX for Pocket PC** software is already installed on your Pocket PC it must be uninstalled before the new version is installed. For instructions on how to uninstall CMX for Pocket PC read chapter **Uninstalling CMX for Pocket PC** on page 139.

CMX for Pocket PC can be installed on Pocket PCs with the following operating system: Windows® Mobile 6.5 and later.

CMX for Pocket PC's installation files are located in the CMX Installation CD-ROM's **Pocket PC** folder. Start the **Setup** software and follow the instructions on computer's screen.

Setup is divided into two phases: First the Pocket PC **Installer** is installed to your desktop/laptop computer. Then the actual CMX for Pocket PC software is installed to your Pocket PC.

If you are installing CMX for Pocket PC to several Pocket PCs, the first installation is done as described above. Subsequent installations can be done using the desktop/laptop computer's **Windows Mobile Device Center** software. See instructions for subsequent installations further on.

Availability:

- CMX Light
- CMX Professional
- CMX Enterprise

Notes.

You may install the CMX for Pocket PC to as many Pocket PCs as you like.

The installation of CMX for Pocket PC can also be done manually:

Copy all files found in **Pocket PC\Files** folder on the CMX installation media to an optional program folder (e.g. **Program Files\CMX for Pocket PC**) in your Pocket PC.

Subsequent installations with Windows Mobile Device Center (Windows® 7 or 8)

These instructions apply in the following case:

- You have already installed CMX for Pocket PC into one Pocket PC as described in chapter **Installing CMX for Pocket PC** on page 136.
- You have several Pocket PCs you want to install CMX for Pocket PC into.

Dock your Pocket PC device on your computer. Open **Windows Mobile Device Center** and select **Program and Services**. Select **Add/Remove Programs** from the list. If **Add/Remove Programs** is not visible click on the **More** link. Check the **Beamex CMX for Pocket PC** option that is shown in the opened window and click the **OK** button to run the installation.

Changing the User Interface Language in Pocket PC

By default, **CMX for Pocket PC** installs all available user interface languages into Pocket PC. All languages are available in **CMX for Pocket PC's** Tools menu. Choose one that suits your needs.

If you do not need certain languages, you can remove them by exploring the Pocket PC to folder:

Pocket PC:\Program Files\CMX for Pocket PC\Languages

This folder contains sub-folders, one for each language. Remove the folders that you do not need. They are easily recognized since the folders have names based on the language. Then when you restart CMX for Pocket PC, the Tools menu no longer contain the language folders removed from Pocket PC.

Creating Customized User Interface Languages for Pocket PC

If you want to create a custom user interface language, you must first create a specific sub-folder to this folder in your Pocket PC:

Pocket PC: \Program Files\CMX for Pocket PC\Languages\

The allowed folder names for this use are:

UserDefined1, UserDefined2 and UserDefined3.

Be sure you name the folder(s) as defined here. Otherwise CMX for Pocket PC will not recognize them and they are not available for use in CMX for Pocket PC.

Continue by copying one of the existing language files (*Translation.xml*) to where editing is possible and edit it according to your needs. Then copy the edited file into the folder you created for a custom user interface language.

Note.

Editing the language file requires knowledge of XML files and how to edit them.

Uninstalling CMX for Pocket PC

Uninstalling CMX for Pocket PC is required if a new version is going to replace the currently installed version or if you for some reason re-install the same version.

Before uninstalling CMX for Pocket PC from the actual Pocket PCs, remove Pocket PC **Installer** from your desktop/laptop computer.

To remove Pocket PC **Installer** from your desktop/laptop computer, do as follows:

- Open Windows **Start** menu,
- select **Settings, Control Panel** and from the opened window,
- select **Add or Remove Programs** tab.
- From the list of programs, select **CMX for Pocket PC Installer**.
- Click the **Remove** button.

Uninstalling CMX for Pocket PC from your Pocket PCs can optionally be done through ActiveSync®, Windows Mobile Device Center or directly on the Pocket PC.

Note.

Before attempting to remove **CMX for Pocket PC**, ensure that it is not running in the background. If you're unsure, do as follows:

- Open Pocket PC's **Start** menu,
- select **Settings** and from the opened window,
- select **System** tab.
- Select **Memory** icon and from the opened window,
- select **Running Programs** tab.

Now you are able to see a list of running programs. If **CMX for Pocket PC** is on the list, select it and tap "Stop". Newer Pocket PC operating systems may also have a shortcut for opening the memory window directly from the desktop.

Option 1: Uninstall using Windows Mobile Device Center (Windows® 7 or 8)

Connect your Pocket PC to your desktop/laptop computer and open Windows Mobile Device Center on your PC. Select "Program and Services". Select "Add/Remove Programs" from the list (if Add/Remove Programs is not visible click on the "more" link). Uncheck the **Beamex CMX for Pocket PC** option that is shown in the opened window and proceed by clicking **OK**.

Option 2: Uninstalling directly on the Pocket PC

Select **Start, Settings, Remove Programs** on your Pocket PC. In the list of installed programs select **Beamex CMX for Pocket PC** and click **Remove**.

Sending Instrument Data to the Pocket PC

Availability:

- CMX Light
- CMX Professional
- CMX Enterprise

For CMX the Pocket PC is like a calibrator connected to the USB port. Sending instrument data as well as receiving results is done just like it is done for any other communicating calibrator.

Open the **Send to Calibrator** window (menu commands: **Calibration, Send**) and drag the instruments you want to calibrate to the window.

Select **ActiveSync**[®] as the port. CMX uses it to communicate with the Pocket PC no matter if the Pocket PC is connected to a USB port or if the Pocket PC uses some ActiveSync[®] compatible wireless technology.

When all instruments have been selected for sending, press the **Send** button.

Using the Pocket PC Interface

Availability:

- CMX Light
- CMX Professional
- CMX Enterprise

This chapter describes the use of CMX for Pocket PC software.

Section **Work Order Handling** presents some additional information when using your Pocket PC for Work Order Handling.

Starting

When CMX for Pocket PC is started for the first time or it is not used for a while, the CMX for Pocket PC icon is not seen in the **Start** menu. In that case, select **Programs** from the **Start** menu and locate the CMX icon in the list of available programs. CMX icon:



When CMX for Pocket PC has recently been used, the CMX icon is available in the **Start** menu's list of recently used programs. Use the CMX icon to start CMX for Pocket PC.

When CMX for Pocket PC starts, a list of sent instruments is shown.

In the example startup picture on the right some of the instruments have already been calibrated.

An instrument that is still not calibrated is presented with bold text together with its calibration due date.

A calibrated instrument is shown with regular text together with two dates: the uppermost is the due date sent from CMX and the lower is the actual calibration date.

9 Instruments, 6 not calibrated		
	01GA05PI-24 Pressure Indicator	02/05/2005
	01GA06PI-25 Pressure Indicator	02/05/2005 26/04/2005
	01GA01TI-22 Temperature Indicator	28/04/2005 26/04/2005
	01GA04TI-23 Temperature Indicator	28/04/2005
	01GA07QI-27 pH Sensor	09/05/2005
	01GA08QI-28 pH Sensor	09/05/2005 26/04/2005
	01GA09EEC-29 Electrical Converter	10/05/2005
	01GA10EI-30 Electrical Indicator	28/04/2005
	01GA11EIR-31 Electrical Indicator, % display	11/05/2005

The icons used are similar to what is used in CMX main window, with the following addition:

A calibrated position/device has a check mark on the icon.

Selecting Instruments for Calibration Data Entry

In the list of sent instruments, tap on the instrument you want to calibrate and a calibration window opens.

Note.

If you want to simultaneously enter calibration results of multiple instruments, see chapter **Calibrating Groups of Instruments** on page 146.

Viewing Instrument Details

Instrument data may be viewed starting from the calibration window (**Tools, View Instrument Details**). The same menu commands also apply in the list of sent instruments. There you are also able to use the pop-up menu.

The Instrument Details window always opens with the Position data shown. Use the **View** menu to select other views of instrument data.

You may edit instrument data by entering the **Tools, Edit** menu commands. Be aware that unnecessary alterations may cause problems when receiving the results (the main CMX software may not "recognize" the instrument as the one that was sent).

Note.

If the instrument is already calibrated, only the Environment and Note data may be edited in Pocket PC.

To close the Instrument Details window, select **Tools, Close**.

- Availability:
- CMX Light
 - CMX Professional
 - CMX Enterprise

Entering Calibration Data

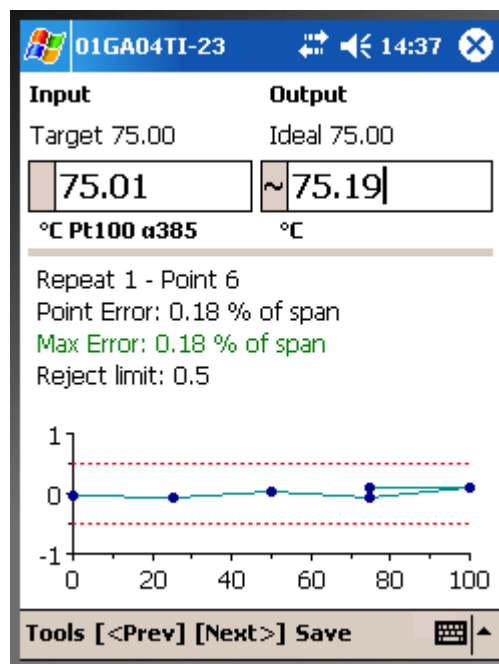
This chapter and its subchapters describe how to enter calibration data of process instruments into Pocket PC. When calibrating **Weighing Instruments** in Pocket PC, see chapter **Using a Pocket PC** in section **Calibrating Weighing Instruments**.

CMX for Pocket PC shows input and output values in the upper part of the window.

Tap on the editable large numeric fields.

Use the up/down navigation buttons to change the pre-entered values. Alternatively, use the "keyboard" that opens from the lower right corner.

Immediately to the left of the numeric fields is an area for indicating/saving that the entered value was unstable. Tap the area and the "unstable" symbol (⊞) becomes visible.



When both the input and output values are edited accordingly, either tap the **[Next>]** button or press the middle button in a 5-way navigation button (if applicable).

The fields in the middle of the window as well as the graph below the fields are updated. Also: The large numeric fields have pre-entered values for the next calibration point.

Note.

Input values outside the calibration point's *Max. Deviation* limit are indicated in red. This does however not affect any calculations.

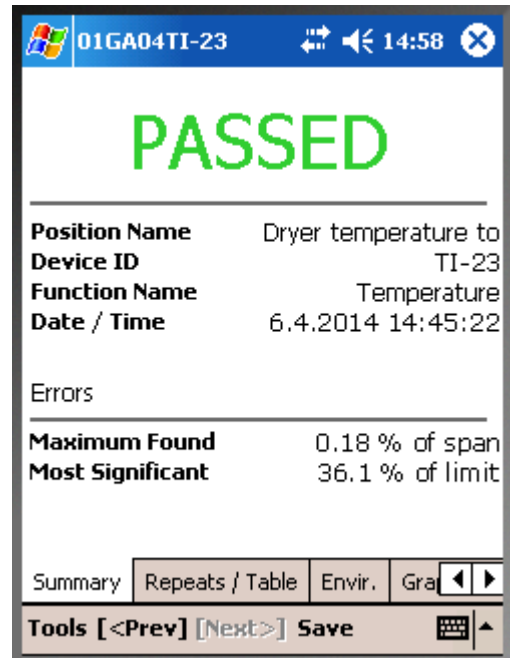
During the calibration run and even when viewing results, before the results are saved, you can correct any mistakes by tapping the **[<Prev]** button until you see the point/data with the erroneous data. Correct the data and tap the **[Next>]** button until you are back where you were.

Saving Results

You can save the results at any time, even if only part of the data is entered. Then the results are saved as a partly done repeat.

Before the results are saved you are requested to enter calibrator reference data and then continue to see **Summary** data (see adjacent picture). Additional result data is available in the other tabs. One of them is a tab where you may enter environment data.

After you save the results, a pop-up window opens where you may either start another calibration run or end the calibration and return to the list of instruments.



Calibrator References

In the calibrator reference window you may enter calibrator references for the calibration. If the **Points** field is set to **All**, then the entered calibrator reference applies for all points. If the **Points** field is set to a single point, e.g. **3/9**, the entered calibrator reference is valid from that point onwards either to the last point or to the following point with a new calibrator reference.

Note.

The Calibrator reference window may also be opened while entering the calibration point values. Open the **Tools** menu and select option **Set Calibrator Reference**.

Environment Data

You may enter environment at the end of the calibration or at any time during the calibration too. Open the **Tools** menu and select option **Environment Information**.

Note.

Environment data history is not saved. Whenever you rewrite the environment data, they are the ones that are saved at the end of calibration.

Calibrating Groups of Instruments

A **Group** in CMX for Pocket PC can be any set of standard instruments that you want to calibrate at the same time. A Group can be:

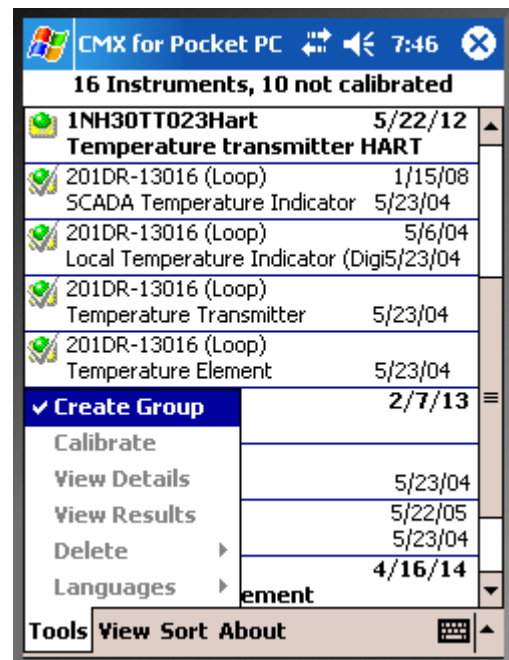
- Instruments part of a control loop
- A set of Temperature Sensors that are calibrated at the same time using, e.g. a temperature dry block.
- Etc. etc. Your own needs define the Group.

Activating Group Calibration

To activate Group calibration, open the **Tools** menu in CMX for Pocket PC's Instrument List window.

Check **Create Group** and you are ready to select (highlight) multiple instruments.

When ready, select **Tools** menu's **Calibrate** option to advance to **Group View** window.



Notes.

To get back to "normal" Instrument List and calibrating a single instrument at a time, uncheck **Create Group**.

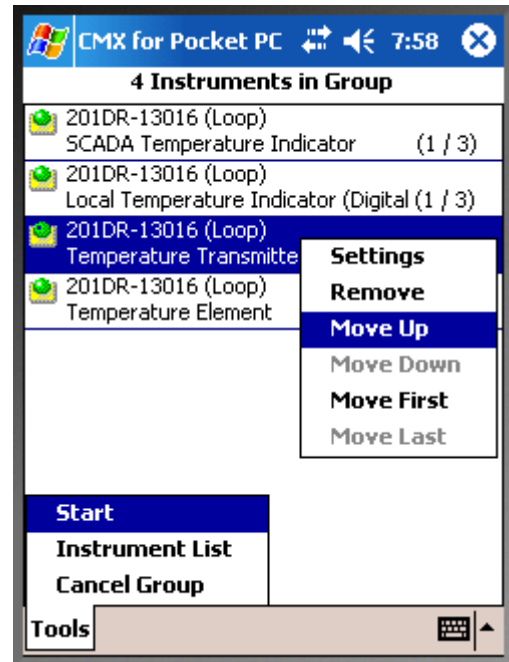
Groups cannot be saved and only one group may be active at a time.

Maximum amount of items in a group is 10.

Group View

In **Group View** window you may sort the selected instruments using the pop-up menu available. See adjacent picture.

The group calibration advances in the order the instruments are in the group, first points first for all instruments. Then the second points for all instruments etc. This continues until all calibration points for all instruments are done.



Example of default calibration advancement in group calibration for instruments **A**, **B** and **C**:

A, 5 points	B, 3 points	C, 6 points
1 st point ⇨	1 st point ⇨	1 st point ⇨
⇦	⇦	⇦
⇨ 2 nd point ⇨	2 nd point ⇨	2 nd point ⇨
⇦	⇦	⇦
⇨ 3 rd point ⇨	3 rd point ⇨	3 rd point ⇨
⇦	⇦	⇦
⇨ 4 th point ⇨	⇨	4 th point ⇨
⇦	⇦	⇦
⇨ 5 th point ⇨	⇨	5 th point ⇨
		⇦ ⇨
		⇨ 6 th point

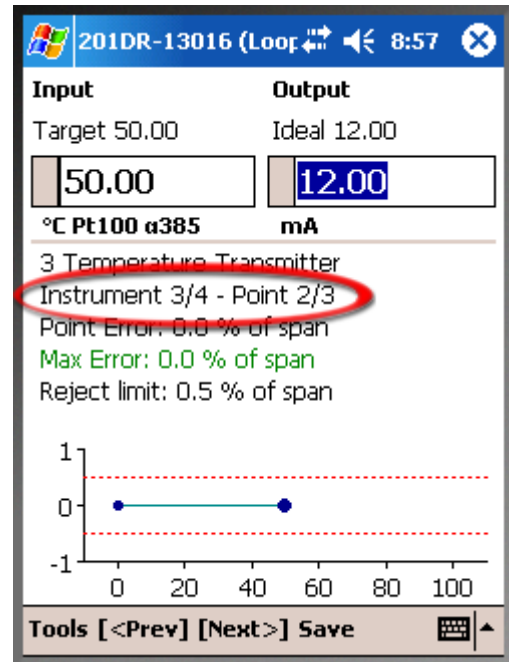
Start Group Calibration by clicking the **Start** menu option.

Calibrating a Group

Entering calibration results is done mostly as it is done for a single instrument as described in chapter **Entering Calibration Data** and its subchapters starting from page 144.

A row in the Calibration window indicates which instrument is calibrated in the Group and at which calibration point you are.

In the adjacent picture:



The third instrument of a group of four (3/4) is active at the moment and the current calibration point is the second of three (2/3).

If you want to depart from the default order the calibration points are done in, open **Tools** menu and tap on menu item **Select Instrument** then select which instrument's next point should be done now. After the special point is done, **CMX for Pocket PC** continues according to the default advancement.

Calibration Reference and **Environment Data** are entered similarly as they are for a single instrument (see chapters **Calibrator References** on page 145 and **Environment Data** on page 145). The only exception is that when the data is entered for the first time for any of the Group's items, the data is copied to all instruments belonging to the Group. You may, of course, customize the Calibrator Reference and Environment data for each instrument when needed.

Chapter **Saving Results** on page 145 also applies for Groups.

Notes.

The **Tools** menu includes the option **Cancel Calibration**. It removes the current instrument from the group.

Selecting **Reject All** cancels all open instruments and the Group calibration ends.

Receiving Data from the Pocket PC

Availability:

- CMX Light
- CMX Professional
- CMX Enterprise

As sending instrument data to the Pocket PC, receiving data is just like receiving data from a communicating calibrator:

Select **Calibration, Receive** in CMX's main window, select **ActiveSync®** port, connect and receive the results from the Pocket PC.

Note.

If you have the **Calibration Options** field *Update Calibrator data from instruments received from Pocket PC* checked, the following happens when you receive a calibration that refers to a calibrator that is in the Pocket PC's memory, but not in CMX's database:

CMX opens a dialog asking whether the calibrator should be added to CMX's database.

How different types of calibrators are received to CMX database:

- A **Weight Set** is fully received, including specifications.
 - A **Beamex calibrator** is received and specifications are added to it from CMX's database.
 - A **non Beamex calibrator** is received without specifications since no specifications are available in Pocket PC's memory.
-

Calibrating Weighing Instruments

General

Availability:

- CMX Light
- CMX Professional
- CMX Enterprise

CMX's Weighing Instrument Calibration feature includes a possibility to add Weight Sets and Weights as well as Weighing Instruments to be calibrated into CMX's database. Weighing Instruments can then be calibrated by using either the Manual Entry window or by using the Pocket PC interface.

CMX's Weighing Instrument Calibration feature is based on:

- OIML international recommendation OIML R 76-1: 2015 (OIML = **Organization Internationale de Métrologie Légale** or **International Organization of Legal Metrology**),
- European standard EN45501:2015 + AC:1993,
- NIST Handbook 44 – 2017 / 2.20. Scales (NIST = **The National Institute of Standards and Technology**, US),
- **EURAMET cg-18, Version 4.0 (11/2015)**
Previously: EA-10/18 EA Guidelines on the calibration of non-automatic weighing instruments (EA = European co-operation for accreditation).
- **U.S. Pharmacopeia Convention's Chapter 41** (briefly **USP 41**).
In USP 41, repeatability is assessed by weighing one test weight 10 times. Details of pre-USP 41 calculations and USP 41 calculations can be found in **CMX Calculations**, available in CMX main window's Help menu.

Note that this document do not give an exhaustive presentation of what Weighing Instruments are and how they are calibrated in general. This document gives you help in how to do calibrations using CMX. To get deeper Weighing Instrument information, read the documents presented above and other Weighing Instruments related material.

This section presents Weighing Instrument Calibration specific information. Where the functionality of CMX's Weighing Instrument Calibration is similar to other type of instruments and calibrators, this section refers to the more general presentation elsewhere in this document.

Basic Settings for Weighing Instruments

Availability:

- CMX Light
- CMX Professional
- CMX Enterprise

This chapter and its subchapters present basic settings specific for Weight Sets and Weights. Subjects like creating a Plant Structure are not described here. This is because Weighing Instrument Calibration does not affect it at all. Please read the section **Basic Settings** to see a full description of CMX's Basic Settings.

Entering Weight Sets and Weights

For CMX, Weight Sets, Weights and process instrument Calibrators are analogous in the following way:

- A set of weights used for calibrating Weighing Instruments equals a calibrator used for calibrating process instruments.
- A single weight equals a measurement module in a process instrument calibrator.
- Finally, the specifications of a weight equal a measurement range in the module of a process instrument calibrator.

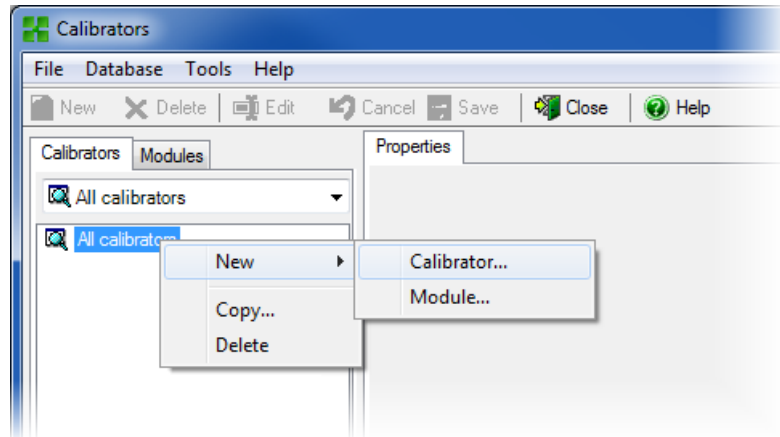
Only the fields that have a specific meaning for Weights and Weight Sets are described in the following chapters. Equally important fields that have the same meaning for weights and calibrators are not discussed here. For descriptions of other fields, refer to section **Description of Fields** in the on-line help.

Finally, the following chapters present a straight forward method of adding Weight Sets, Weights and Weight Specifications. CMX's flexible user interface allows you to do the same thing using other views/windows too. Feel free to also experiment with the other possibilities, but use this as the way to get into entering Weight Set, Weight and Weight Specification data.

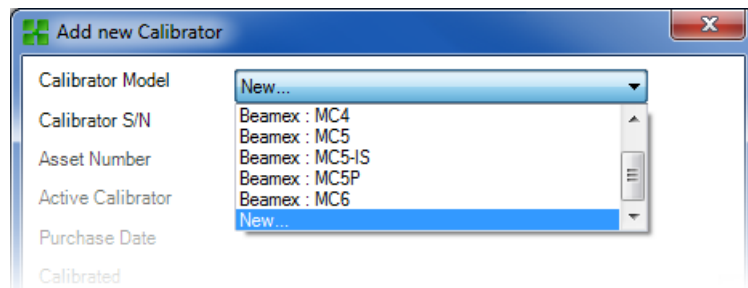
Weight Sets

To add a Weight Set, open the Calibrators window. Use the following menu commands when you are in the Main Window: **Database, Calibrators**.

To add a Weight Set, click the mouse's secondary button anywhere in the **Calibrators** tree structure. Select **New, Calibrator** (remember, a Weight Set is a “Calibrator for Weighing Instruments”).

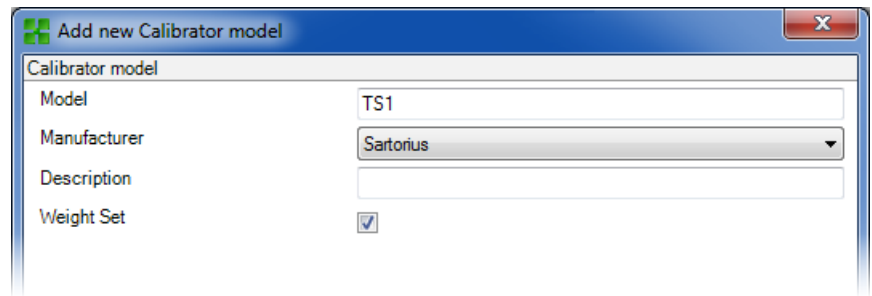


A window like the one below opens:



Select the **New** option in the **Calibrator Model** combo or select an existing Weight Set from the list if you are adding a new similar set. In the latter case, advance to **Adding “New Calibrator” Data**.

Adding a New Calibrator Model



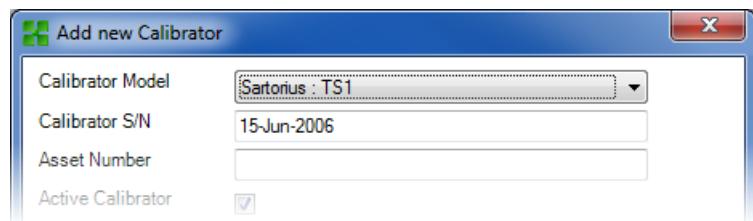
When adding a new Weight Set, enter the set's name as the **Model**. Also, assure that you check the **Weight Set** check box. Then CMX treats the new Calibrator Model as a Weight Set, not a Process Instrument Calibrator.

Full field level information of Calibrator Model properties are available in the on-line help delivered with CMX.

When ready, press the OK key to return to the **Add New Calibrator** window.

Adding "New Calibrator" Data

When the Calibrator Model is entered/selected, add a serial number to the Weight Set. The Serial Number field is a required field in CMX (together with the **Calibrator Model** field they identify the Calibrator / Weight Set). If the weight set has no serial number, enter its purchase date as a serial number.



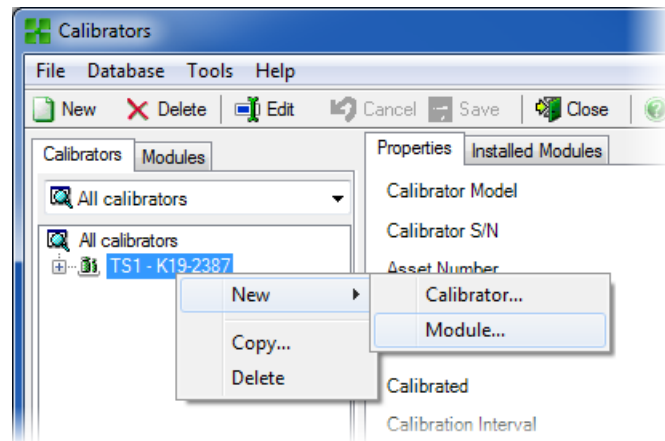
Full field level information of Calibrator properties are available in the on-line help delivered with CMX.

Weights

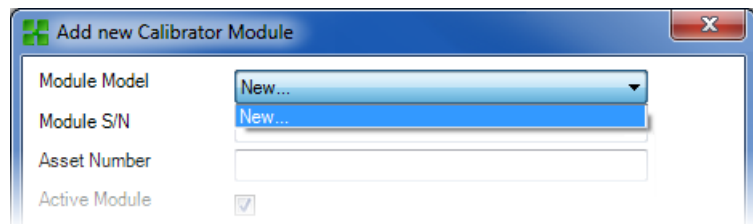
Availability:

- CMX Light
- CMX Professional
- CMX Enterprise

To add a Weight to a Weight Set, click the mouse's secondary button above the Weight Set in the **Calibrators** window. Select **New, Module** (remember, a Weight is a “Calibrator Module”).

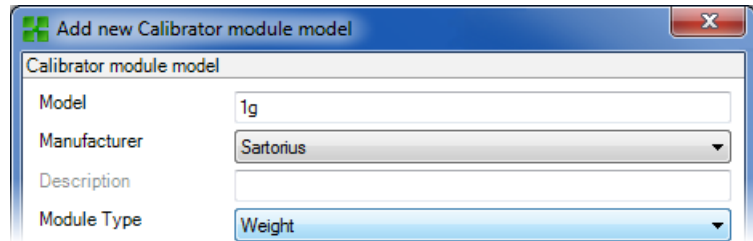


A window like the one below opens:



Select the **New** option in the **Module Model** combo or select an existing Weight from the list if you are adding a new similar Weight. In the latter case, advance to **Adding “New Calibrator Module” Data**.

Adding a New Calibrator Module Model



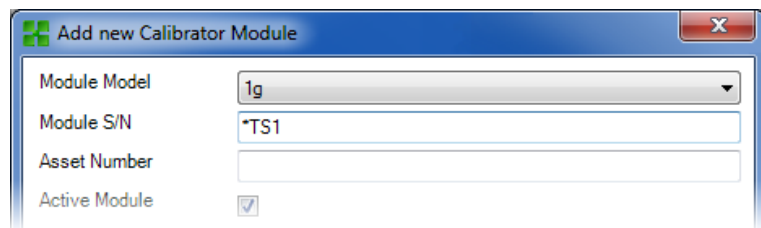
When adding a new Weight, enter its weight as the **Model**. Also, assure that you select Weight from the **Module Type** combo. Then CMX treats the new Calibrator Module Model as a Weight, not a Process Instrument Calibrator Module.

Full field level information of the Module Model properties are available in the on-line help delivered with CMX.

When ready, press the OK key to return to the **Add New Calibrator Module** window.

Adding “New Calibrator Module” Data

When the Calibrator Module Model is entered/selected, add a “serial number” to the Weight. The Serial Number field is a required field in CMX (together with the **Module Model** field they identify the Module / Weight).



Hint!

Enter the Weight Set name as the Serial Number. This “ties” the weight to the set it belongs to. If you have several weights with the same nominal weight, include the identifying symbol (*) or number (1, 2 ...) to the serial number.

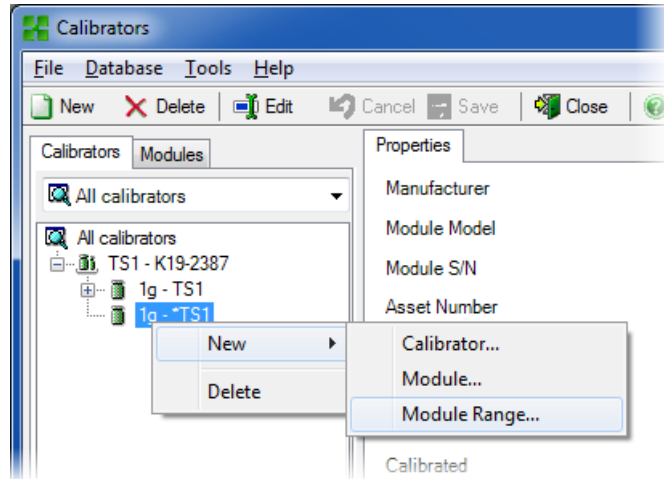
Full field level information of Calibrator Module properties are available in the on-line help delivered with CMX.

Weight Specifications

Availability:

- CMX Light
- CMX Professional
- CMX Enterprise

To add Weight Specifications to a Weight, click the mouse's secondary button above the Weight in the **Calibrators** window. Select **New, Module Range** (remember, a Weight Specification is a “Calibrator Module Range”).



A window like the one below opens:

The 'Add new Module Range' dialog box contains the following fields and controls:

- Range Name: 1g - *TS1
- Manuf. Specifications:
- Quantity: MASS
- Method: Keyed
- Nominal Mass: 1 g
- Conventional Mass: 1.00001 g
- Min. Operating Temp.: [empty]
- Max. Operating Temp.: [empty]
- Spec. Min. Temp.: [empty]
- Spec. Max. Temp.: [empty]
- Temp. Coefficient: [empty] % RDG / °C
- Constant Error: 0.000015 g
- Rel. Error (% of RDG): [empty]
- Error Calc. Method: Sum

Buttons for 'OK' and 'Cancel' are at the bottom right.

Some important fields are highlighted in the picture above. Enter a **Range Name** and set the **Method** field to “Keyed”. Enter both the **Nominal** and **Conventional** (“true”) mass for the weight.

If you want CMX to calculate uncertainties, a **Constant Error** (the uncertainty of the Conventional Mass or the Nominal Mass, depending on the instrument's **Calibration Procedure**

settings) need to be entered and an **Error Calculation Method** need to be selected.

Full field level information of Calibrator Module Range properties are available in the on-line help delivered with CMX.

Weighing Instrument Function Templates and Calibration Procedures

Availability:
-- CMX Light
○ CMX Professional
● CMX Enterprise

CMX is shipped with pre-entered Function Templates and Calibration Procedures. This makes it easy to create new Functions for Positions and Devices. There is also a Function Template and Calibration Procedure suited for Weighing Instruments. Select them when creating a Weighing Instrument Function and edit them to suit the specifics of your Weighing Instrument.

The subchapters further on only present the Weighing Instrument specific fields.

Hint.

You can also make you own Weighing Instrument Function Templates and Calibration Procedures using the **Function Templates** utility presented in **Basic Settings** section. CMX automatically adds the Weighing Instrument specific fields if the new Function's **Input/Output Quantity** field is set to "Mass".

Function Fields Specific for Weighing Instruments

Field	Description
<i>Partial Weighing Ranges</i>	<p>Select the amount of unique partial weighing ranges found in the Weighing Instrument at hand.</p> <p>Example of Partial Weighing Ranges:</p> <p>A Weighing Instrument with a 100 gram span has two partial weighing ranges.</p> <ul style="list-style-type: none">- 0 to 20 g with a 0.001 resolution and- 20 to 100 g with a 0.01 resolution. <p>Required field for Weighing Instruments.</p>
<i>*d1 ... d4</i>	<p>Actual Scale Interval.</p> <p>OIMLR76-1:</p> <p>“the difference between the values corresponding to two consecutive scalemarks, for analogue indication, or the difference between two consecutive indicated values, for digital indication.”</p> <p>This is the smallest change in mass that corresponds to a change in displayed value. On analog (mechanical) scales, this is the smallest subdivision of the scale dial or beam for analog indication. Example:</p> <p>A known weight of 12.0512 g is weighed on a scale with actual scale interval 0.1 g. The reading will be 12.1 g.</p> <p>Note that the “<i>Partial Weighing Ranges</i>” setting determines the amount of <i>Actual Scale Intervals</i> seen.</p> <p>Required field(s) for Weighing Instruments.</p>

e1 ... e4

Verification Scale Interval. The “*Partial Weighing Ranges*” setting determines the amount of *Verification Scale Intervals* seen.

Required field(s) for Weighing Instruments.

The smallest scale interval that can be used to determine price, when using a particular Weighing Instrument. Verification Scale Interval need not be the same as Weighing Instrument's Actual Scale Interval.

Note.

Editing the Scale Intervals affect the MPE values found among a Weighing Instrument's **Calibration Procedure data**, unless you are using a custom *Accuracy Class*.

Scale Range 1 ...
Scale Range 4

Defines the Scale's Partial Weighing Range.

Visible only for Weighing Instruments with more than one weighing range.

Required field(s) for Weighing Instruments.

Note.

Make sure both input and output methods are set to “**Keyed**”.

Full field level information for Function Templates is available in the on-line help delivered with CMX.

Calibration Procedure Fields Specific for Weighing Instruments

Field	Description
<i>Accuracy Class</i>	<p>Weighing Instruments are grouped according to the amount of weighing ranges and actual/verification scale divisions (d and e). Accuracy Class determines the intended area of use for a Weighing Instrument.</p> <p>CMX presents a list of standard Weighing Instrument accuracy classes and a possibility to make a customized accuracy class. Available standard accuracy classes:</p> <ul style="list-style-type: none">- HB 44 I- HB 44 II- HB 44 III- HB 44 IIII- HB 44 IIIIL- OIML I- OIML II- OIML III- OIML IIII <p>HB 44: NIST Handbook 44: 'Specifications, Tolerances and Other Technical Requirements for a Weighing and Measuring Devices'. Used in USA.</p> <p>OIML: 'International Recommendation OIML R 76-1', 1992. Used in Europe.</p> <p>Note. Selecting a standard <i>Accuracy Class</i> affects the <i>MPE Range</i> and <i>MPE</i> fields. New <i>MPE</i> limits are calculated based on the Weighing Instrument's <i>Verification Scale Interval</i> data found among Function data.</p>

MPE Range

Maximum Permissible Error range(s) and their corresponding Maximum Permissible Error (MPE). The amount of MPE ranges depends on the selected *Accuracy Class*. Also note that selecting a standard *Accuracy Class* automatically defines the *MPE Ranges*. Edit the *MPE Ranges* and *MPE* limits only when using custom *Accuracy Classes*.

Available error calculation methods:

 % of accuracy class limit

 % of load

 absolute error

Repeatability Stdev. Limit

Maximum permissible standard deviation for repeatability test. If field is left empty, repeatability test's standard deviation error limit is not in use.

More info of uncertainty calculation in a help file entitled "CMX Calculations". Open it from CMX Main Windows' Help menu. Select option **CMX Calculations**.

Note that this field is visible for Weighing instruments and enabled only when *USP 41 Repeatability Test* check box is **unchecked**.

Minimum Weight Limit

Maximum permissible minimum weight deviation error limit. If you make a custom minimum weight test, make sure it requires at least ten repeats. Otherwise this deviation error calculation always fails.

If field is left empty, minimum weight test's error limit is not in use and CMX indicates the test's status is "Passed".

More info of CMX's calculations can be found in a help file entitled "CMX Calculations".

Note that this field is visible for Weighing instruments only when *USP 41 Repeatability Test* check box is **unchecked**.

<i>Minimum Weight k-value</i>	<p>Is the coverage factor in a Weighing instrument's Minimum Weight Test. Default value is 3, which is for 99 % confidence level (USP requirement before USP 41).</p> <p>Note that this field is visible for Weighing instruments only when <i>USP 41 Repeatability Test</i> check box is unchecked.</p> <p>More info of CMX's calculations can be found in a help file entitled "CMX Calculations". Open it from CMX Main Windows' Help menu. Select option CMX Calculations.</p>
<i>Repeatability Limit</i>	<p>Replaces <i>Minimum Weight Limit</i> when <i>USP 41 Repeatability Test</i> is checked.</p> <p>This is the pass/fail limit for USP 41 Repeatability Test.</p> <p>Default value: 0.0010.</p> <p>Note that the trailing zero is significant.</p> <p>Note that this field is visible for Weighing instruments only when <i>USP 41 Repeatability Test</i> check box is checked.</p>
<i>Repeatability k-value</i>	<p>This field replaces <i>Minimum Weight k-value</i> when <i>USP 41 Repeatability Test</i> is checked.</p> <p>The value of this field should be 2 (USP 41 requirement).</p> <p>Note that this field is visible for Weighing instruments only when <i>USP 41 Repeatability Test</i> check box is checked.</p>
<i>Repeatability Accuracy Limit</i>	<p>Accuracy limit for the repeatability test</p> <p>Default value: <i>0.10 % of load</i></p> <p>Note that this field is enabled only when <i>USP 41 Repeatability Test</i> check box is checked.</p>

<i>USP 41 Repeatability</i>	<p>Checked if USP 41 rules are enabled for Repeatability test. Default value: <i>Not Checked</i></p> <p>Checking this field affects the following Calibration Procedure fields:</p> <ul style="list-style-type: none"> - <i>Repeatability Stdev. Limit,</i> - <i>Minimum Weight Limit,</i> - <i>Minimum Weight k-value,</i> - <i>Repeatability Limit,</i> - <i>Repeatability k-value,</i> - <i>Repeatability Accuracy Limit</i> and - <i>Minimum Weight Test Calibration Points.</i>
<i>MPE in Service</i>	<p>Check if service error limits should be used. Maximum permissible errors are doubled when service error limits are used. If <i>MPE in Service</i> field is checked, both error limits, "normal" limit and service error limit, are shown in graph in Manual Entry, Result view, Certificates and in the PocketPC.</p>
<i>Hysteresis in Uncertainty</i>	<p>Check if the found hysteresis of a Weighing Instrument is to be included in uncertainty calculation.</p>
<i>Weight Mass</i>	<p>The mass value that is used when calibrating Weighing Instruments. Options:</p> <ul style="list-style-type: none"> - Conventional Mass - Nominal Mass <p>Note that this selection affects the calculations. More of this in CMX's online Help files. See Calibrator Module Range Fields: Nominal Mass, Conventional Mass and Constant Error.</p>
<i>Eccentricity Uncertainty</i>	<p>How the found eccentricity should be included in uncertainty calculation. Options:</p> <ul style="list-style-type: none"> - Full Value - Half Value - Not Included

<i>Uncert. at No Load Point</i>	<p>How uncertainty at no load point is calculated. Options:</p> <ul style="list-style-type: none"> - As with other loads (<i>default value</i>) - No Load resolution uncertainty only - Zero <p>More info of uncertainty calculation in a help file entitled "CMX Calculations". Open it from CMX Main Windows' Help menu. Select option CMX Calculations.</p>
<i>No Load Resol. Uncert.</i>	<p>How the no load resolution uncertainty is calculated. Options:</p> <ul style="list-style-type: none"> - $d0/(2*\sqrt{3})$ (<i>default value</i>) - $d0/(4*\sqrt{3})$ <p>More info of uncertainty calculation in a help file entitled "CMX Calculations".</p>
<i>Eccentricity Test Calibration Points</i>	<p>In how many points the Eccentricity test is done. Select a value from the combo box. CMX updates the table below accordingly and shows a picture of the eccentricity test points.</p>
<i>Repeatability Test Calibration Points</i>	<p>How many repeats are done in the Repeatability test and what mass is used in the test.</p> <p>When <i>USP 41 Repeatability</i> check box is checked:</p> <p>The amount of similar Repeatability Test Calibration Points needs to be at least 10. They need to be between 5% and 100% of the balance capacity. If the points are not correct then an instructional error message is shown and the procedure cannot be saved before the test points are correct.</p>
<i>Weighing Test Calibration Points</i>	<p>Calibration points to be used in the actual weighing test (linearity test). Select one from the list.</p>

*Minimum Weight Test
Calibration Points*

Select how many minimum weight test repeats are done and what mass is used for the test (percentage of full scale).

To get minimum weight deviation calculation results, at least 10 repeats is needed.

Note that this table of calibration points is visible for Weighing instruments only when *USP 41 Repeatability Test* check box is unchecked.

Full field level information for Calibration Procedures is available in the on-line help delivered with CMX.

Adding Weighing Instruments to the Instrument Database

Availability:

- CMX Light
- CMX Professional
- CMX Enterprise

Adding Weighing Instruments to CMX is done just as any other instrument. Remember to select a Function Type meant for Weighing Instruments when adding the Function(s). The fields unique for Weighing Instruments are presented in the two previous chapters:

- **Function Fields Specific for Weighing Instruments and**
- **Calibration Procedure Fields Specific for Weighing Instruments.**

General presentation of adding instruments is in section **Adding Instruments to the Database**.

Hint.

You can also make your own Weighing Instrument Function Templates and Calibration Procedures using the **Function Templates** utility presented in **Basic Settings** section. CMX automatically adds the Weighing Instrument specific fields if the new Function's **Input/Output Quantity** field is set to "Mass".

Calibrating Weighing Instruments

Availability:

- CMX Light
- CMX Professional
- CMX Enterprise

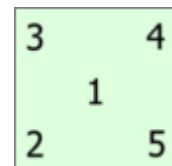
Calibrating Weighing Instruments requires good knowledge of Weighing Instrument Calibration practises. CMX gives you tools to document the calibration, but does not offer full Weighing Instrument Calibration theory. One of the following subchapters does however offer some basic terminology for the uninitiated.

Terminology

This section presents some Weighing Instrument Calibration related keywords. The focus is on the different types of calibrations that are part of Weighing Instrument Calibrations. The descriptions are based on the standard mentioned in the beginning of this section and “**EA-10/18** EA Guidelines on the calibration of non-automatic weighing instruments” (EA = European co-operation for accreditation).

Eccentricity Test

The test consists of placing a test load in different positions on the load receptor in such a manner that the centre of gravity of the load takes positions indicated in the adjacent picture.



The test load should not be below 10 % of full scale. Otherwise the uncertainty component of the eccentricity test may be too large for uncertainties close to full scale.

Repeatability Test

The test searches the difference between the results of several weighings of the same load. The conditions should, as far as possible, be identical. This applies to the handling of the load and the instrument as well as environmental conditions.

U.S. Pharmacopeia Convention’s Chapter 41 (briefly USP 41), official in late 2013, defines a new procedure for doing the repeatability and minimum weight tests. CMX supports calculating both the old Repeatability and Minimum Weight tests and the new test according to USP 41. Which one is used is defined in Weighing Instrument's Calibration Procedure.

Weighing Test

This test is performed with at least five different test loads distributed fairly evenly over the normal weighing range. The purpose of this test is an appraisal of the performance of the instrument over the whole weighing range.

For people more familiar with calibrating process instruments, this test equals the typical “up/down” calibration of a process instrument.

Minimum Weight Test

Minimum weight test (also known as: Minimum Weighing Capability Test) determines the smallest weight the Weighing Instrument is able to detect. This test is based on USP's (United States Pharmacopeia) definition of Minimum Sample Weight.

See also **Repeatability Test** above.

Sending Weighing Instruments to Manual Entry Window or to a Pocket PC

Availability:

- CMX Light
- CMX Professional
- CMX Enterprise

Sending Weighing Instruments to the Manual Entry window or to a Pocket PC is done as any other kind of instruments. Similarly, receiving the results do not require any special duties. Just do it as you have done for other kind of instruments.

For more information of selecting/sending, see **Selecting Functions for Manual Entry** and **Sending Instrument Data to the PocketPC**.

Using Manual Entry

When entering calibration data of a Weighing Instrument, the Manual Entry window's result table adapts to the needs of Weighing Instrument Calibration.

Select the type of calibration from the list on the left. Then enter the results in the grid shown on the **Results** tab. Columns with a gray background are read-only data. Depending on your Calibration settings, you may have to select a Weight Set and Weight(s) used in the calibration. More about this in **Basic Settings** section's chapter **Calibration Options**.

Also check the **Calibration Date** field and the **Calibrated By** fields shown in the same tab. You can select one or two users as the ones that carried out the calibration. Additionally, if a calibration certificate number is not automatically created, a field for adding the certificate number is shown. Whether the certificate number is automatically set by CMX or not, is part of CMX's configuration options. More of this in **Basic Settings** section's chapter **Calibration Certificate Options**.

Enter calibration related data (e.g. the environment temperature) into the **Conditions** tab.

The **Procedure** tab contains read-only data about the calibration procedure, including possible instructions to guide you through the calibration.

Field level information is available in the on-line help delivered with CMX.

Using a Pocket PC

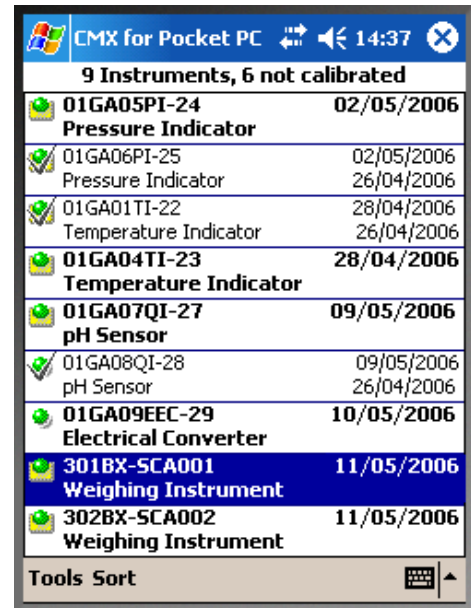
Availability:

- CMX Light
- CMX Professional
- CMX Enterprise

This chapter describes how to calibrate a Weighing Instrument using a Pocket PC. For a more general description of how to calibrate instruments using a Pocket PC see section **Pocket PC Interface**.

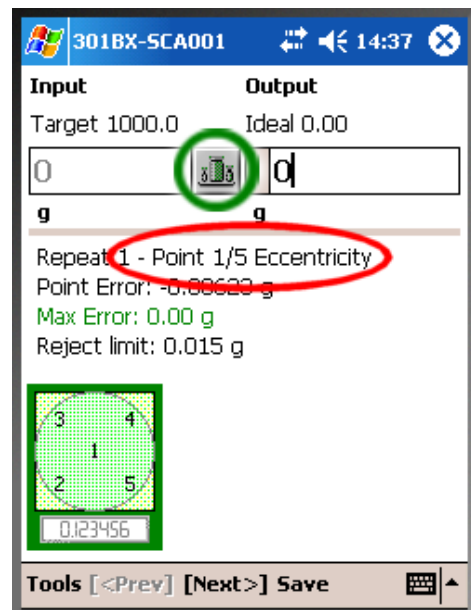
Pocket PC's list of sent instruments does look the same no matter what kind of instruments are listed. In the example picture, the **Position ID** and **Function Name** fields reveal that the two lower-most items are Weighing Instruments.

In the list of sent instruments, tap on the instrument you want to calibrate and a calibration window opens. The calibration window for Weighing Instruments is suited for Weighing Instrument Calibration needs.



By default CMX starts a Weighing Instrument Calibration with an **Eccentricity Test**. The current **Calibration Type** can be seen in the middle of the screen (see the red ellipse in the adjacent picture).

You can change the Calibration Type from the calibration window's **Tools** menu. Then, if any unsaved data exists, CMX asks you to confirm that the current calibration is aborted.



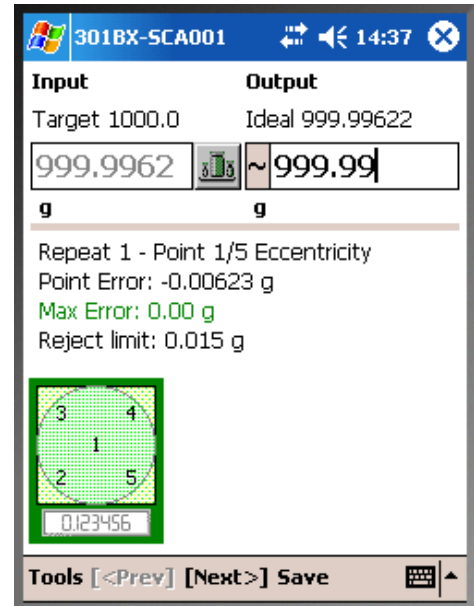
For each calibration point, the input field displays a target value.

Click on the Weight Set button (the green circle in the picture on the previous page) to select/check weights.

A window for selecting weights opens. First select a Weight Set, then the suitable weights from the list of weights. This window also includes a possibility to enter a **Tare Weight** for Weighing Instruments that cannot be zeroed.

The **Add. Weight** field allows you to enter the additional weight that was needed to change the least significant digit in a digital Weighing Instrument.

When a weight (or several weights) is selected and you close the window for selecting weights, The nominal or conventional weight (depending on your basic settings) is shown in the framed Input field. The same value is copied as the Ideal output value and the editable output value (with the Weighing Instrument's resolution taken into account).



Use the up/down navigation buttons to change the pre-entered output value. Alternatively, use the "keyboard" that opens from the lower right corner.

Notes.

Immediately to the left of the field where the output reading is entered is an area for indicating/saving that the reading was unstable. Tap the area and the "unstable" symbol (⊠) becomes visible. For Weighing Test: Input values outside the calibration point's *Max. Deviation* limit are indicated in red. This does however not affect any calculations.

For Eccentricity, Repeatability, and Minimum Weight test, CMX remembers the selected weights. Thus when you press **[Next>]**, you do not need to re-select the same weight(s). In Weighing Test CMX lets you choose the weights during upscale calibration. During downscale calibration CMX pre-selects the weights used for corresponding points in upscale calibration.

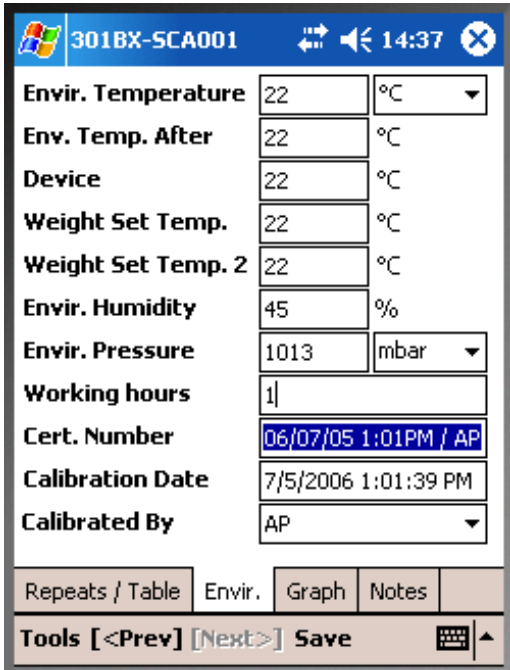
For situations where a **Tare Weight** is entered: Enter the true reading (including both the calibration weights and the Tare Weight). CMX automatically subtracts the Tare Weight from the reading before performing any error and uncertainty calculations.

Calibration Result View

After the calibration points are entered, the calibration result window opens. There you are able to get an overview of the calibration. If, e.g. an error occurred when entering the data of a point and it is seen in the overview window, you can still correct the mistake by tapping the [**<Prev**] button until you see the point with the erroneous data. Correct the data and tap the [**Next>**] button until you are back in the calibration result window.

Remember to check the **Envir.** tab for entering the environment data.

If automatic certificate number generation is disabled, you are able to enter the certificate number here.



The screenshot shows a software interface for a calibration result. The title bar at the top reads "301BX-SCA001" and includes a clock showing "14:37". The main area contains a list of calibration parameters with their values and units:

Envir. Temperature	22	°C
Env. Temp. After	22	°C
Device	22	°C
Weight Set Temp.	22	°C
Weight Set Temp. 2	22	°C
Envir. Humidity	45	%
Envir. Pressure	1013	mbar
Working hours	1	
Cert. Number	06/07/05 1:01PM / AP	
Calibration Date	7/5/2006 1:01:39 PM	
Calibrated By	AP	

At the bottom, there are navigation tabs: "Repeats / Table", "Envir.", "Graph", and "Notes". Below these is a "Tools" bar with buttons for "<Prev", "Next>", and "Save", along with a keyboard icon.

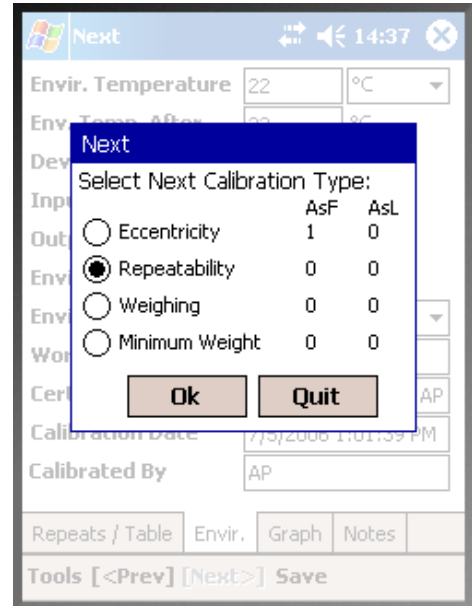
Saving Results

You can save the results at any time, even if only part of the data is entered. Then the results are saved as a partly done repeat.

After the results are saved in Pocket PC's memory, first a dialog opens telling you about error related data as when saving results in CMX for Pocket PC in general. See **Saving Results** in section **Pocket PC Interface**.

Then CMX for Pocket PC displays a list of calibrations already done (the table on the right).

It also allows you to select what type of calibration should be done next.



Notes.

You can do one As Found test (AsF) and one As Left test (AsL) for Eccentricity, Repeatability, and Weighing tests. You may however do several As Found and As Left Minimum Weight tests.

After the first As Left test is saved, you may only do As Left tests.

Maintenance Inspection

General

Availability:

- CMX Light
- CMX Professional
- CMX Enterprise

Maintenance Inspection allows you to run check procedures either according to IEC 60079-17 standard or by creating custom check procedures. The checks and check procedure definitions are saved in CMX's database. When checks are scheduled to be done, the checks are sent to a compatible tablet with **bMobile**[™] software. After the checks are done, the results are returned to CMX.

Beamex bMobile[™] software, required in a tablet, is available at Google Play store. See also note below. Find the App there, select and download it. The installation should start automatically and bMobile is immediately available for use.

Note.

bMobile version 1 supports Maintenance Inspection only.
bMobile version 2 supports all instruments available in CMX. Version 2 is available in Windows Store too.

The requirements for **bMobile version 1** are:

- Android tablet, operating system version 4.4 (Kit-Kat), or later.
- Recommended screen resolution: 1280 x 720 or higher.
- Recommended screen size: 8 inch or higher.
- USB port, for communication with CMX.

The requirements for **bMobile version 2** are:

- Device: **Windows**[®] **10** or **Android**[®], version 5.1 or later, device.
- Recommended screen size: 4 inch or higher.
- Connection to a CWSI Server for communication with CMX.

Windows is a trademark of *Microsoft Corporation*.
Android is a trademark of Google Inc.

Maintenance Inspection in CMX

All Checklist definitions are done in CMX. The following sub chapters present how the Checklists are defined.

Function

When selecting a Function Template for a new Position/Device that is meant to be a Checklist, select one of the following templates:

- **Checklist**, includes a fully customizable Checklist with three pre-entered checks.
- **Checklist, IEC60079-17, Table 1**. A pre-entered Checklist according to IEC60079-17, Table 1. This may be customized, if needed.
- **Checklist, IEC60079-17, Table 2**. A pre-entered Checklist according to IEC60079-17, Table 2. This may be customized too, if needed.

For a Checklist Function, the Quantity is **CHECKLIST**.

Procedure

Each procedure contains a single Checklist. A Checklist consists of an unbounded amount of Checklist items. The Checklist items may be arranged to unbounded amount of groups. The picture below presents a Checklist consisting of three Checklist items in a single group.

The screenshot displays the CMX interface for defining a Checklist. At the top, there is a text input field for 'Check List Description' containing the text 'Check List's Description'. Below this, there are three checkboxes for 'Require Result Note': 'Passed', 'Failed', and 'Skipped', all of which are currently unchecked. To the right of these checkboxes is a green plus icon labeled 'Add Check List Group'. Below this section, a group titled 'Group 1' is shown. This group contains three checklist items. Each item has an 'ID' field and a 'Description' field. The first item has 'Checklist item 1' as the ID and 'Description of item 1' as the description. The second item has 'Checklist item 2' as the ID and 'Description of item 2' as the description. The third item has 'Checklist item 3' as the ID and 'Description of item 3' as the description. To the right of each item's fields are three small icons: a blue up arrow, a blue down arrow, and a red X icon.

The following Checklist items may be used for editing/configuring the Checklist, when procedure is in edit mode:

- All texts in italics in the picture above may be edited to suit your needs.
- The group name may be edited by double-clicking on the name ("Group 1" in the picture above).
- With the three check boxes (Passed, Failed and Skipped) you may define what kind of changes during the check procedure have to have a written note.
- The colorful round buttons to the right allows sorting, adding and deleting checklist items and groups.

Sending Checklists to a Tablet

To send Checklists to a compatible tablet with **bMobile** software installed, connect the tablet to a USB port in the computer CMX is installed to.

bMobile version 1:

Open the **Send to Calibrator** window and select **USB** as the **Protocol** and **bMobile** as the **Calibrator**. The send procedure is similar to sending any other instrument into a calibrator. In this case, the tablet is the "calibrator" and the Checklist is the "instrument".

bMobile version 2:

Avaa **Lähetä kalibraattorille** -ikkuna ja valitse **protokollaksi CWSI**. Seuraa bMobile versio 2:n ohjetiedoston neuvoja.

Receiving Checklist Results from a Tablet

Open the **Send to Calibrator** window and, depending on bMobile version, select **USB** or **CWSI** as the **Protocol**. The receive procedure is similar to receiving any other instrument from a calibrator. In this case, the tablet is the "calibrator" and the Checklist is the "instrument".

Viewing Checklist Results

The result view looks like procedure properties window with additional passed/failed status for each check and also the master pass/fail status.

Checklist Reports

Reports for checklists include instrument data as presented in regular certificates. The checklist results are shown below in table format.

Maintenance Inspection in a Tablet

The requirements for a tablet is presented in this section's chapter **General**, on page 175.

Additionally, the tablet must include **Beamex bMobile™** software, provided by Beamex.

Installing bMobile software to a tablet

Beamex bMobile™ software is available in Google Play store. Version 2 is available in Windows Store too. Find the App there, select and download it. The installation should start automatically and *bmobile* is immediately available for use.

Working with a Tablet

Start **bMobile** by tapping the icon shown in the adjacent picture. Use the **All Apps** view to locate the icon.



Note.

The following instructions apply to **bMobile version 1** and its checklists

. For additional instructions on how to work with **bMobile version 2** and entering calibration results for other than checklists too, refer to bMobile version 2's help file.

Checklists

bMobile opens in Home View (Checklist). It presents all Checklists sent from CMX. The icons in front of checklists describe the status of the each checklist:



In Progress, i.e. currently going through the checks that are part of this check list.



Open, which means this check list hasn't been run through as yet.



Failed, i.e. the checklist has been run through and master pass/fail status is "Failed".



Passed, i.e. the checklist has been run through and the master pass/fail status is "Passed".

To run through a checklist, tap on it.

Note.

bMobile's Home View includes tools for sorting and filtering

checklists. Open **bMobile**'s help file for detailed information on the available options.

Doing the Checks

When you tap on a checklist in **bMobile**'s Home View, the current checklist's window opens with **Description** tab selected.

All items to be checked, and the possible groups the checks belong to, are listed in the **Checklist** tab.

The **Details** tab presents the results and allows you to add tester name and environment related data. They need not be entered before the actual test, because after the tests are done you return to the **Details** tab.

The **Start** link at the bottom of the **Description** tab page starts the checklist run.

During the checklist run each check is presented with the possibility to enter the test's status as **Pass**, **Fail** or **Skip**. As long as you are not pressing the **Next** link, you are able to change the status.

When the last point of the checklist run is done, the current checklist window's **Details** tab is opened.

The **Details** tab allows you to select tester, add environmental information and enter master **Pass** or **Fail** status to the test.

Notes.

Previously not existing testers cannot be added into **bMobile**, but you can select one of the available testers sent from CMX.

Working hours are entered for each tester in the pop-up window for adding testers. The **Details** tab presents the total hours as read-only data.

Work Order Handling

General

Availability:

- CMX Light
- CMX Professional
- CMX Enterprise

Enhanced Work Order Handling is an option in CMX. To fully utilize it, an ERP (Enterprise Resource Planning) or CMMS (Computerized Maintenance Management System) software together with **Beamex® Business Bridge** software should be part of the system. The latter does the communication between the ERP/CMMS and CMX.

Enhanced Work Order Handling eliminates re-typing calibration data/information to an ERP/CMMS software. Business Bridge takes care of transferring information between CMX and ERP/CMMS software.

CMX's Basic Work Order Handling

CMX has had, even from the beginning, basic non-optional work order handling for Positions. You can manually enter a work order to a Position.

However, with basic work order handling, there is no possibility to automatically reply from CMX back to the ERP/CMMS software. When the calibration/calibrations are done, the Work order has to be manually set to "Done" in the ERP/CMMS software.

CMX's Enhanced Work Order Handling

CMX's Enhanced Work Order Handling option makes CMX's work order handling more useful, especially when working with CMX in conjunction with ERP/CMMS software. Business Bridge software provides a transfer channel for sharing instrument, work order and basic calibration data between CMX ERP/CMMS software.

When CMX's Enhanced Work Order Handling option is active, the following fields are shown among instrument's Calibration Procedure data:

- **Work Order Number,**
- **Work Order State,**
- **Work Order Start Date** and
- **Work Order End Date.**

Work Order State field has four possible states:

- **Not Available**, (Currently no work order assigned),
- **Open**, (Work order assigned, but not calibrated, yet),
- **Done** (Calibration done) and
- **Cancel** (Calibration cancelled).

Business Bridge changes the Work Order State automatically based on information from ERP/CMMS software and CMX:

- When a Work Order is entered into ERP/CMMS software, **Business Bridge** communicates the **Work Order Number, Work Order Start Date** and **Work Order End Date**.
Additionally: the **Work Order State** is set to state **Open** in CMX.
- When a calibration is done or canceled in CMX, **Business Bridge** communicates state **Done** or **Cancel** to ERP/CMMS software, then automatically changes the **Work Order State** in CMX to **Not Available** and clears the **Work Order Number, Work Order Start Date** and **Work Order End Date** fields.

Depending on settings on **Options** window's **General** page, the state change from **Open** to **Done** is changed either manually or automatically in CMX.

When needed, the **Work Order State** may be manually changed to **Cancel** from the pop-up menu available in Tree views. See also **Changes in CMX User Interface**, on page 186.

Notes.

Depending on your **Business Bridge** settings, the Work Order Number sent from ERP/CMMS can be located in a Procedure's **Work Order Number** field and/or in a Position's **Work Order Number** field.

Free Devices do not have a **Work Order Number** field on their Device page. If you want to see the Work Order Number in the Device page, consult Beamex's support. Remember that the Work Order Number can be assigned to be seen on free Device's Procedure page.

If a work order message from an ERP/CMMS software contains both the Position ID and the Function abbreviation, only the matching Function's Calibration Procedure will receive the Work Order

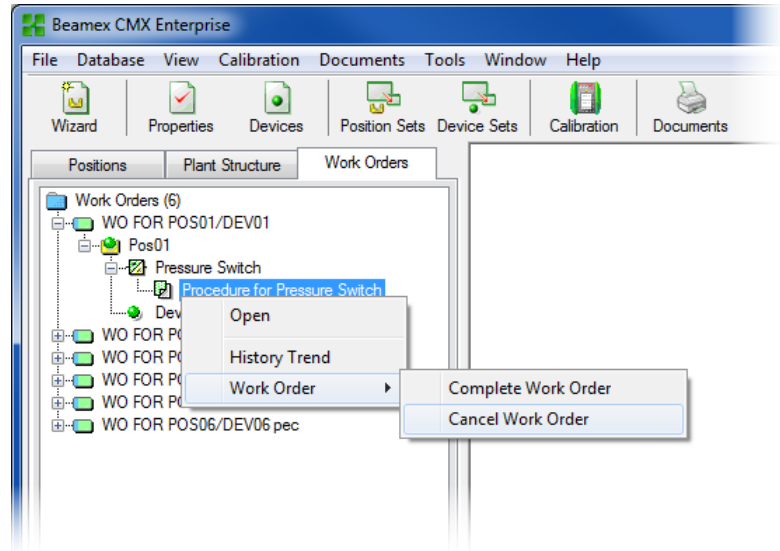
If a work order message from an ERP/CMMS software contains the Position ID only, Position's all Functions / Calibration Procedures will receive the Work Order.

Work Order Start Date and **Work Order End Date** are not obligatory fields. They may also be empty fields.

If the start dates and/or end dates vary for a multiple instrument work order, the earliest date is shown with a tilde (~) in front to the date.

Changes in CMX User Interface

When Enhanced Work Order Handling is Active, CMX's main window includes an additional tab beside the Position tree and the Plant Structure tree: **Work Orders** tree.



If any work orders are active, the pop-up menu on Procedure level includes a sub-menu for changing the Work Order's state:

- **Complete Work Order** sets a Function's Work Order State to "**Done**". This is useful, especially, when the state is changed manually. Note that changing the state from "**Open**" to "**Done**" requires that the calibration is done.
- **Cancel Work Order** sets a Function's Work Order State to "**Cancelled**".

Notes.

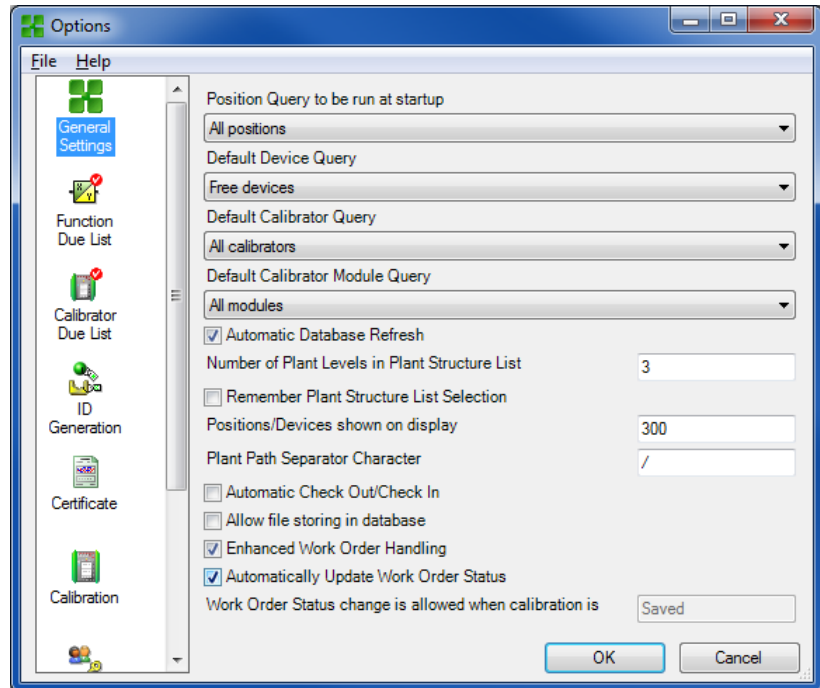
A Work Order item in the **Work Orders** tree has no property data. It is a virtual element in the tree structure.

The Work Order sub-menu is also available in Devices, Positions and Plant Structure Trees.

Remember to Cancel/Complete all Functions/Procedures being part of a Work Order. Otherwise, Business Bridge does not forward the data to ERP/CMMS.

Settings in CMX Options

In CMX's main window, select **Tools, Options** to edit Enhanced Work Order Handling options.



Among all other general options, the following options are part of Enhanced Work Order Handling

- **Enhance Work Order Handling** enables/disables the Enhanced Work Order Handling feature.
- **Automatically Update Work Order State**
When checked and when all Work Order related calibrations are done/approved, CMX changes **Work Order State** to "**Done**". Then Business Bridge software sends the Work Order State to ERP/CMMS software.
- **Work Order State change is allowed when calibration is...**
This is read only information received from Business Bridge software. Available options:
 - **Saved.** CMX sets the **Work Order State** to "**Done**" when all required calibrations are saved.
 - **Approved.** CMX sets the **Work Order State** to "**Done**" when all required calibrations are approved in CMX.

Calibration Using Enhanced Work Order Handling

When calibrations are done using Enhanced Work Order Handling, everything starts from your ERP/CMMS software. The work order is created in and ERP/CMMS software, transferred to CMX using Business Bridge software.

The actual calibrations are done just as always, nothing new there. The **Work Order State** changes according to CMX's settings:

- If the **Work Order State** is set to be **automatically** updated, the state is set to "**Done**".
- If the **Work Order State** is set to be **manually** updated, a dialog opens when the calibrations are saved/approved asking whether the state should be changed to "**Done**".

Then Business Bridge transfers data to your ERP/CMMS software, specifying the work order is done.

Note.

The pop-up menu described in chapter **Changes in CMX User Interface**, on page 186, allows you to change the **Work Order State**, when necessary.

Special Situations

This chapter presents Enhanced Work Order related special situations.

Canceling a Work Order in CMX

Sometimes there is a need to cancel a calibration. This can be done in CMX using the pop-up menu presented in chapter **Changes in CMX User Interface**, on page 186.

If an instrument has already been calibrated, you can still cancel it, provided the full work order is not yet set to **"Done"**. Then Business Bridge communicates the value **"Aborted"**, for that particular instrument, to ERP/CMMS software.

Emergency Calibration

An emergency calibration means that there is an acute need to calibrate an instrument but there is no time or no means to create a work order in the ERP/CMMS software first. CMX supports emergency calibrations as follows:

- Do the calibration normally and save the results in CMX's database.
- Afterwards, in ERP/CMMS software:
Create a **Work Order Number** and set the **Work Order Start Date** to a date prior to the moment the emergency calibration was performed. Send the work order to CMX.
- A person with **Calibration - Modify** permission edits the instrument's results to add the **Work Order Number** sent from ERP/CMMS software to the calibrated instrument's **Calibration Result** page.
- Depending on Work Order State's update settings in CMX, the state is either set to **"Done"** automatically or CMX asks you whether to update the state or not.
- When the Work Order State is **"Done"**, Business Bridge communicates the Work Order Number and the Work Order State **"Done"** to the ERP/CMMS software.

This allows doing emergency calibrations without a pre-made work order. However, the work order state will still be included afterwards to ERP/CMMS software just as for "normal" calibrations.

Note.

Emergency calibration of free devices is not supported.

Pocket PC and Enhanced Work Order Handling

Enhanced Work Order Handling option is included in CMX for Pocket PC option as follows:

- You switch to **Work Order Mode** from CMX for Pocket PC's **Tools** menu. The same menu is used for returning to "normal mode".
- In Work Order Mode, the work orders are listed according to the current sort order (set in **Sort** menu). Any instruments sent to Pocket PC that are not part of any work order are listed after the work orders.
- When selecting a work order, the instrument being part of that particular work order are shown. To return to the Work Order list, select **Back** from the menu bar.

Note.

While in Work Order Mode: Group calibration is possible for instruments belonging to the same work order only. To do group calibration for a group of instruments not being part of the same work order, use "normal mode".

Mobile Security Plus

General

Availability:

- CMX Light
- CMX Professional
- CMX Enterprise

Data integrity has become a focal point in Pharmaceutical industry. Both, MHRA and FDA have published their own guidance document for the subject:

- MHRA: [GMP Data Integrity Definitions and Guidance for Industry](#) (March 2015)
- FDA: [Data Integrity and Compliance With CGMP Guidance for Industry](#) (April 2016, Draft)

Beamex's **Mobile Security Plus** is an optional tool in CMX, giving answers to problems presented in the documents mentioned above.

In addition to CMX **Mobile Security Plus** is supported in modern Beamex calibrators and other **Mobile Devices** as follows:

- **MC6** Advanced Field Calibrator and Communicator, from firmware version 1.80 onwards.
- **MC6 Workstation**, Advanced Panel Mounted Calibrator and Communicator, from firmware version 1.80 onwards.
- **MC6-Ex** Intrinsically Safe Advanced Field Calibrator and Communicator Calibrator, from firmware version 3.00 onwards.
- **bMobile Version 2**. A software available in Windows® 10 and Android devices.

Note.

Mobile Security Plus is optional in CMX Professional.

CMX for Pocket PC does not support Mobile Security Plus.

Terminology

Mobile Security Plus option presents some new terms. They are defined here.

Term	Description
Mobile User	<p>A CMX user that also uses any of the Mobile Devices listed in previous chapter.</p> <p>When Mobile Security Plus is active, CMX users defined as Mobile Users are the only ones allowed to calibrate instruments in supported Mobile Devices.</p> <p>More details in Users .</p>
Mobile Supervisor	<p>A Mobile User may also be defined as a Mobile Supervisor, e.g. allowed to change date and time of a Mobile Device.</p> <p>Note that a Mobile supervisor must also be defined as a Mobile User.</p> <p>More details in Users .</p>
Mobile Password	<p>When a CMX user is also defined as a Mobile User, a Mobile Password is also defined. Note that the Mobile Password is separate from the CMX user's password.</p> <p>More details, including supported characters, in Options Window.</p>

Mobile Security Plus Option in CMX

The following chapters present Mobile Security Plus related settings etc. in CMX. Note that the things presented here are not the full settings available in CMX. This is a collection of items that may be useful when taking Mobile Security Plus in use.

Important!

Before activating Mobile Security Plus in CMX, ensure that all existing calibration results on all mobile devices (MC6, tablet etc.) are received to CMX.

Options Window

To activate Mobile Security Plus option, open **Tools** menu on CMX's Main Window and select **Options**.

In **General Settings** (the page that opens first) is a check box labelled **Mobile Security Plus**. It activates Mobile Security Plus Page.

Note.

If the check box is disabled, your CMX does not include Mobile Security Plus option.

When Mobile Security Plus is activated, a Mobile Security icon is visible in the list of icons/subjects shown on the left side of the Options window. Select the icon to open Mobile Security page.

The following settings are available:

- **Password Required.** This allows you to activate a Mobile Password. This password is asked when utilizing supported Mobile Devices. When a CMX user has been defined as a Mobile User and a Mobile Password is required, the first time user logs into CMX, he/she can enter a Mobile Password. The allowed characters are listed below. The password is saved in CMX's database. See also notes below.
When utilizing this feature, user has to be defined as a Mobile User in CMX. See **Users** .
- **Minimum Password Length.** When Mobile Password is required, you may define the minimum password length here.
- **Password Change Interval** (days). Here you may define how often the Mobile Password should be changed.
- **Warn before password expires** (days). Time period for warning that the Mobile Password should soon be changed.
- **Number of previous passwords not accepted.** How many of the previous passwords are refused when changing the Mobile Password.
0 = no check for previous passwords.
- **Illegal Login Attempts.** How many illegal attempts (i.e wrong password entered) are allowed before Mobile User is locked from the Mobile Device. See also notes below.

- **Enforce Password Complexity.** When checked, the Mobile User's password has to include at least one of all the character groups presented below.

Supported characters for Mobile Passwords:

Character Group	Description
Upper Case	ABCDEFGHIJKLMNOPQRSTUVWXYZ
Lower Case	abcdefghijklmnopqrstuvwxyz
Numbers	1234567890
Special Characters	@'-'! "\$%&()*^*_.,/:;?[\]^_`{ }~+<=>

Calibration related settings in CMX's Mobile Security page.

These settings are sent to Mobile Device when connecting to CMX:

- **Do not allow results to be deleted until all results are received for an instrument.** No results may be deleted from Mobile Device's memory before they are received to CMX.
- **Restrictions for undo and result deleting on mobile devices.** A setting for defining what are the restrictions when trying to undo a calibration point and deleting results in Mobile Device. A description of available options is available in the on-line help delivered with CMX.
- **User ID selection.** A setting for defining how user is identified in Mobile Device. A description of available options is available in the on-line help delivered with CMX.

MC6 Family Calibrator related settings in CMX's Mobile Security page.

- **Required firmware version.** A list of firmware versions supporting Mobile Security Plus in MC6 family calibrators. A description on how to use this field is available in the on-line help delivered with CMX.
- **Require Mobile Security Option.** Check this item to require that the MC6 family calibrator communicating with CMX must include Mobile Security Plus option.

Devices not Supporting Mobile Security settings in CMX's Mobile Security page.

- **Disable communication.** Check this to prevent communication with calibrators that do not include Mobile Security Plus.

Notes.

Mobile Users must enter their Mobile Password in CMX before sending instruments for calibration to a Mobile Device. Mobile Password can be entered/changed while working with CMX. In CMX's main window, do the following menu commands: **Tools, Security, Change Mobile Password.**

If a Mobile User's account has been locked in a Mobile Device, e.g. after too many illegal attempts, the account can be re-activated by synchronizing the Mobile Device with CMX. When Mobile Security Plus is in use, **Use Electronic Signature ID as Calibrated By ID** field in **Change Management** options is disabled.

Calibration Options Page

Some of Calibration Options are useful to keep in mind when using Mobile Security Plus:

- **Add Database Name as 1st Plant Path Level.** This setting is of use if several CMX databases are in use, e.g. each plant has their own CMX database. Then when sending instruments to a supported Mobile Device, it is possible to identify instrument's source.
- **Deny Skipping Points.** When checked, calibrator technician may not skip a calibration point.
- **Require a Note for Skipped/Abnormal Points.** When checked, calibrator technician need to write a comment for all skipped calibration points.

Users and Permissions Window

Open **Users** window by doing following menu commands in CMX's main window: **Tools, Security, Users**.

In User Properties

User properties include two Mobile Security Plus related check boxes:

- **Mobile User**. When checked, CMX User also uses the Mobile Devices supporting Mobile Security Plus. If Mobile Security Plus is not part of your CMX or it is deactivated, this setting is obsolete.
A Mobile User may not perform certain actions in a Mobile Device, e.g. deleting calibration results. The restrictions depend on settings done by Mobile Supervisor(s).
- **Mobile Supervisor**. If checked, a Mobile User also has supervisor rights. It allows the supervisor to define functionality restrictions for ordinary Mobile Users, e.g. deleting instruments with calibration results.
The available functionality restrictions depend on the Mobile Device at hand. Refer to its own manual for details on what can be restricted.
Note that a Mobile Supervisor has no Supervisor rights in CMX, unless he/she is also a CMX Supervisor.

A Mobile Password may be set for Mobile Users in CMX. Open main window's **Tools** menu and from there **Security** and **Change Mobile Password**. See also chapter **Options Window** to get acquainted with Password related settings.

Note.

At the **Users** window's bottom left corner is a check box: **Show only mobile users**. When checked, all non-Mobile Users are temporarily hidden.

Permissions

The **Permissions** tab of **User Groups** has new Mobile Security Plus related items. Some of them are visible only when Mobile Security Plus option is included in your CMX:

- **Calibration - Lock.** Permission to lock approved calibration results so no further edit is allowed. More of locking and unlocking results in chapter **Locking Calibration Results**.
- **Calibration - Unlock.** Permission to unlock previously locked calibration results making it possible to edit the results.
- **Manual Entry – Calibration time edit.** Allowed by default, but with this setting you may restrict certain User Groups from changing calibration date when doing calibration using Manual Entry.
- **Option maintain - Mobile Security.** Permission to edit Mobile Security options.

Manual Entry in CMX

This chapter presents CMX Manual Entry's new items related to Mobile Security Plus. Not all items are uniquely part of Mobile Security Plus, but they are good to take into account when performing calibrations using the Manual Entry window.

- Depending on permissions, user may or may not alter the calibration time. See **Users and Permissions Window**.
- Depending on CMX options, user may or may not skip calibration points. See **Options Window**.
- If skipping a calibration point is allowed, user may be required to enter a note. This is also defined in CMX Options. The note may not be "invisible" characters. Again, see **Options Window**.

Calibration Results in CMX

The following settings does not require that **Mobile Security Plus** is active:

- When viewing results any skipped points are indicated in the result window. If in **CMX Options**, the skipped point is required to have a comment, it is seen among the results.
- Also, if the calibration was saved as an incomplete calibration, it is indicated in the result page.

If **Mobile Security Plus** is active:

- Clicking the secondary mouse button above a calibration result icon in CMX main window's tree view, opens a pop-up menu where you can **Lock** or **Unlock** the calibration result.

Note that locking/unlocking requires permission to do changes to calibration results. See **Users and Permissions Window**.

A locked result's icon:



Mobile Security in Mobile Devices

Mobile Devices have their own Mobile Security Plus related settings, provided their firmware support Mobile Security Plus. Refer to Mobile Device's own manual/help on what the settings are. When a Mobile Device is connected to CMX, CMX "pushes" some data/settings to the Mobile Device.

Mobile Security Plus related things when connecting CMX and a Mobile Device:

- CMX synchronizes the calendar and clock of a Mobile Device and the Computer CMX is installed to. The Mobile Device's clock is the one that is adjusted, if needed.
Note. This does not apply to tablets with **Beamex bMobile™** software
- CMX also synchronizes Mobile Security related settings in CMX to the Mobile Device.
- If Mobile Password is in use (see **Options Window**), CMX sends Mobile User credentials to the Mobile Device. Then the Mobile Device requires users to authenticate themselves when starting calibrations and also when saving a calibration result.
- If Mobile Password is **not** in use, the Mobile Device does not require a login or authentication when saving a calibration. However, Mobile Users defined in CMX are transferred to the Mobile Device. This allows calibration technician, a Mobile User, to select his/hers name from a pick up list when saving a calibration.
- When communicating with a Mobile Device, CMX reads the Device's firmware version. If the firmware version does not support Mobile Security Plus, user is asked to update the firmware in the Mobile Device.
- If a Mobile Device contains an instrument with results, the same instrument may not be sent to the Mobile Device, overwriting the existing results.
- MC6 support receiving instruments to it from several CMX Databases. When calibrating instruments, you first select a database and then the instrument.
Note that this is not supported in **Beamex bMobile™**.

CMX Database Manager

General

CMX Database Manager is a tool for doing backups of your databases as well as restoring databases using a backup database as the source. Additionally you can also install/uninstall, create and copy CMX databases.

Note that certain CMX Database Manager features are not available in CMX Light.

Warning!

CMX Database Manager should be used by experienced database and database server users. Using this tool without knowing what you are doing may result in loss of valuable data.

Starting CMX Database Manager

CMX Database Manager is installed in the same folder as CMX. Look for **BxbDatabaseSetup.exe**.

The next chapters describe the use of the Database Manager.

Note.

Start the CMX Database Manager in same computer where the CMX database server is.

Server Connection

The upper part of **CMX Database Manager**'s window contains server connection data. The data is pre-entered as needed for CMX. If you log into another server, you need to enter the server login and password accordingly. Click **Login**, to log into the server.

Note.

CMX Database Manager includes a possibility utilize either **SQL Server Authentication** (default) or **Windows Authentication**. Use the **Authentication** selection list to choose the one you want.

The following sub chapters describe the functionality of the lower part of the window.

Backup and Restore a Database

Select the database to be backed up or restored from the Database Name list.

When making a backup copy of a CMX database, the backup file is named as the original file with the addition of the backup date (format: `_yyyy-mm-dd_hh-mm`). The path and the backup file name is editable but we recommend you use the default values.

To restore a database, first select the backup database to be used for restoring and then click the **Restore** button.

Notes.

Making database backups is highly recommended. It minimizes data loss in case of power failure, network problems etc.

CMX Database Manager must be run locally on the computer where the database is located, you can not, e.g. restore a database remotely (via the network) to another computer.

If you get the following error message when restoring a backup file:

**"Restore failed for server
'*computer name*\CMXSQLEXPRESS",**

it means you are trying to restore backup file that is located in a path the SQL server does not have permissions to. An example is the desktop. Each user may copy files etc. to their own desktop, but the SQL server does not have permissions to the desktop.

Copy the backup file to, e.g. the root of the C:\ disk. Then retry.

Database backup and restore is not possible if the same database is in use in CMX. Close CMX before starting backup or restore procedures.

Installing and Uninstalling a Database

CMX is shipped with two databases. The installed databases depend on the installed CMX version.

In **CMX Light**:

- **CMX_Light_Database**, an empty database for creating your own database. This database is available when the License Key is installed.
- **CMX_Light_Demo_Database**, a demo database to see how the user interface looks like with some data added to the database. Maximum amount of positions/devices: 15. This database is available when the License Key is **not** in place.

In **CMX Professional** and **Enterprise**:

- **CMX_Demo_Database**, a demo database to see how the user interface looks like with some data added to the database. This is the default database when CMX is started for the first time after installation.
- **CMX_Database**, an empty database for creating your own database. When needed, you may switch to this database as described in section **Starting CMX**, chapter **Opening a Database**.

If you want to either uninstall or re-install one of the databases, use the tools found in the second tab.

First select which database you want to work with and then select the button that suits your needs (**Uninstall/Detach** or **Install/Attach**).

Notes.

Uninstalling a Database is not possible if the same database is in use in CMX. Close CMX before starting the uninstall procedure.

If you have entered your own data into either of the databases shipped with CMX, uninstalling that database results in data loss!


Availability:

- CMX Light
- CMX Professional
- CMX Enterprise

Creating a New Database

Allows you to create an all new (empty) CMX database. Give the new database a name. Standard Windows® file naming conventions apply, except that you do not need to enter the file extension. Then click the **Create** button.

Taking the new database into use depends on the type of CMX software you have.

- In **CMX Enterprise** or **CMX Professional with the floating server license option** you first need to add the database to the **CMX Application Server**. Open the **Application Server** from the icon found in the system tray (). Enter the following menu commands in the **Application Server** window: **Tools, Database Settings**.

During login CMX offers to connect to the latest database used. To switch database, select another (host and) database from the login window.

Alternatively, when CMX is already running, use the main window's menu to select:

- **File, Database** in **CMX Professional without the floating server license option** or
- **File, Host** in **CMX Enterprise** or **CMX Professional floating server license option**. Then enter required information to log into another database.

Copying a Database

Availability:

- CMX Light
- CMX Professional
- CMX Enterprise

This feature allows you to copy a backup database and create a new CMX database of it.

Give the new database a name. Standard Windows® file naming conventions apply, except that you do not need to enter the file extension. Then click the **Copy** button.

See the end of chapter **Creating a New Database** for information on how to take use of the copied (new) database.

Availability:

- CMX Light
- CMX Professional
- CMX Enterprise

Deleting a Database

Select the database to be deleted from the list provided. Click the **Delete** button to do it.

Note.

There is no way of retrieving a deleted database. Perform the delete only if you are sure that the database to be deleted is no longer of use at all.

Moving a Database

Select the database to be moved and the destination server. You may also rename the database to be moved.

Note.

The source and destination databases have to be in the same computer when moving. If not, use CMX Database Manager's Backup and Restore tools.

The **Move** utility includes a possibility to utilize either **SQL Server Authentication** (default) or **Windows Authentication**. Use the **Authentication** selection list to choose the one you want.

If source and target SQL Server versions are different you may get a permission error. To fix this, it is required to give the service account of the target database engine read permission to the backup folder of the source. This folder is by default located in the installation folder of SQL server. Read permission can be given to either all users (builtin\users) or to the target's database engine service account directly.

Additional Information

General

This section includes additional information not related to CMX alone, but useful when working with calibrators communicating with CMX.

Calibrators and USB Communication

This chapter applies to **Beamex** calibrators that use USB communication when connected to a computer. This description is general, so check the calibrator's own manual for possible detailed information.

The first time you connect a calibrator to a computer, using the USB cable delivered with the calibrator, Windows' **Found New Hardware Wizard** initializes wanting to install a device driver.

The driver is available in the following locations:

- In the folder where **CMX** is installed.
Default path: **C:\Program Files\CMX**.
- On **CMX** Calibration Maintenance Management software installation media. Path: **X:\Drivers\USB Drivers**.
- On a CD-ROM called **Beamex Integrated Calibration Solutions** shipped with the calibrator.
Path: **X:\Product related\Calibrato\Drivers**.
- At Beamex's web site (<https://www.beamex.com/>).
Look for downloads. The driver may be part of the calibrator's software update package or separately available. Check the web page's description.

Installing the driver for Windows® 7:

Select option **Locate and install driver software**. In the next window, select **Don't search online**, then **Browse my computer for driver software**. Next browse to the location where the driver is. See also notes further on.

Installing the driver for Windows® 8, Windows Server 2012 and later:

If the USB drivers have been installed during CMX's installation, the drivers are automatically available when a calibrator is connected to the computer.

If the drivers weren't installed during CMX's installation, they have to be installed manually as follows:

- Connect the calibrator to the computer's USB port.
- Open **Device Manager**. It can be opened, e.g. by clicking the mouse's secondary button above the Windows logo.
- In the Device Manager, open the **Other devices** list and click the mouse's secondary button above a Beamex calibrator.
- Select **Update Driver Software** from the pop-up menu.
- Select **Browse my computer for driver software** in the opened window.

To avoid further questions by the operating system, check the **Always trust software from "Beamex Oy Ab"** setting in the next dialog.

Notes.

The driver has been tested in 64 bit versions of the recommended operating systems for CMX Client installation.

Windows may warn that the driver is not digitally signed. Please ignore this warning and proceed with the installation. If your system administrator has not allowed using drivers without digital signature you must ask him to allow it.

Absolute Pressure Measurement and Uncertainty Calculation

Absolute Pressure Measurement uses two pressure modules simultaneously: a gauge pressure module and a barometric module. The total uncertainty of that kind of measurement is a combination of the uncertainties of both modules used in the calibration.

There's a catch in how CMX calculates the total uncertainty of an absolute pressure, but first we need to know what kind of pressure modules Beamex offers:

By default, Beamex calibrators use external pressure modules as follows:

- **High Accuracy EXT(-IS)** modules in **MC5, MC5-IS** and **MC5P**.
- **Standard Accuracy EXT-s(-IS)** modules in **MC2, MC2-IS, MC4** (and MC3).

The 1 year uncertainties of available external and internal barometric modules are as follows:

- **High Accuracy EXT B:**
0.05 kPa / 0.5 mbar / 0.0073 psi
- **High Accuracy Internal Barometric Module** used in **MC5, MC5-IS** and **MC5P**:
0.05 kPa / 0.5 mbar / 0.0073 psi
- **Standard Accuracy Internal Barometric Module** used in **MC2, MC2-IS, MC4** (and MC3):
0.1 kPa / 1 mbar / 0.0146 psi

CMX's catch is that it assumes that the barometric module is of the same type as the gauge module.

So, if you are consistent with the use of pressure modules, i.e. you measure absolute pressure using a High Accuracy barometric module together with a High Accuracy gauge pressure module or a Standard Accuracy barometric module together with a Standard Accuracy gauge pressure module, you'll be fine. The uncertainty calculation works as it should.

But if you combine pressure module types when you measure absolute pressure, the uncertainty of the barometric module is assumed wrongly. Thus, depending on the combination, the total uncertainty is either 0.05 kPa (or 0.5 mbar / 0.0073 psi) too good or too poor.

Examples:

1. A **High Accuracy EXT2C** gauge module is used in an MC4 with a **Standard Accuracy Internal Barometric Module**.
Then CMX assumes that the barometric module is a High Accuracy module too and uses a too good accuracy component when calculating the total uncertainty. You should add 0.05 kPa (or 0.5 mbar / 0.0073 psi) to the total uncertainty.
2. A **High Accuracy EXT B** barometric module is used in an MC4 with a **Standard Accuracy Internal Gauge Module**.
Then CMX assumes that the barometric module is a standard accuracy module too and uses a too poor accuracy component when calculating the total uncertainty. You should subtract 0.05 kPa (or 0.5 mbar / 0.0073 psi) from the total uncertainty.
3. A **Standard Accuracy EXT2C-s** gauge module is used in an MC5 with a **High Accuracy Internal Gauge Module**.
Then CMX assumes that the barometric module is a standard accuracy module too and uses a too poor accuracy component when calculating the total uncertainty. You should subtract 0.05 kPa (or 0.5 mbar / 0.0073 psi) from the total uncertainty.

Note.

If absolute pressure is **always** measured using the same pair of standard accuracy and high accuracy modules, consider editing the absolute pressure measuring range specifications for that particular gauge module. The field in question is *Constant Error*. More of specifications in chapters **Adding Module Ranges** and **Calibrator Module Range Fields**. When performing this customization, you should record the change for future needs. If you later on purchase more pressure modules / calibrators and maybe use a different combination to measure absolute pressure, you need to assure the specifications are valid for that combination.

Temperature Blocks and CMX

When calibrating temperature instruments using Beamex' Temperature Blocks, such as FB Field Temperature Block series and MB Metrology Temperature Block series, there are some issues to be taken into account. Here's a brief description of them.

Specifications of Temperature Blocks

The specifications of Temperature Blocks are divided into several components as follows:

Component	Description
<i>Display Accuracy</i>	The specification of the internal measurement.
<i>Stability</i>	The instability of the block's temperature
<i>Axial Uniformity</i>	The vertical temperature gradient in the block
<i>Radial Uniformity</i>	The horizontal temperature gradient in the block
<i>Load Effect</i>	Measurement probe(s) leaking heat to/from the block to the ambient
<i>Hysteresis</i>	The variation in readouts when reaching a certain temperature from higher or lower temperatures
<i>Reference Connection</i>	From reading the reference sensor connected to the Temperature Block

Notes.

Not all components are valid in all applications using a Temperature Block.

Detailed specification data is in the Temperature Block's User Guide.

Specifications of Temperature Blocks in CMX

In CMX, the uncertainty for a certain calibrator's/module's (sub-)range is saved as a Constant Error and a possible Relative Error, % of Reading. For Temperature Blocks, the Constant Error and Relative Error are combined from applicable components presented in chapter **Specifications of Temperature Blocks**. The possible methods of use are as follows:

Method 1: Temperature Block With Internal Temperature Measurement

A Temperature Block is used for creating the necessary temperature and the Temperature Block's internal temperature sensor is used for measuring the Block's temperature. The Input Method setting of the instrument to be calibrated is "Controlled/Measured" and no external reference sensor is connected to the calibrator or the Temperature Block.

The following specification components of the Temperature Block are combined in CMX's Constant Error and Relative Error data:

- *Display Accuracy*
- *Stability*
- *Axial Uniformity*
- *Radial Uniformity*
- *Load Effect*
- *Hysteresis*

Method 2: Reference Sensor Connected to R-type Temperature Block

An R-type Temperature Block controls the temperature and a reference sensor connected to the Temperature Block is used for measuring the temperature. The Input Method setting of the instrument to be calibrated is "Controlled/Measured".

In this case, the following specification components of the R-type Temperature Block are combined in CMX's Constant Error and Relative Error data:

- *Stability*
- *Axial Uniformity*
- *Radial Uniformity*
- *Load Effect*
- *Reference Connection*

In modern calibrators, communicating with a Temperature Block, you may define the used reference sensor model. When receiving calibration results to CMX, the reference sensor and, when applicable, its specifications are included with calibration result data. Also: The Temperature Block's specifications, as presented above, are included with calibration result data. See also note below.

Note.

For Beamex smart sensors, the specifications are already available in CMX. For other sensors and devices, the model and its specifications need to be added to CMX's database prior to using them in calibrations.

Method 3: Reference Sensor Connected to an External Device

Temperature Block controls the temperature and an external reference sensor is in the block, but the sensor is connected to an external temperature measuring device. The Input Method setting of the instrument to be calibrated is "Controlled".

In this case, the following specification components of the Temperature Block are combined in CMX's Constant Error and Relative Error data:

- *Stability*
- *Axial Uniformity*
- *Radial Uniformity*
- *Load Effect*

There are two possibilities for the reference sensor connection:

- A. The reference sensor is connected to the calibrator.
- B. The reference sensor is measured using a third party device.

In modern calibrators, communicating with a Temperature Block, you may define the used reference sensor model and, when applicable, the third party device model used for measuring the reference sensor. When receiving calibration results to CMX, the reference sensor, the third party device and, when applicable, their specifications are included with calibration result data. Also: The Temperature Block's specifications, as presented above, are included with calibration result data. See also note in method 2.

How the Temperature Block's accuracy specifications are converted to uncertainty data in CMX

Equation:

$$u_{tb} = \sqrt{\left(\frac{DA}{\sqrt{3}}\right)^2 + \left(\frac{St}{\sqrt{3}}\right)^2 + \left(\frac{AU}{\sqrt{3}}\right)^2 + \left(\frac{RU}{\sqrt{3}}\right)^2 + \dots}$$
$$\dots \sqrt{\left(\frac{LE}{\sqrt{3}}\right)^2 + \left(\frac{Hy}{\sqrt{3}}\right)^2 + \left(\frac{RC}{\sqrt{3}}\right)^2}$$

Where:

- u_{tb} is the standard uncertainty of a Temperature Block.
- DA is the Display Accuracy specification.
Zero when using methods 2 and 3.
- St is the Stability specification.
- AU is the Axial Uniformity specification.
- RU is the Radial Uniformity specification.
- LE is the Load Effect specification.
- Hy is the Hysteresis specification.
Zero when using methods 2 and 3.
- RC is the Reference Connection specification.
Zero when using methods 1 and 3.

Notes.

All specifications have a rectangular probability distribution. That is why they are divided by the square root of three. In CMX, the uncertainties are saved as expanded uncertainties, i.e. the standard uncertainties are multiplied by two.

Third Party Licenses

General

CMX, CWSI Server and CWSI Client include a number of third-party libraries that are used to provide certain features. Additional copyright and legal notices and license terms applicable to the third-party libraries may apply. A list of the third-

party libraries included in CMX, CWSI Server and CWSI Client is provided further on. By accepting the terms of the Beamex software license agreement, You also accept the third party terms.

Third-Party Licenses Used in CMX, CWSI Server and CWSI Client protobuf-net

Copyright(C) 2008 Marc Gravell.

Licensed under the Apache License, Version 2.0 (the "License"); you may not use this file except in compliance with the License. You may obtain a copy of the License at

<http://www.apache.org/licenses/LICENSE-2.0>

Unless required by applicable law or agreed to in writing, software distributed under the License is distributed on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied. See the License for the specific language governing permissions and limitations under the License

The core Protocol Buffers technology is provided courtesy of Google. At the time of writing, this is released under the BSD license. Full details can be found here:

<http://code.google.com/p/protobuf/>

Third-Party Licenses Used in CMX and CWSI Client

Automapper

Copyright(C) 2010 Jimmy Bogard.

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

Json.NET

Copyright (c) 2007 James Newton-King

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

OpenNETCF Desktop Communication Library

Copyright (c) 2005-2009 OpenNETCF Consulting, LLC

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

WebSocket4Net

Copyright(C) 2014 Kerry Jiang.

Licensed under the Apache License, Version 2.0 (the "License"); you may not use this file except in compliance with the License. You may obtain a copy of the License at

<http://www.apache.org/licenses/LICENSE-2.0>

Unless required by applicable law or agreed to in writing, software distributed under the License is distributed on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied. See the License for the specific language governing permissions and limitations under the License

Third-Party Licenses Used in CWSI Server and CWSI Client

CommonServiceLocator

Copyright(C) 2008 CommonServiceLocator
Open Source Project.

Microsoft Public License (Ms-PL)

This license governs use of the accompanying software. If you use the software, you accept this license. If you do not accept the license, do not use the software.

1. Definitions

The terms "reproduce," "reproduction," "derivative works," and "distribution" have the same meaning here as under U.S. copyright law.

A "contribution" is the original software, or any additions or changes to the software.

A "contributor" is any person that distributes its contribution under this license.

"Licensed patents" are a contributor's patent claims that read directly on its contribution.

2. Grant of Rights

(A) Copyright Grant- Subject to the terms of this license, including the license conditions and limitations in section 3, each contributor grants you a non-exclusive, worldwide, royalty-free copyright license to reproduce its contribution, prepare derivative works of its contribution, and distribute its contribution or any derivative works that you create.

(B) Patent Grant- Subject to the terms of this license, including the license conditions and limitations in section 3, each contributor grants you a non-exclusive, worldwide, royalty-free license under its licensed patents to

make, have made, use, sell, offer for sale, import, and/or otherwise dispose of its contribution in the software or derivative works of the contribution in the software.

3. Conditions and Limitations

- (A) No Trademark License- This license does not grant you rights to use any contributors' name, logo, or trademarks.
- (B) If you bring a patent claim against any contributor over patents that you claim are infringed by the software, your patent license from such contributor to the software ends automatically.
- (C) If you distribute any portion of the software, you must retain all copyright, patent, trademark, and attribution notices that are present in the software.
- (D) If you distribute any portion of the software in source code form, you may do so only under this license by including a complete copy of this license with your distribution. If you distribute any portion of the software in compiled or object code form, you may only do so under a license that complies with this license.
- (E) The software is licensed "as-is." You bear the risk of using it. The contributors give no express warranties, guarantees or conditions. You may have additional consumer rights under your local laws which this license cannot change. To the extent permitted under your local laws, the contributors exclude the implied warranties of merchantability, fitness for a particular purpose and non-infringement.

log4net

Copyright(C) 2004-2013 Apache Software Foundation.

Licensed under the Apache License, Version 2.0 (the "License"); you may not use this file except in compliance with the License. You may obtain a copy of the License at

<http://www.apache.org/licenses/LICENSE-2.0>

Unless required by applicable law or agreed to in writing, software distributed under the License is distributed on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied. See the License for the specific language governing permissions and limitations under the License.

MVVM Light Toolkit

Copyright (c) 2009 - 2014 Laurent Bugnion

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

Third-Party Licenses Used in CWSI Server

Fleck

Copyright (c) 2010-2014 Jason Staten

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

Third-Party Licenses Used in CWSI Client

Hardcodet WPF NotifyIcon

Copyright(C) 2009 Philipp Sumi.

Licensed under The Code Project Open License (CPOL) 1.02.

You may obtain a copy of the License at

<http://www.codeproject.com/info/cpol10.aspx>

SecondLanguage

Copyright(C) 2013, 2015 James F. Bellinger.

This software is provided 'as-is', without any express or implied warranty. In no event will the authors be held liable for any damages arising from the use of this software.

Permission is granted to anyone to use this software for any purpose, including commercial applications, and to alter it and redistribute it freely, subject to the following restrictions:

1. The origin of this software must not be misrepresented; you must not claim that you wrote the original software. If you use this software in a product, an acknowledgement in the product documentation would be appreciated but is not required.
2. Altered source versions must be plainly marked as such, and must not be misrepresented as being the original software.
3. This notice may not be removed or altered from any source distribution.

Third-Party Licenses Used in CMX

csharp-argon2

Copyright (c) 2016 Kevin Spinar (Alipha).

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND

NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM,

OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

This software is a binding around Daniel Dinu and Dmitry Khovratovich's Argon2 library. At the time of writing, this is licensed under a Creative Commons CC0 1.0 License/Waiver. Full details can be found here:

<https://github.com/alipha/csharp-argon2/blob/a4bf41dee76a403baac8aa0281ee4c6b2161c24e/libargon2/phc-winner-argon2/LICENSE>

CMX Software License Agreement

LICENSE - This product (the "Program Product") is only licensed, not sold. It remains the property of Beamex Oy Ab ("Beamex"), which grants a non-exclusive, non-transferable license to the individual and/or corporate licensee to use the enclosed Program Product. The Program Product includes all computer programs, machine-readable and printed materials as provided by Beamex in accordance with the terms and conditions set forth in this Software License Agreement. The Program Product includes all codes, techniques, software tools, formats, designs, concepts, methods and ideas associated with this Program Product, and any updates which Beamex may provide to you and backup copies which you may make.

TERM - This license is effective from the date of receipt of this Program Product and shall remain in force until terminated. You may terminate this Agreement at any time by returning all contents of the Program Product and destroying any portions of the Beamex Program Product merged in any form. This Agreement is automatically terminated if you violate any provision of this Agreement. Upon termination you must return all contents of the Program Product and documentation together with all copies, and destroy any portions of Program Product merged in any form. No refund is given unless expressly otherwise agreed in writing by Beamex.

USE OF PROGRAM PRODUCT- This Agreement limits the number of simultaneous users who may use the Program Product. The use of the Program Product is limited to the building or plant area where or to the company to which it is licensed. The limitations depend on whether you purchased an individual copy of the program or a network license.

INDIVIDUAL LICENSE (LOCAL) - You may use the Program Product in accordance with this Agreement on a single microcomputer at any one time. The Program Product may be placed on a network as long as there is no possibility of it being used simultaneously by more than one user at one location. You may not use the Program Product on more than one microcomputer at any given time unless additional licenses for

the additional microcomputers (or additional users on a network) are purchased.

CONCURRENT LICENSE (NETWORK) - You may use the Program Product in accordance with this Agreement on a licensed local area network. A computer network is any combination of two or more terminals that are electronically linked and capable of sharing the use of a single Program Product. The Program Product is delivered with purchased amount of licenses. You may not use the Program Product on more computers or terminals than the number licensed, as shown on your invoice or other documents from Beamex. You may install the Program Product on computers attached to a network, or remove it from one computer and install it on another one, provided that there is no possibility of simultaneous use of the Program Product on more computers than the number licensed.

COPYRIGHT AND RESTRICTIONS - The Program Product, including documentation, is copyrighted under the laws of Finland and international treaty provisions. Except as specifically authorized in the product documentation, the copying, disassembly, or duplication of any part of the Program Product or documentation, shall constitute a violation of copyright law. Accordingly, except as expressly otherwise provided (in the Instruction Manual or Quick Guide or otherwise), you may not copy, duplicate, modify, translate, disassemble or decompile any part of the Program Product or documentation, or create or attempt to create, by reverse engineering or otherwise, the source code from the object code of the Program Product supplied hereunder. Further, you may not reproduce, sublicense, distribute, loan, rent, transfer or otherwise disclose the Program Product or documentation to others, in whole or in part, or remove or alter any ownership or copyright notices on the cd (s), diskette(s) or the documentation except as otherwise expressly permitted by Beamex.

OWNERSHIP - Ownership of the Program Product (including all adaptations), documentation and all copies thereof and all copyrights, trade secrets, know-how, trademarks, trade names and all other proprietary rights and interests re-

lated thereto shall remain the exclusive property of Beamex. The Program Product shall be in executable object code form only and you shall have no right to the source code. Copies are loaned to you to allow you to exercise rights under the License. Only the License is purchased by you. You must prevent any unauthorized use, copying, or disclosure of the Program Product and documentation.

INFRINGEMENT - Beamex does not warrant that the Program Product will not infringe any copyright, patent or any other rights owned or possessed by any third parties and Beamex shall not be required to protect, indemnify, or hold you harmless against, or be liable to you for, any liabilities, losses, expenses, or damages which may be suffered or incurred by you as a result of such infringement or allegation thereof by any third party, Beamex shall not be under any obligation to defend or participate in the defense by you against any claim or suit alleging such infringement.

Beamex warrants that the media on which the Program Product is furnished will be free from defects in materials and workmanship under normal use for a period of ninety (90) days from the date of delivery. Beamex's only obligation under this warranty is to, at its sole discretion, either to replace or to repair the defective media.

THE LIMITED WARRANTIES SET FORTH HEREIN SHALL NOT BE VALID IF (A) THE PROGRAM PRODUCT HAS BEEN SUBJECT TO UNAUTHORIZED ALTERATION OR REPAIR OR MODIFICATION NOT EXPRESSLY CONSENTED BY BEAMEX IN WRITING (e.g. in the Instruction Manual or Quick Guide) OR ABUSE, MISUSE, ACCIDENT OR NEGLIGENCE; OR (B) THE PROGRAM PRODUCT HAS BEEN EXPOSED TO CONDITIONS BEYOND BEAMEX'S ENVIRONMENTAL, POWER OR OPERATING CONSTRAINTS.

DISCLAIMER OF WARRANTY - The Program Product and documentation are intended for professional use by properly trained personnel only. As the Program Product may be used for various purposes unknown to Beamex you (and not Beamex or any authorized representative of Beamex) assume responsibility for the selection of the Program Product to achieve your intended results, and for the installation, use and results obtained from the Program Product. You must always verify proper the performance of the Program Product prior to any particular use.

Therefore, you expressly acknowledge and agree that THE ENTIRE RISK AS TO THE USE, RESULTS AND PERFORMANCE OF THE

PROGRAM PRODUCT IS ASSUMED BY YOU. The Program Product and documentation are provided "AS IS" and without warranty of any kind and BEAMEX EXPRESSLY DISCLAIMS ALL WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND CURRENTNESS OR FITNESS FOR A PARTICULAR PURPOSE.

BEAMEX DOES NOT AND CAN NOT WARRANT THAT THE PERFORMANCE OF THE PROGRAM PRODUCT OR THE FUNCTIONS CONTAINED IN THE PROGRAM PRODUCT WILL MEET YOUR REQUIREMENTS, OR THAT THE PROGRAM PRODUCT WILL OPERATE IN THE COMBINATIONS WHICH MAY HAVE BEEN SELECTED FOR USE BY YOU, OR THAT THE OPERATION OF THE PROGRAM PRODUCT WILL BE UNINTERRUPTED OR ERROR-FREE, OR THAT DEFECTS IN THE PROGRAM PRODUCT WILL BE CORRECTED.

FURTHERMORE, BEAMEX DOES NOT WARRANT OR MAKE ANY REPRESENTATIONS REGARDING THE USE OR THE RESULTS OF THE USE OF THE PROGRAM PRODUCT OR DOCUMENTATION IN TERMS OF THEIR CORRECTNESS, ACCURACY, RELIABILITY, OR OTHERWISE, NO ORAL OR WRITTEN INFORMATION OR ADVICE GIVEN BY BEAMEX OR AN AUTHORIZED REPRESENTATIVE OF BEAMEX SHALL CREATE A WARRANTY OR IN ANY WAY INCREASE THE SCOPE OF THIS WARRANTY. SHOULD THE PROGRAM PRODUCT PROVE DEFECTIVE, YOU (AND NOT BEAMEX OR AN AUTHORIZED REPRESENTATIVE OF BEAMEX) ASSUME THE ENTIRE COST OF ALL NECESSARY SERVICING, REPAIR OR CORRECTION, EXCEPT AS EXPRESSLY STATED IN THIS AGREEMENT.

LIMITATION OF LIABILITY - UNDER NO CIRCUMSTANCES SHALL EITHER BEAMEX NOR ANYONE ELSE WHO HAS BEEN INVOLVED IN THE CREATION, PRODUCTION, OR DELIVERY OF THIS PROGRAM PRODUCT BE LIABLE FOR ANY INCIDENTAL, CONSEQUENTIAL, SPECIAL, DIRECT OR INDIRECT DAMAGES, INCLUDING, BUT NOT LIMITED TO, LOSS OF ANTICIPATED PROFITS OR BENEFITS, LOSS OF USE OF THE PROGRAM PRODUCT, LOSS OF DATA, COSTS OF RECREATING LOST DATA AND/OR THE COST OF ANY SUBSTITUTE EQUIPMENT OR PROGRAM THAT RESULT FROM THE USE OR INABILITY TO USE THE PROGRAM PRODUCT OR DOCUMENTATION,

OR ARISING OUT OF ANY BREACH OF ANY WARRANTY, EVEN IF BEAMEX OR AN AUTHORIZED REPRESENTATIVE OF BEAMEX HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

In no event shall Beamex's total liability to you for all damages, losses and causes of action (whether in contract, tort (including negligence) or otherwise) exceed the amount paid by you for the Program Product.

GENERAL CONDITIONS - This Agreement sets forth the entire Agreement between you and Beamex and may be amended only in a writing signed by both parties. No vendor, distributor, dealer, retailer, sales person or other person is authorized by Beamex to modify this agreement or to make any warranty, representation or promise which is different than, or in addition to, the warranties, representations or promises in this Agreement. This Agreement is to be construed, governed by and interpreted in accordance with the laws of Finland. Disputes arising from this Agreement are to be finally settled by arbitration. The arbitration tribunal shall be composed of one (1) sole arbitrator appointed by the Arbitration Committee of the Central Chamber of Commerce. The Rules of the Arbitration Committee of the Central Chamber of Commerce of Finland are to be followed in the arbitration proceedings that shall be held in Helsinki, Finland. The arbitration proceedings shall be conducted in the English language. Any term of this Agreement found to contravene a jurisdiction's law will

be deleted without affecting the remaining terms. Any waiver by Beamex of a breach of this Agreement shall not constitute a waiver of any later breach. You may not modify or transfer, sell, assign, or otherwise convey this License Agreement or rights or obligations related to it or any part of the Program Product or any copy of the Program Product, not entirely nor even partly, to a third party under any circumstances, if not expressly consented by Beamex in writing.

YOU ACKNOWLEDGE THAT YOU HAVE READ THIS AGREEMENT, UNDERSTAND IT, AND AGREE TO BE BOUND BY ITS TERMS AND CONDITIONS. FURTHERMORE, YOU AGREE THAT THIS IS THE COMPLETE AND EXCLUSIVE STATEMENT OF THE AGREEMENT BETWEEN YOU AND BEAMEX AND THAT THIS AGREEMENT SUPERSEDES ALL PRIOR AGREEMENTS, WHETHER VERBAL OR WRITTEN, AND ANY OTHER COMMUNICATIONS RELATING TO THE SUBJECT MATTER OF THIS AGREEMENT. THIS AGREEMENT MAY BE MODIFIED ONLY IN WRITING SIGNED BY YOU AND BEAMEX.

Should you have questions concerning this License Agreement, please contact Oy Beamex Ab, at Ristisuonraitti 10, FIN-68600 Pietarsaari, Finland

Phone: +358 10 5500 5000, Fax: +358 10 550 5040, E-mail: support@beamex.com, Internet: www.beamex.com

- END OF CMX SOFTWARE LICENSE AGREEMENT -

Supplemental End User License Agreement For Microsoft Software ("Supplemental EULA")

IMPORTANT: READ CAREFULLY - These Microsoft Corporation ("Microsoft") operating system components, including any "online" or electronic documentation ("OS Components") are subject to the terms and conditions of the agreement under which you have licensed the applicable Microsoft operating system product described below (each an "End User License Agreement" or "EULA") and the terms and conditions of this Supplemental EULA. **BY INSTALLING, COPYING OR OTHERWISE USING THE OS COMPONENTS, YOU AGREE TO BE BOUND BY THE TERMS AND CONDITIONS OF THE APPLICABLE OPERATING SYSTEM PRODUCT EULA AND THIS SUPPLEMENTAL EULA. IF YOU DO NOT AGREE TO THESE TERMS AND CONDITIONS, DO NOT INSTALL, COPY OR USE THE OS COMPONENTS.**

NOTE: IF YOU DO NOT HAVE A VALIDLY LICENSED COPY OF ANY VERSION OR EDITION OF MICROSOFT WINDOWS 95, WINDOWS 98, WINDOWS NT 4.0 WINDOWS 2000 OPERATING SYSTEM OR ANY MICROSOFT OPERATING SYSTEM THAT IS A SUCCESSOR TO ANY OF THOSE OPERATING SYSTEMS (each an "OS Product"), YOU ARE NOT AUTHORIZED TO INSTALL, COPY OR OTHERWISE USE THE OS COMPONENTS AND YOU HAVE NO RIGHTS UNDER THIS SUPPLEMENTAL EULA.

Capitalized terms used in this Supplemental EULA and not otherwise defined herein shall have the meanings assigned to them in the applicable OS Product EULA.

General. Each of the OS Components available from this site is identified as being applicable to one or more of the OS Products. The applicable OS Components are provided to you by Microsoft to update, supplement, or replace existing functionality of the applicable OS Product. Microsoft grants you a license to use the applicable OS Components under the terms and conditions of the EULA for the applicable OS Product (which are hereby incorporated by reference except as set forth below), the terms and conditions set forth in this Supplemental EULA, and the terms and conditions of any additional end user license agreement that may accompany the individual OS Components (each an "Individual EULA"), provided that you comply with all such terms and conditions. To the extent that there is a conflict among any of these terms and

conditions applicable to the OS Components, the following hierarchy shall apply: 1) the terms and conditions of the Individual EULA; 2) the terms and conditions in this Supplemental EULA; and 3) the terms and conditions of the applicable OS Product EULA.

Additional Rights and Limitations.

* If you have multiple validly licensed copies of any OS Product, you may reproduce, install and use one copy of the applicable OS Components as part of the applicable OS Product on all of your computers running validly licensed copies of the applicable OS Product, provided that you use such additional copies of such OS Components in accordance with the terms and conditions above. For each validly licensed copy of the applicable OS Product, you also may reproduce one additional copy of the applicable OS Components solely for archival purposes or reinstallation of the OS Components on the same computer as the OS Components were previously installed. Microsoft retains all right, title and interest in and to the OS Components. All rights not expressly granted are reserved by Microsoft.

* If you are installing the OS Components on behalf of an organization other than your own, prior to installing any of the OS Components, you must confirm that the end-user (whether an individual or a single entity) has received, read and accepted these terms and conditions.

* The OS Components may contain technology that enables applications to be shared between two or more computers, even if an application is installed on only one of the computers. You may use this technology with all Microsoft application products for multi-party conferences. For non-Microsoft applications, you should consult the accompanying license agreement or contact the licensor to determine whether application sharing is permitted by the licensor.

* You may not disclose the results of any benchmark test of the .NET Framework component of the OS Components to any third party without Microsoft's prior written approval.

IF THE APPLICABLE OS PRODUCT WAS LICENSED TO YOU BY MICROSOFT OR ANY OF ITS WHOLLY OWNED SUBSIDIARIES, THE LIMITED WARRANTY (IF ANY) INCLUDED IN THE APPLICABLE OS PRODUCT EULA APPLIES TO THE APPLICABLE OS COMPONENTS PROVIDED THE APPLICABLE OS COMPONENTS HAVE BEEN LICENSED

BY YOU WITHIN THE TERM OF THE LIMITED WARRANTY IN THE APPLICABLE OS PRODUCT EULA. HOWEVER, THIS SUPPLEMENTAL EULA DOES NOT EXTEND THE TIME PERIOD FOR WHICH THE LIMITED WARRANTY IS PROVIDED.

IF THE APPLICABLE OS PRODUCT WAS LICENSED TO YOU BY AN ENTITY OTHER THAN MICROSOFT OR ANY OF ITS WHOLLY OWNED SUBSIDIARIES, MICROSOFT DISCLAIMS ALL WARRANTIES WITH RESPECT TO THE APPLICABLE OS COMPONENTS AS FOLLOWS:

DISCLAIMER OF WARRANTIES. TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, MICROSOFT AND ITS SUPPLIERS PROVIDE TO YOU THE OS COMPONENTS, AND ANY (IF ANY) SUPPORT SERVICES RELATED TO THE OS COMPONENTS ("SUPPORT SERVICES") AS IS AND WITH ALL FAULTS; AND MICROSOFT AND ITS SUPPLIERS HEREBY DISCLAIM WITH RESPECT TO THE OS COMPONENTS AND SUPPORT SERVICES ALL WARRANTIES AND CONDITIONS, WHETHER EXPRESS, IMPLIED OR STATUTORY, INCLUDING, BUT NOT LIMITED TO, ANY (IF ANY) WARRANTIES, DUTIES OR CONDITIONS OF OR RELATED TO: MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, LACK OF VIRUSES, ACCURACY OR COMPLETENESS OF RESPONSES, RESULTS, WORKMANLIKE EFFORT AND LACK OF NEGLIGENCE. ALSO THERE IS NO WARRANTY, DUTY OR CONDITION OF TITLE, QUIET ENJOYMENT, QUIET POSSESSION, CORRESPONDENCE TO DESCRIPTION OR NON-INFRINGEMENT. THE ENTIRE RISK ARISING OUT OF USE OR PERFORMANCE OF THE OS COMPONENTS AND ANY SUPPORT SERVICES REMAINS WITH YOU.

EXCLUSION OF INCIDENTAL, CONSEQUENTIAL AND CERTAIN OTHER DAMAGES. TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, IN NO

EVENT SHALL MICROSOFT OR ITS SUPPLIERS BE LIABLE FOR ANY SPECIAL, INCIDENTAL, INDIRECT, PUNITIVE OR CONSEQUENTIAL DAMAGES WHATSOEVER (INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR: LOSS OF PROFITS, LOSS OF CONFIDENTIAL OR OTHER INFORMATION, BUSINESS INTERRUPTION, PERSONAL INJURY, LOSS OF PRIVACY, FAILURE TO MEET ANY DUTY (INCLUDING OF GOOD FAITH OR OF REASONABLE CARE), NEGLIGENCE, AND ANY OTHER PECUNIARY OR OTHER LOSS WHATSOEVER) ARISING OUT OF OR IN ANY WAY RELATED TO THE USE OF OR INABILITY TO USE THE OS COMPONENTS OR THE SUPPORT SERVICES, OR THE PROVISION OF OR FAILURE TO PROVIDE SUPPORT SERVICES, OR OTHERWISE UNDER OR IN CONNECTION WITH ANY PROVISION OF THIS SUPPLEMENTAL EULA, EVEN IF MICROSOFT OR ANY SUPPLIER HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

LIMITATION OF LIABILITY AND REMEDIES. NOTWITHSTANDING ANY DAMAGES THAT YOU MIGHT INCUR FOR ANY REASON WHATSOEVER (INCLUDING, WITHOUT LIMITATION, ALL DAMAGES REFERENCED ABOVE AND ALL DIRECT OR GENERAL DAMAGES), THE ENTIRE LIABILITY OF MICROSOFT AND ANY OF ITS SUPPLIERS UNDER ANY PROVISION OF THIS SUPPLEMENTAL EULA AND YOUR EXCLUSIVE REMEDY FOR ALL OF THE FOREGOING SHALL BE LIMITED TO ACTUAL DAMAGES INCURRED BY YOU BASED ON REASONABLE RELIANCE UP TO THE GREATER OF THE AMOUNT ACTUALLY PAID BY YOU FOR THE OS COMPONENTS OR U.S.\$5.00. THE FOREGOING LIMITATIONS, EXCLUSIONS AND DISCLAIMERS SHALL APPLY TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, EVEN IF ANY REMEDY FAILS ITS ESSENTIAL PURPOSE.

- END OF SUPPLEMENTAL END USER LICENSE AGREEMENT FOR MICROSOFT SOFTWARE ("Supplemental EULA") -

End-User License Agreement For Microsoft Software

IMPORTANT—READ CAREFULLY: This End-User License Agreement (“EULA”) is a legal agreement between you (either an individual or a single entity) and Microsoft Corporation (“Microsoft”) for the Microsoft software that accompanies this EULA, which includes computer software and may include associated media, printed materials, “online” or electronic documentation, and Internet-based services (“Software”). An amendment or addendum to this EULA may accompany the Software. **YOU AGREE TO BE BOUND BY THE TERMS OF THIS EULA BY INSTALLING, COPYING, OR OTHERWISE USING THE SOFTWARE. IF YOU DO NOT AGREE, DO NOT INSTALL, COPY, OR USE THE SOFTWARE; YOU MAY RETURN IT TO YOUR PLACE OF PURCHASE (IF APPLICABLE) FOR A FULL REFUND.**

MICROSOFT SOFTWARE LICENSE

1. **GRANTS OF LICENSE.** Microsoft grants you the rights described in this EULA provided that you comply with all terms and conditions of this EULA. **NOTE:** Microsoft is not licensing to you any rights with respect to Crystal Reports for Microsoft Visual Studio .NET; your use of Crystal Reports for Microsoft Visual Studio .NET is subject to your acceptance of the terms and conditions of the enclosed (hard copy) end user license agreement from Crystal Decisions for that product.

1.1 **General License Grant.** Microsoft grants to you as an individual, a personal, nonexclusive license to use the Software, and to make and use copies of the Software for the purposes of designing, developing, testing, and demonstrating your software product(s), provided that you are the only individual using the Software.

If you are an entity, Microsoft grants to you a personal, nonexclusive license to use the Software, and to make and use copies of the Software, provided that for each individual using the Software within your organization, you have acquired a separate and valid license for each such individual.

1.2 **Documentation.** You may make and use an unlimited number of copies of any documentation, provided that such copies shall be used only for personal purposes and are not to be republished or distributed (either in hard copy or electronic form) beyond your premises.

1.3 **Storage/Network Use.** You may also store or install a copy of the Software on a stor-

age device, such as a network server, used only to install or run the Software on computers used by licensed end users in accordance with Section 1.1. A single license for the Software may not be shared or used concurrently by multiple end users.

1.4 **Visual Studio—Effect of EULA.** As a suite of development tools and other Microsoft software programs (each such tool or software program, a “Component”), Components that you receive as part of the Software may include a separate end-user license agreement (each, a “Component EULA”). Except as provided in Section 4 (“Prerelease Code”), in the event of inconsistencies between this EULA and any Component EULA, the terms of this EULA shall control. The Software may also contain third-party software programs. Any such software is provided for your use as a convenience and your use is subject to the terms and conditions of any license agreement contained in that software.

2. **ADDITIONAL LICENSE RIGHTS -- REDISTRIBUTABLE CODE.** In addition to the rights granted in Section 1, certain portions of the Software, as described in this Section 2, are provided to you with additional license rights. These additional license rights are conditioned upon your compliance with the distribution requirements and license limitations described in Section 3.

2.1 **Sample Code.** Microsoft grants you a limited, nonexclusive, royalty-free license to: (a) use and modify the source code version of those portions of the Software identified as “Samples” in REDIST.TXT or elsewhere in the Software (“Sample Code”) for the sole purposes of designing, developing, and testing your software product(s), and (b) reproduce and distribute the Sample Code, along with any modifications thereof, in object and/or source code form. For applicable redistribution requirements for Sample Code, see Section 3.1 below.

2.2 **Redistributable Code—General.** Microsoft grants you a limited, nonexclusive, royalty-free license to reproduce and distribute the object code form of any portion of the Software listed in REDIST.TXT (“Redistributable Code”). For general redistribution requirements for Redistributable Code, see Section 3.1 below.

2.3 **Redistributable Code—Microsoft Merge Modules (“MSM”).** Microsoft grants you a limited, nonexclusive, royalty-free license to reproduce and distribute the content of MSM file(s)

listed in REDIST.TXT in the manner described in the Software documentation only so long as you redistribute such content in its entirety and do not modify such content in any way. For all other applicable redistribution requirements for MSM files, see Section 3.1 below.

2.4 Redistributable Code—Microsoft Foundation Classes (MFC), Active Template Libraries (ATL), and C runtimes (CRTs). In addition to the rights granted in Section 1, Microsoft grants you a license to use and modify the source code version of those portions of the Software that are identified as MFC, ATL, or CRTs (collectively, the “VC Redistributables”), for the sole purposes of designing, developing, and testing your software product(s). Provided you comply with Section 3.1 and you rename any files created by you that are included in the Licensee Software (defined below), Microsoft grants you a limited, nonexclusive, royalty-free license to reproduce and distribute the object code version of the VC Redistributables, including any modifications you make. For purposes of this section, “modifications” shall mean enhancements to the functionality of the VC Redistributables. For all other applicable redistribution requirements for VC Redistributables, see Section 3.1 below.

3. DISTRIBUTION REQUIREMENTS AND OTHER LICENSE RIGHTS AND LIMITATIONS. If you choose to exercise your rights under Section 2, any redistribution by you is subject to your compliance with Section 3.1; some of the Redistributable Code has additional limited use rights described in Section 3.2.

3.1 General Distribution Requirements.

(a) If you choose to redistribute Sample Code, or Redistributable Code (collectively, the “Redistributables”) as described in Section 2, you agree: (i) except as otherwise noted in Section 2.1 (Sample Code), to distribute the Redistributables only in object code form and in conjunction with and as a part of a software application product developed by you that adds significant and primary functionality to the Redistributables (“Licensee Software”); (ii) that the Redistributables only operate in conjunction with Microsoft Windows platforms; (iii) that if the Licensee Software is distributed beyond Licensee’s premises or externally from Licensee’s organization, to distribute the Licensee Software containing the Redistributables pursuant to an end user license agreement (which may be “break-the-seal”, “click-wrap” or signed), with terms no less protective than those contained in this EULA; (iv) not to use Microsoft’s name, logo, or trademarks to market the Licensee Software; (v) to display your own valid copyright notice which shall be sufficient to protect Microsoft’s

copyright in the Software; (vi) not to remove or obscure any copyright, trademark or patent notices that appear on the Software as delivered to you; (vii) to indemnify, hold harmless, and defend Microsoft from and against any claims or lawsuits, including attorney’s fees, that arise or result from the use or distribution of the Licensee Software; (viii) to otherwise comply with the terms of this EULA; and (ix) agree that Microsoft reserves all rights not expressly granted.

You also agree not to permit further distribution of the Redistributables by your end users except you may permit further redistribution of the Redistributables by your distributors to your end-user customers if your distributors only distribute the Redistributables in conjunction with, and as part of, the Licensee Software, you comply with all other terms of this EULA, and your distributors comply with all restrictions of this EULA that are applicable to you.

(b) If you use the Redistributables, then in addition to your compliance with the applicable distribution requirements described for the Redistributables, the following also applies. Your license rights to the Redistributables are conditioned upon your not (i) creating derivative works of the Redistributables in any manner that would cause the Redistributables in whole or in part to become subject to any of the terms of an Excluded License; or (ii) distributing the Redistributables (or derivative works thereof) in any manner that would cause the Redistributables to become subject to any of the terms of an Excluded License. An “Excluded License” is any license that requires as a condition of use, modification and/or distribution of software subject to the Excluded License, that such software or other software combined and/or distributed with such software be (x) disclosed or distributed in source code form; (y) licensed for the purpose of making derivative works; or (z) redistributable at no charge.

3.2 Additional Distribution Requirements for Certain Redistributable Code. If you choose to redistribute the files discussed in this Section, then in addition to the terms of Section 3.1, you must ALSO comply with the following.

(a) Microsoft SQL Server Desktop Engine (“MSDE”). If you redistribute MSDE you agree to comply with the following additional requirements: (a) Licensee Software shall not substantially duplicate the capabilities of Microsoft Access or, in the reasonable opinion of Microsoft, compete with same; and (b) unless Licensee Software requires your customers to license Microsoft Access in order to operate, you shall not reproduce or use MSDE for commercial distribution in conjunction with a general purpose word

processing, spreadsheet or database management software product, or an integrated work or product suite whose components include a general purpose word processing, spreadsheet, or database management software product except for the exclusive use of importing data to the various formats supported by Microsoft Access. A product that includes limited word processing, spreadsheet or database components along with other components which provide significant and primary value, such as an accounting product with limited spreadsheet capability, is not considered to be a “general purpose” product.

(b) Microsoft Data Access Components. If you redistribute the Microsoft Data Access Component file identified as MDAC_TYP.EXE, you also agree to redistribute such file in object code only in conjunction with and as a part of a License Software developed by you with a Microsoft development tool product that adds significant and primary functionality to MDAC_TYP.EXE.

3.3 Separation of Components. The Software is licensed as a single product. Its component parts may not be separated for use by more than one user.

3.4 Benchmark Testing. The Software may contain the Microsoft .NET Framework. You may not disclose the results of any benchmark test of the .NET Framework component of the Software to any third party without Microsoft’s prior written approval.

4. PRERELEASE CODE. Portions of the Software may be identified as prerelease code (“Prerelease Code”). Such Prerelease Code is not at the level of performance and compatibility of the final, generally available product offering. The Prerelease Code may not operate correctly and may be substantially modified prior to first commercial shipment. Microsoft is not obligated to make this or any later version of the Prerelease Code commercially available. The grant of license to use Prerelease Code expires upon availability of a commercial release of the Prerelease Code from Microsoft. NOTE: In the event that Prerelease Code contains a separate end-user license agreement, the terms and conditions of such end-user license agreement shall govern your use of the corresponding Prerelease Code.

5. RESERVATION OF RIGHTS AND OWNERSHIP. Microsoft reserves all rights not expressly granted to you in this EULA. The Software is protected by copyright and other intellectual property laws and treaties. Microsoft or its suppliers own the title, copyright, and other intellectual property rights in the Software. The Software is licensed, not sold.

6. LIMITATIONS ON REVERSE ENGINEERING, DECOMPILATION, AND DISASSEMBLY. You may not reverse engineer, decompile, or disassemble the Software, except and only to the extent that such activity is expressly permitted by applicable law notwithstanding this limitation.

7. NO RENTAL/COMMERCIAL HOSTING. You may not rent, lease, lend or provide commercial hosting services with the Software.

8. CONSENT TO USE OF DATA. You agree that Microsoft and its affiliates may collect and use technical information gathered as part of the product support services provided to you, if any, related to the Software. Microsoft may use this information solely to improve our products or to provide customized services or technologies to you and will not disclose this information in a form that personally identifies you.

9. LINKS TO THIRD PARTY SITES. You may link to third party sites through the use of the Software. The third party sites are not under the control of Microsoft, and Microsoft is not responsible for the contents of any third party sites, any links contained in third party sites, or any changes or updates to third party sites. Microsoft is not responsible for webcasting or any other form of transmission received from any third party sites. Microsoft is providing these links to third party sites to you only as a convenience, and the inclusion of any link does not imply an endorsement by Microsoft of the third party site.

10. ADDITIONAL SOFTWARE/SERVICES. This EULA applies to updates, supplements, add-on components, or Internet-based services components, of the Software that Microsoft may provide to you or make available to you after the date you obtain your initial copy of the Software, unless we provide other terms along with the update, supplement, add-on component, or Internet-based services component. Microsoft reserves the right to discontinue any Internet-based services provided to you or made available to you through the use of the Software.

11. UPGRADES/DOWNGRADES

11.1 Upgrades. To use a version of the Software identified as an upgrade, you must first be licensed for the software identified by Microsoft as eligible for the upgrade. After upgrading, you may no longer use the software that formed the basis for your upgrade eligibility.

11.2 Downgrades. Instead of installing and using the Software, you may install and use copies of an earlier version of the Software, provided that you completely remove such earlier version and install the current version of

the Software within a reasonable time. Your use of such earlier version shall be governed by this EULA, and your rights to use such earlier version shall terminate when you install the Software.

11.3 Special Terms for Version 2003 Upgrade Editions of the Software. If the Software accompanying this EULA is the version 2003 edition of the Software and you have acquired it as an upgrade from the corresponding "2002" edition of the Microsoft software product with the same product name as the Software (the "Qualifying Software"), then Section 11.1 does not apply to you. Instead, you may continue to use the Qualifying Software AND the version 2003 upgrade for so long as you continue to comply with the terms of this EULA and the EULA governing your use of the Qualifying Software. Qualifying Software does not include non-Microsoft software products.

12. NOT FOR RESALE SOFTWARE. Software identified as "Not For Resale" or "NFR," may not be sold or otherwise transferred for value, or used for any purpose other than demonstration, test or evaluation.

13. ACADEMIC EDITION SOFTWARE. To use Software identified as "Academic Edition" or "AE," you must be a "Qualified Educational User." For qualification-related questions, please contact the Microsoft Sales Information Center/One Microsoft Way/Redmond, WA 98052-6399 or the Microsoft subsidiary serving your country.

14. EXPORT RESTRICTIONS. You acknowledge that the Software is subject to U.S. export jurisdiction. You agree to comply with all applicable international and national laws that apply to the Software, including the U.S. Export Administration Regulations, as well as end-user, end-use, and destination restrictions issued by U.S. and other governments. For additional information see <http://www.microsoft.com/exporting/>.

15. SOFTWARE TRANSFER. The initial user of the Software may make a one-time permanent transfer of this EULA and Software to another end user, provided the initial user retains no copies of the Software. This transfer must include all of the Software (including all component parts, the media and printed materials, any upgrades (including any Qualifying Software as defined in Section 11.3), this EULA, and, if applicable, the Certificate of Authenticity). The transfer may not be an indirect transfer, such as a consignment. Prior to the transfer, the end user receiving the Software must agree to all the EULA terms.

16. TERMINATION. Without prejudice to any other rights, Microsoft may terminate this EULA if you fail to comply with the terms and conditions of this EULA. In such event, you must destroy all copies of the Software and all of its component parts.

17. LIMITED WARRANTY FOR SOFTWARE ACQUIRED IN THE US AND CANADA.

Except for the "Redistributables," which are provided AS IS without warranty of any kind, Microsoft warrants that the Software will perform substantially in accordance with the accompanying materials for a period of ninety (90) days from the date of receipt.

If an implied warranty or condition is created by your state/jurisdiction and federal or state/provincial law prohibits disclaimer of it, you also have an implied warranty or condition, BUT ONLY AS TO DEFECTS DISCOVERED DURING THE PERIOD OF THIS LIMITED WARRANTY (NINETY DAYS). AS TO ANY DEFECTS DISCOVERED AFTER THE NINETY-DAY PERIOD, THERE IS NO WARRANTY OR CONDITION OF ANY KIND. Some states/jurisdictions do not allow limitations on how long an implied warranty or condition lasts, so the above limitation may not apply to you.

Any supplements or updates to the Software, including without limitation, any (if any) service packs or hot fixes provided to you after the expiration of the ninety day Limited Warranty period are not covered by any warranty or condition, express, implied or statutory.

LIMITATION ON REMEDIES; NO CONSEQUENTIAL OR OTHER DAMAGES. Your exclusive remedy for any breach of this Limited Warranty is as set forth below. Except for any refund elected by Microsoft, YOU ARE NOT ENTITLED TO ANY DAMAGES, INCLUDING BUT NOT LIMITED TO CONSEQUENTIAL DAMAGES, if the Software does not meet Microsoft's Limited Warranty, and, to the maximum extent allowed by applicable law, even if any remedy fails of its essential purpose. The terms of Section 19 ("Exclusion of Incidental, Consequential and Certain Other Damages") are also incorporated into this Limited Warranty. Some states/jurisdictions do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This Limited Warranty gives you specific legal rights. You may have other rights which vary from state/jurisdiction to state/jurisdiction. YOUR EXCLUSIVE REMEDY. Microsoft's and its suppliers' entire liability and your exclusive remedy for any breach of this Limited Warranty or for any

other breach of this EULA or for any other liability relating to the Software shall be, at Microsoft's option from time to time exercised subject to applicable law, (a) return of the amount paid (if any) for the Software, or (b) repair or replacement of the Software, that does not meet this Limited Warranty and that is returned to Microsoft with a copy of your receipt. You will receive the remedy elected by Microsoft without charge, except that you are responsible for any expenses you may incur (e.g. cost of shipping the Software to Microsoft). This Limited Warranty is void if failure of the Software has resulted from accident, abuse, misapplication, abnormal use or a virus. Any replacement Software will be warranted for the remainder of the original warranty period or thirty (30) days, whichever is longer, and Microsoft will use commercially reasonable efforts to provide your remedy within a commercially reasonable time of your compliance with Microsoft's warranty remedy procedures. Outside the United States or Canada, neither these remedies nor any product support services offered by Microsoft are available without proof of purchase from an authorized international source. To exercise your remedy, contact: Microsoft, Attn. Microsoft Sales Information Center/One Microsoft Way/Redmond, WA 98052-6399, or the Microsoft subsidiary serving your country.

18. **DISCLAIMER OF WARRANTIES.** The Limited Warranty that appears above is the only express warranty made to you and is provided in lieu of any other express warranties or similar obligations (if any) created by any advertising, documentation, packaging, or other communications. EXCEPT FOR THE LIMITED WARRANTY AND TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, MICROSOFT AND ITS SUPPLIERS PROVIDE THE SOFTWARE AND SUPPORT SERVICES (IF ANY) AS IS AND WITH ALL FAULTS, AND HEREBY DISCLAIM ALL OTHER WARRANTIES AND CONDITIONS, WHETHER EXPRESS, IMPLIED OR STATUTORY, INCLUDING, BUT NOT LIMITED TO, ANY (IF ANY) IMPLIED WARRANTIES, DUTIES OR CONDITIONS OF MERCHANTABILITY, OF FITNESS FOR A PARTICULAR PURPOSE, OF RELIABILITY OR AVAILABILITY, OF ACCURACY OR COMPLETENESS OF RESPONSES, OF RESULTS, OF WORKMANLIKE EFFORT, OF LACK OF VIRUSES, AND OF LACK OF NEGLIGENCE, ALL WITH REGARD TO THE SOFTWARE, AND THE PROVISION OF OR FAILURE TO PROVIDE SUPPORT OR OTHER SERVICES, INFORMATION, SOFTWARE, AND RELATED CONTENT THROUGH THE SOFTWARE OR OTHERWISE ARISING OUT OF THE USE OF

THE SOFTWARE. ALSO, THERE IS NO WARRANTY OR CONDITION OF TITLE, QUIET ENJOYMENT, QUIET POSSESSION, CORRESPONDENCE TO DESCRIPTION OR NON-INFRINGEMENT WITH REGARD TO THE SOFTWARE.

19. **EXCLUSION OF INCIDENTAL, CONSEQUENTIAL AND CERTAIN OTHER DAMAGES.** TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, IN NO EVENT SHALL MICROSOFT OR ITS SUPPLIERS BE LIABLE FOR ANY SPECIAL, INCIDENTAL, PUNITIVE, INDIRECT, OR CONSEQUENTIAL DAMAGES WHATSOEVER (INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFITS OR CONFIDENTIAL OR OTHER INFORMATION, FOR BUSINESS INTERRUPTION, FOR PERSONAL INJURY, FOR LOSS OF PRIVACY, FOR FAILURE TO MEET ANY DUTY INCLUDING OF GOOD FAITH OR OF REASONABLE CARE, FOR NEGLIGENCE, AND FOR ANY OTHER PECUNIARY OR OTHER LOSS WHATSOEVER) ARISING OUT OF OR IN ANY WAY RELATED TO THE USE OF OR INABILITY TO USE THE SOFTWARE, THE PROVISION OF OR FAILURE TO PROVIDE SUPPORT OR OTHER SERVICES, INFORMATION, SOFTWARE, AND RELATED CONTENT THROUGH THE SOFTWARE OR OTHERWISE ARISING OUT OF THE USE OF THE SOFTWARE, OR OTHERWISE UNDER OR IN CONNECTION WITH ANY PROVISION OF THIS EULA, EVEN IN THE EVENT OF THE FAULT, TORT (INCLUDING NEGLIGENCE), MISREPRESENTATION, STRICT LIABILITY, BREACH OF CONTRACT OR BREACH OF WARRANTY OF MICROSOFT OR ANY SUPPLIER, AND EVEN IF MICROSOFT OR ANY SUPPLIER HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

20. **LIMITATION OF LIABILITY AND REMEDIES.** NOTWITHSTANDING ANY DAMAGES THAT YOU MIGHT INCUR FOR ANY REASON WHATSOEVER (INCLUDING, WITHOUT LIMITATION, ALL DAMAGES REFERENCED HEREIN AND ALL DIRECT OR GENERAL DAMAGES IN CONTRACT OR ANYTHING ELSE), THE ENTIRE LIABILITY OF MICROSOFT AND ANY OF ITS SUPPLIERS UNDER ANY PROVISION OF THIS EULA AND YOUR EXCLUSIVE REMEDY HEREUNDER (EXCEPT FOR ANY REMEDY OF REPAIR OR REPLACEMENT ELECTED BY MICROSOFT WITH RESPECT TO ANY BREACH OF THE LIMITED WARRANTY) SHALL BE LIMITED TO THE GREATER OF THE ACTUAL DAMAGES YOU INCUR IN REASONABLE RELIANCE ON THE SOFTWARE UP TO THE AMOUNT

ACTUALLY PAID BY YOU FOR THE SOFTWARE OR US\$5.00. THE FOREGOING LIMITATIONS, EXCLUSIONS AND DISCLAIMERS (INCLUDING SECTIONS 17, 18, AND 19) SHALL APPLY TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, EVEN IF ANY REMEDY FAILS ITS ESSENTIAL PURPOSE.

21. U.S. GOVERNMENT LICENSE RIGHTS. All Software provided to the U.S. Government pursuant to solicitations issued on or after December 1, 1995 is provided with the commercial license rights and restrictions described elsewhere herein. All Software provided to the U.S. Government pursuant to solicitations issued prior to December 1, 1995 is provided with "Restricted Rights" as provided for in FAR, 48 CFR 52.227-14 (JUNE 1987) or DFAR, 48 CFR 252.227-7013 (OCT 1988), as applicable.

22. APPLICABLE LAW. If you acquired this Software in the United States, this EULA is governed by the laws of the State of Washington. If you acquired this Software in Canada, unless expressly prohibited by local law, this EULA is governed by the laws in force in the Province of Ontario, Canada; and, in respect of any dispute which may arise hereunder, you consent to the jurisdiction of the federal and provincial courts sitting in Toronto, Ontario. If you acquired this Software in the European Union, Iceland, Norway, or Switzerland, then local law applies. If you acquired this Software in any other country, then local law may apply.

23. ENTIRE AGREEMENT; SEVERABILITY. This EULA (including any addendum or amendment to this EULA which is included with the Software) are the entire agreement between you and Microsoft relating to the Software and the support services (if any) and they supersede all prior or contemporaneous oral or written communications, proposals and representations with respect to the Software or any other subject matter covered by this EULA. To the extent the terms of any Microsoft policies or programs for support services conflict with the terms of this EULA, the terms of this EULA shall control. If any provision of this EULA is held to be void, invalid, unenforceable or illegal, the other provisions shall continue in full force and effect.

Si vous avez acquis votre produit Microsoft au CANADA, la garantie limitée suivante s'applique :

GARANTIE LIMITÉE

Sauf pur celles du "Redistributables," qui sont fournies "comme telles," Microsoft garantit que le Logiciel fonctionnera conformément aux docu-

ments inclus pendant une période de 90 jours suivant la date de réception.

Si une garantie ou condition implicite est créée par votre État ou votre territoire et qu'une loi fédérale ou provinciale ou d'un État en interdit le déni, vous jouissez également d'une garantie ou condition implicite, MAIS UNIQUEMENT POUR LES DÉFAUTS DÉCOUVERTS DURANT LA PÉRIODE DE LA PRÉSENTE GARANTIE LIMITÉE (QUATRE-VINGT-DIX JOURS). IL N'Y A AUCUNE GARANTIE OU CONDITION DE QUELQUE NATURE QUE CE SOIT QUANT AUX DÉFAUTS DÉCOUVERTS APRÈS CETTE PÉRIODE DE QUATRE-VINGT-DIX JOURS. Certains États ou territoires ne permettent pas de limiter la durée d'une garantie ou condition implicite de sorte que la limitation ci-dessus peut ne pas s'appliquer à vous.

Tous les suppléments ou toutes les mises à jour relatifs au Logiciel, notamment, les ensembles de services ou les réparations à chaud (le cas échéant) qui vous sont fournis après l'expiration de la période de quatre-vingt-dix jours de la garantie limitée ne sont pas couverts par quelque garantie ou condition que ce soit, expresse, implicite ou en vertu de la loi.

LIMITATION DES RECOURS; ABSENCE DE DOMMAGES INDIRECTS OU AUTRES. Votre recours exclusif pour toute violation de la présente garantie limitée est décrit ci-après. Sauf pour tout remboursement au choix de Microsoft, si le Logiciel ne respecte pas la garantie limitée de Microsoft et, dans la mesure maximale permise par les lois applicables, même si tout recours n'atteint pas son but essentiel, VOUS N'AVEZ DROIT À AUCUNS DOMMAGES, NOTAMMENT DES DOMMAGES INDIRECTS. Les termes de la clause «Exclusion des dommages accessoires, indirects et de certains autres dommages » sont également intégrées à la présente garantie limitée. Certains États ou territoires ne permettent pas l'exclusion ou la limitation des dommages indirects ou accessoires de sorte que la limitation ou l'exclusion ci-dessus peut ne pas s'appliquer à vous. La présente garantie limitée vous donne des droits légaux spécifiques. Vous pouvez avoir d'autres droits qui peuvent varier d'un territoire ou d'un État à un autre. VOTRE RECOURS EXCLUSIF. La seule responsabilité obligation de Microsoft et de ses fournisseurs et votre recours exclusif pour toute violation de la présente garantie limitée ou pour toute autre violation du présent contrat ou pour toute autre responsabilité relative au Logiciel seront, selon le choix de Microsoft exercé de temps à autre sous réserve de toute loi applicable, a) le remboursement du prix payé, le cas échéant, pour le Logiciel ou b) la réparation ou le remplacement du Logiciel qui ne respecte

pas la présente garantie limitée et qui est retourné à Microsoft avec une copie de votre reçu. Vous recevrez la compensation choisie par Microsoft, sans frais, sauf que vous êtes responsable des dépenses que vous pourriez engager (p. ex., les frais d'envoi du Logiciel à Microsoft). La présente garantie limitée est nulle si la défectuosité du Logiciel est causée par un accident, un usage abusif, une mauvaise application, un usage anormal ou un virus. Tout Logiciel de remplacement sera garanti pour le reste de la période initiale de la garantie ou pendant trente (30) jours, selon la plus longue entre ces deux périodes. À l'extérieur des États-Unis ou du Canada, ces recours ou l'un quelconque des services de soutien technique offerts par Microsoft ne sont pas disponibles sans preuve d'achat d'une source internationale autorisée. Pour exercer votre recours, vous devez communiquer avec Microsoft et vous adresser au Microsoft Sales Information Center/One Microsoft Way/Redmond, WA 98052-6399, ou à la filiale de Microsoft de votre pays.

DÉNI DE GARANTIES. La garantie limitée qui apparaît ci-dessus constitue la seule garantie expresse qui vous est donnée et remplace toutes autres garanties expresses (s'il en est) créées par une publicité, un document, un emballage ou une autre communication. SAUF EN CE QUI A TRAIT À LA GARANTIE LIMITÉE ET DANS LA MESURE MAXIMALE PERMISE PAR LES LOIS APPLICABLES, LE LOGICIEL ET LES SERVICES DE SOUTIEN TECHNIQUE (LE CAS ÉCHÉANT) SONT FOURNIS TELS QUELS ET AVEC TOUS LES DÉFAUTS PAR MICROSOFT ET SES FOURNISSEURS, LESQUELS PAR LES PRÉSENTES DÉNIENT TOUTES AUTRES GARANTIES ET CONDITIONS EXPRESSES, IMPLICITES OU EN VERTU DE LA LOI, NOTAMMENT, MAIS SANS LIMITATION, (LE CAS ÉCHÉANT) LES GARANTIES, DEVOIRS OU CONDITIONS IMPLICITES DE QUALITÉ MARCHANDE, D'ADAPTATION À UNE FIN PARTICULIÈRE, DE FIABILITÉ OU DE DISPONIBILITÉ, D'EXACTITUDE OU D'EXHAUSTIVITÉ DES RÉPONSES, DES RÉSULTATS, DES EFFORTS DÉPLOYÉS SELON LES RÈGLES DE L'ART, D'ABSENCE DE VIRUS ET D'ABSENCE DE NÉGLIGENCE, LE TOUT À L'ÉGARD DU LOGICIEL ET DE LA PRESTATION OU DE L'OMISSION DE LA PRESTATION DES SERVICES DE SOUTIEN TECHNIQUE OU À L'ÉGARD DE LA FOURNITURE OU DE L'OMISSION DE LA FOURNITURE DE TOUS AUTRES SERVICES, RENSEIGNEMENTS, LOGICIELS, ET CONTENU QUI S'Y RAPPORTE GRÂCE AU LOGICIEL OU PROVENANT AUTREMENT DE L'UTILISATION DU LOGICIEL . PAR

AILLEURS, IL N'Y A AUCUNE GARANTIE OU CONDITION QUANT AU TITRE DE PROPRIÉTÉ, À LA JOUISSANCE OU LA POSSESSION PAISIBLE, À LA CONCORDANCE À UNE DESCRIPTION NI QUANT À UNE ABSENCE DE CONTREFAÇON CONCERNANT LE LOGICIEL.

EXCLUSION DES DOMMAGES ACCESSOIRES, INDIRECTS ET DE CERTAINS AUTRES DOMMAGES. DANS LA MESURE MAXIMALE PERMISE PAR LES LOIS APPLICABLES, EN AUCUN CAS MICROSOFT OU SES FOURNISSEURS NE SERONT RESPONSABLES DES DOMMAGES SPÉCIAUX, CONSÉCUTIFS, ACCESSOIRES OU INDIRECTS DE QUELQUE NATURE QUE CE SOIT (NOTAMMENT, LES DOMMAGES À L'ÉGARD DU MANQUE À GAGNER OU DE LA DIVULGATION DE RENSEIGNEMENTS CONFIDENTIELS OU AUTRES, DE LA PERTE D'EXPLOITATION, DE BLESSURES CORPORELLES, DE LA VIOLATION DE LA VIE PRIVÉE, DE L'OMISSION DE REMPLIR TOUT DEVOIR, Y COMPRIS D'AGIR DE BONNE FOI OU D'EXERCER UN SOIN RAISONNABLE, DE LA NÉGLIGENCE ET DE TOUTE AUTRE PERTE PÉCUNIAIRE OU AUTRE PERTE DE QUELQUE NATURE QUE CE SOIT) SE RAPPORTANT DE QUELQUE MANIÈRE QUE CE SOIT À L'UTILISATION DU LOGICIEL OU À L'INCAPACITÉ DE S'EN SERVIR, À LA PRESTATION OU À L'OMISSION DE LA PRESTATION DE SERVICES DE SOUTIEN TECHNIQUE OU À LA FOURNITURE OU À L'OMISSION DE LA FOURNITURE DE TOUS AUTRES SERVICES, RENSEIGNEMENTS, LOGICIELS, ET CONTENU QUI S'Y RAPPORTE GRÂCE AU LOGICIEL OU PROVENANT AUTREMENT DE L'UTILISATION DU LOGICIEL OU AUTREMENT AUX TERMES DE TOUTE DISPOSITION DE LA PRÉSENTE CONVENTION OU RELATIVEMENT À UNE TELLE DISPOSITION, MÊME EN CAS DE FAUTE, DE DÉLIT CIVIL (Y COMPRIS LA NÉGLIGENCE), DE RESPONSABILITÉ STRICTE, DE VIOLATION DE CONTRAT OU DE VIOLATION DE GARANTIE DE MICROSOFT OU DE TOUT FOURNISSEUR ET MÊME SI MICROSOFT OU TOUT FOURNISSEUR A ÉTÉ AVISÉ DE LA POSSIBILITÉ DE TELS DOMMAGES.

LIMITATION DE RESPONSABILITÉ ET RECOURS. MALGRÉ LES DOMMAGES QUE VOUS PUISSIEZ SUBIR POUR QUELQUE MOTIF QUE CE SOIT (NOTAMMENT, MAIS SANS LIMITATION, TOUS LES DOMMAGES SUSMENTIONNÉS ET TOUS LES DOMMAGES DIRECTS OU GÉNÉRAUX OU AUTRES), LA SEULE RESPONSABILITÉ DE

MICROSOFT ET DE L'UN OU L'AUTRE DE SES FOURNISSEURS AUX TERMES DE TOUTE DISPOSITION DE LA PRÉSENTE CONVENTION ET VOTRE RECOURS EXCLUSIF À L'ÉGARD DE TOUT CE QUI PRÉCÈDE (SAUF EN CE QUI CONCERNE TOUT RECOURS DE RÉPARATION OU DE REMPLACEMENT CHOISI PAR MICROSOFT À L'ÉGARD DE TOUT MANQUEMENT À LA GARANTIE LIMITÉE) SE LIMITE AU PLUS ÉLEVÉ ENTRE LES MONTANTS SUIVANTS : LE MONTANT QUE VOUS AVEZ RÉELLEMENT PAYÉ POUR LE LOGICIEL OU 5,00 \$US. LES LIMITES, EXCLUSIONS ET DÉNIS QUI PRÉCÈDENT (Y COMPRIS LES CLAUSES CI-DESSUS), S'APPLIQUENT DANS LA MESURE MAXIMALE PERMISE PAR LES LOIS APPLICABLES, MÊME SI TOUT RECOURS N'ATTEINT PAS SON BUT ESSENTIEL.

À moins que cela ne soit prohibé par le droit local applicable, la présente Convention est régie par les lois de la province d'Ontario, Canada. Vous consentez à la compétence des tribunaux fédéraux et provinciaux siégeant à Toronto, dans la province d'Ontario.

Au cas où vous auriez des questions concernant cette licence ou que vous désiriez vous mettre en rapport avec Microsoft pour quelque raison que ce soit, veuillez utiliser l'information contenue dans le Logiciel pour contacter la filiale de Microsoft desservant votre pays, ou visitez Microsoft sur le World Wide Web à <http://www.microsoft.com>.

The following MICROSOFT GUARANTEE applies to you if you acquired this Software in any other country:

Statutory rights not affected - The following guarantee is not restricted to any territory and does not affect any statutory rights that you may have from your reseller or from Microsoft if you acquired the Software directly from Microsoft. If you acquired the Software or any support services in Australia, New Zealand or Malaysia, please see the "Consumer rights" section below.

The guarantee - The Software is designed and offered as a general-purpose software, not for any user's particular purpose. You accept that no Software is error free and you are strongly advised to back-up your files regularly. Provided that you have a valid license, Microsoft guarantees that a) for a period of 90 days from the date of receipt of your license to use the Software or the shortest period permitted by applicable law it will perform substantially in accordance with the written materials that accompany the Software; and b) any support services provided by Microsoft shall be substantially as described in ap-

plicable written materials provided to you by Microsoft and Microsoft support engineers will use reasonable efforts, care and skill to solve any problem issues. In the event that the Software fails to comply with this guarantee, Microsoft will either (a) repair or replace the Software or (b) return the price you paid. This guarantee is void if failure of the Software results from accident, abuse or misapplication. Any replacement Software will be guaranteed for the remainder of the original guarantee period or 30 days, whichever period is longer. You agree that the above guarantee is your sole guarantee in relation to the Software and any support services.

Exclusion of All Other Terms - To the maximum extent permitted by applicable law and subject to the guarantee above, Microsoft disclaims all warranties, conditions and other terms, either express or implied (whether by statute, common law, collaterally or otherwise) including but not limited to implied warranties of satisfactory quality and fitness for particular purpose with respect to the Software and the written materials that accompany the Software. Any implied warranties that cannot be excluded are limited to 90 days or to the shortest period permitted by applicable law, whichever is greater.

Limitation of Liability - To the maximum extent permitted by applicable law and except as provided in the Microsoft Guarantee, Microsoft and its suppliers shall not be liable for any damages whatsoever (including without limitation, damages for loss of business profits, business interruption, loss of business information or other pecuniary loss) arising out of the use or inability to use the Software, even if Microsoft has been advised of the possibility of such damages. In any case Microsoft's entire liability under any provision of this Agreement shall be limited to the amount actually paid by you for the Software. These limitations do not apply to any liabilities that cannot be excluded or limited by applicable laws.

Consumer rights - Consumers in Australia, New Zealand or Malaysia may have the benefit of certain rights and remedies by reason of the Trade Practices Act and similar state and territory laws in Australia, the Consumer Guarantees Act in New Zealand and the Consumer Protection Act in Malaysia in respect of which liability cannot lawfully be modified or excluded. If you acquired the Software in New Zealand for the purposes of a business, you confirm that the Consumer Guarantees Act does not apply. If you acquired the Software in Australia and if Microsoft breaches a condition or warranty implied under any law which cannot lawfully be modified or excluded by this agreement then, to the extent permitted by law, Microsoft's liability is limited, at

Microsoft's option, to: (i) in the case of the Software: a) repairing or replacing the Software; or b) the cost of such repair or replacement; and (ii) in the case of support services: a) re-supply of the services; or b) the cost of having the services supplied again.

Should you have any questions concerning this EULA, or if you desire to contact Microsoft for

any reason, please use the address information enclosed in this Software to contact the Microsoft subsidiary serving your country or visit Microsoft on the World Wide Web at <http://www.microsoft.com>.

- END OF END-USER LICENSE AGREEMENT FOR MICROSOFT SOFTWARE -

Glossary of Terms

Availability

Symbols used for a feature's availability in different CMX versions:

- **Not** available
- **Optionally** available
- **Standard** feature

Business Bridge

Beamex® Business Bridge is a software that communicates between CMX and ERP/CMMS Asset Management software. When purchased, Beamex's support helps customizing Business Bridge to work between CMX and the Asset Management software in use.

Calibration Points

Calibration Points are the input signal values (sometimes the output signal values) used in the calibration of a function.

Calibration Procedure

The procedure includes information on how the calibration should be accomplished, like:

- Can the calibration be performed automatically or is it done manually
- Can the calibration be carried out on the field or not.
- Recommended calibrator(s) to be used in the calibration.

d1, d2, d3 and d4

Actual scale interval. More information in CMX's help file (excluding CMX Light). Search for "Actual scale interval".

Device

A Device is the physical instrument that can be installed into a Position.

e1, e2, e3 and e4

Verification scale interval. More information in CMX's help file (excluding CMX Light). Search for "Verification scale interval".

ERP/CMMS

ERP = Enterprise Resource Planning

CMMS = Computerized Maintenance Management System

Both are asset management software.

Function

A single task done with an instrument, e.g. temperature transmitter, pressure indicator etc. Instruments capable of performing several tasks are called multifunction instruments.

Function Type is the description of the function (input/output quantities and ranges) and information concerning the calibration of the function (e.g. calibration points and error limits).

See also Multi-function.

Input Method

How the input signal of the instrument is obtained into CMX. Examples of Input Methods:

Measured by the calibrator, Sourced by the calibrator, Controlled by a pressure controller and measured by the calibrator etc.

Instrument

For CMX, any Position seen on the main windows' Positions Tree are instruments. No matter what kind of function the instrument contains.

Instrument Collection

A collection of instruments located in the same database.

Multi-function

A multi-function Position or Device can carry out several operations, e.g. a temperature transmitter and a temperature indicator is an instrument with two functions.

Output Method

How the output signal of the instrument is obtained into CMX.

Position

A Position is the location in a process where a device can be installed. Positions often have symbolic names (tags) like TTI 215 in instrumentation drawings.

A Position can be calibrated only when a device is installed because a location cannot be calibrated.

Secondary Button

The mouse's secondary button is the rightmost one, if you are using the mouse with your right hand.

Sets

Sets are groups of Device's or Position's Functions that the user may create with the Set Maintain utility. Usually Devices or Positions belonging to a set have something in common, e.g. they are all calibrated during the same week, they are all located in the same unit of plant etc.

How the sets are devised depend on the user application requirements.

User ID

An abbreviation for identifying each user of CMX. Needed, e.g. when starting CMX. Using the same User IDs as is used on your network login is recommended.

UTC

UTC (abbreviation of **Coordinated Universal Time**) is the primary standard time, common to every place in the world. Formerly it was called Greenwich Mean Time (GMT). UTC is expressed using a 24-hour clock. An offset value is used to indicate a time zone's time difference to Greenwich Mean Time (UTC+0)

Examples of time zones presented in UTC format

Central European Time	UTC+1
Central European Summer Time	UTC+2
US Central Standard Time	UTC-6
US Central Daylight Time	UTC-5

Index

A

About CMX.....	1
Accessibility.....	31, 51
Activating Users	46
Activation/Deactivation	33
Adding	
Calibration Procedure	
Templates	70
Calibration Procedures.....	75, 76, 84
Calibrators.....	58
Devices	75, 78
Function Templates.....	70
Functions	75, 76, 79
Instruments	75, 77
Items to a Set.....	98
List Items.....	68
Manufacturers	54, 63
Models	55, 64, 65
Module Ranges	60
Modules	59
Plant Structure Nodes	52
Positions	75, 77
Additional Information.....	203
Absolute Pressure	
Measurement	207
Temperature Blocks	209
Adjusting	10, 107
Administrator	42, 44, 45, 47
Approving Results	122
As Found calibration.....	10, 106
As Left calibration.....	10, 107
Assigning a Spare Device	89
Audit Trail	131, 132
Time Format.....	132
Authorization	45, 47

Automatic Check Out /	
Check In.....	101
Average Calculation	122

B

Backing up a CMX	
database	198
Basic Settings	39
Calibrators.....	57
Change Management.....	43
CMX Options.....	40
Device Manufacturers.....	54
Function Templates.....	69
LDAP	42
Lists.....	67
Passwords.....	46
Plant Structure.....	52
Security	42
Supervisors	45
User Groups.....	47
User Interface.....	72
Users.....	44, 45
Weighing Instrument	
Calibration	152
Business Bridge 181, 182, 185, 186, 187	

C

Calibrating	
Weighing Instruments.....	168
Calibration	10, 42, 105, 106, 107
Approving Results	122
Batch.....	105, 110, 111, 113
Groups (Pocket PC)	146, 148
Locking Results.....	33, 123
Manual Entry	105, 116, 117, 118, 120, 170
Off-line	105, 110, 111, 113
Options.....	42
Pocket PC (Weighing Instruments)	171
Saving Results	119
Saving Results (Weighing Instruments)	174
Signing Results	122
Uncertainty Calculation	122
Unlocking Results	33, 123
Viewing the Results.....	121
Weighing Instruments.....	170, 171
Calibration Certificate	41, 125
Creating	130
Numbering	41
Printing.....	125, 126
Calibration Procedure	
Deleting.....	90
Editing.....	90
Calibration Procedure Templates	
Adding.....	70
Deleting.....	71
Editing.....	69
Calibrators.....	57, 61, 62
Adding.....	58, 59, 60
Copying.....	62
Deleting.....	61
Due List.....	41
Editing.....	61
Installing Modules	61
Manufacturers	63
Models	63, 64
Module Models.....	65
Module Ranges	60, 61, 62
Modules	59, 60, 65
Certificates	125
Creating	130
Numbering	41
Printing.....	125, 126
Change Management.....	131, 132, 134
Options.....	43
Check Out / Check In	99
Automatic	101
Characteristics.....	100
Manual	102
Check Procedures.....	175
CMMS software.....	181, 182, 185, 186, 187
CMX	
Features.....	3
Installing.....	11
CMX Family.....	2
CMX Support.....	4
Colors.....	21
Command Line Parameters.....	15
Concurrency Control	31
Copying	
Calibrators.....	62
Devices	89
Function Templates.....	71
Positions.....	89
Custom Pressure Units	82
Custom PRT Sensors	83
Custom Transfer Function.....	81
Customizing CMX	72
CWSI.....	108, 111
Starting.....	108
Using.....	109

D

Data Integrity.....	37
Database	
Backup	198
Copying	201
Deleting.....	202
Installing/Uninstalling.....	200
Management Tool	198
New	201
Opening	13
Restore	198
Server Connection.....	198
Switching between.....	13, 201
Deactivation of Users	46
Deactivation/Activation.....	33

Deleting	
Calibration Procedure	
Templates	71
Calibration Results	123
Calibrators.....	61
Function Templates.....	71
Items Displayed in a Tree.....	90
Manufacturers	54, 63
Models	55, 64, 65
Module Ranges	61
Modules	61
Device	
Deleting.....	90
Editing.....	90
Devices	
Copying.....	89
Manufacturers	54
Models	54, 55
Documents	
Importing/Exporting	129
E	
<hr/>	
Eccentricity Test.....	168
Editing	
Calibration Procedure	
Templates	69
Calibrators.....	61
Copying Positions/Devices	89
Filters	96
Function Templates.....	69
Items Displayed in a Tree.....	90
Lists	68
Manufacturers	54, 63
Models	55, 64, 65
Plant Structure Nodes	52
Sets.....	98
User Interface.....	72
Electronic Record.....	134
Electronic Signature	122
Enterprise (CMX	
Enterprise).....	2
ERP software	181, 182, 185, 186, 187
Expanded Uncertainty	122
Exporting Document	
Layouts.....	129

F

Family	
CMX	2
Features	3
Fieldbus Instruments.....	80
Fields	
Weighing Instrument	
Calibration Procedures	161
Weighing Instrument	
Functions.....	159
Filters	93
Opening	96
Saving	96
SQL Editor.....	97
Wildcards	95
FOUNDATION Fieldbus	80
Function	41
Deleting	90
Due List.....	41
Editing	90
Templates	24, 76
Function Templates.....	69
Adding.....	70
Copying	71
Deleting	71
Editing	69
Weighing Instrument	
Function Templates.....	158

G

General Settings	40
Group Calibration (Pocket	
PC).....	146
Create Group	146
Group View	147

H

HART® instrument.....	80
History Trend.....	24, 37, 124, 128

I

ID Generation	41
Identification	15
Importing Document	
Layouts.....	129
Installing bMobile	178
Installing CMX	11
Installing Devices	85, 86, 88, 89
Installing Modules	61
Instrument	73

L

Labels.....	125, 128, 130
Language	
User Interface.....	15
LDAP	45, 46
CMX Master Password.....	43
Options.....	42
License Key.....	18
Light (CMX Light)	2
Lightweight Directory	
Access Protocol (LDAP)	12, 42
Linearity Test (Weighing	
Instruments)	168
Linking.....	85, 86, 88, 89
Lists.....	67, 68
Adding.....	68
Deleting.....	68
Lock Out.....	46
Locking	
Calibration Results	33, 123

M

Main Window.....	19
Maintenance Inspection	175
Manual Check Out / Check	
In	102
Manual Entry	116

Manufacturers	
Adding	54, 63
Calibrator Manufacturer.....	63
Deleting	54, 63
Device Manufacturer	54
Editing	54, 63
Master Password	43
Menu Structure.....	24
Minimum Sample Weight	168
Minimum Weighing	
Capability Test	168
Minimum Weight Test	168
Mobile Security Plus.....	37, 189
Locking Results.....	195
Manual Entry	195
Mobile Devices.....	196
Mobile User	193
Options.....	191
Permissions.....	193
Supported Password	
Characters.....	192
Terminology	190
Models	
Adding	55, 64, 65
Calibrator Models	63, 64
Deleting	55, 64, 65
Device Models.....	54
Editing	55, 64, 65
Module Models	65
Modules	57, 61, 62, 65
Adding.....	59, 60
Installing.....	61
Multiple Users	31

N

Nodes	
Adding	52
Deleting	52
Editing	52
Numbering Calibration	
Certificates	41

O

Opening a Database	13
Optimistic Concurrency Control.....	31
Options.....	3, 40
Audit Trail.....	36
Calibration.....	42
Calibration Certificates	41
Change Management.....	36, 43
Drivers for Non-Beamex Calibrators.....	36
Due Lists	41
General Settings	40
History Trend.....	37
ID Generation.....	41
LDAP.....	37, 42
Maintenance Inspection	37
Mobile Security Plus.....	37
Pocket PC Interface	36
Report Designer	36
Security	42
User Interface Editing.....	37
Weighing Instrument Calibration.....	36
Work Order Handling.....	37

P

Parameters, Command Line	15
Password	12, 15, 43, 46
Permissions.....	47
Plant Structure	52
Adding a Node	52
Deleting a Node	52
Editing a Node.....	52
Pocket PC Interface	135
Doing Calibrations.....	142
Receiving Results	149
Sending Instrument Data.....	141
Weighing Instrument Calibration.....	171

Position	
Deleting	90
Editing	90
Positions	
Copying.....	89
Pressure Units	
User Defined	82
Printing	
Audit Trail Report	128
Certificates	126
History Trend Graphs	128
Labels	128
Reports	127
Procedure	
Deleting.....	90
Editing	90
Professional (CMX Professional)	2
Profibus PA	80
PRT Sensors - User Defined.....	83

Q

Queries	91, 106
---------------	---------

R

Repeatability Test	168
Reports	125, 127, 128, 130
Restoring a CMX Database.....	198
Results	
Approving.....	122, 134

S

Saving Filters	96
Security	15, 47
Options.....	42
Password	46
Users.....	44
Sets.....	98
Editing	98
Weight Sets.....	153

Signing Results	122
Site User Maintenance	48
Site Group	50
Site Manager	50
Software	
Audit Trail	36, 128, 131
Change Management	36, 131
Drivers for Calibrators	36
History Trend	24, 37, 124, 128
Maintenance Inspection	37
Pocket PC Interface	36, 135
Report Designer	36
Weighing Instrument	
Calibration	36, 151
Work Order Handling	37
Software Options	36
Sorting Data	91, 93, 98
Spare Devices	89
SQL Editor	97
SSA	4
Starting bMobile	178
Starting CMX	12
Using Parameters	15
Supervisors	12, 45, 47
Switching between	
databases	13, 201

T

Temperature Blocks	209
Specifications	209
Specifications in CMX	210
Templates	69, 76
Time Format	132
Toolbar	29, 30
Transfer Function - Custom	81
Tree Structure	21
Trend	124, 128
Types of Windows	30
Typographic Conventions	5

U

Uncertainty Calculation	32
Absolute Pressure	
Measurement	207
Unlinking	85, 88, 89
Unlocking	
Calibration Results	33, 123
User Defined Pressure	
Units	82
User Defined PRT Sensors	83
User Defined Transfer	
Function	81
User Fields	35
User Groups	44, 47
Sites	48
User Interface	19
Common Features	32
Document Links	34
Editing	72
User Interface Language	15
Users	15, 44, 45
Activating	46
Lock Out	46
Site User Maintenance	48
Supervisors	45
USP 41	164, 168
UTC Timestamp	132
Utilities	198

W

Weighing Instrument	
Calibration Procedure	
Fields	161
Function Fields	159
Minimum Weighing	
Capability Test	168
Minimum Weight Test	168

Weighing Instrument		Window	
Calibration.....	151	Main	19
Basic Settings	152	Window Types.....	30
Eccentricity Test.....	168	Work Area	23
Function Templates.....	158	Work Order	
Linearity Test.....	168	Basic	181
Manual Entry	170	Calibration	186
Minimum Sample Weight.....	168	Cancel	184, 187
Repeatability Test	168	Complete.....	184
Saving Results	174	Emergency Calibration	187
Sending.....	170	Enhanced.....	181, 182
Weight Sets.....	153	Fields	182
Weight Specifications	157	Pocket PC	188
Weights	155	Settings	185
What's New	9	Tree.....	184
Wildcards	95	Work Order Mode.....	188

