Instruction Manual

maXYmos BL
Type 5867B...

CE

valid from
Firmware Version 2.0.1

5867B_002-626e-04.14

KISTLER

measure. analyze. innovate.

Instruction Manual

maXYmos BL
Type 5867B...

CE

valid from
Firmware Version 2.0.1

5867B_002-626e-04.14

Foreword

Thank you for choosing a Kistler quality product, Please read this instruction manual through carefully to ensure you are in a position to get the most from its wealth of features. To the extent permitted by law, Kistler does not accept any liability if this manual is not followed or products other than those listed under accessories used.

The information in this manual is subject to change at any time without prior notice. Kistler reserves the right to change or improve the product in the interest of technical progress, without being obliged to inform any person or organization of such changes.

Kistler Group
Eulachstrasse 22
8408 Winterthur
Switzerland
Tel +41 52 224 11 11
Fax +41 52 224 14 14
info@kistler.com
www.kistler.com

Contents

Total number of pages: 146

1. Important Notes

Please make absolutely sure you take account of the following notes, which are intended to ensure your personal safety when handling this monitor as well as ensuring a long, fault-free service life. As most of the information in this manual is color-coded it is best to print it in color. You should therefore use the PDF included on the CD or request it by email from **maxymos@kistler.com.** You can also pass on information, ideas, requirements and any criticisms to us using **maxymos@kistler.com**.

1.1 For Your Safety

This monitor has been manufactured and tested to ä requirements and EU directive 89/336/EEC, and left the factory in perfect safe condition. To maintain this condition and ensure safe operation, compliance is required with the instructions and warnings in this instruction manual and on the monitor.
It must be assumed that safe operation is no longer possible if the monitor:

- is visibly damaged,
- is no longer responding,
- has been stored under unsuitable conditions for a long time or
- has been treated roughly in transit.

If safe operation is no longer ensured because one or more of these criteria are not met, the monitor must be immediately returned to your local Kistler sales center or distributor for repair.
The monitor must be disconnected from all power sources prior to commissioning and before any maintenance, repair or replacement of parts.

Great care is also essential when connecting the various cables. Accidental connection of a live cable to a signal output can permanently damage the monitor.

1.2 Unpacking

Check all of the packaging of the monitor for any damage in transit. Report such damage to the freight forwarding company and your local Kistler sales center or distributor. Please check that all of the included accessories are present before using the monitor for the first time. Please report any missing parts to your local Kistler sales center or distributor.

1.3 Transportation and Storage

If the monitor is to be transported or stored for a long period of time, take the following safety precautions:

- The temperature must lie in the range 0 … 50 °C.
- BNC connections must be covered with a non-shorting dust cap.
- Ensure no dirt can get into the monitor.
- The environment must be as dry and free from vibration as possible.
- Store the monitor in such a way that it cannot be subjected to any pressure.

1.4 Supply

The monitor is designed for a voltage range from 18 ... 30 VDC (24 VDC). Protective diodes are fitted to prevent the monitor from being irreparably damaged if the polarity is reversed.

1.5 Electromagnetic Compatibility (EMC)

The monitor conforms to ä requirements and the EMC standards EN 61000-6-4 (industrial interference) and EN 61000-6-2 (industrial immunity). It has been subjected to an immunity test (electrostatic charges).

1.6 Disposal

Waste electrical and electronic equipment must not be disposed of in domestic refuse. Please take the old equipment to your nearest collection point for disposal of such equipment or contact your Kistler sales office.

2. Brief Description

The maXYmos BL (Basic Level) monitors and evaluates XY curves of two measurands that have to stand in a certain relation to each other. Such curves arise in applications such as

- Press fitting ball bearings
- Pivoting and adjusting rake of backrests
- Riveting and calking casing parts
- Tactile manipulation of rotary switches, etc.

For instance, the typical measurement curves for press fitting are captured using force and displacement sensors, or torque and rotation angle sensors for swiveling or rotation. The maXYmos BL can be used to capture, monitor and display the interrelation of basically all measurands that can be recorded with piezoelectric, strain gage and potentiometric sensors. The quality of an individual manufacturing step, as assembly or the entire product can be determined on the basis of such measurement curves. The earlier in the production chain such monitoring is started, the more certain the finished product will subsequently pass final inspection. It is then also possible to divert and rework the part at an early stage rather than having to scrap it anyway after a whole series of further manufacturing operations.

Description
The functional modern case design, clear menus and practical functions add up to an impressive monitor. The high-contrast color touch screen display allows smooth operation of the maXYmos BL and shows the process information clearly. This is achieved through a particularly sophisticated menu concept that is context sensitive in the sense of only showing what is actually needed for the particular function. The maXYmos BL provides functions that allow many standard XY monitoring tasks to be solved. All data and control interfaces are always fitted. All the user still has to do is choose between the piezoelectric and the strain gage version.

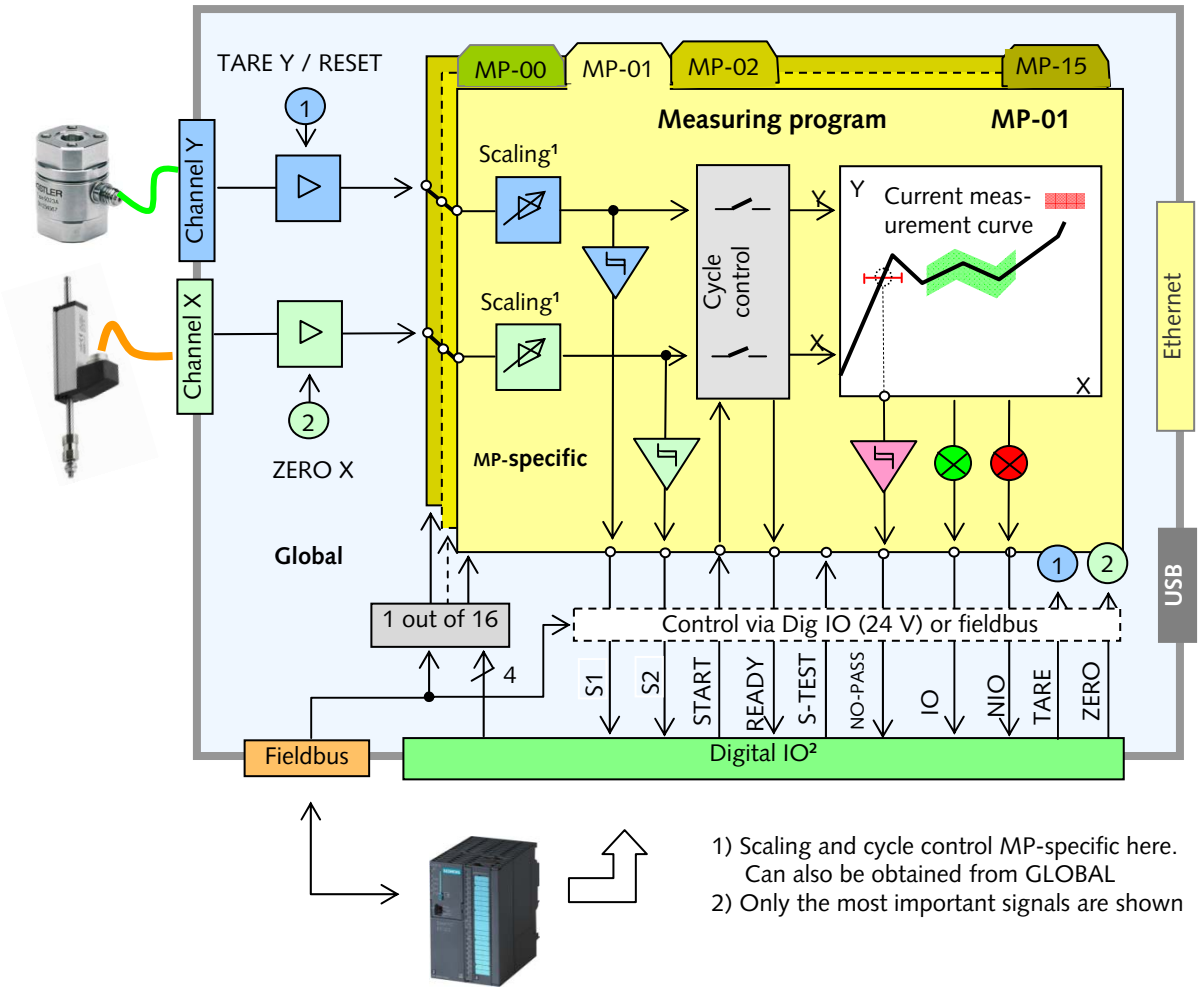
- Measurement function: Y(X), Y(X, t), Y(t) and X(t)
- Evaluation objects: UNI-BOX, LINE-X, LINE-Y and ENVELOPE
- 4 evaluation objects [EOs] per curve
- 16 measuring programs [MPs] for 16 different parts
- Up to 8 000 pairs of XY values per curve
- Short evaluation time of up to 10 parts/second
- Ethernet TCP/IP for measurement data and remote maintenance
- Profibus DP for process values and control
- Dig. IO (24 V) for control and results
- 2 switch signals in real time for X- and Y-threshold
- USB for temporary connection
- Sensor for X channel: Potentiometer and ±10 V
- Sensor for Y channel: strain gage or piezoelectric
- Front panel, desktop or wall-mounting
- Information pages for NOK cause diagnosis
- Internal SN generator with selectable format
- Freely allocatable warning messages and alarms
- Access protection for different user groups
- 3,5" color touch screen display
- 24 VDC power supply

The commonest applications of the maXYmos BL involve monitoring processes:

The quality of a part or production step is often reflected in the relationship between two measurands, i.e. with reference to a characteristic curve for the part or step. The maXYmos BL uses evaluation objects to evaluate this curve as GOOD (OK) or BAD (NOK). For an OK result the curve has to pass through these objects as defined, otherwise the monitor generates an NOK result.

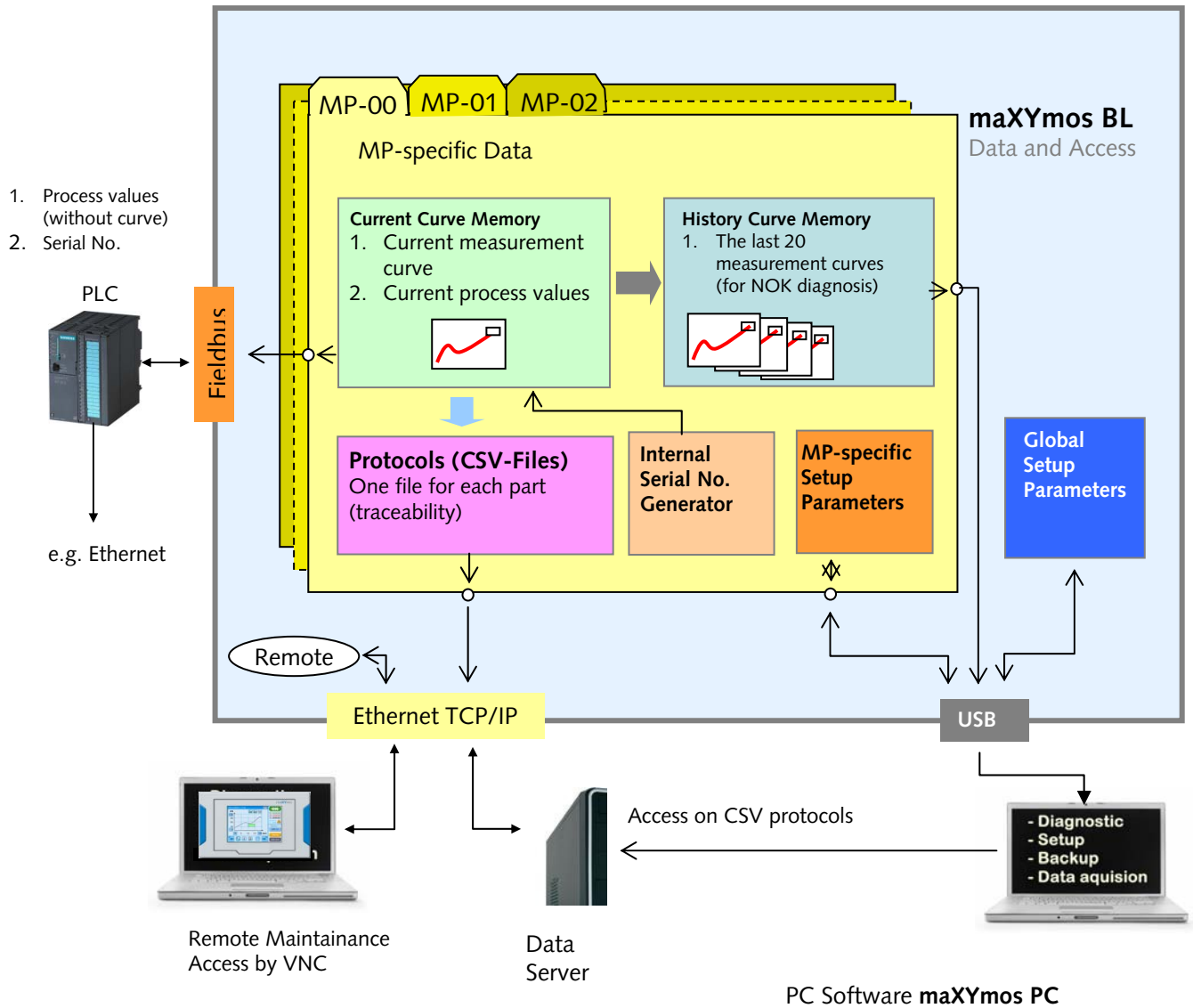
3. Configuration of the Monitor

3.1 Interfaces and Signal Paths



1) Scaling and cycle control MP-specific here. Can also be obtained from GLOBAL
2) Only the most important signals are shown

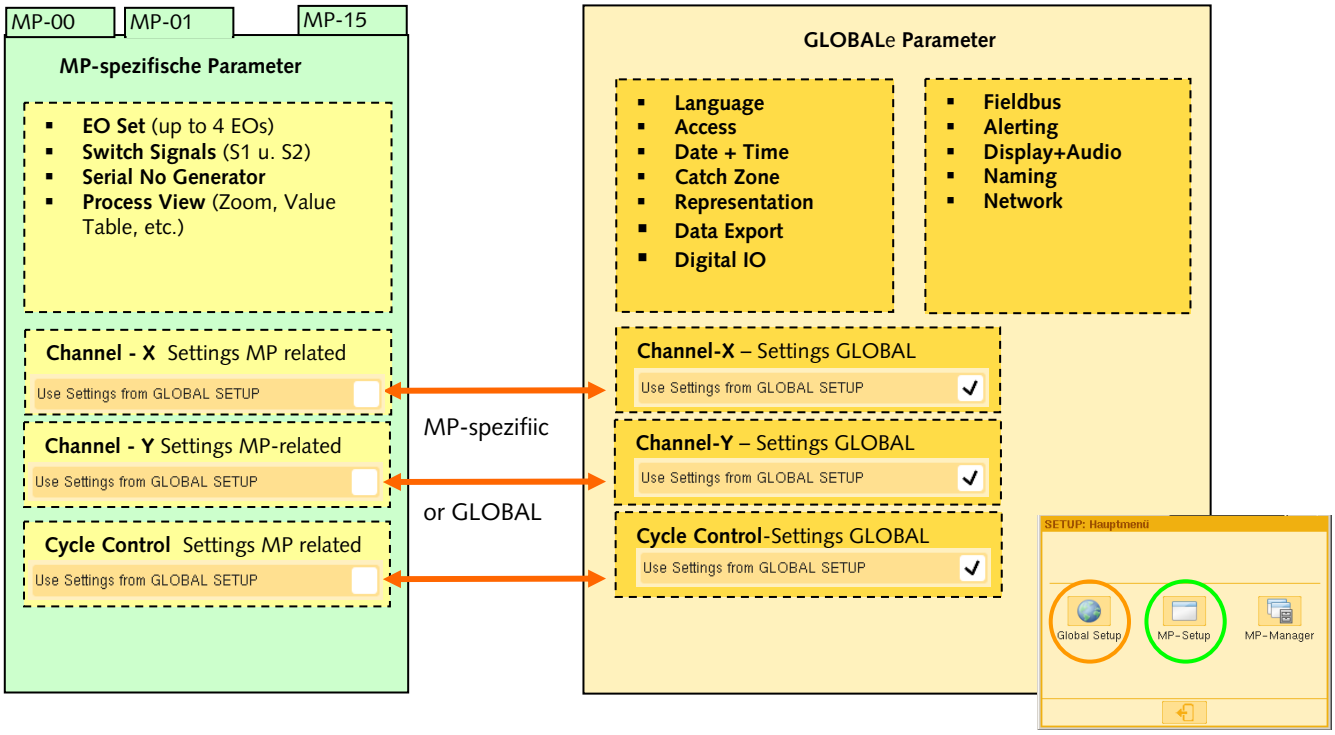
3.2 Data and Access Paths



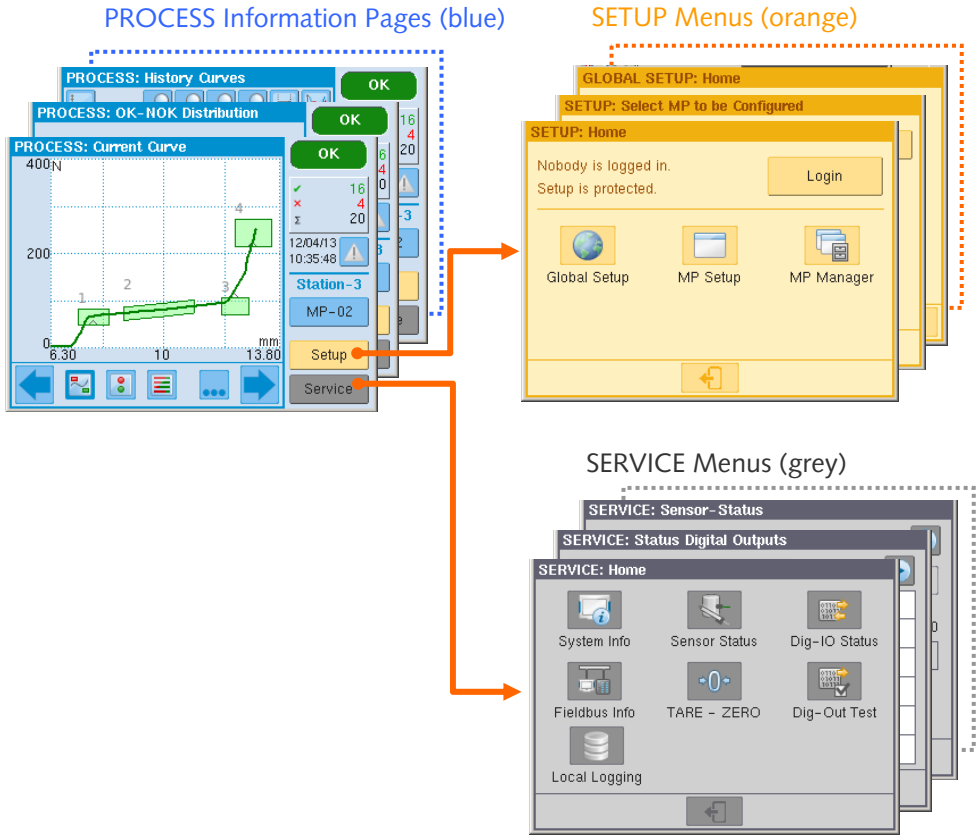
PC Software **maXYmos PC**

- Setup, Backup
- Log explorer
- Log viewer + PDF printer
- Process value trend tracking

3.3 Parameter Structure – Parameters and their Storage Locations



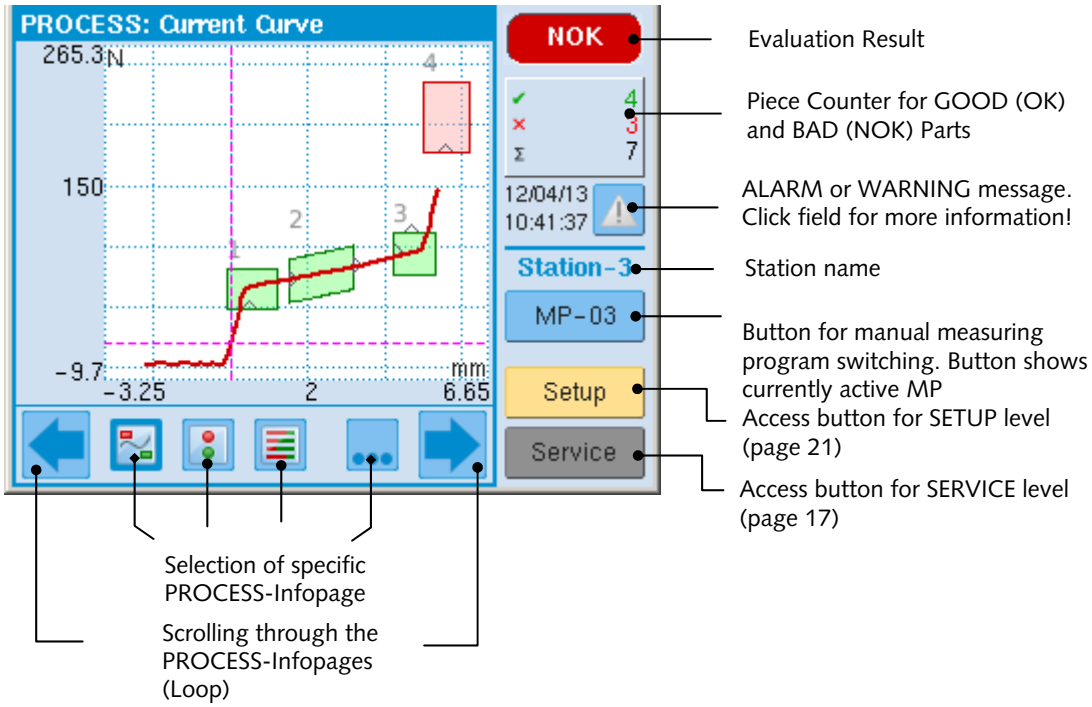
3.4 Menu Structure – The Three Main Levels



3.4.1 PROCESS Menus – Information Pages for Process Status

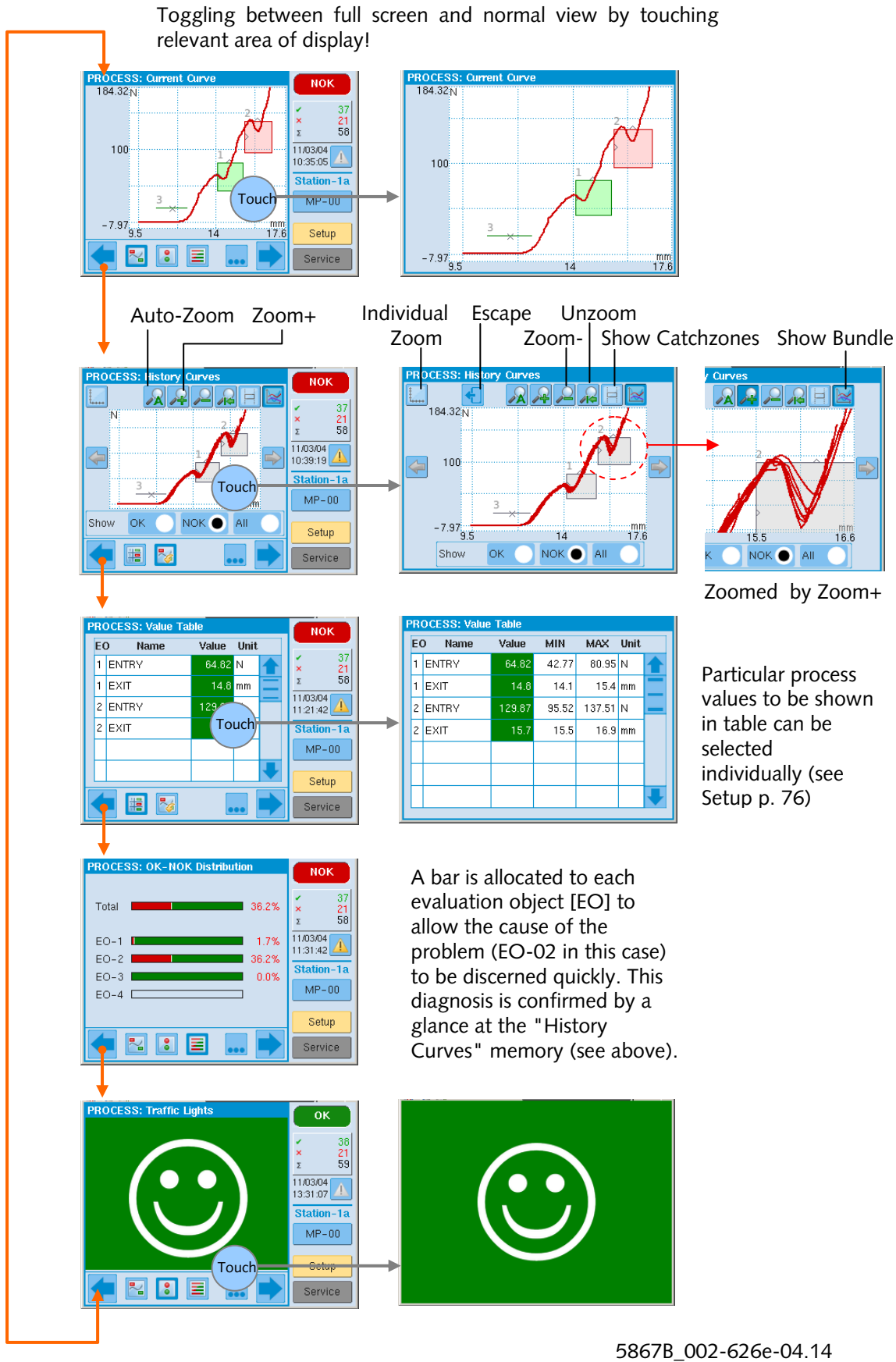
3.4.1.1 Main Page of the PROCESS Menu Level

Starting point for PROCESS information pages and point of access for SETUP and SERVICE menus



3.4.1.2 Scrolling through the Process Information Pages

For meaning of a particular PROCESS information page see related header!



3.4.1.3 PROCESS Information – Warnings and Alarms

The sidebar of the PROCESS level includes the "Warnings and Alarms" button: The symbol on the button flashes if messages have been received.

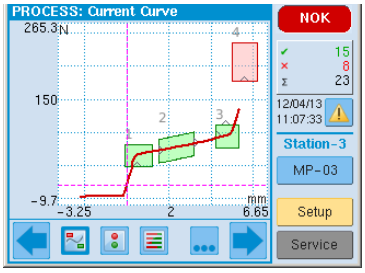
Neither warnings nor alarms have been received.

A warning has been received, but work may be continued. O-READY output continues to be operated. Intervention is not (yet) necessary.

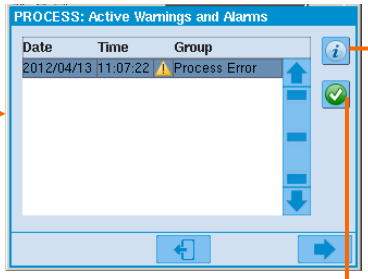
An alarm has been received. Work must not be continued. O-READY output is held on "0". Intervention is necessary.

Procedure in event or warning or alarm (example below is example for a warning):

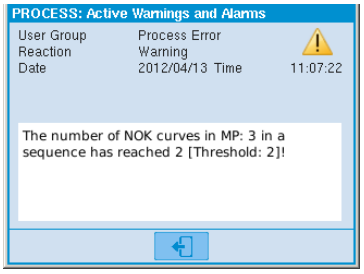
The warning symbol flashes. Touching the symbol…



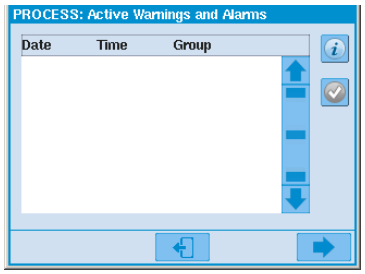
…displays a list of the active warnings and alarms.



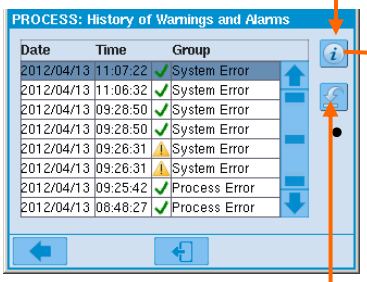
The"i" button displays the cause of the warning.



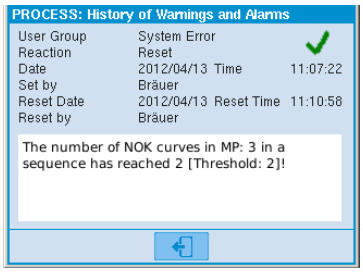
After the alarm has been acknowledged manually the entry disappears here…



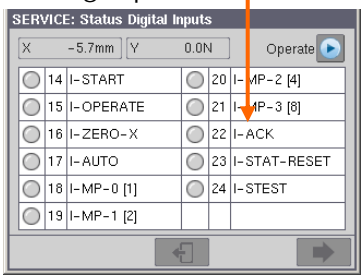
…and appears in the history list on the next page.



Select the relevant line in the history list and press the information button ("i").



Acknowledgement or resetting by means of an external control system uses the dig. input I-ACK

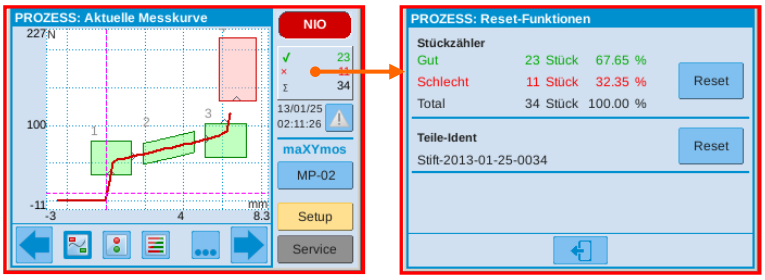


The entire history list can only be deleted with this Delete button by authorized persons!

The "i" button canb e used to display further details:

- What is the cause of the alarm?
- When did the alarm arise?
- Who was logged on at the time of the arlarm?
- When and by whom was the alarm acknowledged?

3.4.1.4 PROCESS Information - Checking Piece Counter

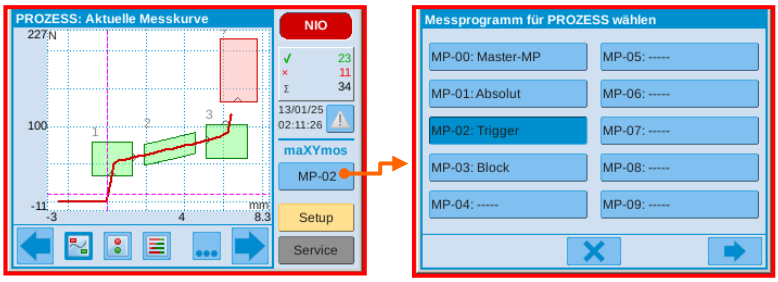


Touching this button displays the following additional information and function buttons:

1. Display of piece counter percentages
2. Piece counter reset button
3. ID of last part
   Reset button for counter of the part ID (only for internal part ID generation

The piece counter and the part ID counter can also be reset using dig. input I-STAT-RESET.

3.4.1.5 Switching PROCESS MP Manually



Touching the (blue) MP selection button displays a selection box. The button of the currently active PROCESS MP is preselected.

Condition for manual switching of MP:

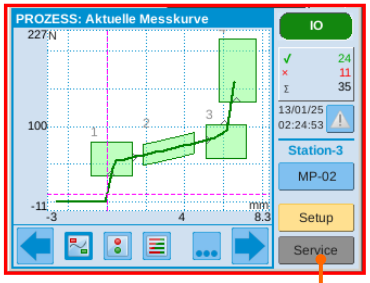
1. User must be authorized.
2. PLC must allow manual switching (I-AUTO=0). See also page 95.

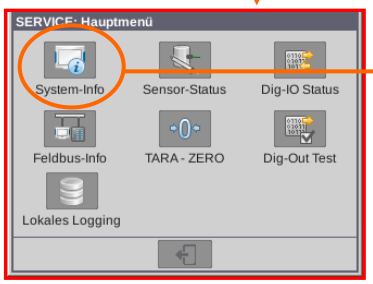
Switching of MP by means of the PLC is described on page 95 .

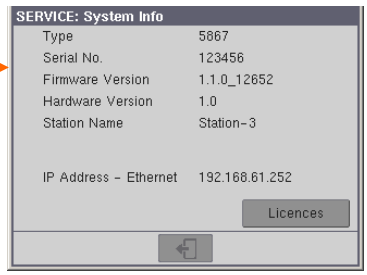
The buttons of unused MPs can be hidden in the MP Manager.

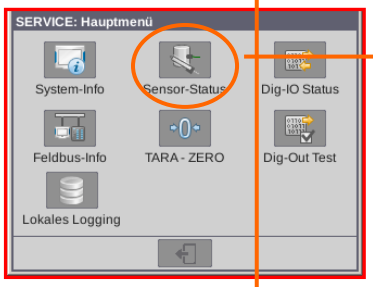
3.4.2 SERVICE Menus – Tools for Commissioning and Tests

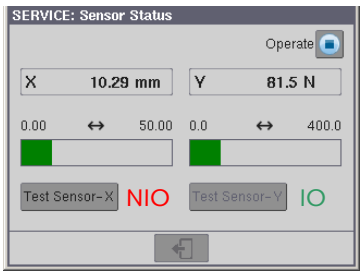
See headers for meaning of the various SERVICE information pages.





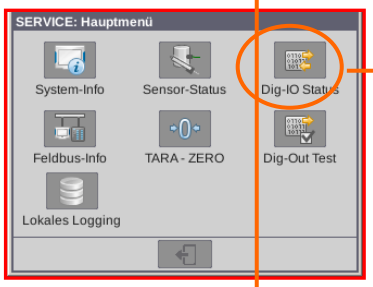


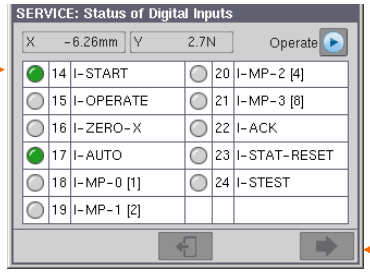


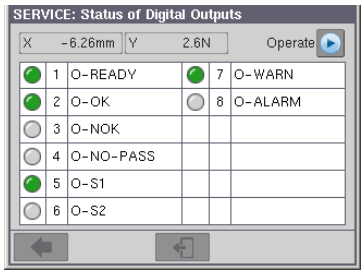


With the piezoelectric version the charge amplifier may have to be switched to OPERATE!

Manual triggering of the "Test Sensor" function. Test point is required to have been taught in advance (see "Test Point" parameters on pp. 28, 30 and 31). Approach the test point physically before triggering!

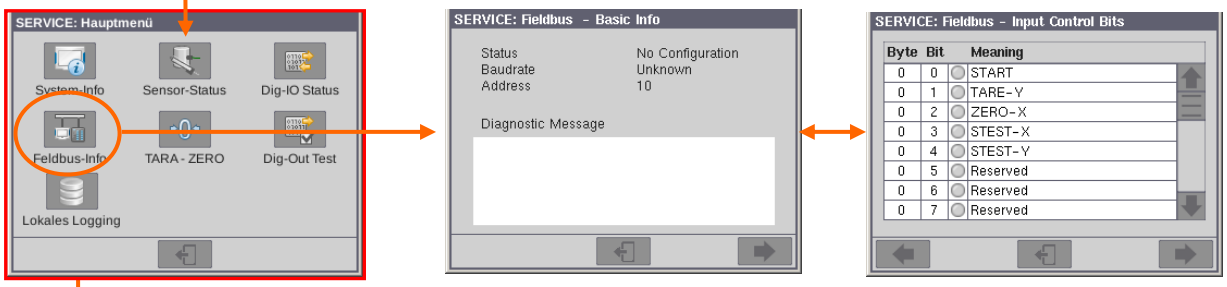




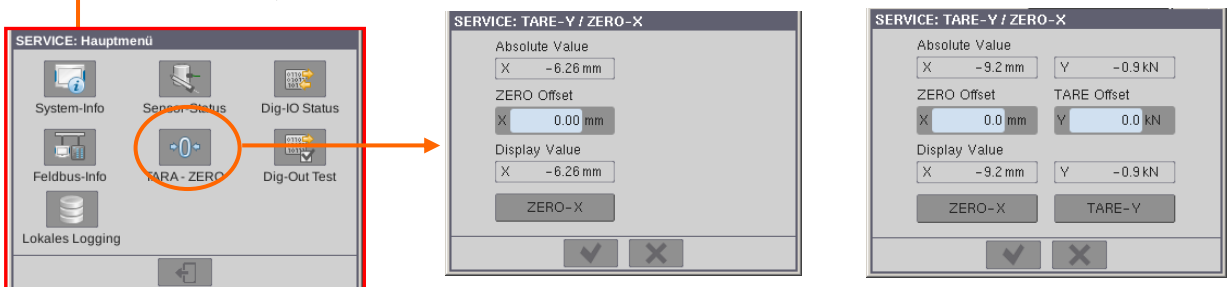


p.18

p.17



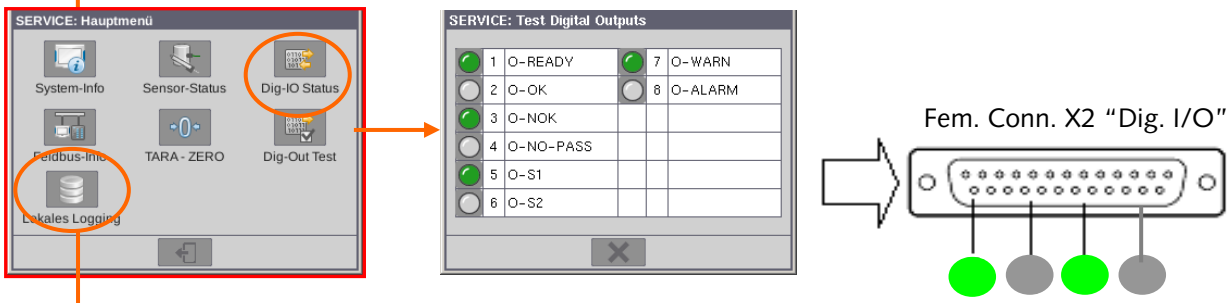
With the **piezoelectric version** (middle screenshot immediately below) only the ZERO-X button is offered (zero X channel). TARE-Y there corresponds to the signal /OPERATE (= reset charge amplifier) and can be triggered using the Operate button on the "Sensor Status" menu or using the I-OPERATE input. On the other hand the TARE-Y button is offered for the strain gage version (right screenshot).



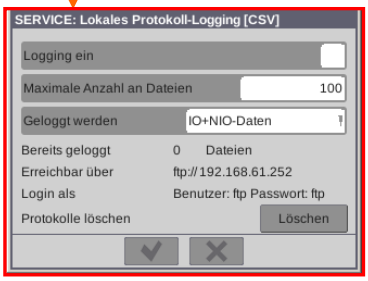
Piezo version

Strain Gage version

Clicking an LED changes the corresponding output to the other state. Quitting this menu causes the outputs to be controlled by the status of the monitor again.



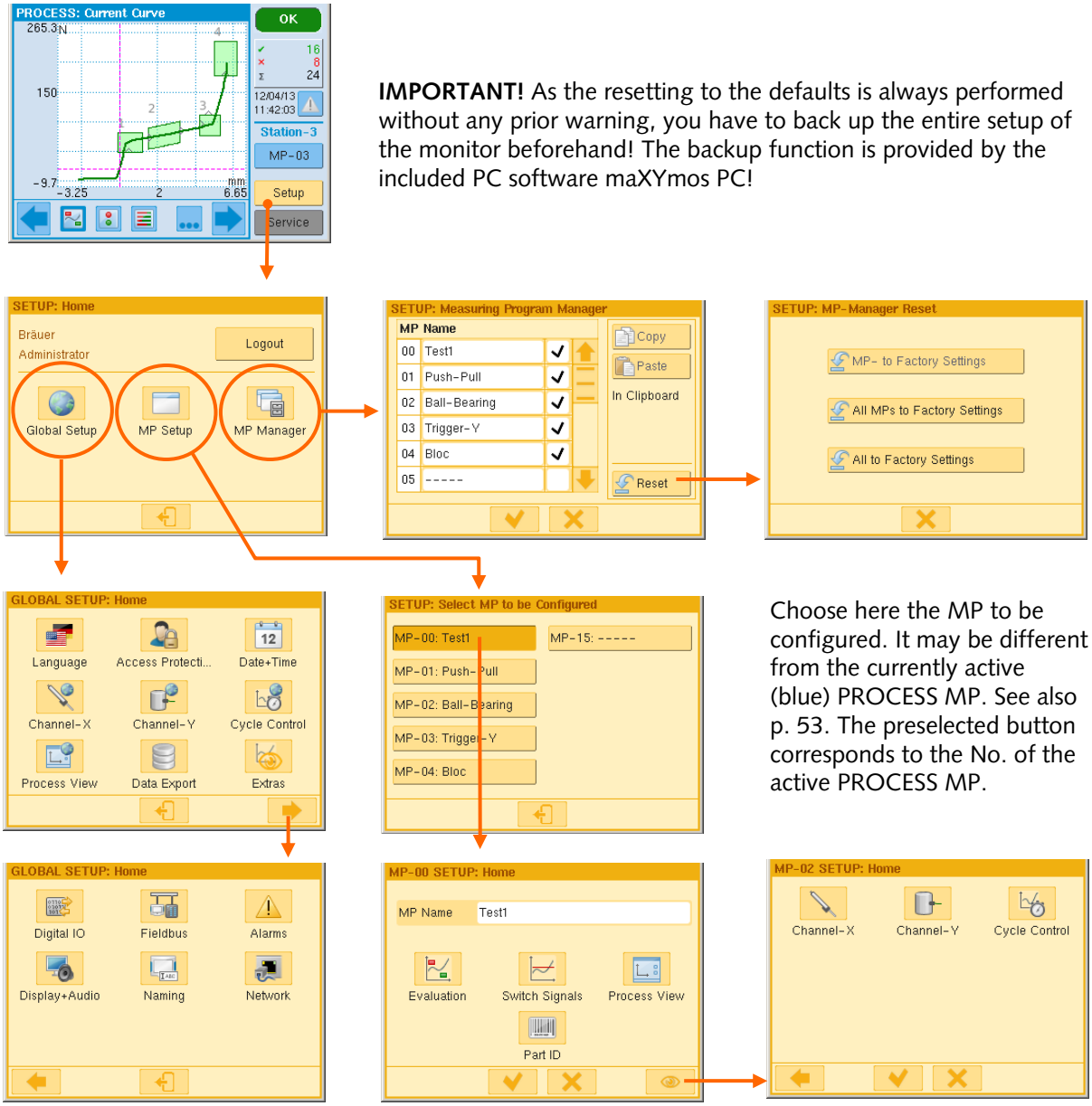
Fem. Conn. X2 "Dig. I/O"



Local logging and test records

CSV logs can be co-logged in the internal file system of the maXYmos for service purposes, for NOK cause diagnosis and for machine optimisation. Place a check mark in the "Logging on" box. This permits readout and analysis of for example NOK curves collected over several days. Readout and analysis is done via "maXYmos-PC-plus" PC software (see maXYmos-PC quick reference, chapter 2.3.4. "Readout measurement logging from maXYmos")

3.4.3 Setup Menus – Structure of the Parameter Configuration Paths



IMPORTANT! As the resetting to the defaults is always performed without any prior warning, you have to back up the entire setup of the monitor beforehand! The backup function is provided by the included PC software maXYmos PC!

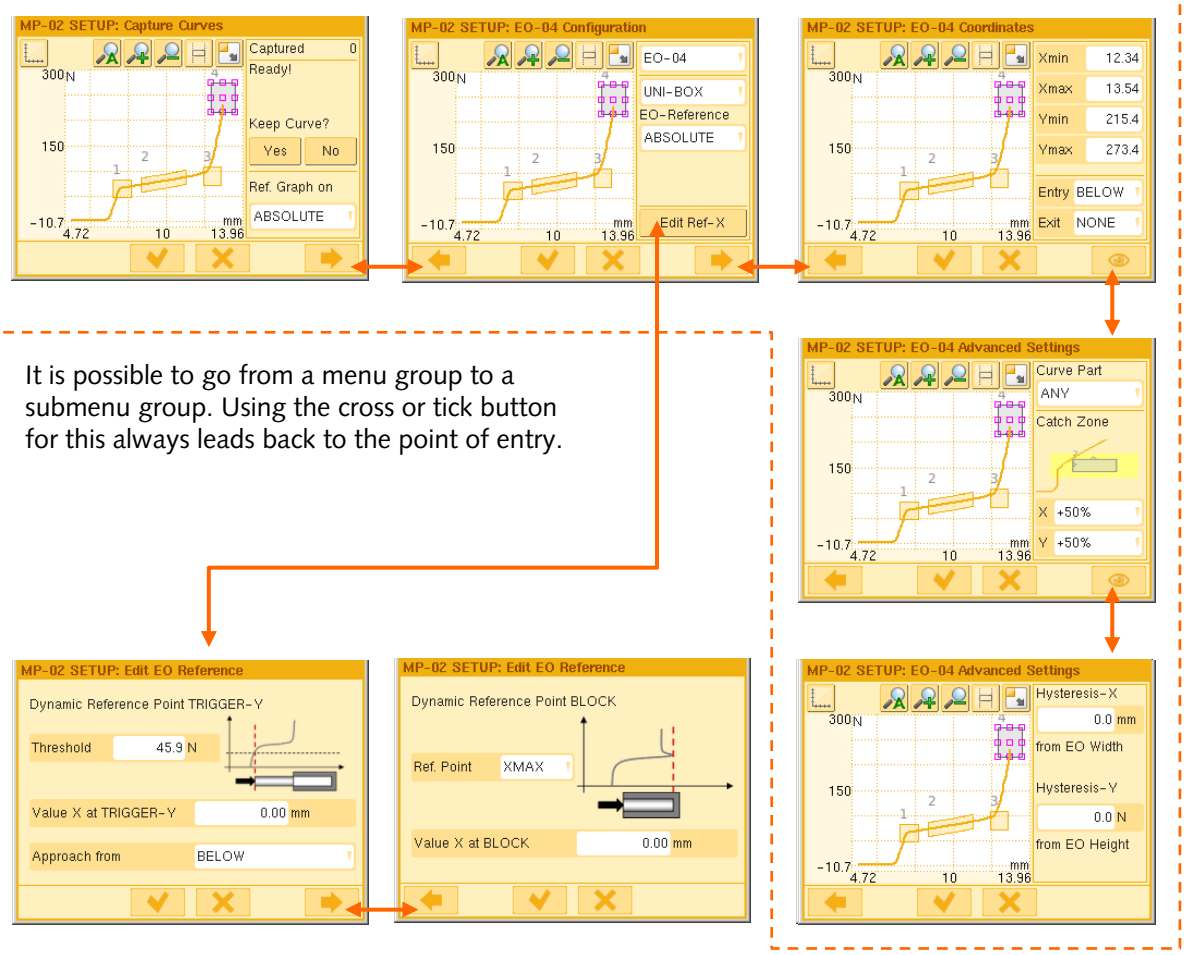
Choose here the MP to be configured. It may be different from the currently active (blue) PROCESS MP. See also p. 53. The preselected button corresponds to the No. of the active PROCESS MP.

Here ML specific and GLOBAL dependent cycle controls for channels X and Y can be set.

4. SETUP – Configuring Monitor Parameters

4.1 Navigating through a Group of Menus

Taking the EO Editor as an example: Several menus with a similar purpose are grouped. The horizontal arrow buttons are used to navigate through the group. A menu group from any individual page can be left by touching the cross or tick button.



It is possible to go from a menu group to a submenu group. Using the cross or tick button for this always leads back to the point of entry.


Scroll through the individual pages of a group of menus with a similar purpose


Scroll to an individual page with parameters for specialists


Apply parameters and exit the Setup routine for all (!) of the individual pages of a group of menus


Discard parameters and exit the Setup routine for all (!) of the individual pages of a group of menus

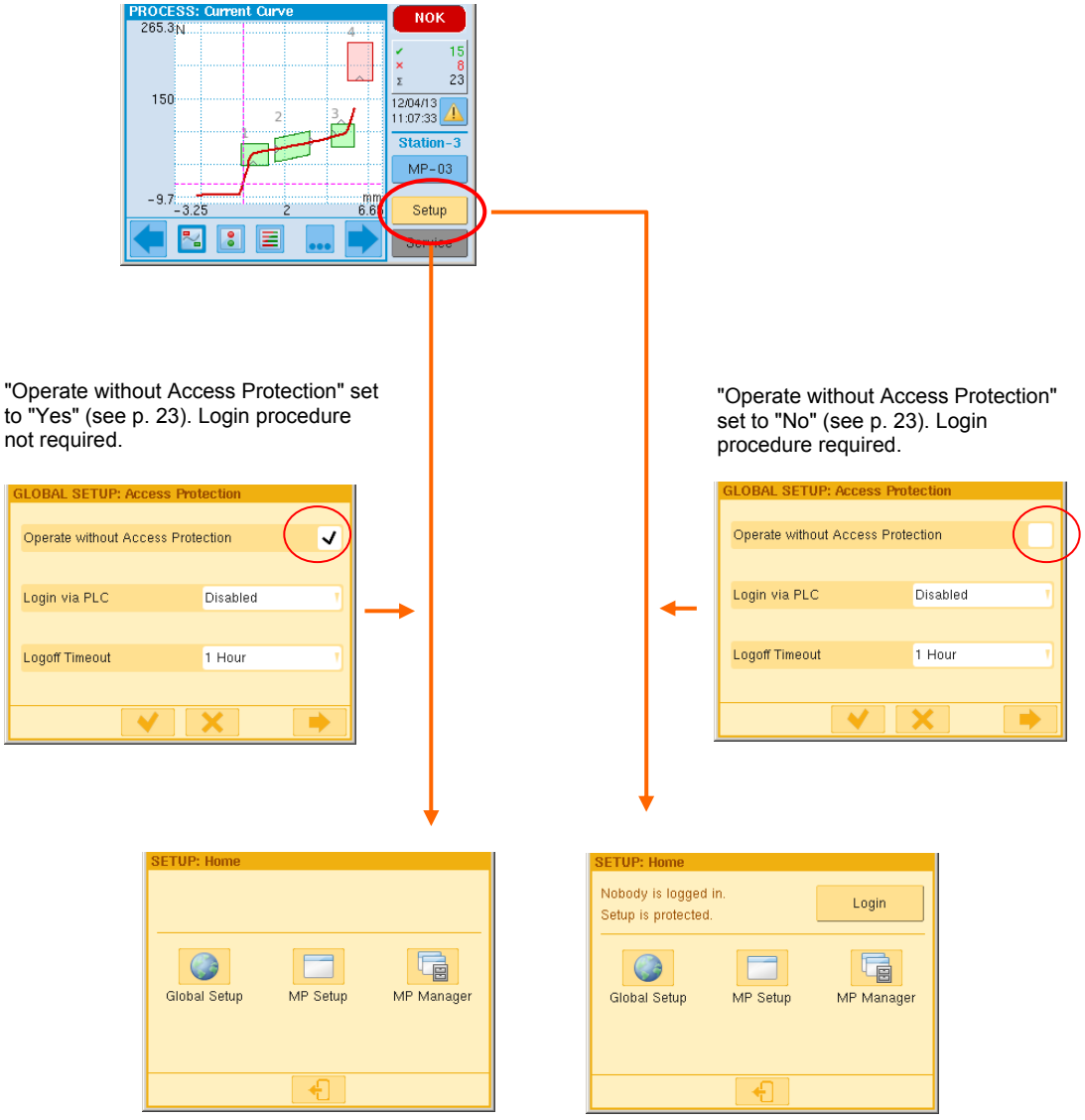

Exit a main menu level without applying anything. You will not be prompted to confirm this decision.

4.2 Accessing Setup Level

Settings can be made at Setup level while the process is running. However, care must be taken, as the altered parameters are applied to the live process immediately after the user exits from the particular menu with ✓. The PLC can, however, prevent this with Dig-IN I-AUTO=1 (see p. 95)!

In its default configuration the maXYmos is supplied with the checkbox "Operate without Access Protection" checked, i.e. all of the monitor's settings are allowed. Later, when the machine has been set up, access protection can be activated. Only then is the "Login"" button offered. After the user has successfully logged in, only those settings for which her or she is authorized depending on USER group are possible. However, all of the parameters can always be viewed, even if the user is not authorized.

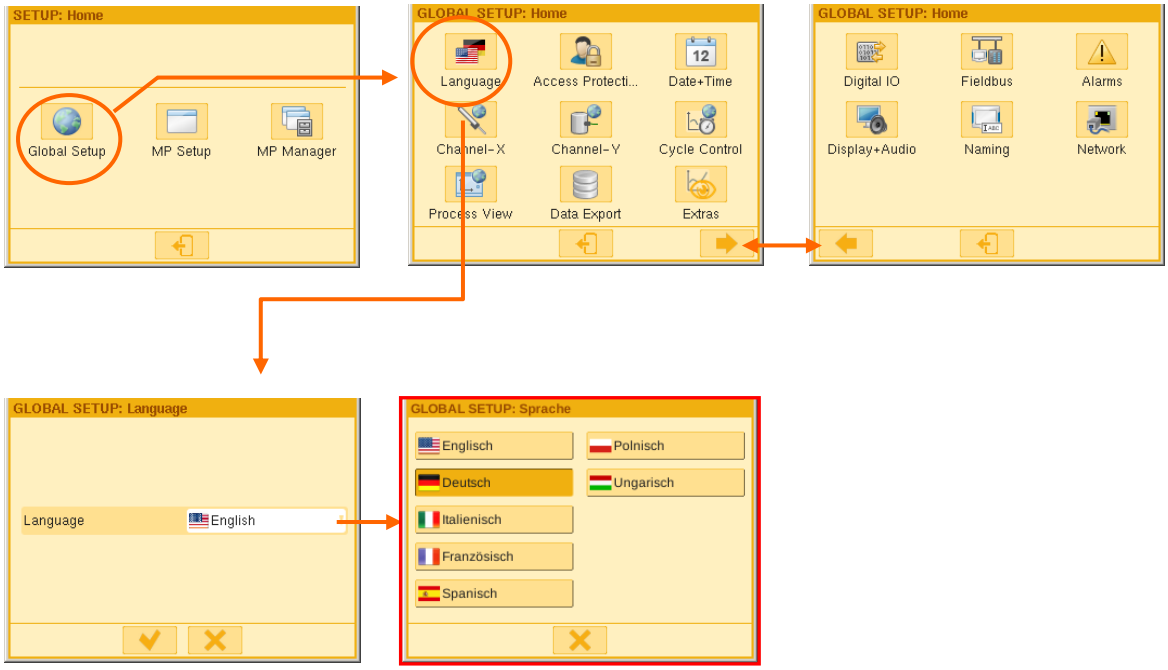
Accessing the SETUP level:



4.3 Global Setup – Global Configuration of Parameters

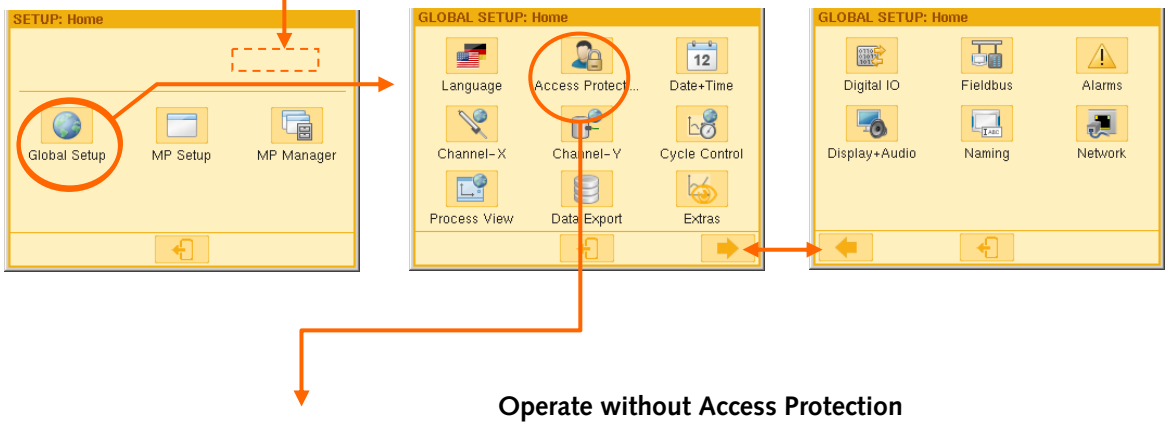
Accessing the Setup level is described in Section 4.2!

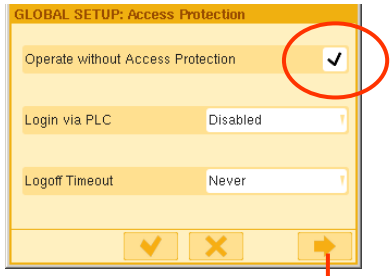
4.3.1 Choosing Language



4.3.2 Specifying (Checking and Unchecking) Access Protection

In the default configuration the "Login" button is not yet visible.



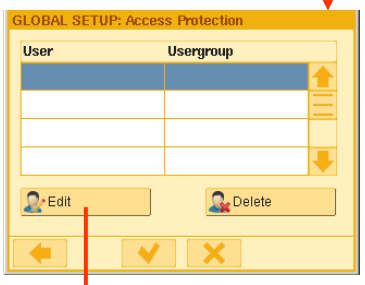


Operate without Access Protection
This is the default configuration. The tick cannot be removed until an administrator has been created and has logged in.

Login via PLC
The PLC can allow the user group chosen here remote access. This is enabled by means of the ACCESS bit on the fieldbus. The access rights then correspond to the user group specified under "Login via PLC". If other access rights are required, the PLC has to change the parameter "Login via PLC" accordingly.

Logoff Timeout
Automatic logoff after the time selected here has elapsed. The period of time starts from the time at which the user logs in.

To create a user switch to page 2 of the menu group "Access Protection"!

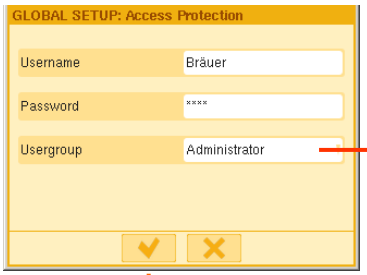


Click an empty row in the table. This will activate the "Edit" and "Delete". Now press the "Edit" button.

p.24

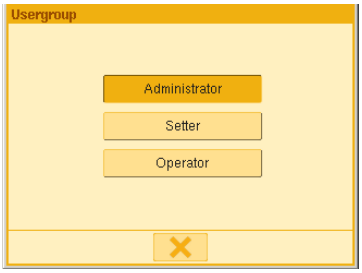
In order to familiarize yourself with your maXYmos, and during commissioning, it is best to work without access protection, so leave the tick in the checkbox.

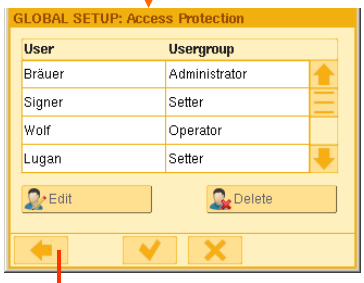
p.23



Click the **Username** and **Password** fields and enter the related information on the keyboard.

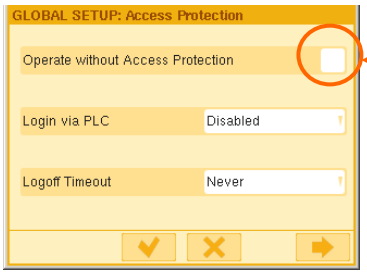
Use the **Usergroup** field to allocate yourself to a usergroup.





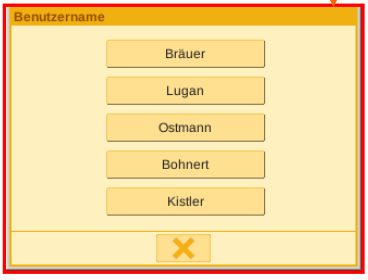
If you are the first person to use the maXYmos, it is est to set yourself up as Administrator. This will give you full access rights.

Now enter other users in a similar way.



As soon as an Administrator has been created, access protection can be activated by removing the tick from the checkbox!

The next time the Setup level is accessed the "Login" button is now shown. You have to log in if parameters are now to be changed.



Now all input users are shown in the login dialogue. If the admin password has been forgotten, it is possible to access from "Kistler". Ask for the corresponding password from Kistler Service at: **+49 7172 184 - 333**

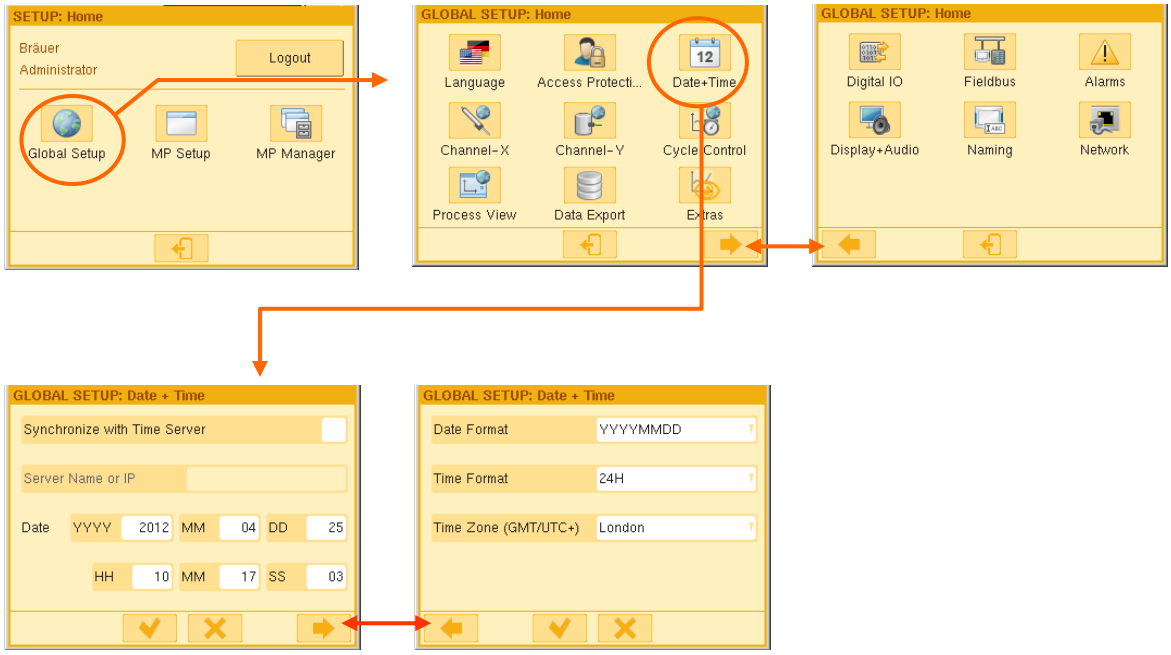
4.3.2.1 Access Rights of the User Groups

All of the parameters can be viewed even without access authorization. You do, however, have to be suitably authorized to change them. Disabled parameter fields are then displayed against an orange rather than a white background, disabled buttons are dimmed.

Authorizations	User Group		
	Administrator	Setter	Operator
Process Menus			
- Switch MP Manually	•	•	•
- Reset Piece Counter	•	•	•
- Reset Serial Number (SN) Generator	•	•	•
- Reset Warnings and Alarms	•	•	•
SERVICE Menus			
- Trigger Operate	•	•	
- Trigger TARE	•	•	
- Trigger ZERO-X	•	•	
- Trigger Test Sensor for Channel X	•	•	
- Trigger Test Sensor for Channel Y	•	•	
- Dig-Out Test	•	•	
SETUP Menus			
- Change All Parameters	•		
- Change Parameters for Channel X		•	
- Change Parameters for Channel Y		•	
- Change Parameters for Cycle Control		•	
- Change Data Export Setup		•	
- Change Display + Audio Setup		•	•
- Configure Alarms/Warnings		•	
- Configure Process View		•	
- Choose Language (of menus)		•	•

The maXYmos obtains the access authorizations for the user groups from an XML file stored inside the monitor. Allocations can be changed using the PC software maXYmos PC *plus* .

4.3.3 Setting Date and Time



If "Synchronization with Time Server" is checked, the maXYmos synchronizes with an external time server. This feature is useful if all of the components (of an assembly line for instance) have to have an identical time base.

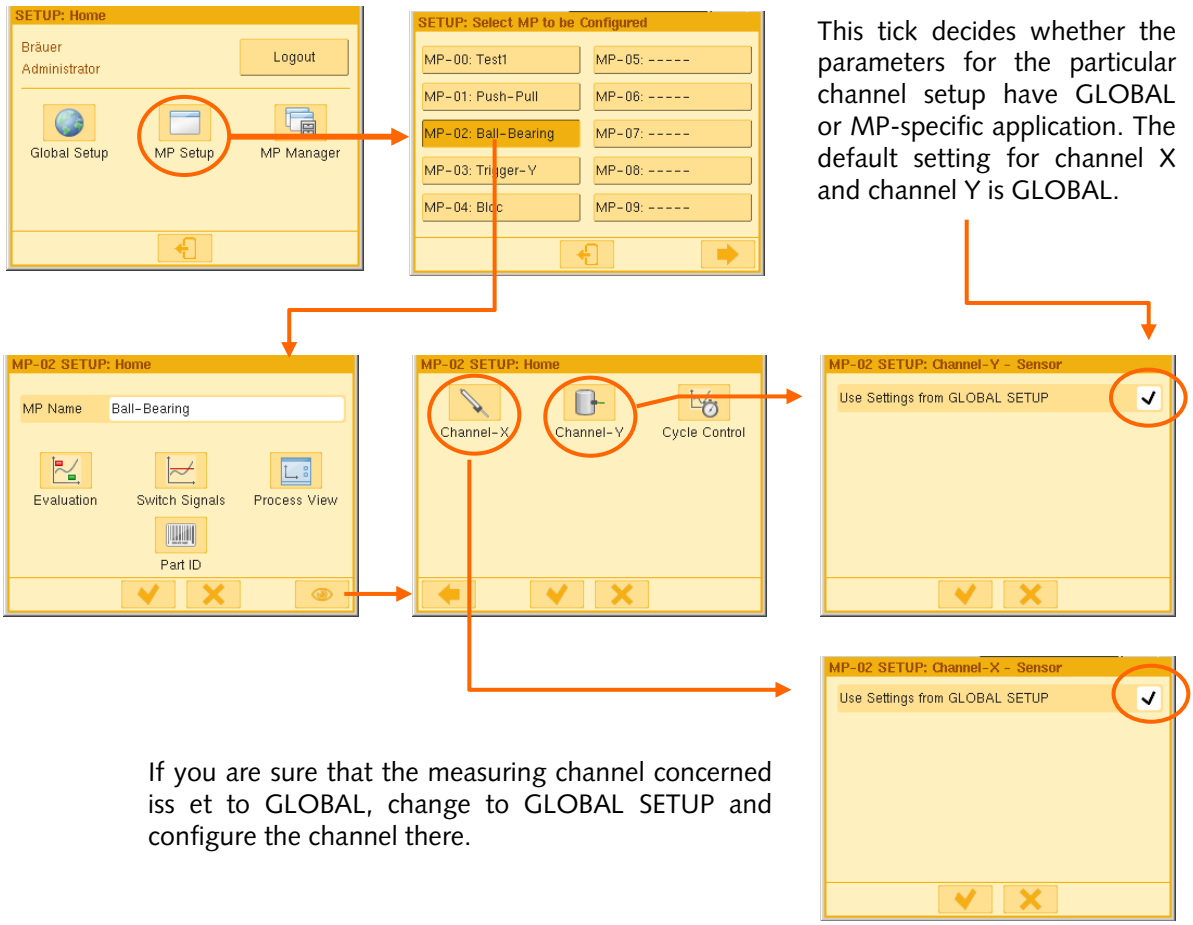
The operating system of the maXYmos specifies the synchronization interval independently. If substantial differences arise the clock of the maXYmos is gradually incremented until it matches that of the time server.

4.3.4 Configuring Measuring Channels

4.3.4.1 Choosing between GLOBAL or MP-specific Configuration

If all of the measuring programs can use the same sensor scaling, because, for example. the items under test have different shaped curves, but approximately identical displacement and/or force ranges, the setup procedure only has to be performed GLOBALLY once for channel X and/or channel Y. All of the measuring programs then use this global channel setting.

Whether the measurement channels are set and obtained as GLOBAL or ML specific is decided in the setup menu of the corresponding ML:



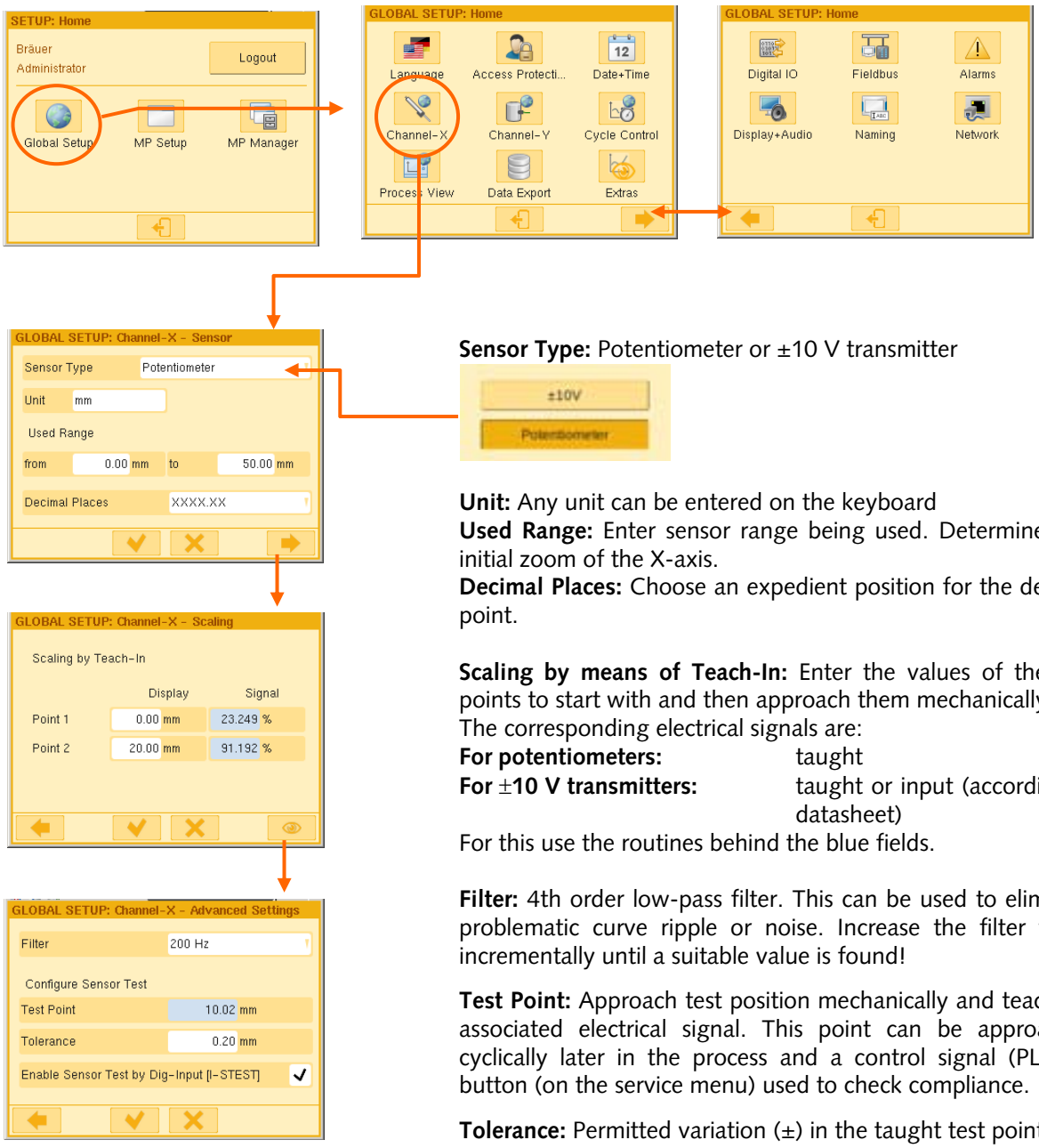
This tick decides whether the parameters for the particular channel setup have GLOBAL or MP-specific application. The default setting for channel X and channel Y is GLOBAL.

If you are sure that the measuring channel concerned iss et to GLOBAL, change to GLOBAL SETUP and configure the channel there.

As MP-specific scaling is only need for special applications, the menus for MP-specific channel setting are accessed with the "eye" button. It is best to only access these menus when necessary!

4.3.4.2 Configuring Channel X GLOBALLY

See page 27 for condition for using the parameters GLOBALLY.



Sensor Type: Potentiometer or ±10 V transmitter

Unit: Any unit can be entered on the keyboard
Used Range: Enter sensor range being used. Determines the initial zoom of the X-axis.
Decimal Places: Choose an expedient position for the decimal point.

Scaling by means of Teach-In: Enter the values of the two points to start with and then approach them mechanically.
The corresponding electrical signals are:
For potentiometers: taught
For ±10 V transmitters: taught or input (according to datasheet)
For this use the routines behind the blue fields.

Filter: 4th order low-pass filter. This can be used to eliminate problematic curve ripple or noise. Increase the filter factor incrementally until a suitable value is found!

Test Point: Approach test position mechanically and teach the associated electrical signal. This point can be approached cyclically later in the process and a control signal (PLC) or button (on the service menu) used to check compliance.

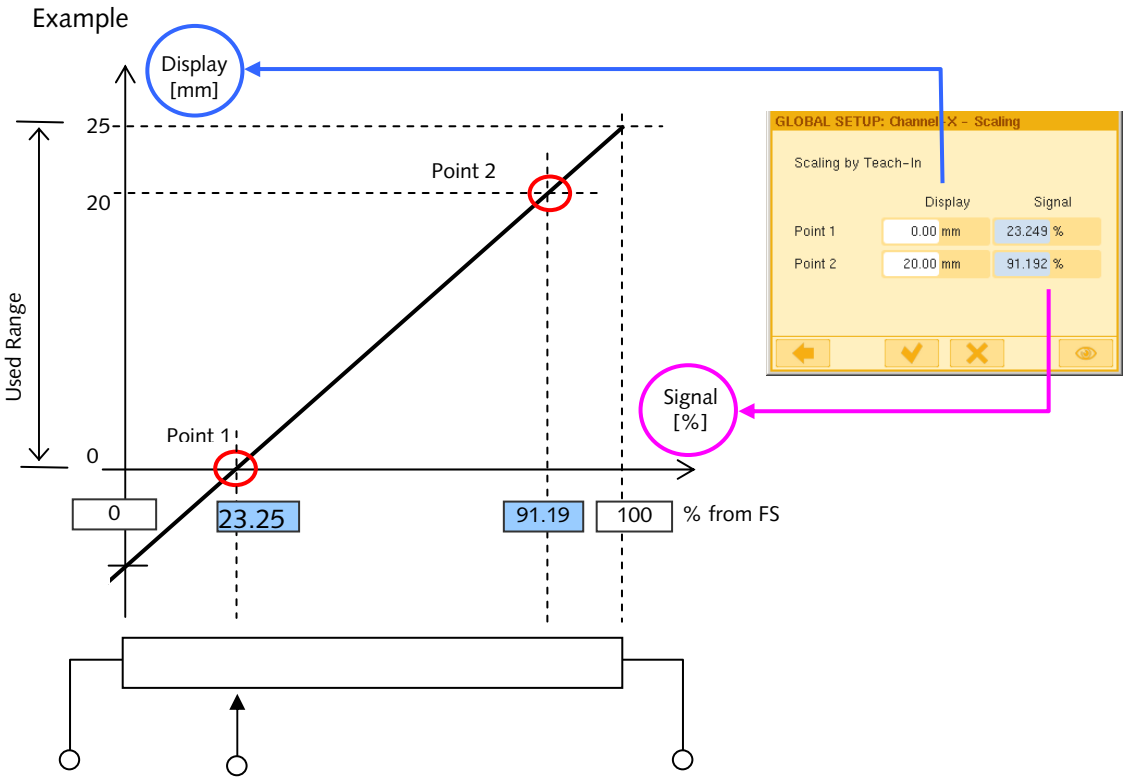
Tolerance: Permitted variation (±) in the taught test point.

⇒ See page 78 ff. for MP-specific configuration of channel X.

4.3.4.3 Principle of 2-point Scaling for Example of Potentiometer

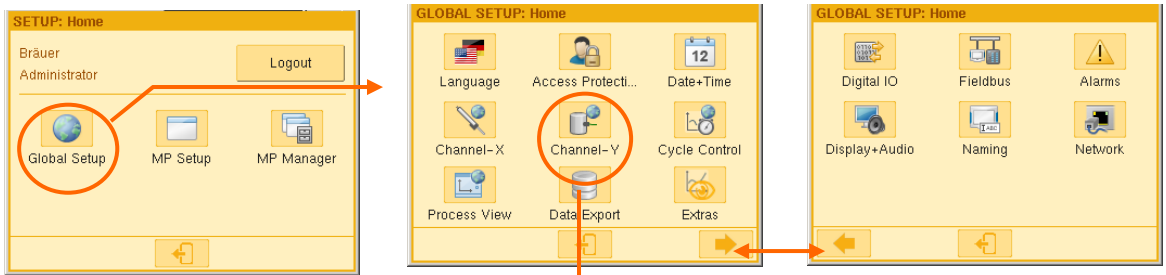
At the bottom (cold) end a potentiometer supplies 0 % and at the hot (top) end 100 % of the possible measurement signal. Within this range two known positions (end points) are approached and the resultant signals taught.

Example

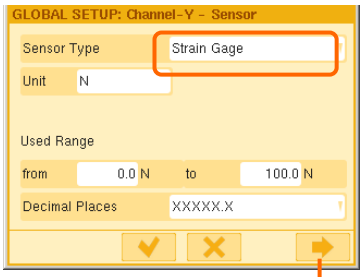


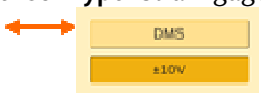
4.3.4.4 Configuring Channel Y GLOBALLY (strain gage version)

See Section 4.3.4.1 on page 27 for condition for using the parameters GLOBALLY.

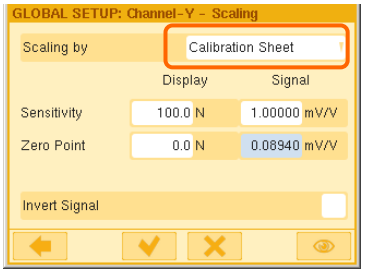


Sensor Type: Strain gage or ±10 V transmitter

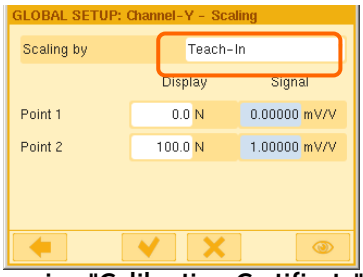




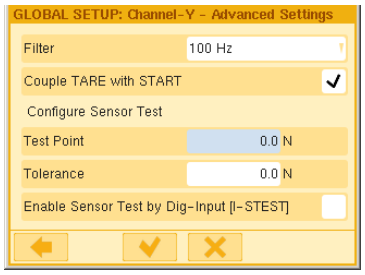
Unit: Any unit can be entered on the keyboard
Used Range: Enter limits of range
Decimal places: Choose an expedient position for the decimal point
Scaling by "Teach-In": Here two physical quantities (such as forces) are applied and taught one after the other. Use this approach if there are unknown relationships between introduced measurand (display) and measurement signal (e.g. with torque applied using force at a certain lever arm).



or



Scaling using "Calibration Certificate": Required entry of the following data from the calibration certificate. Example Sensor type „Strain gage“:
Sensitivity/Display: With force sensors enter the value specified under "Nominal force".
Sensitivity/Signal: Enter the mV/V value specified under "Nominal sensitivity".
Zero Point/Display: Enter zero (0.0).
Zero Point/Signal: It is advisable to teach this mV/V value, as zero points of strain gage sensors creep with age (even in the original packaging!). They then no longer match the value specified on the calibration certificate under "Zero signal".
Important: Relieve sensor of load during Teach-in!



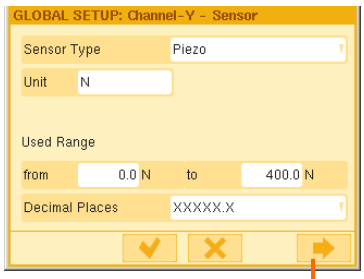
Filter: 4th order low-pass filter enabling elimination of ripple on the Y channel.
Couple TARE with START: When START condition is met, for example when the START-threshold-X or Input I-START 0-->1 is reached, the Y channel is automatically tared (duration < 0,1ms)
Test Point: Approach test position and teach. Approach this point cyclically in the process and use a control signal (PLC) or button (on the Service menu) to check compliance.
Tolerance: Permitted variation (±) in the test point

Enable Test Sensor using Dig-Input: Test Sensor s enabled or disabled by means of Dig-In. Disable if, for example, a test is to be triggered for channel X only (there is only one I-STEST input).

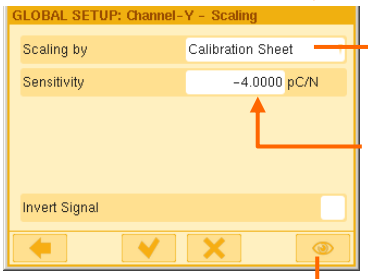
⇒ See page 81 for MP-specific configuration of channel Y

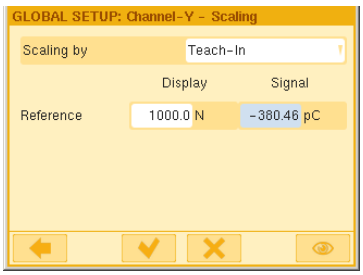
4.3.4.5 Configuring Channel Y GLOBALLY (piezoelectric version)

See Section 4.3.4.1, page 27 for condition for using the parameters GLOBALLY.

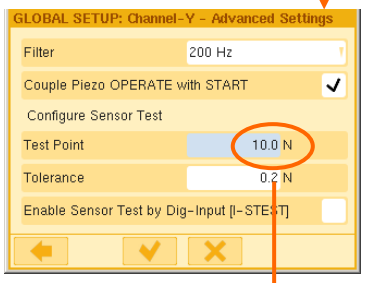


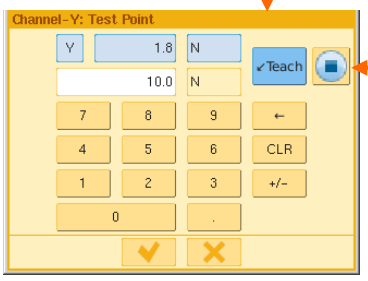
Sensor Type: This is predetermined by the version of the monitor
Unit: Enter any unit on the keyboard
Used Range: Enter expected limits of range
The parameter "up to" (400.0N) multiplied by the parameter "sensitivity" (-4.0pC/N) gives the maximum expected quantity of charge (-1 600pC in this case). Up to 5 000 pC the charge amplifier switches into its lower, and from 5 001 pC into its upper measuring range. Try to stay under 5 000 pC if possible. Do not enter an unnecessarily high value under "up to".
Decimal places: Choose an expedient position for the decimal point





The **Teach-In** approach is helpful, for example for indirect force measurement using strain sensors on stirrup,, where the relationship between force and quantity of charge is not immediately known.





Filter: 4th order low-pass filter allowing elimination of problematic ripple. Approach appropriate value of the filter incrementally!
Couple Piezo-OPERATE with START: If the checkbox is ticked, nobody has to monitor the RESET-OPERATE handling of the charge amplifier. It is now permanently coupled to the START condition (START=True-->OPERATE, START=False-->RESET (or /OPERATE). (see p. 94 ff.)
Test Point: Approach test position mechanically and teach after clicking blue field. This point can be approached in the process and checked by means of a control signal (PLC) or button (on the Service menu).
Tolerance: Permitted variation (±) in the test point
Enable Test Sensor using Dig-Input: Tick if Test Sensor is to be enabled for channel X only using Dig-In.

Before teaching the test point the OPERATE button may have to be touched to switch the charge amplifier to "OPERATE" mode (Measure).

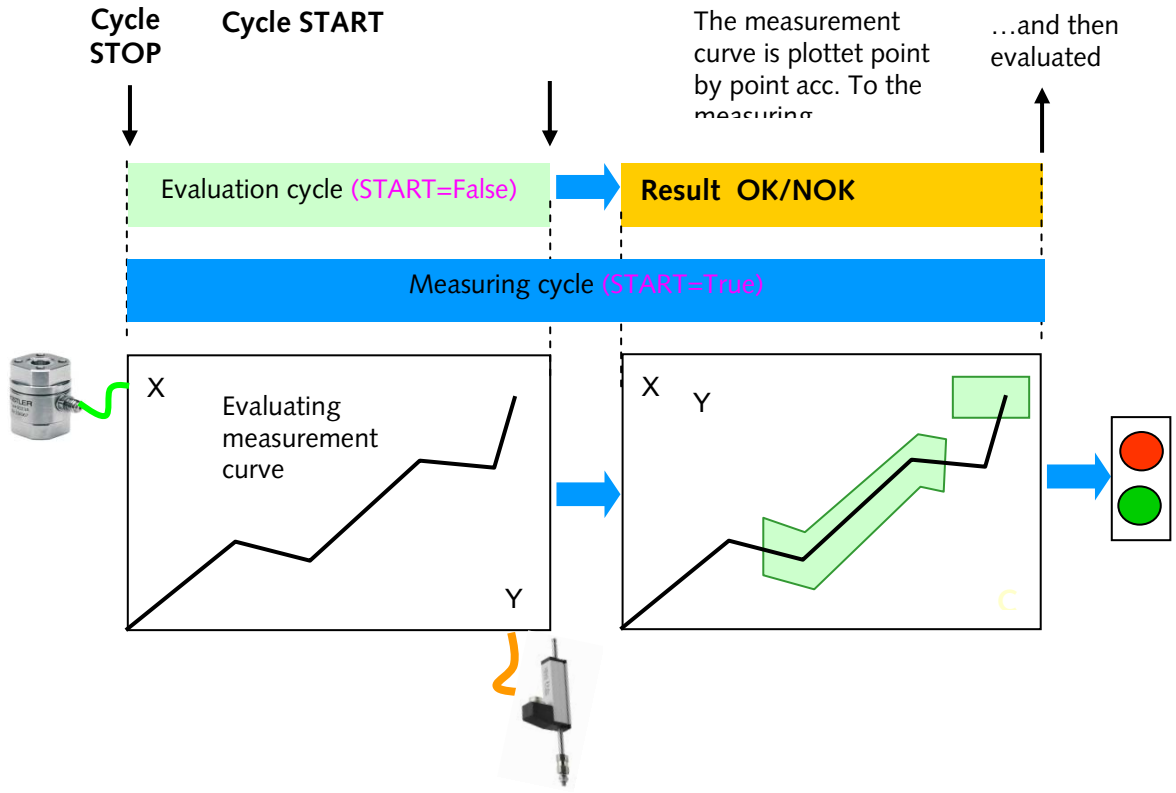
State OPERATE  State RESET 

⇒ channel Y-MP-specific configuration: see page 79

4.3.5 Configuring Cycle Control

4.3.5.1 What is a Cycle?

A complete cycle consists of a measuring cycle and an evaluation cycle. It begins with a met START condition and ends with a valid evaluation result.

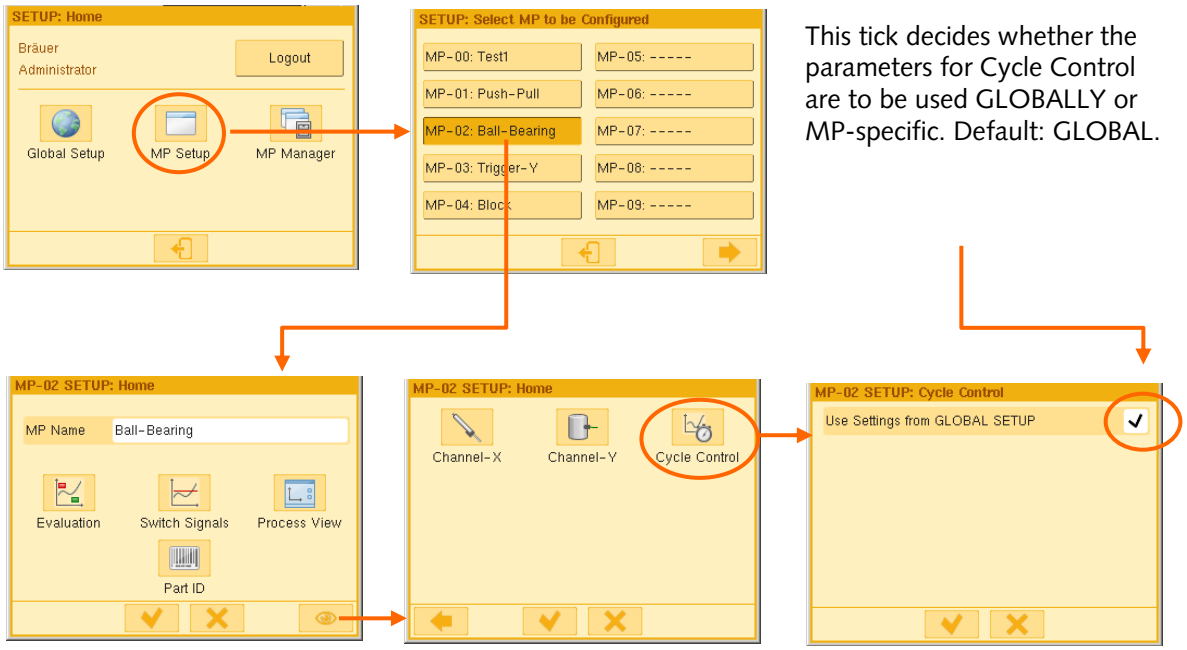


4.3.5.2 Choosing GLOBAL or MP-specific Cycle Control

The checkbox "Use Settings from GLOBAL SETUP" in the MP Setup is used to decide whether the parameters of Cycle Control are to be configured and used GLOBALLY or MP-specific.

An MP-specific setup of cycle control can be necessary when, for example:

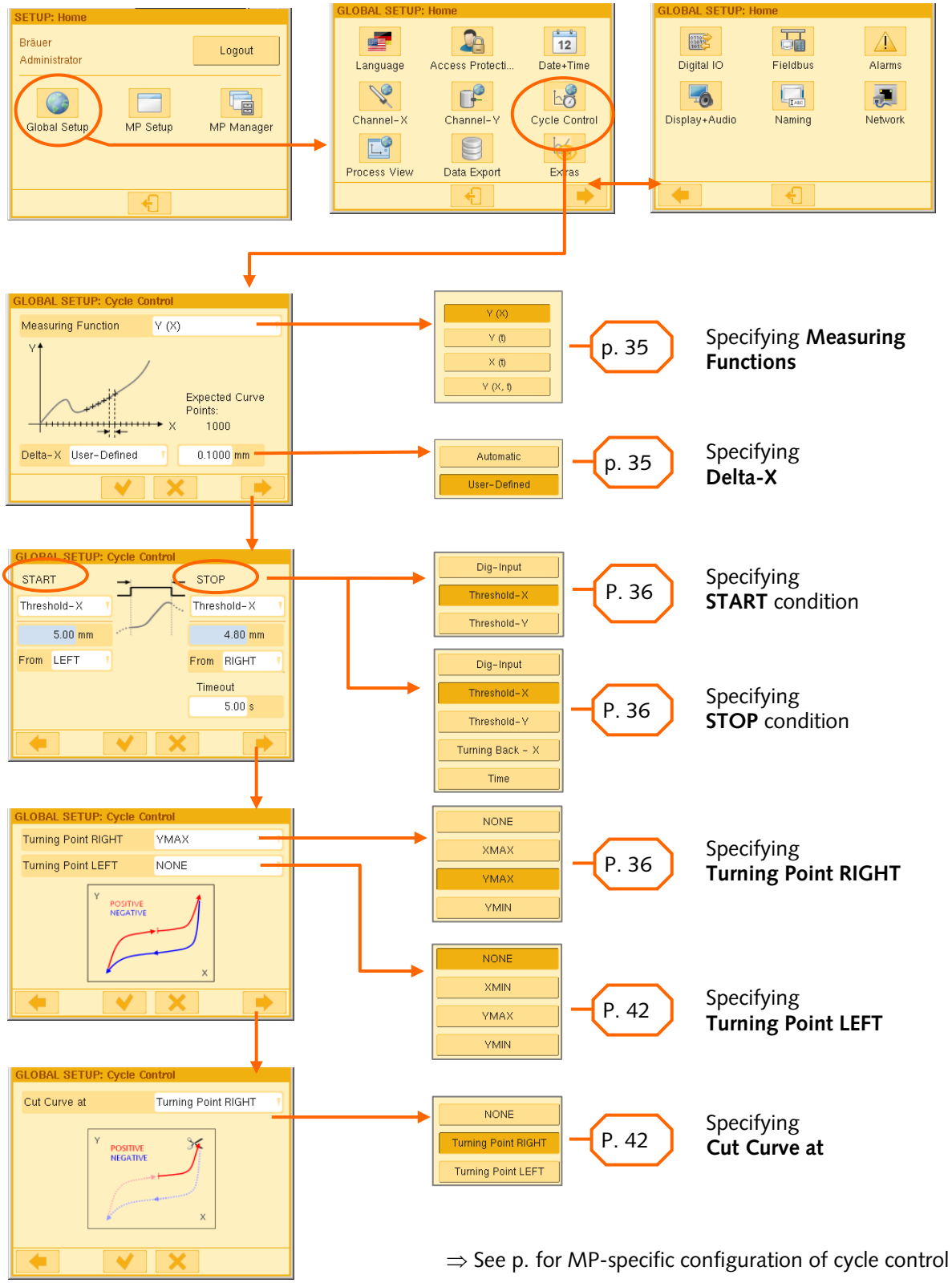
1. The measurement curve of Part1 is to be captured using Y=f(X) and of Part 2 using Y=f(t)
2. The return is to be shown for Part3 and cut off (truncated) for Part4
3. The START conditions are different (Part 5: short displacement, Part 5: long displacement)



This tick decides whether the parameters for Cycle Control are to be used GLOBALLY or MP-specific. Default: GLOBAL.

4.3.5.3 Configuring Cycle Control GLOBALLY – Access und Menus

See Section 4.3.5.2, page 33 for GLOBAL configuration.

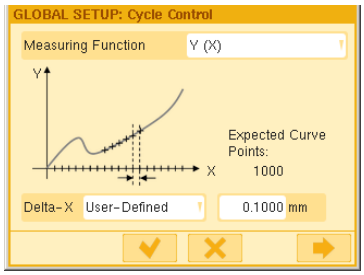


⇒ See p. for MP-specific configuration of cycle control

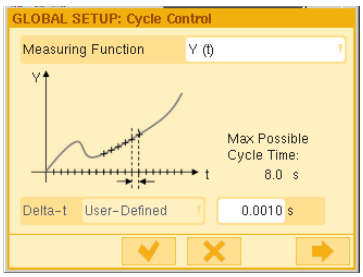
4.3.5.4 Cycle Control – Parameters in Detail

4.3.5.4.1 Specifying Measuring Functions – The Differences

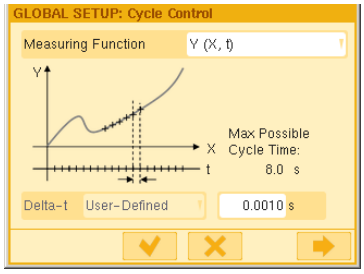
This menu is accessed as described on p. 34.



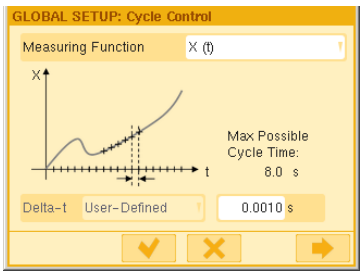
Y = f(X)
A measurand is captured on channel Y against a measurand on channel X. A selectable X increment (Delta-X) controls the reading in of the pairs of Y/X values. They are only read when the curve has passed through a Delta-X.



Y = f(t)
A measurand acquired on channel Y is captured and displayed against time. A selectable time increment controls the reading in of the pairs of Y/t values. Although this saves an additional sensor on channel X, it does require reproducible feed rates or angular velocities. Otherwise the curve would be sometimes compressed and sometimes stretched.



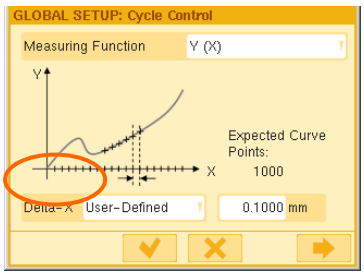
Y = f(X, t)
A measurand on channel Y is captured and displayed against a measurand on channel X. A selectable t-increment (Delta-t) controls the reading in of the pairs of Y/X values. They are read at a time increment that can be preset. This makes sense if, for example during press fitting at the block point , no further Delta-X can be passed through or changes in displacement take place, but the steep rise in force has to be recorded.



X = f(t)
A measurand on channel X is captured and displayed against time. A selectable time increment controls the reading in of the pairs of X/t values. This function is used to monitor, for example, a change in displacement or angle with time. To allow this, a suitable potentiometric displacement or angle sensor is connected on channel X.

4.3.5.4.2 Specifying Delta-X

This menu is accessed as described on p. 34. Values are only read in when changes in X take place. If Delta-X is on "Automatic" (default), the maXYmos specifies a value density of approximately 1 000 pairs of values per curve. These are distributed between the forward and any return part of the curve. The value shown under "Expected Curve Points" is only reached subsequently if the range (e.g. a displacement) specified in the setup of channel X under "Used Range" (see section: "Configuring Channel X GLOBALLY) is actually passed through in both the forward and the return direction. If the measurement curve subsequently only has a forward (POSITIVE) part, a maximum of half the specified number of curve points is achieved.



Delta-X affects: the

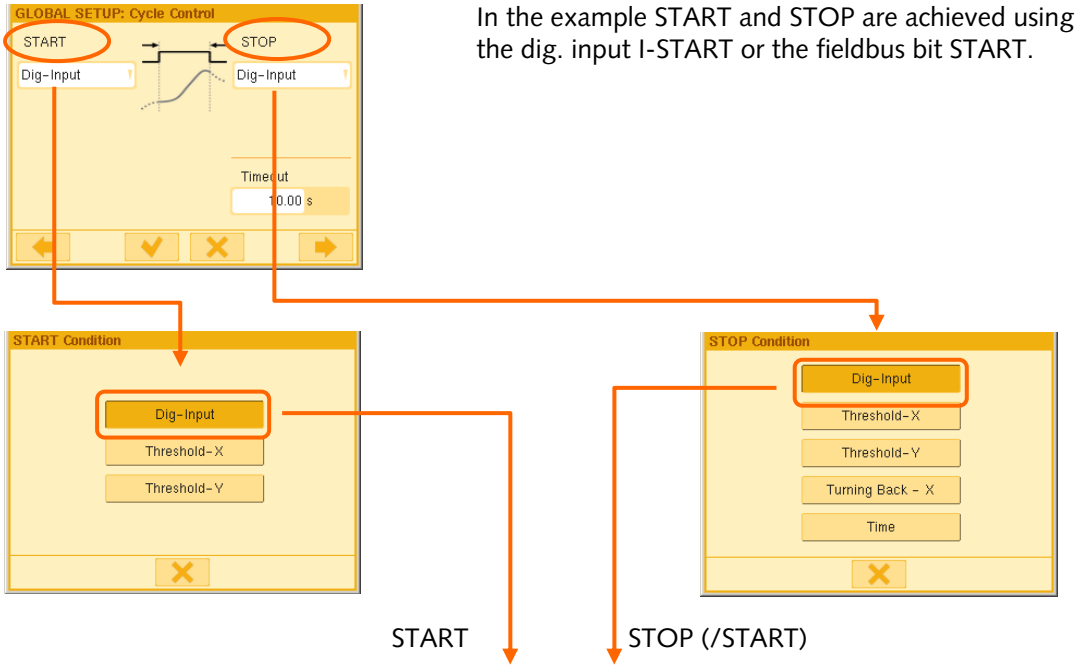
- The number of pairs of values per measurement curve and hence:
- Speed at which it is possible to navigate through the history curve memory and in the EO Editor
- Evaluation time
- Number of values in the log file (CSV)

4.3.5.4.3 Specifying START Condition and STOP Condition

4.3.5.4.4 Controlling START and STOP with External Signal

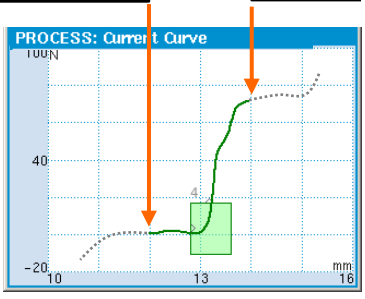
This menu is accessed as described on p. 34.

In the example START and STOP are achieved using the dig. input I-START or the fieldbus bit START.



PLC

I-START



The measurement curve is captured while I-START is set to "1" by the PLC.

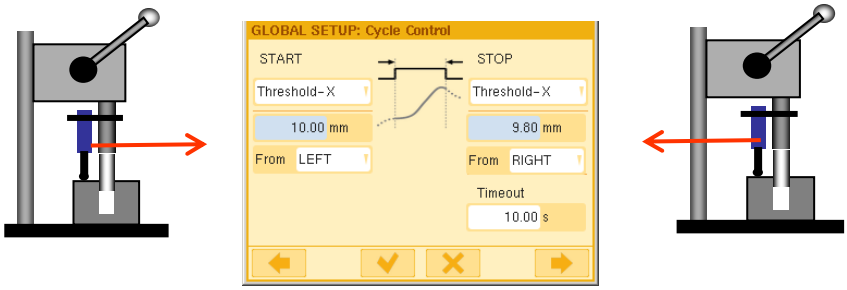
4.3.5.4.4.1 Controlling START-STOP by means of the Measurands

This menu is accessed as described on p. 34.

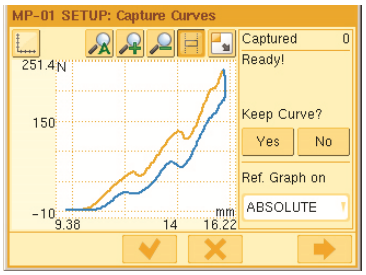
This has the benefit of making the maXYmos independent of external control systems.

Example 1

START-STOP is controlled by means of the measurand on channel X . When a Thresh-X is reached, the measuring cycle is started and is ended with another Thresh-X. Both thresholds can be taught or entered on the keyboard.



Gives the following curve in the EO Editor



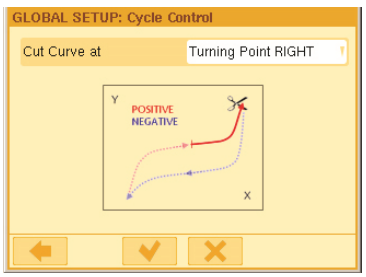
Curves governed by the START-STOP conditions shown above: Capture begins at 10.00 mm coming forward from the LEFT (orange part of curve) and ends again at 9.80 mm, returning from the RIGHT (blue part of curve).

IMPORTANT NOTE! Always enter a lower value for the STOP-Thresh-X than the START-Thresh-X. This prevents X ripple, which can be caused, for example, by the slip-stick effect during press fitting, immediately leading to STOP again.

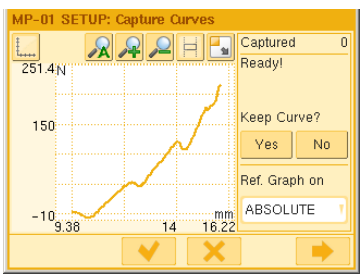
Advantage The entire measurement curve including return is always captured. It is not absolutely essential for a threshold on the right to be reached as a STOP condition.

Disadvantage The return stroke of the press cannot be used for the evaluation phase, as this only begins with STOP. This can be a disadvantage with fast cycle times. It may then be necessary to choose "Turning Back-X" as STOP condition (see Example 2).

Tip If the curve return causes problems it can be cut off (truncated). On the last page of the menu group "Cycle Control" set the parameter "Cut Curve at" to "Turning Point RIGHT" (i.e. at Y-MAX, which you have chosen beforehand).

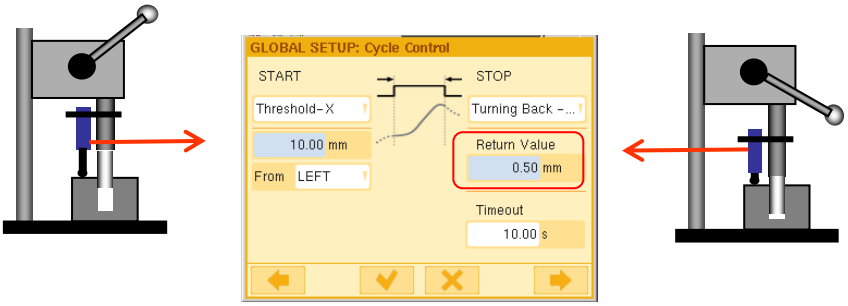


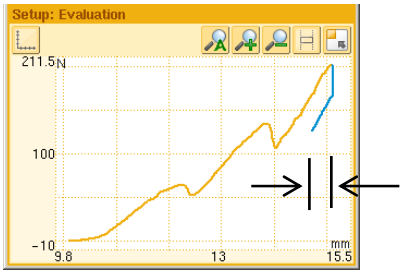
This gives the following curve in the EO Editor (example)



Example 2

START-STOP is again controlled by the measurand of channel X. By contrast with Example 1, the cycle is now stopped after a curve return that can be preset is reached.





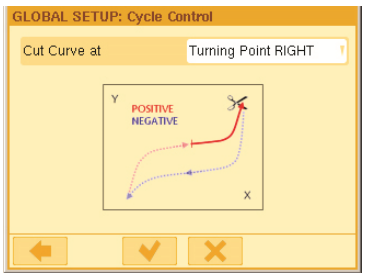
0.50 mm (corresponds to "Return" parameter)

In the above example, curve capture begins at 10.0 mm coming forward from the LEFT (orange part of curve) and now ends after a return stroke of 0.5 mm (blue part of curve), starting from the turning point RIGHT (see Section "Specifying Turning Point", page 42).

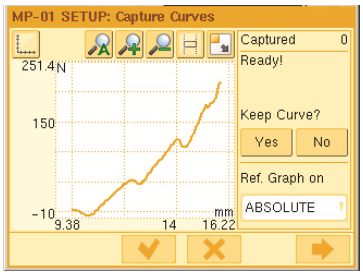
Advantage The return stroke of the press can be used for the evaluation phase, as this has already started shortly after the turning point.

Disadvantage If the return part of the curve is relevant to quality, this method cannot be used. In this case see Example 1!

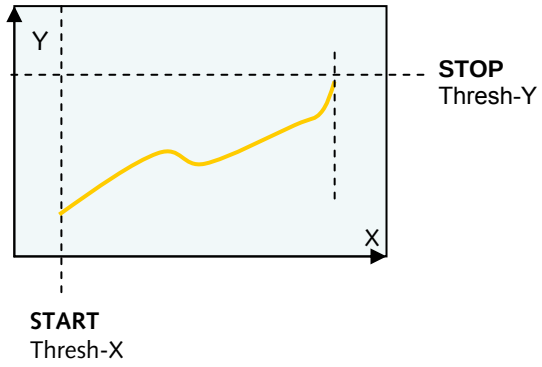
Tip Now eliminate the returning remainder of the curve by setting "Cut Curve at" to "Turning Point RIGHT"! See p. 43 for details!

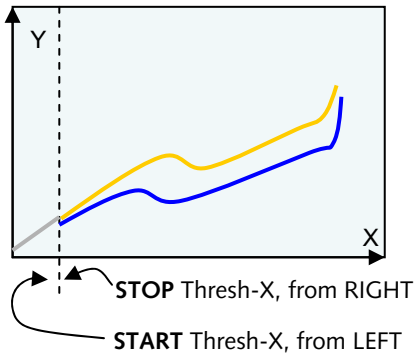


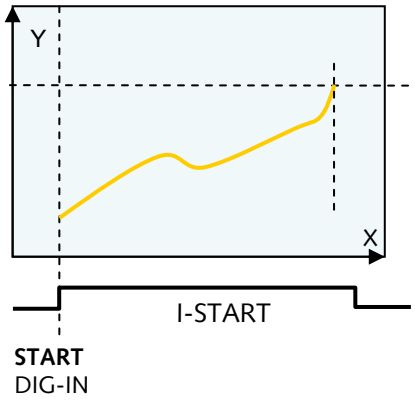
This gives a curve (shown in the EO Editor here) of the following type



4.3.5.4.5 Examples of START-STOP Combinations

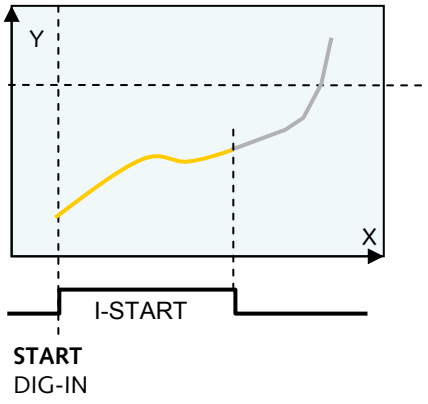


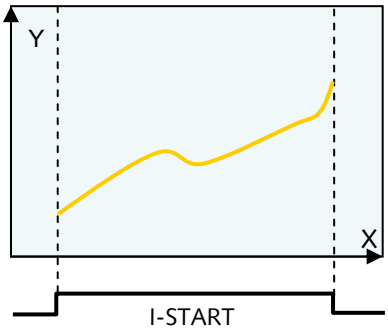




STOP
Thresh-Y

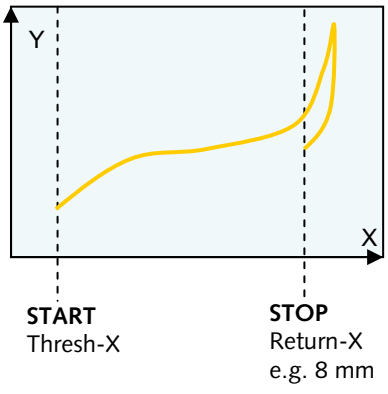
I-START must not be taken to 0 until the STOP-Thresh-Y has been reached. Otherwise the cycle would be prematurely interrupted with the falling edge of I-START!





STOP
DIG-Input

STOP
DIG-Input



4.3.5.4.6 START-STOP for Y(t) Function of the Piezoelectric Version

With the Y(t) function, for example force against time, it is no longer possible to start the cycle by means of Thresh-X. In this case the maXYmos has to be brought into the START condition using either dig. input START or Thresh-Y.

1. START using Thresh-Y

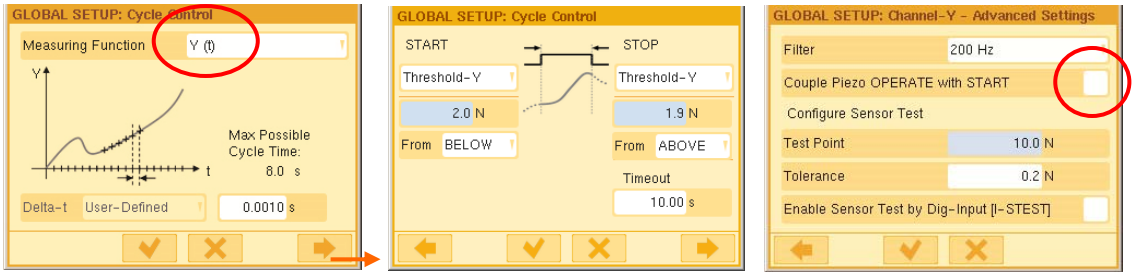
Advantage: Timing does not start until a Y threshold is reached, for example at the precise moment the press comes into contact with the part.

To allow any measurement signal at all to be generated and the Thresh-Y to be reached, the charge amplifier has to be brought into the OPERATE (Measure) condition by setting input I-OPERATE to 1.

Setup

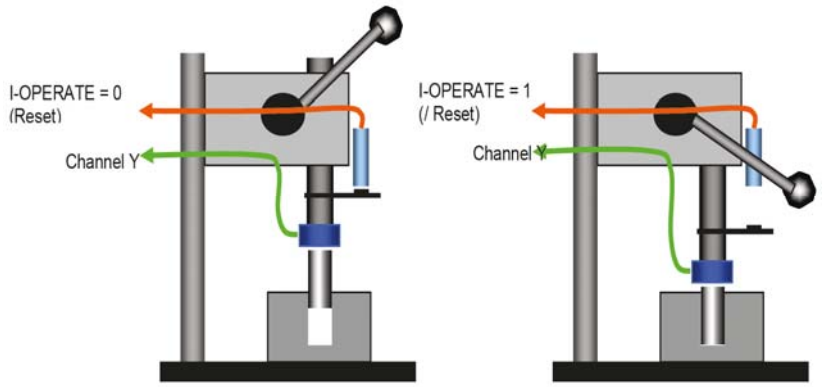
Remove the tick from the checkbox "Couple Piezo OPERATE with START" (right-hand screenshot below). The charge amplifier must now be enabled separately using I-OPERATE=1. This is because without OPERATE there is no signal from the charge amplifier; without any signal from the charge amplifier Thresh-Y is not reached.

The thresholds for START and STOP in the "Cycle Control" menu must be chosen to suit the particular application (middle screenshot below).



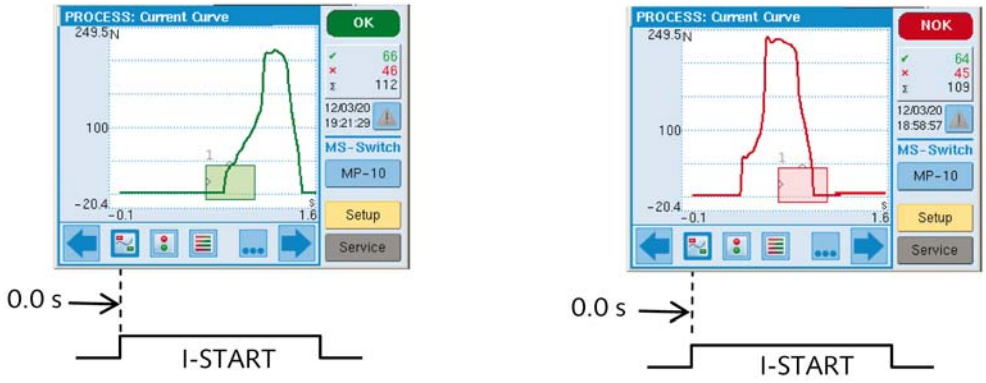
Channel Y setup
(piezoelectric version)

Example: The OPERATE signal for enabling the charge amplifier is achieved by means of the proximity switch.The charge amplifier is activated immediately the press leaves the top position.



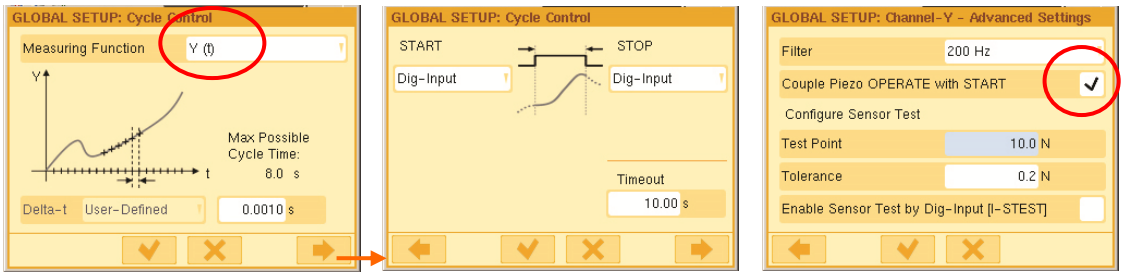
2. START using dig. Input I-START

Benefit: This makes it possible to also capture and monitor the preliminary stage of curve generation. For example, it is then possible to monitor whether the time from when the START signal appears to when the curve first rises is within specified tolerance band limits.



Setup

"Channel Y" menu: tick the checkbox "Couple Piezo OPERATE with START“ (see …). This eliminates the need for additional connection or fieldbus handling of I-OPERATE.



"Chan. Y" menu
(piezoelectric version)

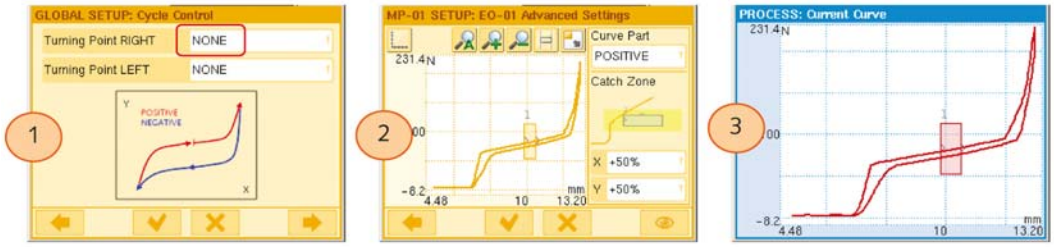
.

4.3.5.4.7 Specifying Turning Point - Dividing Measurement Curve into POSITIVE and NEGATIVE Parts

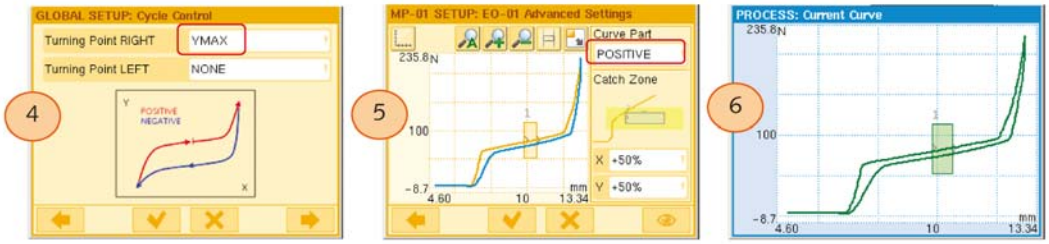
This menu is accessed as described on p. 34!

Benefit: A POSITIVE and/or NEGATIVE part of the curve can then be allocated to each EO . New re-entries through the other part of the curve which then lead to NOKs are then ignored by the EO. As soon as turning points are defined, the curve changes from POSITIVE to NEGATIVE and vice versa at these points.

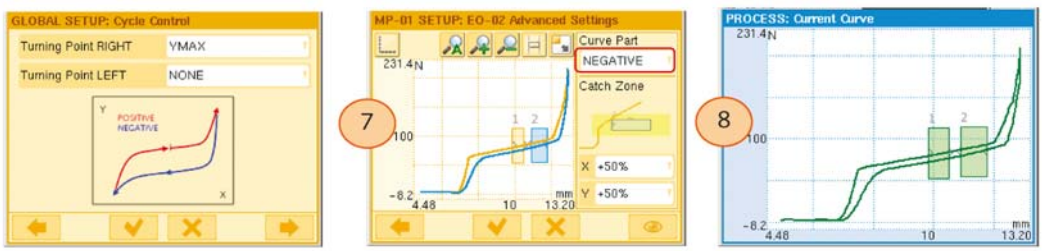
Example 1
The measurement curve is defined as POSITIVE throughout, as the parameter "Turning point RIGHT" is set to NONE (1). As the EO is allocated to the POSITIVE part (2), it also evaluates the re-entry of the returning part of the curve. The result is NOK (3).



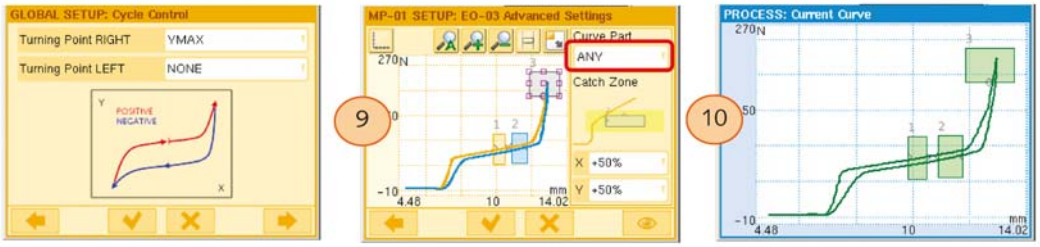
Example 2
Because a Turning Point RIGHT = YMAX (4) is defined here, the measurement curve changes from POSITIVE to NEGATIVE at YMAX (5). The returning, blue part of the curve (NEGATIVE) is ignored by the EO, as this is only responsible for the POSITIVE part. The result is OK (6)



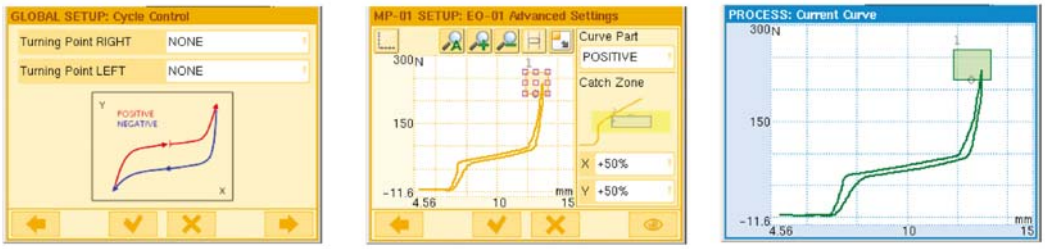
Example 3
An additional evaluation object (EO-2) is to monitor the returning part (NEGATIVE) of the curve. To achieve this it is allocated to the NEGATIVE part of the curve (7). The EO is now displayed in blue to match the color of the part of the curve allocated to it. Both EOs now generate an OK result (8)



Example 4
Evaluation objects that can be passed through by both the POSITIVE and the NEGATIVE part of the curve (EO-3 at the turning point in this case), are to be allocated to the "Curve Part" ANY (9). This means the EO takes NO ACCOUNT of which part ("ANY") of the curve passes through it. The main thing is that there is an entry and exit and these are always through the specified boundary of the box. (in this case: BOTTOM entry, BOTTOM exit) (10)

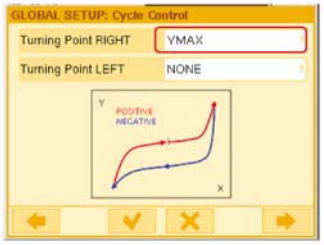


Example 5
The complete curve consists of the POSITIVE part (because Turning Point RIGHT is set to NONE). The evaluation object (EO-1) is therefore to be allocated to the POSITIVE part of the curve (or ANY). It generates NOK if both the entry and exit are through the bottom boundary.

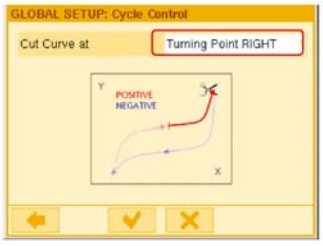


4.3.5.4.8 Cutting Measuring Curve Off (Truncating)

Provided they do not have to be evaluated, in principle return parts of curves can be cut off, so that only the curve part actually determining the quality of the item under test is represented.



This menu is accessed as described on p. 34. After a turning point has been defined, the curve can be cut off (truncated) at exactly this point.

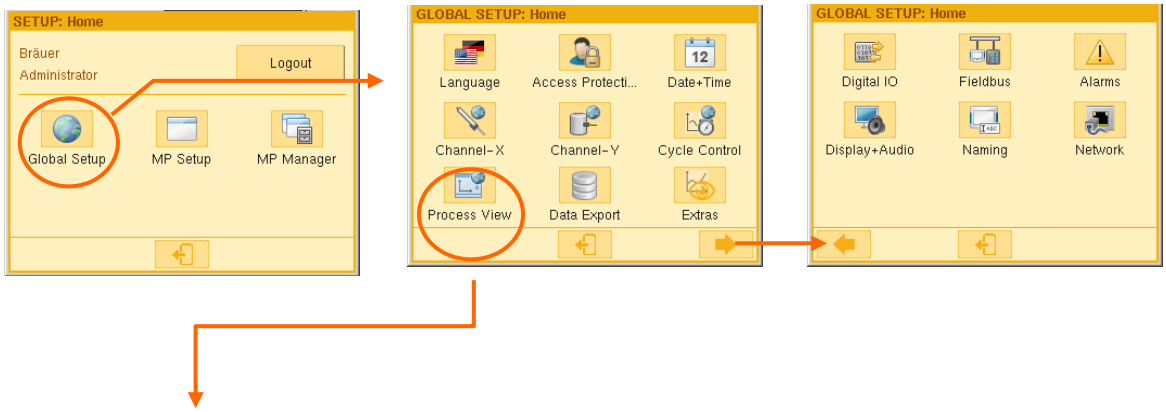


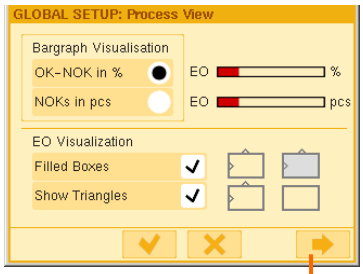
NOTE

The part of the curve that has been cut off is irretrievably deleted from the curve memory.

If the measurement curve exhibits a clear YMAX, choose YMAX. If a significant XMAX is evident you are better to choose XMAX as "Turning point".

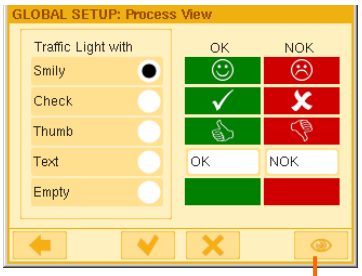
4.3.6 Specifying Process View





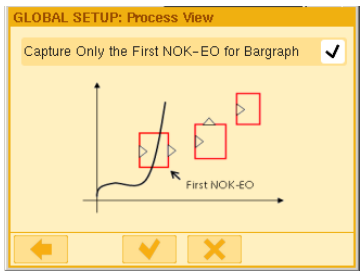
Specifying the form of representation for:

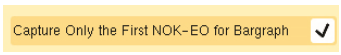
1. The bar graph of the PROCESS page "OK-NOK Distribution"
2. The evaluation objects UNI-BOX and ENVELOPE on the PROCESS page "Current Measurement Curve"



Choose a Traffic Light view here. The "Text" option can be used to enter any text, e.g. GOOD / NOT OK (NOK) to be shown on the green or red traffic light. Click the relevant field to enter the text!

Capture Only the first NOK EO for Bar Graph

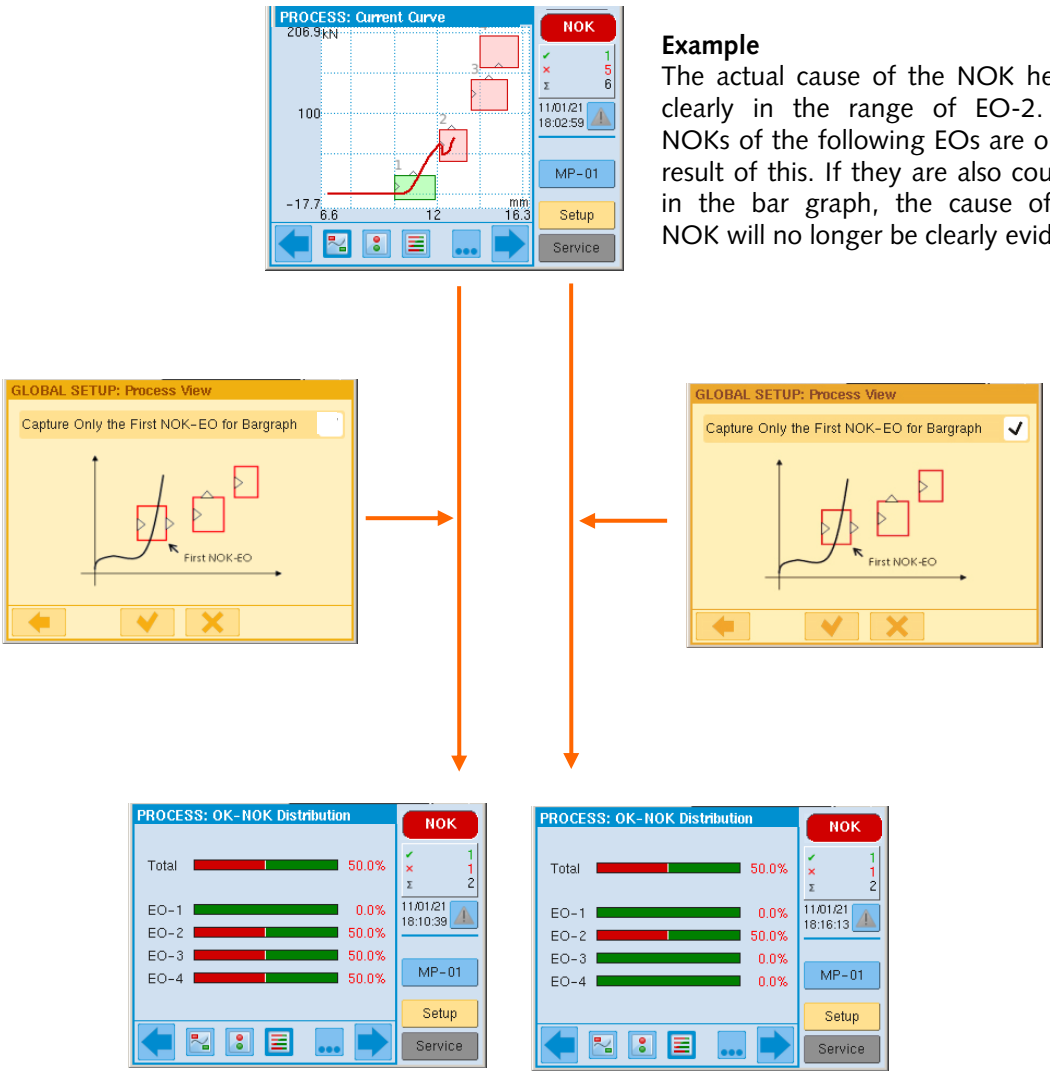




Working from the starting point of the measurement curve, only the first EO causing an NOK is included in the bar graph statistics "OK-NOK Distribution".

All of the NOK EOs are included in the bar graph statistics, even if they are not the cause of the problem (see also p. 45).

4.3.6.1 Parameter "Capture Only the First NOK EO for Bar Graph"



Example
The actual cause of the NOK here is clearly in the range of EO-2. The NOKs of the following EOs are only a result of this. If they are also counted in the bar graph, the cause of the NOK will no longer be clearly evident.

Result 1

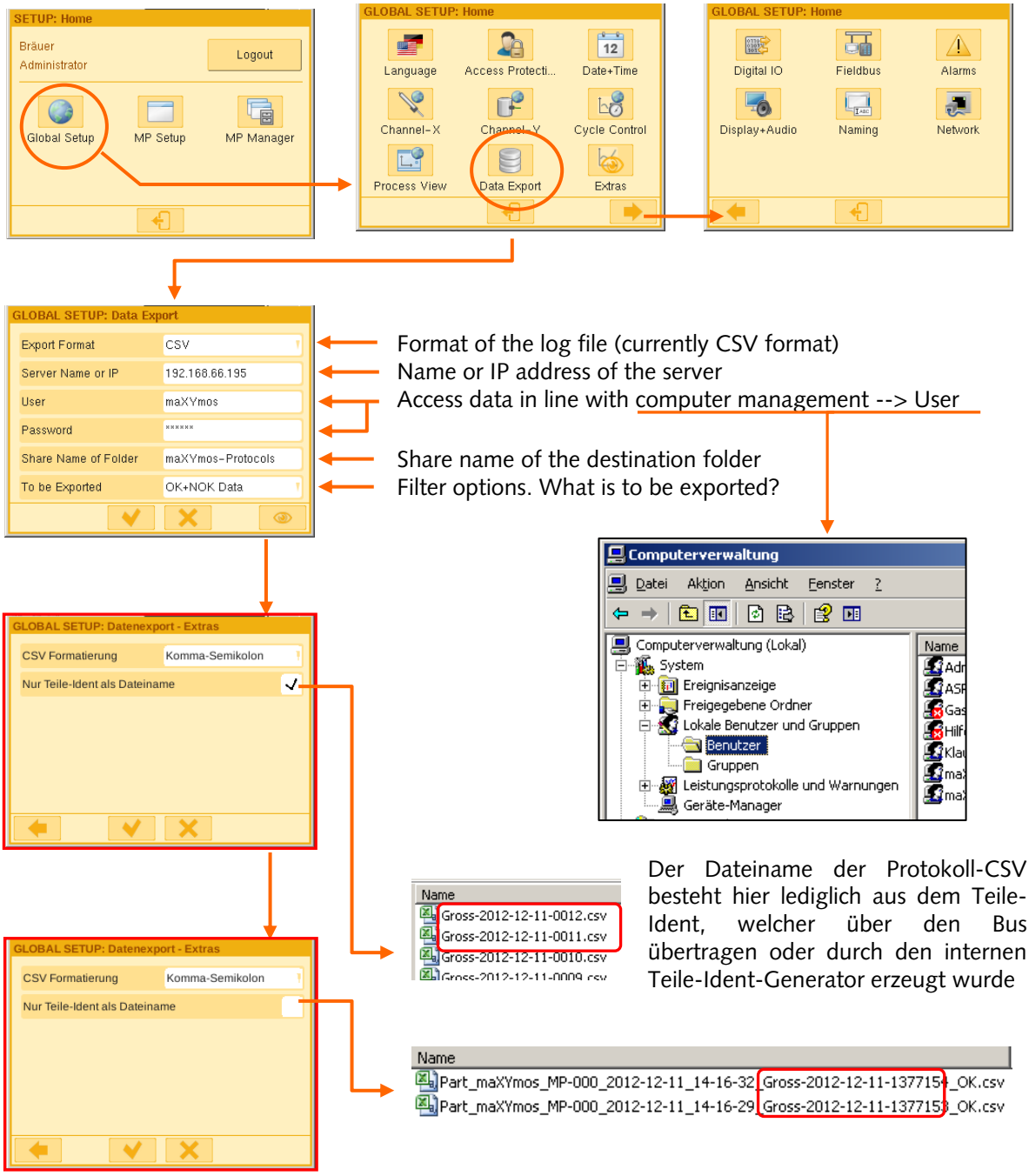
The cause of the NOK is not clearly discernable. The NOKs of EO-3 and EO-4 are only a consequence of the problem in the range of EO-2. They greatly weaken diagnosis of causes.

Result 2

The cause of the overall NOK is now clearly discernable. It lies in the range of EO-02.

To use this function the EOs must be positioned so that their numbering also corresponds to the order in which the curve should pass through!

4.3.7 Setting up Data Export – from the maXYmos

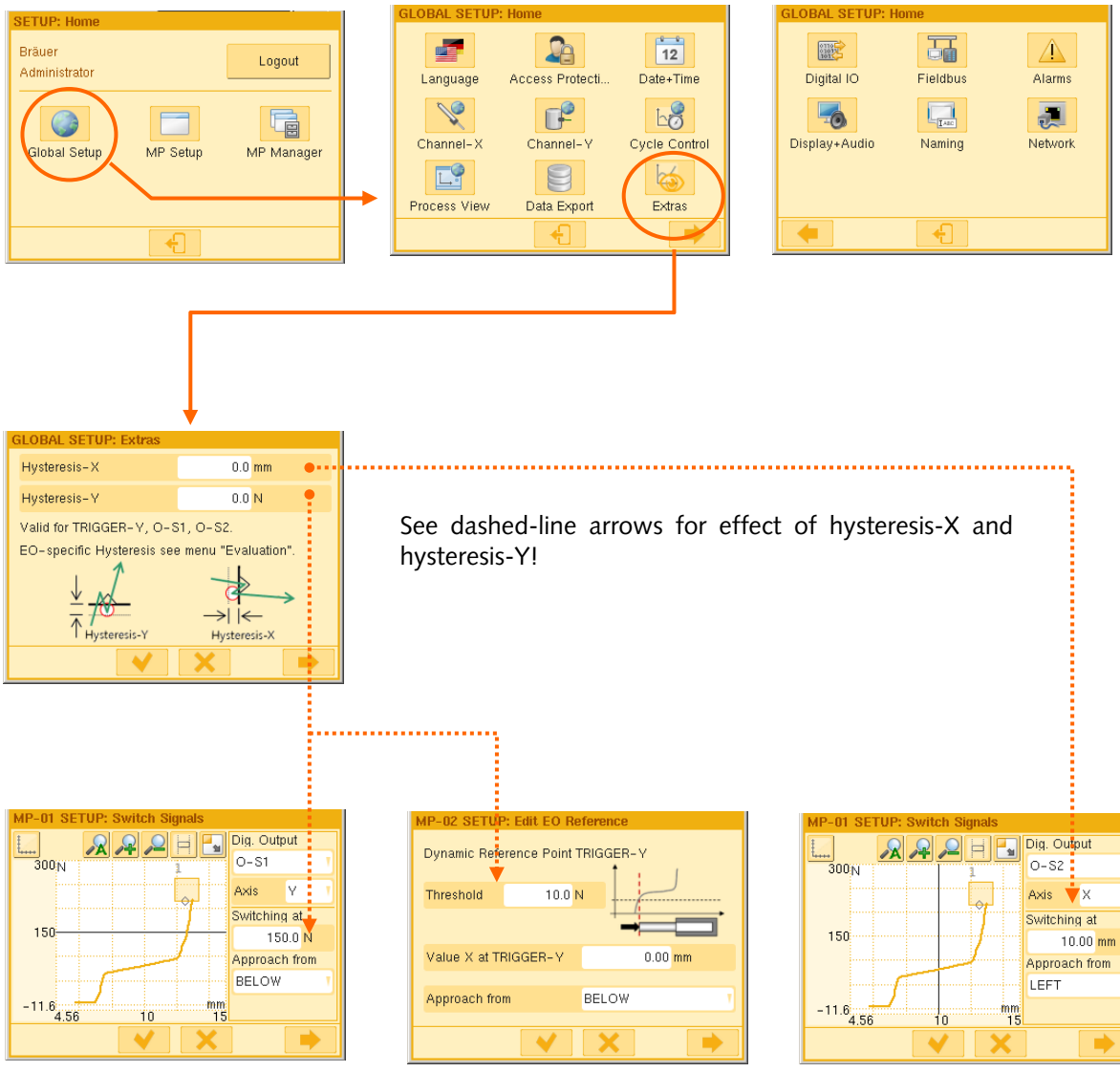


Der Dateiname der Protokoll-CSV besteht hier lediglich aus dem Teile-Ident, welcher über den Bus übertragen oder durch den internen Teile-Ident-Generator erzeugt wurde

Der Dateiname der Protokoll-CSV besteht aus dem, in einem festgelegten Frame eingebetteten Teile-Ident, welcher vor der Messung über den Bus übertragen oder durch den internen Teile-Ident-Generator erzeugt wurde.

See p. 83 for server configuration.

4.3.8 Specifying Hysteresis for Switch Signals and Trigger-Y

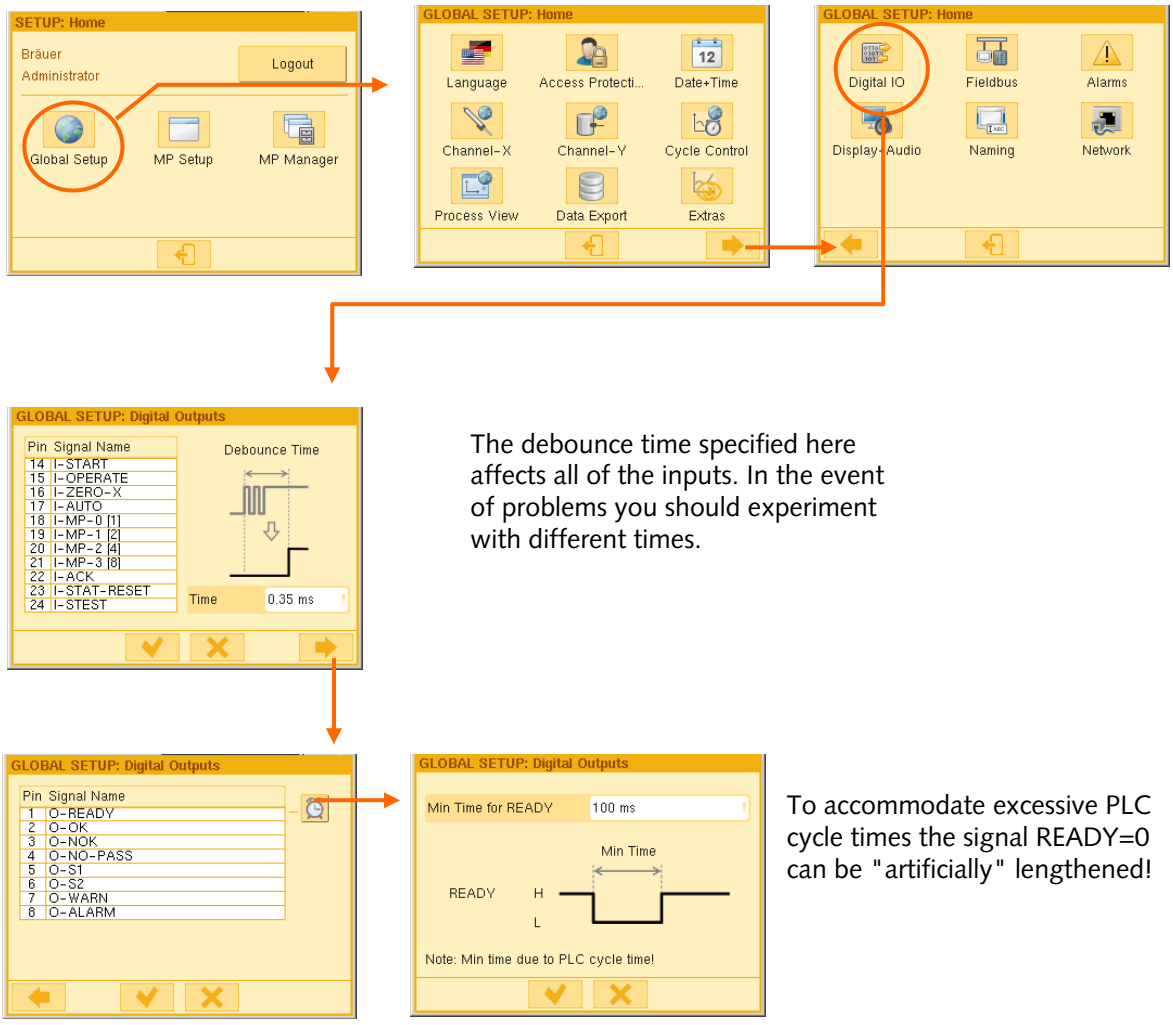


Hysteresis-Y affects the threshold of a switch signal relative to the Y axis.

Hysteresis-Y affects the threshold of the dynamic reference point TRIGGER-Y.

Hysteresis-X affects the threshold of a switch signal relative to the X axis.

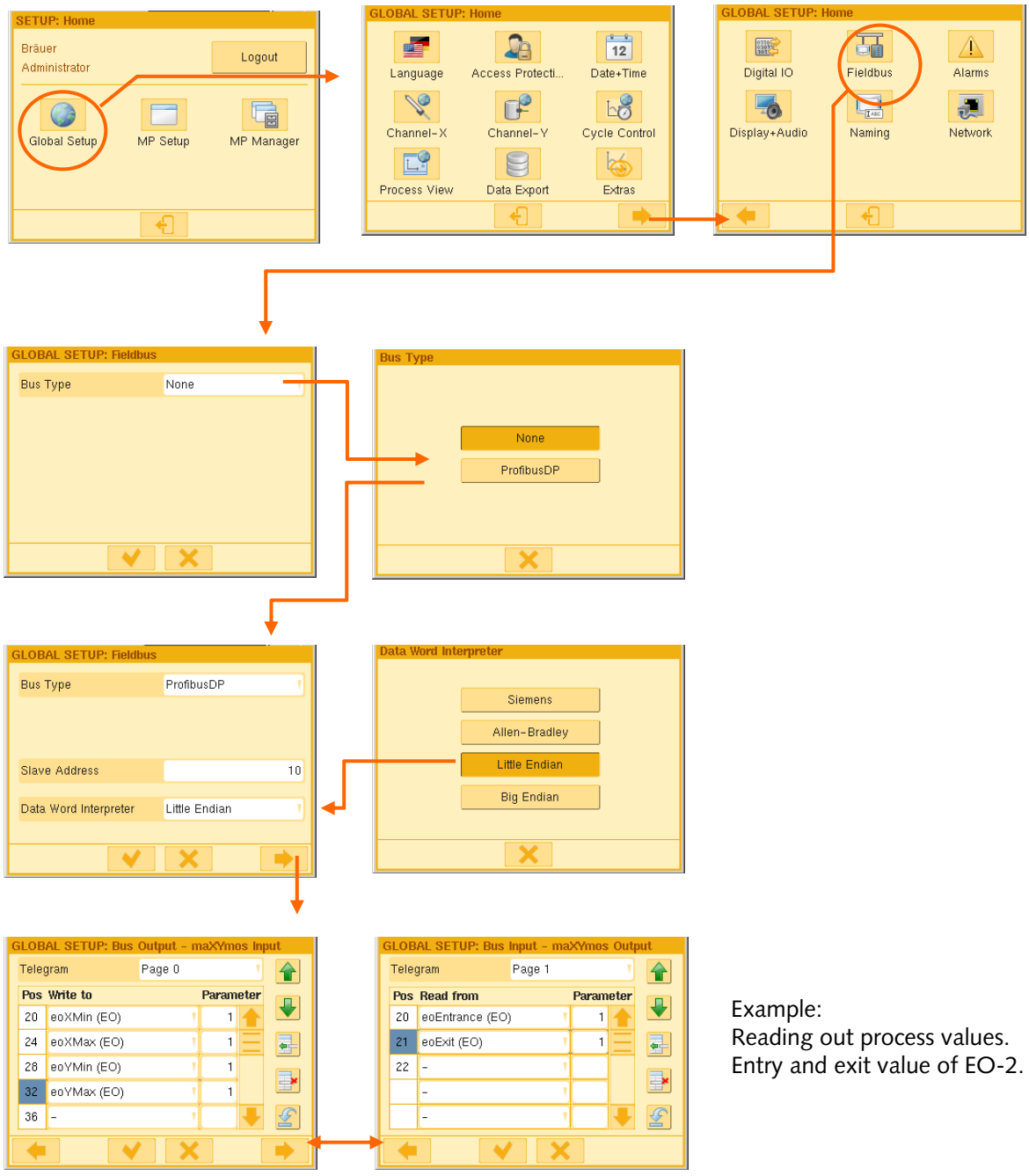
4.3.9 Configuring Digital IOs



The debounce time specified here affects all of the inputs. In the event of problems you should experiment with different times.

To accommodate excessive PLC cycle times the signal READY=0 can be "artificially" lengthened!

4.3.10 Configuring Fieldbus

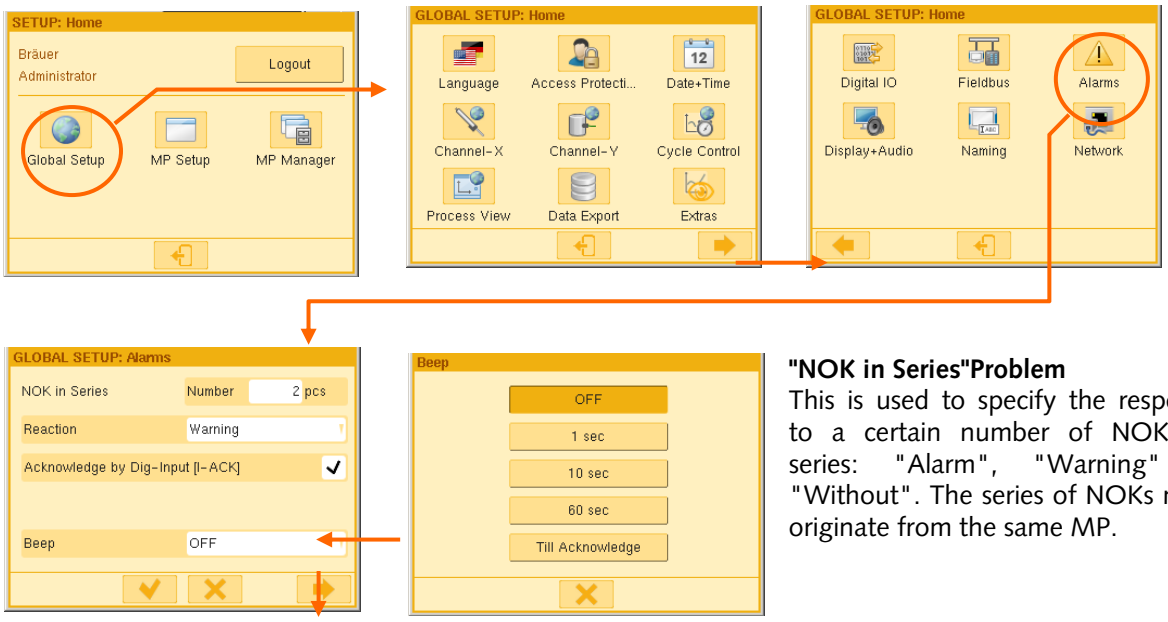


Example:
Setting coordinates of EO-1

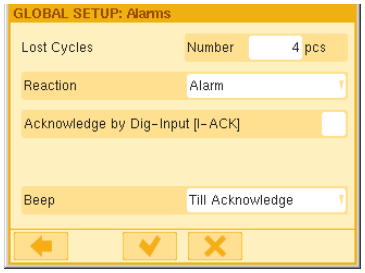
Example:
Reading out process values.
Entry and exit value of EO-2.

4.3.11 Configuring Warnings and Alarms

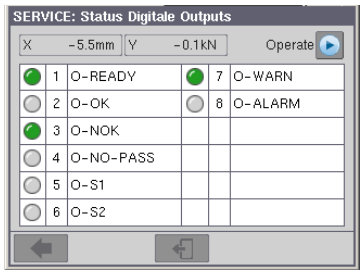
Warning and alarm messages can be configured in this group of menus.



"NOK in Series"Problem
This is used to specify the response to a certain number of NOKs in series: "Alarm", "Warning" or "Without". The series of NOKs must originate from the same MP.

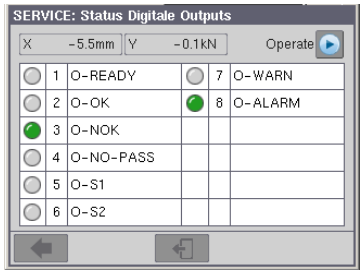


"Lost Cycles in Series"Problem
This is used to specify the reaction to the result: ALARM, WARNING or none at all. A Lost Cycle occurs if the maXYmos receives a START command in the form of the external signal START=1 before the preceding cycle has been ended (with READY=0).
IMPORTANT! Change "Reaction" field from "Without" to "Warning" or "Alarm" to enable the other fields!



Difference between Warning and Alarm:

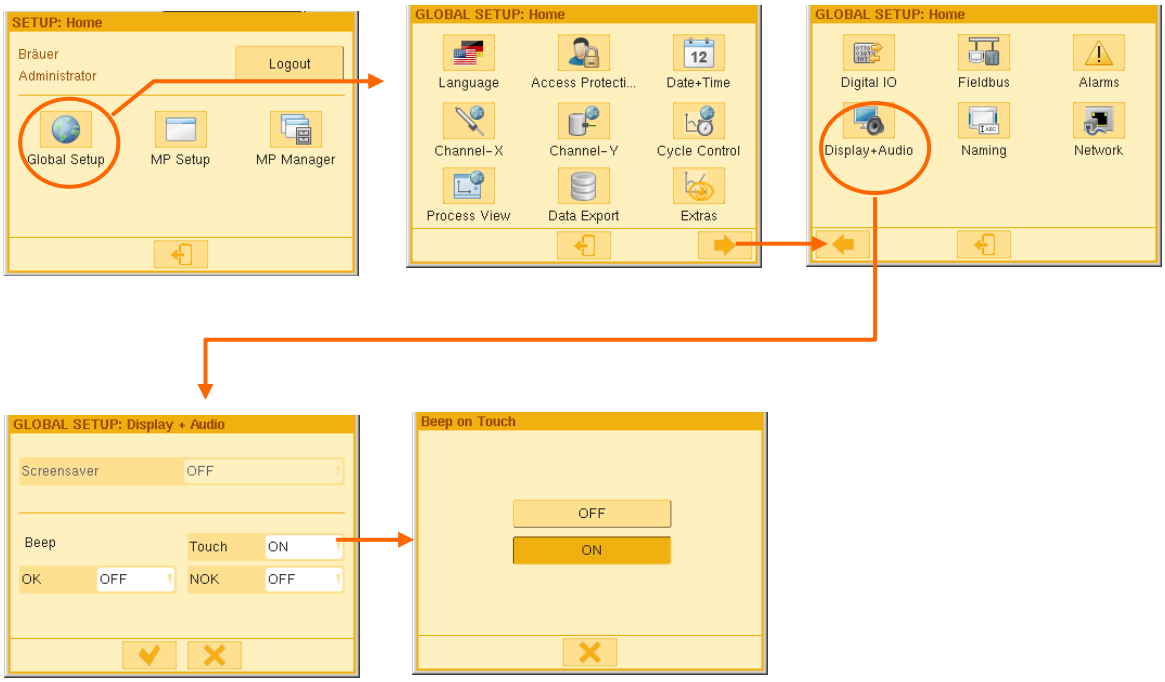
Warning
1. Output O-WARN is set (see left).
2. The yellow warning signal on the sidebar flashes. 
3. The cause of the warning is in the list.
4. Production can be continued, as READY is still enabled.



Alarm
1. Output O-ALARM is set (see left).
2. The red alarm on the sidebar flashes. 
3. The cause of the alarm is in the list.
4. Production cannot be continued, as READY remains on zero until acknowledgement is received. It is necessary to intervene!

See p.14 for handling of warnings and alarms.

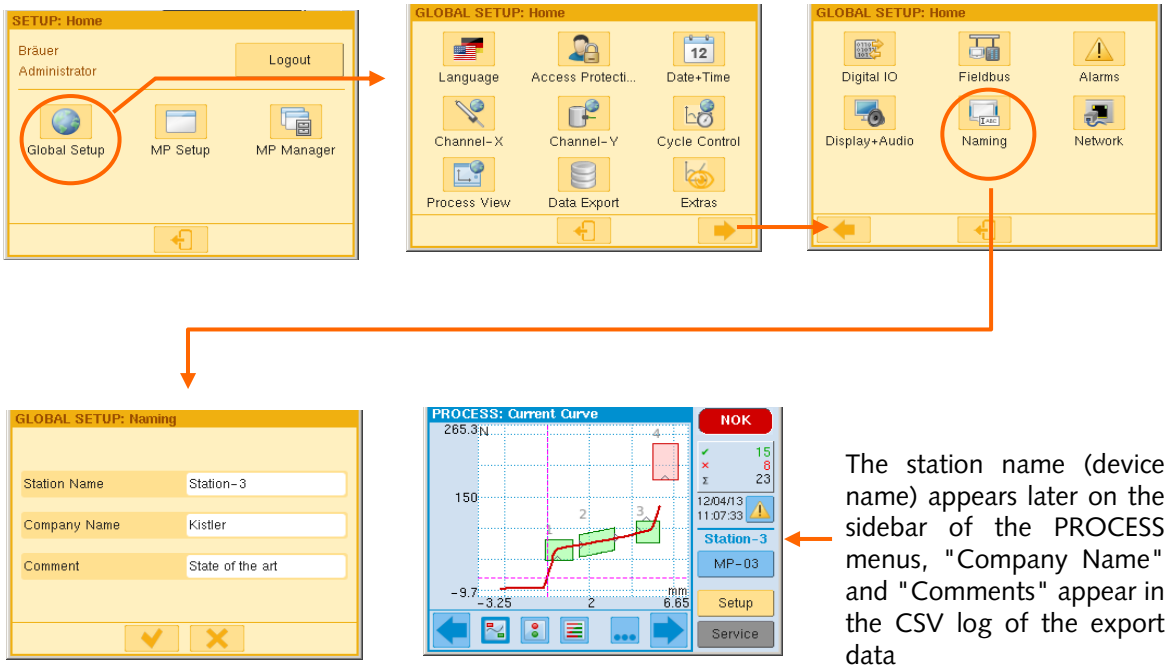
4.3.12 Display Audio Setup



NOTE

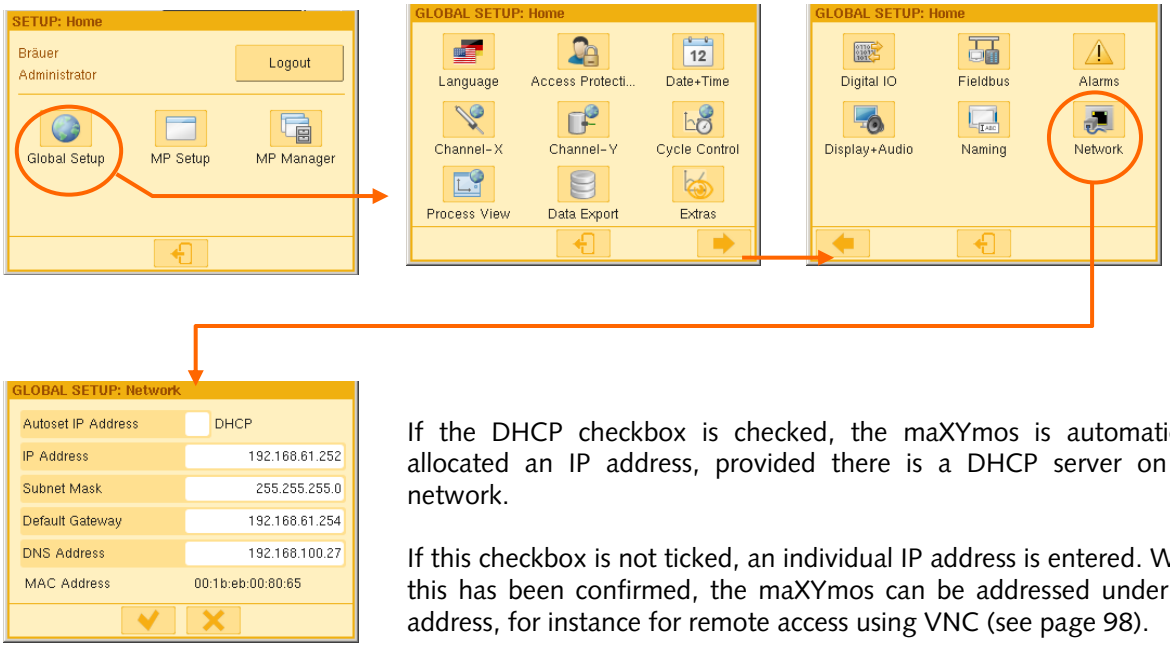
The "Screensaver" function" is available from firmware Version 1.2.

4.3.13 Naming



The station name (device name) appears later on the sidebar of the PROCESS menus, "Company Name" and "Comments" appear in the CSV log of the export data

4.3.14 Network Setup

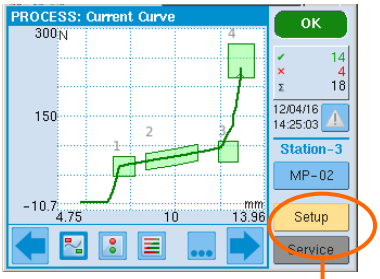


If the DHCP checkbox is checked, the maXYmos is automatically allocated an IP address, provided there is a DHCP server on the network.

If this checkbox is not ticked, an individual IP address is entered. When this has been confirmed, the maXYmos can be addressed under this address, for instance for remote access using VNC (see page 98).

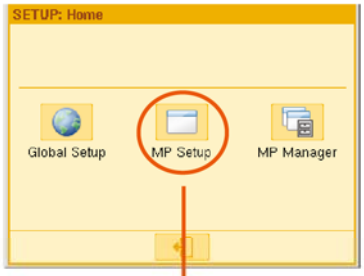
4.4 Measuring Program-specific Setup

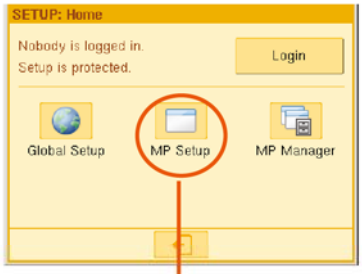
4.4.1 Accessing MP-specific Setup

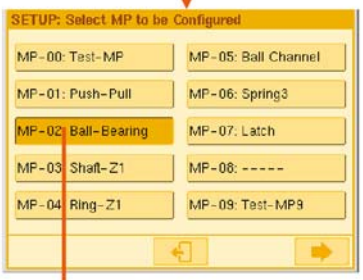


"Operate without Access Protection" is set to "Yes" (see page 23). A login procedure is not required.

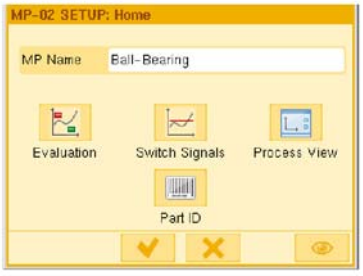
"Operate without Access Protection" is set to "No". A login procedure is required.





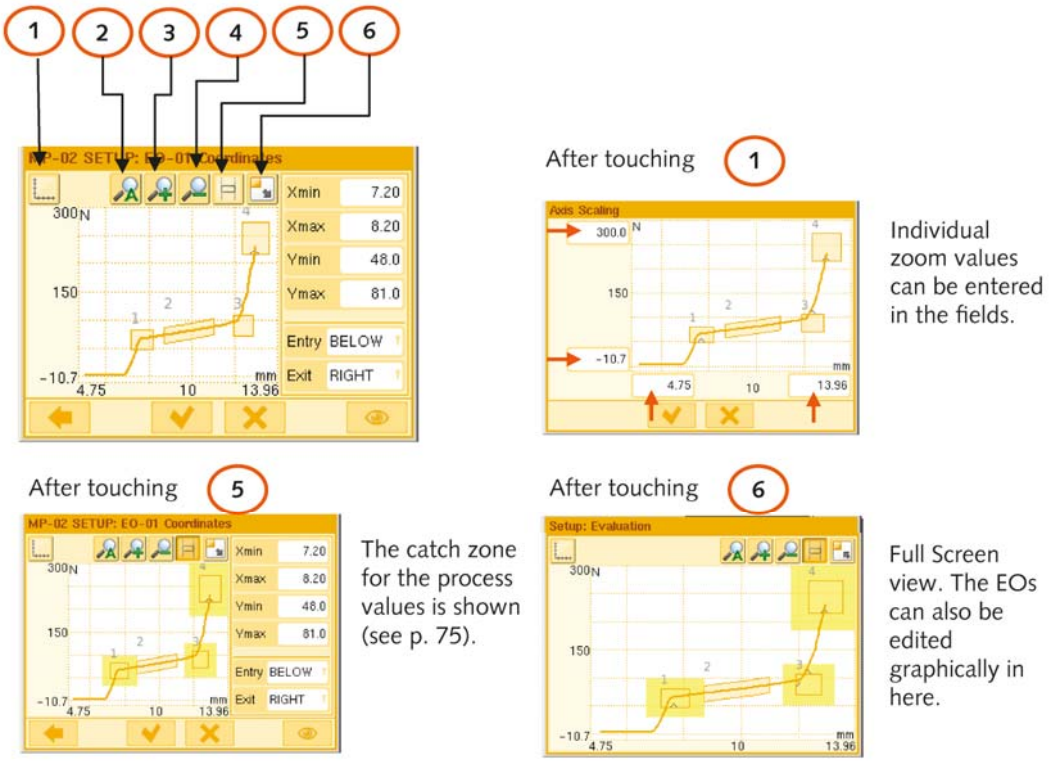


Before the MP-specific setup is performed, the MP to be edited must be chosen. The PROCESS MP active at this point in time is not also switched.



4.4.2 Editing Evaluation Objects – EO Editor

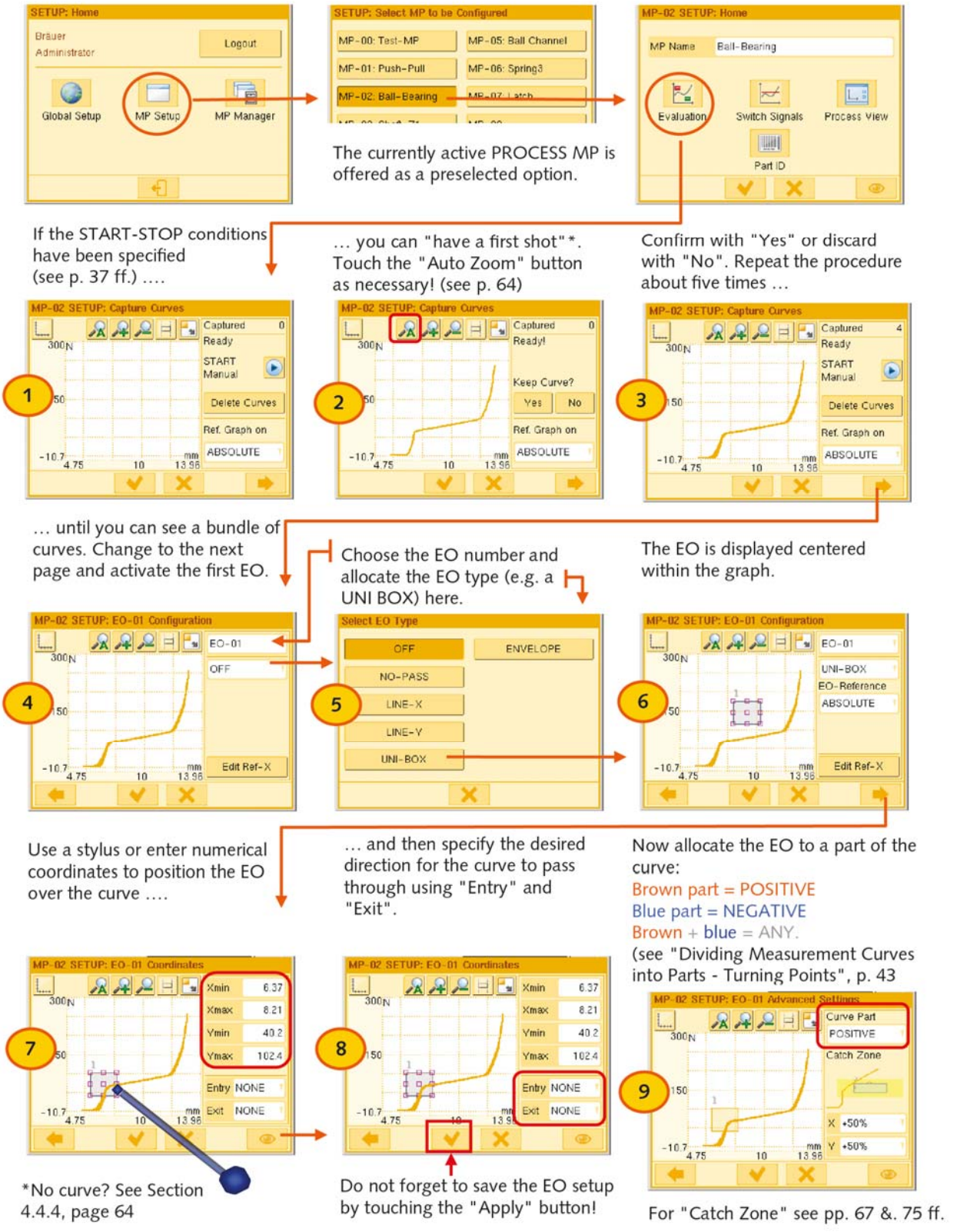
4.4.2.1 Function of Tool Buttons in EO Editor



Button	Purpose	Comments
1	Enter zoom manually	Individual zoom values can be entered in the fields on the axes.
2	Auto zoom	Touching this button zooms the current measurement curves incl. EOs to their limits. The EOs are included. This function is very helpful for setting up the EOs.
3	Zoom in (+)	While the button remains "latched" after being touched, the display zooms in on the graph by one increment each time it is pressed, centering on the point of touch at the same time. The (toggle) button must be touched again to deactivate Zoom+ again.
4	Zoom out (–)	While the button remains "latched" after being touched, the display zooms out from the graph by one increment each time it is pressed, centering on the point of touch at the same time. The (toggle) button must be touched again to deactivate Zoom- again.
5	Superimpose catch zone	Touching this (toggle) button shows the extended catch zone for the process values as a gray area around each EO.
6	Full Screen	The current graph is displayed full screen, with the sidebar on the right hidden.

4.4.3 Setting up Evaluation Objects [EOs]

All of the evaluation objects are set up in the similar way to the procedure shown here for the example of a UNI-BOX. Further details are covered in the section "Types of Evaluation Object" from p. 63. See p. 71 ff. for the additional notes needed for setting an ENVELOPE.



4.4.4 Specifying Reference Point for the EOs

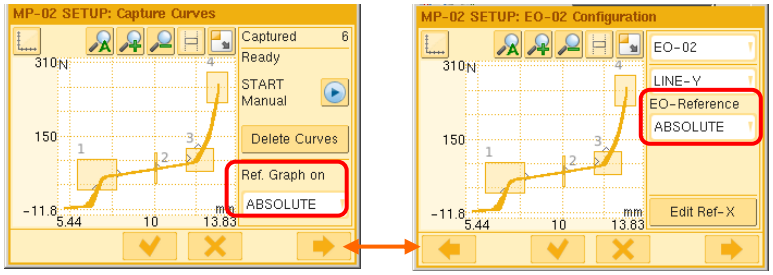
Section 4.4.3 describes how the EOs are positioned over the measurement curve. The default setup of the maXYmos references EOs and measurement curves to the absolute zero of the X-axis, with the parameters "Ref. Graph on" and "EO Reference" initially set to ABSOLUTE. This means that the measurement curve(s) and the EOs are initially specified relative to the absolute (possibly tared!) zero point of channel X. Shifts in the item under test in the X direction then give rise to the measurement curve being correspondingly offset horizontally, which in turn can lead to incorrect evaluations.

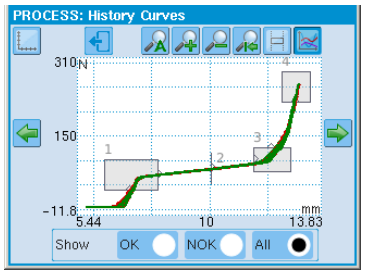
Experiment with the default setting "ABSOLUTE" first before subsequently familiarizing yourself with the effect of the dynamic reference points TRIGGER-Y or BLOCK!

4.4.4.1 Static EO Reference Point "ABSOLUTE"

If there are no problematic external tolerances and it can be ensured that the items under test can always be placed in the same position, for instance under a press, the reference point for the EOs can be left on ABSOLUTE (default).

The curves of 6 items under test give a virtually congruent bundle of curves here. The positioning and the XY characteristics of these parts appear to be perfectly reproducible.





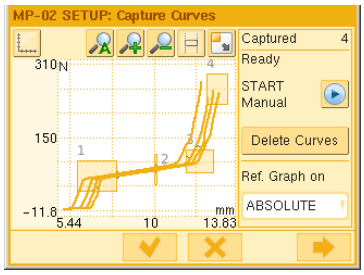
The ABSOLUTE reference point for both curves and EOs clearly leads to evaluation results that can be deemed to be reliable because they are reproducible.

A glance at the History Curves memory of the PROCESS level subsequently confirms this hypothesis (bottom-left screenshot).

You can test the effect of external and positioning tolerances most effectively by assembling the curves of several items under test into a bundle. See also p. 60, Section “Practical example for reference BLOCK”.

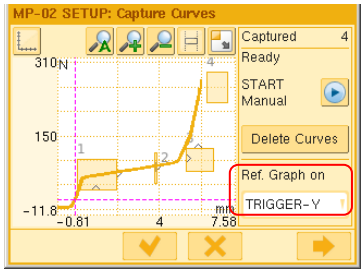
4.4.4.2 Dynamic Reference Point "TRIGGER-Y"

With large positioning tolerances or external tolerances on the item under test itself, the ABSOLUTE zero is unsuitable as reference X. Positioning errors can cause one and the same part to be evaluated as OK one time and NOK the next time.



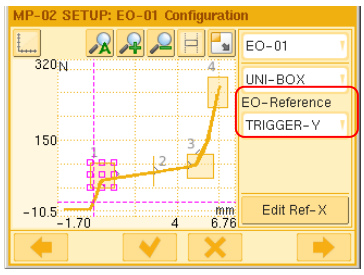
"Ref Graph on" initially still on ABSOLUTE

There is severe, presumably positional, dispersion in the X direction, which makes the bundle of curves extremely fuzzy. Retaining the ABSOLUTE reference point would subsequently lead to many NOK parts. A different reference point has to be found.



Now switch "Ref Graph on" to TRIGGER-Y

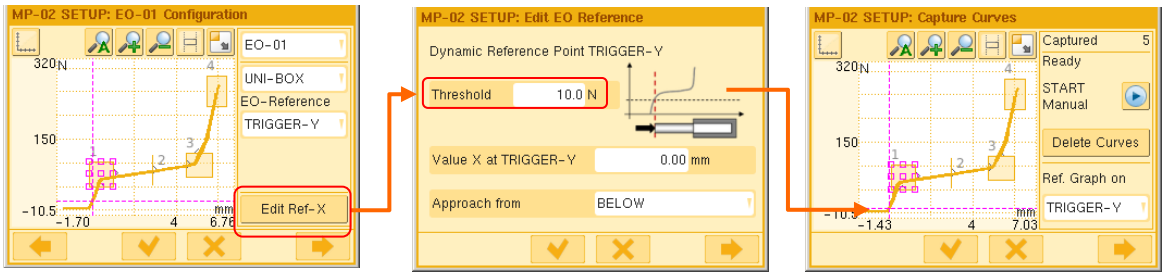
This screenshot shows the same bundle of curves after switching from ABSOLUTE to TRIGGER-Y. All of the curves are now specified relative to the X position (vertical dashed line) when the TRIGGER-Y threshold (horizontal dashed line) is reached. This reference point will subsequently lead to better reproducibility of the evaluation results.



Parameter "EO Reference" also to TRIGGER-Y

After fine adjustment of the EO positions, these are also switched to TRIGGER-Y. However, it is possible to leave individual EOs on ABSOLUTE if, for example, the absolute fluctuations in the block position have to be monitored.

4.4.4.2.1 Editing TRIGGER-Y Threshold

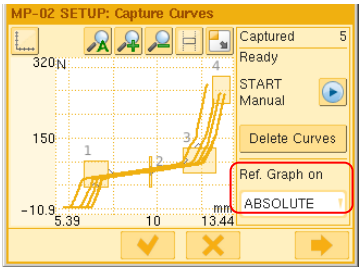


Experiment with the level of the trigger threshold. You will see that the dispersion changes in the different ranges of the bundle of curves. The lower you position the threshold, the more accurate the representation of the dispersion. You then measure from the slightest contact, for example between the feed unit and the item under test (e.g. a spring). The reference point can be set to the dimension on the drawing under the parameter "**X Value at TRIGGER-Y".** This also positions all of the EOs according to drawing dimension.

You should also read section "Finding the suitable reference point, p. 62:
The significance and purpose of dynamic reference points is also described on p. 58.

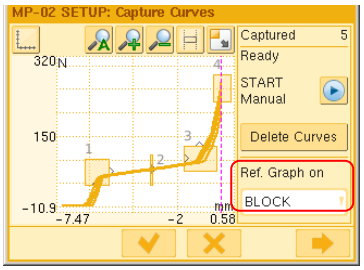
4.4.4.3 Dynamic Reference Point "BLOCK"

If the reference points ABSOLUTE and TRIGGER-Y prove unsuitable because positioning tolerances together with dispersion, for instance in the insertion zone between the parts being joined, cause too much dispersion in the X direction, the reference point BLOCK, i.e. the position at the BLOCK point, may be the correct reference. This can be a location such as the lowest point in a bore, against which a pin is pressed. The EOs are then referenced retrospectively (because the complete measurement curve is available in the memory) relative to the position of this BLOCK point.



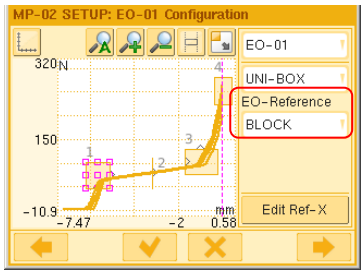
"Ref Graph on" parameter still set to ABSOLUTE

There is severe (presumably positional) dispersion in the X direction. The bundle of curves is extremely fuzzy. Retaining the ABSOLUTE reference point would subsequently lead to many NOK parts. A different reference point has to be found.



Now switch "Ref Graph on" parameter to BLOCK

This screenshot shows the same bundle of curves after switching from ABSOLUTE to BLOCK. All of the curves are referenced to the X position (vertical dashed line) at the "BLOCK" point. All of the curves of the bundle now converge with their particular XMAX-X on this line. It is clearly evident that the BLOCK reference point will subsequently lead to significantly more precise evaluation results.

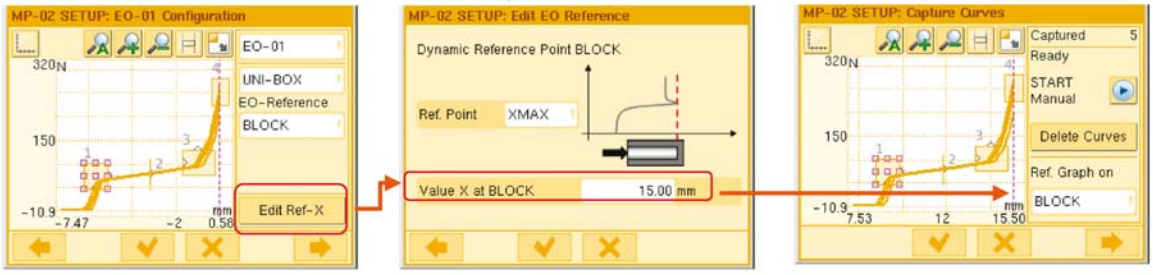


Also switch "EO Reference" parameter to BLOCK

After any fine adjustment of the EO positions these positions are now also switched to BLOCK. They are therefore a fixed distance from the dashed BLOCK line. It is, however, possible to leave individual EOs on ABSOLUTE, for example if the absolute fluctuations of the block position also have to be monitored.

4.4.4.3.1 Editing Reference BLOCK

The parameter **"Value X at BLOCK"** can be used to set the BLOCK point to the dimension

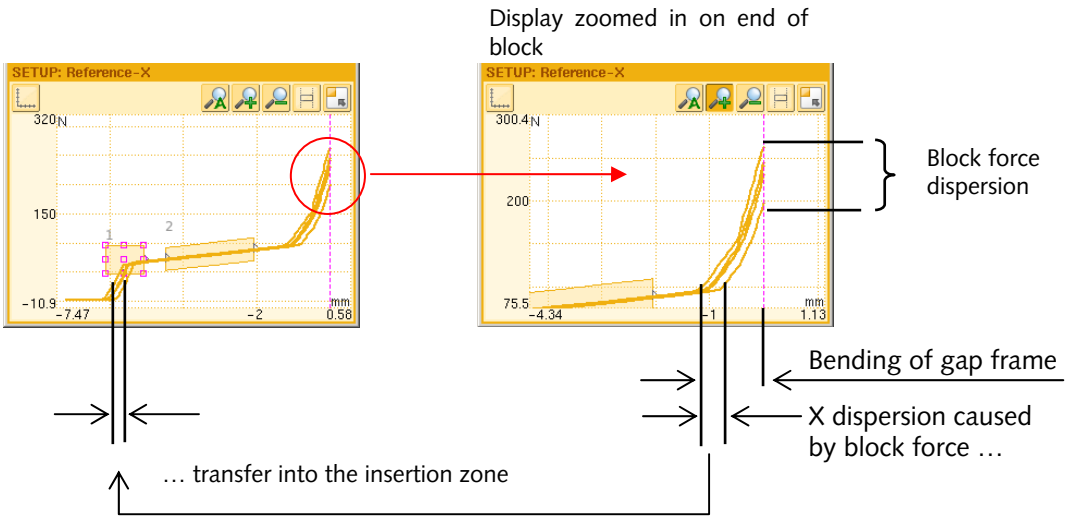


on the drawing (12.0 mm in this case). This also sets the positions of all of the EOs to the drawing dimension. The default value of this parameter is "0". In this case the X coordinates of all of the EOs positioned on the left of the BLOCK line have negative values!

You should also read section: “Finding suitable reference point” , p. 62.
The significance and purpose of dynamic reference points are also described on p. 61.

4.4.4.3.2 Optimizing BLOCK to Improve Reproducibility

Blocking forces on manual presses often depend on the particular force being applied by the operator. If curves ("Ref. Graph on") and evaluation objects ("EO Reference") are referenced relative to BLOCK, the block force measurement curves can be displaced in the X direction so the evaluation results become uncertain:



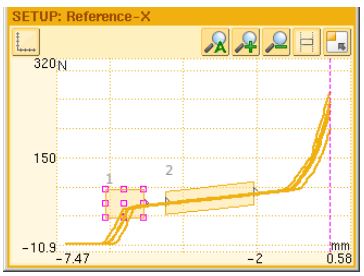
The bending and hence the X dispersion at the block point is inevitably continued into the front insertion zone of the curve. This produces an apparent lengthening of the displacement due to force. The setpoint limits (of EO-1 in this case) have to be made more generous than required by the tolerances actually specified.

4.4.4.3.3 Elimination of Dispersion Caused by Block Force

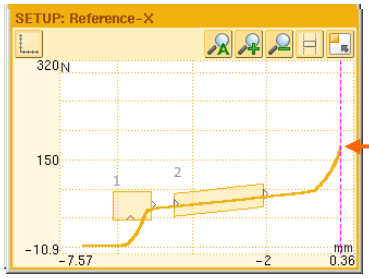
Switch the STOP condition to "Threshold-Y". Choose a value that the operator always has to achieve (170 N in the example). Subsequent curve capture will stop when exactly this force is reached. The bending at the STOP point is then the same for all curves.

Delete the old bundle of curves and now capture a new one (with the new STOP condition this time). This eliminates the dispersion caused by the block force.

Before



After

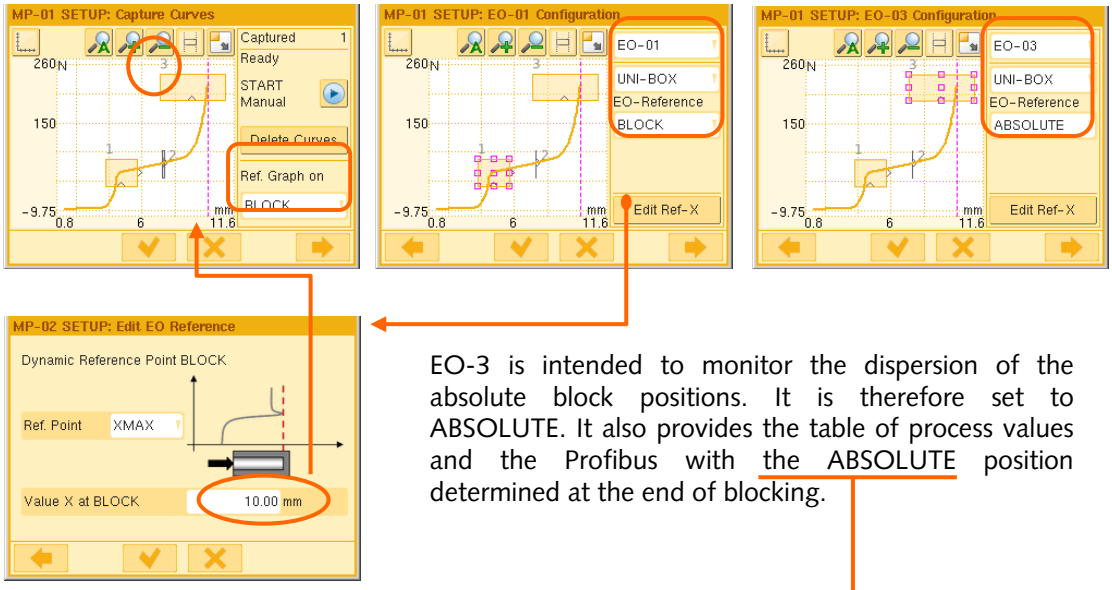


The bundle of curves consists of 10, now almost congruent, curves. At 170 N each curve is cut off (truncated) and converges on the BLOCK line with its XMAX.

4.4.4.3.4 Practical Example for Reference BLOCK

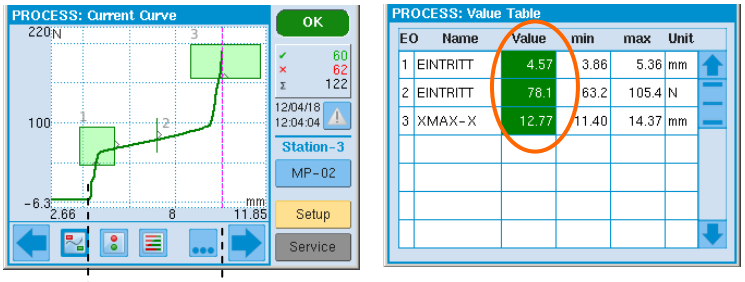
The process of press fitting a pin into a housing is to be monitored. External tolerances on the housing have led to BLOCK being chosen as reference point. The measurement curves and all of the EOs apart from EO-3 are specified relative to this reference point.

SETUP in EO Editor:

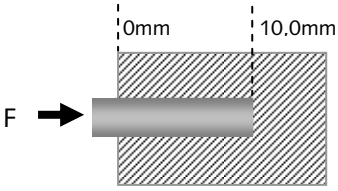


EO-3 is intended to monitor the dispersion of the absolute block positions. It is therefore set to ABSOLUTE. It also provides the table of process values and the Profibus with the ABSOLUTE position determined at the end of blocking.

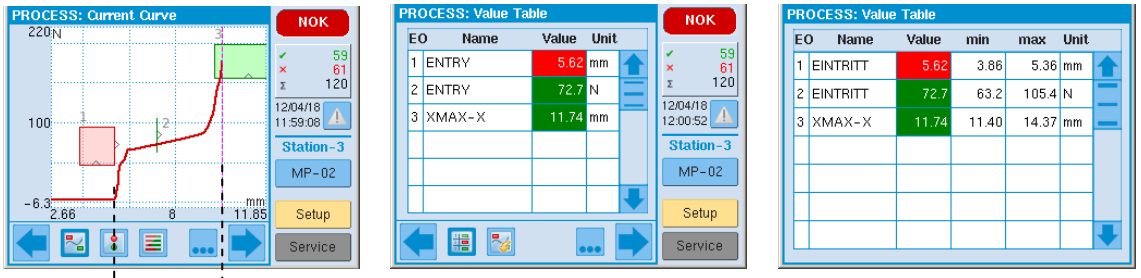
PROCESS Results:

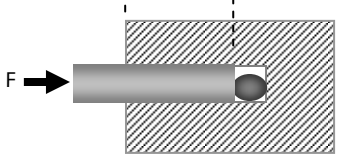


← Insertion position, Ref. BLOCK
← Joining force at 5,0 mm Ref. BLOCK
← BLOCK position Ref. ABSOLUTE.



OK result: The entire displacement involved in press fitting is covered. The length of the curve and its shape are within the specified tolerances. The insertion position is the correct distance from the block point, which is interpreted by EO-1 as OK.





NOK result: As the displacement involved in press fitting is limited by a foreign body, the block force is reached earlier. The insertion position is therefore too close to the block point; EO-1 is missed and generates NOK.

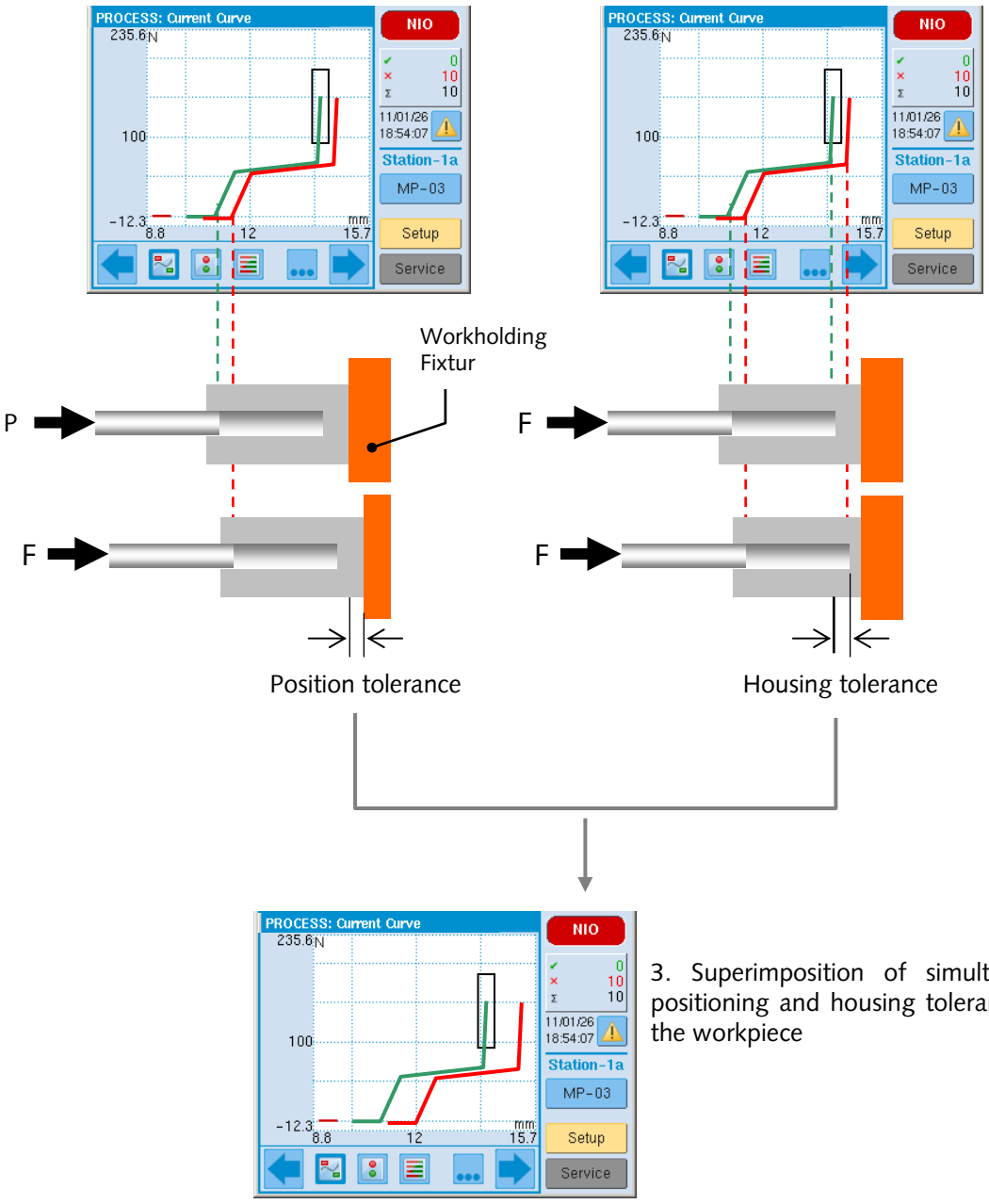
4.4.4.4 What is the Purpose of Dynamic Reference Points?

External tolerances are often not covered by quality control but are nevertheless superimposed on the measurement curve in the X direction. When the ABSOLUTE static reference point is being used they inevitably lead to horizontal offsetting of the measurement curve and hence often to NOK. Even GOOD parts are then evaluated as NOK.

Example: Horizontal displacement of the measurement curves caused by

1. Superimposition of positioning tolerances of the workholding fixture

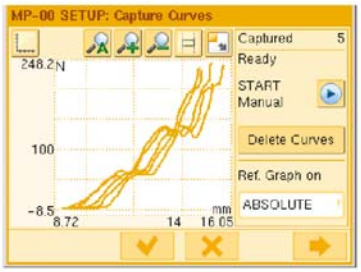
1. Superimposition of external tolerances of the housing of the



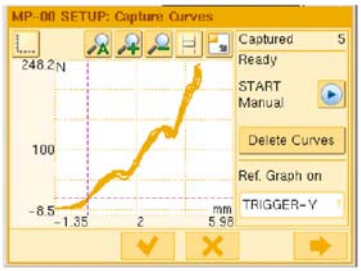
3. Superimposition of simultaneous positioning and housing tolerances of the workpiece

4.4.4.5 Finding Suitable Reference Point

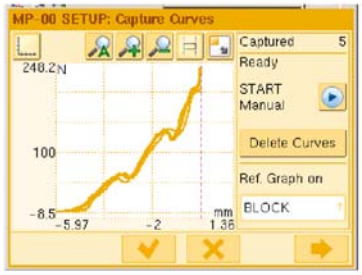
Once a bundle of curves has been "adjusted", the setter can find the most suitable reference point by then switching to TRIGGER-Y, BLOCK or ABSOLUTE.



1. All curves and the EO are referenced relative to ABSOLUTE. They are now referenced relative to the absolute (possibly tared) . Dispersion in the X direction that is presumably caused by positioning tolerances is clearly evident here.



2. The same bundle of curves after switching to reference TRIGGER-Y. All of the curves consequently pass through the point of intersection (trigger point) of the two dashed lines.

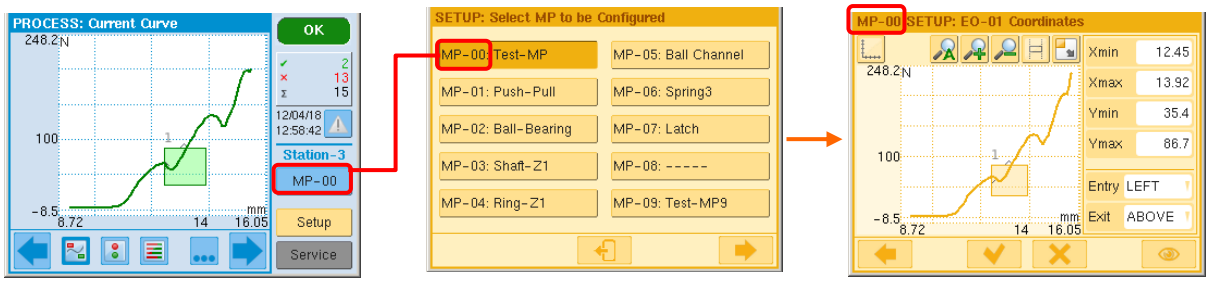


3. The same bundle of curves after switching to Reference BLOCK: The vertical dashed line is the common reference point BLOCK. The XMAX points of all of the curves now converge on this line.

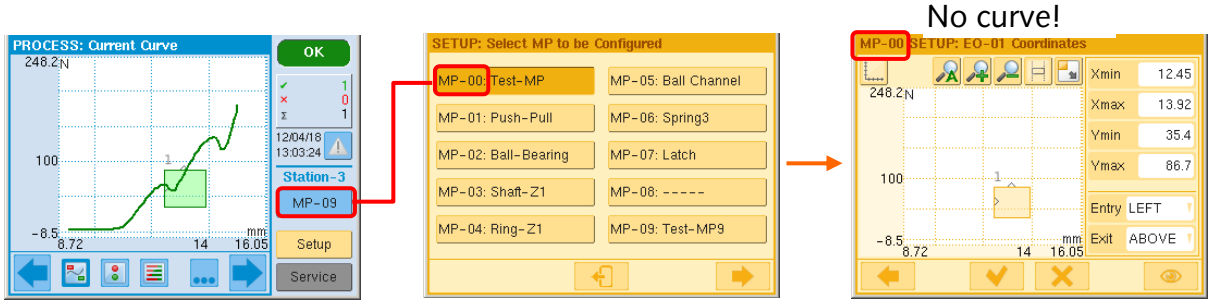
4.4.4.6 No Curve in EO Editor

Always ensure the number of the active PROCESS MPs (blue box) agrees with the number of the Setup MPs (orange box), otherwise you will not see any curve.

PROCESS MP No. = SETUP MP No. (menu sequence shortened!)

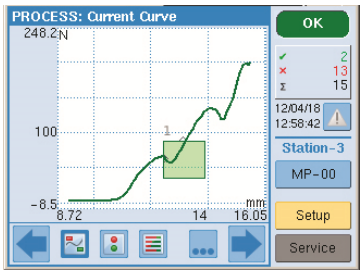


PROCESS MP No. ≠ SETUP MP No.



4.4.5 Testing Newly Set Up Evaluation Objects

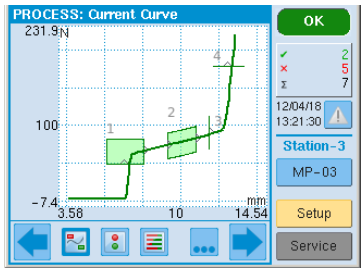
Change over to the PROCESS main menu:

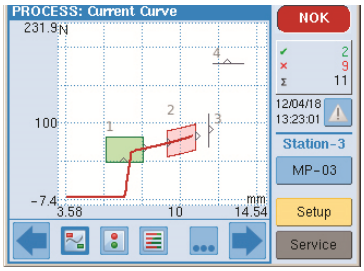


Now run several cycles and assess the evaluation results. Correct reference points and/or the EO coordinates as necessary.

4.4.6 Types of Evaluation Object

The maXYmos BL offers a total of five types of evaluation object [EOs]. Four of these can be specified for each measurement curve or for each measurement program.



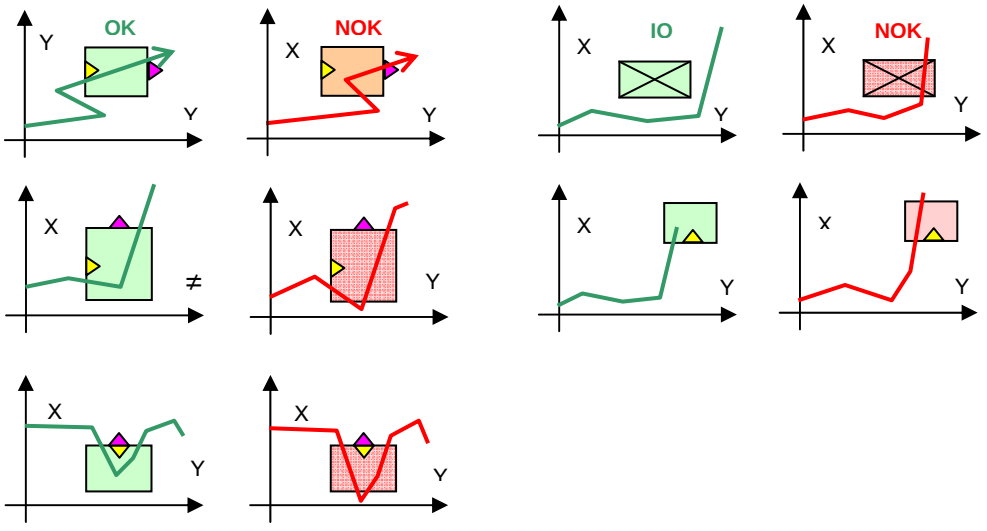


4.4.6.1 Evaluation Object [EO] UNI-BOX

4.4.6.1.1 Evaluation Criterion

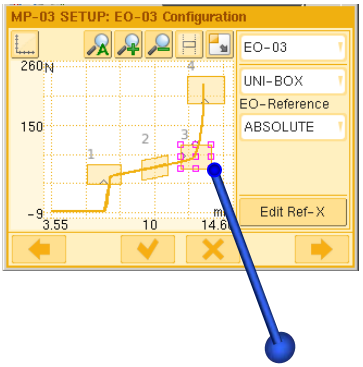
The measurement curve must enter through the specified entry side once and leave through the specified exit side once. Any sides can be defined as entry and exit side. The first point of intersection of the curve with a boundary of the box is the entry event, the following point of intersection with a boundary of the box the exit event.

Example cases



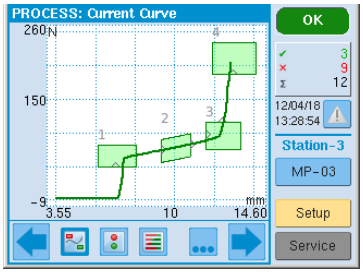
4.4.6.1.2 Positioning UNI-BOX over Measurement Curve

See also Section: "Setting up Evaluation Objects [EOs]", p. 55



Left: Positioning the UNI-BOX with a stylus or numerical entry in the EO Editor

Right: UNI-BOXes in the PROCESS View



4.4.6.1.3 Obtaining Process Values from the UNI-BOX

With the UNI-BOX, provision of process values depends on the configuration and they are best obtained for the particular EO in the dialog "Process View" --> "Value Table" (see p. 65, p.13 ff. and p. 76 ff.). These process values can be displayed in the PROCESS Value Table later or transferred via fieldbus.

ENTRY Process Value
This is captured at the point of intersection of the curve with the box line defined as ENTRY and to the boundary of the catch zone (extended entry line). A value is only provided if an entry line is also defined.

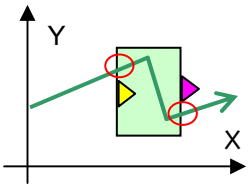
EXIT Process Value
This is captured at the point of intersection of the curve with the box line defined as EXIT and to the boundary of the catch zone (extended exit line). A value is only provided if an exit line is also defined.

.

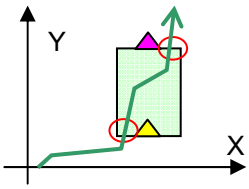
Note! For horizontal box lines the process value is always an X value, for vertical box lines it is a Y value.

Example cases:

ENTRY (Y)
EXIT (Y)



ENTRY (X)
EXIT (X)



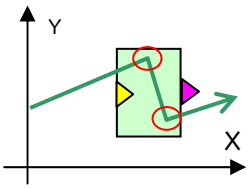
Min-Max Process Values
Within the boundaries of a box and to the boundary of any catch zone defined. Depending on the configuration they can be:

XMIN-X / XMIN-Y (smallest X value and the associated Y value)
XMAX-X / XMAX-Y (largest X value and the associated Y value)

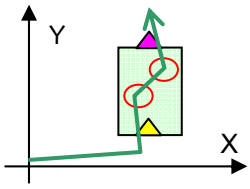
YMIN-Y / YMIN-X (smallest Y value and the associated X value)
YMAX-Y / YMAX-X (largest Y value and the associated X value)

Example cases:

YMAX-Y / YMAX-X
YMIN-Y / YMIN-X



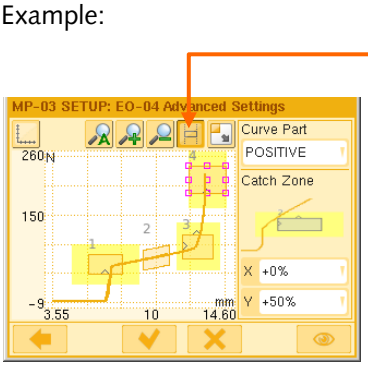
YMAX-X / YMAX-Y
YMIN-X / YMIN-Y



4.4.6.1.4 Specifying Catch Zone of UNI-BOX

See also Section: "Catch Zone for Process Value, p. 73 ff."

Example:

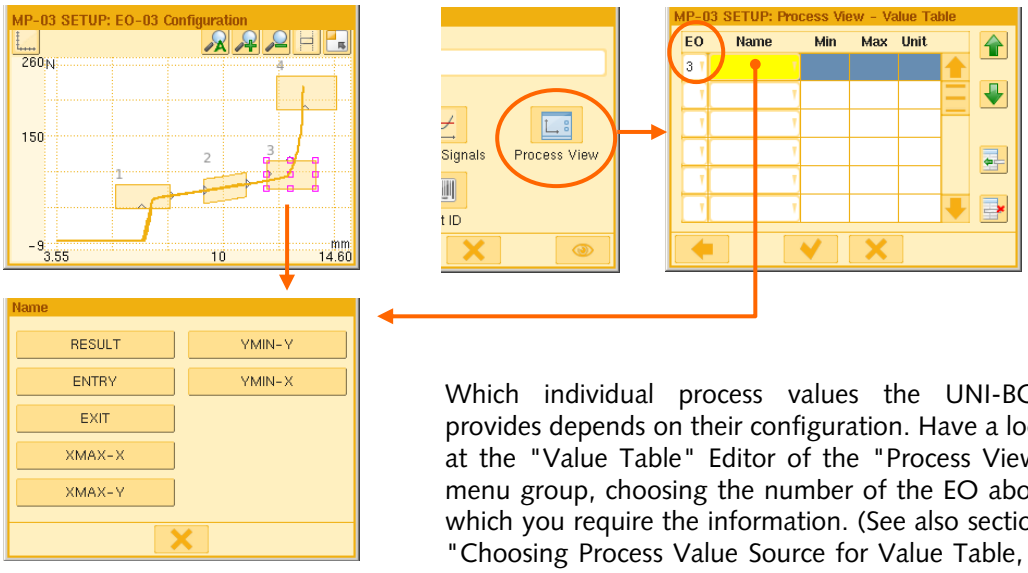


The catch zones, within which process values are still "caught", are specified separately in the EO Editor for each EO (see adjacent screenshot).

For EO-01 a catch zone of 50% in X- and Y-direction (yellow area) has been defined here. Within this zone the process values preset by the particular EO configuration are "caught" (See p. 65 for selection).

IMPORTANT! OK-NOK evaluation is based entirely on the boundaries of the box. The catch zone only ensures that process values are also captured beyond these boundaries. If, for example, the entry side of a box is missed, finding out the distance of the curve from the entry boundary can be of statistical interest .

4.4.6.1.5 Which Process Values Does UNI-BOX Provide?



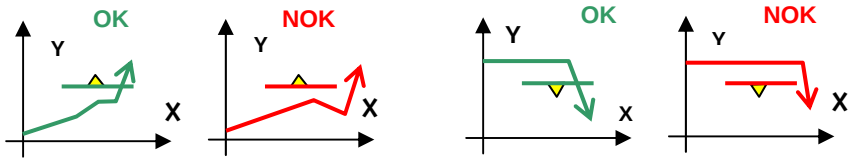
Which individual process values the UNI-BOX provides depends on their configuration. Have a look at the "Value Table" Editor of the "Process View" menu group, choosing the number of the EO about which you require the information. (See also section: "Choosing Process Value Source for Value Table, p. 78)

4.4.6.2 Evaluation Object [EO] LINE-X

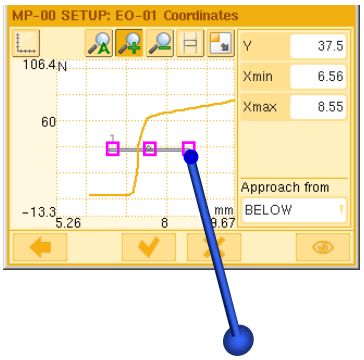
4.4.6.2.1 Evaluation Criterion

The measurement curve has to cross LINE-X once in the specified direction, i.e. coming from ABOVE or from BELOW. LINE-X monitors whether an X value remains within the tolerance band limits XMIN and XMAX. The process value is also an X value.

Example cases

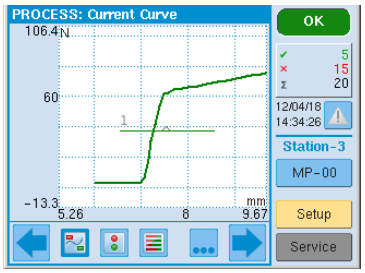


4.4.6.2.2 Positioning LINE-X over Measurement Curve



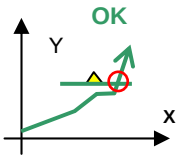
Left: Positioning a LINEX element with a stylus or numerical entry

Right: LINE-X in the PROCESS view

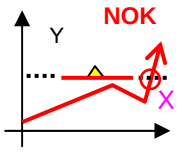


4.4.6.2.3 Obtaining Process Value from LINE-X

The process value ENTRY is the X value at the point of intersection of the curve with the LINE-X element and its horizontal extension in the catch zone. This value is displayed on the PROCESS page "Value Table" (see p. 13 ff., p. 67 and p. 76 ff.) or transferred via fieldbus.

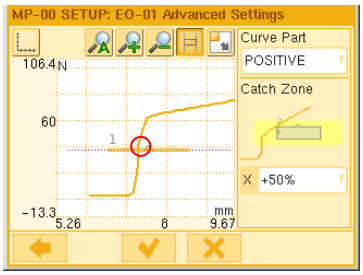


LINE-X supplies the X value at the point of intersection of the curve with the line (left diagram) or with its extension within the X catch zone (right diagram).



4.4.6.2.4 Specifying Catch Zone for LINE-X

See also Section "Catch Zone for Process Value, p. 73 ff."

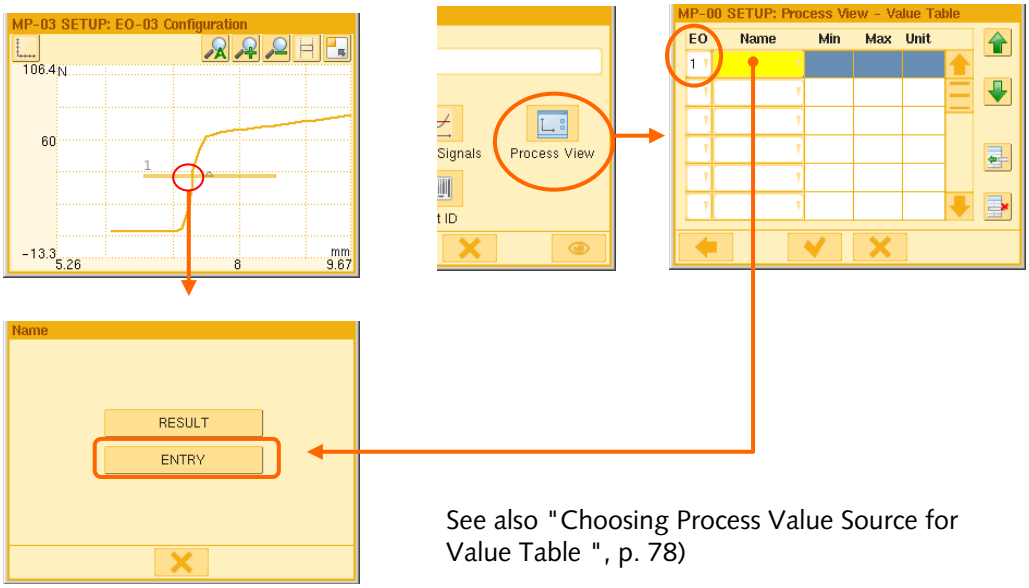


The catch zone, within which process values are still caught, is specified separately for each EO (left screenshot). It is specified as a percentage of the particular width or height of the EO.

50% has been chosen here as catch zone. Consequently, process values are still captured at the LINE-X line extended 50 % to the left and 50 % to the right (relative to the width of this evaluation object).

IMPORTANT! The actual evaluation is carried out entirely on the basis of the LINE-X limits. The only purpose of a catch zone is to ensure process values are also captured beyond these limits. If LINE-X is missed, the distance away the measurement curve passes by can be of statistical interest.

4.4.6.2.5 Displaying Process Value of LINE-X in Value Table



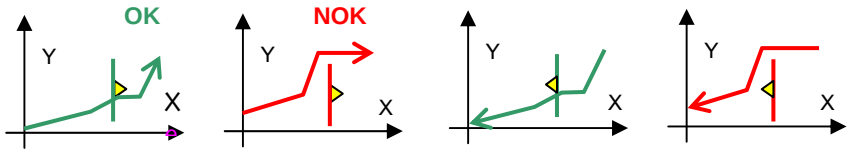
See also "Choosing Process Value Source for Value Table ", p. 78)

4.4.6.3 Evaluation Object [EO] LINE-Y

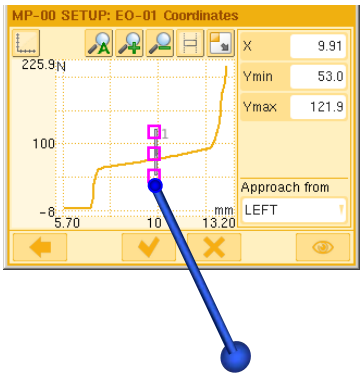
4.4.6.3.1 Evaluation Criterion

The measurement curve must cross LINE-Y once in the specified direction, i.e. coming from the RIGHT or from the LEFT. LINE-Y monitors whether a Y value remains within its tolerance band limits YMIN and YMAX. The process value is also a Y value.

Example cases

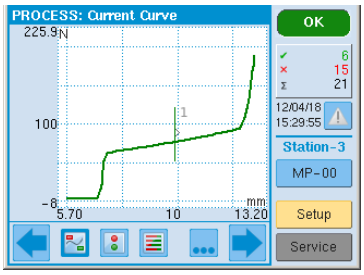


4.4.6.3.2 Positioning LINE-Y over Measurement Curve



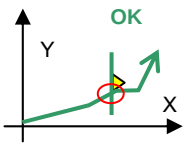
Left screenshot: Positioning a LINE-Y with stylus or a numerical entry in the EO Editor

Right screenshot: LINE-Y being used for evaluation in the PROCESS View.

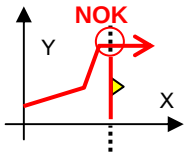


4.4.6.3.3 Obtaining Process Value of LINE-Y

The process value ENTRY is the X value at the point of intersection of the curve with the LINE-Y element and with its vertical extension in the catch zone. This value can be displayed on the PROCESS page "Value Table" (see p. 13 ff., p. 69 and p. 76 ff.) or transferred via fieldbus.

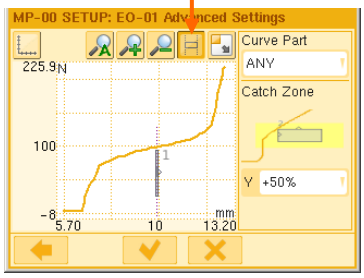


LINE-Y provides the X value at the point of intersection of the curve with the line (red circle on left diagram) or with its extension within the catch zone (dashed extension in right diagram).



4.4.6.3.4 Specifying Catch Zone for LINE-Y

See also section: "Catch Zone for Process Value", p. 73 ff.



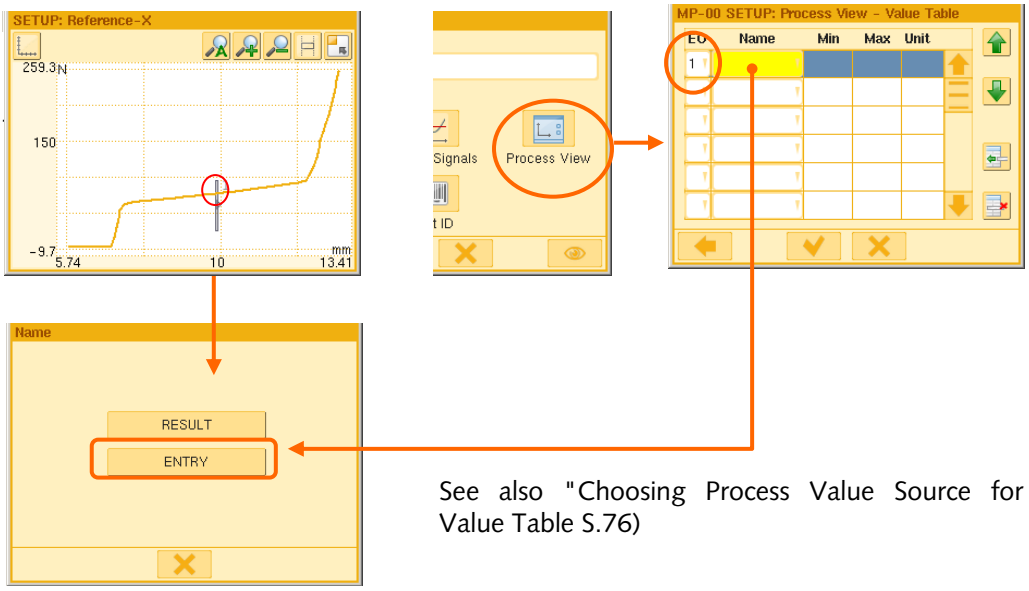
"Display Catch Zone" button

The catch zone, within which process values are still caught, is specified separately for each EO (left screenshot). It is specified as a percentage of the particular width or height of the EO (see adjacent screenshot)

50% has been chosen here as catch zone. Process values are therefore still captured at the LINE-Y line extended 50 % above and 50 % below (relative to the height of this evaluation object).

IMPORTANT! The actual evaluation is carried out entirely manually on the basis of the LINE-X limits. The only purpose of the catch zone is to ensure that process values are captured even beyond these limits. If LINE-Y is missed, the distance away the measurement curve passes by can be of statistical interest.

4.4.6.3.5 Showing Process Value of LINE-Y in Value Table



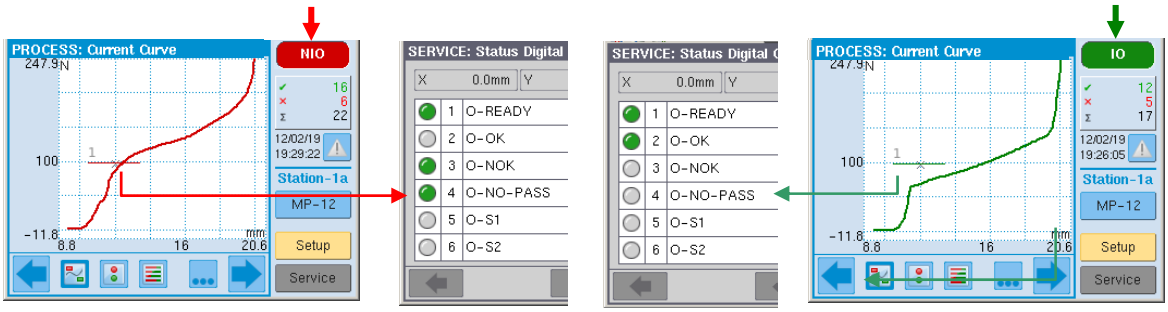
See also "Choosing Process Value Source for Value Table S.76)

4.4.6.4 Evaluation Object [EO] NO-PASS

4.4.6.4.1 Evaluation Criterion

This EO must not be crossed, otherwise it generates NOK and sets the online output O-NO-PASS in real time (<1ms) to "1". The desired pass direction is always from below to above. The O-NO-PASS output remains on "1" until the next START condition met. NO-PASS can only be referenced relative to ABSOLUTE. Only one NO-PASS can be set for each measurement program.

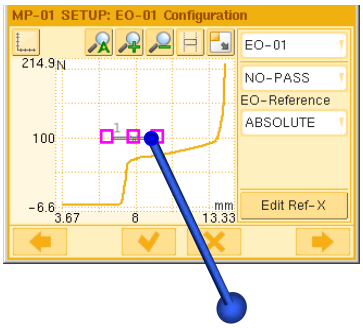
Example cases



The EO is used mainly where what matters is quick response, for example in the insertion zone during press-fit processes. Excessively steep force gradients in this zone indicate skewing of the parts being joined, which results in infringement of the NO-PASS line. The press return stroke can then be initiated with O-NO-PASS.

4.4.6.4.2 Positioning NO-PASS

The NO-PASS threshold is positioned mainly in areas in which the measurement curve must not penetrate. NO-PASS is often positioned over the insertion zone of a press-fit curve (see following screenshot).



Positioning a NO-PASS threshold with a stylus or numerical entry in the EO Editor.

4.4.6.4.3 Obtaining Process Value from NO-PASS

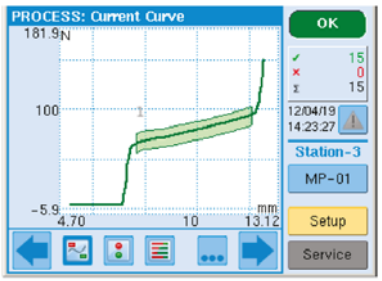
NO-PASS does not provide any process values and therefore does not have any catch zone. (For description of catch zone see section: "Catch Zone for Process Values, p. 73 ff.")

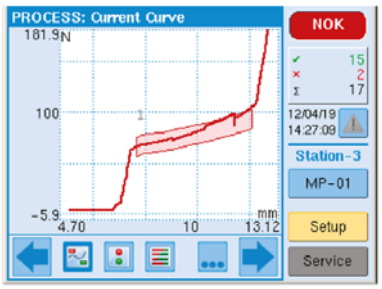
4.4.6.5 Evaluation Object [EO] ENVELOPE

4.4.6.5.1 Evaluation Criterion

The measurement curve must enter through the side of the ENVELOPE defined as ENTRY and leave through the side defined as EXIT, without infringing the top or bottom boundary line in the process.

Example cases

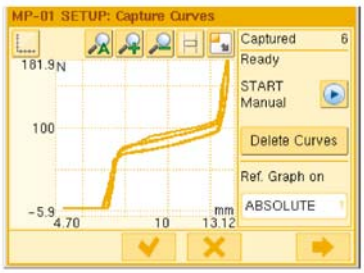




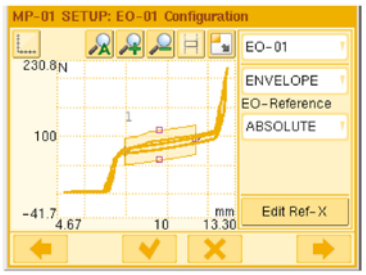
The EO type ENVELOPE is used mainly where evaluation objects need to be taught quickly. It is also suitable for inclined parts of the curves, where a UNI-BOX or several LINE-X elements would provide rather patchy monitoring.

4.4.6.5.2 Positioning ENVELOPE

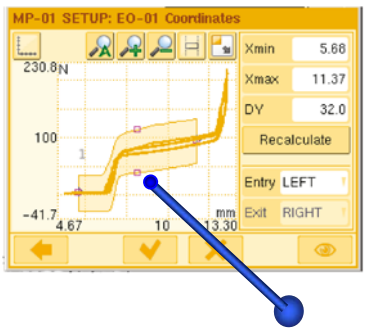
If necessary, consult "Setting up Evaluation Objects [EOs]", p. 55 ff. before reading this section.



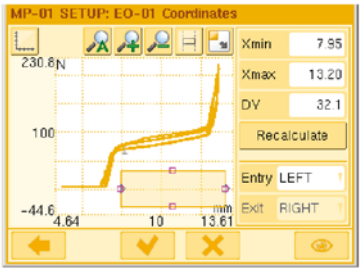
To start with, a bundle of curves is captured whose external contour will subsequently generate the envelope automatically. Measurement curves identified as outliers must therefore be discarded with "No" using the Yes/No procedure. Otherwise such an outlier would be included in the calculation of the envelope.



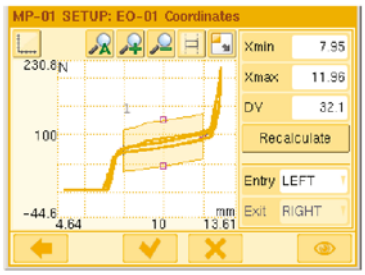
Now activate an EO of the ENVELOPE type. The envelope automatically wraps around the outside contour of the bundle of curves.



Like the UNI-BOX, the envelope can be positioned graphically with its "handles", or using numerical entries. Each time it is moved the boundaries are automatically updated. This process can also be activated using the "Recalculate" button.

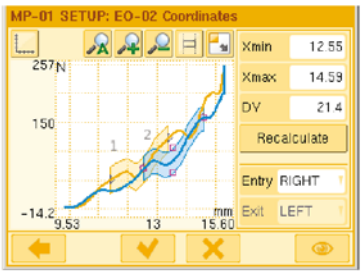


Only those measurement curves that cover the complete X range of the envelope are included in its generation. In the adjacent example none of the curves meet this condition, so the ENVELOPE "drops" onto the X-axis.



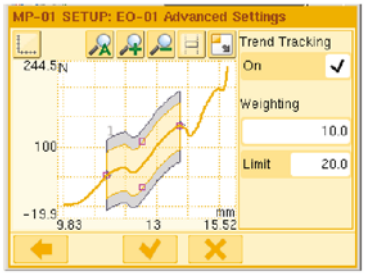
However, as soon as these conditions have been met, for example by moving the right-hand exit side to the left, the envelope will spring back onto the bundle.
The envelope can also be updated by dragging a corner or with the "Recalculate" button

4.4.6.5.3 Allocating ENVELOPE to one Part of Curve

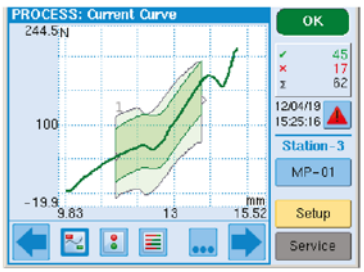


If the measurement curve consists of a forward (POSITIVE) and a return part (NEGATIVE), the envelope can be allocated to one of these parts. The brown envelope then evaluates just the brown, the blue envelope just the blue part of the curve. The particular allocation is made using the "Entry" parameter.

4.4.6.5.4 Activating ENVELOPE Trend Tracking

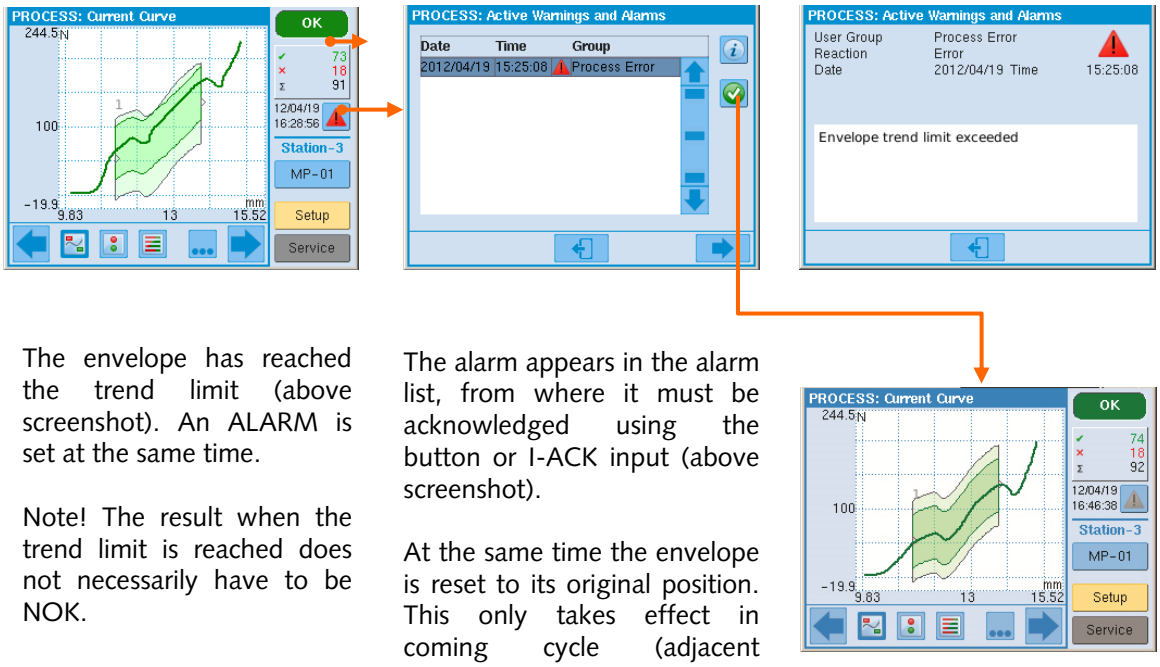


This function is activated by ticking the "Trend Tracking" checkbox. Its purpose is to compensate for creeping drift in the Y values of the measurement curves, for example when tools wear, by selectively migrating the Y limits of the envelope. As soon as the envelope has then reached the outside trend limit, a WARNING message is output (plus O-WARN). Parameter weighting determines the effect of an anomalous measurement curve on the envelope (10=high, 100=low)



Adjacent screenshot: The envelope has migrated as a result of the gradual drifting away of the measurements in the direction of the upper trend limit, which it has already reached.

Note! Only OK curves are ever included in trend tracking. NOK curves are ignored.



The envelope has reached the trend limit (above screenshot). An ALARM is set at the same time.

Note! The result when the trend limit is reached does not necessarily have to be NOK.

The alarm appears in the alarm list, from where it must be acknowledged using the button or I-ACK input (above screenshot).

At the same time the envelope is reset to its original position. This only takes effect in coming cycle (adjacent screenshot).

4.4.6.5.5 Obtaining Process Value from ENVELOPE

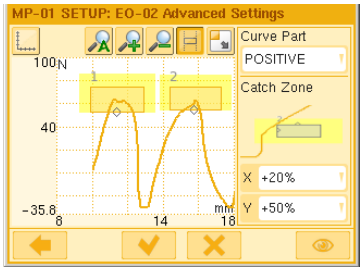
The ENVELOPE element provides two process values, that called ENTRY at the point of intersection of the measurement curve with the entry line, and that called EXIT at the point of intersection of the measurement curve with the exit line. These values can be displayed on the PROCESS page "Value Table" (see p. 13 ff., p. 69 and p. 76 ff.), but can also be transferred via the fieldbus.

Note! A catch zone cannot be defined for ENVELOPE!

4.4.6.6 Catch Zone for Process Values

The only purpose of the catch zone of an evaluation object [EO] is to ensure process values are captured even beyond the boundaries of the box. The catch zone has no effect on the evaluation result (OK/NOK) .

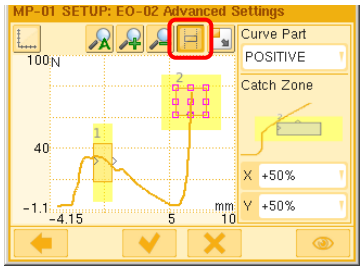
4.4.6.6.1 Significance and Purpose of Catch Zones



To enable better allocation of process values (which EO does which process value belong to?), the catch zones must not overlap. To ensure this a clearly demarcated catch zone is allocated to each EO (adjacent screenshot). For NOK cause diagnosis and NOK statistics it is important to determine even those process values lying outside the setpoint limits (for example, what distance away has the curve passed by the entry line).

4.4.6.6.2 Specifying Size of a Catch Zone

The span of the catch zone can be set separately for each EO. The percentage refers to the width of the particular box boundary in the X- and Y-direction. If no catch zone is required, the parameter is set to 0 % for the particular direction.

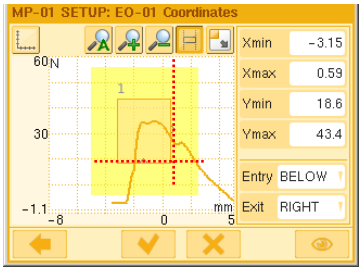


Pressing the "Display Catch Zone" button immediately displays the zones as a yellow area.

IMPORTANT! Moving of EOs is blocked while the button is "latched" on!

EO-specific catch zone for X- and Y-direction

4.4.6.6.3 How are the Catch Zones Formed?



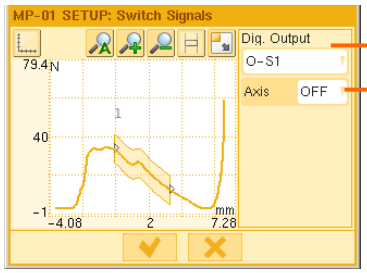
Depending on entry and exit configuration, the catch zones are positioned differently around the particular EO. When the EO is fully configured, touch the "Catch Zone" button (see above screenshot!). The catch zones are now superimposed as yellow areas. Experiment with the percentages for the X- and Y-direction.

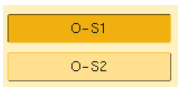
The process values ENTRY and EXIT are captured at the box lines defined as entry and exit and at the (dotted) extensions of these lines right out to the boundary of the catch zone.

With vertical setpoint lines the process value is a Y value, with horizontal setpoint lines it is an X value.

4.4.7 Configuring Switch Signals

The maXYmos has two switch signal outputs (O-S1 and O-S2), each of which can be chosen for allocation to either channel X or channel Y. They can be used for simple control tasks, such as switching a feed unit from "fast" to "slow".
When a freely chosen threshold is reached on the particular allocated channel, a real-time signal is generated.

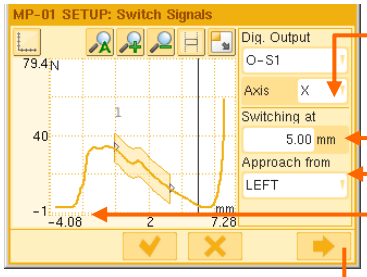




Choose here the output to which you want to allocate the switch signal.

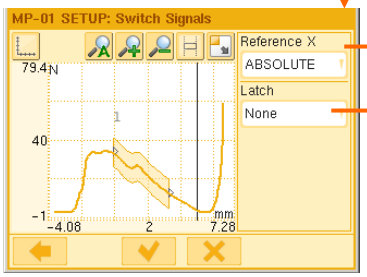
Choose here the axis to which you want to allocate the switch signal.

Note! Other than with the X(t) function, axis = measuring channel

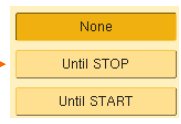


Specify the switching threshold under "**Switching at**".

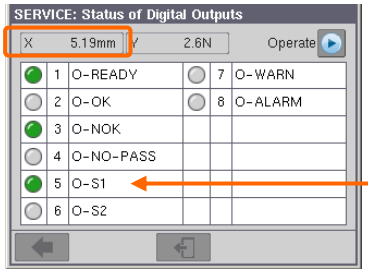
Under "**Approach from**", choose the direction from which the threshold is to be approached.
The switching threshold is displayed as a vertical position corresponds here with the scaling of the X-axis, as both the switching threshold and the curve (parameter "Ref. curve on" = ABSOLUTE (see p. 58 ff.)) are relative to ABSOLUT-X.



Under "**Reference-X**" specify the reference point for the switch signal. This now also applies to a switch signal related to channel X! With TRIGGER-Y the switching threshold is related to the position of the trigger threshold.

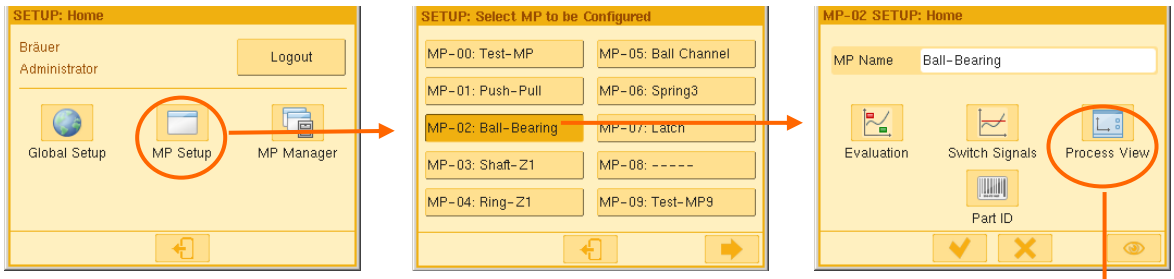


Without: Output changes to "1" if threshold exceeded and returns to "0" if it is undershot
Until STOP: Output is held until STOP
Until START: Output is held until the next START (latch = hold/lock in position)

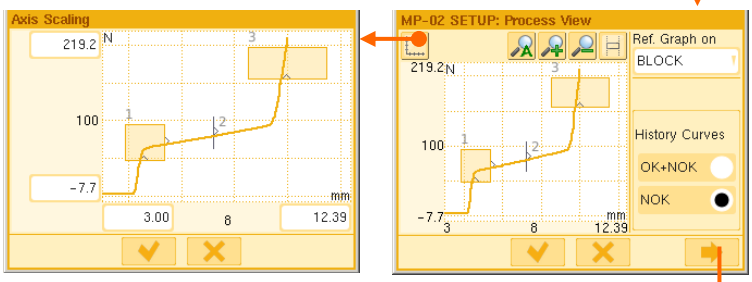


Check the setting on the SERVICE menu → Digital Outputs. When the threshold is reached the allocated output must change to "1" (LED = green).

4.4.7.1 Specifying Process View



4.4.7.2 Setting Scaling, Specifying Reference Point for Graphs of Curves

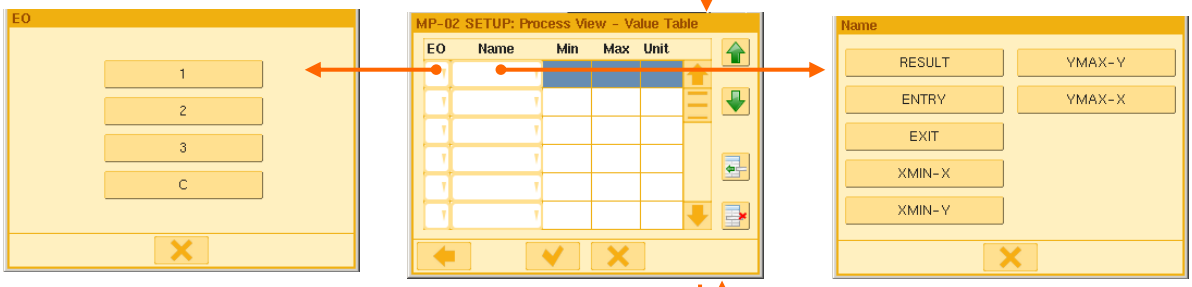


The entry fields on the axes can be used to set an individual scaling value

As in the EO Editor, you can also specify the reference position for the curves here.

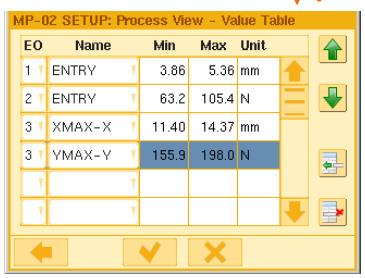
Tip: If you choose NOK here, only the NOK curves of importance to diagnostics are "collected". Subsequent OK curves then do not push these out of the memory again (FIFO)

4.4.7.3 Choosing Process Value Source for Value Table

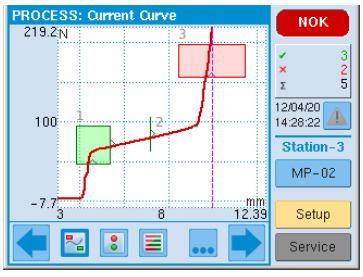


Tap the "EO" field and choose the EO whose process value you want to have displayed. "K" means curve-related values, i.e. values independent of EO.

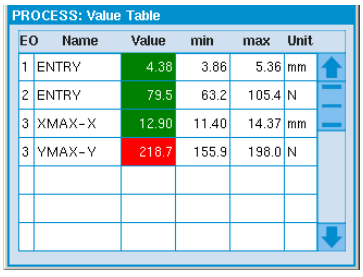
Tap the "Value name" and choose a process value that the chosen EO is to subsequently display in the value table.



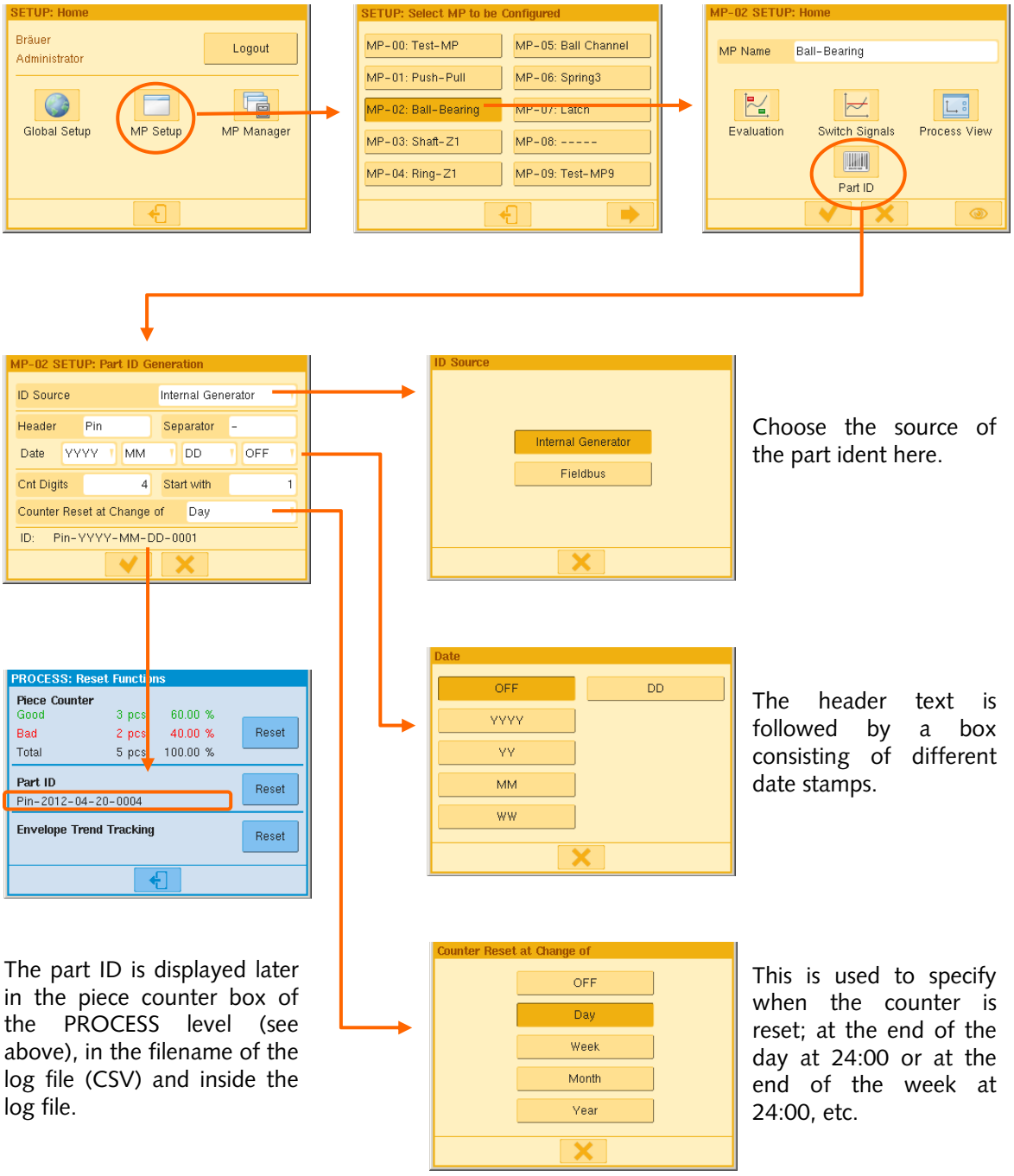
Repeat this procedure until all of the required process values are in the list.



Method of displaying process values of EOs of current measurement curve (left screenshot) in process value table of the (blue) process LEVEL (right screenshot)



4.4.7.4 Part-Ident-Generator – Specifying SN Source



Choose the source of the part ident here.

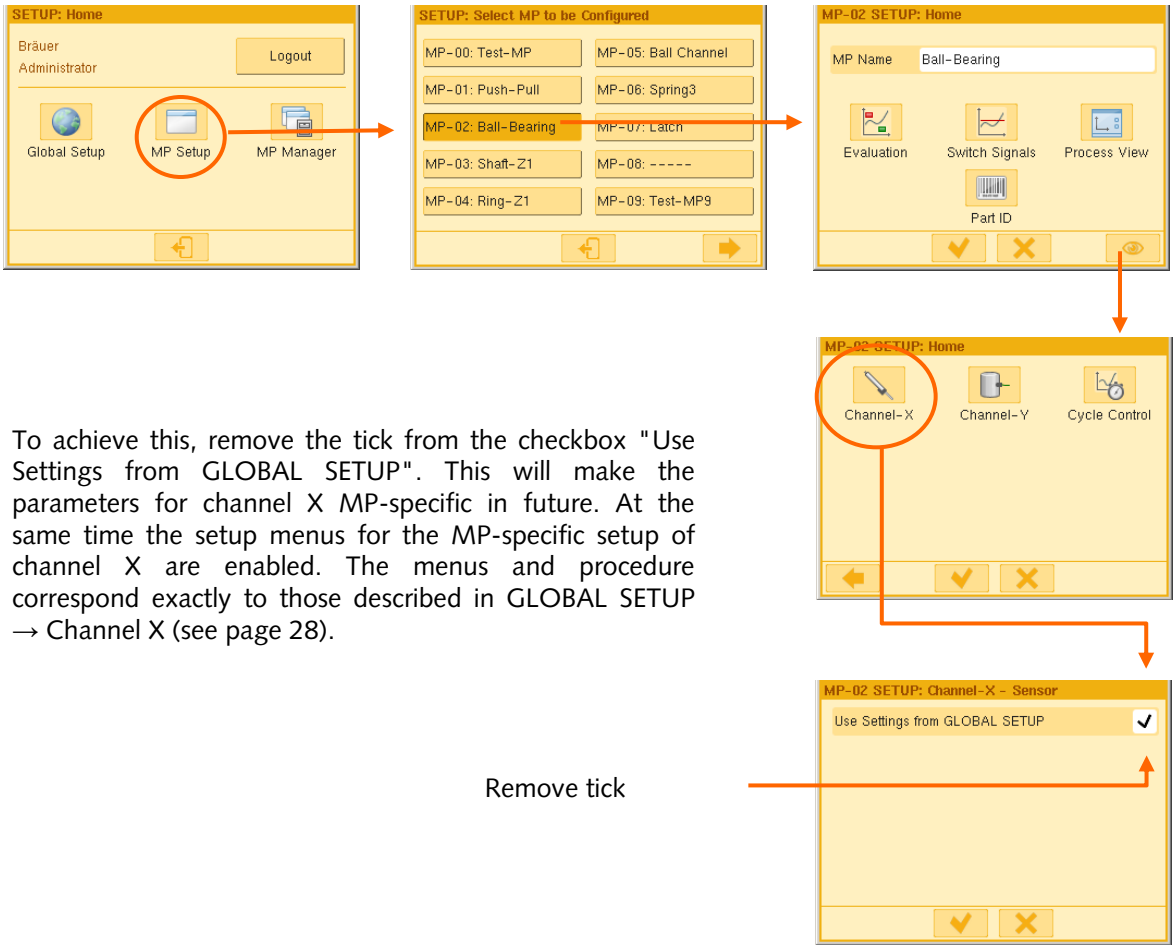
The header text is followed by a box consisting of different date stamps.

The part ID is displayed later in the piece counter box of the PROCESS level (see above), in the filename of the log file (CSV) and inside the log file.

This is used to specify when the counter is reset; at the end of the day at 24:00 or at the end of the week at 24:00, etc.

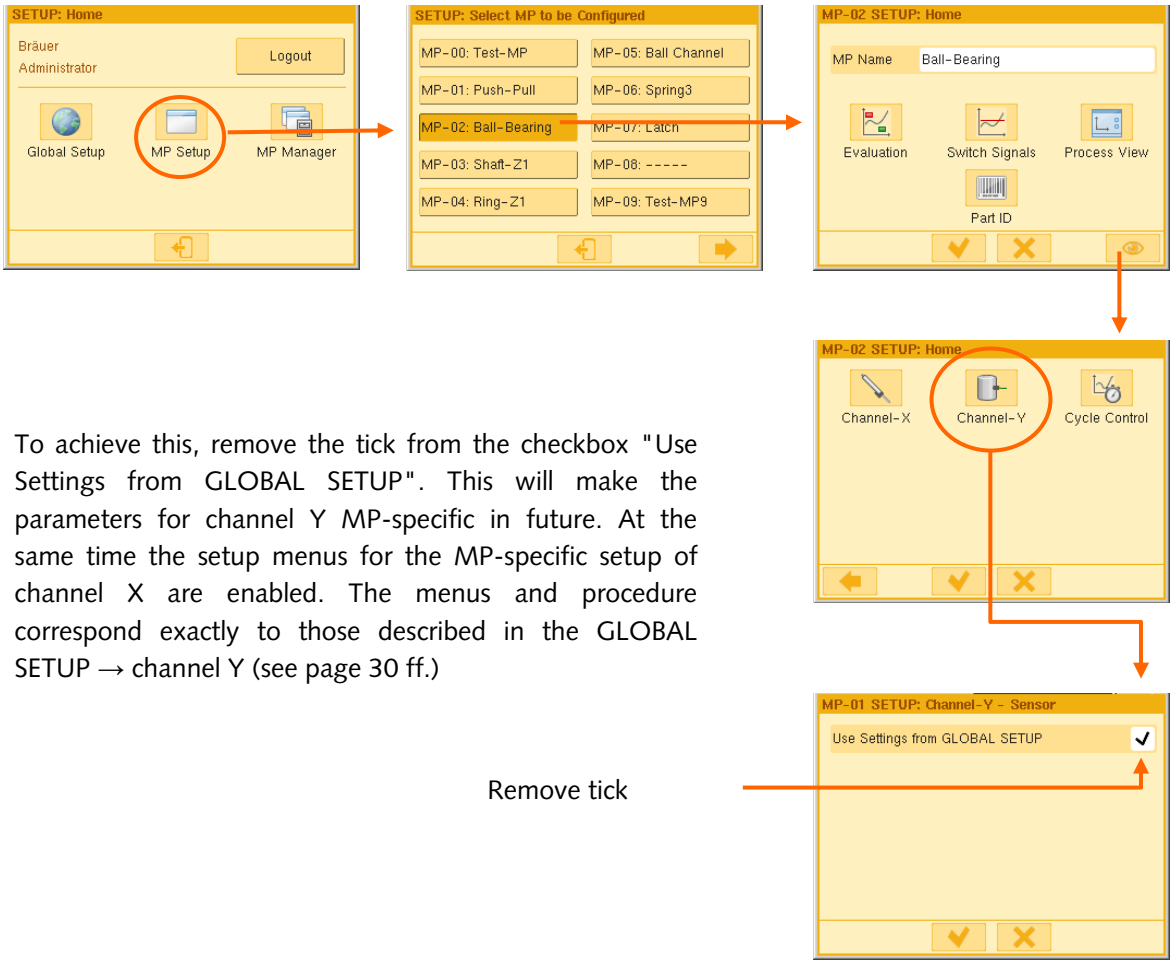
4.4.7.5 Configuring Channel X – MP-specific

If an MP requires special measuring channel settings, for instance because a part type needs a higher filter factor, the corresponding channel parameters can be uncoupled from the global setup and be set MP-specific.



To achieve this, remove the tick from the checkbox "Use Settings from GLOBAL SETUP". This will make the parameters for channel X MP-specific in future. At the same time the setup menus for the MP-specific setup of channel X are enabled. The menus and procedure correspond exactly to those described in GLOBAL SETUP → Channel X (see page 28).

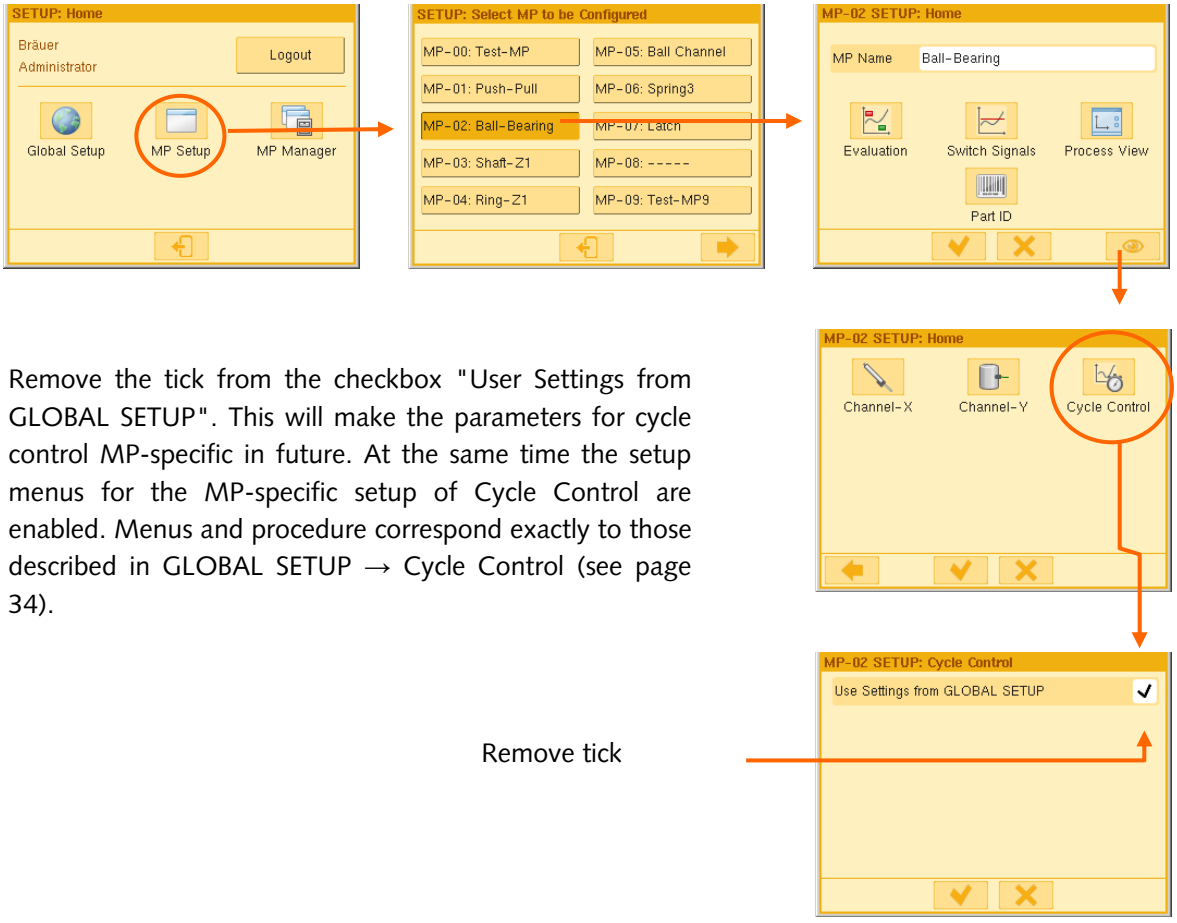
4.4.7.6 Configuring Channel Y – MP-specific



To achieve this, remove the tick from the checkbox "Use Settings from GLOBAL SETUP". This will make the parameters for channel Y MP-specific in future. At the same time the setup menus for the MP-specific setup of channel X are enabled. The menus and procedure correspond exactly to those described in the GLOBAL SETUP → channel Y (see page 30 ff.)

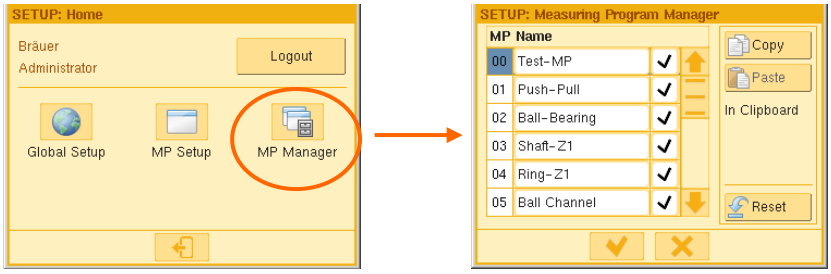
4.4.7.7 Configuring Cycle Control – MP-specific

In most cases the parameters for cycle control are specified only once and this is done GLOBALLY. All of the measuring programs then use these centrally stored parameters. In the "Setup MP-specific" procedure each individual MP can, however, be uncoupled from this global cycle control and use its own parameters. This may be necessary if, for example, one type of part makes special START-STOP settings necessary or a problematic curve return has to be cut off (truncated). Once you have removed the tick from the checkbox "Use Settings from GLOBAL SETUP", the parameters of the corresponding MP program can now be configured MP-specific. This procedure then corresponds exactly to that of GLOBAL (see p. 32).

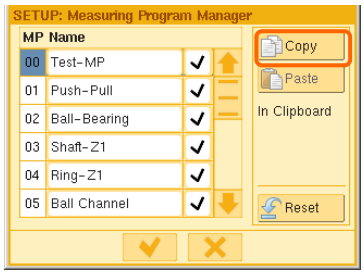


Remove the tick from the checkbox "User Settings from GLOBAL SETUP". This will make the parameters for cycle control MP-specific in future. At the same time the setup menus for the MP-specific setup of Cycle Control are enabled. Menus and procedure correspond exactly to those described in GLOBAL SETUP → Cycle Control (see page 34).

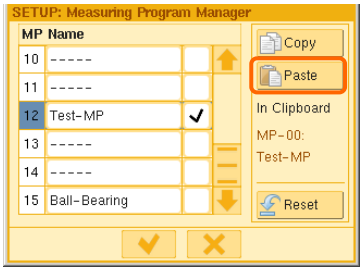
4.4.7.8 The MP Manager



4.4.7.8.1 Copying a Measuring Program

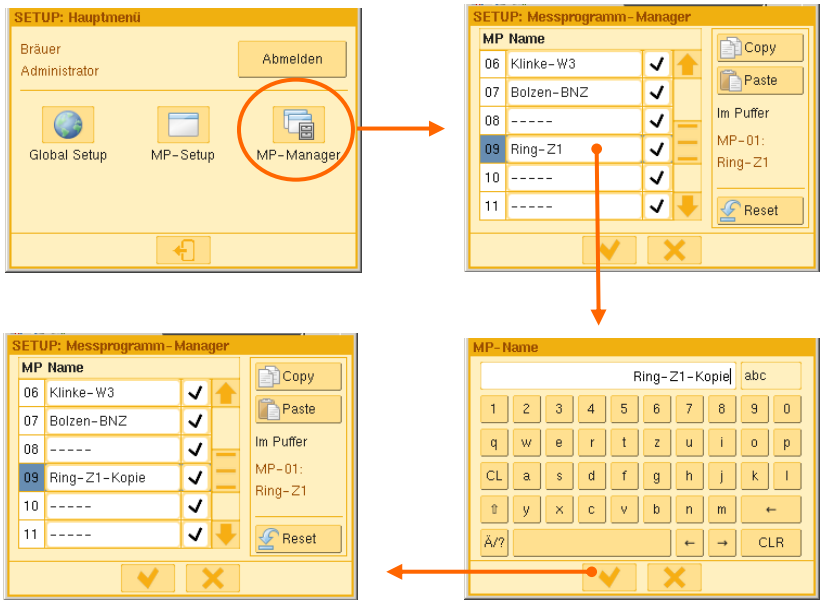


Select the source MP. Then touch the "Copy" button. The contents of the MP are now on the clipboard.

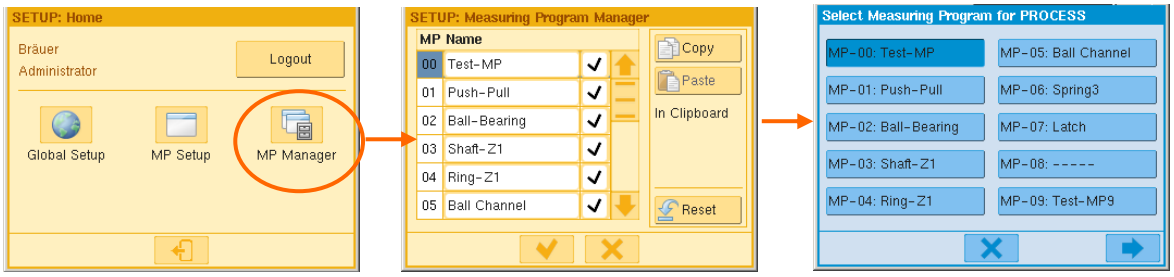


Now select the target MP and touch the "Paste" button. The target MP has now been overwritten by the contents of the source MP

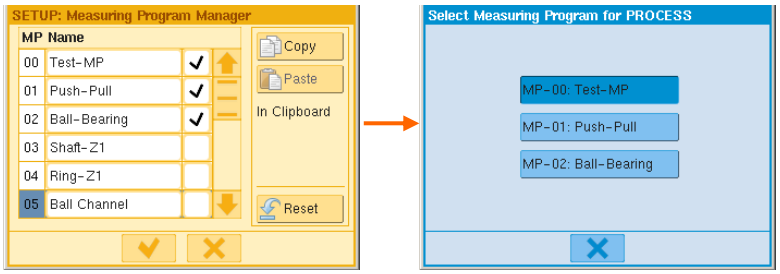
4.4.7.8.2 Naming MP



4.4.7.8.3 Deselecting Unused Measuring Programs

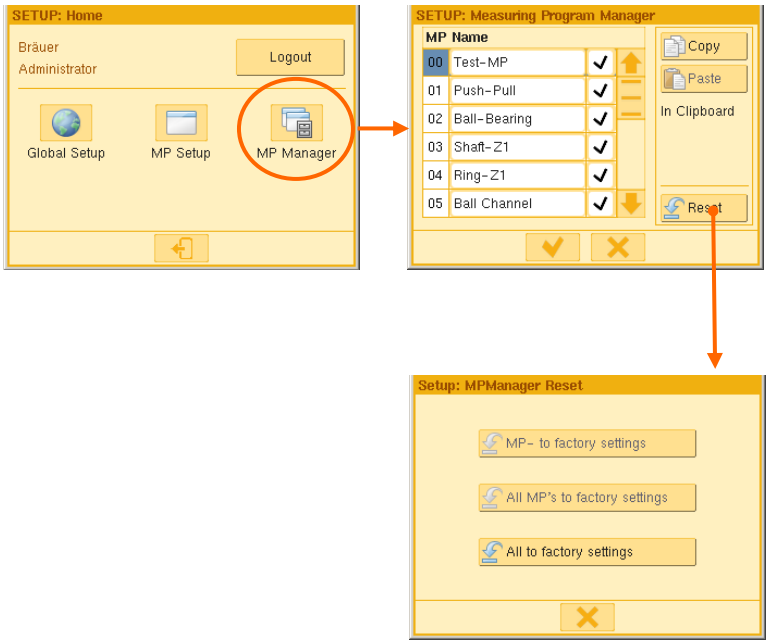


It is best to deselect unused MPs by removing the tick from the checkbox. This gives a better overview of the keypad for switching PROCESS MPs.



Keypad for selecting PROCESS MP before MP deselection (top) and after deselection (bottom).

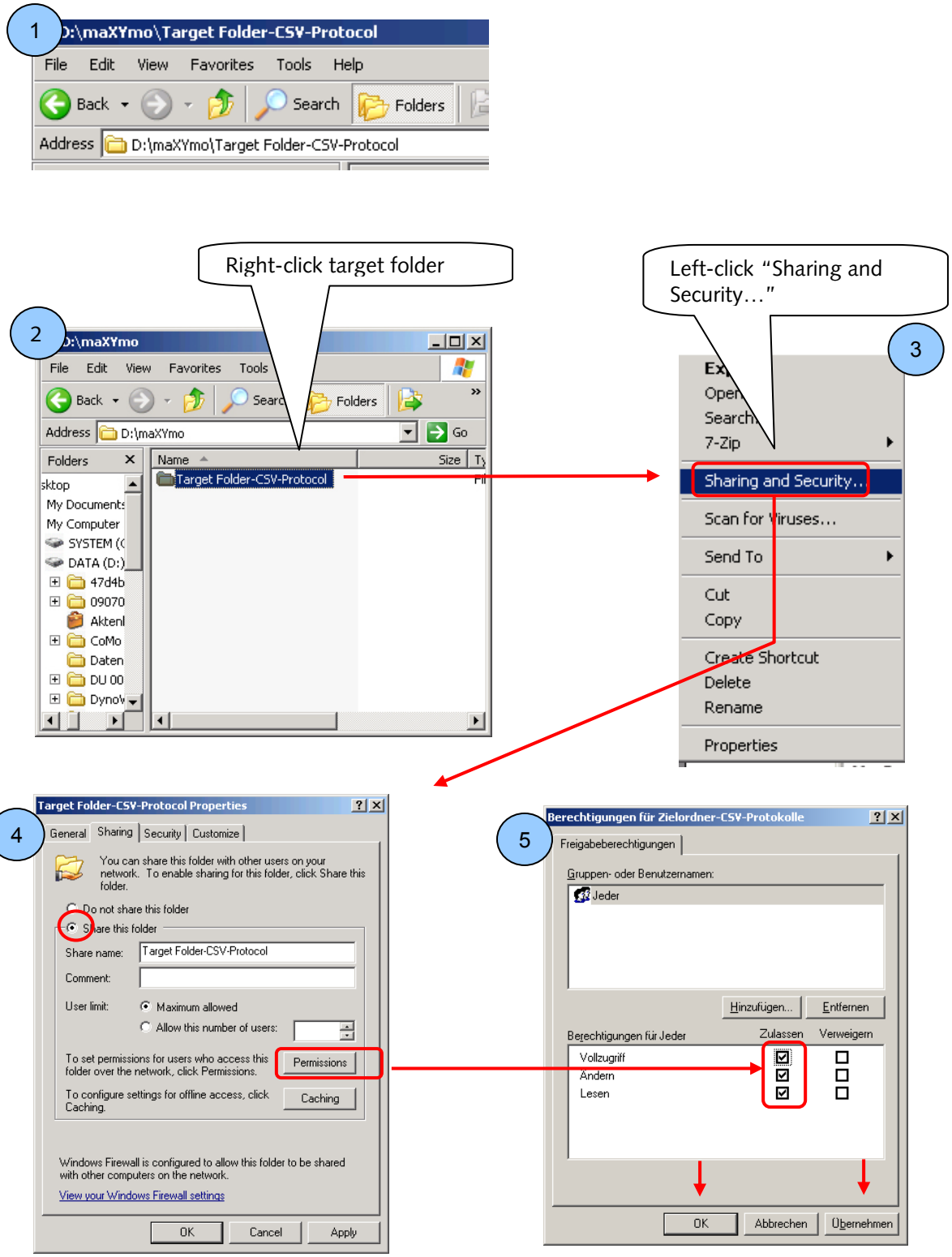
4.4.7.8.4 Targeted Resetting to Defaults



Exercise caution with the Reset functions. It is always best to save the entire setup of the monitor using the Backup function(see p. **Fehler! Textmarke nicht definiert.**).

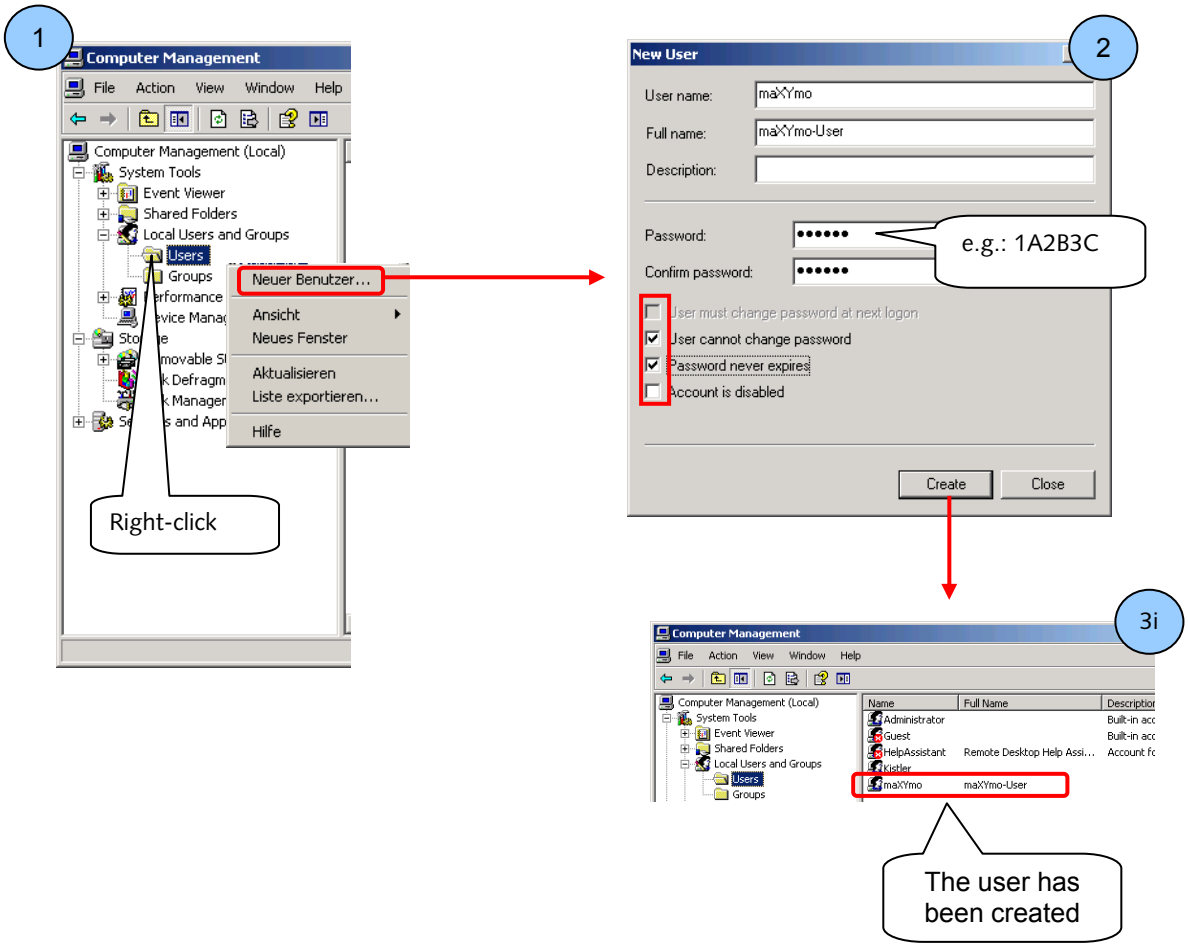
4.5 Configuring Measurement Data Export

4.5.1 Configuring Server – Creating and Enabling Target Folder



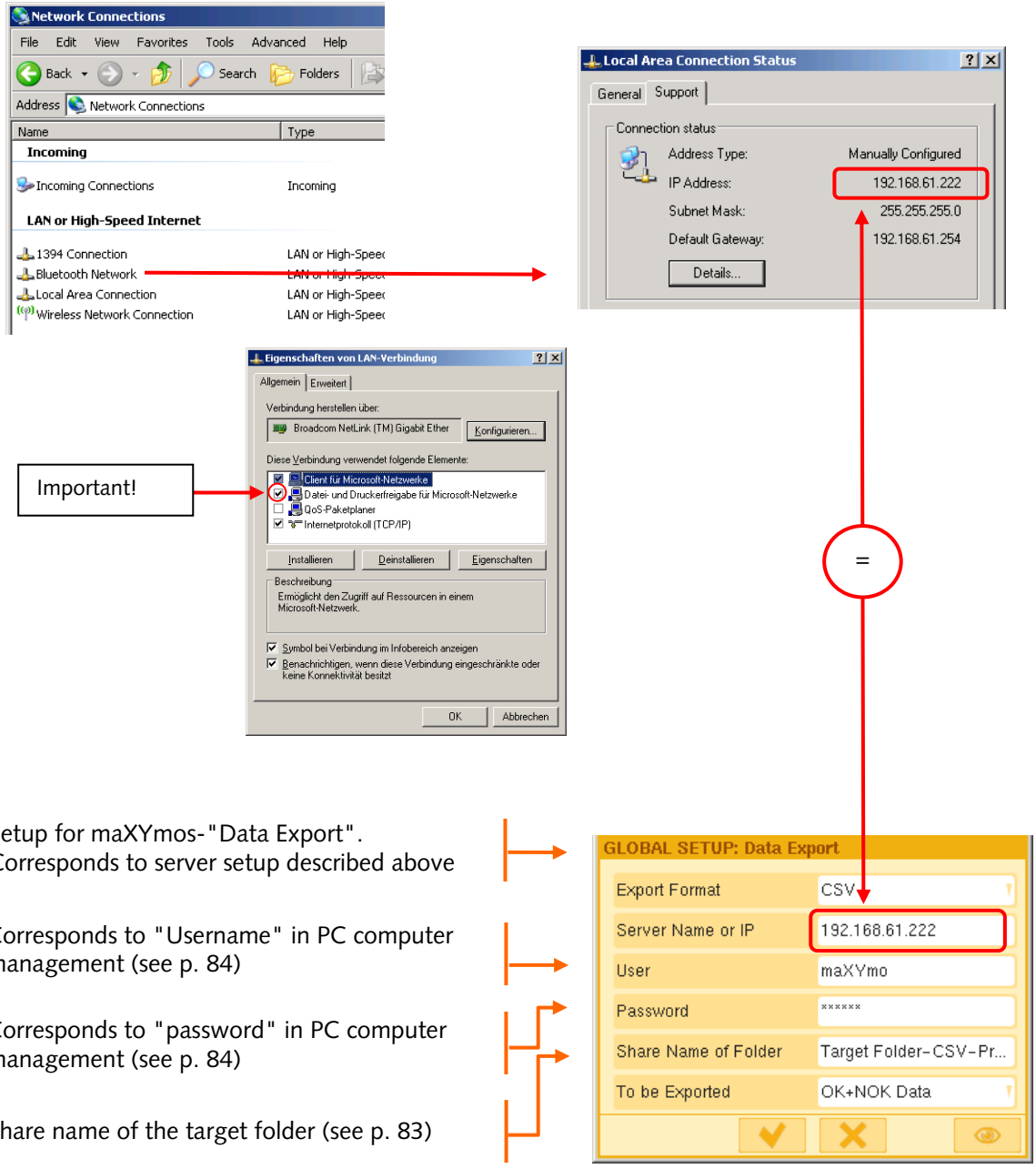
4.5.2 Creating New User in the System (PC)

Control Panel → Administrative Tools → Computer Management → Local Users and Groups → New User



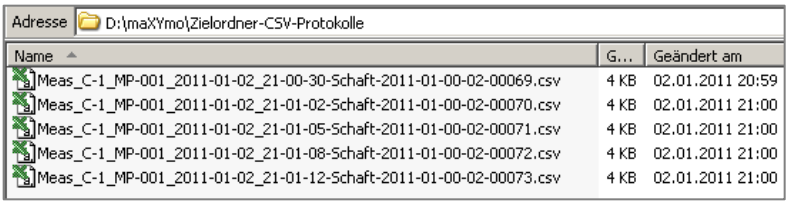
4.5.3 Preparing LAN Connection for Data Export

Network Connections → LAN Connection



4.5.4 Creating Log Files

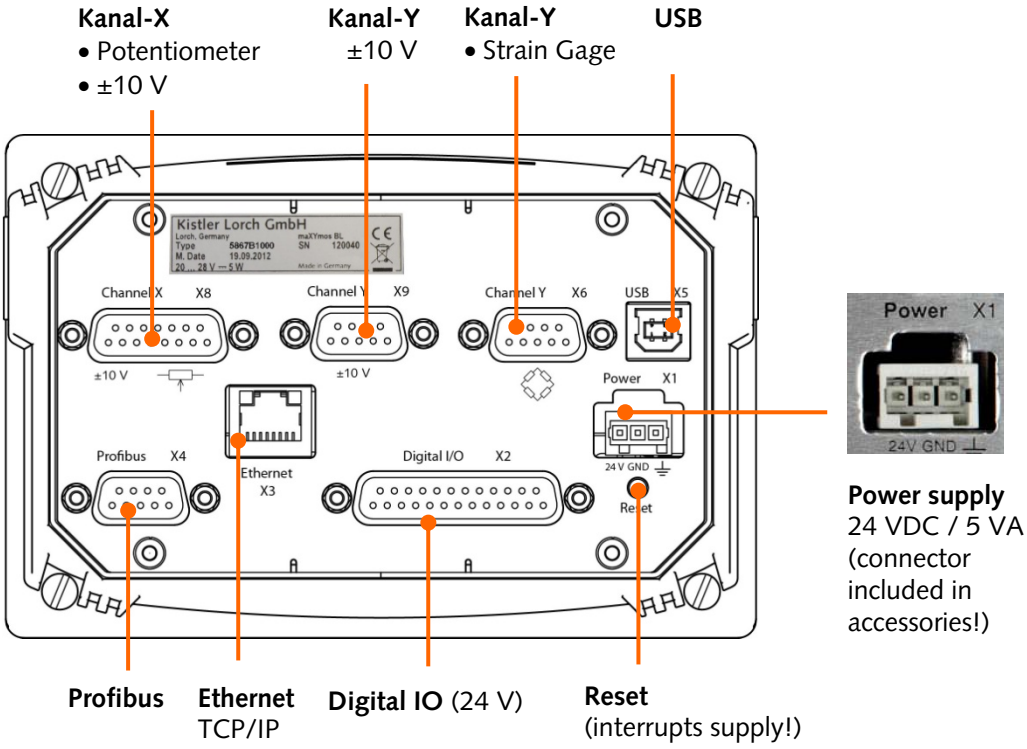
Run the relevant cycles to check that the log files are now displayed in the target folder as required. If they are not, recheck the settings!



5. Connections and Signal Flows

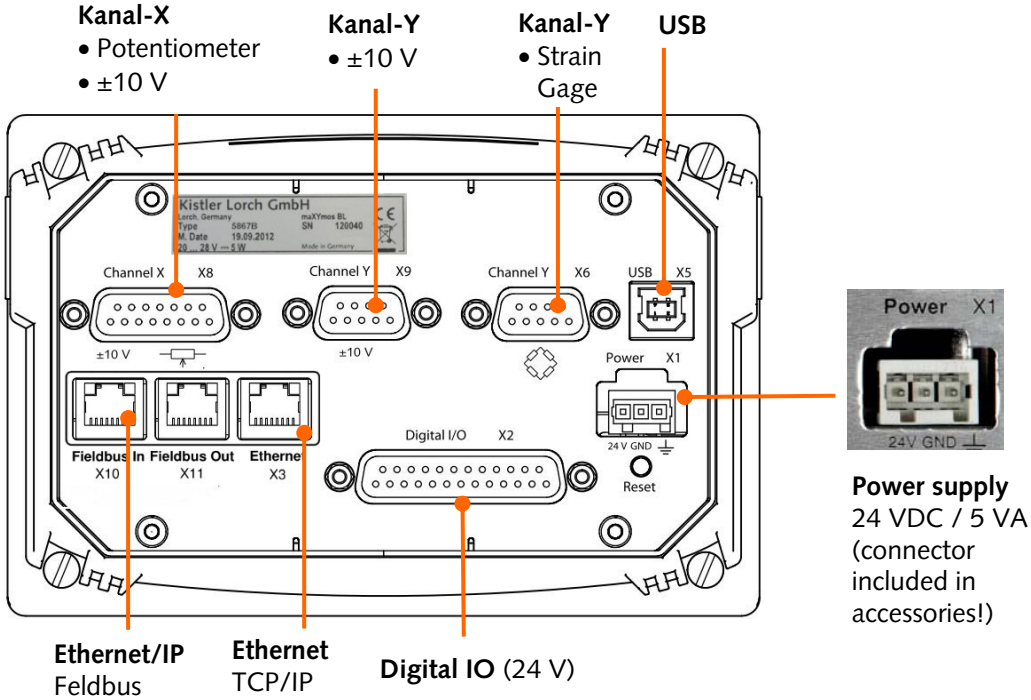
5.1 Position of Female Connectors

Type 5867B10X0 (Kanal-Y: Stain gage a. ±10 V; Kanal-X: Poti a. ±10 V ; ProfibusDP)



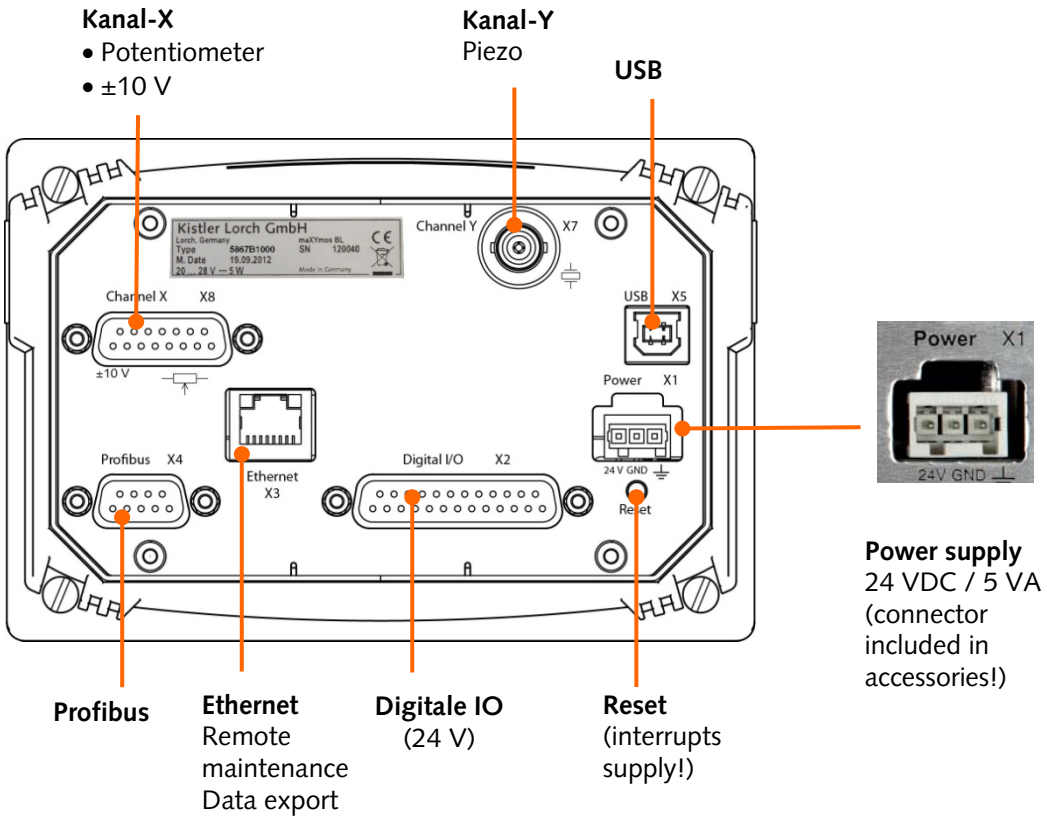
Power supply
24 VDC / 5 VA
(connector
included in
accessories!)

Type 5867B10X1 (Kanal-Y: Strain gage a. ±10V ; Kanal-X: Poti a. ±10 V ; Ethernet/IP - Bus)

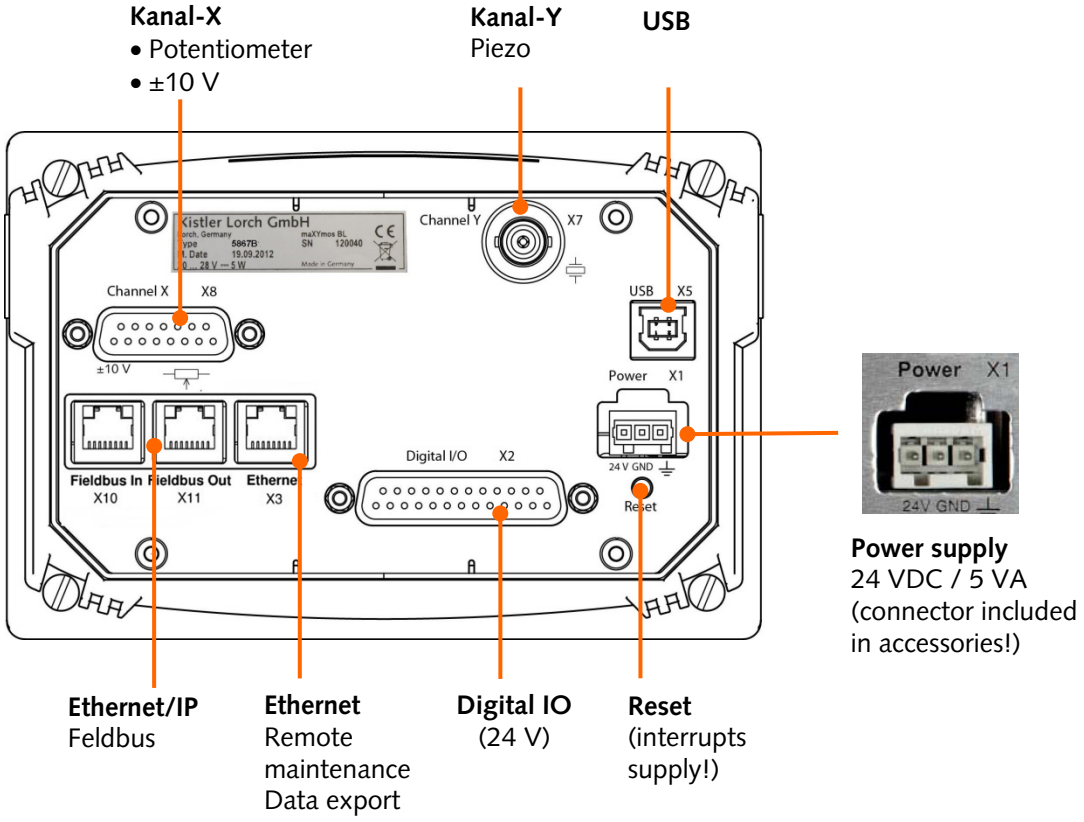


Power supply
24 VDC / 5 VA
(connector
included in
accessories!)

Type 5867B00X0 (Kanal-Y: Piezo; Kanal-X: Poti a. ±10 V ; ProfibusDP)



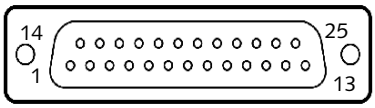
Type 5867B00X1 (Kanal-Y: Piezo; Kanal-X: Poti a. ±10 V; Ethernet/IP - Bus)



5.2 Interfaces

5.2.1 Digital-In-Out (Connector X2)

Dig-IO X2

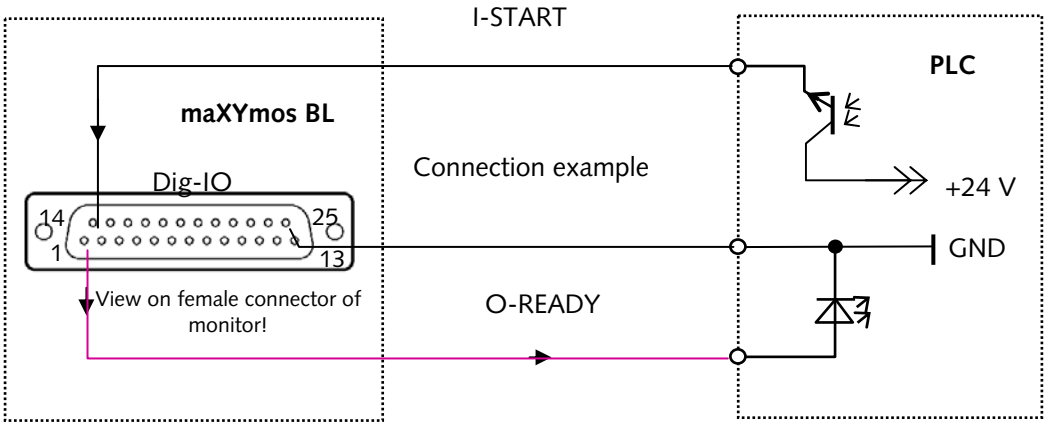


View of female connector of monitor

Level to DIN EN 61131
"0" state: 0 … 5 V
"1" state: 15 … 30 (24) V
I input: approx. 8 mA at 24 V
I output: max.100 mA/Out
Overcurrent protection from: 370 mA/Out

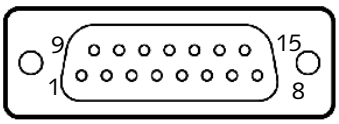
Imprtant! The monitors supply voltage is represented directly at the dig. Outputs. Tp meet the requirements of DIN EN 61131 this hast o be +24VDC! Pins 13 and 25 are connected and are at the GND oft he monitors power supply!

Connector	Pin	Dig-I/O	Signal name	Function
X2	1	DO-1	O-READY	Rasdy to measure
X2	2	DO-2	O-OK	Result OK
X2	3	DO-3	O-NOK	Result BAD
X2	4	DO-4	O-NO-PASS	NO-PASS crossed
X2	5	DO-5	O-S1	Switch signal S1
X2	6	DO-6	O-S2	Switch signal S2
X2	7	DO-7	O-WARN or O-MP-0 [1]*	WARNNING or MP mirror
X2	8	DO-8	O-ALARM or O-MP-1 [2]*	ALARM or MP mirror
X2	9		n.c.	
X2	10		n.c.	
X2	11		n.c.	
X2	12		+24 V	Output, for proximity switch for example
X2	13		DO-GND	Dig. out Ground
X2	14	DI-1	I-START	Cycle START
X2	15	DI-2	I-TARA-Y or I-OPERATE	TARA channel Y (strain gage version) or OPERATE Piezo (piezoelectric version)
X2	16	DI-3	I-ZERO-X	Zero chan. X
X2	17	DI-4	I-AUTO	Control using PLC
X2	18	DI-5	I-MP-0 [1]	MP switchover
X2	19	DI-6	I-MP-1 [2]	MP switchover
X2	20	DI-7	I-MP-2 [4]	MP switchover
X2	21	DI-8	I-MP-3 [8]	MP switchover
X2	22	DI-9	I-ACK	External acknowledge
X2	23	DI-10	I-STAT-RESET	Reset statistics
X2	24	DI-11	I-STEST	Trigger test sensor
X2	25		DI-GND	Dig-In-Ground

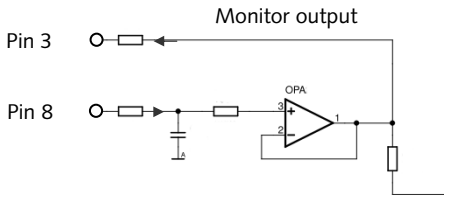


5.2.2 Connecting Potentiometer on Channel X (Connector X8)

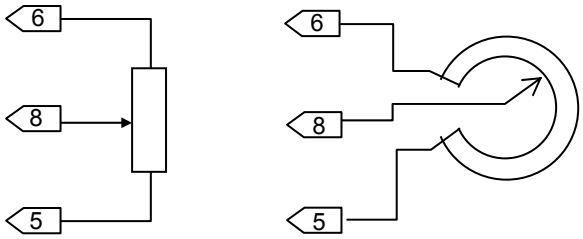
Channel X X8



View on female connector of monitor

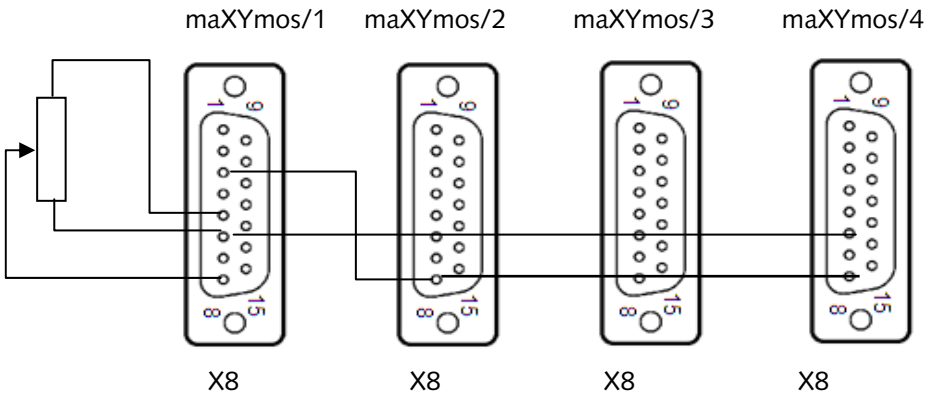


Pin	Function
1	n.c.
2	n.c.
3	Monitor out
4	n.c.
5	Supply –
6	Supply +
7	n.c.
8	Signal +
9	n.c.
10	n.c.
11	n.c.
12	n.c.
13	n.c.
14	Signal GND
15	n.c.
Case	Shield (PE)



Connection example

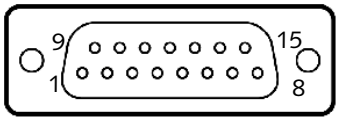
A displacement sensor common to four maXYmos (quadruple press: 1x displacement, 4x forces).



View on female connector of monitors

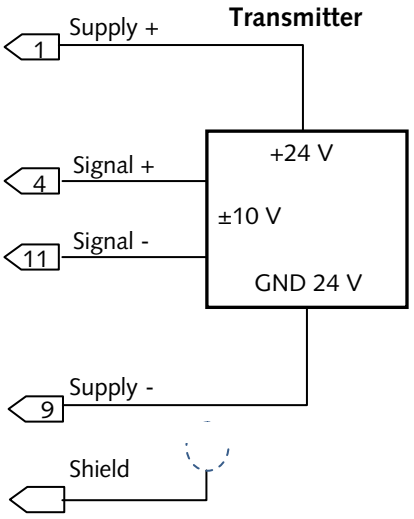
5.2.3 Connecting Sensor with ±10 V- Signal Output on Channel X (Connector X8)

Channel X X8



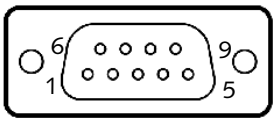
View on female connector of monitor

Pin	Function
1	Supply +24 V
2	n.c.
3	n.c.
4	Signal + (±10 V)
5	n.c.
6	n.c.
7	n.c.
8	n.c.
9	Supply GND
10	n.c.
11	Signal - (±10 V)
12	n.c.
13	n.c.
14	GND (Shield)
15	n.c.
	n.c.



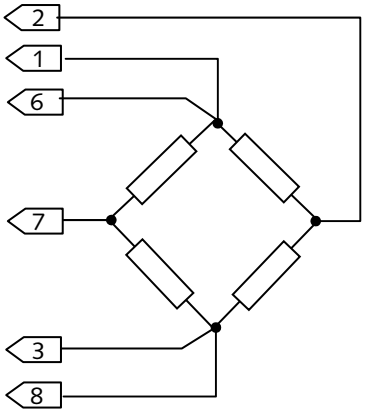
5.2.4 Connecting Strain Gage Sensor on Channel X (Connector X6)

Channel Y X6

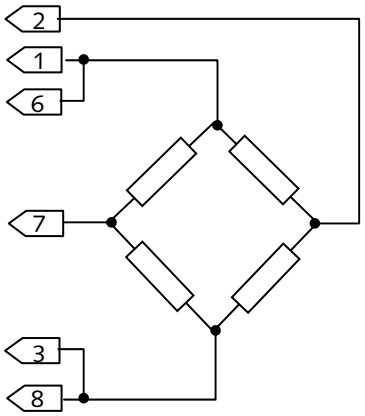


View on female connector of monitor

Pin	Function
1	Supply +
2	Signal +
3	Sense –
4	GND
5	n.c.
6	Sense +
7	Signal –
8	Supply –
9	n.c.
Case	Shield (PE)



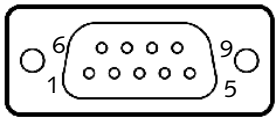
Strain gage sensors with sense lines tot he measuring element.



Starin gage sensors without sense lines. Bridges between supply and sense in the sensor connector.

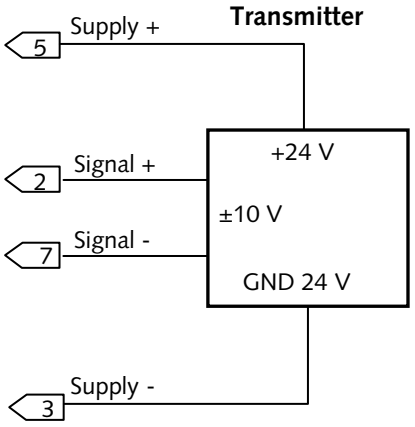
5.2.5 Connecting Sensor with ±10 V Signal Output an Channel Y (Connector X9)

Channel Y X9



View on female connector of monitor

Pin	Function
1	n.c.
2	Signal +
3	GND Supply
4	n.c.
5	+24 V Supply
6	n.c.
7	Signal –
8	n.c.
9	n.c.
Case	Shield (PE)

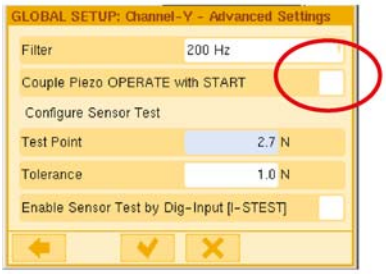


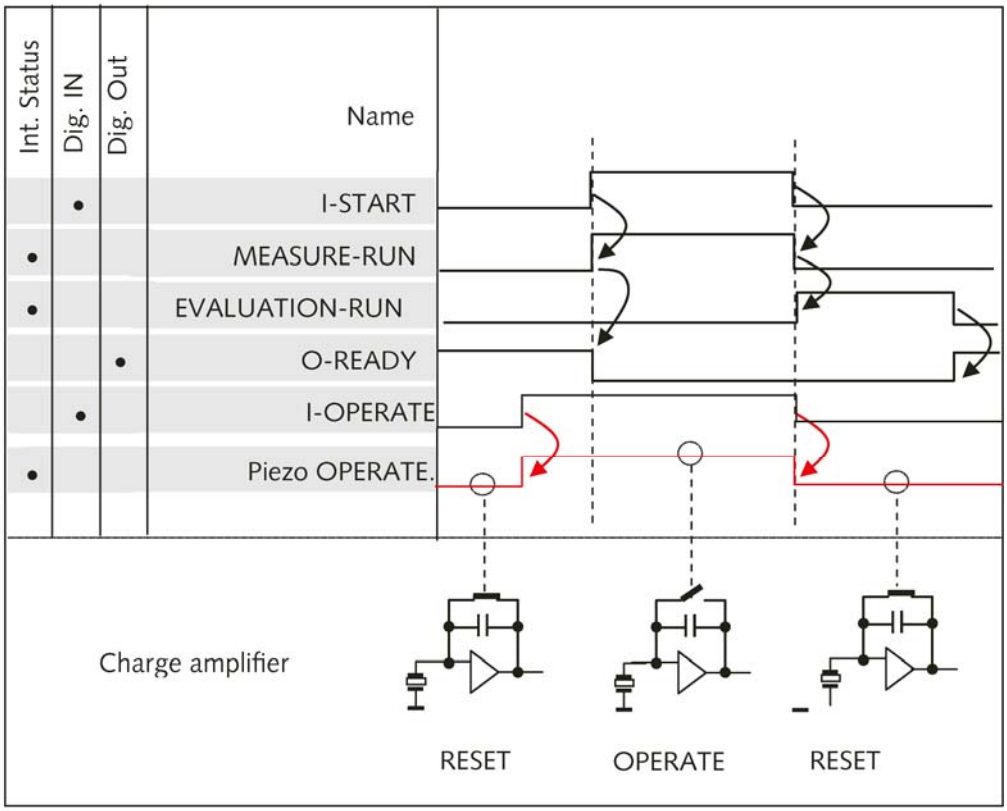
5.3 Control via PLC – The Signal Flowcharts

5.3.1 Triggering Piezo-OPERATE by means of Dig. Input I-OPERATE

The control signal I-OPERATE can be used to enable the charge amplifier using a PLC, or to bring it into the RESET (I-OPERATE=0) state.

Advantage: Events on channel Y can be handled both before and after START, for example monitoring the force threshold in a fast-stroking press.
Disadvantage: The PLC has to pay attention to the state of the charge amplifier .

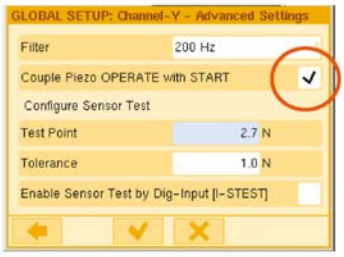


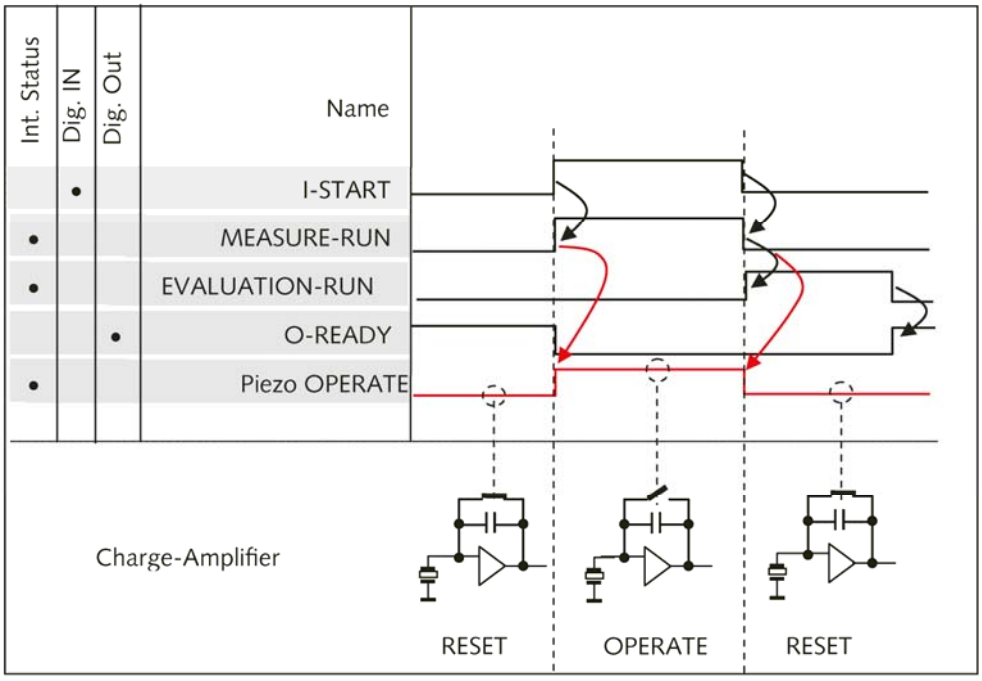


5.3.2 Coupling Piezo-OPERATE to START

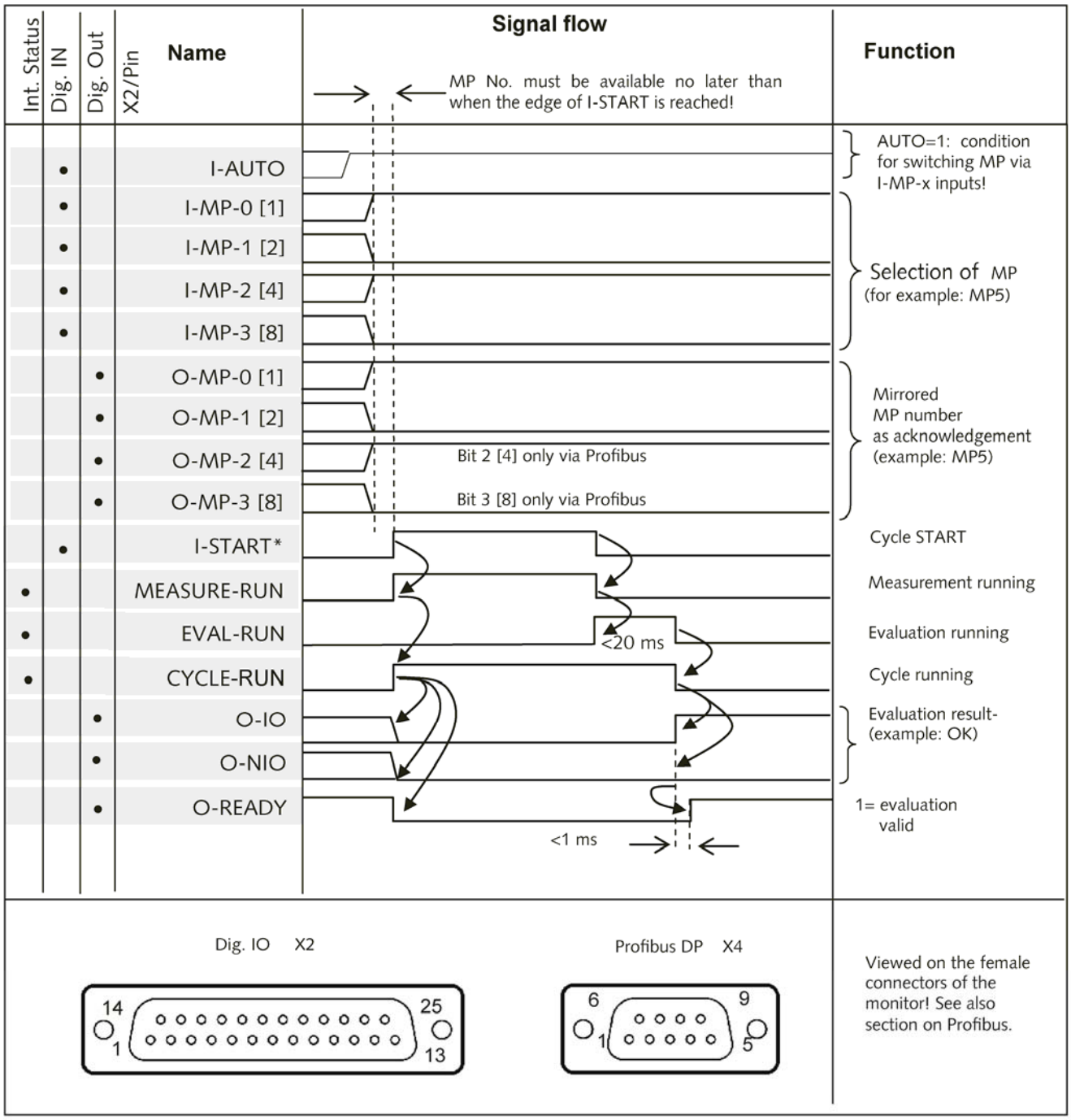
Resetting or enabling (RESET / OPERATE) of the charge amplifier can be permanently coupled to the *internal status* MEASURE-RUN. It makes no difference here whether START is triggered by means of dig. input (or Profibus), or by an internal START condition being met (see section: "Specifying START Condition and STOP Condition", p. 36 ff.).

Advantage: The PLC does not have to monitor the state of the charge amplifier.
Disadvantage: The charge amplifier is not in the OPERATE state before and after capture of the measurement curves. Events that occur in this period of time, such as collisions of the press plunger during fast stroking, are therefore not detected. This is the case unless START, and hence capture of measurement curves, are already activated outside the part of the curve to be evaluated.





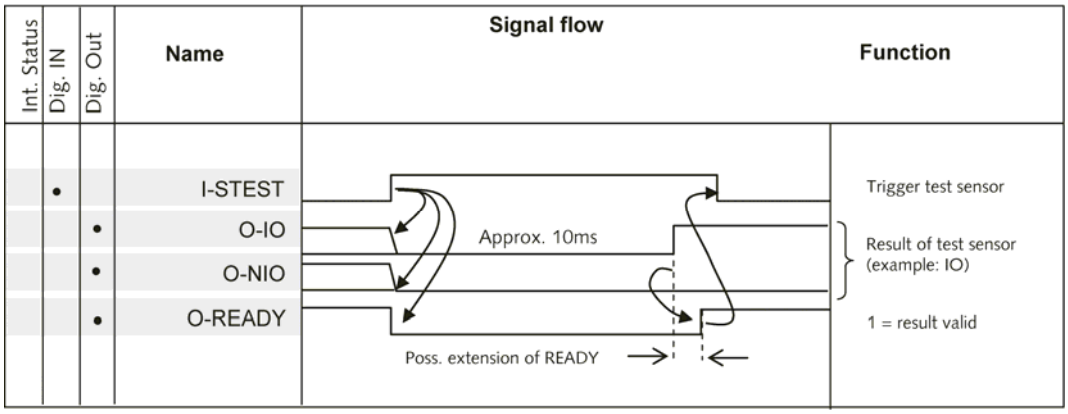
5.3.3 Switching MP by means of PLC – Measuring and Evaluation Cycle



*Or internal START condition, e.g. using threshold X (derived from displacement)

The state on the lines I-MP-0 [1] … I-MP-3 [8], i.e. the MP No. represented on them, is only adopted when I-AUTO=1. The MP No. for the following cycle can be created while the preceding cycle is still running, i.e. already while READY=0. As soon as READY then changes to "1" the MP is switched for the coming cycle.

5.3.4 Triggering "Test Sensor" Function by means of PLC

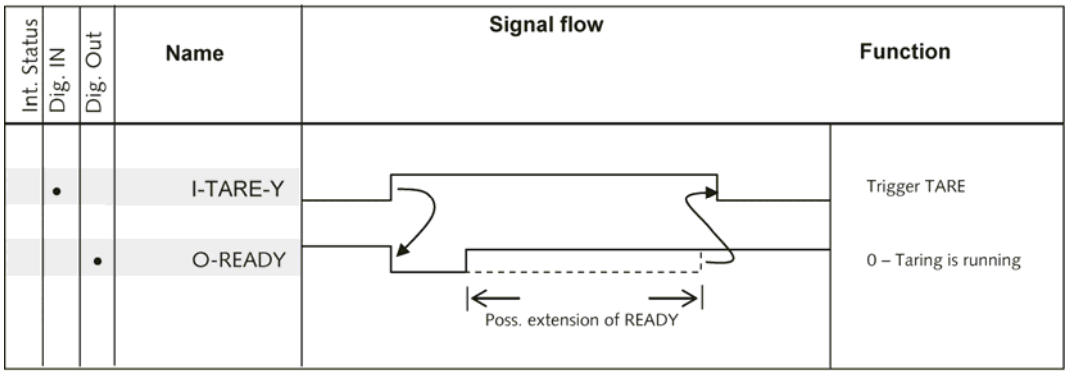


The "Test Sensor" function can also be triggered manually on the menu SERVICE --> Sensor Status.

5.3.5 Triggering TARE-Y Function by means of PLC (Taring Channel Y)

The TARE Y function is only offered with the strain gage versions. On the piezoelectric version this input corresponds to the RESET or /OPERATE function.

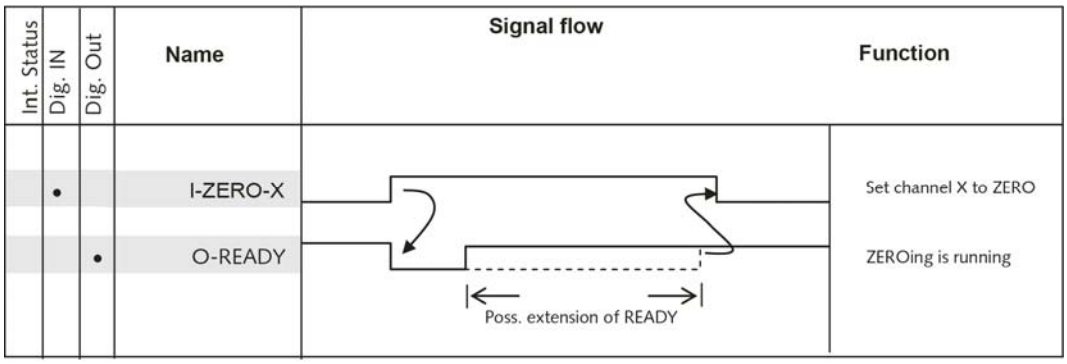
The TARE offset for the MP active at the particular time of taring is saved permanently in battery-backed memory. However, if this MP takes its parameters from GLOBAL, the TARE value is allocated to the global channel setup.



The TARE-Y function can also be triggered manually on the SERVICE --> TARE - ZERO menu.

5.3.6 Triggering ZERO-X Function by means of PLC (Zeroing Channel Y)

The ZERO-X offset for the MP active at the particular ZERO-X time is saved permanently in battery-backed memory. However, if this MP takes its parameters from GLOBAL, the ZERO-X value is allocated to the global channel setup.



The ZERO-X function can be triggered manually on the SERVICE --> TARE - ZERO menu.

6. Remote Maintenance

6.1 Remote Access Using VNC

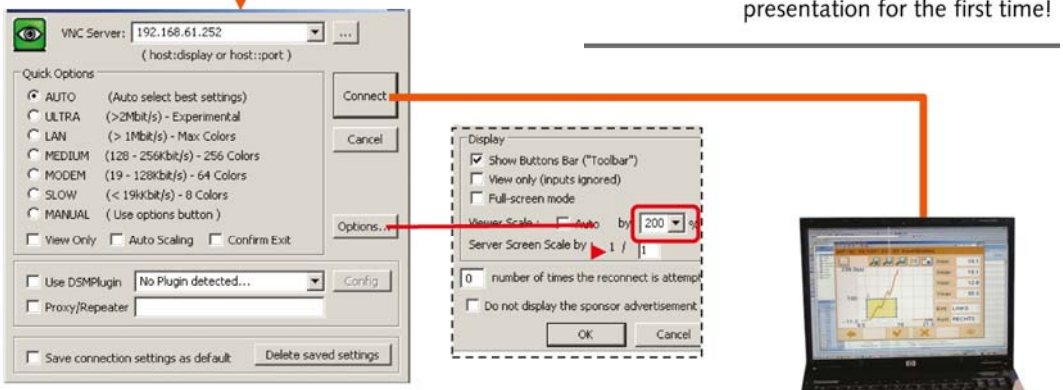
Remote access to the maXYmos BL is possible via Ethernet connection (female connector X3) using VNC. Either use a VNC client already present on your PC, or download the tool from the internet.

Possible client: http://www.uvnc.com/download/

When the VNC client has been installed, enter the IP address of the maXYmos you want to access:

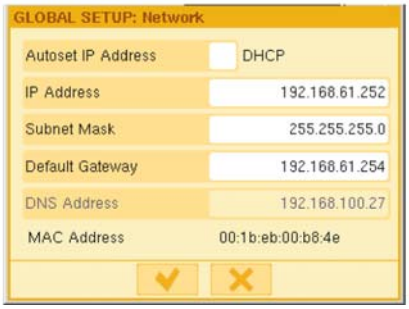
NOTE

- Avoids having to travel great distances at considerable expense!
- Makes remote projector presentation for the first time!



Set the ideal zoom level (scaling)!

With direct point-to-point connection (PC ↔ maXYmos) the LAN setup of the PC has to match the network setup of the maXYmos (same subnet address). The screenshots show a functional setup.



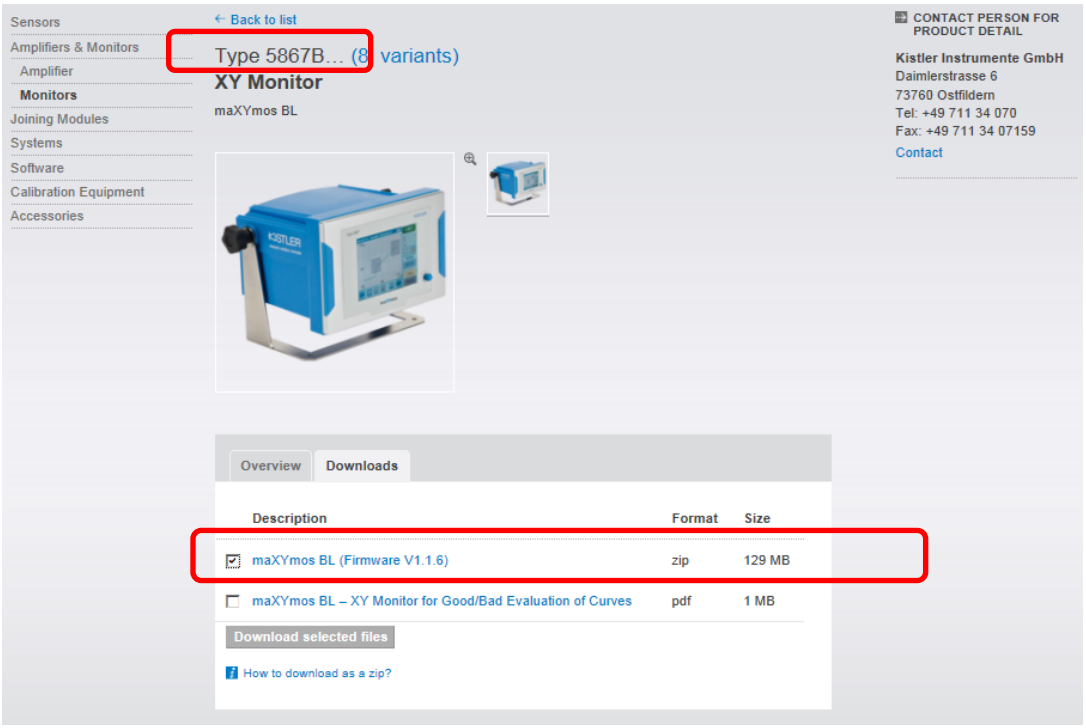
The matching maXYmos settings in the GLOBAL SETUP → Network

7. PC Software maXYmos PC

A free basic version of the PC software "maxXYmos PC" can be found on the CD supplied. In addition, please refer to the separate "maXYmos PC quick reference" manual on the CD. The basic version has the following functions.

7.1 Firmware Update

Function
Download the current version of the firmware to start with. You will find them on the Kistler homepage www.kistler.com in the download section under Products → Type 5867 → Downloads → Software Firmware. The format is „Build-Nr.tar.gz“



7.2 Backup-Restore

Function

Save the entire device settings in a file and reload this file if a device exchange is required, for example, to mirror a successful device setting for other maXYmos.

Also see the "maXYmos PC quick reference" manual.

7.3 Setup-Editor + Backup-Interpreter

Function

The "set up" function permits opening of saved back up files and their contents and to show and print parameters. It is also possible to perform a complete device setting and connect and load into maXYmos.

Also see the "maXYmos PC quick reference" manual.

The purchased version "maXYmos PC plus", type XXXXXX offers some additional functions compared to previously mentioned basic functions.

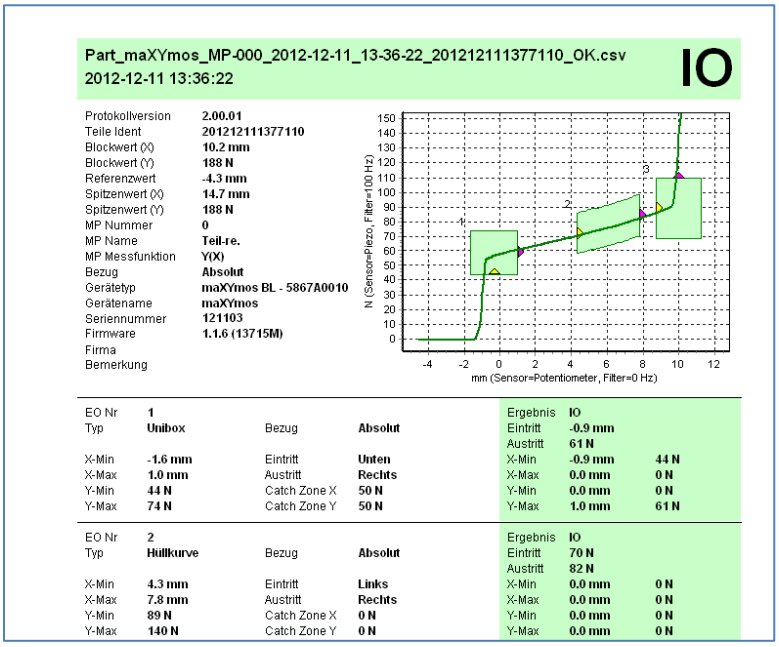
7.4 Protocol Explorer + Protocol Viewer

Additional function for maXYmos PC plus

CSV logs which are exported and stored on a server or in maXYmos are opened and displayed via the "Local logging" function (see Section 3.4.2. p.18). Curves and the most important results are displayed for this and if required, printed in a professional layout as a PDF.

For other functions see the "maXYmos PC quick reference" manual Section xx, page XX

Example of a PDF log:



Part_maXYmos_MP-000_2012-12-11_13-36-22_201212111377110_OK.csv
2012-12-11 13:36:22

IO

Protokollversion	2.00.01
Teile Ident	201212111377110
Blockwert (X)	10.2 mm
Blockwert (Y)	188 N
Referenzwert	-4.3 mm
Spitzenwert (X)	14.7 mm
Spitzenwert (Y)	188 N
MP Nummer	0
MP Name	Teil-re.
MP Messfunktion	Y(X)
Bezug	Absolut
Gerätetyp	maXYmos BL - 5867A0010
Gerätename	maXYmos
Seriennummer	121103
Firmware	1.1.6 (13715M)
Firma	
Bemerkung	

EO Nr	1			Ergebnis	IO	
Typ	Unibox	Bezug	Absolut	Eintritt	-0.9 mm	
				Austritt	61 N	
X-Min	-1.6 mm	Eintritt	Unten	X-Min	-0.9 mm	44 N
X-Max	1.0 mm	Austritt	Rechts	X-Max	0.0 mm	0 N
Y-Min	44 N	Catch Zone X	50 N	Y-Min	0.0 mm	0 N
Y-Max	74 N	Catch Zone Y	50 N	Y-Max	1.0 mm	61 N

EO Nr	2			Ergebnis	IO	
Typ	Hüllkurve	Bezug	Absolut	Eintritt	70 N	
				Austritt	82 N	
X-Min	4.3 mm	Eintritt	Links	X-Min	0.0 mm	0 N
X-Max	7.8 mm	Austritt	Rechts	X-Max	0.0 mm	0 N
Y-Min	89 N	Catch Zone X	0 N	Y-Min	0.0 mm	0 N
Y-Max	140 N	Catch Zone Y	0 N	Y-Max	0.0 mm	0 N

8. Fieldbus

The maXYmos BL Type 5867A… monitor is equipped with a fieldbus interface through which it can communicate directly with the system PLC. This fieldbus also allows the monitor to be controlled and set up. The process values produced during evaluation can also be transmitted via the fieldbus to the system PLC.

The maXYmo device has a BL Type 5867BXXX0 profibus and in device Type 5867BXXX1 an Ethernet/IP as a fieldbus available.

8.1 Feldbus-Configuration

8.1.1 General Information

The fieldbus implementation of the monitor allows bidirectional transmission of control signals (control bits) and bidirectional transfer of data objects in a telegram. The length of the telegram can be up to 220 bytes. 200 bytes (one page) of these contents can be freely defined by the user choosing corresponding data objects. Up to eight of these pages can be created, providing a maximum of 1 600 bytes for transferring data objects.

A detailed description is given in the sections **Telegram Structure** and **Data Objects**.

Monitor configuration is performed on the menu **GLOBAL SETUP: Fieldbus**. In line with the two sections, configuration is broken down into **Basic Configuration of Monitor** and **Telegram Configuration**.

The matching GSD file is to be used to configure the system PLC.

Telegrammaufbau und Datenobjekte sowie der Ablauf des Datenaustauschs sind **unabhängig** vom Feldbustyp.
Nur bei der **Gerätegrundeinstellung** wird zwischen den Feldbustypen unterschieden.

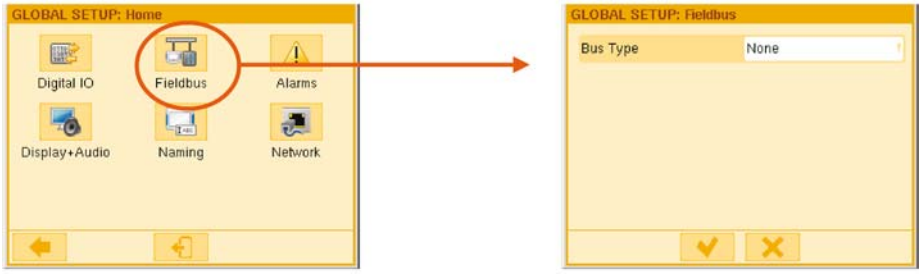
Device configuration is done in the **GLOBAL SETUP menu: Fieldbus**. The configuration is arranged according to two sections **Basic device settings** and **Telegram configuration**.

To configure the PLC system, use the corresponding GSD file (Profibus) or EDS file (Ethernet/IP).

Always use the GSD/ESD file currently valid for the monitor. This file is to be found on the documentation CD supplied with the monitor.
Please take account of the current version of the firmware installed on the monitor.

8.1.2 Fieldbus –Monitor Setup

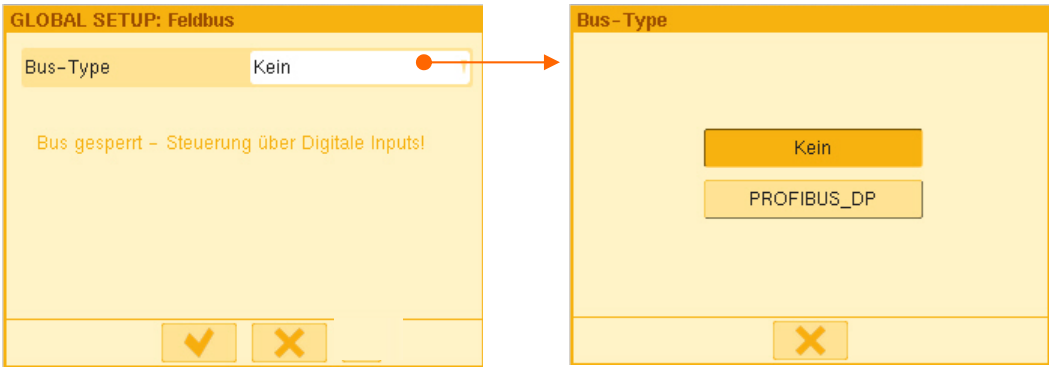
The monitor is configured on the menu **GLOBAL SETUP: Fieldbus**



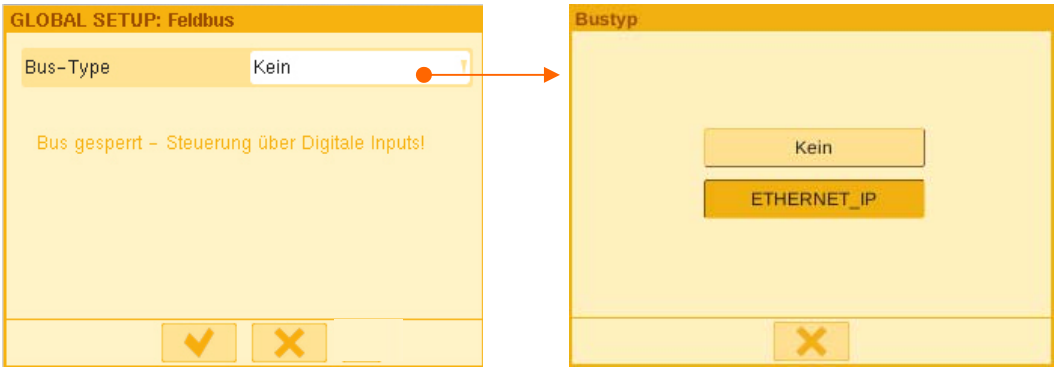
If the slave address set on the monitor is not known, before activating (choosing) the type of fieldbus, pull the fieldbus connector out and disconnect monitor from fieldbus. After choosing the fieldbus, check the slave address and change if necessary. A wrong or invalid slave address (address conflict) can lead to the system being stopped or control failure. The slave address to be used must not have already been allocated; if necessary consult the system operator.

The field bus type is selected from the **Bus type** input field. The field bus is activated after selection.

For device type maXYmo BL 5867BXXX0 only **Profibus DP** selection is possible.



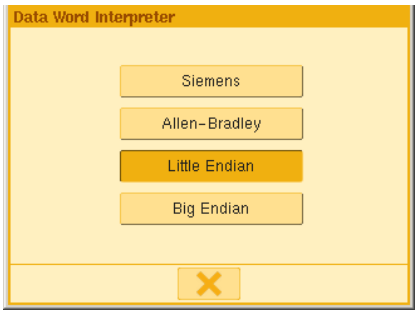
For device type maXYmo BL 5867BXXX1 only **Ethernet/IP** selection is possible.



8.1.2.1 Basic settings Profibus

Set the slave address configured in the Profibus master for the monitor.

Set the data format to match that of the PLC.



Set the data format either by PLC manufacturers or other manufacturers according to their size.

	Order of the bytes B3 B2 B1 B0 with data format:	
Data type	**Little endian**	**Big endian**
Byte	B0	B0
Word	B0 B1	B1 B0
DWord	B0 B1 B2 B3	B3 B2 B1 B0

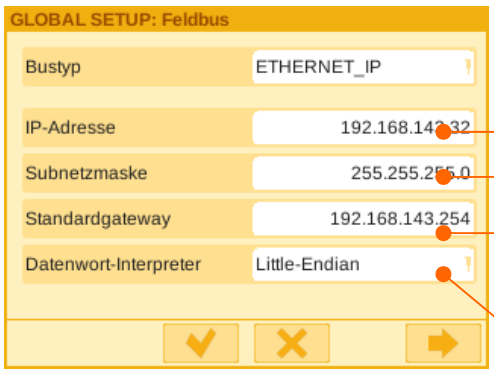
NOTE

The baud rate is detected automatically. The following baud rates are supported: 12 MBit/s, 6 MBit/s, 3 MBit/s,1,5 MBit/s, 500 kBit/s, 187,5 kBit/s, 93,75 kBit/s, 45,45 kBit/s, 19,2 kBit/s and 9,6 kBit/s.

NOTE

Little endian corresponds to Intel format, big endian to Motorola.
Example: Hex 12 34 56 78 (Dec = 305 419 896)
Big endian (Motorola): 12 34 56 78
Little endian (Intel): 78 56 34 12.

8.1.2.2 Basic Settings Ethernet/IP



Set the IP address configured for the device in the Ethernet/IP master.

Corresponding subnet mask for the Ethernet/IP IP address.

Standard gateway IP address of the fieldbus network

Set the data format according to the PLC data format. See Profibus diagram.

8.1.3 Structure of Telegram

The structure of the telegram is divided into the fixed telegram header from byte 0 to byte 19 and the freely configurable part from byte 20 (up to a maximum of byte 219), which is called a page in the following description. This applies to both input and output telegrams. Eight pages can be defined for both transmission directions .

Overview

Byte	maXYmos BL IN	Byte	maXYmos BL OUT
0	Control Bits IN	0	Mirrored Control Bits IN
1	Control Bits IN	1	Mirrored Control Bits IN
2	Control Bits IN	2	Mirrored Control Bits IN
3	Reserved	3	Reserved
4	Reserved	4	Reserved
5	Reserved	5	Reserved
6	Reserved	6	Control Bits OUT
7	Reserved	7	Control Bits OUT
8	Reserved	8	Reserved
9	Reserved	9	Reserved
10	Reserved	10	Reserved
11	Reserved	11	Reserved
12	Reserved	12	Reserved
13	Reserved	13	Reserved
14	Config/Control 200 byte page	14	Config/Control 200 Byte Page
15	Config/Control 200 byte page	15	Config/Control 200 Byte Page
16	Config/Control 200 byte page	16	Reserved
17	Config/Control 200 byte page	17	Reserved
18	Config/Control 200 Byte page	18	Config/Control 200 Byte Page
19	Config/Control 200 Byte page	19	Config/Control 200 Byte Page
20	Fully Configurable200 Byte (Page) IN	20	Fully Configurable 200 Byte (Page) OUT
…		…	
…		…	
219		219	

With the fieldbus activated the fieldbus monitor function and the signal states of the control bits of the fieldbus can be displayed on the menu: **Service: Fieldbus**.

8.1.4 Control Signals (Control Bits)

The functions of the control bits on the fieldbus correspond to those of the digital input and output signals of the interface X2 Dig-IO, where present.

Control signals - input control bits

Bytes 0 … 13 of the telegram

Byte	Bit	maXYmos BL IN	Description
0	0	START	Cycle START
	1	TARE-Y	TARE-Y or reset piezo
	2	ZERO-X	Zero channel X
	3	TEST-X	Trigger test for sensor for channel X
	4	TEST-Y	Trigger test for sensor for channel Y
	5	Reserved	
	6	Reserved	
	7	Reserved	
1	0	Reserved	
	1	ACK-ADMIN	Acknowledgement with Administrator rights (e.g. regarding corresponding warnings or alarms)
	2	Reserved	
	3	ACCESS	Allows the PLC to grant the user access rights. The object protectionPlcLogon is used to set which group of rights (Setter, Operator or Administrator) is active. If ACCESS = 1 the user can use these rights (does not have to log on separately), ACCESS = 0 corresponds to a logoff.
	4	AUTO	The AUTO bit must be set (byte 1.4 = 1) if the measuring program is to be switched by means of the PLC fieldbus. With AUTO=1 the PLC has full control over the maXYmos. This also blocks setting up manually!
	5	STAT-RESET	Reset statistics
	6	STAT-DISABLE	Disable statistics
	7	Reserved	
2	0	MP-0 [1]	Measuring bit selection (see also byte 14: Page control input control/config bits).
	1	MP-1 [2]	
	2	MP-2 [4]	
	3	MP-3 [8]	
	4	Reserved	
	5	Reserved	
	6	Reserved	
	7	Reserved	
3	0…7	Reserved	
4	0…7	Reserved	
5	0…7	Reserved	
6	0…7	Reserved	
7	0…7	Reserved	
8	0…7	Reserved	
9	0…7	Reserved	
10	0…7	Reserved	
11	0…7	Reserved	
12	0…7	Reserved	
13	0…7	Reserved	

Control signals - output control bits

Bytes 0 … 13 of the telegram

Byte	Bit	maXYmos BL OUT	Description
0	0	START	Mirrored cycle START
	1	TARE-Y	Mirrored channel Y tare or reset piezo
	2	ZERO-X	Mirrored zeroing of channel X
	3	TEST-X	Mirrored trigger test of sensor for channel X
	4	TEST-Y	Mirrored trigger test of sensor for channel Y
	5	Reserved	
	6	Reserved	
	7	Reserved	
1	0	Reserved	
	1	ACK-ADMIN	Mirrored acknowledgement with Administrator rights (e.g for corresponding warnings and alarms)
	2	Reserved	
	3	ACCESS	Mirrored ACCESS
	4	AUTO	Mirrored production mode; no editing of setup possible
	5	STAT-RESET	Mirrored reset of statistics
	6	STAT-DISABLE	Mirrored disabling of statistics
	7	Reserved	
2	0	MP-0 [1]	Mirrored selection of measuring program
	1	MP-1 [2]	
	2	MP-2 [4]	
	3	MP-3 [8]	
	4	Reserved	
	5	Reserved	
	6	Reserved	
	7	Reserved	
3	0…7	Reserved	
4	0…7	Reserved	
5	0…7	Reserved	
6	0	READY	Ready for the next cycle
	1	OK-TOTAL	Result OK (GOOD)
	2	NOK-TOTAL	Result NOK (BAD)
	3	NO-THREAD	NO-PASS
	4	Reserved	
	5	Reserved	
	6	WARN	Warning
	7	ALARM	Alarm
7	0	S1	Switch signal S1
	1	S2	Switch signal S2
	2	Reserved	
	3	Reserved	
	4	Reserved	
	5	Reserved	
	6	Reserved	
	7	Reserved	
8	0…7	Reserved	
9	0…7	Reserved	
10	0…7	Reserved	
11	0…7	Reserved	
12	0…7	Reserved	
13	0…7	Reserved	

The allocation and status of control bits are in the **SERVICE menu: Fieldbus input control bits** and **SERVICE: Fieldbus output control bits** displayed.

8.1.4.1 Page Control (Control/Config)

Page control - input control/config bits

Bytes 14 … 19 of the telegram

Byte	Bit	maXYmos BL IN	Description
13	0 … 7	Reserved	
14	0	CFG-MP-0 [1]	Selection of measuring program as destination for the data transmission. This applies to both read and write. See note below. Byte 15.7 has to be set if objects have to be interpreted as global.
	1	CFG-MP-1 [2]	
	2	CFG-MP-2 [4]	
	3	CFG-MP-3 [8]	
	4	Reserved	
	5	Reserved	
	6	Reserved	
	7	Reserved	
15	0	Reserved	
	1	Reserved	
	2	Reserved	
	3	Reserved	
	4	Reserved	
	5	Reserved	
	6	Reserved	
	7	GLOBAL-CFG-MP	If this bit is set, the telegram data is interpreted as global objects.
16	0	CFG-ADDRESS	Address in the fully configurable part of the telegram from which the data is to be transmitted. The address area starts with 00 and ends with 199. This makes it possible to also transmit just sub-areas of the total of 200 bytes. If the entire area is to be transmitted, the address must be set to 00. Please note that the address 00 corresponds to the absolute address 20 of the complete telegram (see also "Page Description").
	1	CFG-ADDRESS	
	2	CFG-ADDRESS	
	3	CFG-ADDRESS	
	4	CFG-ADDRESS	
	5	CFG-ADDRESS	
	6	CFG-ADDRESS	
	7	CFG-ADDRESS	
17	0	CFG-LENGTH	Number of fully configurable bytes to be transmitted in the telegram. The maximum number is 200.
	1	CFG-LENGTH	
	2	CFG-LENGTH	
	3	CFG-LENGTH	
	4	CFG-LENGTH	
	5	CFG-LENGTH	
	6	CFG-LENGTH	
	7	CFG-LENGTH	
18	0	SELEC-TPAGE	Selection of that page displayed in the address from address 20.
	1	SELEC-TPAGE	
	2	SELEC-TPAGE	
	3	Reserved	
	4	Reserved	
	5	Reserved	
	6	Reserved	
	7	Reserved	

If the values of the telegram currently being read are to relate to the current measuring program, the same program number must be set in byte 14 as in Control Signals - Input Control Bits, byte 2: Selection of measuring program.

Byte	Bit	maXYmos BL IN	Description
19	0	SAVE-TO-MP	If this bit is set (19.0 = 1), received data is stored in nonvolatile form in the chosen measuring program. If the bit is not set, the received data is only stored in RAM.
	1	STROBE	Starts data transmission / command.
	2	Reserved	
	3	Reserved	*See note below
	4	RESET-CHANGED-SELECTED-MP	Resets change flag of the currently selected measuring program (see byte 19.4 of the output telegram).
	5	Reserved	
	6	RESET-CHANGED-GLOBAL	Resets the global change flag (see byte 19.6 des of the output telegram).
	7	Reserved	
20	0 … 7		
…			

In firmware with a version number below 1.1, byte 19, bit 3 is used for the DIRECTION function.

DIRECTION: Data transmission direction, 0 = data is transmitted to the maXYmos BL (which receives it). 1 = maXYmos sends data.

As a result of this function being dropped from Version 1.1 onwards, this bit is no longer mirrored. This has changed the sequence for writing values to the monitor!

Page control - output control/config bits

Bytes 14 … 19 of the telegram

Byte	Bit	maXYmos BL OUT	Description
13	0…7	Reserved	
14	0	CFG-MP-0 [1]	Mirrored selection of measuring program of the input telegram
	1	CFG-MP-1 [2]	
	2	CFG-MP-2 [4]	
	3	CFG-MP-3 [8]	
	4	Reserved	
	5	Reserved	
	6	Reserved	
	7	Reserved	
15	0	Reserved	
	1	Reserved	
	2	Reserved	
	3	Reserved	
	4	Reserved	
	5	Reserved	
	6	Reserved	
	7	GLOBAL-CFG-MP	Mirrored bit of the input telegram
16	0…7	Reserved	
17	0…7	Reserved	
18	0	SELECT-PAGE	Mirrored page selection of the input telegram
	1	SELECT-PAGE	
	2	SELECT-PAGE	
	3	Reserved	
	4	Reserved	
	5	Reserved	
	6	Reserved	
	7	Reserved	
19	0	TRANSMISSION-FAULT	Error flag signaling a transmission fault. When a transmission fault is detected it is set simultaneously with clearing of the ACK bit.
	1	ACK	An acknowledge flag is set (byte 19.1 = 1) if the maXYmos BL executes the required command (which has been triggered by the Strobe bit). After the ACK bit has been received the Strobe bit can be cleared. Clearing the Strobe bit resets the ACK bit.
	2	IS-FLOAT-IEEE-754	
	3	Reserved	*See note re. *Page Control - Input Control/Config Bits*.
	4	CHANGED-SELECTED-MP	Measuring program change flag is changed. This flag is set (= 1) if any change in the data since the last measurement is detected. The flag is set after the measurement. Bit is only set if input bit 19.4 = 0.
	5	Reserved	
	6	CHANGED-GLOBAL	Global setup change flag changed. This flag is set (= 1) if any change in the global setup since the last measurement is detected. Bit is only set if input bit 19.6 = 0.
	7	Reserved	
20	0…7		
…			

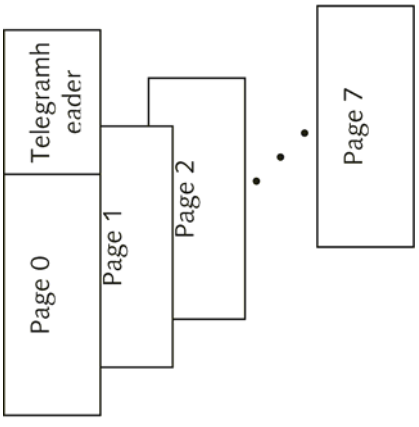
8.1.4.2 Page Description

Bytes 20 … 219 of the telegram

The description applies to both input and output telegrams. A telegram structure with three data objects (1 … 3) is shown by way of example. Data objects 1 and 3 each consist of four bytes (A B C D), data object 2 consists of two bytes (A B). The number of bytes of the data content in this case is ten, CFGLEN = 10.

Byte	CFGADR		Format length	maXYmos BL IN or OUT
0 … 2		Telegram header		Control Bits IN / OUT
3 … 5				Reserved
6 … 7				Reserved / Control Bits OUT
8 … 13				Reserved
14 … 15				Config/Control 200 Byte Page
16 … 19				Config/Control 200 Byte Page / Reserved
18 … 19				Config/Control 200 Byte Page
20	0	Page Fully configurable area	4	Data object 1 (Byte A)
21	1			Data object 1 (Byte B)
22	2			Data object 1 (Byte C)
23	3			Data object 1 (Byte D)
24	4		2	Data object 2 (Byte A)
25	5			Data object 2 (Byte B)
26	6		4	Data object 3 (Byte A)
27	7			Data object 3 (Byte B)
28	8			Data object 3 (Byte C)
29	9			Data object 3 (Byte D)
30	10			
31	11			
…	…			
…	…			
219	199			

Up to eight pages can be created in this way. The data objects and their formats/length are described in the section: **Data Objects**, the configuration is described in the section: **Telegram Configuration**.



If only the green highlighted data is to be transferred, CFGADR must be = 4 and CFGLEN = 6

This makes it possible to transfer just one sub-area of a page, for instance just the order or serial number, without having to create a separate page for this process.

Byte	CFG ADR		Format length	maXYmos BL IN or OUT	CFGLEN
0 … 2		Telegram header		Control Bits IN / OUT	
3 … 5				Reserved	
6 … 7				Reserved	
8 … 13				Reserved	
14 … 15				Config/Control 200 Byte Page	
16 … 19				Config/Control 200 Byte Page	
18 … 19				Config/Control 200 Byte Page	
20	0	Page Fully configurable area	4	Data object 1 (Byte A)	
21	1			Data object 1 (Byte B)	
22	2			Data object 1 (Byte C)	
23	3			Data object 1 (Byte D)	
24	4		2	Data object 2 (Byte A)	1
25	5			Data object 2 (Byte B)	2
26	6		4	Data object 3 (Byte A)	3
27	7			Data object 3 (Byte B)	4
28	8			Data object 3 (Byte C)	5
29	9			Data object 3 (Byte D)	6
30	10				
31	11				
…	…				
…	…				
219	199				

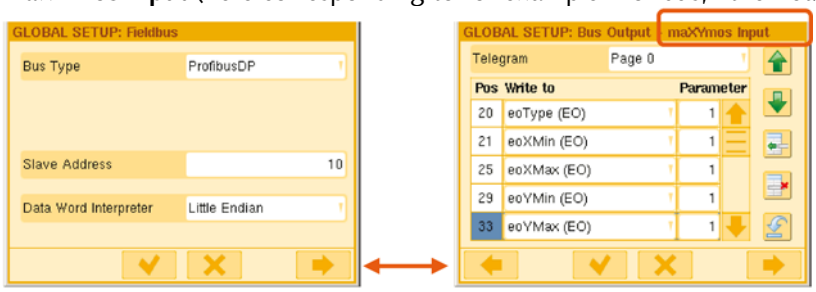
By default, with **CFG-ADDRESS** = 0 the number of bytes defined in the page configuration is automatically adopted. In this case **CFG-LENGTH** must be set = 0.

With **CFG-ADDRESS** ≠ 0 and/or **CFG-LENGTH** ≠ 0, it must be ensured that the corresponding data objects in the page configuration of the telegram are defined.

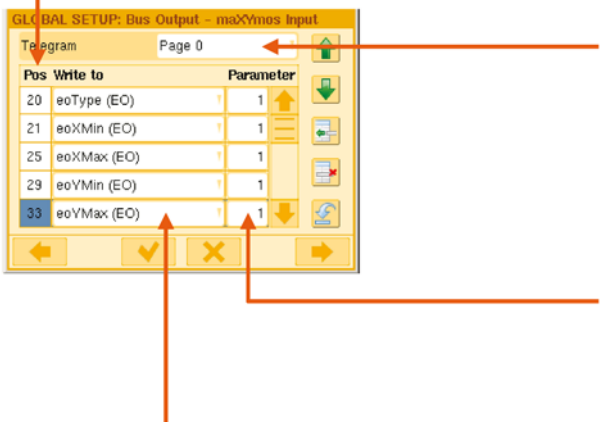
8.1.5 Telegram Configuration

8.1.5.1 Input Telegram

The input telegram is configured on the menu: **GLOBAL SETUP: Data Bus Output – maXYmos Input** (here corresponding to for example Profibus, Ethernet/IP)



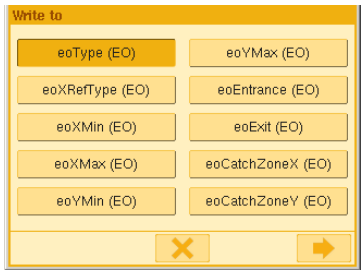
The byte number (position) in the telegram is shown in the **Pos** column. Counting is consecutive in this column and takes account of bytes 0 … 19 of the control signals and page control. Likewise when the data objects are entered in the **Write to** column their data length is taken into account automatically. A maximum of 200 bytes are available. In this case the last position is 219.



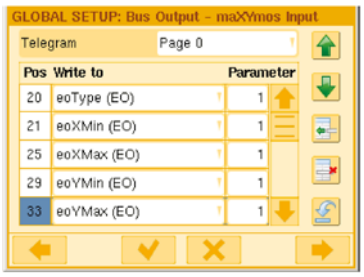
The page required for input is chosen with **Telegram Page**. A maximum of eight pages are available.

The parameter specified for the data object is entered in the **Parameter** column. The **Data Objects** section describes which object requires a parameter as well as the contents of the parameter. Typical parameters are EO number or length of a string.

The required data object is entered in the **Write to** column. The objects on the **Write to** menu can be chosen for the entry.



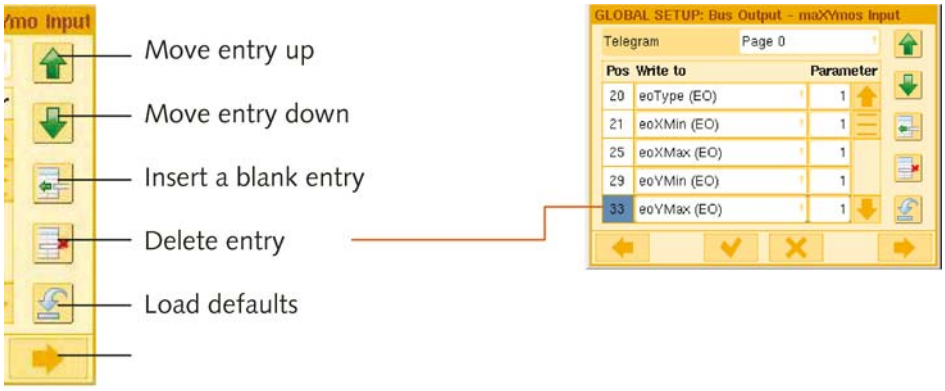
By way of example, four data objects have been included in the telegram in the following description. The byte position is automatically shown and parameters (in this case the EO number) entered in the **Parameter** column for these four objects.



The page required for input is chosen with **Telegram Page**. A maximum of eight pages are available.

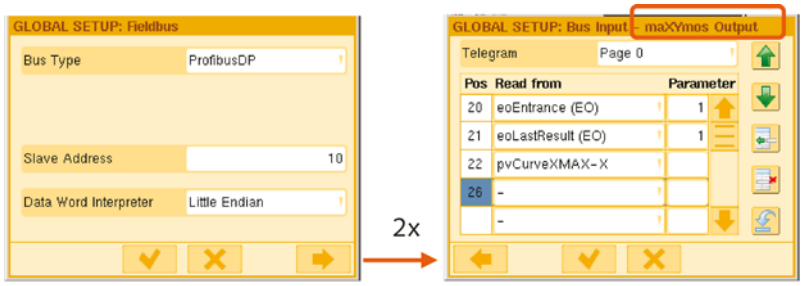
The parameter specified for the data object is entered in the **Parameter** column. The **Data Objects** section describes which object requires a parameter as well as the contents of the parameter. Typical parameters are EO number or length of a string.

The controls on the right-hand side allow the entries to be moved, deleted, or a free position to be inserted. The command relates to the gray-highlighted position/entry in the **Pos** column.



8.1.5.2 Output Telegram

The output telegram is configured on the menu **GLOBAL SETUP: Bus Input – maXYmos Output**



Configuration is similar to that of the input telegram. The input elements have the same function as those for **Data Bus Output – maXYmos Input**. The required output data objects are entered in the **Read from** column.

8.1.6 Data Objects of the Fully Configurable Area

8.1.6.1 Specifying Data Formats

The following data formats are used for the data objects .

Data type	Length in bytes	Description / value range
Bool	1	True/False
Byte	1	0, 1, … 255
Word	2	0, 1, … 65 535
DWord	4	0, 1, … 4 294 967 295
Int	2	–32 767, … 0, … 32 768
DInt	4	–2 147 483 648, … 0, … 2 147 483 647
Real	4	V(1) 8(E), M(23) V = sign E = exponent M = mantissa (X) = number of bits
NCod	1	Allocation / coding, for example: 0 = description A 1 = description B 2 = description C … Corresponds to data type: **Byte**. Allocation and coding are described in the **Data Objects** section.
Char	1 or var.	One character, for example: "T" A string is specified as an array of characters (Char) with the corresponding length. When it has a length that is fully definable by the user, the string is specified as the length parameter "var." (variable). Only the individual characters of the string to be described as Char can be transmitted. PLC-specific string control bytes or terminations must not be transmitted. The length is specified by the monitor in the telegram configuration of the particular data object in the **Parameter** field as "parameter".

The PLC contains strings which may include additional (control) bytes. These bytes must not be transmitted to the maXYmos BL as Char. The monitor only expects the actual characters of the string. For example, if Siemens begins a string with two additional bytes before the actual characters:
[Length][Number][Character]…[Character][Termination],
only the [Character]…[Character] section of this may be transmitted.

8.1.6.2 Specifying Data Objects

The table is divided into object groups to provide an overview. The description of the data types and number of bytes corresponds to the section on data formats. The data direction indicates whether a data object can only be written by the PLC (IN), only read (OUT) or can be read and written (BOTH). The "Related" column specifies what the object relates to (**EO** = evaluation object, **MP** = measuring program, **SW** = switch signal).
If, in the following tables, a particular **Object Identifier** is suffixed with **(...)**, the corresponding parameter (e.g. (EO No.) or (length)) needs to be entered in the **Parameter** field as part of the telegram configuration.

Group: EvaluationObjects						
Object identifier	**Data**			**Name / Description / Example**	**Related**	
	Type	**Num. bytes**	**Dir.**		**EO**	**MP**
eoType (EO No.)	NCod	1	BOTH	EO types	X	
				0 = DISABLED (EO disabled) 1 = NO_PASS 2 = Line-X (horizontal threshold) 3 = Line-Y (vertical threshold) 4 = UNI-BOX 5 = ENVELOPE		
eoXRefType (EO No.) Firmware version 1.08 or earlier	NCod	1	BOTH	EO reference point-X	X	
				1= Absolute 2 = Trigger-Y (threshold) 4 = Block		
eoXRefType (EO No.) From firmware version 1.1	NCod	1	BOTH	EO reference point-X	X	
				1 = Absolute 2 = Trigger-Y (threshold) 4 = Block		
eoXMin (EO No.)	Real	4	BOTH	EO boundary Xmin	X	
eoXMax (EO No.)	Real	4	BOTH	EO boundary Xmax	X	
eoYMin (EO No.)	Real	4	BOTH	EO boundary Ymin	X	
eoYMax (EO No.)	Real	4	BOTH	EO boundary Ymax	X	
eoEntrance (EO No.)	NCod	1	BOTH	EO entry side	X	
eoExit (EO No.)	NCod	1	BOTH	EO exit side	X	
				0 = NONE 1 = LEFT 2 = RIGHT 3 = BELOW 4 = ABOVE 5 = ANY		
eoCatchZoneX (EO No.)	NCod	1	BOTH	EO catch zone in X direction	X	
eoCatchZoneY (EO No.)	NCod	1	BOTH	EO catch zone in Y direction	X	
				0 = 0 % (no catch zone) 1 = 10 % 2 = 20 % 3 = 50 % 4 = 100 % 5 = unlimited catch zone		
eoXHysteresis (EO No.)	Real	4	BOTH	Hysteresis in X direction in % of the width of the particular EO	X	
eoYHysteresis (EO No.)	Real	4	BOTH	Hysteresis in Y direction in % of the height of the particular EO	X	

Group: EvaluationObjects						
Object identifier	**Data**			**Name / Description / Example**	**Related**	
	Type	**Num. bytes**	**Dir.**		**EO**	**MP**
eoDirection (EO No.)	NCod	1	BOTH	EO active in particular pass direction	X	
				0 = EO active in each pass direction 1 = EO active in positive pass direction(left > right) 2 = EO active in negative pass direction (right > left)		
envDy (EO No.)	Real	4	BOTH			
envTrendEnable (EO No.)	Bool	1	BOTH	TRUE = trend tracking ON		
envWeight (EO No.)	Real	4	BOTH	Weighting with trend tracking switched on		
envLimit (EO No.)	Real	4	BOTH	Limit for trend tracking with tracking switched on		

The objects **eoCatchUseGlobal**, **eoGlobalCatchzoneX** and **eoGlobalCatchzoneY** are no longer available from firmware version 1.1.

Group: General EvaluationObjects / Specifying Evaluation Objects						
Object identifier	**Data**			**Name / Description / Example**	**Related**	
	Type	**Num. bytes**	**Dir.**		**EO**	**MP**
eoGlobalFirstNokOnly	Bool	1	BOTH	TRUE = Only the first NOK EO counts for the bar graph		
GlobalHysteresisX	Real	4	BOTH	Global X hysteresis in % of the preset measuring range		
GlobalHysteresisY	Real	4	BOTH	Global Y hysteresis in % of the preset measuring range		

Group: MeasuringSetup						
Object identifier	**Data**			**Name / Description/ Example**	**Related**	
	Type	**Num. bytes**	**Dir.**		**EO**	**MP**
sensorXUseGlobal	Bool	1	BOTH	X channel sensor: True = Use global settings False = MP-specific		X
sensorYUseGlobal	Bool	1	BOTH	Y channel sensor: True = Use global settings False = MP-specific		X
CycleCtlrUseGlobal	Bool	1	BOTH	Cycle control: True = Use global settings False = MP-specific		X
BlockType	NCod	1	BOTH	Reference point BLOCK (point at)		X
				1 = XMAX 2 = XMIN		
BlockValue	Real	4	BOTH	Block dimension		X

Group: Dynamic Reference Point TRIGGER-Y						
Object identifier	**Data**			**Name / Description / Example**	**Related**	
	Type	**Num. bytes**	**Dir.**		**EO**	**MP**
trigYXOffset	Real	4	BOTH	X value at trigger point		X
tirgYLevel	Real	4	BOTH	Threshold value		X
tirgYDirection	NCod	1	BOTH	Approach direction		X
				3 = From BELOW 4 = From ABOVE		

Group: MeasuringProgramSwitchSignals						
Object identifier	**Data**			**Name / Description / Example**	**Related**	
	Type	**Num. bytes**	**Dir.**		**EO**	**MP**
switchType (Switch No.)	NCod	1	BOTH	Choosing signal (channel)	X	
				0 = Deactivated (SWITCH SIGNAL OFF) 1 = X (SWITCH SIGNAL X) 2 = Y (SWITCH SIGNAL Y)		
switchValue (Switch No.)	Real	4	BOTH	Switch threshold (switch at)	X	
switchDirection (Switch No.)	NCod	1	BOTH	Approach direction	X	
				0 = Deactivated (no switch threshold) 1 = From LEFT with switchType = 1 2 = From RIGHT with switchType = 1 3 = From BELOW WITH switchType = 2 4 = From ABOVE with switchType = 2		
switchLatchType (Switch No.)	NCod	1	BOTH	Latching action	X	
				0 = No 1 = Until Stop (until the end of the current cycle) 2 = Until Start (until the start of the following cycle)		
switchRefType (Switch No.)	NCod	1	BOTH	Reference point X	X	
				0 = Absolute 1 = TRIGGER-Y (not possible with swType = 2)		

Group: MeasuringProgram						
Object identifier	**Data**			**Name / Description / Example**	**Related**	
	Type	**Num. bytes**	**Dir.**		**EO**	**MP**
mpName (length)	Char	Var.	BOTH	Name of the measuring program (MP name)		X
mpEnabled	Bool	1	BOTH	Measuring program enabled = TRUE		X
snSource	Ncod	1	BOTH	Source of ID (serial number)		X
				0 = Internal generator 1 = Fieldbus		
snHeader(length)	Char.	Var.	BOTH	String for the header of the ID (serial number)		X

Group: CycleControl / Cycle Control						
Object identifier	**Data**			**Name / Description / Example**	**Related**	
	Type	**Num. bytes**	**Dir.**		**EO**	**MP**
ccMeasuringFunction	NCod	1	BOTH	Measuring function		X
				0 = Measuring function y = f(x) 1 = Measuring function y = f(t) 2 = Measuring function x = f(t) 3 = Measuring function y = f(x,t)		
ccXSamplingMode	NCod	1	BOTH	Sampling time setup		X
				0 = Automatic 1 = Manual (condition: the sampling time Delta t must be defined with parameter ccXSamplingInterval)		
ccXSamplingInterval	Real	4	BOTH	Delta t (sampling time)		X
ccStartMeasureEvent	NCod	1	BOTH	Measuring START with (condition)		X
				0 = Dig. input (START bit on fieldbus if in Fieldbus mode) 1 = Threshold-X 2 = Threshold-Y		
ccStartMeasureValue	Real	4	BOTH	Value for switching threshold if, with CycleControl – ccStartMeasureEvent, a switching threshold has been selected		X
ccStartMeasureOption	NCod	1	BOTH	Approach from		X
				1 = From LEFT at threshold-X 2 = From RIGHT at threshold-X 3 = From BELOW at threshold-Y 4 = From ABOVE at threshold-Y		
ccStopMeasureEvent	NCod	1	BOTH	Measure STOP with (condition)		X
				0 = Dig. input (STOP bit on fieldbus if in Fieldbus mode) 1 = Threshold-X 2 = Threshold-Y 3 = Turning back 4 = Time		
ccStopMeasureValue	Real	4	BOTH	Switch threshold value if, with CycleControl - ccStopMeasureEvent, a switch threshold has been selected		X
ccStopMeasureOption	NCod	1	BOTH	Approach from)		X
				1 = From LEFT at threshold-X 2 = From RIGHT at threshold-X 3 = From BELOW at threshold-Y		

				4 = From ABOVE at thresholdY		
ccCycleTimeout	Real	4	BOTH	Timeout cycle		X
ccCutCurve	NCod	1	BOTH	Cut off (truncate) curve at		X
				0 = NONE 1 = Turning point RIGHT 2 = Turning point LEFT		
ccXMaxReturn	NCod	1	BOTH	Turning point RIGHT		X
				0 = NONE 1 = XMAX 3 = YMAX (at Xmax) 5 = YMIN (at Xmax)		
ccXMinReturn	NCod	1	BOTH	Turning point LEFT		X
				0 = NONE 2 = XMIN 4 = YMAX (at Xmin) 6 = YMIN (at Xmin)		

Group: Diagnostics						
Object identifier	**Data**			**Name / Description / Example**	**Related**	
	Type	**Num. bytes**	**Dir.**		**EO**	**MP**
dateYear	Int	2	BOTH	Date: Year (e.g. 2010 = 0x07DA hex)		
dateMonth	Int	2	BOTH	Date: Month (e.g. Nov. = 0x0B hex)		
dateDay	Int	2	BOTH	Datum: Day (e.g. 28th = 0x01C hex)		
timeHour	Int	2	BOTH	Time: Hours (e.g. 15.00 hours = 0x0F hex)		
timeMinute	Int	2	BOTH	Time: Minutes (e.g. 45 min. = 0x02D hex)		
timeSecond	Int	2	BOTH	Time: Seconds (e.g. 53 sec. = 0x035 hex)		

Group: EvaluationObjects						
Object identifier	**Data**			**Name / Description/ Example**	**Related**	
	Type	**Num. bytes**	**Dir.**		**EO**	**MP**
CoordinateSystem	NCod	1	BOTH	Coordinate system reference for representation	X	
				0 = Absolute 1 = Block reference 1 = Reference to threshold		
HistoryBuffer	NCod	1	BOTH	Saving results	X	
				0 = All (OK & NOK) 1 = NOK only		

Group: SystemSetup						
Object identifier	**Data**			**Name / Description / Example**	**Related**	
	Type	**Num. bytes**	**Dir.**		**EO**	**MP**
language	NCod	1	BOTH	Language		
				0 = English 1 = German		

Group: Naming / Name						
Object identifier	**Data**			**Name / Description / Example**	**Related**	
	Type	**Num. bytes**	**Dir.**		**Type**	**Num. bytes**
deviceName (length)	Char	Var.	BOTH	Device name		
companyName (length)	Char	Var.	BOTH	Company name		
deviceComment (length)	Char	Var.	BOTH	Comments		

Group: Protection / Access Authorization						
Object identifier	**Data**			**Name / Description / Example**	**Related**	
	Type	**Num. bytes**	**Dir.**		**EO**	**MP**
protectionDeactivated	Bool	1	BOTH	Access protection deactivated = True		
protectionPlcLogon	NCod	1	BOTH	Access gained by being enabled by PLC		
				0 = DEACTIVATED 1 = SETTER 2 = OPERATOR		
protectionLogoffTimeout	NCod	1	BOTH	Time: Logoff after timeout		
				0 = 1 hour 1 = 4 hours 2 = 8 hours 3 = 24 hours		

Group: DataStorage / Data Export						
Object identifier	**Data**			**Name / Description / Example**	**Related**	
	Type	**Num. bytes**	**Dir.**		**EO**	**MP**
dataExportFormat	NCod	1	BOTH	Export format		
				0 = No data export (Export OFF) 1 = CSV format		
dataExportServerName (length)	Char	Var.	BOTH	Length for server name or IP address (e.g. IP address: sensible length = 15)		
dataExportPath (length)	Char	Var.	BOTH	Destination path		
dataExportMode	NCod	1	BOTH	Contents to be exported		
				0 = All curves 1 = OK curves 2 = NOK curves		
dataExpUsername (length)	Char	Var.	BOTH	Username		
dataExpPassword (length)	Char	Var.	BOTH	Password		
dataExportStyle	NCod	1	BOTH	Formatting of the export file 0 = Comma_Semicolon (x,xx;x,xx) 1 = Point_Semicolon (x.xx;x.xx) 2 = Point_Comma (x.xx,x.xx)		

Group: InputX						
Object identifier	**Data**			**Name / Description / Example**	**Related**	
	Type	**Num. bytes**	**Dir.**		**EO**	**MP**
inputXType	NCod	1		Sensor type channel X		X
				0 = No sensor (e.g. measurement against time) 1= ±10V 2 = Potentiometer (permanently preset by the type of device 5867AX0XX)		
inputXRangeFrom	Real	4	BOTH	Used measuring range from		X
inputXRangeTo	Real	4	BOTH	Used measuring range to		X
inputXScalingMode	NCod	1	BOTH	Scaling mode		X
				0 = Not available with potentiometer 1 = Scaling by teach-in		
inputXSensitivity	Real	4	BOTH	Sensor sensitivity		X
inputXInverted	Bool	1	BOTH	Signal inversion (True = X signal inverted)		X
inputXSensDisplay	Real	4	BOTH	Sensitivity in display units		X
inputXSensSignal	Real	4	BOTH	Sensitivity in sensor signal units		X
inputXZeroDisplay	Real	4	BOTH	Zero in display units		X
inputXZeroSignal	Real	4	BOTH	Zero in sensor units		X
inputXRefDisplay1	Real	4	BOTH	Teach-in point 1 in display units		X
inputXRefSignal1	Real	4	BOTH	Teach-in point 1 in sensor signal units		X
inputXRefDisplay2	Real	4	BOTH	Teach-in point 2 in display units		X
inputXRefSignal2	Real	4	BOTH	Teach-in point 2 in signal sensor signal units		X
inputXUnitString (length)	Char	Var.	BOTH	X unit		X
inputXFilterFrequency Firmware version 1.08 or earlier	NCod	1	BOTH	Filter (low-pass cut-off frequency)		X
				0 = OFF (no filter) 1 = 500 Hz 2 = 200 Hz 3 = 100 Hz 4 = 50 Hz 5 = 20 Hz 6 = 10 Hz 7 = 5 Hz 8 = 2 Hz 9 = 1 Hz 10 = 0,5 Hz 11 = 0,2 Hz 12 = 0,1 Hz		

The object **inputXDecimalPlaces** is no longer available from firmware version 1.1.

Group: InputX						
inputXFilterFrequency From Firmware version 1.1	NCod	1	BOTH	Filter (low-pass cut-off frequency) 0 = OFF (no filter) 3 = 500 Hz 4 = 200 Hz 5 = 100 Hz 6 = 50 Hz 7 = 20 Hz 8 = 10 Hz 9 = 5 Hz 10 = 2 Hz 11 = 1 Hz 12 = 0,5 Hz 13 = 0,2 Hz 14 = 0,1 Hz		
inputXTestValue	Real	4	BOTH	Test point (expected value in sensor test)		X
inputXTestTolerance	Real	4	BOTH	Permissible tolerance on the test value		X
inputXTestEnabled	Bool	1	BOTH	Test sensor using DigIN = TRUE		X
inputXZoomFrom	Real	4	BOTH	Display range from		X
inputXZoomTo	Real	4	BOTH	Display range to		X

Group: InputY						
Object identifier	**Data**			**Name / Description / Example**	**Related**	
	Type	**Num. bytes**	**Dir.**		**EO**	**MP**
inputYType	NCod	1		Sensor type channel Y		X
				0 = No sensor (e.g. for classification) 3 = Piezoelectric sensor (permanently preset by device type5867A0XXX) 4 = Strain gage sensor (permanently preset by device type 5867A1XXX) 5= ±10 V (permanently preset by device type 5867B1XXX)		
inputYRangeFrom	Real	4	BOTH	Used measuring range from		X
inputYRangeTo	Real	4	BOTH	Used measuring range to		X
inputYScalingMode	NCod	1	BOTH	Scaling mode		X
				0 = Scaling using calibration certificate 1 = Scaling by means of teach-in		
inputYSensitivity	Real	4	BOTH	Sensor sensitivity		X
inputYInverted	Bool	1	BOTH	Signal inversion		X
inputYSensDisplay	Real	4	BOTH	Sensitivity in display units		X
inputYSensSignal	Real	4	BOTH	Sensitivity in sensor signal units		X
inputYZeroDisplay	Real	4	BOTH	Zero point in display units		X
inputYZeroSignal	Real	4	BOTH	Zero point in sensor signal units		X
inputYRefDisplay1	Real	4	BOTH	Teach-in point 1 in display units		X
inputYRefSignal1	Real	4	BOTH	Teach-in point 1 in sensor signal units		X
inputYRefDisplay2	Real	4	BOTH	Teach-in point 2 in display units		X
inputYRefSignal2	Real	4	BOTH	Teach-in point 2 in sensor signal units		X
inputYUnitString (length)	Char	Var.	BOTH	X unit		X
inputYFilterFrequency Firmware version 1.08 or earlier	NCod	1	BOTH	Filter (low-pass cut-off frequency)		X
				0 = OFF (no filter) 1 = 500 Hz 2 = 200 Hz 3 = 100 Hz 4 = 50 Hz 5 = 20 Hz 6 = 10 Hz 7 = 5 Hz 8 = 2 Hz 9 = 1 Hz 10 = 0,5 Hz 11 = 0,2 Hz 12 = 0,1 Hz		

The object **inputYDecimalPlaces** is no longer available from firmware version 1.1.

Group: InputY						
inputYFilterFrequency From firmware version1.1	NCod	1	BOTH	Filter (low-pass cut-off frequency) 0 = OFF (no filter) 3 = 500 Hz 4 = 200 Hz 5 = 100 Hz 6 = 50 Hz 7 = 20 Hz 8 = 10 Hz 9 = 5 Hz 10 = 2 Hz 11 = 1 Hz 12 = 0,5 Hz 13 = 0,2 Hz 14 = 0,1 Hz		X
inputYTestValue	Real	4	BOTH	Test point (expected value in sensor test)		X
inputYTolerance	Real	4	BOTH	Permissible tolerance on the test value		X
inputYTestEnabled	Bool	1	BOTH	Test sensor using DigIN = TRUE		X
inputYTareCycleStart	Bool	1	BOTH	True = Link tare with start		
ResetPiezoMode	Bool	1	BOTH	True = Reset of piezoelectric sensor at start of cycle		X
inputYZoomFrom	Real	4	BOTH	Display range from		X
inputYZoomTo	Real	4	BOTH	Display range to		X

Group: ProcessData						
Object identifier	**Data**			**Name / Description / Example**	**Related**	
	Type	**Num. bytes**	**Dir.**		**EO**	**MP**
okCycles	DInt	4	OUT	Number of OK pieces/cycles		X
totalCycles	DInt	4	OUT	Total number of pieces/cycles		X
eoNokCycles (EO No.)	DInt	4	OUT	Number of NOK pieces/cycles from this EO	X	
eoTotalCycles EO No.)	DInt	4	OUT	Total number of pieces/cycles from this EO	X	
eoLastResult (EO No.)	NCod	1	OUT	Last result from this EO	X	
				0 = No evaluation result 1 = OK 2 = NOK		
snCurrentSn (length)	Char	Var.	BOTH	Current serial number		X
CurrentSensorXType	NCod	1	OUT	0 = No sensor (e.g. measurement against time) 1= ±10V 2 = Potentiometer (permanently set by device type 5867AX0XX)		X
CurrentSensorYType	NCod	1	OUT	0 = No sensor (e.g. for classification) 3 = Piezoelectric sensor (permanently preset by device type 5867A0XXX) 4 = Strain gage sensor (permanently preset by device type 5867A1XXX) 5= ±10 V (permanently preset by device type 5867B1XXX)		X
pvBlockPositionX	Real	4	OUT	Process value: Block position X		X
pvBlockPositionY	Real	4	OUT	Process value: Block position Y		X
pvTriggerYPosition	Real	4	OUT	Process value: Position of Trigger-Y		X
pvTriggerYCrossed	Bool	1	OUT	Trigger Y threshold has been passed = TRUE		X
pvEoEntryOK (EO No.)	NCod	1	BOTH	Result of monitoring of the entry condition of the EO chosen with (EO No.)	X	
pvEoExitOK (EO No.)	NCod	1	BOTH	Result of the monitoring of the exit condition of the EO chosen with (EO NO.)	X	
				0 = No evaluation result 1 = OK 2 = NOK		
pvEoEntry (EO No.)	NCod	1	BOTH	Curve entry of EO chosen with (EO No.)	X	
pvEoExit (EO No.)	NCod	1	BOTH	Curve exit with EO chosen with (EO No.)	X	
				0 = NONE 1 = LEFT 2 = RIGHT 3 = BELOW 4 = ABOVE		

The note regarding writing of Char(s) must be followed for transmission of the serial number to the data object snCurrentSn (length) .
If only the serial number snCurrentSn (length) is to be transferred as a single object within one telegram page, CFGADR = (position within the telegram) and CFGLEN = (length) must be set.

Group: ProcessData						
Object identifier	**Data**			**Name / Description / Example**	**Related**	
	Type	**Num. bytes**	**Dir.**		**EO**	**MP**
pvXMinX (EO No.)	Real	4	OUT	Process value XMinX of the EO chosen with (EO No.)	X	
pvXMinY (EO No.)	Real	4	OUT	Process value: XMinY	X	
pvXMaxX (EO No.)	Real	4	OUT	Process value: XMaxX	X	
pvXMaxY (EO No.)	Real	4	OUT	Process value: XMaxY	X	
pvYMinX (EO No.)	Real	4	OUT	Process value: YMinX	X	
pvYMinY (EO No.)	Real	4	OUT	Process value: YMinY	X	
pvYMaxX (EO No.)	Real	4	OUT	Process value: YMaxX	X	
pvYMaxY (EO No.)	Real	4	OUT	Process value: YMaxY	X	
pvYMinOk (EO No.)	NCod	1	OUT	Result of monitoring the YMin condition of the EO chosen with (EO No.)	X	
pvYMaxOk (EO No.)	NCod	1	OUT	Result of the YMax condition	X	
pvXMinOk (EO No.)	NCod	1	OUT	Result of the XMin condition	X	
pvXMaxOk (EO No.)	NCod	1	OUT	Result of the XMax condition	X	
				0 = No evaluation result 1 = OK 2 = NOK		
pvCurveXMinX	Real	4	OUT	Process value XMinX of the curve		X
pvCurveXMinY	Real	4	OUT	Process value XMinY of the curve		X
pvCurveXMaxX	Real	4	OUT	Process value XMaxX of the curve		X
pvCurveXMaxY	Real	4	OUT	Process value XMaxY of the curve		X
pvCurveYMinX	Real	4	OUT	Process value YMinX of the curve		X
pvCurveYMinY	Real	4	OUT	Process value YMinY of the curve		X
pvCurveYMaxX	Real	4	OUT	Process value YMaxX of the curve		X
pvCurveYMaxY	Real	4	OUT	Process value YMaxY of the curve		X
pvCurvePeakPeakX	Real	4	OUT	Process value: Peak-Peak X of the curve		X
pvCurvePeakPeakY	Real	4	OUT	Process value: Peak-Peak Y of the curve		X

If an EO is not reached, or a corresponding process value cannot be evaluated, its data object departs from the table in providing: **NONE** in the process display, and 0,0 as output. It is therefore advisable to test the evaluation status of the particular EO with the objects **pvLastResult** or **pvEoEntryOK** and **pvEoExitOK** .

Group: Alarmtatus								
Object identifier			**Data**			**Name / Description / Example**	**Related**	
			Type	**Num. bytes**	**Dir.**		**EO**	**MP**
alarmState			Byte	8	OUT	8-byte long bit-coded status word of the active alarm messages. Please note that it is advisable to read in the 8 bytes in a consistent manner.		
	Byte	Bit						
	0	0				ALARM_SETUP_MISMATCH		
		1				ALARM_X_SENSOR_CALIBRATION		
		2				ALARM_Y_SENSOR_CALIBRATION		
		3				ALARM_NO_EO_CONFIGURED		
		4				ALARM_EO_X_OUT_OF_BOUNDS		
		5				ALARM_EO_Y_OUT_OF_BOUNDS		
		6				ALARM_SETUP_MISMATCH_WARNING		
		7				ALARM_NO_PIEZO_INPUT_MODULE		
	1	0				ALARM_NO_DMS_MODULE		
		1				ALARM_INACTIVE_MP_SELECTED		
		2				ALARM_SETUP_CHANGE_TIME		
		3				ALARM_TREND,		
		4				ALARM_UNACKED_NOK		
		5				ALARM_PROCESS_VALUE		
		6				ALARM_NOK_IN_SEQUENCE		
		7				ALARM_LOST_CYCLES,		
	2	0				ALARM_PART_IN_WRONG_BOX		
		1				ALARM_NOK_PERCENTAGE_EXCEEDED		
		2				ALARM_ENVELOPE_TREND		
		3				ALARM_ENVELOPE_WARNING		
		4				ALARM_SELFTEST_STRAIN_GAGE_NOK		
		5				ALARM_DIG_IO_SHORT_CIRCUIT		
		6				ALARM_SELFTEST_5V_SENSOR_POWER		
		7				ALARM_SELFTEST_24V_SENSOR_POWER		

Group: AlarmStatus								
Object identifier			**Data**			**Name / Description / Example**	**Related**	
			Type	**Num. bytes**	**Dir.**		**EO**	**MP**
alarmState			Byte	8	OUT	8-byte long bit-coded status word of the active alarm messages. Please note that it is advisable to read in the 8 bytes in a consistent manner.		
	Byte	Bit						
	3	0				ALARM_INCREMENT_ZERO		
		1				ALARM_SAMBA_NO_NETWORK_WARNING		
		2				ALARM_SAMBA_NO_NETWORK, //		
		3				ALARM_SAMBA_FILES_IN_CACHE		
		4				ALARM_SAMBA_MEMORY_FULL_SOON		
		5				ALARM_SAMBA_MEMORY_FULL_WARNING		
		6				ALARM_SAMBA_MEMORY_FULL		
		7				ALARM_SAMBA_PUT_FILE_FAILED		
	4	0				ALARM_MEMORY_CARD_FULL_SOON		
		1				ALARM_MEMORY_CARD_FULL_WARNING		
		2				ALARM_MEMORY_CARD_FULL		
		3				ALARM_GATEWAY_NOT_ACCESSIBLE		
		4				ALARM_FIFO_FULL_SOON		
		5				ALARM_FIFO_FULL_WARNING		
		6				ALARM_FIFO_FULL		
		7				ALARM_RECALIBRATION_PIEZO_NEEDED		
	5	0				ALARM_RECALIBRATION_SG_NEEDED		
		1				Reserved		
		2				Reserved		
		3				Reserved		
		4				Reserved		
		5				Reserved		
		6				Reserved		
		7				Reserved		
	6	0				Reserved		
		1				Reserved		
		2				Reserved		
		3				Reserved		
		4				Reserved		
		5				Reserved		
		6				Reserved		
		7				Reserved		
	7	0				Reserved		
		1				Reserved		
		2				Reserved		
		3				Reserved		
		4				Reserved		
		5				Reserved		
		6				Reserved		
		7				Reserved		

The objects **alertGlobalState**, **alertActiveAlarmsCount** und **alertActiveAlarmNo** have been replaced with the bit-coded 64-bit **alarmState** status word from firmware version 1.1. Additionally, the global status bits 6.6 Warning and 6.7 Alarm from the control signals (output bits) are also available.

Group: SystemStatus						
Object identifier	**Data**			**Name / Description / Example**	**Related**	
	Type	**Num. bytes**	**Dir.**		**EO**	**MP**
statusDeviceType (length)	Char	Var.	OUT	Device type* (recommended length = 6)		
statusDeviceSerialNo (length)	Char	Var.	OUT	Device serial No.* (recommended length = 8)		
statusFirmwareVersion (length)	Char	Var.	OUT	Firmware version* (recommended length = 10)		
statusHWVersion (length)	Char	Var.	OUT	Hardware version* (recommended length = 10)		

Group: SensorStatus						
Object identifier	**Data**			**Name / Description / Example**	**Related**	
	Type	**Num. bytes**	**Dir.**		**EO**	**MP**
statusMeasValueX	Real	4	OUT	Current measurement, X input (tared)		
statusMeasValueY	Real	4	OUT	Current measurement, Y input (tared)		
statusAbsoluteValueX	Real	4	OUT	Current measurement, X input (absolute)		
statusAbsoluteValueY	Real	4	OUT	Current input Y input (absolute)		
statusZeroOffsetValue X	Real	4	BOTH	X offset value		
statusTaraOffsetValue Y	Real	4	BOTH	Y offset/tare value		

The objects **statusSensorTestX** and **statusSensorTestX** are no longer available from firmware version 1.1. In the event of miscalibration the corresponding alarm bits are set in the bit-coded 64-bit **alarmState** status word.

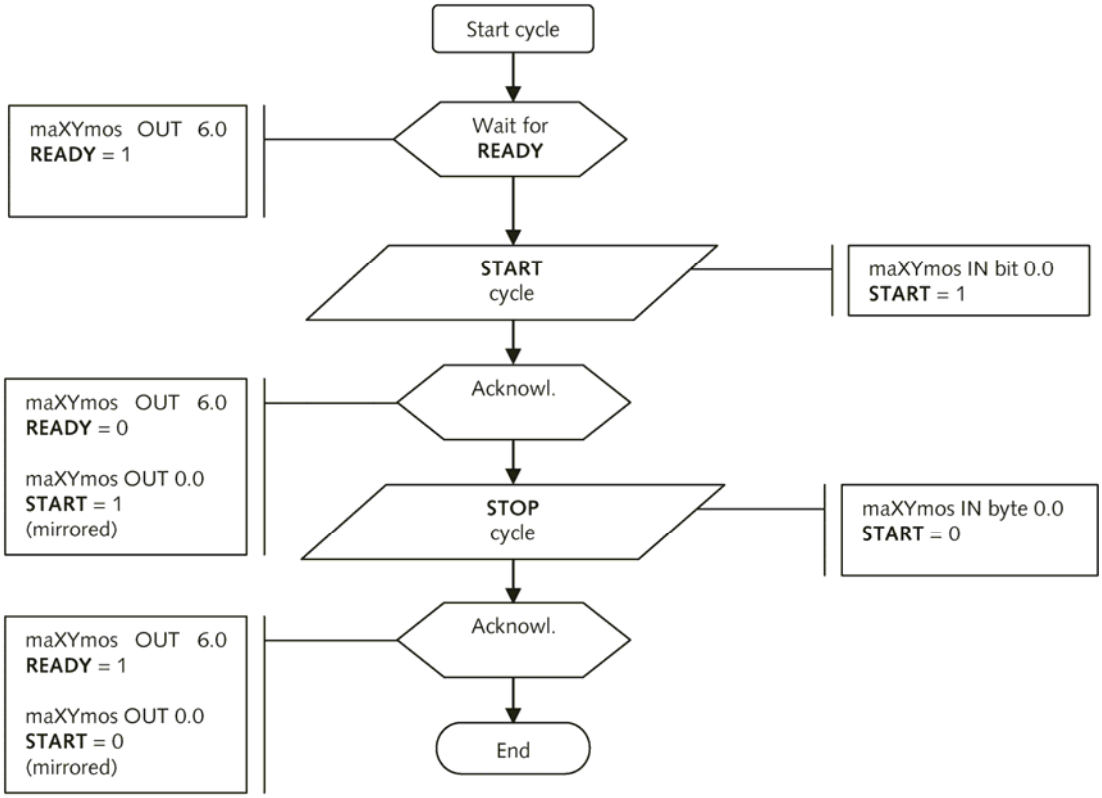
8.1.7 Control / Data Transfer

8.1.7.1 General Information

The control signals **maXYmos OUT** are transparent and are constantly updated. These signals can be continuously requested by the PLC. All control inputs **maXYmos IN** are mirrored for acknowledgement.

Control must observe the following sequences.

8.1.7.2 Control: Starting/Stopping Cycle by means of PLC



NOTE

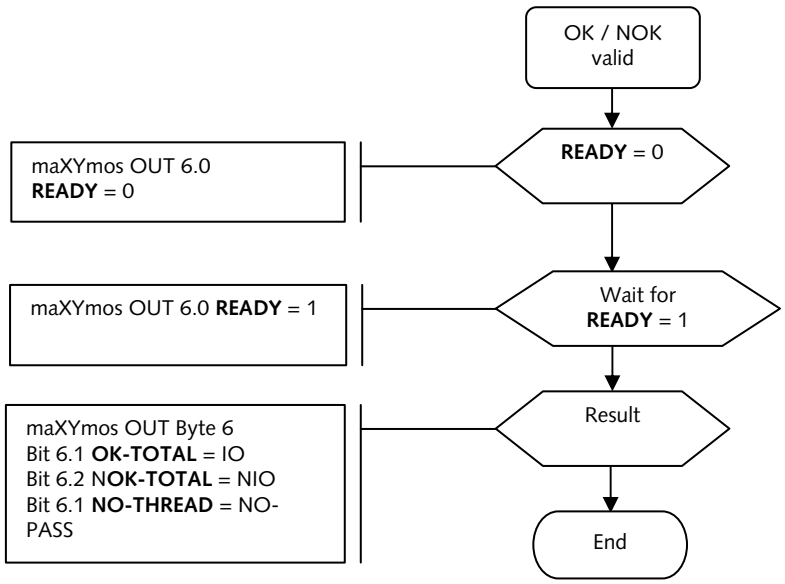
If thresholds have been configured as **Start at** (StartMeasureEvent), the corresponding condition must be met for READY = 0 .
Resetting **START** interrupts the cycle, even if the configured **Stop at** (StopMeasureEvent) has not been reached.

NOTE

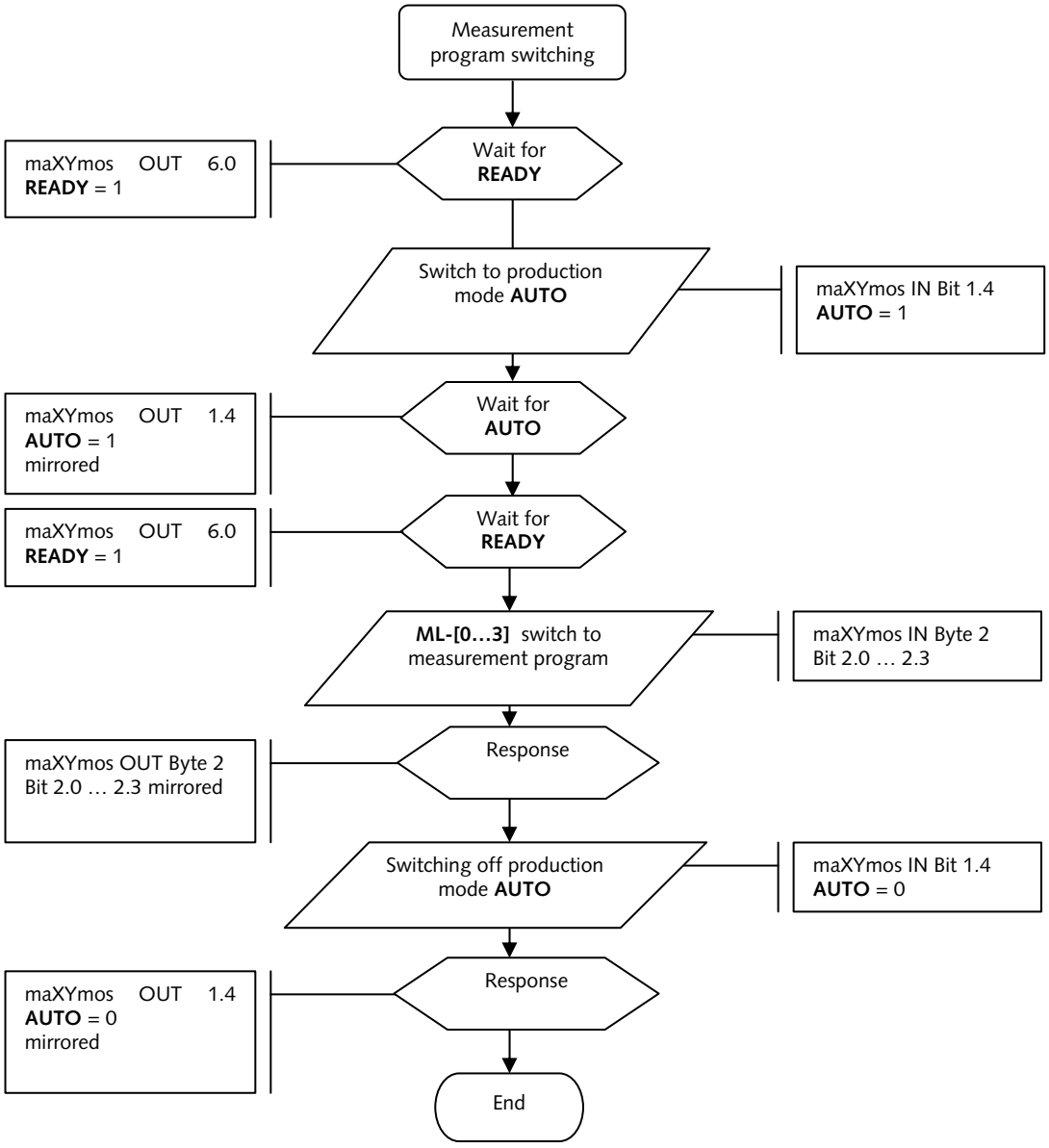
With control input **AUTO** = 0 the manually set measuring program is used. If the measuring program is to be preset by means of the PLC, program selection must use AUTO = 1. See section **Control: Switching Measuring Program by means of PLC**.

8.1.7.3 Data Request: Event OK/NOK valid

The event OK/NOK at the end of a measuring cycle becomes valid with the change in edge of the output signal **maXYmos READY** from 0 to 1.



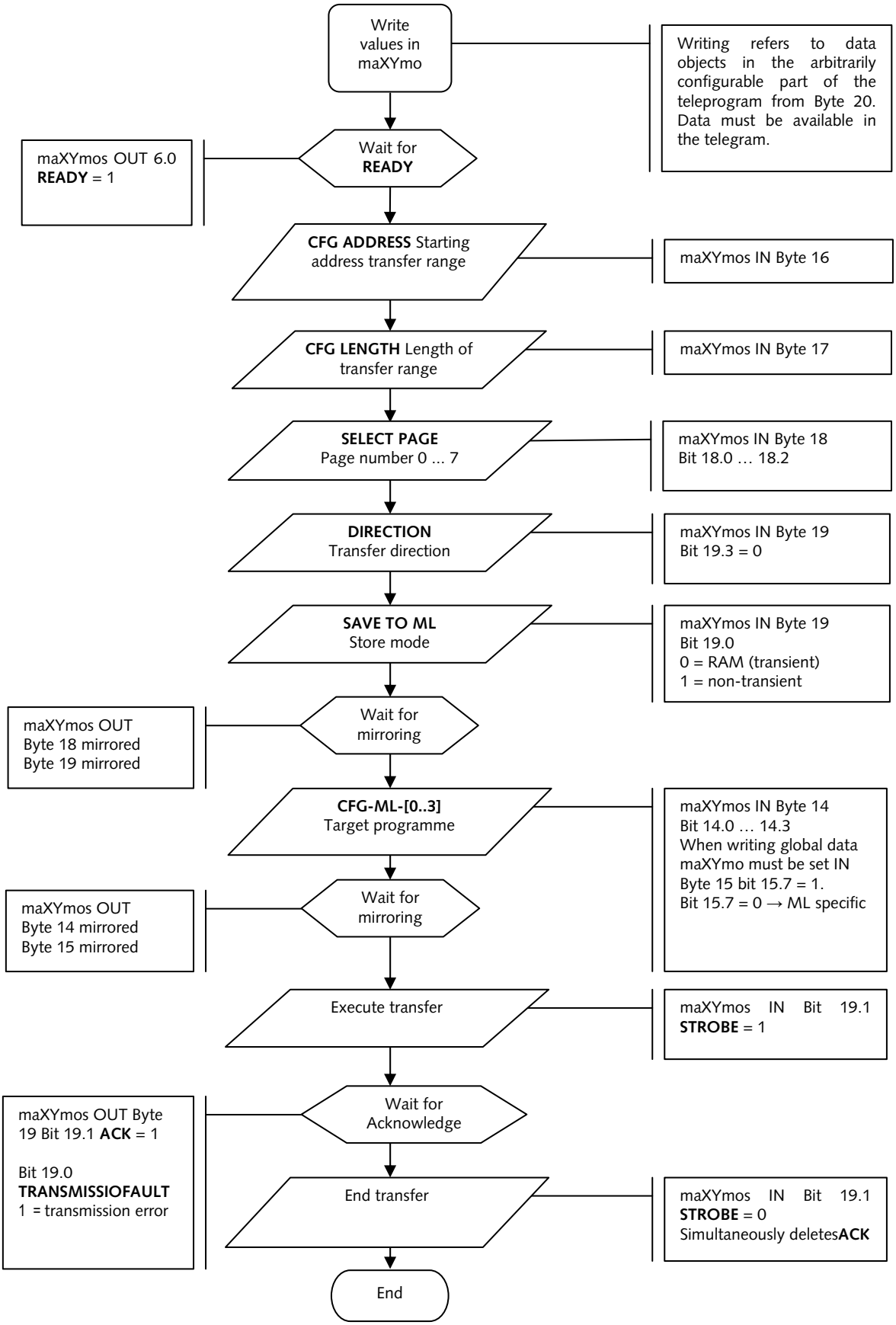
8.1.7.4 Control: Switching Measuring Program by means of PLC



NOTE

Switching off the production mode allows the operator to choose the MP manually by entering details on the screen.

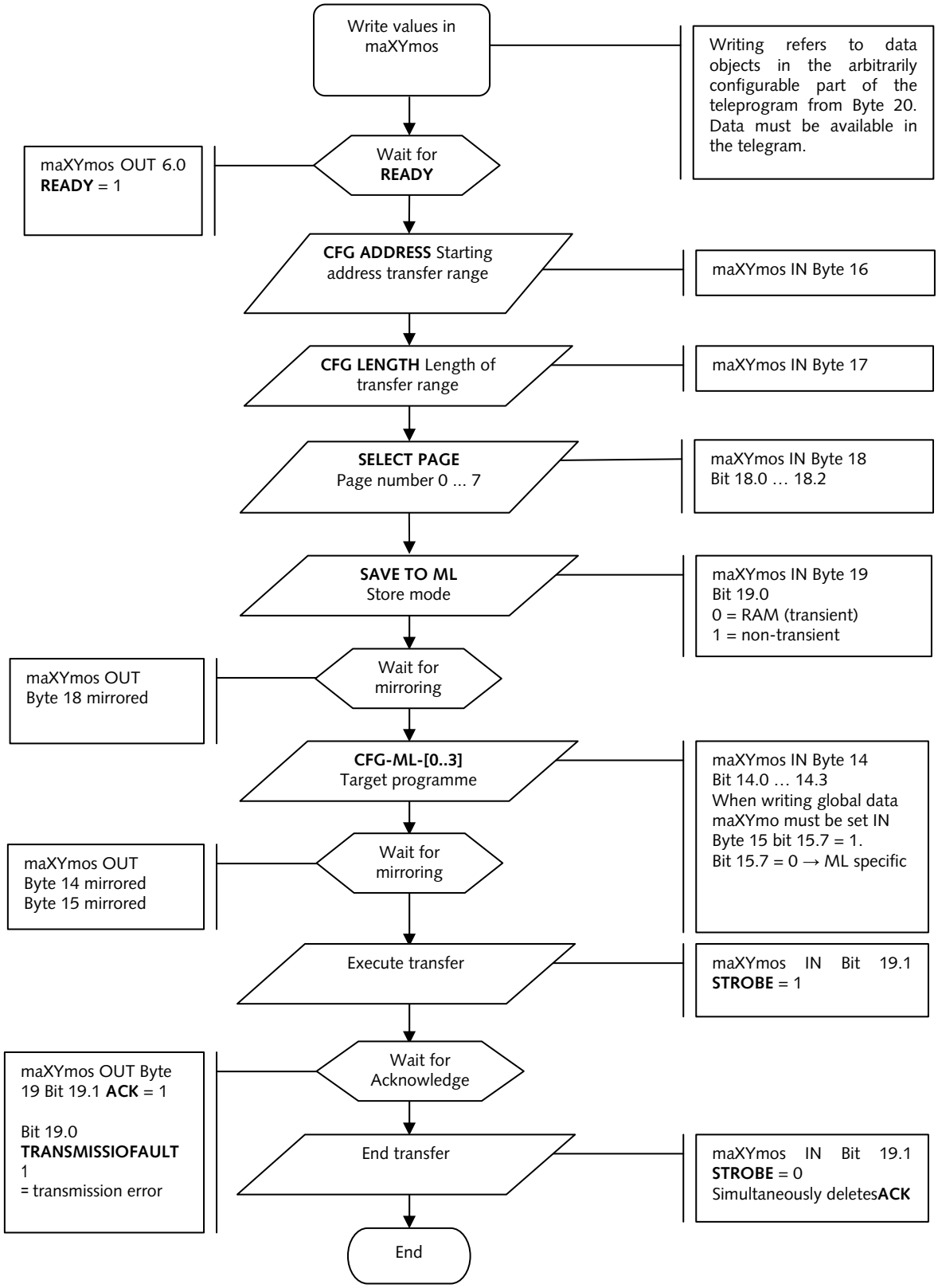
8.1.7.5 Writing Values from PLC to maXYmos BL with Firmware Version 1.08 (or earlier)



With **CFG-ADDRESS** ≠ 0 and/or **CFG-LENGTH** ≠ 0, it must be ensured that the corresponding data objects are defined in the page configuration of the telegram.

By default, with **CFG-ADDRESS** = 0 the number of bytes defined in the page configuration is applied automatically. In this case **CFG-LENGTH** must be set = 0.

8.1.7.6 Writing Values from PLC to maXYmos BL from Firmware Version 1.1



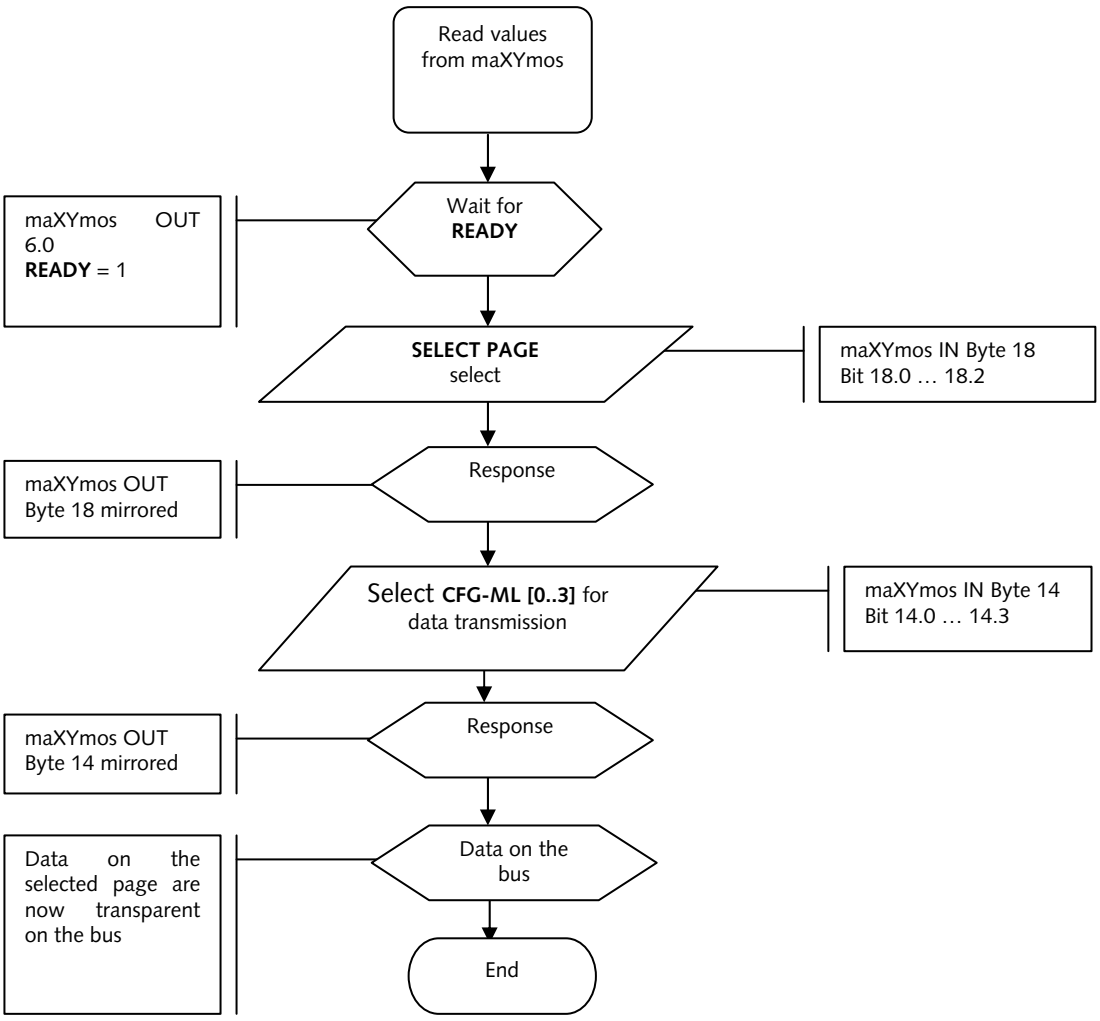
CAUTION

With **CFGADR** K 0 and/or **CFGLEN** K 0, it must be ensured that the corresponding data objects are defined in the page configuration of the telegram.

NOTE

By default, with **CFGADR** = 0 the number of bytes defined in the page configuration is applied automatically. In this case **CFGLEN** must be set = 0.

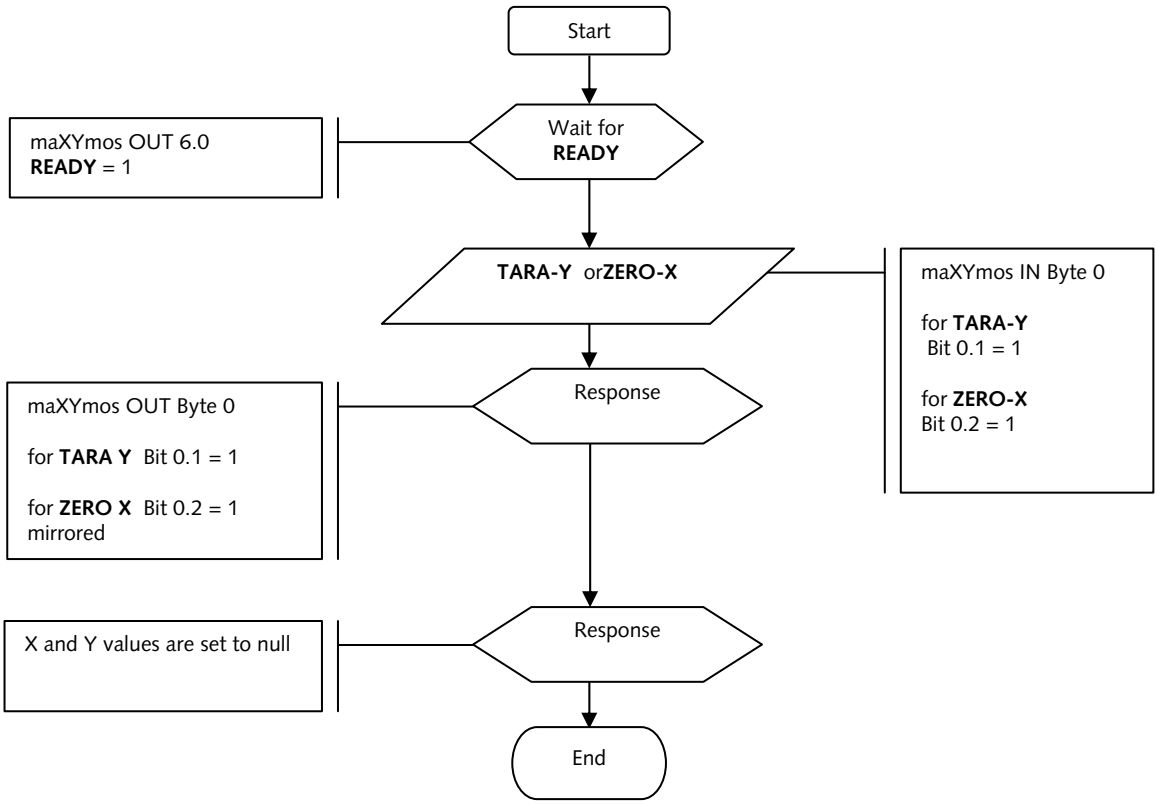
8.1.7.7 Reading Values from maXYmos BL to PLC



NOTE

Current measured values (e.g. statusMeasValueX) are continuously updated. The change of the edge of signal READY = 0 → 1 must be taken into account in capturing the measurement results and process values and checking their validity.

8.1.7.8 Triggering Signals TARAY, ZEROX



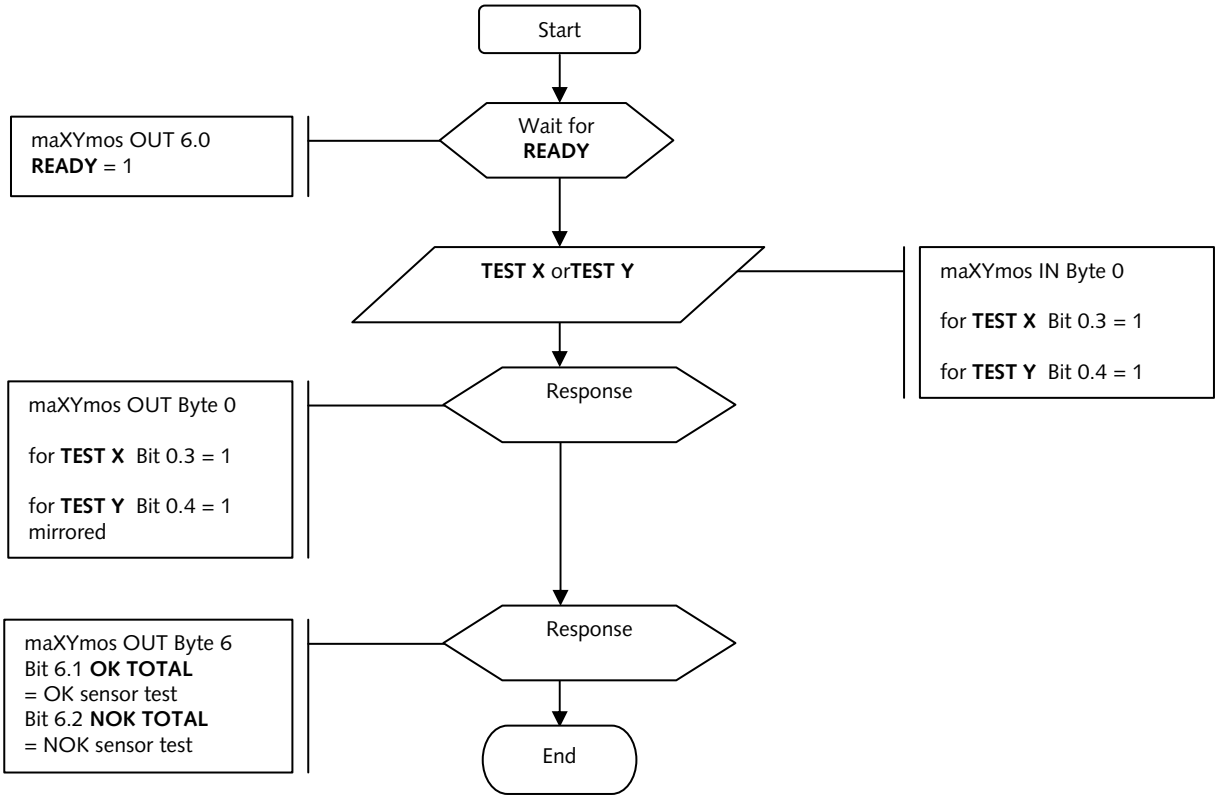
NOTE

If thresholds have been defined by teach-in before the **TARA-Y** or **ZERO-X** function is triggered (e.g. as **Start at** (StartMeasureEvent)), the teach-in procedure may have to be repeated.

CAUTION

If control signals are set during measurement, this may lead to erroneous process values.

8.1.7.9 Triggering Signals TESTX, TESTY (Sensor Test)



Triggering of the **TEST-X** or **TEST-Y** function allocates the outputs **OK-TOTAL** and **NOK-TOTAL** to these functions so that they no longer correspond to the result of the last measuring cycle. After a new measuring cycle the outputs **OK-TOTAL** and **NOK-TOTAL** are allocated to the measurement result again.

In the event of miscalibration the corresponding alarm bits are set in the bit-coded 64-bit **alarmState** status word.

9. Mounting Monitor

9.1 Mounting Options

Basic Version maXYmos BL
Type 5867Bxx0x

Front panel mounting

Additional case with mounting kit
Type 5867Bxx1x

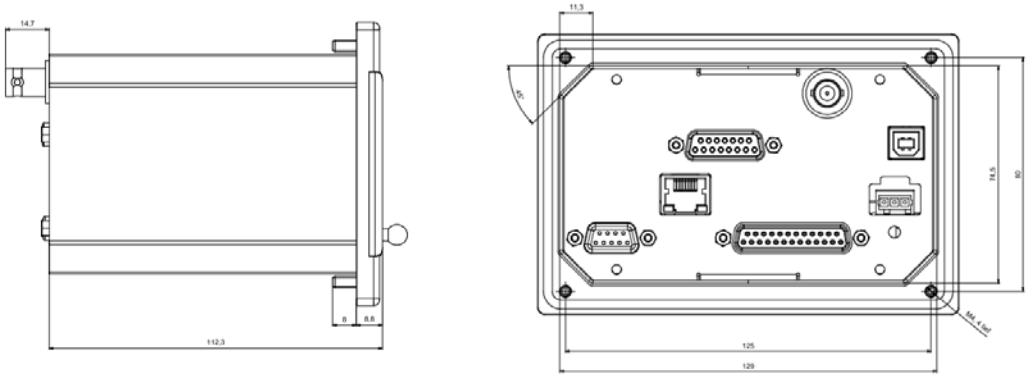
Wall mounting

Desktop mounting
without mounting kit

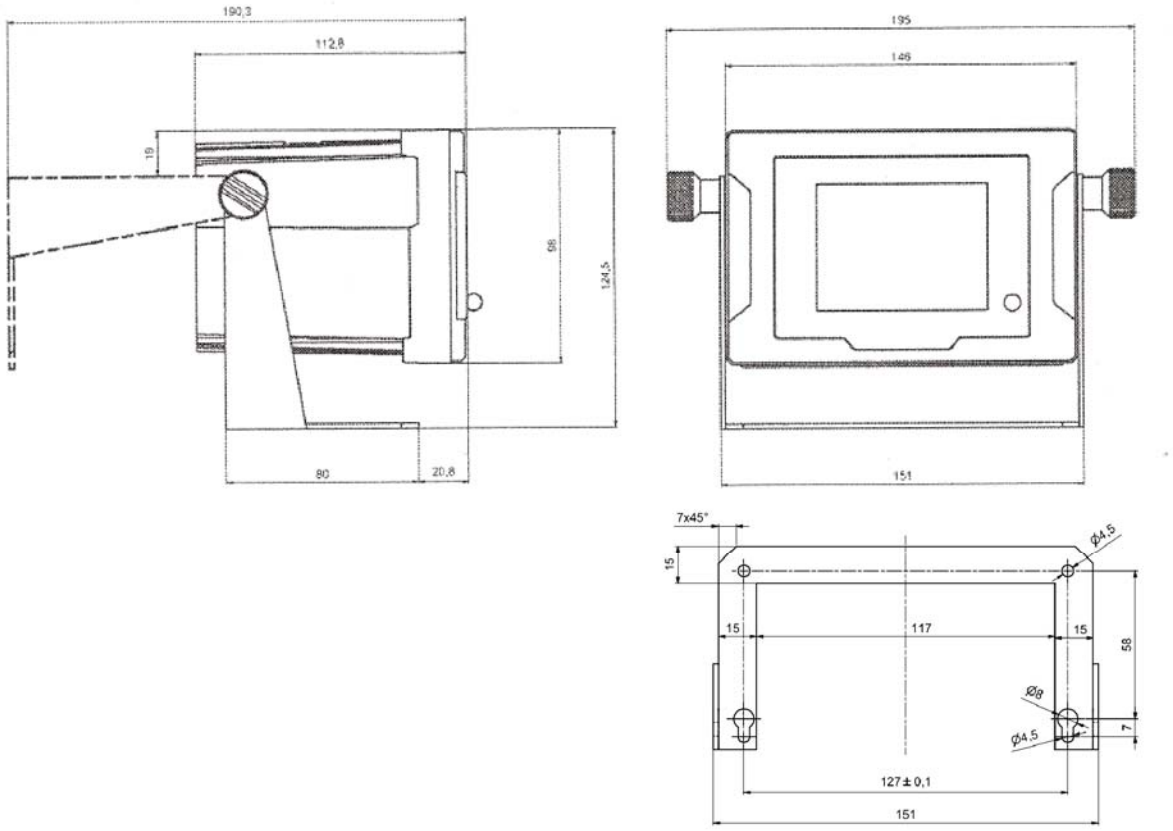
Desktop mounting with mounting kit

9.2 Case and Mounting Dimensions

9.2.1 Front Panel Version Type 5867B0000



9.2.2 Desktop/Wall Version Type 5867BXX1X



10. Technical Data

Technical Data

Measuring Channels

Number		2
Max. X/Y sampling rate	S/s	5 000
Resolution on each channel	bit	24
Accuracy class	%	0,3
Cut-off frequency for each channel	Hz	2 000
Low-pass filter for each channel	Hz	in steps 0,1 ... 500
Channel X		
Sensor type 1		potentiometer
Track resistance	kΩ	1 ... 5
Supply voltage	V	4 (4,16)
Connection system	3-wire	
Wiper current	uA	<0,1
Sensor type 2	V	process signal ±10
Supply voltage	V	24
Channel Y		
Sensor type 1		piezoelectric
Measuring range	pC	±100 ... ±700 000
At 4 pC/N corresponds to	kN	0 ... ±175
Drift	pC/s	0,05
Sensor type 2		strain gage
Measuring range	mV/V	0 ... ±6
Supply voltage	V	5
Connection system		4-wire/6-wire
Bridge resistance	Ω	100 ... 1 000
Sensor type 3	V	process signal ±10
Supply voltage	V	24

Cycle Control

START – STOP	Dig.-In / X-threshold / Y-threshold

Measuring Functions

Measurement curve based on	Y(X), Y(t), Y(X,t), X(t)

Curve Memory

Current curve	pairs of XY-values max. 8 000
Historical curves (for NOK diagnosis)	the last 20

Evaluation Objects (EOs)

EO-Typen		UNI-BOX/LINE-X/LINE-Y ENVELOPE/NO-PASS
Reference points in X-channel		absolute, block or trigger-Y
Editing		numerical entry, drawing with stylus
Evaluation time	ms	<50 (for 4 EOs)

Data Export

Format	csv
Destination	Server
Transmission via	USB/Ethernet

Serial Interfaces

Ethernet	1 x TCP/IP 100 Base-TX
USB*	1 x USB Device 1.1
BUS	Profibus DP, 12 MBaud or EtherNet/IP

Dig-In/Out

Standard		DIN EN61131
Level of "0" state	V	0 ... 5
Level of "1" state	V	15 ... 30
Number of inputs		11
Input current, max.	mA	8 (at 24 V)
Number of outputs		8
Output current, max.	mA	100 (at 24 V)

Measurement Programs

Number		16
Switching by means of		Menu/Dig.-In/BUS
Switching time	ms	<5

Switching Signals

Number	2 (S1 and S2)
Channel allocation	X or Y (selectable)
Switching point	when X-threshold reached when Y-threshold reached
Output	Dig.-Out or SPS
Modus	continuous or latch
Effect on evaluation	no

Real-time Responses

S1/S2 switching signals	ms	<1
EO-Type "NO-PASS"	ms	<1

Power Supply

Voltage	VDC	24 (18 ... 30)
Power consumption	VA	5

Connection terminal screws, 1 piece in scope of delivery
Wago, Ordering no. 734-103/037-000
Housing: Ordering no. 734-603

Environmental

Operating temperature range	°C	0 ... 50
Storage temperature range	°C	0 ... 50
Degree of protection front/Connection side		IP65/IP40

General Data

Front panel version		
Weight	g	700
Dimensions		see drawing
Desktop/wall version		
Weight	g	840
Dimensions		see drawing

11. Accessories

11.1 General Accessories

Accessories	Type
• Desktop/wall case for converting a front panel version into a desktop/ wall version, compl. with mounting kit	5867AZ000
	
• Power supply, 90-240 VAC/24 VDC, ready to be connected	5779A3
• Set of connectors, strain gage version, compl. for sensors, dig. IO and supply (1 set in included accessories)	5867AZ010
• Connector set, piezoelectric version for sensors dig. IO and supply (1 set in included accessories)	5867AZ011
• Adapter cable to connect throught of potentiometric displacement sensor or angle sensor to several maXYmos	1200A156AX (X= count of units)

Windows®-Software maXYmos PC (Basic) **2830A1**
- Organise firmware update
- Backup of device settings as file (backup)
- Restore of device settings in unit (restore)
- Access, check and edit of buckup files

(included in delivery)

- **Windows®-Software maXYmos PC (Plus)** **2830A2**

Like Basic version, though accessory
- All settings can be done by PC (setupeditor)
- Protocol explorer access and interprets exported measuring protocols
- Measuring of cursors, display of bundled curves etc.
- Completed Y(X)-curves can be dispayed as Y(t) or X(t)
- Generating of an Excel® statistik with selected process values
- PDF-printer for measuring protocols

Windows® and Microsoft Excel® are registered trademarks of Microsoft Corporation.

11.2 Sensors

Kistler supplies a wide range of sensors for measurands such as force, torque, displacement and angle. These sensors are based on piezoelectric, strain gage or potentiometric measurement.

Visit www.kistler.com/maxymos for more information.

12. Declaration of Conformity

KISTLER
measure. analyze. innovate.

CE- Declaration of Conformity

According to EG-EMV Rule 2004/108/EG

This is to confirm that the construction of the device, which is specified in the following

Designation:	XY Monitor für Good/Bad Evaluation of Curves
Data sheet no.:	003-054
Type:	maXYmos BL Typ 5867B...
Operation manual no.:	002-626

in the design supplied by us, complies with the following relevant specifications 2004/108/EG (EMV-Rule).

Following harmonised standards used:

EN 61000-6-2, 2006-3	Standard of industrial immunity to interference
EN 61000-6-3, 2007-9	Standard of residential areas emitted interference, limit class B
EN 61326-1, 2006-10	Electric measurement, control, closed looped and laboratory devices – EMC requirements
EN 61000-4-2, 2009-12	Immunity of discharge static electricity
EN 61000-4-3, 2011-4	Immunity high-frequency fields
EN 61000-4-4, 2010-11	Immunity fast transient electric disturbance / Burst
EN 61000-4-5, 2007-7	Immunity against surge voltage
EN 61000-4-6, 2009-12	Immunity against conducted disturbances, induced of high-frequency fields
EN 55011, 2011-4	Thresholds and measurement procedures for radio interference of ISM devices
Inspection report:	maXYmos EMC report of 05.11.2012, Baudisch Electronic GmbH

In case the device is modified without notification of Company Kistler Lorch GmbH – this declaration looses validity.

Date, signature of manufacturer: 22.03.2013

Information about the signer: Franz Winter, General Manager
Kistler Lorch GmbH

13. Index