



Operating instructions  
Multifunction displays  
for standard analogue signals

UK

**AX460**

80257643 / 00 02 / 2018



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# 1 Preliminary note

This document applies to devices of the type "AX460".



These instructions are part of the device.

This document is intended for specialists. These specialists are people who are qualified by their appropriate training and their experience to see risks and to avoid possible hazards that may be caused during operation or maintenance of the device. The document contains information about the correct handling of the device.

Read this document before use to familiarise yourself with operating conditions, installation and operation. Keep this document during the entire duration of use of the device.

Adhere to the safety instructions.

## 1.1 Symbols used

- Instructions
- > Reaction, result
- [...] Designation of keys, buttons or indications
- Cross-reference
-  Important note  
Non-compliance may result in malfunction or interference.
-  Information  
Supplementary note

## 1.2 Warning signs used

### **WARNING**

Warning of serious personal injury.  
Death or serious irreversible injuries may result.

### **CAUTION**

Warning of personal injury.  
Slight reversible injuries may result.

### **NOTE**

Warning of damage to property.

## 2 Safety instructions

### 2.1 General safety instructions

This description is an essential part of the device and contains important information concerning installation, function and operation. Non-compliance may result in damage or can affect the safety of operators and installations!

Using this device description requires appropriately qualified staff. The device may only be installed, configured, set up and maintained by a qualified and trained electrician.

Exclusion of liability: The manufacturer is not liable for any personal injuries or damage to property that may be caused by improper installation, set-up, operation and maintenance or by human misinterpretation or mistakes in this device description. Moreover, the manufacturer reserves the right to change technical aspects of the device or the description at any time; also without prior notice. Therefore, possible deviations between the device and the descriptions cannot be excluded.

The builder of the installation / the entire system is responsible for the safety of the installation / the entire system in which this device is to be integrated.

During installation, operation and maintenance works, all general and country-specific as well as application-specific safety regulations and standards must be observed and respected.

If the device is used in processes where human error or operating errors may cause damage to the installation or injuries to persons, corresponding measures must be taken to ensure reliable prevention of such consequences.

## 3 Functions and features

This device must only be used in industrial machines and installations. Other uses do not comply with the regulations and are the sole responsibility of the user.

The manufacturer is not liable for damage caused by improper use. The device must only be installed in compliance with the instructions and only be used and operated in a perfect technical condition that is in accordance with the technical data. The device is neither suited for explosion-protected areas nor for areas that are excluded in DIN EN 61010-1.

### 3.1 Product features:

- Multifunction device with operating modes for display of input 1 and input 2 and for linking of input 1 + input 2, input 1 - input 2, input 1 x input 2, input 1 : input 2
- 2 universal 16 bit analogue inputs for -10 ... 10 V / 0 ... 20 mA / 4 ... 20 mA
- Reference output 10 V for potentiometer  $1 \geq \text{kohms}$
- 7-segment display with symbols and units
- Parameter setting via clear text and touch screen
- Auxiliary voltage output 24 VDC for sensor supply
- Totalizer for each input
- Linearization with 24 data points per input
- Functions such as tare, averaging, sampling intervals per input
- Standardised 96 x 48 mm housing for panel mounting and protection rating IP65 (front)

## 4 Installation

The device may only be installed and operated in an environment that is in accordance with the permissible temperature range. Provide sufficient ventilation and avoid direct contact of the unit with hot or aggressive gases or fluids.

Before installation and maintenance works, the unit must be disconnected from all voltage sources. Also ensure that contact with disconnected voltage supply wires is prevented.

Devices that are supplied via AC may only be connected via switches or circuit breakers to the low voltage supply system. This switch must be positioned close to the device and clearly marked as disconnecting device.

Ingoing and outgoing cables for extra-low voltage must be separated from dangerous live cables (SELV circuits) by double and/or reinforced insulation.

The choice of all cables and their insulation must guarantee that they comply with the permissible voltage and temperature range. Moreover, both device and country specific standards are to be observed that apply to the cables with regard to their structure, shape and quality. Please view the technical data for specifications concerning permissible wire cross-sections for the screw terminal connections.

Before set-up, all connections and cables must be checked if they are tightly fitted in the screw terminals. All (even unused) screw terminals must be turned to the right up to the end stop and thereby reliably attached, so that they cannot get loose due to shocks and vibration.

Voltage spikes on the connections of the device are to be limited to the values of overvoltage category II.

With regard to installation conditions, wiring, environmental conditions as well as screening and grounding of connected cables, the general standards for control cabinet construction in the machine industry as well as the manufacturer's specific screening instructions apply.

## 5 General

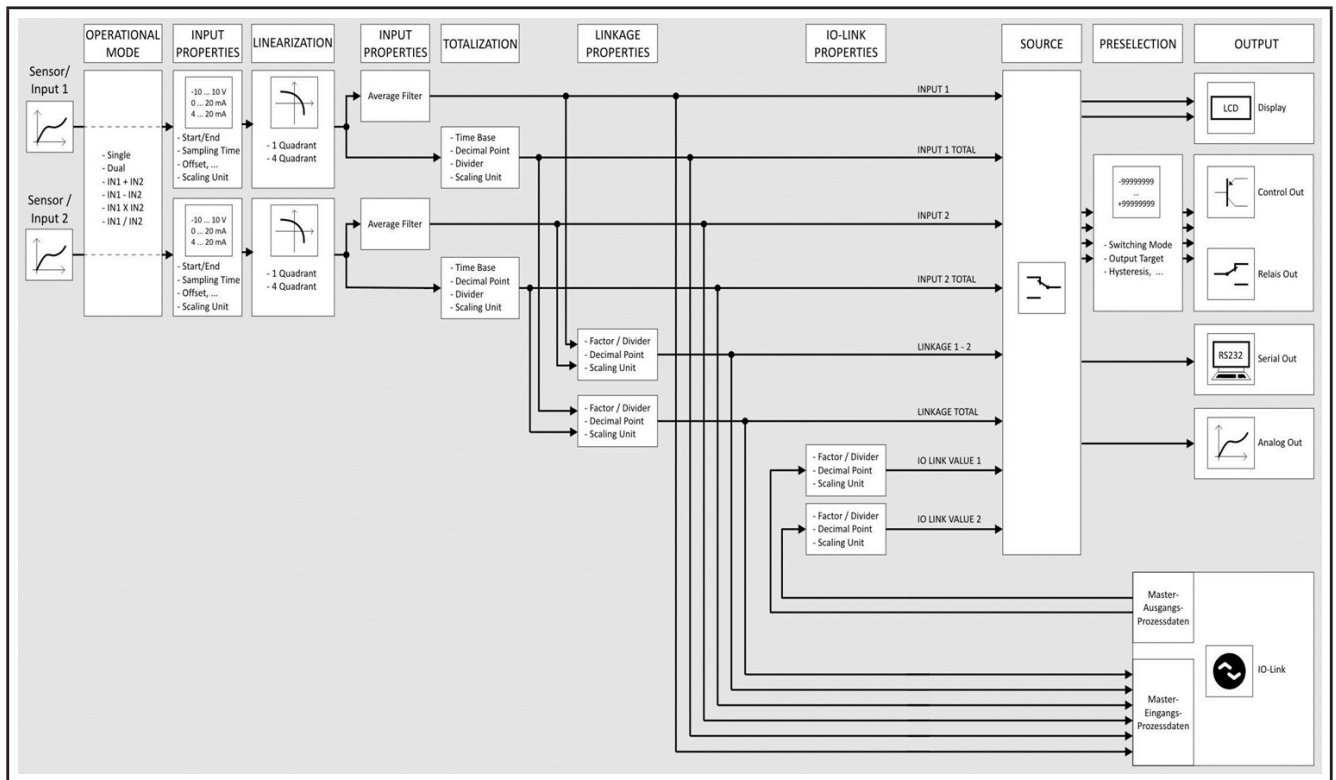
The device is designed as panel-mounting display unit for analogue signals (-10 ... 10 V / 0 ... 20 mA / 4 ... 20 mA).

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### 5.1 Operating mode

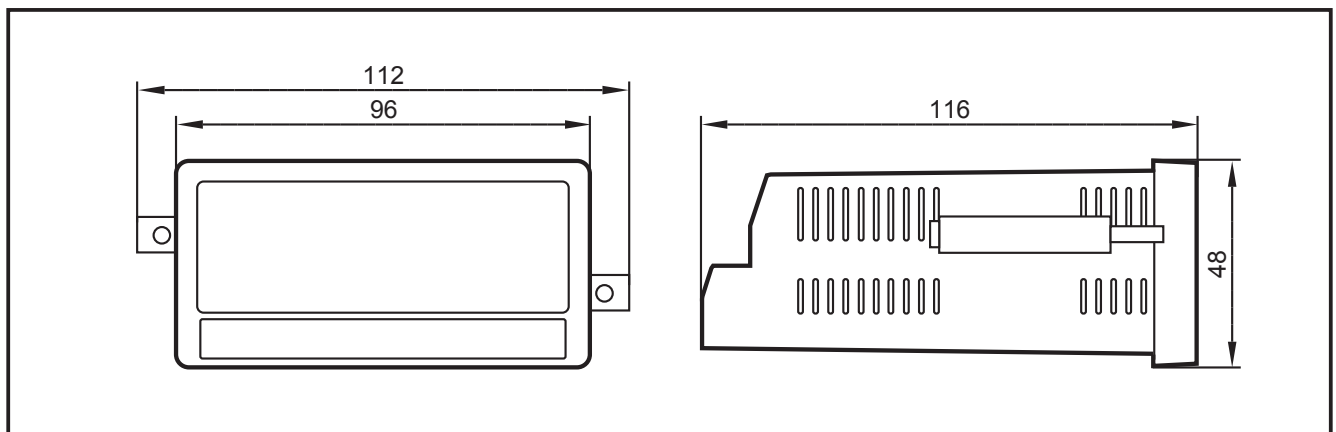
In general, all functions can be configured in the parameter menu. The device can be operated in the following modes:

- **SINGLE:**  
One-channel operation of input 1.
- **DUAL:**  
Two-channel operation of inputs 1 and 2.
- **IN 1 + IN 2:**  
Two-channel operation of inputs 1 and 2, type of linking: addition.
- **IN 1 - IN 2:**  
Two-channel operation of inputs 1 and 2, type of linking: subtraction.
- **IN 1 x IN 2:**  
Two-channel operation of inputs 1 and 2, type of linking: multiplication.
- **IN 1 / IN 2:**  
Two-channel operation of inputs 1 and 2, type of linking: division.



Function diagram

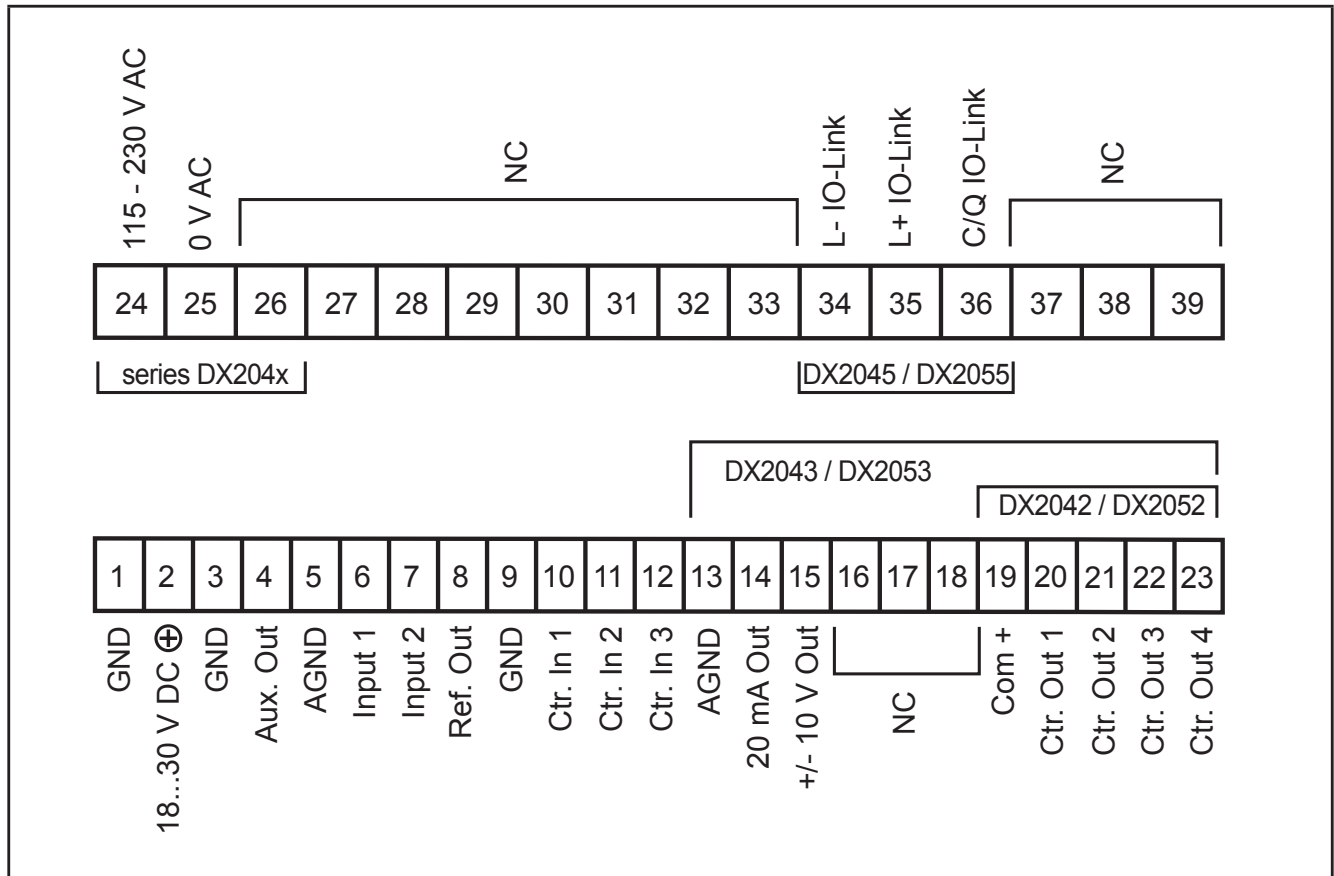
## 6 Dimensions and mounting



- Make a panel cut-out (91 x 43 mm) and fix the device into the panel with the 2 screws.



## 7 Electrical connection



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Connections on the rear of the housing

### NOTE

Important: The terminals 16, 17 and 18 must not be used.

### 7.1 DC voltage supply

The device can be supplied with direct voltage between 18 and 30 V DC via the terminals 1 and 2. The current consumption depends, among other things, on the level of the supply voltage and the setting and is typically at approx. 100 mA plus the sensor current consumed at the auxiliary voltage output.

All GND connections are internally connected with each other.

### 7.2 Auxiliary voltage output

Auxiliary voltage for sensor supply is provided at terminals 3 and 4.

The output voltage depends on the device supply:

- In case of DC device supply, the output voltage is approx. 1 V less than the supply voltage applied at terminals 1 and 2 and the max. load must not exceed 250 mA.

- In case of AC device supply, the output voltage is 24 VDC ( $\pm 15\%$ ) and the max. load must not exceed 150 mA at temperatures up to 45 °C. At higher temperatures the max. output current is reduced to 80 mA.

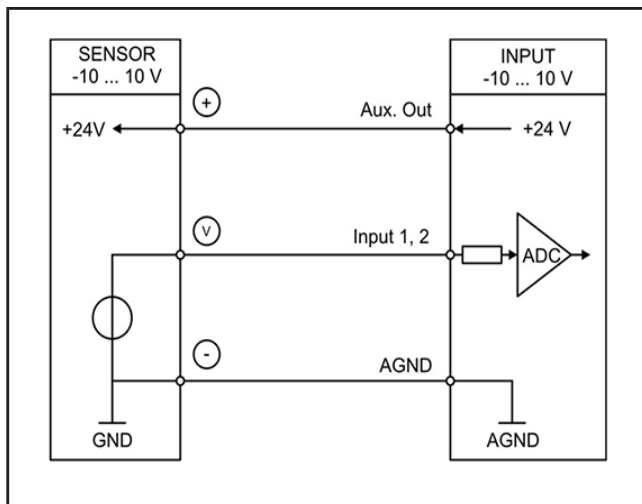
### 7.3 Analogue inputs

On terminal 5, the reference potential (AGND) for the analogue inputs is connected. On terminals 6 and 7, two 16 bit analogue outputs are available. The configuration (voltage input or current input) is set in the IN 1 / IN 2 Properties menus.

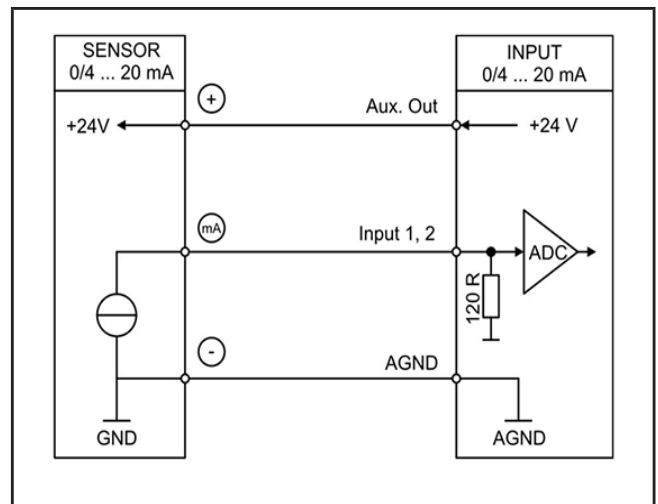
#### NOTE

Important: The configuration (voltage input or current input) has to be set before connecting the sensor.

Connection of the analogue inputs:



voltage input

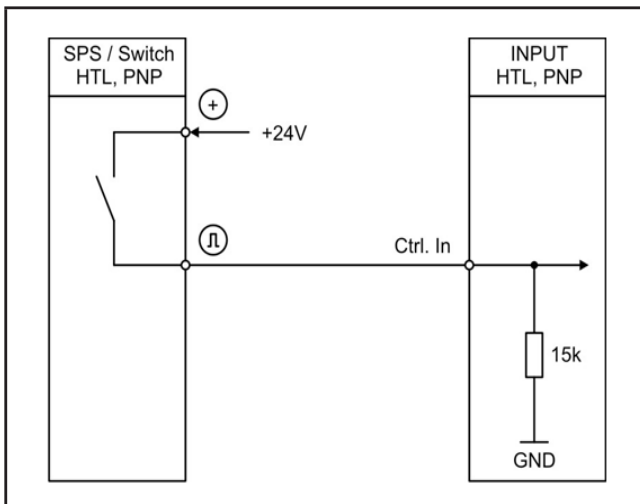


Current input

### 7.4 Control inputs

On terminals 10, 11 and 12, three control inputs with HTL-PNP characteristic are available.

These inputs can be configured in the COMMAND MENU and are used for functions that can be triggered externally such as resetting the display value, changing the display, locking buttons of the touch screen or releasing the latching of control outputs.



Connection of the control inputs

Open control inputs are generally "LOW".

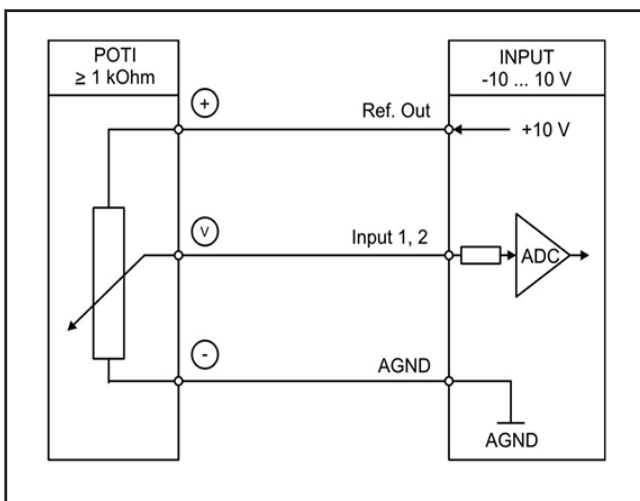
The input stages are designed for electronic control signals.

Remark on mechanical switching contacts:

If mechanical contacts are to be used as pulse source, a standard, external capacitor of about 10  $\mu\text{F}$  must be connected to the terminals between GND (-) and the corresponding input (+). This damps the maximum input frequency to approx. 20 Hz and contact bouncing is suppressed.

## 7.5 Reference output

On terminal 8, a 10 V reference output is available. The max. load of this output must not exceed 10 mA. This reference output can, for example, be used to connect a potentiometer.



Reference output with potentiometer

## 7.6 Analogue output (DX2043, DX2053)

On terminals 13 and 14 / 15, a 16 bit analogue output is available.

This output can be configured and scaled in the ANALOG MENU. The following configuration is possible:

- Voltage output: -10 ... +10 V
- Voltage output: 0 ... 20 mA
- Voltage output: 4 ... 20 mA

The analogue output is proportional to the displayed value and refers to the AGND potential.

AGND and device GND are internally connected.

### NOTE

Important: Parallel operation of voltage and current output is not permitted.

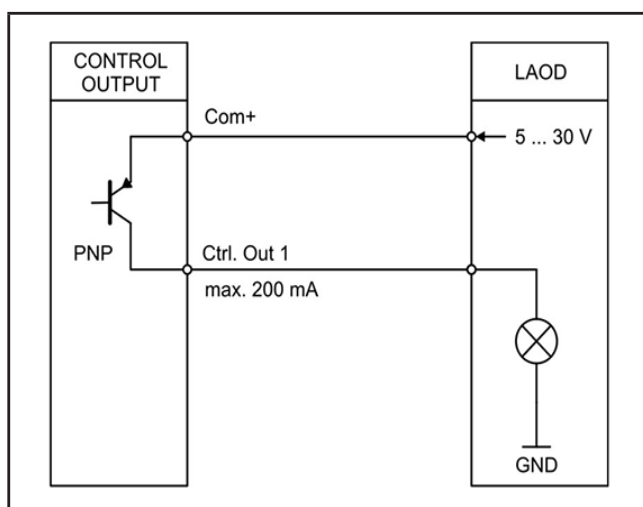
## 7.7 Control outputs (DX2042, DX2043 DX2052, DX2053)

On terminals 19, 20, 21, 22 and 23, four control outputs are available.

The switching conditions can be set in the PRESELECTION MENU.

The outputs Ctrl. Out 1 – Ctrl. Out 4 are fast PNP outputs with a switching capacity of 5 – 30 V / 200 mA per channel.

The switching voltage is determined by the voltage at terminal 19 (Com+). To switch inductive loads, external damping measures are recommended. The switching status is indicated in the display as C1 – C4 (display with unit and status line).



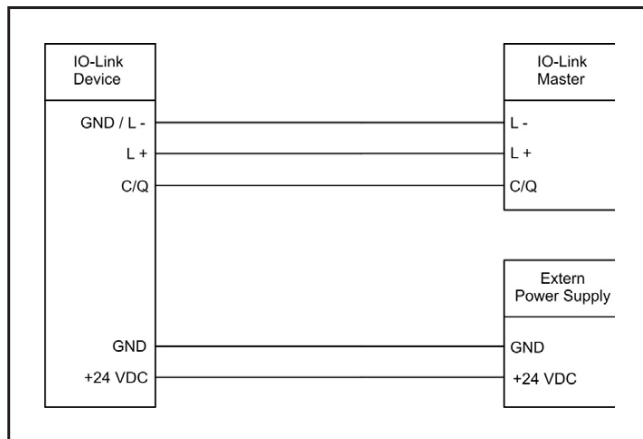
Connection of the control outputs

## 7.8 AC voltage supply (DX2041, DX2042, DX2043)

On terminals 24 and 25, the device can be supplied with an alternating voltage between 115 and 230 V AC. The power consumption depends, among other things, on the level of the supply voltage and the setting and is at approx. 3 VA plus the sensor current consumed at the auxiliary voltage output.

## 7.9 IO-Link (DX2045, DX2055)

Terminals 34, 35 and 36 offer an interface to connect an IO-Link master. The display unit must be connected to a separate voltage supply (AC or DC).



IO-Link interface

The unit can be used in two ways as an IO-Link device:

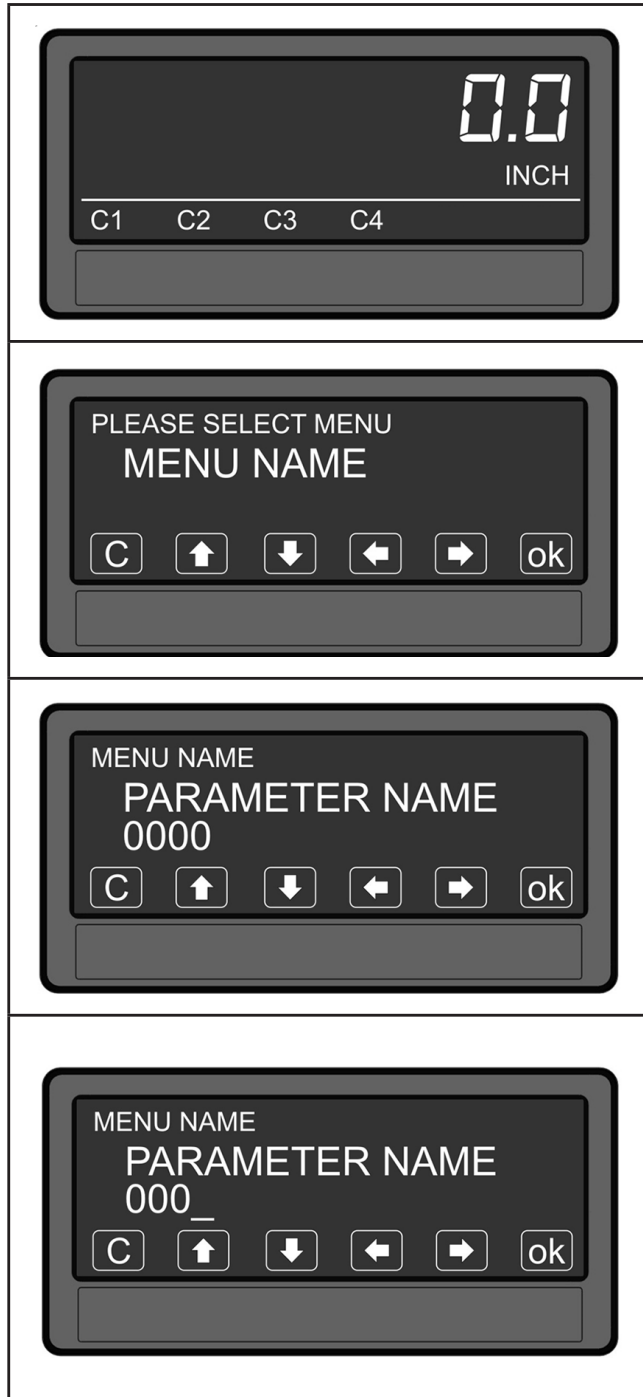
- Display of 2 output process values:  
The IO-Link master cyclically sends 2 output process values. Both values can be additionally configured / scaled in the IO LINK PROPERTIES menu.
- Display for analogue sensors and data transmission of 6 input process values:  
The IO-Link master cyclically receives 6 input process values.  
The following values are transmitted:
  - Value 1: result of input 1
  - Value 2: result of input 2
  - Value 3: result of the linking of input 1 and input 2
  - Value 4: result of the totalization of input 1
  - Value 5: result of the totalization of input 2
  - Value 6: result of the totalization of the linking of input 1 and input 2

These functions are defined in the IO-Link master.

## 8 Operation / touch screen

### 8.1 Display for parameter setting

The individual parameter menus and their parameters are described in a separate chapter (→ 9 Parameter / menu overview).



Device parameter setting:

In order to be able to set device parameters, the touch screen must be pressed for 3 seconds.

Select menu:

The required parameter menu can be selected via the arrow keys and confirmed with OK.

To close the menu selection, press [C].

Select parameter:

The required parameter can be selected via the arrow keys and confirmed with OK.

To close the parameter selection, press [C].

Edit parameters:

When the parameter value is flashing, it can be edited via the arrow keys and stored with OK.

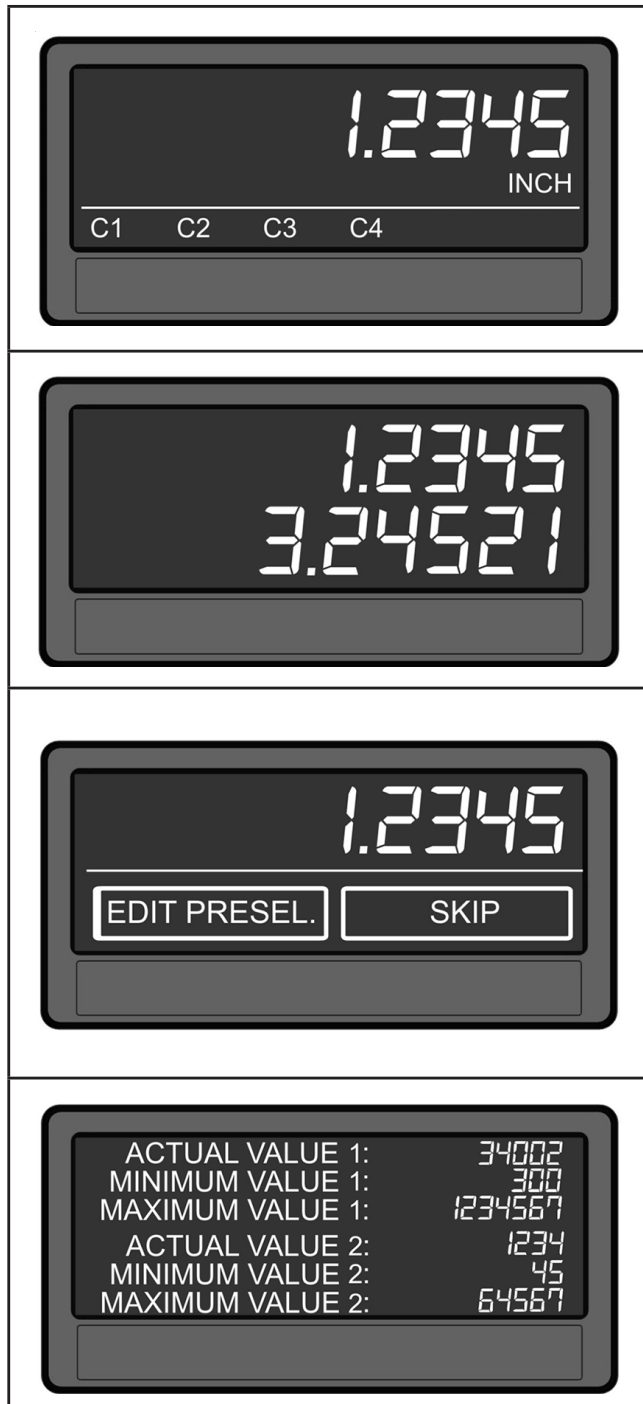
To close the editing mode, press [C].

Parameter changes are only active after quitting the menu selection.

## 8.2 Display during operation

The following displays are available. Depending on the device version and the selected operating mode, only certain visualisations are possible.

The source (input 1, input 2, ...) for the single-line and double-line display is defined in the DISPLAY MENU.



Single-line display with unit and status line:

Press the touch screen to access the next display.

Only for DX2042, DX2043, DX2052 and DX2053.

Two-line display:

Press the touch screen to access the next display.

Display with quick-start function to enter the preselection values:

In order to access the next display, you need to tap the top of the touch screen or tap SKIP.

Only for DX2042, DX2043, DX2052 and DX2053.

Display of the actual / min / max values of input 1 and input 2:

Press the touch screen to access the next display.

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## 9 Parameter / menu overview

### 9.1 Overview

This section gives an overview of the individual menus and their parameters. The menu name is always in bold characters. The parameters belonging to the menu are arranged directly under the menu name. Default values are greyed out. Depending on the device version and the selected operating mode only certain menus are displayed.

The following menu structure is valid for software version 04A or higher.

| Menu / parameter          | Menu / parameter          |
|---------------------------|---------------------------|
| <b>GENERAL MENU</b>       | <b>IN 1 TOTALIZATION</b>  |
| OPERATIONAL MODE          | TIME BASE                 |
| PIN PRESELECTION          | DIVIDER                   |
| PIN PARAMETER             | DECIMAL POINT             |
| BACK UP MEMORY            | SCALE UNITS               |
| FACTORY SETTINGS          |                           |
|                           | <b>IN 2 PROPERTIES</b>    |
| <b>IN 1 PROPERTIES</b>    | CONFIGURATION             |
| CONFIGURATION             | START VALUE               |
| START VALUE               | END VALUE                 |
| END VALUE                 | DECIMAL POINT             |
| DECIMAL POINT             | SCALE UNITS               |
| SCALE UNITS               | SAMPLING TIME (S)         |
| SAMPLING TIME (S)         | AVERAGE FILTER            |
| AVERAGE FILTER            | OFFSET                    |
| OFFSET                    | LINEARIZATION             |
| LINEARIZATION             | TOTALIZATION              |
| TOTALIZATION              |                           |
|                           | <b>IN 2 LINEARIZATION</b> |
| <b>IN 1 LINEARIZATION</b> | P1(X)                     |
| P1(X)                     | P1(Y)                     |
| P1(Y)                     | P2(X)                     |
| P2(X)                     | P2(Y)                     |
| P2(Y)                     | ...                       |
| ...                       | P24(X)                    |
| P24(X)                    | P24(Y)                    |
| P24(Y)                    |                           |



| Menu / parameter           | Menu / parameter           |
|----------------------------|----------------------------|
| <b>IN 2 TOTALIZATION</b>   | <b>PRESELECTION 1 MENU</b> |
| TIME BASE                  | SOURCE 1                   |
| DIVIDER                    | MODE 1                     |
| DECIMAL POINT              | HYSTERESIS 1               |
| SCALE UNITS                | PULSE TIME 1 (S)           |
|                            | OUTPUT TARGET 1            |
| <b>LINKAGE PROPERTIES</b>  | OUTPUT POLARITY 1          |
| FACTOR                     | OUTPUT LOCK 1              |
| DIVIDER                    | START UP DELAY 1 (S)       |
| ADDITIVE VALUE             | EVENT COLOR 1              |
| DECIMAL POINT              |                            |
| SCALE UNITS                | <b>PRESELECTION 2 MENU</b> |
|                            | SOURCE 2                   |
| <b>IO LINK PROPERTIES</b>  | MODE 2                     |
| IN1 FACTOR                 | HYSTERESIS 2               |
| IN1 DIVIDER                | PULSE TIME 2 (S)           |
| IN1 ADDITIVE VALUE         | OUTPUT TARGET 2            |
| IN1 DECIMAL POINT          | OUTPUT POLARITY 2          |
| IN1 SCALE UNITS            | OUTPUT LOCK 2              |
| IN2 FACTOR                 | START UP DELAY 2 (S)       |
| IN2 DIVIDER                | EVENT COLOR 2              |
| IN2 ADDITIVE VALUE         |                            |
| IN2 DECIMAL POINT          | <b>PRESELECTION 3 MENU</b> |
| IN2 SCALE UNITS            | SOURCE 3                   |
|                            | MODE 3                     |
| <b>PRESELECTION VALUES</b> | HYSTERESIS 3               |
| PRESELECTION 1             | PULSE TIME 3 (S)           |
| PRESELECTION 2             | OUTPUT TARGET 3            |
| PRESELECTION 3             | OUTPUT POLARITY 3          |
| PRESELECTION 4             | OUTPUT LOCK 3              |
|                            | START UP DELAY 3 (S)       |
|                            | EVENT COLOR 3              |

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| Menu / parameter           | Menu / parameter    |
|----------------------------|---------------------|
| <b>PRESELECTION 4 MENU</b> | <b>COMMAND MENU</b> |
| SOURCE 4                   | INPUT 1 ACTION      |
| MODE 4                     | INPUT 1 CONFIG      |
| HYSTERESIS 4               | INPUT 2 ACTION      |
| PULSE TIME 4 (S)           | INPUT 2 CONFIG      |
| OUTPUT TARGET 4            | INPUT 3 ACTION      |
| OUTPUT POLARITY 4          | INPUT 3 CONFIG      |
| OUTPUT LOCK 4              |                     |
| START UP DELAY 4 (S)       | <b>DISPLAY MENU</b> |
| EVENT COLOR 4              | START DISPLAY       |
|                            | SOURCE SINGLE       |
| <b>ANALOG OUT MENU</b>     | SOURCE DUAL TOP     |
| ANALOG SOURCE              | SOURCE DUAL DOWN    |
| ANALOG FORMAT              | COLOR               |
| ANALOG START               | BRIGHTNESS (%)      |
| ANALOG END                 | CONTRAST            |
| ANALOG GAIN (%)            | SCREEN SAVER (S)    |
| ANALOG OFFSET (%)          | UP-DATE-TIME (S)    |
|                            | FONT                |

## 9.2 General menu

|   |   |
|---|---|
| <b>OPERATIONAL MODE</b>   |   |
| This parameter defines which measuring function (operating mode) the device is supposed to fulfil.  |   |
| SINGLE  | One-channel operation (only input 1)                                      |
| DUAL  | Two-channel operation (input 1 and 2 separately)                          |
| IN 1 + IN 2   | Two-channel operation of inputs 1 and 2, type of linking: addition.       |
| IN 1 – IN 2   | Two-channel operation of inputs 1 and 2, type of linking: subtraction.    |
| IN 1 x IN 2   | Two-channel operation of inputs 1 and 2, type of linking: multiplication. |
| IN 1 / IN 2   | Two-channel operation of inputs 1 and 2, type of linking: division.       |
| <b>PIN PRESELECTION</b>   |   |
| This parameter defines the PIN code for locking the quick-start function to enter the preselection values in the PRESELECTION VALUES menu (emergency PIN: 6079). Locking the quick start is only useful if all parameters are locked. |   |
| 0000  | Access not locked   |
| ...   |   |

|   |  |
|---|--|
| 9999  | Access after entering the PIN code 9999  |
| <b>PIN PARAMETER</b>  |  |
| This parameter defines the PIN code for the locked access for all parameters (emergency PIN: 6079). |  |
| 0000  | Access not locked  |
| ...   |  |
| 9999  | Parameter setting of the device is only possible after entering the PIN code.      |
| <b>BACK UP MEMORY</b>   |  |
| NO  | No backup in case of a power failure.  |
| YES   | In case of a power failure the device stores the actual value. Only for totalizer. |
| <b>FACTORY SETTINGS</b>   |  |
| NO  | The factory settings are not loaded.   |
| YES   | The factory settings are loaded (default values highlighted in grey).              |

### 9.3 IN 1 Properties

In this menu the parameters for output 1 are defined.

|   |                            |
|---|----------------------------|
| <b>CONFIGURATION</b>  |                            |
| This parameter defines the configuration of input 1.  |                            |
| -10 ... +10 V   | Voltage input -10 ... 10 V |
| 0 ... 20 mA   | Current input 0 ... 20 mA  |
| 4 ... 20 mA   | Current input 4 ... 20 mA  |
| <b>START VALUE</b>  |                            |
| This parameter defines the display value for an input signal of 0 V, 0 mA or 4 mA. Signals between START VALUE and END VALUE behave proportionally. |                            |
| -99999  | Lowest value               |
| 0   | Default value              |
| 99999   | Highest value              |
| <b>END VALUE</b>  |                            |
| This parameter defines the display value for an input signal of 10 V or 20 mA. Signals between START VALUE and END VALUE behave proportionally.     |                            |
| -99999  | Lowest value               |
| 10000   | Default value              |
| 99999   | Highest value              |

**DECIMAL POINT**

This setting defines the position of the decimal point.

|           |                                     |
|-----------|-------------------------------------|
| NO        | No decimal point                    |
| 0000000.0 | Decimal point at the specified spot |
| 000000.00 | Decimal point at the specified spot |
| 00000.000 | Decimal point at the specified spot |
| 0000.0000 | Decimal point at the specified spot |
| 000.00000 | Decimal point at the specified spot |
| 00.000000 | Decimal point at the specified spot |
| 0.0000000 | Decimal point at the specified spot |

**SCALE UNITS**

This parameter defines which unit is indicated in the display. It does not influence the display value. The decimal point for decimal places is set with the DECIMAL POINT parameter.

|          |         |
|----------|---------|
| V        | Default |
| mV       |         |
| A        |         |
| mA       |         |
| km/h     |         |
| mph      |         |
| feet/min |         |
| inch/min |         |
| g        |         |
| kg       |         |
| oz       |         |
| W        |         |
| kW       |         |
| VA       |         |
| mm       |         |
| cm       |         |
| m        |         |
| inches   |         |
| feet     |         |
| C        |         |
| F        |         |
| K        |         |
| 1/sec    |         |
| 1/min    |         |

|   |  |   |   |    |   |    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |   |   |  |
|---|--|---|---|----|---|----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|---|---|--|
| 1/h   |  |   |   |    |   |    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |   |   |  |
| gal/min   |  |   |   |    |   |    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |   |   |  |
| Pa  |  |   |   |    |   |    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |   |   |  |
| kPa   |  |   |   |    |   |    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |   |   |  |
| %   |  |   |   |    |   |    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |   |   |  |
| Edit Unit   | <div>With this parameter, a customer-specific unit with up to 16 digits can be edited.</div> <div>Open the "Edit Unit" menu with the [OK] button. Use the arrow keys to change the unit. Keep the arrow key pressed for fast scrolling. Save with [OK]. Quit the "Edit Unit" menu with [C].</div> <table><tr><td></td><td>!</td><td>"</td><td>#</td><td>\$</td><td>%</td><td>&amp;</td><td>'</td><td>(</td><td>)</td><td>*</td><td>+</td><td>,</td><td>-</td><td>.</td><td>/</td></tr><tr><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>:</td><td>;</td><td>&lt;</td><td>=</td><td>&gt;</td><td>?</td></tr><tr><td>@</td><td>A</td><td>B</td><td>C</td><td>D</td><td>E</td><td>F</td><td>G</td><td>H</td><td>I</td><td>J</td><td>K</td><td>L</td><td>M</td><td>N</td><td>O</td></tr><tr><td>P</td><td>Q</td><td>R</td><td>S</td><td>T</td><td>U</td><td>V</td><td>W</td><td>X</td><td>Y</td><td>Z</td><td>[</td><td>\</td><td>]</td><td>^</td><td>_</td></tr><tr><td>`</td><td>a</td><td>b</td><td>c</td><td>d</td><td>e</td><td>f</td><td>g</td><td>h</td><td>i</td><td>j</td><td>k</td><td>l</td><td>m</td><td>n</td><td>o</td></tr><tr><td>p</td><td>q</td><td>r</td><td>s</td><td>t</td><td>u</td><td>v</td><td>w</td><td>x</td><td>y</td><td>z</td><td>{</td><td> </td><td>}</td><td>~</td><td></td></tr></table> |   | ! | "  | # | \$ | % | & | ' | ( | ) | * | + | , | - | . | / | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | : | ; | < | = | > | ? | @ | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | [ | \ | ] | ^ | _ | ` | a | b | c | d | e | f | g | h | i | j | k | l | m | n | o | p | q | r | s | t | u | v | w | x | y | z | { |  | } | ~ |  |
|   | !  | " | # | \$ | % | &  | ' | ( | ) | * | + | , | - | . | / |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |   |   |  |
| 0   | 1  | 2 | 3 | 4  | 5 | 6  | 7 | 8 | 9 | : | ; | < | = | > | ? |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |   |   |  |
| @   | A  | B | C | D  | E | F  | G | H | I | J | K | L | M | N | O |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |   |   |  |
| P   | Q  | R | S | T  | U | V  | W | X | Y | Z | [ | \ | ] | ^ | _ |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |   |   |  |
| `   | a  | b | c | d  | e | f  | g | h | i | j | k | l | m | n | o |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |   |   |  |
| p   | q  | r | s | t  | u | v  | w | x | y | z | { |   | } | ~ |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |   |   |  |
| <b>SAMPLING TIME (S)</b>  |  |   |   |    |   |    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |   |   |  |
| The set value corresponds to the sampling interval. This interval defines the interval in seconds between the samples of the analogue signal. This parameter has a direct influence on the response time of the device. |  |   |   |    |   |    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |   |   |  |
| 0,001   | Lowest value   |   |   |    |   |    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |   |   |  |
| 0.01  | Default value  |   |   |    |   |    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |   |   |  |
| 60,000  | Highest value  |   |   |    |   |    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |   |   |  |
| <b>AVERAGE FILTER</b>   |  |   |   |    |   |    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |   |   |  |
| Optional averaging to prevent display fluctuations.   |  |   |   |    |   |    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |   |   |  |
| OFF   | No averaging   |   |   |    |   |    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |   |   |  |
| CYCLE FILTER 2  | Free-flowing averaging with 2 cycles   |   |   |    |   |    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |   |   |  |
| CYCLE FILTER 4  | Free-flowing averaging with 4 cycles   |   |   |    |   |    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |   |   |  |
| CYCLE FILTER 8  | Free-flowing averaging with 8 cycles   |   |   |    |   |    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |   |   |  |
| CYCLE FILTER 16   | Free-flowing averaging with 16 cycles  |   |   |    |   |    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |   |   |  |
| <b>OFFSET</b>   |  |   |   |    |   |    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |   |   |  |
| With this parameter, the zero point shift / tare of the input is set.   |  |   |   |    |   |    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |   |   |  |
| -99,999   | Lowest value   |   |   |    |   |    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |   |   |  |
| 0   | Default value  |   |   |    |   |    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |   |   |  |
| +99,999   | Highest value  |   |   |    |   |    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |   |   |  |

**LINEARIZATION**

This parameter defines the linearization function (→ ). The linearization points are set in the IN 1 / IN 2 LINEARIZATION menu.

|            |                                   |
|------------|-----------------------------------|
| OFF        | No linearization                  |
| 1 QUADRANT | Linearization in the 1st quadrant |
| 4 QUADRANT | Linearization in all 4 quadrants  |

**TOTALIZATION**

This parameter activates the totalization function. Settings are made in the IN 1 / IN 2 TOTALIZATION menu. The totalization depends on the selected operating mode (→ 9.5 IN 1 Totalization).

|     |                     |
|-----|---------------------|
| NO  | No totalization     |
| YES | Totalization active |

**9.4 IN 1 Linearization**

In this menu, the linearization points for input 1 are defined. This menu is only displayed if the corresponding linearization is selected in the IN 1 PROPERTIES menu (→ ).

**P1(X) ... P24(X)**

X coordinate of the linearization point

This is the display value which the device generates without linearization depending on the input signal.

|           |               |
|-----------|---------------|
| -99999999 | Lowest value  |
| 0         | Default value |
| +99999999 | Highest value |

**P1(Y) ... P24(Y)**

Y coordinate of the linearization point

This is the display value which the device is to generate instead of the X coordinate. For example, P2(X) is replaced by P2(Y).

|           |               |
|-----------|---------------|
| -99999999 | Lowest value  |
| 0         | Default value |
| +99999999 | Highest value |

**9.5 IN 1 Totalization**

In this menu the parameters for the totalization are defined. This menu is only displayed if the totalization has been activated in the IN 1 PROPERTIES menu. The totalizer depends on the selected operating mode (see table below).

| Operating mode | Totalizer     |               |               |
|----------------|---------------|---------------|---------------|
|                | INPUT 1 TOTAL | INPUT 2 TOTAL | LINKAGE TOTAL |
| SINGLE         | active        | → 0           | → 0           |
| DUAL           | active        | active        | → 0           |

| Operating mode | Totalizer     |               |                   |
|----------------|---------------|---------------|-------------------|
|                | INPUT 1 TOTAL | INPUT 2 TOTAL | LINKAGE TOTAL     |
| IN 1 + IN 2    | active        | active        | Total 1 + Total 2 |
| IN 1 - IN 2    | active        | active        | Total 1 - Total 2 |
| IN 1 x IN 2    | active        | active        | → 0               |
| IN 1 / IN 2    | active        | active        | → 0               |

**TIME BASE**

This parameter defines the time base for the totalization. It indicates the time interval for the detection of the measured values.

|         |  |
|---------|--|
| SECONDS | The current value is added to INPUT 1 TOTAL every second   |
| MINUTES | The current value is added to INPUT 1 TOTAL every minute   |
| HOURS   | The current value is added to INPUT 1 TOTAL every hour   |
| COMMAND | The current value of input 1 is added to INPUT 1 TOTAL by means of the command (ADD TO TOTAL 1) via the operation function of a control input (→ 9.17 Command menu). |

**DIVIDER**

This parameter defines the divisor for the totalization.

|      |  |
|------|--|
| 1    | No division                                    |
| 10   | Result of the totalization is divided by 10.   |
| 100  | Result of the totalization is divided by 100.  |
| 1000 | Result of the totalization is divided by 1000. |

**DECIMAL POINT**

This setting defines the position of the decimal point.

|           |                                     |
|-----------|-------------------------------------|
| NO        | No decimal point                    |
| 0000000.0 | Decimal point at the specified spot |
| 000000.00 | Decimal point at the specified spot |
| 00000.000 | Decimal point at the specified spot |
| 0000.0000 | Decimal point at the specified spot |
| 000.00000 | Decimal point at the specified spot |
| 00.000000 | Decimal point at the specified spot |
| 0.0000000 | Decimal point at the specified spot |

**SCALE UNITS**

Configuration of the indicated unit (→ 9.3 IN 1 Properties)

## 9.6 IN 2 Properties

In this menu the parameters for output 2 are defined.

|   |
|---|
| <b>CONFIGURATION</b><br>Configuration of input 2 (→ 9.3 IN 1 Properties)  |
| <b>START VALUE</b><br>Display value of input 2 for an input signal of 0 V, 0 mA or 4 mA (→ 9.3 IN 1 Properties) |
| <b>END VALUE</b><br>Display value of input 2 for an input signal of 10 V or 20 mA (→ 9.3 IN 1 Properties)       |
| <b>DECIMAL POINT</b><br>Setting of the decimal point (→ 9.3 IN 1 Properties)                                    |
| <b>SCALE UNITS</b><br>Unit indicated on the display (→ 9.3 IN 1 Properties)                                     |
| <b>SAMPLING TIME (S)</b><br>Sampling interval of input 2 (→ 9.3 IN 1 Properties)                                |
| <b>AVERAGE FILTER</b><br>Optional averaging (→ 9.3 IN 1 Properties)   |
| <b>OFFSET</b><br>Zero point shift / tare (→ 9.3 IN 1 Properties)  |
| <b>LINEARIZATION</b><br>Linearization function (→ 9.3 IN 1 Properties)  |
| <b>TOTALIZATION</b><br>Totalization function (→ 9.3 IN 1 Properties)  |

## 9.7 IN 2 Linearization

In this menu the linearization points for output 2 are defined.

|   |
|---|
| <b>P1(X) ... P24(X)</b><br>X coordinate of the linearization point (→ 9.4 IN 1 Linearization) |
| <b>P1(Y) ... P24(Y)</b><br>Y coordinate of the linearization point (→ 9.4 IN 1 Linearization) |

## 9.8 IN 2 Totalization

In this menu the parameters for the totalization of input 2 are defined.

|  |
|--|
| <b>TIME BASE</b><br>Time base for the totalization (→ 9.5 IN 1 Totalization) |
| <b>DIVIDER</b><br>Divisor for the totalization (→ 9.5 IN 1 Totalization)     |



**DECIMAL POINT**

Position of the decimal point (→ 9.5 IN 1 Totalization)

**SCALE UNITS**

Unit indicated on the display (→ 9.5 IN 1 Totalization)

## 9.9 Linkage Properties

In this menu the parameters for the linked operating mode are defined. This menu is only displayed if an operating mode with linking (e.g. IN 1 – IN 2) has been selected in the GENERAL MENU. For use of a linked operating mode the parameters in the IN 1 PROPERTIES and IN 2 PROPERTIES menus have to be set first. The result of the linking can be scaled with the following parameters.

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**FACTOR**

This parameter defines the factor with which the result of the linking is offset.

-99999999 Lowest value

1 Default value

99999999 Highest value

**DIVIDER**

This parameter defines the divisor with which the result of the linking is offset.

-99999999 Lowest value

1 Default value

99999999 Highest value

**ADDITIVE VALUE**

This parameter defines a constant that is added to the result of the linking.

-99999999 Lowest value

0 Default value

99999999 Highest value

**DECIMAL POINT**

This setting defines the position of the decimal point (→ 9.5 IN 1 Totalization).

**SCALE UNITS**

Configuration of the indicated unit (→ 9.3 IN 1 Properties)

## 9.10 IO-Link Properties

In this menu, the parameters for the display of both output process data values can be defined

This function is only available for the devices DX2045 and DX2055.

|   |               |
|---|---------------|
| <b>IN1 FACTOR</b>   |               |
| This parameter defines the factor with which the received value 1 is offset.                          |               |
| -99999999   | Lowest value  |
| 1   | Default value |
| 99999999  | Highest value |
| <b>IN1 DIVIDER</b>  |               |
| This parameter defines the divisor with which the received value 1 is offset.                         |               |
| -99999999   | Lowest value  |
| 1   | Default value |
| 99999999  | Highest value |
| <b>IN1 ADDITIVE VALUE</b>   |               |
| This parameter defines a constant that is added to the received value.                                |               |
| -99999999   | Lowest value  |
| 0   | Default value |
| 99999999  | Highest value |
| <b>IN1 DECIMAL POINT</b>  |               |
| This setting defines the position of the decimal point for value 1 (→ 9.5 IN 1 Totalization).         |               |
| <b>IN1 SCALE UNITS</b>  |               |
| Configuration of the unit that the display indicates for value 1 (→ 9.3 IN 1 Properties)              |               |
| <b>IN2 FACTOR</b>   |               |
| This parameter defines the factor with which the received value 2 is offset (see IOL IN1 FACTOR).     |               |
| <b>IN2 DIVIDER</b>  |               |
| This parameter defines the divisor with which the received value 2 is offset (see IOL IN1 DIVIDER).   |               |
| <b>IN2 ADDITIVE VALUE</b>   |               |
| This parameter defines a constant that is added to the received value 2 (see IOL IN1 ADDITIVE VALUE). |               |
| <b>IN2 DECIMAL POINT</b>  |               |
| This setting defines the position of the decimal point for value 1 (→ 9.5 IN 1 Totalization).         |               |
| <b>IN2 SCALE UNITS</b>  |               |
| Configuration of the unit that the display indicates for value 1 (→ 9.3 IN 1 Properties)              |               |

## 9.11 Preselection Values

In this menu, the preselection values and switching values are set. The preselection values / switch points always refer to the parameter SOURCE selected in the PRESELECTION MENU.

This function is only available for the devices DX2042, DX2043, DX2052 and DX2053.

|                               |                            |
|-------------------------------|----------------------------|
| <b>PRESELECTION 1</b>         |                            |
| Preselection / switch point 1 |                            |
| -99999999                     | Lowest preselection value  |
| 1000                          | Default value              |
| +99999999                     | Highest preselection value |
| <b>PRESELECTION 2</b>         |                            |
| Preselection / switch point 2 |                            |
| -99999999                     | Lowest preselection value  |
| 2000                          | Default value              |
| +99999999                     | Highest preselection value |
| <b>PRESELECTION 3</b>         |                            |
| Preselection / switch point 3 |                            |
| -99999999                     | Lowest preselection value  |
| 3000                          | Default value              |
| +99999999                     | Highest preselection value |
| <b>PRESELECTION 4</b>         |                            |
| Preselection / switch point 4 |                            |
| -99999999                     | Lowest preselection value  |
| 4000                          | Default value              |
| +99999999                     | Highest preselection value |

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## 9.12 Preselection 1 Menu

In this menu the parameters for the source, the switching conditions and further definitions for the preselection value / switching point 1 are set.

This function is only available for the devices DX2042, DX2043, DX2052 and DX2053.

|  |                   |
|--|-------------------|
| <b>SOURCE 1</b>  |                   |
| This parameter defines the source for preselection 1.                              |                   |
| The totalization depends on the selected operating mode (→ 9.5 IN 1 Totalization). |                   |
| INPUT 1  | Source is input 1 |

|  |   |
|--|---|
| INPUT 2  | Source is input 2   |
| LINKAGE 1 – 2  | The source is the result of the linking of input 1 and input 2  |
| INPUT 1 TOTAL  | Source is input 1 with totalization   |
| INPUT 2 TOTAL  | Source is input 2 with totalization   |
| LINKAGE TOTAL  | The source is the result of the linking of input 1 and input 2 with totalization  |
| IO LINK VALUE 1  | The sent PDout value 1 sent by the IO-Link master is the source for preselection  |
| IO LINK VALUE 2  | The sent PDout value 2 sent by the IO-Link master is the source for preselection  |
| <b>MODE 1</b>  |   |
| Switching condition for preselection 1. Output / display switch according to the following conditions: |   |
| $ RESULT  \geq  PRES $   | <p>The result of the display value is greater than or equal to the result of preselection 1</p> <p>With hysteresis 1 not equal to 0, the following switching condition results:</p> <p>Display value <math>\geq</math> preselection 1 <math>\rightarrow</math> ON</p> <p>Display value <math>&lt;</math> preselection 1 - hysteresis 1 <math>\rightarrow</math> OFF</p>   |
| $ RESULT  \leq  PRES $   | <p>The result of display value is smaller or equal to the result of Preselection 1 (start-up delay recommended)</p> <p>With hysteresis 1 not equal to 0 the following switching condition results:</p> <p>Display value <math>\leq</math> preselection 1 <math>\rightarrow</math> ON</p> <p>Display value <math>&gt;</math> preselection 1 + hysteresis 1 <math>\rightarrow</math> OFF</p>  |
| $ RESULT  =  PRES $  | <p>The result of the display value is equal to the result of preselection 1. In combination with hysteresis, a frequency band (preselection <math>\pm \frac{1}{2}</math> hysteresis) can be defined and monitored.</p> <p>With hysteresis 1 not equal to 0 the following switching condition results:</p> <p>Display value <math>&gt;</math> preselection 1 + <math>\frac{1}{2}</math> hysteresis 1 <math>\rightarrow</math> OFF</p> <p>Display value <math>&lt;</math> preselection 1 - <math>\frac{1}{2}</math> hysteresis 1 <math>\rightarrow</math> OFF</p> |
| $RESULT \geq PRES$   | <p>If the display value is greater than or equal to preselection 1, e.g. overspeed</p> <p>With hysteresis 1 not equal to 0 the following switching condition results:</p> <p>Display value <math>\geq</math> preselection 1 <math>\rightarrow</math> ON</p> <p>Display value <math>&lt;</math> preselection 1 - hysteresis 1 <math>\rightarrow</math> OFF</p>   |
| $RESULT \leq PRES$   | <p>If the display value is smaller than or equal to preselection 1, e.g. underspeed (start-up delay recommended)</p> <p>With hysteresis 1 not equal to 0 the following switching condition results:</p> <p>Display value <math>\leq</math> preselection 1 <math>\rightarrow</math> ON</p> <p>Display value <math>&gt;</math> preselection 1 + hysteresis 1 <math>\rightarrow</math> OFF</p>   |

|   |   |
|---|---|
| RESULT=PREs   | <p>Display value equal to preselection 1. In combination with hysteresis 1 a frequency band (preselection <math>\pm</math> 1/2 hysteresis) can be defined and monitored.</p> <p>With hysteresis 1 not equal to 0 the following switching condition results:<br/>           Display value &gt; preselection 1 + 1/2 hysteresis 1 → OFF<br/>           Display value &lt; preselection 1 - 1/2 hysteresis 1 → OFF</p> |
| RES≥PRES-TRAIL  | <p>Tracking preset 1:<br/>           Display value greater or equal to preselection 2 – preselection 1<br/>           Preselection 1 is the tracking preset of preselection 2.</p>  |
| <b>HYSTERESIS 1</b><br>Hysteresis to define the switch-off point for the switching condition of preselection 1  |   |
| 0   | No switching hysteresis   |
| ...   |   |
| 99999   | Switching hysteresis of 99999   |
| <b>PULSE TIME 1 (S)</b><br>Duration of the fleeting pulse (in seconds) for the switching condition of preselection 1  |   |
| 0,000   | No fleeting pulse (static signal)   |
| ...   |   |
| 60,000  | Pulse duration of 60 seconds  |
| <b>OUTPUT TARGET 1</b><br>Assignment of an output for the switching condition of preselection 1.<br>If several switching conditions are assigned to one single output, this output is active as soon as one of the switching conditions is met. |   |
| NO  | No attribution  |
| CTRL OUT 1  | Assignment of the switching condition to Ctrl. Out 1  |
| CTRL OUT 2  | Assignment of the switching condition to Ctrl. Out 2  |
| CTRL OUT 3  | Assignment of the switching condition to Ctrl. Out 3  |
| CTRL OUT 4  | Assignment of the switching condition to Ctrl. Out 4  |
| <b>OUTPUT POLARITY 1</b><br>Start-up delay for the switching condition of preselection 1  |   |
| ACTIVE HIGH   | Active "HIGH"   |
| ACTIVE LOW  | Active "LOW"  |
| <b>OUTPUT LOCK 1</b><br>Start-up delay for the switching condition of preselection 1  |   |
| NO  | No latching   |
| YES   | Latching  |

**START UP DELAY 1 (S)**

Start-up delay for the switching condition of preselection 1.

Time window until the monitoring function has been activated. This setting only applies for the switching conditions  $!RESULT \leq !PRES$  and  $RESULT \leq PRES$ . (Start-up delays 3 and 4 are set automatically.)

|        |                           |
|--------|---------------------------|
| 0,000  | No start-up delay         |
| ...    |                           |
| 60,000 | Start-up delay in seconds |

**EVENT COLOR 1**

Event-dependent colour change of the display for the switching condition of preselection 1. Event Color 1 is of lowest priority. Event Color 2 ... 4 can overwrite this colour change.

|                  |                          |
|------------------|--------------------------|
| NO CHANGE        | No colour change         |
| CHANGE TO RED    | Colour changes to red    |
| CHANGE TO GREEN  | Colour changes to green  |
| CHANGE TO YELLOW | Colour changes to yellow |

## 9.13 Preselection 2 Menu

**SOURCE 2**

Source for preselection 2 (→ 9.12 Preselection 1 Menu)

**MODE 2**

Switching condition for preselection 2, (→ 9.12 Preselection 1 Menu) (except tracking preset)

|                       |  |
|-----------------------|--|
|                       | see Preselection 1 Menu  |
| RES $\geq$ PRES-TRAIL | Tracking preset 2:<br>Display value greater than or equal to preselection 1 – preselection 2<br>Preselection 2 is the tracking preset of preselection 1. |

**HYSTERESIS 2**

Switching hysteresis for the switching condition of preselection 2 (→ 9.12 Preselection 1 Menu)

**PULSE TIME 2 (S)**

Duration of the fleeting pulse for the switching condition of preselection 2 (→ 9.12 Preselection 1 Menu)

**OUTPUT TARGET 2**

Assignment of an output for the switching condition of preselection 2 (→ 9.12 Preselection 1 Menu) (except default value)

|            |  |
|------------|--|
|            | see Preselection 1 Menu                              |
| CTRL OUT 2 | Assignment of the switching condition to Ctrl. Out 2 |

**OUTPUT POLARITY 2**

Switching status for the switching condition of preselection 2 (→ 9.12 Preselection 1 Menu)

**OUTPUT LOCK 2**

Latching for the switching condition of preselection 2 (→ 9.12 Preselection 1 Menu)

**START UP DELAY 2 (S)**

Start-up delay for the switching condition of preselection 2 (→ 9.12 Preselection 1 Menu)  
(Start-up delays 3 and 4 are set automatically.)

**EVENT COLOR 2**

Event-dependent colour change of the display for the switching condition of preselection 2, see Preselection 1 Menu

**9.14 Preselection 3 Menu**

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**SOURCE 3**

Source for preselection 3 (→ 9.12 Preselection 1 Menu)

**MODE 3**

Switching condition for preselection 3, (→ 9.12 Preselection 1 Menu) (except tracking preset)

see Preselection 1 Menu

**RES≥PRES-TRAIL**

Tracking preset 3:  
Display value greater or equal to preselection 4 – preselection 3  
Preselection 3 is the tracking preset of preselection 4.

**HYSTERESIS 3**

Switching hysteresis for the switching condition of preselection 3 (→ 9.12 Preselection 1 Menu)

**PULSE TIME 3 (S)**

Duration of the fleeting pulse for the switching condition of preselection 3 (→ 9.12 Preselection 1 Menu)

**OUTPUT TARGET 3**

Assignment of an output for the switching condition of preselection 3 (→ 9.12 Preselection 1 Menu)  
(except default value)

see Preselection 1 Menu

**CTRL OUT 3**

Assignment of the switching condition to Ctrl. Out 3

**OUTPUT POLARITY 3**

Switching status for the switching condition of preselection 3 (→ 9.12 Preselection 1 Menu)

**OUTPUT LOCK 3**

Latching for the switching condition of preselection 3 (→ 9.12 Preselection 1 Menu)

**START UP DELAY 3 (S)**

Start-up delay for the switching condition of preselection 3. This setting only applies for the switching conditions  $|RESULT| \leq |PRES|$  und  $RESULT \leq PRES$ .  
(Start-up delays 1 and 2 are time-dependent.)

**OFF**

No start-up delay

**AUTO**

Automatic start-up delay until the preselection value / switch point is exceeded for the first time.

**EVENT COLOR 3**

Event-dependent colour change of the display for the switching condition of preselection 3, see Preselection 1 Menu

## 9.15 Preselection 4 Menu

|  |   |
|--|---|
| <b>SOURCE 4</b>  |   |
| Source for preselection 4 (→ 9.12 Preselection 1 Menu)   |   |
| <b>MODE 4</b>  |   |
| Switching condition for preselection 4, (→ 9.12 Preselection 1 Menu) (except tracking preset)  |   |
|  | see Preselection 1 Menu   |
| RES≥PRES-TRAIL   | Tracking preset 4:<br>Display value greater or equal to preselection 3 – preselection 4<br>Preselection 4 is the tracking preset of preselection 3. |
| <b>HYSTERESIS 4</b>  |   |
| Switching hysteresis for the switching condition of preselection 4 (→ 9.12 Preselection 1 Menu)  |   |
| <b>PULSE TIME 4 (S)</b>  |   |
| Duration of the fleeting pulse for the switching condition of preselection 4 (→ 9.12 Preselection 1 Menu)                                  |   |
| <b>OUTPUT TARGET 4</b>   |   |
| Assignment of an output for the switching condition of preselection 4 (→ 9.12 Preselection 1 Menu) (except default value)                  |   |
|  | see Preselection 1 Menu   |
| CTRL OUT 4   | Assignment of the switching condition to Ctrl. Out 4  |
| <b>OUTPUT POLARITY 4</b>   |   |
| Switching status for the switching condition of preselection 4 (→ 9.12 Preselection 1 Menu)  |   |
| <b>OUTPUT LOCK 4</b>   |   |
| Latching for the switching condition of preselection 4 (→ 9.12 Preselection 1 Menu)  |   |
| <b>START UP DELAY 4 (S)</b>  |   |
| Start-up delay for the switching condition of preselection 4 (→ 9.14 Preselection 3 Menu)<br>(Start-up delays 1 and 2 are time-dependent.) |   |
| OFF  | No start-up delay   |
| AUTO   | Automatic start-up delay until the preselection value / switch point is exceeded for the first time.  |
| <b>EVENT COLOR 4</b>   |   |
| Event-dependent colour change of the display for the switching condition of preselection 4, see Preselection 1 Menu                        |   |



## 9.16 Analog Out Menu

In this menu the basic settings for the analogue output are defined. This function is only available for the devices DX2043 and DX2053.

|  |  |
|--|--|
| <b>ANALOG SOURCE</b>   |  |
| This parameter defines the source for preselection for the analogue output.<br>The totalization depends on the selected operating mode (→ 9.5 IN 1 Totalization).  |  |
| INPUT 1  | Source is input 1  |
| INPUT 2  | Source is input 2  |
| LINKAGE 1 – 2  | The source is the result of the linking of input 1 and input 2                   |
| INPUT 1 TOTAL  | Source is input 1 with totalization  |
| INPUT 2 TOTAL  | Source is input 2 with totalization  |
| LINKAGE TOTAL  | The source is the result of the linking of input 1 and input 2 with totalization |
| IO LINK VALUE 1  | The sent PDout value 1 sent by the IO-Link master is the source for preselection |
| IO LINK VALUE 2  | The sent PDout value 2 sent by the IO-Link master is the source for preselection |
| <b>ANALOG FORMAT</b>   |  |
| This parameter defines the output characteristic. For the output format (-10 ... +10 V), the polarity of the output follows the algebraic sign in the display (only in the operating mode COUNTER).<br>The analogue output is proportional to the display value. |  |
| -10...10V  | -10 ... +10 V  |
| 0...20MA   | 0 ... 20 mA  |
| 4...20MA   | 4 ... 20 mA  |
| <b>ANALOG START</b>  |  |
| With this parameter, the start value of the analogue gain can be set. The start value determines at which display value the analogue output has a gain of 0 V or 0 / 4 mA.   |  |
| -99999999  | Lowest possible start value  |
| 0  | Default value  |
| +99999999  | Highest possible start value   |
| <b>ANALOG END</b>  |  |
| With this parameter, the end value of the analogue gain can be set. The end value determines at which display value the analogue output has a maximum value of +/- 10 V or 20 mA.  |  |
| -99999999  | Lowest possible final value  |
| 10000  | Default value  |
| +99999999  | Highest possible final value   |

**ANALOG GAIN (%)**

With this parameter, the maximum gain can be set. The analogue gain indicates the maximum gain of the analogue output in % referred to +/- 10 V or 20 mA.

Examples:

- 101.00 corresponds to a gain of 10.2 V / 20 mA after reaching the "Analog End" value.
- 95.00 corresponds to a gain of 9.5 V / 18 mA after reaching the "Analog End" value.

|        |                       |
|--------|-----------------------|
| 0.00   | Lowest possible gain  |
| 100.00 | Default value         |
| 110.00 | Highest possible gain |

**ANALOG OFFSET (%)**

With this parameter, the zero point shift of the output can be set.

Example: 0.20 corresponds to a gain of 0.2 V / 0.4 mA after reaching the "Analog Start" value.

|        |                                   |
|--------|-----------------------------------|
| -99.99 | Lowest possible zero point shift  |
| 0      | Default value                     |
| +99.00 | Highest possible zero point shift |

**9.17 Command menu****INPUT 1 ACTION**

This parameter defines the control function of the Ctrl. In 1 input.

d = dynamic switching characteristics (edge evaluation), INPUT CONFIG must be set to RISING/FALLING EDGE

s = static switching characteristics (level evaluation), INPUT CONFIG must be set to ACTIVE LOW/HIGH

|                 |  |      |
|-----------------|--|------|
| NO              | No function.   |      |
| TARA INPUT 1    | The value of input 1 is saved as OFFSET of input 1.  | d    |
| TARA INPUT 2    | The value of input 2 is saved as OFFSET of input 2.  | d    |
| TARA INPUT 1+2  | The value of input 1 is saved as OFFSET of input 1,<br>The value of input 2 is saved as OFFSET of input 2. | d    |
| RESET TOTAL 1   | The value of totalizer 1 is reset to 0.  | d, s |
| RESET TOTAL 2   | The value of totalizer 2 is reset to 0.  | d, s |
| RESET TOTAL 1+2 | The values of totalizer 1 and 2 are reset to 0.  | d, s |
| TEACH PRESEL. 1 | Value of SOURCE 1 is saved as PRESELECTION 1.  | d    |
| TEACH PRESEL. 2 | Value of SOURCE 2 is saved as PRESELECTION 2.  | d    |
| TEACH PRESEL. 3 | Value of SOURCE 3 is saved as PRESELECTION 3.  | d    |
| TEACH PRESEL. 4 | Value of SOURCE 4 is saved as PRESELECTION 4.  | d    |
| SCROLL DISPLAY  | Display change (→ 8.2 Display during operation).   | d    |
| RESET MIN/MAX   | Reset of the min. / max. values.   | d, s |
| CLEAR LOOP TIME | N.A.   |      |
| ACTIVATE        | N.A.   |      |

|   |  |   |
|---|--|---|
| STORE DATA  | N.A.   |   |
| TESTPROGRAM   | N.A.   |   |
| SET RED COLOR   | Display is red. The colour can be changed by means of the event-dependent colour change in the PRESELECTION 1 ... 4 MENU.    | d |
| SET GREEN COLOR   | Display is green. The colour can be changed by means of the event-dependent colour change in the PRESELECTION 1 ... 4 MENU.  | d |
| SET YELLOW COLOR  | Display is yellow. The colour can be changed by means of the event-dependent colour change in the PRESELECTION 1 ... 4 MENU. | d |
| FREEZE  | Freezes the display value.   | s |
| KEY LOCK  | Locks the keys of the touch screen.  | s |
| LOCK RELEASE  | Release latching of all outputs.   | d |
| SERIAL PRINT  | N.A.   |   |
| START PRESELECT   | N.A.   |   |
| ADD TO TOTAL 1  | Adds the current value of input 1 to INPUT 1 TOTAL.  | d |
| ADD TO TOTAL 2  | Adds the current value of input 2 to INPUT 2 TOTAL   | d |
| <b>INPUT 1 CONFIG</b>   |  |   |
| This parameter defines the switching characteristics for Ctrl. In 1.  |  |   |
| ACTIVE LOW  | Activation in case of "LOW" (static)   |   |
| ACTIVE HIGH   | Activation in case of "HIGH" (static)  |   |
| RISING EDGE   | Activation in case of rising edge (dynamic)  |   |
| FALLING EDGE  | Activation in case of falling edge (dynamic)   |   |
| <b>INPUT 2 ACTION</b>   |  |   |
| This parameter defines the control function of the Ctrl. In 2 input.<br>See function assignment parameter INPUT 1 ACTION.   |  |   |
| <b>INPUT 2 CONFIG</b>   |  |   |
| This parameter defines the switching characteristics for Ctrl. In 2.<br>See activation assignment parameter INPUT 1 CONFIG. |  |   |
| <b>INPUT 3 ACTION</b>   |  |   |
| This parameter defines the control function of the Ctrl. In 3 input.<br>See function assignment parameter INPUT 1 ACTION.   |  |   |
| <b>INPUT 3 CONFIG</b>   |  |   |
| This parameter defines the switching characteristics for Ctrl. In 3.<br>See activation assignment parameter INPUT 1 CONFIG. |  |   |

## 9.18 Display menu

Parameter changes are only active after quitting the menu selection.

The totalization depends on the selected operating mode (→ 9.5 IN 1 Totalization).

|   |  |
|---|--|
| <b>START DISPLAY</b>  |  |
| This parameter defines the start display after power-on of the device.                        |  |
| SINGLE  | Single-line display. The source has to be defined in SOURCE SINGLE.              |
| DUAL  | Two-line display. The sources have to be defined in SOURCE DUAL TOP / DOWN.      |
| <b>SOURCE SINGLE</b>  |  |
| This parameter defines the source for preselection for a single-line display.                 |  |
| INPUT 1   | Source is input 1  |
| INPUT 2   | Source is input 2  |
| LINKAGE 1 – 2   | The source is the result of the linking of input 1 and input 2                   |
| INPUT 1 TOTAL   | Source is input 1 with totalization  |
| INPUT 2 TOTAL   | Source is input 2 with totalization  |
| LINKAGE TOTAL   | The source is the result of the linking of input 1 and input 2 with totalization |
| IO LINK VALUE 1   | The sent PDout value 1 sent by the IO-Link master is the source for preselection |
| IO LINK VALUE 2   | The sent PDout value 2 sent by the IO-Link master is the source for preselection |
| <b>SOURCE DUAL TOP</b>  |  |
| This parameter defines the source for preselection for the first line of a two-line display.  |  |
| INPUT 1   | Source is input 1  |
| INPUT 2   | Source is input 2  |
| LINKAGE 1 – 2   | The source is the result of the linking of input 1 and input 2                   |
| INPUT 1 TOTAL   | Source is input 1 with totalization  |
| INPUT 2 TOTAL   | Source is input 2 with totalization  |
| LINKAGE TOTAL   | The source is the result of the linking of input 1 and input 2 with totalization |
| IO LINK VALUE 1   | The sent PDout value 1 sent by the IO-Link master is the source for preselection |
| IO LINK VALUE 2   | The sent PDout value 2 sent by the IO-Link master is the source for preselection |
| <b>SOURCE DUAL DOWN</b>   |  |
| This parameter defines the source for preselection for the second line of a two-line display. |  |
| INPUT 1   | Source is input 1  |
| INPUT 2   | Source is input 2  |
| LINKAGE 1 – 2   | The source is the result of the linking of input 1 and input 2                   |

|  |  |
|--|--|
| INPUT 1 TOTAL  | Source is input 1 with totalization  |
| INPUT 2 TOTAL  | Source is input 2 with totalization  |
| LINKAGE TOTAL  | The source is the result of the linking of input 1 and input 2 with totalization |
| IO LINK VALUE 1  | The sent PDout value 1 sent by the IO-Link master is the source for preselection |
| IO LINK VALUE 2  | The sent PDout value 2 sent by the IO-Link master is the source for preselection |
| <b>COLOR</b><br>This parameter defines the display colour.<br>The colour can be changed by means of the event-dependent colour change in the PRESELECTION 1 ... 4 MENU. Event-dependent colour change is only available for the devices DX2042, DX2043, DX2052 and DX2053. |  |
| RED  | The display is red.  |
| GREEN  | The display is green.  |
| YELLOW   | The display is yellow.   |
| <b>BRIGHTNESS (%)</b><br>This parameter defines the display brightness in %.   |  |
| 10   | Minimum display brightness   |
| 80   | Default value  |
| 100  | Maximum display brightness   |
| <b>CONTRAST</b><br>This parameter defines the display's angle of view.   |  |
| 0  | Angle of view from above   |
| 1  | Angle of view from the front   |
| 2  | Angle of view from below   |
| <b>SCREEN SAVER (S)</b><br>This parameter defines the time in seconds after which the display is switched off.   |  |
| 0  | Display stays on   |
| ...  |  |
| 9999   | Longest time until the display is switched off                                   |
| <b>UP-DATE-TIME (S)</b><br>This parameter defines the display refreshing time in seconds.  |  |
| 0.005  | Minimum update time  |
| 0.1  | Default value  |
| 9.999  | Maximum update time  |

**FONT**

With this parameter, the font of the clear text can be selected.

|   |          |
|---|----------|
| 0 | Standard |
| 1 | Font 1   |

## 10 Linearization

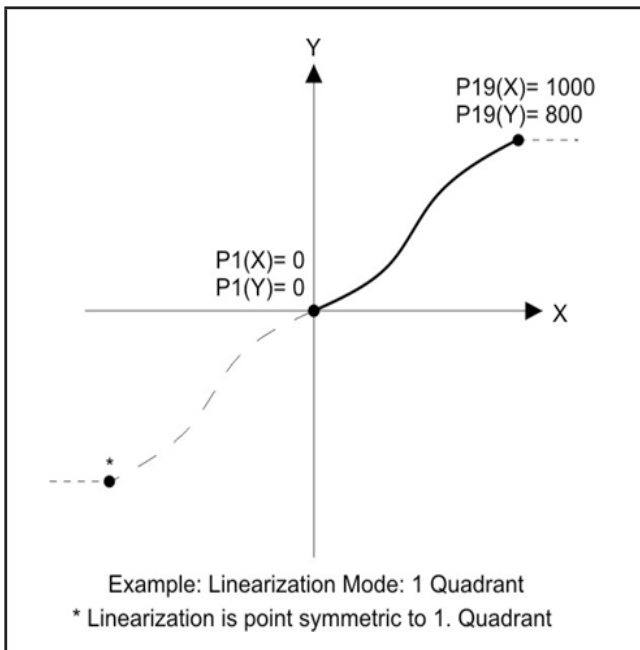
With this function, a linear input signal can be converted into a non-linear visualisation (or the other way round). Up to 24 linearization points are available for input 1 and input 2. They can be distributed across the whole conversion area at any distances. There is automatic linear interpolation between 2 predefined coordinates.

It is recommended to set as many points as possible in sections where curves are strongly bent. In sections with slight curve bending, only a few points are sufficient. To predefine a linearization curve the LINEARIZATION MODE parameter has to be set to 1 QUADRANT or 4 QUADRANT in the IN1 Properties and IN 2 Properties menus (see diagram below).

Up to 24 X coordinates can be defined via the parameters P1(X) to P24(X) in the IN 1 Linearization and IN 2 Linearization menus. They correspond to the display values without linearization.

With the parameters P1(Y) to P24(Y), you can enter the values which the display should indicate instead of the X values. Value P5(X) is replaced by value P5(Y), for example.

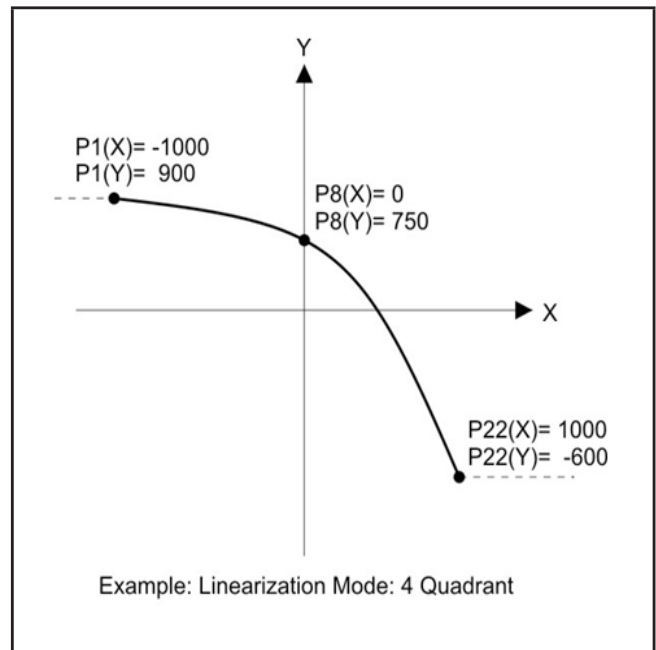
The X coordinates have to be assigned with continuously increasing values. That means P1(X) is the lowest value; every following value must be higher. In case of measured values that are higher than the X value that was defined last, the corresponding Y value is constantly displayed.



#### Mode 1 Quadrant:

P1(X) must be set to 0. Linearization is only defined in the positive value range.

With negative measured values, the curve is mirrored point-symmetrically.

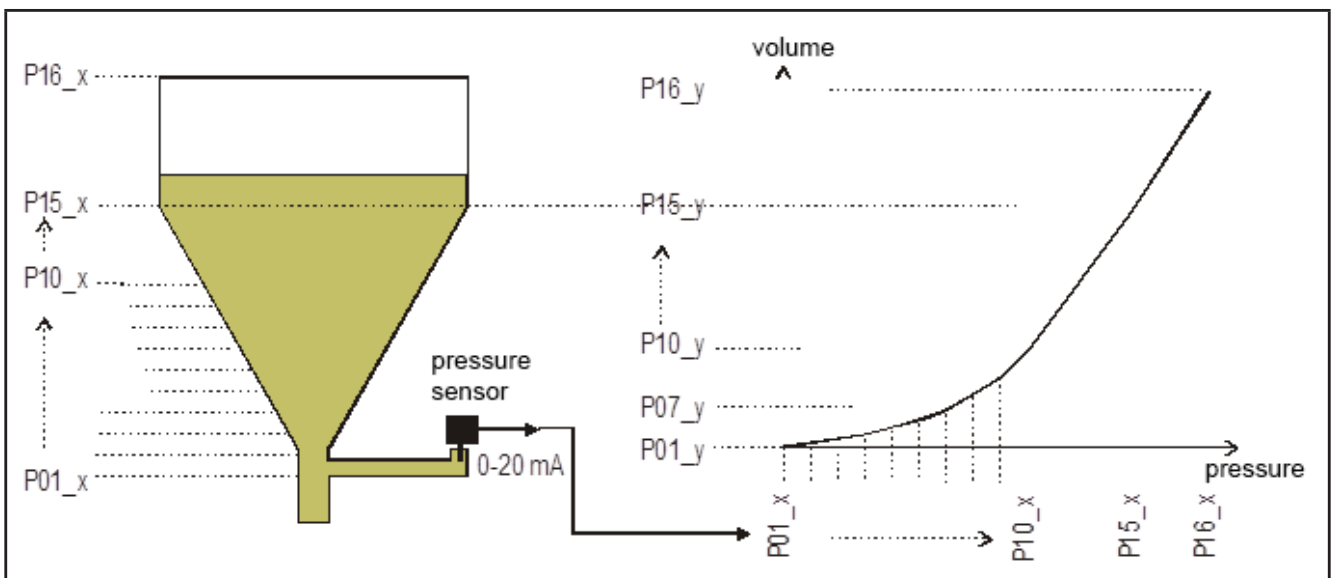


#### Mode 4 Quadrant:

P1(X) can also be set to negative values. With measured values lower than P1(X) the value P1(Y) is constantly displayed.

### Application example: linearisation

Using a pressure sensor, the level (volume) of a tank is to be determined and displayed. The analogue signal of the sensor is proportional to the level, but due to the shape of the tank, it is not proportional to the volume.



### Application example: volume calculation

## 11 Technical data

|  |                       |   |
|--|-----------------------|---|
| Voltage supply (DC):                             | Input voltage:        | 18 ... 30 VDC                                       |
|  | Protection circuit:   | reverse polarity protection                         |
|  | Current consumption:  | approx. 100 mA (without load)                       |
|  | Protection:           | external: T 0.5 A                                   |
| Voltage supply (AC):<br>(DX2041, DX2042, DX2043) | Input voltage:        | 115 ... 230 VAC (50 ... 60 Hz)                      |
|  | Power consumption:    | approx. 3 VA (without load)                         |
|  | Protection:           | external: T 0.1 A                                   |
| Connections:                                     | Connection type:      | screw terminals, 1.5 mm <sup>2</sup> / AWG 16       |
| Sensor supply:                                   | In case of DC supply: | approx. 1 V lower than the input voltage            |
|  | Output current:       | max. 250 mA   |
|  | In case of AC supply: | approx. 24 V ( $\pm 15\%$ )                         |
|  | Output current:       | 150 mA (at max. 45 °C) / 80 mA (at > 45 °C)         |
| Reference output:                                | Output voltage:       | 10 V  |
|  | Accuracy:             | $\pm 0.1 \%$  |
|  | Load:                 | max. 10 mA / $\geq 1$ kohms                         |
| Analogue inputs:                                 | Number                | 2   |
|  | Configuration         | voltage input or current input                      |
|  | Voltage input         | -10 ... 10 V ( $R_i \approx 50$ kohms)              |
|  | Current input         | 0 ... 20 mA / 4 ... 20 mA ( $R_i \approx 120$ ohms) |
|  | Resolution            | 16 bits   |
|  | Accuracy:             | $\pm 0.1 \%$  |
| Control inputs:                                  | Number:               | 3   |
|  | Format:               | HTL, PNP (LOW 0 ... 3 V, HIGH 9 ... 30 V)           |
|  | Frequency:            | max. 10 kHz   |
|  | Load:                 | max. 2 mA / $R_i > 15$ kohms / 470 pF               |
| Analogue output:<br>(DX2043, DX2053)             | Configuration:        | current or voltage output                           |
|  | Voltage output:       | -10 ... +10 V (max. 2 mA)                           |
|  | Current output:       | 0 ... 20 mA / 4 ... 20 mA (load max. 270 ohms)      |
|  | Resolution:           | 16 bits   |
|  | Accuracy:             | $\pm 0.1 \%$  |
|  | Response time:        | < 150 ms  |



|   |                            |   |
|---|----------------------------|---|
| Control outputs:<br>(DX2042, DX2043, DX2052,<br>DX2053) | Number:                    | 4   |
|   | Format / level:            | 5 ... 30 V (depending on the voltage on Com+),<br>PNP |
|   | Output current:            | max. 200 mA   |
|   | Response time:             | < 1 ms  |
| IO-Link:  | IO-Link revision:          | 1.1   |
|   | Type of transmission:      | COM3  |
|   | Master port class:         | A   |
| Display:  | Type:                      | graphic LCD with backlight                            |
|   | Display range              | 8 decades plus sign (-99999999 ... +99999999)         |
|   | Character height           | 13 mm   |
|   | Colour:                    | red / green / yellow (selectable)                     |
|   | Operation:                 | touch screen (resistive)                              |
| Housing:  | Material:                  | ABS, UL 94 V-0  |
|   | Installation:              | panel mounting  |
|   | Dimensions<br>(W x H x D): | 96 x 48 x 116 mm                                      |
|   | Section (W x H):           | 91 x 43 mm  |
|   | Protection rating:         | IP 65 front, IP 20 back                               |
|   | Weight:                    | approx. 200 g   |
| Ambient temperature:                                    | Operation:                 | -20 °C ... 60 °C                                      |
|   | Storage:                   | -25 °C ... 70 °C                                      |
| Conformity and standards:                               | EMC 2004/108/EC:           | EN 61000-6-2, EN 61000-6-3, EN 61000-6-4              |
|   | NS 2006/95/EC:             | EN 61010-1  |
|   | RoHS 2011/65/EU:           | EN 50581  |

## **12 Maintenance, repair and disposal**

### **12.1 Maintenance**

In case of regular operation, no maintenance measures are necessary for the unit. In case of unexpected problems, errors or functional failures, the unit must be sent to the manufacturer to be examined and, if necessary, repaired. Unauthorised opening and set-up may impair the functioning of the unit or cause failure of the protective measures supported by the unit.

### **12.2 Cleaning the housing surface**

- ▶ Clean the device from dirt using a soft, chemically untreated cloth.
- ▶ The competent maintenance staff or the corresponding installer is responsible for unscheduled cleaning.

### **12.3 Repair**

- ▶ The device must only be repaired by the manufacturer.  
Observe the safety instructions (→ 2 Safety instructions).

### **12.4 Disposal**

- ▶ Dispose of the device in accordance with the national environmental regulations.

## **13 Approvals/standards**

Test standards and regulations (→ 11 Technical data)

EC Declaration of Conformity and approvals are available at [www.ifm.com](http://www.ifm.com).