



Level



Pressure



Flow



Temperature

Liquid
Analysis

Registration

Systems
Components

Services



Solutions

Technical Information

Multidrop Connector FXN520

Gateways / Interfaces

Operation of several HART devices in multidrop mode for Fieldgate FXA520



Application

The Multidrop Connector is used in conjunction with Fieldgate (FXA520) for remote interrogation of connected 4...20 mA HART field devices or actuators. In HART multidrop mode, up to 15 field devices can be connected in parallel to one segment. As a result, wiring costs can be reduced considerably.

The number of field devices to be connected can be calculated exactly with the E+H FieldNetCalc calculation program.

In multidrop mode, the measured values of the field devices are recorded digitally. Here, the loop current is set to a fixed value (typically 4 mA).

With the integrated communication resistor and a switch-on delay, safe field device start-up behaviour is ensured.

Your benefits

- Safe field device switch-on behaviour by bridging the communication resistors in the moment of switch-on.
- 2-channel output, up to 15 devices can be connected per channel.
- Remote diagnosis and remote configuration of the field devices can take place in conjunction with Fieldgate FXA520.
- Inexpensive solution for the inventory control market.

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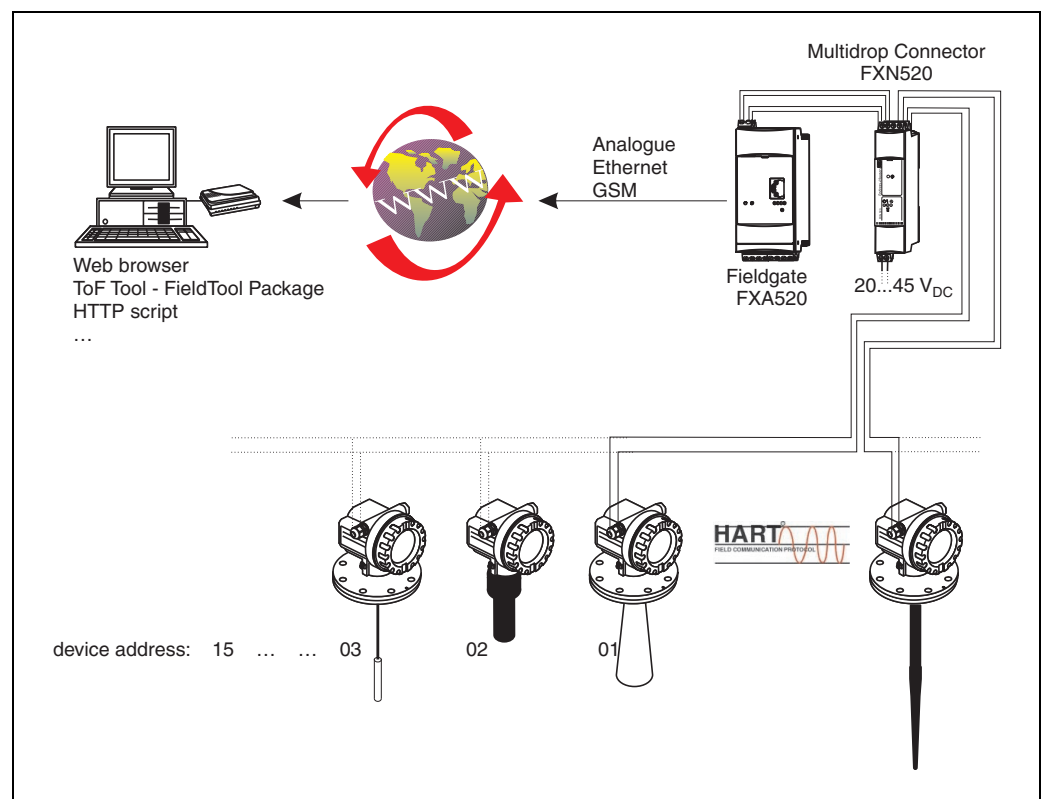
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Function and system design

Measuring system

HART Multidrop configuration with Fieldgate FXA520 + Multidrop Connector FXN520

- Can be connected to HART field devices.
- Up to 30 devices (2 x 15) can be connected
- When the maximum number of devices are connected, observe the following:
 - Minimum operating voltage of the connected devices,
 - Voltage drop at the communication resistor,
 - Multidrop HART conformity of the connected devices
 - Current consumption of the connected devices
 - Output characteristics of the power supply unit
 - All connected devices must first be allocated their own HART polling address
- The number of devices that can be connected can be calculated exactly with the E+H FieldNetCalc calculation program.
- A HART communication resistor is already integrated into the device.
- Starting currents of the connected devices no longer need to be taken into account when using the FXN520.



L00-FXA520xx-14-00-06-en-003

All E+H measuring devices with the HART protocol can, therefore, be used to the full extent with the Fieldgate

A current list of all E+H measuring devices that have the HART protocol can be found under:

- www.hartcomm.org: "HART Products/Product Catalogue/ ...".

All Endress+Hauser measuring devices with HART protocol can be connected to the Fieldgate.

Further information and a description of HART multidrop is provided in the Inventory Control Engineering Handbook from Endress+Hauser or on the Internet at www.hartcomm.org.

Input

Input signal 20...45 V_{DC}

Output

HART channel 1&2 The HART signal is coupled and decoupled capacitively by means of an integrated communication resistor.

Communication resistor in the 4...20 mA signal line	250 Ω ($\pm$ 1 %)
Maximum continuous current per channel	70 mA
Max. number of HART devices per channel in multidrop mode	15 units (theoretical) -> calculate using FieldNetCalc
Voltage drop at communication resistor at 70 mA	18 V
short-circuit duration	Not short-circuit proof

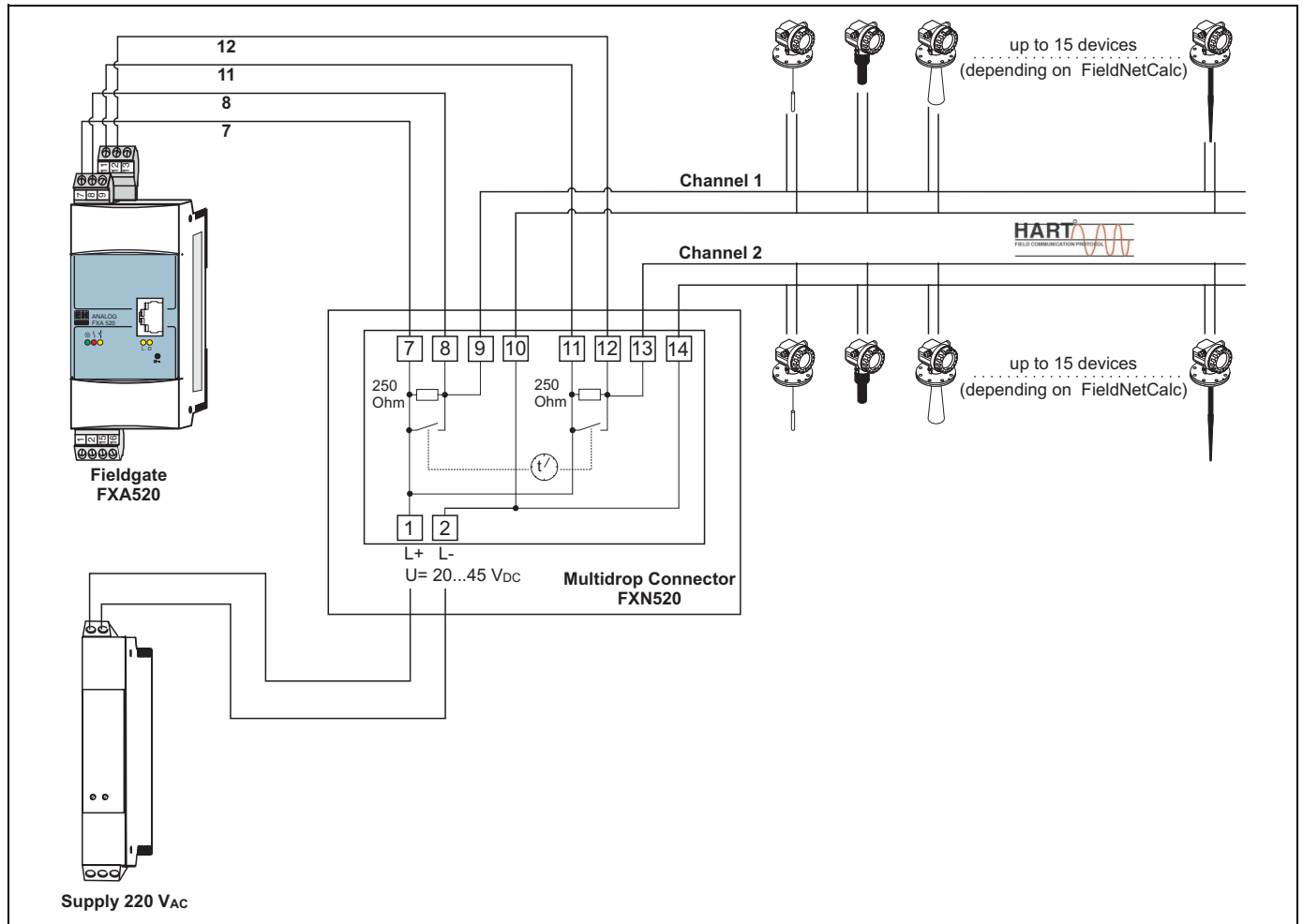
Power supply

Electrical connection

Terminal blocks

The terminal blocks are detachable.

Connecting the devices



L00-FXN520xx-04-00-00-en-002

Connecting the supply voltage



Warnung!

Please ensure that the maximum supply voltage at terminal 1 and 2 observes the maximum voltage range of the connected devices.

Supply voltage

Direct current version (DC):

Voltage range: 20...45 V_{DC}

Power consumption

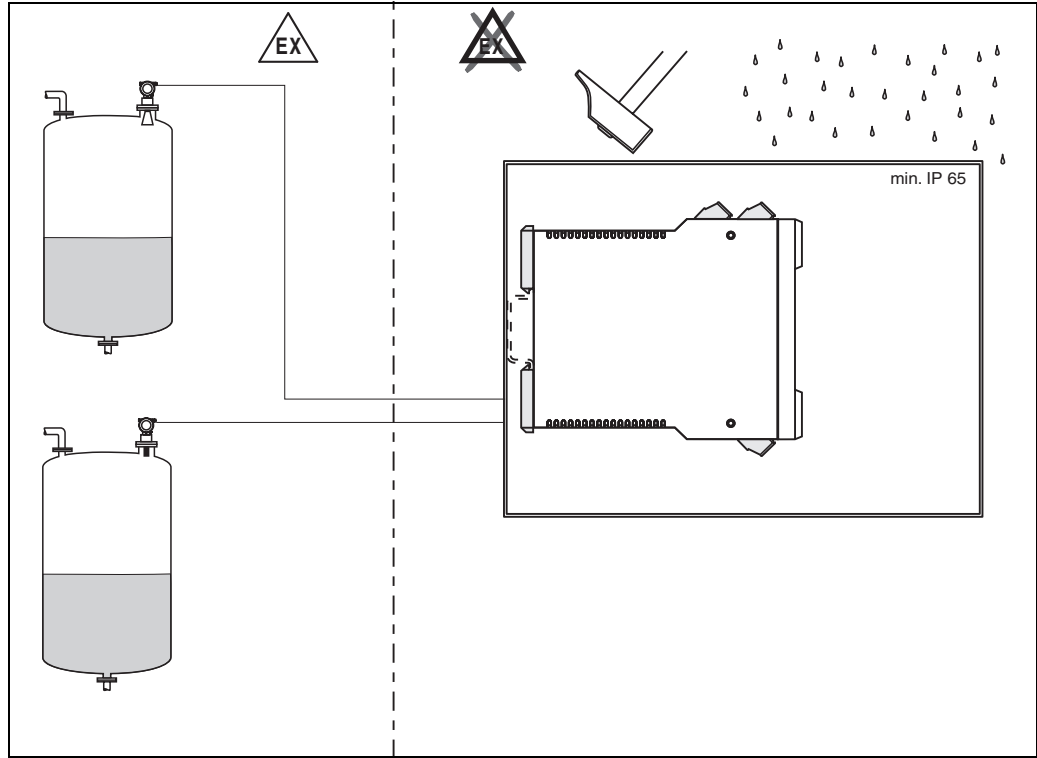
- Max. 0.5 W (at 45 V_{DC}) at idle
- Max. 3 W at full load (2 x 70 mA output current)

Operating conditions: Installation

Installation instructions

Mounting location

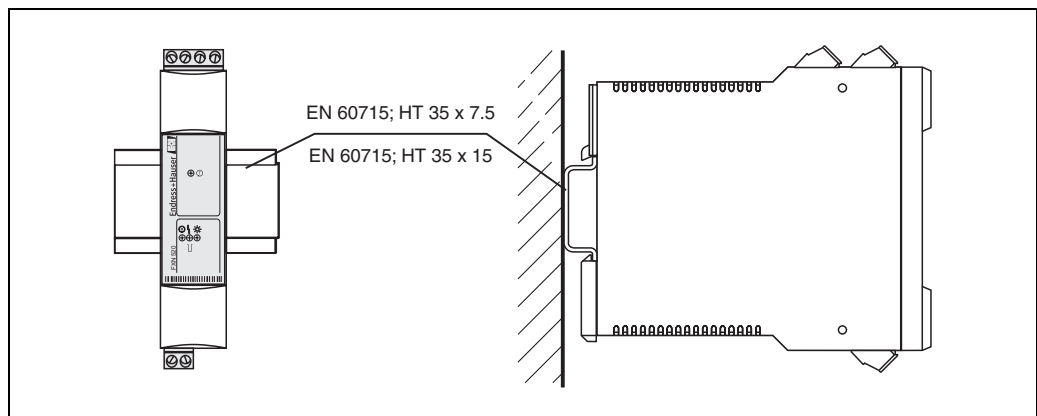
The Multidrop Connector must be located in a switch cabinet outside the hazardous area. There is also a protective housing (IP65) for two devices available for outdoor installation.



L00-FXN520xx-17-00-06-en-002

Orientation

Vertical on DIN top-hat rail (HT 35 as per EN 60715).



L00-FXN520xx-17-00-06-en-001

Operating conditions: Environment

Mounting location	Cabinet or protective housing
Permitted ambient temperatures	For individual mounting -20 C... +60 C For series mounting without lateral spacing -20 C... +50 C Storage temperature -25 C... +85 C (preferably at +20 C) Installation in protective housing -20 C... +40 C Caution! The devices must be mounted such that they are protected from the weather and from impacts, and where possible in places that are not exposed to direct sunlight. This must be especially observed in regions with warm climates.
Climatic and mechanic application class	3K3 In accordance with DIN EN 60721-3-3 3M2 In accordance with DIN EN 60721-3-3
Ingress protection	IP 20, in accordance with EN 60529
Electromagnetic compatibility (EMC)	Interference Emission to EN 61326, Electrical Equipment Class B.

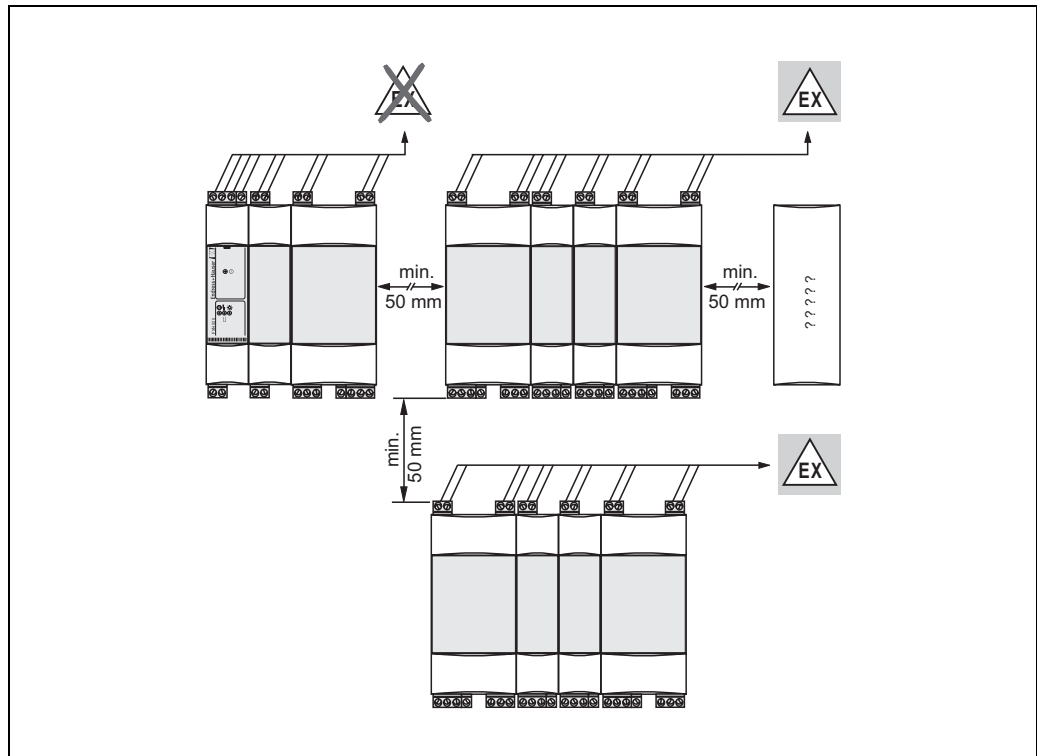
Mechanical construction

Design, dimensions

Note!

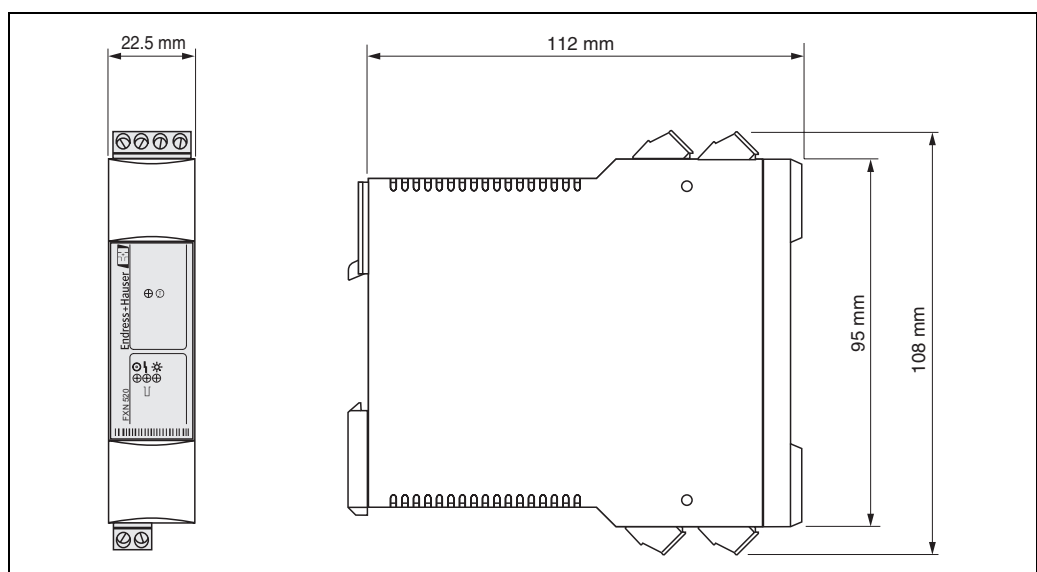
100 mm = 3.94 in

- Housing: aligned housing (top-hat rail design) made of plastic
- Installation: on top-hat rail as per EN 60715; HT 35x7.5 or EN 60715; HT 35x15
- Ingress protection as per EN 60529; IP 20



L00-FXN520xx-06-00-00-en-002

Dimensions



L00-FXN520xx-06-00-00-en-001

Weight

approx. 110 g

Materials

Housing

Polycarbonate
Colour: light grey, RAL 7035

Front cover

Polyamide PA6
Colour: blue

Fixing slide (for fastening on the top-hat rail)

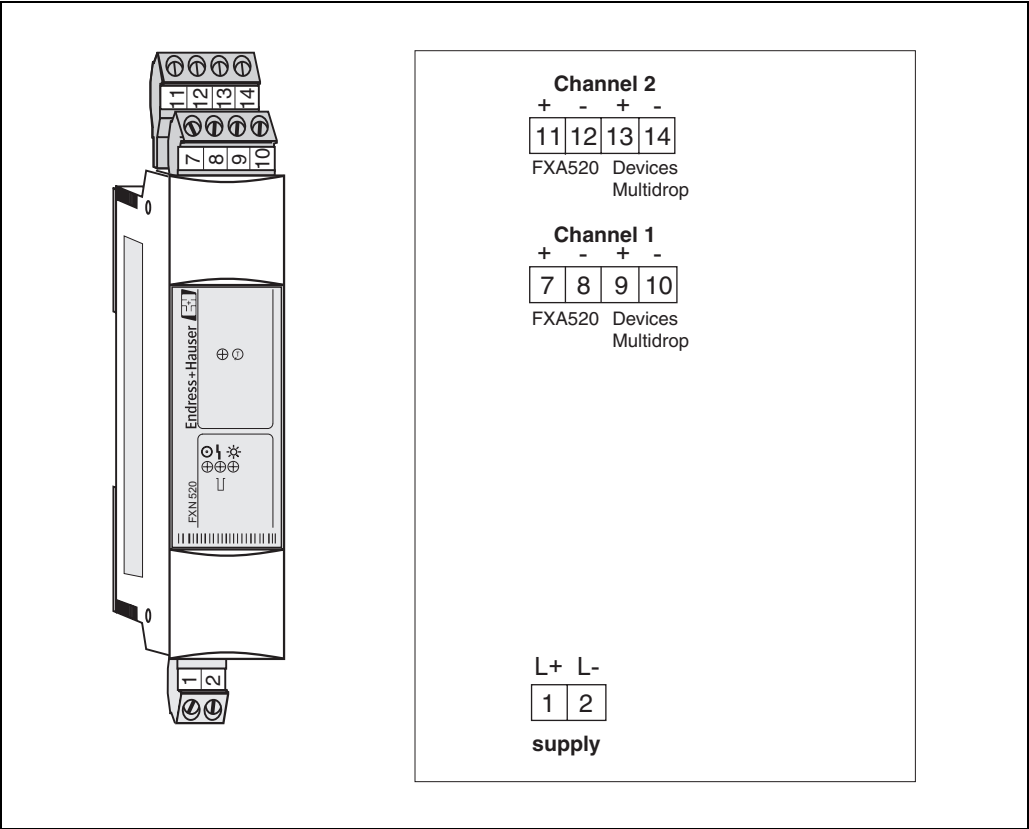
Polyamide PA6
Colour: black, RAL 9005

Terminals

Connection cross-section

maximum 1 x 2.5 mm or 2 x 1.5 mm

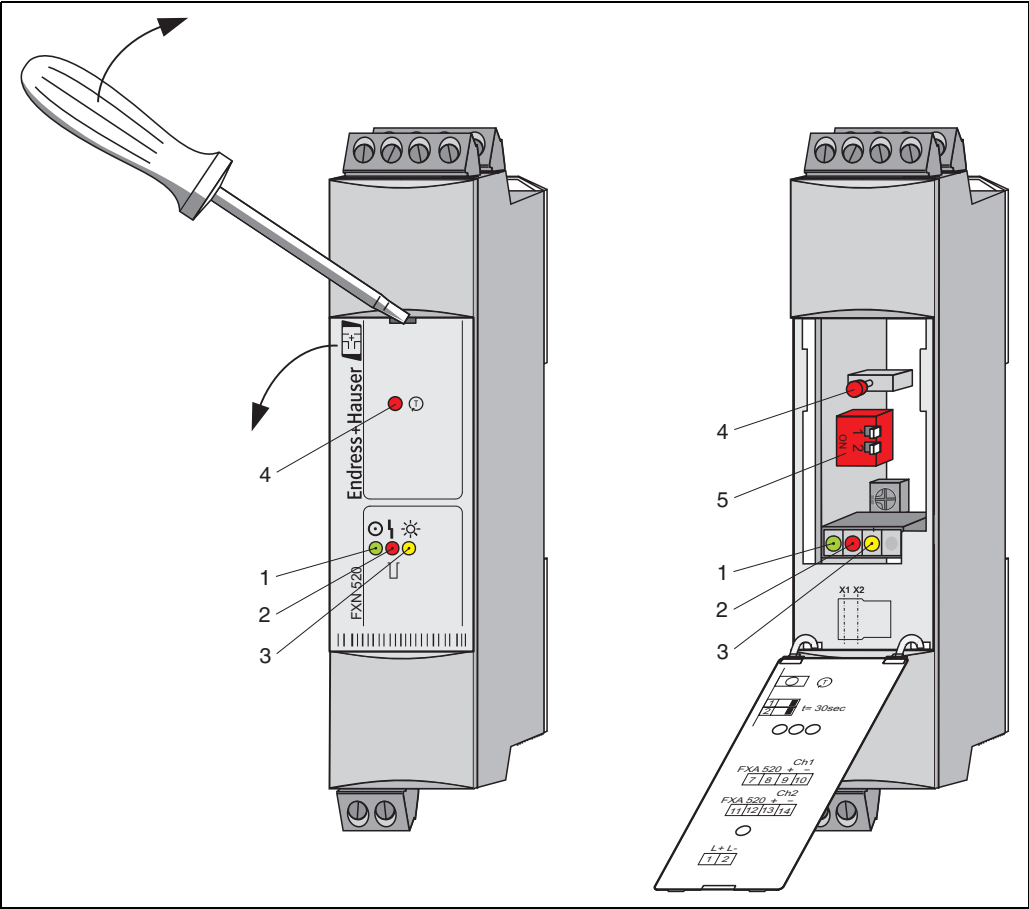
Multidrop Connector FXN520 terminal assignment



L00-FXN520xx-04-00-06-en-001

Human interface

Display elements



100-FXN520cx-07-00-06-xx-001

Position	Light emitting diode (LED)	Meaning
1	Green LED constant	Indicates the power supply is correct
2	Red LED constant	Display start-up mode, communication resistor bridged
3	Yellow LED	Display normal mode with communication resistor

Operating elements

For the arrangement of the elements, see the diagram above.

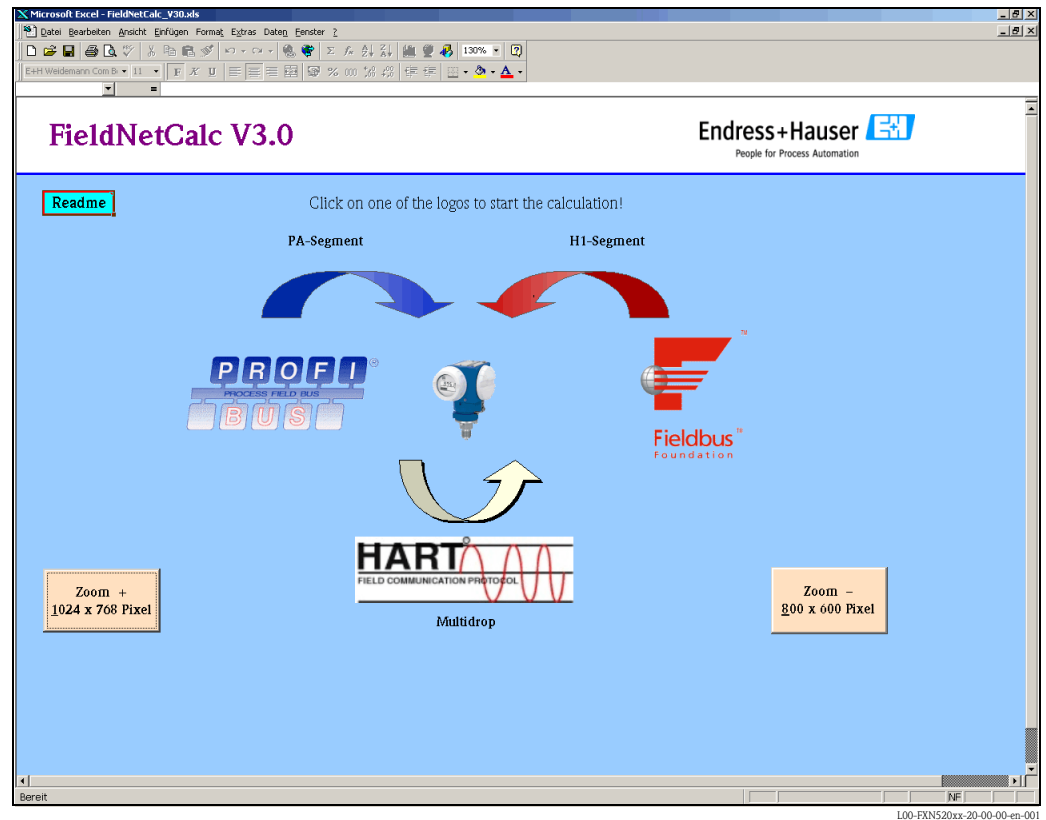
Position	Element	Meaning
4	Button	Button for manual communication resistor bridging
5	Switch	Configuration of delay time
	Switch position:	
	Delay time:	7 s 10 s 20 s 30 s

FieldNetCalc V3.0

With this calculation program, you can check whether multidrop installation works with the desired field devices, supply sources and cable lengths.

User interface in FieldNetCalc V3.0

1. Start the "FieldNetCalc V3.0" program. The latest version can be found in ENGINE at "Product Centers/PC Process Solutions/Services/Service/Download/..."



2. Select the relevant screen resolution and click the HART multidrop icon.
3. In the screen that follows, you can enter the project data needed for the calculation (here, type and number of measuring devices, bus length, cable resistance, etc.).

PG4

<< Back Reset Database E+H Database Various Next >> Situation

Safe Area

E+H Devices	Pieces
Levelflex M	3
Microplot M	3
	1
	1
	1
	1
	1
	1
	1
	1
	1
	1
	1
	1
	1
	1
	1
	1
	1
	1
	1
	1

Various Devices	Pieces
	1
	1
	1
	1
	1
	1
	1
	1
	1
	1
	1
	1
	1
	1
	1
	1
	1
	1
	1
	1
	1

Chose your devices and insert Uq, bus length and cable resistance.

Please insert power supply voltage Uq: **24 V** Total bus length in m: 1000

It is not allowed to be larger than: 36 V Cable resistance in ohm/km: 44

Result: **Still all right, but segment voltage is critical.**

Total devices =	6 pieces	shall be <= 15 pieces	OK
Total Current =	24 mA	shall be <= 70mA	OK
Segment voltage =	16,94 V	shall be >= Umin = 16V	OK
Total Startup Current =	66 mA		

L00-FXN520xx-20-00-00-en-002

4. The results can be saved in the form of a report and printed out.

Network Calculation HART Multidrop

Customer: A. N. Other Co.
 Details 1: Multidrop example 1
 Details 2: Level measurement
 Details 3:
 Details 4:
 Details 5:
 Details 6:

Engineer: Mr. Smith
 Date: 12.11.2004

Location: Safe Area

Power Supply Voltage	Uq (V)
	24,0

E+H Devices	Pieces	I (mA)	Umin (V)	Umax (V)	I startup (mA)
Levelflex M	3	12	16	36	33
Microplot M	3	12	16	36	33

Various Devices	Pieces	I (mA)	Umin (V)	Umax (V)	I startup (mA)

Endress+Hauser **EH**
 People for Process Automation

Results

Total Devices	6	Max: 15 Pieces	OK
Total current in mA	24	< 70mA	OK
Uq in V	24	< Umax	OK
		36	
Total bus length in m:	1000		
Cable resistance in ohm/km:	44		
Power Supply Voltage Uq in V	16,9	> Umin	OK
		16	
Total startup current in mA	66		

Endress+Hauser **EH**

Certificates and approvals

CE mark	The Mutidrop Connector meets the legal requirements of the EC directives. Endress+Hauser confirms that the device has been successfully tested by applying the CE label.
Other standards and guidelines	Other standards and guidelines that were taken into consideration in designing and developing FXN520. EN 60529 Ingress protections for housing (IP code) EN 61010 Safety requirements for electrical equipment for measurement, control and laboratory use EN 61326 Interference emission (class B operating equipment), interference immunity (appendix A - industrial sector)

Ordering information

Multidrop Connector FXN520	Order number: 52023652.
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Accessories

Protective housing	The protective housing in protection class IP 66 is equipped with an integrated top-hat rail and is closed with a transparent cover that can also be lead sealed. Dimensions: W 180 / H 182 / D 165 Colour: Light grey RAL 7035. Order number: 52010132.
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Documentation

Technical Information**TI3689F/00/en**

Technical Information for Fieldgate FXA320/520.

Operating Instructions**KA243F/00/a6**

Mounting and installation instructions for Multidrop Connector FXN520. Order number: 52026246.

KA193F/00/a6

Mounting and installation instructions for Fieldgate FXA520. Order number: 52013633.

BA258F/00/en

Operating Instructions for Fieldgate FXA520 (online help in the Internet browser).

BA273F/00/en

Operating instructions for Fieldgate Data Access software (download via the Internet).

BA272F/00/en

Operating instructions for Fieldgate OPC server software (download via the Internet).

Accessories**BA269F/00/en**

Switched power supply. Order number: 52017698.

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