Level Measurement
prolevel FMB 662

**Two-channel transmitter for field mounting
For two hydrostatic probes
System integration via Rackbus RS-485 interface**

Prolevel FMB 662 in
IP 66 housing

Application

- The Prolevel FMB 662 measures level in liquids using one or two hydrostatic probes. The transmitter, designed for mounting in the field, determines the level in two vented tanks, calculates volume and monitors limit levels. Differential level measurement is also possible.
- Special functions with two probes on one tank: level measurement in one pressurised tank or density measurement of a liquid, level measurement in one vented tank with automatic compensation for variations in density.
- System integration via the Rackbus RS-485 interface.
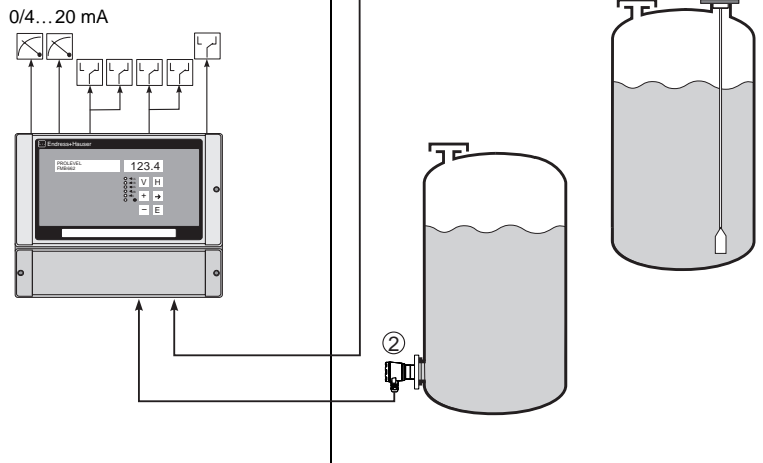
Features and Benefits

- Economical transmitter for field mounting with IP 66 protection
- Simple start-up, simple operating matrix, can be configured by Endress+Hauser operating and display programs
- Reliable operation: function monitoring of probe and transmitter.

Endress+Hauser

Nothing beats know-how

Measuring System


0/4…20 mA

Measuring System
- Prolevel FMB 662 and
- two Deltapilot *hydrostatic pressure sensors* with electronic insert EB 17 Z or EB 27 Z

Hazardous Areas
Provided it they are used with a certified transmitter (in preparation) the certified sensors can be mounted in the hazardous area.

Hydrostatic level measurement in open tanks
① with rope probe
② with Deltapilot as standard version

Differential Functions
- Differential measurement between two levels
- Hydrostatic level measurement in a closed tank:
  A positive or negative gauge pressure will occur in a closed tank if there is no pressure compensation with atmospheric pressure. The pressure acting above the water column is always measured at the bottom of the tank. This requires a Deltapilot to be connected to the second channel input which measures only the gauge pressure p_e in the tank. The Prolevel subtracts the gauge pressure from the pressure of the first channel and thus compensates for the effects of gauge pressure.
- Other functions: density measurement of a liquid or automatic compensation for variations in density.

Channel 1

p_e
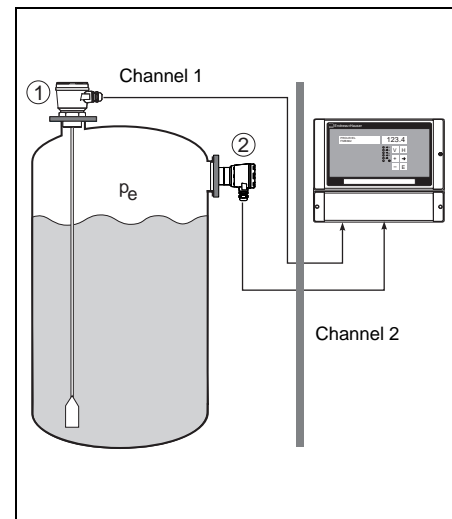
Channel 2

Level measurement in a closed tank:
① hydrostatic pressure + p_e
② gauge pressure p_e

Analogue Outputs
The Prolevel transmitter provides a standard 0 to 20 mA signal per channel (switchable to 4 to 20 mA). Depending upon calibration, this is proportional to either level or volume. The start and end of the signal range can be programmed as required.

Relay Outputs
The Prolevel is equipped with five relays, each with a potential-free changeover contact.
- two sets of two limit relays with adjustable switch point and hysteresis

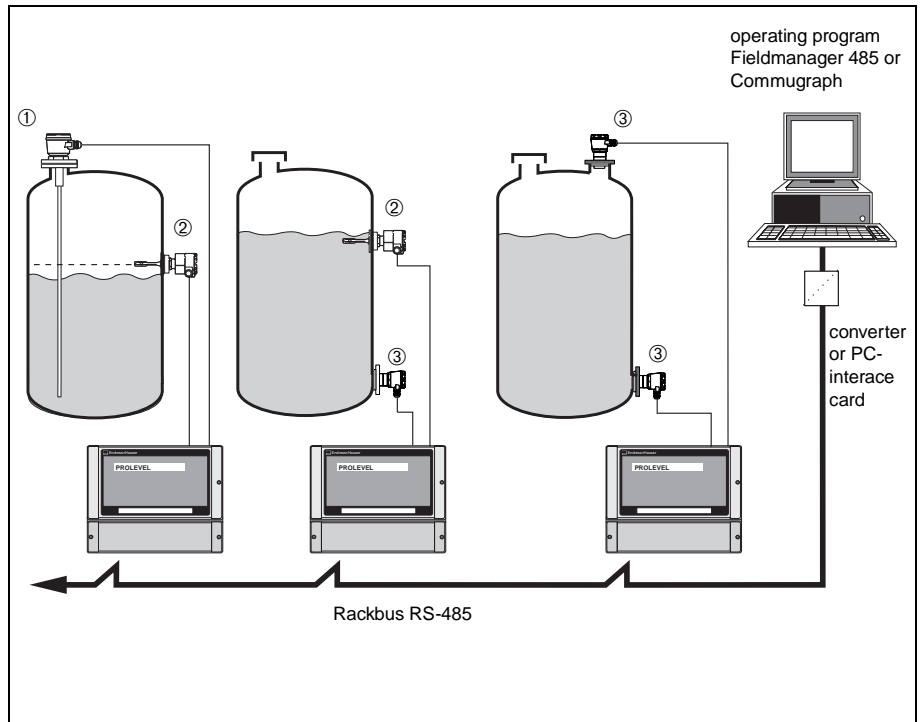**Additional System Components For Rackbus RS-485 Interface Option**
Hardware
- RS-485 interface card or RS-232C/ RS-485 converter for connection to a personal computer
- FXA 675 interface card for connection to the Rackbus
Software for personal computers
- Fieldmanager 485: configuration and display program for small and medium-sized plants
- Commugraph: easy-to-use visualisation program with limit value display.

System Integration

Connection to personal computer. Prolevel transmitters are also available for
① capacitive probes and as a one-channel unit with separate
② limit switch input
③ hydrostatic probe

operating program Fieldmanager 485 or Commugraph

converter or PC-interace card

Rackbus RS-485

Personal Computer

Transmitters equipped with a Rackbus RS-485 interface can be connected to a personal computer via the Rackbus RS-485 bus. A measuring system then comprises:
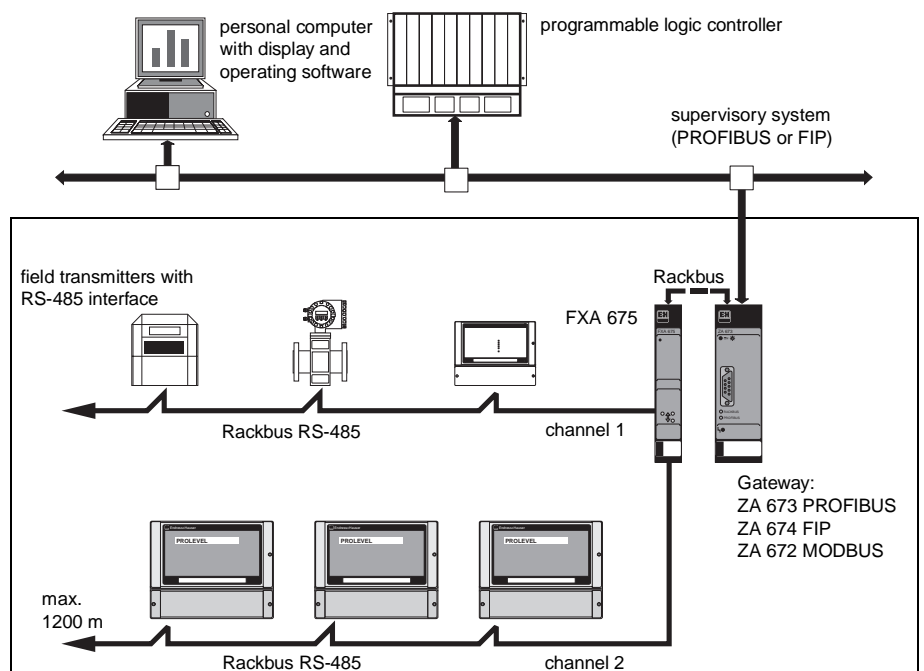
• Several Prolevel measuring points (or other units with Rackbus RS-485 interface)
• PC connection (RS-485 interface card or a RS-232C/RS-485 converter).

Depending on the system topology, up to 25 transmitters can be connected at various points on the bus, which may be up to 1200 m long.

Process Control Systems

The Prolevel FMB can be easily and economically integrated into existing industrial process control systems. Individual Rackbus RS-485 buses, each with up to 25 transmitters, are connected to the Rackbus via the FXA 675 interface card (exceptionally via Monorack RS-485). A gateway connects the Rackbus to standard supervisory systems such as PROFIBUS, FIP or MODBUS.

Integration into process control systems: Two Rackbus RS-485 buses can be connected to the Rackbus via the FXA 675 interface card. A gateway connects the Rackbus to a supervisory system

personal computer with display and operating software

programmable logic controller

supervisory system (PROFIBUS or FIP)

field transmitters with RS-485 interface

Rackbus

FXA 675

Rackbus RS-485

channel 1

max. 1200 m

Rackbus RS-485

channel 2

Gateway:
ZA 673 PROFIBUS
ZA 674 FIP
ZA 672 MODBUS

Operating Principle

Hydrostatic Pressure Measurement

Hydrostatic pressure is created by the weight of a column of liquid. When the density ρ is constant, the pressure acting on the sensor is simply a function of the height h of the column.

$$p_{hydrostatic} = \rho \cdot g \cdot h$$

ρ = density
g = acceleration due to gravity
h = distance between the surface of the liquid and the centre of the sensor diaphragm
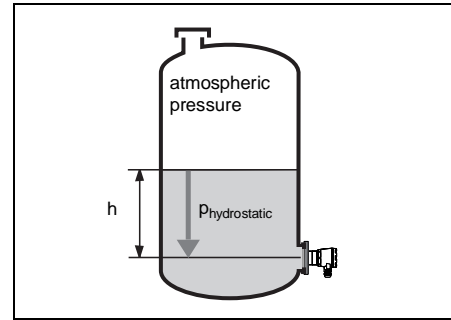
Hydrostatic measurement principle

Signal Processing

The Prolevel provides the sensors with power over an unscreened two-wire cable. Every sensor supplies an interference-free, level proportional, pulse frequency modulated (PFM) signal via the same cable. The measured value derived from this signal is displayed at the transmitter and output as a standard 0/4…20 mA signal. It may also be read by a Commulog VU 260 Z handheld terminal or passed on to a supervisory system via the optional Rackbus RS-485 interface.

Function Monitoring

The Prolevel transmitter monitors the complete measuring system from the sensor to the outputs. On fault condition:

- the alarm relay de-energises and the corresponding LED lights
- the current falls to −10 %, rises to +110 % or holds the last value (programmable)
- the limit relays respond according to the fail-safe mode selected or de-energise (programmable).

Simple Linearisation

A linearisation is made by entering a vessel characteristic which describes the relationship between the height h and volume V of the vessel.

The most common application – a horizontal cylinder – is pre-programmed in the transmitter. A linearisation table for any other vessel shape, e.g., a tank with a conical outlet, can be simply programmed by entering up to 30 reference points.
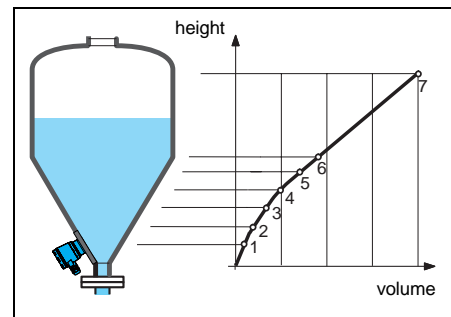
Entering a linearisation table. The vessel characteristic is described by 3…30 reference points
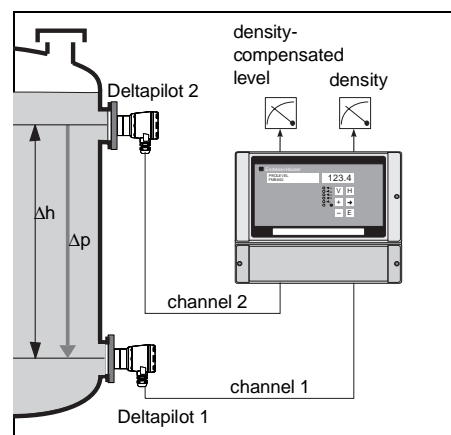
Density Measurement

If both Deltapilot sensors are covered and the difference in height between them is known, then the density of the liquid can be calculated from the formula:

$$\rho = \frac{\Delta p}{g \cdot \Delta h}$$

ρ = density
Δp = hydrostatic pressure difference
Δh = difference in height

The density can be measured in both closed and vented vessels.
A density-compensated level measurement is only possible in an open vessel.

Density compensated level measurement in vented vessels

4

Selection/Design

Transmitter Selection

Prolevel can be selected according to the requirements of the measuring point:

• Economical version without display or keypad; can be operated by the Commulog VU 260 Z handheld terminal
• Version with display (also illuminated) and keypad
• Version with Rackbus RS-485 interface option for system integration and remote operation of the transmitter.
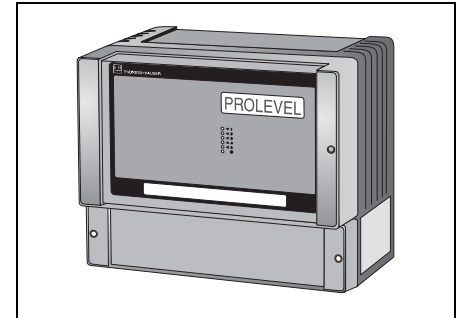
Prolevel Product Family

Prolevel transmitters are also available :
• For two capacitive probes: Prolevel FMC 662
• As a single channel unit for one capacitive or hydrstatic sensor with separate limit switch input, Prolevel FMC 661.

For further information see page 16.
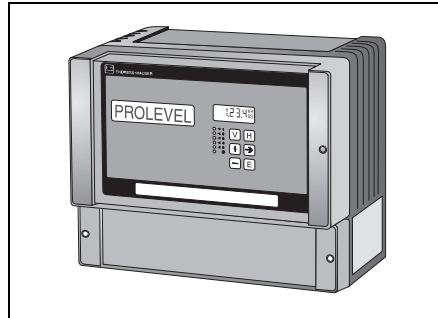
Prolevel with display and keypad

Cost-effective versions without display or keypad

Dimensions
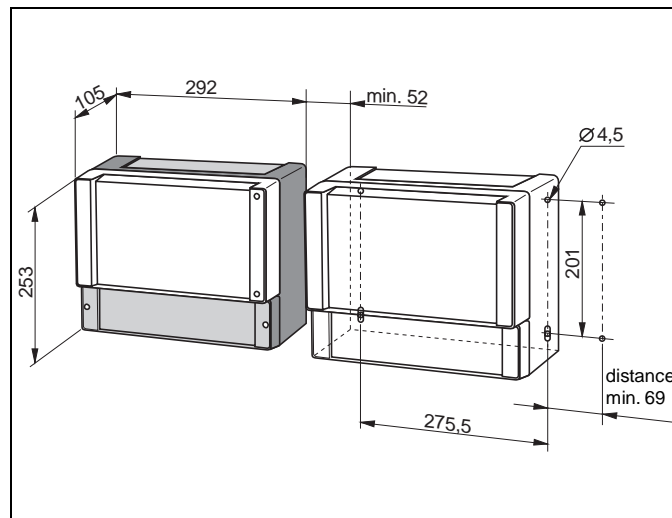
Dimensions and space required for mounting the IP 66 housing

Installation

Mounting

Housing with protection IP 66:

• For wall-mounting
• For post-mounting on a 1" or 2" pipe (see page 15, **»Accessories«**).

An all-weather hood is available for mounting in the open (**see page 15, »Accessories«**).

Hazardous Areas

Probes and sensors with appropriate certification may be installed in explosion hazardous areas. The transmitter must always be installed outside the explosion hazardous area. All local regulations concerning installation must be observed

Electrical Connection

Terminal Strip

The terminal strip, suitable for cable cross-sections up to 2.5 mm^2, is located in a separate connection compartment. The cable entries are prestamped for easy removal (5 x Pg 16; 4 x Pg 13.5 at bottom; 4 x Pg 16 at rear).

Power Supply

- *AC:*
  85...253 V 50/60 Hz or
  20...55 V, 50/60 Hz or
  DC: 16...60 V (residual ripple within tolerance), integrated reverse polarity protection
- *Power consumption:* maximum 7 W.
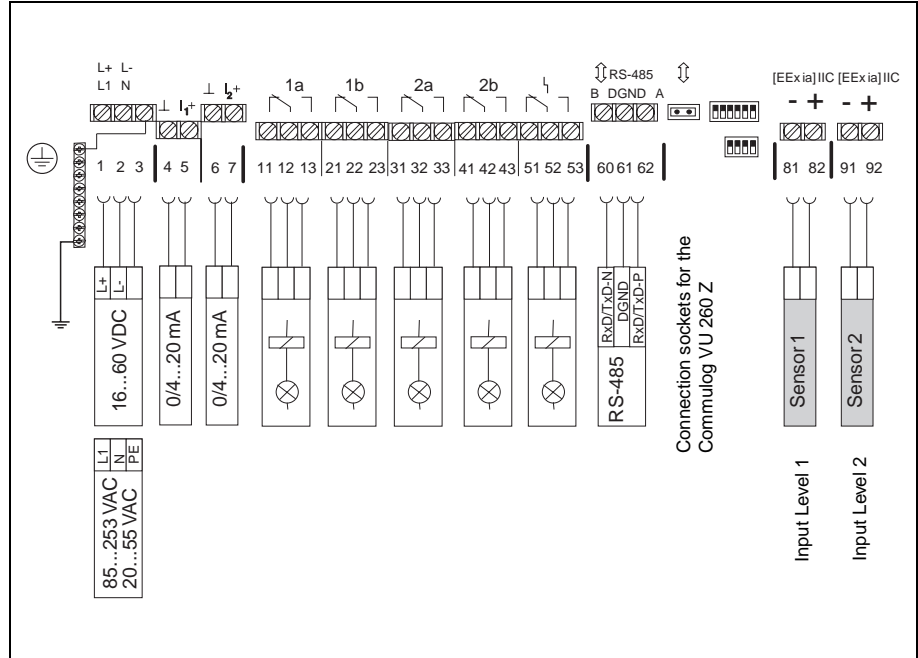
Terminal strip of the FMB 662 – the electrically isolated circuits are indicated by the blue lines
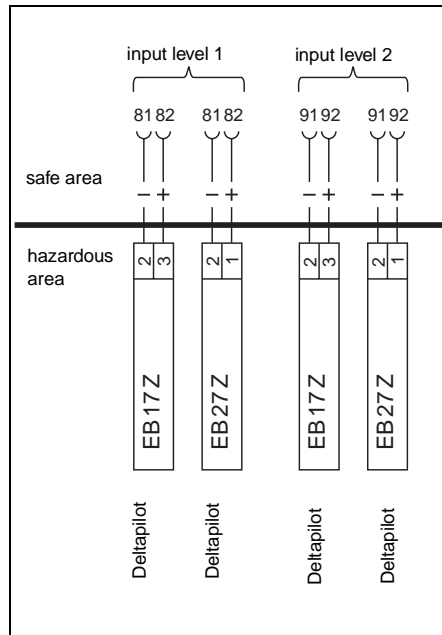
Connecting the sensors

Hazardous Areas

When laying cables in hazardous areas, the maximum permissible values for U, I, R, L, C (see Certificate of Conformity) and all local regulations are to be observed.

Electrical Isolation

Current output, relay outputs, power supply, sensor input and bus inputs are electrically isolated from each other (safe isolation to DIN/VDE 0160). Both sensor inputs are intrinsically safe and electrically isolated from each other.

Overvoltage Protection

The external overvoltage protection unit HAW 262 for signal outputs is recommended for protecting the transmitter from voltage peaks, especially when it is mounted in the field. The overvoltage protection unit HAW 261 should be used to protect against mains power voltage peaks.

Electromagnetic Compatibility

The interference immunity of the Prolevel has been checked to a test strength of 10 V/m. The signal deviation over the total frequency range of 10 kHz to 1 GHz is always less than 1 %. Over wide frequency ranges the deviation is significantly lower.

Bus Installation
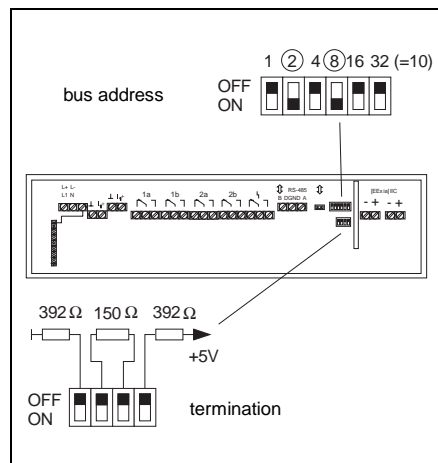
Bus address and terminal resistance switch of the Prolevel. The setting shown is standard for all Prolevel transmitters except the last one on the bus

Rackbus RS-485

Normally, up to 25 Prolevel transmitters can be connected to the bus: the actual number depends upon the topology and conditions of operation. The bus connection requires:

• connecting cable (two-core, twisted and screened)
• cable length: max. 1200 m.

Bus Address

Every transmitter is given a unique address which is configured at the DIP switches at the terminal strip.

Termination

For reliable transmission of the communication signal:

• set the terminal resistance at the PC board and the furthest Prolevel from the board to 150 Ω.

The bus power is provided by the PC interface card or RS-232C/RS-485 adapter.

Bus Installation (continued)

serial structure

tree structure

longer branch
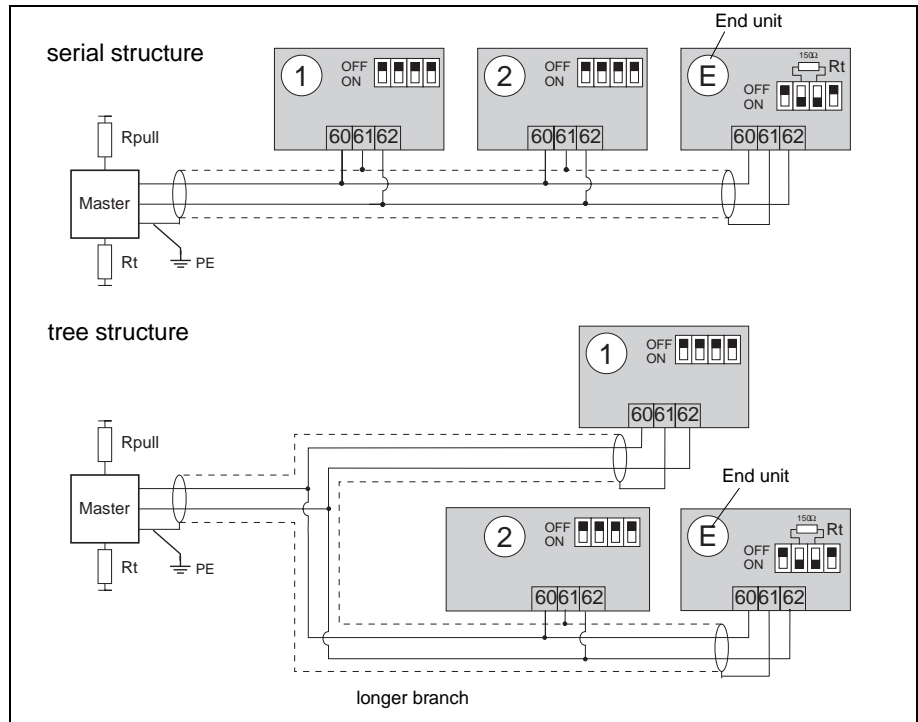
Bus topology.
The master is a PC interface card or converter

internal

61 62 63

Data B   Data A
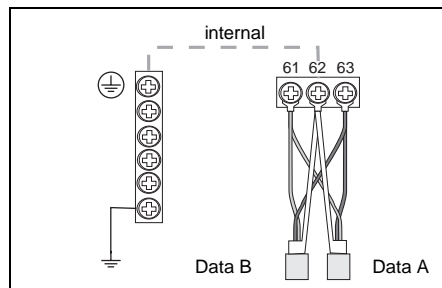
Example for wiring the bus to the Prolevel

Bus Topology
When planning the system, attention should be paid to the possible segmentation of the bus according to individual plant sections. Suitable topologies are:
• Serial, max. 1200 m,
• Tree of total length 1200 m.
The bus screening must have electrical continuity throughout the bus.

Personal Computer
A personal computer is connected up using either a RS-485 PC interface card or an RS-232C/RS-485 converter (both with electrical isolation).

bus screening

25 24 23 22 21 20 19 18 17 16 15 14 PE

1 2 3 4 5 6 7 8 9 10 11 12 13

RxD/TxD-P (Data A)   RxD/TxD-N (Data B)

Wiring the plug for the PC interface card

RS-485 PC Interface card
The card is configured for use as the COM 3 interface port. Also supplied for the bus connection is a 25-pin plug with screw terminals:

• Terminal 1: Bus screening
• Terminal 17: Data A (RxD/TxD-P)
• Terminal 16: Data B (RxD/TxD-N).

bus screening   RxD/TxD-P (Data A)

5 4 3 2 1

390 Ω   390 Ω

8 7

9   6

RxD/TxD-N (Data B)

Wiring the plug for the RS-232C/RS-485 converter
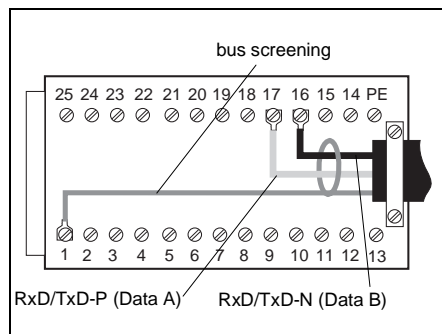
RS-232C/RS-485 Converter
The bus connector is supplied with a 9-pin plug with screw terminals:

• Terminal 5: Bus screening
• Terminal 3: Data A (RxD/TxD-P)
• Terminal 8: Data B (RxD/TxD-N).

Operation

Simple Operation

The six keys on the front panel are used to configure the instrument or call up measured values: parameters are displayed on the 4-digit LC-display.

The transmitter is configured via an operating matrix, whereby each field is selected by the $\boxed{V}$ (vertical) and $\boxed{H}$ (horizontal) keys. Parameters are entered using only three keys $\boxed{+}$, $\boxed{-}$, $\boxed{\rightarrow}$: pressing the $\boxed{E}$ key stores and registers the entered value.

Operating Matrix

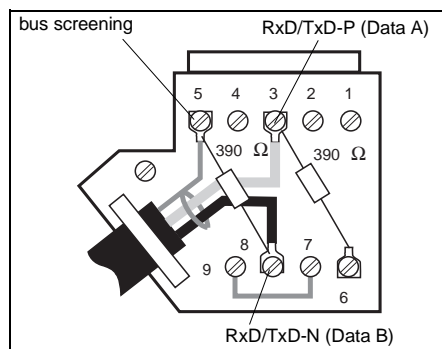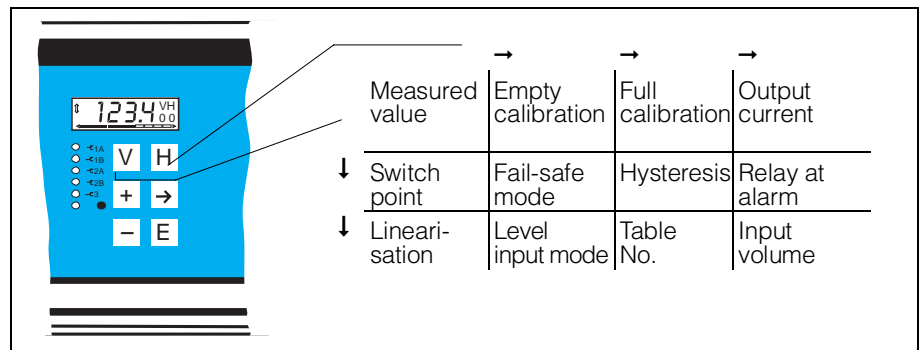Whether the Prolevel is configured via the keypad, with the handheld terminal or remotely via the Rackbus RS-485 interface, the easy-to-use operating matrix ensures programming procedures are uniform and clear. An in-depth knowledge of Endress+Hauser is not needed instrumentation to quickly configure the transmitter.

		→	→	→
	Measured value	Empty calibration	Full calibration	Output current
↓	Switch point	Fail-safe mode	Hysteresis	Relay at alarm
↓	Lineari-sation	Level input mode	Table No.	Input volume

Prolevel is configured by entering only a few parameters

Handheld Terminal

All Prolevel transmitters can be operated by the Commulog VU 260 Z handheld terminal, which displays parameters, measured values and operating status. Its large display gives simple, self-explanatory information on all parameters in the language selected when ordering. The transmitter continues to measure normally while data are entered or read.
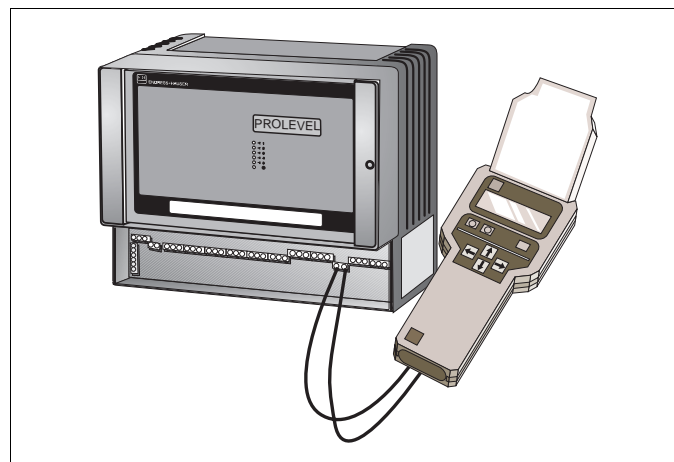
Prolevel without keypad. The communication sockets for the Commulog VU 260 Z handheld terminal are located in the connection compartment

Operating Program

Prolevel Nr.2 FMB 672	LIC 005	LIC 001	V-H Position 00
Measured value	Empty »calibration«	Full »calibration«	Output current
Relay 1 switch point	Relay 1 fail-safe mode	Relay 1 hysteresis	Relay 1 at alarm
Linearisation	Level input mode	Tab. No.	Input volume
Calibration mode	Offset	Sensitivity	

Select VH pos. with cursor keys - or press ESC and enter VH pos.
To configure press RETURN key

F1: Dev0...31 F2: Dev32...63	F3: Dev Addr F4: COM-Port	F5: Envelope F6: Matrix	F7: Bargraph F8: Up/Down	F9: Terminal F10: Exit

Section of operating matrix used for configuring the Prolevel FMB 662 (Fieldmanager 485)

Remote Operation and Display

Prolevel transmitters with a Rackbus RS-485 interface can be operated from personal computer. Each transmitter is accessed on-line via its individual bus address. The operating program uses the standard operating matrix in which each parameter field can be quickly and easily selected.

Fieldmanager 485 Operating Program

The Fieldmanager 485 operating program is a simple, economical configuration and display system for small and medium-sized plants. It can run on any AT personal computer having an MS-DOS operating system. A self-explanatory menu, available in English and other languages, offers a total of nine menus for the following functions:

- Summary of connected and operative transmitters - the so-called live list
- Selection of the Prolevel transmitters
- Configuration and calibration of the transmitters via the operating matrix
- Presentation of measured values as moving columns
- Back-up of configurations by the up/download functions
- Setting of the COM port
- Terminal program for on-line communication with individual transmitters.

Fieldmanager 485	Endress+Hauser	Version 5.1

Nr.	Device	Measuring points		Nr.	Device	Measuring points
00	FMB 672	LIC 001	LIC 002	17	-----	
01	FMB 672	LIC 003	LIC 004	18	-----	
02	FMB 672	LIC 005	LIC 006	19	-----	
03	FMB 672	LIC 007		20	-----	
04	FMB 672	LIC 008	LIC 009	21	-----	
05	-----			22	-----	
06	-----			23	-----	
07	-----			24	-----	
08	-----			25	-----	
09	-----			26	-----	
10	FMB 672	LIC 101	LIC 102	27	-----	
11	FMB 672	LIC 103		28	-----	
12	FMB 672	LIC 104	LIC 105	29	-----	
13	-----			30	-----	
14	-----			31	-----	
15	-----			32	-----	

F1: Dev0...31 F2: Dev32...63	F3: Dev Addr F4: COM-Port	F5: Envelope F6: Matrix	F7: Bargraph F8: Up/Down	F9: Terminal F10: Exit

Live list of connected transmitters Shown are the individual instrument addresses on the Rackbus (Column 1), transmitter designations (Column 2) the customer's measuring tag names (Column 3)
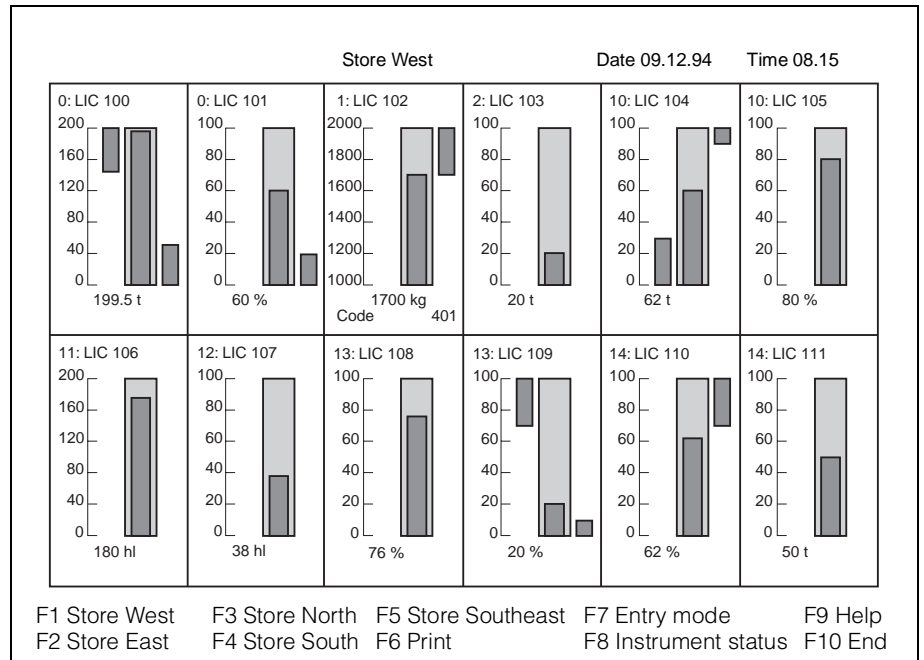

Fieldmanager 485	Endress+Hauser	Version 5.1

00: LIC 001 LIC 002   01: LIC 003 LIC 004

75,5 %   31.0 %   23.7 %   58.0 %

Diagnosecode: 0   Diagnosecode: 0

Alt F1 - Select transmitter   Alt F2 - Select transmitter

F1: Dev0...31 F2: Dev32...63	F3: Dev Addr F4: COM-Port	F5: Envelope F6: Matrix	F7: Bargraph F8: Up/Down	F9: Terminal F10: Exit

Display of measured values of two Prolevel units using the operating program Fieldmanager 485

Visualisation

Store West			Date 09.12.94		Time 08.15
0: LIC 100	0: LIC 101	1: LIC 102	2: LIC 103	10: LIC 104	10: LIC 105
199.5 t	60 %	1700 kg Code 401	20 t	62 t	80 %
11: LIC 106	12: LIC 107	13: LIC 108	13: LIC 109	14: LIC 110	14: LIC 111
180 hl	38 hl	76 %	20 %	62 %	50 t

F1 Store West F3 Store North F5 Store Southeast F7 Entry mode F9 Help
F2 Store East F4 Store South F6 Print F8 Instrument status F10 End

Display of a measured
value group – function
keys simplify operatiion

Commugraph

The Commugraph visualisation program
is the ideal support tool for the
operating program. It is easily installed
and operated. The principle functions
are as follows:

- Analogue display of measured values
  as columns. 12 measuring points can
  be displayed simultaneously, 60 in all
- Transmitter status display
- Limit value display. When the limit
  value is exceeded, the column
  changes from green to red
- Level display as numerical value with
  technical units
- List of connected transmitters
- Printed log of measured values.
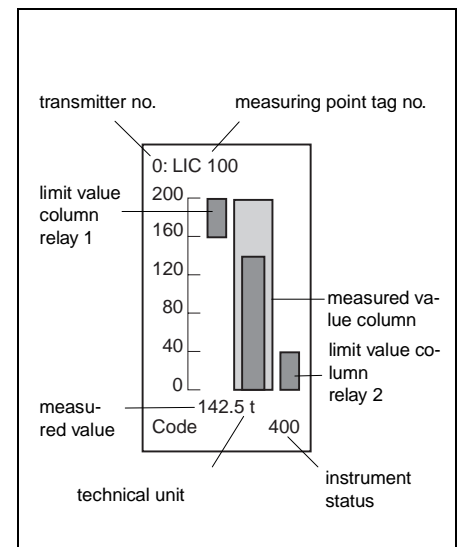
Display for individual
measurement point

No.	Meas. point	Contents	Meas. val.	Units	Factor
0	LIC 100	Rain retention basin 1	1.58	m	1
0	LIC 101	Rain retention basin 2	0.00	m	1
1	LIC 102	Rake control	0,02	m	1
2	LIC 103	Inflow measurement	780	l/sec.	1
10	LIC 104	Presettling basin 1	3.78	m	1
10	LIC 105	Presettling basin 2	3.82	m	1
11	LIC 106	Filter basin 1	1,95	m	1
12	LIC 107	Filter basin 2	1,87	m	1
13	LIC 108	Digestion tank	2824	m^3	1
13	LIC 109	Flocculant	1230	mm	1
14	LIC 110	Neutralisation NaOH	2100	mm	1

Printout of measuring
points and their
measured values

No.	Meas. point.		Code	Status text
0	LIC 100	LIC 101	0	Operating mode...
1	LIC 102		401	None...
2	LIC 103		0	Operating mode...
3				@04, 03,…
4				@04, 04,…
5				@04, 05,…
6				@04, 06,…
7				@04, 07,…
8				@04, 08,…
9				@04, 09,…
10	LIC 104	LIC 105	0	Operating mode...
11	LIC 106		0	Operating mode...
12	LIC 107		0	Operating mode...
13	LIC 108	LIC 109	0	Operating mode...
14	LIC 110		0	Operating mode...

Display of transmitter
status

Technical Data

General specifications

Manufacturer	Endress+Hauser GmbH+Co. D-79689 Maulburg
Designation	Prolevel FMB 662
Function	Two-channel trasnmitter for level measurement with two hydrostatic probes, differential measurement, density measurement
Input signal	two PFM signals
Interface	0/4 to 20 mA, Communication with VU 260 Z handheld terminal, Rackbus RS-485 (optional)
Reference conditions	To DIN IEC 770 (T_U = 25 °C) or as specified
Other	CE mark

Input characteristics

Signal	Pulse frequency modulated (PFM); current pulses, which are superimposed on the base current. Electronic insert: – for hydrostatic probe: EB 17 Z or EB 27 Z
Explosion protection (in preparation)	CENELEC [EEx ia] IIC, FM, CSA
Intrinsically safe electrical isolation	Between sensor circuit and other electronics as well as with the other channel

Output characteristics

Analogue output

Output	Both outputs 0... 20 mA, switchable to 4... 20 mA Signal underflow: -2 mA Signal overflow: 22 mA
On alarm	Switchable +110%, -10% or hold last measured value
Electrical isolation	Analogue output electrically isolated from the CPU and the other electronics
Current limitation	23 mA
Temperature coefficient	0.3%/10 K of range end value
Warm-up time	1 s
Adjustable damping	0 to 99 s (T_{90} – time)
Maximum load	600 Ω
Load effect	negligible

Relay

Version	5 relays, each with a potential-free changeover contact
Relay function	2 sets of 2 limit relays, each set monitoring a limit value 1 alarm relay (de-energises on fault condition)
Hysteresis	Switch points and switching hysteresis of limit relays freely adjustable, fail-safe mode selectable minimum or maximum
Switching capacity	AC:6 A, 250 V, 750 VA at cos φ=0.7 1500 VA at cos φ= 1 DC: 6 A, 250 V, 200 W
Electrical isolation	Relays electrically connected to each other, electrically isolated from other electronics

Displays

Display (LCD)	4-digit measured value display with optional lighting and bargraph (analogue display of current with 10 segments)
LEDs	One yellow LED for every limit relay to indicate its switching status: LED lit indicates "relay energised". One red LED for the alarm relay: LED lights on alarm and flashes on warning (LED lit indicates alarm relay de-energised). One green LED indicates power on.

Output characteristics (continued)

Communication interfaces

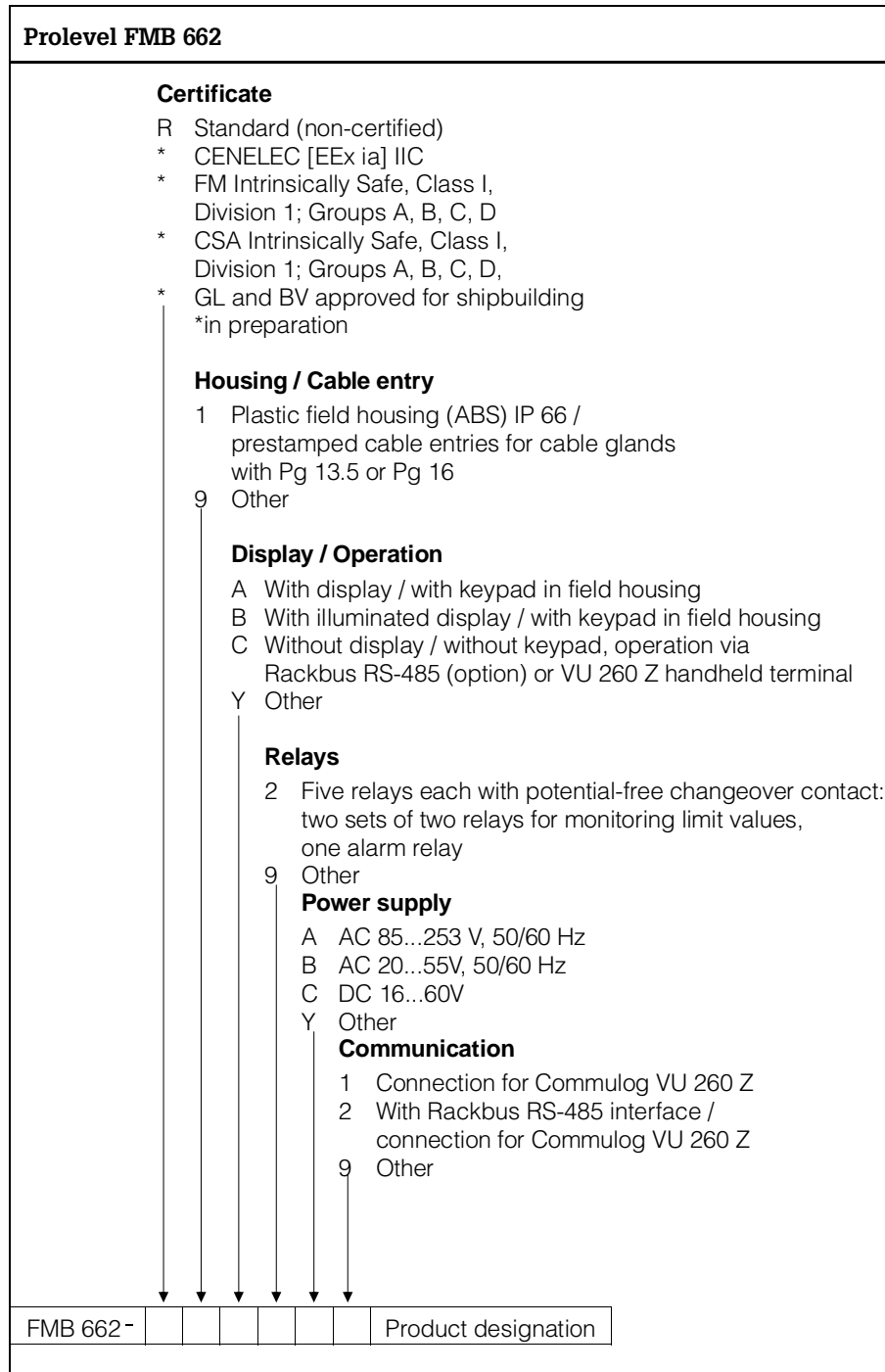|	
Keypad	6 keys (optional)
Rackbus RS-485 interface (optional)	No. of units: maximum 25. When using other Endress+Hauser instruments with Rackbus RS-485 interfavce the following applies: – max. 25 units when mounted in safe areas – max. 10 units when one or more mounted in a hazardous area Baud rate: 19 200 bit/s, fixed Cable: screeened, twisted pairs (screen connected to DGND on Prolevel) Topology: serial bus, electrically isolated, tree structure optional Length: max. 1200 m, including taps or branches (taps under 3 m do not count) Transmitter address: via 6-pole DIL switches in connection compartment Termination: via 4-pole DIL switches in connection compartment Electrical isolation: bus inputs are electrically isolated from the other electronics
Commulog VU 260 Z handheld terminal (standard)	Communication sockets in connection compartment

Power Supply

Power supply	AC: 85...253 V, 50/60 Hz or 20... 50, 50/60 Hz or DC: 16...60 V, residual ripple within the permissible voltage range
Power consumption	maximum 7 W
Safe electrical isolation	Between power supply and signal output, CPU, Rackbus RS-485 interface, relay and other electronics

Environmental conditions

Temperature ranges	Nominal temperature : -0 to 60 °C Limiting temperature : -20 to 60 °C Storage temperature: -40 to 80 °C
Electromagnetic compatibility	better than 1% of full scale value. Immunity to EN 50082-2 (E 1993, VDE 0839 Part 82-2) Emission to EN 500081-2, industrial range (VDE 0839 Part 81-1), industrial standard NAMUR, with 10 V/m
Climatic class	To DIN 40 040 Tab. 10 "R": unit in the open or in outside areas. Annual average humidity 95%, dew permissible
Vibration resistance	To DIN 40 040 Tab. 6 "W"
Protection	IP 66 with closed housing and cable glands of same protection type (with open housing IP 40, with open connection compartment IP 20)
Wetted parts	Housing body PC (polycarbonate)/ABS (Acrylnitrile Butadiene Styrol), RAL 5012 (blue) Transparent cover PC (polycarbonate) blue front panel with field for labelling Sealing of body in PU soft foam, FCC-free, for sealing the cover

Mechanical specifications

Electrical connection	Pre-stamped cable glands: rear wall or base for each 5 or 4 cable entries Pg 16, additional 4 cable entries Pg 13.5 on base. Terminal connections for cable diameter 2.5 mm^2
Connection cable for probe or switching input	Two-wire, unscreened, maximum 25 Ω per core
Housing	For wall or post mounting
Dimensions (L x H x W)	292 mm x 253 mm x 176 mm
Position	Vertical recommended
Weight	2.45 kg

Product Structure

Prolevel FMB 662

Certificate
R   Standard (non-certified)
*   CENELEC [EEx ia] IIC
*   FM Intrinsically Safe, Class I,
    Division 1; Groups A, B, C, D
*   CSA Intrinsically Safe, Class I,
    Division 1; Groups A, B, C, D,
*   GL and BV approved for shipbuilding
    *in preparation

Housing / Cable entry
1   Plastic field housing (ABS) IP 66 /
    prestamped cable entries for cable glands
    with Pg 13.5 or Pg 16
9   Other

Display / Operation
A   With display / with keypad in field housing
B   With illuminated display / with keypad in field housing
C   Without display / without keypad, operation via
    Rackbus RS-485 (option) or VU 260 Z handheld terminal
Y   Other

Relays
2   Five relays each with potential-free changeover contact:
    two sets of two relays for monitoring limit values,
    one alarm relay
9   Other

Power supply
A   AC 85...253 V, 50/60 Hz
B   AC 20...55V, 50/60 Hz
C   DC 16...60V
Y   Other

Communication
1   Connection for Commulog VU 260 Z
2   With Rackbus RS-485 interface /
    connection for Commulog VU 260 Z
9   Other

FMB 662 -						Product designation

Supplementary Documentation

☐ Deltapilot
   System Information SI006F/00/e
☐ Multicap
   Product Information PI008F/00/e
☐ Liquiphant
   System Information SI007F/00/e
☐ Soliphant
   System Information SI013F/00/e
☐ Rackbus
   System Information SI014F/00/e

☐ Commutec operating program
   Technical Information TI 113F/00/e
☐ Commugraph
   Technical Information TI 158F/00/e
☐ Rackbus-RS-485 Interface and
   FXA 675 Monorack II RS-485
   Technical Information TI 221F/00/e
☐ Modbus Gateway ZA 672
   Technical Information TI 148F/00/e
☐ Profibus Gateway ZA 673
   Technical Information TI 162F/00/e
☐ FIP Gateway ZA 674
   Technical Information TI 167F/00/e
☐ Rackbus RS-485
   Operating manual BA 134F/00/e

Accessories

All-Weather Protective Hood for the Field Housing
Material:
- aluminium (Order No. 919567-0000) blue lacquered finish
- stainless steel 1.4301 (Order No. 919567-0001).

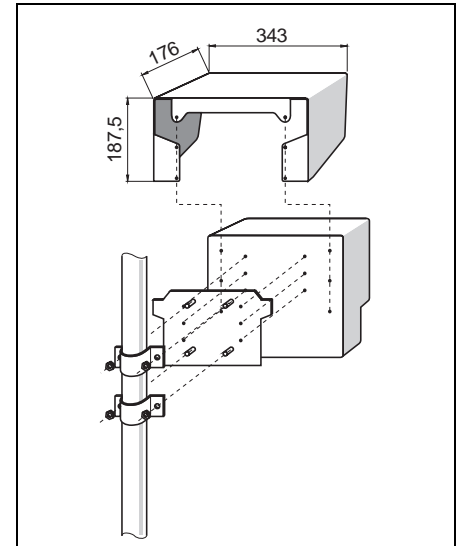Weight: approx. 1 kg.
Mounting screws supplied.

Post Mounting
Material:
- galvanised steel (Order No. for 2" pipe: 919566-0000; for 1" pipe: 919566-1000)
- stainless steel 1.4301 (Order No. for 2" pipe: 919566-0001; for 1" pipe: 919566-1001).

Weight: approx. 1 kg.
Mounting screws and nuts supplied.

Mounting and dimensions for the all-weather cover. Mounting to a 2" post

Commulog VU 260 Z
Handheld terminal for calibrating the Prolevel version without display or keypad (see Technical Information TI 140/00/e).

Overvoltage Protection
Separate overvoltage protection unit HAW 261 and HAW 262 (see Technical Information TI 108F/00/e).
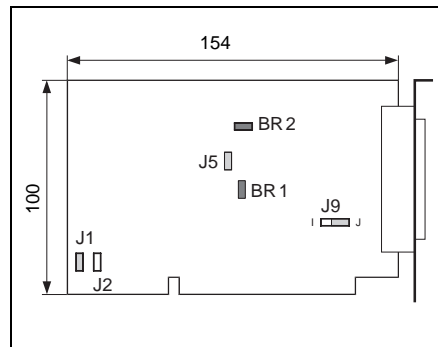
Dimensions of the RS-485 PC interface card and position of the jumpers (blue = default)

RS-485 PC Interface Card
- Connector: 25-pin Min-D plug, pin assignment: see figure on Page 8, plug supplied with screw terminals
- Baud rate: 19 200 bit/s
- Configuration: supplied configured for COM 3, address 3E8H, with protective ground at Pin 1 of connector
- Slot: 8 or 16 bit
- RS-485 output electrically isolated

Order No. 016399-0000
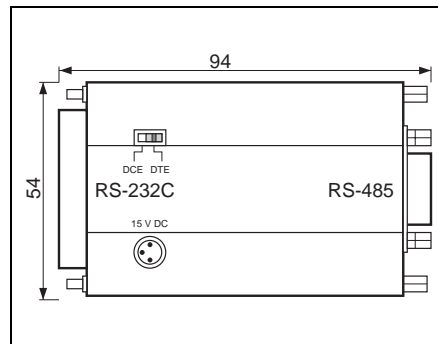
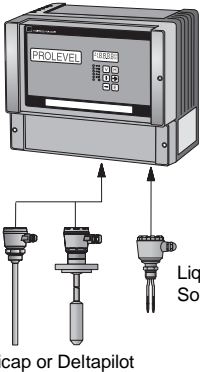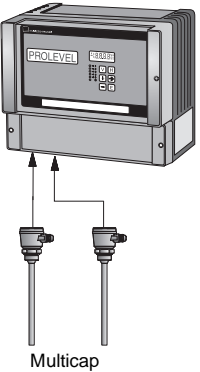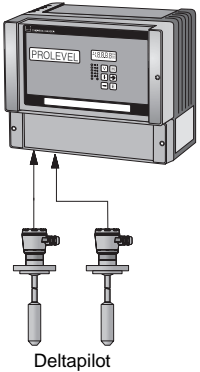

Dimensions of the converter

Converter: RS-232C/RS-485 Interface
- Connector for PC: 25-pin Min-D plug
- for bus 9-pin Min-D jack, pin assignment on bus side, see figure, Page 8, plug supplied with terminal screws
- Baud rate: 19 200 bit/s
- RS-485 output electrically isolated
- Power supply 15 V DC; power unit 230 V or 115 V to order
- RS-232C interface, can be configured as DCE/DTE

Order No. 016398-0000 for 230 V / 016398-0050 for 115 V

Product Line

	Prolevel FMC 661	Prolevel FMC 662	Prolevel FMB 662
	Multicap or Deltapilot (Liquiphant/Soliphant)	Multicap	Deltapilot
Applications	Level and volumetric measurement in liquids and bulk solids	Level and volumetric measurement in liquids and bulk solids	Level and volumetric measurement in liquids
Versions	Single-channel transmitter with limit switch input	Two-channel transmitter	Two-channel transmitter
Sensors	One capacitive or hydrostatic probe optionally Liquiphant or Soliphant limit switch	Two capacitive probes, e.g. of the Multicap series	Two Deltapilot hydrostatic probes
Extra functions	• Vessel linearisation • Independent limit detection • Automatic calibration correction for changing media	• Vessel linearisation • Differential measurement between two levels • Level measurement with reference probe	• Vessel linearisation • Differential measurement between two levels • Density compensated level measurement • Dry calibration without filling the vessel
Limit value/ Fault indication	Two sets of two relays, each set monitoring a limit value; one alarm relay		
Options	Display with keypad Illuminated display with keypad Rackbus RS-485 interface		
Certificates	CENELEC EEx ia, FM, CSA (in preparation)		
Protection	IP 66		
Documentation	Technical Information TI 232 F/00/e	Technical Information TI 233 F/00/e	Technical Information TI 234 F/00/e

Endress+Hauser

Nothing beats know-how