LT1000 PRESSURE PROBE MANUAL

SOLUTIONS

SAFETY INSTRUCTIONS

▪ Select the right level measuring device regarding measurement range, version and specific measurement conditions before mounting or using the device.

▪ To avoid operator hazards and damage of the device, the following Instructions have to be worked out by qualified technical personnel.

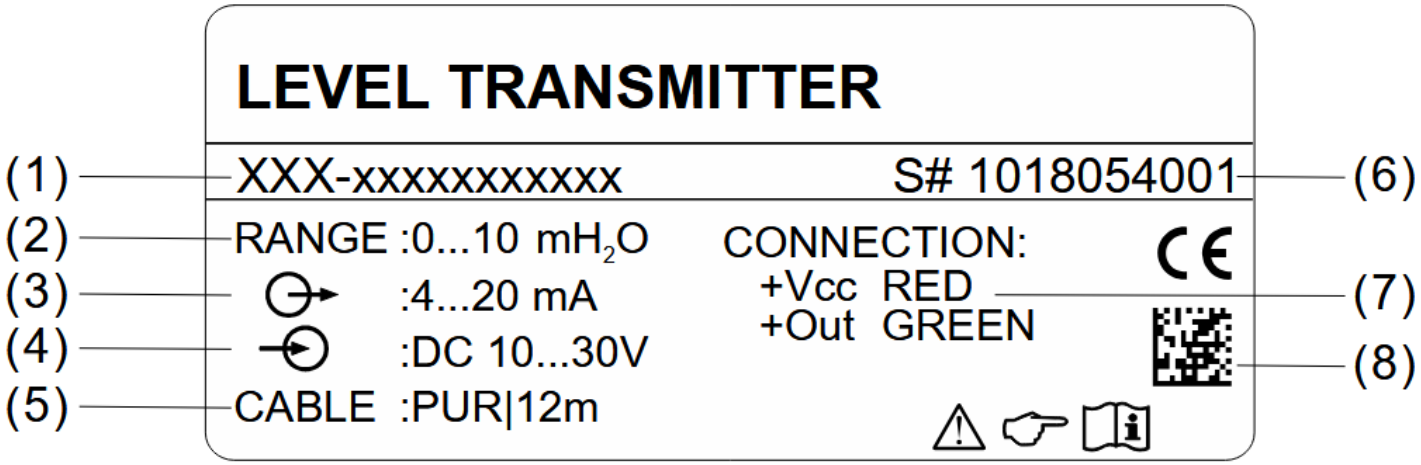
▪ By non-observance of the operating manual, inappropriate use, modification or damage, no liability is assumed, and warranty claims will be excluded.

▪ Permissible media are liquids (no solids and frozen media), specified in the datasheet. In addition, it must be ensured that this medium is compatible with the media wetted parts.

▪ Handle this high-sensitive electronic precision measuring device with care, Both in packed and unpacked condition.

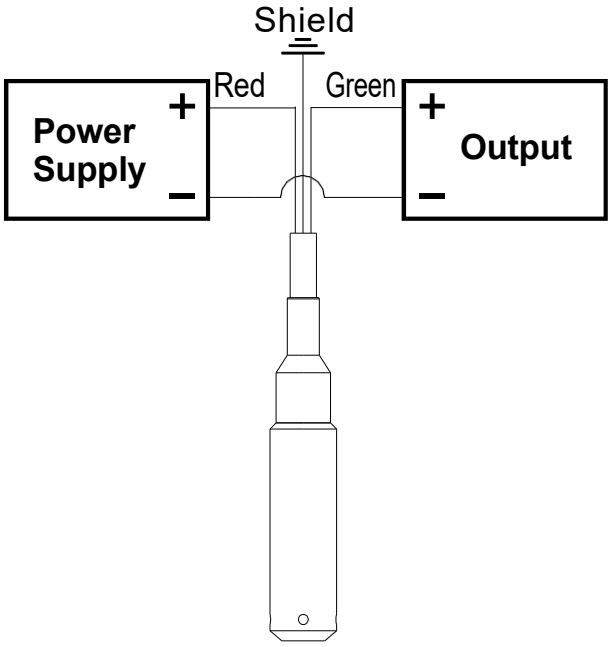
▪ This user manual contains product installation matters; Properties are not guaranteed. Subject to change without notice.

NAMEPLATE

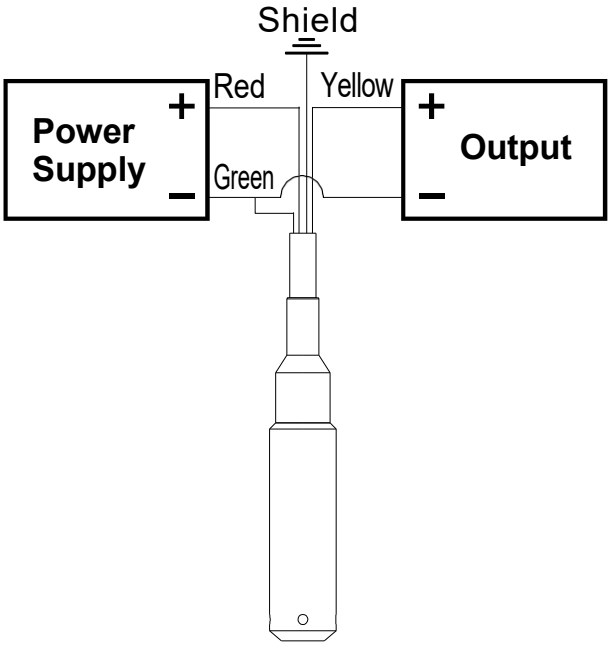


(1) Type
(2) Measuring range
(3) Output signal
(4) Power supply
(5) Cable
(6) Serial number
(7) Electrical connections
(8) SN QR code

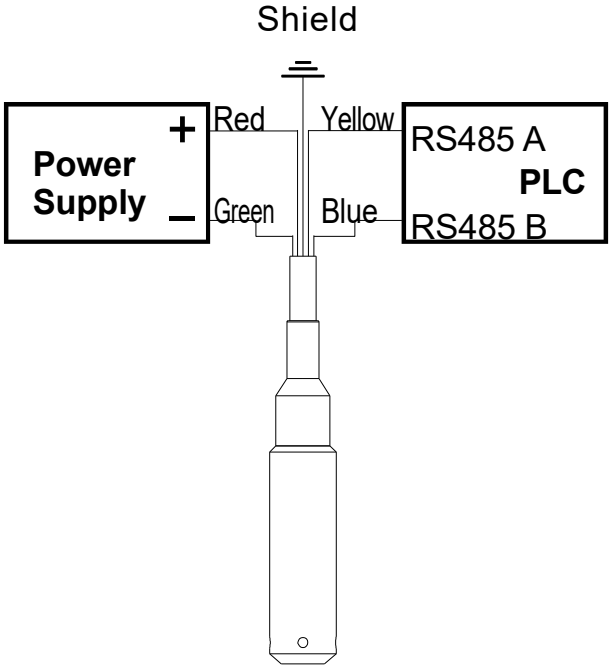
2-wire system (Current output)



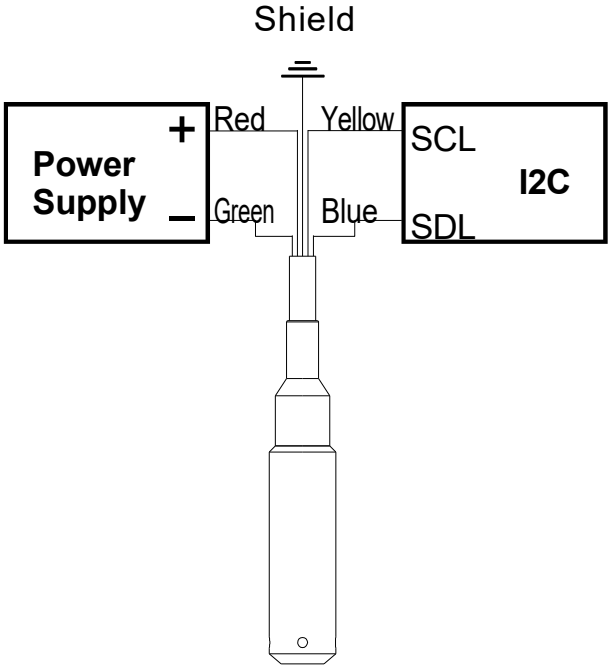
3-wire system (Voltage output)



4-wire system(RS485 output)



4-wire system(I2C output)



Cable outlet				
	2-wire system Current output	3-wire system Voltage output	4-wire system RS485 output	4-wire system I2C output
Supply+	Red	Red	Red	Red
Supply-	Green	Green	Green	Green
Signal+	-	Yellow	-	-
RS485 A	-	-	Yellow	-
RS485 B	-	-	Blue	-
SDA	-	-	-	Yellow
SCL	-	-	-	Blue

Requirements for electrical connection

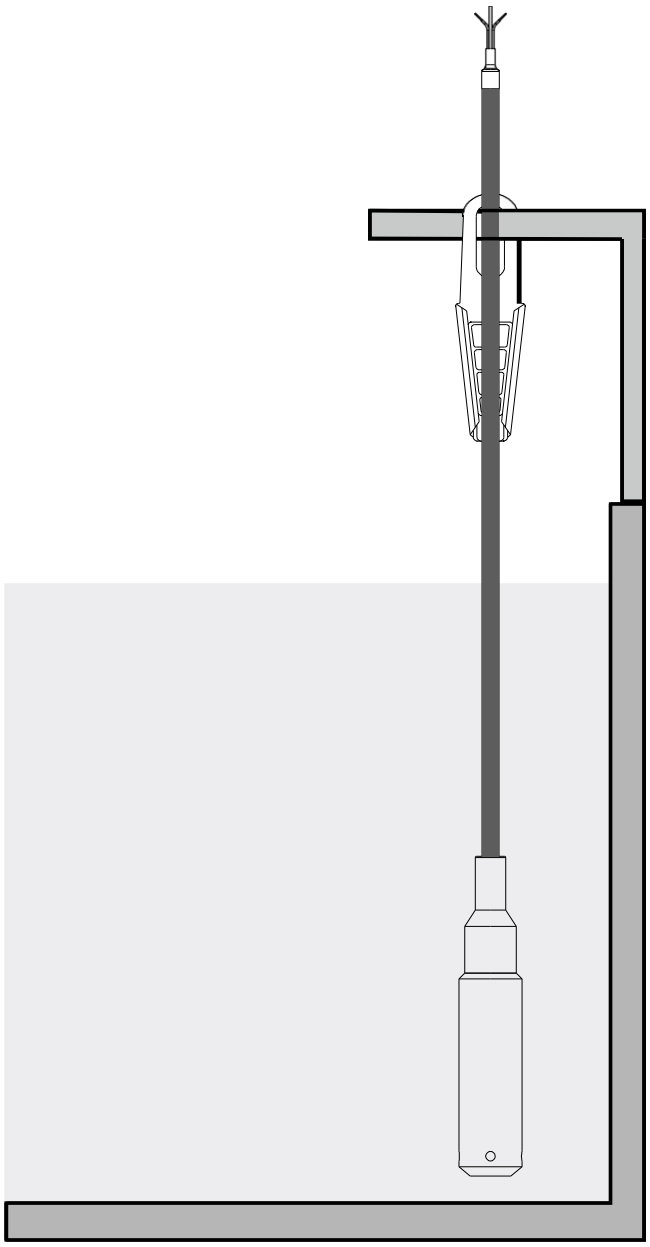
■ Cable diameter matches the cable bushing of the mating connector.

■ Cable gland and seals of the mating connector are correctly seated.

■ With cable outlets, no humidity can ingress at the cable end. Make sure that no moisture enters at the cable end.

■ Requirement for shielding and grounding.The instrument must be connected to the equipment bonding of the plant. The connection is made via the process connection of the instrument.

Mounting the level sensor with a cable strain relief clamp



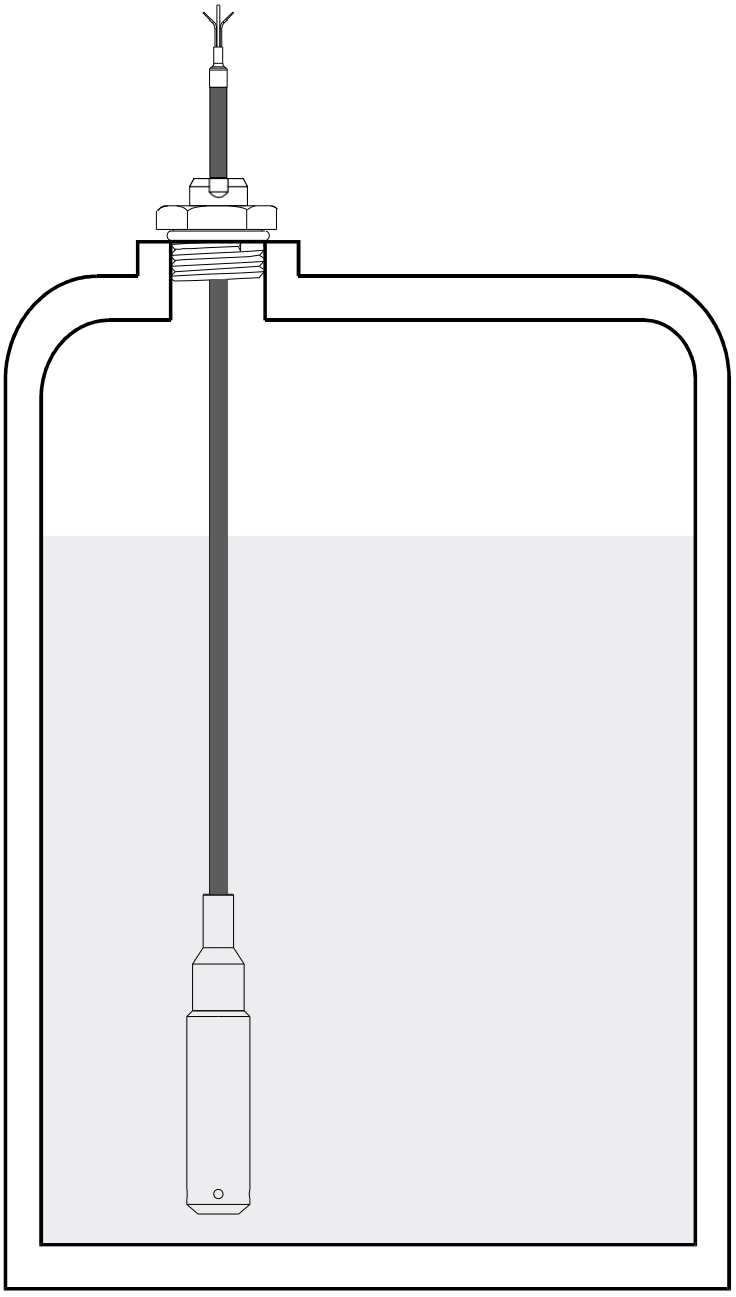
Mount the cable strain relief clamp.

■ Take the weight of the extension cable and the device into account when selecting the fastening point.

■ Push up the clamping jaws. Place the extension cable between the clamping jaws as shown in the graphic.

■ Hold the extension cable in position and push the clamping jaws. back down. Tap the clamping jaws gently from above to fix them in place.

Mounting with screw connection for suspension cable



■ The static pressure produced by the liquid in the installation place may exceed the transmitter FS range.
■ The measuring liquid is compatible with the transmitter construction material or not.
■ The measuring liquid may stop up the holes on the protection cap or not.
■ The installation direction of transmitter is vertically down.
■ In the water flowing condition, the acted surface should be parallel with the water flowing direction.

Service

• The level transmitters do not require any maintenance.
• In the event of a fault, there are no components or modules which can be replaced or repaired by the user.
Please return the instrument to the supplier, with a detailed description of the fault.
• We recommend recalibrating the devices annually.

ACCESSORIES

Cable strain relief clamp

The cable strain relief clamp enables easy and secure mechanical fastening of the submersible pressure transmitter's cable at the measuring point. It acts as a guide for the cable, in order to avoid mechanical damage and to reduce the tensile stress.

Filter element

The filter element prevents dirt and moisture from entering the venting tube. The watertight diaphragm also offers reliable protection for the submersible level transmitter.

Terminal box

The terminal box, with IP 66 ingress protection and watertight ventilation element, provides a moisture-free electrical termination for the submersible level transmitter. It should be mounted in a dry environment or directly in the switch cabinet.

MODBUS RTU COMMUNICATION (16BIT INT)

Configuration of Modbus RTU

- Slave Address: 1~247
- Baud rate: 1200,2400,4800,9600,19200,38400,57600,115200
- Paritate: None, Even, Odd
- Data length: 8 bit
- Stop bit: 1 bit
- Default Address = 1, Data format= 9600, N,8,1

Calculation Formula for Actual Displayed Value
Actual Pressure/Level Value= PRESSURE*DECIM

Read command format (03 function code)							
Register address	Function code	Register address high byte	Register address low byte	Register quantity high byte	Register quantity low byte	CRC16 low byte	CRC16 high byte
0x01	0x03	0x00	0x00	0x00	0x01	0x84	0x0A

Return data format						
Register address	Function code	Data bytes	Value high byte	Value low byte	CRC16 low byte	CRC16 high byte
0x01	0x03	0x02	0x00	0x01	0x79	0x84

Set command format (06 function code)							
Register address	Function code	Register address high byte	Register address low byte	Register quantity high byte	Register quantity low byte	CRC16 low byte	CRC16 high byte
0x01	0x06	0x00	0x00	0x00	0x02	0x08	0x0B

Return set data format							
Register address	Function code	Register address high byte	Register address low byte	Register quantity high byte	Register quantity low byte	CRC16 low byte	CRC16 high byte
0x01	0x06	0x00	0x00	0x00	0x02	0x08	0x0B

Abnormal response return				
Register address	Function code	Abnormal code	CRC16 low byte	CRC16 high byte
0x01	0X80+ function code	0x01(illegal function) 0x02(illegal data address) 0x03(illegal data)		

MODBUS RTU COMMUNICATION (16BIT INT)

Read command list (03 function code)					
Function code	Register address	Register quantity	Data byte	Data	Description
0x03	0x0000	1	2	1-247	Read slave address
0x03	0x0001	1	2	0-1200 1-2400 2-4800 3-9600 4-19200 5-37400 6-57600 7-115200	Read baud rate
0x03	0x0002	1	2	0-MPa 1-kPa 2-Pa 3-bar 4-mbar 5-kg/cm2 6-psi 7-mH2O 8-mmH2O	Pressure unit
0x03	0x0003	1	2	0-xxxx 1-xxx.x 2-xx.xx 3-x.xxx	Decimal point
0x03	0x0004	1	2	-32768~32767	Measurement of output value
0x03	0x0005	1	2	-32768~32767	Zero pressure value
0x03	0x0006	1	2	-32768~32767	Full scale pressure value
0x03	0x000c	1	2	-32768~32767	Zero point offset value, factory sets as 0

MODBUS RTU COMMUNICATION (16BIT INT)

Set command list (06 function code)				
Function code	Register address	Data byte	Data	Description
0x06	0x0000	2	1-247	Set slave address
0x06	0x0001	2	0-1200 1-2400 2-4800 3-9600 4-19200 5-37400 6-57600 7-115200	Set baud rate
0x06	0x000c	2	-32768~32767	Output value=calibration measurement value + Zero point offset value
0x06	0x000F	2	0-Save to user area	Save
0x06	0x0010	2	1-Factory reset	Factory reset

Communication Data Example				
Register address	Description	Command	Answer	Note
0x0000	Read slave address	01 03 00 00 00 01 84 0A	01 03 02 00 01 79 84	Return data:00 01 Device address:01
	Set slave address	01 06 00 00 00 06 09 C8	01 06 00 00 00 06 09 C8	Return data:00 06 Device address:06
0x0001	Read baud rate	01 03 00 01 00 01 D5 CA	01 03 02 00 03 F8 45	Return data:00 03 Baud rate:03-9600
	Set baud rate	01 06 00 01 00 04 D9 C9	01 06 00 01 00 04 D9 C9	Return data:00 04 Baud rate:04-19200
0x0002	Read pressure unit	01 03 00 02 00 01 25 CA	01 03 02 00 03 F8 45	Return data:00 03 Unit:03-bar
	Set pressure unit	01 06 00 02 00 01 E9 CA	01 06 00 02 00 01 E9 CA	Return data:00 00 Unit:01-kPa
0x0003	Read decimal point	01 03 00 03 00 01 74 0A	01 03 02 00 01 79 84	Return data:00 01 Decimal:01-xxx.x
	Set decimal point	01 06 00 03 00 02 F8 0B	01 06 00 03 00 02 F8 0B	Return data:00 02 Decimal:02-xx.xx
0x0004	Read measurement value	01 03 00 04 00 01 C5 CB	01 03 02 00 02 39 85	Return data:00 02 00 02(hex)=2(D)
0x000F	Save to user area	01 06 00 0F 00 00 B9 C9	01 06 00 0F 00 00 B9 C9	Save to user area
0x0010	Factory reset	01 06 00 10 00 01 49 CF	01 06 00 10 00 01 49 CF	Factory reset