HP LMA Modbus RTU

Active high-pressure conductivity cell with integrated electronics

RS-485 with Modbus RTU · IO-Link connection via external converter

The HP LMA measures the electrical conductivity of liquids using the conductive method. LMA denotes an active conductivity cell: the evaluation electronics are integrated in the housing mounted on the cell. Conductivity and temperature are available via Modbus RTU; an external, preconfigured converter provides the connection to IO-Link.



HP LMA with integrated electronics and digital signal output

200 bar at 100 °C · K 0.01 cm^{-1} · Pt1000 · G 3/4″ process connection

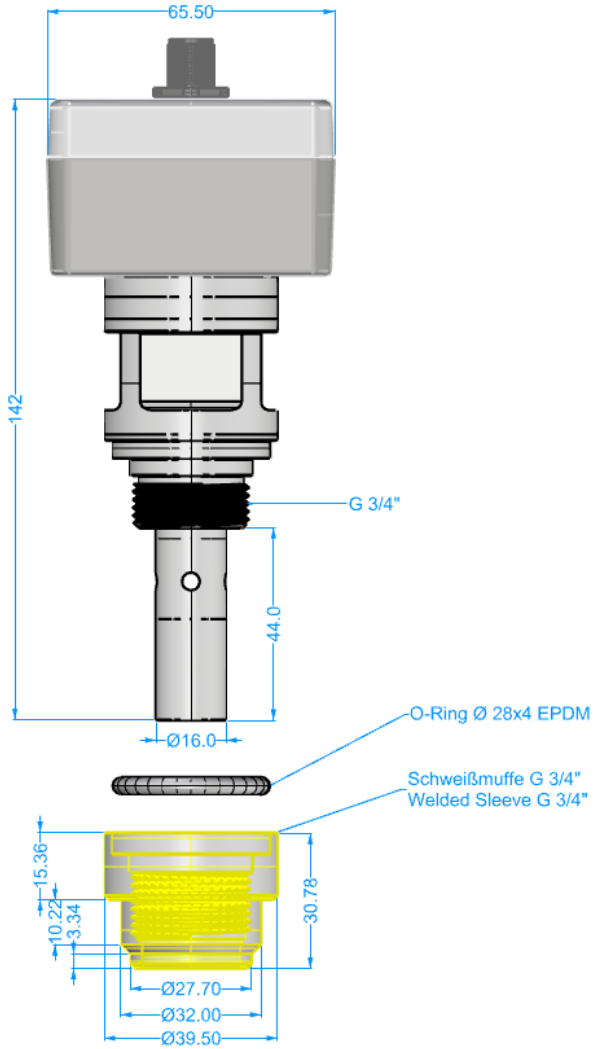
Measurement and configuration

Feature	Technical data
Measuring principle	Conductive measurement of conductivity in liquids
Measuring range	0.001...2000 µS/cm (up to 2 mS/cm)
Cell constant	K = 0.01 cm^{-1}; fine calibration possible
Range switching	Automatic; five internal measuring ranges
Temperature sensor	Pt1000, integrated
Temperature compensation	Programmable: off / TK nat / TK lin 0.00...6.00 %/K
Reference temperature	Factory setting 25.0 °C; adjustable via Modbus
Electronics measurement error	±1 % after fine adjustment, as specified for LF-TR-MOD
Value representation	Three significant figures; additional raw Float32 value

The achievable overall accuracy also depends on the cell, installation, medium and temperature conditions.

HP LMA dimensions

High-pressure cell with G 3/4″ process connection



HP LMA dimension drawing with O-ring and matching weld-in socket · Dimensions in mm

Mechanical data and operating conditions

Feature	Technical data
Maximum cell pressure	200 bar at 100 °C
Cell materials	316L stainless steel, PEEK, EPDM
Process thread	G 3/4″
Cell dimensions	Width 65.50 mm; height 142 mm from top of housing; measuring shaft Ø16 mm; 44 mm below the thread shoulder
Seal and weld-in socket	O-ring Ø28 × 4 mm, EPDM; G 3/4″ weld-in socket Socket: outside diameter 39.50 mm, height 30.78 mm

The height of 142 mm excludes the electrical connector projecting above the housing. The pressure and temperature rating applies to the high-pressure cell; the electronics have separate ambient limits.

HP LMA interfaces

Direct Modbus connection and preconfigured IO-Link connection

Direct connection: HP LMA → RS-485 / Modbus RTU → Modbus master
IO-Link connection: HP LMA → Banner S15C-MGN-KQ → IO-Link master



External Banner S15C-MGN-KQ IO-Link converter

Factory-preconfigured and ready to use

The IO-Link converter is fully configured for the HP LMA. The Modbus address, baud rate, data format and register mapping are already stored. No manual entry of Modbus addresses or registers is required. Use the supplied original Banner IODD to integrate the converter into the IO-Link master.

Electrical data and Modbus RTU

Feature	Technical data
HP LMA supply voltage	12/24 V DC ±10 %; current consumption <50 mA
Interface	RS-485, 2-wire, Modbus RTU
Baud rate	Selectable from 9600 to 115200 baud
Factory settings	9600 baud, 8N1, device address 10
Address range and functions	1...247; FC03/04, FC06, FC16
Process values	Conductivity, temperature, cell resistance, status, measuring range
Ambient limits and housing	-20...50 °C; IP65 protection

IO-Link via external converter

Feature	Technical data
Converter and function	Banner S15C-MGN-KQ; Modbus master / IO-Link device
IO-Link connection	IO-Link 1.1; connection to an IO-Link master, Class A port
Combined system supply	24 V DC ±10 % via the IO-Link master
Converter current consumption	Max. 50 mA in addition to the HP LMA
Process data	32 bytes input / 31 bytes output; read register set 0
Preconfiguration	Address 10; 9600 baud; 8N1; register mapping stored

Pin assignment

Pin	Wire colour	HP LMA / Modbus side	Converter IO-Link side
1	BN brown	Supply +V DC	Supply +24 V DC
2	WH white	D1 / B / +	Banner-specific
3	BU blue	0 V / Common	0 V / GND
4	BK black	D0 / A / -	IO-Link C/Q

The converter has 4-pin M12 connectors: a female connector towards the HP LMA and a male connector towards the IO-Link master. In IO-Link operation, power is supplied by the master; do not connect a second supply simultaneously. For direct RS-485 operation, fit bus termination only at the two cable ends and provide active bus biasing at one point only.

Electrical specifications correspond to the LF-TR-MOD electronics. For register details and commissioning, see the integration manual. Specifications subject to change.