

HiQDT-EX-LEDTX Explosion-Proof Transmitter & Controller for HiQDT RS-485 MODBUS RTU Smart Digital Sensors



PNCE 6331-6631-HiQDT-WPC Slurry, Sulfide & Dehydration Resistant Submersible RS-485 MODBUS RTU Smart pH Sensor



PN 6353-HiQDT-STUB Immersion Slurry Resistant "STUBBY" Style RS-485 MODBUS RTU Smart pH Sensor with HiQDT-EX-LEDTX transmitter & controller shown displaying the current pH value.



HiQDT-EX-LEDTX transmitter/controller with HiQ4F-Xm-TL female snap connector ready for plug & play operation in explosion-proof area

PV 1 3.91 PH	PV 5 1418 ItEm	PV 9 1.4 dAYS	PV 13 11 month
PV 2 21.1 dEgC	PV 6 -16.4 OFFSEt	PV 10 59.2 mV/PH	PV 14 4 SoFtw
PV 3 153 AbSmV	PV 7 1.4 dAYS	PV 11 2.5 dAYS	PV 15 19.1 min-C
PV 4 2.5 dAYS	PV 8 56.4 mV/PH	PV 12 2018 YEAr	PV 16 30.5 mAX-C

Up to 16 parameters are continuously polled in the master configuration where one each HiQDT sensor is interfaced with the typical modbus registers selected for display are detailed below with a live sampling of these registers is shown in the screenshot to the left as an example.

For "snooper" configuration up to 8 each HiQDT sensors can be simultaneously interfaced but only the process value and temperature can be simultaneously displayed (Abs mV can also be displayed if interface up to 5 each sensors max)

- | | | | |
|-----------------------------|---------------------------------|---------------------------------|--------------------------|
| 1. Process Value (pH/ORP) | 5. Sensor Item Number | 9. Days since Acid Slope Cal * | 13. Month of Manufacture |
| 2. Process Temperature °C | 6. A.P. / mV Offset Calibration | 10. Alakline (Base) Slope Cal * | 14. Software Revision |
| 3. Absolute Raw mV | 7. Days Since mV Offset Cal | 11. Days since Base Slope Cal * | 15. Min Temp in Use (°C) |
| 4. Total Time in Use (Days) | 8. Acid Slope Cal * | 12. Year of Manufacture | 16. Max Temp in Use (°C) |

* These parameters are relevant only for pH type sensors. Other parameters can be substituted when interfacing ORP type sensors if desired.



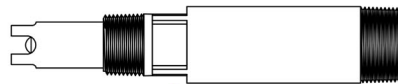
EX, PANEL & NEMA 4X LED Transmitters & Controllers for HiQDT RS-485 MODBUS RTU Smart Digital Sensors

Feature or Functionality	Explosion Proof HiQDT-EX-LEDTX-PSXX ¹	1/8-DIN Panel HiQDT-PANEL-LEDTX-PSXX ¹	NEMA 4X HiQDT-NEMA4X-LEDTX-PSXX ¹
Display	0.60" (15mm) upper & 0.46" (12mm) lower 6 digit LED (-999999 to 999999) adjustable from five to zero decimal places Brightness is user adjustable including high intensity mode for best visibility even under bright direct sunlight		
Installation Styles Supported	1.5" to 2.5" NPS or DN 40 to 65 mm Pipe Mounting or Wall Mounting with 4 each slotted flanges	1/8-DIN Panel Mount	Wall/Plate Mounting Standard or Pipe Mounting with optional kit
Agency Approvals	FM & CSA Class I, Division I ATEX II 2 G D & IECEX d IIC T Gb	CE, CSA & UL listed for use in non-hazarduous safe areas UL & c-UL Listed. E160849; 508 Industrial Control Equipment.	
Calibration Methods	Windows Software or Battery Powered Handheld Communicator Auto-buffer calibration with Windows software with 1.68, 4.00, 6.86, 7.00, 9.18, 10.00, 12.45 pH buffers supported Separate slope for acid conditions (pH <7) and alkaline conditions (pH >7) supported for all calibration methods		
Power Configurations	85-265 VAC 50/60 Hz 20W max (-PSAC) ¹ or 12-24 VDC ±10% 15W max (-PSDC) ¹		
Conduit Connections for Power, Outputs & Sensor Inputs	Four ¾" NPT threaded conduit openings and two ¾" NPT metal conduit plugs with 12 mm hex key fitting installed	Not Applicable (Panel Mount)	Up to 8 each HiQ4FP female panel connectors for 8 each HiQDT sensors Up to 6 each ½" MNPT cable glands factory installed for power & outputs
Enclosure Information	Explosion-proof die cast aluminum with glass window, corrosion resistant epoxy coating, color: blue. NEMA 4X, 7, & 9, IP68 rated	high impact plastic UL 94V-0 color: black	NEMA 4X thermoplastic polyester color: gray
Max Number of HiQDT Sensors	1 each Single Parameter in Master Configuration 8 each Single Parameters or 4 each Dual Parameters in "Snooper" ² Configuration		
Typical Input Scheme for HiQDT Sensors	HiQ4F-Xm-TL female snap to tinned lead extension cable wired into enclosure is suitable for EX use	HiQDT bridge box for 85-265 VAC or 9-36 VDC power input with 12VDC output to energize sensor(s)	HiQ4FP panel mount connectors can interface up to 8 each HiQDT smart digital sensors for "Snooper" Style
Power for HiQDT Sensors	Integral 10VDC 25mA max for EX or 200mA max for use in non-EX areas	Provided by external power supply in HiQDT bridge box assembly	Internal DIN-RAIL 12VDC power supply for 85-265 VAC or 9-36VDC
Analog Output	Scalable 4-20mA Max 700 Ω with 4kV Isolation input/output-to-power line and 500 V isolation input-to-output		
Contact Relays	4 ea Isolated SPDT (Form C) Max 3A @ 250VAC/30VDC ³ Deadband: 0-100% of span; Time Delay: 0 to 999.9 seconds. Each relay configurable for low or high setpoint. Settings are programmable and independent for each relay.		
Special Features	SafeTouch® Through-Glass Button Programming Ideal for EX area use	Simple plug and play operation for panel pH monitoring & control	Serves as local display of process values and powers HiQDT sensors
Typical Applications for Master Configuration	Transmitter & controller for use in locations requiring explosion-proof electronics and/or installation areas with very aggressive environments	Transmitter & controller for use in facilities with existing panels not requiring any secondary enclosure	Transmitter & controller for field installations in safe non-hazarduous areas requiring NEMA 4X package
Typical Applications for "Snooper" ² Configuration	Local display in field for sensor(s) between field installation and PLC where data is to be acquired for monitoring or control purposes	Local display in field for sensor(s) between field installation and PLC with existing panels not requiring any secondary enclosure	Local display in field for sensor(s) between field installation and PLC where no panel or power supply exists and NEMA4X package is required

2. The "Snooper" configuraiton allows for reading any modbus registers requested by the RS-485 MODBUS PLC master when the HiQDT LED transmitter & controller is installed between HiQDT smart digital RS-485 MODBUS RTU sensor and modbus master.
3. If a higher amperage rating is required than what is specified for HiQDT LEDTX controller then please use an ice cube relay that has a suitable amperage rating for the required use as well as satisfactory electrical & safety rating for where it is to be installed.

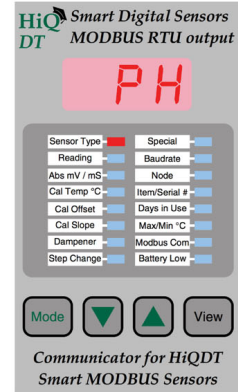
Installation of HiQDT-EX-LEDTX Explosion-Proof Controller In “Master” Configuration Mode for use with Legacy PLC using only Analog Inputs and/or for Local Control

ASTI Windows Setup & Calibration
Software for HiQDT Smart Sensors



**Modbus
over RS485**

ASTI Handheld Communicator for HiQDT
Smart Sensor Calibration & Configuration



Explosion-Proof LED Controller in “**MASTER**” style configuration displays calibrated & temperature compensated pH/ORP & Temperature process values plus the following for the connected HiQDT smart digital RS845 MODBUS RTU sensor:

- Absolute (Raw) mV
- Total Time in Use
- Cal Offset & Time Since Cal Performed
- Cal Acid Slope & Time Since Cal Performed
- Cal Base Slope & Time Since Cal Performed
- Year of Manufacture
- Month of Manufacture
- Software Revision
- Minimum Temp in Field Use
- Maximum Temp in Field Use



1 ea 4-20mA
4 ea Relays

**CUSTOMER PLC AS
ANALOG INPUT ONLY
CONTROL SYSTEM**

NOTE:

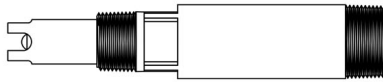
The max number of HiQDT sensors per each EX controller in the “Master” style configuration shown above is one (1) since there exists only one (1) each 4-20mA output from each controller. If only contact relays for local control or alarm are needed for 2nd & 3rd channels then “Master” configuration can add 2nd or 3rd HiQDT sensor if desired.

“MASTER” CONFIGURATION COMMENTS:

1. Mating HiQ4F-Xm-TL female snap to tinned lead extension cable (where X is length in meters) is required for this configuration in explosion-proof rated areas to provide a waterproof & corrosion resistant NEMA 6P rated field connection when interfaced. HiQ4F-Xm-TL extension cables are available in lengths of 1.5 meters (5 feet), 3 meters (10 feet), 6 meters (20 feet), Up to 1,000 meters total cable length can be supported. Standard sensor cable lengths are 6 meters (20 feet) with optional 12 meters (40 feet) and 22 meters (75 feet) available as special order options.
2. HiQDT RS845 MODBUS RTU sensors are slaves and HiQDT-EX-LEDTX Explosion-Proof Controller is MODBUS RTU master. If same baudrate and node address is used for multiple installations then HiQDT sensors can be readily hot-swapped between installation in a plug and play fashion removing or connecting to any HiQDT-EX-LEDTX Explosion-Proof Controller without any user action whatsoever since calibration and analytic data is integral to sensor.
3. If installation is in a safe non-hazarduous area then 1/8-DIN Panel HiQDT-PANEL-LEDTX or NEMA 4X HiQDT-NEMA4X-LEDTX controller can be used instead of HiQDT-EX-LEDTX.

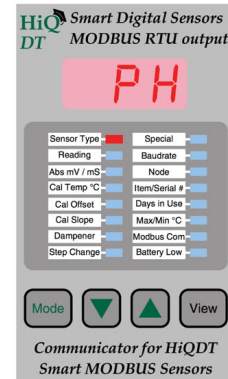
Installation of HiQDT-EX-LEDTX Explosion-Proof Controller In “SNOOPER” Configuration Mode for use with Modern PLC that can act as MODBUS RTU Master

ASTI Windows Setup & Calibration
Software for HiQDT Smart Sensors



**Modbus
over RS485**

ASTI Handheld Communicator for HiQDT
Smart Sensor Calibration & Configuration



**Explosion-Proof (EX) LED
Controller in “SNOOPER”
style configuration displays
pH/ORP & Temp values as
well as powering up to 8 each
HiQDT MODBUS RTU sensors**



CALIBRATION & ANALYTIC

- Cal pH - Offset
- Cal pH - Acid & Base Slopes
- Cal ORP - Offset Only
- Cal pH & ORP - Temp. Offset
- Time since each cal last done
- Total Time in Field Use
- Min & Max Temp in Use
- Dampener - Time Averaging
- Sensor Item # and Serial #
- Manufacture (Build) Date
- Software Revision

REAL-TIME PROCESS DATA

Poll pH/ORP & Temp values
Poll Raw mV & Temp values

**CUSTOMER PLC AS
MODBUS RTU MASTER
CONTROL SYSTEM**

“SNOOPER” CONFIGURATION COMMENTS:

1. If multiple sensors are to be connected to HiQDT-EX-LEDTX Explosion-Proof Controller in “SNOOPER” configuration then a bridge box suitable for the area to be installed and the number of sensors to be used needs to be employed. Such bridge boxes are available in configurations for use with up to 3 each or 6 each HiQDT sensors from the ASTI factory as may be most appropriate.
2. Detailed information about how to access the modbus registers containing the various available process data, calibration and analytic information stored in each sensor is provided in the ASTI provided HiQDT sensor implementation guide. Contact factory for assistance if required.
3. The “SNOOPER” configuration allows for the HiQDT-EX-LEDTX Explosion-Proof Controller to display and use any register from any connected sensor node that is continuously polled by the MODBUS RTU master. This typically always includes at least the calibrated and temperature compensation pH value (or ORP value) & calibrated temperature value of each connected sensor.
4. If installation is in a safe non-hazardous area then 1/8-DIN Panel HiQDT-PANEL-LEDTX or NEMA 4X HiQDT-NEMA4X-LEDTX controller can be used instead of HiQDT-EX-LEDTX.

Last Revised December 28, 2018