

# Supplement for Isolated Dual 4-20mA Analog Output Expansion Module for HiQDT-NEMA4X-LEDTX Controllers for Smart Digital RS-485 MODBUS RTU HiQDT Dual pH-ORP All-In-One Sensors

## ANLAOG OUTPUT EXPANSION MODULE GUIDE - Revised September 17, 2019

This supplement is intended to be used with the main Guide for ScanView Windows Software to Configure HiQDT-NEMA4X-LEDTX Single & Dual Controllers in Master Configuration for Smart Digital RS-485 MODBUS RTU HiQDT pH, ORP & D.O. Sensors. **For general documentation including configuration from the LED interface rather than with the ScanView Windows software please refer to the separate main HiQDT-NEMA4X-PANEL-LEDTX controller manual.** The isolated dual 4-20mA analog output module option can be added to HiQDT-NEMA4X-LEDTX controller in both the master and snooper configurations. These expansion modules must be energized in order to be configured by the ScanView Windows software. Since these are passive 4-20mA analog output the mating device must provide the 24VDC power to energize the modules. To ensure isolation for each analog output either use a PLC that supports loop-powered 4-20mA devices with channel to channel analog input isolation or else two separate isolated 24VDC power supplies. The most typical use for the isolated dual analog 4-20mA output expansion module is to supply outputs for additional parameters than just the main measured process pH, ORP or dissolved oxygen (D.O.) values. Most typically the temperature output is also desired to be sent for some control and datalogging systems and this is typically configured as output 2 (the first of the two outputs on the expansion module). The third output (the second of the two on the expansion module) is typically reserved for special purposes. In the case of the dual pH/ORP all-in-one type sensors the third output is used to send the ORP value. In the configuration for the dual pH/ORP all-in-one type sensors output 1 is for the pH, while output 2 is for the temperature and output 3 is for the ORP value. This requires some slight changes to the 16 registers that are polled by the HiQDT controller which is reflect in the monitoring screenshot shown below:



### "4-20mA Analog Output Ch1"

4-20mA analog output is configured from process value provided by the connected sensor. For pH, Standard & Wide Range ORP sensors this is always PV1. For dissolved oxygen (D.O.) sensors this is either PV1 for DO ppm or PV3 for DO percent (%) saturation with salinity correction. The scaling limits provided for the 4-20mA analog output should always lie within the permissible limits for each measurement type. These are as follows:

- pH.                 -2.00 to +16.00 (Default 0.00 to 14.00)
- ORP.               -1,000 to +1,000
- Wide ORP.       -2,000 to +2,000
- DO ppm.           0.00 to 150.00
- DO % Sat.         0.0 to 1,500.0

When break box is unchecked the analog output will hold last value before break occurs effectively acting as a retentive register if sensor is accidentally disconnected or loses communications.

When disconnecting sensor always first press F1 key to hold all outputs. Before reconnecting sensor always press F2 to release all outputs from hold.

### "4-20mA Analog Outputs Ch2 & Ch3"

Analog outputs for Ch2 and Ch3 are only active when the isolated dual analog output expansion module is energized. Scaling is performed exactly as it would be for the given parameter for Ch1 except that the process variable needs to be set. For the Ch2 the typical output is temperature which is always configured as PV2 as can be visualized with the screenshot to the right.

The analog output for Ch3 is typically only used when the dual pH/ORP all-in-one type sensor is used. In this case there are some changes to the configuration for the 16 sensor registers that are polled as can be visualized in the monitoring screenshot on the previous page. In this configuration the absolute mV parameter that is typically set for PV3 for the single parameter type HiQDT sensor has been replaced with the ORP process value and is the basis for the analog output for Ch3 as can be visualized in the screenshot to the right. If the dual pH/ORP all-in-one type sensor had used the wide style ORP then scaling could have the max full range of -2,000 to +2,000 mV instead of the standard -1,000 to +1,000 mV shown in the screenshot to the right here.

