3TX Transmitters for Measurement, Control & Datalogging of Ion Selective, pH & ORP, Dissolved Oxygen & Conductivity

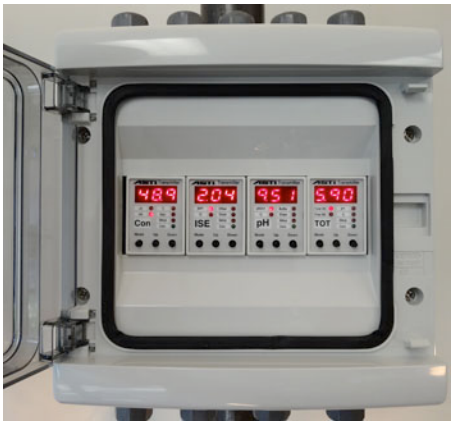
Triple Channel Nitrate, pH & Conductivity Transmitter 3TX-3MF-ISE-NO3-D-pH-D-CON-1.0/50-D-PS

The modular components of the 3TX series provide the flexibility to meet your application needs in a cost-effective way:

- **Custom configurations** means you only pay for the specific modules you need
- **Select any combination of measurements** that you need: pH, ORP, dissolved oxygen (DO), conductivity and ion selective (ISE)
- **Select the number of measurement channels** in the field assembly, from a single channel up to seven (7) channels
- Enjoy the flexibility to **add complementary modules either at initial installation or at a later time** without decommissioning the original analyzer assembly, including controllers (3TX-REL), dataloggers (3TX-DAT), pH compensation for ISE modules including MODbus converter for all inputs (3TX-TOT) and universal AC power supply

All modules in the 3TX series share these features and options:

- **Easy-to-read displays**: Bright three-digit LED displays are visible even in bright sunlight and do not suffer from the common problems associated with LCD displays, such as environmental fatigue and wear.
- **Easy to use**: Simple and intuitive three-button operation with no complex codes to memorize for most day-to-day tasks.



Triple Channel Total Ammonia, pH & Conductivity Transmitter 3TX-4M-ISE-NH4-A-pH-A-TOT-CON-1.0/50-A

- **Easy installation**: Enclosures are customized for your modules and arrive ready for field mounting on any wall with no additional specialized hardware required. Modules are also available individually in a small, 35mm DIN-rail mountable form factor for direct integration into OEM equipment.
- **Weatherproof**: NEMA 4X CSA/UL rated & IP65 enclosures include high quality sealing cable glands (a.k.a. strain reliefs) that are ideal for weatherproof sealing on sensor, power, and output cables. Waterproof caps are also provided at no additional cost for all cable glands to seal and weatherproof any channels that will not be used.
- **Certifications**: CE approved for use in safe, non-hazardous areas (Class I, Division II or above - a.k.a. Zone 1 or above).
- **Security**: Optional lock available for all enclosure assemblies to restrict access to selected keyholders.
- **Power supply options**: Choose our CSA/UL/CE approved universal 100 to 240 VAC 50/60 Hz power supply module for line powered operation, or use any 3TX module with 3-wire 24VDC powered operation if you already have a dedicated 24VDC power supply (i.e. not shared with any other equipment) available onsite.

Single Channel pH Controller
3TX-2M-pH-A-REL

- **Option to customize default values**: Each module can be preset with your own preferred defaults for all user parameters at no additional cost (minimum order quantities apply for the feature)
- **½-DIN Panel & Pipe mounting option:** A universal two-inch (2") NPT pipe mounting kit is available for all 3TX enclosure options. The 3MP enclosure can be installed into any standard ½-DIN panel cutout. All enclosures are ready for wall mounting standard without any additional special hardware.

3TX Measurement Modules

- Measurement modules are available for pH, ORP, mV, temperature, ion selective (ISE), dissolved oxygen and conductivity.
- Scalable 4-20mA analog output is standard for all measurement modules, with optional MODbus digital output available at a nominal surcharge. Precise factory-calibrated linear analog output allows excellent use in control applications. All analog outputs have built-in trim calibration support, including both offset and span adjustments.
- Hold feature standard for all versions of the measurement modules for pH, ORP, ion selective (ISE), dissolved oxygen (DO) and conductivity parameters. When calibration mode is entered, the last value from measurement mode is held for both 4-20mA analog output as well as the MODbus output(s).
- Calibration of temperature is available for all measurement modules.

Single Channel Contacting Conductivity Transmitter
3TX-2M-CON-2.0/200-A-PS

- Active 4-20mA can support remote external displays for viewing measured values in control panels, secondary field locations, or instrumentation shops.
- **ISE measurement module (3TX-ISE)**:
  - 3TX-ISE displays, calibrates, and output in convenient ppm units.
  - Measures any ion, including Ammonium (NH_4^+), Calcium (Ca^{++}), Fluoride (F^-), Nitrate (NO_3^-) and Nitrite (NO_2^-) amongst many others. The type of ISE measurement must be preset at the factory. *
  - Simple offset adjustment allows easy field calibration of sensors while in service to agree with grab sample or laboratory analysis.
  - The standard 3TX-ISE transmitter supports and requires directly interfacing ion selective sensors without preamplifiers. In addition, the 3TX-ISE-X hardware version supports and requires ion selective sensors with preamplifiers to enable installations that require long cable lengths or to operate in very high interference areas. The software, features and functionality is perfectly identical for both hardware versions.
  - When the 3TX-ISE is combined with the 3TX-TOT and 3TX-pH modules, it can provide continuous inline field measurement of total ammonia (NH_3-N), total fluoride (HF), total cyanide (HCN) or total sulfide (H_2S) parameters without the use of any reagents within the permissible pH & temperature ranges.

Six Channel pH/ORP/ISE/Conductivity Assembly
3TX-6MW-CON-ISE-REL-pH-ORP-ISE-PS

- **Contacting Conductivity measurement module (3TX-CON)**:
  - The 3TX-CON module supports most any cell constant (K), including 0.01, 0.02, 0.05, 0.1, 0.2, 0.5, 1.0, 2.0, 3.0, 5.0, 10.0 & 20.0. Effective calibrated cells anywhere from K=0.005/cm up to K=34.0/cm.
  - Support for low ranges down to 0-5 µS and all the way up to 0-1,000 milliSiemens as required for the given application requirements.
  - Zero calibration for true 0.00 reading with your sensor dry in air.
  - Precise and wide-range gain calibration allows for effective (a.k.a. apparent) cell constant to be +/- 70% of the nominal sensor value.
  - Automatic correction for resistance and capacitance contribution of the cable length to the measurement for any sensor wire gauge and distance.
  - High resolution MODbus output available with 3TX-CON-E style unit.

Seven Channel
pH/ORP/ISE/Conductivity Assembly
3TX-7MF-ISE-CON-ISE-REL-pH-ORP-ISE-PS

- **pH/ORP measurement module (3TX-pH)**:
  - The 3TX-pH pH/ORP/mV/Temp transmitter allows for precise sensor calibration with support for two and three point slope calibrations. This means that a precise acid slope (pH below 7) and alkaline slope (pH above 7) is possible. One-point offset calibrations are possible at any pH value to allow for agreement with grab sample laboratory analysis.
  - The standard 3TX-pH transmitter supports and requires directly interfacing pH or ORP sensors without preamplifiers. In addition, the 3TX-pH-X hardware version supports and requires pH or ORP sensors with preamplifiers to enable installations that require long cable lengths or to operate in very high interference areas.
- **Dissolved Oxygen (DO) measurement module (3TX-DO)**:
  - 3TX-DO module displays and outputs the concentration of dissolved oxgyen in ppm, % saturation units, as well as the process temperature
  - Automatic correction for temperature, pressure and salinity for calibration and % saturation measurement modes
  - A simple gain calibration with sensor dry in air. The automatic gain calibration adjusts the sensor slope (mV per ppm DO) based upon pre-programmed 100% DO saturation at the temperature & pressure. No look-up tables are ever needed to calibrate the galvanic DO sensor.
    - No "Zero" calibration is ever needed for galvanic type dissolved oxygen (DO) sensors as they have a true zero potential.
  - The 3TX-DO module supports most any galvanic dissolved oxygen type sensor that is self temperature compensating (internal without integrated TC element required for this correction).

Temperature Module (3TX-TEM)

- 3TX-TEM is a module to add a scalable analog output for Temperature to any 3TX-pH, 3TX-ISE, 3TX-CON or 3TX-DO measurement module. This optional module can be used to add a temperature output at any time before or after commissioning.
- Input for temperature measurement can be Pt100 or Pt1000 type TC element integrated inside the sensor or else a separate temperature probe.
- Special hardware & software allows a single Pt100/Pt1000 element to be used both as input for a 3TX measurement module and a 3TX-TEM temperature transmitter. This configuration is referred to as “spliced” input mode and is the default.
- Any pH, ORP, ISE, conductivity or DO sensor with integral Pt100 or Pt1000 TC when in “splice” input mode will be used both for temperature compensation on the measurement module and to send a scalable output for temperature from the 3TX-TEM temperature module
- Direct wiring from separate (rather than shared) Pt100 or Pt1000 temperature elements is also supported. This configuration is referred to as “raw” input mode. In "raw" mode automatic correction for the resistance due to the cable is performed from user entered values for the wire gauge and cable length.
- Displays Temperature (°C) and raw Ohms from connected Pt100/Pt1000 element.
- Offset and gain (span) calibration types supported in both "splice" and "raw" modes for precise temperature measurement.
- Full range 0-210°C with a resolution of 0.2°C, Scalable 0-20mA or 4-20mA analog output type is selectable.

Control Module (3TX-REL)

- Each 3TX-REL module has 2 each independent Single-Pole Single-Throw (SPST) 5 Amp contact relays.
- Each relay is fully configurable by the user as to control mode and variables for each control algorithm.
- Tight integration between 3TX alarm & relay controller and 3TX measurement modules software makes configuration and scaling simple & easy for any local control requirements of the pH, ORP, ion selective (ISE), dissolved oxygen (DO) or conductivity parameters.
- The 3TX-REL alarm and relay controller module includes both basic and more sophisticated controlling options, including all of the following modes:
    - 1) A simple supervision option for alarm functionality only;
    - 2) An On/Off control with a user-configurable deadband (a.k.a. hysteresis);
    - 3) Time proportional control (TPC); and,
    - 4) Proportional frequency control (PFC, a.k.a. variable pulse controller).

It is possible to wire the analog 0/4-20mA output from 3TX-pH, 3TX-ISE, 3TX-DO or 3TX-CON measurement transmitter to other data acquisition or control device prior to connection with 3TX-REL alarm/relay module using the appropriate wiring scheme (see alternate wiring schematic for details).

Datalogging Module (3TX-DAT) and MODbus Options

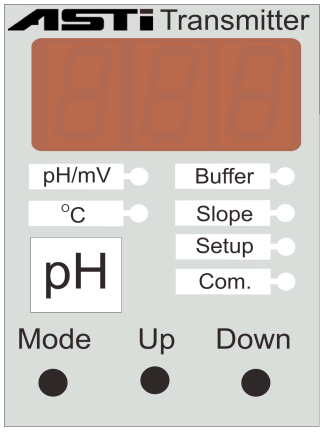
- **MODbus**: If you would like to have MODbus digital output, there are two different approaches available:
    - 1: **Order measurement modules with MODbus option included**. Please note that adding the MODbus output is not an option after the module leaves the factory without MODbus.
    - 2: **Add a 3TX-TOT module to convert from analog to MODbus output.** Unlike the first approach, this flexible option may be selected either at the time of initial installation or at any time thereafter. The 3TX-TOT module also has additional functionality, as detailed in the section below.
- **Datalogging**: For datalogging functionality, there are also two different approaches:
    - 1: If you have opted for MODbus output using either of the approaches described above, you may **use a free of charge optional Windows PC software interface kit to the MODbus digital output**. This allows for real time display of all values for all transmitters that are wired to that MODbus line. In addition, the software kit allows for datalogging for all transmitters connected on the line, including both the scaled output value and temperature for each measurement module. Up to 247 devices can be supported on a single MODbus digital line (2-wire cable), and long cable length can be supported for field installations up to 6500 feet (1.23 miles or 1.98 kilometers) to make viewing in the instrument shop practical and easy.
    - A **free of charge Windows PC datalogging and graphing software** is provided for use with 3TX transmitters with the optional MODbus RS-485 digital output:
    - 2: A **3TX-DAT module** can be added to perform MODbus datalogging. The 3TX-DAT module allows for datalogging up to 63 each MODbus digital inputs from any mix of 3TX-pH, 3TX-ISE, 3TX-CON, 3TX-DO and 3TX-TOT modules. The sampling rate is configurable from once per second to once per hour. The 16MB onboard flash memory allows extensive datalogging capacity. Configuration of the 3TX-DAT is accomplished via the free of charge Windows datalogging and graphing software for 3TX transmitters with MODbus and uploaded & downloaded the separate ASTI Windows software for 3TX-DAT. The 3TX-DAT can be pre-configured upon request without additional charge. The logged data is downloaded to a Windows PC or tablet for further workup, graphing and analysis via the ASTI Windows software. The 3TX-DAT can be added at any time after commissioning if the mating 3TX measurement module(s) have the MODbus output option.
    - 3: Datalogging can also be accomplished by connecting (either directly or in series) the standard scalable 4-20mA analog output from the 3TX transmitters to any commercial PLC, SCADA or other data acquisition device that can be suitable configured to log engineered units for all measurements.

3TX-TOT pH Compensation Module to Compute Total ISE

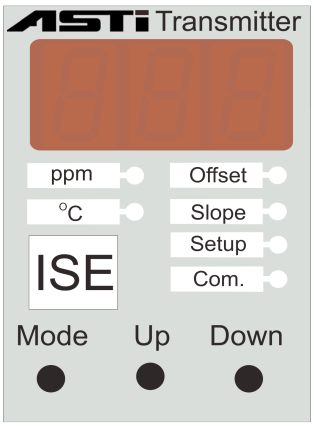
- The 3TX-TOT module computes the total ISE. This module can compute total ammonia, total cyanide, total fluoride and total sulfide.
- The module computes the total ISE using three inputs: 1) the free ion activity; 2) the pH; and, 3) the temperature. These three input parameters are provided by the analog output from the respective measurement modules.
- A scalable 4-20mA analog signal is available to output the computed total ISE to PLC or other data acquisition equipment.
- MODbus included: All input and output data sent via MODbus standard with the 3TX-TOT module.

3TX Product Specification Sheet and Manual Links

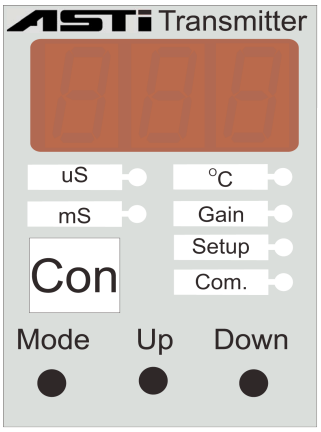
3TX-pH
pH/ORP Transmitter



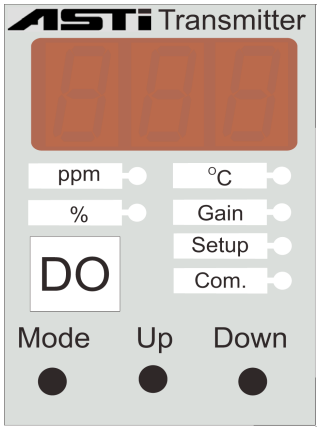
3TX-ISE
Ion Selective Transmitter



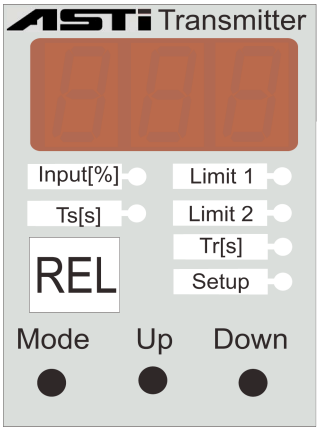
3TX-CON
Conductivity Transmitter



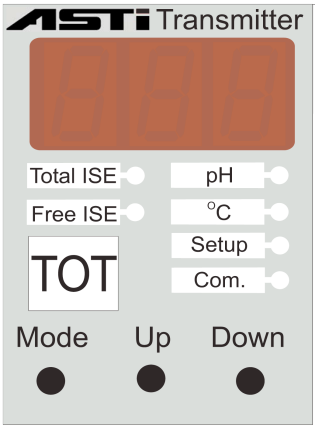
3TX-DO Dissolved
Oxygen Transmitter



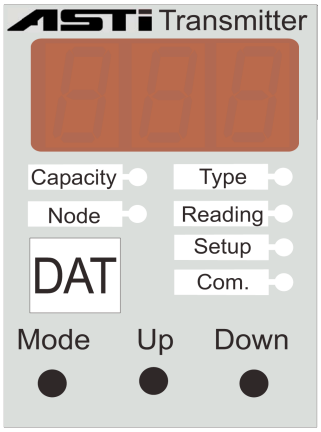
3TX-REL
Alarm & Relay Controller



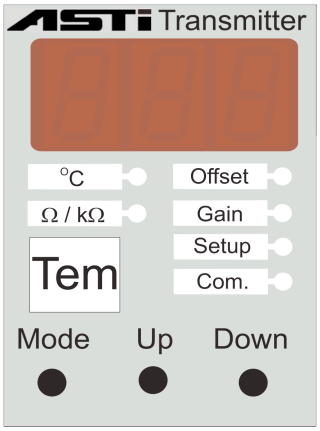
3TX-TOT Total ISE pH
Compensation Module



3TX-DAT
MODbus Datalogger



3TX-TEM
Temperature Transmitter



Common Special Features for All Measurement Modules (See Next Page)

* Support for Custom OEM Configuration upon Request to define all setup parameter to a value of your choosing

* Optional RS-485 MODbus digital output for all measurement modules (standard on 3TX-TOT module)

* Low Cost datalogging and real-time monitoring with Windows PC software & MODbus digital output combination

* 3TX-DAT MODbus datalogger interfaces with 3TX-pH, 3TX-ISE, 3TX-DO, 3TX-CON & 3TX-TOT modules with MODbus option

Key Features of 3TX Measuring Modules

Measurement	Input	Measurement Range	Outputs	Calibration Points	Compatible Sensor(s)	Special Features
Ion Selective (ISE) **(3TX-ISE)** *	- Any Combination Ion Selective Solid State & Organic Membrane *	Low (0.00 to 9.99), Mid (00.0 to 99.9), High (000 to 999) *All units for ranges are in ppm (mg/L)*	- Scalable Analog 0/4-20 mA for ISE or Temperature - Scaling Minimum 20% of selected range for Analog & MODbus outputs	- 2 point user defined to determine ISE slope - 1 point user defined for ISE standardize to correct for offset (drift)	- Any Suitable ASTI Ion Selective (ISE) Sensor with Pt100 or Pt1000 TC * *or* - Any Suitable ASTI Ion Selective (ISE) Sensor with Pt100 or Pt1000 TC and compatible preamp *	- Simplest field ISE instrument available on the market for easy commissioning and maintenance
pH or ORP **(3TX-pH)**	- Any Combination pH or ORP Sensor	- 0 to 14 for pH Standard *(-2 to +16 with 3TX-pHE)* -1000 to +1000 mV for ORP	- Scalable Analog 0/4-20 mA for pH, ORP (mV) or Temperature - Minimum 3 pH for Analog & MODbus outputs	- 2 point or 3 point calibration for determination of acid and alkaline slopes - 1 point user defined pH standardize calibration to correct for offset (drift)	- Any Suitable ASTI pH/ORP Sensor with Pt100 or Pt1000 TC *or* - Any Suitable ASTI pH/ORP Sensor with Pt100 or Pt1000 TC and compatible preamp	- Support for 1-point, 2-point, 3-point and arbitrary field offsets for optimal calibrations
Contacting Conductivity **(3TX-CON)**	- Any Contacting Conductivity Sensor with supported Cell Constant (K)	<u>Cell Constants Supported:</u> 0.01, 0.02, 0.05, 0.1, 0.2, 0.5, 1.0, 2.0, 3.0, 5.0, 10.0 & 20.0 <u>Ranges:</u> 0-5uS up to 0-1,000 mS as per mating cell/configuration	- Scalable Analog 0/4-20 mA for Conductivity or Temperature - Minimum 10% of full scale range for Analog & MODbus outputs	- Gain adjustment to calibrate to effective (a.k.a. "apparent") cell constant - User configurable corrections for sensor cable length	- Any Suitable ASTI Contacting Conductivity Sensor with supported cell constant and integrated 100 or 1000 Ohm Platinum TC	- Correction for resistance and capacitance of sensor cable for both TC input and conductivity measurement itself
Dissolved Oxygen (DO) **(3TX-DO)**	- Most galvanic dissolved oxygen sensors that are self temperature compensating	<u>Minimum</u> 0.00 to 4.00 ppm (0-40% Saturation) <u>Maximum</u> 00.0 to 40.0 ppm (0-400% Saturation)	- Scalable Analog 0/4-20 mA output for DO readings in ppm or % Saturation - Minimum 10% of full scale range for Analog & MODbus outputs	- Gain calibration with sensor dry in air using either automatic or manual mode - No "zero" calibration for galvanic type DO sensors	- AST-DO or equivalent active self-polarizing galvanic DO cell that is self temperature compensating (without need of integrated TC element for this correction)	- Calibration and % saturation is automatically corrected for temperature, pressure and salinity for accurate measurements

* *Ion selective measurement type must be set at time of purchase at ASTI factory. 3TX-ISE transmitters are not sold separately but rather only as part of complete ISE system including both the ISE transmitter AND ISE sensor supplied complete from ASTI factory. ISE measurement must be validated for feasibility by ASTI prior to sale.*

Last Modified October 15, 2015

ORDERING INFORMATION FOR 3TX FAMILY OF TRANSMITTERS

ENCLOSURE TYPE	
CODE	**DESCRIPTION**
3TX-0M	3TX Transmitter with No Enclosure
3TX-DIN	3TX Transmitter with No Enclosure; Preinstalled onto 35mm DIN-Rail
3TX-2MW	3TX Transmitter(s) with IP65 WeatherProof Enclosure; Up to 2 Total Modules (**Wall Installations Only**)
3TX-2M	3TX Transmitter(s) with IP65 WeatherProof Enclosure; Up to 2 Total Modules (Wall or Pipe Installations)
3TX-3MP	3TX Transmitter(s) with NEMA 4X Enclosure for ½-DIN **Panel Only**; Up to 3 Modules (**with Panel Bracket Assembly**)
3TX-3MF	3TX Transmitter(s) with NEMA 4X Enclosure; Up to 3 Total Modules (Wall or Pipe Installations)
3TX-4MW	3TX Transmitter(s) with IP65 WeatherProof Enclosure; Up to 4 Total Modules (**Wall Installations Only**)
3TX-4M	3TX Transmitter(s) with IP65 WeatherProof Enclosure; Up to 4 Total Modules (Wall or Pipe Installations)
3TX-6M ***	3TX Transmitter(s) with IP65 WeatherProof Enclosure; Up to 6 Total Modules (Wall or Pipe Installations)
3TX-7MF ***	3TX Transmitter(s) with NEMA 4X Enclosure; Up to 7 Total Modules (Wall or Pipe Installations)
3TX-9MF ***	3TX Transmitter(s) with NEMA 4X Enclosure; Up to 9 Total Modules (Wall or Pipe Installations)
MEASUREMENT MODULES ONE (1) THROUGH SEVEN (7)	
CODE	**DESCRIPTION**
-pH **	pH/ORP/mV/Temp Measurement Module / Transmitter
-CON-CELL/RANGE	Contacting Conductivity Measurement Module / Transmitter (CELL Constant & RANGE in mS Defined at Time of Order)
-ISE-ION **	Ion Selective (ISE) Measurement Module / Transmitter (Ion Measurement Type ION Must be Defined at Time of Order) *
-DO	Dissolved Oxygen Measurement Module / Transmitter For Galvanic Type DO sensors
OUTPUT OPTIONS FOR MEASUREMENT MODULES (ONE OPTION MUST BE SELECTED FOR EACH MODULE)	
CODE	**DESCRIPTION**
-A	Single Fully Scalable Analog 0-20 or 4-20 mA Ouput Only
-D	Single Fully Scalable Analog 0-20 or 4-20 mA Ouput Only AND RS-485 MODbus Digital Output
ADD-ON MODULES FOR MEASUREMENT MODULE ENCLOSURE ASSEMBLIES	
CODE	**DESCRIPTION**
-PS	100 to 240 VAC 50/60 Hz Universal Power Supply Adapter for Line Powered Operation
-TEM	Scalable Analog 0-20 or 4-20mA Temperature Transmitter for Raw or Spliced Pt100/Pt1000 temperature element
-SW	On/Off Power Switch (½ Width of power supply module and ¼ width of standard 3TX transmitter)
-REL	Alarm and Relay Controller Module for 3TX-pH, 3TX-ISE, 3TX-CON and 3TX-DO measurement modules
-TOT	Compute pH compensated "Total ISE" from analog inputs for ISE & pH, 0/4-20mA analog & MODbus digital ouputs
-DAT	Datalogger & MODbusmaster for 3TX Transmitters with RS485 MODbus; Download & Setup via RS232/USB on Windows
-TIM	Timer for Intermittent Operation with Battery Packs – Special Ultralow Power Consumption Style
-BAT	Universal Uninterruptible Power Supply with 1.4Ah (33W) LiPo Battery; For use with 7MF or 9MF Enclosures Only

Contact the factory for specific recommendations & ALL ISE inqueries. Pipe mounting bracket kits supplied separately. For 3MP, 3MF, 6M & 7MF enclosures power supply is not counted as a module for space purposes.

Model: **3TX-2M-pH-A-CON-1.0/50-D**
Description: Dual Channel Transmitter Assy w/ Weatherproof Enclosure (2 Total Modules); 1 each pH Measurement w/ Analog Output; 1 each Contacting Conductivity Measurement w/ Cell Constant 1.0/cm & Full Range 0-50mS/cm (Min Scaling 0-5.0mS/cm); with Analog and Digital MODbus RS-485 Outputs (No AC Power Supply)

Model: **3TX-3MP-ISE-F-A-pH-A-TOT-PS**
Description: Dual Channel Total Fluoride Measurement Transmitter Assembly with NEMA 4X (UL) Enclosure for ½-DIN Panel Mounting Installations (for 3 Total Modules); 1 each ISE Fluoride Ion and 1 each pH Measurement Module with Analog Output Only; 1 each TOT module to compute total fluoride (HF + F^-) with Analog & MODbus Outputs for all free fluoride, total fluoride, pH and temperature; With Universal 11 Power Supply Module

Model: **3TX-3MF-DO-D-TEM-SW-PS**
Description: Dissolve Oxygen Transmitter Assembly with NEMA 4X CSA/UL rated Enclosure; Field or Wall Mounting Installations (3 Module Max); 1 each DO transmitter for galvanic type dissolved oxygen sensors; Scalable Analog & MODbus Output for DO ppm, saturation & Temperature; 115/230 Power Supply with On/Off Switch

Model: **3TX-4MW-ISE-NH4-A-pH-A-TOT-PS**
Description: Dual Channel Total Ammonia Measurement Transmitter Assembly; Weatherproof Wall Mount Only Enclosure (4 Modules Max); 1 each ISE Ammonium Ion and 1 each pH Measurement Module with Analog Output Only; 1 each TOT to compute total ammonia (NH_3) with Analog & MODbus Outputs; With 115/230 Power Supply

Model: **3TX-6M-ISE-NH4-A-pH-A-TOT-ISE-NO2-A-pH-D-DO-D-PS**
Description: Five Channel Transmitter Assembly with Weatherproof Enclosure (for 6 Total Modules); 1 each ISE Ammonium Ion and 1 each pH Measurement Module with Analog Output Only; 1 each TOT module to compute total ammonia (NH_3) with Analog & MODbus Outputs; 1 each ISE Nitrite Ion with Analog Output Only; 1 each ORP Measurement Module and 1 each DO transmitter for galvanic active self-polarizing type sensors both with Scalable Analog & MODbus Outputs; With 115/230 Power Supply

Model: **3TX-6M-ISE-X-F-D-REL-pH-X-D-REL-CON-10.0/500-D-DAT-PS**
Description: Triple Channel Transmitter Assembly with Weatherproof Enclosure (for 6 Total Modules Max); 1 each Preamp Style Fluoride ISE Measurement Module & 1 each Preamp Style pH Measurement Module with Alarm/Relay Controller for both Fluoride ISE & pH; 1 each Contacting Conductivity Measurement with K=10.0/cm & Full Range 0-500mS; Analog & MODbus Outputs for All Measurements; DAT Datalogger/MODbusmaster Module to record all parameters; Universal 115/230 Power Supply

Model: **3TX-7MF-ISE-NH4-D-ISE-NO3-D-ISE-NO2-D-pH-D-CON-1.0/50-D-DO-D-DAT**
Description: Six Channel Measuring Transmitter Assembly Optimized for Low-Power Battery Operation; with NEMA 4X CSA/UL rated Enclosure (7 Module Max); 1 each ISE Ammonium Ion, 1 each ISE Nitrate Ion and 1 each ISE Nitrite Ion Module; 1 each pH module; 1 each Contacting Conductivity K= 1.0/cm & Full Range 0-50mS; 1 each Dissolved Oxygen module; Analog & MODbus Outputs for all Measurements & Temp; DAT Datalogger/MODbusmaster for continuous datalogging of all parameters

** To obtain a 3TX that supports and requires sensors with **preamplifiers**, order the pH/ORP transmitters as **–pH-X** and the ion selective (ISE) transmitters as **–ISE-X**
*** For 2" NPT pipe mounting installations, an additional adapter plate must also be ordered for the 6M, 7MF & 9MF enclosures (inquire to factory for details).