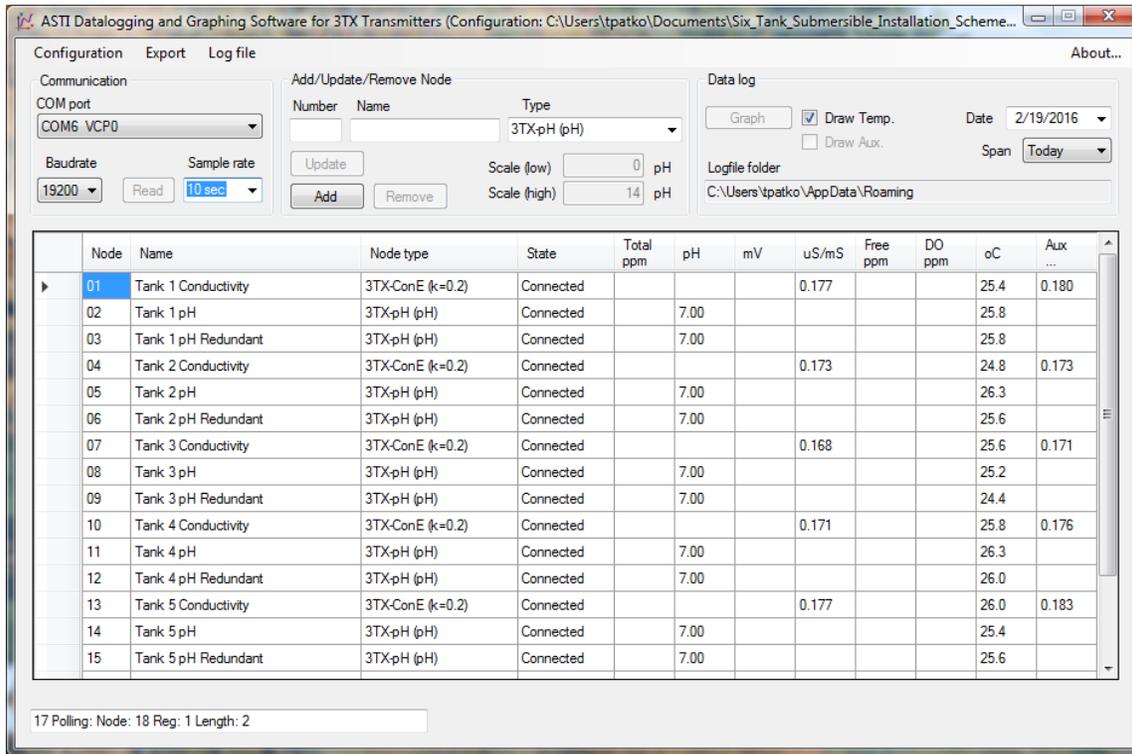


Installation and User Guide

ASTI Datalogging & Graphing Windows Software **Version 2.5** for 3TX pH, ISE, TOT, DO & Conductivity Transmitters with MODBUS Output



INSTALLATION GUIDE

Welcome to the ASTI 3TX MODbus Windows Software package. This software and Guide are provided by ASTI free of charge for use with its 3TX MODbus transmitters, although you must complete a ticket inquiry form to receive the installer. If you have not already done so, you may initiate a request to receive this software using the following URL:

<http://www.astisensor.com/cgi-bin/ttx.cgi>

There are **three requirements** to use this software with ASTI 3TX MODbus transmitters:

- 1) First, you must have a **Windows computer or tablet with a .NET framework 4.0 and a compatible operating system (OS)** AND an available USB port. Only these Windows operating systems are currently supported:
 - Windows XP SP3 (Not Officially Supported, Use on Best Faith Legacy Basis Only)
 - Windows Server 2003 SP2
 - Windows Vista SP1 or later
 - Windows Server 2008 (not supported on Server Core Role)
 - Windows Server 2008 R2 & Windows Server 2008 R2 SP1 (also not supported on Server Core Role)
 - Windows 7 & Windows 7 SP1 or later
 - Windows 8 & Windows 8.1
 - Windows Server 2012
 - Window 10 Professional (Tested on Microsoft Surface Pro Tablet for Touchscreen Compatibility)



Windows 7 and above computers & tablets already have the .NET framework 4.0 (or higher compatible version) installed. If your computer does not already have it, the software installer will automatically prompt you to install this dependency.

- 2) Second, you must have a **USB to RS-485 converter** to allow data from the 3TX MODbus digital output(s) to connect with a COM port in your Windows computer. You may purchase a converter from ASTI (to be shipped with your 3TX transmitter order or at a later time), or you may buy it from another company.

Although there are a number of USB to RS-485 converters available that are compatible with the ASTI 3TX MODbus software, the “USB to RS485 / RS422 Converter, Mini Premium” XS885 unit from USConverters is preferred because it has been very well tested with this software and is reasonably priced. This hardware device may be purchased from ASTI for your convenience, or may be purchased directly from USConverters through the following link:

<http://www.usconverters.com/usb-rs485-converter-xs885>

A single one of these USB to RS-485 XS885 units from USConverters can support up to 32 MODbus 3TX transmitters (also referred to as “nodes”). If you are using more than 32 nodes, you will need to add another piece of hardware called a MODbus repeater.

Please note that both the ASTI 3TX MODbus software and the hardware protocol can support up to a 247-node maximum. If you require support for more than 32 nodes (3TX transmitters), please contact the ASTI factory for assistance.

- 3) Third, you must have the **3TX transmitter units wired correctly and connected to the computer’s USB port with the converter**.

For discussion purposes in this Guide, it is assumed that you will be using the specific USB to RS485 / RS422 Converter, Mini Premium unit (“Converter”) recommended above. The driver for this converter is automatically loaded by the installer if not already present.

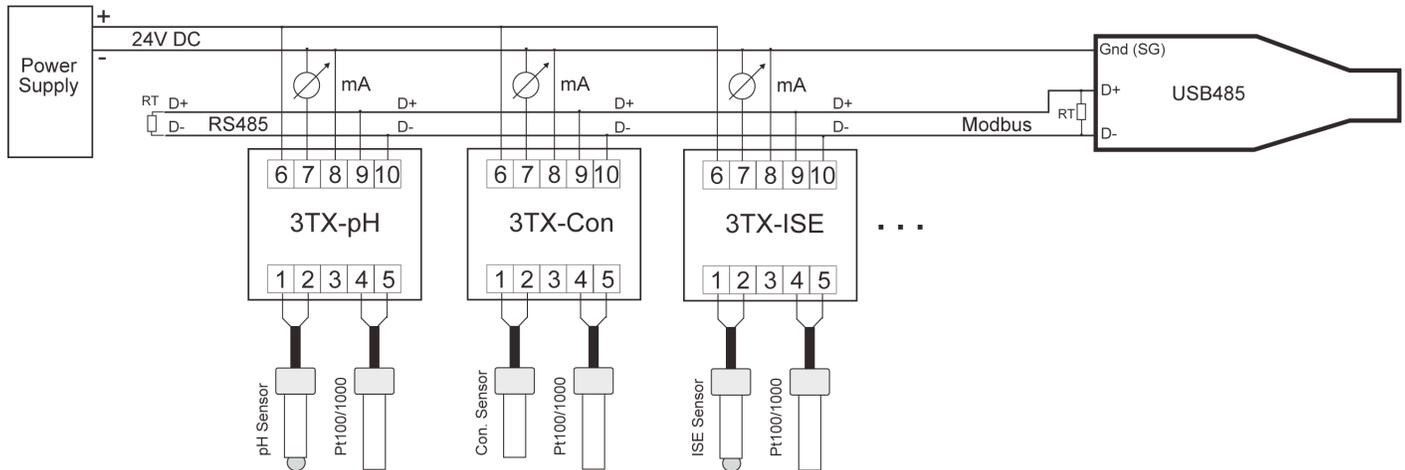
Cable distances up to 6500 feet (1.23 miles or 1.98 kilometers) can be supported for the Converter at the 9600 bps baudrate setting under optimal installation conditions. (Please see the User Guide below for further discussion of baudrate settings). A shielded two-wire PVC jacketed cable run in conduit is recommended for best results, particularly when running close to the maximum supported cable length.

WARNING: For your safety, always disconnect power from the transmitters before connecting or adjusting wiring.

To connect the MODbus output from the 3TX transmitter(s) to your computer: Match up the D+ and D- terminal connections on your 3TX transmitters with the D+ and D- terminal strip connections on the Converter. The 3TX MODbus connections can be “ganged” together so that many signals can be connected to the Converter with a single two-wire twisted-pair cable. If multiple 3TX transmitters are to be interfaced, you will need to bridge together all of the D+ and D- terminals. The two-wire twisted-pair cable can then be wired between any terminating transmitter (in other words, either the first or last transmitter in the line) and connected to any open USB port on your computer with the USB plug adapter on the Converter.

All 3TX transmitters with a MODbus digital output option can be interfaced, whether they are all installed on a single DIN-rail or multiple sets of transmitters separated by significant distances each located within remote weatherproof field enclosures.

The following diagram is a sample wiring scheme for 3TX transmitters with a Converter:



In most cases it is possible to omit the terminating “RT” resistors detailed in the schematic above without causing any problems. If you have difficulties with the software operating without these resistors installed, please contact the ASTI factory for assistance with selecting the most suitable terminating resistors for your installation.

If you have any specific wiring questions related to your 3TX transmitters (MODbus or otherwise), please inquire to the ASTI factory for further assistance.

Using the Software Installer

IMPORTANT NOTE: You must agree to the terms of the license to install the ASTI 3TX MODbus software. A copy of the license is included in the final two pages of this Guide. Please review it to ensure that the terms are acceptable before installation. Installation of the software shall constitute acceptance of the license.

To use the software installer, simply click on the link that is provided by e-mail from ASTI and follow the on-screen instructions to install the ASTI 3TX MODbus software. It is not usually necessary for you to be an administrator on the computer to install this software, although you might need to be an administrator to install the dependencies if they are not already present on your machine.

If you do not have the .NET framework 4.0 or the drivers for the USB converter already installed, you will be prompted to install one or both of them as well.

Software Versions and Updates

If the ASTI 3TX Modbus software is updated or revised in the future, new versions will be made available free of charge upon request through the ASTI ticket system. The current Guide will be available on the ASTI 3TX transmitter webpage:

<http://www.astisensor.com/3tx.htm>

You may check the 3TX transmitter webpage to ensure that you are running the most current version of the software. Each version will display the software revision number and release date. To view this information, click on the word “About” in the upper-right corner of the main software window.



USER GUIDE

The ASTI 3TX MODbus Windows Software is specifically designed to be used with ASTI 3TX transmitters to provide straightforward and easy-to-use datalogging and graphing functionality.

PLEASE NOTE: This software must be correctly configured and running at all times you wish datalogging to occur.

As an overview, the software contains the following **menus** and **fields**, all of which are accessible starting with the main window once the application has been installed and launched.

<u>MENUS</u> (Top, left to right in the main window):	<u>See page(s):</u>
"Configuration" menu <ul style="list-style-type: none"> • Load/ Save/ Save as 	4
"Export" menu <ul style="list-style-type: none"> • Selected Transmitter • All Transmitters • Column Delimiter • Decimal Point 	18-19
"Log file" menu <ul style="list-style-type: none"> • Select folder • Backup log • Restore log • Keep Log For • Delete log 	19-20
Supplemental Screenshots to Visualize Configuration Options	21-23

<u>FIELDS</u> (Middle, left to right in the main window):	<u>See page(s):</u>
"Communication" fields <ul style="list-style-type: none"> • COM Port • Baudrate • Sample Rate 	5-6
"Add/Update/Remove Node" fields <ul style="list-style-type: none"> • Number • Name • Type • Scale (low)/ Scale (high) 	6-15
"Data Log" fields <ul style="list-style-type: none"> • "Graph" button • "Draw Temp." checkbox • Date • Span • Logfile folder 	15-17
Sample Datalogging Graphs	15-16

These features are discussed in more detail below, in the approximate order in which you will likely use them:

"Configuration" Menu

The settings used in this software as well as the MODbus configuration for all attached 3TX transmitters are stored in a single configuration file with a ".csv" extension. These configuration files can be loaded from a previously saved configuration file ("**Load**"), saved as the default Configuration.csv filename ("**Save**"), or saved with an alternate filename of your choosing ("**Save As**"). The configuration file that was used most recently will load automatically.

NOTE: It is recommended that you save your first configuration file both after setting up the "Communication" fields, and after completing the "Add Node" process for each of your 3TX transmitters, as described below.



“Communication” Fields

There are three “Communication” fields: COM port, Baudrate, and Sample Rate.

1. COM Port

To set up your 3TX transmitters to connect properly with this software, you will need to select the correct COM port. As described above in the Installation Guide, you should already have the 3TX transmitter(s) connected through the USB port on your computer with a Converter.

If you click on the COM Port field, you will see that there are several COM ports listed (COM1, COM2, etc.), and there is a description after each COM port. Select the COM port with a description that starts with the letters “VCP” which is an acronym for “virtual com port” employed for FTDI chipset based serial to USB converter devices.

IMPORTANT NOTE: After the initial selection of the proper COM port, you will need to **close and restart the ASTI 3TX MODbus Windows Software**. The software will prompt you to save changes to the configuration file when you do this.

The last used COM port will be saved in the current configuration file, and will be selected automatically upon startup.

2. Baudrate

All transmitters connected together must be set to the same baudrate. The default baudrate for all 3TX transmitters with MODbus output is **19200 bps**.

Changing the default setting: You may need to choose the lower **9600 bps** setting if:

- You are using a long cable (such as 0.5 miles/ 0.8 kilometers or longer), or
- You experience problems with timeouts or other latency-related issues. Such problems may also be resolved by using a shielded two-wire twisted pair cable, or running the cable in conduit for better shielding and noise rejection.

NOTE: If you lower the baudrate, it must be changed on both the 3TX transmitters themselves and in the Baudrate field in the ASTI 3TX MODbus Windows Software. The parameter to change on the 3TX transmitter depends upon which type you are using. Please refer to the 3TX documentation to confirm the parameter.

If you lower the baudrate, you may also need to reduce the sampling frequency. (Please see next section.)

3. Sample Rate

Sample rate refers to the frequency of data sampling, or how often the connected 3TX transmitters are queried for data. The default sample rate is **10 seconds**. **Please see page 20 for a screenshot of all of the sampling rate options.**

Changing the default setting: There are 14 sample rates to choose from: 1, 2, 5, 10, and 30 seconds, and 1, 2, 5, 10, 30 or 60 minutes (one hour). Fast sampling rates of 2 Hz (2 times per sec), 3 Hz (3 times per sec) and 4 Hz (4 times per sec) are also possible for all 3TX transmitters. For very fast sampling rates such as 2 Hz (½ second), 3 Hz (1/3 sec) or 4 Hz (1/4 sec) a very short cable is required. Please note that data from all connected 3TX transmitters will be sampled at whichever sample rate is selected.

Manual Sampling: In addition to automatic sampling all connected 3TX transmitters at the available sampling frequencies it is also possible to perform manual measurements whereupon readings are taken only with user action. Manual readings are done when sample rate is set to “Manual”. In “manual” mode readings are only taken each time the “Read” button is clicked. All connected transmitters will have the readings taken simultaneously for each time this button is clicked.

If you experience timeout error messages at your selected sample rate, it is recommended that you reduce the sampling frequency by increasing the time interval (for example, adjust the sample rate from 10 seconds to 30 seconds or more), decrease the baudrate as described in the previous section, or both.

If you experience timeout issues with the sample rate set at the default 10 seconds, there is most likely another issue with the installation itself that must be addressed aside from modifying your sampling or baudrate settings.

“Add/Update/Remove Node” Fields

Each of your 3TX transmitters is considered a “node” in the software, and each node must be added, updated, or removed individually by clicking on the appropriate button for each function.

The “Add/ Update/ Remove Node” fields allow you to identify the MODbus address “Number,” the “Name,” the “Type,” and the “Scale” of each node.

ADDING NODES

Any time you have a 3TX transmitter that has not previously been used with this software, you will need to use the “Add Node” process to define its Number, Name, and Type. It is important to identify each node accurately so that you can properly datalog and graph the data. This process is identical whether the 3TX transmitters are added all at one time or individually.

NOTE: If you add nodes at a later date after the initial installation, be sure to save the new configuration (using “Save” to overwrite or “Save As” to rename it).

Overview: How to Add Nodes

To add nodes (3TX transmitters) to be tracked in the software, you will need repeat the following process for each node and enter the information into the software, one node at a time:

- 1) Define the node “number,”
- 2) Define the node “name,”
- 3) Identify the node “type,”
- 4) Click “Add,” and
- 5) Cross-check software data with 3TX data (Recommended).

Each step of this process is discussed in greater detail below.

1. Define the Node “Number”

Defining the MODbus address “number” for each node (3TX transmitter) is itself a three-part process:

- First, **assign a number to each individual node** (3TX transmitter). Best practice dictates that these numbers start at the number one (1) and increase sequentially for each transmitter to be added (1, 2, 3, etc.), taking care not to skip or duplicate any number.

For example, if you have 5 transmitters you would like to track with this software, number them 1 through 5, moving either from left-to-right or right- to-left. However, sequential numbering is not strictly required, and the software will still function if non-sequential numbers are assigned (although this creates greater potential for confusion).

- Second, **enter the assigned node number into parameter 02 (P02)** on the corresponding 3TX transmitter. To do this, follow these steps for each transmitter:
 - Step 1: Press the "Mode" button until the "Setup" light is lit.
 - Step 2: Press the "Up" button once to make the display read "P01," then press "Mode" to select.
 - Step 3: Press the "Up" button once to make the display read "OFF," then press "Mode" to select.
 - Step 4: Press the "Up" button once to make the display read "P02," then press "Mode" to select.
 - Step 5: Press the "Up" button until the display reads the number that you have assigned to that transmitter (ex: for the first transmitter, select "01"), then press "Mode" to select.

- NOTE 1: At steps 1-3, you are temporarily turning off the software lock (P01) so you can make a change to the 3TX settings. If there is a period of inactivity, the software lock may automatically toggle back to "On" mode. If so, start again at step 1.

- NOTE 2: For more details about navigating through the settings on your 3TX transmitter, please see the documentation that was delivered in the box with that 3TX transmitter.

- Third, **type the assigned number into the "Number" field** in the software. Please note that you will need to also enter the "Name" and "Type" of each node as described below before clicking the "Add" node button.

Up to 32 nodes can be supported on a single Converter without adding a MODbus repeater. If a MODbus repeater is correctly installed, as many as 247 nodes can be supported on a single MODbus line (network) with this software.

2. Define the Node "Name"

Assign a meaningful name to each 3TX transmitter, and type it into the "Name" field that corresponds with its assigned number. The name will be used as the header for datalogging graphs and exports for further workup in Excel. To be the most helpful, the name should reflect both:

- 1) The physical location of the installation, and
- 2) The type of measurement being performed.

For example, node names may be something like "Holding Tank pH," "Holding Tank Fluoride," etc.

3. Identify the Node "Type"

Each individual node is one of **21 possible "types"** described below.¹ Each type is associated with a corresponding range for the **Scale (low)** and **Scale (High)**.

To identify the correct type for each node:

First, check the label on the front of the 3TX transmitter to confirm which of the following 5 categories it fits into:

- A) pH/ORP ("pH" and "pHE")
- B) Conductivity ("Con" and "CON-E")
- C) Ion Selective ("ISE")
- D) Dissolved Oxygen ("DO")
- E) Total ISE ("TOT")

¹ NOTE: The software lists two additional types of special transmitters, "mVE" and "Tem." Please contact the factory for further details about these two special order transmitters.

Next, after confirming the general transmitter category, refer to the corresponding section below to determine which “type” fits that particular node. You will then select that type in the pull-down “Type” field in the software.

TIP: To check value of a parameter on your transmitter, press Mode" button until the "Setup" light is lit, then press the "Up" key until the display reads the parameter number. Press "Mode" again to read value.

A. 3TX-pH/ORP (“pH”) Transmitters:

There are 8 types of 3TX-pH/ORP transmitters configuration options falling into three different categories: **Transmitter 3TX-pH** (4 types) and **Transmitter 3TX-pHE** (2 types) and **Transmitter 3TX-HiQ-pH** (2 types). The MODbus output from the 3TX-pHE or 3TX-HiQ-pH with P10 set to ‘pHE’ mode are NOT compatible for use with the DAT field datalogger module.

NOTE: For both categories, the label on the front of the transmitter will simply say “pH.” Therefore, to confirm whether your transmitter is **-pH** or **-pHE**, check the top line of the label affixed to the **left side** of the transmitter.

Then, follow the corresponding directions below:

i. Transmitter 3TX-pH or 3TX-HiQ-pH with P10 set to ‘Dat’ mode:

Check the setting on parameter 3 (“P03”) on your 3TX-pH transmitter to determine whether it is in pH Mode or ORP Mode, and then select the corresponding settings below.

- If P03 reads “pH,” select type the **pH mode** as described below.
- If P03 reads “mV,” select the **ORP mode** as described below.
- For 3TX-HiQ-pH intelligent transmitter the sensor type (HiQ-pH or HiQ-ORP) is automatically determined from the connected sensor. Check the “Stats” menu of the HiQ Windows software or check the label on the smart digital HiQ sensor to determine which type of sensor is connected.

pH Mode:

- Select type: **3TX-pH (pH)**
 - Scale (low) is fixed at 0 pH, Scale (high) is fixed at 14 pH
 - Note: The resolution for the 3TX-pH in pH mode is 0.01 pH.

ORP Mode:

Check the ORP range at parameter 9 (“P09”) on your 3TX-pH transmitter, then select one of the three corresponding types in the chart below:

If P09 on 3TX-pH reads this:	Then select this type:	Scale (low) will be fixed at:	Scale (high) will be fixed at:
Neg	3TX-pH (-1000 mV)	-1000 mV	0 mV
Pos	3TX-pH (+1000 mV)	0 mV	+1000 mV
Ful	3TX-pH (±1000 mV)	-1000 mV	+1000 mV

- Note: The resolution for the 3TX-pH in ORP/mV mode is 1 mV.

ii. **Transmitter 3TX-pHE:**

Check parameter 3 (“P03”) on your analog 3TX-pH transmitter to determine whether it is in pH Mode or ORP Mode, and select the corresponding settings below.

- If P03 reads “pH” select the **pH mode** below.
- If P03 reads “mV” select the **ORP mode** below.

pH Mode:

- Select type: **3TX-pHE (pH)**
 - Scale (low) is fixed at -2 pH, Scale (high) is fixed at 16 pH
 - Note: The resolution for the 3TX-pHE in pH mode is 0.001 pH
 - The temperature range is 0 to 105 degrees Celsius with a resolution of 0.1 degrees

ORP Mode:

- Select type: **3TX-pHE (mV)**
 - Scale (low) is fixed at -1000 mV, Scale (high) is fixed at 1000 mV
 - Note: The resolution for the 3TX-pHE in ORP/mV mode is 0.1 mV
 - The temperature range is 0 to 105 degrees Celsius with a resolution of 0.1 degrees

iii. **Transmitter 3TX-HiQ-pH with P10 set to ‘pHE’ mode:**

For the 3TX-HiQ-pH Intelligent transmitters the type of connected smart digital pH sensor or ORP sensor is automatically detected (see 3TX-HiQ-pH manual for details). You can check parameter 3 (“P03”) on your 3TX-HiQ-pH transmitter to determine whether it is in pH Mode or ORP Mode, and the select the corresponding settings below. You can also check the “Stats” menu of the HiQ Windows software or else check the label on the smart digital HiQ sensor to determine which type of sensor is connected.

- If P03 reads “pH” select the **pH mode** below.
- If P03 reads “mV” select the **ORP mode** below.

pH Mode:

- Select type: **3TX-HiQ-pHE (pH)**
 - Scale (low) is fixed at -2 pH, Scale (high) is fixed at 16 pH
 - Note: The resolution for the 3TX-pHE in pH mode is 0.001 pH
 - The temperature range is -40 to +210 degrees Celsius with a resolution of 0.1 degrees

ORP Mode:

- Select type: **3TX-HiQ-pHE (mV)**
 - Scale (low) is fixed at -1000 mV, Scale (high) is fixed at 1000 mV
 - Note: The resolution for the 3TX-pHE in ORP/mV mode is 0.1 mV
 - The temperature range is -40 to +210 degrees Celsius with a resolution of 0.1 degrees

B. 3TX-Conductivity Transmitters ("Con", "Con-E" & "Con-F"):

There are 12 types of standard resolution 3TX-CON transmitters and 8 types of high resolution 3TX-CON-E & 3TX-CON-F transmitters. The conductivity transmitter output mode is defined if parameter 9 ("P09") and must be set to "Con". For all standard resolution conductivity transmitters, you must both:

1) select the conductivity transmitter type, and 2) enter the scale low and high settings.

The high resolution units are defined by the P22 setting only and the possible choices are described in section 3).

- 1) **Select the standard resolution 3TX-CON conductivity transmitter type.** Check Cell constant value (K) at parameter 22 ("P22") and the range at parameter 21 ("P21"), then select one of the 12 transmitter types below:

If P22 on 3TX-CON reads this:	And if P21 reads:	Then select this type:	Full scale range is:	Min. scale range is:
0.01	500	3TX-CON (K=0.01)	0-500 µS	0-50 µS
0.01	20	3TX-CON (K=0.01, 20µS)	0-20 µS	0-5 µS
0.1	5.00	3TX-CON (K=0.1)	0-5.00 mS	0-0.50 mS
0.1	200	3TX-CON (K=0.1, 200µS)	0-200 µS	0-50 µS
0.2	10	3TX-CON (K=0.2)	0-10.0 mS	0-1.00 mS
0.2	20	3TX-CON (K=0.2, 20mS)	0-20.0 mS	0-2.00 mS
1.0	50	3TX-CON (K=1.0)	0-50.0 mS	0-5.00 mS
1.0	2.00	3TX-CON (K=1.0, 2mS)	0-2.00 mS	0-0.50 mS
2.0	100	3TX-CON (K=2.0)	0-100 mS	0-10.0 mS
2.0	200	3TX-CON (K=2.0, 200mS)	0-200 mS	0-20.0 mS
10.0	500	3TX-CON (K=10)	0-500 mS	0-50.0 mS
20.0	1000	3TX-CON (K=20)	0-1000 mS	0-100 mS

- 2) **Enter the scale (low) and scale (high) data.** The MODbus output scaling will follow the analog 4mA and 20mA setpoints for that 3TX-CON transmitter. The minimum difference between the scale (low) and scale (high) values is defined by the "min. scale range" detailed above.

- **To set the scale (low):** Check parameter 11 ("P11") to find the 4mA setpoint, and enter that number in the "Scale (low)" field under the Add/Update/Remove Node section.
- **To set the scale (high):** Check parameter 12 ("P12") to find the 20mA setpoint, and enter that number in the "Scale (high):" field under the Add/Update/Remove Node section.

Note: Difference between scale low & high must be at least 10 percent full range for standard resolution units.



3) **Select the High resolution 3TX-CON-E or 3TX-CON-F conductivity transmitter type.** Check Cell constant value (K) at parameter 22 ("P22") then select one of the 9 transmitter types below:

P22 on 3TX-CON-E reads:	P21 will then read as follows:	Then select this type:	Full scale range is:	Min. scale range is:
0.02	2.00	3TX-ConE (K=0.02)	0-2.00 mS	N/A
0.1	5.00	3TX-ConE (K=0.1)	0-5.00 mS	N/A
0.2	20	3TX-ConE (K=0.2)	0-20 mS	N/A
1.0	50	3TX-ConE (K=1.0)	0-50.0 mS	N/A
2.0	200	3TX-ConE (K=2.0)	0-200 mS	N/A
10.0	500	3TX-ConE (K=10)	0-500 mS	N/A
20.0	1,000	3TX-ConE (K=20)	0-1,000 mS	N/A
20.0	1,000	3TX-ConF <i>For Use in -40 to +210°C</i>	0-1,000 mS	N/A

Note: The MODbus output for the 3TX-CON-E & 3TX-CON-F does NOT follow the analog output scaling setpoints. Please see 3TX-CON-E & 3TX-CON-F supplements for further details. The 3TX-CON-E & 3TX-CON-F MODbus outputs are NOT compatible with the DAT MODBUS datalogger field module.

C. 3TX-ISE Transmitters:

There are 3 types of 3TX-ISE transmitters. The ISE mode is defined if parameter 7 ("P07") is set to "ISE" on the 3TX-ISE transmitter. Check parameter 9 ("P09") on the ISE transmitter, then select one of the three types below:

If P09 on ISE transmitter reads this:	Then select this type:	Full scale range is:	Min. scale range is:
Lo	3TX-ISE (10 ppm)	0-10	0-2
Mi	3TX-ISE (100 ppm)	0-100	0-20
Hi	3TX-ISE (1000 ppm)	0-1000	0-200

Note: The difference between the scale (low) and scale (high) must be at least 20 percent of the full range. Note that the MODbus output on the 3TX-ISE transmitters does NOT follow the analog output scaling.

D. 3TX-DO & 3TX-DO-T Type Transmitters:

There are 2 types of 3TX-DO transmitters: **3TX-DO (ppm)** and **3TX-DO (%)**. Follow the steps below:

- 1) **Check parameter 11** (“P11”) to confirm which of the 2 types you have, and select that “type” in the software.
- 2) **Enter the scale (low) and scale (high) data.** The MODbus output scaling will follow the analog 4mA and 20mA setpoints for that 3TX-DO transmitter. The minimum difference between the scale (low) and scale (high) values is defined by the “min. scale range” detailed above.
 - **To set the scale (low):** Check parameter 14 (“P14”) to find the 4mA setpoint, and enter that number in the “Scale (low)” field under the Add/Update/Remove Node section.
 - **To set the scale (high):** Check parameter 15 (“P15”) to find the 20mA setpoint, and enter that number in the “Scale (high):” field under the Add/Update/Remove Node section.

Please note the scaling limits for each type of transmitter:

Transmitter Type	Full scale range is:	Min. scale range is:
3TX-DO (ppm)	0-40 ppm	0-4 ppm
3TX-DO (%)	0-400%	0-40%

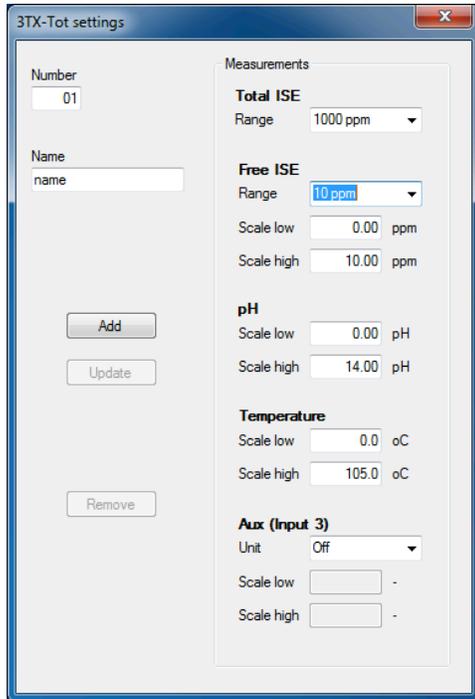
Notes: The difference between the scale (low) and scale (high) must be at least 10 percent of the full range (4 ppm or 40%). The ppm and % saturation ranges are tied together with a fixed 10X factor. As examples if the 3TX-DO (ppm) type is set to 2-10ppm then the corresponding % saturation is set to 20-100% or else if the 3TX-DO (%) type is set to 100-400% then the corresponding ppm range is set to 10-40ppm.

NOTE:

Please see page 22 for visualization of the drop-down menu options for the “Type” of 3TX transmitter to select for the “Add/Update/Remove Node” field.

E. 3TX-TOT Transmitters:

There is only one type of 3TX-TOT transmitter: select type **3TX-TOT** in the software. A box will open that prompts you to adjust the TOT settings; see sample screen image below.



Please refer to the chart below to adjust the TOT settings before clicking the “Add” button.

Measurement name	Variable	Default value	Check this parameter on TOT transmitter:	Then select:
Total ISE	Range	1000 ppm	P24	10, 100, or 1000 ppm
Free ISE	Range	10 ppm	P04	10, 100, or 1000 ppm
	Scale low	0.00 ppm	P05	Enter the ppm value
	Scale high	10.00 ppm	P06	Enter the ppm value
pH	Scale low	0.00 pH	P08	Enter the pH value
	Scale high	14.00 pH	P09	Enter the pH value
Temperature	Scale low	0.00 °C	n/a	Do not change default value
	Scale high	105.0 °C	n/a	Do not change default value
Aux (Input 3) - (OPTIONAL) * Please note special graphing options; see graphing section below	Unit	Off	P15	If present, select type: °C, pH, ORP/mV, CON, or ISE ²
	Scale low		P19	Enter the value
	Scale high		P20	Enter the value

² NOTE: If Aux (Input 3) is used for a 3TX-DO transmitter, it is treated as an ISE for purposes of this configuration.

4. Click the “Add” Button

After you have entered the Number, Name, and Type for an individual node, click the “Add” button. After a few seconds, this information should appear on a line in the **Datalogging Chart** in the bottom half of the screen. The "State" column should read "Connected," and the temperature and process measurement values should appear.

5. Cross-Check Software Data With 3TX Data (Recommended)

It will take a few seconds for the software to start receiving data from the node after you click the “Add” button. To confirm that the software is working properly, there are two easy ways to cross-check the data displayed in the Datalogging Chart and the 3TX data:

- **Cross-check the process measurement.** Press the "Mode" button on the 3TX transmitter until the light is lit next to the unit being measured (pH/mV, ppm, etc.) The reading on the transmitter should match the reading listed next to that node in the Datalogging Chart in the software. And/or:
- **Cross-check the temperature reading.** Press the "Mode" button on the 3TX transmitter until the light is lit next to the °C unit. The reading on the transmitter should match the reading listed next to that node in the Datalogging Chart in the software.

NOTE: Small deviations between the two values are normal and should be well within the margin of error of the digital MODbus output resolution.

Repeat steps 1 through 5 for each 3TX transmitter until each one has been added successfully, remembering to save changes to the configuration.

UPDATING OR REMOVING NODES

Updating or removing a node will alter your configuration and could possibly compromise historical data unless you take steps to preserve the data first. Before updating or removing any node, you should take each of the following steps for documentation purposes:

- 1) Save the current configuration file with a new file name (“Configuration” menu → “Save As”) to preserve historical configuration.
- 2) Save a backup of the existing database by creating a “Backup Log.” (Please see related section later in this Guide for more details).
- 3) Use the “Export → All Transmitters” function to save the existing data for further workup in Excel if needed in the future. (Please see related section later in this Guide for more details).

After these steps have been completed, you may click on the node you wish to update or delete, then:

- **To update:** Double-click in the blank box in the far-left column of the Datalogging Chart next to the “Node” number you wish to update. This will make a ► icon appear in that column, and the corresponding node number should appear in the “Number” field above. Make the desired changes to the node using the “Name” and “Type” fields in the “Add/Update/Remove Node” section, then click the “Update” button.
- **To remove:** Click in the blank box in the far-left column of the Datalogging Chart next to the “Node” number you wish to remove to highlight the row, then click the “Remove” button to delete it from the software.

After you have either updated or removed the node(s), you should then take the following steps:

- 1) Save the new configuration with a new name ("Save As"); and,
- 2) Delete the previous database log file. This will allow a clean new database log to automatically be created with the new configuration. (Please see related section later in this Guide for more details).

"Data Log" Fields

The "Data log" fields allow you to select which data will be exported or graphed for any individual transmitter selected ("Date" and "Span"), display node data graphically ("Graph"), and display the saved location of the database log file ("Logfile folder").

IMPORTANT NOTE: This software only tracks data when the software is running! The software must be correctly configured and running at all times that you wish datalogging to occur. No datalogging will occur in the "background" if the computer goes to "sleep" or if the program is closed.

"Date" and "Span"

The "Date" and "Span" that you select will be used for all graphing and exporting functions for individual nodes. "Date" is the end date for the time period you select, and "Span" is the period of time prior to that end date that you wish to review.

Example: If "Date" is the current date, and "Span" is "1 week," the software will select and display data from the past one week through today's date each time you "Graph" or "Export" data for any individual node.

Initial default settings: The initial default "Date" is the current date, and the initial default "Span" is "Today." With those settings, you may graph and view data logs for all connected 3TX transmitters from the start of the current date through the present time. (Note that if you save a new configuration, the software will no longer revert to these default values.)

Changing the default settings: To select a different period of time to view, graph, or export, simply select any valid "Date" that exists in the database, then select a span of time to look back at the data in the database. You may click on the calendar icon on the right side of the "Date" field to bring up a calendar, then click on the desired end date.

The "Span" options that may be selected from the pull-down menu are "Today," "1 day," "2 days," "1 week," "2 weeks," "1 month," "3 months," or "All." Choosing "All" will select all data that exists in the database for all nodes. Note that choosing "Today" as the span will select data up to the present time, if the current date is selected for "Date." **Please see page 22 for screenshots to visualize the available options for the "Span" drop-down menu.**

The "Date" and "Span" settings may be changed at any time, and should be checked before graphing or exporting to make sure only the subset of data that is relevant at that time will be included. If you would like to save the Date and Span options selected, you will need to save any change(s) to the configuration. You will be prompted to do so if you try to close the software without saving such change(s).

"Graph"

To graph the process measurement data for a particular 3TX transmitter for the period of time selected in the Date and Span fields, simply click on the ► icon next to the node that you wish to graph, then click the Graph button.

You may include or exclude the temperature from your graph using the "**Draw Temp.**" checkbox. A graph for that node will automatically open in a new window, and can automatically update in real time at the frequency defined in the "Sample Rate" field. The scaling will auto range for both the process measurement and temperature on this graph based upon the datalogged values for the selected time span.

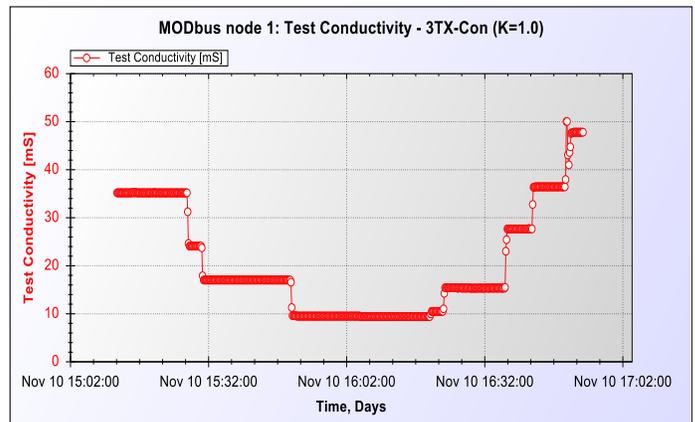
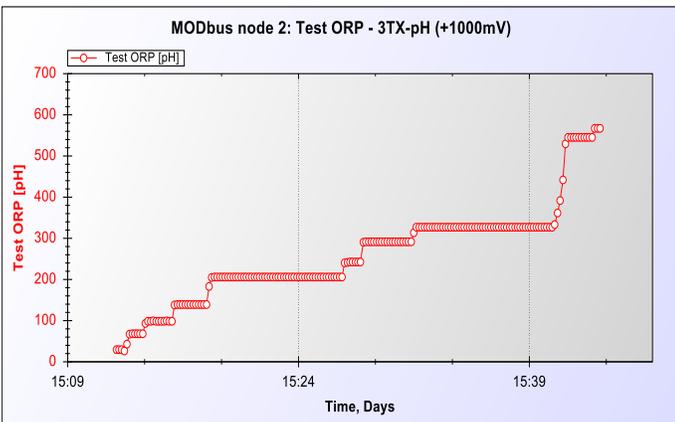
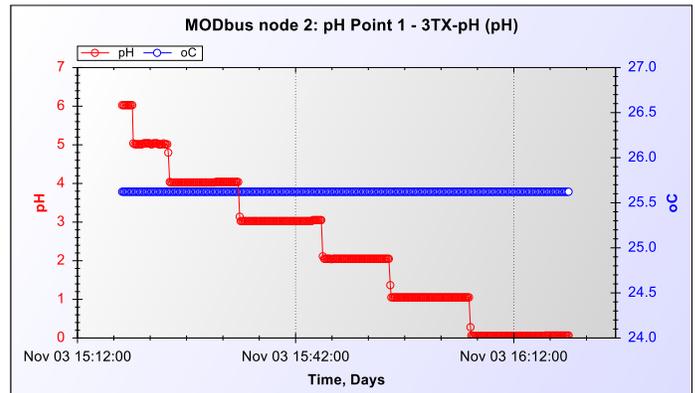
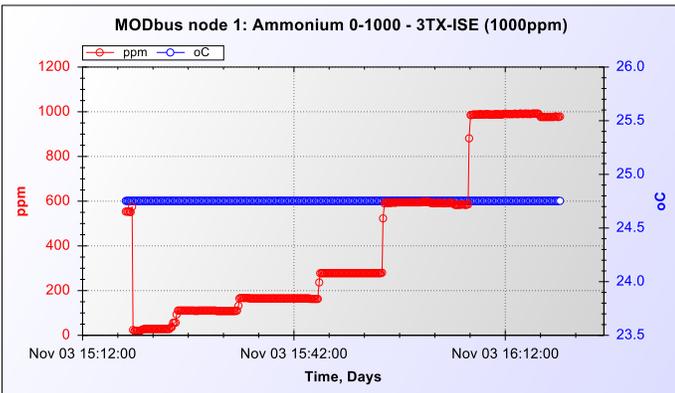
Each 3TX transmitter selected to "Graph" will be graphed in a separate window. There is no limit to how many graphs can be loaded for live visualization at the same time beyond the system resources of your Windows PC itself. For most modern computers, this means that all 3TX transmitter nodes can be graphed and displayed at the same time, provided that you have sufficient room on your computer monitor(s) to effectively view all graphs at once. Alternatively, graphs can be minimized or maximized as desired if you have limited space on your monitor for simultaneous display.

Graphing Right-Click Options

A number of functions are available by right-clicking anywhere within a graph window:

1. "Copy" allows you to copy a static image of the current graph to the clipboard of your computer. It may then be "pasted" into a Word document or other file type.
2. "Save Image As" allows you to select a file name and offers a variety of possible file formats.
3. "Page Setup" can be used to make adjustments to how the graph will appear if printed.
4. "Print" allows you to print the graph as it currently appears in the window.
5. "Show Point Values" allows you to hover the cursor over any point along the graph line and view a pop-up field displaying the date, time, and value of that point.
6. "Un-Zoom", "Undo All Zoom/ Pan" revert to the default view.
7. "Set Scale to Default" reverts to predefined scale settings.

Sample graphs are shown below to illustrate some example data sets, both with and without the temperature displayed:





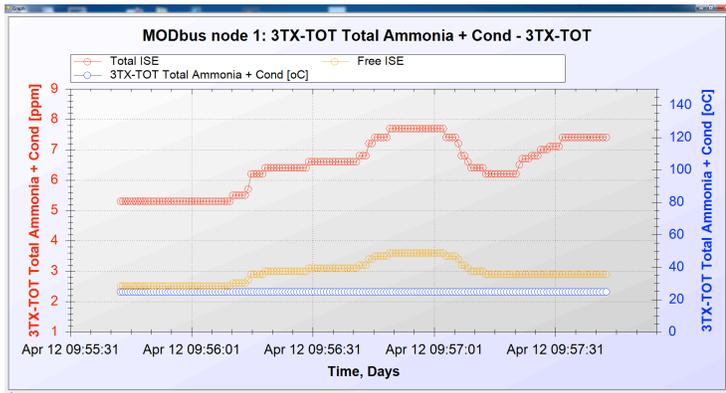
“Draw Aux.” Graphing Options for 3TX-TOT Transmitters With Aux (Input 3)

When a 3TX-TOT transmitter is set up with the optional Aux (Input 3) feature, the checkbox beneath “Draw Temp” also becomes available as a graphing option: “Draw Aux.” The software will allow graphing of up to 3 variables at once, so you may check either “Draw Temp,” “Draw Aux,” or neither checkbox to display different variables.

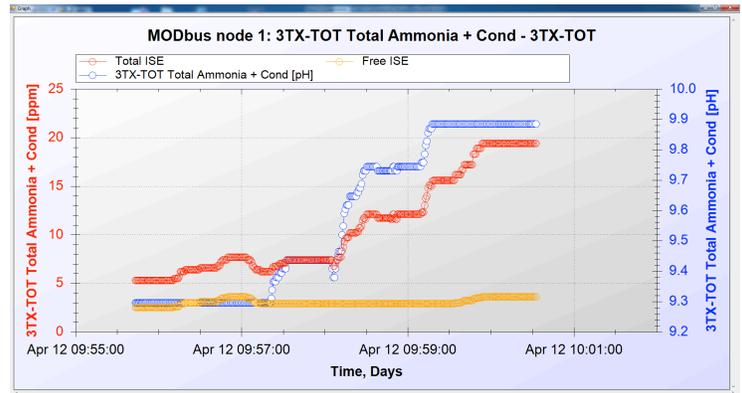
Status of “Draw Temp” Box	Status of “Draw Aux” Box	Variables graph will display
Not checked	Not checked	<ul style="list-style-type: none"> • Total ISE • Free ISE • pH
Checked	Not checked	<ul style="list-style-type: none"> • Total ISE • Free ISE • Temperature
Not checked	Checked	<ul style="list-style-type: none"> • Total ISE • Free ISE • Aux/ Input 3

Note: Although you may not select both “Draw Temp” and “Draw Aux” in a single graph, you may open multiple graphs simultaneously in different windows if you wish.

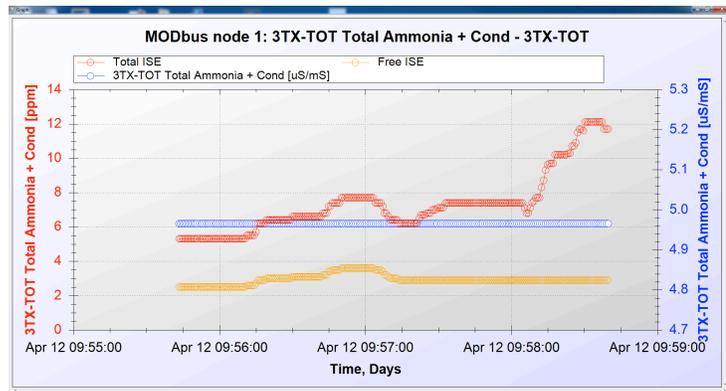
Some additional screenshots showing the graphing capabilities for the TOT and DO transmitter type nodes:



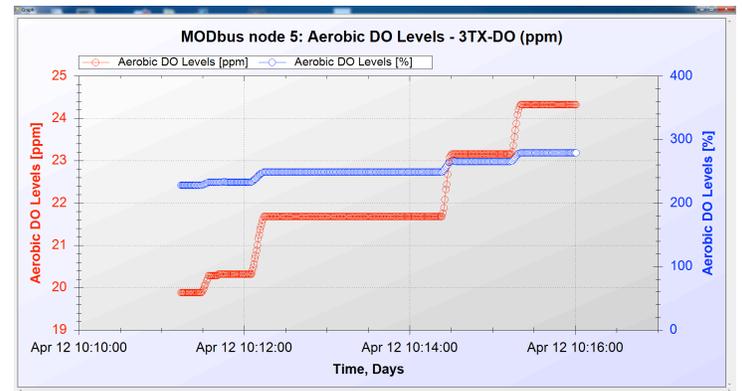
Graph showing total ISE & free ISE at constant pH & temperature



Graph showing total ISE & free ISE with changing pH & constant temp



Graph showing total ISE & free ISE with Auxillary Conductivity Input



Graph showing Dissolved Oxygen ppm & % Saturation at constant temp

"Export" Menu

The "Export" menu allows you to view, save, or print a subset of data for a "Selected Transmitter" for the "Date" and "Span" of your choosing. You may also save or export all data for all connected 3TX transmitters with the "All Transmitters" option.

"Selected Transmitter"

To select a single 3TX transmitter node, click on the ► icon to the left of the node number, then click on "Selected Transmitter" in the "Export" pull-down menu. This will open a window containing the data set for the period of time identified in the "Date" and "Span" fields. This data set may then be viewed, printed, or exported and saved as a ".csv" file for further workup in Excel.

Print Options

"Print options" allows you to adjust settings such as which columns to print, the title of the print, and whether to print "All" or "Selected" rows. Clicking "OK" will take you to a Print Preview window before actually printing. Please note before printing that reports can be very many pages long, and you can instead select just a portion of the report to print.

To select certain rows for printing, click on the ► icon or blank box in the far left-hand column of a row using either control+click to highlight individual rows, or shift+click to select a range of multiple rows at one time. Then select the "Print" menu, and in the "Rows to print" box, click to choose "Selected."

In the alternative, if you find that the report is too lengthy to print, you may wish to go back and reduce the "Span" field to a shorter period of time to limit the data selected.

Save Options

Please note that you must select ".csv" under "Save as type" in order to workup the data in Excel.

NOTE: The window opened through this menu option takes the place of the main window, and you will need to close the window to view the main window and access other software functions again.

"All Transmitters"

Selecting "All Transmitters" from the "Export" menu will prompt you to name and save a file with a ".csv" extension. Unlike the "Selected Transmitter" option described above, the data set will not be limited to the "Date" and "Span" selected in the "Data log" fields. That file will contain all data that exists in the database for all connected 3TX transmitters, and may then be used to view, print, or workup data in Excel.

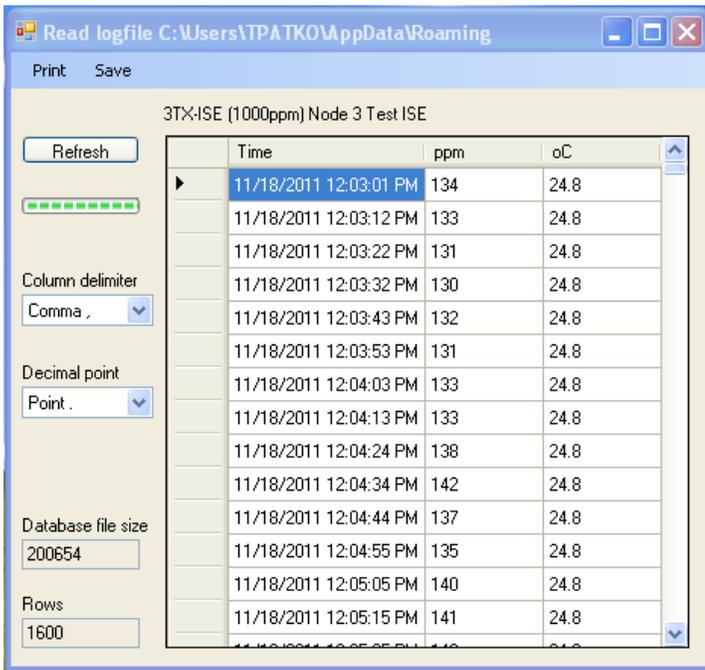
"Column Delimiter" and "Decimal Point"

You may need to change from the default column delimiter and decimal point settings to address any localization issues related to importing into your version of Excel. The default delimiter and decimal point selections will be saved as part of your configuration file.

The default "Column delimiter" is "Semicolon ;" which may be changed to "Comma ,"

NOTE: It is recommended to change this default setting to "Comma" for all customers in the United States to ensure compatibility with Excel.

The default "Decimal point" is "Point ." which may be changed to a "Comma ,"



Read logfile C:\Users\TPATKOV\AppData\Roaming

Print Save

3TX-ISE (1000ppm) Node 3 Test ISE

Refresh

Column delimiter: Comma ,

Decimal point: Point .

Database file size: 200654

Rows: 1600

Time	ppm	oC
11/18/2011 12:03:01 PM	134	24.8
11/18/2011 12:03:12 PM	133	24.8
11/18/2011 12:03:22 PM	131	24.8
11/18/2011 12:03:32 PM	130	24.8
11/18/2011 12:03:43 PM	132	24.8
11/18/2011 12:03:53 PM	131	24.8
11/18/2011 12:04:03 PM	133	24.8
11/18/2011 12:04:13 PM	133	24.8
11/18/2011 12:04:24 PM	138	24.8
11/18/2011 12:04:34 PM	142	24.8
11/18/2011 12:04:44 PM	137	24.8
11/18/2011 12:04:55 PM	135	24.8
11/18/2011 12:05:05 PM	140	24.8
11/18/2011 12:05:15 PM	141	24.8

"Log File" Menu

This menu allows you to choose how long to retain the log data ("Keep Log for"), select the database log file location, and backup, restore or delete the log file. Please note that there can only be one active log file at any given time that contains the data for all attached 3TX transmitters; there are no separate files for individual transmitters.

"Keep Log for"

This field defines the period of time that the entire database log file will be stored for all values for all nodes.

Initial default setting: The initial default setting is "Always."

Changing the default setting: Click on the "Log file" menu, then select "Keep Log for." The options that may be selected are "Always," "1 Day," "1 Week," "1 Month," or "3 Months." For most modern computers, there is little reason not to select "3 Months" or "Always," as the filesize of database generated from such logging is quite reasonable.

The "Keep Log for" option may be changed at any time. After doing so, you will need to save the change to the configuration. You will be prompted to do so if you try to close the software without saving the change.

"Select Folder"

Click on "Select folder" to choose a destination folder for your active database log file. Be sure to choose a location where you have local read and write permission. It is not recommended to choose a network drive for the location. A file containing the database with the file name "logdb.db" will appear in the selected folder.

The location of the current database log file will be displayed in the Data log fields ("Logfile folder" field).

"Backup log"

The database file is saved and updated automatically in real time as the datalogging occurs. However, you may wish to manually create a backup log with the "Backup log" function periodically for the following reasons:

- Archiving;
- Before performing certain operations, such as Update Node, Restore log, or Delete log; and/or
- To view the data on a different computer than where the datalogging occurred using the same software (as opposed to viewing in Excel, which may be accomplished using the "Export All" function).

To create a backup of the entire database and configuration, click on the "Log file" menu, then select "Backup log." You will be prompted to select a destination folder and choose a file name with a ".dbb" extension. Be sure not to save as any other file type than .dbb or you will not be able to use the data for restoration purposes.

"Restore Log"/ "Delete log"

Before restoring or deleting the log file, it is highly recommended that you follow the same steps to preserve data that were recommended above when updating or removing a node:

- 1) Save the current configuration file with a new file name ("Configuration" menu → "Save As") to preserve historical configuration.
- 2) Save a backup of the existing database by creating a "Backup log." (See section above).
- 3) Use the "Export → All Transmitters" function to save the existing data for further workup in Excel if needed in the future.

After following the steps above, you may either restore the log file from a backup log, or delete the log file.

To Restore Log:

Click on the "Log file" menu and select "Restore log" to load the database from a backup file. A pop-up window will warn that the existing log and configuration will be overwritten. This is required to complete the restore function, as there may only be one configuration and database log file active at any time.

You will then need to double-click on a valid database backup file with a ".dbb" file extension. The backup will then automatically restore both the configuration and the database and make the data available for all functions, such as graphing, exporting, etc.

NOTE: The restored configuration might not be compatible with the current configuration of the 3TX transmitters themselves.

To Delete Log:

Click on the "Log file" menu and select "Delete log" to delete the database file. The current configuration will not be deleted with this function, and would need to be manually changed if changes are desired. Please refer to the section on Adding, Updating, and Removing Nodes, or load a previously saved configuration.

Last Revised April 2018



SUPPLEMENTAL SCREENSHOTS TO VISUALIZE CONFIGURATION OPTIONS (1 of 3)

ASTI Datalogging and Graphing Software for 3TX Transmitters (Configuration: C:\Users\tpatko\Documents\Six_Tank_Submersible_Installation_Scheme...)

Configuration Export Log file

Communication: COM port: COM6 VCPD, Baudrate: 19200, Sample rate: 10 sec

Add/Update/Remove Node: Type: 3TX-pH (pH), Scale (low): 0 pH, Scale (high): 14 pH

Data log: Graph, Draw Temp. (checked), Date: 2/19/2016, Draw Aux. (unchecked), Logfile folder: C:\Users\tpatko\AppData\Roaming

Node	Name	Node type	State	Total ppm	pH	mV	uS/mS	Free ppm	DO ppm	oC	Aux ...
01	Tank 1 Conductivity	3TX-ConE (k=0.2)	Connected				0.177			25.4	0.180
02	Tank 1 pH	3TX-pH (pH)	Connected		7.00					25.8	
03	Tank 1 pH Redundant	3TX-pH (pH)	Connected		7.00					25.8	
04	Tank 2 Conductivity	3TX-ConE (k=0.2)	Connected				0.173			24.8	0.173
05	Tank 2 pH	3TX-pH (pH)	Connected		7.00					26.3	
06	Tank 2 pH Redundant	3TX-pH (pH)	Connected		7.00					25.6	
07	Tank 3 Conductivity	3TX-ConE (k=0.2)	Connected				0.168			25.6	0.172
08	Tank 3 pH	3TX-pH (pH)	Connected		7.00					25.4	
09	Tank 3 pH Redundant	3TX-pH (pH)	Connected		7.00					24.4	
10	Tank 4 Conductivity	3TX-ConE (k=0.2)	Connected				0.171			25.8	0.176
11	Tank 4 pH	3TX-pH (pH)	Connected		7.00					26.3	
12	Tank 4 pH Redundant	3TX-pH (pH)	Connected		7.00					26.0	
13	Tank 5 Conductivity	3TX-ConE (k=0.2)	Connected				0.178			26.0	0.183
14	Tank 5 pH	3TX-pH (pH)	Connected		7.00					25.4	
15	Tank 5 pH Redundant	3TX-pH (pH)	Connected		7.00					25.6	

125 Polling: Node: 18 Reg: 1 Length: 2

Screenshots are above and below to visualize the automatic sampling rate and manual sampling configuration options.

ASTI Datalogging and Graphing Software for 3TX Transmitters (Configuration: C:\Users\tpatko\Documents\Six_Tank_Submersible_Installation_Scheme...)

Configuration Export Log file

Communication: COM port: COM6 VCPD, Baudrate: 19200, Sample rate: Manual

Add/Update/Remove Node: Type: 3TX-pH (pH), Scale (low): 0 pH, Scale (high): 14 pH

Data log: Graph, Draw Temp. (checked), Date: 2/19/2016, Draw Aux. (unchecked), Logfile folder: C:\Users\tpatko\AppData\Roaming

Node	Name	Node type	State	Total ppm	pH	mV	uS/mS	Free ppm	DO ppm	oC	Aux ...
01	Tank 1 Conductivity	3TX-ConE (k=0.2)	Connected				0.177			25.4	0.180
02	Tank 1 pH	3TX-pH (pH)	Connected		7.00					25.8	
03	Tank 1 pH Redundant	3TX-pH (pH)	Connected		7.00					25.8	
04	Tank 2 Conductivity	3TX-ConE (k=0.2)	Connected				0.173			24.8	0.173
05	Tank 2 pH	3TX-pH (pH)	Connected		7.00					26.3	
06	Tank 2 pH Redundant	3TX-pH (pH)	Connected		7.00					25.6	
07	Tank 3 Conductivity	3TX-ConE (k=0.2)	Connected				0.168			25.6	0.171
08	Tank 3 pH	3TX-pH (pH)	Connected		7.00					25.2	
09	Tank 3 pH Redundant	3TX-pH (pH)	Connected		7.00					24.4	
10	Tank 4 Conductivity	3TX-ConE (k=0.2)	Connected				0.171			25.8	0.176
11	Tank 4 pH	3TX-pH (pH)	Connected		7.00					26.3	
12	Tank 4 pH Redundant	3TX-pH (pH)	Connected		7.00					26.0	
13	Tank 5 Conductivity	3TX-ConE (k=0.2)	Connected				0.177			26.0	0.183
14	Tank 5 pH	3TX-pH (pH)	Connected		7.00					25.4	
15	Tank 5 pH Redundant	3TX-pH (pH)	Connected		7.00					25.6	

17 Polling: Node: 18 Reg: 1 Length: 2



SUPPLEMENTAL SCREENSHOTS TO VISUALIZE CONFIGURATION OPTIONS (2 of 3)

ASTI Datalogging and Graphing Software for 3TX Transmitters (Configuration: C:\Users\tpatko\Documents\Six_Tank_Submersible_Installation_Scheme...)

Configuration Export Log file

Communication: COM port: COM6 VCP0, Baudrate: 19200, Sample rate: 10 sec

Add/Update/Remove Node

Number	Name	Type
		3TX-pH (pH)
		3TX-pH (pH)
		3TX-pH (-1000mV)
		3TX-pH (+1000mV)
		3TX-pH (±1000mV)
		3TX-pHE (pH)
		3TX-pHE (mV)
		3TX-mVE
		3TX-Con (K=0.01, 20uS)
		3TX-Con (K=0.01)
		3TX-Con (K=0.1, 200uS)
		3TX-Con (K=0.1)
		3TX-Con (K=0.2)
		3TX-Con (K=0.2, 20mS)
		3TX-Con (K=1.0, 2mS)
		3TX-Con (K=1.0)
		3TX-Con (K=2.0)
		3TX-Con (K=2.0, 200mS)
		3TX-Con (K=10)
		3TX-Con (K=20)
		3TX-ConE (k=0.02)
		3TX-ConE (k=0.1)
		3TX-ConE (k=0.2)
		3TX-ConE (K=1.0)
		3TX-ConE (k=2.0)
		3TX-ConE (K=10)
		3TX-ConE (k=20)
		3TX-ConF
		3TX-ISE (10ppm)
		3TX-ISE (100ppm)
		3TX-ISE (100ppm)

Node	Name	Node type	pH	mV	uS/mS	Free ppm	DO ppm	oC	Aux ...
01	Tank 1 Conductivity	3TX-ConE (k=0.2)			0.177			25.4	0.180
02	Tank 1 pH	3TX-pH (pH)	7.00					25.8	
03	Tank 1 pH Redundant	3TX-pH (pH)	7.00					25.8	
04	Tank 2 Conductivity	3TX-ConE (k=0.2)			0.173			24.8	0.173
05	Tank 2 pH	3TX-pH (pH)	7.00					26.3	
06	Tank 2 pH Redundant	3TX-pH (pH)	7.00					25.6	
07	Tank 3 Conductivity	3TX-ConE (k=0.2)			0.168			25.6	0.171
08	Tank 3 pH	3TX-pH (pH)	7.00					25.2	
09	Tank 3 pH Redundant	3TX-pH (pH)	7.00					24.4	
10	Tank 4 Conductivity	3TX-ConE (k=0.2)			0.171			25.8	0.175
11	Tank 4 pH	3TX-pH (pH)	7.00					26.3	
12	Tank 4 pH Redundant	3TX-pH (pH)	7.00					26.0	
13	Tank 5 Conductivity	3TX-ConE (k=0.2)			0.177			26.0	0.183
14	Tank 5 pH	3TX-pH (pH)	7.00					25.4	
15	Tank 5 pH Redundant	3TX-pH (pH)	7.00					25.6	

161 Polling: Node: 18 Reg: 1 Length: 2

Screenshots are above and below to visualize the available 3TX transmitter "Types" available for configuration each node.

ASTI Datalogging and Graphing Software for 3TX Transmitters (Configuration: C:\Users\tpatko\Documents\Six_Tank_Submersible_Installation_Scheme...)

Configuration Export Log file

Communication: COM port: COM6 VCP0, Baudrate: 19200, Sample rate: 10 sec

Add/Update/Remove Node

Number	Name	Type
		3TX-pH (pH)
		3TX-pHE (pH)
		3TX-pHE (mV)
		3TX-mVE
		3TX-Con (K=0.01, 20uS)
		3TX-Con (K=0.01)
		3TX-Con (K=0.1, 200uS)
		3TX-Con (K=0.1)
		3TX-Con (K=0.2, 20mS)
		3TX-Con (K=1.0, 2mS)
		3TX-Con (K=2.0)
		3TX-Con (K=2.0, 200mS)
		3TX-Con (K=10)
		3TX-Con (K=20)
		3TX-ConE (k=0.02)
		3TX-ConE (k=0.1)
		3TX-ConE (k=0.2)
		3TX-ConE (K=1.0)
		3TX-ConE (k=2.0)
		3TX-ConE (K=10)
		3TX-ConE (k=20)
		3TX-ConF
		3TX-ISE (10ppm)
		3TX-ISE (100ppm)
		3TX-ISE (100ppm)
		3TX-DO (ppm)
		3TX-DO (%)
		3TX-TOT
		3TX-Tem

Node	Name	Node type	pH	mV	uS/mS	Free ppm	DO ppm	oC	Aux ...
01	Tank 1 Conductivity	3TX-ConE (k=0.2)			0.177			25.4	0.180
02	Tank 1 pH	3TX-pH (pH)	7.00					25.8	
03	Tank 1 pH Redundant	3TX-pH (pH)	7.00					25.8	
04	Tank 2 Conductivity	3TX-ConE (k=0.2)			0.173			24.8	0.173
05	Tank 2 pH	3TX-pH (pH)	7.00					26.3	
06	Tank 2 pH Redundant	3TX-pH (pH)	7.00					25.6	
07	Tank 3 Conductivity	3TX-ConE (k=0.2)			0.168			25.6	0.172
08	Tank 3 pH	3TX-pH (pH)	7.00					25.4	
09	Tank 3 pH Redundant	3TX-pH (pH)	7.00					24.4	
10	Tank 4 Conductivity	3TX-ConE (k=0.2)			0.171			25.8	0.176
11	Tank 4 pH	3TX-pH (pH)	7.00					26.3	
12	Tank 4 pH Redundant	3TX-pH (pH)	7.00					26.0	
13	Tank 5 Conductivity	3TX-ConE (k=0.2)			0.177			26.0	0.183
14	Tank 5 pH	3TX-pH (pH)	7.00					25.4	
15	Tank 5 pH Redundant	3TX-pH (pH)	7.00					25.6	

179 Polling: Node: 18 Reg: 1 Length: 2



SUPPLEMENTAL SCREENSHOTS TO VISUALIZE CONFIGURATION OPTIONS (3 of 3)

The screenshot displays the 'ASTI Datalogging and Graphing Software for 3TX Transmitters' interface. The window title is 'ASTI Datalogging and Graphing Software for 3TX Transmitters (Configuration: C:\Users\tpatko\Documents\Six_Tank_Submersible_Installation_Scheme...'. The interface includes several panels:

- Communication:** COM port (COM6 VCP0), Baudrate (19200), Sample rate (10 sec).
- Add/Update/Remove Node:** Fields for Number, Name, Type (3TX-pH (pH)), Scale (low: 0 pH, high: 14 pH), and buttons for Update, Add, and Remove.
- Data log:** Graph button, checkboxes for Draw Temp. and Draw Aux., Date (2/19/2016), Span dropdown (Today, 1 day, 2 days, 1 week, 2 weeks, 1 month, 3 months, All), and Logfile folder (C:\Users\tpatko\AppData\Roaming).

The main data table lists 15 nodes with the following columns: Node, Name, Node type, State, Total ppm, pH, mV, uS/mS, Free ppm, DO ppm, and °C. Node 01 is selected.

Node	Name	Node type	State	Total ppm	pH	mV	uS/mS	Free ppm	DO ppm	°C
01	Tank 1 Conductivity	3TX-ConE (k=0.2)	Connected				0.177			25.4
02	Tank 1 pH	3TX-pH (pH)	Connected		7.00					25.8
03	Tank 1 pH Redundant	3TX-pH (pH)	Connected		7.00					25.8
04	Tank 2 Conductivity	3TX-ConE (k=0.2)	Connected				0.173			24.8
05	Tank 2 pH	3TX-pH (pH)	Connected		7.00					26.3
06	Tank 2 pH Redundant	3TX-pH (pH)	Connected		7.00					25.6
07	Tank 3 Conductivity	3TX-ConE (k=0.2)	Connected				0.168			25.6
08	Tank 3 pH	3TX-pH (pH)	Connected		7.00					25.4
09	Tank 3 pH Redundant	3TX-pH (pH)	Connected		7.00					24.4
10	Tank 4 Conductivity	3TX-ConE (k=0.2)	Connected				0.171			25.8
11	Tank 4 pH	3TX-pH (pH)	Connected		7.00					26.3
12	Tank 4 pH Redundant	3TX-pH (pH)	Connected		7.00					26.0
13	Tank 5 Conductivity	3TX-ConE (k=0.2)	Connected				0.178			26.0
14	Tank 5 pH	3TX-pH (pH)	Connected		7.00					25.4
15	Tank 5 pH Redundant	3TX-pH (pH)	Connected		7.00					25.6

At the bottom, it shows '215 Polling: Node: 18 Reg: 1 Length: 2'.

Screenshot is above to visualize options for the "Span" of data to be exported and graphed from the working database.



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Version 2.1 January, 2013

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