



Texmate Ethernet Supplement NZ216

Revision 20150717

Overview

Texmate offers two different Ethernet communication modules. The S8 is an ASCII Ethernet interface centered on a Lantronix XPort Server built into the Ethernet connector. The S9 is a Modbus RTU Ethernet interface centered on a Lantronix XPort-M Server, also built into the connector.

ASCII interfaces are very common for a variety of control and data logging tasks. The full set of Tiger 320 data and text registers are available for robust control of the meter. Talking to an S8 equipped meter is as simple as a) connect the meter to your network or computer using a standard network cable, b) get or set the IP address, c) open a socket to the meter (IP address and port), d) use the Texmate ASCII protocol¹ to send commands to the meter to read data and write setup parameters. The meter can be set to send data per an internal timer or external trigger. The meter typically acts as an ASCII slave, but can be configured to be an ASCII master using a special macro program (only available on the Tiger 320 "T" series meters). Simple (no data) or complex (data) email notifications are possible; the latter requires a special macro and the "T" version of the meter. Texmate's Configuration Utility and DataViewer utility are useful tools.

Modbus interfaces are commonly used for simpler industrial control scenarios where the meter is polled for data, e.g., SCADA implementations. As such, only a limited set of data registers are accessible; no text registers are accessible so Configuration Utility functions are limited to reading data values, and the DataViewer and Texmate Development System utilities are not compatible. The meter acts as a slave to a user-developed control program. Simple (no data) or complex (data) email notifications are also possible; the latter requires a special macro and the "T" version of the meter.

The S8 (ASCII) Ethernet module allows you to connect a Tiger 320 meter to a computer via TCP/IP (Ethernet) to accomplish a variety of tasks. The communication protocol is Texmate ASCII over TCP/IP. The default mode for the meter is to automatically obtain an IP address when it is connected to a network.

The S9 (Modbus) Ethernet module allows you to connect a Tiger 320 meter to a computer via TCP/IP (Ethernet). The communication protocol is Modbus RTU over TCP/IP. The default mode for the meter is to automatically obtain an IP address when it is connected to a network.

¹ Tiger 320 Series – Serial Communications Module Supplement, NZ202, www.texmate.com

S8 ASCII Ethernet Interface

This section discusses using the S8 ASCII Ethernet interface for using with the Configuration Utility, sending serial commands, and data logging to a serial terminal program.

Key things to know:

1. Get the IP address of the meter (use the Lantronix DeviceInstaller utility).
2. The port to access the meter is 10001 for ASCII Ethernet.
3. To configure the meter using the Texmate Configuration Utility or to send serial commands to the meter, the meter must be set up in Ethernet mode (Code_3 = xx4).
4. To set up the meter to periodically send data to a computer or serial printer, e.g., in a data logging configuration, the meter must be set up in Print mode (Code_3 = xx3).

Configuration Utility (confirmed using WinXP, Win7, Win8)

1. Set the meter Code_3 to xx4 (Ethernet mode, see meter user manual). This done by pressing the Program and Up buttons at the same time (meter displays "bri"), the press the Program button until you see "Cod_3" alternating with a three digit value. Press the up or down button to get the right most digit to the value 4. Press the Program button again to set the change. Press Program and Up again to return to the main display.
2. Use a suitable network cable to connect the meter to your network or directly to your computer's network port. Connect only one meter at a time until the meter's IP address becomes known or is set.
3. Start the Lantronix DeviceInstaller utility (www.lantronix.com) to find and/or set the meter's IP address. The utility automatically runs a "Search" to find connected meters, or press the Search button. The IP address is shown and should be written down for future reference.
 - a. To change the meter's IP address using DeviceInstaller, keep opening the Lantronix Device tree in the left hand frame until you see the IP address, then click the IP address.
 - b. Click the Telnet tab in the right hand frame.
 - i. NOTE: You can also Telnet directly into the XPort using the IP address and port 9999 to access the internal setup menu.
 - c. Click the Connect button, then immediately press the return key; failure to press the return key within 5 seconds resets the telnet session, so you have to reconnect.
 - d. You can scroll up and down to see the various settings that are current.
 - e. From the menu at the bottom of the displayed information, select 0 (Server).
 - f. The first entry is the first number of the IP address. Enter the desired number and press return or just press return to keep the current number.
 - g. You then can enter the second number of the IP address. Enter or accept the current number and repeat two more times to enter the full address.
 - h. Accept the default settings for the other entries by just pressing the return key.
 - i. When the Change Setup menu appears again, press 9 and return to save the change.

- j. Be sure to write down the new IP address.
 - k. You can do a new Search in DeviceInstaller to re-find your meter and confirm the new IP address.
4. Start the Texmate Configuration Utility.
- a. Select File\New to open a New Meter communication configuration window.
 - b. Under Choose Communication, select TCP/IP from the drop down list.
 - c. Under Choose Parameters, select Texmate ASCII from the drop down Protocol list.
 - d. Enter the IP address of the meter, confirm that Port is 10001.
 - e. Press the OK button to initiate communication
 - f. If connection is successful, you will see a picture of the meter and the bargraph at the lower left of the utility screen will scroll from 100% to 0%.
 - g. The utility allows you to set many operational parameters for the meter to customize for your particular needs. See the Texmate Configuration Utility Supplement, Z114, for additional information or contact Texmate Application Engineering Support.

Sending Serial Commands to the Meter over TCP/IP (confirmed using WinXP, Win7, Win8)

1. Set up the meter using instruction steps 1 – 3 for Configuration Utility above.
2. Start your favorite serial communication utility, such as Hyperterminal, PuTTY, etc.
 - a. You may be asked to select the base communication protocol, such as RS-232, RS-485 or Ethernet (TCP/IP). Select Ethernet (TCP/IP).
 - b. Enter the host address (IP address) and port (10001).
 - c. You may want to set up the communication utility for ease of use, such as echoing the things you type.
 - d. Typically, once communication is opened, a window appears with a cursor.
 - e. Enter a Texmate ASCII command¹ and press return.
 - i. Refer to the referenced supplement. The general format is S (start of command) followed by R (read) or W (write), followed by a register number (see the register supplement²), followed by a \$ (50msec delay) or * (2msec delay) to end the command.
 - ii. For example, "SR6\$" returns the setpoint1 activation value as an ASCII number, e.g., "180.00).
 - f. Special ASCII registers that hold displayed text are provided in the Serial Communication Supplement.
 - i. For example, "SWL Hello\$" sets the text shown for setpoint 1 to "HELLO" (letter structure may be different depending on the use of 7-segment or 16-segment LED display characters).

² Tiger 320 Series – Registers Supplement (CA101)

Data Logging to a Serial Terminal Program over TCP/IP (confirmed using WinXP, Win7, Win8)

1. Data logging using an external trigger.
 - a. Set the meter Code_3 to xx4 (Ethernet mode, see meter user manual or instructions above).
 - b. Using the Texmate Configuration Utility:
 - i. Press the Data Logging button in the left side panel, configure the Print String at the lower part of the middle panel.
 1. You can also write to a special print register using the serial communication utility.
 2. Refer to the Texmate Serial Communications Module Supplement NZ202 for print command structure and print register information.
 3. NOTE: if you elect to have a time stamp sent and the Texmate meter does not have a real time clock option, you can still set the meter's internal clock to the computer's time using the Configuration Utility; from the Data Logging window, press the "Set meter time to system time" button. The date and time will remain active as long as the meter is powered.
 - ii. In the Data Logging window, find the Triggers pane. You can set a trigger on a button or logic input to the meter to trigger a "print data" command.
 1. NOTE: you can also set this up directly in the meter by setting Code_8 or writing to the Code_8 register.
 - iii. "Send" the setup to the meter using the button near the top.
 - c. Close the Texmate Configuration Utility.
 - d. Set the meter Code_3 to xx3 (Print mode, see meter user manual).
 - e. Use your favorite serial communication utility to open a channel to the meter as described above.
 - f. When you activate the trigger you set above, you will see the information that was set in the Print String sent to the serial communication utility.
2. Data logging using a Setpoint trigger.
 - a. Set the meter Code_3 to xx4 (Ethernet mode, see meter user manual or instructions above).
 - b. Using the Texmate Configuration Utility:
 - i. Press the Data Logging button in the left side panel, configure the Print String at the lower part of the middle panel.
 1. You can also write to a special print register using the serial communication utility.

2. Refer to the Texmat Serial Communications Module Supplement NZ202 for print command structure and print register information.
 3. NOTE: if you elect to have a time stamp sent and the Texmate meter does not have a real time clock option, you can still set the meter's internal clock to the computer's time using the Configuration Utility; from the Data Logging window, press the "Set meter time to system time" button. The date and time will remain active as long as the meter is powered.
- ii. In the Data Logging window, find the Triggers pane. Make sure this is set to "No trigger".
 - iii. Press the Setpoints button in the left side panel, configure the Trigger for the desired Setpoint (lower part of the window).
 1. For example, set Setpoint 1 to trigger on "Level" using the drop down menu (this sets the Setpoint 1 trigger to a voltage level trigger as opposed to an edge trigger, for example), then in the "On Trigger" column, click the "Print" box to enable printing.
 2. You can set the trigger "Value" in the upper part of the window, when the setpoint input is greater than this value, a print command is sent.
 3. In the "Timer" section, for Setpoint 1, Mode is "Off", Timer is set to "Repeat" (or other desired logging method, like one-shot). Set OFF Time to 1.0 (sends every 1.0 seconds); ON Time has no meaning in this example.
 4. NOTE: setpoint printing can be set directly on the meter using the Setpoint Programming Mode (see the user manual) or by writing to setpoint registers (see the registers supplement).
 - iv. "Send" the setup to the meter using the button near the top.
- c. Close the Texmate Configuration Utility.
 - d. Set the meter Code_3 to xx3 (Print mode, see meter user manual).
 - e. Use your favorite serial communication utility to open a channel to the meter as described above. You will see the data being sent every 1 second.

S9 Modbus RTU Ethernet Interface

Key things to know:

1. The Modbus RTU interface only allows access to data registers, see the Registers Supplement, so this limits functionality. The Texmate Configuration Utility can be used with limits, the DataView and Development System utilities cannot be used.
2. Get the IP address of the meter (use the Lantronix DeviceInstaller utility);
3. The port to access the meter is 502 for Modbus Ethernet;
4. To configure the meter using the Texmate Configuration Utility or to send serial commands to the meter, the meter must be set up in Modbus mode (Code_3 = xx1).

5. You can Telnet into the meter using the IP address and the appropriate port: port 9999 gets you to the Lantronix Modbus device set up; port 3000 starts a debug session that shows you requests (from the control program) and responses (from the meter) in hex format that requires you to know how a Modbus message is constructed.

Configuration Utility (confirmed using WinXP, Win7, Win8)

1. Set the meter Code_3 to xx1 (Modbus mode, see meter user manual).
2. Use a suitable network cable to connect the meter to your network or directly to your computer's network port. Connect only one meter at a time until the meter's IP address becomes known or is set.
3. Start the Lantronix DeviceInstaller utility (www.lantronix.com) to find and/or set the meter's IP address. The utility automatically runs a "Search" to find connected meters, or press the Search button. The IP address is shown and should be written down for future reference.
4. Start the Texmate Configuration Utility.
 - a. Select File\New to open a New Meter communication configuration window.
 - b. IMPORTANT: You must select the meter's model from the "Choose Meter Type:" drop down list.
 - c. Under Choose Communication, select TCP/IP from the drop down list.
 - d. Under Choose Parameters, select Modbus/TCP from the drop down Protocol list.
 - e. Enter the IP address of the meter, confirm that Port is 502.
 - f. Press the OK button to initiate communication
 - g. If connection is successful, you will see a picture of the meter and the bargraph at the lower left of the utility screen will scroll from 100% to 0%, then periodically scroll as the utility updates the meter.
 - h. Because of the Modbus implementation, only data registers are accessible. No text registers can be changed. See the Texmate Serial Communications Supplement and Registers Supplement for additional information, or contact Texmate Application Engineering Support.

Modbus Utility and Custom Control Program (confirmed using WinXP, Win7, Win8)

1. Any Modbus utility or custom control program that supports sending requests for data from particular registers can be used to extract data from the meter. This capability was confirmed using ModScan (www.win-tech.com).
2. Consult the Texmate Registers Supplement CA101 for a detailed list of Modbus supported registers.
3. Requests and responses can be confirmed by using Telnet to connect the Lantronix XPort-M internal server. Start the Telnet application, open a port using the meter's IP address and port 3000 to open a Debug window. Requests and responses will be shown.
4. You can use the Lantronix DeviceInstaller utility to Telnet in to the meter on port 9999 (or use a Telnet utility) in order to change certain settings including the IP address.