



## **XR5-SE Text Interface User's Guide**

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**Note:** This document pertains only to the XR5-SE’s Text Interface. Please see the [XR5-SE User’s Guide](#) for complete details on using the Pace XR5-SE Data Logger and free LogXR Software.

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## The XR5-SE Text Interface

The Text Interface enables an XR5 to be accessed from any computer or mobile device equipped with a serial port and communications software (like HyperTerminal on Windows XP). LogXR Software is the primary way to interact with an XR5 Data Logger. The Text Interface is an alternate way. LogXR and the Text Interface may be used interchangeably during a logging session.

### “Top Level” Commands

The XR5 is normally in the “Top Level” command state. In the “Top Level” state, the XR5 will respond to 3 commands (below). All other character combinations are ignored.

<u>Command</u>	<u>Total characters</u>	<u>Result</u>
text	4	Enter the Text Interface menu system. XR5 outputs the Main Menu character strings. Sending an Esc character from the Main Menu puts the XR5 back into the “top level”.
r	1	Sends a readable text string consisting of the current date and time, and the current scaled value of each active channel. Each value is separated by a comma. The XR5 continues to respond to any “top level” command. The XR5's response (the text string) occurs within 1 second of receiving the r command. The maximum rate that the text string can be transmitted from the XR5 is once per second. <i>The r command provides a simple way to use the XR5 as a sensor “front end”.</i>
h	1	Enters host (LogXR) communications protocol. Commands in this mode are binary commands with CRC checksums. Sending an Esc character puts the XR5 back into the “top level”. The XR5 host communications protocol used by LogXR is not currently available. A document detailing how to unpack and convert an XR5 binary data file into a readable text file is available. Please contact Pace for details.

### Text Interface Limitations

Using the Text Interface, a computer running a terminal emulation program can launch a logging session, view readings in Real Time, read current XR5 Status, start/stop logging, and transfer logged data as a binary data file. Data files transferred using the Text Interface **must be converted to readable files using Pace LogXR Software or a user written software program.** The XR5 is configured for a logging session when it receives a Setup file via the Xmodem protocol. **XR5 Setup files must be created using Pace LogXR Software.**

Using the Text Interface "r" command or Real Time mode, sensor values are output as a string of readable text. Linear sensors / transducers and Pace PT9xx Series Temperature Probes display scaled, readable values. Non-linear sensors display resistance or voltage values. Non-linear sensors include the LS100 Light Sensor and the PT510 Platinum RTD. The Text Interface does not support Thermocouple channel Types, and the internal temperature sensor included with the millivolt option is not readable from the Text Interface.

The Text Interface's Real Time readings from the TRH-100 Probe are not temperature compensated. RH temperature compensation is not necessary for temperatures from approximately 55 to 95 deg F (13 to 35 deg C). TRH-100 readings displayed using the Text Interface beyond this temperature range will have additional measurement errors. TRH-100 readings contained in binary files transferred using the Text Interface and converted using LogXR Utilities | Convert Binary File will be within the accuracy specifications of the TRH-100 Probe (temperature compensation will be automatically applied).

## Terminal Emulation Software

The XR5's Text Interface displays sensor readings using a terminal emulation program (like HyperTerminal for Windows XP). A terminal emulator simply sends all manually typed characters out a serial port (to be received by the XR5), and all characters sent by the XR5 are received and appear on the terminal emulator's display. In addition, most emulation programs support the Xmodem file transfer protocol used by the XR5 for file transfers (sending a Setup file to the XR5, or receiving a data file from the XR5).

To communicate using the Text Interface, use the following com port settings:

Bits per second: 9600  
 Data Bits: 8  
 Parity: None  
 Stop Bits: 1  
 Flow control: None

*The following instructions explain the setup and use of HyperTerminal with the XR5. Similar instructions apply if using another terminal emulation program.*

## HyperTerminal (for Windows XP)

In order to use HyperTerminal, your Windows computer needs a serial port or USB port equipped with a Serial Adapter (Pace part number USB-A). Or the Pace WPT-100 Wireless Link can be used (details on page 15).

### Hardware Setup

Connect the IC209 Cable from the Com Port on the XR5 to a serial port on your PC or the USB-A Serial Adapter. The com port # may be displayed by selecting Start | Control Panel | System (classic view) | Hardware | Device Manager and clicking the + sign beside Ports. The USB Adapter's com port number displays as USB Serial Port COMx (where x is the COM port number)

### Creating a HyperTerminal session

1. Launch HyperTerminal (usually found by selecting Start | Programs | Accessories | Communications). A "New Connection" screen is displayed.
2. Enter a session name. We suggest "9600comx" (where x is the com port number). You can also select an icon to launch future HyperTerminal sessions for the XR5 with a single click. Click OK
3. You are asked for a phone number. Ignore this, and click the down button of the selection field labeled "Connect using" and select the Com port you will be using for the XR5. For example: "Direct to Com1". Click OK.
4. Enter the following port settings:  
 Bits per second: 9600  
 Data Bits: 8  
 Parity: None  
 Stop Bits: 1  
 Flow control: None  
 Click OK

5. The terminal screen now appears. Keys pressed on your keyboard are sent to the XR5, and any characters transmitted by the XR5 appear on your terminal screen. To display the Text Interface's Main Menu, type the following 4 letters: "text". The XR5 Main Menu should appear on your screen (if the Main Menu does not appear when you type "text", you may not have the right com port selected in HyperTerminal).

### XR5 Text Interface Menus

Note: The screen illustrations that follow use HyperTerminal on Windows XP. Other terminal emulation programs will display similar screens.

To display the Main Menu, send 'text' (4 characters) to the XR5.

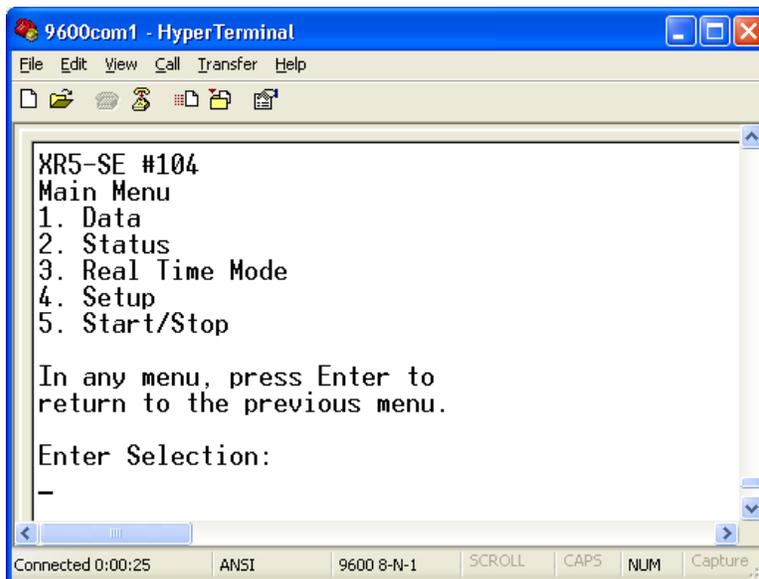
#### *IMPORTANT!*

*You must first send 'text' (4 characters) to the XR5 to display the Main Menu (see screen below).*

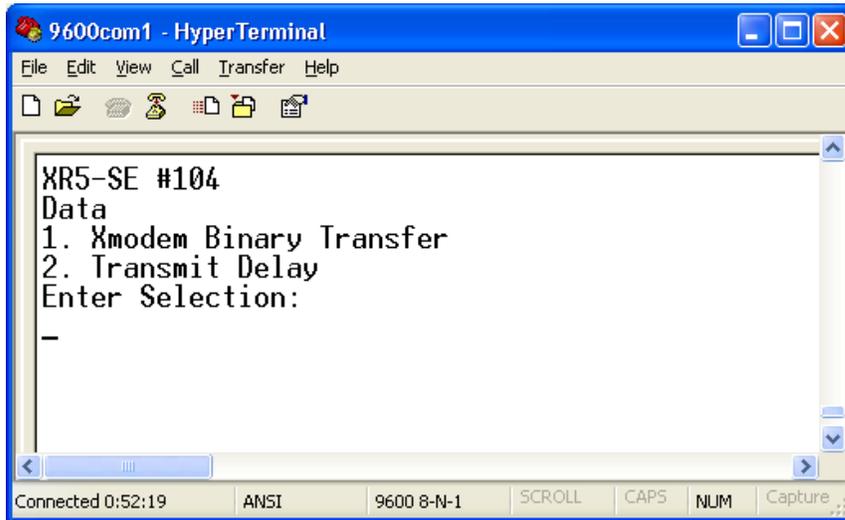
### Menu Navigation

- All menu choices must be followed by the Enter (Return) key.
- Pressing only the Enter key in any menu will return you to the previous menu.
- When prompted for a numerical value, pressing only the Enter key will cause the current value to be retained.
- Pressing the Esc key while transferring data will cause the data transfer to immediately terminate.

### Main Menu



## Main Menu | 1. Data



The Data menu enables a user (or computer program) to transfer binary data to a computer or mobile device using the Xmodem file transfer protocol.

1. **Xmodem Binary Transfer** Transfers all logged data.
2. **Transmit Delay:** Adds a delay to each transmitted character equal to the “Transmit Delay” value times 30ms. A delay may be needed if transferring data to slow devices to prevent character over-runs.

NOTE: When a data transfer is in progress, the transfer may be terminated by sending an Esc character (press the Esc key).

## Xmodem transfer using HyperTerminal

1. Select 1 (Xmodem Binary Transfer).
2. If the XR5 Data Logger has no data to transfer, the message "No Data" appears.
3. From the HyperTerminal menu, select Transfer | Receive File...
4. Click the Browse button to select a different directory if the directory shown is not where you wish to store your data file.
5. Make sure "Use receiving protocol:" is set to "Xmodem".
6. Click the “Receive” button.
7. Type in a file name and add a ".bin" or ".binary" extension to signify it is a binary file.
8. Once the transfer is complete, you need to convert the file using [Pace LogXR Software](#) (Utilities | Convert Binary File). The converted file can be viewed in Excel or a text editor (like Notepad).

### Interruption in the data transfer

If the xmodem data transfer is interrupted (cable disconnected, etc.) while a data transfer is in progress, the data transfer will resume when the connection is restored. If the connection is not restored, or if the device receiving the XR5 data via xmodem "times out", the XR5 will continue to wait indefinitely for incoming xmodem file transfer characters. Sending a Ctrl-X character to the XR5 will cause the XR5 to break out of its xmodem "wait loop".

## Converting binary XR5 Data Files

1. Launch LogXR Software.
2. From the main menu, select Utilities | Convert Binary File.
3. Navigate to the saved XR5 binary file and select it.
4. Click Unpack.
5. A text file is created with the same name as the binary file and has a .txt or .csv extension (based on LogXR's "Data preferences" in the Transfer | Settings menu selection) and can be opened in a program such as Excel or Notepad.

## Main Menu | 2. Status

```

9600com1 - HyperTerminal
File Edit View Call Transfer Help
XR5-SE #104
Status
Current State: Stopped
Log Time Until Full: 4h, 25m, 4s
Log Interval: 0h, 0m, 2s
Log Mode: Manual
Clock: 2005/03/25 14:23:42
Label:
FwRev: 1.00.86, Bat: 7.25V
1. Alarms
2. Description
3. Channel List
4. System Log
Enter Selection:
_
Connected 0:58:35 ANSI 9600 8-N-1 SCROLL CAPS NUM Capture

```

### Current status of the XR5

A “snap-shot” of the XR5 Data Logger at the time Status was selected from the Main Menu. Additional screens may be displayed for Alarm status, Channel information, and System Log.

<b>Current State:</b>	Displays “Stopped”, “Logging”, or “Start Logging” + preset time.
<b>Log Time Until Full:</b>	Time remaining until memory is full (based on current setup).
<b>Log Interval:</b>	Current log interval, selected in Setup.
<b>Log Mode:</b>	Current log mode, selected in Setup.
<b>Clock:</b>	XR5’s time clock reading (static) when Status was initially displayed.
<b>Label:</b>	A descriptive label of up to 32 characters.
<b>FwRev:</b>	Internal firmware revision number.
<b>Bat:</b>	Battery voltage. Battery voltage is the total voltage across both batteries. With fresh batteries installed, the voltage should be about 7.2V

AUXILIARY STATUS MENU

- 1. **Alarms:** Lists alarm status, SMS alarm messages, and current readings.
- 2. **Description:** Currently non-functioning and inaccessible from LogXR Software.
- 3. **Channel List:** Lists channel Status and Descriptions.
- 4. **System Log:** Internal system log (for factory system testing).

**Status**

**Current State:**

<u>Display</u>	<u>Meaning</u>
‘Stopped’	Not logging, XR5 inactive; any logged data from prior logging session is available.
‘Start Logging’+Preset Time	If the Preset Time has been reached, then logging is active. If the Preset Time has not been reached, then not logging. (used for ‘Cycle’, ‘Preset’ and ‘Preset Start/Wrap’ logging modes)
‘Logging’	Logging is active.  OR  If logging mode is ‘Log on Alarms’:  Logging session has begun, but data is being logged only if one or more alarms are active.  <i>If no alarms are currently active, no data is being logged.</i>  OR  If logging mode is ‘Log on Ext. Trigger’:  Logging session has begun, but data is being logged only if selected trigger level (High/Open or Low/Closed) is present.  <i>If the trigger state selected in the Pulse tab of LogXR to log data is not present on Terminal X, then no data is being logged.</i>

## Main Menu | 3. Real Time Mode

Continues to display the XR5's current sensor readings at a pre-determined update rate. When the Real Time Mode is active, sending a Return character ("Enter" key) causes the Real Time Mode to terminate and the Main Menu to display. The Real Time Mode can function while logging is active and will not affect the logging session in any way.

*The Real Time mode is not available when fast logging (2Hz – 1000Hz) is active.*

### Real Time Mode Settings

Two Real Time Mode settings may be selected from LogXR Software's Setup, Other tab. When a Setup file is sent to the XR5, the Real Time mode selections in effect when the Setup file was saved are sent as well.

#### Update Interval

Two selections are available: '2 seconds' and 'When Logging'.

##### **2 seconds**

Real Time readings are updated every 2 seconds.

##### **When Logging**

Real Time readings are updated only when readings are logged and stored in memory. For example, if the XR5 is set to Log on Alarms, the Real Time Display will be active only when Alarms are active, and the Real Time readings will be updated at the selected Slow Logging Interval.

##### **LogStream**

A special "always active" mode designed to send Real Time Data to a host computer via an Ethernet LAN. LogStream is a binary format and is not compatible with the Text Interface.

#### **Auto Stop**

Auto Stop automatically terminates the Real Time Display mode after the selected Auto Stop time has elapsed (the default is 1 hour). Auto Stop is disabled by setting it to 0.

#### **Note:**

Not all Pace sensors provide scaled, readable output from the Text Interface (using the Real Time mode or "r" command). Please see "Text Interface Limitations" on page 4 for details.

## Main Menu | 4. Setup

Menu selections:

1. **Clock:** Use to set the XR5's time and date.
2. **Load Setup File:** Use to set up the XR5 for a data logging session. The Setup file must have been previously created using Pace LogXR Software. Using LogXR, a Setup file must be based on the correct model using Setup | Extract, or Setup | New and selecting the correct model number.

To proceed using HyperTerminal:

1. Enter 2 and press Enter. The XR5 will respond by sending a "C" character every 10 seconds for up to 1 minute (7 times)\* until the xmodem file transfer is initiated by the user (or sending program).
2. In the HyperTerminal menu bar, click Transfer and Send File.
3. Make sure the Xmodem protocol is selected.
4. Click the Browse button and navigate to the LogXR Setup file you wish to send, then click the Send button.

CAUTION! Any XR5 setup file can be loaded into the XR5-SE; if the file is not for the correct model then the setup configuration will be incorrect.

Load Setup File. note:

After initiating step 1 above (Enter 2 and press Enter), the XR5 outputs a "C" character every 10 seconds until a HyperTerminal xmodem transfer is initiated by the user (steps 2, 3, and 4). If steps 2 through 4 are not completed within 1 minute\*, the XR5 breaks out of its xmodem receive state and re-displays the setup menu.

\* 3.5 minutes for firmware version 1.00.98 and lower.

- 3. Export Setup File:** Extract the current XR5 Setup as a LogXR Setup file. The resulting file could be loaded into a different XR5 to give it the same Setup, or opened as a Setup in LogXR. If you wish to open the file in LogXR, it must have the correct file-name extension: '.8SE' for the XR5-SE and XR5-SE-M. Millivolt models have the Setup file extension of the millivolt option. For example, the XR5-SE-250mv has a Setup file extension of '.250mv'. Extended memory models (-M models) have the same setup file extension as standard memory models.

To export an XR5 Setup File using HyperTerminal:

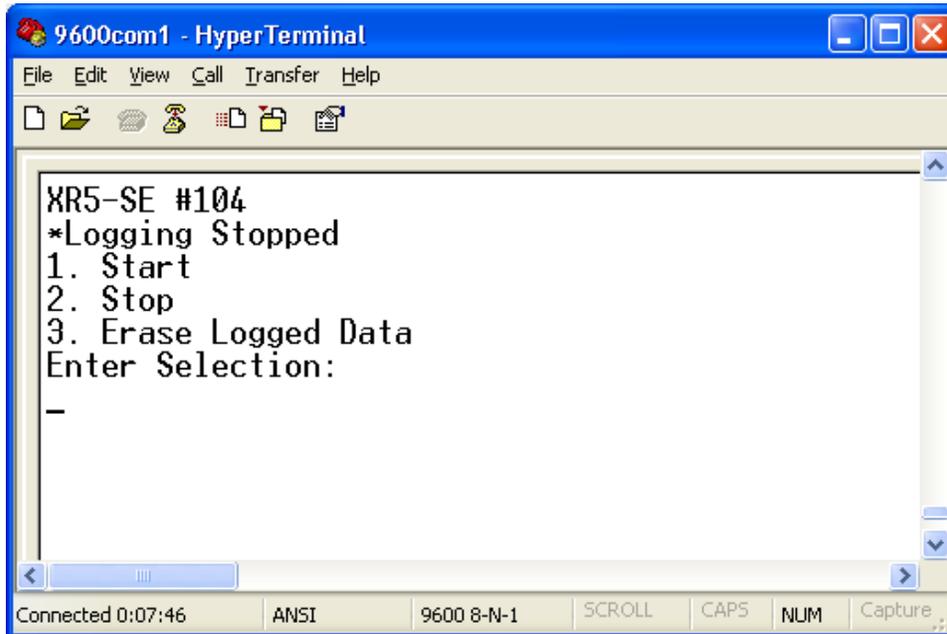
1. From the Text Interface Setup Menu, enter 3 and press Enter.
2. In the HyperTerminal menu bar, click Transfer and Receive File.
3. If you do not wish to store the Setup file in the directory shown, click Browse and select a different directory.
4. Make sure the Xmodem protocol is selected.
5. Click the Receive button.
6. Enter a file name for the Setup file (make sure you use the correct file extension; see Export Setup File (above)).

- 4. Load Sensor Table:** The Sensor Table is used to convert a non-linear resistive sensor into readable values for the Text Interface's Real Time display, the "r" command response, and the SMS Alarm function. The XR5 ships with a Sensor Table for Pace PT9xx series thermistors (30k ohm). Resistive sensors which do not match the loaded Sensor Table will either display raw a/d values (0 to 4095) using the Text Interface's Real Time mode, or display as actual resistance if "Resistance" was selected as the channel Type in the LogXR Setup file.

To proceed using HyperTerminal:

1. Enter 4 and press Enter.
2. In the HyperTerminal menu bar, click Transfer and Send File.
3. Make sure the Xmodem protocol is selected.
4. Click the Browse button and navigate to the Sensor Table you wish to send, and then click the Send button.

## Main Menu | 5. Start/Stop



### 1. Start Logging

Starts a logging session for all logging modes except Cycle, Preset, and Preset/Wrap (these modes start automatically at a pre-selected time). If Manual slow logging is selected, starts or restarts an existing logging session.

### 2. Stop Logging

If Manual slow logging mode is selected:

Logging stops but the logging session remains “open”. In the Manual slow logging mode, if logging is re-started (using menu choice #1), prior logged data is retained, and additional new data is logged (until the memory is full or Stop Logging is selected again).

If Fast Logging:

If Fast Logging is active, press the “Q” key to stop logging; the XR5’s menu screens are disabled while Fast Logging is active.

For all other slow logging modes, the logging session is stopped.

### 3. Erase Logged Data

Use to maximize the capacity of the XR5 to store new data. Be careful using this selection! Once logged data is erased, it can not be recovered. Only Logged Data is erased. The setup configuration is retained.

## Millivolt Range limitations using the Text Interface

*(applies to XR5-SE models with a millivolt option)*

On XR5-SE models equipped with a millivolt option, Text Interface readings of millivolt channels set to Type: Millivolt in LogXR need to be converted to read as millivolts. Multiplying the channel's Text Interface reading by the Multiplier in the table below will convert the reading to actual millivolts.

<b>mV Option</b>	<b>Multiplier</b>
20mv	4.0010
50mv	10.097
100mv	20.088
250mv	50.873
500mv	101.53
1000mv	203.19

Alternately, if the above multiplier is entered as the millivolt channel's Slope in LogXR Software, millivolt readings will read correctly using the Text Interface. But in this case, if LogXR Software is also used to display readings (while the XR5 has the Slope from the above table), millivolt readings will need to be divided by the channel's Slope value (using a spreadsheet or external program) to read actual millivolts in data files created using LogXR Software.

## Wireless Communications

### Pace WTP-100 Wireless Transceiver Pair

The Pace WTP-100 consists of two miniature wireless modules. One module inserts into a computer's USB port and requires no external power. A second module plugs into the XR5 using a short version of the IC209 cable (included). Also included is an AC power adapter and Battery Cable to power the module on the XR5 side (module requires 5 to 12vdc). The WTP-100 has a range of up to 300 ft (100 meters) outdoors, and up to 100 ft (30 meters) indoors. Operating frequency is 2.4 GHz for world-wide compatibility. No software installation or setup is required.

Part # WTP-100

*Includes Battery Cable / AC power adapter for XR5 side*

Overseas customers use part # WTP-100-exp

*Includes Battery Cable / AC power adapter with plugs for UK, EU and Australia.*

Dimensions:

Computer side: 2.2" x 1.0" x 0.3" (56 x 24 x 8 millimeters).

XR5 side: 2.9" x 1.2" x 0.7" (72 x 31 x 16 millimeters)

*No software installation required. Just plug and go!*