

Temperature Monitor System 2 (TMS-2) Connections and Operations

25 March 2005



SmarTek Systems®

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Limited Warranty

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TMS-2 Overview

The Temperature Monitor System 2 (TMS-2) is used to collect, process, and log temperature data from a small or large number of distributed digital temperature sensors. The heart of the TMS-1 system is the SmarTek Systems Universal Sensor Interface (USI) processor which is designed to operate around the clock in adverse environments.

The USI provides the capability for:

Automatic monitoring and recording of all measurements from temperature sensors connected to the system's local sensor network (Sensor Net).

Individual temperature sensor alarm settings, and automatic alarms when temperature measurements violate these settings.

Multiple hardware alarm relay signals which can be connected (as triggers) to a security system or auto dialer.

Archiving and formatting of temperature data for trend analysis, equipment operation analysis, inspection reports, and other types of long term analysis and reporting.



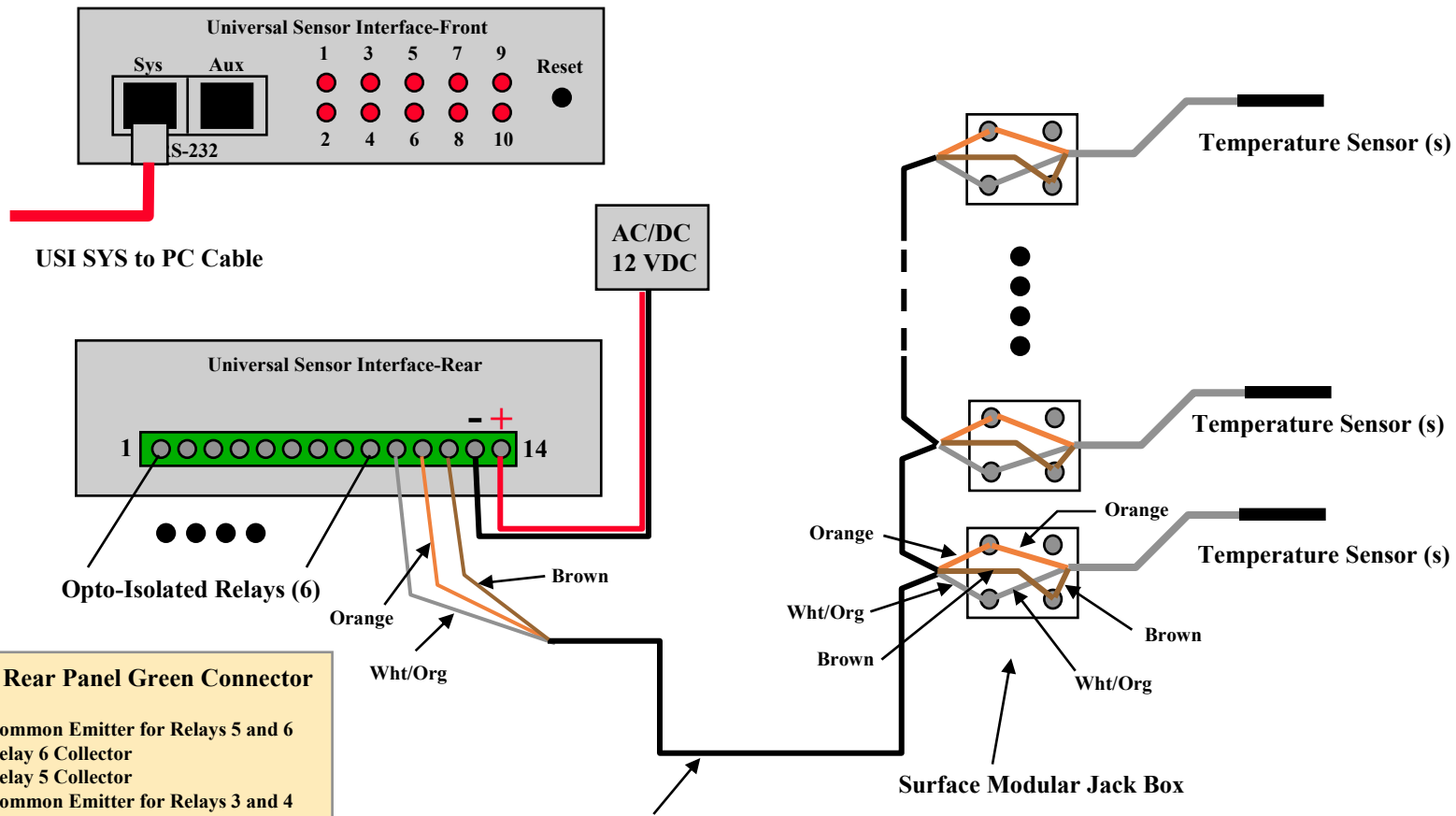
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Temperature Monitor System (TMS-2) Wiring Diagram



USI SYS to PC Cable

AC/DC
12 VDC

Universal Sensor Interface-Rear

1 14

Opto-Isolated Relays (6)

Orange

Wht/Org

Brown

Orange

Wht/Org

Brown

Surface Modular Jack Box

Sensor Net (Cat5E Cable):
10 Ground (White/Orange)
11 Data (Orange)
12 Power +5VDC (Brown)

**Sensor Net Wire is Cat 5E Network
Data Cable (Max Length=500ft
Cumulative in all directions from the USI).**

USI Rear Panel Green Connector

- 1 Common Emitter for Relays 5 and 6
- 2 Relay 6 Collector
- 3 Relay 5 Collector
- 4 Common Emitter for Relays 3 and 4
- 5 Relay 4 Collector
- 6 Relay 3 Collector
- 7 Common Emitter for Relays 1 and 2
- 8 Relay 2 Collector
- 9 Relay 1 Collector
- 10 Sensor Net-Gnd (White/Orange)
- 11 Sensor Net-Data (Orange)
- 12 Sensor Net-Power +5 VDC (Brown)
- 13 Power-Ground
- 14 Power-12 VDC



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TMS-2 Temperature Sensor Mounting



Mount Temperature Sensor Using Clips and Screws



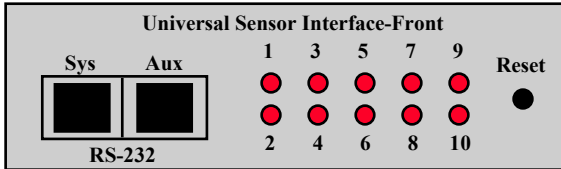
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TMS-2 USI Front Panel Indications



- 1) On Power Up or Reset, LEDs Light in Sequence:
LEDs 5, 6 On, Then 7, 8 and 3, 4 On, Then 9, 10 and 1, 2 On
LEDs 5, 6 Off, Then 7, 8 and 3, 4 Off, Then 9, 10 and 1, 2 Off**
- 2) While Operating Assigned LEDs Light in Sequence (approx 1 second per LED)
Every Update Period (Faster sequencing indicates a temperature probe problem)**
- 3) While in Alarm Condition Assigned LEDs Double Flash:
Assigned LEDs are On Solid Once Acknowledged (TMS-2 Monitor Program)
Assigned LEDs are Off When Not in Alarm Condition**



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TMS-2 Start Window - Connectivity

After starting the TMS-2 Monitor and Setup Program, this window appears. The user must click one of the buttons to specify the connectivity between the PC where TMS-2 Monitor is running and the USI.



Network – Connectivity using TCP/IP sockets between the PC and a serial device server connected to the USI Sys Port.

Modem – Connectivity using dial up modems connected to the PC and the USI Sys Port.

Direct – Connectivity using an RS-232 serial cable (PC to USI Sys) between the PC comm port and the USI Sys Port.

Exit – Terminates the TMS-2 Monitor Program.



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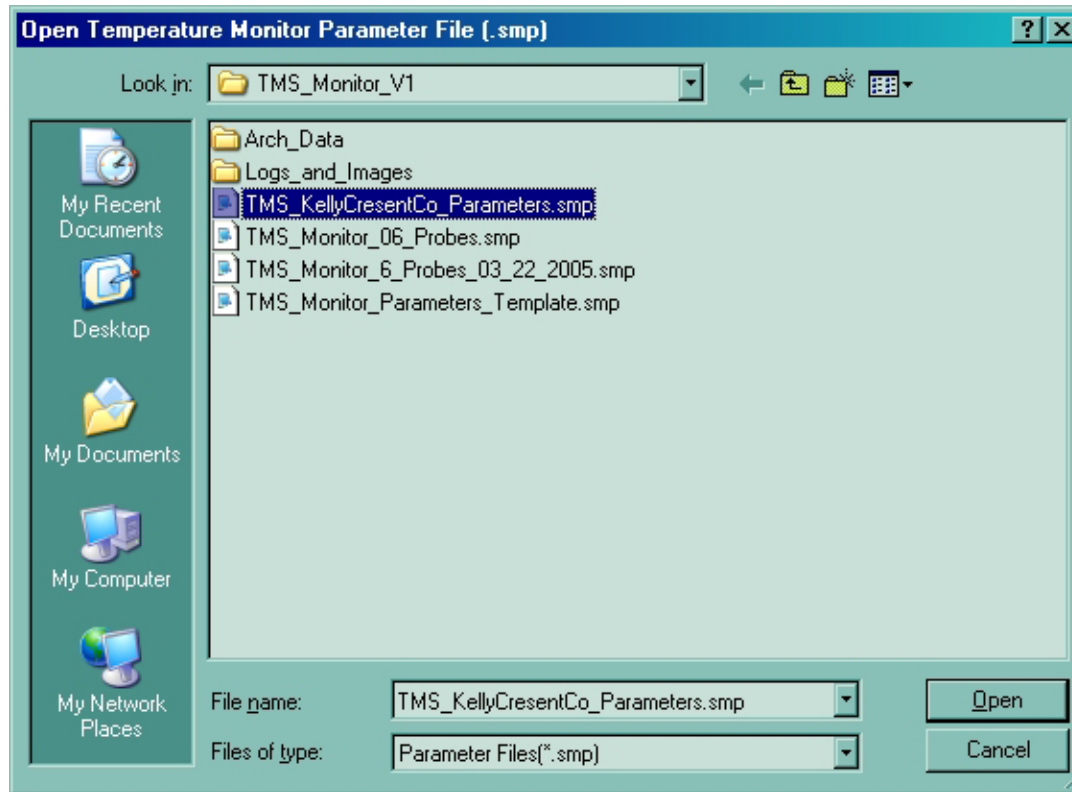
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TMS-2 Start Window – Open Parameter File

After clicking one of the connectivity buttons on the opening window, this Standard Windows File Open Window appears. Select a parameter file (.smp) and click Open to start the TMS-2 program.



The file selection is not critical when connected to a USI that is already setup and operating. As shown on the next page, as soon as the TMS-2 Monitor Main window appears, the user should perform a *Get TMS ID* and then a *Get TMS Parameters* via the TMS-USI pull-down menus. This action loads the TMS-2 parameters from the USI and thus overwrites the parameters that were loaded from the file on startup.



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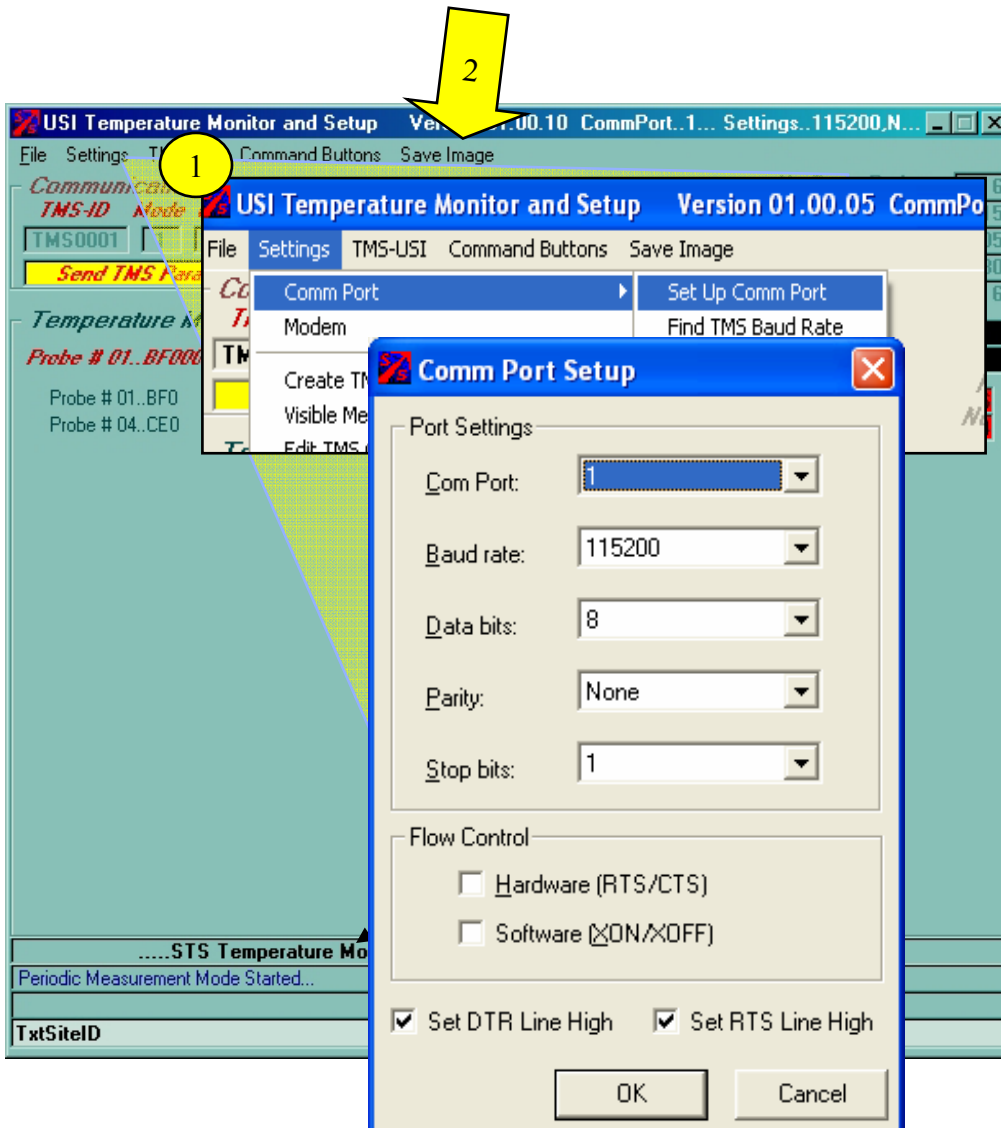
TMS-2 Main Display - Startup

On Startup:

- 1) Click TMS-USA Menu/Get TMS ID
- 2) Click TMS-USA Menu/Get TMS Parameters
To Remove Yellow Mismatch Flag
- 3) Click TMS-USA Menu/Get TMS Date and Time
- 4) Click in Mode Field to Change Mode to 1

Probe #	ID	Temp (Deg_F)	Probe #	ID	Temp (Deg_F)
01	BF0	58.4	02	D00	76.3
04	CE0	76.2	05	AB0	76.3
03	E30	76.5	06	360	76.4

TMS-2 Main Display - Startup



1) Use Settings Menu/Comm Port to Modify
Comm Port Settings:

Comm Port Number = PC Comm Port Used
Baud Rate = 115200 bps
Data Bits = 8
Parity = None
Stop Bits = 1
HW Flow Control - Unchecked
SW Flow Control - Unchecked
Set DTR Line High - Checked
Set RTS Line High - Checked

2) Clicking the Save Image Button or the Save Image
Menu Item on any Display will Save the Window
As a .BMP image in the Logs_and_Images
Sub-Folder



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TMS-2 Main Display

Complete Descriptive Text for Selected Probe

Temperature Probe Descriptive Text
- Right Click in Field to open Probe
Parameter Editor Window (Pg 13)

Color Coded Temperature Measurement Readout
- Left Click in Field to Select
- Right Click in Field to Acknowledge Alert
- Double Click in Field to Open History Display as
shown on page 15



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TMS-2 Main Display

Communication

TMS-ID Mode Comm Type Log

TMS0001 1 Periodic OFF

Send TMS Parameters to USI Stop

Temperature Measurements (Deg_F)

Probe # 01..BF0000000A28F510

Probe # 01..BF0	58.4	Probe # 02..D00	75.6	Probe # 03..E30	76.6
Probe # 04..CEO	76.2	Probe # 05..AB0	76.3	Probe # 06..360	76.4

3/22/2005 3:06:14 PM
Since Last Message..3 Sec

.....STS Temperature Monitor..General text Description..Up to 80 Characters.....
Periodic Measurement Mode Started..
TxtSiteID

Readout of General Parameter Settings

Click This Button to Start or Stop A Communication Process

Yellow Flag Indicates Possible Parameter Differences Between TMS-2 Monitor and the USI. Use TMS-USI Menu /Send Parameters or Get Parameters To Remove Yellow Mismatch Flag.

Edit Temperature Probe Parameters

TMS-ID Mode Comm Type Log
TMS0001 1 Periodic OFF

Stop

Temperature Measurements (Deg_F)

Probe # 01..BF0000000A26F510 Ack All Alarms

Probe # 01..BF0	55.6	Probe # 02..D00	76.9
Probe # 04..CE0	78.7	Probe # 05..AB0	79.3

To Open The Probe Parameter Edit Window, Right Click on Probe Description Field.

Click in Upper/Lower Field to Increment/Decrement

Enter/Modify Descriptive Text for the Probe

Click in Upper/Lower Field to Increment/Decrement

Edit TMS Temperature Probe Parameters

Probe Index 2 No of Probes 6

Probe Text Description Probe # 02..D000000006CE9E10

Serial Number 0000000006CE9E10 Calibration Offset (Deg) 00.0

No of Samples for LED Activation 5 Max Alarm Threshold (Deg) 45.0

Alarm LED Assignment (0-Disables) 2 Min Alarm Threshold (Deg) 10.0

Alarm Relay Assignment (0-Disables) 2

OK Cancel

NOTE: Probe Serial Numbers must match the electronic serial numbers in the digital temperature probes. Probe Serial Numbers should not be modified unless replacing a failed probe or adding probes.



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Edit General Parameters

To Open The General Parameters Edit Window, Click the Settings Menu/Edit TMS General Parameters Menu Item on the Main TMS-2 Window.

Enter/Modify File Name for Archive Data
File Storage Upon Down Load from the USI

Enter/Modify Descriptive Text for the Facility

.....STS Temperature Monitor..General text Description..Up to 80 Characters.....

Archive File Name Archive_Test_000.atx Archive Update Period (Min) 05

No. of Temperature Probes 6 Real Time Update Period (sec) 15 Comms Type Periodic

Temperature Measurement Units Deg_F Relay Activation Latency (min) 30

Probe Power Parasitic

OK Cancel

Click in Field to Modify
(Default-Powered)
(Default-Deg_F)

Click in Upper/Lower Field
to Increment/Decrement

Click in Field to Modify
(Default-Periodic)



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TMS-2 Temperature Measurement History Display

TMS-ID Mode Comm Type Log
TMS0001 1 Periodic OFF

Stop

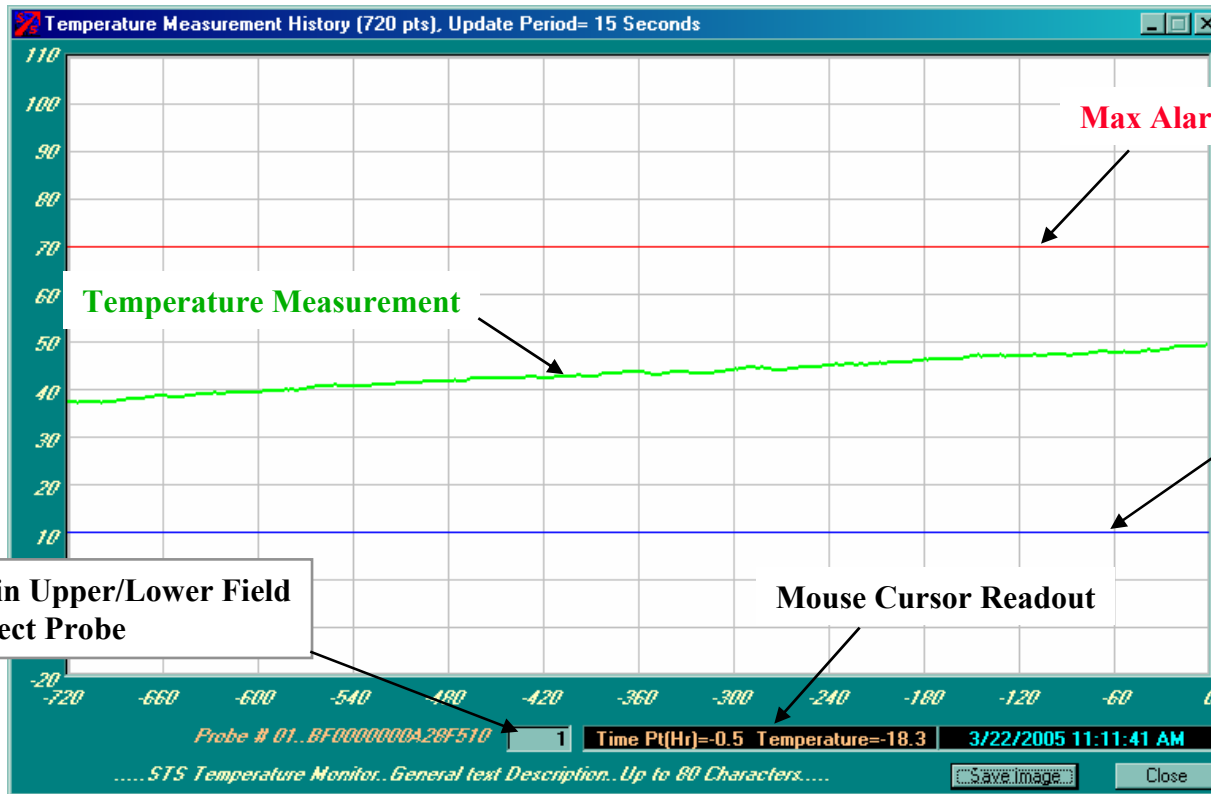
Temperature Measurements (Deg_F)

Probe # 01..BF0000000A28F510 Ack All Alarms

Probe # 01..BFD	55.6	Probe # 02..D00	76.9
Probe # 04..CEO	78.7	Probe # 05..AB0	79.3

To Open The Temperature Measurement History Window, Double Click on the Measurement Readout Field

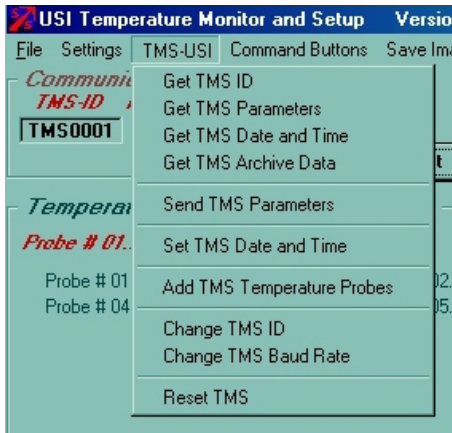
Present Time is at the Right Edge of Display



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TMS-2 TMS-UI Menu



Get TMS ID – USI responds with its ID (TMSxxxx)

Get TMS Parameters – USI responds with its parameters

Get TMS Date and Time – USI responds with its date and time

Get TMS Archive Data – USI sends the archive data line by line until complete
Archive file is saved in the Arch_Data sub-folder using the name specified in the General Parameters. The archive file is a space delimited, spread sheet ready file.

Send TMS Parameters – TMS-2 Monitor sends its current parameters to the USI

Set TMS Date and Time – TMS-2 Monitor sends its date and time (PC clock) to the USI
Note: This will reset the Data Archive in the USI.

Add TMS Temperature Probes – Begins the procedure to identify and add additional temperature probes to the existing list or creates a new list.

Change TMS ID – Changes the USI ID from the Current ID to the New ID

Change TMS Baud Rate – Changes the USI Sys Port baud rate

Note: This requires that the TMS-2 Monitor baud rate be changed as well to match the USI.

Reset TMS – Causes the USI to Reset



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