



TED 5000 V2 Module Application Guide






Description

This module allows any ethernet-equipped Crestron 2-series processor to monitor current data and historical data from a TED (The Energy Detective) 5000 Series home energy monitor.

Current data provided includes voltage, power, and cost data as well as peak and month-to-date (mtd) data from any of up to four MTUs (Measuring Transmitting Units). Historical data provided includes power and cost from the last 12 hours, days, or months. Note that the data is being logged internally on the TED 5000 unit and that until it has logged sufficient data, the historical fields may be partially and/or completely blank.

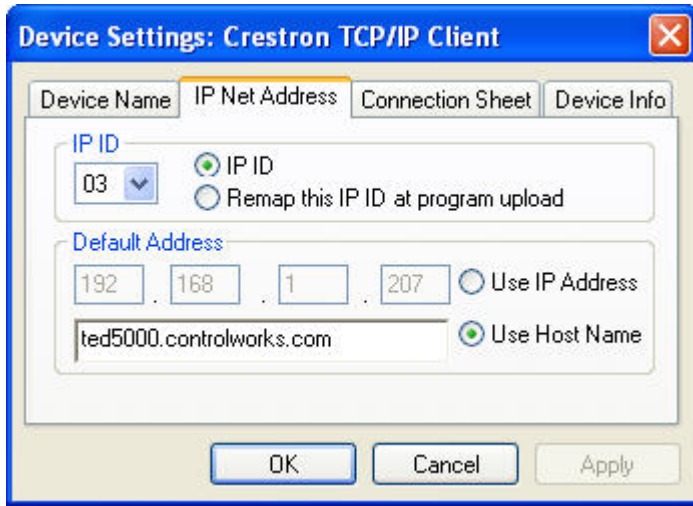
Supported Processors

This module is supported on any 2-series processor with Ethernet.

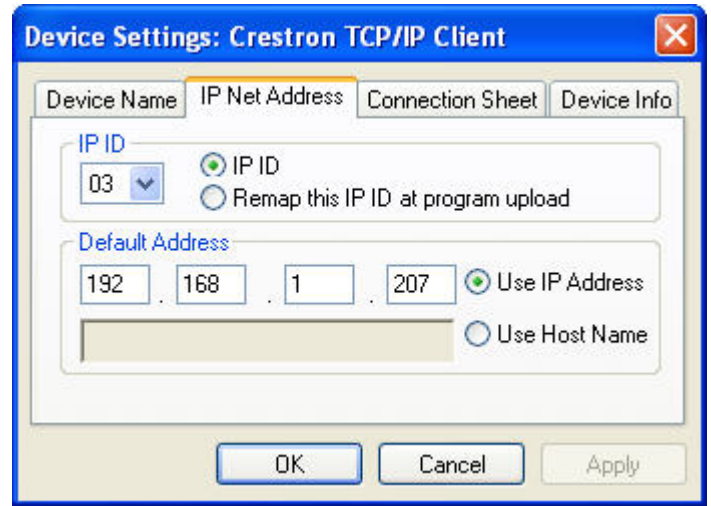
Compatibility			Processor Requirements	
 2-Series Compatible	 NOT CNMSX Compatible	 NOT System Builder Compatible	 Ethernet REQUIRED	 Compact Flash NOT NEEDED

Ethernet Configuration Information

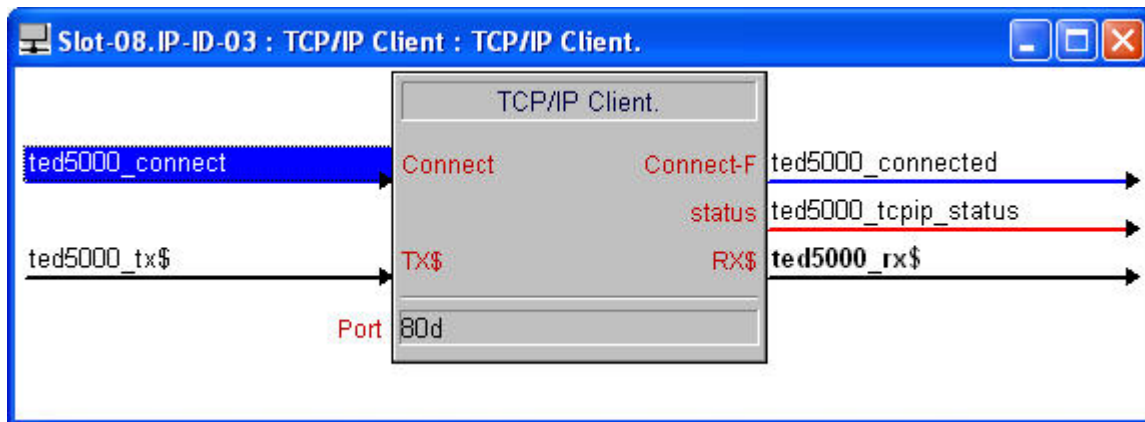
This module requires one TCP/IP client connection to the TED 5000. The HTTP port, unless changed from the default is 80.



or



The connection to the TED5000 unit should be allowed to be managed by the module and not kept open at all times.



Module Application

It is important to install the TED 5000 per their instructions. Failure to install it correctly, or in an unsupported environment (such as in a three-phase electrical system) can result in spurious or out-of-range data being returned to Crestron. It is also important to remember that, until sufficient data is logged by the TED 5000 itself, the historical data will be empty.

When first installing the system, it suggested that the daily and month-to-date totals are reset to zero, and the historical data is cleared. Both of these can be done from the "Advanced" tab of the manufacturers Footprints interface, which can be accessed at http://<ipaddress/hostname_of_unit>/Footprints.html . This interface is also where system and utility settings can be changed.

Operational Notes

The module can query for either Current or Historical data.

A Current data query will return voltage, power, and cost data for ALL MTUs as well as the TOTAL each time the query is made. These values are stored in the Crestron processor and buffered to the output of the module based upon which MTU (or Total) is selected for display.

Historical data is queried independently for Hourly, Daily, and Monthly so that each time one is selected a new query is sent out. Since the query is for only the last 12 data points, the retrieval and parsing is fairly quick.

Signal and Parameter Descriptions

Bracketed signals such as "[signal_name]" are optional signals

DIGITAL INPUTS

tcpip_connected_fb.....	Feedback from the "Connect-F" line on the TCP/IP Client.
get_current_data.....	Pulse to retrieve current data.
get_historical_data.....	Pulse to retrieve historical data.
current_data_total_sel.....	Pulse to display total values for current data.
current_data_mtu1_sel.....	Pulse to display mtu1 values for current data.
current_data_mtu2_sel.....	Pulse to display mtu2 values for current data.
current_data_mtu3_sel.....	Pulse to display mtu3 values for current data.
current_data_mtu4_sel.....	Pulse to display mtu4 values for current data.
historical_data_hourly_sel.....	Pulse to retrieve hourly values for historical data.
historical_data_daily_sel.....	Pulse to retrieve daily values for historical data.
historical_data_monthly_sel.....	Pulse to retrieve monthly values for historical data.

ANALOG INPUTS

tcp_ip_status.....	Feedback from the "status" line in the TCP/IP Client.
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SERIAL INPUTS

tcp_ip_rx\$.....	Feedback from the "RX\$" on the TCP/IP Client.
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DIGITAL OUTPUTS

tcpip_connect.....	Tie to "Connect" line on TCP/IP Client to manage connection to the TED5000.
get_data_busy.....	Remains high while a query is active, or while returned data is being parsed.
current_data_total_sel_fb.....	High while displaying total values for current data.
current_data_mtu1_sel_fb.....	High while displaying mtu1 values for current data.
current_data_mtu2_sel_fb.....	High while displaying mtu2 values for current data.
current_data_mtu3_sel_fb.....	High while displaying mtu3 values for current data.
current_data_mtu4_sel_fb.....	High while displaying mtu4 values for current data.
historical_data_hourly_sel_fb.....	High while displaying hourly values for historical data.
historical_data_daily_sel_fb.....	High while displaying values for historical data.
historical_data_monthly_sel_fb.....	High while displaying monthly values for historical data.

ANALOG OUTPUTS

voltage_now.....	Current voltage.
low_voltage_hour.....	Low voltage reading so far this hour
low_voltage_today.....	Low voltage reading so far today.
high_voltage_hour.....	High voltage reading so far this hour.
high_voltage_today.....	High voltage reading so far today.
low_voltage_mtd.....	Low voltage reading so far this month.
high_voltage_mtd.....	High voltage reading so far this month.
power_now.....	Current power reading in kWh.
power_hour.....	Power consumed so far this hour.
power_tdy.....	Power consumed so far today.
power_proj.....	Projected power consumption for the month.
kva.....	Current power expressed as kVA rather than kWh.
power_peak_tdy.....	Peak power reading today.
power_peak_mtd.....	Peak power reading so far this month.
power_min_tdy.....	Minimum power reading today.

power_min_mtd	Minimum power reading so far this month.
power_avg.....	Average daily kWh usage.
cost_now.....	Current rate per hour in effect.
cost_hour	Current cost per hour.
cost_tdy.....	Money spent since midnight.
cost_mtd.....	Money spent this month so far.
cost_proj.....	Projected bill amount.
cost_peak_tdy.....	Money spent in the most expensive hour so far today.
cost_peak_mtd.....	Money spent on the most expensive day so far this month.
cost_min_tdy	Money spent in the least expensive hour so far today.
cost_min_mtd	Money spent on the least expensive day so far this month.
cost_avg	Average daily spending.
history_power1..12.....	Power reading for historical fields 1 through 12.
history_cost1..12.....	Cost reading for historical fields 1 through 12.

SERIAL OUTPUTS

tcp_ip_tx\$	Tie to "TX\$" input on TCP/IP Client to send queries to TED5000.
gateway_time\$	Time reported back from the unit with a current data query.
gateway_date\$.....	Date (in MM/YY format) reported back from the unit with a current data query.
low_voltage_time\$.....	Time (in military time HH:MM format) corresponding to the low_voltage_today reading.
high_voltage_time\$	Time (in military time HH:MM format) corresponding to the high_voltage_today reading.
low_voltage_mtd_date\$	Date (in MM/YY format) corresponding to the low_voltage_mtd reading.
high_voltage_mtd_date\$	Date (in MM/YY format) corresponding to the high_voltage_mtd reading.
power_mtd\$	Power used so far this month.
power_peak_tdy_time\$	Time (in military time HH:MM format) corresponding to the power_peak_tdy reading.
power_peak_mtd_date\$	Date (in MM/YY format) corresponding to the power_peak_mtd reading.
power_min_tdy_time\$.....	Time (in military time HH:MM format) corresponding to the power_min_tdy reading.
power_min_mtd_date\$.....	Date (in MM/YY format) corresponding to the power_min_mtd reading.
cost_peak_tdy_time\$	Time (in military time HH:MM format) corresponding to the cost_peak_tdy reading.
cost_peak_mtd_date\$	Date (in MM/YY format) corresponding to the cost_peak_mtd reading.
cost_min_tdy_time\$	Time (in military time HH:MM format) corresponding to the cost_min_tdy reading.
cost_min_mtd_date\$	Date (in MM/YY format) corresponding to the cost_min_mtd reading.
history_date1..12\$	Date reading for historical fields 1 through 12.

PARAMETERS

IPADDRESS	IP address (or hostname) of the TED5000 unit. This should match the value in the TCP/IP Client.
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Support

This module is supported by ControlWorks Consulting, LLC. Should you need support for this module please email support@controlworks.com or call us at 440-449-1100. ControlWorks normal office hours are 9 AM to 5 PM Eastern, Monday through Friday, excluding holidays.

Before calling for support, please ensure that you have loaded and tested operation using the included demonstration program and touchpanel(s) to ensure that you understand the correct operation of the module. It may be difficult for ControlWorks to provide support until the demonstration program is loaded.

Updates, when available, are automatically distributed via Email notification to the address entered when the module was purchased. In addition, updates may be obtained using your username and password at <http://www.controlworks.com/customerlogin.aspx>

Distribution Package Contents

The distribution package for this module should include:

ted_5000_v2.umc.....	Crestron User Module for data monitoring of TED5000.
xml_parser_v2.usp.....	SIMPL+ file used within the ted_5000_v1.umc module.
xml_parser_v2.ush.....	SIMPL+ header file.
atoi_v1.usp.....	SIMPL+ file used within the ted_5000_v1.umc module.
atoi_v1.ush.....	SIMPL+ header file.
serial_combine_v1.usp.....	SIMPL+ file used within the ted_5000_v1.umc module.
serial_combine_v1.ush.....	SIMPL+ header file.
analog_adjustable_scaler_v1.umc.....	Crestron User Module for use with variable scale gauges on Xpanel.
variable_gauge_v1.usp.....	SIMPL+ file used within the analog_adjustable_scaler_v1.umc module.
variable_gauge_v1.ush.....	SIMPL+ header file.
ted_5000_Demo_XPanel_v2.vtp.....	Demo touchpanel file for Xpanel.
TED_5000_Demo_Program_v2.smw.....	Demo program for PRO2 processor.
TED_5000_v2_Help.pdf.....	Help file for module.

Revision History

V2 bob@controlworks.com 2010.06.08

-Added Average power and cost outputs to reflect new return data in XML with latest firmware (Gateway v1.0.350).

V1 bob@controlworks.com 2010.03.19

-Initial release

Development Environment

This module version was developed on the following hardware and software. Different versions of hardware or software may or may not operate properly. If you have questions, please contact us.

TED Hardware	Software Version
TED 5000	Gateway 1.0.350
	Daughterboard 1.0.48
	Footprints 1.0.184
	MTU 1.0.57
Crestron Hardware	Firmware Version
Crestron PRO2 Processor	4.001.1012
Software	Software Version
Crestron SIMPL Windows	2.12.30
Crestron Vision Tools Pro-e	4.0.20
Crestron Database	21.03.023.00
Crestron Symbol Library	657
Crestron Device Library	657

ControlWorks Consulting, LLC Module License Agreement

Definitions:

ControlWorks, *We*, and *Us* refer to ControlWorks Consulting, LLC, with headquarters located at 701 Beta Drive, Suite 22 Mayfield Village, Ohio 44143-2330. *You* and *Dealer* refer to the entity purchasing the module. *Client* and *End User* refer to the person or entity for whom the Crestron hardware is being installed and/or will utilize the installed system. *System* refers to all components described herein as well as other components, services, or utilities required to achieve the functionality described herein. *Module* refers to files required to implement the functionality provided by the module and may include source files with extensions such as UMC, USP, SMW and VTP. *Demo Program* refers to a group of files used to demonstrate the capabilities of the Module, for example a SIMPL Windows program and VisionTools Touchpanel file(s) illustrating the use of the Module but not including the Module. *Software* refers to the Module and the Demo Program.

Disclaimer of Warranties

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Provision of Support

We provide limited levels of technical support only for the most recent version of the Module as determined by Us. We do not provide support for previous version of the module, modifications to the module not made by Us, to persons who have not purchased the module from Us. In addition, we may decline to provide support if the Demo Program has not been utilized. We may withdraw a module from sale and discontinue providing support at any time and for any reason, including, for example, if the equipment for which the Module is written is discontinued or substantially modified. The remainder of your rights and obligations pursuant to this license will not be affected should ControlWorks discontinue support for a module.

Modification of Software

You may not decrypt (if encrypted), reverse engineer, modify, translate, disassemble, or de-compile the Module in whole or part. You may modify the Demo Program. In no event will ControlWorks Consulting, LLC be liable for direct, indirect, incidental or consequential damages resulting from You modifying the Software in any manner.

Indemnification/Hold Harmless

ControlWorks, in its sole and absolute discretion may refuse to provide support for the application of the Module in such a manner that We feel has the potential for property damage, or physical injury to any person. Dealer shall indemnify and hold harmless ControlWorks Consulting LLC, its employees, agents, and owners from any and all liability, including direct, indirect, and consequential damages, including but not limited to personal injury, property damage, or lost profits which may result from the operation of a program containing a ControlWorks Consulting, LLC Module or any component thereof.

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