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Manage. Monitor. Test.
Trip Unit Toolkit

VERIFICATION

Trip Unit Toolkit

User Guide

imagination at work

Contents

Installation Requirements

The Trip Unit Tool kit requires .Net Framework 4.5.1 to be installed for its operation. If the computer is connected to the internet, the software installer setup file will automatically prompt to download the .Net framework. For PremEon S and G communication, the USB driver must also be installed and is available in the installation package.

Hardware

The Trip Unit Tool Kit package requires the GTUTK20 to power and communicate with EntelliGuard trip units. The GTUTK20 utilizes a serial interface to communicate. For computers without a serial communication port a USB to RS232 converter can be used.

Note: Some USB –RS232 adaptors have poor drivers for Windows 7 & 8. The following USB – RS232 adaptors are recommended when being used with the Trip Unit Tool Kit software:

- FTDI Chip (available on DigiKey)
- TRENDnet TU-S9 (available on Amazon)

Trip Unit Support

The Trip Unit Tool Kit software supports EntelliGuard, microEntelliGuard (including MPRO 27 & 50), PremEon S for Record Plus (E Frame) and GuardEon (E frame and G frame) and PremEon G for GuardEon (E and G frame) Breakers.

Feature	EntelliGuard	microEntelliGuard[1]	PremEon S (E Frame)	PremEon S (G and K Frame)	PremEon G (E, G and K Frame)
Alarms	✓	✓	N/A	N/A	✓
Breaker Mechanism Time (Save As Pdf)	✓*	N/A	N/A	N/A	✓
Contact Wear Alarm	N/A	N/A	N/A	N/A	✓
Device Name edit and Save	✓*	✓	N/A	N/A	✓
Digital Current Injection Testing	✓*	✓	N/A	✓	✓
Display Trip Time Curve	✓	✓	N/A	N/A	N/A
Earth Fault Protection Settings	✓	N/A	N/A	N/A	N/A
Event Log (Save As Pdf)	✓	✓	✓	✓	✓
Frequency Change	✓	✓	N/A	✓	✓
GF Defeat	N/A	N/A	N/A	N/A	✓
Monitor Metering and Status Change	✓	✓	✓	✓	✓
Offline Protection Setting	✓	✓	N/A	N/A	✓
Phasor Diagram	✓*	✓	N/A	N/A	✓
Read/Write Settings	✓	✓	Read Only	Read Only	✓
Save As Pdf	✓	✓	✓	✓	✓
Trip Unit Firmware Update	✓**	✓	✓	✓	✓
Trip Unit Language Pack upload	✓*	N/A	N/A	N/A	N/A
Test Log (Save As Pdf)	✓*	✓	N/A	✓	✓
Waveform Capture (Harmonics)	✓	✓	N/A	✓	✓

*Supported in Firmware version 08.00.26 or later

**Supported in Firmware version 08.00.26 or later

[1]Supported in latest version of MET

Trip unit features vary by catalog number. Some features displayed in the software may not be supported by the connected trip unit.

Minimum System Requirements

- Windows 7 (Service Pack 1 or higher, x86, x64) / Windows 8 (x86, x64)/Windows 10
- 1 GHz or faster processor
- 1 GB RAM
- 500 MB of available hard disk space
- Video capable of displaying 800x600 or higher in High Color (16-bit)
- Internet Explorer version 10 or above

Features

The software provides the following features:

- Device and application configuration.
- View and edit the settings of various protection features the Trip unit offers namely, Over Current protection, Relay protection, Alarms, Inputs and Outputs, RELT and ZSI settings. View Trip Time curve.
- Monitor various metering and status information, events and alarms. It also provides waveform, breaker open timing and phasor diagrams for selected trip units.
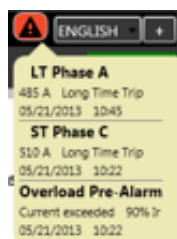- Secondary digital injection testing.
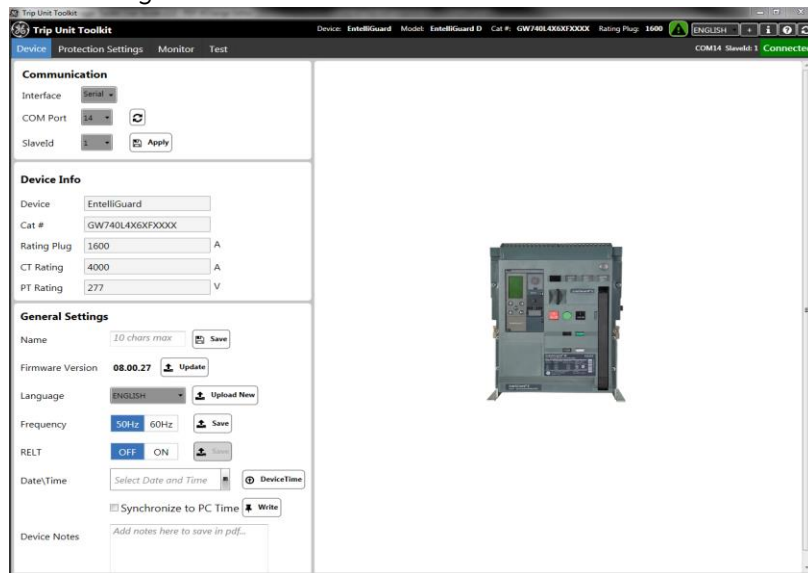
Title bar
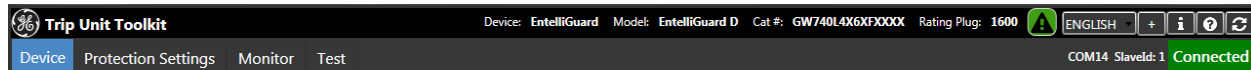
Displays **Name** of the device connected, its Device **Model Catalog** number, **Rating Plug** values (CT rating), **com port** and **slave ID**.

Alarms:

When the alarms indicator is clicked, it displays the active alarms of the connected trip unit on the Title bar.

ENGLISH ▾ **Language** (Drop down selector): Specify the language to be used of the user interface display of the application.
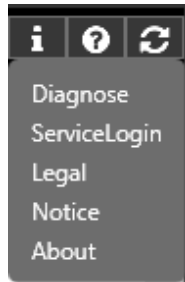
+ (Button):

Add new Language by clicking the **+** button. A *File Open* dialog is displayed to browse and select the new language file.

Additional Language packs can be downloaded from www.geindustrial.com site

i (Button):

Diagnose: Outputs a log file for troubleshooting purpose.

ServiceLogin: This feature is applicable for service professionals only. Opens login dialog window asking for password to access Service Tool.

Legal and Notice: Displays EULA information and open source notices when clicked.

About: Displays the software version of EntelliGuard Manager.

? (Button): Display "Help" file in PDF format, when clicked.

↻ (Refresh): Refreshes the device connectivity when switching between different devices.

Device tab
Communication

Interface (Drop down Selection): RS232 (serial) or RS485 (Networked devices over Ethernet S)

Supports Moxa (MGate MB3170) or Multinet 4 device which converts from RS485 to Ethernet.

IP Address and Port: Enter IP address and port to connect via RS485 to Ethernet.

Communication

Interface	Serial ▾
COM Port	1 ▾ ↻
SlaveId	1 ▾ 💾 Apply

COM Port (Drop down selection): Specify the PC's COM port number to connect the device via serial (RS232), using the drop-down selector. Hit refresh ↻ to show the current used com ports.

Slave Id (Drop down selection): Specify the MODBUS Slave Id of the device, using the drop-down selector.

Apply (Button): Click the "Apply" button to confirm the **COM Port / IP Address** and **Slave Id** selection to establish the communication with trip unit.

Device Info/Device Selection

Device Info

|		
Device	EntelliGuard	
Cat #	GW740L4X6XFXXXX	
Rating Plug	1600	A
CT Rating	4000	A
PT Rating	277	V

When connected to a device: Displays the type of the device connected, e.g. EntelliGuard / MET/PremEon S/ PremEon G.

Device Type (Read only field):
When not connected to a device: Specify the type of the device, for which to create a *Settings file,* using the drop-down selection.

EntelliGuard ▾
EntelliGuard
PremEon S
microEntelliGuard
Mpro
PremEon G
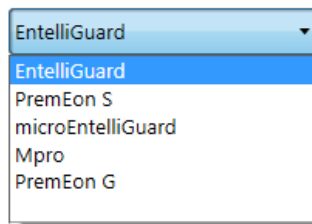
Catalog number (Read only field):
When connected to a device: Displays the catalog number of the device connected, by reading from the device, if the connected device has a catalog number already available.

Rating Plug (Read only field):
When connected to a device: Displays the Rating Plug value of the device connected, by reading from the device.

CT Rating (Read only field):
When connected to a device: Displays the CT Rating value of the device connected, by reading from the device.

Note: User cannot change the CTRating and Frame Rating via RS-485 for Mpro conversion kits (EntelliGuard-L breakers). It can only be changed via RS-232 (front port) communication.
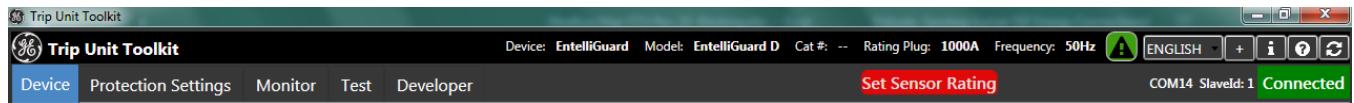
PT Rating (Read only field):
When connected to a device: Displays the PT Rating value of the device connected, by reading from the device.

Sensor Configuration (Button)
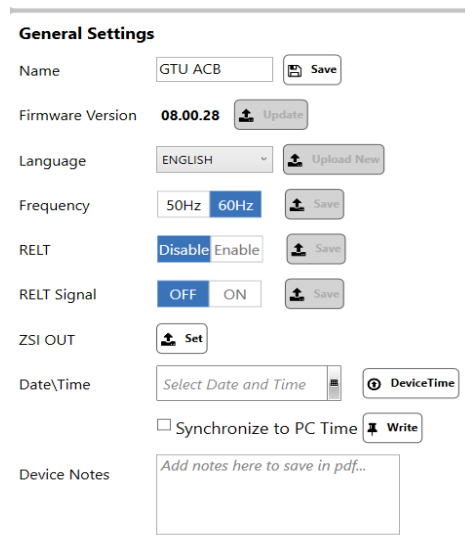
Sensor Configuration

When connected to a device: This button will be visible for breakers with EntelliGuard Universal trip units only. User can set sensor rating and breaker rating from this screen.

When universal trip unit is connected for the first time, the top shows the blinking message "Set Sensor Rating" as shown above.

General Setting

Name (Read/Write field):
When connected to a device: Displays the Name of the device connected, by reading from the device. This field can also be used to update the device name, on the device.

Save (Button):
When connected to a device: Updates the device name, by writing it to the device. Name of the device can be up to a maximum of 10 characters long.

Firmware Version (Read only field):
When connected to a device: Displays the **Firmware Version** of the device connected, by reading from the device.

Update (Button):
When connected to a device*: Initiates the **Firmware Upload** process. Firmware upload process requires the connected breaker to be in Open state. All functionalities including protections are not available during the firmware upload process. Connectivity between the PC and the trip unit must be maintained in RS 232 (Serial connection) during the entire process, except when power recycling is required.

*When connecting to a device that was previously erased but no firmware was loaded the connection indicator will show orange disconnected but firmware upload is functional to load the selected firmware file. Before selecting firmware file in this case, make sure you have selected appropriate device type and frame in device info/device selection area.

Follow below process:

1. Specify the PC's COM port number to connect the device via serial (RS232), using the COM port drop down selector.
2. Select Modbus Slave ID as 1, using the Slave ID drop down selector.
3. Select the device type using device type drop down and continue Firmware upload process.

Note: Firmware update is unavailable if Modbus/Slave ID is not set to 1. Firmware update is unavailable via RS485 connection. User should ensure that the trip unit is connected either via RS232(Serial) to EntelliGuard/microEntelliGuard breakers and via micro-USB for PremEon breakers before initiating a firmware update.
For PremEon G devices, do not unzip the firmware file folder, provide the path of the zip folder as it is received by us.

Language (Drop down selection):

When connected to a device: Displays the selected **Language** of the device connected that used on its LCD display, by reading from the device. Language can be changed by selecting a new language from the drop-down menu.

Upload New (Button):

When connected to a device: Initiates the **Language Upload** process. The language upload process requires the connected device to be in Open state. All functionalities including protections are not available during the language upload process. Connectivity between the PC and the trip unit must be maintained in RS 232 9Serial) connection) during the entire process. This is supported only by selected EntelliGuard trip units with firmware version 08.00.26 later.

Frequency (Read/Write field):

When connected to a device: Indicates the frequency of the device. Click on the desired frequency and click *Save* to update the frequency.

Note: PremEon G Trip Unit resets when frequency is updated. Protections are not available during reset.

Certain Trip units that are optioned for other than 50 Hz/ 60 Hz frequency will not display frequency option on the user interface.

RELT (Reduced Energy Let Through):

When connected to a device: This feature offered in selected *EntelliGuard and [1]microEntelliGuard trip units. If the connected device has valid catalog number and device is optioned with RELT, RELT feature can be Enabled/Disabled via Modbus Communication.

 * Supported in firmware version 08.00.26 or later

 [1] Supported in the latest version of microEntelliGuard.

RELT Signal (Reduced Energy Let Through) (Write Field):
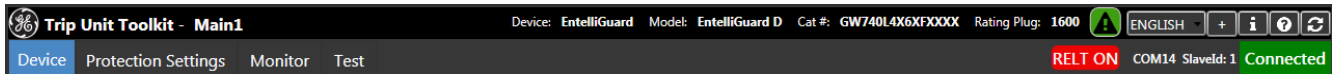
When connected to a device: If the connected device is optioned with RELT feature, RELT Signal can be turned *ON* via Modbus communication. Click *ON* then *Save* to turn RELT Signal on. Once RELT Signal is turned on, it is indicated on the LCD screen of Trip Unit and top bar of the Trip Unit Tool Kit software.

To properly connect RELT, please refer to the Trip Unit manual for proper installation of RELT

CO-ST (Command Operated Shunt Trip) (Write Field):

When connected to a device: This feature comes with only EntelliGuard Breakers. This will be useful for breakers having an accessory of Command Operated Shunt Trip. Using this feature, customer can ON/OFF the signal injection from trip unit to accessory.

GF Defeat (Write Field):

When connected to a device: This feature comes with only GuardEon Breakers with PremEon G trip units. This is useful for disabling the GF temporarily for 30 secs.

EntelliGuard UL/ANSI Inverse curves (Write Field):

When connected to a device: This feature comes with only EntelliGuard UL/ANSI Breakers having firmware version greater than or equal to 08.00.33. User can enable/disable the Inverse curves for LT protection when I4T is optioned.

Caution: The breaker should be in open mode and no protections will be required while doing this operation as the trip unit will reset while doing this operation.

ZSI OUT (Write Field):

When connected to a device: This feature comes with only EntelliGuard Breakers. This is useful for setting ZSI OUT signal in downstream breakers. This is useful testing the ZSI wiring network. This is equivalent to setting ZSI OUT from trip unit LCD.

Trip Unit Health Status (Indicator):

When connected to a PremEon G device, the device tab shows an indication of health status of Trip Unit.

Date / Time (Read/Write field):
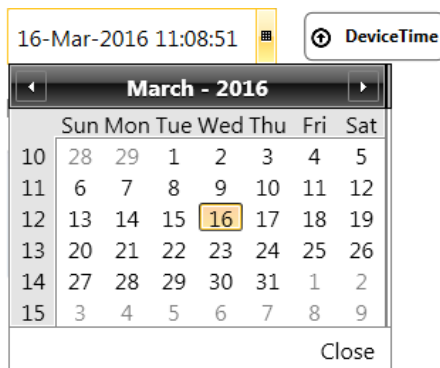
When connected to a device: Displays the date and time value from the device connected, when the **Device Time** button is clicked. This field can also be used to update the time in the device.

Write (Button):

When connected to a device: Select the date from calendar and enter the time values in text fields and click the write button, date and time information is updated in the connected device.

Synchronize to PC Time (Check box):

When connected to a device: Synchronizes the time value of the device connected with the PC's time, by writing the time info provided by the Operating System of the PC to the device, when the **Write** button is clicked.

Note: If a trip unit has operational battery, date and time will not reset once the unit is disconnected from self or auxiliary power.

Device Notes (Edit box) User notes can be typed in the text box. These notes will be saved in the pdf when **Save as Pdf** is clicked in the protection Settings tab.
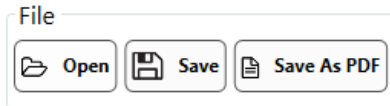
Device Notes   *Add notes here to save in pdf...*
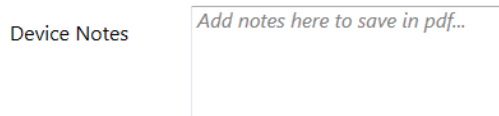
Protection Settings tab
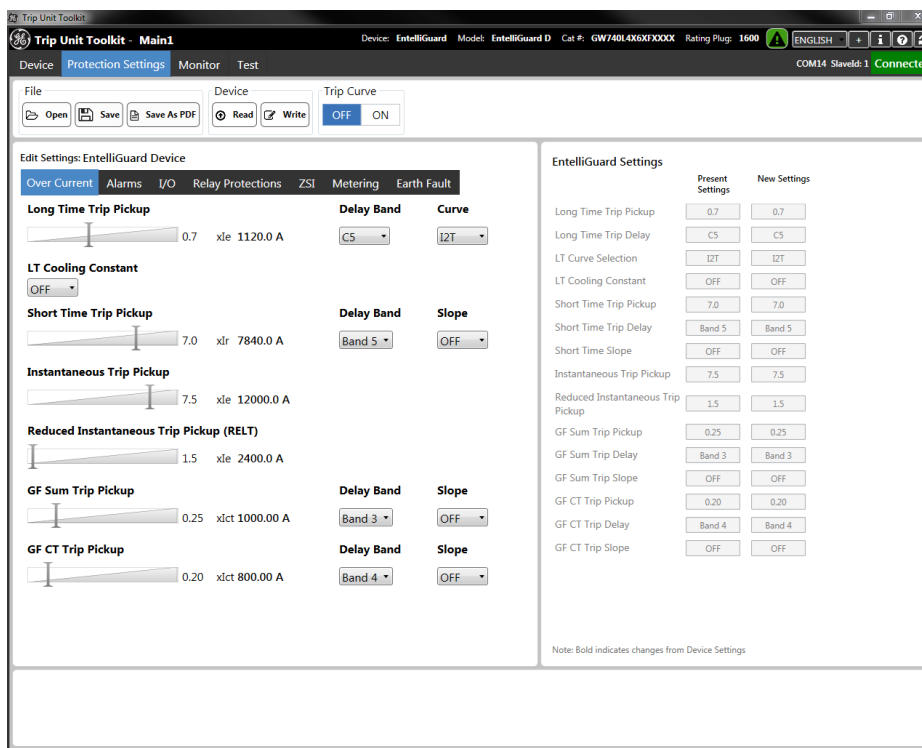
Tool bar region
File tool bar

Open (Button): Displays a *File Open* dialog to select a Settings file to be opened, and upon a Settings file selection, displays all the setting values from the selected Settings file corresponding to the Over Current Protection, Relay Protection, I/O s, RELT, Alarms, ZSI, Metering and Earth Fault settings in the edit region (left side of the screen) and the present and new settings view region (Right side of the screen).

Save (Button): Displays a *File Save* dialog to specify the name of the Settings file to be created and creates a new Settings file with chosen name in *XML format*, by copying all the settings from the Settings Edit region to the created file. A Settings file thus created can be opened by the application by using the **Open** button.

Save As PDF (Button): Displays a *File Save* dialog to specify the name of the Settings file to be created and creates a new Settings file with chosen name in *PDF format*, by copying all the settings from the Settings Edit region to the created file.

Device tool bar
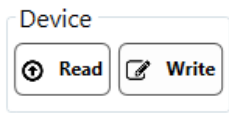
Read (Button): Reads all the setting values corresponding to the Over Current Protection, Relay Protection, I/O s, RELT, Alarms, ZSI, metering and Earth Fault settings from the device connected, and updates in both the settings edit region and the settings view region. A busy indicator will be displayed while the Read operation is in progress.

Write (Button): Writes to the device connected, the setting values that were changed in the Over Current Protection, Relay Protection, I/O s, RELT, Alarms, ZSI and metering settings tabs in the Settings Edit region. A busy indicator will be displayed while the Write operation is in progress.
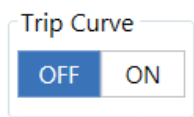
OFF (Button): Turns off the trip time curve.

ON (Button): Provides a graphic representation of protection parameters L, S, I and G of the connected trip unit. Both edit and current settings curves are displayed.

- Individual protection settings (Long time, short time, instantaneous, Ground Fault and RELT) on the graph can be turned on/off for the new and present settings of the trip unit for viewing purpose only.

- Tick marks are shown to indicate the pickup values of the overcurrent protection settings. Hovering over the beginning or end of the tick mark indicates the type of pick up. Clicking on the pop out 🔍 will open the graph in a separate window where the user can read the time and current values for select points.
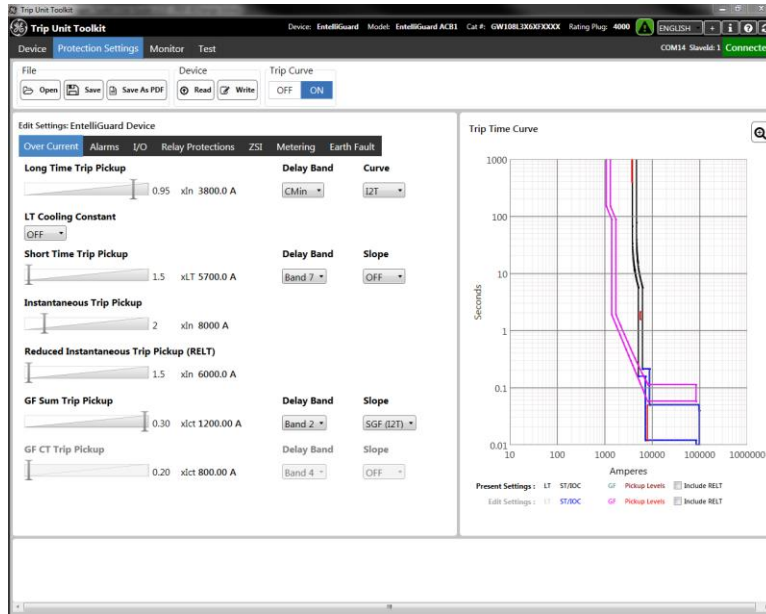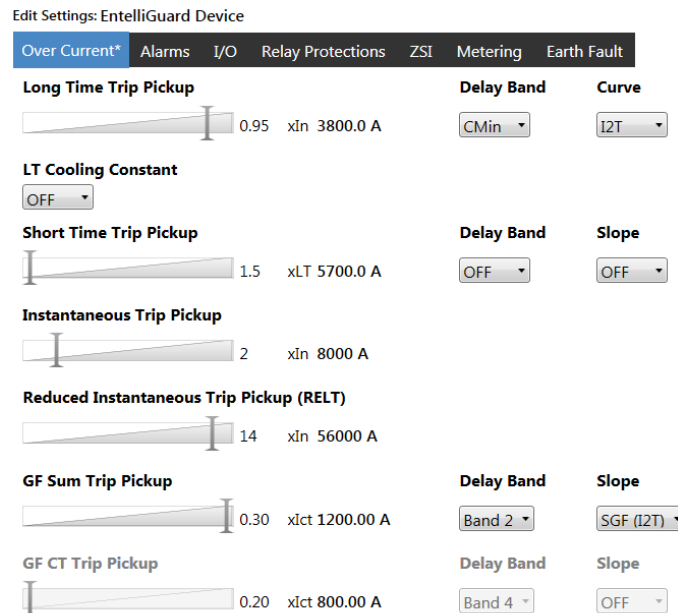

🔍 Pop out for the trip time curves

- Provides the availability to turn on/off individual curves for viewing purposes only.
- Provides the "Save As PDF" feature to save the image of the graph in pdf.
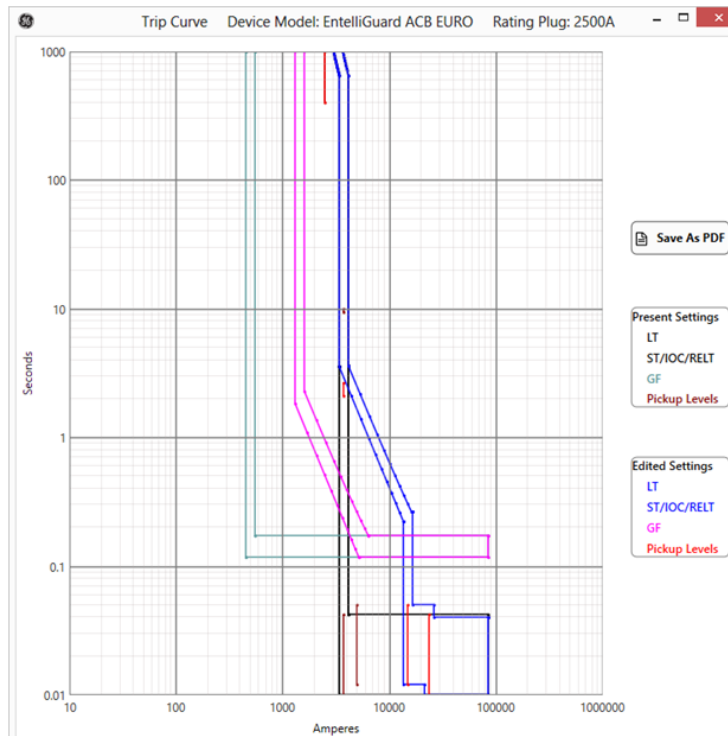
Edit Settings region

Displays the setting values corresponding to the various Protections functions in Over Current, Alarms, RELT, I/O, Relay Protections, ZSI, metering and Earth Fault tabs.

The setting values can be modified by using various user interface elements on these tabs like sliders, drop down boxes and combo buttons. An asterisk (*) symbol will be displayed on the tab when there are any changes between the current settings and device settings to mark the modification. The asterisk symbol disappears when the modified values are saved to the trip unit by clicking on **Write** button.

If the trip unit is not optioned with a feature, it will be disabled or grayed on the user interface.

Note: If a Trip unit is optioned with switchable protections, to turn off a feature in EntelliGuard / MET, click OFF from *Delay Band* drop down. For PremEon G, click *OFF* next to the protection label.
Also for PremEon G units, if I4T is selected in LT Curve, ST K cannot be set and will be disabled and will have a default value OFF.
Whenever you a see a difference in the present settings and new settings after a device write operation, chances are that the changes you have done for some settings has changed other dependent settings in the device. You can review those changes as those are highlighted and click on read device settings to sync all the current and new settings.
If you see anything red in the edit settings region, it means the value that is loaded from a file is not in the range acceptable, change the setting and write it device.

Settings View region
Displays the setting values corresponding to the tab selected on the Edit Settings region - among the tabs are Protections functions in Over Current, Alarms, RELT, I/O, Relay Protections, ZSI and metering.

When a setting value in the Edit Settings region is modified, its corresponding entry in the **New settings** (Right hand side) would be highlighted in bold. Side by side comparison of the present and new setting provides the user with better visual of the intended changes to the trip unit. The highlighting disappears when the modified values are written to the device connected by clicking on the *Write* button from the Device Tool bar.

EntelliGuard Settings

|	Present Settings	New Settings
Long Time Trip Pickup	0.95	0.95
Long Time Trip Delay	CMin	CMin
LT Curve Selection	I2T	I2T
LT Cooling Constant	OFF	OFF
Short Time Trip Pickup	1.5	1.5
Short Time Trip Delay	Band 7	**OFF**
Short Time Slope	OFF	OFF
Instantaneous Trip Pickup	2	2
Reduced Instantaneous Trip Pickup	14.0	**6**
GF Sum Trip Pickup	0.30	**0.25**
GF Sum Trip Delay	Band 2	Band 2
GF Sum Trip Slope	SGF (I2T)	SGF (I2T)
GF CT Trip Pickup	0.20	0.20
GF CT Trip Delay	Band 4	Band 4
GF CT Trip Slope	OFF	OFF

Note: Bold indicates changes from Device Settings

Write Status region

Short Time Trip Delay: Band 7 --> OFF
GF Sum Trip Pickup: 0.30 --> 0.25
Reduced Instantaneous Trip Pickup: 14.0 --> 6
Completed All Writes.

When connected to the trip unit, displays informative messages regarding the settings updates and status of on-going communication activity.

Monitor tab
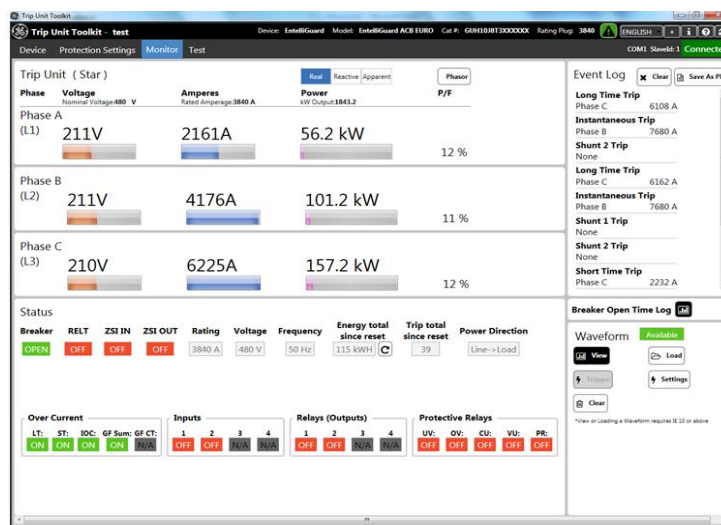
Status (Read only): Displays status information about various data items in the connected device like Voltage, Measured Frequency, Breaker status (Open/Close), RELT Status, ZSI Status, trip total since reset, power direction and Energy total etc.

Metering Values
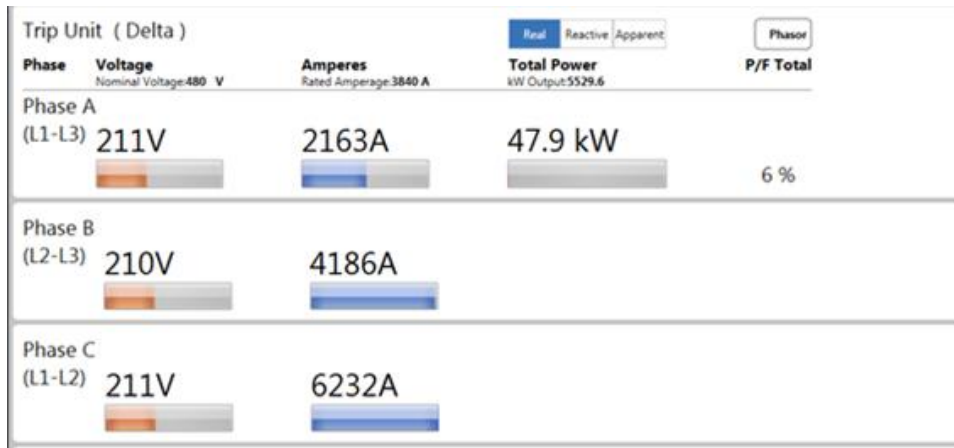
Metering (Read Only): Displays various metering data like Currents, Voltages, Power and Power Factor for different phases. Also, displays the PT system configuration (Star or Delta). The user can select to view real, reactive or apparent power from the selection box.

Note: For PremEon G trip units, Total Harmonic Distortion (THD) for voltages and currents are shown as percentage.

Phasor

When clicked on the Phasor button, a pop out screen displays the phasor of the signals, voltages, currents, Power factor (%), phase angles and assumptions about lead and lag are displayed.

When individual phases of a three-phase system differ, an unbalance results, the measure of unbalance is calculated and is represented as a percentage. When the unbalance is above 15% it is highlighted in red.
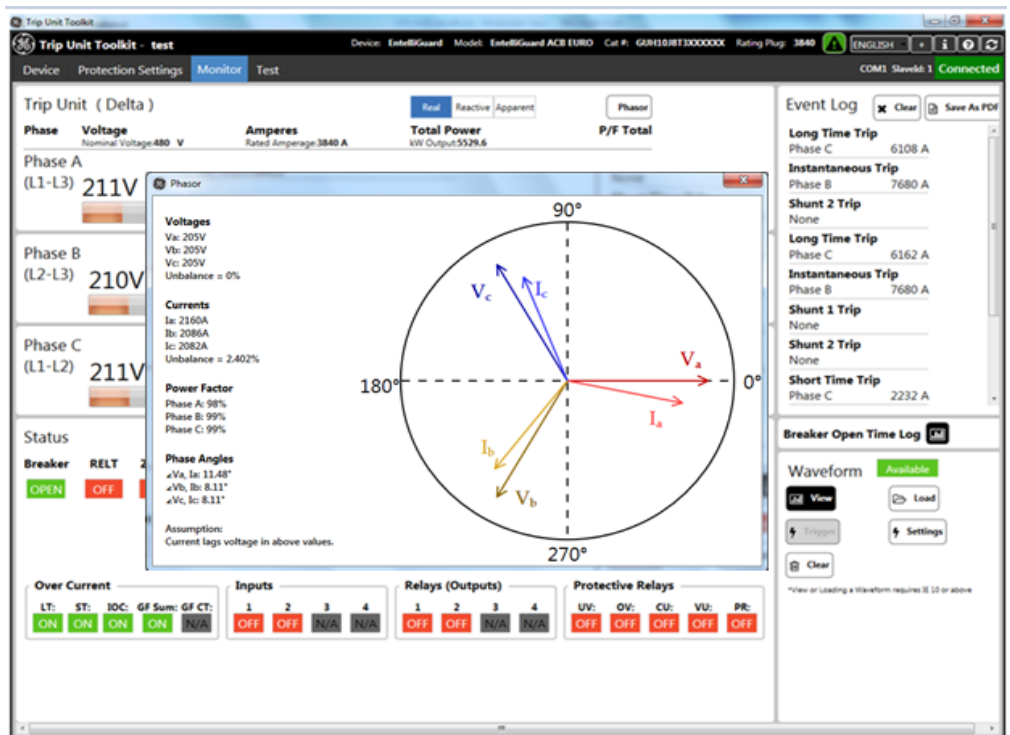
Options Status

Displays the optioning status of various features for the connected device like, Over Current protection, Relays protection, Input and Output lines and Relay status.
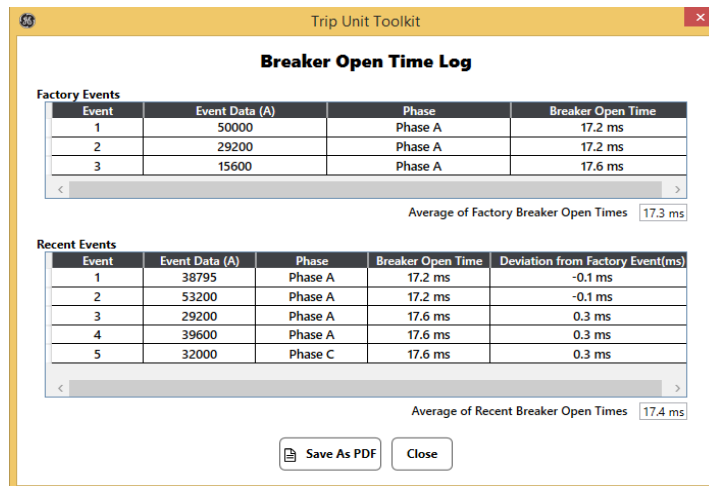
Events Log

Event Log

Ground Fault Sum Trip
None   322
10/3/0013 11:41:10 AM
Long Time Trip
Phase B   5031
10/3/0013 11:35:52 AM
Long Time Trip
Phase B   4998
10/3/0013 11:34:49 AM
Ground Fault Sum Trip
None   131
10/3/0013 11:34:04 AM
Long Time Trip
Phase A   800
10/1/0013 5:40:46 PM
Long Time Trip
Phase A   800
10/1/0013 5:24:38 PM

Displays the various events logged in the device. The events along with settings can be saved in pdf by clicking on Save as PDF.

Breaker Open Time Log

Displays breaker opening time, event data (amps) and phase information for the factory and recent events. The first three blocks are fixed in memory once they have been populated. This forms the "baseline data" for the performance of the breaker. The remaining five blocks contain the five most recent trip events. As additional events occur the oldest of the five is deleted and replaced with the new information. These five registers can be compared to the original three registers to determine if there is a need to service the breaker. This information can be tracked over time to provide an indication of breaker performance and alert the need for the equipment to be serviced.

Note that breaker operations initiated manually or by Shunt Trip or other means are not recorded.

If measurement time exceeds 300ms, Mechanical Error is displayed to indicate flux shifter failure.

Trip Unit Toolkit

Breaker Open Time Log

Factory Events

Event	Event Data (A)	Phase	Breaker Open Time
1	50000	Phase A	17.2 ms
2	29200	Phase A	17.2 ms
3	15600	Phase A	17.6 ms

Average of Factory Breaker Open Times | 17.3 ms

Recent Events

Event	Event Data (A)	Phase	Breaker Open Time	Deviation from Factory Event(ms)
1	38795	Phase A	17.2 ms	-0.1 ms
2	53200	Phase A	17.2 ms	-0.1 ms
3	29200	Phase A	17.6 ms	0.3 ms
4	39600	Phase A	17.6 ms	0.3 ms
5	32000	Phase C	17.6 ms	0.3 ms

Average of Recent Breaker Open Times | 17.4 ms

Save As PDF   Close

Save As PDF: Allows the user to save the Breaker open time log as PDF.

Note: PremEon G Trip unit can record up to 10 events in the field.
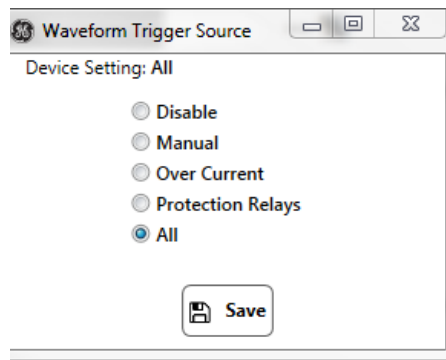
Waveform Capture
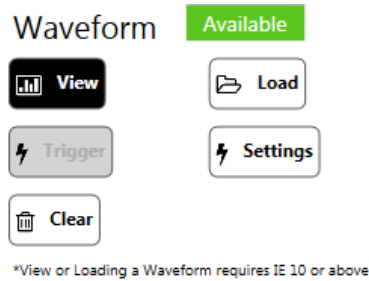
Clear (button): Clears the waveform capture data in the connected device.

Trigger (button): Triggers the waveform capture in the connected device. The device captures the complete waveform data and stores in device memory.

View (button): Reads waveform capture data from the connected device and plots the waveform in viewable format in new **Waveform viewer** screen.

Load (button): Loads the existing COMMTRADE waveform capture data from the selected path and plots the waveform in viewable format in new **Waveform viewer** screen.

Settings (Radio Button): Displays the trigger type available that can be selected from the list. Select the trigger type and click on **Save**

Status: Displays the waveform capture data availability in connected device.

GREEN: Waveform data available in device.

RED: Waveform data not available in device.

Waveform Viewer screen
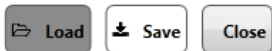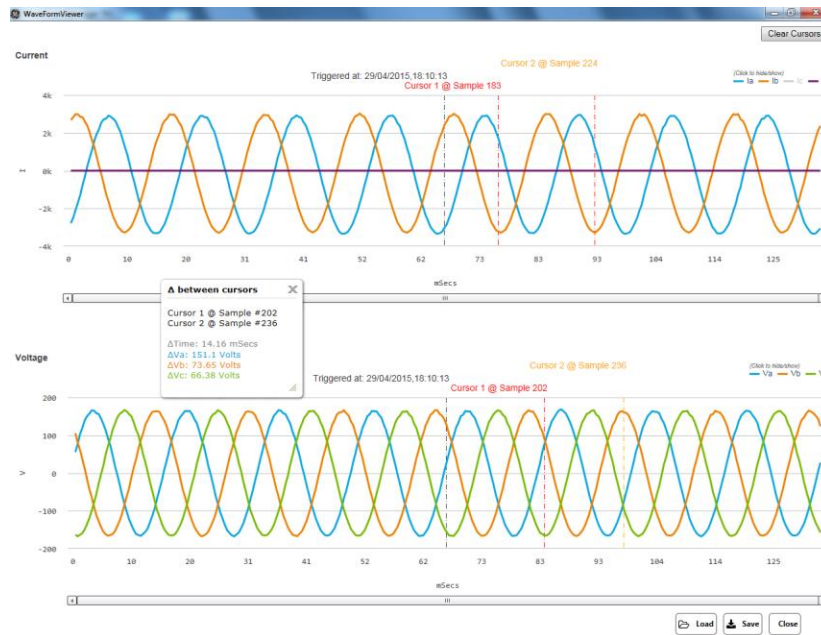
Load (button): Loads the existing COMMTRADE waveform capture data and plots the waveform in viewable format in new **Waveform viewer** screen.
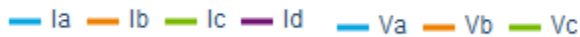
Save (button): Saves the waveform in COMMTRADE format at selected path.

Save Harmonics (button): Saves the Harmonics calculation data in csv format at selected path.
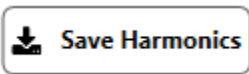
Close (button): Closes the **Waveform viewer** screen.

Filter: Toggles the selected phase for plotting of waveform.

Zooming the waveform

Waveform can be zoomed out by selecting the portion of curve with the help of mouse click and drag.

Scroll bar

Scroll bar below waveform is used to navigate through the zoomed waveform.
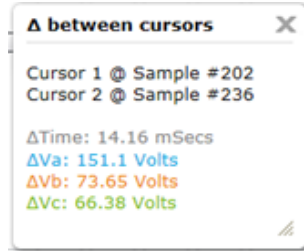
Reset Zoom
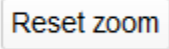
Reset zoom

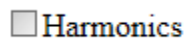When the waveform is zoomed-out, Reset Zoom is shown. By clicking this button, zoom is reset.

Delta between Cursors

Displays the time and voltage/current differences between the two cursors selected by the user.

Δ between cursors ✕

Cursor 1 @ Sample #202
Cursor 2 @ Sample #236

ΔTime: 14.16 mSecs
ΔVa: 151.1 Volts
ΔVb: 73.65 Volts
ΔVc: 66.38 Volts
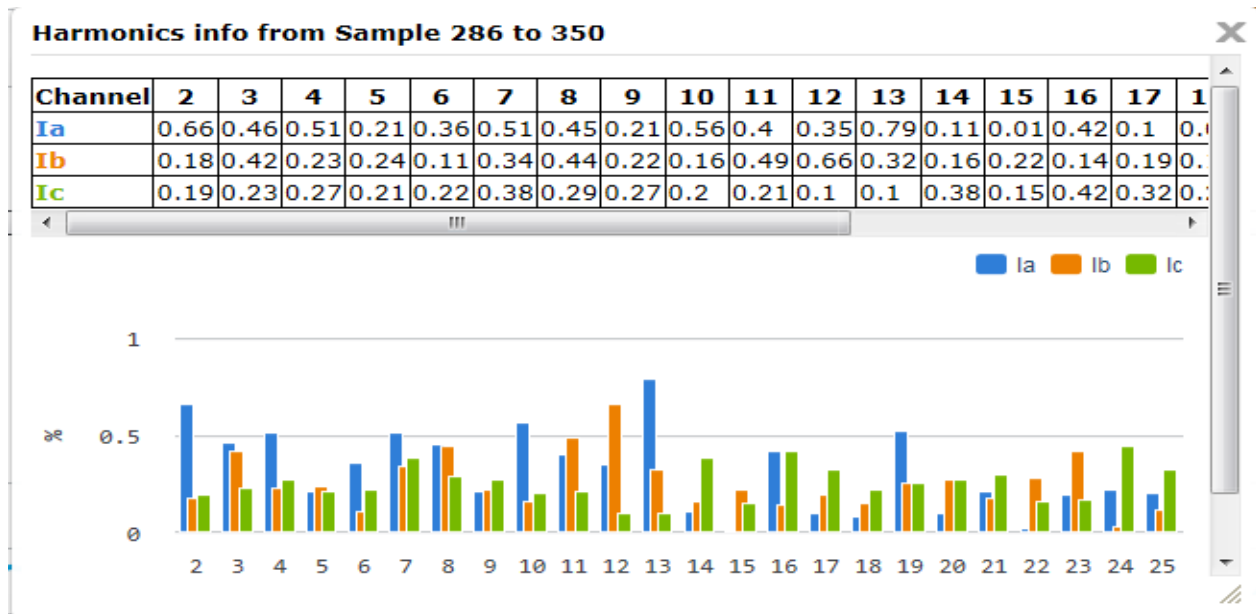
Harmonics
Harmonics (Check box)

☐ Harmonics

Acts as a toggle switch to show either Harmonics data or Delta between Cursors.

When Checked, the wave form viewer shows harmonics data when clicked on the waveform from the cursor position to the next full cycle waveform.
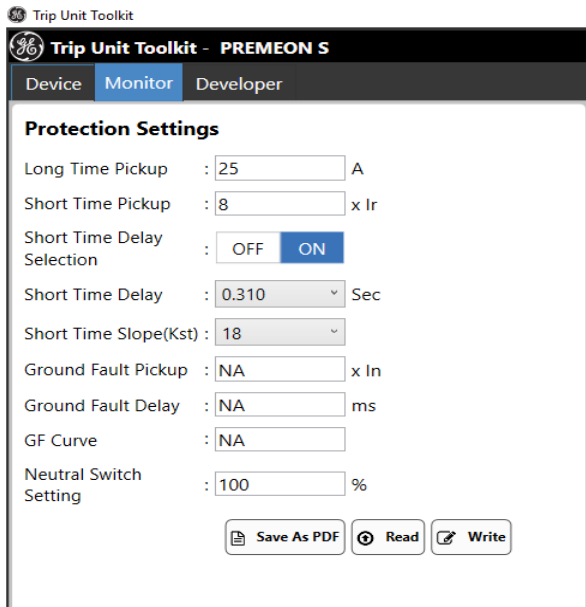
When unchecked, shows delta between cursors when two cursors are selected by the user.

Harmonics Pop-up

Shows the bar graph showing the harmonics content of the waveform from the selected cursor point to next full cycle of waveform. The harmonics are shown from 2nd harmonic to 25th harmonic data.

Harmonics info from Sample 286 to 350 ✕

Channel	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	1
Ia	0.66	0.46	0.51	0.21	0.36	0.51	0.45	0.21	0.56	0.4	0.35	0.79	0.11	0.01	0.42	0.1	0.
Ib	0.18	0.42	0.23	0.24	0.11	0.34	0.44	0.22	0.16	0.49	0.66	0.32	0.16	0.22	0.14	0.19	0.
Ic	0.19	0.23	0.27	0.21	0.22	0.38	0.29	0.27	0.2	0.21	0.1	0.1	0.38	0.15	0.42	0.32	0.

Short Time Delay Selection

When Connected to device: This feature offered in Premeon S (G Frame) trip units with the firmware version 17.00.15 or later.

If the trip unit is not optioned with ST feature, it will be hidden on the user interface.

If the Short Time Selection is set to "ON", allows user to configure Short Time Delay and Short Time Slope settings and modified values are written to device by clicking on the write button.
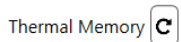
If the Short Time Selection is "OFF", Short Time Delay and Short Time Slope selection will be hidden or disabled on the user interface.

Test tab

Tester Name

Maximum 30 characters can be specified as tester name. This is used for log purposes only.

Clear Thermal Memory

When Connected to device: This feature offered in EntelliGuard and microEntelliGuard trip units only. Allows user to clear thermal memory if optioned already.

Sequence Execution

Allows the user to queue up multiple tests in a row at user defined current for digital injection.

Tested Protections

Over Current : Enables or disables the Over Current protection test functionality on the device.

GF Sum : Enables or disables the GF Sum protection test functionality on the device.

Test Settings

Current: Allows the user to set the currents for the different phases.

No Trip: The breaker will not trip when **No Trip** test is selected**.** The observed trip time is the algorithm timing plus a constant mechanism timing of the breaker.

Trip Test: When Trip test is selected, it will check for the breaker position to ensure it is closed. Observed trip time includes the actual breaker transition t and algorithm time.

Note: In case aux switch is not installed, Trip test will send a signal to trip the breaker but might show "Error: Breaker did not trip due to Mechanical error" as it has no feedback. User needs to ensure that the breaker tripped and reclose before the next trip test in the queue.

In case when the breaker position is detected as open, a message is displayed asking the user to close the breaker to continue the sequence tests.

Load: Loads an Xml file of previously created test sequences.

Save: Saves the current test queue in XML file for later use.

Add to Queue: After choosing the currents, click on Add to Queue to add the tests in the sequence. Any modification to the currents requires the user to click on *Add to Queue* to add the test.

Clear Queue: Clears the test queue.

Start: When enable, click to start the tests in the queue. **Start** will be disabled and the tests will not be allowed to run due to the following reasons:

- Active currents are flowing
- Test already in progress or no tests added to queue
- Device does not support this functionality
- Device is not connected

Stop: Stops the test currently being executed and reports Test Interrupted by user in observed trip time area. If no tests are running, Stop is disabled.

Test queue and results area display the added tests by user in sequence along with phase currents, protections to test (trip or no trip), Min and Max trip times for the tested protection band and the observed trip times for the current test setting values.

	Phase A	Phase B	Phase C	Neutral Current	Ground Current	Feature To Test	Trip Breaker?	Min Trip Time	Max Trip Time	Observed Trip Time	
1	(3.1 xIn) 6200 A	(5.3 xIn) 10600 A	(2.6 xIn) 5200 A	(0.0 xIn) 0 A	(0.0 xIct) 0 A	Long Time and Short Time	No	49.67ms	136.33ms	85.83ms	❌
2	(3.1 xIn) 6200 A	(5.3 xIn) 10600 A	(2.6 xIn) 5200 A	(0.0 xIn) 0 A	(0.0 xIct) 0 A	Long Time and Short Time	No	49.67ms	136.33ms	87.92ms	❌
3	(5.9 xIn) 11800 A	(10.8 xIn) 21600 A	(2.6 xIn) 5200 A	(0.0 xIn) 0 A	(0.0 xIct) 0 A	Long Time and Short Time	No				❌
4	(5.9 xIn) 11800 A	(10.8 xIn) 21600 A	(12.2 xIn) 24400 A	(0.0 xIn) 0 A	(0.0 xIct) 0 A	Long Time and Short Time	No				❌

Up arrow key allows rearranging the tests in the queue. Individual tests can be deleted by clicking on the red x sign.

To see all the tests, slide the scroll bar on the right. Number of the tests that can be added is limited to 20.

Test Log

Displays various log messages corresponding to the current test being performed, that include information like the selected protection functions to be tested, input current values, Trip / No trip setting, test initiation time, Min / Max trip times, and observed trip times. A **Notes** section allows the tester to add comments specific to that test. These notes will be shown on the test log when saved as a PDF.

Clear: Clears the test log which cannot be restored once deleted.

Save As PDF (Button): Saves the **test log** content in PDF format with the chosen file name and location.

Trip Curve Validation
Performs test on range of set points of trip time curve

Test Settings

User can select start, end and customized step size in terms of 0.1X. Based on the selection, test queue is created (limited to maximum 30 curve set point). Trip curve validation tests do not cause the breaker to trip.

Start: Starts the tests in the order shown in the Trip curve validation window.

Close: Stops the execution of the tests

Progress bar shows the number of tests complemeted out of total.

Test Log: Once the tests are completed, Test log is created which can be **clear**ed or Saved **as** PDF.

1. The program does not start up after install
   a) Verify NET Framework 4.5.1 installed (see below)

2. The Program starts up but displays close program dialog box
   a) If you have Digital Guardian agent (Formerly VERDASYS) installed, it will conflict with the EntelliGuard Manager application. Please contact your IT department to have EntelliGuard manager whitelisted in Digital Guardian

3. Program starts but I cannot get it to connect, Disconnected indicator red
   a) Close and Restart the program

4. Program starts but I cannot get it to connect, Disconnected indicator Orange
   a) Verify USB to RS232 COM port address
   b) Are the Slave Ids matching (Device & Software)?
   c) Confirm installation of USB – RS232 drivers
   d) Is the USB – RS232 a recommended adaptor?

5. During digital injection, my actual time exceeds the specification limits?

   Some variance is expected due to breaker wear and injection timing. The specification limits are determined by the trip curves. If there is a deviation from the specification limits, inspect the breaker wiring. Mechanism timing is determined by the auxiliary switch (during a trip test) and added to the trip time. Service to the switch may be required.

6. Waveform window is blank

   View or loading of waveform requires IE 10 or above.

7. Harmonics check box is not visible.
   When the waveform data is not proper this may lead to exceptions in the calculation of harmonics and hence not visible.

8. I am connected via RS485 but cannot upload firmware or languages to the trip unit.
   Firmware and language upload currently is not supported via the Rs485 communication. Please connect via RS232 (Serial connection, front port) for this feature.

9. Display Trip Time curve **ON** is disabled

   Reasons for the Trip curve **ON** is disabled is listed below based on the Trip unit type:

    PremEon G

   o   Not supported in current release.

   PremEon S

   o   Device not Connected
   o   Incorrect catalog number or no catalog number: Please go to **Device** tab and enter catalog number in the Cat # field under the Device info
   o   Currently Trip Time curve is available only for UL Standard
   o   Relevant protection options are not enabled in the Trip unit.

GTU

- o   Supported only for EntelliGuard G Breakers
- o   Not supported when Inverse curves is selected for LT Curve
- o   Device not connected
- o   Incorrect Frame and Sensor Rating
- o   No rating plug
- o   Relevant protection options are not enabled in the trip unit

10. Observed Trip time is showing Error: Breaker did not trip due to mechanical error
   a.   Ensure that the auxiliary switch is installed properly. If it is still showing error, inspect the switch and flux shifter is functional.
   b.   If the user has old test kit and does not have self-power breaker, then trip test will give error in observed trip time.

11. I am connected to the trip unit (shows green connect on the upper right hand corner) but cannot see Trip unit settings

   We have seen this issue with the prolific RS232 to USB converter drivers. Please update the drive and connect again.

12. Intermittent disconnections and connection stable while connected to a RS-485 network.

   Check if you have more than one trip unit in the RS-485 network with the same slave Id. Ensure to assign different slave Id for each trip unit when connected in a network either via RS-485 or Serial to Ethernet Connectors.

13. Breaker position showing as N/A for PremEon G breakers.
   Breaker position doesn't work if you don't have ICM module connected to the trip unit.

14. Firmware upload failed for PREMEON G/GR.
   Recycle the power to the trip unit by turning off all the power sources like aux power and unplug the USB and connect it again and then turn on the aux power and then re-try.

Verification of .NET Framework 4.5.1 requirements:

1.   Open the control panel from the start menu
2.   Click on "Uninstall a program" under Programs
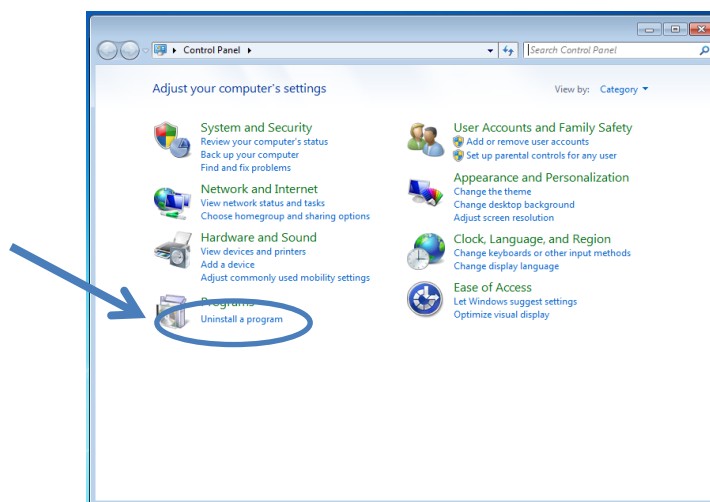
3. Look for Microsoft .NET Framework 4.5.1 in the list of programs. It must be installed for Trip Unit Tool kit to function properly.
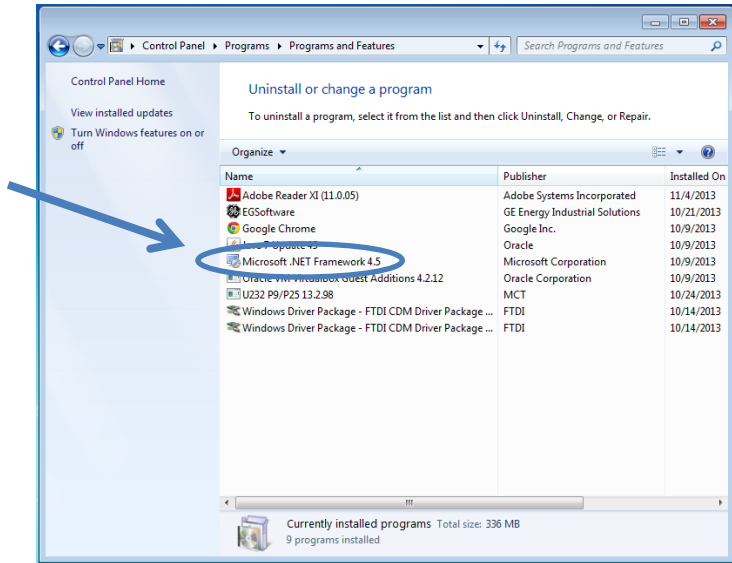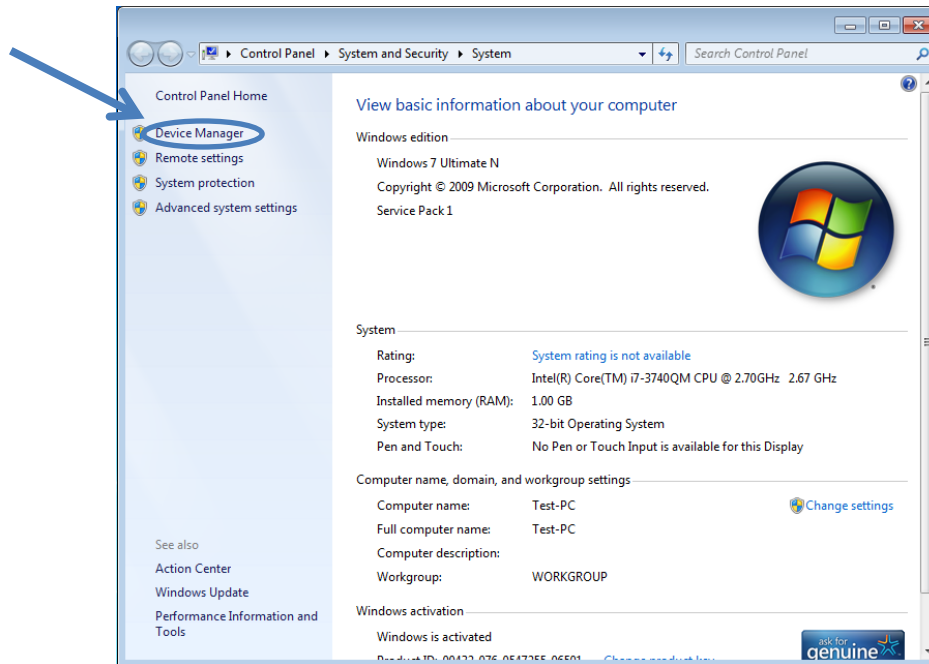

USB to RS 232 Driver installed & COM port identification Open the Start Menu and right click on "Computer"
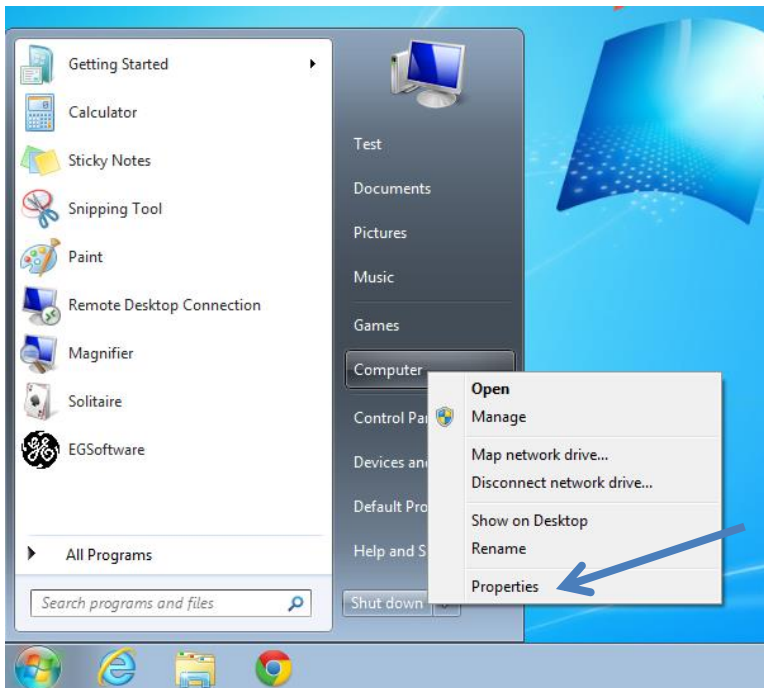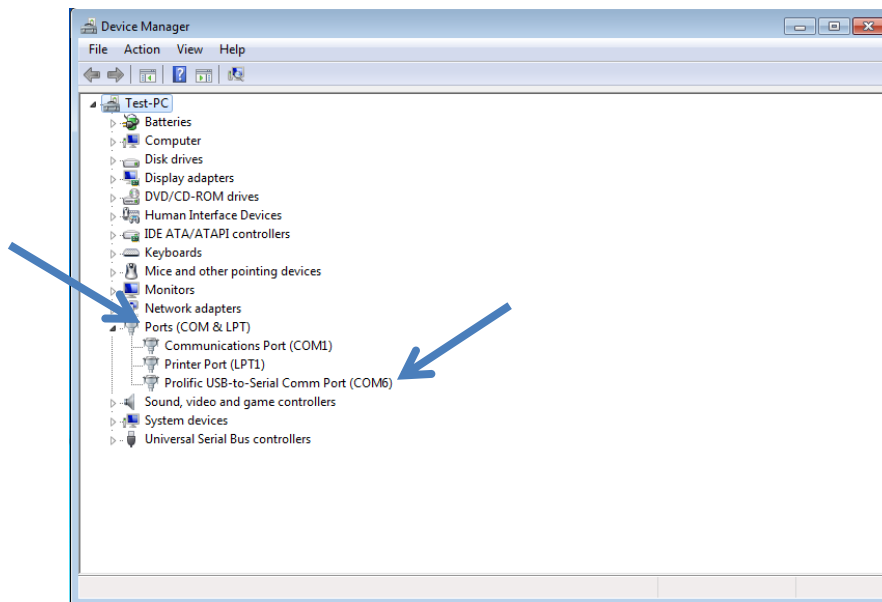

1. Click on "Properties" from the drop down menu

2. Click on "Device Manager" in the top left corner

3. Expand Ports (COM & LPT)
4. Look for a USB Serial Port and identify the COM Port

Re-assigning conflicting COM ports

1. From the Device Manager, double-click the appropriate USB Serial Port.
2. Go to the "Port Settings" tab
3. Click the "Advanced..." button
4. Change the COM Port to the desired number and click OK

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