

# UWP 3.0 Driver for TemBreak PRO MCCB SMART Electronic Trip Unit with TemCom PRO Communication module

## Using this manual

### Safety Precautions

#### **Authorised Personnel Only**

The product or system described in this documentation must be installed, operated, and maintained by qualified personnel only. NHP accept no responsibility for the consequences of the use of this equipment by unqualified personnel.

A qualified person is one with the necessary skills and knowledge of the construction and operation of the installation of electrical equipment and has been trained to identify and avoid risks.

#### **Appropriate use of NHP, Carlo Gavazzi / Terasaki products**

NHP, Carlo Gavazzi or Terasaki products are intended to be used only for the applications described in the catalogue and technical documentation, which is dedicated to them. If products and components from other manufacturers are used, they must be recommended or approved by NHP, Carlo Gavazzi or Terasaki.

Appropriate use of NHP, Carlo Gavazzi or Terasaki products during transport, storage, installation, assembly, commissioning, operation, and maintenance is necessary to ensure safe operation and without any problems.

The permissible ambient conditions must be met. The information contained in the technical documentation must be observed.

#### **Publication of responsibility**

The contents of this document have been reviewed to ensure that the reliability of the information is correct at time of publication.

NHP, Carlo Gavazzi or Terasaki are not responsible for printing or damage resulting from errors. NHP, Carlo Gavazzi or Terasaki reserve the right to make corrections and changes needed in subsequent edition.

## Firmware Notice

Please ensure you are using the latest firmware revisions. Errors experienced while using this document may be due to miss matched firmware versions. If errors are experienced after a firmware upgrade has been completed, please contact NHP for the latest version of the driver.

This manual has been developed with UWP Firmware V8.4.0.3.

## Summary of Changes

This section highlights the details of changes made since the previous issue of this document.

The versioning convention used to track changes in this document follows the structure **Vx.y.z** where:

**x:** Major revision, where extensive changes are made which is generally incompatible with the previous version. Such changes may include new firmware upgrade and/or features, or removal of information which is no longer relevant or applicable to the previous version.

**y:** Minor revision, where changes made do not change the overall scope of the previous version but may include additional information which complements or corrects the previous version or provides additional clarity on an existing topic.

**z:** Patch version, where small changes are made to correct minor errors or adjust existing text, charts, figures and/or images, and which do not add or remove information from the previous version. Example changes may include spelling corrections, image re-sizing and adjustments, updated images, etc.

Version	Publication date	Changes	By
V 1.0.0		Initial release	F.G.



## Table of Contents

Using this manual.....	1
Safety Precautions.....	1
Firmware Notice.....	1
Summary of Changes.....	2
Introduction.....	5
Who Should Use This Manual?.....	5
Applicable Products.....	5
Additional resources.....	5
Terminology and Abbreviations.....	6
Adding the Driver to UWP 3.0 Software.....	7
Modbus Communication Address Map.....	12
Last Trip.....	12
LTD Current and time Setting.....	12
Metering 1.....	12
Metering 2.....	13
Network Balance Values.....	13
Trip Unit Values.....	14
Previous GF Setting Time Values.....	14
Previous I2t Setting Time Values.....	14
Previous Ir Setting Values.....	15
Previous N Coefficient Setting Time Values.....	15
Previous NP Setting Time Values.....	15
Previous STD Setting Time Values.....	16
Previous tr Setting Values.....	16
Previous Zone interlocking Setting Time Values.....	17
Status – Alarms.....	17



Status – Error.....	18
Status – Log Priority Settings.....	18
Status – Previous GF Settings.....	19
Status – Previous I2t Settings.....	19
Status – Previous N Coefficient Setting .....	20
Status – Previous NP Settings.....	20
Status – Previous STD Settings.....	21
Status – Previous Zone Interlocking Settings .....	21
Status – System Settings.....	22
Status – Trips.....	24
Status – Zone Interlocking .....	27
Trip Counter.....	28
Trip Time – Event #1 .....	28
Trip Time – Event #2 .....	28
Trip Time – Event #3 .....	28
Trip Time – Event #4 .....	28
Trip Time – Event #5 .....	29
Trip Time – Event #6 .....	29
Trip Time – Event #7 .....	29
Trip Time – Event #8 .....	29
Trip Time – Event #9 .....	29
Trip Time – Event #10 .....	30



## Introduction

The UWP 3.0 has the capability to centralise multiple meters and power components with Modbus RTU or TCP capability. It can act as a central point of information or a gateway to a larger building management or energy management system. To reduce UWP 3.0 commissioning time, drivers have been created for NHP's meters and power components.

This user manual outlines the variables included in the TemBreak PRO SE driver and their respective placement within the TemCom Modbus communication address map. The driver has been created for monitoring purposes only, no write functions have been included in this version. To obtain the write functionality offered by the TemCom PRO, alternate products must be used.

### Who Should Use This Manual?

This manual aims to provide users, electricians, panel builders and maintenance personnel, with the technical information required for commissioning and operation of the NHP/Carlo Gavazzi UWP3.0 and NHP/Terasaki TPCM together.

Users of this document must have at minimum a basic understanding of the following:

- Modbus RTU communication
- Serial RS-485 wiring practices
- Electrical circuit protection

### Applicable Products

- UWP 3.0
  - Product ID: UWP30RSEXXX
- TemBreak Pro MCCB P and B models with the SE Trip Unit
  - Product ID range: P\*\*\*SE
  - Product ID range: B\*\*\*SE
- TemCom Communication Module
  - Product ID: TPCM00D02N (without Relay Contacts)
  - Product ID: TPCM00D02WA (with Relay Contacts)

Wiring and installation instruction of these products can be found in the respective product's user manual. Please see additional resources section for links.

### Additional resources

The following resources contain additional information which should be read in conjunction with this document.

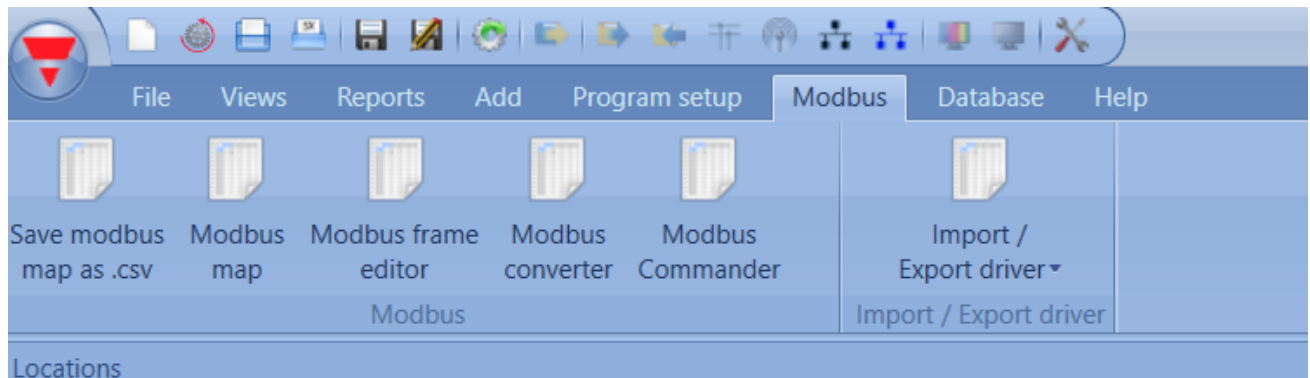
Resource	Description
TemCom PRO Communication Module User Manual	Information on installing, mounting, wiring, and Modbus map the TemCom <i>PRO</i> Communication Module.
UWP 3.0 Installation Manual	Information on installing, mounting, wiring the UWP 3.0 Module.
UWP 3.0 Tool User Manual	Information on configuring and commission the UWP 3.0 Module.
UWP 3.0 WebApp User Manual	Information on setting up the monitoring page, reoccurring reports, and alarms UWP 3.0 Module.

## Terminology and Abbreviations

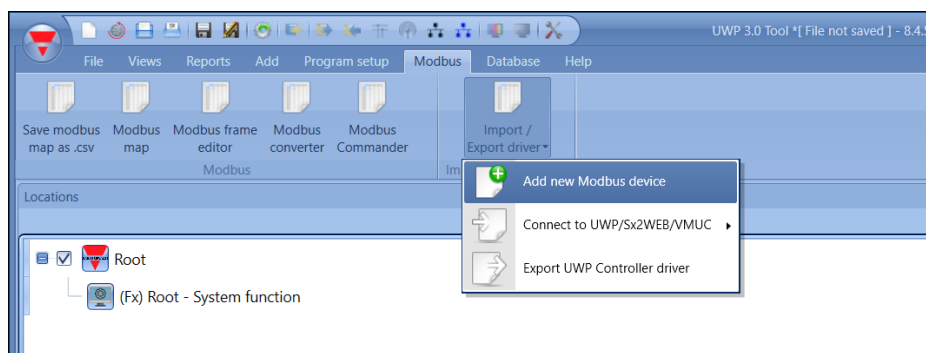
Abbreviation	Description	Abbreviation	Description
<b>AX or AUX</b>	Auxiliary: Auxiliary contact indicating open / closed	<b>MIP</b>	Maintenance Interface Port: Plug for temporary connection to Trip Unit testing, servicing, and maintenance tools
<b>CCW</b>	Connected Components Workbench software	<b>N</b>	Neutral
<b>CIP 1 2</b>	1 Communication Interface Port: Plug for control power and data for use with the TPED remote display and TPCM communication module 2 Common Industrial Protocol	<b>NP</b>	Neutral Protection
<b>CRC</b>	Cyclic Redundancy Check – error-detecting code used at the end of each Modbus message	<b>OAC</b>	Optional Alarm Contact: Connection connector optional alarm output contact
<b>DINT</b>	Signed Double Integer datatype (4 bytes or 32 bits in length)	<b>OCR</b>	Over Current Relay. In this document it will be referred to as “Trip Unit”
<b>G or GF</b>	Ground Fault Protection	<b>P or PTA</b>	Pre-trip Alarm
<b>hex</b>	Hexadecimal (base-16) numbering system	<b>PDU</b>	Protocol Data Unit
<b>I or INST</b>	Instantaneous Protection	<b>PELV</b>	Protected Extra Low Voltage (earthed system)
<b>Ig</b>	Ground Fault Protection Current	<b>PTA</b>	Pre-Trip Alarm: is a programmable output contact to advise when a trip may be imminent.
<b>Ii</b>	Instantaneous Protection Current	<b>RTU</b>	Remote Terminal Unit
<b>In</b>	Rated Current	<b>S or STD</b>	Short Time Delay Protection
<b>IN</b>	Neutral Protection Current	<b>SE</b>	Smart Energy Trip Unit
<b>INT</b>	Signed Integer datatype (2 bytes or 16 bits in length)	<b>SELV</b>	Separated Extra Low Voltage
<b>IP</b>	International Protection (Ingress Protection)	<b>SN</b>	Solid Neutral
<b>Ir</b>	LTD Protection Current	<b>TF</b>	Adjustable Thermal and Fixed Magnetic
<b>I<sub>sd</sub></b>	STD Protection Current	<b>THD</b>	Total Harmonic Distortion
<b>I<sub>tsp</sub></b>	Thermal Self-Protection Current	<b>tr</b>	LTD Time delay
<b>L or LTD</b>	Long Time Delay Protection	<b>tsd</b>	STD Time delay
<b>LCD</b>	Liquid Crystal Display (LCD)	<b>ttsp</b>	Thermal Self-Protection Time delay
<b>LED</b>	Light Emitting Diode	<b>WORD</b>	2 bytes or 16-bits of data
<b>LINT</b>	Signed Long Integer datatype (8 bytes or 64 bits in length)	<b>ZSI</b>	Zone Selective Interlocking (zone selectivity)
<b>LSI</b>	Long Time, Short Time and Instantaneous Protection	<b>LSIG</b>	Long Time, Short Time, Instantaneous and Ground Fault Protection
<b>MCCB</b>	Moulded Case Circuit Breaker		

## Adding the Driver to UWP 3.0 Software

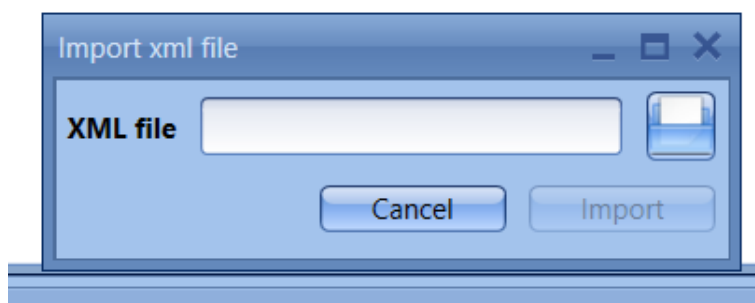
1. Download G\_TERASAKI\_TemCom\_Pro\_Vx\_y.xml file from the [NHP Energy management website](#).
2. In the UWP Tool, go to the Modbus tab, then Import/Export Driver.



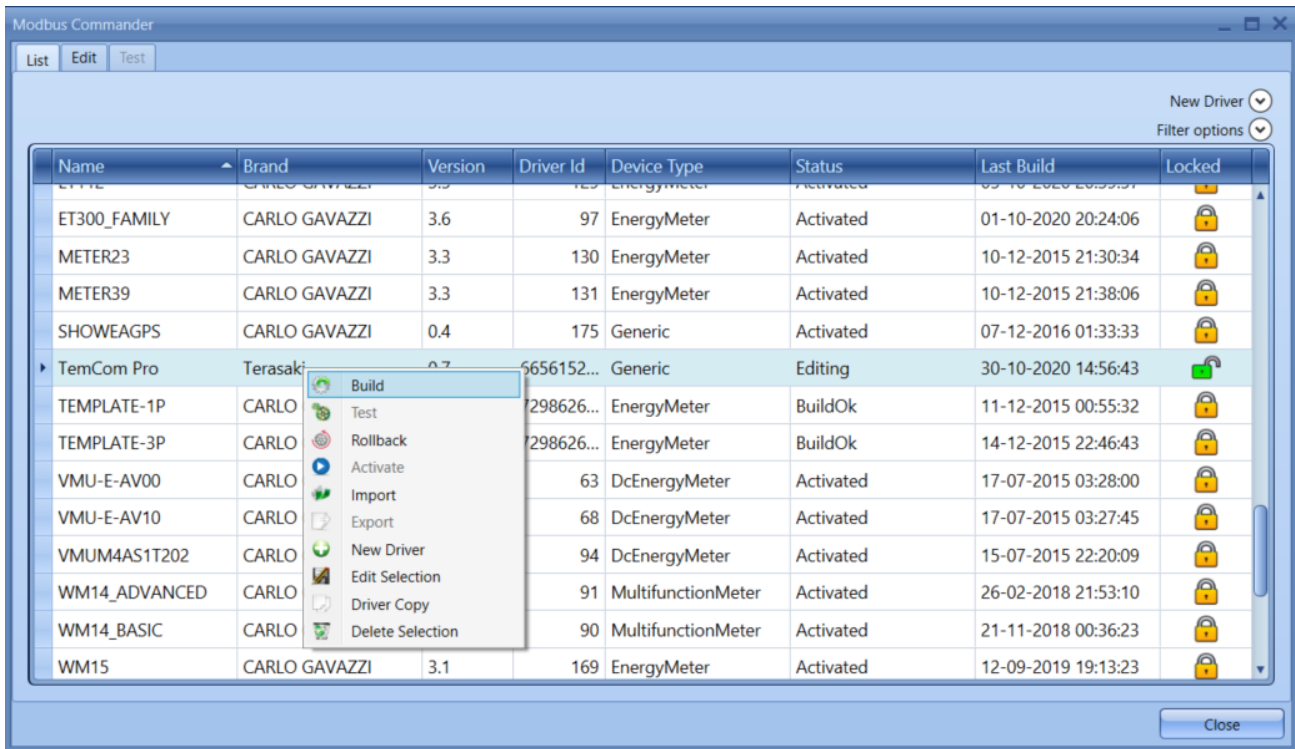
3. Select, Add new Modbus device.



4. Select the folder to browse your documents for the downloaded file. Then click import.



5. Open the Modbus Commander. Select the newly imported driver from the list. Right-click to Build and Activate.

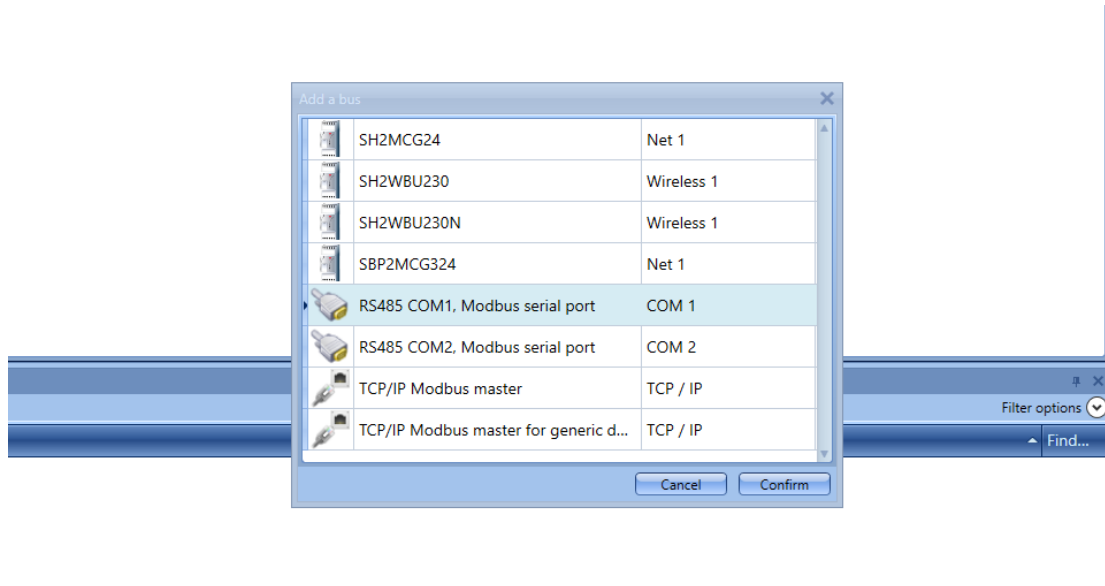


It is now available to be added as a Modbus RTU module into the project.

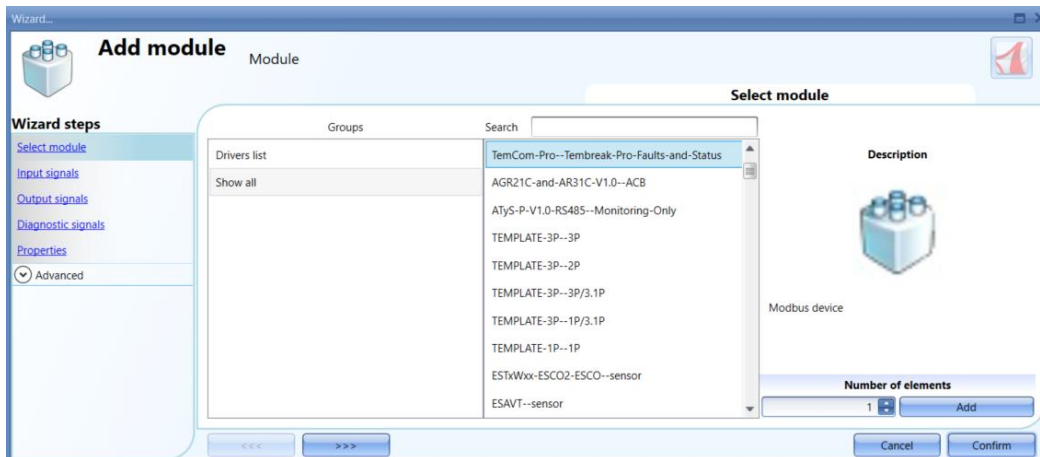


## Adding TemBreak Pro SMART Energy Trip Unit with TemCom Pro as a Module to your project

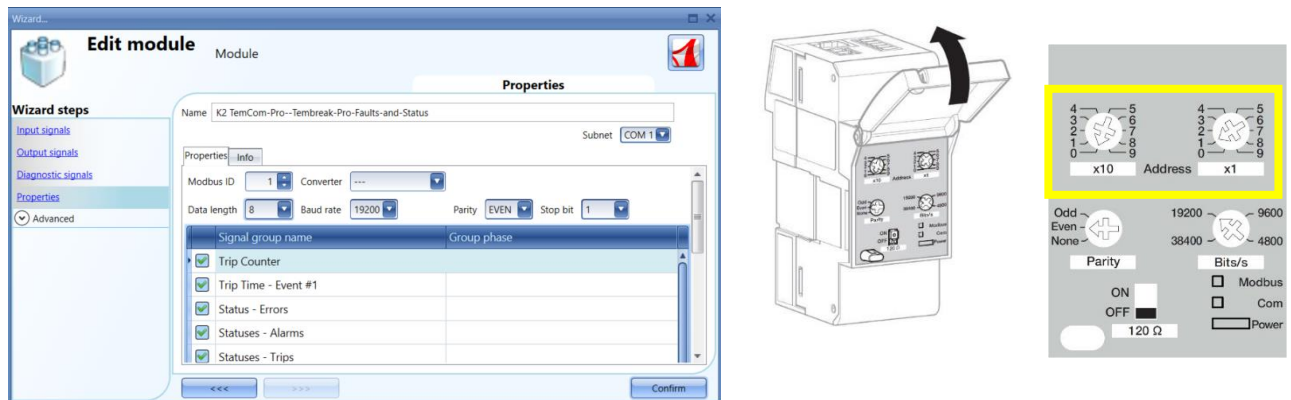
- Go to Add, then Bus – Name the bus and click confirm. Using Modbus RTU RS485 in this example:



- Select the new bus and click Module. Select the TB-Pro driver

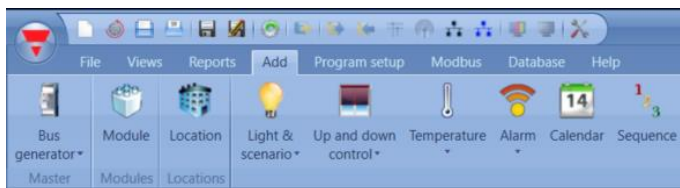


8. Before clicking on confirm go to properties and check the Modbus ID matches that of the TemCom Pro module. Click confirm.

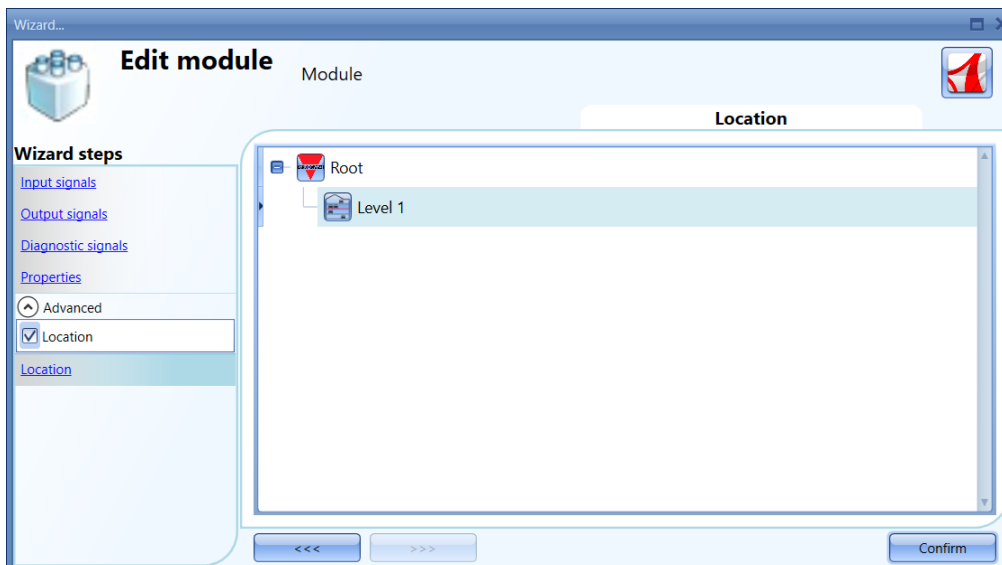


The screenshot shows the 'Edit module' wizard in the 'Properties' tab. The 'Modbus ID' is set to 1. To the right, a physical module is shown with a red arrow pointing to its top cover. Below it is a terminal block diagram with 'x10' and 'x1' labels highlighted in yellow.

9. For ease of monitoring and future maintenance, the location and naming conventions of the module can be changed at this stage.
  - a. To add a location, click Location. Name and select the location type - you can choose room or building names. Here we have chosen to represent the modules by levels. Click confirm.

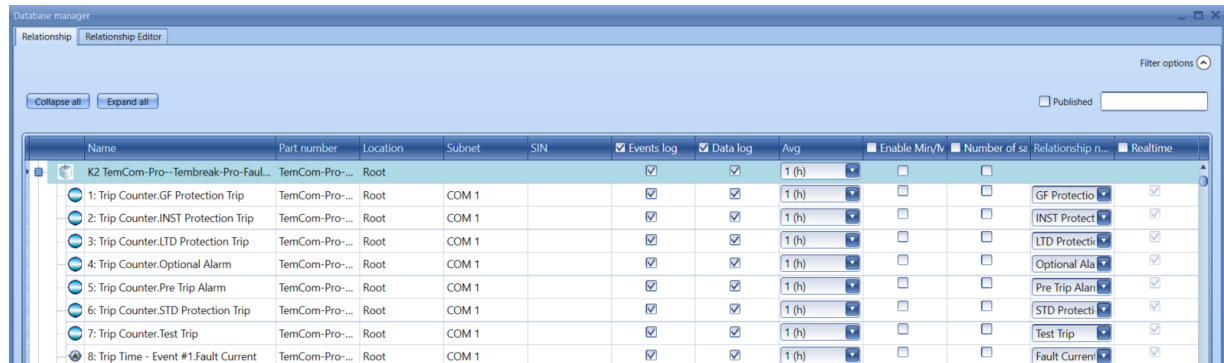


- b. Once the location is added, click on the module icon.
  - c. Go to advanced → tick location → select the location for the module to be assigned to. Click confirm.



The screenshot shows the 'Edit module' wizard in the 'Location' tab. The 'Location' checkbox is checked, and 'Level 1' is selected under the 'Root' folder.

10. Before the setup can be compiled and sent to the controller, you will need to choose how often the data needs to be read.
  - a. Under the Database tab, go to Database Management
  - b. Tick events and data log for the variables to be read and pick a sampling time (1 hour)
  - c. Confirm



11. Under the File menu, compile the project and download to controller.

## Modbus Communication Address Map

The grouping of the variables has been changed from the original map for the ease of monitoring and grouping on the UWP WebApp. The descriptions in this document are more detailed than the driver as this can be used as a reference.

### Last Trip

Function 3 Code (read only)

Hex. Address	Word Count	Description	Units	Place in Tembreak Pro TemCom Pro Modbus Map
183C	1	Fault Current	A	History
183B	1	Fault Duration	s	History
1839	2	Event Time (Timestamp user (user settable))	s	History
1837	2	Trip Unit Timestamp (Non-Resettable)	s	History

### LTD Current and time Setting

Function 3 Code (read only)

Hex. Address	Word Count	Description	Units	Place in Original Map
1B5D	1	lr	A	Configuration
185E	1	tr	s	Configuration

### Metering 1

Function 3 Code (read only)

Hex. Address	Word Count	Description	Units	Place in Original Map
12B8	4	Absolute Active Energy [Eaabs] (Eaabs = Ealn + EaOut) Since Last Reset	Wh	Measure
1130	2	Calculated Ig	A	Measure
12C0	4	Direct Active Energy [Ealn] Since Last Reset	Wh	Measure
12C8	4	Ealn (Direct Active Energy non-resettable)	Wh	Measure
12CC	4	EaOut (Reverse Active Energy non-resettable)	Wh	Measure
116A	2	F (Network Frequency)	Hz	Measure
129E	2	F Max Since Last Reset (Network Frequency)	Hz	Measure
11FA	2	F Min Since Last Reset (Network Frequency)	Hz	Measure
1128	2	I1 (Phase 1 Current)	A	Measure
112A	2	I2 (Phase 2 Current)	A	Measure
112C	2	I3 (Phase 3 Current)	A	Measure
112E	2	IN (Phase Current of Neutral)	A	Measure
12BC	4	Net Active Energy [Ea] (Ea = Ealn - EaOut) Since Last Reset	Wh	Measure
1160	1	PFtot (Total Power Factor)		Measure
129C	2	PFtot Max Since Last Reset		Measure
11F8	2	PFtot Min Since Last Reset		Measure
1148	2	Ptot (Total Active Power)	W	Measure
1150	2	Qtot (Total Reactive Power)	VAr	Measure
12C4	4	Reverse Active Energy [EaOut] Since Last Reset	Wh	Measure
1158	2	Stot (Total Apparent Power)	VA	Measure
117E	2	THD Imax (Max. THD between Phase Current I1, I2 and I3)	%	Measure
1100	2	U12 (Phase to Phase Voltage)	V	Measure
1102	2	U23 (Phase to Phase Voltage)	V	Measure
1104	2	U31 (Phase to Phase Voltage)	V	Measure
110C	2	Umax (Max. Phase to Phase Voltage between U12, U23 & U31)	V	Measure

## Metering 2

Function 3 Code (read only)

Hex. Address	Word Count	Description	Units	Place in Original Map
12E4	2	I1 dmd (Demand Phase Current of Phase 1)	A	Measure
12EE	2	I1 dmd Max Since Last Rest	A	Measure
12E6	2	I2 dmd (Demand Phase Current of Phase 2)	A	Measure
12F0	2	I2 dmd Max Since Last Rest	A	Measure
12E8	2	I3 dmd (Demand Phase Current of Phase 3)	A	Measure
12F2	2	I3 dmd Max Since Last Rest	A	Measure
12EA	2	IN dmd (Demand Phase Current of Phase N)	A	Measure
12F4	2	IN dmd Max Since Last Rest	A	Measure
12FE	2	Ptot dmd (Total Demand Power)	W	Measure
1306	2	Ptot dmd since last reset	W	Measure
130E	2	Qtot dmd (Total Demand Reactive Power)	VAr	Measure
1316	2	Qtot dmd Since Last Reset	VAr	Measure
131E	2	Stot dmd (Total Demand Apparent Power)	VA	Measure
1326	2	Stot dmd Since Last Reset	VA	Measure
12A4	2	THD U12 Max Since Last Reset	%	Measure
12A6	2	THD U23 Max Since Last Reset	%	Measure
12A8	2	THD U31 Max Since Last Reset	%	Measure

## Network Balance Values

Function 3 Code (read only)

Hex. Address	Word Count	Description	Units	Place in Original Map
1138	2	I1 Unb (Unbalance Phase Current of I1)	%	Measure
113A	2	I2 Unb (Unbalance Phase Current of I2)	%	Measure
113C	2	I3 Unb (Unbalance Phase Current of I3)	%	Measure
113E	2	IN Unb (Unbalance Phase Current of IN)	%	Measure
1140	2	Max. Unbalance Phase Current	%	Measure
1126	2	Max. Unbalance Phase to Neutral Voltage (Vmax Unb)	%	Measure
111E	2	Max. Unbalance Voltage between Phases (Umax Unb)	%	Measure
1118	2	U12 Unb (Unbalance Phase to Phase Voltage of U12)	%	Measure
111A	2	U23 Unb (Unbalance Phase to Phase Voltage of U12)	%	Measure
111C	2	U31 Unb (Unbalance Phase to Phase Voltage of U12)	%	Measure
1120	2	V1N Unb (Unbalance Phase 1 to Neutral Voltage)	%	Measure
1122	2	V2N Unb (Unbalance Phase 2 to Neutral Voltage)	%	Measure
1124	2	V3N Unb (Unbalance Phase 3 to Neutral Voltage)	%	Measure



## Trip Unit Values

Function 3 Code (read only)

Hex. Address	Word Count	Description	Units	Place in Original Map
1514	1	Internal Temperature	°C	Indicator
1522	2	Operating Time Counter	s	Indicator

## Previous GF Setting Time Values

Function 3 Code (read only)

Hex. Address	Word Count	Description	Units	Place in Original Map
18ED	2	Log #1 Trip Unit Timestamp (non-Resettable)	s	History
18EF	2	Log #1 User Timestamp (User Settable)	s	History
18F2	2	Log #2 Trip Unit Timestamp (non-Resettable)	s	History
18F4	2	Log #2 User Timestamp (User Settable)	s	History
18F7	2	Log #3 Trip Unit Timestamp (non-Resettable)	s	History
18F9	2	Log #3 User Timestamp (User Settable)	s	History
18FC	2	Log #4 Trip Unit Timestamp (non-Resettable)	s	History
18FE	2	Log #4 User Timestamp (User Settable)	s	History
1901	2	Log #5 Trip Unit Timestamp (non-Resettable)	s	History
1903	2	Log #5 User Timestamp (User Settable)	s	History

## Previous I2t Setting Time Values

Function 3 Code (read only)

Hex. Address	Word Count	Description	Units	Place in Original Map
1938	2	Log #1 I2t for GF Trip Unit Timestamp (non-Resettable)	s	History
193A	2	Log #1 I2t for GF User Timestamp (User Settable)	s	History
18BB	2	Log #1 I2t for STD Trip Unit Timestamp (non-Resettable)	s	History
18BD	2	Log #1 I2t for STD User Timestamp (User Settable)	s	History
193D	2	Log #2 I2t for GF Trip Unit Timestamp (non-Resettable)	s	History
193F	2	Log #2 I2t for GF User Timestamp (User Settable)	s	History
18C0	2	Log #2 I2t for STD Trip Unit Timestamp (non-Resettable)	s	History
18C2	2	Log #2 I2t for STD User Timestamp (User Settable)	s	History
1942	2	Log #3 I2t for GF Trip Unit Timestamp (non-Resettable)	s	History
1944	2	Log #3 I2t for GF User Timestamp (User Settable)	s	History
18C5	2	Log #3 I2t for STD Trip Unit Timestamp (non-Resettable)	s	History
18C7	2	Log #3 I2t for STD User Timestamp (User Settable)	s	History
1947	2	Log #4 I2t for GF Trip Unit Timestamp (non-Resettable)	s	History
1949	2	Log #4 I2t for GF User Timestamp (User Settable)	s	History
18CA	2	Log #4 I2t for STD Trip Unit Timestamp (non-Resettable)	s	History
18CC	2	Log #4 I2t for STD User Timestamp (User Settable)	s	History
194C	2	Log #5 I2t for GF Trip Unit Timestamp (non-Resettable)	s	History
194E	2	Log #5 I2t for GF User Timestamp (User Settable)	s	History
18CF	2	Log #5 I2t for STD Trip Unit Timestamp (non-Resettable)	s	History
18D1	2	Log #5 I2t for STD User Timestamp (User Settable)	s	History

## Previous Ir Setting Values

Function 3 Code (read only)

Hex. Address	Word Count	Description	Units	Place in Original Map
183E	2	Log #1 Trip Unit Timestamp (non-Resettable)	s	History
183D	1	Log #1 Previous Ir Setting	A	History
1840	2	Log #1 User Timestamp (User Settable)	s	History
1843	2	Log #2 Trip Unit Timestamp (non-Resettable)	s	History
1842	1	Log #2 Previous Ir Setting	A	History
1845	2	Log #2 User Timestamp (User Settable)	s	History
1848	2	Log #3 Trip Unit Timestamp (non-Resettable)	s	History
1847	1	Log #3 Previous Ir Setting	A	History
184A	2	Log #3 User Timestamp (User Settable)	s	History
184D	2	Log #4 Trip Unit Timestamp (non-Resettable)	s	History
184C	1	Log #4 Previous Ir Setting	A	History
184F	2	Log #4 User Timestamp (User Settable)	s	History
1852	2	Log #5 Trip Unit Timestamp (non-Resettable)	s	History
1851	1	Log #5 Previous Ir Setting	A	History
1854	2	Log #5 User Timestamp (User Settable)	s	History

## Previous N Coefficient Setting Time Values

Function 3 Code (read only)

Hex. Address	Word Count	Description	Units	Place in Original Map
196A	2	Log #1 Trip Unit Timestamp (non-Resettable)	s	History
196C	2	Log #1 User Timestamp (User Settable)	s	History
196F	2	Log #2 Trip Unit Timestamp (non-Resettable)	s	History
1971	2	Log #2 User Timestamp (User Settable)	s	History
1974	2	Log #3 Trip Unit Timestamp (non-Resettable)	s	History
1976	2	Log #3 User Timestamp (User Settable)	s	History
1979	2	Log #4 Trip Unit Timestamp (non-Resettable)	s	History
197B	2	Log #4 User Timestamp (User Settable)	s	History
197E	2	Log #5 Trip Unit Timestamp (non-Resettable)	s	History
1980	2	Log #5 User Timestamp (User Settable)	s	History

## Previous NP Setting Time Values

Function 3 Code (read only)

Hex. Address	Word Count	Description	Units	Place in Original Map
1951	2	Log #1 Trip Unit Timestamp (non-Resettable)	s	History
1953	2	Log #1 User Timestamp (User Settable)	s	History
1956	2	Log #2 Trip Unit Timestamp (non-Resettable)	s	History
1958	2	Log #2 User Timestamp (User Settable)	s	History
195B	2	Log #3 Trip Unit Timestamp (non-Resettable)	s	History
195D	2	Log #3 User Timestamp (User Settable)	s	History
1960	2	Log #4 Trip Unit Timestamp (non-Resettable)	s	History
1962	2	Log #4 User Timestamp (User Settable)	s	History
1965	2	Log #5 Trip Unit Timestamp (non-Resettable)	s	History
1967	2	Log #5 User Timestamp (User Settable)	s	History

## Previous STD Setting Time Values

Function 3 Code (read only)

Hex. Address	Word Count	Description	Units	Place in Original Map
1870	2	Log #1 Trip Unit Timestamp (non-Resettable)	s	History
1872	2	Log #1 User Timestamp (User Settable)	s	History
1875	2	Log #2 Trip Unit Timestamp (non-Resettable)	s	History
1877	2	Log #2 User Timestamp (User Settable)	s	History
187A	2	Log #3 Trip Unit Timestamp (non-Resettable)	s	History
187C	2	Log #3 User Timestamp (User Settable)	s	History
187F	2	Log #4 Trip Unit Timestamp (non-Resettable)	s	History
1881	2	Log #4 User Timestamp (User Settable)	s	History
1884	2	Log #5 Trip Unit Timestamp (non-Resettable)	s	History
1886	2	Log #5 User Timestamp (User Settable)	s	History

## Previous tr Setting Values

Function 3 Code (read only)

Hex. Address	Word Count	Description	Units	Place in Original Map
1857	2	Log #1 Trip Unit Timestamp (non-Resettable)	s	History
1856	1	Log #1 Previous tr Setting	s	History
1859	2	Log #1 User Timestamp (User Settable)	s	History
185C	2	Log #2 Trip Unit Timestamp (non-Resettable)	s	History
185B	1	Log #2 Previous tr Settings	s	History
185E	2	Log #2 User Timestamp (User Settable)	s	History
1861	2	Log #3 Trip Unit Timestamp (non-Resettable)	s	History
1860	1	Log #3 Previous tr Settings	s	History
1863	2	Log #3 User Timestamp (User Settable)	s	History
1866	2	Log #4 Trip Unit Timestamp (non-Resettable)	s	History
1865	1	Log #4 Previous tr Settings	s	History
1868	2	Log #4 User Timestamp (User Settable)	s	History
186B	2	Log #5 Trip Unit Timestamp (non-Resettable)	s	History
186A	1	Log #5 Previous tr Settings	s	History
186D	2	Log #5 User Timestamp (User Settable)	s	History





## Previous Zone interlocking Setting Time Values

Function 3 Code (read only)

Hex. Address	Word Count	Description	Units	Place in Original Map
199C	2	Log #1 GF Trip Unit Timestamp (non-Resettable)	s	History
199E	2	Log #1 GF User Timestamp (User Settable)	s	History
1983	2	Log #1 STD Trip Unit Timestamp (non-Resettable)	s	History
1985	2	Log #1 STD User Timestamp (User Settable)	s	History
19A1	2	Log #2 GF Trip Unit Timestamp (non-Resettable)	s	History
19A3	2	Log #2 GF User Timestamp (User Settable)	s	History
1988	2	Log #2 STD Trip Unit Timestamp (non-Resettable)	s	History
198A	2	Log #2 STD User Timestamp (User Settable)	s	History
19A6	2	Log #3 GF Trip Unit Timestamp (non-Resettable)	s	History
19A8	2	Log #3 GF User Timestamp (User Settable)	s	History
198D	2	Log #3 STD Trip Unit Timestamp (non-Resettable)	s	History
198F	2	Log #3 STD User Timestamp (User Settable)	s	History
19AB	2	Log #4 GF Trip Unit Timestamp (non-Resettable)	s	History
19AD	2	Log #4 GF User Timestamp (User Settable)	s	History
1992	2	Log #4 STD Trip Unit Timestamp (non-Resettable)	s	History
1994	2	Log #4 STD User Timestamp (User Settable)	s	History
19B0	2	Log #5 GF Trip Unit Timestamp (non-Resettable)	s	History
1AFE	2	Log #5 GF User Timestamp (User Settable)	s	History
1996	2	Log #5 STD Trip Unit Timestamp (non-Resettable)	s	History
1999	2	Log #5 STD User Timestamp (User Settable)	s	History

## Status – Alarms

Function 3 Code (read only)

Hex. Address	Word Count	Description	Unit	Place in Original Map
1515	1	<b>Trip Unit Internal Temperature</b> 0: Not Activated 1: Activated		Indicator
1510	1	<b>Pre-Trip</b> 0: Not Activated 1: Activated		Indicator
1511	1	<b>Pre-Trip Alarm OUT Contact</b> 0: Open 1: Closed		Indicator
1512	1	<b>Optional Alarm</b> 0: Not Activated 1: Activated		Indicator
1513	1	<b>Optional Alarm OUT Contact</b> 0: Not Activated 1: Activated		Indicator
150F	1	<b>Trip</b> 0: Not Activated 1: Activated		Indicator

## Status – Error

Function 3 Code (read only)

Hex. Address	Word Count	Description	Unit	Place in Original Map
1537	1	<b>Trip Unit</b> 0: Trip coil disconnection 1: Current Sensor Phase 1 Disconnection 2: Current Sensor Phase 2 Disconnection 3: Current Sensor Phase 3 Disconnection 4: Current sensor Phase Neutral Disconnection 5– 15: Reserved (Not included)		Indicator

## Status – Log Priority Settings

Function 3 Code (read only)

Hex. Address	Word Count	Description	Unit	Place in Original Map
1B55	1	<b>GF trip</b> 0: No Priority 1: Low Priority 2: Medium Priority 3: High Priority		Configuration
1B54	1	<b>INST trip</b> 0: No Priority 1: Low Priority 2: Medium Priority 3: High Priority		Configuration
1B52	1	<b>LTD trip</b> 0: No Priority 1: Low Priority 2: Medium Priority 3: High Priority		Configuration
1B53	1	<b>STD trip</b> 0: No Priority 1: Low Priority 2: Medium Priority 3: High Priority		Configuration
1B56	1	<b>Test Trip</b> 0: No Priority 1: Low Priority 2: Medium Priority 3: High Priority		Configuration

## Status – Previous GF Settings

Function 3 Code (read only)

Hex. Address	Word Count	Description	Unit	Place in Original Map
18EC	1	<b>Log #1 Previous GF</b> <i>0: Protection Disable</i> <i>1: Protection Enabled</i>		History
18F1	1	<b>Log #2 Previous GF</b> <i>0: Protection Disable</i> <i>1: Protection Enabled</i>		History
18F6	1	<b>Log #3 Previous GF</b> <i>0: Protection Disable</i> <i>1: Protection Enabled</i>		History
18FB	1	<b>Log #4 Previous GF</b> <i>0: Protection Disable</i> <i>1: Protection Enabled</i>		History
1900	1	<b>Log #5 Previous GF</b> <i>0: Protection Disable</i> <i>1: Protection Enabled</i>		History

## Status – Previous I2t Settings

Function 3 Code (read only)

Hex. Address	Word Count	Description	Unit	Place in Original Map
1937	1	<b>Log #1 Previous I2t for GF</b> <i>0: Setting Disable</i> <i>1: Setting Enable</i>		History
18BA	1	<b>Log #1 Previous I2t for STD</b> <i>0: Setting Disable</i> <i>1: Setting Enable</i>		History
193C	1	<b>Log #2 Previous I2t for GF</b> <i>0: Setting Disable</i> <i>1: Setting Enable</i>		History
18BF	1	<b>Log #2 Previous I2t for STD</b> <i>0: Setting Disable</i> <i>1: Setting Enable</i>		History
1941	1	<b>Log #3 Previous I2t for GF</b> <i>0: Setting Disable</i> <i>1: Setting Enable</i>		History
18C4	1	<b>Log #3 Previous I2t for STD</b> <i>0: Setting Disable</i> <i>1: Setting Enable</i>		History
1946	1	<b>Log #4 Previous I2t for GF</b> <i>0: Setting Disable</i> <i>1: Setting Enable</i>		History
18C9	1	<b>Log #4 Previous I2t for STD</b> <i>0: Setting Disable</i> <i>1: Setting Enable</i>		History
194B	1	<b>Log #5 Previous I2t for GF</b> <i>0: Setting Disable</i> <i>1: Setting Enable</i>		History
18CE	1	<b>Log #5 Previous I2t for STD</b> <i>0: Setting Disable</i> <i>1: Setting Enable</i>		History



## Status – Previous N Coefficient Setting

Function 3 Code (read only)

Hex. Address	Word Count	Description	Unit	Place in Original Map
1969	1	<b>Log #1 Previous N Coefficient</b> <i>0: 50% x Ir</i> <i>1: 100% x Ir</i>		History
196E	1	<b>Log #2 Previous N Coefficient</b> <i>0: 50% x Ir</i> <i>1: 100% x Ir</i>		History
1973	1	<b>Log #3 Previous N Coefficient</b> <i>0: 50% x Ir</i> <i>1: 100% x Ir</i>		History
1978	1	<b>Log #4 Previous N Coefficient</b> <i>0: 50% x Ir</i> <i>1: 100% x Ir</i>		History
197D	1	<b>Log #5 Previous N Coefficient</b> <i>0: 50% x Ir</i> <i>1: 100% x Ir</i>		History

## Status – Previous NP Settings

Function 3 Code (read only)

Hex. Address	Word Count	Description	Unit	Place in Original Map
1950	1	<b>Log #1 Previous NP</b> <i>0: Protection Disabled</i> <i>1: Protection Enabled</i>		History
1955	1	<b>Log #2 Previous NP</b> <i>0: Protection Disabled</i> <i>1: Protection Enabled</i>		History
195A	1	<b>Log #3 Previous NP</b> <i>0: Protection Disabled</i> <i>1: Protection Enabled</i>		History
195F	1	<b>Log #4 Previous NP</b> <i>0: Protection Disabled</i> <i>1: Protection Enabled</i>		History
1964	1	<b>Log #5 Previous NP</b> <i>0: Protection Disabled</i> <i>1: Protection Enabled</i>		History

## Status – Previous STD Settings

Function 3 Code (read only)

Hex. Address	Word Count	Description	Unit	Place in Original Map
186F	1	<b>Log #1 Previous STD</b> <i>0: Protection Disable</i> <i>1: Protection Enabled</i>		History
1874	1	<b>Log #2 Previous STD</b> <i>0: Protection Disable</i> <i>1: Protection Enabled</i>		History
1879	1	<b>Log #3 Previous STD</b> <i>0: Protection Disable</i> <i>1: Protection Enabled</i>		History
187E	1	<b>Log #4 Previous STD</b> <i>0: Protection Disable</i> <i>1: Protection Enabled</i>		History
1883	1	<b>Log #5 Previous STD</b> <i>0: Protection Disable</i> <i>1: Protection Enabled</i>		History

## Status – Previous Zone Interlocking Settings

Function 3 Code (read only)

Hex. Address	Word Count	Description	Unit	Place in Original Map
199B	1	<b>Log #1 Previous Zone interlocking (GF)</b> <i>0: Setting Disabled</i> <i>1: Setting Enabled</i>		History
1982	1	<b>Log #1 Previous Zone interlocking (STD)</b> <i>0: Setting Disabled</i> <i>1: Setting Enabled</i>		History
19A0	1	<b>Log #2 Previous Zone interlocking (GF)</b> <i>0: Setting Disabled</i> <i>1: Setting Enabled</i>		History
1887	1	<b>Log #2 Previous Zone interlocking (STD)</b> <i>0: Setting Disabled</i> <i>1: Setting Enabled</i>		History
19A5	1	<b>Log #3 Previous Zone interlocking (GF)</b> <i>0: Setting Disabled</i> <i>1: Setting Enabled</i>		History
198C	1	<b>Log #3 Previous Zone interlocking (STD)</b> <i>0: Setting Disabled</i> <i>1: Setting Enabled</i>		History
19AA	1	<b>Log #4 Previous Zone interlocking (GF)</b> <i>0: Setting Disabled</i> <i>1: Setting Enabled</i>		History
1991	1	<b>Log #4 Previous Zone interlocking (STD)</b> <i>0: Setting Disabled</i> <i>1: Setting Enabled</i>		History
19AF	1	<b>Log #5 Previous Zone interlocking (GF)</b> <i>0: Setting Disabled</i> <i>1: Setting Enabled</i>		History
1996	1	<b>Log #5 Previous Zone interlocking (STD)</b> <i>0: Setting Disabled</i> <i>1: Setting Enabled</i>		History

## Status – System Settings

Function 3 Code (read only)

Hex. Address	Word Count	Description	Unit	Place in Original Map
1B66	1	<b>GF</b> 0: Disabled 1: Enabled (3P) 2: Enabled (4P)		Configuration
1B68	1	<b>GF Time Delay (tg)</b> 0: 50ms 1: 100ms 2: 200ms 3: 300ms 4: 400ms 5: 500ms		Configuration
1B69	1	<b>I2t for GF</b> 0: Disabled 1: Enabled		Configuration
1B62	1	<b>I2t for STD</b> 0: Disabled 1: Enabled		Configuration
1B64	1	<b>INST</b> 0: Disabled 1: Enabled		Configuration
1B5C	1	<b>LTD Start Mode</b> 0: Cold Start Mode 1: Hot Start Mode		Configuration
1B6C	1	<b>N Coefficient</b> 0: 0.5 x Ir 1: 1 x Ir		Configuration
1B6B	1	<b>NP</b> 0: Protection Disabled 1: Protection Enabled		Configuration
1B5A	1	<b>Optional Alarm contact operation mode</b> 0: Auto Reset Mode 1: Latching Mode		Configuration
1B5B	1	<b>Optional Alarm Setting Index</b> 0: None 1: High Trip Unit Internal Temperature 2: Neutral Monitoring Wire Disconnection (Overvoltage protection according to EN50550) 3: Trip Unit Self-Test Failure 4: Reserved (Not Included) 5: PTA (Pre-Trip Alarm) 6: Custom Alarm 1 7: Custom Alarm 2 8: Custom Alarm 3 9: Custom Alarm 4 10: Custom Alarm 5 11: Custom Alarm 6 12: Custom Alarm 7 13: Custom Alarm 8 14: Custom Alarm 9 15: Custom Alarm 10 16: Custom Alarm 11 17: Custom Alarm 12		Configuration

1B02	1	<b>Phase Sequence</b> <i>0: 1-&gt;2-&gt;3</i> <i>1: 1-&gt;3-&gt;2</i>		Configuration
1B04	1	<b>Power Flow Direction</b> <i>0: Normal (ON side to OFF side)</i> <i>1: Reverse (OFF side to ON side)</i>		Configuration
1B59	1	<b>Pre-Trip Alarm Setting</b> <i>0: Disabled</i> <i>1: Enabled</i>		Configuration
1B5F	1	<b>STD</b> <i>0: Protection Disabled</i> <i>1: Protection Enabled</i>		Configuration
1B61	1	<b>STD Time Delay (tsd)</b> <i>0: 50ms</i> <i>1: 100ms</i> <i>2: 200ms</i> <i>3: 300ms</i> <i>4: 400ms</i>		Configuration
1B03	1	<b>Topology</b> <i>1: 3Phase-3Wire System</i> <i>2: 3Phase-4Wire System</i>		Configuration
1B6A	1	<b>Zone Interlocking (ZSI) for GF</b> <i>0: Disabled</i> <i>1: Enabled</i>		Configuration
1B63	1	<b>Zone Interlocking (ZSI) for STD</b> <i>0: Disabled</i> <i>1: Enabled</i>		Configuration

## Status – Trips

Function 3 Code (read only)

Hex. Address	Word Count	Description	Unit	Place in Original Map
150E	1	<b>Protection Function</b> <i>bit 0: LTD (Long time trip)</i> <i>bit 1: STD (Short time trip)</i> <i>bit 2: INST (Instantaneous trip)</i> <i>bit 3: GF (Ground fault trip)</i> <i>bit 4-15: Reserved (Not included)</i>		Indicator
1836	1	<b>Last Trip</b> <i>0: None</i> <i>1: LTD trip on Phase1</i> <i>2: LTD trip on Phase2</i> <i>3: LTD trip on Phase3</i> <i>4: LTD trip on Neutral Phase (3P+N only)</i> <i>5: STD trip on Phase1</i> <i>6: STD trip on Phase2</i> <i>7: STD trip on Phase3</i> <i>8: STD trip on Neutral Phase (3P+N only)</i> <i>9: GF trip</i> <i>10: INST trip on Phase1</i> <i>11: INST trip on Phase2</i> <i>12: INST trip on Phase3</i> <i>13: INST trip on Neutral Phase (3P+N only)</i> <i>15: Reserved</i>		History
17F0	1	<b>Trip Event #1 Trip ID</b> <i>0: None</i> <i>1: LTD trip on Phase1</i> <i>2: LTD trip on Phase2</i> <i>3: LTD trip on Phase3</i> <i>4: LTD trip on Neutral Phase (3P+N only)</i> <i>5: STD trip on Phase1</i> <i>6: STD trip on Phase2</i> <i>7: STD trip on Phase3</i> <i>8: STD trip on Neutral Phase (3P+N only)</i> <i>9: GF trip</i> <i>10: INST trip on Phase1</i> <i>11: INST trip on Phase2</i> <i>12: INST trip on Phase3</i> <i>13: INST trip on Neutral Phase (3P+N only)</i> <i>15: Reserved</i>		History
17F7	1	<b>Trip Event #2 Trip ID</b> <i>0: None</i> <i>1: LTD trip on Phase1</i> <i>2: LTD trip on Phase2</i> <i>3: LTD trip on Phase3</i> <i>4: LTD trip on Neutral Phase (3P+N only)</i> <i>5: STD trip on Phase1</i> <i>6: STD trip on Phase2</i> <i>7: STD trip on Phase3</i> <i>8: STD trip on Neutral Phase (3P+N only)</i> <i>9: GF trip</i> <i>10: INST trip on Phase1</i> <i>11: INST trip on Phase2</i> <i>12: INST trip on Phase3</i> <i>13: INST trip on Neutral Phase (3P+N only)</i> <i>15: Reserved</i>		History



Hex. Address	Word Count	Description	Unit	Place in Original Map
17FE	1	<b>Trip Event #3 Trip ID</b> 0: None 1: LTD trip on Phase1 2: LTD trip on Phase2 3: LTD trip on Phase3 4: LTD trip on Neutral Phase (3P+N only) 5: STD trip on Phase1 6: STD trip on Phase2 7: STD trip on Phase3 8: STD trip on Neutral Phase (3P+N only) 9: GF trip 10: INST trip on Phase1 11: INST trip on Phase2 12: INST trip on Phase3 13: INST trip on Neutral Phase (3P+N only) 15: Reserved		History
1805	1	<b>Trip Event #4 Trip ID</b> 0: None 1: LTD trip on Phase1 2: LTD trip on Phase2 3: LTD trip on Phase3 4: LTD trip on Neutral Phase (3P+N only) 5: STD trip on Phase1 6: STD trip on Phase2 7: STD trip on Phase3 8: STD trip on Neutral Phase (3P+N only) 9: GF trip 10: INST trip on Phase1 11: INST trip on Phase2 12: INST trip on Phase3 13: INST trip on Neutral Phase (3P+N only) 15: Reserved		History
180C	1	<b>Trip Event #5 Trip ID</b> 0: None 1: LTD trip on Phase1 2: LTD trip on Phase2 3: LTD trip on Phase3 4: LTD trip on Neutral Phase (3P+N only) 5: STD trip on Phase1 6: STD trip on Phase2 7: STD trip on Phase3 8: STD trip on Neutral Phase (3P+N only) 9: GF trip 10: INST trip on Phase1 11: INST trip on Phase2 12: INST trip on Phase3 13: INST trip on Neutral Phase (3P+N only) 15: Reserved		History

Hex. Address	Word Count	Description	Unit	Place in Original Map
1813	1	<b>Trip Event #6 Trip ID</b> 0: None 1: LTD trip on Phase1 2: LTD trip on Phase2 3: LTD trip on Phase3 4: LTD trip on Neutral Phase (3P+N only) 5: STD trip on Phase1 6: STD trip on Phase2 7: STD trip on Phase3 8: STD trip on Neutral Phase (3P+N only) 9: GF trip 10: INST trip on Phase1 11: INST trip on Phase2 12: INST trip on Phase3 13: INST trip on Neutral Phase (3P+N only) 15: Reserved		History
181A	1	<b>Trip Event #7 Trip ID</b> 0: None 1: LTD trip on Phase1 2: LTD trip on Phase2 3: LTD trip on Phase3 4: LTD trip on Neutral Phase (3P+N only) 5: STD trip on Phase1 6: STD trip on Phase2 7: STD trip on Phase3 8: STD trip on Neutral Phase (3P+N only) 9: GF trip 10: INST trip on Phase1 11: INST trip on Phase2 12: INST trip on Phase3 13: INST trip on Neutral Phase (3P+N only) 15: Reserved		History
1821	1	<b>Trip Event #8 Trip ID</b> 0: None 1: LTD trip on Phase1 2: LTD trip on Phase2 3: LTD trip on Phase3 4: LTD trip on Neutral Phase (3P+N only) 5: STD trip on Phase1 6: STD trip on Phase2 7: STD trip on Phase3 8: STD trip on Neutral Phase (3P+N only) 9: GF trip 10: INST trip on Phase1 11: INST trip on Phase2 12: INST trip on Phase3 13: INST trip on Neutral Phase (3P+N only) 15: Reserved		History

Hex. Address	Word Count	Description	Unit	Place in Original Map
1828	1	<b>Trip Event #9 Trip ID</b> 0: None 1: LTD trip on Phase1 2: LTD trip on Phase2 3: LTD trip on Phase3 4: LTD trip on Neutral Phase (3P+N only) 5: STD trip on Phase1 6: STD trip on Phase2 7: STD trip on Phase3 8: STD trip on Neutral Phase (3P+N only) 9: GF trip 10: INST trip on Phase1 11: INST trip on Phase2 12: INST trip on Phase3 13: INST trip on Neutral Phase (3P+N only) 15: Reserved		History
182F	1	<b>Trip Event #10 Trip ID</b> 0: None 1: LTD trip on Phase1 2: LTD trip on Phase2 3: LTD trip on Phase3 4: LTD trip on Neutral Phase (3P+N only) 5: STD trip on Phase1 6: STD trip on Phase2 7: STD trip on Phase3 8: STD trip on Neutral Phase (3P+N only) 9: GF trip 10: INST trip on Phase1 11: INST trip on Phase2 12: INST trip on Phase3 13: INST trip on Neutral Phase (3P+N only) 15: Reserved		History

## Status – Zone Interlocking

Function 3 Code (read only)

Hex. Address	Word Count	Description	Unit	Place in Original Map
1520	1	<b>GF Input</b> 0: No Input from Downstream Breakers 1: Input from Downstream Breakers		Indicator
1521	1	<b>GF Output</b> 0: No Input from Downstream Breakers 1: Input from Downstream Breakers		Indicator
151E	1	<b>STD Input</b> 0: No Input from Downstream Breakers 1: Input from Downstream Breakers		Indicator
151F	1	<b>STD Output</b> 0: No Input from Downstream Breakers 1: Input from Downstream Breakers		Indicator



## Trip Counter

Function 3 Code (read only)

Hex. Address	Word Count	Description	Unit	Place in Original Map
1544	1	GF Protection Trip		Indicator
1543	1	INST Protection Trip		Indicator
1541	1	LTD Protection Trip		Indicator
1547	1	Optional Alarms		Indicator
1546	1	Pre-Trip Alarms		Indicator
1542	1	STD Protection Trip		Indicator
1545	1	Test Trip		Indicator

## Trip Time – Event #1

Function 3 Code (read only)

Hex. Address	Word Count	Description	Unit	Place in Original Map
17F6	1	Fault Current	A	History
17F5	1	Fault Duration	s	History
17F1	2	Trip Unit Timestamp (Non-Resettable)	s	History
17F2	2	Timestamp user (settable by user)	s	History

## Trip Time – Event #2

Function 3 Code (read only)

Hex. Address	Word Count	Description	Unit	Place in Original Map
17FD	1	Fault Current	A	History
17FC	1	Fault Duration	s	History
17F8	2	Trip Unit Timestamp (Non-Resettable)	s	History
17FA	2	Timestamp user (settable by user)	s	History

## Trip Time – Event #3

Function 3 Code (read only)

Hex. Address	Word Count	Description	Unit	Place in Original Map
1804	1	Fault Current	A	History
1803	1	Fault Duration	s	History
17FF	2	Trip Unit Timestamp (Non-Resettable)	s	History
1801	2	Timestamp user (settable by user)	s	History

## Trip Time – Event #4

Function 3 Code (read only)

Hex. Address	Word Count	Description	Unit	Place in Original Map
180B	1	Fault Current	A	History
180A	1	Fault Duration	s	History
1806	2	Trip Unit Timestamp (Non-Resettable)	s	History
1808	2	Timestamp user (settable by user)	s	History



## Trip Time – Event #5

Function 3 Code (read only)

Hex. Address	Word Count	Description	Unit	Place in Original Map
1812	1	Fault Current	A	History
1811	1	Fault Duration	s	History
180F	2	Trip Unit Timestamp (Non-Resettable)	s	History
180D	2	Timestamp user (settable by user)	s	History

## Trip Time – Event #6

Function 3 Code (read only)

Hex. Address	Word Count	Description	Unit	Place in Original Map
1819	1	Fault Current	A	History
1818	1	Fault Duration	s	History
1814	2	Trip Unit Timestamp (Non-Resettable)	s	History
1816	2	Timestamp user (settable by user)	s	History

## Trip Time – Event #7

Function 3 Code (read only)

Hex. Address	Word Count	Description	Unit	Place in Original Map
1820	1	Fault Current	A	History
181F	1	Fault Duration	s	History
181B	2	Trip Unit Timestamp (Non-Resettable)	s	History
181D	2	Timestamp user (settable by user)	s	History

## Trip Time – Event #8

Function 3 Code (read only)

Hex. Address	Word Count	Description	Unit	Place in Original Map
1827	1	Fault Current	A	History
1826	1	Fault Duration	s	History
1822	2	Trip Unit Timestamp (Non-Resettable)	s	History
1824	2	Timestamp user (settable by user)	s	History

## Trip Time – Event #9

Function 3 Code (read only)

Hex. Address	Word Count	Description	Unit	Place in Original Map
182E	1	Fault Current	A	History
182D	1	Fault Duration	s	History
1829	2	Trip Unit Timestamp (Non-Resettable)	s	History
182B	2	Timestamp user (settable by user)	s	History



## Trip Time – Event #10

Function 3 Code (read only)

Hex. Address	Word Count	Description	Unit	Place in Original Map
1835	1	Fault Current	A	History
1834	1	Fault Duration	s	History
1830	2	Trip Unit Timestamp (Non-Resettable)	s	History
1832	2	Timestamp user (settable by user)	s	History