

# Conext™ ComBox - Custom Data Logging

976-0325-01-01/A  
July 2015  
Application Note

EXCLUSION FOR DOCUMENTATION

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## **DANGER**

### **RISK OF FIRE, ELECTRIC SHOCK, EXPLOSION, AND ARC FLASH**

This Application Note is in addition to, and incorporates by reference, the relevant product manuals for each Conext ComBox. Before reviewing this Application Note you must read the relevant product manuals. Unless specified, information on safety, specifications, installation, and operation is as shown in the primary documentation received with the product. Ensure you are familiar with that information before proceeding.

**Failure to follow these instructions will result in death or serious injury.**

## Objective

The goal of this Application Note is to provide information and instructions to setup the Conext ComBox for custom data logging and storing the logs to a micro-SD Card.

## Technical Challenges

1. The Conext ComBox has limited internal storage and only selected data and time frame information are recorded. For example, the plot log records limited parameters by the minute such as:
  - load power use,
  - grid net power,
  - generator power output,
  - photovoltaic system power output, and
  - the individual battery bank voltage and current.

This plot log is restricted to the last seven days worth of data. Similarly, event and fault logs are also recorded with such restrictions.

Data that is limited to one minute intervals cannot give clarity on system performance when event/fault situations are detected. Troubleshooting without the needed details of individual device parameters is challenging.

As a solution to the above challenges, Conext ComBox allows custom data logging. With custom data logging, ComBox can transfer daily/monthly log files via FTP to a localized directory, thereby serving as backup.

2. System integrators may be reluctant to add remote monitoring by Ethernet modem or satellite to installation sites that have expensive or limited telecom access.

Therefore, custom data logging allows the system integrators to record full detail system performance in log files stored locally at the site using an external micro-SD storage card inserted into the ComBox.

Maintenance managers and users may retrieve the micro-SD card from the site and use the stored log files for annual site evaluations and reporting.

## Feature

The Conext ComBox has a built-in micro-SD card push-push slot for external memory storage. The minimum storage capacity required for the Class 2 or better micro-SD card is 2 GB.

**NOTE:** For brand new micro-SD cards, always check for compatibility with the Conext ComBox prior to installing them. Reformat previously used micro-SD cards using a computer prior to installing them. If you are using a micro-SD card that has not been reformatted and has old data in it, the ComBox will not overwrite old data but will only be able to use leftover storage in the micro-SD card for the logs.

Increase or decrease micro-SD storage size and capacity according to application needs.

**Table 1** Micro-SD Card Storage Size and Capacity

Number of logging parameters	Logging Interval (sec)	Micro SD card storage size (GB)	Storage capacity (years)
20	5	2	1.3
20	5	4	2.5
20	5	8	5.5
20	5	16	11.5
20	5	32	23

**NOTE:** When the micro-SD card reaches 90% of its storage capacity, the ComBox Status LED lights up. If email notification is set with a valid email address on the ComBox (highly recommended), a reminder will also be sent to the user/administrator.

## Logging Interval

The custom data logging capability of the ComBox only allows saving to a single CSV (Comma Separated Values) database file based on the selected file creation interval. The logging interval is independent from the file creation interval. Table 2 shows the logging interval, file creation interval used for the custom logging, and the log's filename.

**Table 2** Conext ComBox Custom Logging Interval and File Creation Interval

Logging Interval	File Creation Interval	Filename (.csv)
5 seconds		
10 seconds		
30 seconds		
1 minute	Monthly	YYYYMM.csv
5 minutes	Daily	YYYYMMDD.csv
10 minutes	Hourly	YYYYMMDDHH.csv
15 minutes		
30 minutes		
60 minutes		

Every row of data (a single record) that is created according to logging interval is aggregated to a database file based on the file creation interval.

## Logging Parameters

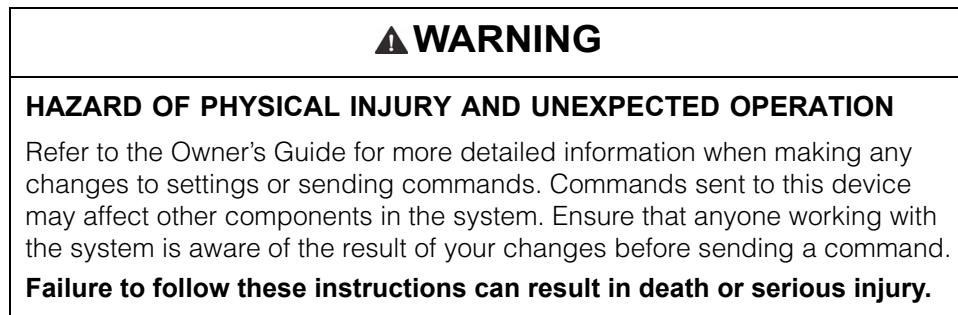
The ComBox can record up to 20 logging parameters of components (such as Xanbus and Modbus devices) from the power system. However, only Xanbus devices which are connected to the ComBox will appear in the “Device” drop down list. For individual Xanbus device logging parameters, refer to “Tables of Device Logging Parameters” on page 13. For connected Modbus devices, only the overall system parameters are recorded.

If a power meter is installed in the system, its data overwrites the associated system source or load parameter data. In the case of grid-tied PV inverters installed in the system, only the overall PV system solar power and grid output data are recorded.

For the list of system logging parameters that will be overwritten by data from Modbus devices, refer to “Tables of Device Logging Parameters” on page 13.

## Procedure

### Configuration of Conext ComBox for Custom Data Logging



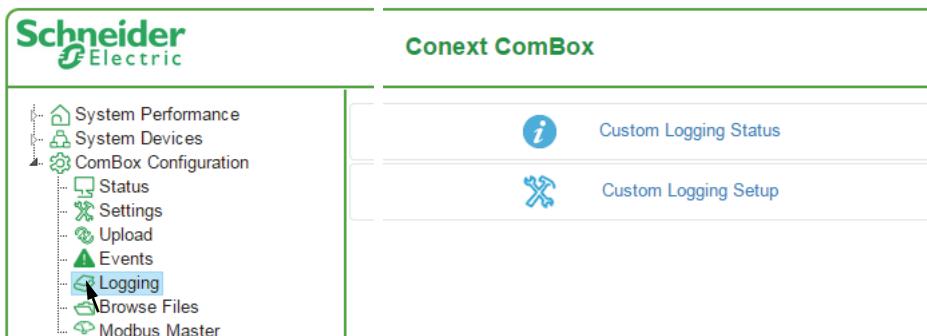
**Pre-requisite** Make sure that the Conext ComBox has been installed and configured. See the latest revision of the Conext ComBox Installation and Configuration Manual (975-0679-01-01) at [solar.schneider-electric.com](http://solar.schneider-electric.com).

**NOTE:** Configure the date and time of the ComBox to local time.

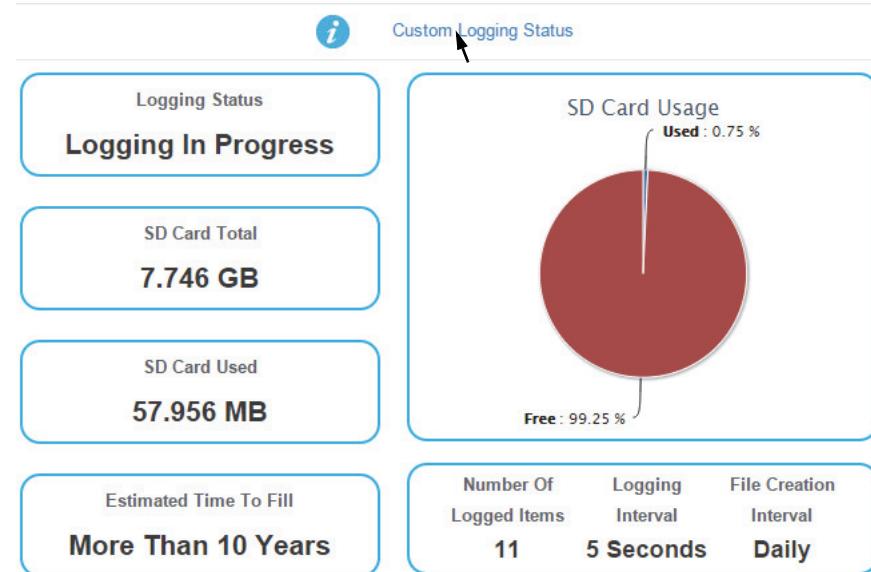
1. Insert a micro-SD card into the ComBox's micro-SD card slot.
2. Open an internet browser and log in to the ComBox web interface.
3. Click the ComBox Configuration drop down arrow to list its settings.



4. Click on Logging to bring up the following Logging page with two configuration settings.



- Click on Custom Logging Status configuration setting.



The overall summary of the micro-SD card with available memory and estimated duration of data storage are shown here.

If the Custom Logging Status shows a “No SD card detected” message, log off the ComBox web interface, check the ComBox to see if there is a micro-SD card in the slot, and log back in.

- Click on Custom Logging Setup from the Logging page.

The screenshot shows the 'Custom Logging Setup' page with the following configuration:

- Enable Logging:** Checked
- Logging Interval:** 5 Seconds
- File Creation Interval:** Daily
- Items Selected:** 11 Items Selected
- Log, Device, Parameter Mapping:**

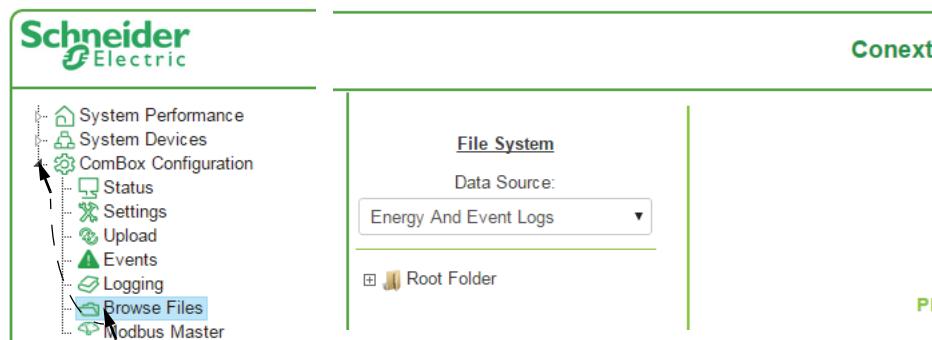
Log	Device	Parameter
1. ✓	System	PV Harvest Power
2. ✓	System	Battery Power Net
3. ✓	System	Load Power
4. ✓	System	AC Generator Power
5. ✓	System	Grid Output Power
6. ✓	System	Grid Input Power
7. ✓	System	DC Charging Power
8. ✓	System	DC Inverting Power
9. ✓	CSW (3)	Battery Temperature
10. ✓	CSW (3)	AC1 Input Current
11. ✓	CSW (3)	Battery Voltage
12. □	System	AC Generator Power
13. □	System	AC Generator Power
14. □	System	AC Generator Power
- Apply:** Button

At this configuration setting page, you can enable logging, set custom logging and file creation intervals, and select different devices and their logging parameters.

## Retrieval of Custom Logging Files

The following are steps for remote accessing of the custom log files through Conext Combox:

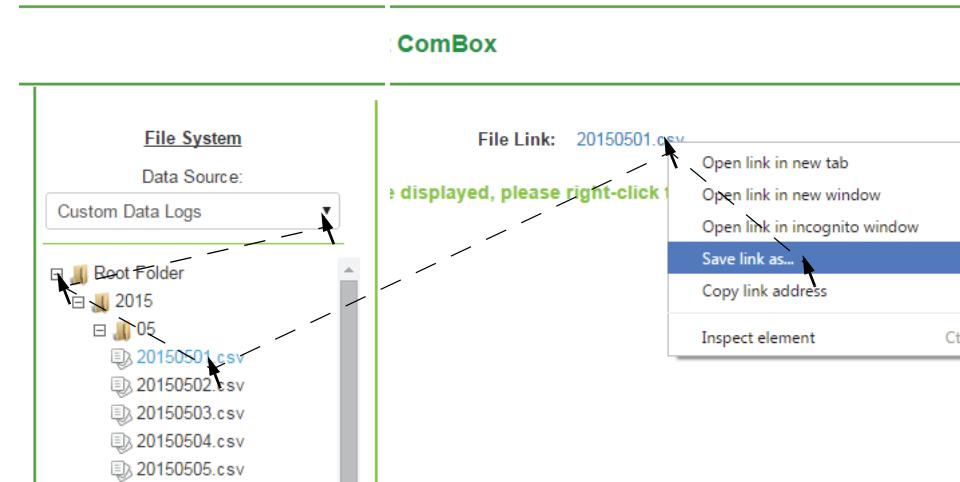
1. Click on the ComBox Configuration tab.
2. Select the Browse Files tab. The page on the left appears.



3. Under Data Source, select Custom Data Logs.
4. Expand the Root Folder by clicking the + sign.

All the files are stored in the “Root Folder”. The files are categorized into sub-folders by Year, Month, and Date. The folders are organized depending on the File Creation Interval.

5. Expand the other folders by clicking the + sign until the desired file is found.
6. Right click on the file next to “File Link”.
7. Select “Save link as...”.



The “Save As” window appears.

8. Select the desired location to save the file. If desired, rename the filename for easier reference.
9. Click the “Save” button and the file will be stored in the local computer.  
It is not necessary to change the “Save as type” from Text Document.

## Understanding the Log File and Its Data

### Timestamp and logging interval

The custom log file timestamp has the format of YYYY/MM/DD HH:MM:SS. The parameters are logged instantly depending on the logging interval.

**Table 3** Examples of Data Timestamp for Different Logging Interval

Interval in seconds (example in 5 seconds)	Interval in minutes (example in 10 minutes)	Interval in minutes (example in 60 minutes)
YYYY/MM/DD HH:MM:00	YYYY/MM/DD HH:00:00	YYYY/MM/DD 00:00:00
YYYY/MM/DD HH:MM:05	YYYY/MM/DD HH:10:00	YYYY/MM/DD 01:00:00
YYYY/MM/DD HH:MM:10	YYYY/MM/DD HH:20:00	YYYY/MM/DD 02:00:00
YYYY/MM/DD HH:MM:15	YYYY/MM/DD HH:30:00	YYYY/MM/DD 03:00:00

### Logged parameters

In the data file, the logged parameters are arranged based on the selection sequence of the device logging parameters in the custom log setup. The parameter headings listed on the first line of the file consists of four parts:

- Device number (in parentheses)
- Device name (in bold letters)
- Parameter name
- Measurement unit (in the square brackets)

Each parameter heading or value is separated by a comma.

### Status parameters

The device status or reason parameters are represented in the log file by a number value. Each number value indicates a specific device status or reason. In order to interpret the number value, lookup the device parameter name on “Tables of Device Logging Parameters” on page 13. The description of the number value will be explained under the column “Notes”.

### Reading the custom data log files

Depending on the computer operating system, the custom data log files can be opened using MS Office Excel or Notepad or any spreadsheet application or text editor available with your computer.

Alternatively, the “Import from Text” function can be used to extract the data from the CSV file to form a table. When extracting the data from the CSV file to form a table, select delimited file type and always select the comma as the delimiter.

## Troubleshooting with Custom Data Logging

Custom data logging allows more visibility on system operation. When the log is opened and analyzed, the system is better understood and troubleshooting any issue meant being able to go down to the root cause. Together with remote access of the ComBox, troubleshooting can be done off site without unnecessary intervention in the field.

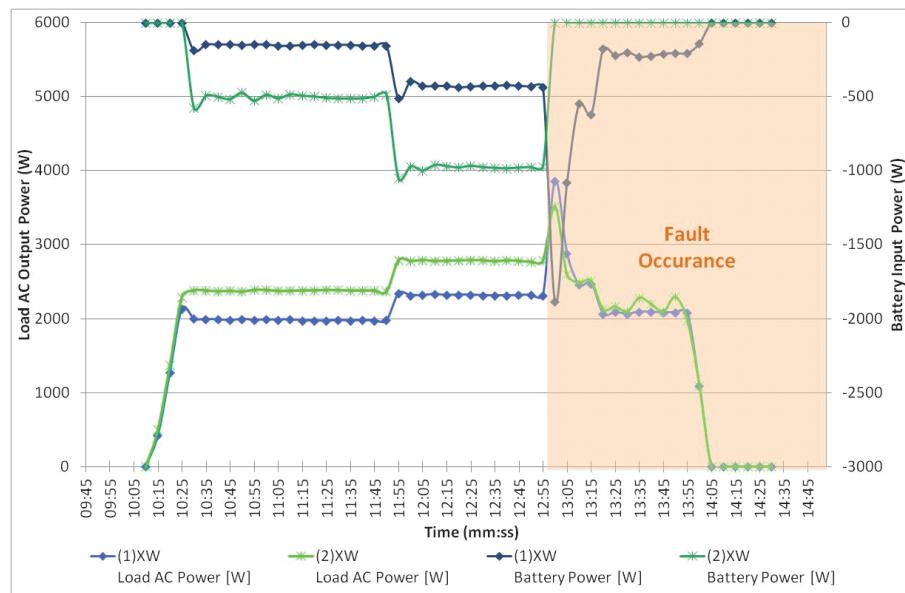
### Scenario 1: Unbalanced output voltage between XW

For this scenario, two units of XW+ 6848 NA were installed for a split-phase backup of a commercial office. The client had configured the XW+ system to be on grid support function with load shave to save on grid electricity usage.

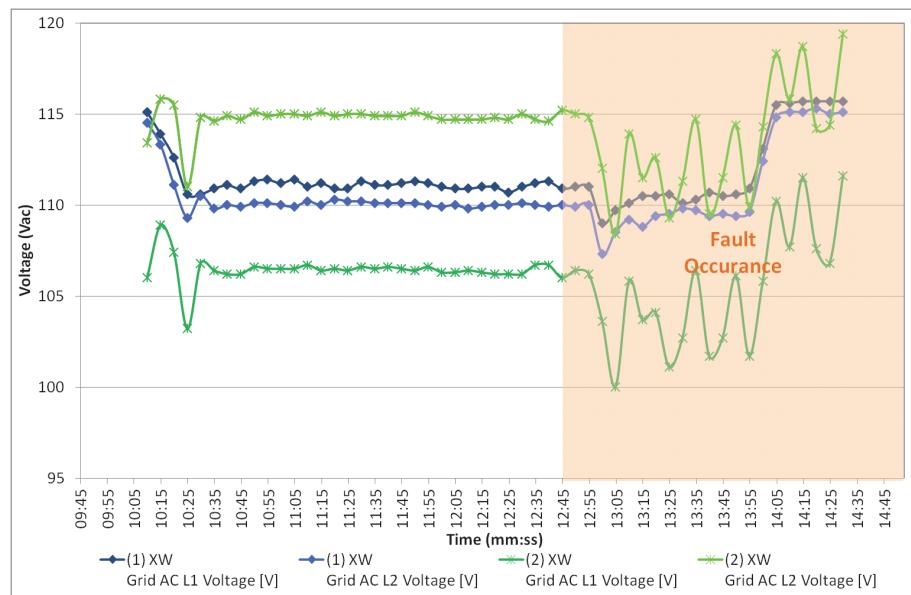
With both XW+ inverter/chargers having each of their own battery bank, the client discovered that the second XW+ unit's [shown as **(2) XW** in the graph] battery bank gets depleted faster than the first XW+ unit [shown as **(1) XW** in the graph].

In order to troubleshoot, the ComBox installed was setup to record the custom data at the interval of 5 seconds with daily file creation. The graphic data shows that (2) XW unit draws about 400W more power than (1) XW unit during the load shave period. Zooming into the Conext XW+ grid AC voltage, it was found that the (2) XW unit was experiencing a very different grid AC voltage compared to the (1) XW unit.

The client was advised to check the incoming grid cable connection and gauge sizing.



**Figure 1** (1) XW and (2) XW Load AC Output Power and Battery Input Power



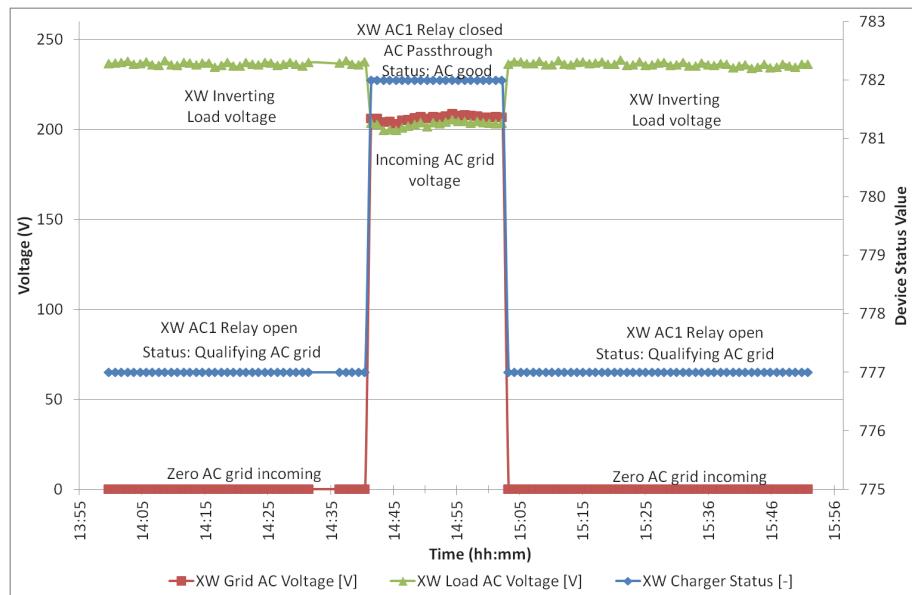
**Figure 2** (1) XW and (2) XW Grid AC Split-phase Voltage

### Scenario 2.1: AC Grid out of range and disqualification

In this second scenario, a unit of XW+ 8548 E was installed as a grid-tie backup solution for a small commercial office. However, due to the poor incoming grid power, the grid voltage range fell out of the grid-interactive parameters range of the Conext XW+ inverter. As a result, the Conext XW+ was disqualifying the AC incoming grid and was going into invert mode to support the load. The ComBox custom logging setting was setup to log at one minute intervals with hourly file creation. Parameters such as the XW+ Charger status, XW Grid AC voltage and the XW Load AC voltage were recorded.

The graph below shows that the Conext XW+ only qualified the AC grid for a short duration of 20 minutes before the AC grid voltage was out of range again. As expected, the Conext XW+ isolated the electrical load network from the grid and started inverting power from the battery.

The solution for this scenario was to install a step up isolation transformer at the incoming grid, so that the incoming voltage is within the operating range of the Conext XW+ inverter grid interactive parameters.



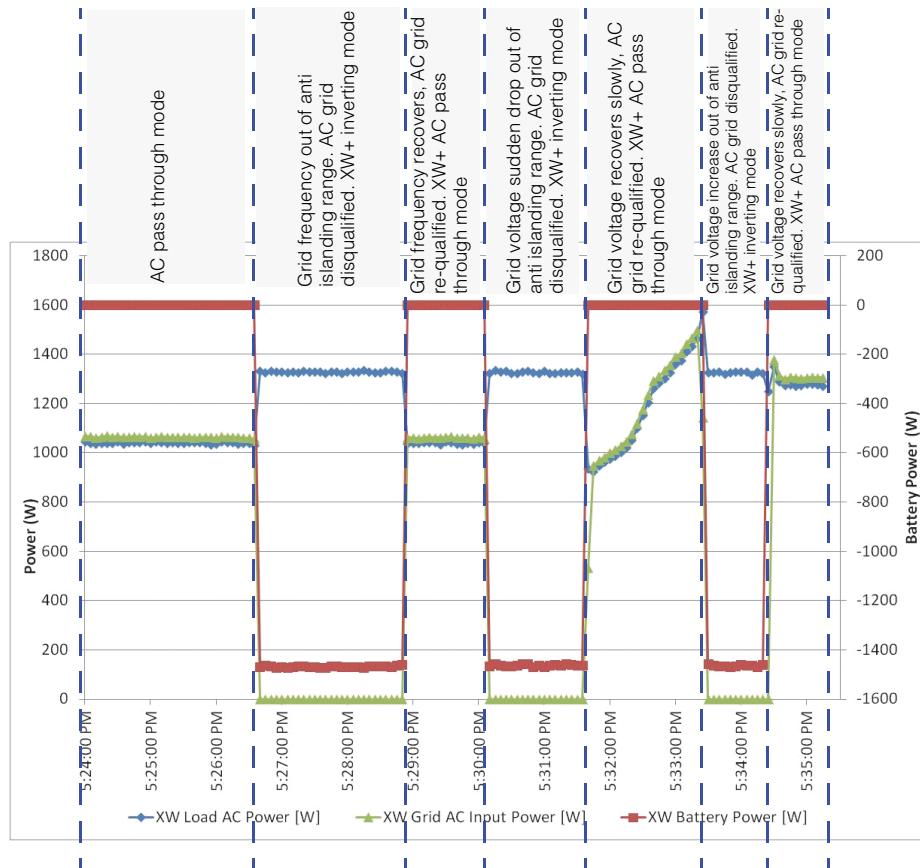
**Figure 3** XW+ Grid and Load Voltage with Charger Status

### Scenario 2.2: AC Pass through and Anti-Islanding

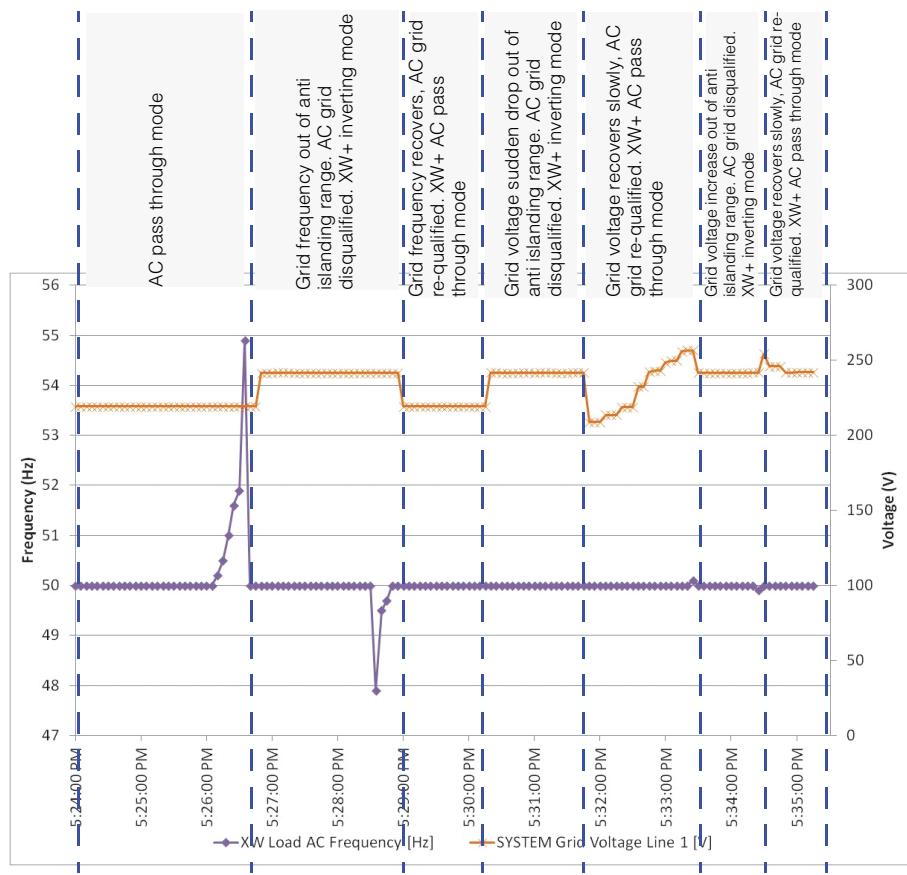
In this scenario, a unit of XW+ 8548 E was going through an AC pass through when the grid frequency increased drastically causing the Conext XW+ to go into anti-islanding mode. This caused the AC relay to open and isolate the grid from the load. The XW+ inverter continued to provide power to the load.

The grid frequency recovers within the anti-islanding range and the Conext XW+ re-qualified the AC grid and enters into AC pass through mode. Following this, the grid voltage drops suddenly below the limits and the Conext XW+ disqualifies the AC grid and goes into invert mode again. The grid voltage increases slowly back within the limit, the AC grid is qualified again, and Conext XW+ goes back to AC pass through mode.

The grid voltage continues to increase above the limit and the grid is disqualified. Conext XW+ comes back to inverting mode to support the load. The grid voltage eventually recovers back and the grid is qualified again with the Conext XW+ going back to AC pass through mode.



**Figure 4** XW+ Load, AC Input, and Battery Power



**Figure 5** AC Grid Voltage and Frequency

## Exceptions

Only the administrator login account on the Conext ComBox can access and change the custom logging setup (custom logging parameters). When the setup is changed, data that is lost because of the changes cannot be recovered including logs that have been written with the previous configuration.

Schneider Electric shall not be liable for any missing data record or files.

## Tables of Device Logging Parameters

**Table 4** Conext ComBox System Device Logging Parameters

Parameter Name	Units	Accuracy	Notes
AC generator power	W	1	See Note A.
Battery Bank 1 Current	A	0.1	
Battery Bank 1 Temperature	°C	0.01	
Battery Bank 1 Voltage	V	0.1	
Battery Bank 2 Current	A	0.1	
Battery Bank 2 Temperature	°C	0.01	
Battery Bank 2 Voltage	V	0.1	
Battery Bank 3 Current	A	0.1	
Battery Bank 3 Temperature	°C	0.01	
Battery Bank 3 Voltage	V	0.1	
Battery Bank 4 Current	A	0.1	
Battery Bank 4 Temperature	°C	0.01	
Battery Bank 4 Voltage	V	0.1	
Battery Bank 1 Power	W	1	
Battery Bank 2 Power	W	1	
Battery Bank 3 Power	W	1	
Battery Bank 4 Power	W	1	
Battery Current Net	A	0.1	
Battery Power Net	W	1	
Battery Temperature	°C	0.01	
Battery Voltage	V	0.1	
DC Charging Current	A	0.1	
DC Charging Power	W	1	
DC Inverting Power	W	1	
External Contactor Status			0 = Close 1 = Open
GT Grid Power	W	1	
GT PV Power	W	1	
Generator Current Line 1	A	0.1	See Note A.
Generator Current Line 2	A	0.1	See Note A.
Generator Current Line 3	A	0.1	See Note A.
Generator Frequency	Hz	0.1	See Note A.
Generator State			0 = Not Running 1 = Running
Generator Voltage	V	0.1	See Note A.
Generator Voltage Line 1	V	0.1	See Note A.
Generator Voltage Line 2	V	0.1	See Note A.

**Table 4** Conext ComBox System Device Logging Parameters

Parameter Name	Units	Accuracy	Notes
Generator Voltage Line 3	V	0.1	See Note A.
Grid Current Line 1	A	0.1	See Note B.
Grid Current Line 2	A	0.1	See Note B.
Grid Current Line 3	A	0.1	See Note B.
Grid Frequency	Hz	0.1	See Note B.
Grid Input Current Line 1	A	0.1	See Note B.
Grid Input Current Line 2	A	0.1	See Note B.
Grid Input Current Line 3	A	0.1	See Note B.
Grid Input Power	W	1	See Note B.
Grid Input Power (APP)	VA	1	See Note B.
Grid Output Current	A	0.1	See Note B.
Grid Output Current Line 1	A	0.1	See Note B.
Grid Output Current Line 2	A	0.1	See Note B.
Grid Output Current Line 3	A	0.1	See Note B.
Grid Output Power	W	1	See Note B.
Grid Output Power (APP)	VA	1	See Note B.
Grid Voltage Line 1	V	0.1	See Note B.
Grid Voltage Line 2	V	0.1	See Note B.
Grid Voltage Line 3	V	0.1	See Note B.
Grid-Tie to Grid Power	W	1	Data taken from Conext TX and Legacy GT-AU connected to Combox via Xanbus, for AC coupled system with XW+
Grid-Tie to Load Power	W	1	
Load Current	A	0.1	See Note C.
Load Current Line 1	A	0.1	See Note C.
Load Current Line 2	A	0.1	See Note C.
Load Current Line 3	A	0.1	See Note C.
Load Frequency	Hz	0.1	See Note C.
Load Output Power	W	1	See Note C.
Load Power	W	1	See Note C.
Load Power (APP)	VA	1	See Note C.
Load Power Max	W	1	See Note C.
Load Voltage Line 1	V	0.1	See Note C.
Load Voltage Line 2	V	0.1	See Note C.
Load Voltage Line 3	V	0.1	See Note C.
MPPT Battery Current	A	0.1	
MPPT Battery Power	W	1	
MPPT PV Power	W	1	

**Table 4** Conext ComBox System Device Logging Parameters

Parameter Name	Units	Accuracy	Notes
PV AC Current Line 1	A	0.1	Data taken from 1 unit of 3 phase grid tied solar Inverter only (Conext TL or CL).
PV AC Current Line 2	A	0.1	No value will be displayed for single phase grid tied solar inverter. For AC coupled grid tied solar inverter connected to Combox via Modbus.
PV AC Current Line 3	A	0.1	See Note D.
PV AC Voltage Line 1	V	0.1	
PV AC Voltage Line 2	V	0.1	
PV AC Voltage Line 3	V	0.1	
PV Harvest Power	W	1	Aggregated data of total output power from both DC coupled MPPT and AC coupled grid tied solar inverter connected to the combox via both Xanbus and Modbus (Conext RL, TX, TL, CL, SCC MPPT 60 150, SCC MPPT 80 600).
PV Total Power	W	1	Aggregated data of total input solar photovoltaic power from both DC coupled MPPT and AC coupled grid tied solar inverter connected to the combox via both Xanbus and Modbus (Conext RL, TX, TL, CL, SCC MPPT 60 150, SCC MPPT 80 600).
PV Total Power Max	W	1	Aggregated data of maximum total input solar photovoltaic power from both DC coupled MPPT and AC coupled grid tied solar inverter connected to the ComBox via both Xanbus and Modbus (Conext RL, TX, TL, CL, SCC MPPT 60 150, SCC MPPT 80 600).
PV Voltage	V	0.1	Solar photovoltaic input voltage data taken from 1 unit of either single or 3 phase grid tied solar Inverter only (Conext RL, TL and CL). For AC coupled grid tied solar inverter connected to ComBox via Modbus. See Note D.
Solar Inverter Frequency	Hz	0.1	Connected grid frequency data taken from 1 unit of either single or 3 phase grid tied solar Inverter only (Conext RL, TL, CL). For AC coupled grid tied solar inverter connected to ComBox via Modbus. See Note D.
Solar Inverter Output Power	W	1	Aggregated data of total output power from all the AC coupled grid tied solar inverters connected to the ComBox via Modbus only (Conext RL, TL and CL). See Note D.
Total Generator Current	A	0.1	See Note A.
Total PV Current	A	0.1	Aggregated data of total input PV current from both DC coupled MPPT and AC coupled grid tied solar inverters connected to the combox via Xanbus only (Conext TX, SCC MPPT 60 150, SCC MPPT 80 600).
Weather Station Irradiance			For pyranometer connected to ComBox via Modbus.
Weather Station Temperature	°C	0.01	

**Note A:** If a power meter associated with generator to be installed, the data source will be taken from the power meter instead from the Conext XW+.

**Note B:** If a power meter associated with grid to be installed, the data source will be taken from the power meter instead from the Conext XW+.

**Note C:** If a power meter associated with load to be installed, the data source will be taken from the power meter instead from the Conext XW+.

**Note D:** If a power meter associated with solar PV to be installed for AC coupling solution, the data source will be taken from the power meter, instead from the PV inverter.

**Table 5** Conext XW+ Device Logging Parameters

Parameter Name	Units	Accuracy	Notes
Auxiliary Output Off Reason		1	See "XW+ Auxiliary Output Status".
Auxiliary Output On Reason		1	See "XW+ Auxiliary Output On Reason".
Auxiliary Output Status		1	See "XW+ Auxiliary Output Off Reason".
Battery Current	A	0.1	
Battery Power	W	1	
Battery Temperature	°C	0.1	
Battery Voltage	V	0.1	
Charger Status		1	See "XW+ Charger Status".
Generator AC Current	A	0.1	
Generator AC Frequency	Hz	0.1	
Generator AC L1 Current	A	0.1	
Generator AC L1 Voltage	V	0.1	
Generator AC L2 Current	A	0.1	
Generator AC L2 Voltage	V	0.1	
Generator AC Power	W	1	
Generator AC Power- Apparent	VA	1	
Generator AC Voltage	V	0.1	
Grid AC Current	A	0.1	
Grid AC Frequency	Hz	0.1	
Grid AC Input Current	A	0.1	
Grid AC Input Power	W	1	
Grid AC Input Power - Apparent	VA	1	
Grid AC L1 Current	A	0.1	
Grid AC L1 Voltage	V	0.1	
Grid AC L2 Current	A	0.1	
Grid AC L2 Voltage	V	0.1	
Grid AC Power	W	1	
Inverter Status		1	See "XW+ Inverter Status".
Grid AC Voltage	A	0.1	
Grid Output Power	W	1	
Grid Output Power - Apparent	VA	1	
Load AC Current	A	0.1	
Load AC Frequency	Hz	0.1	
Load AC L1 Current	A	0.1	
Load AC L1 Voltage	V	0.1	
Load AC L2 Current	A	0.1	
Load AC L2 Voltage	V	0.1	
Load AC Power	W	1	

**Table 5** Conext XW+ Device Logging Parameters

Parameter Name	Units	Accuracy	Notes
Load AC Power - Apparent	VA	1	
Load AC Voltage	V	0.1	

**XW+ Auxiliary Output Status****Auxiliary Ouput Status can report one of the following values:**

- 1=AutoOn
- 2=Auto Off
- 3=Manual On
- 4=Manual Off

**XW+ Auxiliary Output On Reason****Auxiliary Output On Reason can report one of the following values:**

- 0=Not on
- 1=Manual on
- 2=Battery Voltage Low
- 3=Battery Voltage High
- 4=Array Voltage High
- 5=Battery Temp Low
- 6=Battery Temp High
- 7=Heat Sink Temp High
- 8=Fault

**XW+ Auxiliary Output Off Reason****Auxiliary Output Off Reason can report one of the following values.**

- 0=Not off
- 1=No Active Trigger
- 2=Trigger Override
- 3=Fault

**XW+ Inverter Status****Inverter Status can report one of the following values:**

- 1024=Invert
- 1025=AC Pass Through
- 1026=APS Only
- 1027=Load Sense
- 1028=Inverter Disabled

- 1029=Load Sense Ready
- 1030=Engaging Inverter
- 1031=Invert Fault
- 1032=Inverter Standby
- 1033=Grid-Tied
- 1034=Grid Support
- 1035=Gen Support
- 1036=Sell-to-Grid
- 1037=Load Shaving
- 1038=Grid Frequency Stabilization

### XW+ Charger Status

**Charger Status can report one of the following values:**

- 768=Not Charging
- 769=Bulk
- 770=Absorption
- 771=Overcharge
- 772=Equalize
- 773=Float
- 774=No Float
- 775=Constant VI
- 776=Charger Disabled
- 777=Qualifying AC
- 778=Qualifying APS
- 779=Engaging Charger
- 780=Charge Fault
- 781=Charger Suspend
- 782=AC Good
- 783=APS Good
- 784=AC Fault
- 785=Charge
- 786=Absorption Exit Pending
- 787=Ground Fault
- 788=AC Good Pending

**Table 6** Conext MPPT 80 600 Solar Charge Controller Device Logging Parameters

Parameter Name	Units	Accuracy	Notes
Auxiliary Output Off Reason		1	See "HVMPPAUXILIARYOUTPUTONREASON"

**Table 6** Conext MPPT 80 600 Solar Charge Controller Device Logging Parameters

Parameter Name	Units	Accuracy	Notes
Auxiliary Output On Reason		1	See "HVMPPA Auxiliary Output On Reason"
Auxiliary Output Status		1	See "HVMPPA Auxiliary Output Off Reason"
Battery Temperature	°C	0.1	
DC Power Output Percentage	%	1	
Output DC Current	A	0.1	
Input DC Power	W	1	
Input DC Voltage	V	0.1	
Output DC Current	A	0.1	
Output DC Power	W	1	
Output DC Voltage	V	0.1	

### HVMPPA Auxiliary Output Status

**Auxiliary Output can report one of the following values:**

- 1=AutoOn
- 2=Auto Off
- 3=Manual On
- 4=Manual Off

### HVMPPA Auxiliary Output On Reason

**Auxiliary Output On Reason can report one of the following values:**

- 0=Not on
- 1=Manual on
- 2=Battery Voltage Low
- 3=Battery Voltage High
- 4=Array Voltage High
- 5=Battery Temp Low
- 6=Battery Temp High
- 7=Heat Sink Temp High
- 8=Fault

### HVMPPA Auxiliary Output Off Reason

**Auxiliary Output Off Reason can report one of the following values:**

- 0=Not off
- 1=Manual Off
- 2=No Active Trigger
- 3=Trigger Override

- 4=Fault
- 5=Bulk Exit
- 6=Absorption Exit

**Table 7** Conext MPPT 60 150 Solar Charge Controller Device Logging Parameters

Parameter Name	Units	Scale	Notes
Auxiliary Output Off Reason		1	See "MPPT 60 Auxiliary Output Status"
Auxiliary Output On Reason		1	See "MPPT 60 Auxiliary Output On Reason"
Auxiliary Output Status		1	See "MPPT 60 Auxiliary Output Off Reason"
Battery Temperature	°C	0.1	
DC Power Output Percentage	%	1	
Output DC Current	A	0.1	
Input DC Power	W	1	
Input DC Voltage	V	0.1	
Output DC Current	A	0.1	
Output DC Power	W	1	
Output DC Voltage	V	0.1	

### MPPT 60 Auxiliary Output Status

Auxiliary Output Status can report one of the following values:

- 1=Auto On
- 2=Auto Off
- 3=Manual On
- 4=Manual Off

### MPPT 60 Auxiliary Output On Reason

Auxiliary Output On Reason can report one of the following values:

- 0=Not on
- 1=Manual on
- 2=Battery Voltage Low
- 3=Battery Voltage High
- 4=Array Voltage High
- 5=Battery Temp Low
- 6=Battery Temp High
- 7=Heat Sink Temp High
- 8=Fault

**MPPT 60 Auxiliary Output Off Reason****Auxiliary Output Off Reason can report one of the following values:**

- 0=Not off
- 1=Manual Off
- 2=No Active Trigger
- 3=Trigger Override
- 4=Fault
- 5=Bulk Exit
- 6=Absorption Exit

**Table 8** Conext SW Inverter/Charger Device Logging Parameters

Parameter Name	Units	Accuracy	Notes
AC1 Frequency	Hz	0.1	
AC1 Input Current	A	0.1	
AC1 Input Power	W	1	
AC1 Input Power - Apparent	VA	1	
AC1 L1 Current	A	0.1	
AC1 L1 Voltage	V	0.1	
AC1 L2 Current	A	0.1	
AC1 L2 Voltage	V	0.1	
AC1 Voltage	V	0.1	
Battery Current	A	0.1	
Battery Power	W	1	
Battery Temperature	°C	0.1	
Battery Voltage	V	0.1	
Charge DC Current	A	0.1	
Charge DC Power	W	1	
Charge DC Power Percentage	%	1	
Charger Status		1	See "Conext SW Charger Status"
Invert DC Current	A	0.1	
Invert DC Power	W	1	
Load AC Current	A	0.1	
Load AC Frequency	Hz	0.1	
Load AC L1 Current	A	0.1	
Load AC L1 Voltage	V	0.1	
Load AC L2 Current	A	0.1	
Load AC L2 Voltage	V	0.1	
Load AC Power	W	1	
Load AC Voltage	V	0.1	

### Conext SW Charger Status

**Charger Status can report one of the following values:**

- 768=Not Charging
- 769=Bulk
- 770=Absorption
- 771=Overcharge
- 772=Equalize
- 773=Float
- 774=No Float
- 775=Constant VI
- 776=Charger Disabled
- 777=Qualifying AC
- 778=Qualifying APS
- 779=Engaging Charger
- 780=Charge Fault
- 781=Charger Suspend
- 782=AC Good
- 783=APS Good
- 784=AC Fault
- 785=Charge
- 786=Absorption Exit Pending
- 787=Ground Fault
- 788=AC Good Pending

**Table 9** Conext AGS Device Logging Parameters

Parameter Name	Units	Accuracy	Notes
Auto Generator Action		1	See "AGS Auto Generator Actions"
Auto Generator State		1	See "AGS Auto Generator State"
Device Present		1	See "AGS Device Present"
Generator Off Reason		1	See "AGS Generator Off Reasons"
Generator On Reason		1	See "AGS Auto Generator Actions"

### AGS Auto Generator Actions

**Auto Generator Action can report one of the following values:**

- 0=Preheating
- 1=Start Delay
- 2=Cranking
- 3=Starter Cooling
- 4=Warming Up

- 5=Cooling Down
- 6=Spinning Down
- 7=Shutdown Bypass
- 8=Stopping
- 11=Crank Delay

### AGS Auto Generator State

**Auto Generator State can report one of the following values:**

- 0=Quiet Time
- 1=Auto On
- 2=Auto Off
- 3=Manual On
- 4=Manual Off
- 5=Gen Shutdown
- 6=Ext Shutdown
- 7=AGS Fault
- 8=Suspend
- 9=Not Operating

### AGS Device Present

**Device State can report one of the following values:**

- 0=Hibernate
- 1=Power Save
- 2=Safe Mode
- 3=Operating
- 4=Diagnostic Mode
- 5=Remote Power Off
- 255=Data Not Available

### AGS Generator Off Reasons

**Generator Off Reason can report one of the following values:**

- 0=Not Off
- 1=DC Voltage High
- 2=Battery SOC High
- 3=AC Current Low
- 4=Contact Opened
- 5=Reached Absorp
- 6=Reached Float

- 7=Manual Off
- 8=Max Run Time
- 9=Max Auto Cycle
- 10=Exercise Done
- 11=Quiet Time
- 12=Ext Off via AGS
- 13=Safe Mode
- 14=Ext Off via Gen
- 15=Ext Shutdown
- 16=Auto Off
- 17=Fault
- 18=Unable To Start
- 19=Power Low
- 20=DC Current Low
- 21=AC Good

### AGS Generator On Reason

**Generator On Reason can report one of the following values:**

- 0=Not On
- 1=DC Voltage Low
- 2=Battery SOC Low
- 3=AC Current High
- 4=Contact Closed
- 5=Manual On
- 6=Exercise
- 7=Non Quiet Time
- 8=Ext On via AGS
- 9=Ext On via Gen
- 10=Unable To Stop
- 11=AC Power High 12=DC Current High

**Table 10** Conext Battery Monitor Device Logging Parameters

Parameter Name	Units	Accuracy	Notes
Battery Capacity Remaining	Ah	1	
Battery Capacity Removed	Ah	1	
Battery Capacity Returned	Ah	1	
Battery Current	A	0.1	
Battery Midpoint 1 Voltage	V	0.1	
Battery Midpoint 2 Voltage	V	0.1	

**Table 10** Conext Battery Monitor Device Logging Parameters

Parameter Name	Units	Accuracy	Notes
Battery State of Charge	%	1	
Battery Temperature	°C	0.1	
Battery Voltage	V	0.1	