

# **AEG**

Power Solutions

## **Profibus DP Interface for UPS Systems**

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## Table of Contents

<b>1.</b>	<b>General</b> .....	<b>3</b>
<b>2.</b>	<b>Design</b> .....	<b>4</b>
2.1	Structure of the Assembly .....	4
2.2	Structure of Wiring .....	6
<b>3.</b>	<b>Installation</b> .....	<b>8</b>
<b>4.</b>	<b>Configuration</b> .....	<b>10</b>
<b>5.</b>	<b>UPS Unit Profile</b> .....	<b>12</b>
5.1	General .....	12
5.2	Unit profile of a Three-Phase UPS.....	13
5.3	Unit Profile of a Single-Phase UPS.....	16
5.4	Unit Profile of a Three-Phase Inverter.....	19
5.5	Unit Profile of a Single-Phase Inverter .....	21
5.6	Unit Profile of a Three-Phase Inverter.....	23
5.7	Unit Profile of a Single-Phase Inverter .....	25

## 1. General

The Profibus DP interface is the fieldbus interface for UPS units in a Profibus DP network. This interface is configured as a Profibus DP slave. The Profibus DP fieldbus protocol is used in production engineering and, increasingly, also in building systems automation (DP stands for Distributed Periphery). With one RS485 Profibus cable, it is possible to integrate and monitor up to 31 UPS units and inverters with different power ratings (1-phase and 3-phase) in one SCADA system. The interface in the UPS provides the Profibus DP master with status messages, alarms as well as relevant measured values. Writing or controlling via the Profibus DP slave is not permitted for safety reasons, and therefore cannot be performed.

The Profibus DP interface also features a CAN connection for a remote panel and an RS232 interface for the CompuWatch shutdown software or our SNMP adapter.

The RS232 interface (X2) is used for configuration.

### Package content:

- 1 x operating instructions
- 1 x CCC data line for configuration
- 1 x Profibus DP bus interface connector
- 1 x Terminating resistor 120R
- 1 x Screen terminal block

### Prerequisites...

#### for the personnel:

The “Design”, “Installation” and “Configuration” chapters assume technical qualifications as an electrician. These qualifications may take the form of a completed professional training course in an electrical profession or an additional qualification as an “Elektrofachkraft für festgelegte Tätigkeiten” (“Skilled person for defined electrical work”) offered by a Chamber of Industry and Commerce (CIC).

#### for the UPS system:

- 1 x UPS system in the Protect series
- 1 x RS485 data line for connecting to Profibus DP master
- 1 x GSD file “PSS108BF.GSD”  
(can be downloaded from <http://www.aegpss.de>)

### Technical data:

#### Profibus DP:

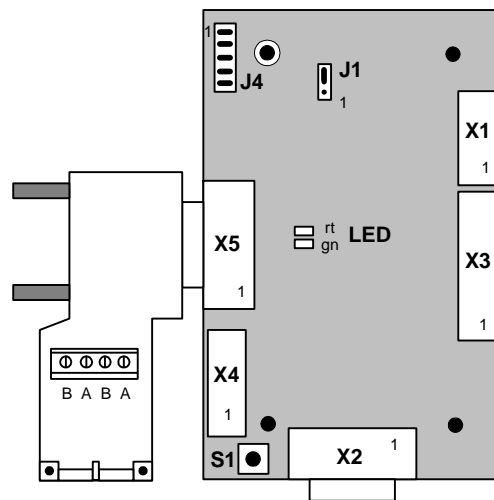
Protocol:	Profibus DP Version 1
Profibus DP identity no.:	0x08BF
Configuration data:	Acc. to GSD file
Synchronisation:	Supported
Freeze:	Supported
Transmission rate:	Up to 12 Mbps (autobaud)

#### RS485:

Max. line length: 1200 m (depending on the transmission rate), max. 32 bus stations, Data line: Screened 1:1 (2 x 0.22; twisted pair), e.g. Lapp “UNITRONIC-BUS LD”

## 2. Design

### 2.1 Structure of the Assembly



Profibus DP Configuration

Figure 1 Profibus DP interface (top view)

#### Configuration jumpers:

**J1:** 1-2: firmware update; 2-3: (factory setting)

**J4:** All closed: (factory setting)

#### Connections:

**X1:** Internal UPS bus and power supply

**X2:** Potential-free RS232 serial interface

**X3:** Triggering of “CCC remote signalling” (optional)

**X4:** Additional UPS devices or remote indicator boards can be connected to this potential-free CAN interface.

**X5:** Potential-free RS232 / RS485 serial interface

#### Button:

**S1:** Button for starting the configuration

#### LED signals:

**green/red flashes:** Configuration mode, slave address can be set (up to 30 seconds after restarting)

**green on:** Profibus network not active, no communication on the serial interfaces (connector X2 or connector X5)

**green flashes:** Profibus DP in data exchange status  
Data transmission on the serial interfaces (connector X2 and/or connector X5)

**red on:** General Profibus error or bus error  
Error on the serial interfaces (connector X2 and/or connector X5)

**Interfaces X2 and X5:**

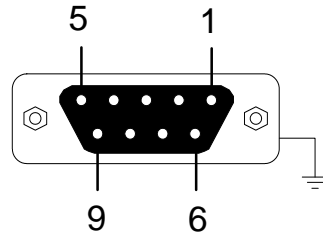


Figure 4 Serial D-SUB connector X2/X5

**X2: RS232 pin assignment for configuration**

Pin number	Signal	Description
2	RxD	PC receiving data from the CCC
3	TxD	PC sending data to the CCC
5	GND	Interface reference potential
Housing		UPS housing potential

**X5: RS485 pin assignment for Profibus DP connection**

Pin number	Signal	Description
1		Screen
3	B	High data
5	GND	Interface reference potential
6		5 V supply voltage
8	A	Low data
Housing		UPS housing potential

**Interface X4:**

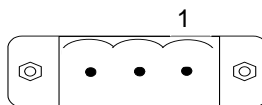


Figure 5 Connector X4

**X4: CAN pin assignment for system expansion**

Pin number	Signal	Description
1	GND	Interface reference potential
2	CANL	Low data
3	CANH	High data

## 2.2 Structure of Wiring

### RS485 bus line at X5:

Connect the two RS485 wires of the data line to the bus interface connector. You must terminate the end of the bus by fitting the enclosed 120R resistor between connections A and B.

The data bus is configured as follows:

D-SUB 9-pin socket (SCADA system)	D-SUB 9-pin male (MultiCom)	Terminal block (signal)
3	3	B
8	8	A

### Screen connection of the RS485 bus line:

**Shielding** is a means of weakening (attenuating) magnetic, electrical or electromagnetic interference fields.

Interference currents on line shields are dissipated to earth by means of the shield busbar that has a conductive connection to the housing. A low-impedance connection to the PE conductor is especially important to prevent these interference currents from themselves becoming a source of interference.

If possible, only use lines with a braided shield. The shield coverage should be at least 80%. Avoid using lines with a foil shield because tensile and compressive stresses applied when fastening the line can easily damage the foil, resulting in a reduction in the shielding effect.

Please bear the following points in mind when handling the screen:

- Use cable clips or shield terminal blocks made of metal to secure the braided shield. The clips must surround the shield and make good contact with it over a large area.
- Route the shield on a shield busbar directly from where the line enters the cubicle. Route the shield right up to the assembly; however, ensure that it does not make contact there!

You can achieve **effective interference suppression** in the high-frequency range **by connecting the shield at both ends**. Therefore, please **always** connect the shield **at both ends**. If there is a potential difference between the earthing points, however, an equalising current can flow along a shield that is connected at both ends. In this case, you should route an additional potential equalising line.

**By connecting the shield at one end, you can only attenuate the low frequencies**. You should **therefore** only connect the shield at one end **in exceptional circumstances, namely if**:

- potential differences exist and you cannot route a potential equalising line,
- foil shields (static shields) are used.

**On the UPS side, you must connect the line screen to the housing potential of the UPS unit** via the enclosed screen terminal block. Openings are provided in the plate of the UPS for installation in the connection room area. Remove

approximately 20 mm of the sheath at this point and fasten the line with the screen terminal block.

Ensure good contact between the terminal, the line screen and the UPS housing!



**ATTENTION:**

You must **route the shield up to the assembly**. It must **not be connected to the bus interface connector**.

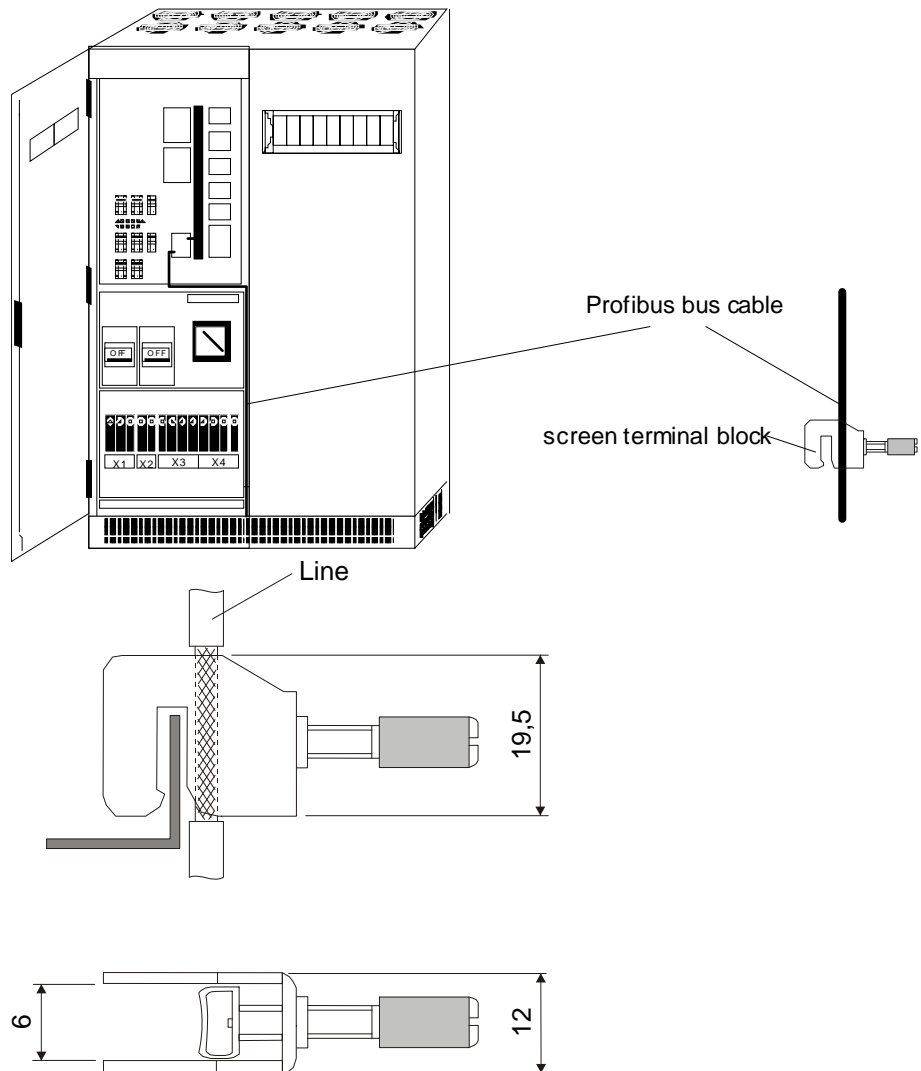


Figure 6 Shield connection

**Configuration line for X2:**

The enclosed data line is required to configure the PC via the RS232 interface X2.

**Controller Area Network (CAN) at X4**

Additional UPS units or remote panels can be connected to the potential-free CAN interface (refer to the Operating Instructions for the MultiCom interface for UPS units or the remote panel).

### 3. Installation

The Profibus DP interface can be installed when the unit is switched on. **Position A29** is reserved for the **Profibus DP interface**. This position is located on the pivot plate, directly behind the cubicle door. You can install one MultiCom interface and one Profibus DP interface simultaneously in some unit types. In this case, you must install the first assembly at position A29.1 and the additional Profibus DP interface at position A29.2. If only one position is available or if only one communication interface assembly is required, the Profibus DP interface must be installed at position A29.1.

Figure 2 shows a typical cubicle design. Please refer to the **operating instructions of your unit** for the **exact position** of A29.

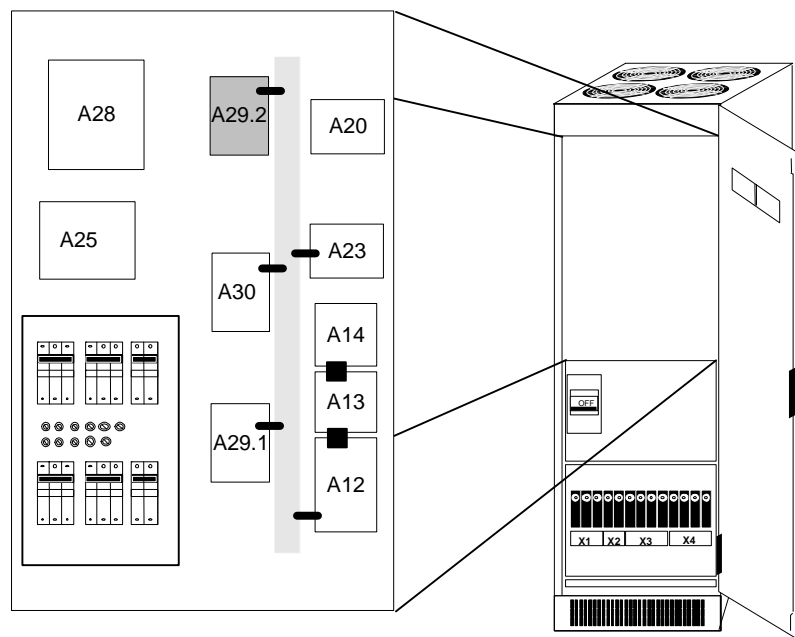


Figure 2 System / pivot plate arrangement of the UPS (example)

**A29.1: MultiCom interface or Profibus DP interface**

**A29.2: Profibus DP interface**



**Uninstalling old printed circuit boards:**

- If only one communication assembly is required and an old communication assembly (e.g. an RS232 bridge) that is no longer required is already inserted at position A29.1, you must uninstall this printed circuit board. Disconnect connector X1 from this PCB, then uninstall the PCB.

If you still need the PCB at position A29.1, you must install the Profibus DP interface at position A29.2.

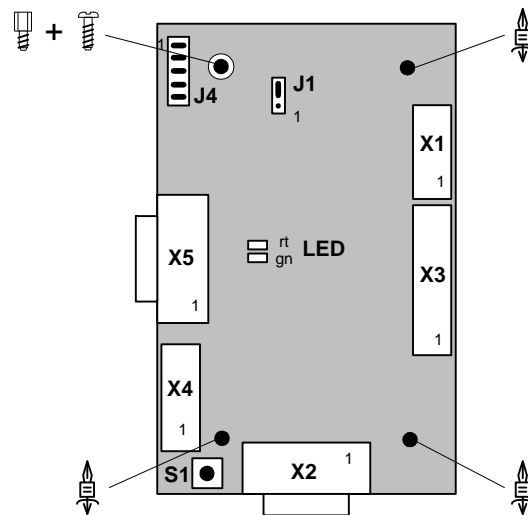
**To install:**

Figure 3 Printed circuit board attachments (top view)

- Insert the three plastic PCB holders and screw the metal spacer bolts into the holes at position A29 (assuming they are not already screwed in).
- Attach assembly A29 to the PCB holders. When doing this, make sure connector X1 is pointing towards the cable duct.
- Screw the fourth PCB holder tight on the spacer bolts. This causes the data line screen to be earthed.
- Now carefully open the cable duct.

**ATTENTION:**

**When working on the cable duct, it is essential to proceed with caution since there is nominal voltage (230 V) at the green CombiCon connectors when the unit is supplied with power!**

- Plug the 10-pin flat-ribbon cable (labelled A29-X1) into connector X1 of the Profibus DP interface.
- The Profibus DP interface is ready.
- Close the cable duct.
- Install the Profibus line at X5.
- Fasten the control and signal lines using cable tie holders.
- The installation is now complete.

## 4. Configuration

When you configure the Profibus DP slave, you simply need to **set** your **Profibus address**. The Profibus DP interface has an autobaud detection function, i.e. the transmission rate is automatically specified by the Profibus DP master.

For this configuration, you must connect the **PC** to the **Profibus DP interface (X2)** via the enclosed **data cable** and **start a terminal program**, e.g. Hyperterminal, on the PC.

### Setting the terminal program:

**Data transmission:** COMx, 9600 baud / 8 data bits / 1 stop bit

No parity / no protocol

**Terminal emulation:** VT100

You can then **start the configuration by pressing the “S1” button** on the Profibus DP interface. Ensure that no communication took place via the X2/X5 interface for at least 10 seconds previously.

Initiation of the configuration is displayed by the two **LEDs flashing** on the interface and the following display on the terminal:

**“PRESS <CR> FOR CONFIGURATION WHILE LED IS FLASHING”**

The **configuration starts** provided you **press the <ENTER> key (<CR>)** **within 30 seconds**. The configuration main menu is opened:

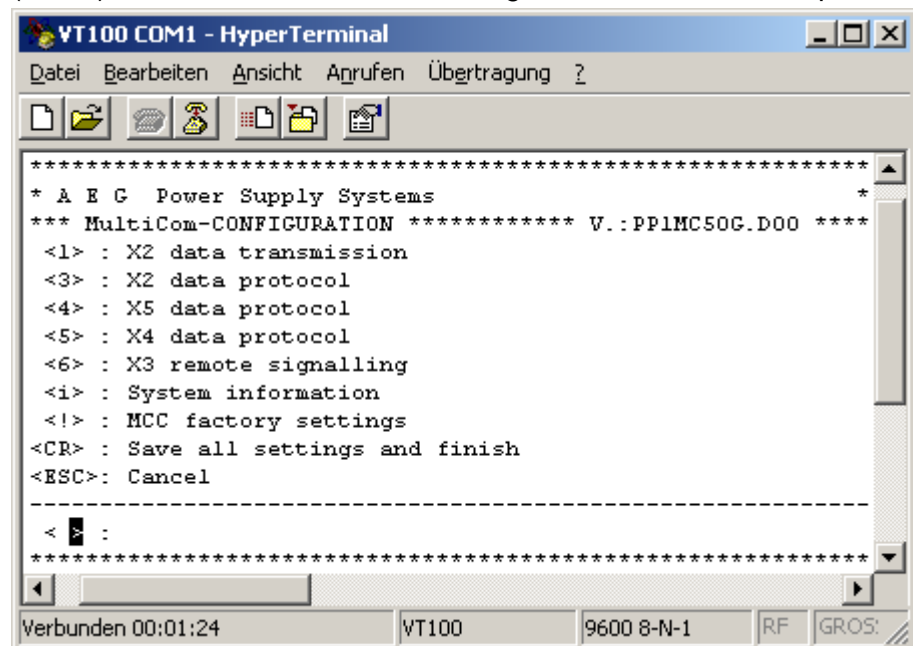


Figure 7 Configuration main menu

If the configuration does not start, you must wait for 10 seconds and repeat the procedure. Make sure that no data is received via the X2/X5 interfaces during this time.

Press the following key in the **main menu**:

- **<CR>** to **save** the set **values**, exit the configuration **and activate** the **MultiCom interface**.
- **<ESC>** to **cancel** the configuration.
- **<1>** to access the **data transmission configuration**.
- **<3-5>** to access the **data protocol configuration**.
- **<6>** to access the **Remote signalling configuration**.
- **<i>** to show the **system properties**.

The possible keyboard actions are shown in the menu in “< >”.

The following **special keys** can be used in all menus:

<b>&lt;CR&gt;</b> :	<b>Carriage return-</b> (↵) or <b>ENTER</b> key
<b>&lt;ESC&gt;</b> :	<b>Escape</b> key
<b>&lt;TAB&gt;</b> :	<b>Tabulator</b> (→) key
<b>&lt;BS&gt;</b> :	<b>Backspace</b> (←) or <b>Rubout</b> key
<b>&lt; &gt;</b> :	<b>Space bar</b>

### X5 data protocol configuration

To access the **X5 data protocol configuration**, you must **press <4>** **in the main menu**. This opens the Profibus DP configuration window:

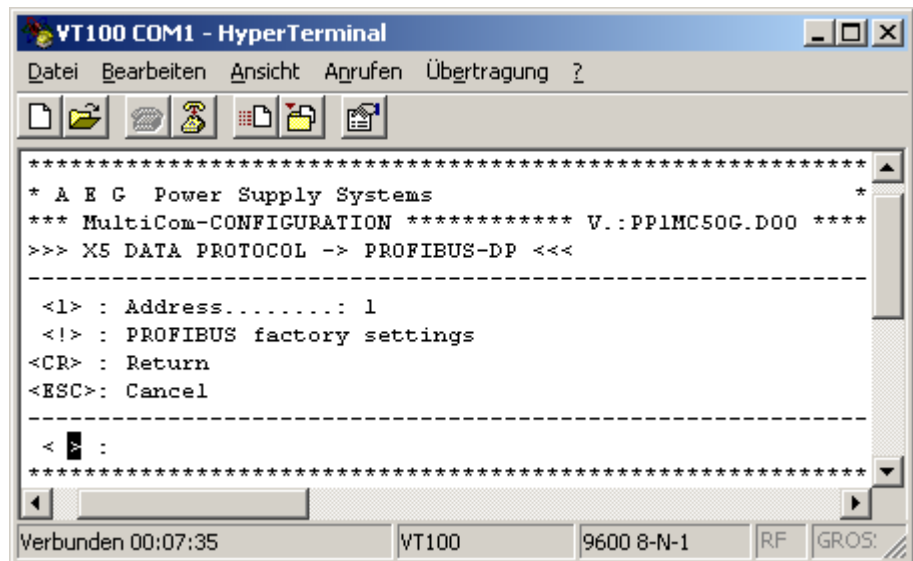


Figure 8 X5 data protocol configuration menu

**Press one of the following keys in the “X5 Data Protocol” menu:**

- **<1>** to set the Profibus DP address.
- **<!>** to **load the factory setting**.
- **<CR>** to **accept** the set **values**. The configuration is finished and the main menu is opened again.
- **<ESC>** to **cancel** the configuration. This opens the main menu.

## 5. UPS Unit Profile

### 5.1 General

Every standardised Profibus DP master can exchange data with the Profibus DP interface. After the parameters have been set, the master must send a configuration message to the corresponding slave. The configuration message provides the slave with information about the length of the output data as well as the baud rate parameters. The user assembles the configuration message in the project planning tool. To do this, you must load the GSD file in your project planning tool and select a module (equivalent to the UPS unit type).

You can **download** the **GSD file** from the AEG SVS Power Supply Systems GmbH **homepage**.

Homepage: <http://www.aegps.com>

In the UPS profile, the following **data types** are used:

**BYTE** is either an 8-bit integer between 0 and 255 or a bit-coded number where each bit indicates a status.

**WORD** is a 16-bit integer between 0 and 65535 (0xFFFF). The value to be displayed is a number between 0 and 65535. The value is sent in the sequence High byte/Low byte.

**WORD10** is a 16-bit integer between 0 and 65535. The value to be displayed is a number between 0.0 and 6553.5. The number transmitted must be divided by 10 to obtain this value.

The value is sent in the sequence HIGH byte / LOW byte.

The modules in the **GSD file** support the following **unit types**:

- **UPS 3in 3out ( +LifeCheck) ( +AUX)**  
UPS units with a three-phase input and a three-phase output
- **UPS 3in 1out ( +LifeCheck) ( +AUX)**  
UPS units with a three-phase input and a single-phase output
- **Inverter 3out ( +Lifecheck) ( +AUX)**  
Inverters with 3-phase output
- **Inverter 1out ( +Lifecheck) ( +AUX)**  
Inverters with single-phase output
- **Converter 3out ( +Lifecheck)**  
Converters with 3-phase output
- **Converter 1out ( +Lifecheck)**  
Converters with single-phase output  
(**+LifeCheck**: with additional LifeCheck toggle bit)  
(**+AUX**: with additional user-defined auxiliary messages)

The following **abbreviations** are used:

- “O”**: Optional
- A**: Alarm, fault or error that causes the assembly to be deactivated
- W**: Warning, self-acknowledging fault
- I**: Information

## 5.2 Unit Profile of a Three-Phase UPS

### GSD file: UPS 3in 3out (+LifeCheck) (+AUX)

#### Status:

Index	Bit no.:	Type	Name	Description
0	3-0	BYTE	UPSStatus	UPS status: 1=Normal Operation 2=Bypass Operation 3=Battery operation 4=Ecomode 6=Deactivation is imminent 7=Off "O"

#### Alarms:

Index	Bit no.:	Type	Name	Description
1	0	BYTE	NonCriticalFault	W: Collective warning
	1	BYTE	CriticalFault	A: Collective alarm
	2	BYTE	Input1Active	W: Freely progr. input at A13/14 "O"
	3	BYTE	Input2Active	W: Freely progr. input at A13/14 "O"
	4	BYTE	Input3Active	W: Freely progr. input at A13/14 "O"
	5	BYTE	EmergencySwitchOff	A: UPS output off "O"
	7	BYTE	DouCanFault	W: DOU CAN fault
2	0	BYTE	MainsFault	W: Rectifier/bypass mains fault
	1	BYTE	RectifierWarning	W: Rectifier warning
	2	BYTE	RectifierFault	A: Rectifier fault
	3	BYTE	BatteryAlarm	A: Battery fault
	4	BYTE	InverterWarning	W: Inverter warning
	5	BYTE	InverterFault	W: Inverter fault
	6	BYTE	SBSWarning	W: Bypass warning
3	0	BYTE	EqualisingCharge	I: Charger status – equalising charging
	1	BYTE	Charge	I: Charger status – charging
	2	BYTE	TrickleCharge	I: Charger status – trickle charging
	3	BYTE	GenSetOperation	I: Charger status: Em. power supply "O"
	4	BYTE	BattTemp.SensFault	W: Battery temp. sensor "O"
	5	BYTE	BatteryTemp.TooHigh	W: Battery temp. too high "O"
	6	BYTE	CircuitBreaker	W: Circuit-breaker tripped "O"
	7	BYTE	BatteryWarning	W: Battery warning
4	0	BYTE	BatteryLow	W: Battery undervoltage
	1	BYTE	Overload	W: Inverter overload
	2	BYTE	FanFault	W: Fan fault
	3	BYTE	Overload	A: Inverter overload
	4	BYTE	ShortCircuit	A: Inverter short-circuit
	5	BYTE	DcUnderVoltage	A: Inverter DC undervoltage
	6	BYTE	DcOverVoltage	A: Inverter DC overvoltage
	7	BYTE	PowerStackOverTemp	A: Inverter stack fault
5	0	BYTE	SBSReady	I: Bypass ready
	1	BYTE	SBSMainsFault	W: Bypass mains fault
	2	BYTE	SBSBlocked	W: Bypass blocked
6	0	BYTE	RectifierOn	I: Rectifier on
	1	BYTE	InverterOn	I: Inverter on
	2	BYTE	SBSOn	I: Bypass on

**GSD file: UPS 3in 3out (+LifeCheck) (+AUX)****Measured values****Rectifier mains:**

Index	Bit no.:	Type	Name	Value range
7	15-0	WORD10	RectMainsFreq.	0.0 – 99.0 Hz
9	15-0	WORD	RectMainsVoltL1	0 – 999 V
11	15-0	WORD	RectMainsVoltL2	0 – 999 V
13	15-0	WORD	RectMainsVoltL3	0 – 999 V

**Bypass mains:**

Index	Bit no.:	Type	Name	Value range
15	15-0	WORD10	SBSMainsFreq.	0.0 - 99.9 Hz
17	15-0	WORD	SBSMainsVoltL1	0 – 999 V
19	15-0	WORD	SBSMainsVoltL2	0 – 999 V
21	15-0	WORD	SBSMainsVoltL3	0 – 999 V

**Battery values:**

Index	Bit no.:	Type	Name	Value range
23	15-0	WORD	BatteryVoltage	0 – 999 V
25	15-0	WORD10	BatteryCurrent	+ - 0.0 – 3000.0 A
27	15-0	WORD10	AutonomyTime	0.0 – 999.0 min
29	15-0	WORD	BatteryCapacity	0 – 100 %
31	15-0	WORD10	BatteryTemperature	+ - 0.0 – 99.9 °C

**UPS output:**

Index	Bit no.:	Type	Name	Value range
33	15-0	WORD10	OutputFreq.	0.0 - 99.0 Hz
35	15-0	WORD	OutputVoltageL1	0 – 999 V
37	15-0	WORD	OutputLoadL1	0 - 100 %
39	15-0	WORD	OutputCurrentL1	0 – 9999 A
41	15-0	WORD10	OutputPowerL1	0.0 – 1000.0 kW
43	15-0	WORD	OutputVoltageL2	0 – 999 V
45	15-0	WORD	OutputLoadL2	0 - 100 %
47	15-0	WORD	OutputCurrentL2	0 – 9999 A
49	15-0	WORD10	OutputPowerL2	0.0 – 1000.0 kW
51	15-0	WORD	OutputVoltageL3	0 – 999 V
53	15-0	WORD	OutputLoadL3	0 - 100 %
55	15-0	WORD	OutputCurrentL3	0 – 9999 A
57	15-0	WORD10	OutputPowerL3	0.0 – 1000.0 kW

**(+ LifeCheck) (Only modules with LifeCheck):**

Index	Bit no.:	Type	Name	Value range
59	0	BYTE	LifeCheck	Bit 0-1 toggled 1x per minute

**(+AUX) Auxiliary signals (for units with customisable signals):**

Index	Bit no.:	Type	Name	Description
60	0	BYTE	AUX1-Rectifier	User-defined signal 1 from rectifier "O"
	1	BYTE	AUX2-Rectifier	User-defined signal 2 from rectifier "O"
	2	BYTE	AUX3-Rectifier	User-defined signal 3 from rectifier "O"
	3	BYTE	AUX4-Rectifier	User-defined signal 4 from rectifier "O"
	4	BYTE	AUX5-Rectifier	User-defined signal 5 from rectifier "O"
	5	BYTE	AUX6-Rectifier	User-defined signal 6 from rectifier "O"
	7	BYTE	AUX7-Rectifier	User-defined signal 7 from rectifier "O"
61	0	BYTE	AUX1-Inverter	User-defined signal 1 from inverter "O"
	1	BYTE	AUX2-Inverter	User-defined signal 2 from inverter "O"
	2	BYTE	AUX3-Inverter	User-defined signal 3 from inverter "O"
	3	BYTE	AUX4-Inverter	User-defined signal 4 from inverter "O"
	4	BYTE	AUX5-Inverter	User-defined signal 5 from inverter "O"
	5	BYTE	AUX6-Inverter	User-defined signal 6 from inverter "O"
	7	BYTE	AUX7-Inverter	User-defined signal 7 from inverter "O"
62	0	BYTE	AUX1-SBS	User-defined signal 1 from bypass "O"
	1	BYTE	AUX2-SBS	User-defined signal 2 from bypass "O"
	2	BYTE	AUX3-SBS	User-defined signal 3 from bypass "O"
	3	BYTE	AUX4-SBS	User-defined signal 4 from bypass "O"
	4	BYTE	AUX5-SBS	User-defined signal 5 from bypass "O"
	5	BYTE	AUX6-SBS	User-defined signal 6 from bypass "O"
	7	BYTE	AUX7-SBS	User-defined signal 7 from bypass "O"

### 5.3 Unit Profile of a Single-Phase UPS

#### GSD file: UPS 3in 1out (+LifeCheck) (+AUX)

##### Status:

Index	Bit no.:	Type	Name	Description
0	3-0	BYTE	UPSStatus	UPS status: 1=Normal Operation 2=Bypass Operation 3=Battery operation 4=Ecomode 6=Deactivation is imminent 7=Off "0"

##### Alarms:

Index	Bit no.:	Type	Name	Description
1	0	BYTE	NonCriticalFault	W: Collective warning
	1	BYTE	CriticalFault	A: Collective alarm
	2	BYTE	Input1Active	W: Freely progr. input at A13/14 "0"
	3	BYTE	Input2Active	W: Freely progr. input at A13/14 "0"
	4	BYTE	Input3Active	W: Freely progr. input at A13/14 "0"
	5	BYTE	EmergencySwitchOff	A: UPS output off "0"
	7	BYTE	DouCanFault	W: DOU CAN fault
2	0	BYTE	MainsFault	W: Rectifier/bypass mains fault
	1	BYTE	RectifierWarning	W: Rectifier warning
	2	BYTE	RectifierFault	A: Rectifier fault
	3	BYTE	BatteryAlarm	A: Battery fault
	4	BYTE	InverterWarning	W: Inverter warning
	5	BYTE	InverterFault	W: Inverter fault
	6	BYTE	SBSWarning	W: Bypass warning
3	0	BYTE	EqualisingCharge	I: Charger status – equalising charging
	1	BYTE	Charge	I: Charger status – charging
	2	BYTE	TrickleCharge	I: Charger status – trickle charging
	3	BYTE	GenSetOperation	I: Charger status: Em. power supply "0"
	4	BYTE	BattTemp.SensFault	W: Battery temp. sensor "0"
	5	BYTE	BatteryTemp.TooHigh	W: Battery temp. too high "0"
	6	BYTE	CircuitBreaker	W: Circuit-breaker tripped "0"
	7	BYTE	BatteryWarning	W: Battery warning
4	0	BYTE	BatteryLow	W: Battery undervoltage
	1	BYTE	Overload	W: Inverter overload
	2	BYTE	FanFault	W: Fan fault
	3	BYTE	Overload	A: Inverter overload
	4	BYTE	ShortCircuit	A: Inverter short-circuit
	5	BYTE	DcUnderVoltage	A: Inverter DC undervoltage
	6	BYTE	DcOverVoltage	A: Inverter DC overvoltage
	7	BYTE	PowerStackOverTemp	A: Inverter stack fault
5	0	BYTE	SBSReady	I: Bypass ready
	1	BYTE	SBSMainsFault	W: Bypass mains fault
	2	BYTE	SBSBlocked	W: Bypass blocked
6	0	BYTE	RectifierOn	I: Rectifier on
	1	BYTE	InverterOn	I: Inverter on
	2	BYTE	SBSOn	I: Bypass on



**GSD file: UPS 3in 1out (+LifeCheck) (+AUX)****Measured values****Rectifier mains:**

Index	Bit no.:	Type	Name	Value range
7	15-0	WORD10	RectMainsFreq.	0.0 - 99.0 Hz
9	15-0	WORD	RectMainsVoltL1	0 – 999 V
11	15-0	WORD	RectMainsVoltL2	0 – 999 V
13	15-0	WORD	RectMainsVoltL3	0 – 999 V

**Bypass mains:**

Index	Bit no.:	Type	Name	Value range
15	15-0	WORD10	SBSMainsFreq.	0.0 – 99.9 Hz
17	15-0	WORD	SBSMainsVoltL1	0 – 999 V

**Battery values:**

Index	Bit no.:	Type	Name	Value range
19	15-0	WORD	BatteryVoltage	0 – 999 V
21	15-0	WORD10	BatteryCurrent	+ - 0.0 – 3000.0 A
23	15-0	WORD10	AutonomyTime	0.0 – 999.0 min
25	15-0	WORD	BatteryCapacity	0 – 100 %
27	15-0	WORD10	BatteryTemperature	+ - 0.0 – 99.9 °C

**UPS output:**

Index	Bit no.:	Type	Name	Value range
29	15-0	WORD10	OutputFreq.	0.0 - 99.0 Hz
31	15-0	WORD	OutputVoltageL1	0 – 999 V
33	15-0	WORD	OutputLoadL1	0 - 100 %
35	15-0	WORD	OutputCurrentL1	0 – 9999 A
37	15-0	WORD10	OutputPowerL1	0.0 – 1000.0 kW

**(+ LifeCheck) (Only modules with LifeCheck):**

Index	Bit no.:	Type	Name	Value range
39	0	BYTE	LifeCheck	Bit 0-1 toggled 1x per minute

**(+AUX) Auxiliary signals (for units with customisable signals):**

Index	Bit no.:	Type	Name	Description
40	0	BYTE	AUX1-Rectifier	User-defined signal 1 from rectifier "O"
	1	BYTE	AUX2-Rectifier	User-defined signal 2 from rectifier "O"
	2	BYTE	AUX3-Rectifier	User-defined signal 3 from rectifier "O"
	3	BYTE	AUX4-Rectifier	User-defined signal 4 from rectifier "O"
	4	BYTE	AUX5-Rectifier	User-defined signal 5 from rectifier "O"
	5	BYTE	AUX6-Rectifier	User-defined signal 6 from rectifier "O"
	7	BYTE	AUX7-Rectifier	User-defined signal 7 from rectifier "O"
41	0	BYTE	AUX1-Inverter	User-defined signal 1 from inverter "O"
	1	BYTE	AUX2-Inverter	User-defined signal 2 from inverter "O"
	2	BYTE	AUX3-Inverter	User-defined signal 3 from inverter "O"
	3	BYTE	AUX4-Inverter	User-defined signal 4 from inverter "O"
	4	BYTE	AUX5-Inverter	User-defined signal 5 from inverter "O"
	5	BYTE	AUX6-Inverter	User-defined signal 6 from inverter "O"
	7	BYTE	AUX7-Inverter	User-defined signal 7 from inverter "O"
42	0	BYTE	AUX1-SBS	User-defined signal 1 from bypass "O"
	1	BYTE	AUX2-SBS	User-defined signal 2 from bypass "O"
	2	BYTE	AUX3-SBS	User-defined signal 3 from bypass "O"
	3	BYTE	AUX4-SBS	User-defined signal 4 from bypass "O"
	4	BYTE	AUX5-SBS	User-defined signal 5 from bypass "O"
	5	BYTE	AUX6-SBS	User-defined signal 6 from bypass "O"
	7	BYTE	AUX7-SBS	User-defined signal 7 from bypass "O"

## 5.4 Unit Profile of a Three-Phase Inverter

### GSD file: Inverter 3out (+LifeCheck) (+AUX)

#### Status:

Index	Bit no.:	Type	Name	Description
0	3-0	BYTE	InverterStatus	UPS status: 1=Normal Operation 2=Bypass Operation 4=Ecomode 7=Off  "O"

#### Alarms:

Index	Bit no.:	Type	Name	Description
1	0	BYTE	NonCriticalFault	W: Collective warning
	1	BYTE	CriticalFault	A: Collective alarm
	2	BYTE	Input1Active	W: Freely progr. input at A13/14 "O"
	3	BYTE	Input2Active	W: Freely progr. input at A13/14 "O"
	4	BYTE	Input3Active	W: Freely progr. input at A13/14 "O"
	5	BYTE	EmergencySwitchOff	A: UPS output off "O"
	7	BYTE	DouCanFault	W: DOU CAN fault
2	4	BYTE	InverterWarning	W: Inverter warning
	5	BYTE	InverterFault	W: Inverter fault
	6	BYTE	SBSWarning	W: Bypass warning
	7	BYTE	SBSFault	A: Bypass fault
3				
4	0	BYTE	BatteryLow	W: Battery undervoltage
	1	BYTE	Overload	W: Inverter overload
	2	BYTE	FanFault	W: Fan fault
	3	BYTE	Overload	A: Inverter overload
	4	BYTE	ShortCircuit	A: Inverter short-circuit
	5	BYTE	DcUnderVoltage	A: Inverter DC undervoltage
	6	BYTE	DcOverVoltage	A: Inverter DC overvoltage
	7	BYTE	PowerStackOverTemp	A: Inverter stack fault
5	0	BYTE	SBSReady	I: Bypass ready
	1	BYTE	SBSMainsFault	W: Bypass mains fault
	2	BYTE	SBSBlocked	W: Bypass blocked
6	1	BYTE	InverterOn	I: Inverter on
	2	BYTE	SBSOn	I: Bypass on

**GSD file: Inverter 3out (+LifeCheck) (+AUX)****Measured values****Bypass mains:**

Index	Bit no.:	Type	Name	Value range
7	15-0	WORD10	SBSMainsFreq.	0.0 - 99.9 Hz
9	15-0	WORD	SBSMainsVoltL1	0 – 999 V
11	15-0	WORD	SBSMainsVoltL2	0 – 999 V
13	15-0	WORD	SBSMainsVoltL3	0 – 999 V

**DC voltage:**

Index	Bit no.:	Type	Name	Value range
15	15-0	WORD	DCVoltage	0 – 999 V

**Inverter output:**

Index	Bit no.:	Type	Name	Value range
17	15-0	WORD10	OutputFreq.	0.0 - 99.0 Hz
19	15-0	WORD	OutputVoltageL1	0 – 999 V
21	15-0	WORD	OutputLoadL1	0 - 100 %
23	15-0	WORD	OutputCurrentL1	0 – 9999 A
25	15-0	WORD10	OutputPowerL1	0.0 – 1000.0 kW
27	15-0	WORD	OutputVoltageL2	0 – 999 V
29	15-0	WORD	OutputLoadL2	0 - 100 %
31	15-0	WORD	OutputCurrentL2	0 – 9999 A
33	15-0	WORD10	OutputPowerL2	0.0 – 1000.0 kW
35	15-0	WORD	OutputVoltageL3	0 – 999 V
37	15-0	WORD	OutputLoadL3	0 - 100 %
39	15-0	WORD	OutputCurrentL3	0 – 9999 A
41	15-0	WORD10	OutputPowerL3	0.0 – 1000.0 kW

**(+ LifeCheck) (Only modules with LifeCheck):**

Index	Bit no.:	Type	Name	Value range
43	0	BYTE	LifeCheck	Bit 0-1 toggled 1x per minute

**(+AUX) Auxiliary signals (for units with customisable signals):**

Index	Bit no.:	Type	Name	Description
44	0	BYTE	AUX1-Inverter	User-defined signal 1 from inverter "O"
	1	BYTE	AUX2-Inverter	User-defined signal 2 from inverter "O"
	2	BYTE	AUX3-Inverter	User-defined signal 3 from inverter "O"
	3	BYTE	AUX4-Inverter	User-defined signal 4 from inverter "O"
	4	BYTE	AUX5-Inverter	User-defined signal 5 from inverter "O"
	5	BYTE	AUX6-Inverter	User-defined signal 6 from inverter "O"
	7	BYTE	AUX7-Inverter	User-defined signal 7 from inverter "O"
45	0	BYTE	AUX1-SBS	User-defined signal 1 from bypass "O"
	1	BYTE	AUX2-SBS	User-defined signal 2 from bypass "O"
	2	BYTE	AUX3-SBS	User-defined signal 3 from bypass "O"
	3	BYTE	AUX4-SBS	User-defined signal 4 from bypass "O"
	4	BYTE	AUX5-SBS	User-defined signal 5 from bypass "O"
	5	BYTE	AUX6-SBS	User-defined signal 6 from bypass "O"
	7	BYTE	AUX7-SBS	User-defined signal 7 from bypass "O"

## 5.5 Unit Profile of a Single-Phase Inverter

### GSD file: Inverter 1out (+LifeCheck) (+AUX)

#### Status:

Index	Bit no.:	Type	Name	Description
0	3-0	BYTE	InverterStatus	UPS status: 1=Normal Operation 2=Bypass Operation 4=Ecomode 7=Off  "O"

#### Alarms:

Index	Bit no.:	Type	Name	Description
1	0	BYTE	NonCriticalFault	W: Collective warning
	1	BYTE	CriticalFault	A: Collective alarm
	2	BYTE	Input1Active	W: Freely progr. input at A13/14 "O"
	3	BYTE	Input2Active	W: Freely progr. input at A13/14 "O"
	4	BYTE	Input3Active	W: Freely progr. input at A13/14 "O"
	5	BYTE	EmergencySwitchOff	A: UPS output off "O"
	7	BYTE	DouCanFault	W: DOU CAN fault
2	4	BYTE	InverterWarning	W: Inverter warning
	5	BYTE	InverterFault	W: Inverter fault
	6	BYTE	SBSWarning	W: Bypass warning
	7	BYTE	SBSFault	A: Bypass fault
3				
4	0	BYTE	BatteryLow	W: Battery undervoltage
	1	BYTE	Overload	W: Inverter overload
	2	BYTE	FanFault	W: Fan fault
	3	BYTE	Overload	A: Inverter overload
	4	BYTE	ShortCircuit	A: Inverter short-circuit
	5	BYTE	DcUnderVoltage	A: Inverter DC undervoltage
	6	BYTE	DcOverVoltage	A: Inverter DC overvoltage
	7	BYTE	PowerStackOverTemp	A: Inverter stack fault
5	0	BYTE	SBSReady	I: Bypass ready
	1	BYTE	SBSMainsFault	W: Bypass mains fault
	2	BYTE	SBSBlocked	W: Bypass blocked
6	1	BYTE	InverterOn	I: Inverter on
	2	BYTE	SBSOn	I: Bypass on

**GSD file: Inverter 1out (+Lifecheck) (+AUX)****Measured values****Bypass mains:**

Index	Bit no.:	Type	Name	Value range
7	15-0	WORD10	SBSMainsFreq.	0.0 - 99.9 Hz
9	15-0	WORD	SBSMainsVoltL1	0 – 999 V

**DC voltage:**

Index	Bit no.:	Type	Name	Value range
11	15-0	WORD	DCVoltage	0 – 999 V

**Inverter output:**

Index	Bit no.:	Type	Name	Value range
13	15-0	WORD10	OutputFreq.	0.0 - 99.0 Hz
15	15-0	WORD	OutputVoltageL1	0 – 999 V
17	15-0	WORD	OutputLoadL1	0 - 100 %
19	15-0	WORD	OutputCurrentL1	0 – 9999 A
21	15-0	WORD10	OutputPowerL1	0.0 – 1000.0 kW

**(+ LifeCheck) (Only modules with LifeCheck):**

Index	Bit no.:	Type	Name	Value range
23	0	BYTE	LifeCheck	Bit 0-1 toggled 1x per minute

**(+AUX) Auxiliary signals (for units with customisable signals):**

Index	Bit no.:	Type	Name	Description
24	0	BYTE	AUX1-Inverter	User-defined signal 1 from inverter "O"
	1	BYTE	AUX2-Inverter	User-defined signal 2 from inverter "O"
	2	BYTE	AUX3-Inverter	User-defined signal 3 from inverter "O"
	3	BYTE	AUX4-Inverter	User-defined signal 4 from inverter "O"
	4	BYTE	AUX5-Inverter	User-defined signal 5 from inverter "O"
	5	BYTE	AUX6-Inverter	User-defined signal 6 from inverter "O"
	7	BYTE	AUX7-Inverter	User-defined signal 7 from inverter "O"
25	0	BYTE	AUX1-SBS	User-defined signal 1 from bypass "O"
	1	BYTE	AUX2-SBS	User-defined signal 2 from bypass "O"
	2	BYTE	AUX3-SBS	User-defined signal 3 from bypass "O"
	3	BYTE	AUX4-SBS	User-defined signal 4 from bypass "O"
	4	BYTE	AUX5-SBS	User-defined signal 5 from bypass "O"
	5	BYTE	AUX6-SBS	User-defined signal 6 from bypass "O"
	7	BYTE	AUX7-SBS	User-defined signal 7 from bypass "O"

## 5.6 Unit Profile of a Three-Phase Inverter

### GSD file: Converter 3in 3out +LifeCheck

#### Status:

Index	Bit no.:	Type	Name	Description
0	3-0	BYTE	UPSStatus	INV Status: 1=Normal Operation 3=Battery operation 6=Deactivation is imminent 7=Off

#### Alarms:

Index	Bit no.:	Type	Name	Description
1	0	BYTE	NonCriticalFault	W: Collective warning
	1	BYTE	CriticalFault	A: Collective alarm
	2	BYTE	Input1Active	W: Freely progr. input at A13/14 "O"
	3	BYTE	Input2Active	W: Freely progr. input at A13/14 "O"
	4	BYTE	Input3Active	W: Freely progr. input at A13/14 "O"
	5	BYTE	EmergencySwitchOff	A: INV output off "O"
	7	BYTE	DouCanFault	W: DOU CAN fault
2	0	BYTE	MainsFault	W: Rectifier mains fault
	1	BYTE	RectifierWarning	W: Rectifier warning
	2	BYTE	RectifierFault	A: Rectifier fault
	3	BYTE	BatteryAlarm	A: Battery fault
	4	BYTE	InverterWarning	W: Inverter warning
	5	BYTE	InverterFault	W: Inverter fault
3	0	BYTE	EqualisingCharge	I: Charger status – equalising charging
	1	BYTE	Charge	I: Charger status – charging
	2	BYTE	TrickleCharge	I: Charger status – trickle charging
	3	BYTE	GenSetOperation	I: Charger status: Em. power supply "O"
	4	BYTE	BattTemp.SensFault	W: Battery temp. sensor "O"
	5	BYTE	BatteryTemp.TooHigh	W: Battery temp. too high "O"
	6	BYTE	CircuitBreaker	W: Circuit-breaker tripped "O"
	7	BYTE	BatteryWarning	W: Battery warning
4	0	BYTE	BatteryLow	W: Battery undervoltage
	1	BYTE	Overload	W: Inverter overload
	2	BYTE	FanFault	W: Fan fault
	3	BYTE	Overload	A: Inverter overload
	4	BYTE	ShortCircuit	A: Inverter short-circuit
	5	BYTE	DcUnderVoltage	A: Inverter DC undervoltage
	6	BYTE	DcOverVoltage	A: Inverter DC overvoltage
	7	BYTE	PowerStackOverTemp	A: Inverter stack fault
5				
6	0	BYTE	RectifierOn	I: Rectifier on
	1	BYTE	InverterOn	I: Inverter on

**GSD file: Converter 3in 3out +LifeCheck****Measured values****Rectifier mains:**

Index	Bit no.:	Type	Name	Value range
7	15-0	WORD10	RectMainsFreq.	0.0 – 99.0 Hz
9	15-0	WORD	RectMainsVoltL1	0 – 999 V
11	15-0	WORD	RectMainsVoltL2	0 – 999 V
13	15-0	WORD	RectMainsVoltL3	0 – 999 V

**Battery values:**

Index	Bit no.:	Type	Name	Value range
15	15-0	WORD	BatteryVoltage	0 – 999 V
17	15-0	WORD10	BatteryCurrent	+ - 0.0 – 3000.0 A
19	15-0	WORD10	AutonomyTime	0.0 – 999.0 min
21	15-0	WORD	BatteryCapacity	0 – 100 %
23	15-0	WORD10	BatteryTemperature	+ - 0.0 – 99.9 °C "0"

**INV output:**

Index	Bit no.:	Type	Name	Value range
25	15-0	WORD10	OutputFreq.	0.0 - 99.0 Hz
27	15-0	WORD	OutputVoltageL1	0 – 999 V
29	15-0	WORD	OutputLoadL1	0 - 100 %
31	15-0	WORD	OutputCurrentL1	0 – 9999 A
33	15-0	WORD10	OutputPowerL1	0.0 – 1000.0 kW
35	15-0	WORD	OutputVoltageL2	0 – 999 V
37	15-0	WORD	OutputLoadL2	0 - 100 %
39	15-0	WORD	OutputCurrentL2	0 – 9999 A
41	15-0	WORD10	OutputPowerL2	0.0 – 1000.0 kW
43	15-0	WORD	OutputVoltageL3	0 – 999 V
45	15-0	WORD	OutputLoadL3	0 - 100 %
47	15-0	WORD	OutputCurrentL3	0 – 9999 A
49	15-0	WORD10	OutputPowerL3	0.0 – 1000.0 kW

**LifeCheck:**

Index	Bit no.:	Type	Name	Value range
51	0	BYTE	LifeCheck	Bit 0-1 toggled 1x per minute



## 5.7 Unit Profile of a Single-Phase Inverter

### GSD file: Converter 3in 3out +LifeCheck

#### Status:

Index	Bit no.:	Type	Name	Description
0	3-0	BYTE	UPSStatus	INV Status: 1=Normal Operation 3=Battery operation 6=Deactivation is imminent 7=Off

#### Alarms:

Index	Bit no.:	Type	Name	Description
1	0	BYTE	NonCriticalFault	W: Collective warning
	1	BYTE	CriticalFault	A: Collective alarm
	2	BYTE	Input1Active	W: Freely progr. input at A13/14 "O"
	3	BYTE	Input2Active	W: Freely progr. input at A13/14 "O"
	4	BYTE	Input3Active	W: Freely progr. input at A13/14 "O"
	5	BYTE	EmergencySwitchOff	A: UPS output off "O"
	7	BYTE	DouCanFault	W: DOU CAN fault
2	0	BYTE	MainsFault	W: Rectifier/bypass mains fault
	1	BYTE	RectifierWarning	W: Rectifier warning
	2	BYTE	RectifierFault	A: Rectifier fault
	3	BYTE	BatteryAlarm	A: Battery fault
	4	BYTE	InverterWarning	W: Inverter warning
	5	BYTE	InverterFault	W: Inverter fault
3	0	BYTE	EqualisingCharge	I: Charger status – equalising charging
	1	BYTE	Charge	I: Charger status – charging
	2	BYTE	TrickleCharge	I: Charger status – trickle charging
	3	BYTE	GenSetOperation	I: Charger status: Em. power supply "O"
	4	BYTE	BattTemp.SensFault	W: Battery temp. sensor "O"
	5	BYTE	BatteryTemp.TooHigh	W: Battery temp. too high "O"
	6	BYTE	CircuitBreaker	W: Circuit-breaker tripped "O"
	7	BYTE	BatteryWarning	W: Battery warning
4	0	BYTE	BatteryLow	W: Battery undervoltage
	1	BYTE	Overload	W: Inverter overload
	2	BYTE	FanFault	W: Fan fault
	3	BYTE	Overload	A: Inverter overload
	4	BYTE	ShortCircuit	A: Inverter short-circuit
	5	BYTE	DcUnderVoltage	A: Inverter DC undervoltage
	6	BYTE	DcOverVoltage	A: Inverter DC overvoltage
	7	BYTE	PowerStackOverTemp	A: Inverter stack fault
5				
6	0	BYTE	RectifierOn	I: Rectifier on
	1	BYTE	InverterOn	I: Inverter on

**GSD file: Converter 3in 3out +LifeCheck****Measured values****Rectifier mains:**

Index	Bit no.:	Type	Name	Value range
7	15-0	WORD10	RectMainsFreq.	0.0 - 99.0 Hz
9	15-0	WORD	RectMainsVoltL1	0 – 999 V
11	15-0	WORD	RectMainsVoltL2	0 – 999 V
13	15-0	WORD	RectMainsVoltL3	0 – 999 V

**Battery values:**

Index	Bit no.:	Type	Name	Value range
15	15-0	WORD	BatteryVoltage	0 – 999 V
17	15-0	WORD10	BatteryCurrent	+ - 0.0 – 3000.0 A
19	15-0	WORD10	AutonomyTime	0.0 – 999.0 min
21	15-0	WORD	BatteryCapacity	0 – 100 %
23	15-0	WORD10	BatteryTemperature	+ - 0.0 – 99.9 °C

**UPS output:**

Index	Bit no.:	Type	Name	Value range
25	15-0	WORD10	OutputFreq.	0.0 - 99.0 Hz
27	15-0	WORD	OutputVoltageL1	0 – 999 V
29	15-0	WORD	OutputLoadL1	0 - 100 %
31	15-0	WORD	OutputCurrentL1	0 – 9999 A
33	15-0	WORD10	OutputPowerL1	0.0 – 1000.0 kW

**LifeCheck:**

Index	Bit no.:	Type	Name	Value range
35	0	BYTE	LifeCheck	Bit 0-1 toggled 1x per minute