Safe DC SDC-M

Micro-UPS DC

Micro backup type

SDC-M 12 V-24 V-48 V

DIN1 / DIN2

RS

Modbus / BACnet MS/TP

EN Operating Instructions

MAN200002 | Ba | 2021.04

1. Safety

These operating instructions contain all the instructions to follow in order to install, commission and operate the **SDC-M** Uninterruptible Power Supply. It is recommended to follow them very carefully to ensure an optimum functioning of the product.
It is vital to read the Safety Precautions before installing or operating this product.

Safety Precautions:

SDC-M is a Micro-UPS DC designed to be connected to the public 110 V / 240 V mains network. It must not be installed outdoors. It ensures continuity of service for equipment in case of power failure. Supercapacitor function is integrated into the product.

- An easily accessible two-pole circuit-breaker must be provided upstream.
- To avoid any risk of electric shock, all **INTERVENTIONS** must be carried out with the equipment **SWITCHED OFF** (upstream two-pole circuit-breaker open).
- Interventions with the equipment switched on are authorized only when it is impossible to switch the equipment off. The operation must only be performed by qualified personnel.
- During installation, connect the ground wire first and disconnect it last when dismantling.
- EN 62368-1 conformity (This equipment is not suitable for use in locations where children are likely to be present).
- The equipment is only designed to be used in an enclosure with restricted access (IP30 control cabinet), and to be installed on a concrete surface or any other non-combustible surface.
- The product can be installed horizontally or vertically.
- Sufficient convection must be guaranteed (minimum top and bottom clearance space 30 mm).
- The wires must be dimensioned and protected according to the maximum input/output current (≥ 0,15 mm^2/A).
- Observe the thermal and mechanical limits.
- The backup is maintenance-free. Do not open it.

2. Directives and environment and public health protection

The SLAT company and its product comply with directives and are committed to protecting the environment and public health.

SLAT manufactures all its products in accordance with RoHS and WEEE environmental directives.

SLAT products are CE certified. The CE mark dates back to 2011.

CE

3. General Information

3.1 The company

To meet its customers' requirements more effectively:

- SLAT has been designing and manufacturing all its products in accordance with the ISO 14001 standard v15.
- SLAT recycles its products at the end of their life cycle, by means of its recycling program.

3.2 Purpose of the document

The operating instructions provide the information necessary for the positioning, the connection, the configuration and the operation of the **SDC-M** equipment.

Theses instructions are also available in PDF format in MySLAT at www.slat.com .

3.3 Related documentation

The following documents are associated with these operating instructions:

- Installation manual
- Commercial brochure
- Datasheet

This documentation is available at www.slat.com.

3.4 Intended audience

The operations described in this document should be performed only by authorized trained staff.

3.5 Indicator labels

This document comprises three types of important notices.
The type of notice informs you of the potential consequences in the case of non-compliance with the instructions.
These consequences are not exhaustive and are sorted in order of ascending risk:

IMPORTANT REMARK!

Contains additional information. Non-compliance will not cause damage to equipment or personal injuries.

CAUTION!

Equipment and goods can be seriously damaged or people seriously injured if the precautions for use are not followed.

DANGER!

Non-compliance may result in serious injury or death.

4. The product

4.1 Description

Micro-UPS with lead and cadmium-free "Smart Backup Inside" with very long service life.

SDC-M are communicating Micro **UPS** (**U**ninterruptible **P**ower **S**upply) of the Safe DC range dedicated to Smart Building applications. They ensure the continuity of service of the equipment they supply and maintain communication with the supervisor in the event of a power failure.

Main functions

- Keeps control of the Smart Building in case of brownouts.
- Integrated supercapacitor energy pack, unlimited storage time without recharging.
- Filters electromagnetic disturbances.
- Avoids the reporting of false alarms to the supervisor due to network brownouts.
- Output voltage can be adjusted via a potentiometer.
- Delivers a constant voltage to equipment.
- Configuration in either Modbus or BACnet MS/TP via available application on the website www.slat.com.

Built-in functions

- 2 SDC-M can be connected (not for 48V) in parallel without accessories for an increase in power or a 100% redundancy.
- Provides selectivity of electrical protections of the equipment.

Benefits of the SDC-M range

- Ultra-compact / Plug and Play, parallel connection without accessories.
- Performs self-diagnostic and that of its environment.
- Lead-free, cadmium-free Lithium-free backup, 100% recyclable.
- Service life of more than 10 years.

4.2 Operating principle

When the mains is operating, the emergency power supply SDC-M stores energy and continuously powers the load.
When the mains fail, the built-in emergency supply continues to provide power to the load.
In the event of a complete discharge, the recharging time to 100% of the backup will in any case be less than 2 minutes of mains presence.

4.3 Schematic diagram

The visual below shows the product diagram when installed:

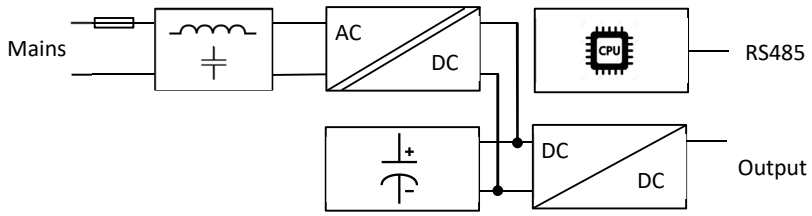

Figure 4.1: Schematic diagram

4.4 Product view

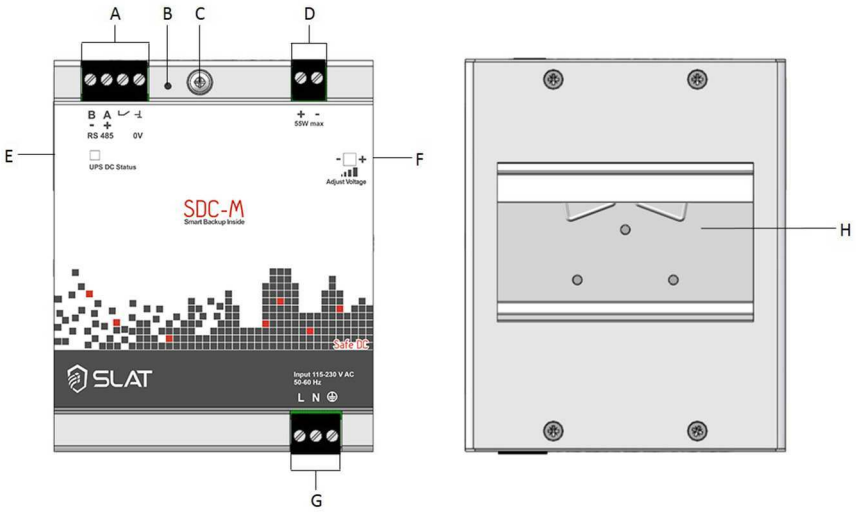

Figure 4.2: Product view

	Name	Use
A	RS485 communication + alarm report	Communication uses an RS485 serial connection and the Modbus or BACnet MS/TP protocol to retrieve detailed product information (see chapter 8.2.2). The alarm report output is an open collector dry contact that indicates whether there is a fault on the product (see chapter 8.2.1).
B	Reset push button	The push button allows a reset of the parameters
C	Ground connection screw	The ground connection screw is used to wire the shielding of the communication wire.
D	Output	User voltage output
E	Status light (LED)	The light indicates the product status (see chapter 8.1).
F	Output voltage adjustment potentiometer	The potentiometer allows to adjust the user output voltage (see Table 10.4).
G	Mains input	Mains input
H	Rail attachment	Attachment to fix the box to the DIN rail.

Table 4.1: Elements on the product faces

4.5 Available references

The list of available product references is to be found at www.slat.com.

The references are designed as follows:

SDC-	M	12V	3	B	DIN1	RS
①	②	③	④	⑤	⑥	⑦

	Meaning
1	Range name
2	Application type
3	Output voltage [12 V / 24 V / 48 V DC]
4	Power range [3 → 55 W]
5	Backup type [B] (see chapter 5.1)
6	Box type
7	Type of communication port

Table 4.2: Meaning of the references

4.6 Scope of delivery

The product is delivered with its installation manual.

4.7 Associated products

A setup cable is available with the following reference: **A SETUP KIT SAFE DC RS**

5. Energy storage

5.1 Available storage option

SLAT products are combined with batteries or backup systems. They are used as emergency supplies in the event the mains voltage disappears. The available autonomy then depends on the capacity of the built-in backup.

In the **SDC-M** the backup system is already built-in (Smart Backup Inside). This product is fitted with an integrated 0.1 Wh energy pack.

5.2 Technology

The **SDC-M** energy pack is based on supercapacitor technology. Supercapacitors guarantee reliable and safe operation by protecting against micro cuts.

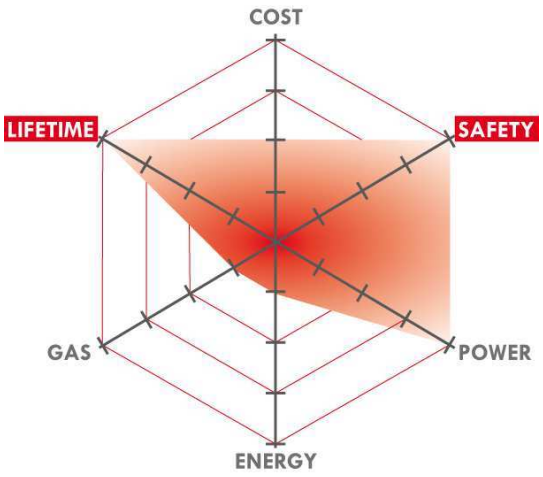

Figure 5.1: Supercapacitor characteristics

All SDC-M backups have the following characteristics:

- Integrated energy pack
- Technology: supercapacitor
- Storage without recharging: unlimited duration
- Service life: 10 year @ 25°C
- Lead-free, cadmium-free, Lithium-free and 100% recyclable

5.3 Autonomy duration

The autonomy of supercapacitor is 3 seconds minimum.

6. Installation

6.1 Positioning / Installation on support

The product must be installed according to the EN 62368-1 standards.

It can be fitted inside a non-ventilated electrical equipment cabinet. Product cooling by natural convection requires a top/bottom clearance of at least 30 mm.

DANGER!

This product must be installed in an IP30 rated cabinet.

Assembly instructions

The DIN1 box of the SDC-M is designed to be fixed to a DIN rail:

1. Position the top part of the attachment (on the rear of the product) on the top part of the rail, tilting the product backwards. Make sure the clip is placed behind the rail.
2. Clip the product onto the rail by returning it to a vertical position.

Figure 6.1 shows how the box must be positioned on the DIN rail once assembled.

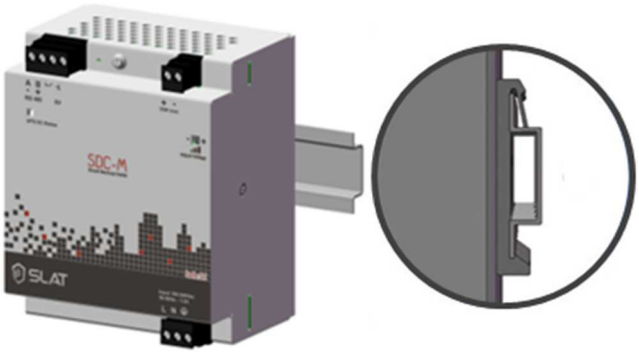

Figure 6.1: Position on DIN rail

CAUTION!

To prevent the product from falling, make sure it is securely attached to the bottom and top of the rail!

6.2 Connection

6.2.1 Connection specifications

Mains	0.75 mm² … 2.5 mm²
User output	0.75 mm² … 2.5 mm²
Communication/ alarm report	0.2 mm² … 2.5 mm²
Length to be stripped	7 mm
Tightening torque	0.5 Nm … 0.6 Nm
Connections	Screw terminals, plug-in connectors

Table 6.1: Connection specifications

DANGER!

The wire sectional area must be chosen according to the operating current (≥ 0,15 mm²/A).

6.2.2 Wiring

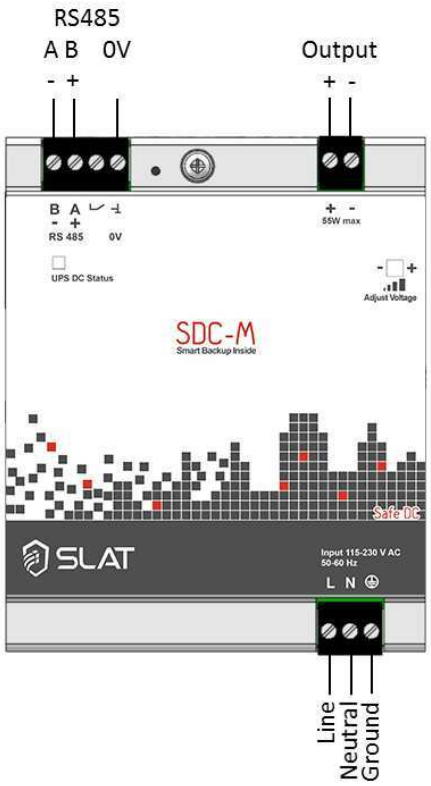

Figure 6.2: Wiring

After installing the product on its support, the wiring must be carried out. In this way the emergency power supply (the product) is connected with the application, the control point and the mains.
Symbols have been placed on the product (above or below the connectors) to indicate the name of the signal / wire so as to facilitate connection (see also Figure 6.2).

Wiring methods

All the wires are attached to the product using a plug-in connectors (the three black parts on Figure 6.2). This makes it possible to carry out the wiring in two different ways:

1. Connect the wires directly to the product
   Connect the wires according to the symbols indicated on the product, using a regular screwdriver.

CAUTION!

To avoid breaking the connector, comply with the screw tightening torque indicated in Table 6.1.

2. Connect the wires to the unplugged connectors and then connect them to the product.
   Pull the connectors to remove them from the product. Connect the wires according to the images on the product, using a regular screwdriver. Put the connectors back on the product.

CAUTION!

To avoid wiring mistakes, make a careful note of the positioning of the connectors and their respective symbols.

Connection

DANGER!

To connect the wires, the application must be switched off. The upstream circuit-breaker of the application must be open!

The wires are connected according to the following steps:

1. Connect the emergency power supply to the application
   The product is connected to the application by the two-point connector (top right). The initial output voltage is set to the rated value.

2. Connect the RS485 communication cable and the alarm report contacts
   The four-point connector (top left) provides the connection to an external PLC or computer.
   - To allow RS485 communication the wires must be connected to the **A**, **B** and **0V** contacts.
   - To connect the alarm report, the wire must be connected between the 3rd contact (with the switch symbol ⌐) and the 0V.

3. Connect the power supply to the mains
   Above the three-point connector (bottom right), the type of wire is indicated by 3 symbols:
   - L Line wire
   - N Neutral wire
   - ⏚ Ground wire

DANGER!

Before connecting the power supply to the mains, the ground wire must be connected!

After connecting the ground wire, the neutral and line wires can be connected.

Once the connections have been made, the upstream circuit-breaker can be closed. To complete the installation, the LED status must be verified to be green.

7. Commissioning

Before starting to commission the power supply, check that the LED is green. This means the product is connected properly and ready to function.

7.1 Hardware configuration

Powering up / Start-up

The voltage adjustment dial is factory-set to have an output voltage of U_n.
Adjust the dial to the required value to compensate for losses due to the wire length.

7.2 Software configuration

The basic communication protocol is Modbus. It can be configured in BACnet MS/TP using the configuration software with the help of an optional setup cable (see chapter 4.7).

The communication parameters can be configured via the RS485 serial connection. SLAT provides a software that allows simple configuration of these parameters. This software is available for download at www.slat.com .

7.2.1 First configuration

Figure 7.1 and the following paragraph explain how to set up the communication and the mode in which it is used. To set up the product, it must be powered up and connected to the PC via the RS485 serial connection.

The configurator is available in three languages (French, English, German). The default language is French. It can be changed using the menu “langue” (language) in the top on the left.

By default, the product is factory pre-set. These settings are shown in Figure 7.1.

To start the configuration, first the serial port, that the SDC-M is connected to, has to be chosen.

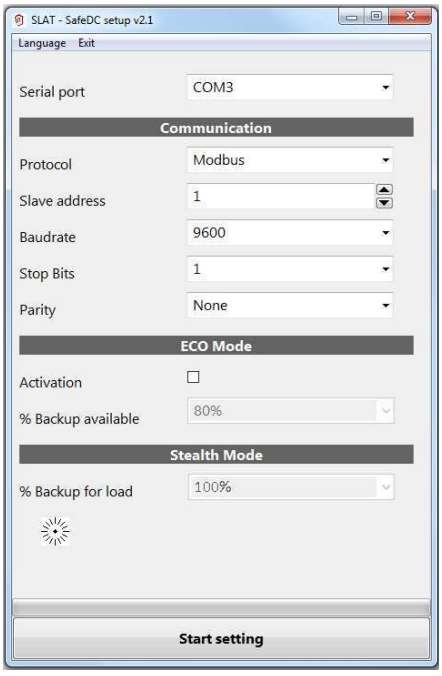

Figure 7.1: Configurator

Communication:

1. Choose the communication protocol (Modbus or BACnet MS/TP).
2. Choose the product's slave address, address 1 to 254 for the Modbus or for the BACnet.
3. Choose the communication speed from the available values:
   9600 bauds / 19200 bauds / 38400 bauds / 57600 bauds / 115200 bauds
4. Choose the number of stop bits: 1 or 2
5. Choose the parity: None / Even / Odd

ECO Mode and stealth Mode

Eco Mode et stealth Mode are disabled with micro backup.

Stealth Mode

Choose the percentage Backup for load, which is the guaranteed autonomy time once the Stealth Mode is used: 25% / 50% / 75% / 100% (100% of Backup for load means the Stealth Mode is not activated.)

7.2.2 Subsequent configurations / Reset of the parameters

If you need to change the configuration after the first configuration, you must reset the product parameters. To do that, follow this procedure:

- The mains power must be present.
- Press the reset push button for 10 seconds (see Figure 4.2) to return to the factory configuration (the status LED changes temporarily its colour) and then reconfigure the product following the steps described above (chapter 7.2.1).

7.2.3 Product switch-off

To stop and switch-off the product, it is necessary to disconnect the mains.

If the product is no load and fully charged, this stop can run for up to 2 minutes.

8. Operation

During use, it is possible to interact with the product. There are two types of communication - local report and/or remote report.

8.1 Local report on product

LED status

The product communicates its status via a state LED on the front. Figure 4.2 in chapter 4.4 indicates the position of this LED on the product. The LED indicates the different statuses of the product by its colour and state. The table explains the meanings of each status.

Colour		Mode
Green	steady	Normal mode
	slow flashing	Eco mode or Stealth mode
Orange	slow flashing	Backup mode
	fast flashing	Installation fault
		Overcurrent, short circuit
		Low output voltage (product overloaded)
		Power supply temperature too high
		No mains (outside specified power supply range)
		End of backup imminent
Red	steady	UPS to be changed
		If no output voltage
		If power supply out of order (charger fault)
		Backup fault
		Emergency supply undervoltage
		Emergency supply overvoltage

Table 8.1: LED status

8.2 Remote report

8.2.1 Alarm reports

An open collector dry contact exists for the alarm report. It gives an indication that a fault is present on the product. If there are no faults, the contact remains closed. In the event of a fault, the contact opens.

Fault contact specifications:

- Max voltage 60 V DC / max current 1.1 A
- Signal:
  “mains fault” or “backup fault” or “output overload” or “output short-circuit” or “charger fault” or “pre-alarm end of autonomy“

8.2.2 Communication

When using the product, it is possible to communicate with it from a distance using the incorporated communication system. The serial connection makes it possible to:

- retrieve information remotely,
- have more details about the types of faults,
- communicate analogue values (operating voltages and currents, remaining backup percentage, internal temperature, autonomy),
- configure the power supply.

The product communicates its information on an RS485 serial connection via the Modbus or BACnet MS/TP protocol. The protocol activated by default is Modbus. It can be configured using a software SLAT makes available at www.slat.com . The information and explanations on how to configure the product are described in chapter 7.2.

Modbus protocol

The information available via the Modbus protocol is organized as follows:

16-bit input variables (input register) accessible only in read mode (modbus function code 4):

Name	Modbus address	Model		Conversion of analogue / digital values
Software Revision	0	Software version		
U_{out}	1	Output voltage		U_{out}[V] = U_{out}[bit]/64
I_{out}	2	Output current		I_{out}[A] = I_{out}[bit]/198.5
Reserved	3			
Reserved	4			
Autonomy	5	Remaining autonomy percentage		
Temperature	6	Internal temperature	Until firmware version 970	T[°C] = (1801-T[bit])/5.337
			From firmware version 971	T[°C] (direct reading)
Default*	7	Fault variable		For details of the faults see Table 8.3

Table 8.2: Modbus input registers

* Description of the "Default" variable		
Bit	**Type of fault**	**Decimal value**
15	*Reserved*	32768
14	*Reserved*	16384
13	Pre-alarm end of autonomy	8192
12	Backup fault	4096
11	Charger fault	2048
10	Mains fault	1024
9	Output overload	512
8	Output short-circuit	256
7	Temperature too high	128
0 - 6	*Reserved*	-

Table 8.3: Description of the "Default" variable

16-bit output variables (holding register) accessible for read (modbus function code 3) / write (modbus function code 6):

Name	Modbus address	Model
Product Serial Number LSB	0	Card Serial Number
Product Serial Number MSB	1	
Reserved	2	-

Table 8.4: Modbus holding registers

Modbus protocol

The information available via the Modbus protocol is organized as follows:

16-bit input variables (input register) accessible only in read mode (modbus function code 4):

Name	Modbus address	Model		Conversion of analogue / digital values
Software Revision	0	Software version		
U_{out}	1	Output voltage		U_{out}[V] = U_{out}[bit]/64
I_{out}	2	Output current		I_{out}[A] = I_{out}[bit]/320
Reserve	3			
Reserve	4			
Autonomy	5	Remaining autonomy percentage		
Temperature	6	Internal temperature	Until firmware version 970	T[°C] = (1801-T[bit])/5.337
			From firmware version 971	T[°C] (direct reading)
Default*	7	Fault variable		For details of the faults see Table 8.6

Table 8.5: Modbus input register

* Description of the "Fault" variable		
Bit	**Type of fault**	**Decimal value**
15	*Reserve*	32768
14	*Reserve*	16384
13	Pre-alarm end of autonomy	8192
12	Backup fault	4096
11	Charger fault	2048
10	Mains fault	1024
9	Output overload	512
8	Output short-circuit	256
7	Temperature too high	128
0 - 6	*Reserve*	-

Table 8.6: Description of the "Fault" variable

16-bit output variables (holding register) accessible for read (modbus function code 3) / write (modbus function code 6):

Name	Modbus address	Model
Product Serial Number LSB	0	Card Serial Number
Product Serial Number MSB	1	
Stealth Mode	2	Variable making it possible to activate the stealth mode to reduce the network load while guaranteeing minimum autonomy (once the guaranteed autonomy is reached, it automatically returns to 0) If 1: Stealth Mode in progress If 0: Normal functioning

Table 8.7: Modbus holding register

BACnet MS/TP protocol

The information available via the BACnet MS/TP protocol is organized as follows:

Property	Remark / Value	RW
Object_Identifier	device, default instance: 9540 + Network-Address	RW-E
Object_Name	Max. 40 Bytes, “SDC-M” default	RW-E
Object_Type	DEVICE (8)	R
System_Status	OPERATIONAL (0)	R
Vendor_Name	“SLAT”	R
Vendor_Identifier	954	R
Model_Name	“SDC-M”	R
Firmware_Revision	“0.975”	R
Application_Software_Version	“1.0”	R
Protocol_Version	1	R
Protocol_Revision	12	R
Protocol_Services_Supported	read-property, write-property, who-has, who-is, device-communication control	R
Protocol_Object_Types_Supported	DEVICE, BINARY_OUTPUT, BINARY_INPUT, GROUP, ANALOG_VALUE	R
Object_List [9]	device, analog-value 1 …7	R
Max_APDU_Length_Accepted	480	R
Segmentation_Supported	NO_SEGMENTATION (3)	R
APDU_Timeout	3000	R
Number_Of_APDU_Retries	3	R
Device_Address_Binding	-	R
Database_Revision	0	R
Serial Number	Serial number	R
R: Read Property, W: Write Property, -E: Storage in EEPROM / Flash		

Table 8.8: BACnet MS/TP variables

Analog Value Object 1		
Property	**Remark / Value**	**RW**
Object_Identifier	analog-value 1	R
Object_Name	“Vout”	R
Object_Type	ANALOG_VALUE (2)	R
Description	"Output Voltage"	R
Present_Value	default 0	R
Status_Flags	IN_ALARM: 0	R
	FAULT: 0	
	OVERRIDDEN: 0	
	OUT_OF_SERVICE: 0	
Event_State	NORMAL (0)	R
Out_Of_Service	FALSE (0)	R
Units	Volts (5)	R
R: Read Property, W: Write Property, -E: Storage in EEPROM / Flash		

Table 8.9: Analog Value Object 1

Analog Value Object 2		
Property	**Remark / Value**	**RW**
Object_Identifier	analog-value 2	R
Object_Name	“Iout”	R
Object_Type	ANALOG_VALUE (2)	R
Description	"Output current"	R
Present_Value	default 0	R
Status_Flags	IN_ALARM: 0	R
	FAULT: 0	
	OVERRIDDEN: 0	
	OUT_OF_SERVICE: 0	
Event_State	NORMAL (0)	R
Out_Of_Service	FALSE (0)	R
Units	Amperes (3)	R
R: Read Property, W: Write Property, -E: Storage in EEPROM / Flash		

Table 8.10: Analog Value Object 2

Analog Value Object 3		
Property	**Remark / Value**	**RW**
Object_Identifier	analog-value 3	R
Object_Name	“Vbatt”	R
Object_Type	ANALOG_VALUE (2)	R
Description	"Battery Voltage"	R
Present_Value	default 0	R
Status_Flags	IN_ALARM: 0	R
	FAULT: 0	
	OVERRIDDEN: 0	
	OUT_OF_SERVICE: 0	
Event_State	NORMAL (0)	R
Out_Of_Service	FALSE (0)	R
Units	Volts (5)	R
R: Read Property, W: Write Property, -E: Storage in EEPROM / Flash		

Table 8.11: Analog Value Object 3

Analog Value Object 4		
Property	**Remark / Value**	**RW**
Object_Identifier	analog-value 4	R
Object_Name	“Ibatt”	R
Object_Type	ANALOG_VALUE (2)	R
Description	"Battery current"	R
Present_Value	default 0	R
Status_Flags	IN_ALARM: 0	R
	FAULT: 0	
	OVERRIDDEN: 0	
	OUT_OF_SERVICE: 0	
Event_State	NORMAL (0)	R
Out_Of_Service	FALSE (0)	R
Units	Amperes (3)	R
R: Read Property, W: Write Property, -E: Storage in EEPROM / Flash		

Table 8.12: Analog Value Object 4

Analog Value Object 5		
Property	**Remark / Value**	**RW**
Object_Identifier	analog-value 5	R
Object_Name	“Temperature”	R
Object_Type	ANALOG_VALUE (2)	R
Description	"Internal temperature"	R
Present_Value	default 0	R
Status_Flags	IN_ALARM: 0	R
	FAULT: 0	
	OVERRIDDEN: 0	
	OUT_OF_SERVICE: 0	
Event_State	NORMAL (0)	R
Out_Of_Service	FALSE (0)	R
Units	Degree Celsius (62)	R
R: Read Property, W: Write Property, -E: Storage in EEPROM / Flash		

Table 8.13: Analog Value Object 5

Analog Value Object 6		
Property	**Remark / Value**	**RW**
Object_Identifier	analog-value 6	R
Object_Name	“Fault”	R
Object_Type	ANALOG_VALUE (2)	R
Description	"Fault register"	R
Present_Value	default 0	R
Status_Flags	IN_ALARM: 0	R
	FAULT: 0	
	OVERRIDDEN: 0	
	OUT_OF_SERVICE: 0	
Event_State	NORMAL (0)	R
Out_Of_Service	FALSE (0)	R
Units	No units (95)	R
R: Read Property, W: Write Property, -E: Storage in EEPROM / Flash		

Table 8.14: Analog Value Object 6

Analog Value Object 7		
Property	**Remark / Value**	**RW**
Object_Identifier	analog-value 7	R
Object_Name	“Gauge”	R
Object_Type	ANALOG_VALUE (2)	R
Description	"Remaining autonomy"	R
Present_Value	default 0	R
Status_Flags	IN_ALARM: 0	R
	FAULT: 0	
	OVERRIDDEN: 0	
	OUT_OF_SERVICE: 0	
Event_State	NORMAL (0)	R
Out_Of_Service	FALSE (0)	R
Units	No units (95)	R
R: Read Property, W: Write Property, -E: Storage in EEPROM / Flash		

Table 8.15: Analog Value Object 7

Analog Value Object 8		
Property	**Remark / Value**	**RW**
Object_Identifier	analog-value 9	R
Object_Name	“StealthMode”	R
Object_Type	ANALOG_VALUE (2)	R
Description	"Set to relieve the mains power"	R
Present_Value	Stealth Mode On 1 – Stealth Mode Off 0	RW
Status_Flags	IN_ALARM: 0	R
	FAULT: 0	
	OVERRIDDEN: 0	
	OUT_OF_SERVICE: 0	
Event_State	NORMAL (0)	R
Out_Of_Service	FALSE (0)	R
Units	No units (95)	R
R: Read Property, W: Write Property, -E: Storage in EEPROM / Flash		

Table 8.16: Analog Value Object 8

9. Maintenance and troubleshooting

Maintenance

The product has been designed to function for a long period of time without requiring maintenance. To ensure the best level of service, it is essential to install it in a dry dust-free location, or to provide for cleaning and maintenance operations.

IMPORTANT REMARK!

Maintenance must only be performed by qualified personnel.

DANGER!

At no time should the box be opened, even for maintenance purposes.

For a proper functioning of the product, it is necessary to ensure that the ventilation grilles are dust-free.

Troubleshooting

During installation, commissioning or use, unexpected situations may arise. In the event of a problem, the table below can be consulted. It contains a list of possible problems with their corresponding causes and solutions.

Problem	Fault via communication	Cause	Solution
The product does not start; the UPS DC status LED remains off.	No communication	The mains voltage is not connected or is not present.	Check if the mains voltage is connected properly.
		The mains voltage fuse is not connected or is not present.	Product replacement.
The UPS DC status LED is orange + flashes quickly and there is no voltage at the output.	Output short-circuit	Output overload or short-circuit.	Disconnect the load from the output until the load is less than the maximum output current (see Table 10.4).
The UPS DC status LED is red; the output voltage is OK.	Backup fault	Backup malfunction; the backup is disconnected or has failed.	Product replacement.
	Backup fault	Charger malfunction.	The charger has failed. Product replacement.
	Charger fault		
The UPS DC status LED is orange + flashes quickly and the output voltage is less than the normal value.	Output overload	There is a slight overload.	Lower the output load until the current is less than the maximum output value (see Table 10.4).
The UPS DC status LED is orange + flashes quickly, and the output voltage is OK.	Temperature too high	Temperature is too high because the ambient temperature does not fulfil the conditions specified in Table 10.7.	Cool the installation.
		The air intake is blocked.	Clean the blocked air intake.
The UPS DC status LED is green and there is no communication.	No communication	Unsatisfactory communication connection.	See connection details chapter 6.2.2 (Figure 6.2).
	No communication	Unsatisfactory communication configuration.	Use the communication configuration software to enter the right parameters.

Table 9.1: Problems, causes and solutions

For additional technical assistance, contact the SLAT hotline +33 4 78 66 63 70.

For an RMA request (authorization to return goods), refer to chapter 11.2 .

No equipment may be returned without prior issuance of an RMA number.

10. Technical data

10.1 Electrical characteristics

10.1.1 Electric power supply characteristics

Mains input	
AC network voltage	99 V … 264 V
DC network voltage	140 V ... 375 V
Frequency	45 Hz … 65 Hz
Class	1
Inrush current	limited by CTN
Neutral system	TT, TN, IT
Primary short-circuit protection	Short-circuit on the primary power supply by a slow-blow fuse on the phase.
Characteristics of built-in fuse	2.5 A (slow-blow, internal)
Shock wave protection	Differential mode by varistor and filter
Primary current @ 99 V	1.5 A
Primary current @ 264 V	0.38 A
Circuit breaker to be provided upstream	Curve C or D (recommended rating 2 A)

Table 10.1: Mains input electrical characteristics

Current behaviour:

Inrush current at start-up

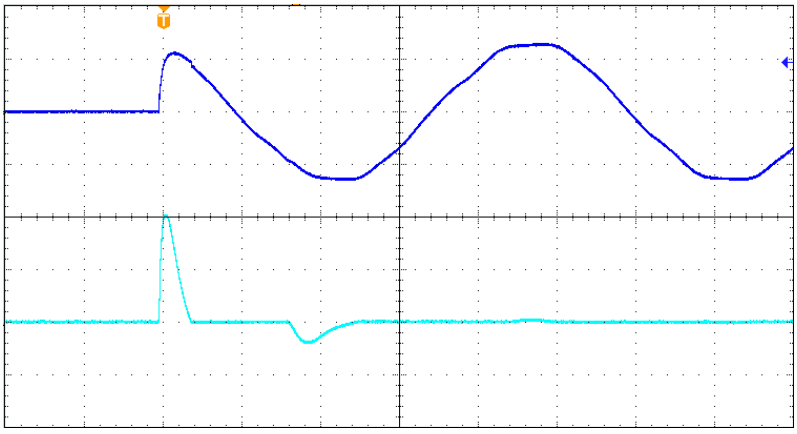

Figure 10.1: Oscillogram - inrush current

Test conditions	
Input voltage	240 V AC
Output current and voltage	12 V DC; no load
Ambient temperature	+20°C
Description of the diagram	
Upper curve	Input voltage (250 V / DIV)
Lower curve	Input current (20 A / DIV)
Time scale	4 ms / DIV

Table 10.2: Description of the oscillogram - inrush current

Start-up sequencing

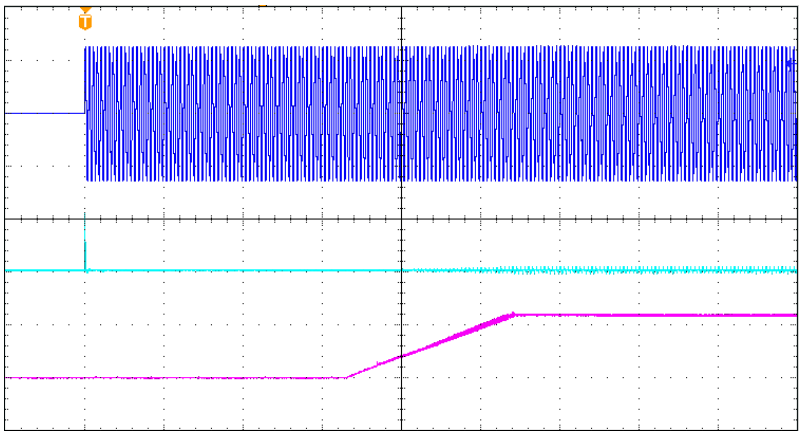

Figure 10.2: Oscillogram - starting behaviour

Test conditions	
Input voltage	240 V AC
Output current and voltage	12 V DC; 4.5 A
Ambient temperature	+20°C
Description of the diagram	
Upper curve	Input voltage (250 V / DIV)
Medium curve	Input current (20 A / DIV)
Lower curve	Output voltage (10 V / DIV)
Time scale	400 ms / DIV

Table 10.3: Description of the oscillogram - starting behaviour

10.1.2 Electrical output characteristics

Output			
One user output	constant DC voltage		
Rated voltage U_n	12 V	24 V	48 V
Rated output current I_n	4.6 A	2.3 A	1.15 A
Permissible peak currents	9 A / 12 ms	4.6 A / 8 ms	2.3 A / 3.8 ms
	23 A / 4 ms	11 A / 1.6 ms	5.5 A / 1.1 ms
Voltage precision	1%		
Available output power	55 W		
Adjustment by potentiometer	-8% … +13%		
Power limitation	from P_{max} to P_{max}+10% for output voltage > 6 V		
HF ripple peak-peak (20 MHz-50 Ω)	< 4% of U_n		
Effective LF ripple	< 0.5% of U_n		
Static and dynamic regulation characteristics	< 5 % of U_n for cumulative variations of the mains and the load (from 10 to 90%)		
Protection	electronic (no fuse)		
η @ 20% of use load	90%		
η @ 75% of use load	93%		
η @ 100% of use load	92%		
Protection against output short-circuit	by power supply cut with cyclical restart		
Protection against surges in user output	deregulation or connection error, by cut-off with cyclical restart if output voltage > U_n + 10%		
Short-circuit if	U_{output} < 6 V or I > 30 A		

Table 10.4: Electrical output characteristics

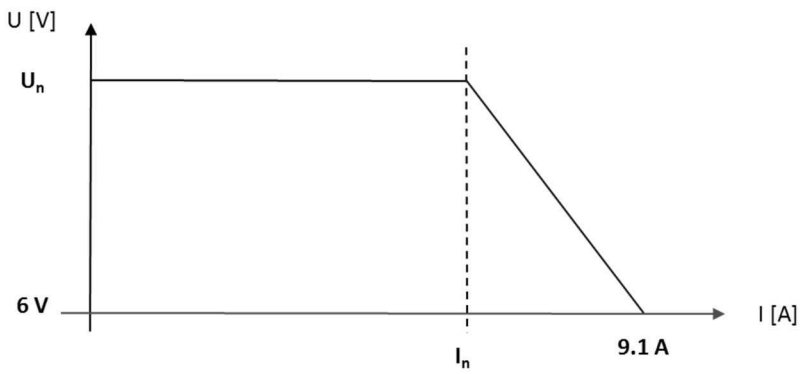

Figure 10.3: Output voltage vs User current

10.1.3 Functional characteristics

A user output permanently supplies a constant voltage (12 V DC, 24 V DC or 48 V DC) to the equipment which has to be powered. In the event of a mains failure, the built-in backup maintains the electrical power supply of the equipment connected to the UPS for the duration defined when the SDC-M was chosen.

An asynchronous RS485 serial connection retrieves the information remotely and communicates the analogue values (voltages and load current, backup, autonomy, internal electronic temperature)

The basic communication protocol is Modbus The configuration software supplied on the web site www.slat.com, makes it possible via an RS485 cable to choose the BACnet MS/TP protocol, to configure the communication parameters and to choose the functioning mode.
An open collector dry contact for the alarm report (60 V DC/1.1 A) and a status LED on the front panel are also available.

10.1.4 Peak current

The figure and table below show the maximum peak current duration in ms for an output voltage > 80% U_n.

	12 V	24 V	48 V
I/I_n	Time [ms]		
5	4	1.6	1.1
3	7	3.7	2.1
2	12	8	3.8
1.5	22	12	7
1.2	60	40	30
1.1	100000	100000	100000

Table 10.5: Overload capacity

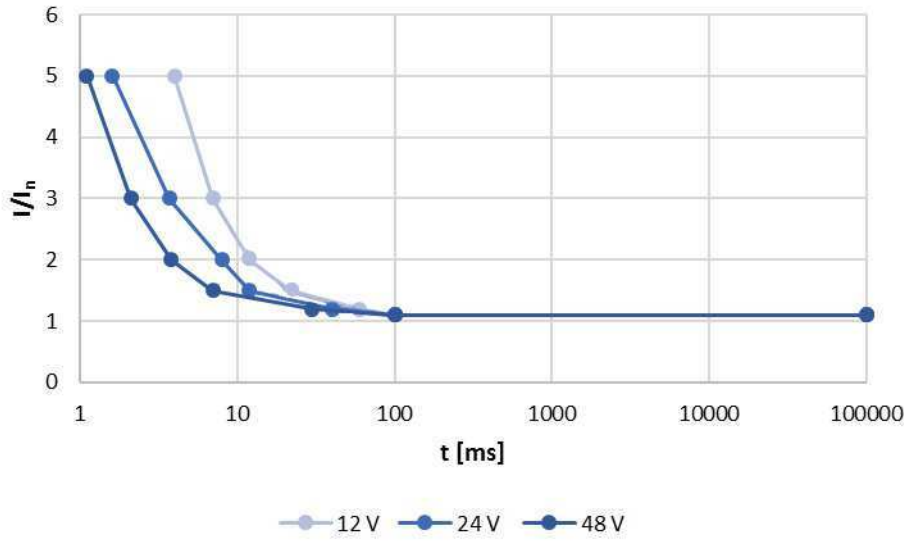

Figure 10.4: Overload capacity curve

10.2 Mechanical characteristics

Mechanical specifications		
Envelope		Aluminium
Protection rating		IP20
Size	DIN1 box	W 100 x H 124 x D 82 mm
Weight	DIN1 box	0.44 kg (backup B)
Installation		Box to be attached to a DIN rail

Table 10.6: Mechanical specifications

10.3 Environmental specifications

Environmental specifications		
Storage temperature	-25 … +60°C	
Operating temperature	-10 … +55°C	
Relative humidity	in storage	10 … 95%
	operating	20 … 95%
Altitude	Above 2,000 m, the temperature decreases by 5% every 1,000 m.	

Table 10.7: Environmental specifications

10.4 Standards

The product is designed to meet with LV and EMC directives (immunity and emission). It complies with the following standards.

10.4.1 Safety standards

Section	Standard number	Title/Content
LVD Safety	EN 62368-1 (2020)	Audio/video, information and communication technology equipment - Part 1: Safety requirements.

Table 10.8: Safety standards

10.4.2 EMC standards

Section	Standard number	Title/Content
Immunity	EN 61000-6-1 (2007)	Immunity for residential, commercial and light-industrial environments (generic standard)
Immunity	EN 61000-6-2 (2006)	Immunity standard for industrial environments (generic standard)
Emissions	EN 61000-3-2 (2014) (class A)	Limits for harmonic current emissions (equipment input current <= 16 A per phase)
Emissions	EN 61000-6-3 (2007)	Emission standard for residential, commercial and light-industrial environments (generic standard)
Emissions	EN 61000-6-4 (2007) A1 (2011)	Emission standard for industrial environments (generic standard)
Emissions	EN 55032 (2015) (class B)	Electromagnetic compatibility of multimedia equipment

Table 10.9: EMC standards

11. Warranty and Product Returns

11.1 Warranty

The equipment is guaranteed for three years from the date of delivery (ex-works). It is strictly limited to reimbursement or replacement (at our discretion and without compensation of any sort) of parts recognized as faulty by our services, following the return of the product to our premises at the buyer's expense. The replacement or repair of equipment is possible only on our premises. In order to allow our customers to benefit from the latest technical improvements, SLAT reserves the right to make all necessary modifications to its products.

IMPORTANT REMARK!

Mechanical opening of the product cancels the manufacturer warranty!

11.2 Product Returns

11.2.1 Product under warranty

For the maintenance of your products under warranty, SLAT offer the best solution to facilitate your repairs and minimize lead times:

- Contact the Customer Service department using the form available on our web site www.slat.com , taking care to fill in all the required fields.
- The RMA form will be processed and sent back by the SLAT account manager.
- After receiving your RMA form, return two copies with your product(s), one INSIDE the package and the other on the OUTSIDE of the package for warehouse identification purposes, thereby guaranteeing traceability of your product.
- The repaired or replaced product(s) will be returned within a maximum of 15 business days.

11.2.2 Product not under warranty

SLAT offers 2 solutions for maintenance of its products:

QUICK AND EASY: Personal replacement of the equipment

It is not necessary to send the equipment back to SLAT.

Order the maintenance cards at the applicable price. The reception will take place within one week. Contact the SLAT Sales Department for advice by completing the contact form (available at www.slat.com).

The new cards are guaranteed for 1 year.

Product repair by SLAT

Contact Customer Service at after.sales@slat.fr, making sure to provide all of the following information:

- Last name/First Name
- Company / Complete Address / Phone / Email
- Exact model of the product (indicated on the product label) / SLAT reference (indicated on the product label, code number) / Serial No. / Quantity / Problems(s) encountered (describe the faults encountered with the product)

The form to request the RMA number is also available at www.slat.com.

The account manager will send the RMA form by email together with a quote according to the relevant product range.

After receiving your RMA form, return two copies with your product(s), one INSIDE the package and the other on the OUTSIDE of the package for warehouse identification purposes, thereby guaranteeing traceability of your product. The repairs will be made only after the receipt of the accepted quote together with the repair order form. If the quote is rejected, please return it to after.sales@slat.fr marked "refused" and specify whether the equipment should be destroyed or returned in its existing condition (in this case a charge of €150 will be invoiced for handling costs).

The repaired or replaced product(s) will be returned within a maximum of 15 business days. A new 3 month warranty is attributed to the relevant product.

Conditions: Authorization to return products is issued by SLAT.

An RMA number is assigned to each product to be returned. Each RMA number is valid for 30 days.

No equipment may be returned without prior issuance of an RMA number.

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