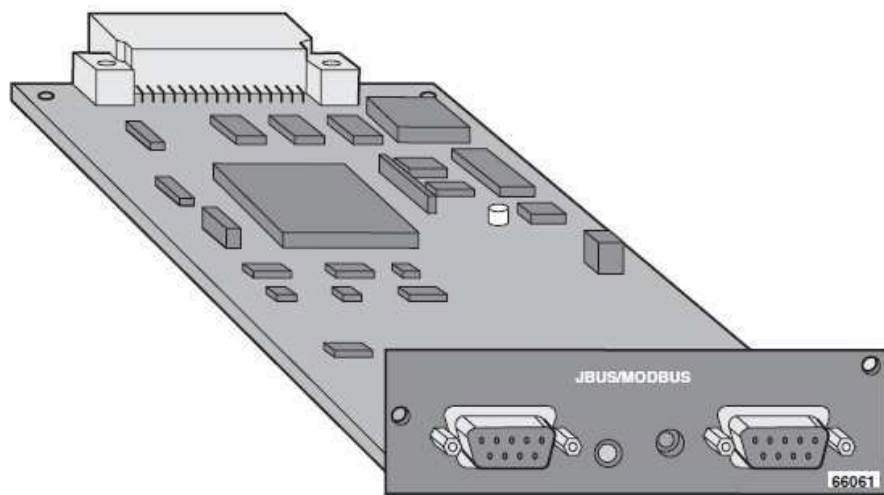


JBus/Modbus Communication Card

Installation and Operation

05/2018



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Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

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Important Safety Instructions — SAVE THESE INSTRUCTIONS

Read these instructions carefully and look at the equipment to become familiar with it before trying to install, operate, service or maintain it. The following safety messages may appear throughout this manual or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.



The addition of this symbol to a “Danger” or “Warning” safety message indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages with this symbol to avoid possible injury or death.

DANGER

DANGER indicates a hazardous situation which, if not avoided, **will result in** death or serious injury.

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

WARNING

WARNING indicates a hazardous situation which, if not avoided, **could result in** death or serious injury.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

CAUTION

CAUTION indicates a hazardous situation which, if not avoided, **could result in** minor or moderate injury.

Failure to follow these instructions can result in injury or equipment damage.

NOTICE

NOTICE is used to address practices not related to physical injury. The safety alert symbol shall not be used with this type of safety message.

Failure to follow these instructions can result in equipment damage.

Please Note

Electrical equipment should only be installed, operated, serviced, and maintained by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction, installation, and operation of electrical equipment and has received safety training to recognize and avoid the hazards involved.

FCC Statement

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

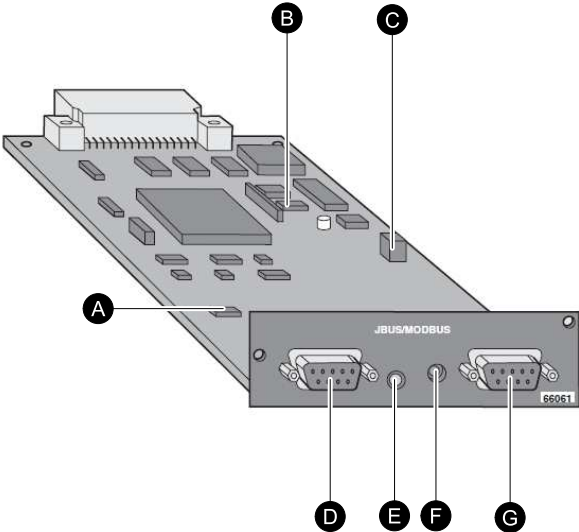
Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Introduction

System Overview

Overview

- A. Switches for RS485 settings (SA2)
- B. Switches for JBus/Modbus settings (SA1)
- C. RS232 link configuration jumpers
- D. RS485 communication port
- E. Push button (card restart)
- F. Diagnostics LED
- G. RS232 communication port



Functions

The JBus/Modbus communication card:

- provides UPS and STS (Static Transfer Switch) data (states and measures) to be sent to a computer.
- provides a communication channel with an RS485 or RS232 interface (2– or 4–wire RS485 links are available).
- may be used in all UPSs and STSs equipped with UPS Bus communication slots.
- can under specific constraints for a restricted use be inserted in a MultiSlot product. Contact Schneider Electric to make sure your configuration is operational.
- is operational 2 minutes after start-up of the card.

The JBus hexadecimal (Modbus RTU) communication protocol is used in slave mode.

NOTE: RS232 and RS485 communication ports cannot be used together.

Settings

Functions	Parameters	Default setting	Possible settings
JBus/Modbus communication	Baud rate	1200 bauds	1200, 2400, 4800, 9600
	Parity	Without parity	Without parity, even parity
	Slave number	Slave no. 1	1 to FF (hexadecimal)
RS232 link	Link connection in transmit data (Tx) or receive data (Rx)	Rx on pin 3	Rx on pin 3 or on pin 2
		Tx on pin 2	Tx on pin 2 or on pin 3
RS485 link	Polarity	No polarity	With or without (2 or 4 wires)

Functions	Parameters	Default setting	Possible settings
	Termination	No termination	With or without (2 or 4 wires)

JBus Protocol

Detailed description of the JBus/Modbus protocol is available from the website: www.schneider-electric.com

The standard functions provided by the card are:

- Function 3: read n words
- Function 5: write 1 bit
- Function 6: write 1 word
- Function 16: write n words

The data (states or measures) are stored sequentially in tables. In order to optimize the time to read data, it is recommended to access blocks of words to decrease the number of requests.

All the JBus responses are coded in 16 bits unsigned format except for the battery current which is signed; positive for the battery recharge and negative for the battery discharge.

Environmental

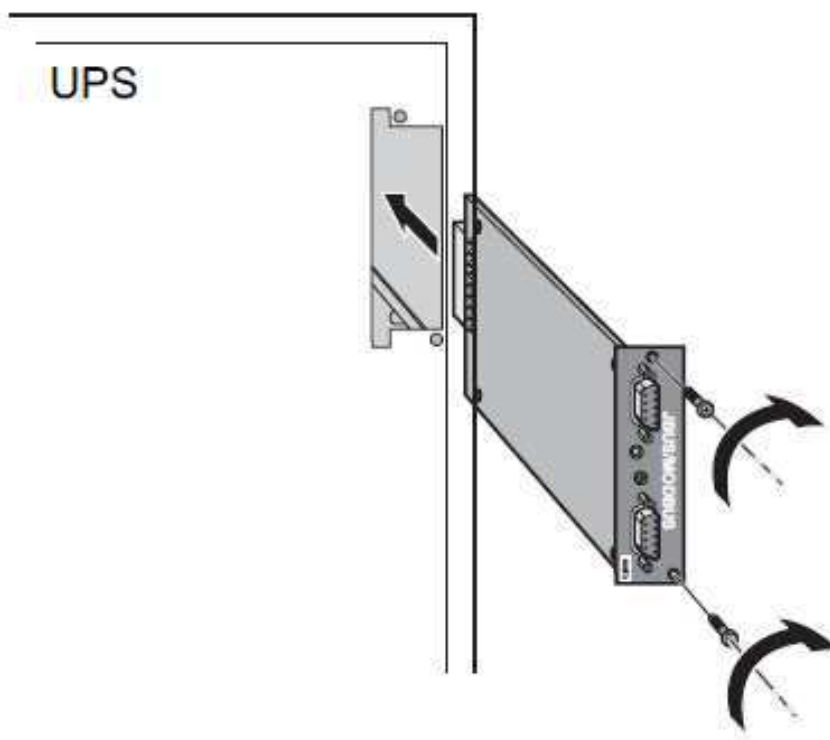
If the card is stored prior to installation, it must be stored in a dry place. The admissible storage temperature is -10 to 70 °C.

Installation and Configuration

Install the JBus/Modbus Communication Card

NOTE: It is not necessary to turn the UPS or the STS off before installing the card.

1. Remove the cover from a free slot in the UPS or in the STS.
2. Insert and secure the card in the slot.



Once the card has been inserted and connected, the diagnostics LED:

- flashes regularly once per second during the start-up phase;
- flashes faster during initialization of the dialogue with the UPS or with the STS;
- flashes in step with the exchange of data with the UPS or with the STS.

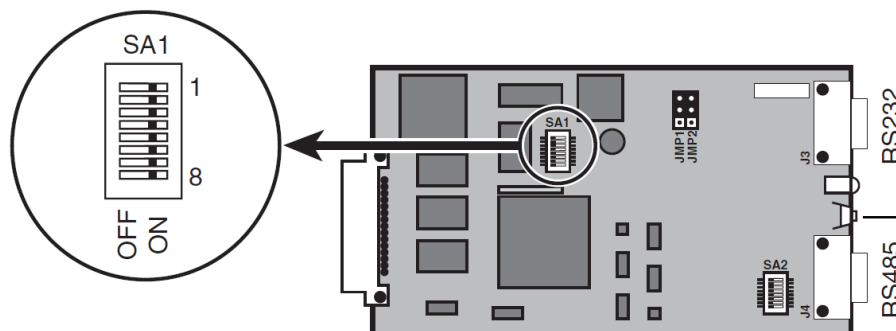
Approximately 2 minutes after inserting the card, the JBus/Modbus communication is operational.

Configure the Communication Parameters

NOTE: It is possible to change the default settings of the communication parameters by following the steps below. See *Settings, page 7* for an overview of the default settings and the possible settings.

NOTE: The communication parameters for the terminal are not configurable and not related to the JBus/Modbus communication parameters.

1. Set all SA1 switches in the ON position.



2. Connect the RS232 link to a terminal (Microsoft hyper terminal).
3. Set the following communication parameters in the terminal: **9600 baud rate, even parity, 1 stop bit and 7 data bits, without flow control.**
4. Press the push button on the card for more than 3 seconds.
The communication parameters can now be configured.
5. Check that the diagnostics LED is blinking regularly twice per second. A command prompt **CDE ->** is displayed on the terminal screen.
6. Enter the required configuration command in accordance with the table below.
Press Enter on the keyboard after each command.

Command	Function	Value to set
L	Reading current parameters.	None.
V	Baud rate setting.	1200, 2400, 4800, or 9600
P	Parity setting.	0 (without parity) or 2 (even parity)
E	Slave number setting.	from 1 to FF (hexidecimal)
M	Switching to Eco mode .	None.

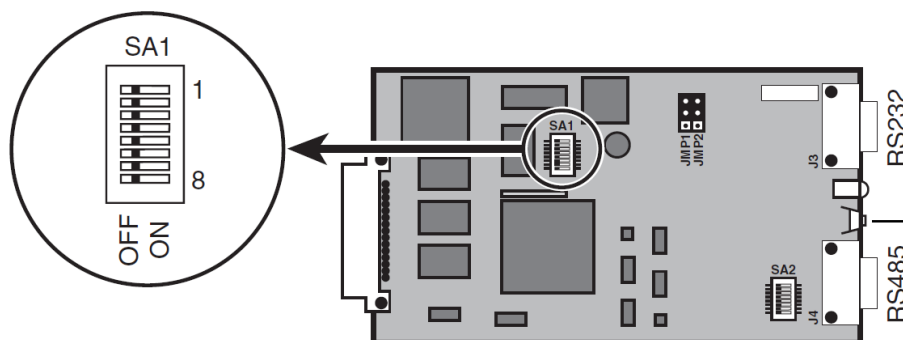
7. When the required configuration is completed, restart the board by pressing the push button for less than 3 seconds.
The card returns to operational mode, and the new parameters are operational after 2 minutes.

NOTE: The updated parameters are saved even if the card is turned off.

NOTE: In **Eco mode**, characters typed in on the keyboard are displayed on the screen. This mode is only available during the configuration of the communication parameters.

Return to the Default Communication Parameters

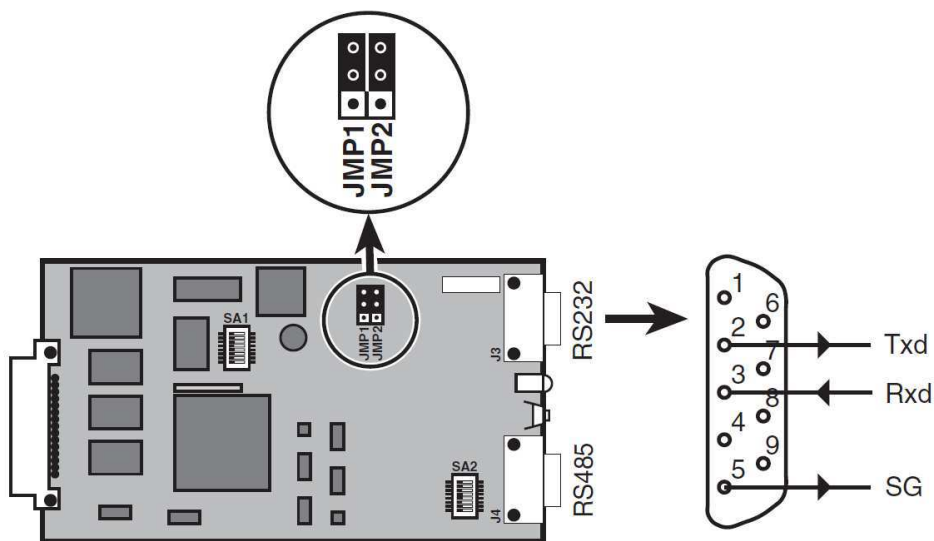
1. Set all SA1 switches in the OFF position.



2. Press the push button on the card for more than 3 seconds.
3. Release the push button and press the push button for less than 3 seconds to restart the board.
The card returns to operational mode and the default parameters are operational after 2 minutes.

RS232 Link Configuration and Connection

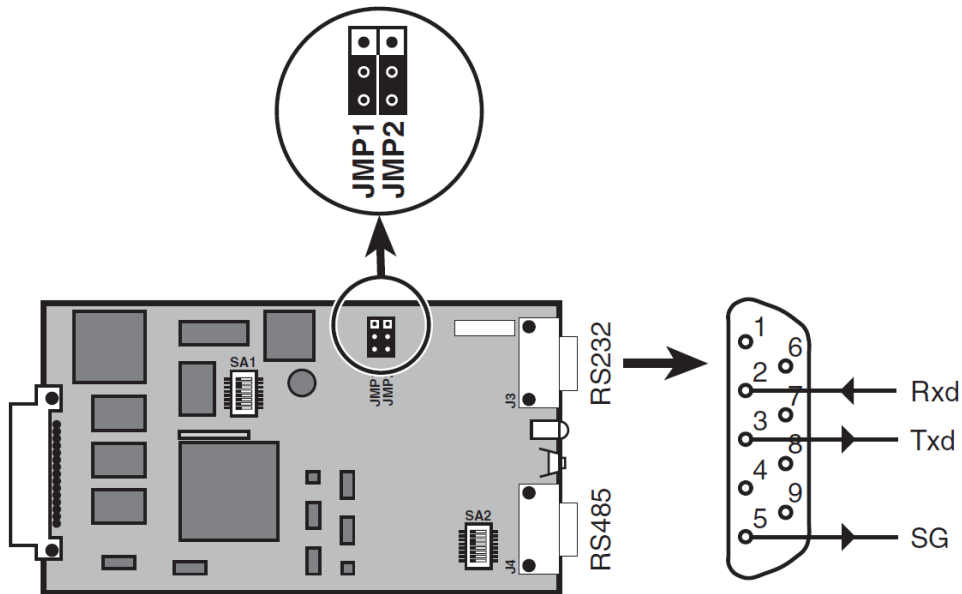
Default Connection



Txd = transmit data, Rxd = receive data, SG = signal ground

Rx and Tx Inverted

NOTE: If needed, it is possible to invert Rx and Tx.



Txd = transmit data, Rxd = receive data, SG = signal ground

RS485 Link Configuration and Connection

NOTE: For proper operation, the polarity of EIA RS485 2–wire and 4–wire lines must be at only one point and the lines terminated at the end.

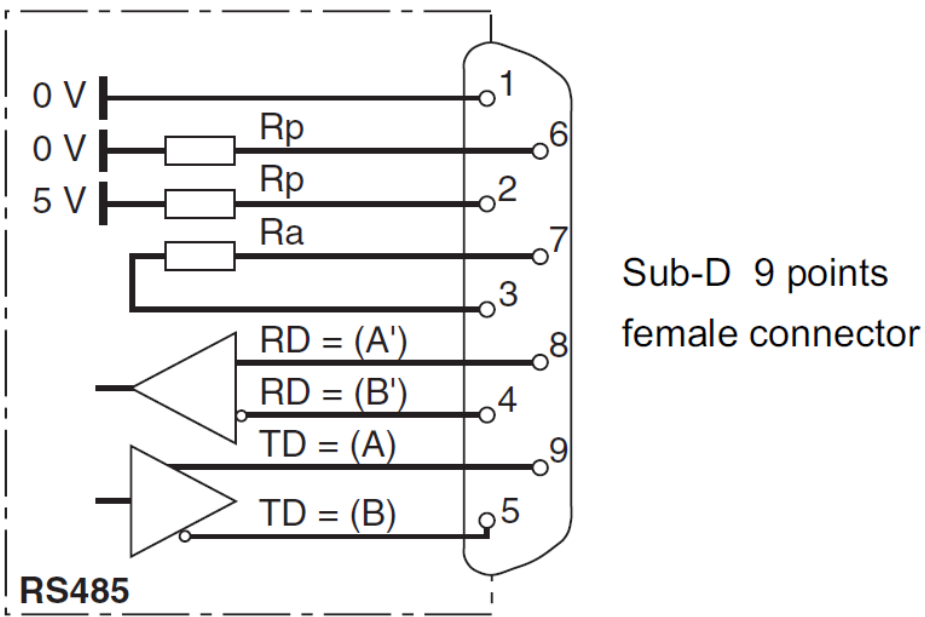
Polarity

Normally, the master of the network sets the polarity of the line (Rp resistor).

Termination

The two ends of the line must be terminated (Ra resistor). Allow for one or two terminators to avoid mismatching the line when any equipment at the end of the line is disconnected.

The default setting of the RS485 is a 4–wire configuration without polarity and without termination.

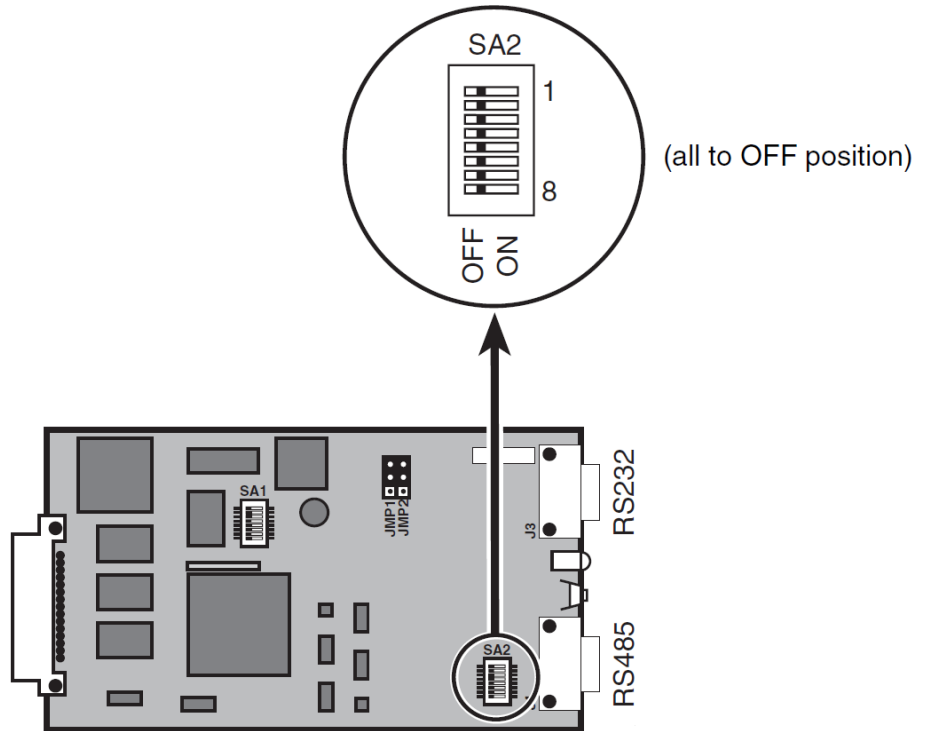


SA2 switches are used for the termination and polarity of the RS485 link:

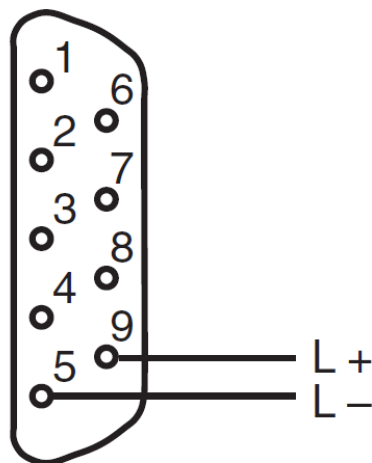
Polarity resistance = 332 Ω

Termination resistance = 166 Ω

- Polarity T- (J4-5) to +5V
- Polarity T+ (J4-9) to 0V
- Link termination T+ T-
- Connection T- to R- (_J4-5 to J4-4)
- Connection T+ to R+ (J4-9 to J4-8)
- Polarity R- (J4-4) to +5V
- Polarity R+ (J4-6) to 0V
- Link termination R+ R-



2-wire configuration



4-wire configuration

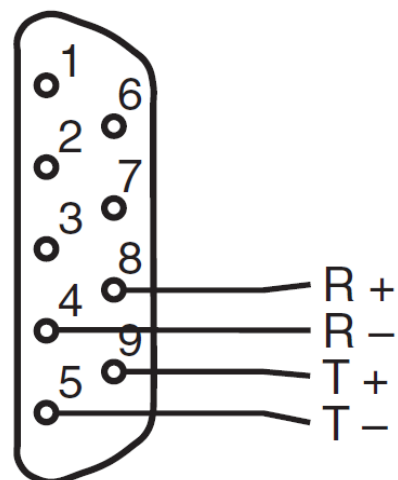
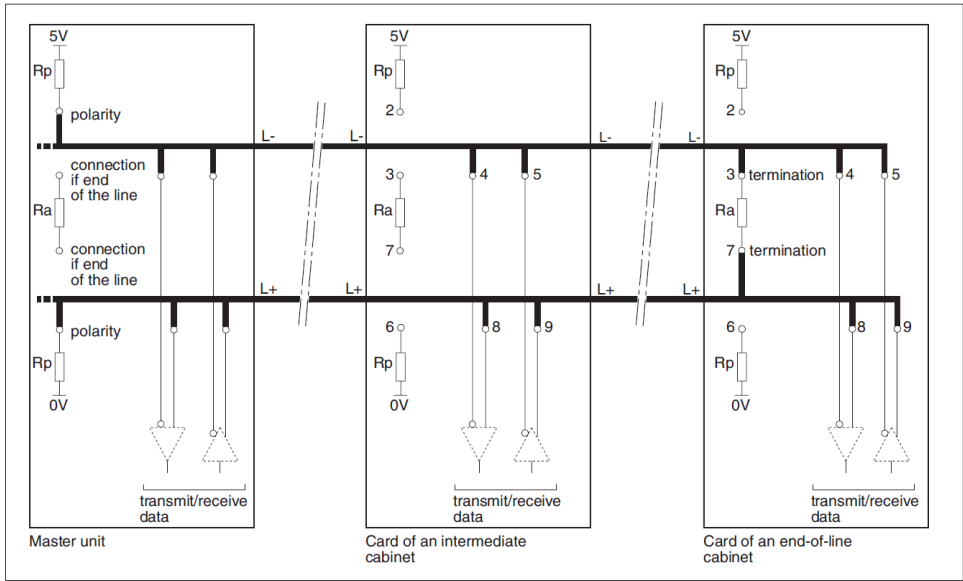
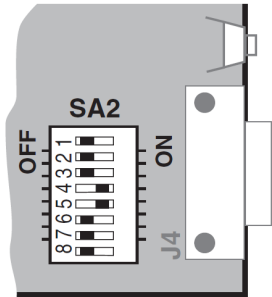


Diagram of a 2-wire inter-cabinet connection

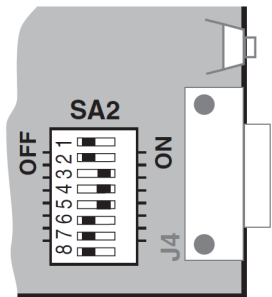


Card settings of an intermediate cabinet in 2-wire configurations



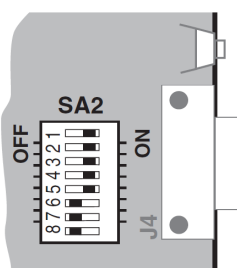
Link without polarity and without termination

Card settings of an end-of-row cabinet in 2-wire configurations

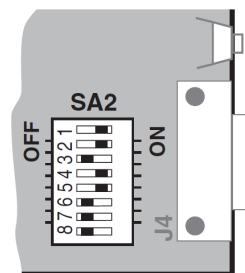


Link without polarity and with termination

Other settings in 2-wire configurations

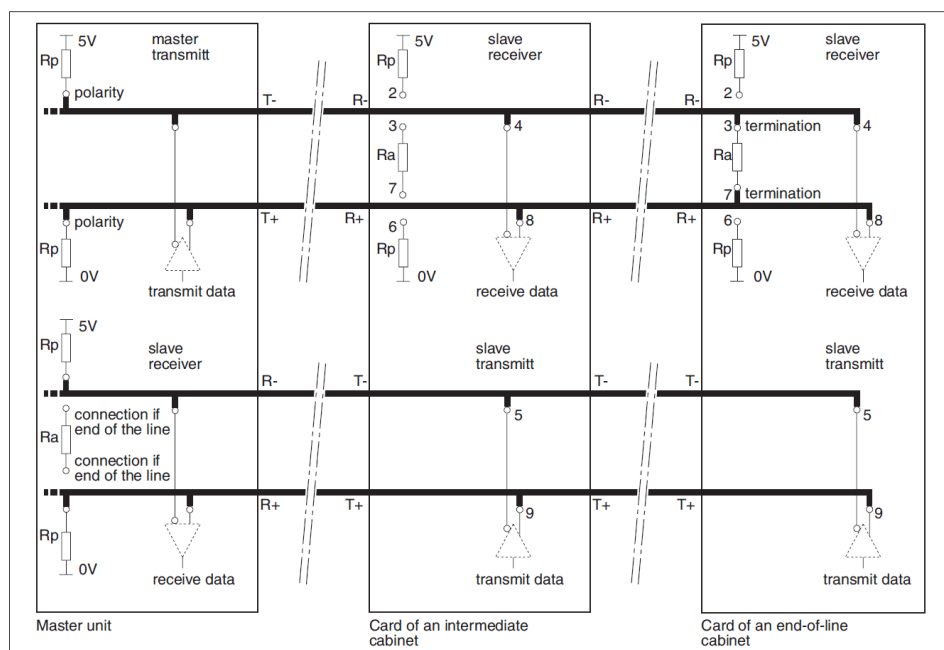


Link with polarity and with termination

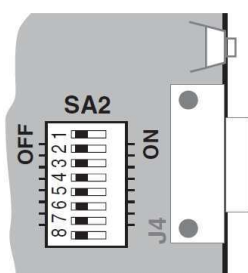


Link with polarity and without termination

Diagram of a 4-wire inter-cabinet connection

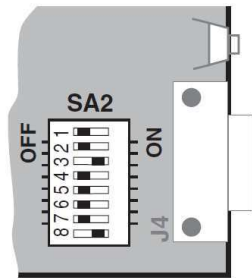


Card settings of an intermediate cabinet in 4-wire configurations



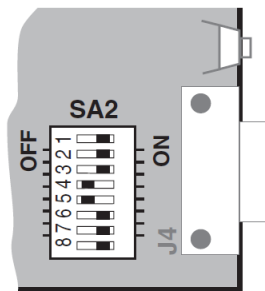
Link without polarity and without termination

Card settings of an end-of-row cabinet in 4-wire configurations

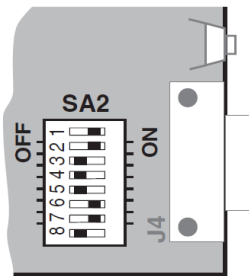


Link without polarity and with termination

Other settings in 4-wire configurations



Link with polarity and with termination



Link with polarity and without termination

Status Messages and Measurement Tables

Galaxy 3000

Status Messages

Status message	Status to 0	Status to 1	Word	Bit
Load protected	no	yes	40	0
UPS coupled	no	yes	40	1
Unit general alarm	no	yes	40	2
System downgraded operation	no	yes	40	3
UPS in backup	no	yes	40	4
Battery low warning	no	yes	40	5
End of backup time (voltage or time)	no	yes	40	6
Operation on static switch	no	yes	40	7
Emergency stop	no	yes	40	B
Device ventilation fault	no	yes	40	E
Manual bypass switch (Q3BP)	open	closed	41	6
Battery end of life	no	yes	42	1
Battery test result	battery test OK	battery test error	42	2
Battery compensation in progress	no test in progress	test sequence activated	42	5
Battery temperature out of tolerance	no	yes	42	A
Battery fuse fault	no	yes	42	B
Battery circuit breaker (QF1)	open	closed	42	F
Rectifier normal on/off	rectifier off	rectifier on	44	2
Mains 1 input switch (Q1)	closed	open	44	3
Mains 1 voltage out of tolerance	no	yes	44	8
Mains 1 frequency out of tolerance	no	yes	44	B
Rectifier thermal overload	no	yes	44	C
Maintenance position	no	yes	46	1
Mains 2 overload	no	yes	46	5
Mains 2 thermal overload	no	yes	46	6
Mains 2 frequency out of tolerance	no	yes	46	9
Mains 2 voltage out of tolerance	no	yes	46	A
Phase M2 out of tolerance	no	yes	46	B
Forced desynchronisation	no	yes	47	1
Bypass in free frequency	no	yes	47	8
Output switch (Q5N)	closed	open	47	B
Charger general fault	no	yes	49	0
Battery charged state	not charged	charged	49	3
Major UPS fault	no	yes	4C	1
Inverter overload	no	yes	4C	2
Inverter thermal overload	no	yes	4C	3

Status message	Status to 0	Status to 1	Word	Bit
Inverter limitation	no	yes	4C	4
Output thermal overload	no	yes	4D	F
Output overload	no	yes	4F	0
Inverter fuse fault	no	yes	4C	5
Output in short-circuit	no	yes	4F	1

Measurements Table

Description of the physical quantity	Word	Unit
I1 (I phase 1) mains 1	100	A
I2 (I phase 2) mains 1	101	A
I3 (I phase 3) mains 1	102	A
I1 (I phase 1) mains 2	106	A
I2 (I phase 2) mains 2	107	A
I3 (I phase 3) mains 2	108	A
I1 (I phase 1) output	109	A
I2 (I phase 2) output	10A	A
I3 (I phase 3) output	10B	A
I Battery	10E	A
Device nominal active power	111	kW
U12 mains 1	115	V
U23 mains 1	116	V
U31 mains 1	117	V
U1N inverter	118	V
U2N inverter	119	V
U3N inverter	11A	V
U12 mains 2	121	V
U23 mains 2	122	V
U31 mains 2	123	V
U1N output	124	V
U2N output	125	V
U3N output	126	V
U12 output	127	V
U23 output	128	V
U31 output	129	V
U battery	12D	V
Output active power (phase 1)	130	kW
Output active power (phase 2)	131	kW
Output active power (phase 3)	132	kW
Output apparent power (phase 1)	133	kVA
Output apparent power (phase 2)	134	kVA
Output apparent power (phase 3)	135	kVA

Description of the physical quantity	Word	Unit
Output total active power	136	kW
Output total apparent power	137	kVA
% output load level	139	(0–100)
Peak factor phase 1 x 100	13A	(0–400)
Peak factor phase 2 x 100	13B	(0–400)
Peak factor phase 3 x 100	13C	(0–400)
Power factor x 100	13D	(0–100)
Mains 1 frequency	13E	Hz
Inverter frequency	13F	Hz
Mains 2 frequency	140	Hz
Output frequency	141	Hz
Battery backup time	149	minutes
Battery room temperature	14A	°C
Battery charging level	14B	%
Battery recharge duration	14F	minutes
UPS rated power	209	kVA

Galaxy 5000/5500

Status Messages

Status message	Status to 0	Status to 1	Word	Bit
Load protected	no	yes	40	0
UPS coupled	no	yes	40	1
Unit general alarm	no	yes	40	2
System downgraded operation	no	yes	40	3
UPS in backup	no	yes	40	4
Battery low warning	no	yes	40	5
End of backup time (voltage or time)	no	yes	40	6
Operation on static switch	no	yes	40	7
Emergency stop	no	yes	40	B
UPS in “on-line” mode	no	yes	41	1
UPS in “eco” mode	no	yes	41	2
Unitary/parallel-connected UPS	no	yes	41	3
Manual bypass switch (Q3BP)	open	closed	41	6
Battery end of life	no	yes	42	1
Battery test result	battery test OK	battery test error	42	2
Battery automatic test in progress	no test in progress	test sequence activated	42	8
Battery temperature out of tolerance	no	yes	42	A
Battery circuit breaker (QF1)	open	closed	42	F
Mains 1 input switch (Q1) in EMEA	closed	open	44	3

Status message	Status to 0	Status to 1	Word	Bit
Mains 1 backfeed (KA1 optional) status	closed	open	44	6
Mains 1 voltage out of tolerance	no	yes	44	8
Mains 1 fuse fault	no	yes	44	9
Mains 1 frequency out of tolerance	no	yes	44	B
Rectifier thermal overload	no	yes	44	C
Maintenance position	no	yes	46	1
Mains 2 overload	no	yes	46	5
Mains 2 thermal overload	no	yes	46	6
Bypass out of tolerance (voltage or frequency)	no	yes	46	7
Mains 2 voltage out of tolerance	no	yes	46	A
Phase M2 out of tolerance	no	yes	46	B
Mains 2 input switch (Q4S)	closed	open	46	E
Forced desynchronisation	no	yes	47	1
Output switch (Q5N)	closed	open	47	B
Number of UPS ready sufficient for coupling	no	yes	47	F
Charger general fault	no	yes	49	0
Battery charged state	not charged	charged	49	3
Major UPS fault	no	yes	4C	1
Inverter overload	no	yes	4C	2
Inverter thermal overload	no	yes	4C	3
Inverter limitation	no	yes	4C	4
Inverter fuse fault	no	yes	4C	5
Output thermal overload	no	yes	4D	F
Output overload	no	yes	4F	0
Output in short-circuit	no	yes	4F	1
End of warranty soon	no	yes	43	1

Measurements Table

Description of the physical quantity	Word	Unit
I1 (I phase 1) mains 1	100	A
I2 (I phase 2) mains 1	101	A
I3 (I phase 3) mains 1	102	A
I1 (I phase 1) mains 2	106	A
I2 (I phase 2) mains 2	107	A
I3 (I phase 3) mains 2	108	A
I1 (I phase 1) output	109	A
I2 (I phase 2) output	10A	A
I3 (I phase 3) output	10B	A
I Battery	10E	A
Device nominal active power	111	kW

Description of the physical quantity	Word	Unit
U12 mains 1	115	V
U23 mains 1	116	V
U31 mains 1	117	V
U1N inverter	118	V
U2N inverter	119	V
U3N inverter	11A	V
U12 mains 2	121	V
U23 mains 2	122	V
U31 mains 2	123	V
U1N output	124	V
U2N output	125	V
U3N output	126	V
U12 output	127	V
U23 output	128	V
U31 output	129	V
U battery	12D	V
Output active power (phase 1)	130	kW
Output active power (phase 2)	131	kW
Output active power (phase 3)	132	kW
Output apparent power (phase 1)	133	kVA
Output apparent power (phase 2)	134	kVA
Output apparent power (phase 3)	135	kVA
Output total active power	136	kW
Output total apparent power	137	kVA
% output load level	139	(0–100)
Peak factor phase 1 x 100	13A	(0–400)
Peak factor phase 2 x 100	13B	(0–400)
Peak factor phase 3 x 100	13C	(0–400)
Power factor x 100	13D	(0–100)
Mains 1 frequency	13E	Hz
Inverter frequency	13F	Hz
Mains 2 frequency	140	Hz
Output frequency	141	Hz
Battery backup time	149	minutes
Battery room temperature	14A	°C
Battery charging level	14B	%
Battery recharge duration	14F	minutes
UPS rated power	209	kVA

Galaxy PW

Status Messages

Status message	Status to 0	Status to 1	Word	Bit
Load protected	no	yes	40	0
UPS coupled	no	yes	40	1
Unit general alarm	no	yes	40	2
System downgraded operation	no	yes	40	3
UPS in backup	no	yes	40	4
Battery low warning	no	yes	40	5
End of backup time (voltage or time)	no	yes	40	6
Operation on static switch	no	yes	40	7
Emergency stop	no	yes	40	B
Device ventilation fault	no	yes	40	E
Protected shutdown on external contact	no	yes	40	F
UPS in "on-line" mode	no	yes	41	1
UPS in "eco" mode	no	yes	41	2
Unitary/parallel-connected UPS	no	yes	41	3
Status UPS ready for coupling	no	yes	41	4
Manual bypass switch (Q3BP)	open	closed	41	6
Battery end of life	no	yes	42	1
Battery test result	battery test OK	battery test error	42	2
Battery manual test in progress	no test in progress	test sequence activated	42	4
Battery compensation in progress	not activated	activated	42	5
Battery automatic test in progress	no test in progress	test sequence activated	42	8
Battery temperature out of tolerance	no	yes	42	A
Battery ventilation fault	no	yes	42	D
Battery circuit breaker (QF1)	open	closed	42	F
Rectifier normal on/off	rectifier off	rectifier on	44	2
Mains 1 input switch (Q1)	closed	open	44	3
Mains 1 voltage out of tolerance	no	yes	44	8
Mains 1 frequency out of tolerance	no	yes	44	B
Major coupling fault	no	yes	46	0
Maintenance position	no	yes	46	1
Mains 2 overload	no	yes	46	5
Mains 2 thermal overload	no	yes	46	6
Mains 2 frequency out of tolerance	no	yes	46	9
Mains 2 voltage out of tolerance	no	yes	46	A
Mains 2 phase out of tolerance	no	yes	46	B
Mains 2 input switch (Q4S)	closed	open	46	E
UPS in free frequency	no	yes	47	8
Output switch (Q5N)	closed	open	47	B

Status message	Status to 0	Status to 1	Word	Bit
Forced shutdown on external contact	no	yes	47	C
Number of UPS ready sufficient for coupling	no	yes	47	F
Charger general fault	no	yes	49	0
Battery charged state	not charged	charged	49	3
Major inverter fault	no	yes	4C	1
Inverter overload	no	yes	4C	2
Inverter thermal overload	no	yes	4C	3
Inverter limitation	no	yes	4C	4
Inverter fuse fault	no	yes	4C	5
Output thermal overload	no	yes	4D	F
Output overload	no	yes	4F	0

Measurements Table

Description of the physical quantity	Word	Unit
I1 (I phase 1) mains 1	100	A
I2 (I phase 2) mains 1	101	A
I3 (I phase 3) mains 1	102	A
I1 (I phase 1) inverter	103	A
I2 (I phase 2) inverter	104	A
I3 (I phase 3) inverter	105	A
I1 (I phase 1) mains 2	106	A
I2 (I phase 2) mains 2	107	A
I3 (I phase 3) mains 2	108	A
I1 (I phase 1) output	109	A
I2 (I phase 2) output	10A	A
I3 (I phase 3) output	10B	A
I Battery	10E	A
Device nominal active power	111	kW
U12 mains 1	115	V
U23 mains 1	116	V
U31 mains 1	117	V
U1N inverter	118	V
U2N inverter	119	V
U3N inverter	11A	V
U12 inverter	11B	V
U23 inverter	11C	V
U31 inverter	11D	V
U1N mains 2	11E	V
U2N mains 2	11F	V
U3N mains 2	120	V
U12 mains 2	121	V
U23 mains 2	122	V

Description of the physical quantity	Word	Unit
U31 mains 2	123	V
U1N output	124	V
U2N output	125	V
U3N output	126	V
U12 output	127	V
U23 output	128	V
U31 output	129	V
U battery	12D	V
Battery voltage end of backup threshold	12E	V
Output active power (phase 1)	130	kW
Output active power (phase 2)	131	kW
Output active power (phase 3)	132	kW
Output apparent power (phase 1)	133	kVA
Output apparent power (phase 2)	134	kVA
Output apparent power (phase 3)	135	kVA
Output total active power	136	kW
Output total apparent power	137	kVA
% output load level	139	(0–100)
Peak factor phase 1 x 100	13A	(0–400)
Peak factor phase 2 x 100	13B	(0–400)
Peak factor phase 3 x 100	13C	(0–400)
Power factor x 100	13D	(0–100)
Mains 1 frequency	13E	Hz
Inverter frequency	13F	Hz
Mains 2 frequency	140	Hz
Output frequency	141	Hz
Nominal backup time	148	minutes
Battery backup time	149	minutes
Battery room temperature	14A	°C
Battery charging level	14B	%
Battery recharge duration	14F	minutes

Upsilon STS

In addition to the data tables (states and measures) available for reading, there is a table for writing commands. If you need more information on this table in order to control the Upsilon STS through its JBus/Modbus communication, please contact Schneider Electric.

Status Messages

Status message	Status to 0	Status to 1	Word	Bit
Source 1 input switch (Q1)	open	closed	1002	3
Source 1 input switch (Q2)	open	closed	1002	4
Output switch (Q3)	open	closed	1002	5
Source 1 bypass switch (Q1BP)	open	closed	1002	6
Source 2 bypass switch (Q2BP)	open	closed	1002	7
Source 1 active	no	yes	1002	8
Source 2 active	no	yes	1002	9
Source 1 preferred	no	yes	1002	A
Source 2 preferred	no	yes	1002	B
Load supplied	no	yes	1002	C
Source 1 out of tolerance	no	yes	1002	D
Source 2 out of tolerance	no	yes	1002	E
Transfert valid	no	yes	1003	7
Source 1 phases inversion	no	yes	1003	8
Source 2 phases inversion	no	yes	1003	9
Prohibited transfert	no	yes	1003	A
Phase source 1/source 2 fault	no	yes	1000	0
Load supplying fault	no	yes	1000	5
EPO supplying fault	no	yes	1000	6
EPO activated fault	no	yes	1000	B
Thermal overload fault	no	yes	1001	1
Source 1 voltage fault	no	yes	1000	C
Source 2 voltage fault	no	yes	1000	D
Static Switch 1 fault	no	yes	1001	8
KM1 fault	no	yes	1001	9
Static Switch 2 fault	no	yes	1001	E
KM2 fault	no	yes	1001	F
Phase S1/S2 rotation fault	no	yes	1002	0
Source 1 frequency out of tolerance fault	no	yes	1002	1
Source 2 frequency out of tolerance fault	no	yes	1002	2
Overload fault	no	yes	1001	0
Internal fault	no	yes	1001	2
General Alarm fault	no	yes	1001	3

Measurements Table

Description of the physical quantity	Word	Unit
U12 source 1	1100	V
U23 source 1	1101	V
U31 source 1	1102	V
U12 source 2	1103	V
U23 source 2	1104	V

Description of the physical quantity	Word	Unit
U31 source 2	1105	V
I1 source 1	1106	A
I2 source 1	1107	A
I3 source 1	1108	A
I1 source 2	1109	A
I2 source 2	110A	A
I3 source 2	110B	A
Source 1 active power (ph 1)	110C	kW
Source 1 active power (ph 2)	110D	kW
Source 1 active power (ph 3)	110E	kW
Source 2 active power (ph 1)	110F	kW
Source 2 active power (ph 2)	1110	kW
Source 2 active power (ph 3)	1111	kW
Source 1 apparent power (ph 1)	1112	KVAR
Source 1 apparent power (ph 2)	1113	KVAR
Source 1 apparent power (ph 3)	1114	KVAR
Source 2 apparent power (ph 1)	1115	KVAR
Source 2 apparent power (ph 2)	1116	KVAR
Source 2 apparent power (ph 3)	1117	KVAR
U1N source 1	1118	V
U2N source 1	1119	V
U3N source 1	111A	V
U1N source 2	111B	V
U2N source 2	111C	V
U3N source 2	111D	V
Source 1 neutral current	1127	A
Source 2 neutral current	1128	A
Source 1 frequency (ph 1)	1129	Hz
Source 2 frequency (ph 1)	112A	Hz
Phase source 1 / source 2	112B	°C
Total active power	112C	kW
Total apparent power	112D	kVA
Total reactive power	112E	KVAR
% load level	112F	%
Power factor x 100	1130	(0–100)
Peak factor x 100	1131	(0–400)
Nominal voltage of sources	1135	V
Nominal frequency	1136	Hz
Nominal current	113A	A

Troubleshooting

Problem	Probable cause	Corrective action
The diagnostics LED remains OFF.	The card is not supplied with power.	- Check that the card is inserted correctly and secured in its slot. - Check that the system is energized. - Remove the card and reinstall it.
The diagnostics LED remains ON.	The card is blocked.	- Check that the push button is released (not pressed). - Remove the card and reinstall it.
JBus/RS232 communication is inoperable.	- Communication parameters are not correct. - The RS232 connection is inoperable.	- Wait 2 minutes after installing or restarting the card. - Check that the ports RS485 and RS232 are not both connected. - Check that the Rx/Tx jumper position is in accordance with the serial cable used, see <i>RS232 Link Configuration and Connection, page 11</i> - Check that the communication parameters used by the JBus master application are in accordance with the card parameters. - Check the link with the default parameters, see <i>Return to the Default Communication Parameters, page 11.</i>
JBus/RS485 communication is inoperable.	- Communication parameters are not correct. - The RS485 connection is inoperable.	- Wait 2 minutes after installing or restarting the card. - Check that the ports RS485 and RS232 are not both connected. - Check that the polarity and termination are in accordance with the card position in the RS485 network, see <i>RS485 Link Configuration and Connection, page 12.</i> - Check that the communication parameters used by the JBus master application are in accordance with the card parameters. - Check the link with the default parameters, see <i>Return to the Default Communication Parameters, page 11.</i> - Validate the communication parameters by checking the card in point to point RS232 link.
The access of the configuration menu is impossible.	- Maintenance mode is not activated. - The RS232 connection is inoperable.	- Check the position of the SA1 switches, see <i>Configure the Communication Parameters, page 9.</i> - Check that the Rx/Tx jumper position is in accordance with the serial cable used, see <i>RS232 Link Configuration and Connection, page 11.</i> - Check the terminal settings: 9600 bauds, even, 7 data bits, 1 stop bit. - Press the push button for more than 3 seconds.

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As standards, specifications, and design change from time to time,
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