



DIRIS G-30, G-40, G-50 & G-60 Gateways

EN



www.socomec.com/en/diris-g

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1. DOCUMENTATION

All documentation concerning the DIRIS G-30, G-40, G-50 and G-60 gateways is available at the SOCOMEC website at the following address:

www.socomec.com/en/diris-g





2. HAZARDS AND WARNINGS

The term "device" used in the following paragraphs encompasses all of the DIRIS G-30, G-40, G-50 and G-60 gateways.

The assembly, use, servicing and maintenance of this equipment must only be carried out by trained, qualified professionals.

SOCOMECC shall not be held responsible for failure to comply with the instructions in this manual.



2.1. Risk of electrocution, burns or explosion

	Caution: risk of electric shock	Ref. ISO 7000-0434B (2004-01)
	Caution Refer to the accompanying documentation each time this symbol is shown	Ref. ISO 7000-0434B (2004-01)

- This device must only be installed and serviced by qualified personnel who have in-depth knowledge of installing, commissioning and operating the device and who have had appropriate training. He or she should have read and understood the various safety measures and warnings stated in the instructions.
- Before starting any type of work on the device, switch it off and disconnect it from the mains.
- Always use an appropriate voltage detection device to confirm the absence of voltage.
- Replace all devices, doors and covers before connecting the device to the power again.
- Always power the device with the correct rated voltage.
- Install the device in accordance with the recommended installation instructions and in a suitable electrical cabinet.
- The device contains a lithium battery. Replace the battery with a battery of the same type.

Failure to take these precautions could cause serious injuries or death.

2.2. Risk of damaging the device

	Caution: risk of electric shock	Ref. ISO 7000-0434B (2004-01)
	Caution Refer to the accompanying documentation each time this symbol is shown	Ref. ISO 7000-0434B (2004-01)

To ensure that the device operates correctly, make sure that:

- The device is correctly installed.
- The auxiliary power supply tension indicated on the device is observed: 110 V - 230 VAC ($\pm 15\%$).
- The network frequency indicated on the device is observed: 50 or 60 Hz.

Failure to respect these precautions could cause damage to the device.

2.3. Liability

- Assembly, connection and use must be carried out in accordance with the installation standards currently in force.
- The device must be installed in accordance with the rules given in this manual.
- Failure to observe the rules for installing this device may compromise the device's intrinsic protection.
- The device must be positioned within an installation which complies with the standards currently in force.

3. PRELIMINARY OPERATIONS

To ensure the safety of personnel and the device, please carefully read the contents of these user manual before installation.

Check the following points as soon as you receive the package containing the device:

- The packaging is in good condition,
- The device has not been damaged during transportation,
- The device reference number conforms to your order,
- The packaging includes the device fitted with removable terminal blocks and a Quick Start guide.

4. PRESENTATION

4.1. DIRIS G presentation

The DIRIS G-30, G-40, G-50 and G-60 are communication gateways with a modular format which act as an interface between devices (PMD*, meters, etc.) equipped with an RS485 communication bus using the Modbus protocol, DIRIS B-30 using radio communication (DIRIS G-40 and G-60 only) and the Ethernet network. On the Ethernet network, the gateways use the Modbus TCP protocol (max. 4 simultaneous connections) to enable data to be exchanged and centralised between the meters, the PMDs and monitoring software. In addition, the WEBVIEW web server embedded in the gateways can be used for monitoring of electrical values in real-time (Power Monitoring version) and reporting of energy data (Power & Energy Monitoring version).

*PMD: Performance Measuring and Monitoring Device in accordance with IEC 61557-12.

4.1.1. Range

				
Gateway	DIRIS G-30	DIRIS G-40	DIRIS G-50	DIRIS G-60
Ethernet communication	•	•	•	•
RS485 communication	•	•	•	•
RF communication		•		•
WEBVIEW Webservice Power Monitoring <i>Monitoring: real-time measurements and alarms.</i>	•	•		
WebServer WEBVIEW Power & Energy Monitoring <i>Monitoring: real-time measurements and alarms.</i> <i>Visualisation: measurement and consumption datalogger.</i>			•	•
	Ref. 4829 0300	Ref. 4829 0301	Ref. 4829 0302	Ref. 4829 0303

Accessories

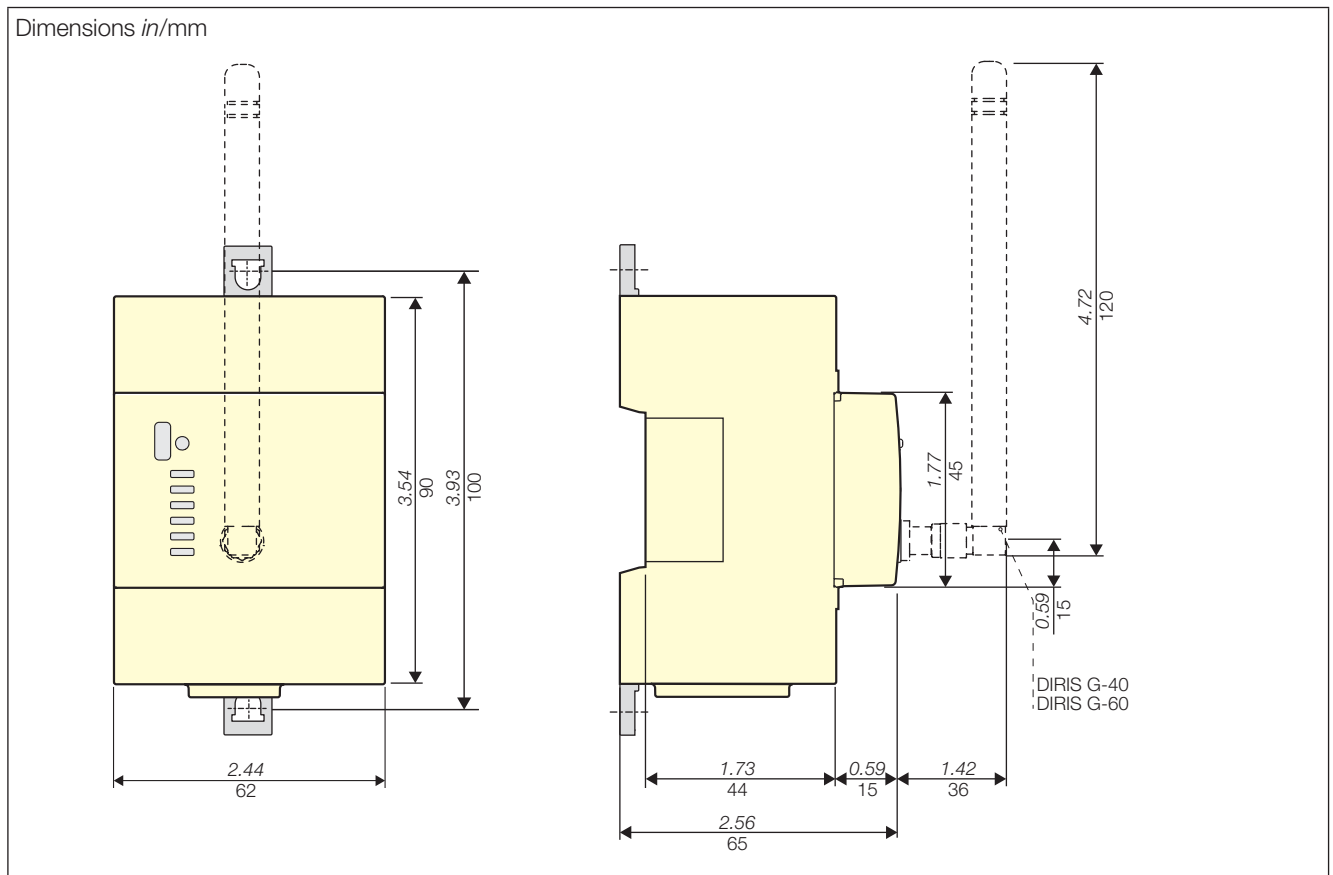
Remote antenna RF 868MHz Height: 210mm	Cable for remote antenna. SMA connector. Length: 3m	USB cable for configuration
Ref. 4854 0126	Ref. 4854 0127	Ref. 4829 0050

4.1.2. Functions

Depending on the reference, the DIRIS G-30, G-40, G-50 and G-60 perform a range of functions, including:

- Ethernet communication interface with the Modbus TCP protocol (max. 4 simultaneous connections)
- Access to data for devices equipped with Modbus RTU communication over RS485
- Access to data for DIRIS B-30 equipped with wireless radio communication
- Access to data for remote devices via Ethernet with TCP Modbus protocol
- Auto-addressing mode for devices
- Synchro input
- Input/output extension (logic, analogue, temperature) and RS485 communication modules
- Memory extension of connected PMD per model
 - Consumption logging (1 year with a period of 60 minutes)
 - Logging electric values (2 months with an integration period of 10 minutes)
 - Memorisation of 1000 timestamped alarms for overloads, events and input status changes
 - Store 1,000 quality network events according to EN 50160
- Time updated by the SNTP (Network Time Protocol) server
- Sends mail via SMTP (Simple Mail Transfer Protocol)
- Automatic data export to FTP server (on DIRIS G-50 / G-60 only)
- 2 Ethernet ports with integrated switch
- Embedded WEBVIEW web server for multi-device applications (max. 32 devices)

4.1.3. Dimensions



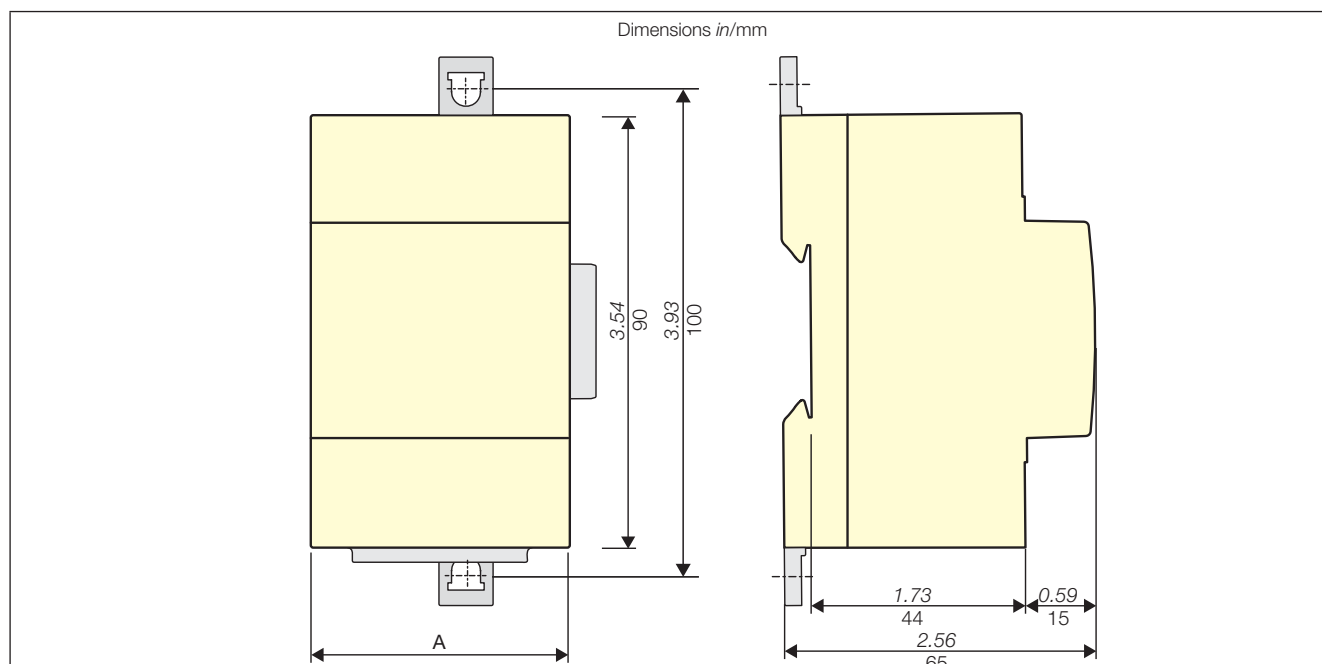
4.2. Optional modules presentation

The optional modules, which have a modular format, are fitted on the DIRIS G; they are used to extend its functionalities in terms of inputs/outputs and communication modes.

4.2.1. Range

			
DIRIS O-iod	DIRIS O-ioa	DIRIS O-it	DIRIS O-m
Module with 2 digital inputs/ outputs	Module with 2 analogue inputs	Module with 3 temperature inputs	Additional slave RS485 communication
Ref. 4829 0030	Ref. 4829 0031	Ref. 4829 0032	Ref. 4829 0033

4.2.2. Dimensions



	DIRIS O-iod	DIRIS O-ioa	DIRIS O-it	DIRIS O-m
A		1.77in / 45mm		2.12in / 54mm

5. MOUNTING

The following paragraphs describe the installation of the DIRIS G-30, G-40, G-50 and G-60 gateways and the optional modules.

5.1. Recommendations and safety

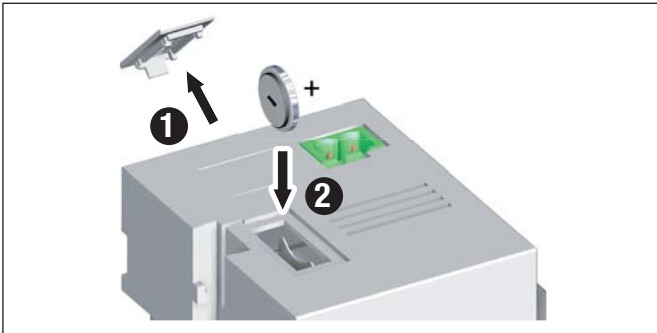
Refer to the safety instructions (section “2. Hazards and warnings”, page 4)

5.2. Fitting the battery

Environment: This device contains a 3 V CR1220 lithium button battery. Because of the potential health and environmental effects of the substances used in batteries, do not dispose of them with household waste.

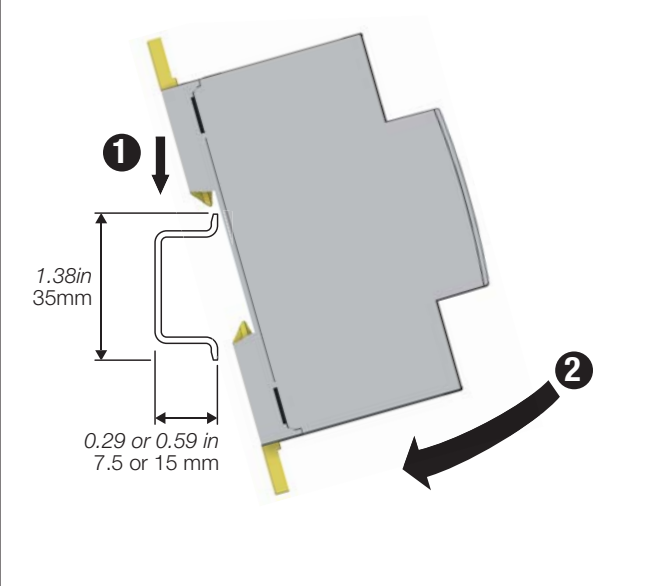
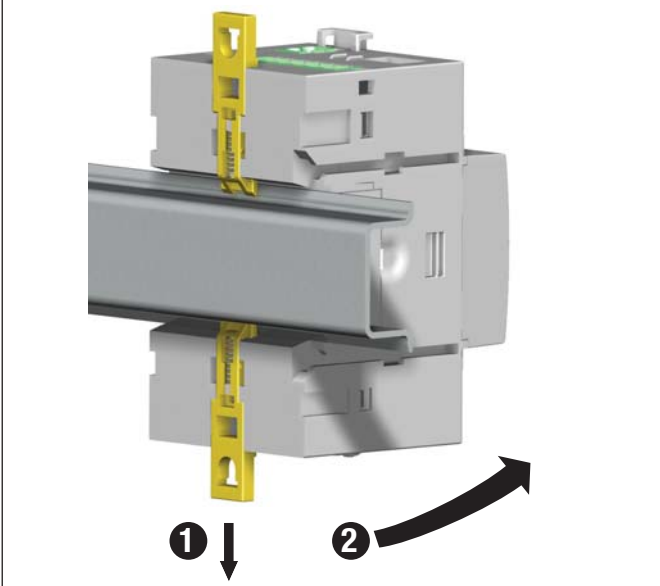
The battery is supplied in a separate bag.

To insert the battery, first power off the device and wait for 1 minute before using a finger to slide off the cover on the top of the gateway. Insert the battery, observing the polarity. Close the cover.

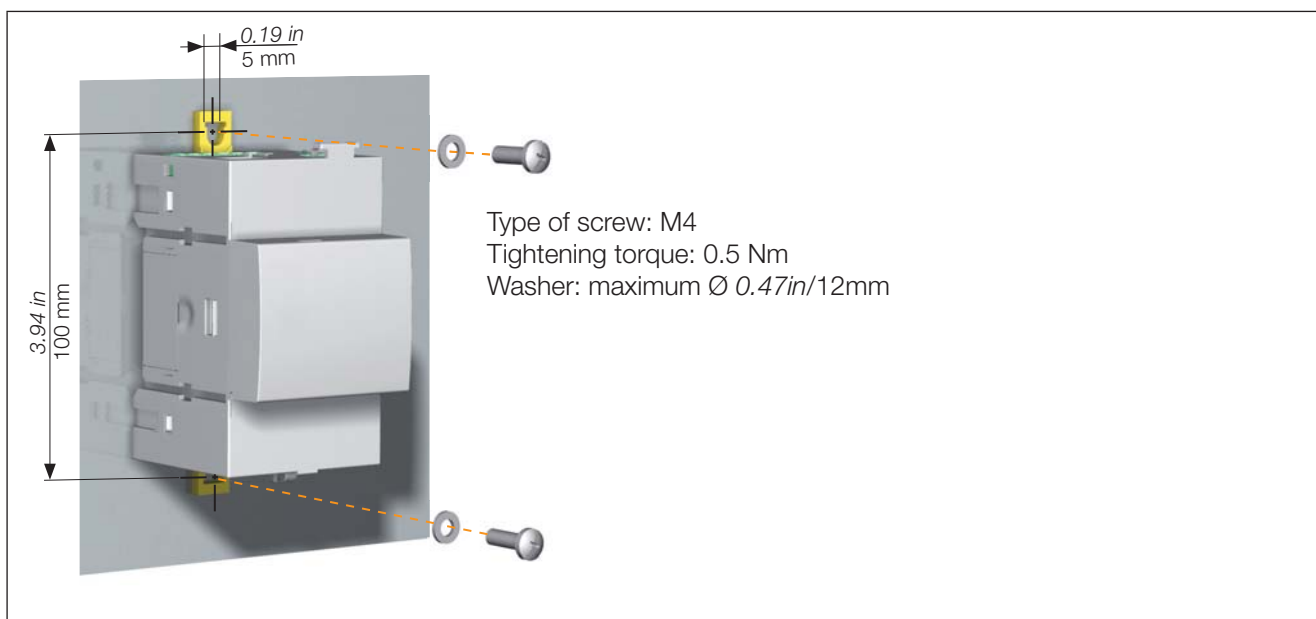


5.3. DIRIS G gateway mounting

5.3.1. DIN rail mounting

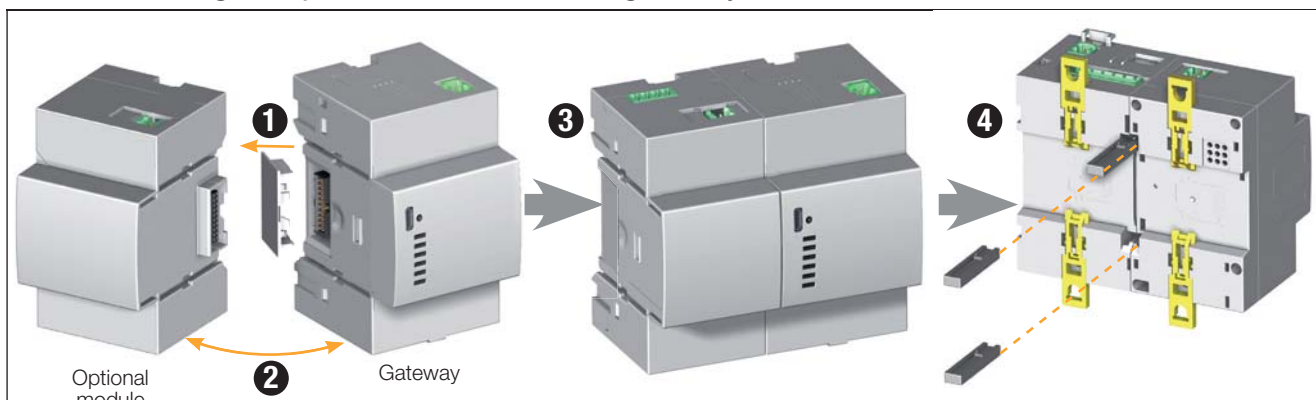
Mounting	Removal
	

5.3.2. Plate mounting

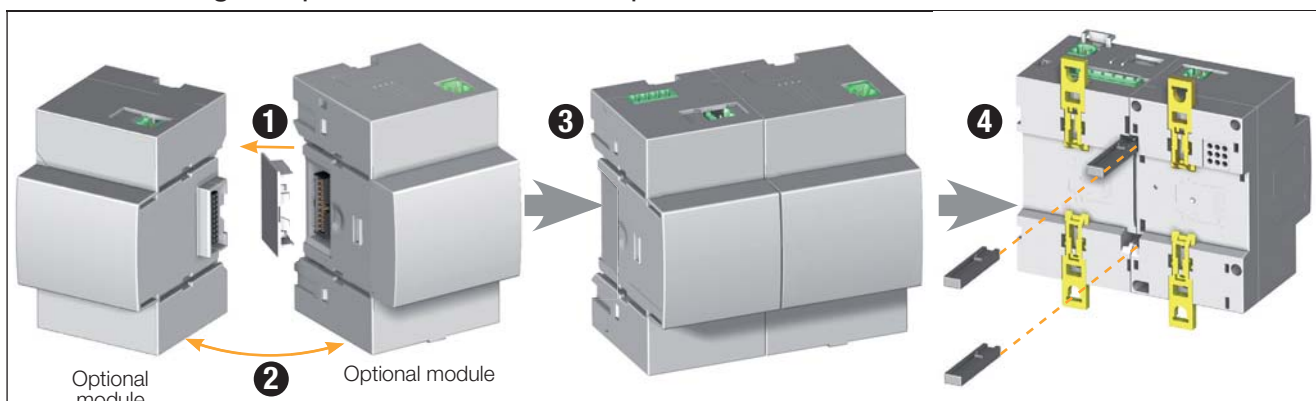


5.4. Optional modules mounting

5.4.1. Mounting an optional module on the gateway



5.4.2. Mounting an optional module on an optional module

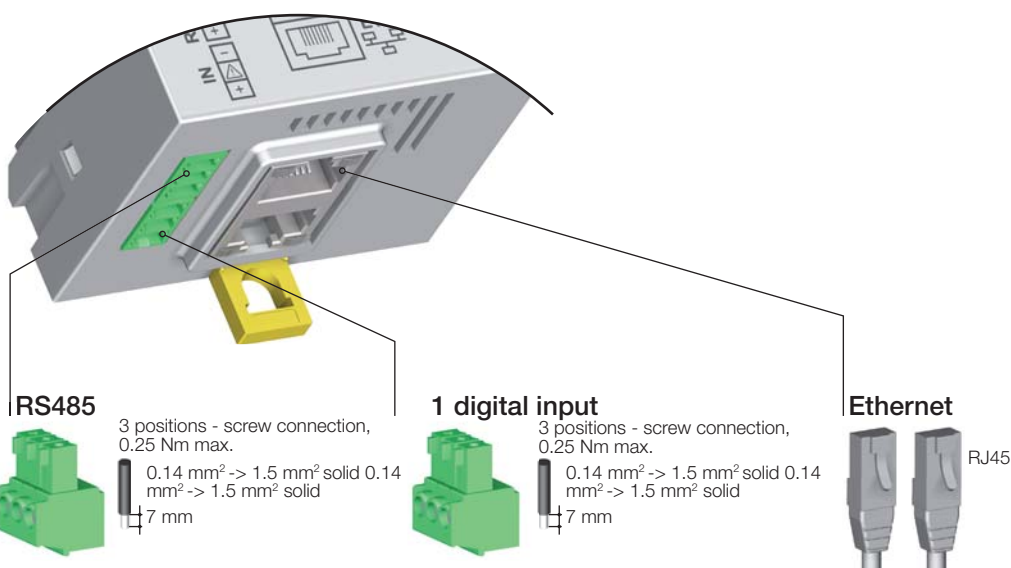
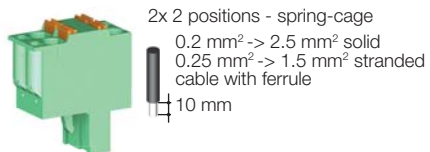
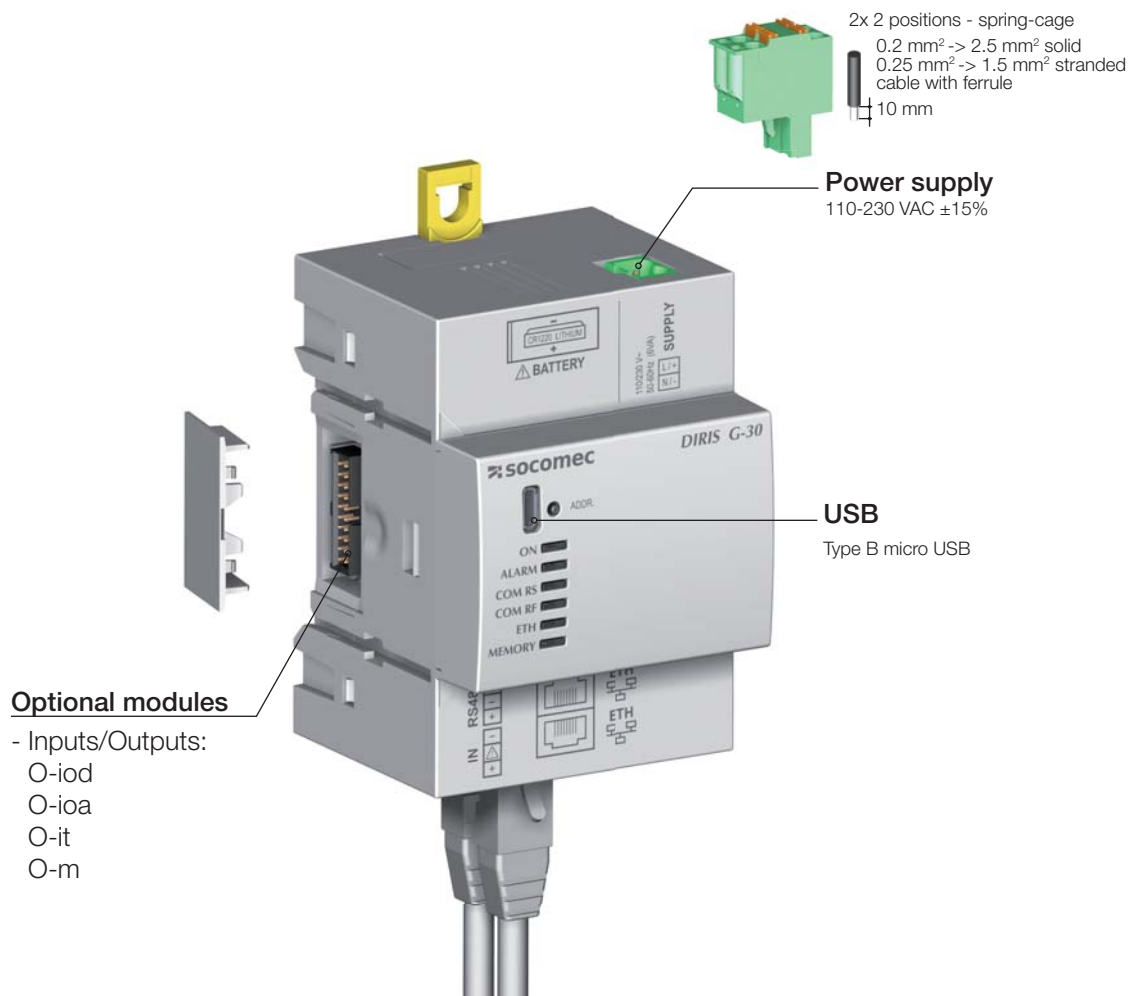


The following guidelines for installation must be observed:

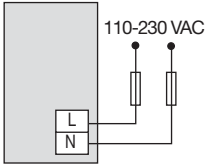
- A maximum of 4 optional modules can be installed on the gateway
- One single temperature module (DIRIS O-it) may be used.
- The gateway assembly with its optional modules must be installed on a DIN rail or base plate.

6. CONNECTION

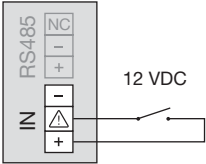
6.1. DIRIS G connection



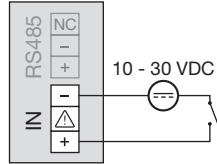
Power supply



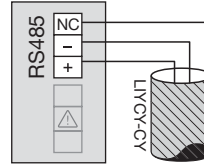
Input powered by the device



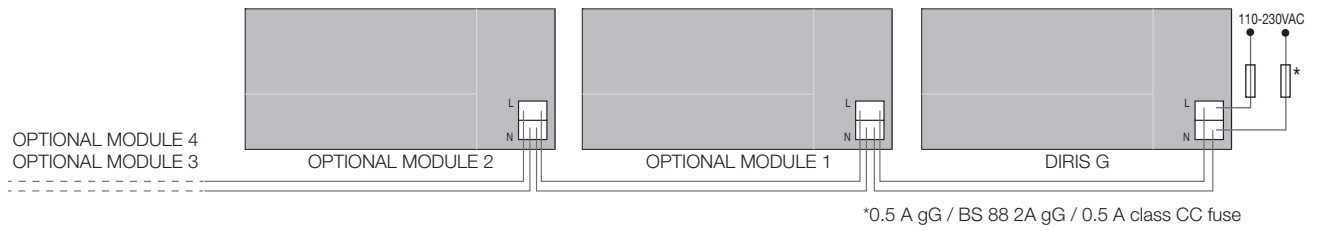
Input with external power supply



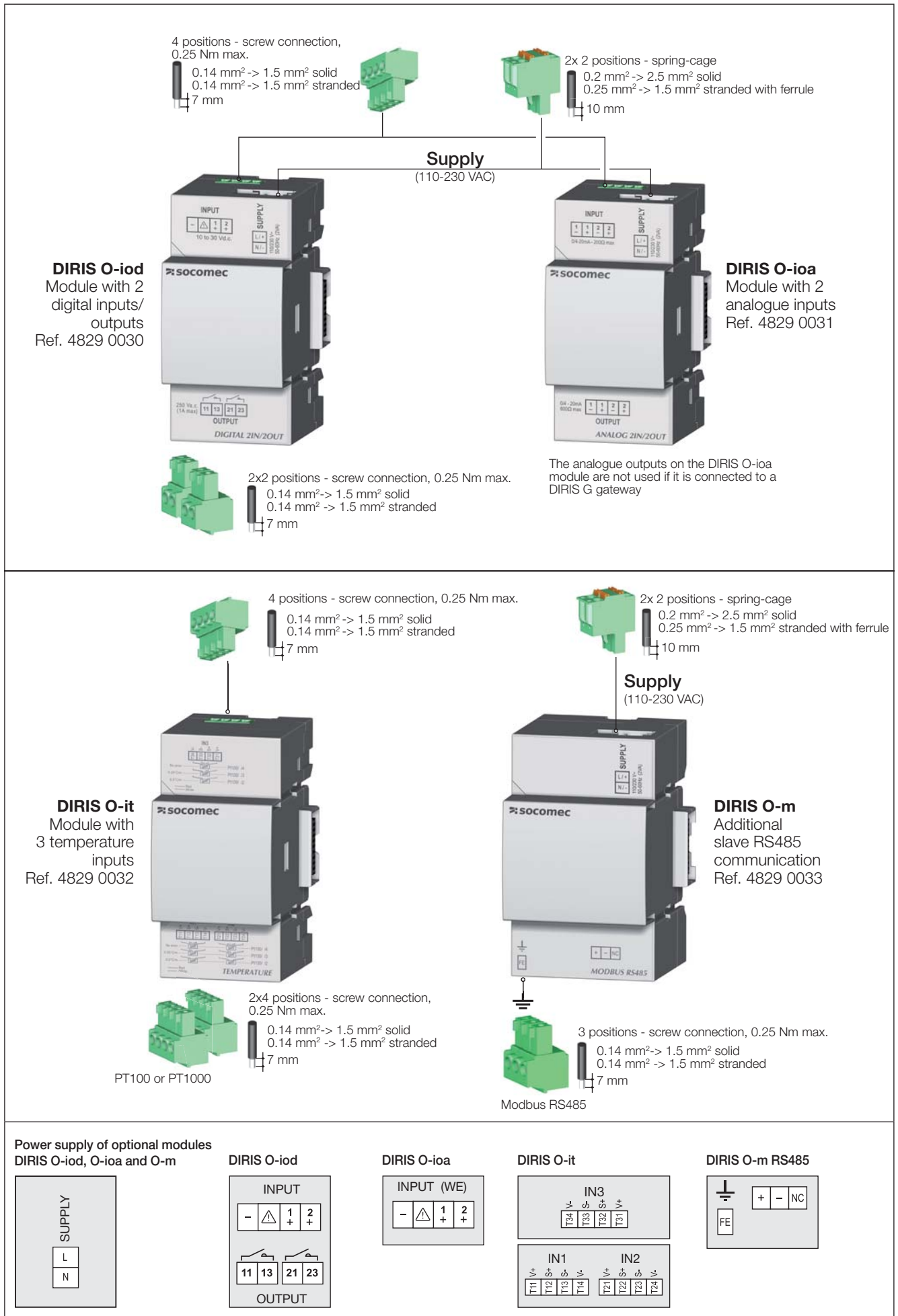
RS485



Power supply of optional modules



6.2. Optional modules connection

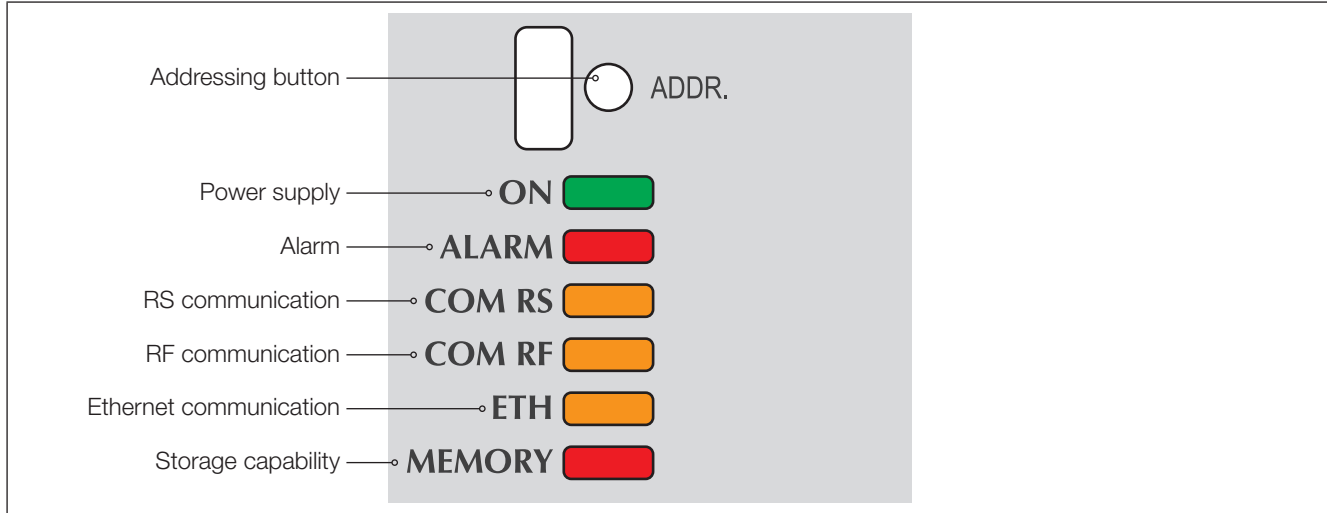


7. STATUS AND AUTO-ADDRESSING LEDS

7.1. Status LEDs

LEDs are used to view the status of the device.

The addressing button are used to automatically assign a Modbus® address from the gateway to all the devices in its RS485 or RF network.



LED state	Fixed	Blinking	Pulse
ON	In operation	10 seconds - on request via a Modbus control to identify the device (remote screen, etc.)	1 second to start-up
/ALARM	An alarm (logical/analogue, etc.) is active	Internal Alarm (battery empty, etc)	1 second to start-up
RS COM	In the addressing phase	In the scan phase	1 second to start-up and when a frame received is processed
COM RF	In the addressing phase	In the scan phase	1 second to start-up and when a frame received is processed
ETH	Initialisation problem	-	1 second to start-up and in Modbus TCP communication
MEMORY	Full or write problem	-	1 second to start-up and during a write to the memory

Note: The "ON" / "ALARM" / "RS COM" LEDs flash if an error within the device is detected.

7.2. Auto-addressing

Auto-addressing mode is used to automatically allocate addresses to devices connected to the gateway. This mode is only compatible with DIRIS B-30 and Digiware type PMDs. The addresses will be allocated manually on the other PMD (DIRIS A) and meters (COUNTIS).

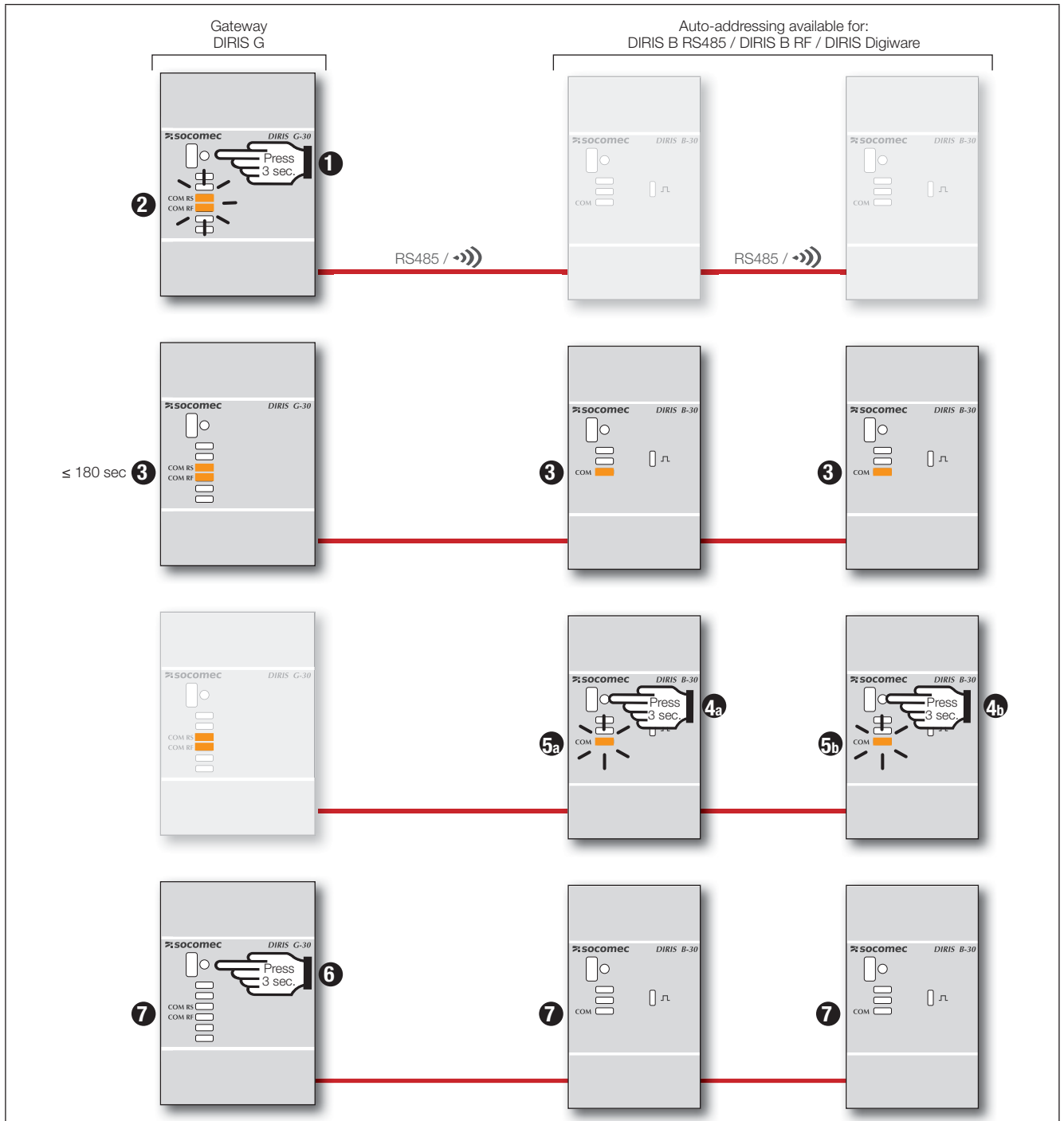
Two modes are available:

- Mode 1 - Auto-detection and automatic addressing
- Mode 2 - Auto-detection and address selection

Mode 1 is without external equipment (see description below).

Mode 2 is carried out from a PC equipped with Easy Config. This mode is described in the Easy Config manual.

Description of mode 1



Note: During the auto-addressing process, the RS485 line is reserved for allocating addresses and no other exchange of data is possible at this time

8. COMMUNICATION

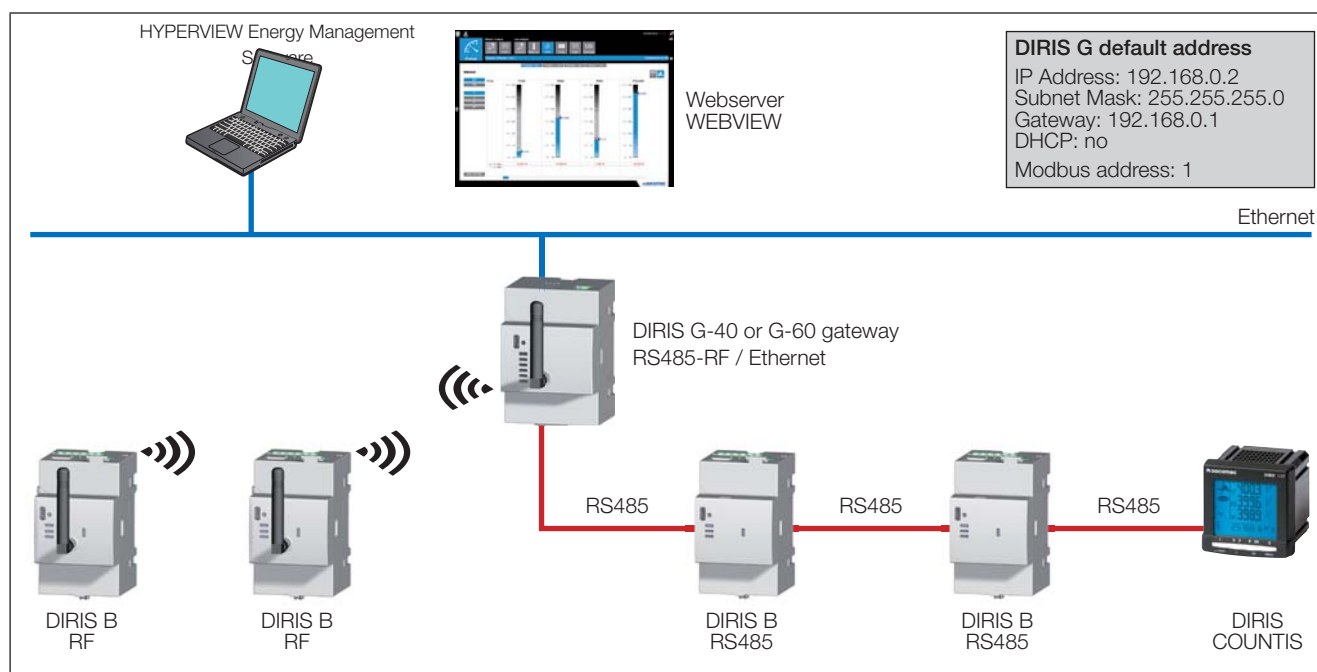
8.1. General information

Depending on its reference, the gateway communicates using RS485 or RS485/RF. With a RS485 link, the devices are connected in series to the gateway (DIRIS G-30, G-40, G-50 and G-60). With a radio-frequency link, the DIRIS B-30 communicate with the gateway in the RS485/RF version (DIRIS G-40 and G-60).

The table below shows the communication modes available on each of the gateways.

	Gateway	DIRIS G-30	DIRIS G-40	DIRIS G-50	DIRIS G-60
Communication	RS485	•	•	•	•
	Radio frequency		•		•
		Ref. 4829 0300	Ref. 4829 0301	Ref. 4829 0302	Ref. 4829 0303

Example of an installation integrating a DIRIS G-40 or G-60 gateway with DIRIS B-30 RF and RS485 multifunction meters:



The DIRIS G-30, G-40, G-50 & G-60 gateways communicate via the Modbus protocol with the devices connected to them. The DIRIS B which integrate radio communication are seen as Modbus slaves.

The Modbus protocol requires a dialogue with a master/slave structure. The mode of communication is the RTU (Remote Terminal Unit).

The gateway integrates the following parameters:

- communication (speed, parity, data size, stop bit)
- configuration of the Modbus RTU link, such as Timeout and number of send attempts.

The gateway transmits the data collected using the Modbus TCP protocol via the Ethernet communication port. The default IP address is:

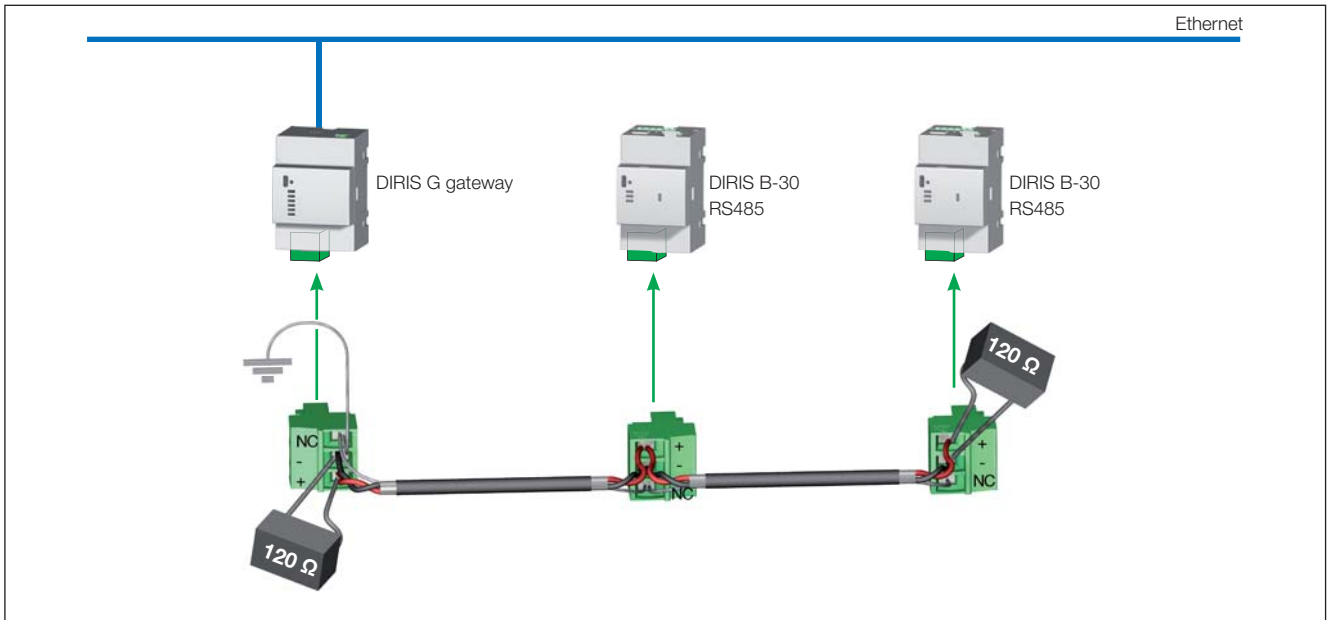
DIRIS G default address IP Address: 192.168.0.2 Subnet Mask: 255.255.255.0 Gateway: 192.168.0.1 DHCP: no Modbus address: 1
--

8.2. RS485 rules

RS485 communication is available on all the gateways. It takes place via an RS485 serial link (2- or 3-wire) in accordance with the Modbus RTU protocol. It is used to collect all the data coming from the connected devices (meters, multifunction meters, etc.).

In a standard configuration, an RS485 link enables the interconnection of 32 devices to a PC, a PLC or the gateway over a distance of 1200 metres.

Example of connecting an RS485 link with the gateway:



A LIYCY type connecting cable with a shielded twisted pair is required. In a disturbed environment or large network (in terms of length or number of devices) the use of a type LIYCY-CY twisted pair with general shielding is recommended.

A 120-ohm resistor must be placed at both ends of the link.

A 120-ohm resistor is supplied with each DIRIS G gateway.

Comment: class B in radiated power is obtained using ferrites (ref. 4829 0048) with the following number of rounds:

- RS485: 1 round
- Ethernet: 2 rounds
- Power: 1 round

Note: If the RS485 (+/-) wiring is reversed, the DIRIS G gateway cannot detect or auto-address the connected devices.

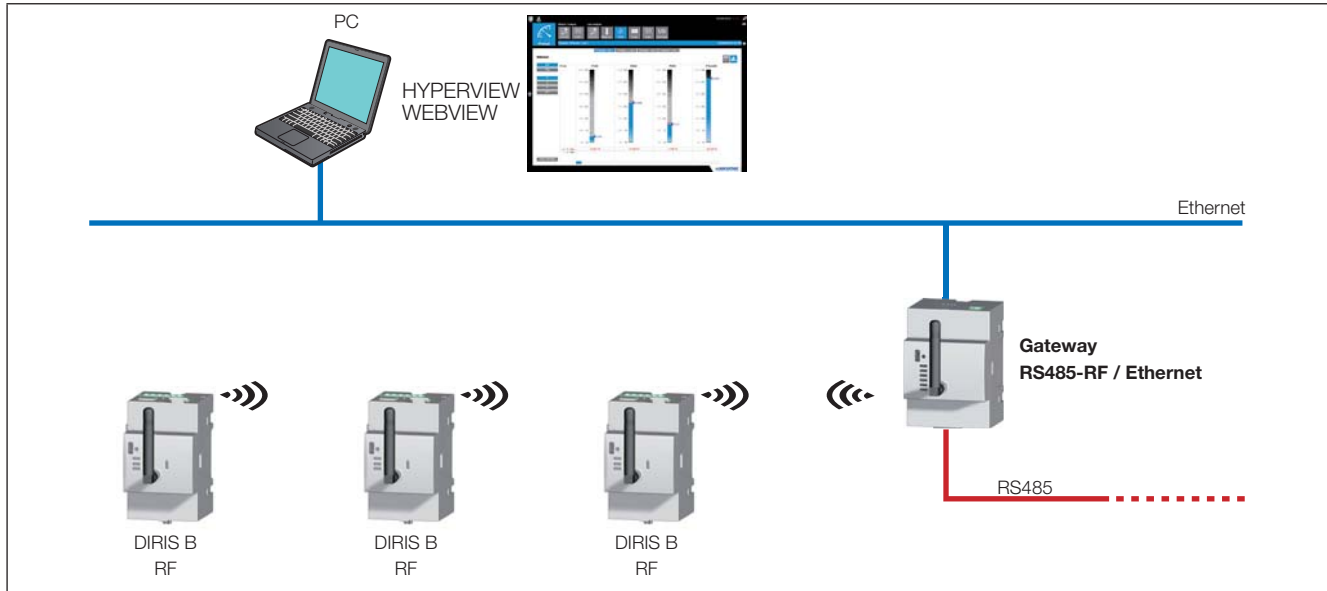
8.3. Radio-frequency (RF) rules

Wireless radio-frequency communication on the 868 MHz bandwidth is available on the DIRIS G-40 and G-60 gateways for communicating with the DIRIS B-30 in RF version (ref. 4829 0002).

These gateways collect data from the wireless DIRIS B-30 and also from the DIRIS B-30 or other devices (COUNTIS, DIRIS...) with a RS485 link. This data can then be transferred to a PC via an Ethernet link with Modbus TCP protocol.

The radio DIRIS B-30 are particularly useful for using loads located in isolated, remote areas, without the need to set up a cabled communication link.

Example of an installation integrating DIRIS B-30 RF with a DIRIS G-40 or G-60 gateway:



8.3.1. Installation

Only use antennae recommended by SOCOMEC.

The wireless gateway communicates over a distance of 300 metres in free-field conditions.

The permitted occupancy rate depends on the frequency used. The frequency is selected using the Easy Config configuration tool.

The table below describes the permitted occupancy rate based on the selected frequency and the resulting maximum number of DIRIS B-30 which can be connected.

Channel no.	Frequency (MHz)	Permitted occupancy rate	Maximum number of DIRIS B-30 connected
420	868.1000	1%	16
436	868.3000	1%	16
452	868.5000	1%	16
472	868.7500	0.10%	3
488	868.9500	0.10%	3
504	869.1500	0.10%	3
534*	869.5250	10%	32
539	869.5875	10%	32

According to EN300 220: radiated radio and REC7003 emissions: use of the RF 868 MHz bandwidth.

*Default channel.

Note: in order to observe a frequency spacing of 200 kHz, channels 534 and 539 cannot be used at the same time.

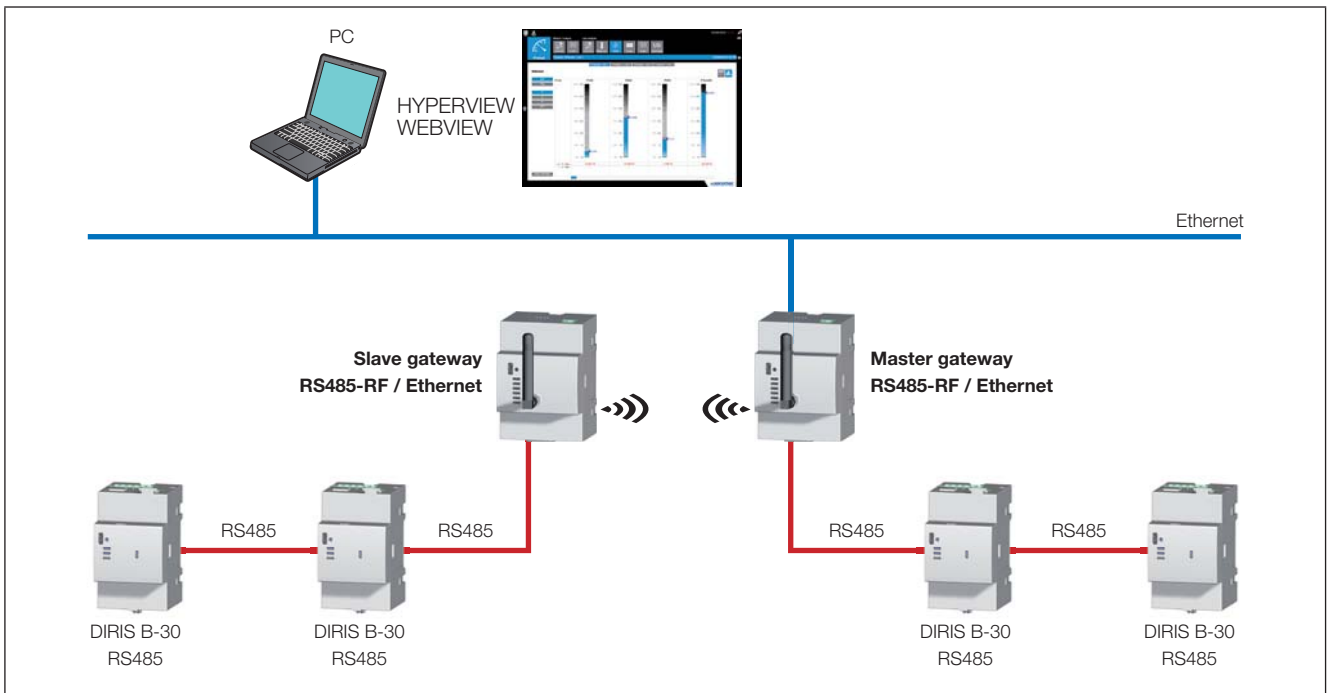
8.3.2. EC Declaration of Conformity

The EC Declaration of Conformity for the DIRIS G is available here:
www.socomec.com/en/diris-g



8.4. Multi-gateway communication

In this configuration, a slave RF gateway communicates with the master RF gateway.



Note: In this setup only the master gateway needs to auto-address the devices, not the slave gateway.

Note: Slave gateways cannot feature DIRIS O optional modules.

8.5. Communication tables

The communication tables and the associated explanations are available on the documentation page for the DIRIS G-30, G-40, G-50 and G-60 on the website SOCOME C at the following address:

www.socomec.com/en/diris-g



9. CONFIGURATION

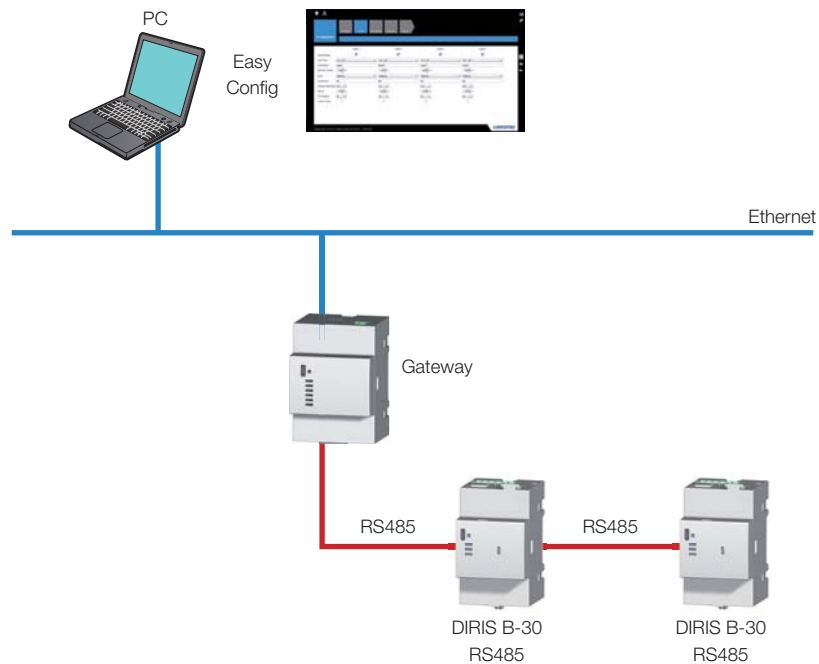
The gateway is configured via the Easy Config configuration software using Ethernet or USB. Easy Config must be installed before using the USB connection.

The Easy Config software is also used to configure the SOCOMEC devices via Ethernet or USB via the gateway without having to individually connect to each of the devices.

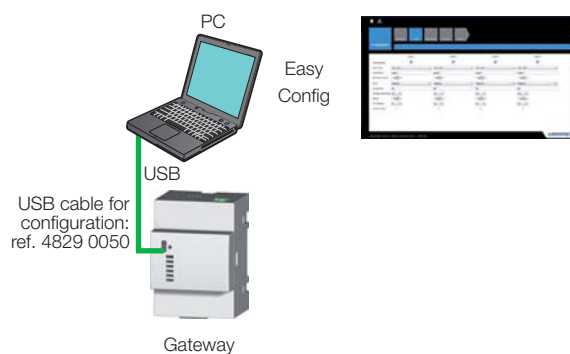
9.1. Configuration using Easy Config

9.1.1. Connection modes

Configuration using Easy Config (Ethernet)



Configuration using Easy Config directly (USB)



9.1.2. Time setting

From Easy Config, synchronisation is completed from an SNTP server or manually. We recommend using an FTP server. The time may be displayed on connected devices automatically based on a configurable update schedule.

The screenshot displays the 'EASY CONFIG TOOL V2.2' interface for configuring time settings on a DIRIS G-30/G-40/G-50/G-60 device. The interface is organized into several sections:

- SNTP server settings:** Activation is set to 'Yes'. The SNTP server IP address is '0.0.0.0' and the SNTP Server Port is '123'.
- Slave Time Diffusion:** Automatic slaves time update is set to 'Yes'. The Gateway time update frequency is '60 s' and the Slaves time update frequency is '30 s'.
- Slaves Information Diffusion:** Slaves load curve synchronisation method is 'Disabled', Slaves load curve integration time is '15 Min', Slaves historical values synchronisation method is 'Disabled', and Slaves historical values integration time is '60 Min'.
- Date/Time:** The Time Zone is set to 'UTC'.

At the bottom of the configuration window, there are options for synchronization:

- Automatic:** A button labeled 'Sync from PC Date/Time'.
- Manual:** A field showing '5/15/2014 3:04:28 PM' and a 'Send' button.

The status bar at the bottom indicates 'New File : DIRIS G-30/G-40/G-50/G-60' and 'Profile Level : Super User'. The Socomec logo is visible in the bottom right corner.



So that all connected devices display the same time, use the DIRIS G gateway or the multipoint DIRIS Digiware D-50 screen for synchronisation. Do not use the synchronisation function on a single-point DIRIS D-30 screen as part of a multidevice configuration.

10. CHARACTERISTICS

10.1. DIRIS G characteristics

10.1.1. Mechanical characteristics

Casing type	DIN-rail mounting module and base
Casing protection index	IP20 / IK06
Index of protection of front side	IP40 on the nose in modular assembly / IK08
Weight	DIRIS G-30, G-50 = 190 g DIRIS G-40, G-60 = 215 g

10.1.2. Electrical characteristics

Power supply	
Alternative voltage	110-230 VAC \pm 15% (Ph/N or Ph/Ph) Cat III
Frequency	50/60 Hz
Power consumption	6 VA
Battery	CR 1220 3 V lithium button cell battery
Connection	Removable spring-cage terminal block, 2x 2 positions, 0.5 - 2.5 mm ² solid cable or 0.25 - 1.5 mm ² stranded cable with ferrule

10.1.3. Input characteristics

Input	
Number	1
Type / Power supply	Optocoupler internal (12 VDC \pm 10%) or external (10-30 VDC \pm 10%) polarisation
Input function	Logic status, pulse meter or synchronisation pulse status
Connection	Removable screw terminal block, 2 positions, stranded or solid 0.14 - 1.5 mm ² cable

10.1.4. Communication characteristics

DIRIS G	
Connection	RS485
Connection type	2 - 3 half duplex wires
Protocol	Modbus RTU
Baudrate	2,400 - 115,200 bauds
Function	Communication with PMDs and meters
Connection	Removable screw terminal block, 2 positions, stranded or solid 0.14 - 1.5 mm ² cable
DIRIS G-40 and DIRIS G-60	
Connection	Radio-frequency (RF)
Frequency range	868 MHz (low frequency: 868.1 MHz and high: 869.5875 MHz)
Baudrate	38400 bauds
Function	Communication with DIRIS B-30 RF
Scope	300 m (free field)
Ethernet	

Connection	Ethernet 10/100 base-T, 2 RJ45 bases with integrated switch
Protocol	Modbus TCP (port 502, max. 4 simultaneous connections), Modbus RTU over TCP (port 503, max. 4 simultaneous connections), HTTP, SMTP, SNMP, DHCP, FTP
Clock	Internal
SNTP protocol	Gateway time updating from an NTP server. Connected PMDs time updating.
SMTP protocol	Sending of alarm emails from the gateway
FTP protocol	Automatic data export to FTP server (consumption curves, load curve, measurement logs) on DIRIS G-50 / G-60 only)
Function	Configuration of the gateway, connected PMDs and meters Access to the WEBVIEW web server, data centralisation
Connection	RJ45 connector - Straight-through or crossover cable
USB	
Connection type	USB 2 (required installation of Easy Config)
Protocol	Modbus RTU on USB
Function	Configuration of the gateway, connected PMDs and meters
Connection	Type B micro USB connector

10.1.5. Memory characteristics

Consumption history (memory extension for meters and measurement devices)	1 year (1 hour period)
Electrical values	2 months (for 10 minutes)
Number of events	Alarms: 1000 Network quality according to EN 50160: 1000

10.1.6. Environmental characteristics

Operating temperature	-10 - +70°C (IEC 60068-2-1/IEC 60068-2-2)
Storage temperature range	-25 - +85°C (IEC 60068-2-1/IEC 60068-2-2)
Operating humidity	55°C / 97% HR (IEC 60068-2-30)
Operating altitude	< 2000 m
Vibration	0.35 mm, 25 Hz, 20 min/axe (CEI 61557-12)
Rated impulse voltage	IEC 60947-1 V. IMP: 6.4 kV
UL	UL 61010 (DIRIS G-30 and G-50)
PEP ecopassport - ISO 14025	DIRIS G: SOCO-2014-02-v1-fr, SOCO-2014-02-v1-en

10.1.7. Electromagnetic compatibility

Immunity to electrostatic discharges	IEC 61000-4-2 LEVEL III
Immunity to radiated radio-frequency fields	IEC 61000-4-3 LEVEL III
Immunity to electrical fast transients/bursts	IEC 61000-4-4 LEVEL IV
Immunity to impulse waves	IEC 61000-4-5 LEVEL IV
Immunity to conducted disturbances	IEC 61000-4-6 LEVEL III
Immunity to power frequency magnetic fields	IEC 61000-4-8 400A/m LEVEL IVt
Conducted emissions	CISPR11 Group1 - CLASS B
Radiated emissions	CISPR11 Gr:1 - CLASS B (with external ferrites - ref. 4829 0048)

Immunity to voltage dips and short interruptions	IEC 61000-4-11 LEVEL III
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10.1.8. Safety

Safety	Compliance with Low Voltage Directive 2006/95/EC of 12th December 2006 (EN 61010-1:2010)
Insulation	Installation category III (300 VAC Ph/N), degree of pollution 2

10.1.9. Service life

MTTF (mean time to failure)	> 100 years
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10.2. DIRIS O optional modules characteristics

Mechanical characteristics	
Casing type	Modular for DIN rail mounting
Power supply ⁽¹⁾	
Alternative voltage	110-230 VAC $\pm 15\%$
Frequency	50/60 Hz
Connection	Removable spring-cage terminal block, 2x 2 positions, 0.5 - 2.5 mm ² solid cable or 0.25 - 1.5 mm ² stranded cable with ferrule
<i>(1) No power supply to DIRIS O-it.</i>	
DIRIS O-iod - 2 digital inputs/2 digital outputs	
Number of inputs	2 per optional module - 4 optional modules max.
Type	Optocoupler internal (12 VDC $\pm 10\%$) or external (10-30 VDC $\pm 10\%$) polarisation
Function	Logic status or pulse meter
Input connection	Removable screw terminal block, 4 positions, stranded or solid 0.14 - 1.5 mm ² cable
Number of outputs	2 per optional module - 4 optional modules max.
Type	Relay / 230 V $\pm 15\%$ - 1A
Function	Configurable alarm (current, power, etc.) on threshold overruns or remote controlled status
Output connections	2 removable screw terminal blocks, 2 x 2 positions, stranded or solid 0.14 - 1.5 mm ² cable
UL	UL 61010-1 conformity
DIRIS O-ioa - 2 analogue inputs/2 analogue outputs	
Number of inputs	2 per optional module - 4 optional modules max.
Type	4-20 mA
Function	Connection of analogue sensors (pressure, humidity, temperature, etc.)
Input connection	Removable screw terminal block, 4 positions, stranded or solid 0.14 - 1.5 mm ² cable
Outputs	Outputs that cannot be used with DIRIS G
UL	UL 61010-1 conformity
DIRIS O-it - 3 temperature inputs	
Number of inputs	3 external inputs + 1 ambient measurement Max 1 optional module
Dynamic	-20 °C to 150 °C
Type	PT100 or PT1000
Function of inputs 1, 2 and 3	Temperature measurement

Connection	3 removable screw terminal blocks, 3 x 4 positions, stranded or solid 0.14 - 1.5 mm ² cable
UL	UL 61010-1 conformity
DIRIS O-m - RS485 communication	
Connection	RS485 2 - 3 half duplex wires
Protocol	Modbus RTU
Baudrate	1,200 - 115,200 bauds
Function	Additional RS485 communication
Connection	Removable screw terminal block, 3 positions, stranded or solid 0.14 - 1.5 mm ² cable

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