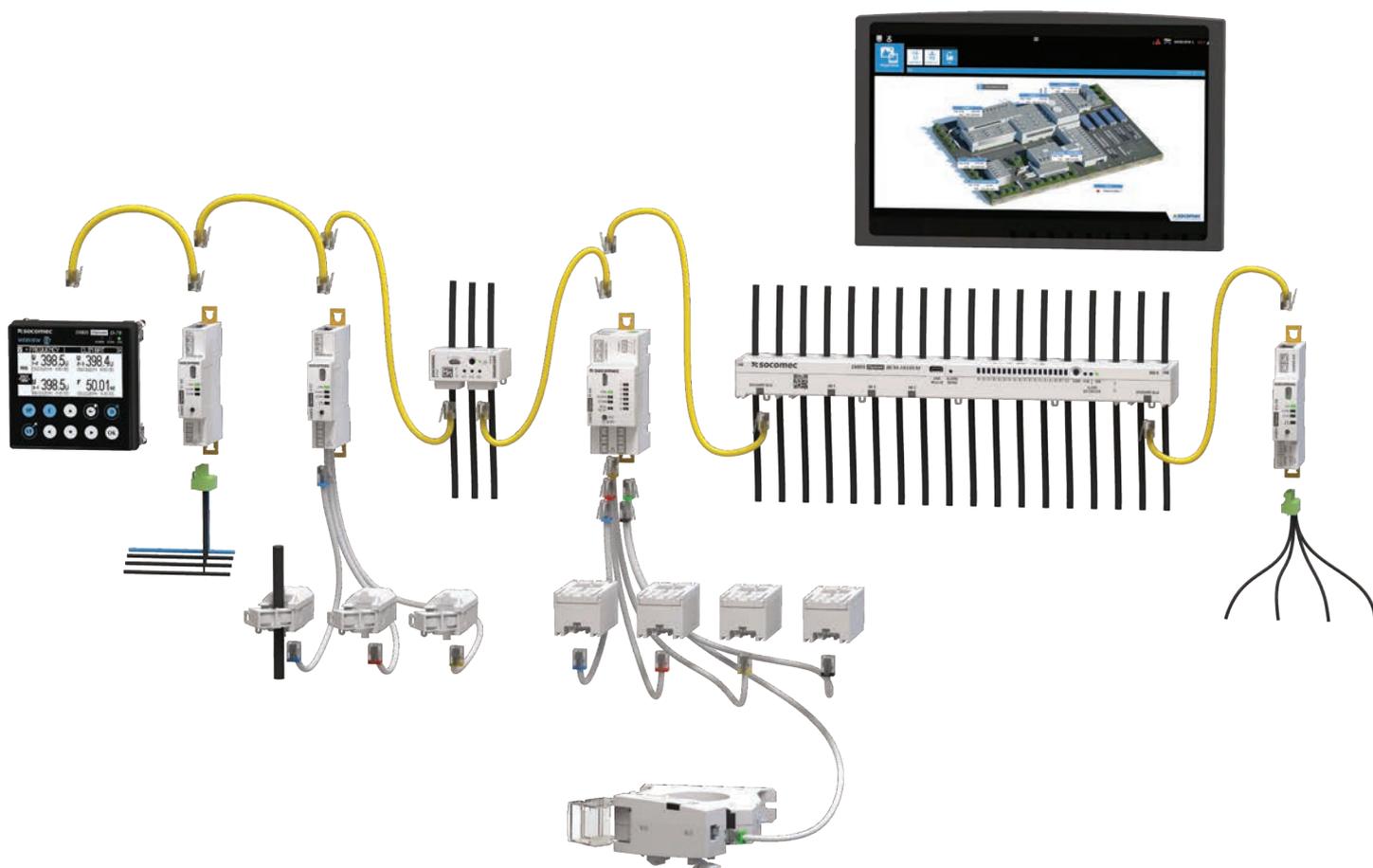# INSTALLATION AND OPERATING MANUAL

DIRIS Digiware

Multi-circuit Power Metering and Monitoring System

Socomec Resources Center
To download, brochures, catalogues
and technical manuals.

socomec
Innovative Power Solutions

CONTENTS

CONTENTS

1. DOCUMENTATION

All documentation relating to DIRIS Digiware and its associated sensors is available on the SOCOMEC website at the following address:
www.socomec.com

2. HAZARDS AND WARNINGS

The term "device" used in the following paragraphs encompasses DIRIS Digiware and its associated current sensors (TE, TR/iTR or TF).

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

SOCOMEC 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)

- Only duly authorised and qualified personnel may work or install/uninstall the device.
- The instructions are valid together with the specific instructions for the device.
- The device is designed only for its intended purpose as set out in the instructions.
- Only accessories authorised or recommended by SOCOMEC may be used in association with the device.
- Before proceeding with installation, maintenance, cleaning, disassembly, connection, or maintenance work, the device and system must be cut off from the mains to avoid electrocution and damaging the system and device.
- This device is not designed to be repaired by the user.
- For any questions related to the disposal of the device, please contact SOCOMEC.
- Do not put TBTS parts (USB, RJ45, ...) in contact with hazardous voltage.

Integrated current inputs of DIRIS Digiware BCM and S modules must be installed on 300 V insulated cables only. Do NOT clamp or pull out NON-INSULATED conductors carrying DANGEROUS VOLTAGE which could cause an electric shock, burn or arc flash.
Ref. IEC 61010-2-032

Failure to comply with the instructions of the device and this safety information can cause bodily injury, electric shock, burns, death or damage to property.

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 voltage indicated on the device is observed: 24 VDC ± 10%.
- The use of a SOCOMEC 230 VAC / 24 VDC power unit or a 24 VDC max 20 W class 2 power unit / SELV according to UL1310. The device must be protected with a 1A 24 VDC fuse.
- The network frequency indicated on the device is observed: 50 or 60 Hz.
- A maximum voltage at the voltage input terminals of 520 VAC phase/phase or 300 VAC phase/neutral is observed.
- Always connect the TE, TR/iTR or TF current sensors using the recommended connection cables and observing the maximum prescribed currents.
- Only use RJ45 SOCOMEC cables to interconnect the modules via the Digiware bus.

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

2.3. Responsibility

- 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.
- The installation, commissioning and operation of the devices described in this documentation must only be carried out by qualified personnel, i.e. trained. Failure to comply with the instructions of this manual does not incur liability of the manufacturer.
- Failure to observe the rules for installing this unit may compromise the device's intrinsic protection.
- The device must be placed in a system which itself complies with the applicable standards, directives and safety regulations of the country of installation.
- Any cable which needs to be replaced may only be replaced with a cable having the correct rating.
- Despite constantly striving for quality in preparing this manual, errors or omissions are always a possibility and are not the responsibility of SOCOMEC.

3. PRELIMINARY OPERATIONS

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

Check the following points as soon as you receive the package containing the device, one or several sensors:

- The packaging is in good condition
- The device has not been damaged during transit
- The device part number match your order
- The packaging includes the device fitted with removable terminal blocks and a Quick Start Guide.

4. PREREQUISITES

Before commissioning your DIRIS Digiware system, make sure all equipment operate under the latest firmware versions.

The latest firmware versions are available on the Socomec website.

The firmware upgrade is done using the Product Upgrade Tool software, by connecting a laptop to the Micro USB port of your DIRIS Digiware equipment.

For DIRIS Digiware M-50/M-70 and D-50/D-70, firmware upgrade can also be done remotely directly from their embedded webserver.

5. INTRODUCTION

5.1. DIRIS Digiware System

DIRIS Digiware is a measurement system (PMD*) with modular format. It always comprises a voltage measurement module (U-xx) and one or several current measurement modules.

The current measurement modules can be of three types:

- DIRIS Digiware S with 3 integrated current sensors to measure circuits up to 63A.
- DIRIS Digiware I (with 3, 4 or 6 current inputs) associated with TE, TR /iTR and TF sensors for the measurement from 5A up to 6000A.
- DIRIS Digiware BCM with 18/21 integrated current sensors to measure circuits up to 63A and 3 external current inputs associated with TE, TR/iTR and TF sensors for the measurement from 5A up to 6000A and residual current transformers.

DIRIS Digiware is an innovative concept based on centralising the voltage measurement by a dedicated DIRIS Digiware U module and the current by dedicated DIRIS Digiware I, S or BCM modules. The voltage and current measurements are interconnected by the Digiware bus. Several modules may be connected to the Digiware bus. This approach offers the possibility of characterising a high number of loads from a single voltage tap.

Cabling is made simple by a single voltage measurement connection. The connection mode for the current sensors also contributes to quick, easy installation and the automatic identification of the sensor (type and rating) significantly reduces the risk of installation errors. In addition, combining the current sensor with DIRIS Digiware means the overall accuracy of DIRIS Digiware + Current sensor measurement chain can be guaranteed for all values measured.

DIRIS Digiware is configured from its remote display or via the Easy Config System software. The measurements can be viewed on WEBVIEW-M, a web-based visualisation and analysis software embedded in the DIRIS Digiware M-70/D-70.

Thanks to its architecture, DIRIS Digiware can be easily integrated into an energy management system which requires a large number of loads to be monitored.

* PMD: Power Metering and Monitoring Device in accordance with IEC 61557-12.

5.1.1. Range

Communication and power supply interface

**DIRIS Digiware C
System interface***
DIRIS Digiware C-31
Ref. 4829 0101
*if there is no multipoint display
DIRIS Digiware C-32
Ref. 4829 0103
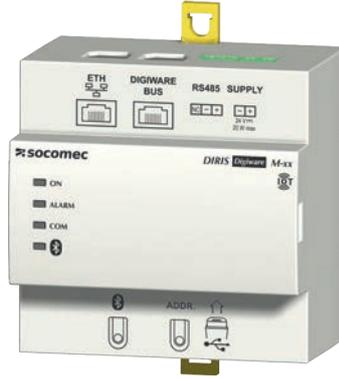
**DIRIS Digiware M
Communication gateway**
DIRIS Digiware M-50
Ref. 4829 0219 (without Bluetooth)
Ref. 4829 0221 (with Bluetooth)
DIRIS Digiware M-70
Ref. 4829 0220 (without Bluetooth)
Ref. 4829 0222 (with Bluetooth)

**DIRIS Digiware D
Multi-point display**
Diris Digiware D-50
Ref. 4829 0204 (without Bluetooth)
Ref 4829 0206 (with Bluetooth)
DIRIS Digiware D-70
Ref. 4829 0203 (without Bluetooth)
Ref. 4829 0207 (with Bluetooth)

Voltage measurement module	Current measurement module		
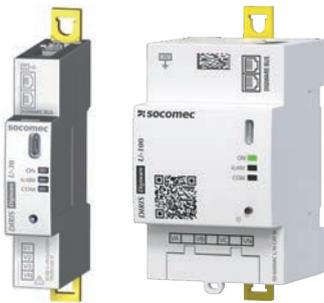
**DIRIS Digiware U-x
Voltage measurement**
DIRIS Digiware U-10
Ref. 4829 0105
DIRIS Digiware U-30
Ref. 4829 0102
DIRIS Digiware U-100
Ref. 4829 0108

**DIRIS Digiware I-3x
3 current measurement
inputs**
DIRIS Digiware I-30
Ref. 4829 0110
DIRIS Digiware I-31
Ref. 4829 0111
DIRIS Digiware I-35
Ref. 4829 0130
DIRIS Digiware I-31R
Ref. 4829 0115
DIRIS Digiware I-35R
Ref. 4829 0116

**DIRIS Digiware I-4x
4 current measurement
inputs**
DIRIS Digiware I-43
Ref. 4829 0129
DIRIS Digiware I-45
Ref. 4829 0131

**DIRIS Digiware I-6x
6 current measurement
inputs**
DIRIS Digiware I-60
Ref. 4829 0112
DIRIS Digiware I-61
Ref. 4829 0113
DIRIS Digiware I-61R
Ref. 4829 0117

Current measurement and sensing module	Branch-circuit Meter

Current measurement and sensing module

DIRIS Digiware S
3 current measurement inputs
DIRIS Digiware S-130
Ref. 4829 0160
DIRIS Digiware S-135
Ref. 4829 0161

Branch-circuit Meter

DIRIS Digiware BCM
Branch-circuit Meter 18 & 21 circuits

DIRIS Digiware BCM-1818
Ref. 4829 0165
DIRIS Digiware BCM-1818VM
Ref. 4829 0166
DIRIS Digiware BCM-2119
Ref. 4829 0167
DIRIS Digiware BCM-2119VM
Ref. 4829 0168

DIRIS Digiware BCM-2125
Ref. 4829 0169
DIRIS Digiware BCM-2125VM
Ref. 4829 0170
DIRIS Digiware BCM-2125R
Ref. 4829 0171

RCM Adaptor

RJ12 adaptor for residual CTs
DIRIS Digiware T-10
Ref. 4829 0620

IO input/output modules

DIRIS Digiware IO-10
Digital inputs/outputs
DIRIS Digiware IO-10
Ref. 4829 0140

DIRIS Digiware IO-20
Analogue inputs
DIRIS Digiware IO-20
Ref. 4829 0145

5.1.2. Principle

Digiware Bus

DIRIS
Digiware U

Voltage
measurement
(U)

DIRIS
Digiware I

Current
inputs (3I)

Multipoint display
DIRIS Digiware D

or

N
L3
L2
L1

Communication gateway
DIRIS Digiware M

DIRIS
Digiware I

DIRIS Digiware S

DIRIS
Digiware I

**DIRIS
Digiware I**

Current
inputs (4I)

Current
inputs (6I)

**DIRIS
Digiware IO**

Inputs/
outputs
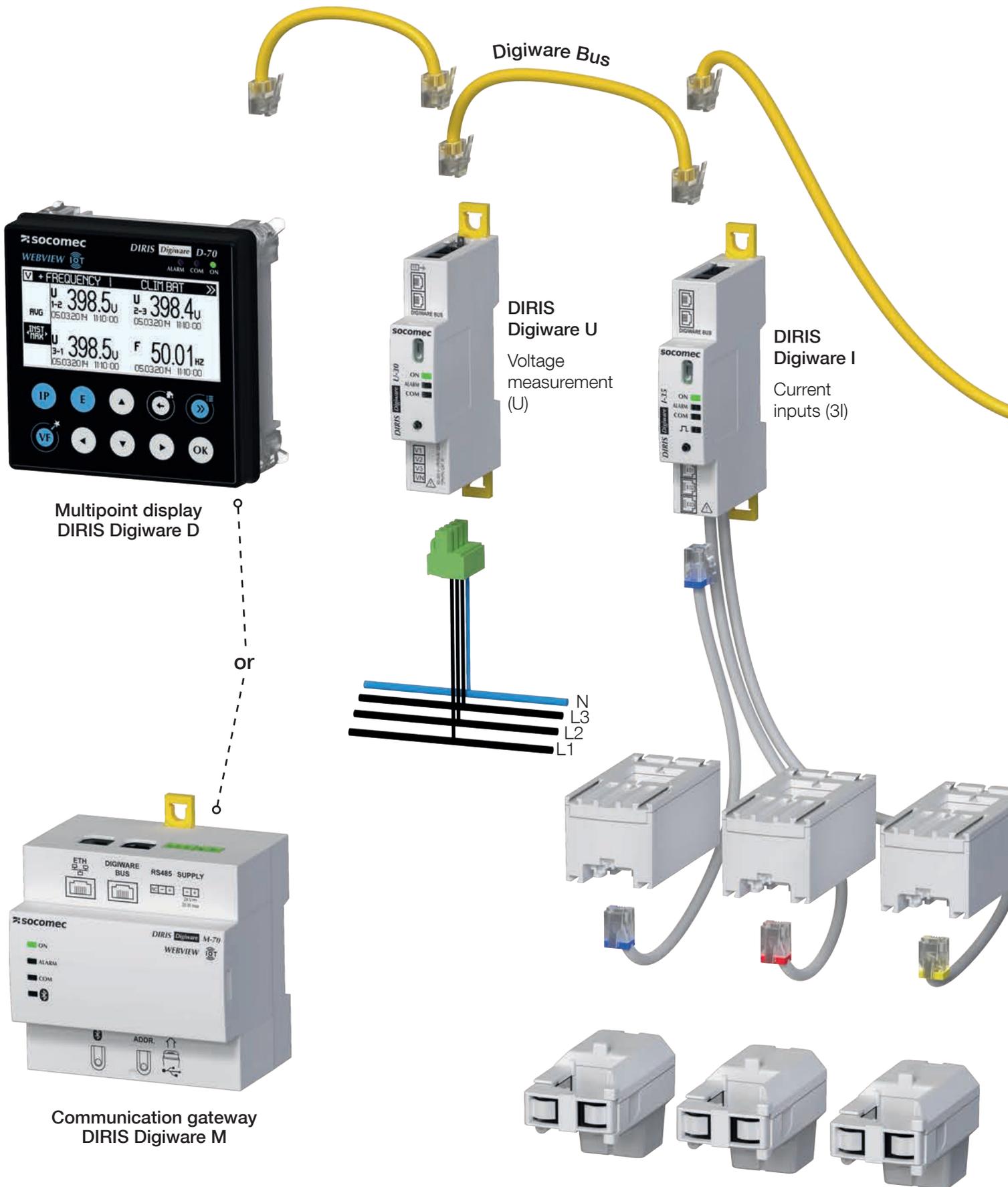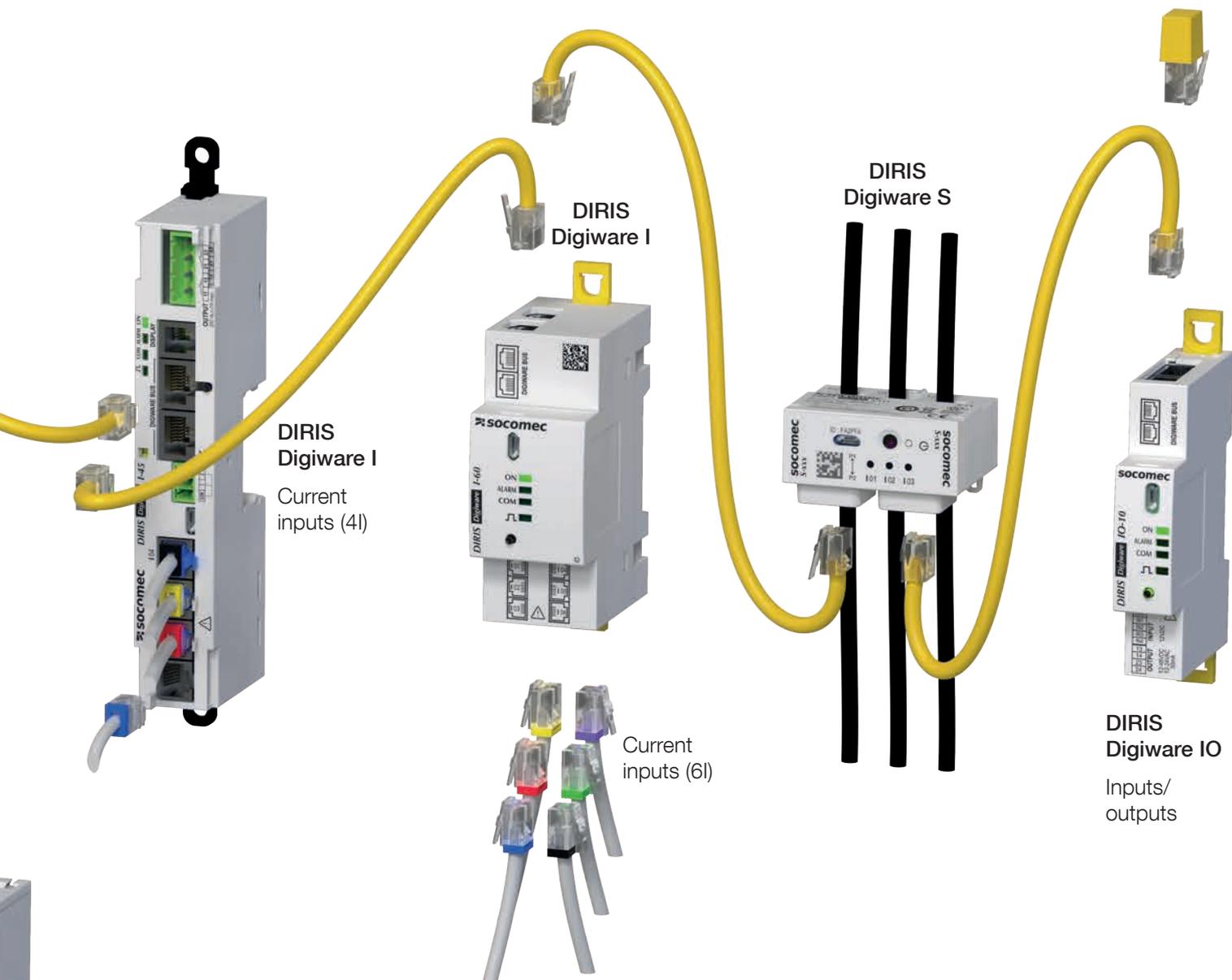
**Current sensors
TE, TR/iTR or TF**

5.1.3. Functions

DIRIS Digiware offers numerous functions, including:
- General measurements
    - Voltage measurement
    - Multi-load current measurement
    - Power, power factor, phi, cos phi and tan phi
    - Operation across 4 quadrants
    - Predictive power
    - Accuracy of the active energy class 0.5 according to the IEC 61557-12 standard
- Residual Current Monitoring
    - Residual current I∆.
    - Protective Earth current IPE in Protective Earth conductor
- Power quality
    - THD and harmonics up to 63rd for voltage and current
    - K-factor
    - Crest Factor for voltage and current
    - Current and voltage unbalance
    - Direct, inverse and zero-sequence voltages and currents
    - EN50160 events (Uswl, Udip, Uint) and overcurrents
    - Waveform Capture
- Data logging
    - Recording of average electrical values
    - Recording and timestamping of min/max electrical values
- Metering
    - Total and partial active, reactive and apparant energies (+/- kWh, +/- kVarh, kVAh)
    - Load curves / demand profiles
- Alarm
    - Timestamped alarms with boolean combination
- Current inputs
    - Measurement of 3,4,6,21 or 24 currents per current measurement module
    - Current inputs with quick connection and automatic recognition of the current sensors
    - Simultaneous management of several single-phase, two-phase and three-phase loads
    - Connection of TE solid-core, TR/iTR split-core and TF flexible current sensors and residual current transformers (for DIRIS Digiware BCM)
    - Checking the connection, detecting the CT and auto-configuring the networks
    - Accuracy of the global measurement chain (DIRIS Digiware + sensors) = Class 0.5 performance according to IEC 61557-12
- Inputs/outputs
    - Analogue and digital inputs/outputs
- Communication
    - RS485 or Ethernet communication ports
    - Multiple communication protocols (Modbus RTU, Modbus TCP, BACnet IP, SNMP V1, V2, V3 & Traps)
    - Measurements available in the web server (WEBVIEW-M) embedded in the DIRIS Digiware M-70 gateway and DIRIS Digiware D-70 display
    - Time synchronisation done by the DIRIS Digiware M-50/M-70 gateway and DIRIS Digiware D-50/D-70 display
    - Auto-Discovery of slave modules from the DIRIS Digiware M gateway and DIRIS Digiware D display

5.1.4. Measured electrical parameters

	DIRIS Digiware				
	C-31	M-50	M-70	D-50	D-70
Function					
Basic system interface	•				
Multi-point display				•	•
Multifunction gateway		•	•	•	•
Power supply					
24 VDC	•	•	•	•	•
Communication					
Master RS485		•	•	•	•
Slave RS485	•	•	•	•	•
Digiware bus	•	•	•	•	•
Ethernet Modbus TCP		•	•	•	•
BACnet IP		•	•	•	•
SNMP v1, v2, v3 & Traps		•	•	•	•
WEBVIEW-M webserver			•		•
WEB-CONFIG webserver		•	•	•	•
Format					
Mounting	DIN rail	DIN rail	DIN rail	Panel mounted	Panel mounted
Dimensions	1 module	9 modules	9 modules	96 mm x 96 mm	96 mm x 96 mm
Reference	48290101	48290219 48290221 (Bluetooth)	48290220 48290222 (Bluetooth)	48290204 48290206 (Bluetooth)	48290203 48290207 (Bluetooth)

	DIRIS Digiware U		
	U-10	U-30	U-100
Multi-measurement			
U12, U23, U31, V1, V2, V3, Vn, F	•	•	•
U system, V system		•	•
Ph/N unbalance (Vnb, Vnba, Vdir, Vinv, Vhom)		•	•
Ph/Ph unbalance (Unb, Unba, Udir, Uinv)		•	•
Power quality			
THDv1, THDv2, THDv3, THDu12, THDu23, THDu31, THD Vsys, THD Usys		•	•
Individual harmonics U & V (up to 63rd)		•	•
Crest Factor		•	•
Voltage dips, swells and interruptions according to EN50160		•	•
Alarms			
Thresholds		•	•
Data logging			
Logs of average values		•	•
Regulations			
NYPSC			•
California Weights & Measures			•
Format			
Width/Number of modules	18 mm / 1	18 mm / 1	54 mm / 3
Part number	4829 0105	4829 0102	4829 0108

	DIRIS Digiware I									
	I-30	I-31	I-31R	I-35	I-35R	I-43	I-45	I-60	I-61	I-61R
Application	Metering			Analysis		Monitoring	Analysis	Metering		
Number of current inputs	3	3	3	3	3	4	4	6	6	6
Metering										
± kWh, ± kvarh, kVAh	•	•	•	•	•	•	•	•	•	•
Multi-tariff (max. 8)		•	•	•	•		•		•	•
Load curves		•	•	•	•		•		•	•
Multi-measurement										
I1, I2, I3, In, ΣP, ΣQ, ΣS, ΣPF	•	•	•	•	•	•	•	•	•	•
P, Q, S, PF per phase		•	•	•	•	•	•			
Predictive power				•	•		•			
Current unbalance (Inba, Idir, Iinv, Ihom, Iunb)				•	•		•			
Phi, cos Phi, tan Phi				•	•		•			
Quality										
THDi1, THDi2, THDi3, THDin, THD Isys				•	•	•	•			
Individual harmonics I (up to 63rd)				•	•		•			
Crest Factor				•	•		•			
Overcurrents				•	•		•			
Alarms										
Thresholds		○		•	•		•		○	
Inputs/outputs										
Number						2/2	2/2			
Data logging										
Logs of average values				•	•		•			
Regulations										
NYPSC			•		•					•
California Weights & Measures			•		•					•
Format										
Width	18 mm	18 mm	18 mm	18 mm	18 mm	27 mm	27 mm	36 mm	36 mm	36 mm
Number of modules	1	1	1	1	1	1.5	1.5	2	2	2
Part number	4829 0110	4829 0111	4829 0115	4829 0130	4829 0116	4829 0129	4829 0131	4829 0112	4829 0113	4829 0117

○: only for Total Power (P,Q,S).

	DIRIS Digiware S	
	S-130	S-135
Application	Metering	Analysis
Number of current inputs	3	3
Basic current Ib / Maximum current Imax	10A / 63A	10A / 63A
Load type accepted	1P+N 2P 2P+N 3P 3P+N	1P+N 2P 2P+N 3P 3P+N
Metering		
± kWh, ± kvarh, kVAh	●	●
Multi-tariff (max 8)		●
Load curves / demand profiles		●
Multi-measurement		
I1, I2, I3, In, ∑P, ∑Q, ∑S, ∑PF	●	●
P, Q, S, PF per phase		●
Predictive power		●
Current unbalance (Inba, Idir, Iinv, Ihom, Inb)		●
Phi, cos Phi, tan Phi		●
Power Quality		
THDi1, THDi2, THDi3, THDin, THD Isys		●
Individual harmonics I (up to rank 63)		●
Crest Factor I1, I2, I3		●
Inrush		●
Alarms		
Thresholds		●
System alarms		●
Protection alarms		●
Protection counters		●
Boolean combination of alarms		●
Trends		
Average values		●
Advanced features		
Voltage detection	●	●
VirtualMonitor technology	●	●
AutoCorrect technology	●	●
Format		
Width	54 mm	54 mm
Part number	**4829 0160**	**4829 0161**

	DIRIS Digiware BCM						
	BCM-1818	**BCM-1818VM**	**BCM-2119**	**BCM-2119VM**	**BCM-2125**	**BCM-2125VM**	**BCM-2125R**
Application	Analysis	Analysis	Analysis	Analysis	Analysis	Analysis	Analysis
Number of current inputs	18 + 3xRJ12	18 + 3xRJ12	21 + 3x RJ12	21 + 3xRJ12	21 + 3xRJ12	21 + 3xRJ12	21 + 3xRJ12
Nominal current In / Maximum current Imax	32...63A/ 80A	32...63A/ 80A	32...63A/ 80A	32...63A/ 80A	40...100A/ 120A	40...100A/ 120A	40...100A/ 120A
Load type accepted	1P+N 2P 2P+N 3P 3P+N	1P+N 2P 2P+N 3P 3P+N	1P+N 2P 2P+N 3P 3P+N	1P+N 2P 2P+N 3P 3P+N	1P+N 2P 2P+N 3P 3P+N	1P+N 2P 2P+N 3P 3P+N	1P+N 2P 2P+N 3P 3P+N
Metering							
± kWh, ± kvarh, kVAh	•	•	•	•	•	•	•
Multi-tariff (max 8)	•	•	•	•	•	•	•
Load curves / demand profiles	•	•	•	•	•	•	•
Multi-measurement							
I1, I2, I3, In, ∑P, ∑Q, ∑S, ∑PF	•	•	•	•	•	•	•
P, Q, S, PF per phase	•	•	•	•	•	•	•
Predictive power	•	•	•	•	•	•	•
Current unbalance (Inba, Idir, Iinv, Ihom, Inb)	•	•	•	•	•	•	•
Phi, cos Phi, tan Phi	•	•	•	•	•	•	•
Power Quality							
THDi1, THDi2, THDi3, THDin, THD Isys	•	•	•	•	•	•	•
Individual harmonics I (up to rank 63)	•	•	•	•	•	•	•
Crest Factor I1, I2, I3	•	•	•	•	•	•	•
Inrush	•	•	•	•	•	•	•
Alarms							
Thresholds	•	•	•	•	•	•	•
System alarms	•	•	•	•	•	•	•
Protection alarms	•	•	•	•	•	•	•
Protection counters	•	•	•	•	•	•	•
Boolean combination of alarms	•	•	•	•	•	•	•
Trends							
Average values	•	•	•	•	•	•	•
Advanced features							
Voltage detection	•	•	•	•	•	•	•
VirtualMonitor technology		•		•		•	
AutoCorrect technology	•	•	•	•	•	•	•
Residual Current Monitoring	•	•	•	•	•	•	•
Regulation							
NYPSC							•
California Weights & Measures							•
Format							
Width	324 mm	324 mm	400 mm	400 mm	533.5 mm	533.5 mm	533.5 mm
Part number	4829 0165	4829 0166	4829 0167	4829 0168	4829 0169	4829 0170	4829 0171

	DIRIS Digiware IO	
	IO-10	**IO-20**
Application	Metering / Monitoring / Analysis	
Number of digital inputs/outputs	4/2	-
Number of analogue inputs	-	2
Format		
Width	18 mm	18 mm
Number of modules	1	1
Part number	4829 0140	4829 0145

5.1.5. Dimensions

5.1.5.1. M-50 & M-70 gateways
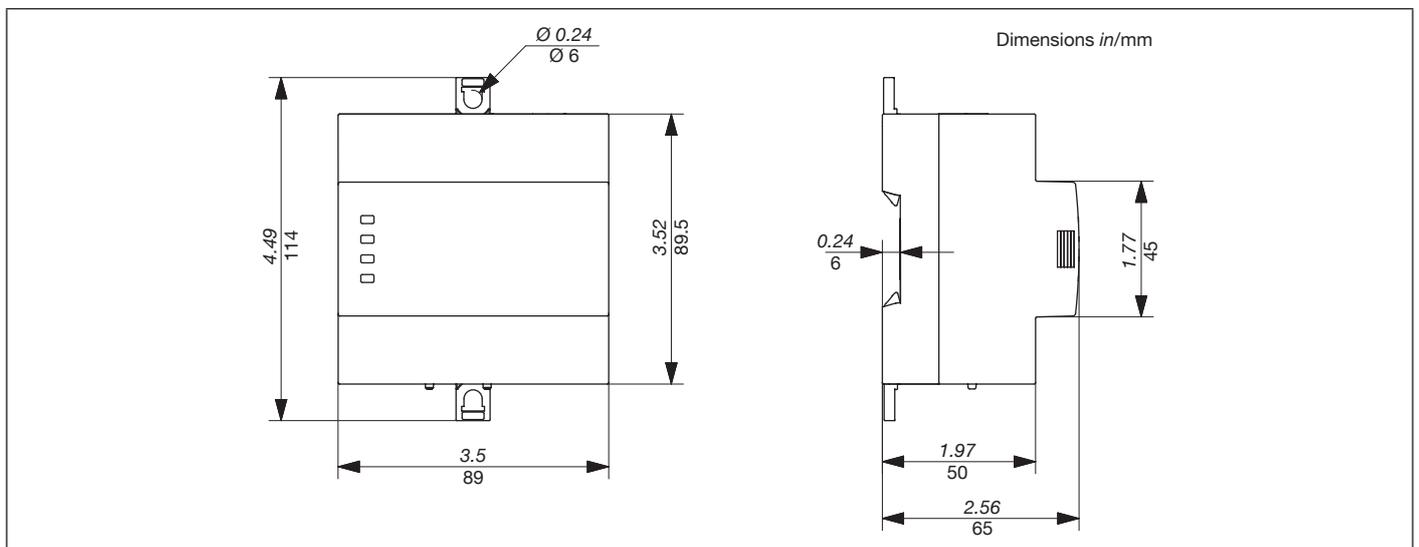
5.1.5.2. D-50 & D-70 displays

5.1.5.3. DIRIS Digiware C, U & I-3x, I-6x, IO-x

Dimensions *in*/mm

C-3x
U-10
U-30
I-3x
IO-x

3.94 / 100

0.19 / 5

0.70 / 18

I-6x

3.54 / 90

1.42 / 36

U-100

2.12 / 54

1.77 / 45

1.73 / 44

0.59 / 15

2.56 / 65

5.1.5.4. DIRIS Digiware I-4x

Dimensions *in*/mm

5.90 / 150

1 / 25.5

0.83 / 21

1.77 / 45

1.06 / 27

1.76 / 45

2.28 / 58

2.83 / 72
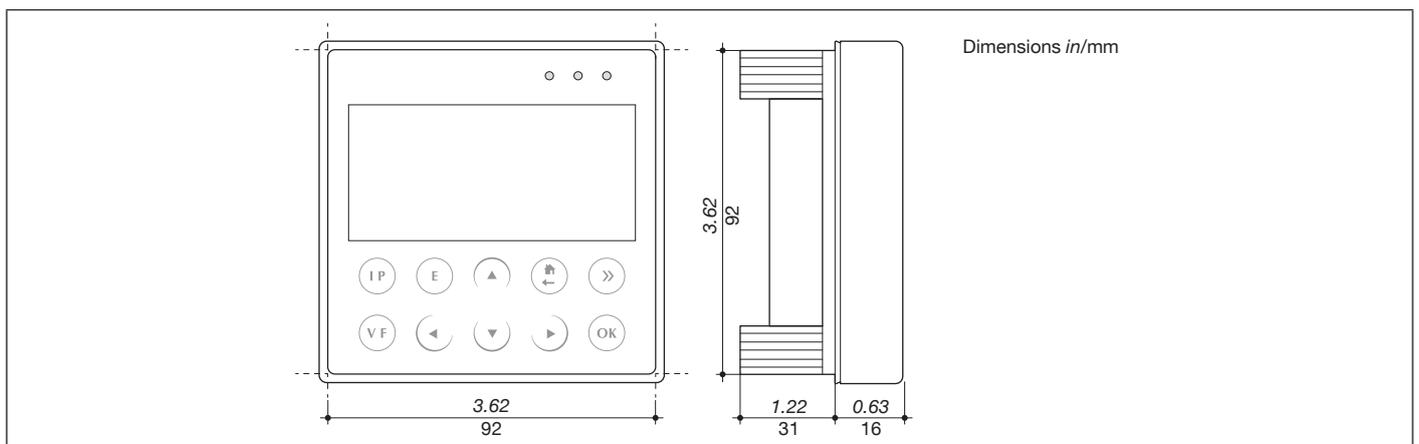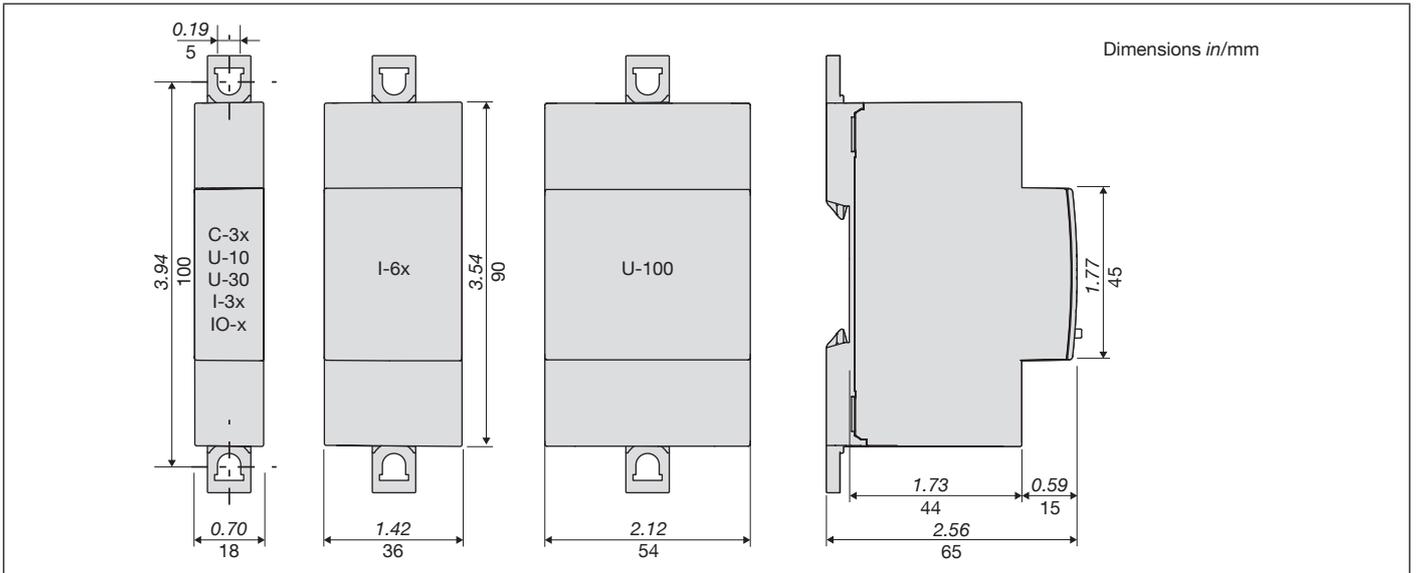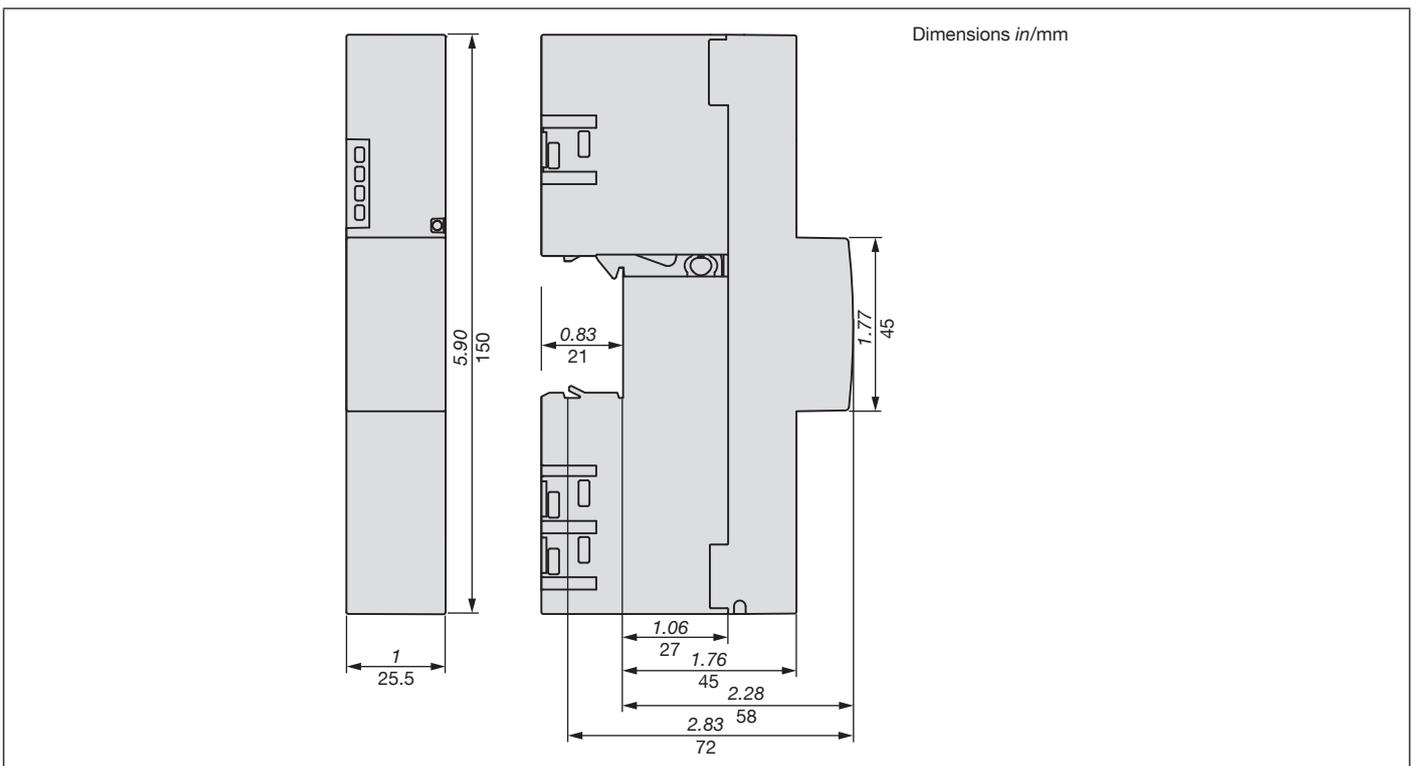
5.1.5.5. DIRIS Digiware S-xx

Dimensions *in*/mm

5.1.5.6. DIRIS Digiware BCM

DIRIS Digiware BCM-1818

Dimensions *in*/mm

DIRIS Digiware BCM-21xx

Dimensions *in*/mm

	A	B	C	D	E	F	G
DIRIS Digiware BCM-2119 / 2119VM	*15.75* 400	*0.75* 19	*0.35* 8,8	*0.34* 8,6	*0.39* 10	*1.18* 30	*2.09* 53
DIRIS Digiware BCM-2125 / 2125VM	*20.98* 533,5	*0.98* 25	*0.55* 14	*0.54* 13,6	*0.75* 19	*1.26* 32	*2.68* 68
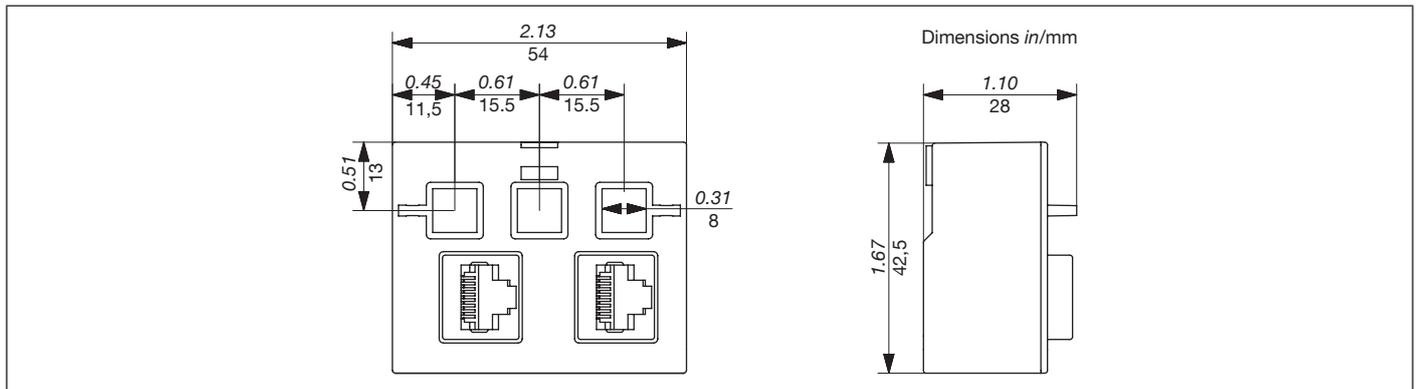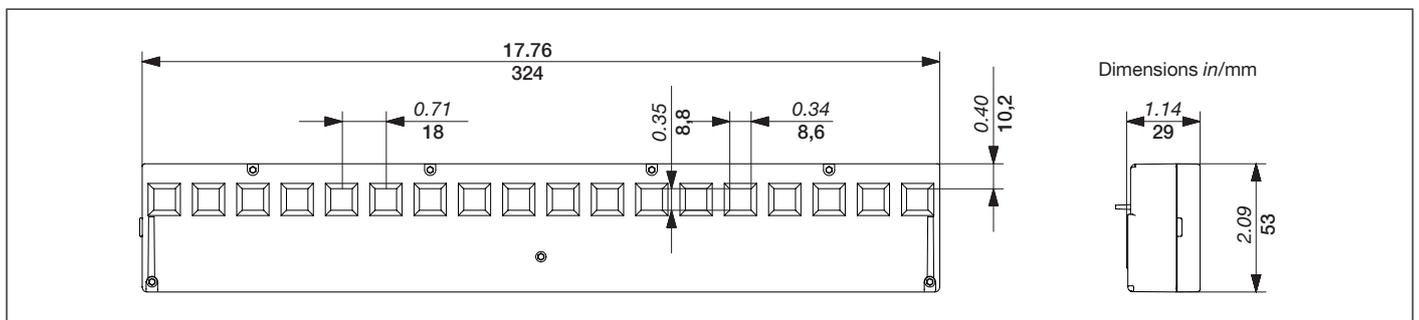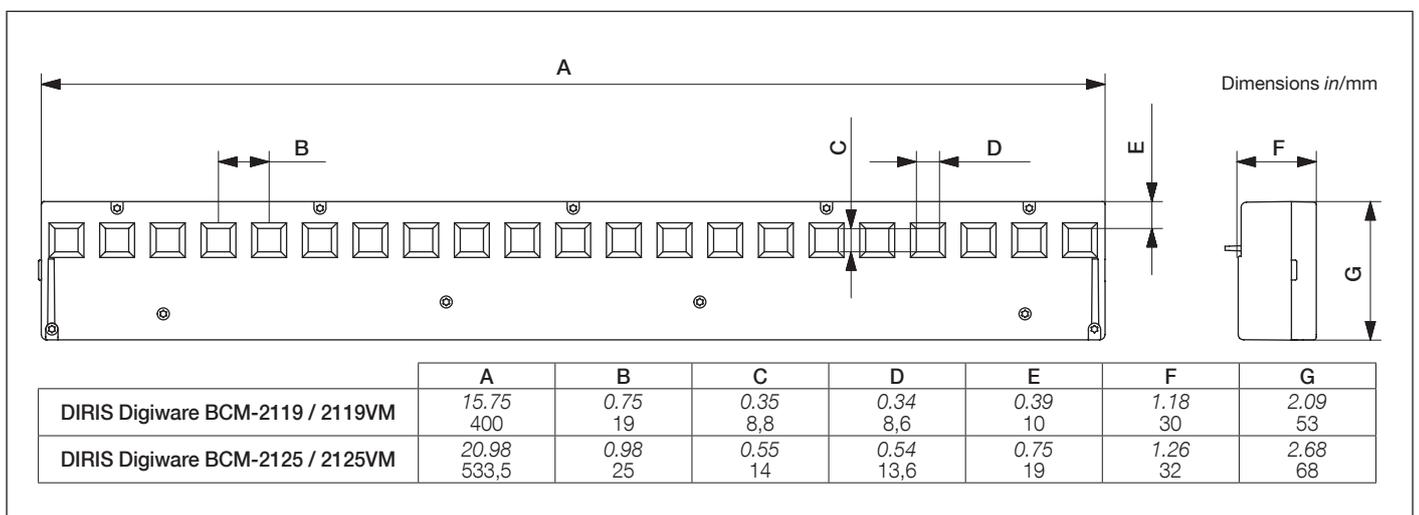
5.2. Presentation of the associated current sensors

Various types of current sensors are connected to DIRIS Digiware I & BCM modules: solid-core (TE), split-core (TR/iTR) or flexible (TF). The variety of these sensors make them suitable with any type of new, existing or high-current existing installation. They all use a specific link with the DIRIS Digiware I current measurement module. This link ensures rapid connection without any wiring error. DIRIS Digiware automatically recognises the type of current sensor that is connected and its rating.. In addition, combining them means the overall accuracy of DIRIS Digiware + Current sensor measurement chain can be guaranteed over a large measurement range.

DIRIS Digiware
I-30 / I-31 / I-35

DIRIS Digiware
I-4x

DIRIS Digiware
I-60 / I-61

3 Current sensors
TE / TR/iTR / TF

4 Current sensors
TE / TR/iTR / TF

6 Current sensors
TE / TR/iTR / TF
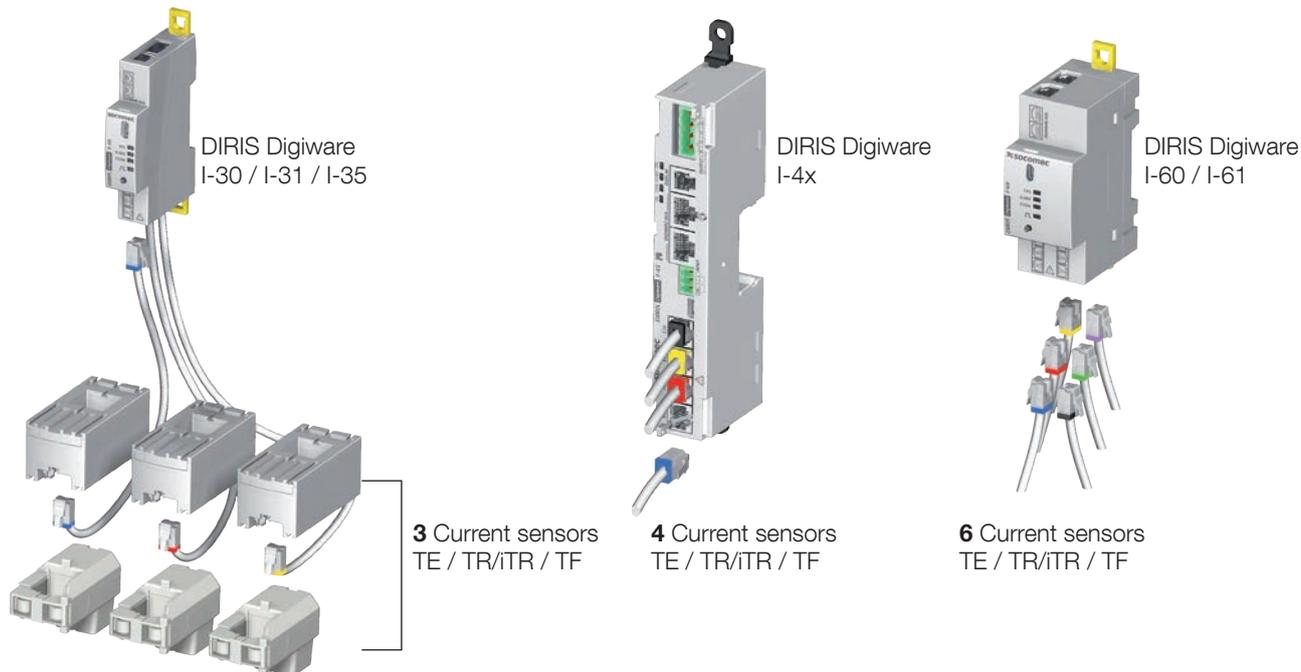
⚠ For connecting the current sensors, use SOCOMEC cables or RJ12 straight cables, twisted pair, unshielded, 600 V -10°C / +70°C. It is recommended that all the current sensors be installed in the same direction.

Digiware Bus

DIRIS Digiware
BCM-18xx

3 current sensors
TE / TR / iTR / TF

Connection cables for current sensors:

RJ12 connection cables	Cable length (m)										
	0.1	0.2	0.3	0.5	1	2	3	5	7	10	50 m reel + 100 connectors*
Number of cables	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
1	-	-	-	-	-	-	-	4829 0602	-	4829 0603	4829 0601
3	4829 0580	4829 0581	4829 0582	4829 0595	4829 0583	4829 0584	4829 0606	4829 0607	4829 0608	4829 0609	-
4				4829 0596	4829 0588	4829 0589	-	-	-	-	-
6	4829 0590	4829 0591	4829 0592	4829 0597	4829 0593	4829 0594	-	-	-	-	-

* When producing cables, do not exceed a maximum length of 10 metres.

5.2.1. TE solid-core current sensors

The TE solid-core current sensors are used to set up measurement points in a new or existing installation. They are easy to integrate as they are compact and match the pitch of the circuit breakers. A wide range of accessories are also available for direct fitting on all type of cabling (cable, flexible or rigid busbar) or on a DIN rail support or plate.

Thanks to the specific link, they are recognised by DIRIS Digiware and a high level of overall accuracy for the measurement chain is guaranteed.

5.2.1.1. Range

	TE-18	TE-18	TE-25	TE-35	TE-45	TE-55
Pitch	18 mm	18 mm	25 mm	35 mm	45 mm	55 mm
Nominal current range In	5 - 20 A	25 - 63 A	40 - 160 A	63 - 250 A	160 - 630 A	400 - 1000 A
Maximum I	24 A	75.6 A	192 A	300 A	756 A	1200 A
Part number	4829 0500	4829 0501	4829 0502	4829 0503	4829 0504	4829 0505

	TE-90
Pitch	90 mm
Nominal current range In	600 - 2000 A
Maximum I	2400 A
Part number	4829 0506

5.2.1.2. Dimensions

Dimensions *in*/mm

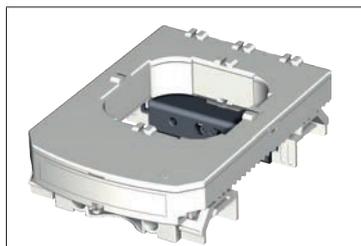|	TE-18	TE-25	TE-35	TE-45	TE-55
Pitch	*0.71* 18 (staggered assembly)	*0.98* 25	*1.37* 35	*1.77* 45	*2.16* 55
LxHxD	*1.10 x 0.79 x 1.77* 28 x 20 x 45	*0.98 x 1.28 x 2.56* 25 x 32.5 x 65	*1.37 x 1.28 x 2.79* 35 x 32.5 x 71	*1.77 x 1.28 x 3.38* 45 x 32.5 x 86	*2.16 x 1.28 x 3.93* 55 x 32.5 x 100
Window (W)	*Ø 0.33* Ø 8.4	*0.53 x 0.53* 13.5 x 13.5	*0.82 x 0.82* 21 x 21	*1.22 x 1.22* 31 x 31	*1.61 x 1.61* 41 x 41
(T)	-	*0.69* 17.5	*0.69* 17.5	*0.77* 19.5	*0.85* 21.5

TE-90
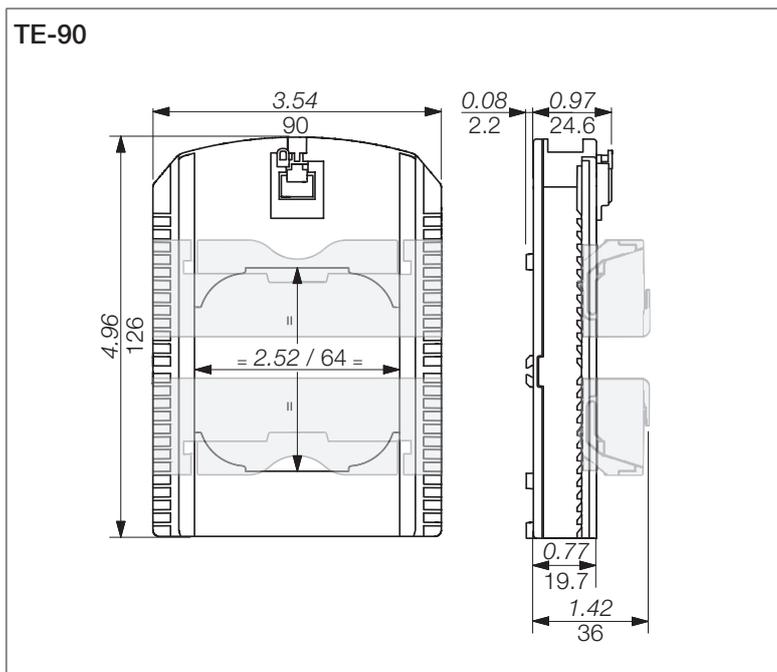
5.2.2. TR/iTR split-core current sensors

The TR/iTR split-core current sensors are used to set up measurement points in a new or existing installation without interfering with its cabling. Thanks to the specific link, they are recognised by DIRIS Digiware and the overall accuracy of the measurement chain is guaranteed.

In addition, iTR sensors detect the presence of voltage in the cable passing through them.

5.2.2.1. Range

Four models are available from 25A to 600A to analyse several types of loads.

	TR-10 / iTR-10	TR-14 / iTR-14	TR-21 / iTR-21	TR-32 / iTR-32
Cable passage diameter	Ø 10 mm	Ø 14 mm	Ø 21 mm	Ø 32 mm
Nominal current range In	25 - 63 A	40 - 160 A	63 - 250 A	160 - 600 A
Recommended cable section	6 mm² (iTR-10)	10 mm² (iTR-14)	50 mm² (iTR-21)	50 mm² (iTR-32)
Maximum I	75.6 A	192 A	300 A	720 A
Part number	4829 0555 / 4829 0655	4829 0556 / 4829 0656	4829 0557 / 4829 0657	4829 0558 / 4829 0658

5.2.2.2. Dimensions

Dimensions *in*/mm

	TR-10 / iTR-10	TR-14 / iTR-144	TR-21 / iTR-21	TR-32 / iTR-32
A	*1.74* 44	*2.63* 67	*2.56* 65	*3.38* 86
B	*1.02* 26	*1.14* 29	*1.45* 37	*2.08* 53
C	*1.10* 28	*1.10* 28	*1.69* 43	*1.85* 47
D	-	*0.55* 14	*0.82* 21	*1.26* 32
E	-	*0.59* 15	*0.90* 23	*1.30* 33
Window	*0.39* 10	*0.55* 14	*0.82* 21	*1.26* 32

5.2.3. TF flexible current sensors

The TF flexible current sensors use the Rogowski principle, covering a wide current range without saturation.

Their flexible design and easy opening system enables a quick installation inside electrical panels, making them particularly well suited for adding measuring points in existing electrical installations, especially when space is limited.

The secure lock technology prevents non voluntary openings of the Rogowski rope.

5.2.3.1. Range

Six models are available, covering a large current range up to 6000 A with openings of different shapes and sizes. They include a compact and self-supplied integrator, required to shape the current signal.

⚠️ Due to the specific RJ12 connection, the TF current sensors can only be used with DIRIS Digiware I, DIRIS Digiware BCM, DIRIS B and DIRIS A-40/A-100/A-200 power meters. Used in conjunction with these PMD equipped with RJ12 connectors, the overall accuracy of the measurement chain is guaranteed.

	TF-40	TF-80	TF-120	TF-200	TF-300	TF-600
Ø (mm)	40	80	120	200	300	600
I nom. (a.c.)	100 … 400A	150 … 600A	400 … 2000A	600 … 4000A	1600 … 6000A	1600 … 6000A
Part number	4829 0573	4829 0574	4829 0575	4829 0576	4829 0577	4829 0578

5.2.3.2. Dimensions

Dimensions *in*/mm

	TF-40	TF-80	TF-120	TF-200	TF-300	TF-600
Diameter D	*1.57* 40	*3.15* 80	*4.72* 120	*7.87* 200	*11.81* 300	*23.62* 600
Perimeter P	*4.96* 126	*9.88* 251	*14.84* 377	*24.72* 628	*37.09* 942	*74.21* 1885
Integrator	*8.04 x 0.75 x 0.6* 128 x 19 x 15					
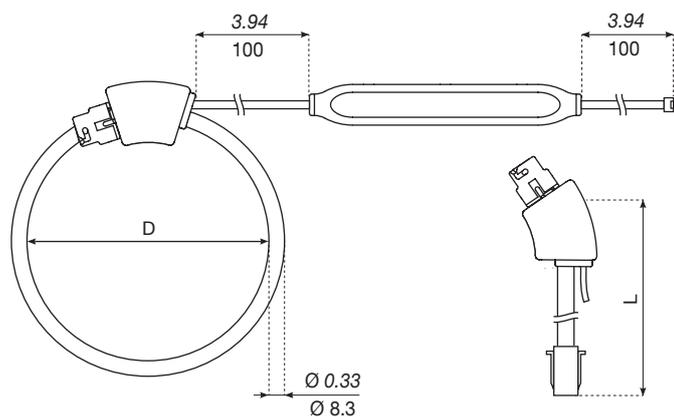
5.2.4. Adaptor for 5A current transformers

The adaptor enables the use of a standard sensor supplying a 1A or 5A current to the secondary sensor. When this kind of sensor is used, the overall accuracy of DIRIS Digiware + sensor is not guaranteed and will depend on the accuracy of the associated sensor (see standard "IEC 61557-12 annex F" for more information).
The max primary current is 10000 A for a 5A-secondary CT and 2000 A for a 1A-secondary CT.

5.2.4.1. Range

	5A adaptor
I nom.	5 A
I max.	6 A
Part number	4829 0599

5.2.4.2. Dimensions

Dimensions *in*/mm
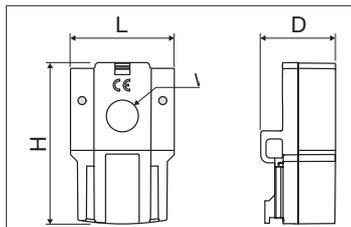
	5A adapter
LxHxD	*1.10 x 0.79 x 1.77* 28 x 20 x 45
Aperture (W)	*Ø 0.33* Ø 8.4

5.2.5. ΔIC, ΔIP-R, WR and TFR residual current transformers

Residual Current Transformers enclose active conductors, providing the differential summation of vector currents which enables the detection of leakage currents.

Solid-core (ΔIC, WR and TFR series) or split-core (ΔIP-R series), and available in all shapes and sizes, they are suitable for any cable/bar size and configuration.

With a choice of multiple mounting accessories (for ΔIC and ΔIP-R), they can mounted on a DIN rail, on a back plate or attached directly to the cable.

A centering accessory (for ΔIC and ΔIP-R) which uses a flexible clamping allows you to center the cable in residual CT, ensuring accurate measurements and better immunity to disruptions in the mains power. It also allows you to mount the residual CT directly on a cable.

ΔIP-R split-core residual CTs are quick and easy to install with their innovative «one-click» open/close system. This system, designed without any parts, guarantees safe installation.

5.2.5.1. Range

Connection cables for current sensors:

RJ12 connection cables	Cable length (m)										
	0.1	0.2	0.3	0.5	1	2	3	5	7	10	50 m reel + 100 connectors*
Number of cables	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
1	-	-	-	-	-	-	4829 0606	4829 0602	-	4829 0603	4829 0601
3	4829 0580	4829 0581	4829 0582	4829 0595	4829 0583	4829 0584	-	4829 0607	4829 0608	4829 0609	-
4				4829 0596	4829 0588	4829 0589	-	-	-	-	-
6	4829 0590	4829 0591	4829 0592	4829 0597	4829 0593	4829 0594	-	-	-	-	-

* When producing cables, do not exceed a maximum length of 10 meters.

ΔIC circular solid-core residual current transformers

	ΔIC8	ΔIC15	ΔIC30	ΔIC50	ΔIC80	ΔIC120	ΔIC200	ΔIC300
Diameter	8 mm	15 mm	30 mm	50 mm	80 mm	120 mm	200 mm	300 mm
Residual Current range	3 mA - 3 A							
Reference	4829 0520	4950 6015	4950 6030	4950 6050	4950 6080	4950 6120	4950 6200	4950 6300

ΔIP-R circular split-core residual current transformers

	ΔIP-R50	ΔIP-R80	ΔIP-R120
Diameter	50 mm	80 mm	120 mm
Residual Current range	3 mA - 3 A		
Reference	4750 6051	4750 6081	4750 6121

WR/TFR rectangular solid-core residual current transformers

	WR70x175	WR115x305	WR150x350	TFR200x500
Diameter	70 x 175 mm	115 x 305 mm	150 x 350 mm	200 x 500 mm
Residual Current range	3 mA - 3 A			
Reference	4795 0717	4795 1130	4795 1535	4795 2050

5.2.5.2. Dimensions

ΔIC circular solid-core residual current transformers
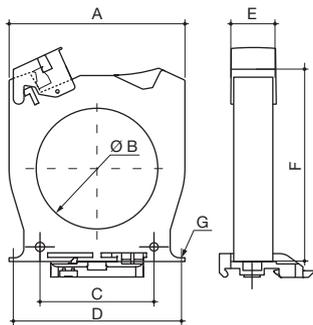
Type	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	Weight (kg)
ΔIC Ø 15	53	17.3	25	50	26	81	M4	0.10
ΔIC Ø 30	92	30	50	85	26	103.5	M4	0.15
ΔIC Ø 50	102.5	50	50	90	26	125	M5	0.27
ΔIC Ø 80	116	80	75	105	26	142.5	M5	0.38
ΔIC Ø 120	163	120	100	150	26	182.5	M6	0.72
ΔIC Ø 200	253	200	150	175x41.2	51	274	M6	1.74
ΔIC Ø 300	370	300	200	250x41.5	50	390	M6	3.60

A. Width
B. Diameter
C. Spacers
D. Rear bracket spacers

E. Depth
F. Height
G. Diameter of fixing screws
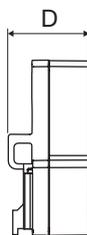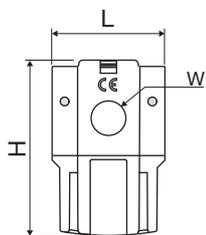
Dimensions (mm)	ΔIC ø 8
Pitch	18
LxHxD	28 x 45 x 20
Ø W	ø 8.4

ΔIP-R circular split-core residual current transformers
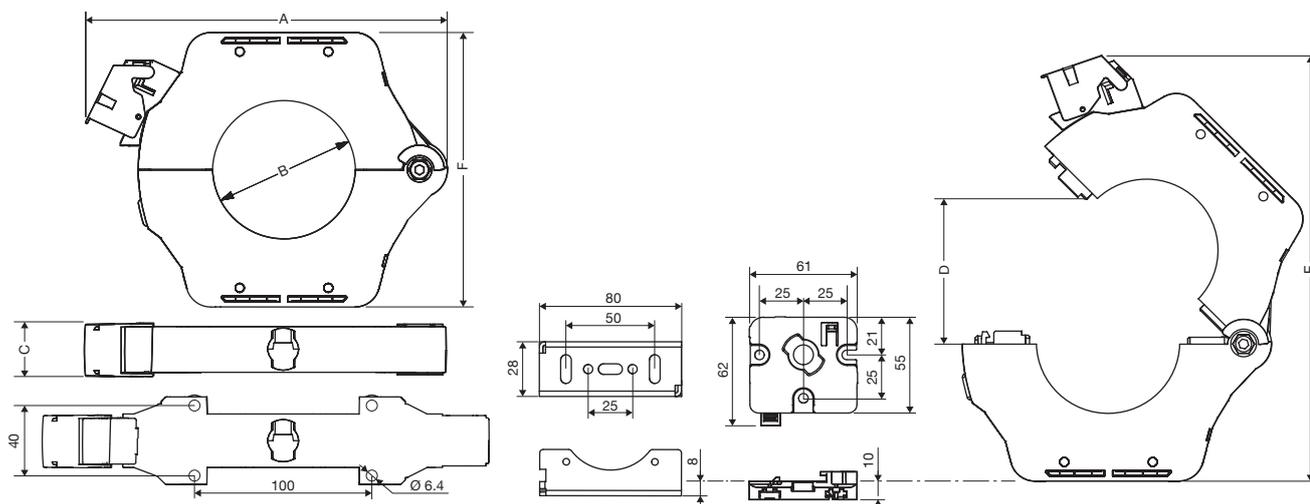
ΔIP-R	Ø 50 mm	Ø 80 mm	Ø 120 mm
A (mm)	160	204	252
B (mm)	49	79	119
C (mm)	30	30	30
D (mm)	77	108	149
T (mm)	200	260	328
F (mm)	116	156	204
Weight (g)	380	850	1500

WR/TFR rectangular solid-core residual current transformers
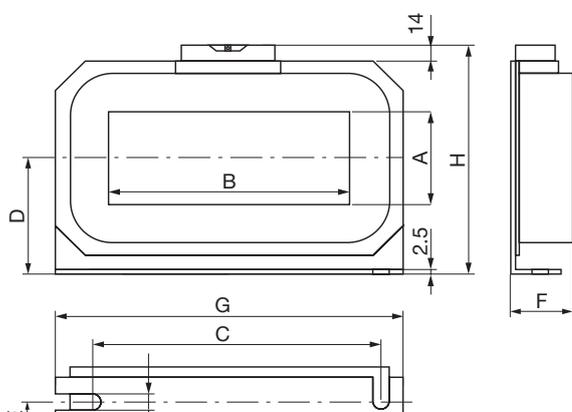
Type	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	H (mm)	I (mm)	Weight (kg)
WR 70x175	70	175	225	85	22	46	261	176	7.5	2.9
WR 115x305	115	305	360	116	25	55	402	240	8	6.3
WR 150x350	150	350	415	140	28	55	460	285	8	8.2

A. Window width   F. Depth
B. Window length   G. Width
C. Spacers   H. Height
D. Half-height   I. Width of oblong fixing holes
E. Depth of mounting spacer
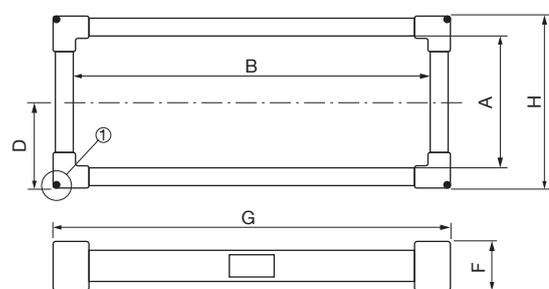
Type	A (mm)	B (mm)	D (mm)	F (mm)	G (mm)	H (mm)	Weight (kg)
TFR 200x500	200	500	140	62	585	285	7.2

A. Window width
B. Window length
D. Half-height
F. Depth
G. Width
H. Height

① Attachments for residual current transformer

Ø 2.5
Ø 6.1
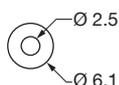
5.2.6. DIRIS Digiware T-10 adaptor

Use the T-10 RJ12 adaptor to ensure the conversion and analysis of the signal between the output of the residual CT (ΔIC diameter 15 mm and above, ΔIP-R, WR and TFR residual CTs) and the DIRIS Digiware R-60 RCM module.

It can be mounted directly onto the ΔIC residual CT (diameter ≥30mm), and on a DIN rail or a back plate for other residual CTs (ΔIC Ø 15mm, ΔIP-R, WR and TFR).

It comes with all the connectivity required for any kind of application.

⚠ Do not install the adaptor close to or touching any live parts, or close to breakers or other equipment carrying dangerous voltage.

Mounting onto ΔIC (*)
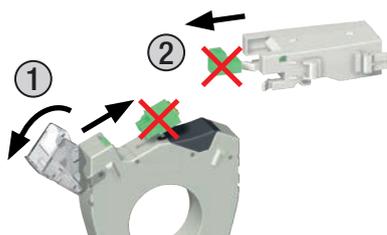
STEP 1   STEP 2
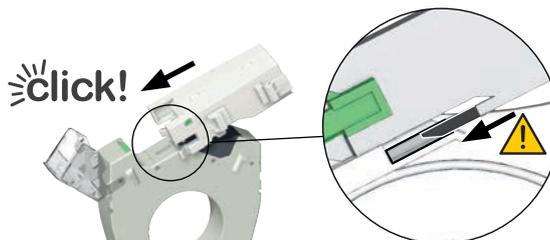
(*) Direct mounting onto residual CT is only possible for ΔIC Ø 30mm and above.

Mounting onto plate
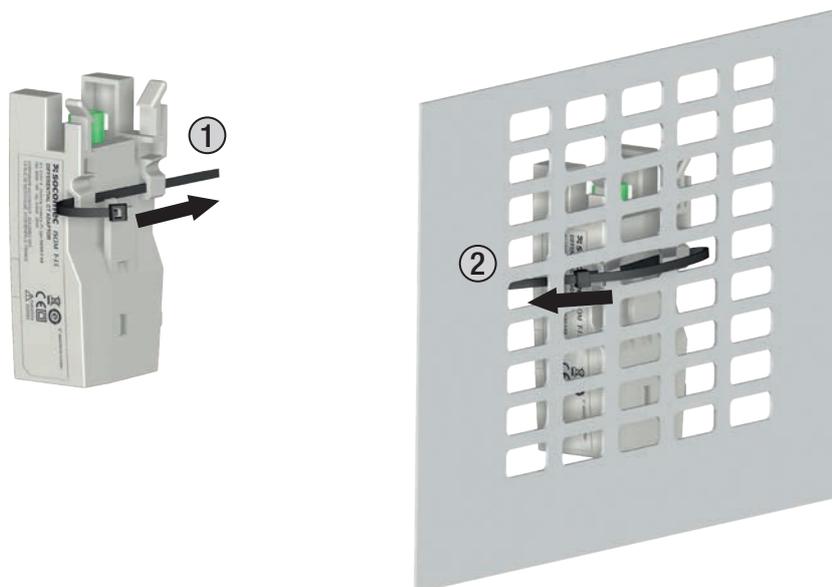
5.2.7. Accessories for ΔIC residual CTs

• Centering accessory

Flexible cable centering accessory	Ø (mm)	Reference
Flexible cable centering accessory	30	4950 0011
Flexible cable centering accessory	50	4950 0012
Flexible cable centering accessory	80	4950 0013
Flexible cable centering accessory	120	4950 0014

• Metal mounting bracket

Metal mounting bracket	Ø (mm)	Reference
Metal mounting bracket	30	4950 0001
Metal mounting bracket	50 *	4950 0002
Metal mounting bracket	80 / 120	4950 0003
Metal mounting bracket	200	4950 0004
Metal mounting bracket	300	4950 0005

* Also compatible with ΔIP-R Ø 80/120 mm residual CTs

• DIN rail mounting accessory

Accessory	Reference
DIN Rail mounting accessory	4950 0031

ⓘ Note: a DIN rail mounting accessory is provided with the ΔIC 8mm residual CT and the ΔIP-R range.

6. INSTALLATION

The following paragraphs describe the installation of DIRIS Digiware and its associated sensors.

6.1. Recommendations and safety

Refer to the safety instructions (section "2. Hazards and warnings", page 7).

6.2. DIRIS Digiware mounting

6.2.1. DIRIS Digiware C, U, I-3x, I-6x, IO-x - DIN rail-mounting
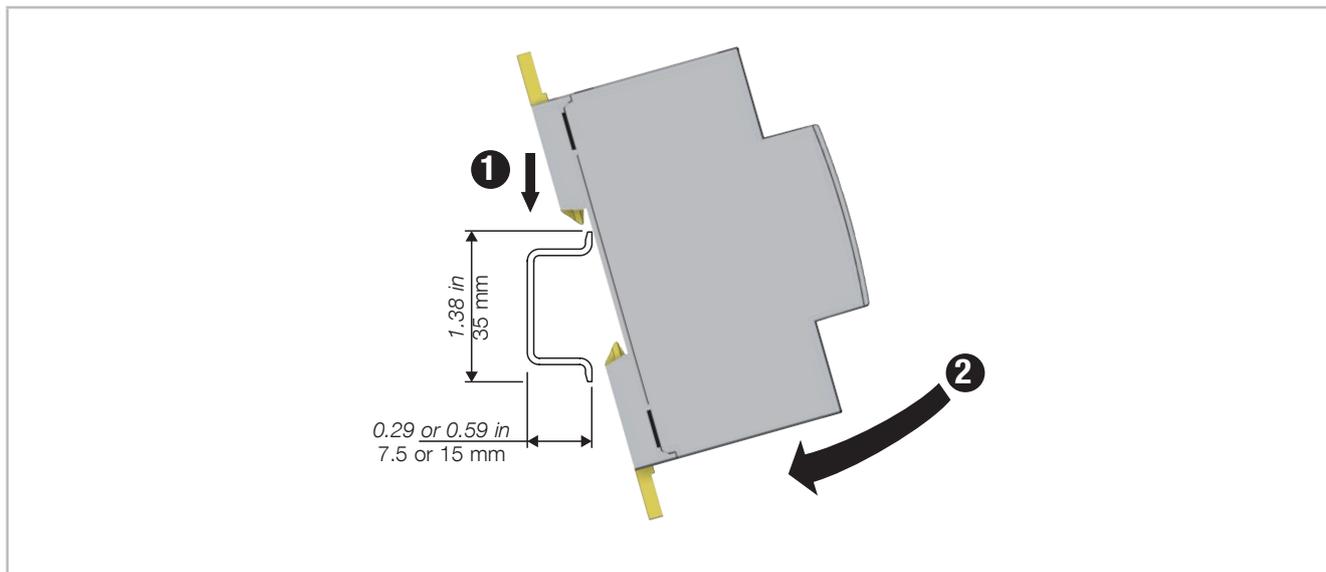
6.2.2. DIRIS Digiware C, U, I-3x, I-6x, IO-x - backplate-mounting

Type of screw: M4
Tightening torque: 0.5 Nm
Washer diameter *0.47 in* / 12 mm max.
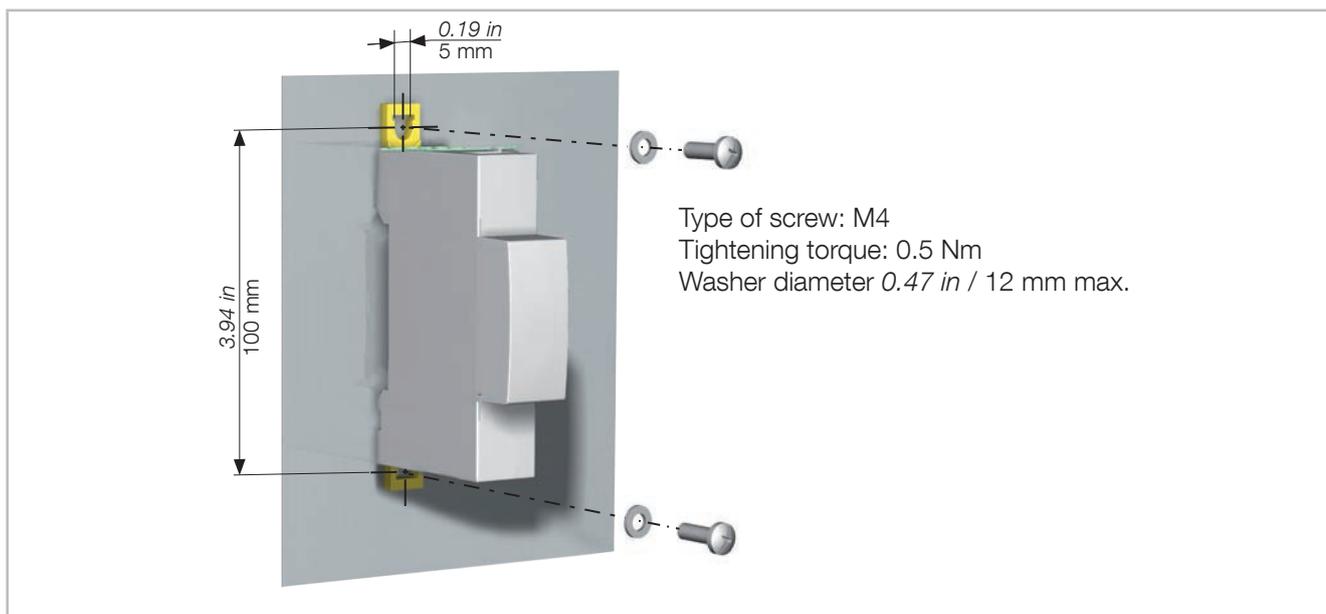
6.2.3. DIRIS Digiware U-100 - Sealing voltage inputs

6.2.4. DIRIS Digiware I-4x - DIN rail mounting

DIRIS Digiware I-4x mounting	DIRIS Digiware I-4x dismounting
Two mounting positions are possible: *Position I (factory assembly): for 15mm rail.* *Position II: for 7.5mm rail*	

Mounting in Position II

click!
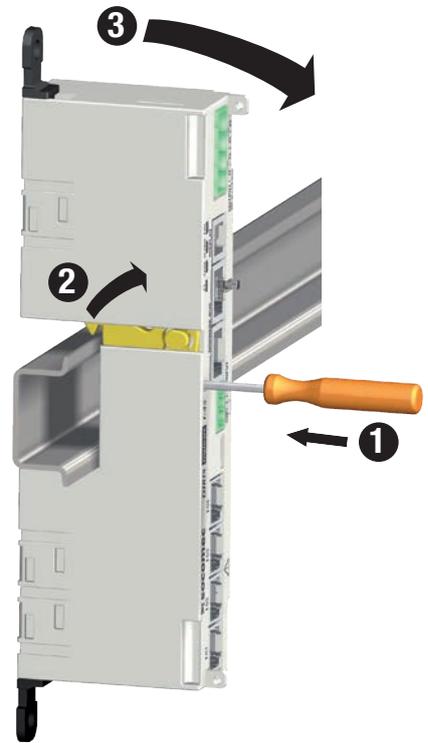
6.2.5. DIRIS Digiware I-4x - back-plate mounting

Mounting of the brackets on the top and bottom of the module.

6.81 in / 173 mm

Type of screw: M4
Tightening torque: 0.5 Nm
Washer diameter *0.47 in / 12 mm max.*
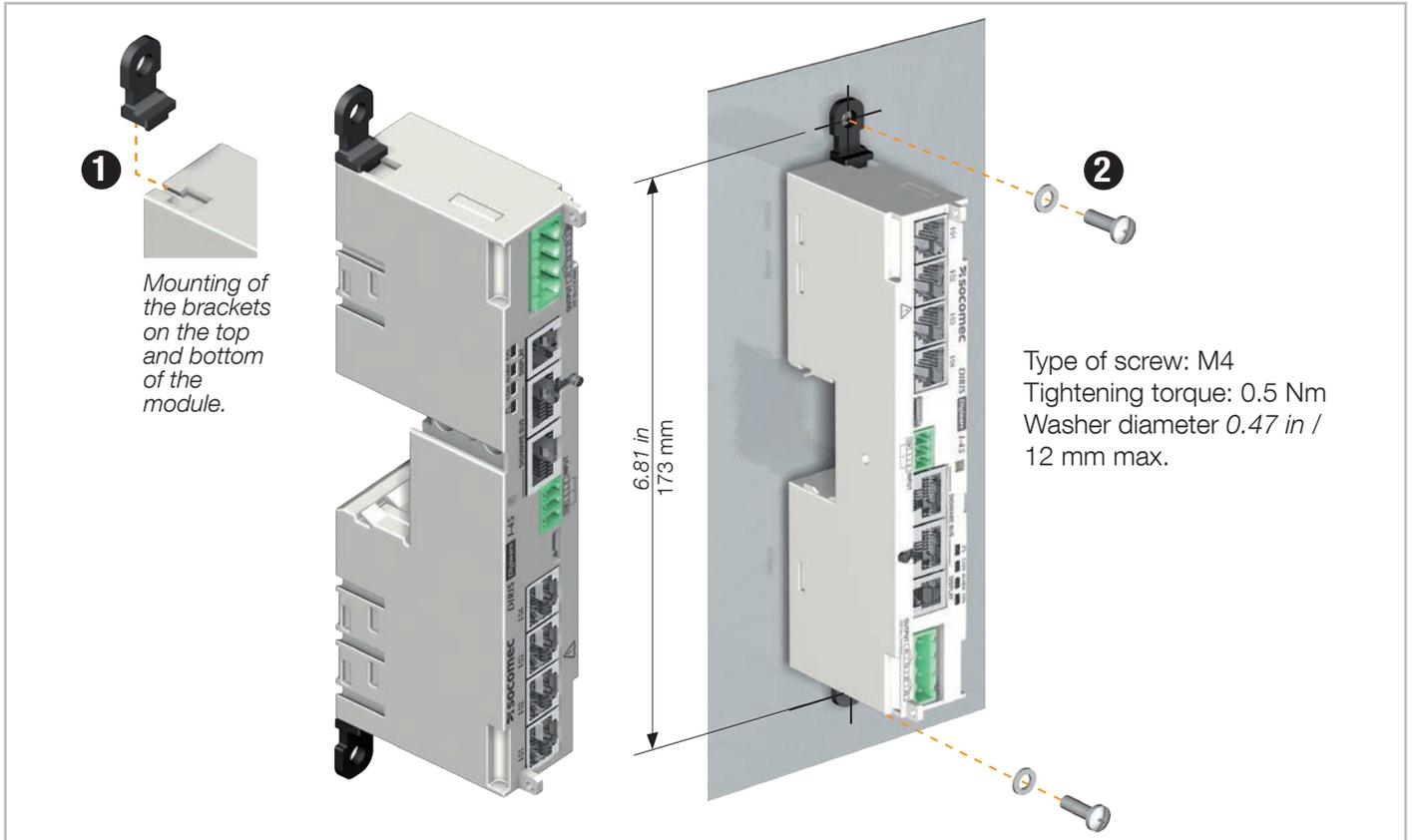
6.2.6. DIRIS Digiware S – DIN rail mounting

Ref: 4829 0195 (x10)
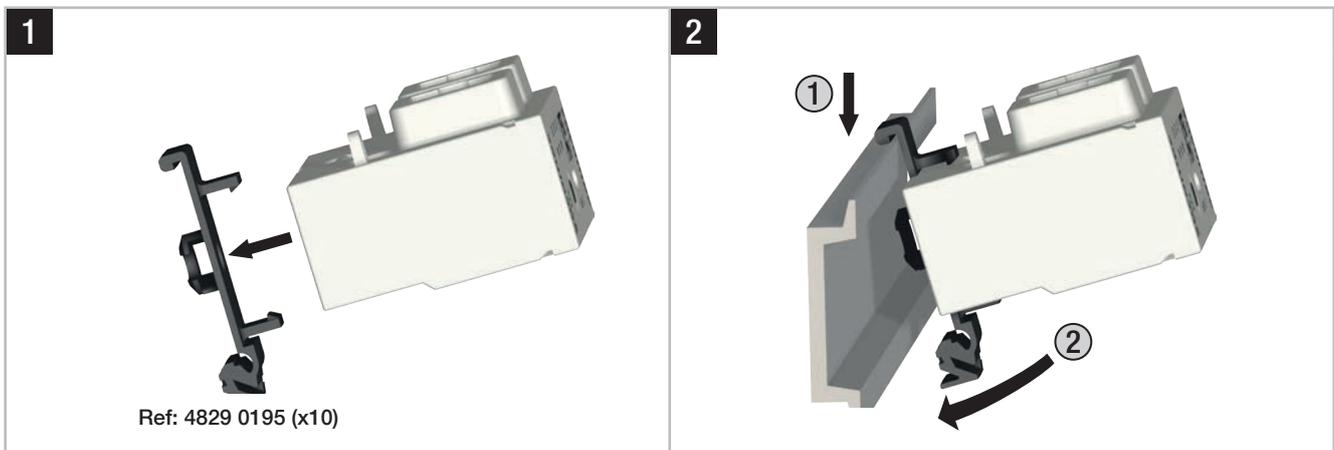
6.2.7. DIRIS Digiware S – Back plate mounting

1x
Ø **0.17**/4.2
M4 max 1 Nm

The device can
be turned over
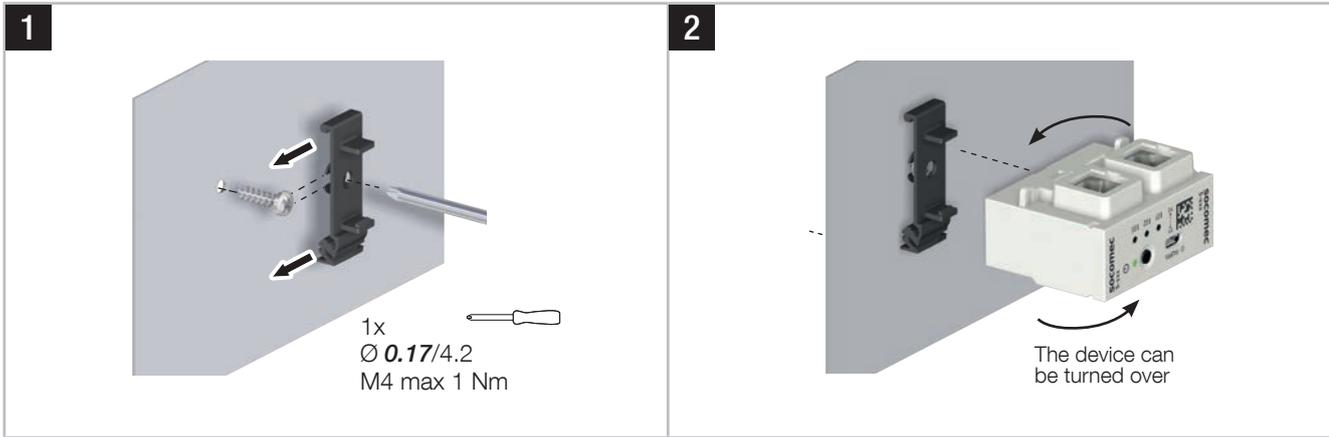
6.2.8. DIRIS Digiware S holding

• Temporary MCB insert:

The DIRIS Digiware S module can be fixed and transported directly on top or under the protective device using a temporary insert tool:
Step 1: Insert the tool through one of the current inputs and into the corresponding breaker terminal.
Step 2: Tighten the associated screw(s).
Please refer to the operating instructions of the protective device for additional information related to its installation.

Ref:
4829 0196 (x10)
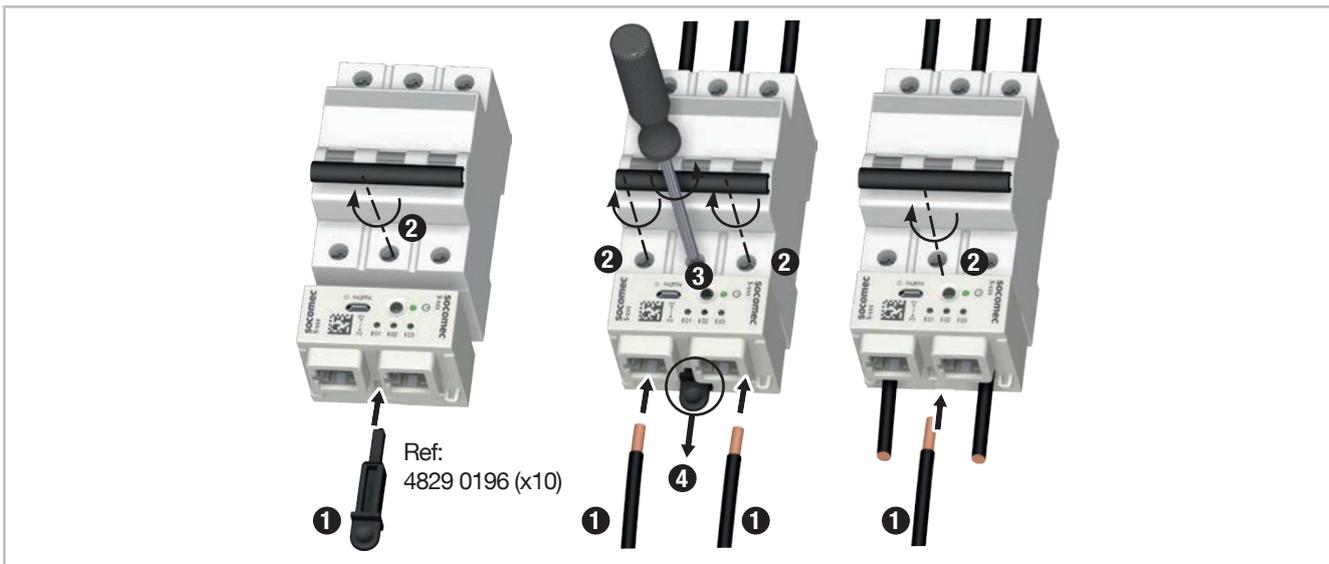
• Cable tie tethers:

The DIRIS Digiware S module has 2 tethers which can be used with tightening clamps:

The dimensions of the tightening clamp must not exceed 4 mm x 2 mm.

6.2.9. Diris Digiware S Accessories overview

	Part number	Description
	4829 0195	DIN-rail and back plate fixing tool (x10)
	4829 0196	Temporary MCB insert (x10)

6.2.10. Diris Digiware BCM - Back plate mounting

M5 Hexagon Key
3.5 Nm

M4 Hexagon Key
1 Nm
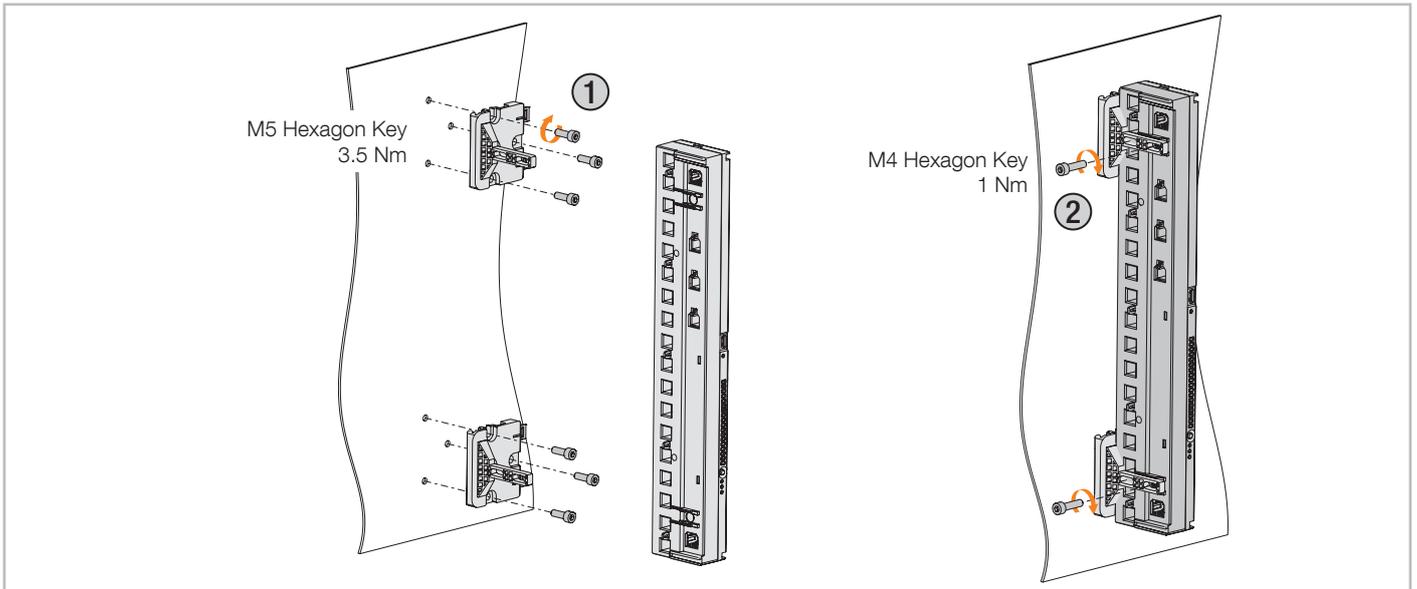
6.2.11. Diris Digiware BCM - DIN rail mounting

M4 Hexagon Key
1 Nm

click!
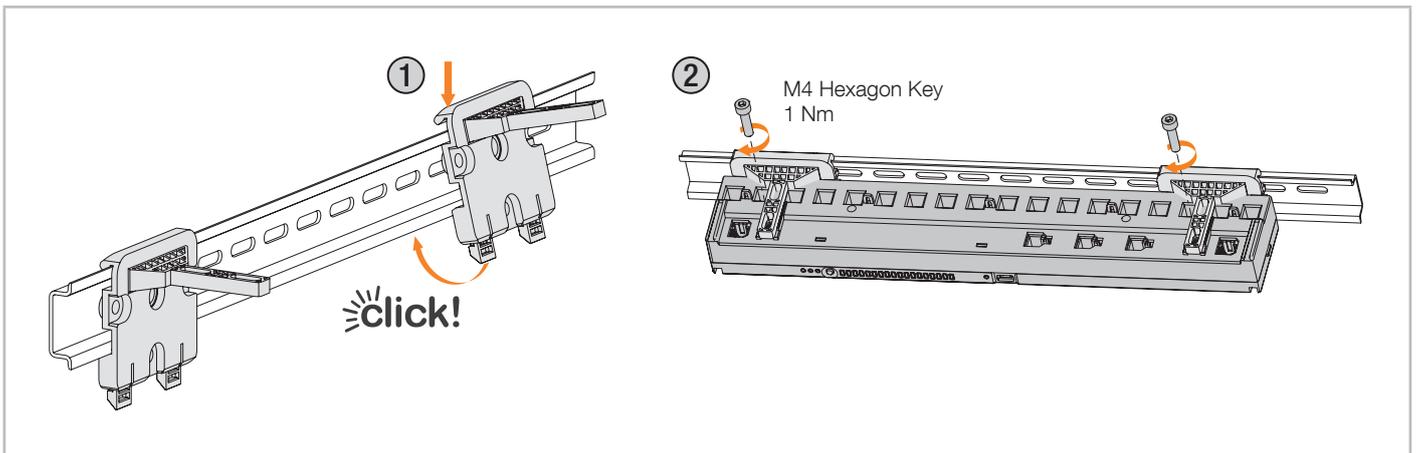
The depth-adjustable DIN rail mounting accessory allows to match the positionning of any breaker output terminal.

6.3. Installing TE solid-core sensors

6.3.1. Mounting accessories

All mounting accessories supplied with the sensors are listed below:

Part number		Pitch	DIN rail and plate mounting	DIN rail mounting	Plate mounting	Busbar mounting
4829 0500 4829 0501	TE-18	18 mm	x 1			
4829 0502	TE-25	25 mm		x 2	x 4	
4829 0503	TE-35	35 mm		x 2	x 4	x 2
4829 0504	TE-45	45 mm		x 2	x 4	x 2
4829 0505	TE-55	55 mm		x 2	x 4	x 2
4829 0506	TE-90	90 mm	x 2		x 6	

6.3.2. DIN rail mounting

TE-18 -> TE-55
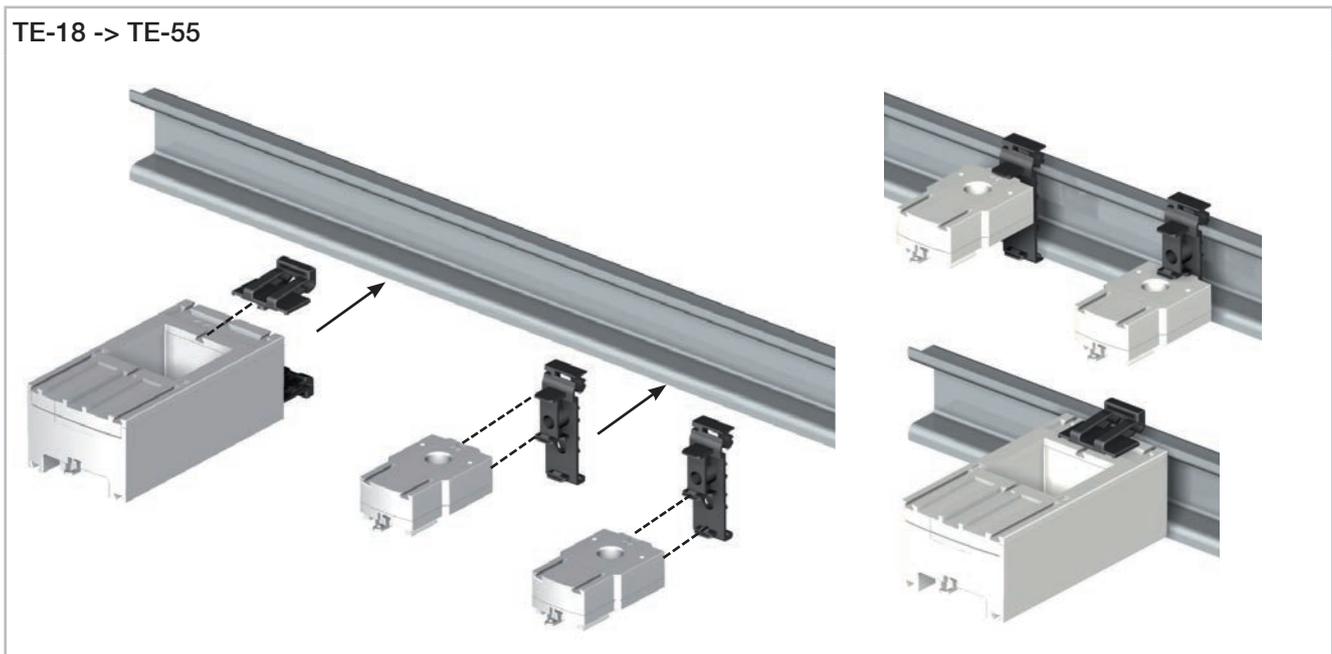
TE-90

Removing the clamps
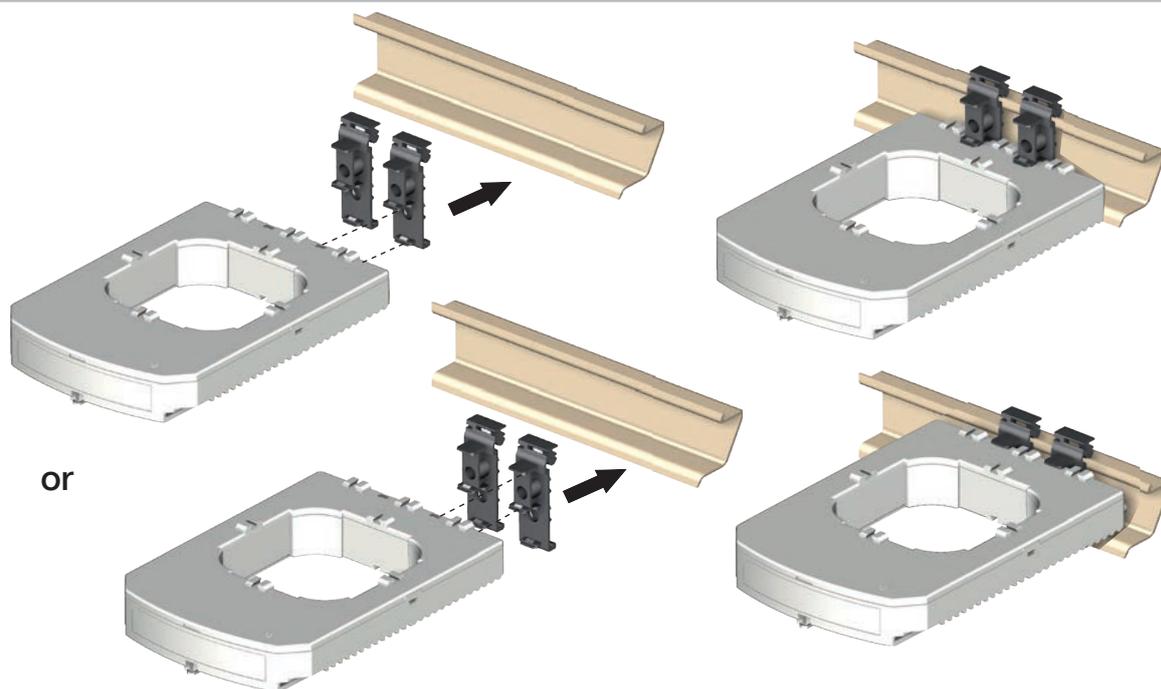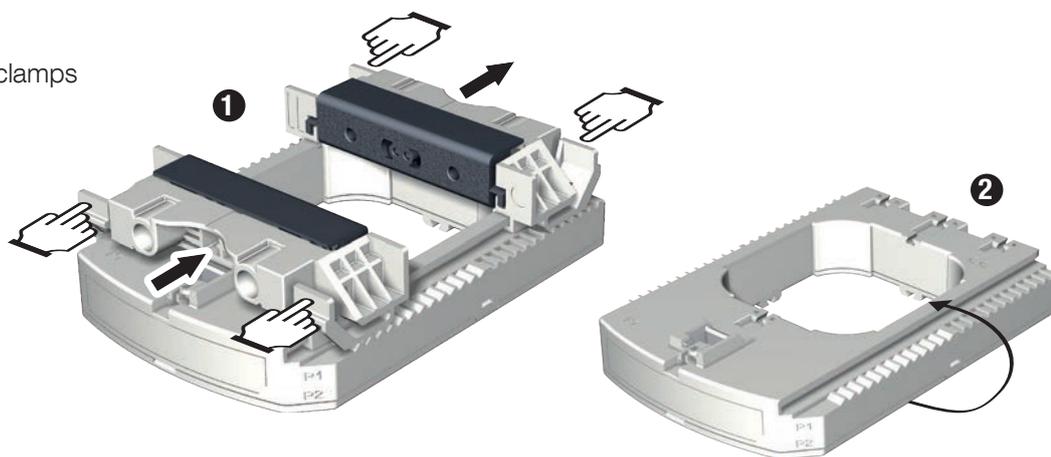
Note: it is possible to fix the TE-90 sensor to a DIN rail to make it easier to install.
This is a temporary installation. Remove the clamps to install the TE-90 sensors on the DIN rail.

6.3.3. Back-plate mounting

TE-18

1x diameter *0.17* / 4.2 M4
max 1 Nm

2

2

1

3

1.05
26.8

2

2

1

3

0.81
20.5

TE-25 - > TE-55

4x
diameter *0.20*
/ 5.2 M5 max
1 Nm

TE-90

Removing the clamps

❶

❷

Ø 0.20
Ø 5.2

x6
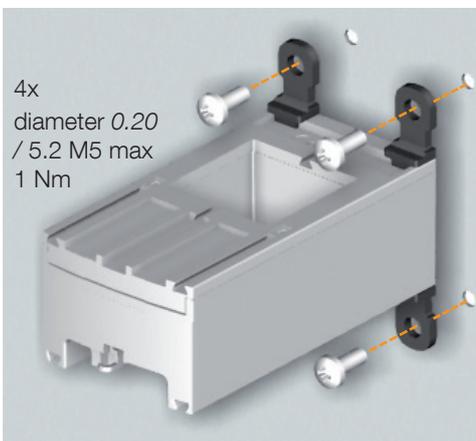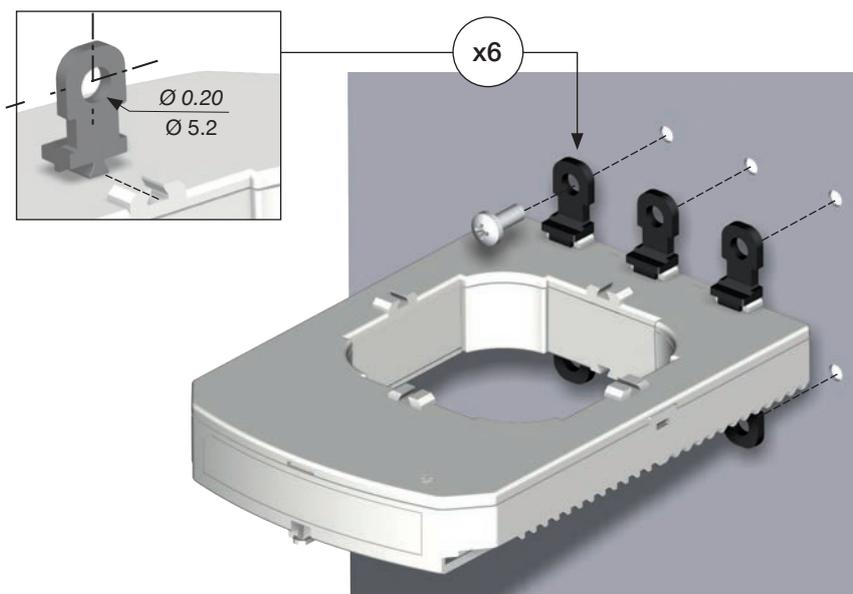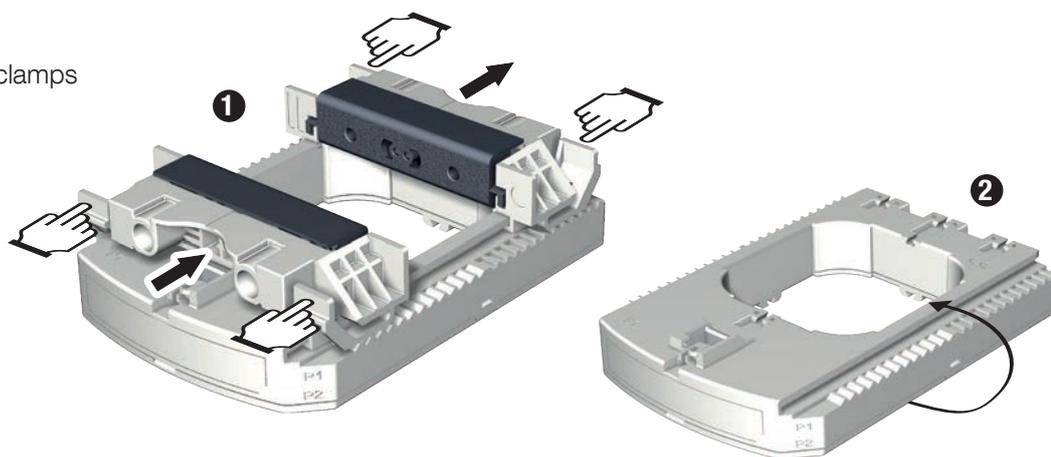
ⓘ Note: remove the clamps to install the TE-90 sensors on the back-plate.

6.3.4. Installing on a cable with clamping collar

TE-18

Install on 600 V insulated cables only! ⚠️

TE-25 - > TE-55

①
②

Install on 600 V insulated cables only! ⚠️

③

TE-90

Removing the clamps

①

②

I
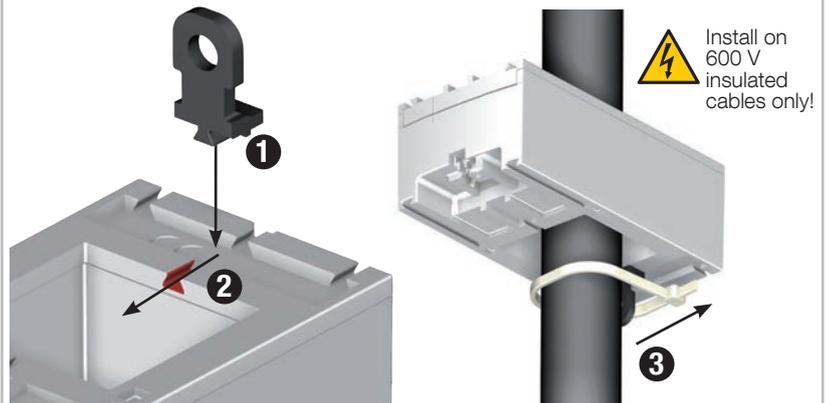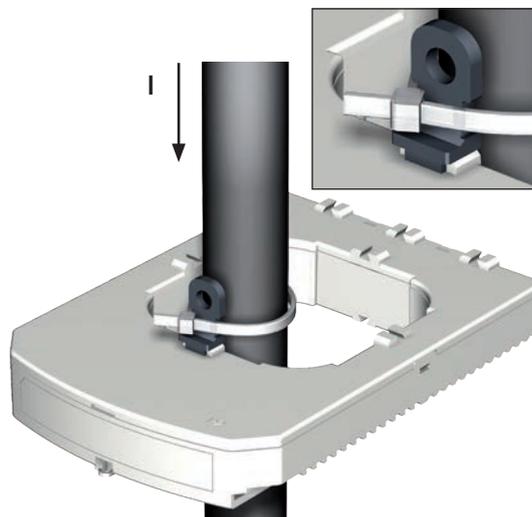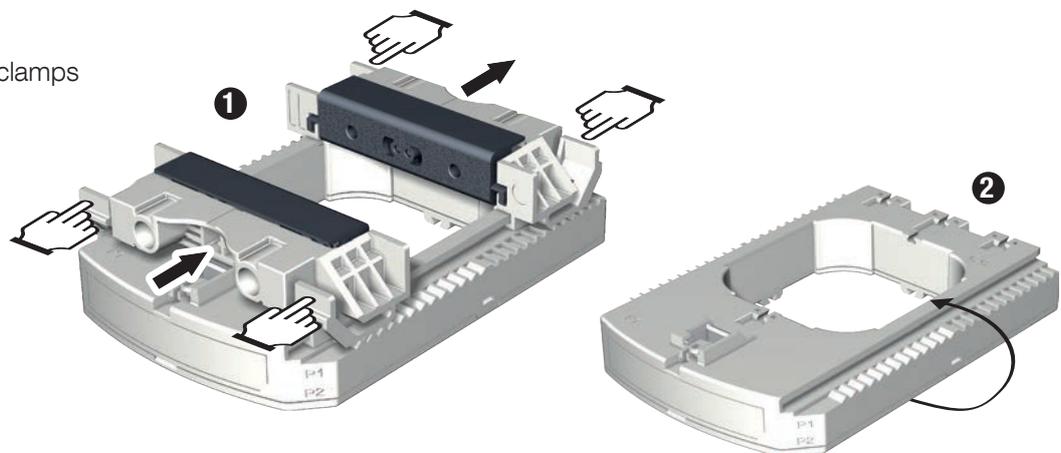
ℹ️ Note: remove the clamps to install the TE-90 sensors on a cable with clamping collar.

🚫 Do NOT clamp or pull out NON-INSULATED conductors carrying DANGEROUS VOLTAGE which could cause an electric shock, burn or arc flash. Ref. IEC 61010-2-032

6.3.5. Bar mounting

TE-35 - > TE-55

B

A

C

Installation options:
A+B, A+C

B

A

A

C
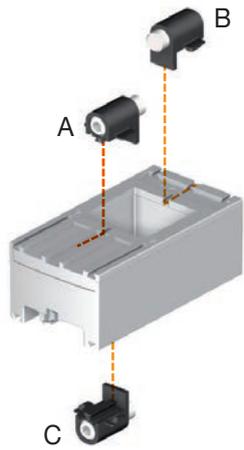
0.4 Nm, 4mm
key
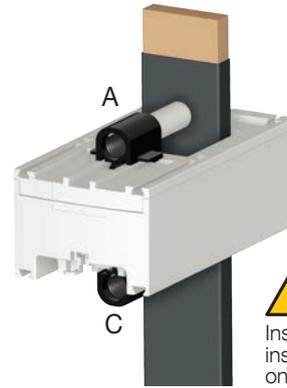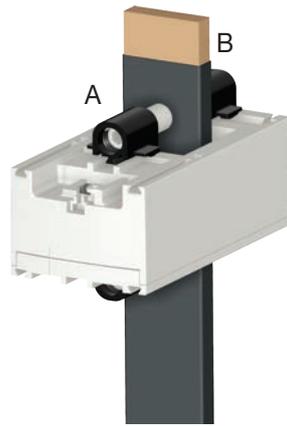
⚠ Install on 600 V
insulated cables
only!

TE-90

50x10 mm

60x10 mm

I

or

I

❶

❷
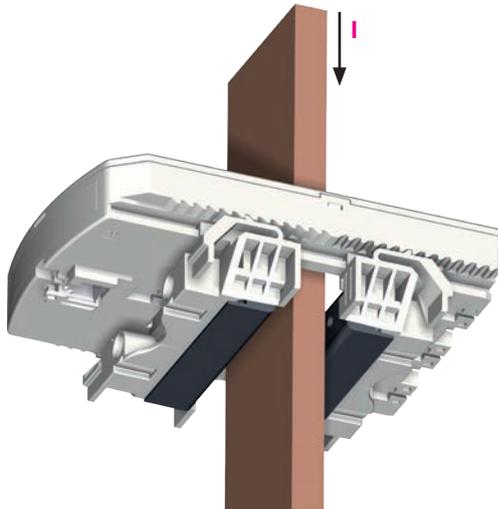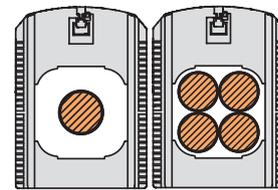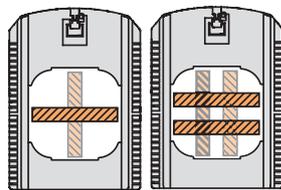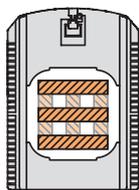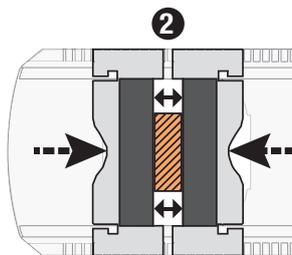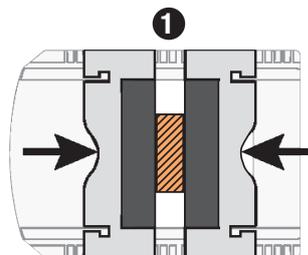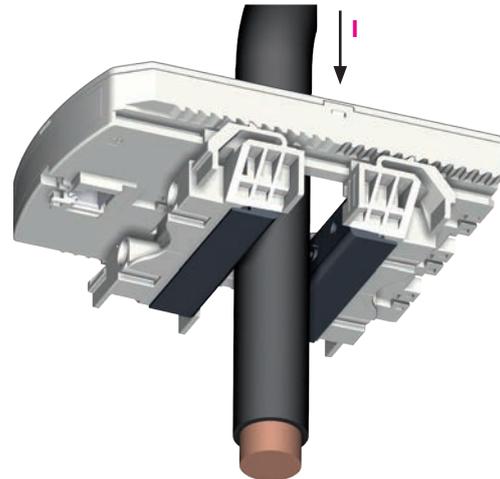
Tighten the jaws on both
sides of the cable by
applying pressure.
The jaws must be
perpendicular to the
holding notches.

Do NOT clamp or pull out NON-INSULATED conductors carrying DANGEROUS VOLTAGE which could cause
an electric shock, burn or arc flash. Ref. IEC 61010-2-032

6.3.6. Sensors assembly

TE-18	TE-25 - > TE-55	TE-35 - > TE-55
1.42 36	2x	1x
Staggered assembly	Linear assembly	Staggered assembly
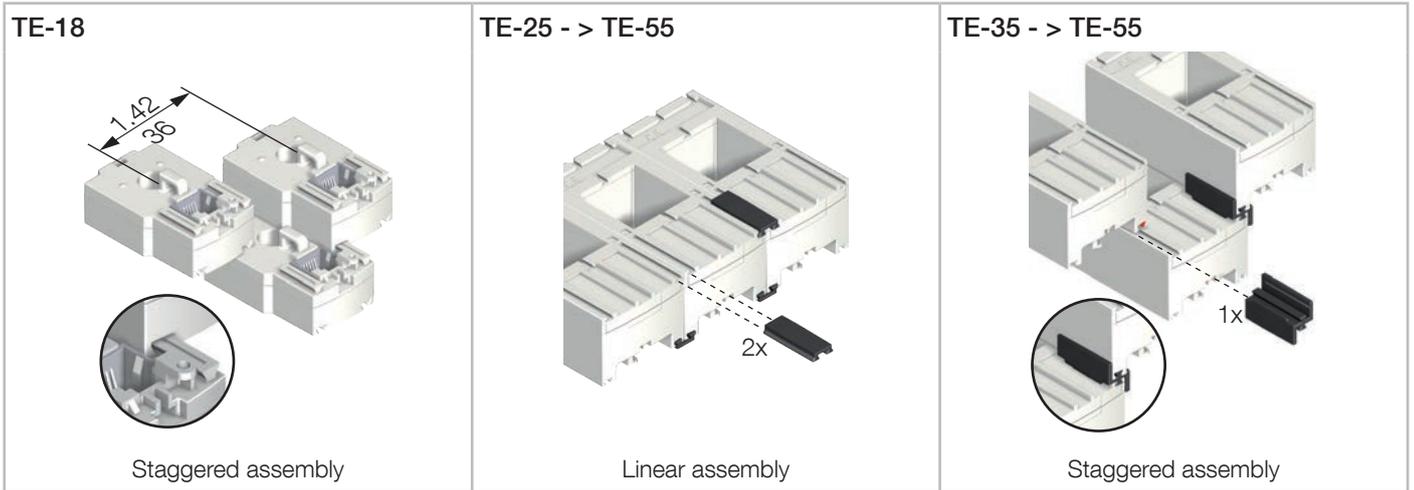
Mounting accessories for sensor combination:

Part number	Linear assembly	Staggered assembly
4829 0598	x30	

These accessories must be ordered separately.

6.3.7. Sealing accessories for sensors
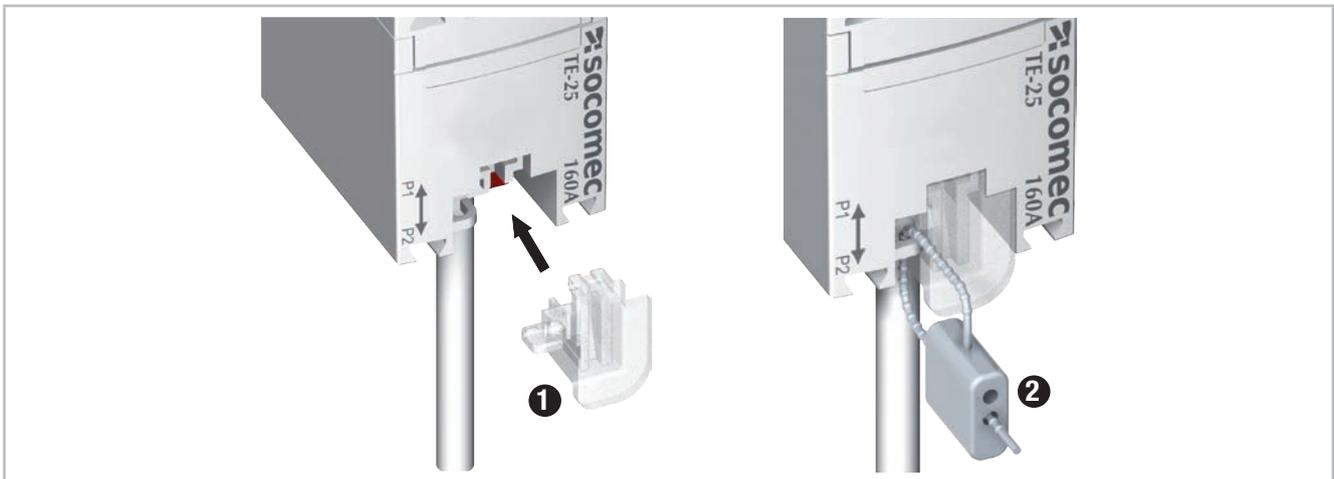
Part number	Sealing case for terminal
4829 0600	x20

These accessories must be ordered separately.

6.4. Installing TR/iTR split-core sensors

6.4.1. Cable mounting
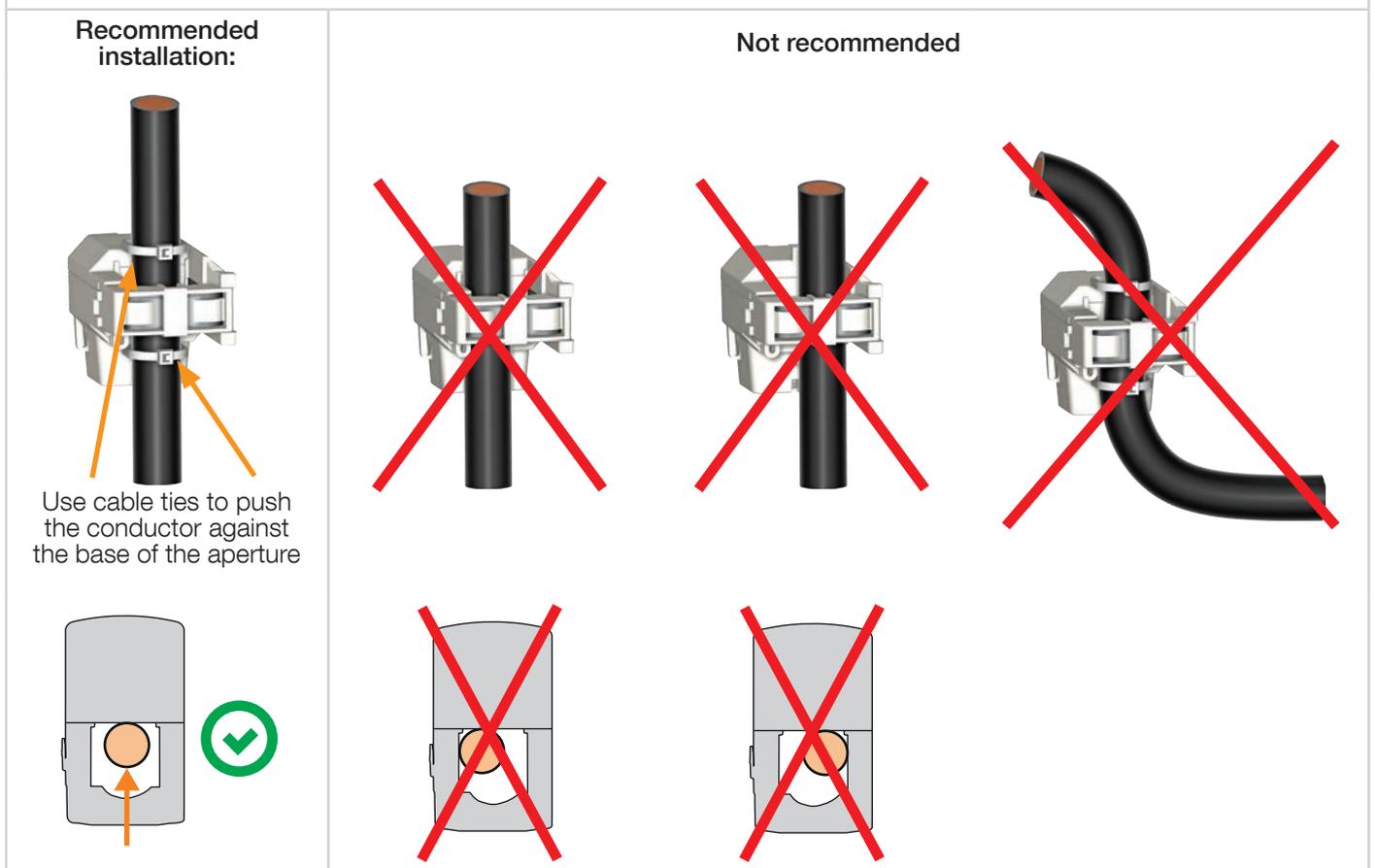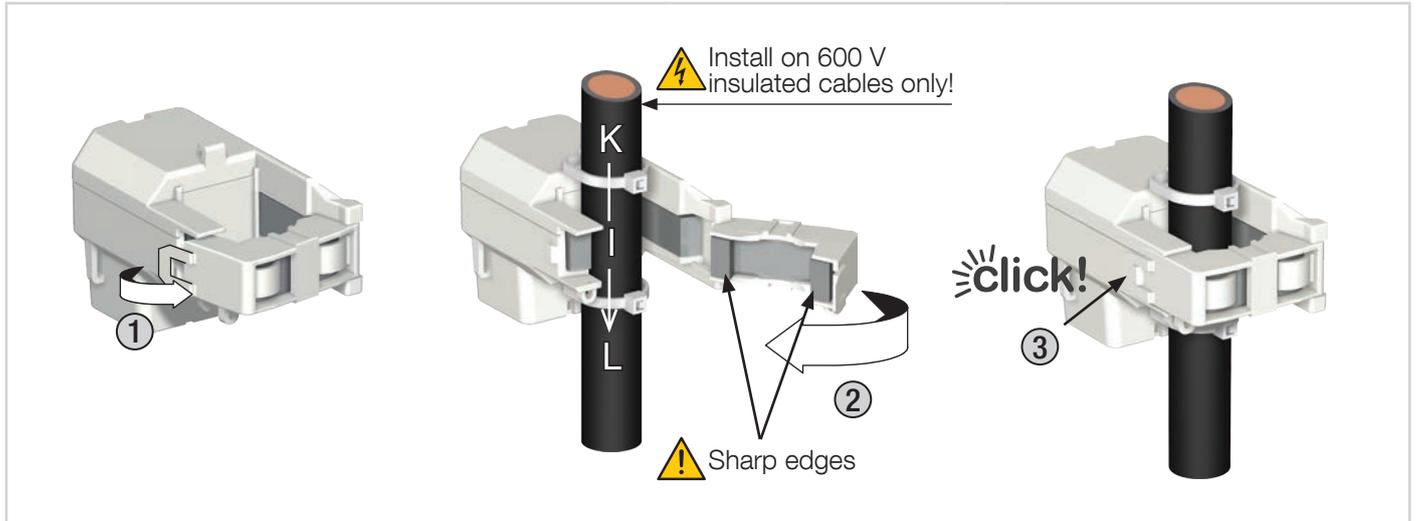
Install on 600 V insulated cables only!

1

K
I
V
L

2

⚠ Sharp edges

3

click!

Recommended installation:

Use cable ties to push the conductor against the base of the aperture

Not recommended

Do NOT clamp or pull out NON-INSULATED conductors carrying DANGEROUS VOLTAGE which could cause an electric shock, burn or arc flash. Ref. IEC 61010-2-032

⚠ Before closing the TR /iTR sensor, check that the air gap is clean (no contamination or corrosion).

6.5. Installing TF Flexible current sensors

6.5.1. Bar or cable mounting

① ② ③

click!

④ DIRIS Digiware I
DIRIS B
DIRIS A-40

Centred position for the best measurement

Centred position for the best measurement

Do NOT clamp or pull out NON-INSULATED conductors carrying DANGEROUS VOLTAGE which could cause an electric shock, burn or arc flash. Ref. IEC 61010-2-032
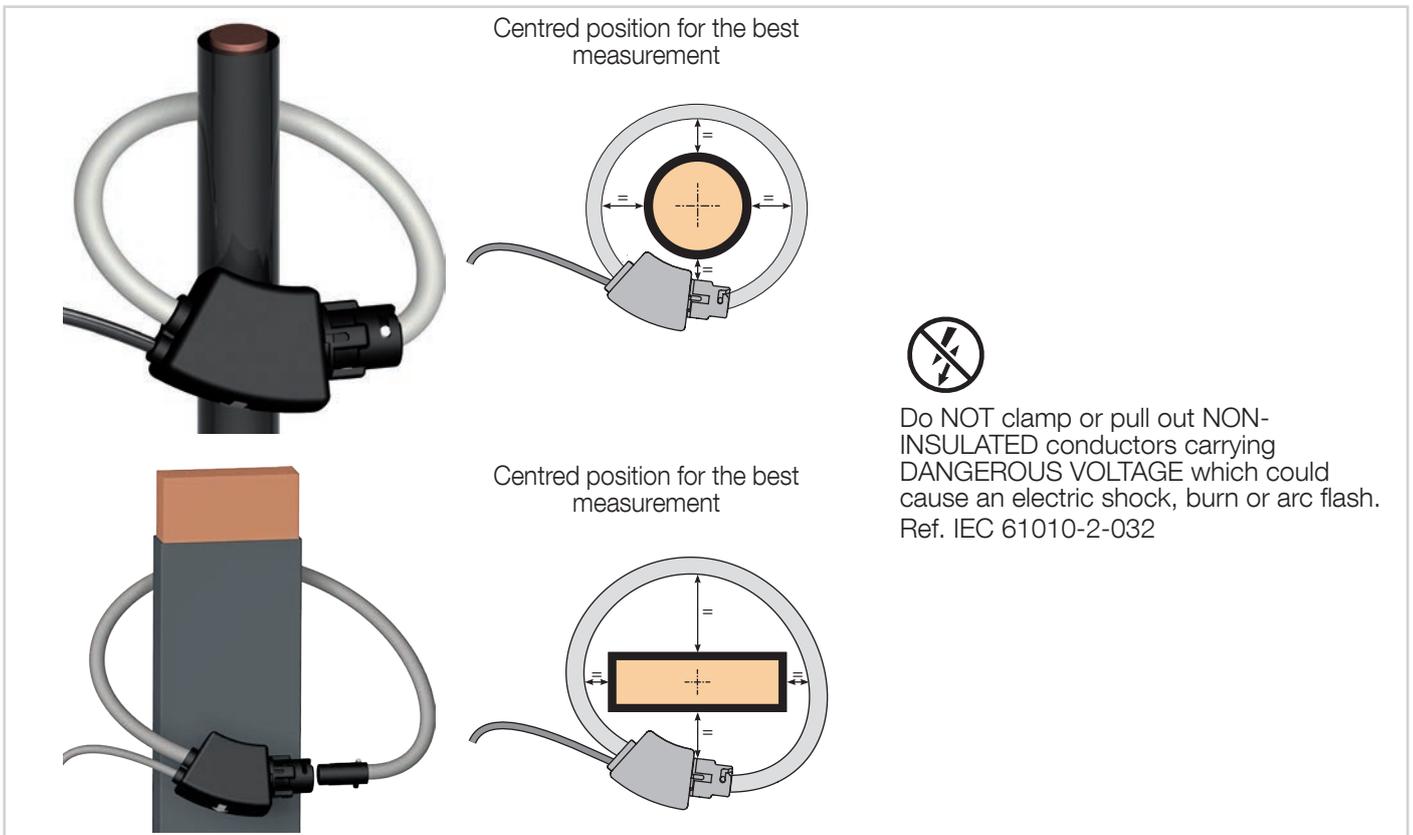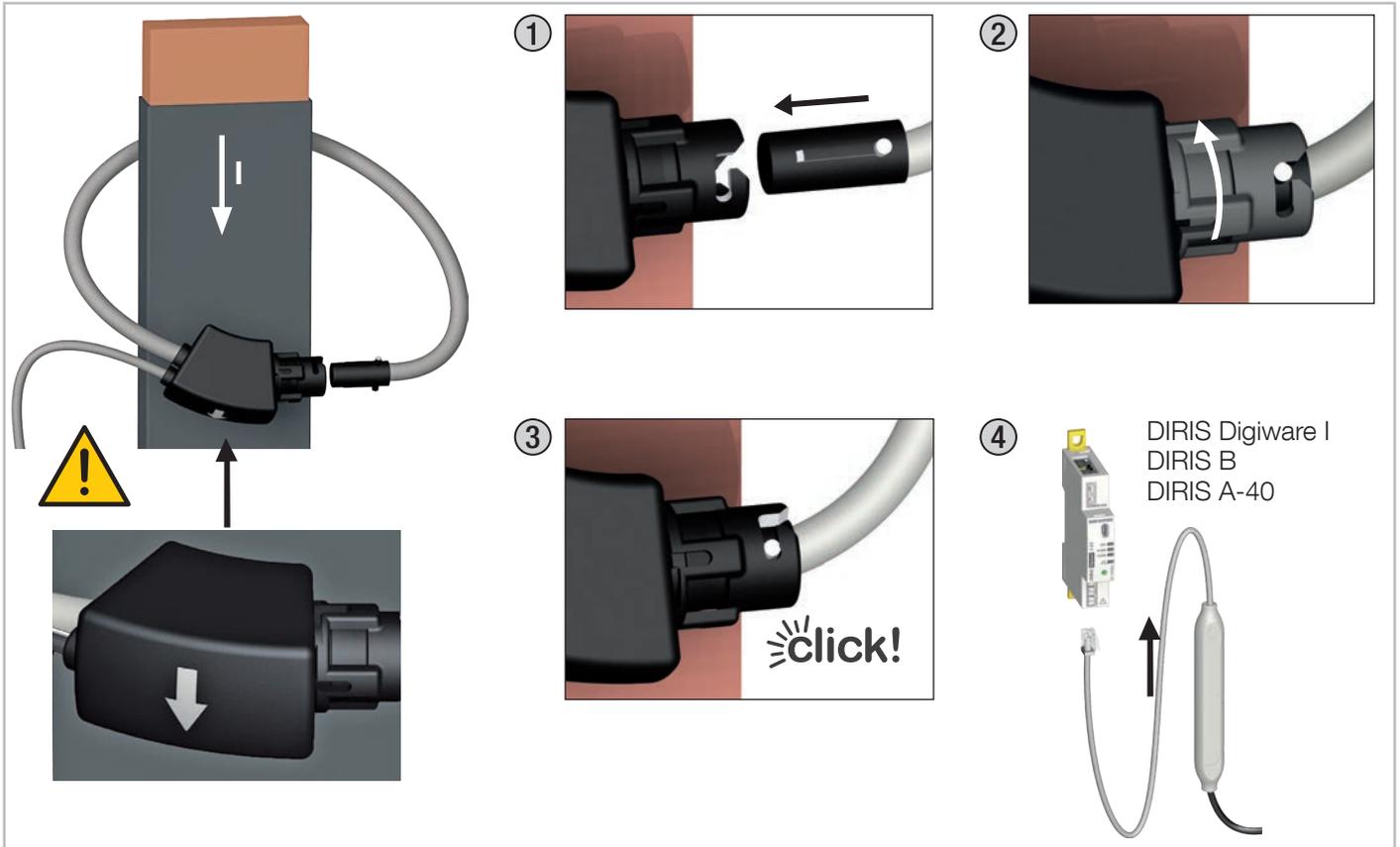
6.6. Installing Core-balanced toroïds

6.6.1. Recommendations for the installation of core-balanced toroïds around distribution cables

$$Ø1 ≥ 2 \times Ø2$$
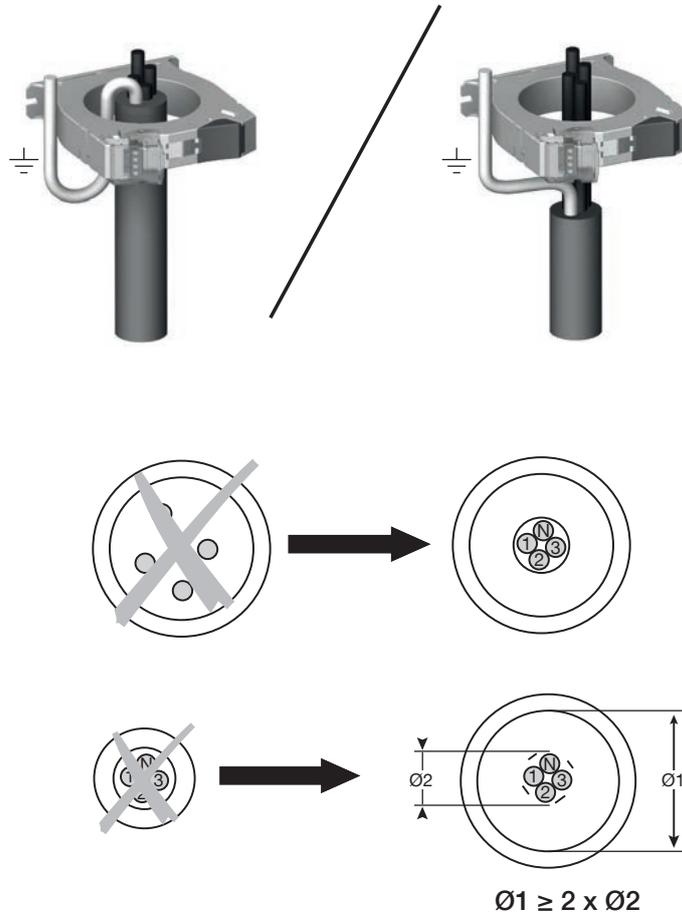
6.7. Installing the 5A adapter
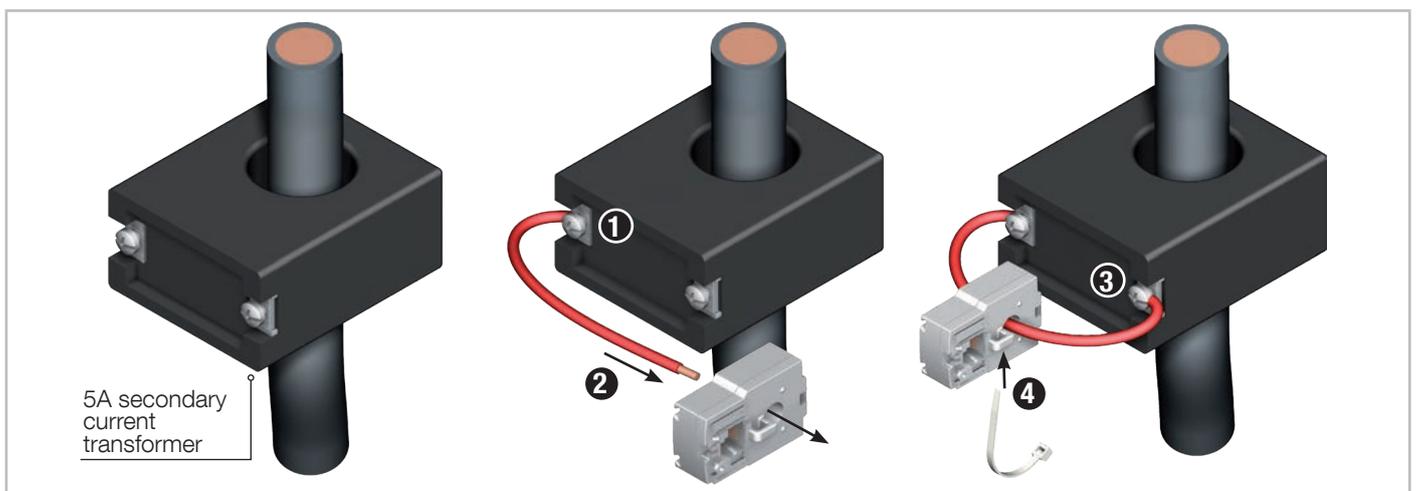
5A secondary current transformer

⊘ Do NOT clamp or pull out NON-INSULATED conductors carrying DANGEROUS VOLTAGE which could cause an electric shock, burn or arc flash. Ref. IEC 61010-2-032

7. CONNECTION

7.1. DIRIS Digiware connection

Digiware Bus

Multipoint display DIRIS Digiware D

or

DIRIS Digiware C
System interface

(2)

DIRIS Digiware U
Voltage measurement (U)

(1)

DIRIS Digiware I
Current inputs (3I)

(1)

(1)

U-10/U-30 Voltage input
50-300 VAC PH/N
4 positions - screw connection,
0.25 Nm max.
0.2 mm² -> 2.5 mm² solid
0.2 mm² -> 2.5 mm² flexible
7 mm

Use Copper conductors only

I-3x
3x current sensor inputs

Power supply

⚠️ **24 VDC**
2 positions - screw connection,
0.25 Nm max.
0.2 mm²-> 2.5 mm² solid
0.2 mm² -> 2.5 mm² flexible
7 mm

Use Copper conductors only

N
L3
L2
L1

Communication gateway DIRIS Digiware M

Communication
RS485 Modbus
3 positions
screw connection,
0.25 Nm max.
0.14 mm²-> 1.5 mm² solid
0.14 mm² -> 1.5 mm² flexible
7 mm
Use Copper conductors only

RS485 line polarisation
OFF = RS485 line polarisation disabled (by default)
ON = RS485 line polarisation enabled

Current sensors TE, TR/iTR or TF

(1)

⚡ Only use a SOCOMEC Digiware bus cable (UTP RJ45 straight, twisted pair, unshielded, AWG24, 600V CAT V (-10 ... +70°C). When wiring, make sure you separate the low voltage (LV) section and the very low voltage (SELV) section to prevent any risk of electric shock.

⚠ Do not pull on the RJ45 cable more than 20N.

2x digital outputs
250 VAC - 1 A max.
4 positions - screw connection,
0.25 Nm max.
▮ 0.2 mm²-> 2.5 mm² solid
▮ 0.2 mm² -> 2.5 mm² flexible
⊔ 7 mm

Option to connect a local
single-point display
DIRIS D-30 on the I-4x

2x digital inputs
12 VDC - 1 mA max.
3 positions - screw connection,
0.25 Nm max.
▮ 0.14 mm²-> 1.5 mm² solid
▮ 0.14 mm² -> 1.5 mm² flexible
⊔ 7 mm

Digiware Bus
Termination

DIRIS
Digiware S
L1 L2 L3

(1)

**DIRIS
Digiware I**
*Current
inputs (6I)*

(1)

**DIRIS
Digiware IO**
*Inputs/
outputs*

(1)

**DIRIS
Digiware I**
*Current
inputs (4I)*

I-6x
**6x current
sensor inputs**

I-4x
**4x current
sensor inputs**

IO-10
4x digital inputs
12 VDC - 3 mA max.
5 screw connections,
0.25 Nm max.

2x digital outputs
48 VDC - 50 mA max.
24 VAC - 50 mA max.
4 screw connections,
0.25 Nm max.

IO-20
2x analogue inputs
0/4 - 20 mA
2x2 screw connections,
0.25 Nm max.

▮ 0.14 mm²-> 1.5 mm² solid
▮ 0.14 mm² -> 1.5 mm² flexible
⊔ 7 mm

⚠ For direct current inputs, install on 300 V insulated cable only.
(1) Micro USB - type B
(2) Do not forget to connect earth to the DIRIS Digiware U module

DIRIS Digiware U-100 connections

Digiware Bus

GND

USB type C

DIRIS Digiware U

VA VC
VB N

| 50-600 VAC L/N CAT III |
| AWG 17 - AWG 14 / 1 - 2.5 mm² |

X | X= 7mm
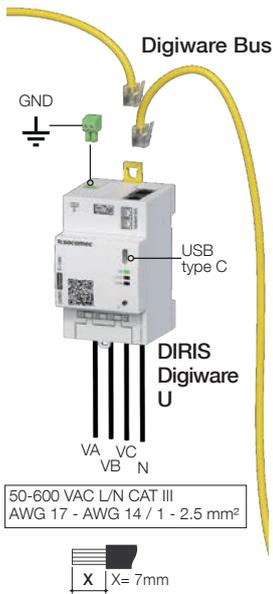
Description of the terminals

DIRIS Digiware D-50/D-70 display and M-50/M-70 gateway

• RS485 master mode

ETHERNET

DIGIWARE BUS

LIYCY-CY

NC
−
+

MASTER

(20 W max)
Protection 1A gG

• RS485 slave mode

ETHERNET

DIGIWARE BUS

LIYCY-CY

NC
−
+

SLAVE

(20 W max)
Protection 1A gG
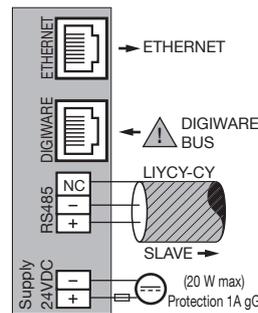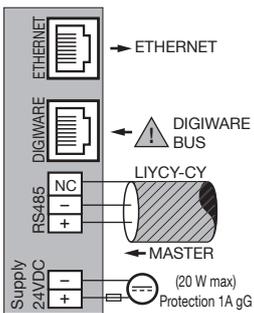
(*) The use of a 1A / 24 VDC fuse protection is recommended if the 24 VDC power supply is not provided by Socomec.
For North America, the use of recognized fuses is mandatory.

DIRIS Digiware C-31

| Power supply | Digiware BUS | Communication | Line polarisation |
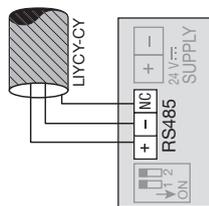
DIRIS Digiware C-32
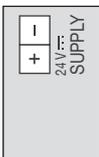
Power supply | Digiware BUS
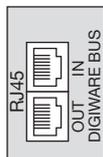
DIRIS Digiware U-10/U-30

Voltage measurement | Digiware BUS

| V1 |
| V2 |
| V3 |
| VN |
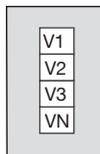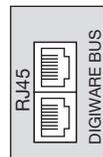
DIRIS Digiware U-100

GND

Voltage measurement | Digiware BUS

| VA | VB | VC | N |
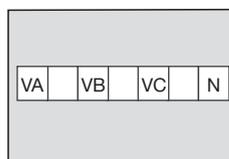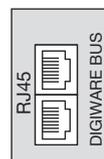
DIRIS Digiware I-3x

Current measurement[(**)]

RJ12 — I01, I02, I03

Digiware BUS
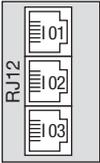
RJ45 — DIGIWARE BUS

DIRIS Digiware I-4x

Current measurement[(**)]

RJ12 — I01, I02, I03, I04

RJ9 for DIRIS D-30
(Self-powered and data)

RJ9

Inputs

INPUT 12 Vd.c.(1mA max) — 1, 2, COM

Outputs

OUTPUT 250 Va.c.(1A max) — 11, 13, 21, 23
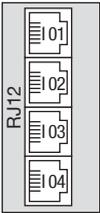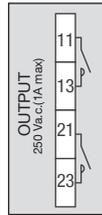
Digiware BUS
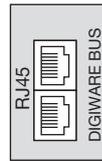
RJ45 — DIGIWARE BUS

DIRIS Digiware I-6x

Current measurement[(**)]

RJ12 — I01, I02, I03
RJ12 — I04, I05, I06
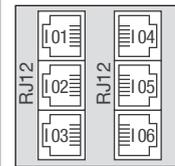
Digiware BUS
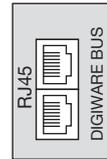
RJ45 — DIGIWARE BUS

(**) Always connect input I01 first.

DIRIS Digiware S

RJ45 - DIGIWARE BUS

I01, I02, I03
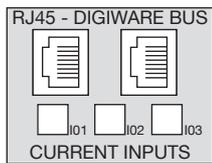
CURRENT INPUTS

DIRIS Digiware IO-10

Inputs/outputs

INPUT — COM-, IN1, IN2, IN3, IN4   12VDC

OUTPUT — 13, 14, 23, 24   OUT1, OUT2   12-48VDC max / 12-24VAC max / 50mA max
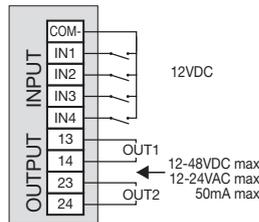
Digiware BUS
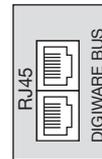
RJ45 — DIGIWARE BUS

DIRIS Digiware IO-20

Inputs

INPUT — 1-, 1+, 2-, 2+   0/4-20mA 200 Ω max

Digiware BUS

RJ45 — DIGIWARE BUS

DIRIS Digiware BCM-1818

DIGIWARE BUS

RJ45
RJ12 — M1
RJ12 — M2
RJ12 — M3

DIGIWARE BUS

RJ45

I01 I02 I03 I04 I05 I06 I07 I08 I09 I10 I11 I12 I13 I14 I15 I16 I17 I18

Current Inputs I01-I18

DIRIS Digiware BCM-21xx

DIGIWARE BUS

RJ45
RJ12 — M1
RJ12 — M2
RJ12 — M3

DIGIWARE BUS

RJ45

I01 I02 I03 I04 I05 I06 I07 I08 I09 I10 I11 I12 I13 I14 I15 I16 I17 I18 I19 I20 I21

Current Inputs I01-I21
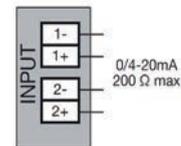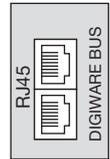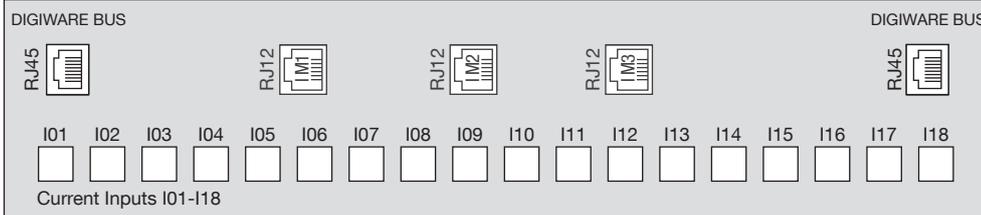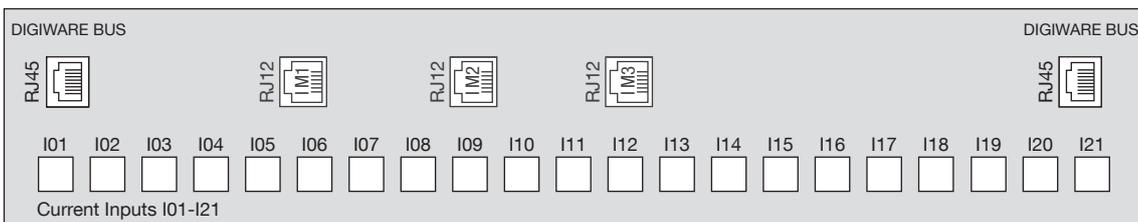
7.2. Connecting the current sensors

7.2.1. Connection concept

DIRIS Digiware
I-3x

DIRIS Digiware
I-4x

DIRIS Digiware
I-6x

3 Current sensors
TE / TR/iTR / TF

4 Current sensors
TE / TR/iTR / TF

6 Current sensors
TE / TR/iTR / TF
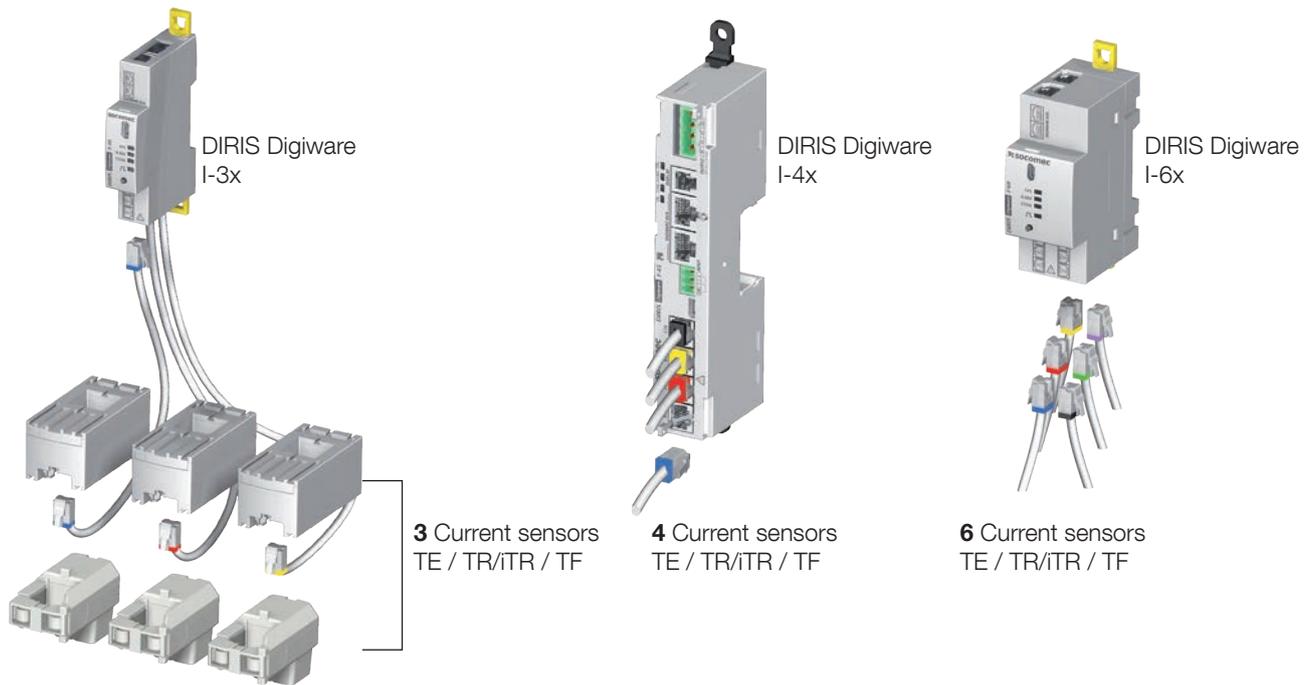
⚠️ - For connecting the current sensors, only use a SOCOMEC RJ12 cables (UTP unshielded, twisted pair, straight, AWG24, 600V, CATV, -10 ... +70°C).
- Always connect input I01 first.
- It is recommended that all current sensors be installed in the same direction.

Digiware Bus

DIRIS Digiware
BCM-18xx

3 current sensors
TE / TR / iTR / TF
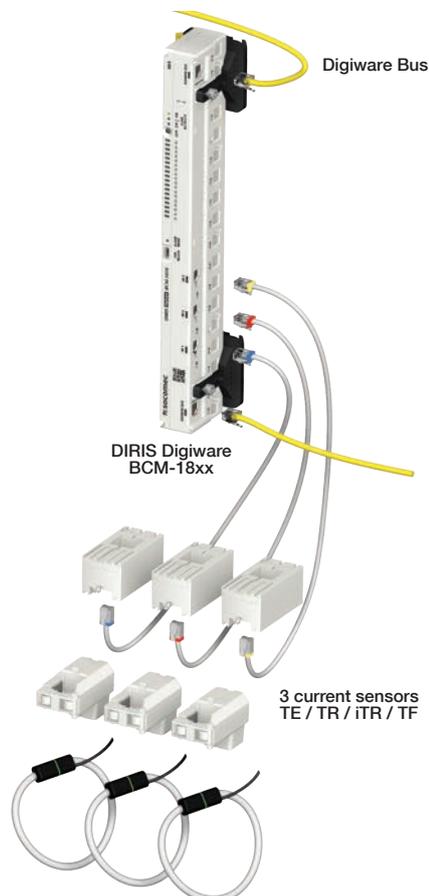
7.2.2. Details on the RJ12 connections for each current sensor

TE	TR/iTR	TF
TE-18 to TE-55		

TE-90

≋click! ↑

PMD
DIRIS Digiware I ↓
DIRIS A-40
DIRIS B

⚡ SOCOMEC cable
for current sensors

Do not bring
into contact
with dangerous
voltages

PMD
DIRIS Digiware I
DIRIS A-40 ↓
DIRIS B

⚡ SOCOMEC cable
for current sensors

⚡ SOCOMEC
cable for current
sensors

≋click! ↑

PMD
DIRIS Digiware I
DIRIS A-40
DIRIS B
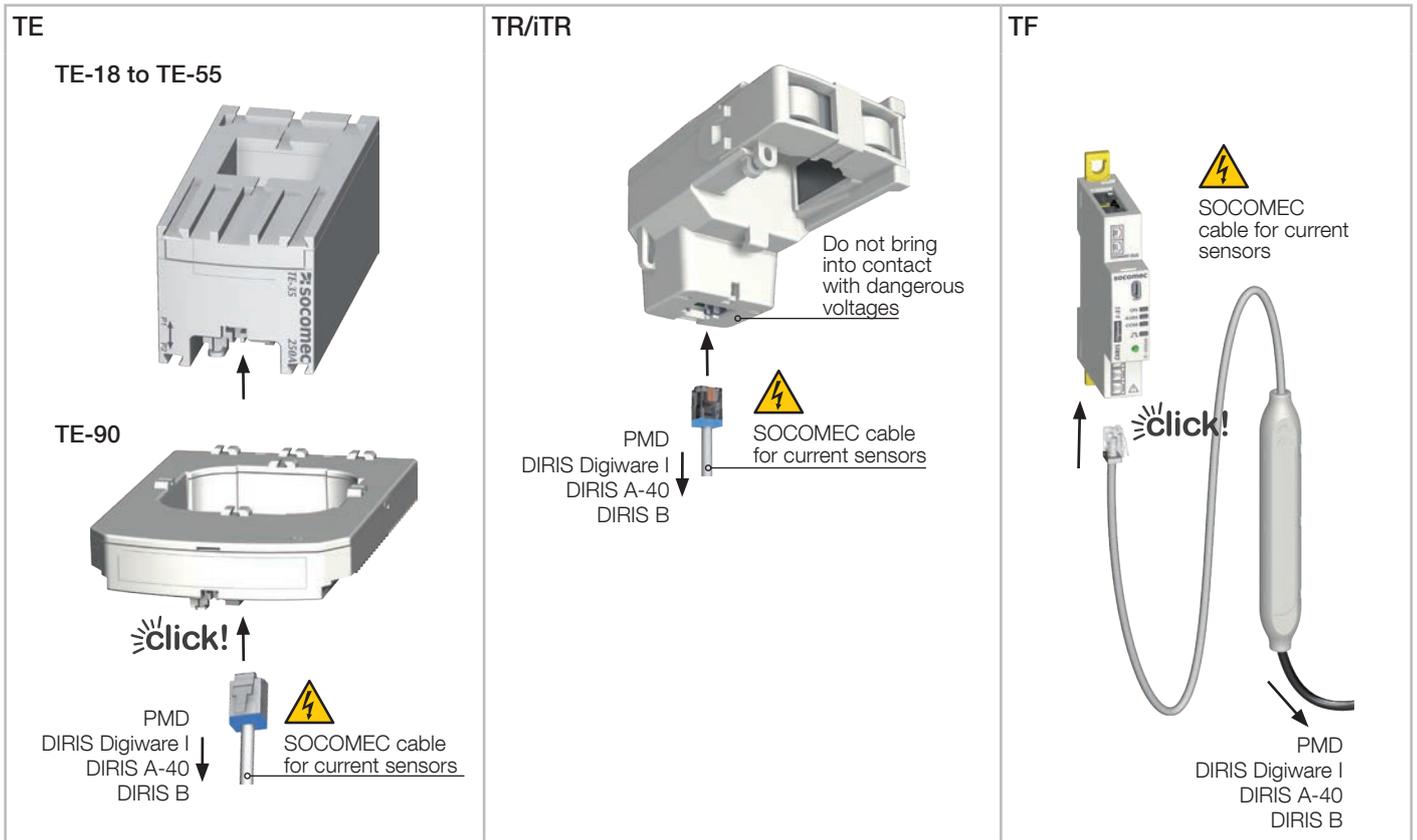
7.3. Connecting to the electrical network and loads

DIRIS Digiware can be used on single-phase, two-phase or three-phase networks.

Each DIRIS Digiware I,S and BCM current measurement module can simultaneously measure several loads, for example a three-phase load and a single-phase load. This approach allows great flexibility in terms of where it is fitted in the installation.

The loads are measured using several types of current sensors (solid-core, split-core, flexible) selected depending on the new, existing or high-current installations. The link between each DIRIS Digiware I current measurement module and its associated sensors is made using specific cables. With this connection you can quickly and easily install the units without any risk of cabling error and in complete safety. The connected sensors are automatically detected.

In addition, DIRIS Digiware can identify the majority of load types to be measured: single-phase, three-phase with or without neutral using 1, 2, 3 or 4 sensors for balanced or unbalanced loads.

The overall accuracy of the measurement chain (DIRIS Digiware + sensors) is guaranteed. To guarantee this accuracy, SOCOMEC current sensor connection cables must be used.

7.3.1. Configurable loads based on the network type

The following table summarises the loads which can be configured based on the installation's network type

Network type	Configurable load
1P+N	1P+N – 1CT
2P	2P – 1CT
2P+N	2P+N – 2CT / 2P – 1CT / 1P+N – 1CT
3P*	3P – 3CT / 3P – 2CT / 3P – 1CT / 2P - 1CT
3P+N	3P+N – 4CT / 3P+N – 3CT / 3P+N – 1CT / 3P – 3CT / 3P – 2CT / 3P – 1CT / 2P - 1CT / 2P+N - 1CT / 1P+N – 1CT

(*) Note: Single-phase loads cannot exist on a 3P network.

7.3.2. Description of the main network and load combinations

7.3.2.1. DIRIS Digiware I-3x

Legend:

3P+N – 3CT

Three phase + Neutral
network with 3 current
sensors

Current sensor (CT)

Three phase load

Voltage terminal

Current terminal

(1) For connection to IT system earthing, adapt the insulation monitoring and/or earth fault protection in accordance with the installation requirements.
IT systems 600V~ CAT III maximum.

CT
Current sensor
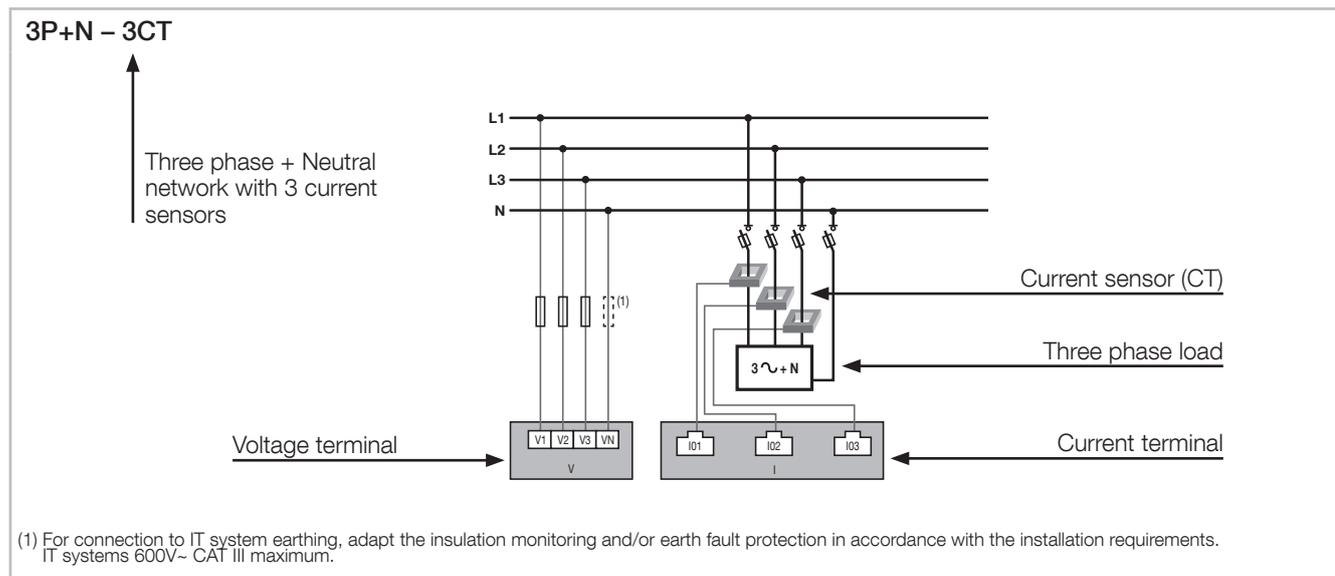
Balanced load

Unbalanced load

Each current input is individual; see below for some connection examples:

Three-phase + Neutral
3P+N - 3CT (1 three-phase load + measured Neutral)

Three-phase[2]
3P – 3CT (1 three-phase load)

Three-phase
3P – 2CT & 3P – 1CT
(1 three-phase load and 1 three-phase balanced load)

Three-phase
3P – 1CT (x3)
(3 three-phase balanced loads)

Two-phase
2P – 1CT (x3)
(3 two-phase loads)

Single-phase
1P+N – 1CT (x3)
(3 single-phase loads)
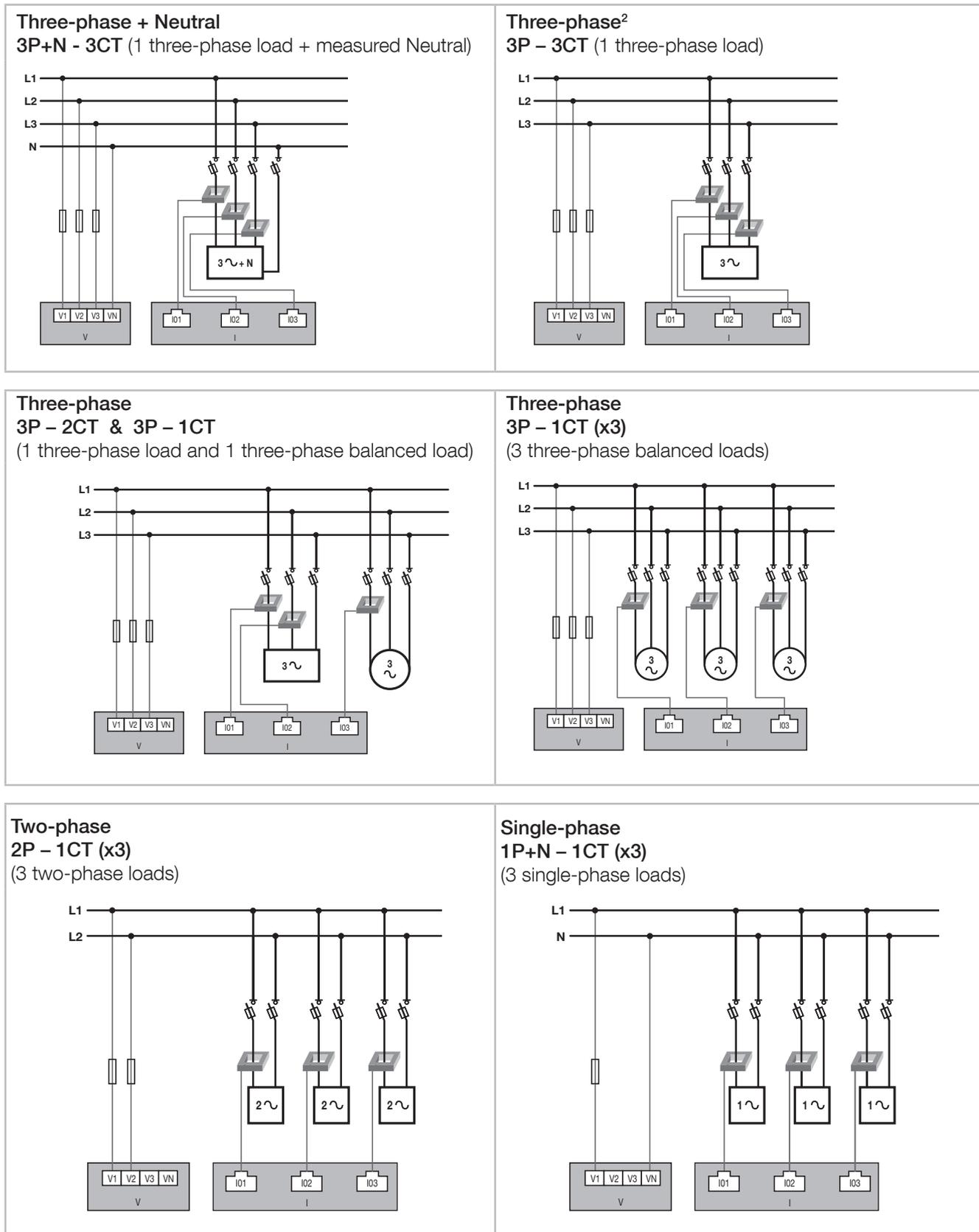
Fuse: 0.5 A gG / BS 88 2A gG / 0.5 A class CC Listed fuses for UL application.

(2) Delta systems 600V~ CAT III maximum.

7.3.2.2. DIRIS Digiware I-4x

Three-phase + Neutral
3P+N – 4CT
(1 three-phase load + measured Neutral)

Three-phase + Neutral
3P+N – 3CT & 3P – 1CT
(1 three-phase load + calculated Neutral + 1 three-phase balanced load)

Three-phase + Neutral 3P+N – 3CT & 1P+N – 1CT
(1 three-phase load + calculated Neutral + 1 single-phase load)

Three-phase 3P – 3CT & 3P – 1CT
(1 three-phase load and 1 three-phase balanced load)

Three-phase 3P – 2CT (x2)
(2 three-phase loads)

Three-phase 3P – 1CT (x4)
(4 three-phase balanced loads)

Fuse: 0.5 A gG / BS 88 2A gG / 0.5 A class CC Listed fuses for UL application.

Two-phase + Neutral 2P+N – 2CT (x2)
(2 two-phase loads)
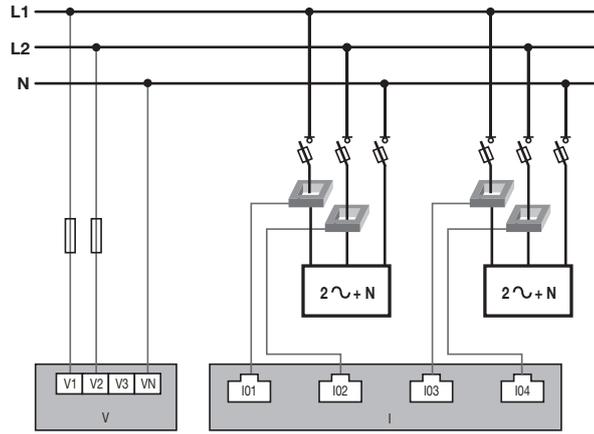
Two-phase2P – 1CT (x4)
(4 two-phase loads)
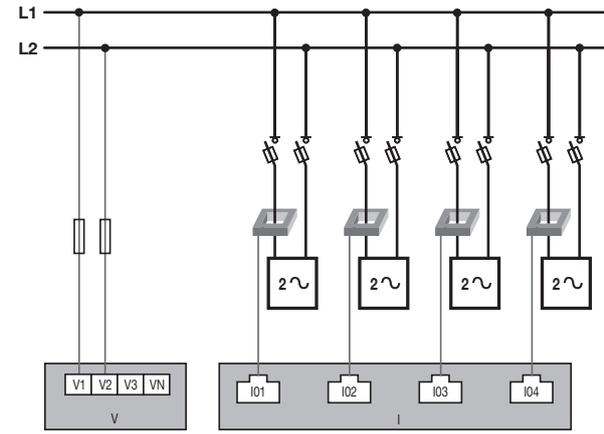
Single-phase1P+N – 1CT (x4)
(4 single-phase loads)
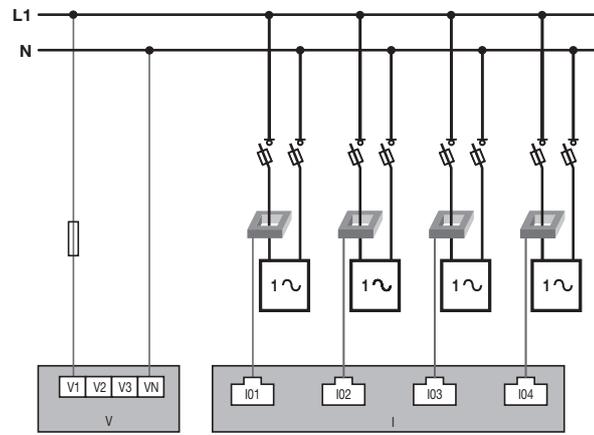
⌷ Fuse: 0.5 A gG / BS 88 2A gG / 0.5 A class CC Listed fuses for UL application.

7.3.2.3. DIRIS Digiware I-6x

Three-phase
3P – 3CT + 3P – 1CT (x3)
(1 three-phase load and 3 three-phase balanced load)
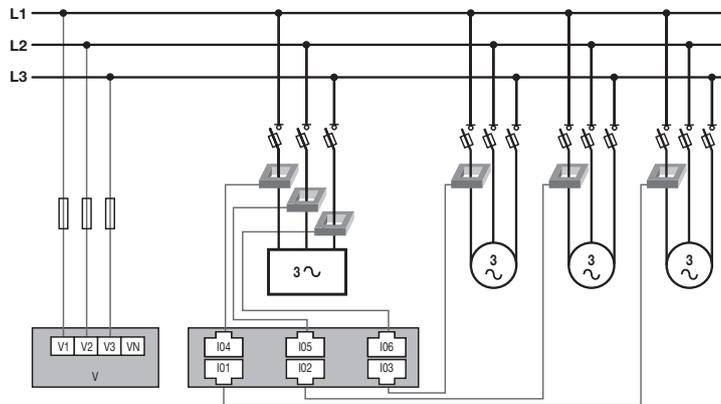
Single-phase 1P+N – 1CT (x6)
(6 single-phase loads)
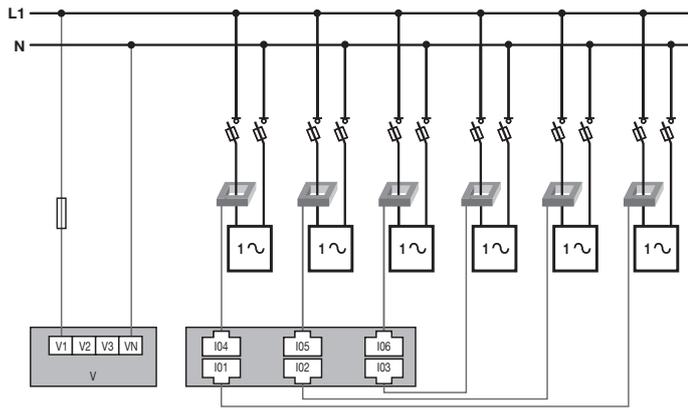
0.5 A gG / BS 88 2A gG / 0.5 A class CC fuse
If self-supplied, a fuse should be added to the neutral.

Fuse: 0.5 A gG / BS 88 2A gG / 0.5 A class CC Listed fuses for UL application.

7.3.2.4. DIRIS Digiware S-xx

3P+N – 3CT

Three phase + Neutral network with 3 current sensors

DIRIS Digiware S

Three phase load

Voltage terminal
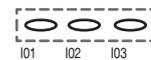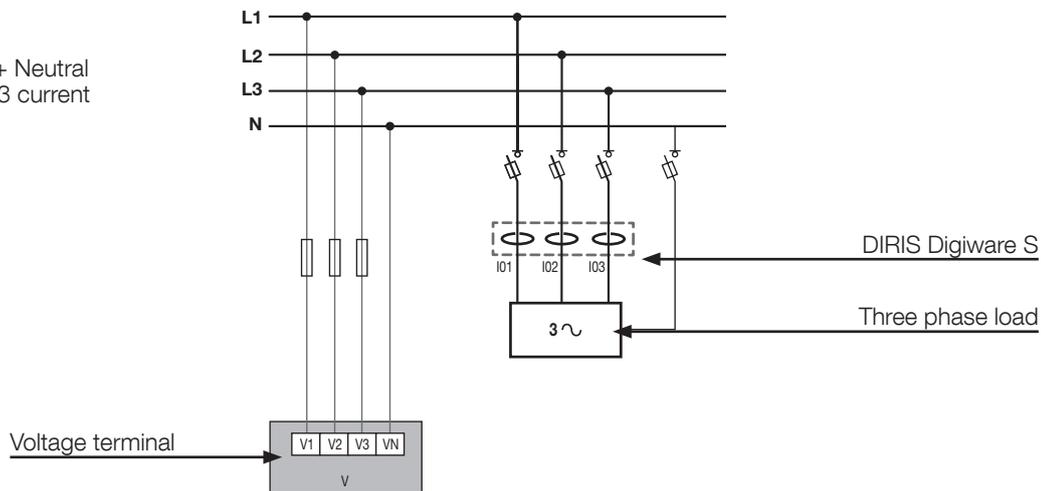
DIRIS Digiware S current inputs I01, I02, I03

Three phase load

Below are some connection examples of the DIRIS Digiware S module:

3P+N - 3CT
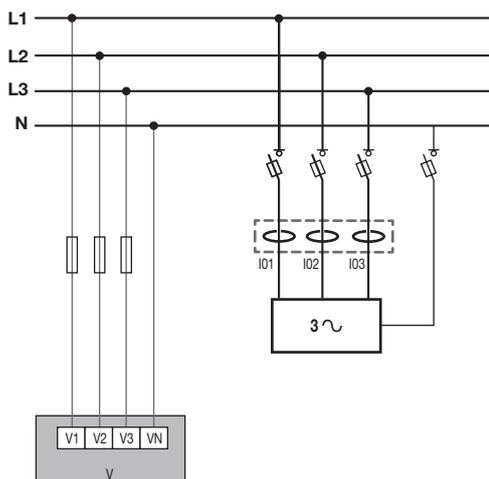
3P - 3CT
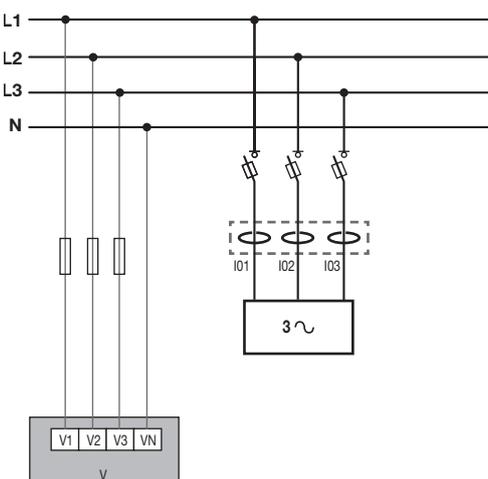
2P+N-2CT & 2P+N-1CT
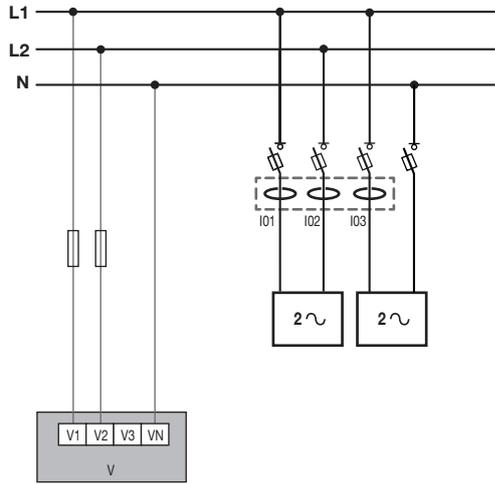
1P+N - 1CT (3x)
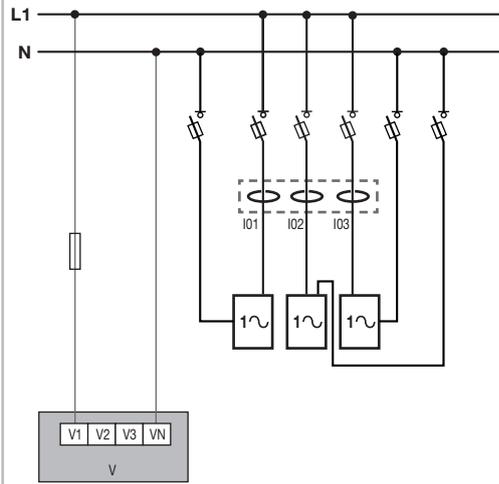
3P+N - 1 CT (x3)
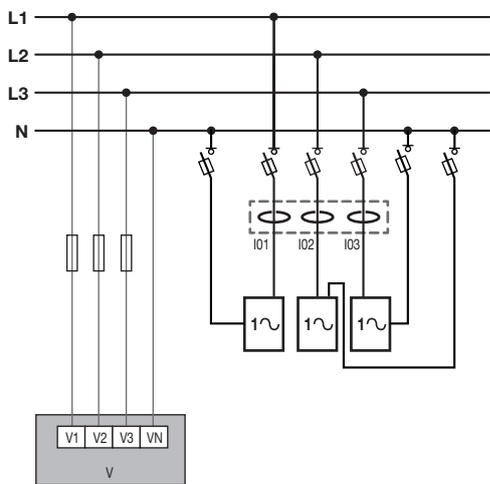
2P+N - 1CT (x3)
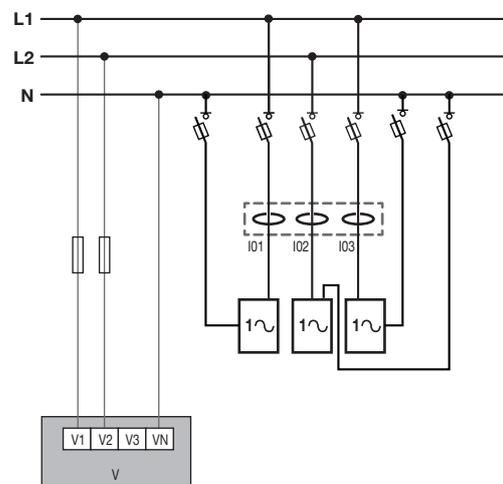
Fuse: 0.5 A gG / BS 88 2A gG / 0.5 A class CC Listed fuses for UL application.

7.3.2.5. DIRIS Digiware BCM

DIRIS Digiware BCM-1818 (Integrated sensors)	DIRIS Digiware BCM-21xx (Integrated sensors)
3P+N - 3 CT (x6)	3P+N - 3 CT (x7)
1P + N (x18)	1P + N (x21)
Multi-loads types configuration	Multi-loads types configuration

Legend:

DIRIS Digiware U

DIRIS Digiware BCM

Load

Fuse: 0.5 A gG / BS 88 2 A gG
0.5 A class CC listed fuses for UL application.

For connection to IT system earthing, adapt the protection in accordance with the installation standards currently in force.

⚠️ When installing the DIRIS Digiware BCM in a right-side configuration, default phase assignment must be changed in Easy Config System software.

TE/TR/iTR/TF current sensors or
ΔIC / ΔIP-R residual CTs

Left-side

Right-side

RJ12 cables

	Input Number *	Default 3-Phase assignment	CT Way **
Mains	IM1	A / 1	P1 ➜ P2
	IM2	B / 2	P1 ➜ P2
	IM3	C / 3	P1 ➜ P2
Branches	I01	A / 1	P1 ➜ P2
	I02	B / 2	P1 ➜ P2
	I03	C / 3	P1 ➜ P2
	I04	A / 1	P1 ➜ P2
	I05	B / 2	P1 ➜ P2
	I06	C / 3	P1 ➜ P2
	I07	A / 1	P1 ➜ P2
	I08	B / 2	P1 ➜ P2
	I09	C / 3	P1 ➜ P2
	I10	A / 1	P1 ➜ P2
	I11	B / 2	P1 ➜ P2
	I12	C / 3	P1 ➜ P2
	I13	A / 1	P1 ➜ P2
	I14	B / 2	P1 ➜ P2
	I15	C / 3	P1 ➜ P2
	I16	A / 1	P1 ➜ P2
	I17	B / 2	P1 ➜ P2
	I18	C / 3	P1 ➜ P2

DIRIS
Digiware BCM

DIRIS
Digiware BCM

	Input Number *	Default 3-Phase assignment	CT Way **
Branches	I18	A / 1	P1 ➜ P2
	I17	B / 2	P1 ➜ P2
	I16	C / 3	P1 ➜ P2
	I15	A / 1	P1 ➜ P2
	I14	B / 2	P1 ➜ P2
	I13	C / 3	P1 ➜ P2
	I12	A / 1	P1 ➜ P2
	I11	B / 2	P1 ➜ P2
	I10	C / 3	P1 ➜ P2
	I09	A / 1	P1 ➜ P2
	I08	B / 2	P1 ➜ P2
	I07	C / 3	P1 ➜ P2
	I06	A / 1	P1 ➜ P2
	I05	B / 2	P1 ➜ P2
	I04	C / 3	P1 ➜ P2
	I03	A / 1	P1 ➜ P2
	I02	B / 2	P1 ➜ P2
	I01	C / 3	P1 ➜ P2
Mains	IM1	A / 1	P1 ➜ P2
	IM2	B / 2	P1 ➜ P2
	IM3	C / 3	P1 ➜ P2

⚠️ For direct current inputs, install on 300 V insulated cable only.
(*) Refer to product marking for input number.
(**) CT Way can be changed in Easy Config System software if necessary.

Notes relating to connections:

The **Easy Config System** software can also be used to select numerous other configuration variants for the types of loads and associated network voltages.

3P – 2CT: this connection reduces the accuracy of the phases, the current for which is worked out by vector calculation, by 0.5%.

3P – 1CT: this connection requires a three-phase network that is perfectly balanced.

7.3.3. Connection of the functional earth

It is recommended that the functional earth be connected to guarantee optimum measurement accuracy and better emissivity/immunity for the electromagnetic compatibility (class B in conducted emission).

In order to use the VirtualMonitor and AutoCorrect technologies, Earth must be connected to the DIRIS Digiware U module.

8. DIGIWARE BUS

8.1. Principle
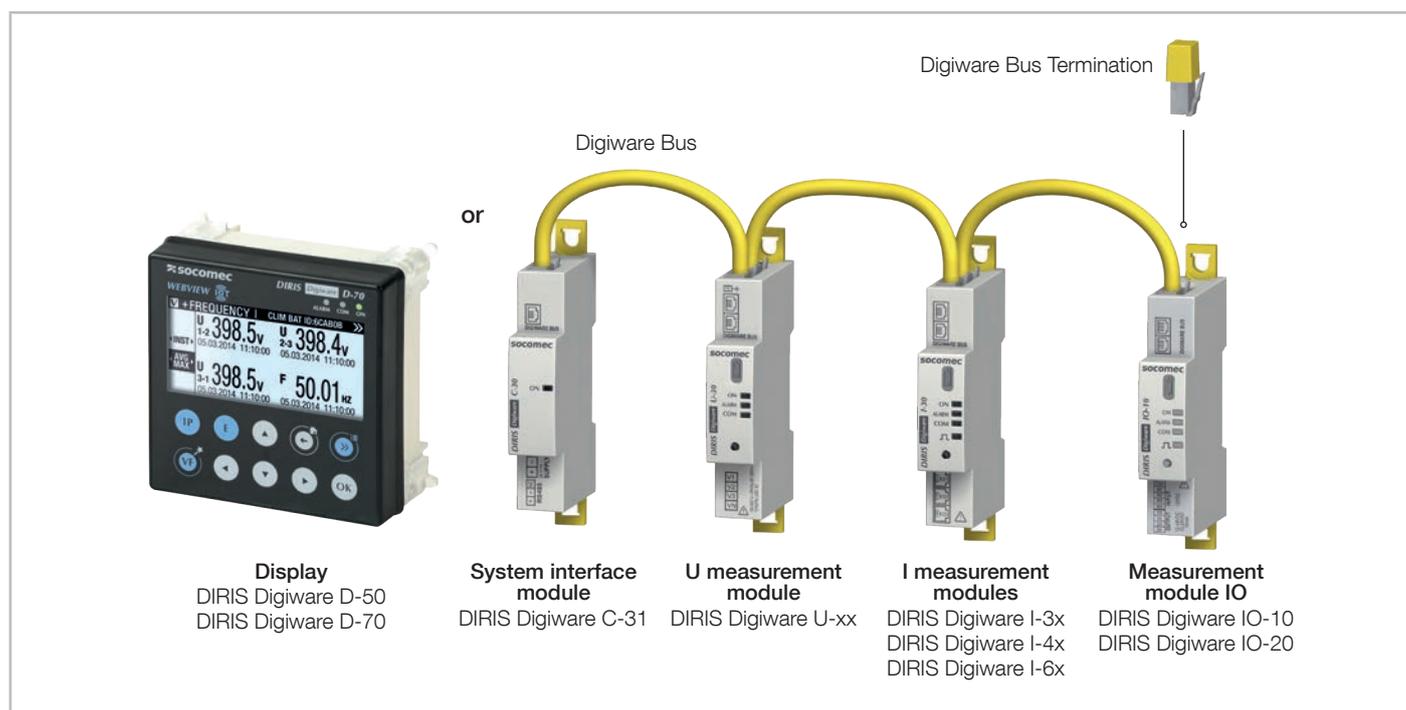
DIRIS Digiware is a system comprising the following elements:

- One DIRIS Digiware D remote display or one DIRIS Digiware M gateway or one DIRIS Digiware C-31 system interface module.
- One DIRIS Digiware U voltage measurement module.
- One or several DIRIS Digiware I, S or BCM current measurement modules.
- One or several DIRIS Digiware IO input/output modules.
- A Digiware bus termination (ref. 4829 0180) positioned on the last module. It is provided with the DIRIS Digiware D display and the DIRIS Digiware C-31 system interface module.

8.1.1. Digiware Bus connection cables

Length (m)	Quantity	Reference
0.06	1	4829 0189
0.1	1	4829 0181
0.2	1	4829 0188
0.5	1	4829 0182
1	1	4829 0183
2	1	4829 0184
3	1	4829 0190
5	1	4829 0186
10	1	4829 0187
50 m reel + 100 connectors		4829 0185

Use the shortest possible length of cable to optimise the electromagnetic emissions.

The total maximum length must not exceed 100 metres.

⚠ Use only SOCOMEC RJ45 cables for the Digiware bus.

8.1.2. Digiware Bus Termination

	Quantity	Part number
	1	4829 0180

A DIRIS Digiware bus termination is supplied with each DIRIS Digiware D display, with each DIRIS Digiware M gateway and with each DIRIS Digiware C system interface module.

8.2. Sizing of the power supply

DIRIS Digiware units are supplied by a single 24VDC power supply via the DIRIS Digiware C-31 system interface module.
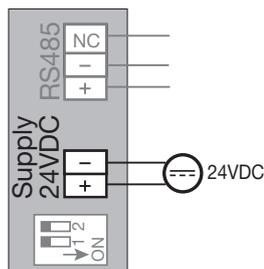
A P15 24VDC power supply is available in a 15 W version (part no. 4829 0120).

Specifications:
- 230 VAC / 24 VDC - 0.63 A - 15 W
- Modular format
- Dimensions (H x W): 90 x 36 mm

8.2.1. Equipment consumption

Device	Power supplied (W)	Power consumed (W)
Power supply		
P15 230 V / 24 V	15	-
Cables		
50 metre package	-	1.5
System interface		
DIRIS Digiware D-50 / D-70	-	2.5
DIRIS Digiware C-31	-	0.8
Module voltage		
DIRIS Digiware U-10 / U-30	-	0.72
DIRIS Digiware U-100	-	0.45
Module current		
DIRIS Digiware I-3x	-	0.52
DIRIS Digiware I-4x	-	1.125
DIRIS Digiware I-6x	-	0.7
DIRIS Digiware IO-10	-	0.5
DIRIS Digiware IO-20	-	0.5
DIRIS Digiware S-xx	-	0.35
DIRIS Digiware BCM	-	1.25
Repeater		
DIRIS Digiware C-32		1.5
Single-point display		
DIRIS D-30		2

8.2.2. Calculation rules for the max. number of devices on the Digiware BUS

The total power consumed by the equipment connected to the Digiware BUS must not exceed the power from the 24 VDC supply.
Power supply must not exceed 20 W.

Size with P15 power supply (ref: 4829 0120) delivering 15 W
For example, it is possible to use

- 1 DIRIS Digiware D-50 (2.5 W) display
- 1 DIRIS Digiware U-xx (0.72 W) voltage module
- 50 metres of cable (1.5 W)

and

- 19 DIRIS Digiware I-3x current modules (19 x 0.52 = 9.88 W)
  ⇨ **Total power = 14.6 W**

or

- 9 DIRIS Digiware I-4x current modules (9 x 1.125 = 10.125 W)
  ⇨ **Total power = 14.845 W**.

Size with a 24 VDC power supply delivering a maximum of 20 W
For example, it is possible to use

- 1 DIRIS Digiware D-50 (2.5 W) display
- 1 DIRIS Digiware U-xx voltage module (0.72 W)
- 50 metres of cable (1.5 W)

and

- 29 DIRIS Digiware current modules I-3x (29 x 0.52 = 15.08 W)
  ⇨ **Total power = 19.30 W**

or

- 13 DIRIS Digiware current modules I-4x (13 x 1.125 = 14.625)
  ⇨ **Total power = 19.345 W**.

⚠ For applications using female/female RJ45 connectors to interconnect several enclosures (e.g Busway with tap-off boxes), the additional power loss of each connector must be take into account in the overall calculation.

Socomec has estimated (but this can vary from one connector to another) that the power loss of an RJ45 female/female connector averages 0.1 W and represents an additional 3.33m of RJ45 cable length within the Digiware bus.

8.2.3. Digiware bus repeater

Whenever the power consumption is higher than 20 W or the distance is greater than 100 m, a DIRIS Digiware C-32 repeater is required.

In a DIRIS Digiware system, a maximum of 2 repeaters may be used.

	DIRIS Digiware C-32 repeater
Reference	4829 0103

Configuration example:
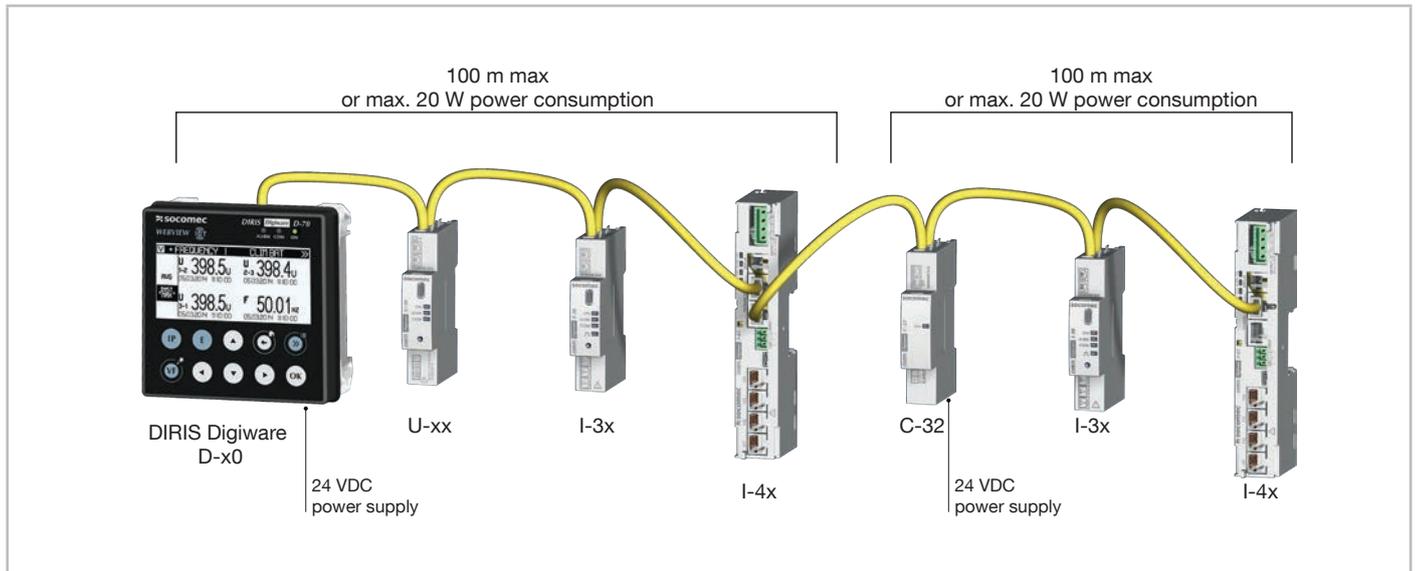
⚠️ The DIRIS Digiware U voltage module must be located upstream of the repeater.

The repeater has a 24VDC power supply.

DIRIS Digiware C-32
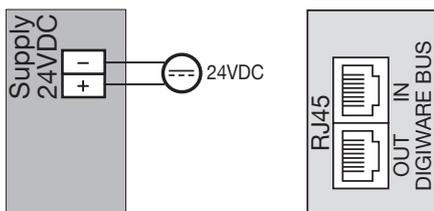
9. STATUS AND LEDS

9.1. DIRIS Digiware U / I / IO / S LEDs

Several LEDs are present on the DIRIS Digiware modules to identify their status at any time.

9.1.1. DIRIS Digiware U / I / IO

LED state	Fixed	Blinking	Pulse
ON	Product operating normally	10 seconds - on request via a Modbus control to identify the device (remote screen, etc.)	1 second during power-on
ALARM	Presence of a measurement alarm or logical alarm (do not have priority over system alarms)	• DIRIS Digiware U: Network phase rotation system alarm is active (*) • DIRIS Digiware I: At least one system alarm is active: - Disconnection of a current sensor - Incorrect V/I association (possible wiring error) - Incorrect CT primary	1 second during power-on
COM	Addressing conflict during Auto-Discovery process	Address OK	1 second during power-on and when a communication frame is received is processed
⊓	Not available	I - xx: not available IO-10: Corresponds to the change of state in all of the inputs (IN1, IN2, IN3, IN4) configured in logical mode	I - xx: Corresponds to the metrological pulse weight IO-10: The metrological pulse weight of input 1 (IN1) configured in pulse counter mode

(*) Network rotation alarm possibly indicating a configuration error

9.1.2. DIRIS Digiware S
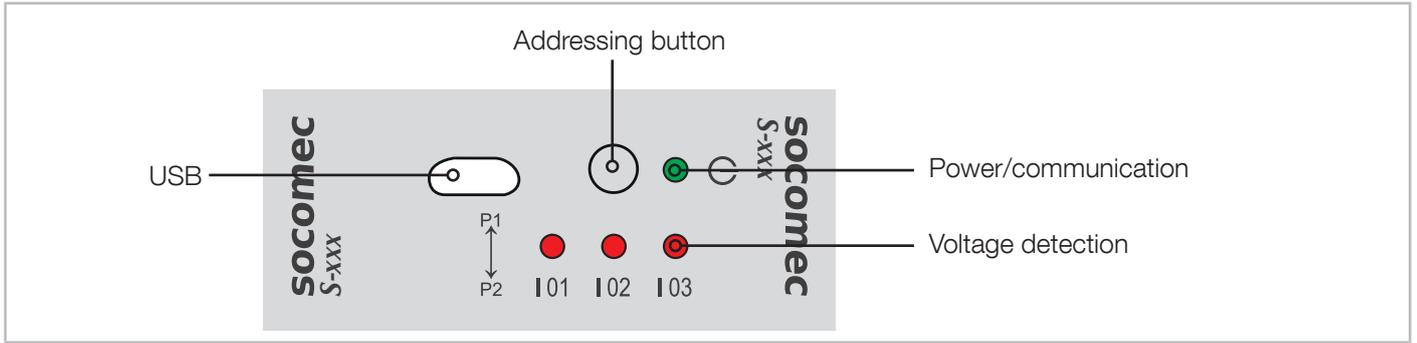
Main LED	Fixed	Blinking
Green	Product operating normally	When a communication frame is received is processed and During 10 seconds, if an identification command is initiated from the Easy Config System software
Red	Indicates the presence of a measurement alarm (does not have priority over system alarms)	Indicates the presence of a system alarm (**)
Orange	Address conflict during Auto-Discovery process	Not available

I01, I02 & I03 LEDs (***)	Fixed	Pulse
Red	Indicates that no voltage is detected on a phase.	Corresponds to the metrological pulse weight (1Wh by default)

(**) System alarms for the DIRIS Digiware S module can be a bad V/I association indicating a possible wiring error.

(***) By default, I01, I02, I03 LEDs are configured in voltage detection mode.
Settings can be changed to metrological LED mode from the Easy Config System configuration software.

⚠ The voltage detection feature is an indication of the presence or the absence of voltage on one of the phases.
It should only be used as an indication, and must not replace the use of a voltage tester.
In addition, the nominal voltage must be correctly configured in the DIRIS Digiware U module.

9.1.3. DIRIS Digiware BCM

USB Type B   ADDR. Button
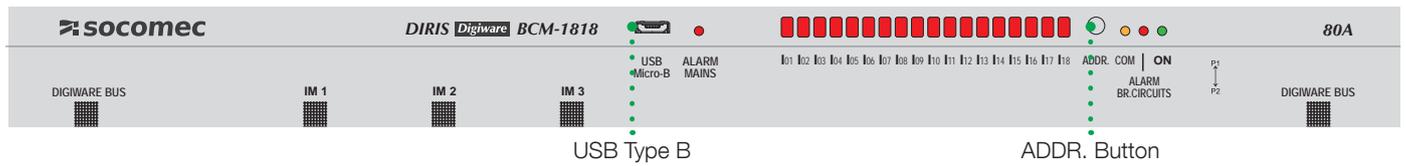
	FIXED	BLINKING
ALARM MAINS (Red)	Ongoing alarm (measurement, protection)	Ongoing system alarm (disconnected CT, V/I association, incorrect CT rating)
I01 - I18 (Red)	Indicates that no voltage is detected on a phase	Corresponds to the metrological pulse weight (1Wh/pulse by default for BCM-1818 and BCM-2119) (2Wh/pulse by default for BCM-2125)
COM (Orange)	Address conflict during Auto-Discovery process	Device is communicating
ALARM BR. CIRCUITS (Red)	Ongoing alarm (measurement, protection)	Ongoing system alarm (disconnected CT, V/I association, incorrect CT rating)
ON (Green)	Product powered and operating normally	When D-xx display is navigating on device and upon manual request (10 sec)

⚠ The voltage detection feature is an indication of the presence or the absence of voltage on one of the phases.
It should only be used as an indication, and must not replace the use of a voltage tester.
In addition, the nominal voltage must be correctly configured in the DIRIS Digiware U module.

9.2. T-10

RCM FAULT (amber)
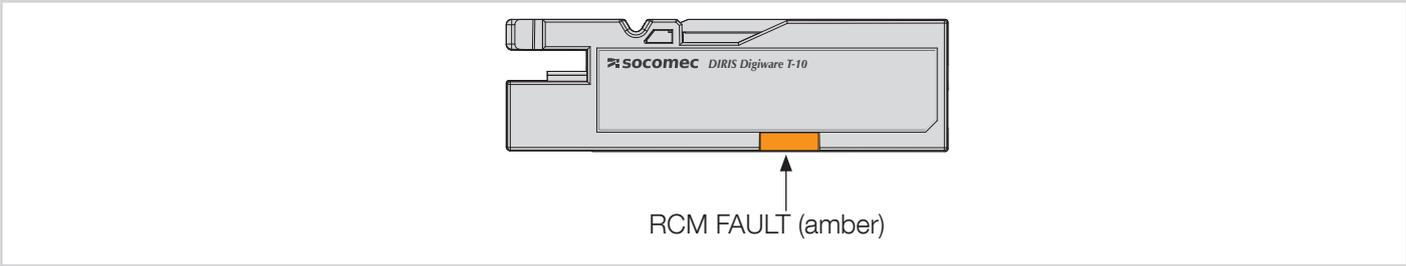
LED state	Fixed	Blinking	Pulse
ALARM	Presence of an RCM alarm on the circuit monitored by the residual CT	Presence of a Residual CT disconnected system alarm indicating that the residual CT is not properly connected to the DIRIS Digiware R-60.	-

10. AUTO-DISCOVERY PROCESS

Once the system is fully wired and powered on, you must launch the auto-discovery process.

The auto-discovery process scans all slave devices connected on the Digiware and RS485 bus of the display/gateway and assigns them with a unique Modbus address.

Two auto-discovery modes can be used:

- FAST (default mode): this mode will only detect DIRIS Digiware modules on the Digiware bus and RS485 bus, DIRIS B and DIRIS A-40 on the RS485 bus.

- FULL: this mode will also detect other Socomec PMDs (DIRIS A) and meters (COUNTIS E) connected on the RS485 bus.

You can launch the auto-discovery using the push button of the DIRIS Digiware M-50/M-70 gateway, using the DIRIS Digiware D-50/D-70 display, or from the Easy Config System software.

10.1. Auto-discovery from the DIRIS Digiware M gateway
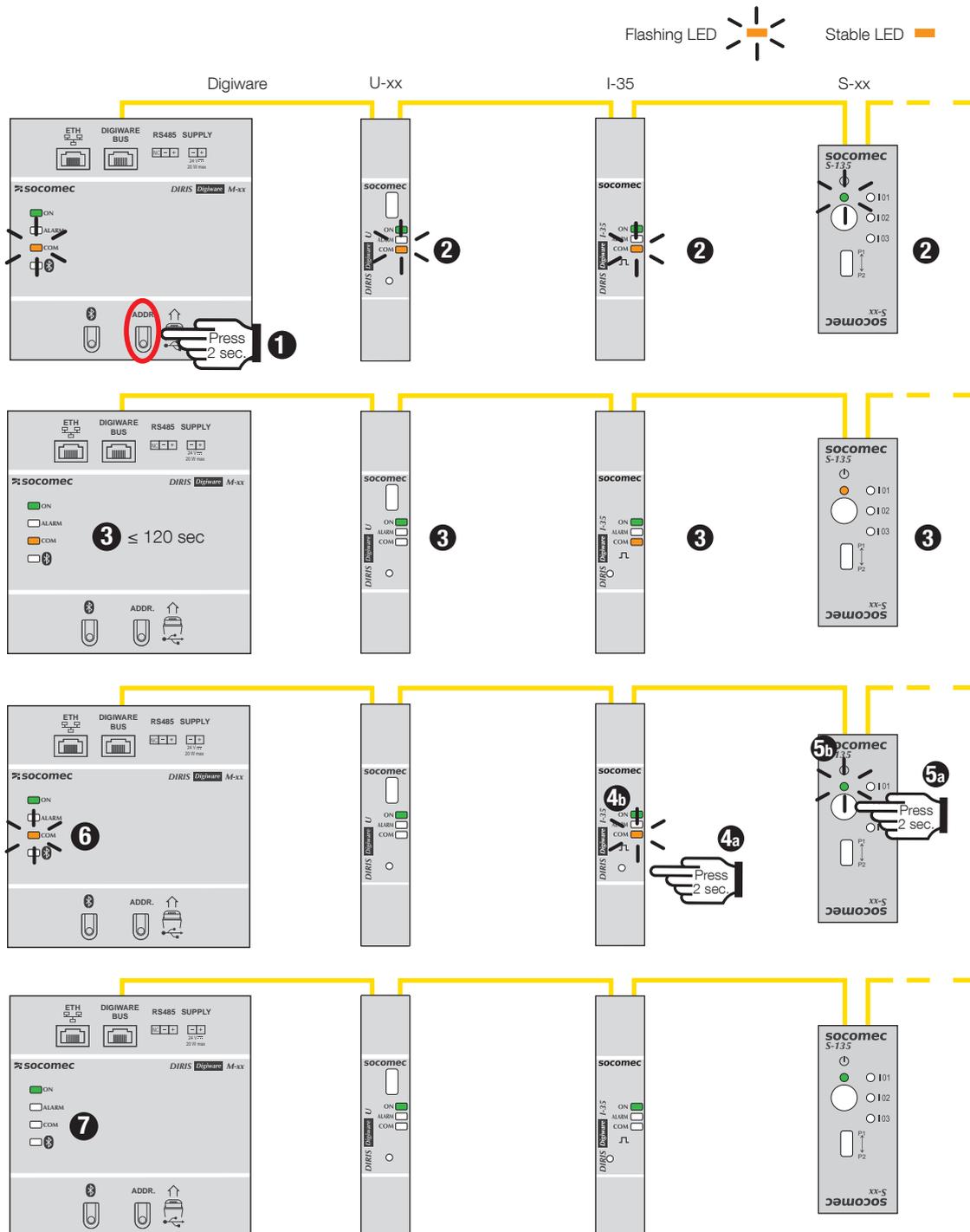
1. Start the auto-discovery of all devices connected to the Digiware or RS485 buses, by pressing the "ADDR." button under the M-50/M-70.
2. "COM" LEDs of all devices will start blinking synchronously during the process. If com LEDs are not blinking, there could be a configuration issue (inconsistent baud rate between the M-xx gateway and slave devices).
3. After approximately 1 minute, the COM LED of the M-xx gateway as well as I-xx / S-xx / BCM-xx / IO-xx modules are lit and stable. This is perfectly normal; it simply indicates that address conflicts have been detected since multiple devices have the same Modbus address (same factory default settings).
4a/5a. Press the front button on each slave device that has a fixed COM LED, for at least 2 seconds to resolve address conflicts.
4b/5b. COM LEDs of the modules start blinking again.
6. COM LED of the M-xx gateway starts blinking again, and slave devices can now communicate with the M-xx gateway.
7. The auto-discovery process is finished, the COM LEDs blink when communication is on-going between the M-xx gateway and downstream modules.

ⓘ Notes:

- The Easy Config System software must be used if you wish to change the auto-discovery process mode to FULL.

- The order used when pressing the push buttons on the modules also determines the order for the Modbus addressing of those modules.

- The auto-discovery process can also be launched from the Easy Config System software where you can choose an automatic resolution of conflicts, instead of having to press the front button on the modules.

⚠ If you would like to assign specific Modbus addresses to the devices connected to the M-50/M-70 gateway, launch the auto-discovery from the Easy Config System software, and change the Modbus addresses of slave devices directly from the dashboard of the M-50/M-70 display (see "12.2. Configuration via Easy Config System", page 79).

10.2. Auto-discovery from the DIRIS Digiware D display
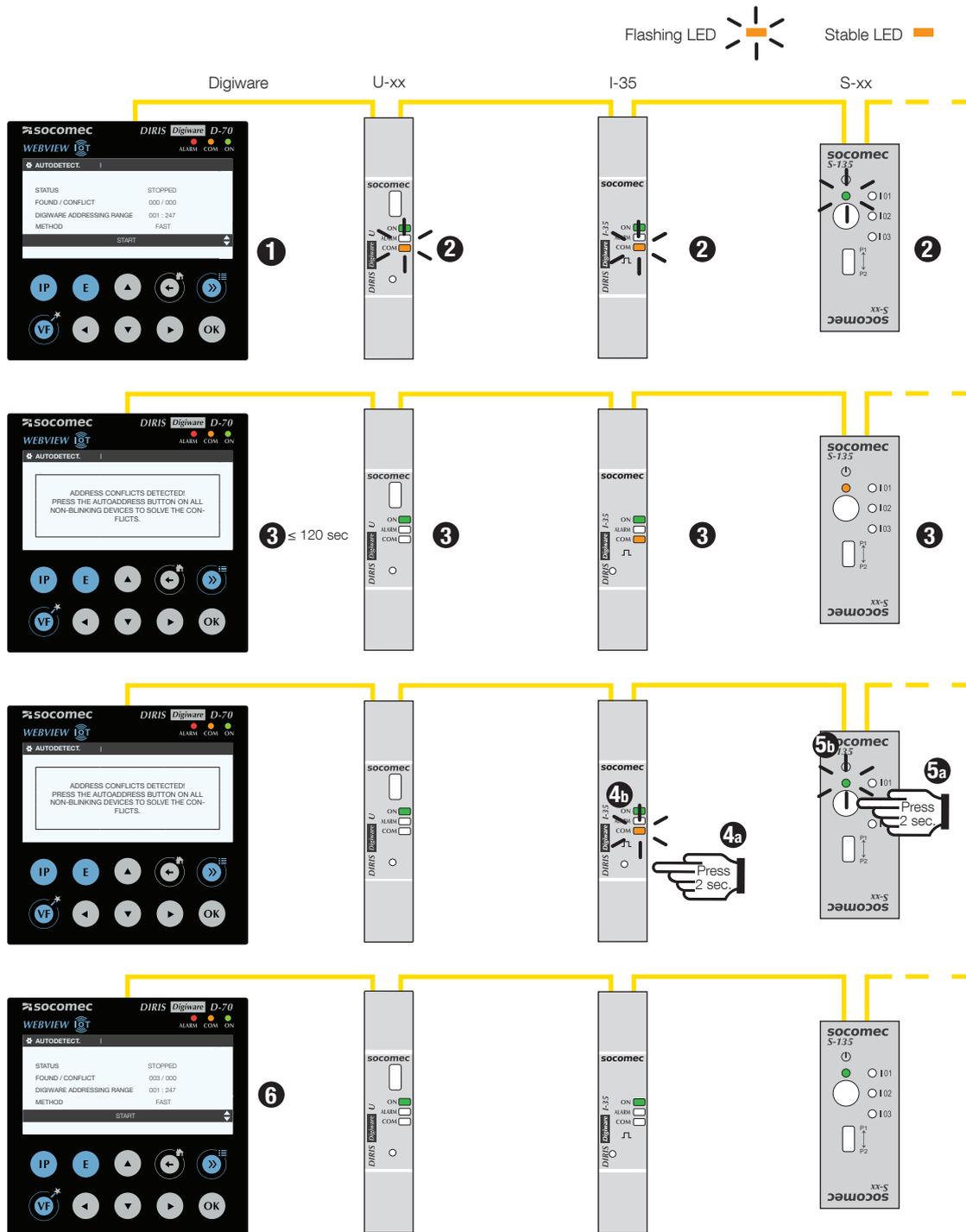
1. Go to PARAMETERS (password is 100), then AUTODETECT SERIAL DEVICES. Click on START, then OK to start the auto-discovery process.

2. "COM" LEDs of all devices will start blinking synchronously during the process. If com LEDs are not blinking, there could be a configuration issue (inconsistent baud rate between D-xx display and slave device etc.).

3. After approximately 1 minute, a pop-up message on the D-xx display indicates that address conflicts have been detected, and the COM LED of slave devices in conflict are lit and stable. This is perfectly normal; it simply indicates that address conflicts have been detected since multiple devices have the same Modbus address (same factory default settings).

4a/5a. Press the front button on each slave device that has a fixed COM LED, for at least 2 seconds.

4b/5b. COM LEDs of the modules start blinking again.

6. The auto-discovery process is finished, the D-xx display shows the number of discovered devices (3 in our example). The COM LEDs blink when communication is on-going between the D-xx display and downstream modules.

Notes:

- The order used when pressing the push buttons on the modules also determines the order for the Modbus addressing of those modules.
- Before launching the auto-discovery process, you can change the method to resolve address conflicts and set it to AUTOMATIC. In this case, steps 3-5 are avoided

If you would like to assign specific Modbus addresses to the devices connected to the D-50/D-70 display, launch the auto-discovery from the Easy Config System software, and change the Modbus addresses of slave devices directly from the dashboard of the D-50/D-70 display (see 13.2). (see "12.2. Configuration via Easy Config System", page 79).

11. COMMUNICATION

11.1. General information

The DIRIS Digiware system communicates via RS485 or Ethernet from the DIRIS Digiware M-50/M-70 gateway or D-50/D-70 display, both acting as the unique point of access to measurements.

The M-50/M-70 and D-50/D-70 can communicate via multiple communication protocols: Modbus RTU, Modbus TCP, BACnet IP, SNMP v1, v2, v3.

Maximum 32 devices can be visualised on the D-50/D-70 display or on WEBVIEW-M, the webserver embedded in the M-70 gateway and D-70 display.

11.2. RS485 communication

The DIRIS Digiware C-31 module, DIRIS Digiware D-50/D-70/M-50/M-70 can communicate over RS485 (2- or 3-wire) using the Modbus RTU protocol.

The Modbus protocol requires a dialogue with a master/slave structure. The mode of communication is the RTU (Remote Terminal Unit). In a standard setup, an RS485 link enables the interconnection of 32 RS485 devices to a PC (with DIRIS Digiware C-31 or DIRIS Digiware D-50/D-70 counting as one device), or a PLC over a distance of 1,200 metres.

Example of architecture using a C-31 module* :

Digiware Bus

RS485

C-31   U-xx   I-35   S-xx

Digiware bus terminating resistor
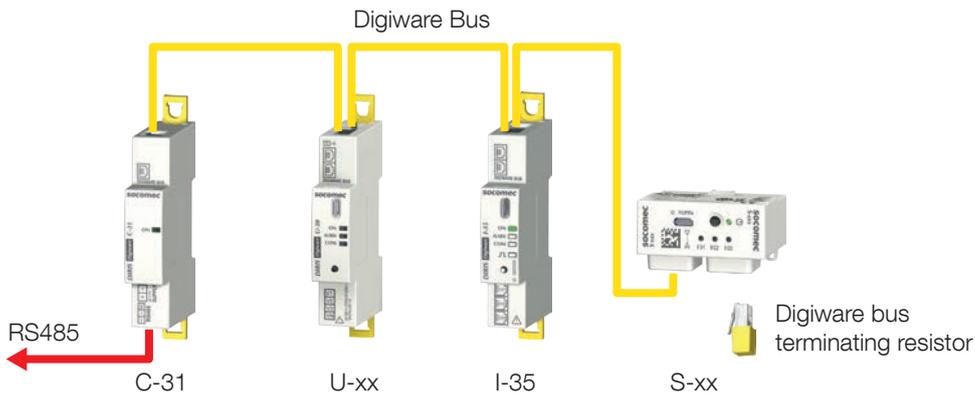
* RS485 communication is also possible with M-50/M-70 gateways and D-50/D-70 displays.

⚠ The following rules must be observed:
- A 120 Ω resistor must be added at the start of the RS485 link
- A 120 Ω resistor must be added at the end of the RS485 link
- A terminating resistor must be added at the end of the Digiware bus.

11.3. Ethernet communication

The DIRIS Digiware M-50/M-70 gateway and DIRIS Digiware D-50/D-70 display can communicate over Ethernet using multiple communication protocols (Modbus TCP, BACnet IP, SNMP v1, v2, v3 & Traps).

Example of architecture using an M-50/M-70 gateway:
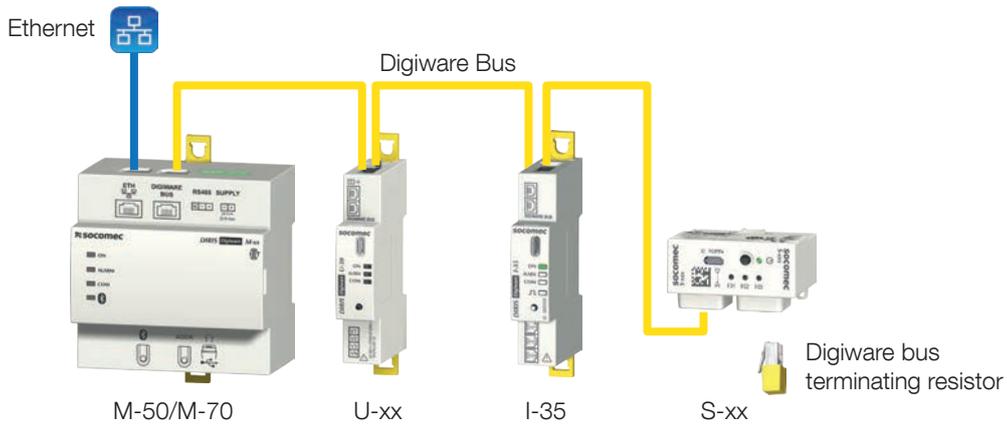
11.4. Ethernet and RS485 communication

In the event that the system needs to communicate to a second PLC via RS485, you can configure M-50/M-70 gateways and D-50/D-70 displays as RS485 slave to communicate via the RS485 bus in addition to the Ethernet bus.

Example of architecture using a D-50 or D-70 display:
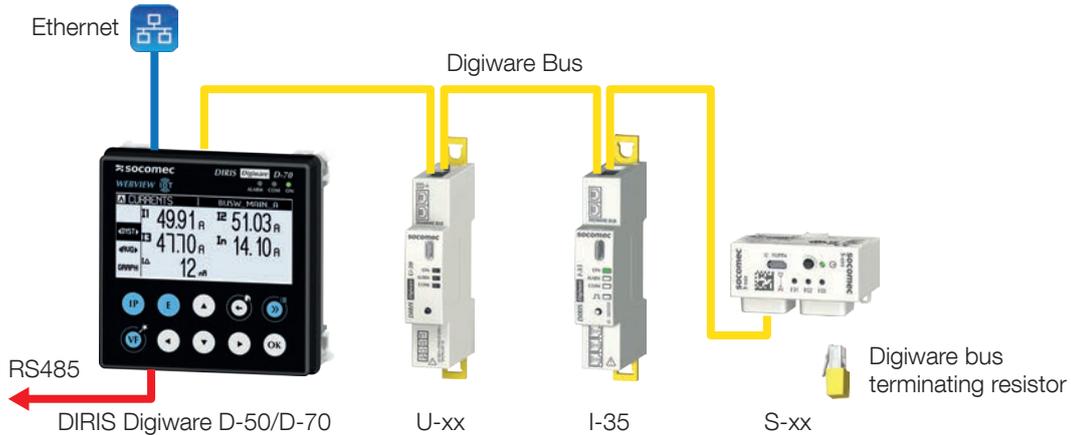
⚠ The following rules must be observed:
 - A 120 Ω resistor must be added at the end of the RS485 link
 - An end of line resistor must be added at the end of the Digiware bus.

11.5. Communication tables

The communication tables and associated explanations can be found on the documentations page for DIRIS Digiware on the SOCOMEC website: www.socomec.com/operating-instructions_en.html

12. CONFIGURATION

Configuration can be carried out using the Easy Config System configuration software or directly from the DIRIS Digiware D-xx remote display.

The Easy Config System software is used to configure the DIRIS Digiware system directly via Ethernet or USB. Easy Config System must be installed before using the USB connection.

⚠️ Before configuring the DIRIS Digiware system, please make sure it operates using the latest available firmware versions. The latest firmware versions are available on the Socomec website.

12.1. Connection modes

> **USB through M-xx gateway or D-xx display**

Easy Config System software

Digiware Bus

USB

DIRIS Digiware M-xx   *U-xx*   *I-xx*   *S-xx*   *DIRIS B*

RS485
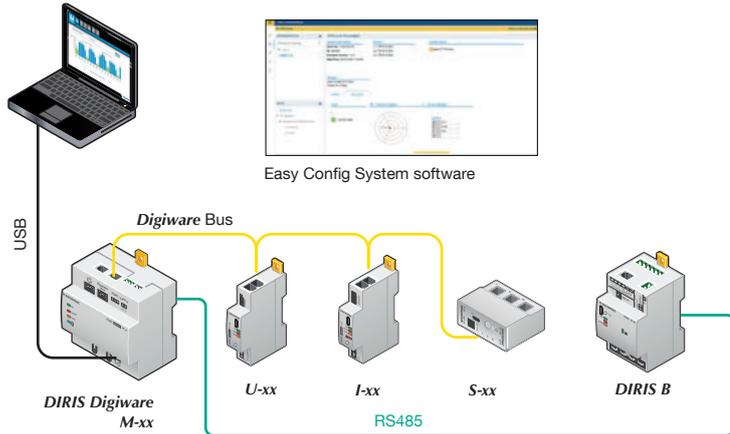
> **Ethernet through M-xx gateway or D-xx display**

Easy Config System software

Digiware Bus

Ethernet

DIRIS Digiware M-xx   *U-xx*   *I-xx*   *S-xx*   *DIRIS B*

RS485
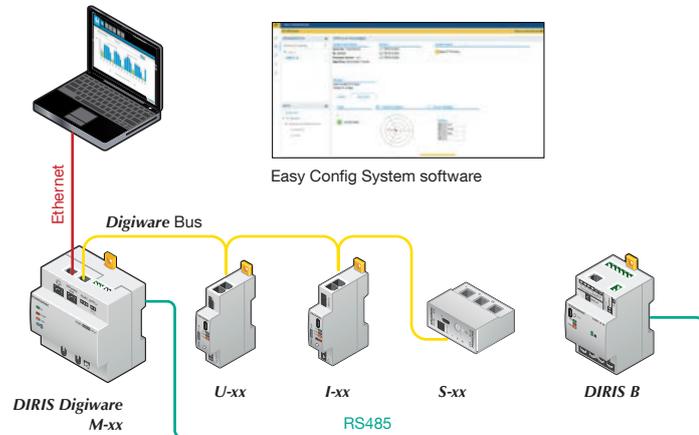
> **Direct USB to U-xx/I-xx/S-xx modules**

Easy Config System software

USB

Module must be powered by Digiware bus in order to be configured via USB

I-xx
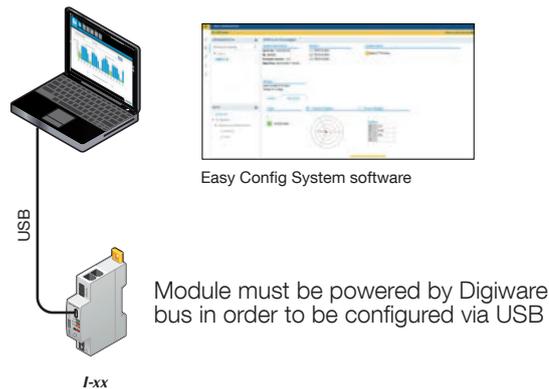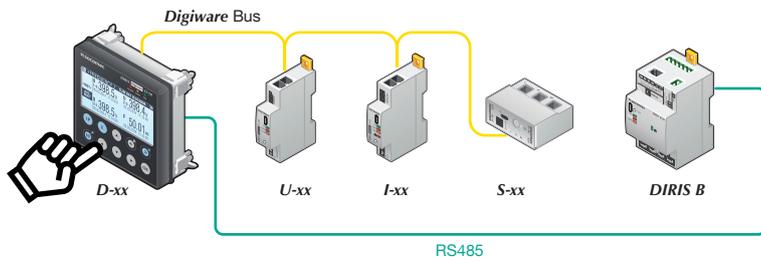
⚠️ Connect the power supply before configuring the products.

12.2. Configuration via Easy Config System

Easy Config System is the software used to configure the DIRIS Digiware system easily and quickly.

It can be downloaded at the following link: https://www.socomec.com/easy-config-system_en.html

The DIRIS Digiware system should be configured in the following sequence:
- Configuration of the DIRIS Digiware D display / M gateway
- Configuration of the DIRIS Digiware U voltage module
- Configuration of DIRIS Digiware I modules and IO-10/IO-20 modules

Refer to the Easy Config System instruction manual for more details on the full configuration procedure.

12.3. Configuration from the DIRIS Digiware D remote display

12.3.1. Connection mode

Configuration from the remote display
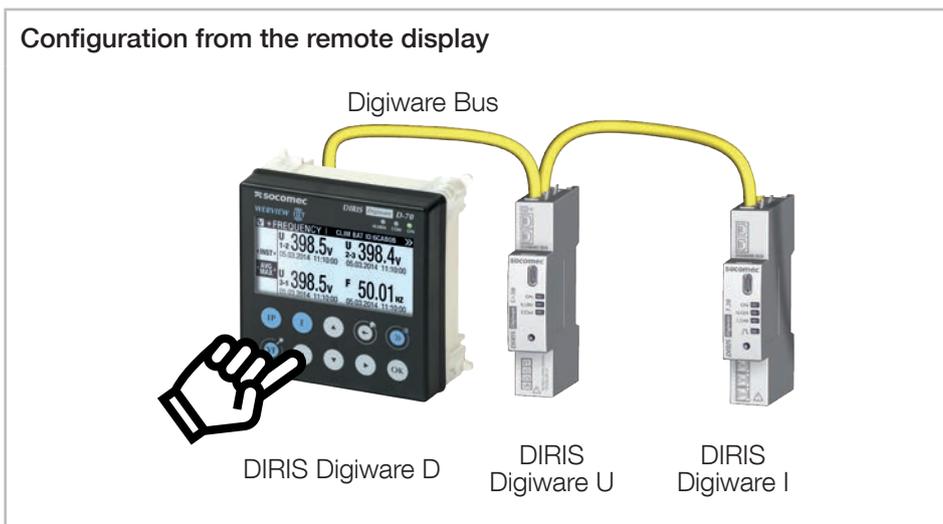
The main settings of the DIRIS Digiware system (U, S, I, IO) can be configured from the DIRIS Digiware D-xx display directly.

Refer to the manual for the DIRIS Digiware D display for more details.

13. ALARMS

Several types of alarms are available with the DIRIS Digiware system.
The alarm type depends on the type of module, as detailed in the table below:

Module Type / Alarm type	U-10	U-30	U-100	S-130	I-30	I-60	I-31	I-61	I-43	S-135
System alarms	X	X	X	X	X	X	X	X	X	X
Measurement alarms		X	X							X
Protection alarms*				X	X	X	X	X	X	X
Protection counter alarms*										X
Logical alarms									X	
Combination alarms		X	X							X
EN 50160 alarms		X	X							
Overcurrent alarm										X

Module Type / Alarm type	BCM-1818 BCM-2119 BCM-2125	BCM-1818VM BCM-2119VM BCM-2125VM	I-35	I-45	IO-10	IO-20
System alarms	X	X	X	X		
Measurement alarms	X	X	X	X	X	X
Protection alarms*	X	X	X	X		
Protection counter alarms*		X	X	X	o	
Logical alarms				X	X	
Combination alarms	X	X	X	X	X	X
EN 50160 alarms						
Overcurrent alarm	X	X	X	X		

x = available
o = partially available
(*) Protection and Protection Counter alarms are only available with DIRIS Digiware S, BCM and when iTR current sensors are used with DIRIS Digiware I modules.

Active alarms and logs of timestamped finished alarms can be accessed from WEBVIEW and from the DIRIS Digiware D-xx display.

13.1. System alarms

System alarms are activated upon detection of a commissioning error.

Voltage/current association

A "V/I association" alarm is activated upon detection of a wrong association between the current inputs of the DIRIS Digiware I or S current module and the voltage inputs on the DIRIS Digiware U module:
- If TE/TR/TF current sensors are used, this feature requires a certain load level: 0.6 < PF < 1 and I > 2% In
- If iTR current sensors or DIRIS Digiware S modules are used, the V/I association alarm also works off-load

Incorrect phase rotation (three-phase system only)

A "Phase rotation" alarm is activated upon detection of an incorrect direction of phase rotation (for example 3-2-1 instead of 1-2-3).

CT disconnected

A "CT disconnected" alarm is activated upon disconnection of a current sensor from the DIRIS Digiware I module.

Incorrect CT primary

An "Incorrect CT primary" alarm is activated if the detected current sensor rating is different from the one configured in the DIRIS Digiware I module.

DIRIS Digiware - 542875K - SOCOMEC

Acknowledgement

System alarms can be acknowledged either:
- Automatically
- Via communication (from WEBVIEW, DIRIS Digiware D display or Modbus command)
- Via a digital input (for devices with digital inputs, such as DIRIS Digiware IO-10 and I-4x modules)

Output report

System alarms can be linked to a digital output for alarm reporting purposes.

Delay

A time delay can be configured at the start and the end of the alarm.

13.2. Measurement alarms

Measurement alarms are activated when a threshold is exceeded for the instantaneous or average values measured by the DIRIS Digiware module: current, voltage, frequency, power, energies, power factor, Cos phi, THD, K-factor, Crest factor, unbalance and analogue input values.

For each measurement alarm:
- A high and a low threshold must be configured
- A hysteresis can be configured
- A time delay can be configured at the start and the end of the alarm

You can choose to activate the alarm if the configured threshold is exceeded on all phases simultaneously (Phase 1 and Phase 2 and Phase 3) or at least on one phase (Phase 1 or Phase 2 or Phase 3).

Acknowledgement

Measurement alarms can be acknowledged either:
- Automatically
- Via communication (from WEBVIEW, DIRIS Digiware D display or Modbus command)
- Via a digital input (for devices with digital inputs, such as DIRIS Digiware IO-10 and I-4x modules)

Output report

Measurement alarms can be linked to a digital output for alarm reporting purposes.

Delay

A time delay can be configured at the start and the end of the alarm.

13.3. Protection alarms

Protection alarms alert you in case of an event on a protective device. They can be configured in case of:
- an opening of the protective device.
- a trip of the protective device (only available for circuit breakers)
- a defect of the protective device (for multi-phase protective devices only, when one pole is in a different position from the other poles).

⚠️ Make sure you have configured the protective device type used in the "Protection" menu of Easy Config System in order to use the Protection alarms.

Acknowledgement

Protection alarms can be acknowledged either:
- Automatically
- Via communication (from WEBVIEW, DIRIS Digiware D display or Modbus command)
- Via a digital input (for devices with digital inputs, such as DIRIS Digiware IO-10 and I-4x modules)

Output report

Protection alarms can be linked to a digital output for alarm reporting purposes.

Delay

A time delay can be configured at the start and the end of the alarm.

13.4. Protection counter alarms

Alarms on protection counters can be configured thanks to the VirtualMonitor technology (available with DIRIS Digiware S-135 module and with DIRIS Digiware I-35/I-45 modules connected to iTR current sensors):
- Total operation counter
- Low-load operation counter
- On-load operation counter
- Overload operation counter
- Total Trip Counter (this feature is also available using the inputs of the DIRIS Digiware IO-10)

Refer to the VirtualMonitor paragraph (section 14 of this instruction manual) for more information on protection counters.

Acknowledgement

Protection counter alarms can be acknowledged either:
- Automatically
- Via communication (from WEBVIEW, DIRIS Digiware D display or Modbus command)
- Via a digital input (for devices with digital inputs, such as DIRIS Digiware IO-10 and I-4x modules)

Output report

Protection counter alarms can be linked to a digital output for alarm reporting purposes.

Delay

A time delay can be configured at the start and the end of the alarm.

13.5. Logical alarms

Logical alarms are activated upon the change of status of a digital input.

Acknowledgement

Logical alarms can be acknowledged either:
- Automatically
- Via communication (from WEBVIEW, DIRIS Digiware D display or Modbus command)
- Via a digital input (for devices with digital inputs, such as IO-10, I-4x etc.)

Output report

Logical alarms can be linked to a digital output for alarm reporting purposes.

Delay

A time delay can be configured at the start and the end of the alarm.

13.6. Combination alarms

Combination alarms consist of Boolean combinations (OR, AND) of multiple existing alarms.

Acknowledgement

Combination alarms can be acknowledged either:
- Automatically
- Via communication (from WEBVIEW, DIRIS Digiware D display or Modbus command)
- Via a digital input (for devices with digital inputs, such as DIRIS Digiware IO-10 and I-4x modules)

Output report

Combination alarms can be linked to a digital output for alarm reporting purposes.

Delay

A time delay can be configured at the start and the end of the alarm.

13.7. EN50160 alarms

EN50160 alarms are activated upon on power quality events: voltage dips (Udip), voltage swells (Uswl) and voltage interruptions (Uint).

Acknowledgement

EN50160 alarms can be acknowledged either:
- Automatically
- Via communication (from WEBVIEW, DIRIS Digiware D display or Modbus command)

Output report

EN50160 alarms can be linked to a digital output for alarm reporting purposes.

Delay

A time delay can be configured at the start and the end of the alarm.

13.8. Overcurrent alarm

An "Overcurrent" alarm is activated if an overcurrent is detected. The thresholds can be configured in the "Overcurrent Event" menu.

Acknowledgement

The overcurrent alarm can be acknowledged either:
- Automatically
- Via communication (from WEBVIEW, DIRIS Digiware D display or Modbus command)
- Via a digital input (for devices with digital inputs, such as DIRIS Digiware I-4x)

Output report

The overcurrent alarm can be linked to a digital output for alarm reporting purposes.

Delay

A time delay can be configured at the start and the end of the alarm.

14. VIRTUALMONITOR TECHNOLOGY: MONITORING OF PROTECTIVE DEVICES

The VirtualMonitor technology is only available with DIRIS Digiware I modules when connected to iTR split-core current sensors, and natively embedded in DIRIS Digiware S and BCM modules.

The technology offers an advanced real-time monitoring of protective devices without using auxiliary contacts:
- Position (open/closed)
- Trip information
- Operation counters and trip counters
- Alarms:
    - On the opening or the trip of protective devices
    - On the defect of protective devices

The protective device can be:
    - a circuit breaker
    - a switch
    - a fusible switch
    - a fuse

Visualisation is available from the DIRIS Digiware D-50/D-70 displays and WEBVIEW, embedded in the DIRIS Digiware M-70/D-70 and DATALOG H80/H81.

You must configure the type of protective device from the Easy Config System software in the "Protection" menu for the VirtualMonitor function to be used:
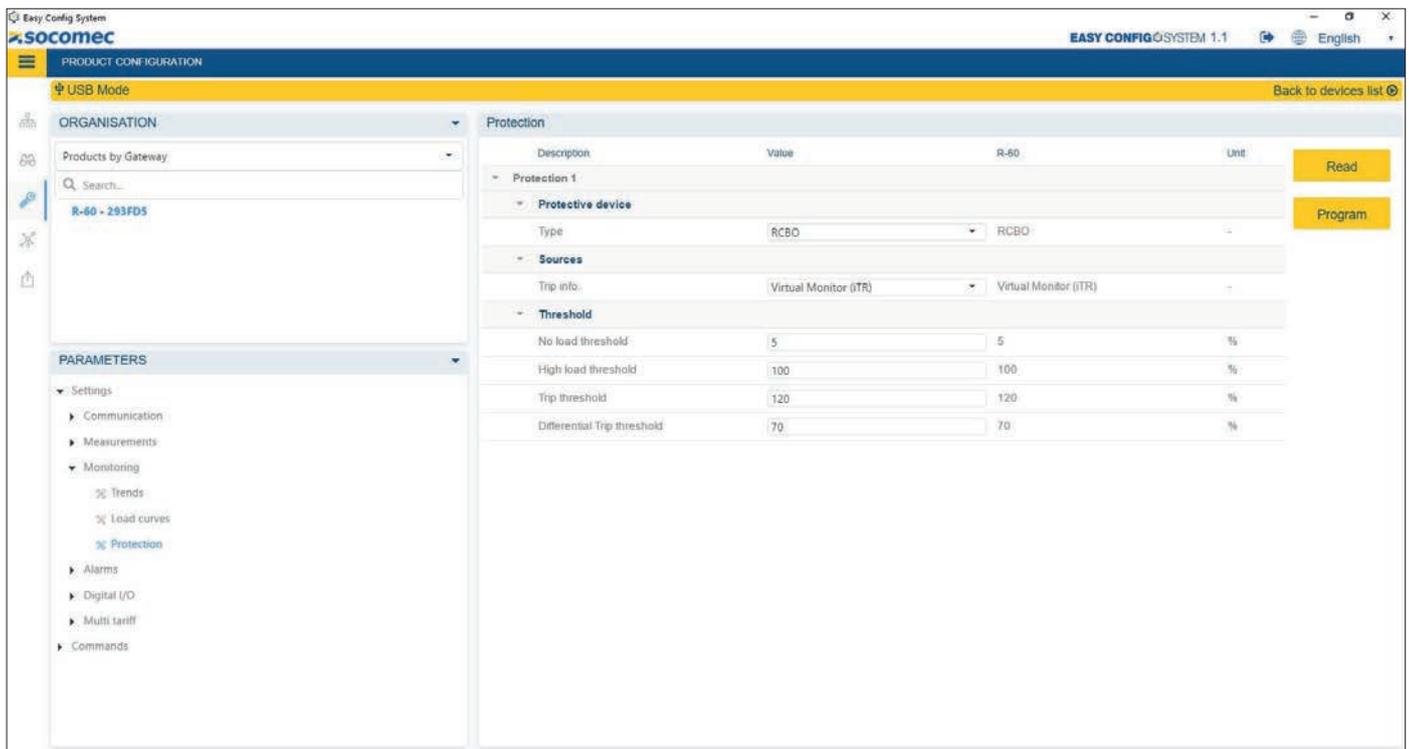
VirtualMonitor can only be used if the DIRIS Digiware U module is connected upstream of the protective device, and the current sensor downstream. This is illustrated in the architectures below:

Architecture 1: with DIRIS Digiware I module and iTR sensors
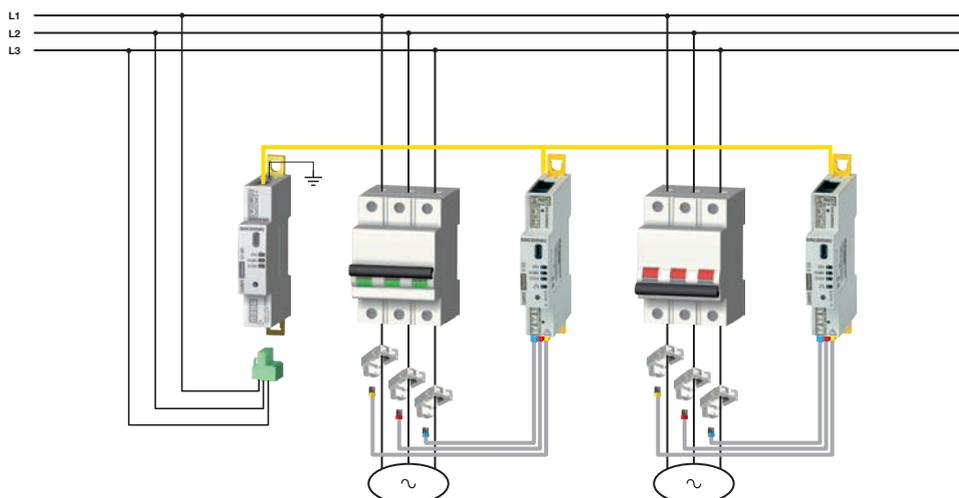
Thanks to its voltage detection capability, the iTR sensors connected to DIRIS Digiware I modules can monitor the position of the protective device. An example corresponding to the above illustration is given in the table below:

	MCB 1	MCB 2
Voltage on U module	Yes, 230 V L-N measured for instance	
Voltage detected by iTR	Yes	No
Position of MCB	Closed	Open

Architecture 2: with DIRIS Digiware S
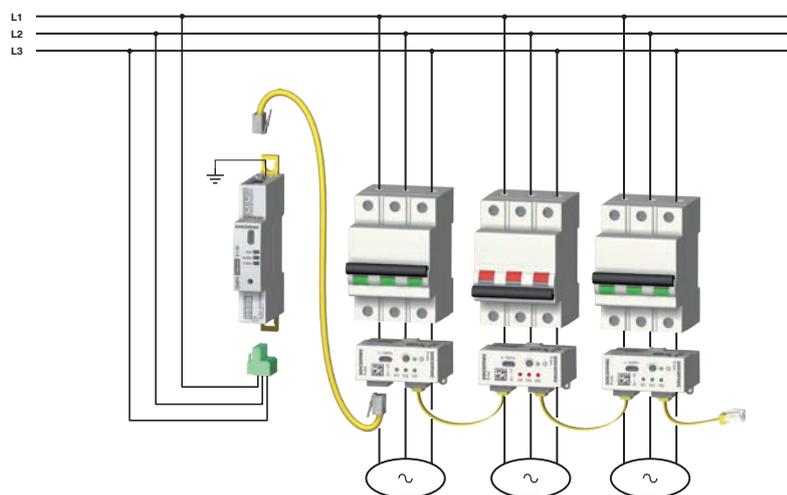
Thanks to its voltage detection capability, the DIRIS Digiware S module can detect the position of the protective device. An example corresponding to the above illustration is given in the table below:

Voltage measured on U module (*)	Yes, 230V L-N		
Voltage detected on S modules	Yes	No, 0V	Yes
Position of protective device	Closed	Open	Closed

Architecture 3 : with DIRIS Digiware BCM and iTR sensors

When a circuit breaker is used, the VirtualMonitor technology also enables to detect and count trips. A trip is detected if the 2 following conditions are met:

- the sensor records an opening of the protective device

- the sensor records an overcurrent ≥ 120% In(*)

(*) It is important to configure the nominal current correctly in the "Loads" configuration menu for the VirtualMonitor technology to work.

Several protection counters are also accessible thanks to the VirtualMonitor technology:

Protection counter type	Description
Total operation counter	Number of times the protective device was opened
Low-load operation counter	Number of times the protective device was opened when load current was ≤ 5% Inom
On-load operation counter	Number of times the protective device was opened when load current was [5% Inom – 100% Inom)
Overload operation counter	Number of times the protective device was opened when load current was ≥ 100% Inom
Trip Counter	Number of times the protective device has tripped (only available if the protective device is a breaker)

⚠ The VirtualMonitor technology allows to detect several successive openings of a protective device if the interval between 2 openings is greater than or equal to 200 ms.

⚠ Make sure Earth is connected on the DIRIS Digiware U module to use the VirtualMonitor technology.

⚠ For the voltage detection (hence the VirtualMonitor technology) to work properly when using iTR current sensors, make sure the section of live conductors are above the minimal sections given in the table below:

iTR Type	iTR-10	iTR-14	iTR-21	iTR-32
Min cable section (mm²)	6	10	50	50

15. AUTOCORRECT TECHNOLOGY: AUTOMATIC DETECTION OF WIRING ERRORS AND SOFTWARE CORRECTION

The AutoCorrect technology enables the detection and software correction of wiring errors such as the connection of a current sensor on the wrong phase.

If the DIRIS Digiware I or S module detects an incorrect voltage/current association between the voltage module and the current module, a system alarm will be triggered on the DIRIS Digiware I/S/BCM module and on the DIRIS Digiware M gateway or DIRIS Digiware D display.

15.1. Identifying the wiring error from the DIRIS Digiware D-50/D-70 display

- Go to PARAMETERS --> CONFIGURE A DEVICE
- Select a DIRIS Digiware S module or a DIRIS Digiware I module connected to iTR current sensors
- Choose a load
- Click on "AUTOCORRECT"

The AutoCorrect menu enables a live diagnostic of the system's wiring. It indicates what is detected by the sensor thanks to the embedded voltage detection feature and what should be corrected.

If the wiring is correct, the following table will be displayed for a three-phase load:

✿ **AUTOCORRECT**			**PC 1-2-3**	≫	
		INPUT	**WAY**	**V**	**P**
✓	P1	I01	+/DIRECT	V1	+
✓	P2	I02	+/DIRECT	V2	+
✓	P3	I03	+/DIRECT	V3	+
	PRESS OK TO LAUNCH AUTOCORRECT				

The table indicates that the load power P1 will be correctly calculated by associating current from the sensor associated to input I01 with voltage V1 from the DIRIS Digiware U-xx module and if the CT way is DIRECT (p1 --> p2). The resulting Power is positive (import/consumption).

Ex.1: DIRIS Digiware I module and iTR current sensors, with phase inversion of current sensors 1 and 3.

Let's consider a phase inversion between current sensors 1 and 3, as showed in the following picture:
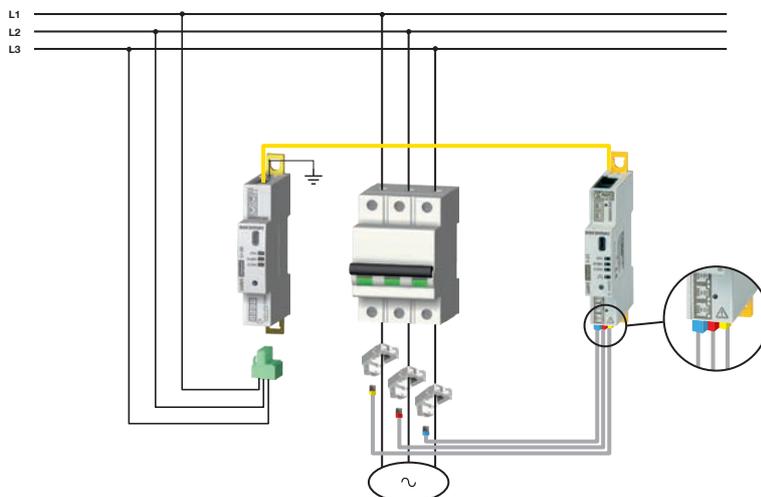
The AUTOCORRECT menu will display the following diagnostic table:

		INPUT:	WAY	V	P
✗	P1	I03	+/DIRECT	V1	-
✓	P2	I02	+/DIRECT	V2	+
✗	P3	I01	+/DIRECT	V3	-

⚙ AUTOCORRECT | PC 1-2-3 »

PRESS OK TO LAUNCH AUTOCORRECT

The table indicates that the load power P1 will be correctly calculated by associating current from the iTR connected to input I03 with voltage V1 from the DIRIS Digiware U-xx module.
This is not the case as per the cross marks on lines P1 and P3 and the gray cells that indicate the errors are on the INPUT I03 and I01.

- Press "OK" to launch AUTOCORRECT:

⚙ AUTOCORRECT | PC 1-2-3

✗
✓
✗

AUTOCORRECT: SOFTWARE CORRECTION
MANUAL: PHYSICAL WIRING CORRECTION

◄ AUTOCORRECT ►

Choose the power sign – "POSITIVE" for Power import (consumption) or "NEGATIVE" for Power export (generation), and press "OK":

⚙ AUTOCORRECT | PC 1-2-3

✗
✓
✗

CHOOSE POWER SIGN

◄ POSITIVE ►

- Now the wiring has been corrected in the software and power values are correctly calculated:

⚙ AUTOCORRECT | PC 1-2-3 »

		INPUT:	WAY	V	P
✓	P1	I03	+/DIRECT	V1	+
✓	P2	I02	+/DIRECT	V2	+
✓	P3	I01	+/DIRECT	V3	+

PRESS OK TO LAUNCH AUTOCORRECT

Ex.2: Incorrect CT orientation on phase 1

If there is an incorrect CT orientation on phase 1, it will be detected by the current module, a cross mark will appear on the first line of the diagnostic table and the cell "WAY" will be gray:

⚙ AUTOCORRECT			PC 1-2-3		»
		INPUT:	**WAY**	**V**	**P**
✖	P1	I01	-/INV	V1	-
✓	P2	I02	+/DIRECT	V2	+
✓	P3	I03	+/DIRECT	V3	+
		PRESS OK TO LAUNCH AUTOCORRECT			

The table shows the error and indicates that the correct power P1 will be calculated using a reverse CT way for the current sensor connected to the I01 input.

- Press "OK" to launch AUTOCORRECT, and choose a positive power sign. The error mark is cleared and the cell WAY is no longer gray:

⚙ AUTOCORRECT			PC 1-2-3		»
		INPUT:	**WAY**	**V**	**P**
✓	P1	I01	-/INV	V1	+
✓	P2	I02	+/DIRECT	V2	+
✓	P3	I03	+/DIRECT	V3	+
		PRESS OK TO LAUNCH AUTOCORRECT			

15.2. Identifying the wiring error from the Easy Config System software

Let's use the previous phase inversion example as per the following picture:
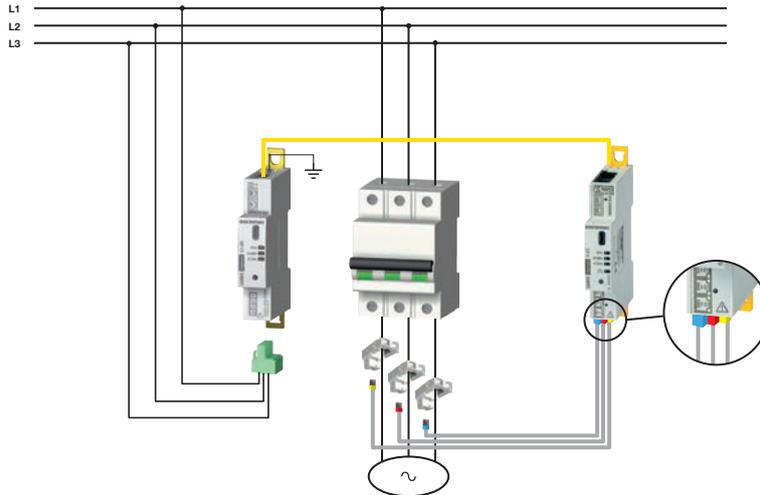
Connect to the DIRIS Digiware in Easy Config System.

- In the visualisation menu, select the DIRIS Digiware I module and click on «Dashboard». A Fresnel phase diagram is available and shows if phase voltages and phase currents are in phase or out of phase:
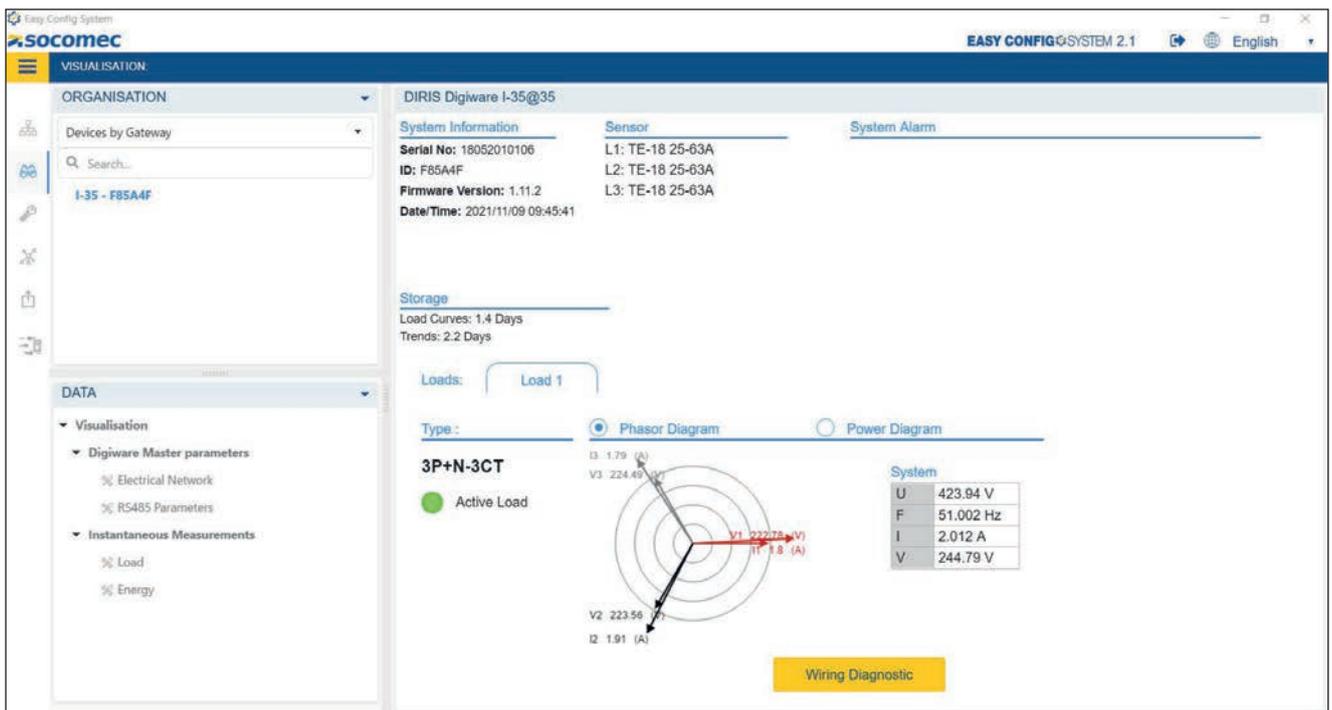
You can correct the wrong voltage/current association in the «Current Sensor» menu.

⚠️ Make sure Earth is connected on the DIRIS Digiware U module to use the AutoCorrect technology.

⚠️ For the voltage detection (hence the VirtualMonitor technology) to work properly when using iTR current sensors, make sure the section of live conductors are above the minimal sections given in the table below:

iTR Type	iTR-10	iTR-14	iTR-21	iTR-32
Min cable section (mm²)	6	10	50	50

16. TECHNICAL CHARACTERISTICS

16.1. DIRIS Digiware C, U, I, S, BCM and IO technical characteristics

16.1.1. Mechanical characteristics

Casing type	DIN-rail mounting module and base
Casing protection index	IP20
Front panel protection index	IP40 on the nose in modular assembly (IP20 for DIRIS Digiware BCM)
Weight	DIRIS Digiware C: 65 g DIRIS Digiware U-10/U-30/U-100: 64 g / 64 g / 114 g DIRIS Digiware S: 54 g DIRIS Digiware I-3x/I-4x/I-6x: 63 g / 133 g / 83 g DIRIS Digiware IO-xx: 63 g DIRIS Digiware BCM-1818/BCM-2119/BCM-2125: 475 g / 565 g / 995 g
Mechanical strength	IK08 (Digiware S) and IK06 (Digiware C, U, I, BCM, IO)

16.1.2. Electrical characteristics

DIRIS Digiware C-31	
Input voltage	24 VDC ± 10 % - 20 W max - SELV, class 2 power supply unit according to UL1310
Connection	Removable screw terminal block, 2 positions, stranded or solid 0.2 - 2.5 mm² cable. Use Copper Conductors Only.
Link with DIRIS Digiware U voltage module	The DIRIS Digiware U voltage module is linked to the DIRIS Digiware C-31 by a Digiware Bus
P15 power supply	Features: 230 VAC / 24 VDC - 0.63 A - 15 W Modular format - Dimensions (H x L): 90 x 36 mm

16.1.3. Measuring characteristics

Measurement accuracy	
Accuracy	• According to IEC 61557-12 - PMD DD classification in association with dedicated sensors (TE, TR/iTR, TF) • According to ANSI C12.1
Measuring energy and power	

Active energy and active power accuracy	• For DIRIS Digiware I and BCM (RJ12 current input) modules and sensors:
	  - Class 0.2 DIRIS Digiware module alone
	  - Class 0.5 system accuracy with TE, iTR or TF sensors
	  - Class 1 system accuracy with TR sensors
	
	• For DIRIS Digiware S and BCM (integrated current inputs) modules:
	  - Class 0.5 for active energy
	  - Class 1 for active power

Accuracy of reactive energy	Class 2 system accuracy
Power factor measurement	

Accuracy	• For DIRIS Digiware I and BCM (RJ12 current input) modules and sensors:
	  - Class 0.5 system accuracy with TE, iTR or TF sensors
	  - Class 1 system accuracy with TR sensors
	
	• Class 1 for DIRIS Digiware S and BCM (integrated current inputs) modules

Voltage measurement - DIRIS Digiware U	
Characteristics of the network measured	U-10/U-30: 50 - 300 VAC (Ph/N). 87-520 VAC (Ph/Ph) U-100: 50 - 600 VAC (Ph/N, Ph/Ph)
Frequency range	45 - 65 Hz
Frequency accuracy	Class 0.02
Network type	Single-phase/ Two-phase / Two-phase with neutral / Three-phase / Three-phase with neutral
Measurement by voltage transformer	Primary: 400,000 VAC Secondary: 60, 100, 110, 173, 190 VAC
Input consumption	U-10/U-30: $\leq$ 0.1 VA U-100: $\leq$ 0.5 VA
Permanent overload	U-10/U-30: 300 VAC Ph/N U-100: 600 Ph/N
Rated impulse voltage	IEC 60947-1 V. IMP: 6.4 kV
Accuracy of voltage measurement	U-10/U-30: Class 0.2 U-100: Class 0.2
Connection	U-10/U-30: Removable screw terminal block, 4 positions, solid cable or stranded cable with ferrule, AWG 24 - AWG 14 / 0.2 - 2.5 mm² Use Copper conductors only. U-100: Board-mounted screw terminal block, 4 positions, solid cable or stranded cable with ferrule, AWG 17 - AWG 14 / 1 – 2.5 mm² Use Copper conductors only.

Current measurement - DIRIS Digiware S	
Number of current inputs	3
Accuracy of current measurement	Class 0.5
Basic current Ib	10 A
Maximum current Imax	63 A

Current measurement - DIRIS Digiware BCM	DIRIS Digiware BCM-1818	DIRIS Digiware BCM-2119	DIRIS Digiware BCM-2125
Number of integrated current inputs	18	21	21
Accuracy of current measurement	Class 0.5		
Nominal current I_n	32 … 63 A	32 … 63 A	40 … 100 A
Maximum current I_{max}	80 A	80 A	120 A
Number of RJ12 current inputs (3xRJ12 connections)	3		
Associated current sensors (3xRJ12 connections)	Solid-core TE, split-core TR/iTR, flexible TF current sensors		
Accuracy of current measurement (3xRJ12 connections)	Class 0.2 DIRIS Digiware BCM module alone Class 0.5 with TE, iTR or TF sensors Class 1 with TR sensors		
Connection (3xRJ12 connections)	Specific Socomec cable with RJ12 connectors		

Current measurement - DIRIS Digiware I	
Number of current inputs	I-3x: 3 / I-4x: 4 / I-6x: 6
Associated current sensors	Solid-core TE, split-core TR/iTR, flexible TF current sensors
Accuracy of current measurement	Class 0.2 DIRIS Digiware I module alone Class 0.5 with TE, iTR or TF sensors Class 1 with TR sensors
Connection	Specific Socomec cable with RJ12 connectors

Inputs - DIRIS Digiware I-4x	
Number of inputs	2
Type / Power supply	Non-insulated input, internal polarisation 12 VDC max., 1mA
Input functions	Logical status, pulse meter
Connection	Removable screw terminal block, stranded or solid 0.14 - 1.5 mm² cable (max. length 1000 m)
Outputs - DIRIS Digiware I-4x	
Number of outputs	2
Relay type	230 V ±15% - 1 A 30 VDC - 3 A
Function	Configurable alarm (current, power,…) on threshold overruns or remote controlled status
Connection	Removable screw terminal block, stranded or solid 0.2 to 2.5 mm² cable - Fuse or circuit-breaker protection 1A
Digital inputs/outputs- DIRIS Digiware IO-10	
Number of inputs	4
Type / Power supply	Insulated input, internal polarisation 12 VDC max., 3 mA - SELV
Input functions	Logical status Position of protective device Pulse counter: choice of pulse weight, measurement unit, multiple tariff rates (max. 8)
Connection	Removable screw terminal block, 9 positions - 5 dedicated to inputs, stranded or solid 0.14 - 1.5 mm² cable. Use Copper Conductors Only.
Number of outputs	2
Type	Insulated output - SELV Maximum applicable voltage 12 - 48 VDC 12 - 24 VAC 50 mA
Output functions	Configurable alarm on threshold overruns Remote control
Connection	Removable screw terminal block, 9 positions - 4 dedicated to outputs, stranded or solid 0.14 - 1.5 mm² cable. Use Copper Conductors Only.
Analogue inputs - DIRIS Digiware IO-20	
Number of inputs	2
Type / Power supply	0/4-20mA, 200 Ω max - SELV
Accuracy	0.5% full scale
Function	Connection of analogue sensors (pressure, humidity, temperature...) with linear or quadratic interpolation
Connection	Removable screw terminal block, 2x2 positions, stranded or solid 0.14 - 1.5 mm² cable. Use Copper Conductors Only.

16.1.4. Communication characteristics

Digiware BUS	
Function	Connection between DIRIS Digiware modules
Cable type	Specific SOCOMEC cable with RJ45 connections
Baudrate	9600 to 500 000 bauds
RS485	EN
Connection type	2 - 3 half duplex wires
Protocol	Modbus RTU
Baudrate	9600 to 115 200 bauds
Function	Configuration and reading of centralised data on the DIRIS Digiware U and all of the DIRIS Digiware I linked by the Digiware bus
Location	Single-point on DIRIS Digiware C-31
Connection	Removable screw terminal block, 3 positions, stranded or solid 0.14 - 1.5 mm² cable. Use Copper Conductors Only.
USB	
Protocol	Modbus RTU over USB
Function	Firmware upgrade and configuration of DIRIS Digiware U / S / BCM / I / IO modules
Location	On each DIRIS Digiware U / S / BCM / I / IO module
Connection	Type B micro USB connector / Type C micro usb connector (for U-100)

16.1.5. Environmental characteristics

Ambient operating temperature	-10°C ... +70°C (+55 °C for DIRIS Digiware S and BCM) -25°C ... +70°C (for U-100) (IEC 60068-2-1/IEC 60068-2-2)
Storage temperature	-25 (-40 for DIRIS Digiware BCM) … +70°C (IEC 60068-2-1/IEC 60068-2-2)
Operating humidity	25°C / 97% RH & 55°C / 93% RH (IEC 60068-2-30)
Operating altitude	< 2000 m
Location	Indoor
Vibration	0.35 mm, 25 Hz, 20 min/axe (IEC 61557-12)
Impact resistance	Front panel: 1J (5J for DIRIS Digiware S) - casing: 1J (IEC 61010-1 Ed 3.0)
PEP ecopassport - ISO 14025	DIRIS Digiware U: SOCO-2014-05-v1-fr, SOCO-2014-05-v1-en DIRIS Digiware U-100: SOCO-00145-V01.01-EN DIRIS Digiware S: SOCO-00006-V01.01-FR; SOCO-00006-V01.01-EN DIRIS Digiware I: SOCO-2014-06-v1-fr, SOCO-2014-06-v1-en DIRIS Digiware IO :SOCO-00001-V01.01-fr, SOCO-00001-V01.01-en DIRIS Digiware BCM: SOCO-00054-V01.01-EN.

16.1.6. Electromagnetic characteristics

Immunity to electrostatic discharges (ESD)	IEC 61000-4-2 LEVEL III (IEC 61000-4-2 LEVEL II for DIRIS Digiware BCM)
Immunity to radiated radio-frequency electromagnetic fields	IEC 61000-4-3 LEVEL III
Immunity to electrical fast transients/bursts	IEC 61000-4-4 LEVEL III
Immunity to surges	IEC 61000-4-5 LEVEL III
Immunity to conducted disturbances induced by radio-frequency fields	IEC 61000-4-6 LEVEL III (IEC 61000-4-2 LEVEL II for DIRIS Digiware BCM)
Immunity to power frequency magnetic fields	IEC 61000-4-8 400A/m (IEC 61000-4-8 30A/m for DIRIS Digiware BCM)
Radiated emissions	CISPR11 Group1 - CLASS B

⚠ CAUTION! The user that changes modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

ⓘ Note : This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
  - Reorient or relocate the receiving antenna.
  - Increase the separation between the equipment and receiver.
  - Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
  - Consult the dealer or an experienced radio/TV technician for help.

16.1.7. Standards and safety

Device	IEC 61557-12, power metering and monitoring device (PMD)
CE	Compliant with Low Voltage Directive: 2014/35/EU of February 26th 2014 (IEC EN61010-1 & IEC EN61010-2-030). Compliant with Electromagnetic Compatibility Directive: 2014/30/EU of February 26th 2014 (IEC EN 61326-1).
Insulation	Installation category III (300VAC Ph/N), degree of pollution 2 Installation category III (600VAC Ph/N), degree of pollution 2 (for U-100)
UL	UL 61010-1 & UL 61010-2-030 compliant CAN/CSA-C22.2 No. 61010-1 & CSA C22.2 No. 61010-2-030 UL installation: The DIRIS Digiware system must be enclosed in an NRTL certified electrical/fire enclosure, listed Industrial Control Panel Equipment, or similar equipment. - Always open or disconnect circuit from power-distribution system (or service) of building before installing or servicing current transformers. - The current transformers may not be installed in equipment where they exceed 75 percent of the wiring space of any cross-sectional area within the equipment. - Restrict installation of current transformer in an area where it would block ventilation openings. - Restrict installation of current transformer in an area of breaker arc venting. - Not suitable for Class 2 wiring methods and Not intended for connection to Class 2 equipment. - Secure current transformer and route conductors so that the conductors do not directly contact live terminals or bus. - WARNING : To reduce the risk of electric shock, always open or disconnect circuit from power[1] distribution system (or service) or building before installing or servicing current transformers. Not intended for retrofit applications

16.1.8. Service life

MTTF (mean time to failure)	> 100 years

16.2. TE, TR/iTR and TF sensor technical characteristics

16.2.1. General characteristics

TE - solid-core sensor TE-18 to TE-55						
Model	TE-18	TE-18	TE-25	TE-35	TE-45	TE-55
Nominal current range In (A)	5 - 20	25 - 63	40 - 160	63 - 250	160 - 630	400 - 1000
Max. current (A)	24	75.6	192	300	756	1200
Weight (g)	24	24	69	89	140	187
Max. voltage (AC)	600 VAC L-N					
Rated withstand voltage	3 kV				3.6 kV / 1min	
Frequency	50/60 Hz					
Intermittent overload	10x In in 1 second					
Measurement category	CAT III					
Protection degree	IP30 / IK06					
Operating temperature	-10 … +70°C					
Storage temperature	-25 … +85°C					
Relative humidity	95% RH without condensation					
Altitude	< 2,000 m					
PEP ecopassport - ISO 14025	TE sensors: SOCO-2014-03-v1-fr, SOCO-2014-03-v1-en					
UL	UL 61010 & CSA 61010 conformity					
Connection	SOCOMEC RJ12 cables: UTP, unshielded, twisted pair, straight, AWG24, 600V, CATV, -10 ... +70°C					

TE - solid-core sensor TE-90	
Model	TE-90
Nominal current range In (A)	600 - 2000 A[1]
Max. current	2400 A
Weight	163g (118g without clamps)
Max. voltage (AC)	600 VAC L-N
Rated withstand voltage	3.6 kV AC 1 min
Frequency	50/60 Hz
Intermittent overload	40x In in 0.5 sec
Measurement category	CAT III
Protection degree	IP30 / IK06
Operating temperature	-10 … +70°C
Storage temperature	-25 … +85°C
Relative humidity	95% RH without condensation
Altitude	< 2,000 m
Connection	SOCOMEC RJ12 cables: UTP, unshielded, twisted pair, straight, AWG24, 600V, CATV, -10 ... +70°C.

(1) 5A CT adaptor (max primary current is 10 000 A for 5A CT).

TR/iTR - Split-core sensor				
Model	TR-10 / iTR-10	TR-14 / iTR-14	TR-21 / iTR-21	TR-32 / iTR-32
Nominal current range In (A)	26 - 63	40 - 160	63 - 250	160 - 600
Max. current (A)	75.6	192	300	720
Weight (g)	74	117	211	311
Max. voltage (AC)	600 VAC L-N			
Rated withstand voltage	3 kV			
Frequency	50/60 Hz			
Intermittent overload	10x In in 1 second			
Measurement category	CAT III			
Protection degree	IP20 / IK06			
Operating temperature	-10 … +55°C			
Storage temperature	-25 … +85°C			
Relative humidity	95% RH without condensation			
Altitude	< 2,000 m			
PEP ecopassport - ISO 14025	TR sensors: SOCO-2014-04-v1-fr, SOCO-2014-04-v1-en			
UL	UL 61010 & CSA 61010 conformity			
Connection	SOCOMEC RJ12 cables: UTP, unshielded, twisted pair, straight, AWG24, 600V, CATV, -10 ... +70°C			

TF - Flexible current sensor						
Model	TF-40	TF-80	TF-120	TF-200	TF-300	TF-600
Weight (g)	90	130	142	164	193	274
Nominal current range In (A)	100 … 400	150 … 600	400 … 2000	600 … 4000	1600 … 6000	1600 … 6000
Max. voltage (AC)	600 VAC L-N					
Measurement category	CAT III					
Frequency	50/60 Hz					
Power ratings (d.c.)	3.3V / max. 10mAC (exclusively from specified PMD)					
Accuracy	Performance class for power and energy: 0.5 in combination with DIRIS Digiware I, according to IEC 61557-12					
Intermittent overload	10x In for 1 second					
Rated withstand voltage	3.6 kV					
Protection degree	IP30 / IK07					
Operating temperature	-10 … +70°C					
Storage temperature	-25 … +85°C					
Relative humidity	95%					
Pollution degree	2					
Altitude	< 2,000 m					
Connection	SOCOMEC RJ12 cables: UTP, unshielded, twisted pair, straight, AWG24, 600V, CATV, -10 ... +70°C					

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16.3. DIRIS D-30 - technical characteristics

16.3.1. Mechanical characteristics

Type of screen	Capacitive touch-screen technology, 10 keys
Screen resolution	350 x 160 pixels
Front panel protection index	IP65*
Weight	D-30: 160 g

* Front face only. The use of a silicone seal may be required to ensure sufficient sealing of the junction between D-50/D-70 display and panel door.

16.3.2. DIRIS D-30 communication characteristics

Type of screen	Local single-point screen for DIRIS Digiware I-4x
RJ9	Self-powered and data
USB	Upgrade and configuration via type B micro USB connector

16.4. DIRIS Digiware D-50/D-70 & M-50/M-70 characteristics

16.4.1. Mechanical characteristics

Display type (D-50/D-70)	Capacitive touchscreen technology, 10 keys, 4 LEDs
Display resolution (D-50/D-70)	350 x 160 pixels
Front panel protection index (D-50/D-70)	IP65*
Material and flammability class of housing (D-50/D-70)	Polycarbonate UL94-V0
Weight	210 g (M-50/M-70) 210 g (D-50/D-70)

* Front face only. The use of a silicone seal may be required to ensure sufficient sealing of the junction between D-50/D-70 display and panel door.

16.4.2. Electrical characteristics

Power supplies	
Power supply	24 VDC ±10% - Class 2 power supply unit according to UL1310
Power consumption	2.5 VA

16.4.3. Communication characteristics

Type of display	Multipoint remote display
Ethernet RJ45 10/100 Mbs	Gateway function: - Modbus TCP, BACnet IP, SNMP v1, v2, v3 & Traps - Embedded web server WEBVIEW-M (M-70/D-70 only)
SNTP protocol	Synchronises the date/time of the M-50/M-70 or D-50/D-70 with an SNTP server. The M-50/M-70 or D-50/D-70 then synchronises the connected devices.
SMTP(S) protocol	Sends email notifications in case of alarms.
FTP(S) protocol	Automatically exports data via standard or secure FTP server (energy index, load curves, measurement logs)
RJ45 Digiware	Control and power supply interface function
RS485 2-3 wires	RS485 2-3 wire master or slave communication function
USB	Firmware upgrade and configuration via type B micro USB connector

16.4.4. Environmental characteristics

Standard model	
Operating temperature	-10 ... +55°C (IEC 60068-2-1 / IEC 60068-2-2)
Storage temperature	-40 ... +70°C (IEC 60068-2-1 / IEC 60068-2-2)
Humidity	+23°C/97% RH & +55°C/93% RH (IEC 60068-2-30)
Installation category, Degree of pollution	Device powered by SELV, 2

17. PERFORMANCE CLASSES

17.1. DIRIS Digiware I

Performance classes are given in compliance with IEC 61557-12

Classification of DIRIS Digiware	DD in combination with dedicated sensors (TE, TR/iTR, TF)
Temperature	K55
Overall operating performance class for active power or active energy	0.5 in combination with TE, iTR or TF solid-core sensors 1 in combination with TR split-core sensors

Symbol	Description	Overall operating performance class DIRIS Digiware I + dedicated sensors* (TE, TR/iTR, TF) in compliance with IEC 61557-12	Measurement range
Pa	Total active power	0.2 DIRIS Digiware only 0.5 with TE, iTR or TF sensors 1 with TR sensors	10% … 120% In 2% … 120% In 2% … 120% In
Q_A, Q_V	Total reactive power (arithmetic, vectorial)	2 with TR sensors 1 with TE, iTR or TF sensors	5% … 120% In
S_A, S_V	Total apparent power (arithmetic, vectorial)	0.5 with TE, iTR or TF sensors 1 with TR sensors	10% … 120% In
Ea	Total active energy	0.2 DIRIS Digiware only 0.5 with TE, iTR or TF sensors 1 with TR sensors	10% … 120% In 2% … 120% In 2% … 120% In
Er_A, Er_V	Total reactive energy (arithmetic, vectorial)	2 with TE, TR/iTR or TF sensors	5% … 120% In
Eap_A, Eap_V	Total apparent energy (arithmetic, vectorial)	0.5 with TE, iTR or TF sensors 1 with TR sensors	10% … 120% In
f	Frequency	0.02	45 - 65 Hz
I, IN	Phase current, measured neutral current	0.2 DIRIS Digiware only 0.5 with TE, iTR or TF sensors 1 with TR sensors	5% … 120% In 10% … 120% In 10% … 120% In
INc	Calculated neutral current	1 with TE, iTR or TF sensors 2 with TR sensors	10% … 120% In
U	Voltage (Lp-Lg or Lp-N)	0.2	50 - 300 VAC Ph/N
PF_A, PF_V	Power factor (arithmetic, vectorial)	0.5 with TE, iTR or TF sensors 1 with TR sensors	0.5 lagging to 0.8 leading
Pst, Plt	Flicker (short-term, long-term)	-	-
Udip	Voltage dip (Lp-Lg or Lp-N)	0.5	-
Uswl	Voltage swell (Lp-Lg or Lp-N)	0.5	-
Uint	Voltage interruption (Lp-Lg or Lp-N)	0.2	-
Unba	Voltage amplitude unbalance (Lp-N)	0.5	-
Unb	Voltage phase and amplitude unbalance (Lp-Lg or Lp-N)	0.2	-
THDu, THD-Ru	Total harmonic distortion rate of the voltage (relative to the fundamental, relative to the RMS value)	1	Orders 1 to 63
Uh	Voltage harmonics	1	-
THDi, THD-Ri	Total harmonic distortion rate of the current (relative to the fundamental, relative to the RMS value)	1 with sensors TE, TR/iTR or TF	Orders 1 to 63
Ih	Current harmonics	1 with sensors TE, TR/iTR or TF	-
Msv	Centralised remote control signals	-	-

*With SOCOMEC RJ12 and RJ45 connection cables.

17.2. DIRIS Digiware S

Performance classes are given in compliance with IEC 61557-12

Classification of DIRIS Digiware	DD
Temperature	K55
Overall operating performance class	0.5 for active energy 1 for active power

Symbol	Description	Overall operating performance class DIRIS Digiware S with integrated current sensors in compliance with IEC 61557-12	Measurement range
Pa	Total active power	1	5% Ib ... Imax
Q_A, Q_V	Total reactive power (arithmetic, vectorial)	1	5% Ib ... Imax
S_A, S_V	Total apparent power (arithmetic, vectorial)	1	5% Ib ... Imax
Ea	Total active energy	0.5	2% Ib ... Imax
Er_A, Er_V	Total reactive energy (arithmetic, vectorial)	2 according to IEC 61557-12 1 according to IEC 62053-24	5% Ib ... Imax
Eap_A, Eap_V	Total apparent energy (arithmetic, vectorial)	1	5% Ib ... Imax
f	Frequency	0.02	45 - 65 Hz
I	Phase current	0.5	20% Ib ... Imax
INc	Calculated neutral current	1	20% Ib ... Imax
U	Voltage (Lp-Lg or Lp-N)	0.2	50 - 300 VAC Ph/N 50 - 600 VAC Ph/N (with U-100)
PF_A, PF_V	Power factor (arithmetic, vectorial)	1	0.5 lagging to 0.8 leading
Pst, Plt	Flicker (short-term, long-term)	-	-
Udip	Voltage dip (Lp-Lg or Lp-N)	0.5	-
Uswl	Voltage swell (Lp-Lg or Lp-N)	0.5	-
Uint	Voltage interruption (Lp-Lg or Lp-N)	0.2	-
Unba	Voltage amplitude unbalance (Lp-N)	0.5	-
Unb	Voltage phase and amplitude unbalance (Lp-Lg or Lp-N)	0.2	-
THDu, THD-Ru	Total harmonic distortion rate of the voltage (relative to the fundamental, relative to the RMS value)	1	Rank 1 to 63
Uh	Voltage harmonics	1	-
THDi, THD-Ri	Total harmonic distortion rate of the current (relative to the fundamental, relative to the RMS value)	1	Rank 1 to 63
Ih	Current harmonics	1	-
Msv	Centralised remote control signals	-	-

17.3. DIRIS Digiware BCM

Performance classes are given in compliance with IEC 61557-12

• For the integrated current inputs :

Classification of DIRIS Digiware	DD
Temperature	K55
Overall operating performance class	0.5 for active energy 1 for active power

Symbol	Description	Overall operating performance class DIRIS Digiware BCM with integrated current sensors in compliance with IEC 61557-12	Measurement range
Pa	Total active power	1	5% In ... Imax
Q_A, Q_V	Total reactive power (arithmetic, vectorial)	2	5% In ... Imax
S_A, S_V	Total apparent power (arithmetic, vectorial)	1	5% In ... Imax
Ea	Total active energy	0.5	2% In ... Imax
Er_A, Er_V	Total reactive energy (arithmetic, vectorial)	2 according to IEC 61557-12 1 according to IEC 62053-24	5% In ... Imax
Eap_A, Eap_V	Total apparent energy (arithmetic, vectorial)	1	5% In ... Imax
f	Frequency	0.02	45 - 65 Hz
I	Phase current	0.5	20% In ... Imax
INc	Calculated neutral current	1	20% In ... Imax
U	Voltage (Lp-Lg or Lp-N)	0.2	50 - 300 VAC Ph/N 50 - 600 VAC Ph/N (with U-100)
PF_A, PF_V	Power factor (arithmetic, vectorial)	1	0.5 lagging to 0.8 leading
Pst, Plt	Flicker (short-term, long-term)	-	-
Udip	Voltage dip (Lp-Lg or Lp-N)	0.5	-
Uswl	Voltage swell (Lp-Lg or Lp-N)	0.5	-
Uint	Voltage interruption (Lp-Lg or Lp-N)	0.2	-
Unba	Voltage amplitude unbalance (Lp-N)	0.5	-
Unb	Voltage phase and amplitude unbalance (Lp-Lg or Lp-N)	0.2	-
THDu, THD-Ru	Total harmonic distortion rate of the voltage (relative to the fundamental, relative to the RMS value)	1	Rank 1 to 63
Uh	Voltage harmonics	1	-
THDi, THD-Ri	Total harmonic distortion rate of the current (relative to the fundamental, relative to the RMS value)	1	Rank 1 to 63
Ih	Current harmonics	1	-
Msv	Centralised remote control signals	-	-

• For the RJ12 current inputs :

Classification of DIRIS Digiware	DD in combination with dedicated sensors (TE, TR/iTR, TF)
Temperature	K55
Overall operating performance class for active power or active energy	0.5 in combination with TE, iTR or TF solid-core sensors 1 in combination with TR split-core sensors

Symbol	Description	Overall operating performance class DIRIS Digiware BCM + dedicated sensors* (TE, TR/iTR, TF) in compliance with IEC 61557-12	Measurement range
Pa	Total active power	0.2 DIRIS Digiware only 0.5 with TE, iTR or TF sensors 1 with TR sensors	10% … 120% In 2% … 120% In 2% … 120% In
Q_A, Q_V	Total reactive power (arithmetic, vectorial)	2 with TR sensors 1 with TE, iTR or TF sensors	5% … 120% In
S_A, S_V	Total apparent power (arithmetic, vectorial)	0.5 with TE, iTR or TF sensors 1 with TR sensors	10% … 120% In
Ea	Total active energy	0.2 DIRIS Digiware only 0.5 with TE, iTR or TF sensors 1 with TR sensors	10% … 120% In 2% … 120% In 2% … 120% In
Er_A, Er_V	Total reactive energy (arithmetic, vectorial)	2 with TE, TR/iTR or TF sensors	5% … 120% In
Eap_A, Eap_V	Total apparent energy (arithmetic, vectorial)	0.5 with TE, iTR or TF sensors 1 with TR sensors	10% … 120% In
f	Frequency	0.02	45 - 65 Hz
I, IN	Phase current, measured neutral current	0.2 DIRIS Digiware only 0.5 with TE, iTR or TF sensors 1 with TR sensors	5% … 120% In 10% … 120% In 10% … 120% In
INc	Calculated neutral current	1 with TE, iTR or TF sensors 2 with TR sensors	10% … 120% In
U	Voltage (Lp-Lg or Lp-N)	0.2	50 - 300 VAC Ph/N 50 - 600 VAC Ph/N (with U-100)
PF_A, PF_V	Power factor (arithmetic, vectorial)	0.5 with TE, iTR or TF sensors 1 with TR sensors	0.5 lagging to 0.8 leading
Pst, Plt	Flicker (short-term, long-term)	-	-
Udip	Voltage dip (Lp-Lg or Lp-N)	0.5	-
Uswl	Voltage swell (Lp-Lg or Lp-N)	0.5	-
Uint	Voltage interruption (Lp-Lg or Lp-N)	0.2	-
Unba	Voltage amplitude unbalance (Lp-N)	0.5	-
Unb	Voltage phase and amplitude unbalance (Lp-Lg or Lp-N)	0.2	-
THDu, THD-Ru	Total harmonic distortion rate of the voltage (relative to the fundamental, relative to the RMS value)	1	Orders 1 to 63
Uh	Voltage harmonics	1	-
THDi, THD-Ri	Total harmonic distortion rate of the current (relative to the fundamental, relative to the RMS value)	1 with sensors TE, TR/iTR or TF	Orders 1 to 63
Ih	Current harmonics	1 with sensors TE, TR/iTR or TF	-
Msv	Centralised remote control signals	-	-

*With SOCOMEC RJ12 and RJ45 connection cables.

17.4. RCM performance

Function	Overall operating characteristics (in compliance with IEC 62020-1) DIRIS Digiware BCM + T-10 adapter + dedicated residual CT	Measurement Range
Operating characteristic in presence of residual currents	RCM Type A with: - T-10 adaptor and ΔIC ≥ Ø 15 mm or ΔIP-R residual CTs - ΔIC Ø 8 mm residual CT	6 mA to 3 A 6 mA to 2 A
Residual current (I_Δ, I_{PE})	± 2% with ΔIC, ΔIP-R residual CTs	6 mA to 3 A
Maximum actuating time (T_{max})	8.5 s	
Minimum non-actuating time (T_{min})	1.5 s	

18. ANNEX 1 - COMPLIANCE TO MID ("MEASURING INSTRUMENT DIRECTIVE")

18.1. DIRIS Digiware MID presentation
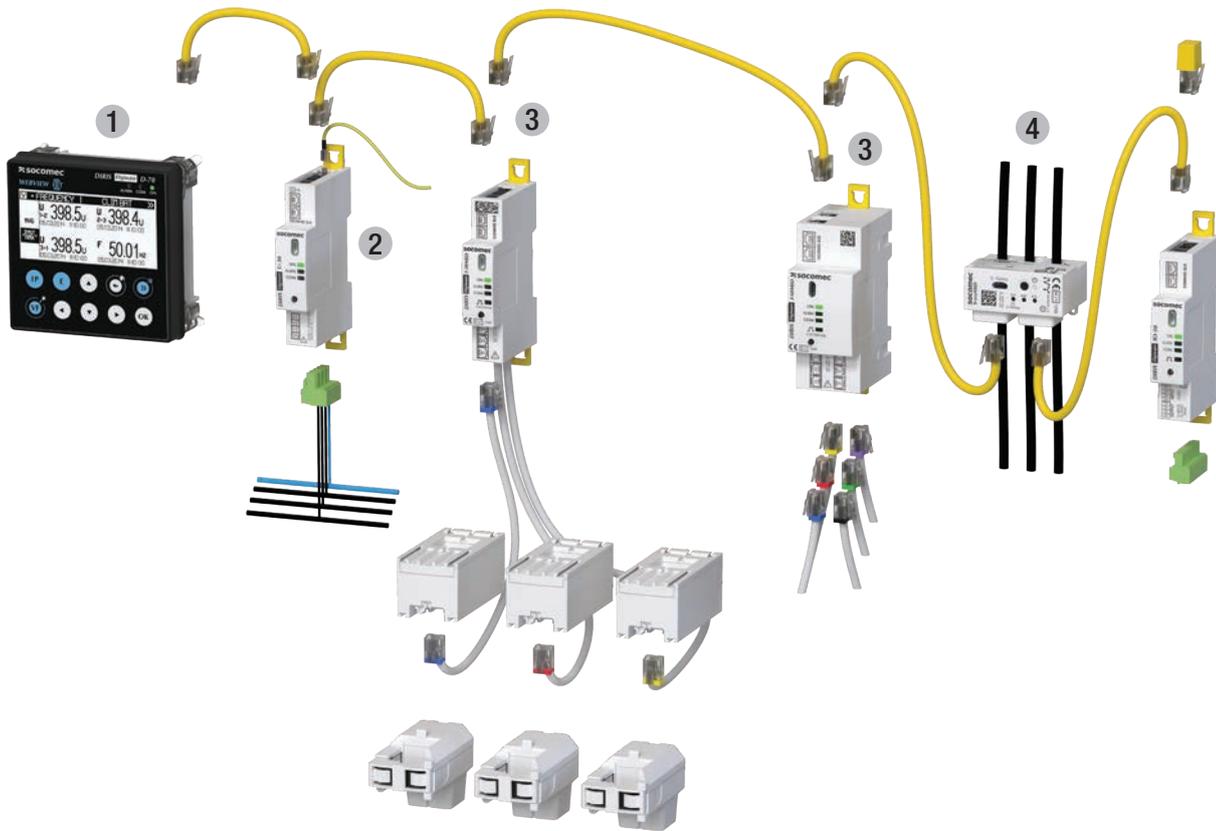
⚠️ Refer to chapter ""7.1. DIRIS Digiware connection", page 50 for the wiring of the DIRIS Digiware system.

① Detached indicating display	② Voltage transformer	③ MID transformer operated meters*		④ MID direct connected meter
DIRIS Digiware D-50 (without Bluetooth) Ref. 4829 0204 DIRIS Digiware D-70 (without Bluetooth) Ref. 4829 0203 DIRIS Digiware D-50 (with Bluetooth) Ref. 4829 0206 DIRIS Digiware D-70 (with Bluetooth) Ref. 4829 0207	DIRIS Digiware U-10 Ref. 4829 0105 DIRIS Digiware U-30 Ref. 4829 0102	DIRIS Digiware I-30MID Ref. 4829 0133 DIRIS Digiware I-35MID Ref. 4829 0135	DIRIS Digiware I-60MID Ref. 4829 0134 DIRIS Digiware I-61MID Ref. 4829 0136	DIRIS Digiware S-130MID Ref. 4829 0163 DIRIS Digiware S-135MID Ref. 4829 0164

⚠️ The use of a DIRIS Digiware D-x0 display is mandatory to claim compliance of the DIRIS Digiware system to the MID directive.

⚠️ If the DIRIS Digiware I-xxMID /S-xxMID modules are added to an existing DIRIS Digiware system, make sure to upgrade the DIRIS Digiware D display and existing DIRIS Digiware U-xx / I-xx / S-xx / IO-xx modules to the latest firmware versions available on the Socomec website: www.socomec.com

(*) The current sensors which can be connected to DIRIS Digiware I-xxMID energy meters are listed below:

Solid Core TE current sensors						
TE-18	TE-18	TE-25	TE-35	TE-45	TE-55	TE-90
5 - 20 A	25 - 63 A	40 - 160 A	63 - 250 A	160 - 630 A	400 - 1000 A	600 - 2000 A
Ref. 4829 0500	Ref. 4829 0501	Ref. 4829 0502	Ref. 4829 0503	Ref. 4829 0504	Ref. 4829 0505	Ref. 4829 0506

Split Core TR/iTR current sensors			
TR-10	TR-14	TR-21	TR-32
25 – 63 A	40 – 160 A	63 – 250 A	160 – 600 A
Ref. 48290555	Ref. 48290556	Ref. 48290557	Ref. 48290558
iTR-10	iTR-14	iTR-21	iTR-32
25 – 63 A	40 – 160 A	63 – 250 A	160 – 600 A
Ref. 48290655	Ref. 48290656	Ref. 48290657	Ref. 48290658

Flexible TF current sensors						
TF-40	TF-55	TF-80	TF-120	TF-200	TF-300	TF-600
100 – 400 A	25 – 63 A	150 – 600 A	400 – 2000 A	600 – 4000 A	1600 – 6000 A	1600 – 6000 A
Ref. 48290573	Ref. 48290570	Ref. 48290574	Ref. 48290575	Ref. 48290576	Ref. 48290577	Ref. 48290578

18.2. Compatible load types

The MID certification of the DIRIS Digiware system covers the following load types, listed in the table below:

Network type Configured in DIRIS Digiware U-xx	Load type Configured in DIRIS Digiware I-xxMID / S-xxMID
1P+N	1P+N – 1CT (1P2W)
2P+N	1P+N – 1CT (1P2W)
3P	3P – 3CT (3P3W)
3P+N	1P+N – 1CT (1P2W) 3P – 3CT (3P3W) 3P+N – 3CT (3P4W)

18.3. Installation

18.3.1. Wiring diagrams

18.3.1.1. DIRIS Digiware I-3xMID

Three-phase + Neutral
3P+N - 3CT (1 three-phase load + measured Neutral)
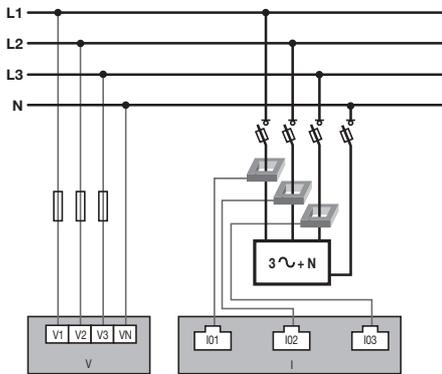
Three-phase
3P – 3CT (1 three-phase load)
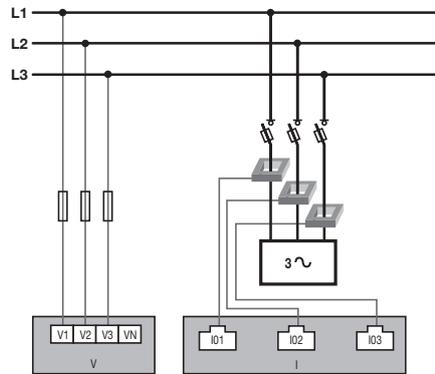
Single-phase
1P+N – 1CT (x3)
(3 single-phase loads)
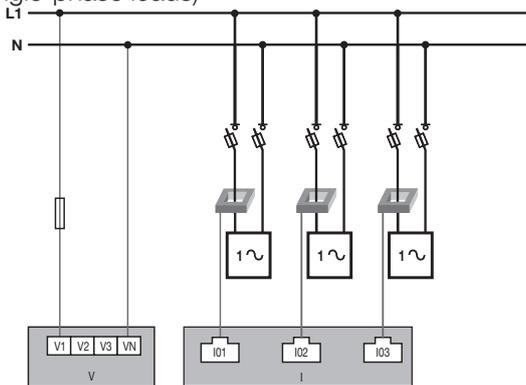
18.3.1.2. DIRIS Digiware I-6xMID

Single-phase 1P+N – 1CT (x6)
(6 single-phase loads)
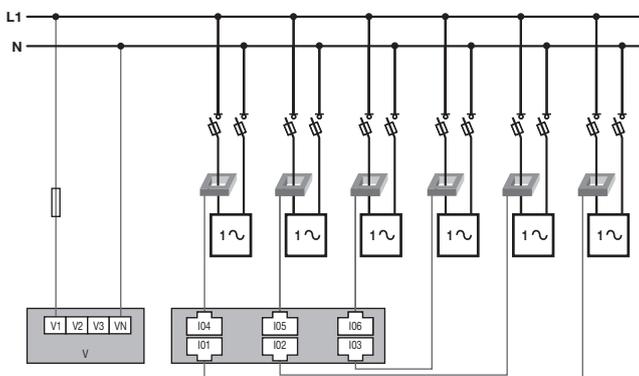
Three-phase 3P+N - 3CT + 3P+N - 3CT
(2 three-phase loads)

18.3.1.3. DIRIS Digiware S-xxMID

3P+N - 3CT

L1
L2
L3
N

I01 I02 I03

3∿

V1	V2	V3	VN

V

3P - 3CT

L1
L2
L3
N

I01 I02 I03

3∿

V1	V2	V3	VN

V

1P+N - 1CT (3x)

L1
N

I01 I02 I03

1∿ 1∿ 1∿

V1	V2	V3	VN

V

CT
Current sensor

Balanced load

Unbalanced load

Fuse: 0.5 A gG / BS 88 2A gG / 0.5 A class CC
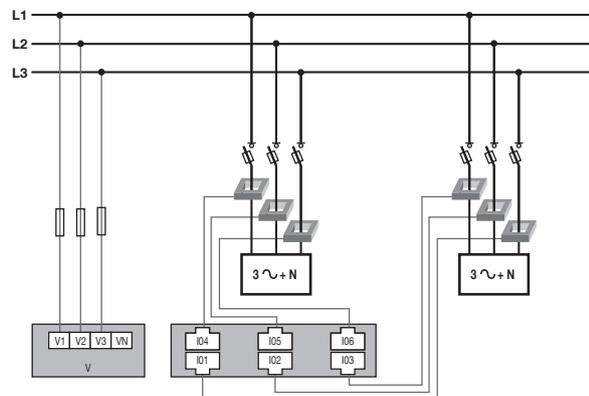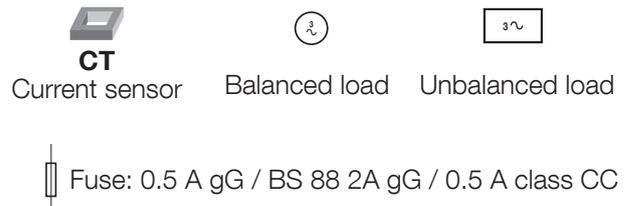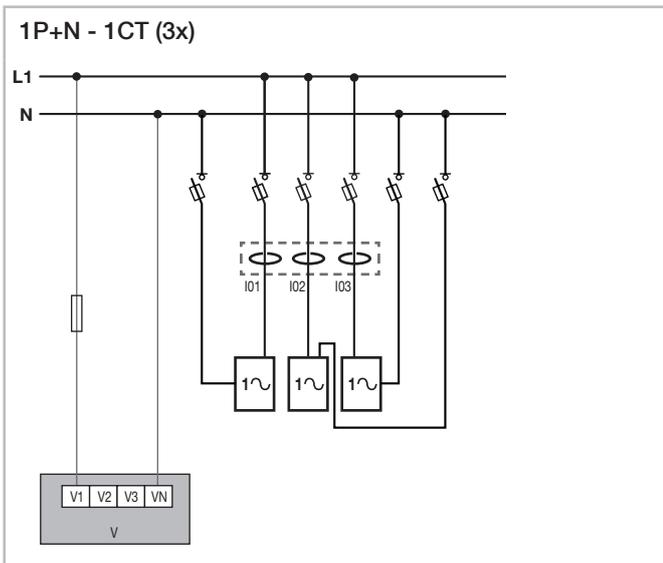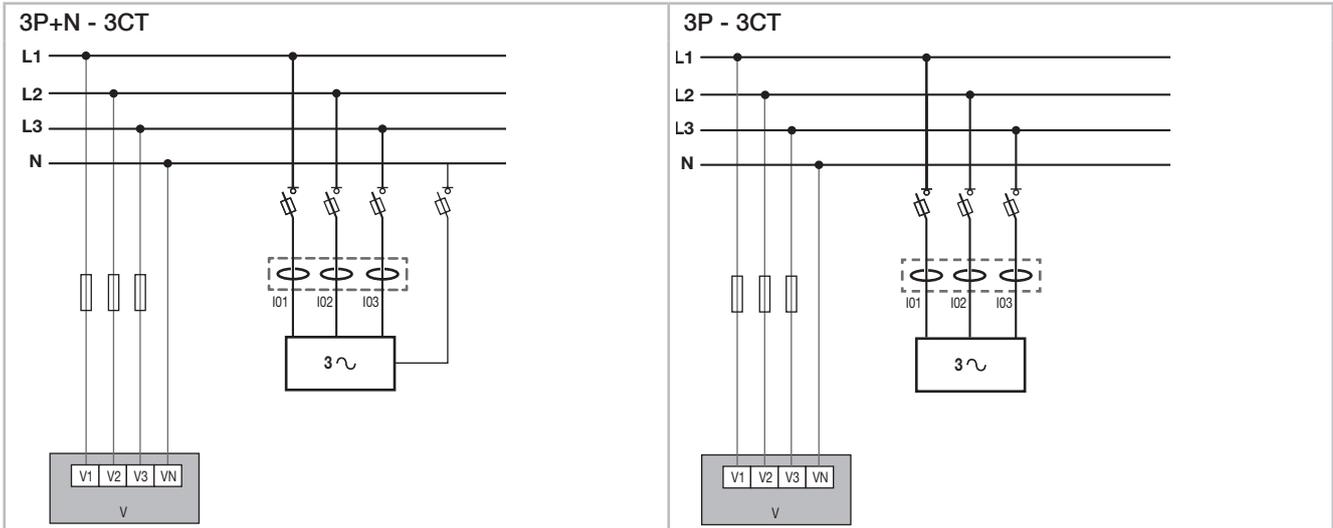
18.3.2. Void covers and stickers (for DIRIS Digiware I-xxMID meter only)

After connecting current sensors to DIRIS Digiware I-xxMID meters using the dedicated RJ12 cables, two void covers and stickers must be used on DIRIS Digiware I-xxMID meters in order to guarantee compliance to the MID directive. They provide additional protection against tampering with RJ12 cables.

I-3xMID

I-6xMID
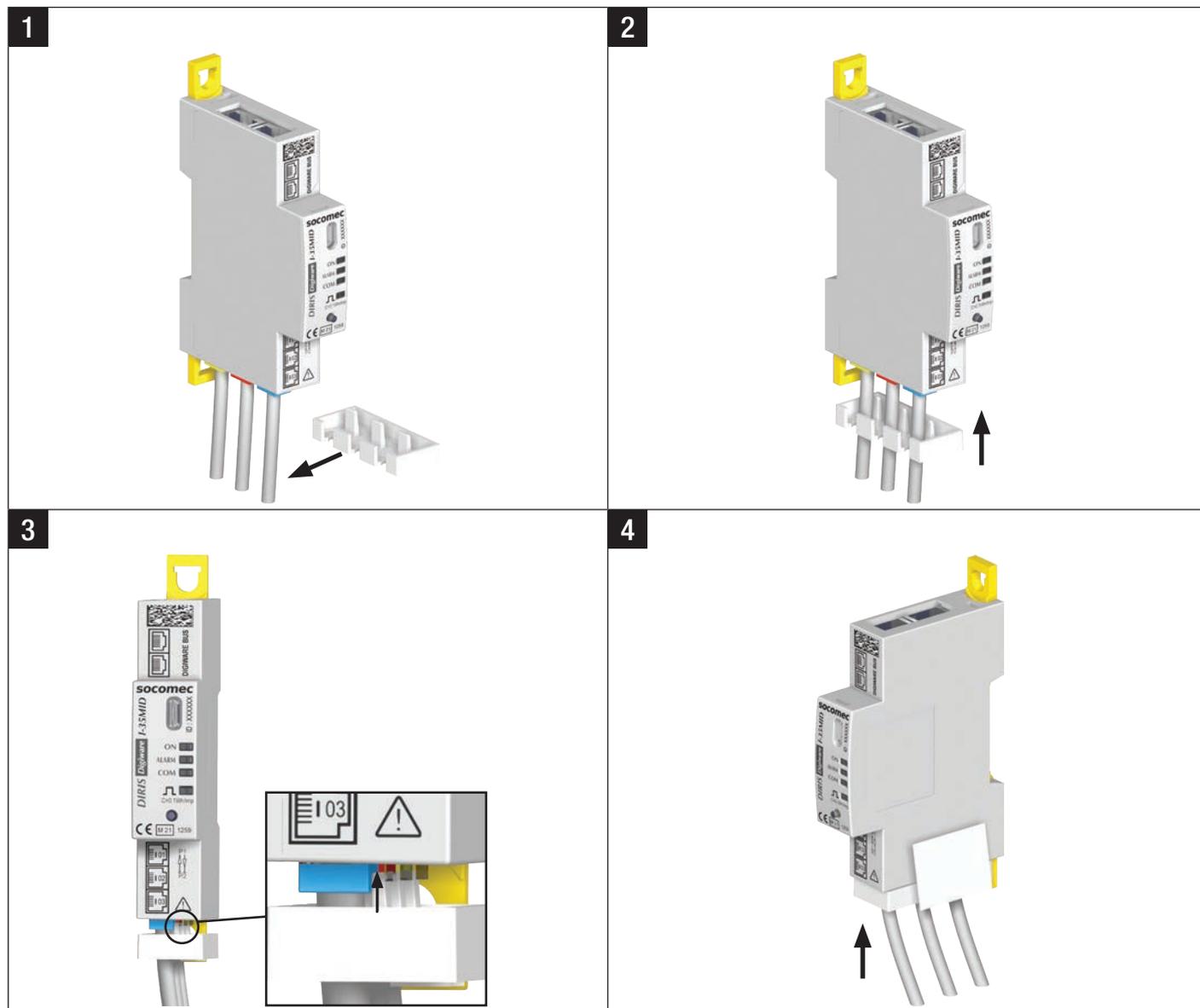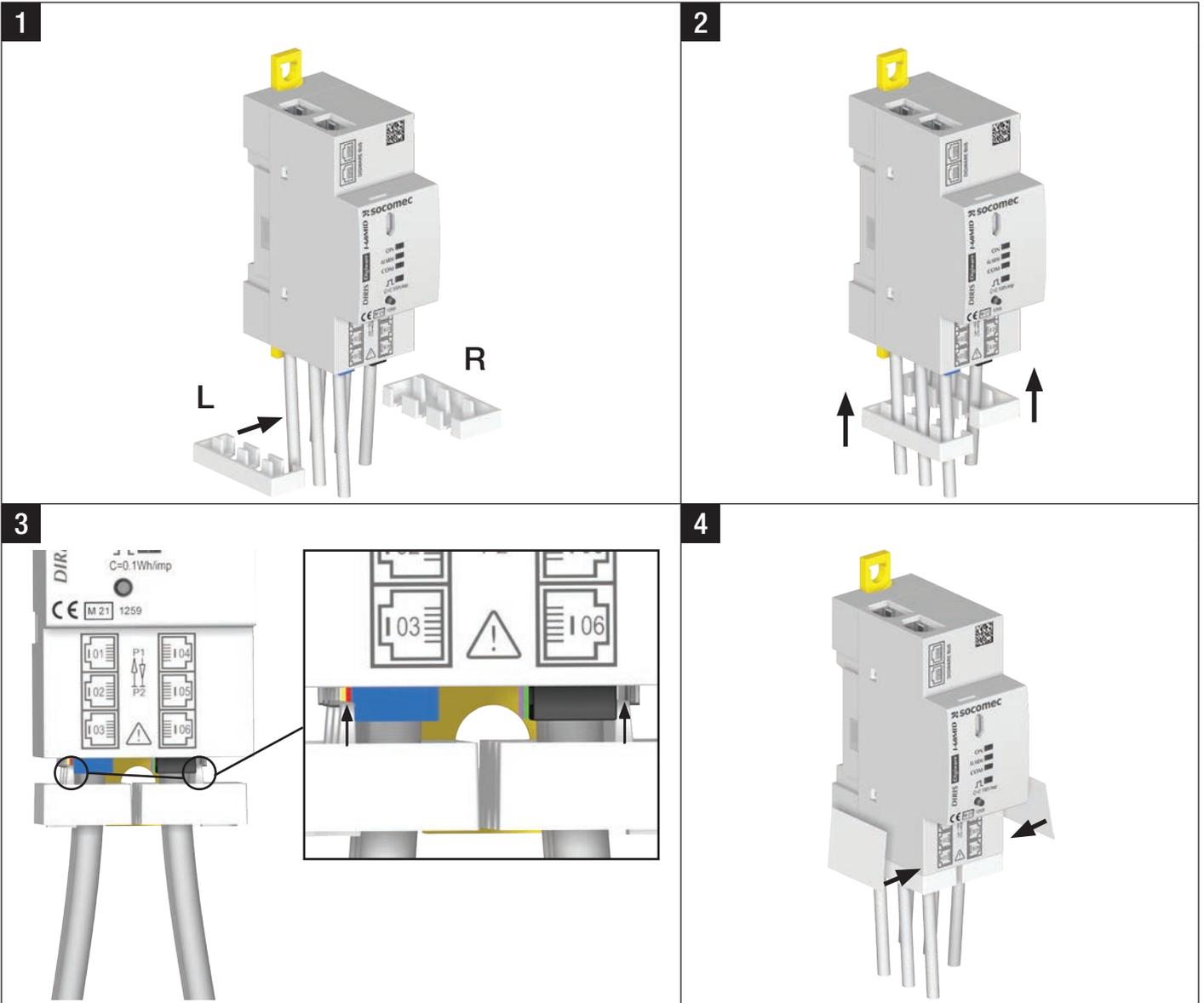
18.4. MID System Alarm

18.4.1. Description

Any change (both intentional and unintentional) impacting the authenticity of energy readings will result in the activation of a dedicated **MID Alarm called MID SYSTEM ALARM**.

Furthermore a blinking red LED is activated on the DIRIS Digiware D display and on the DIRIS Digiware I-xxMID / S-xxMID modules affected by the alarm.

To access to MID SYSTEM ALARM go to "EVENTS" ➔ "IN PROGRESS" ➔ "MID SYSTEM ALARMS".

For more information on the activation cause, you can click on "OK":

ALARMS		S-135MID@2
MID SYSTEM ALARM	11.10.21 12:14	⬍

OK

MID SYSTEM ALARM		S-135MID@2
TYPE	VT USED	⬍
START	11.10.2021 12:14:48	
DURATION	00h 00mn 01s	

Additionally a log (called MID EVENT LOG) provides detailed information on each event having impacted the authenticity of energy readings. The log can be consulted by clicking on "EVENTS" ➔ "MID EVENT LOG" from the DIRIS Digiware D-xx's home screen.

The list of events which can activate the MID SYSTEM ALARM, is detailed in the following paragraphs (18.4.2 – 18.4.9).

18.4.2. Intentional and unintentional configuration change

The MID SYSTEM ALARM is activated upon at least one configuration change, resulting in the modification of legally relevant measurements.

- **Electrical Network type**

Modifying the electrical network type in the DIRIS Digiware U-xx module (for instance from a 3P+N electrical system to 1P+N electrical system) may result in inconsistent measurements including energy readings in the DIRIS Digiware I-xxMID / S-xxMID modules.

The MID EVENT LOG provides more details such as the previous network type, and the date/time at which the event occurred:

! MID EVENT LOG		S-135MID@5
TYPE	CONFIG. CHANGE	
PARAMETERS	NETWORK TYPE	
NEW VALUE	1P + N	
PREVIOUS VALUE	3P + N	
DATE/TIME	10.27.2021 18:04:38	

• **Nominal frequency**

Modifying the nominal frequency in the DIRIS Digiware U-xx module (for instance from 50 Hz to 60 Hz) may result in inconsistent measurements including energy readings in the DIRIS Digiware I-xxMID / S-xxMID modules.

The MID EVENT LOG provides more details such as the previous nominal frequency, and the date/time at which the event occurred:

! MID EVENT LOG	|	S-135MID@5
TYPE	**CONFIG. CHANGE**	
PARAMETERS	NOMINAL FREQUENCY	
NEW VALUE	60 Hz	
PREVIOUS VALUE	50 Hz	
DATE/TIME	10.27.2021 18:10:07	

• **Voltage transformer use and ratio**

Enabling or disabling the use of a voltage transformer in the DIRIS Digiware U-xx module or modifying its primary/secondary ratio may result in inconsistent measurements including energy readings in the DIRIS Digiware I-xxMID / S-xxMID modules.

The MID EVENT LOG provides more details such as the previous configuration state and the date/time at which the event occurred:

! MID EVENT LOG	|	S-135MID@5
TYPE	**CONFIG. CHANGE**	
PARAMETERS	VT USED	
NEW VALUE	ENABLED	
PREVIOUS VALUE	DISABLED	
DATE/TIME	10.27.2021 18:12:02	

! MID EVENT LOG	|	S-135MID@5
TYPE	**CONFIG. CHANGE**	
PARAMETERS	VT SECONDARY	
NEW VALUE	120	
PREVIOUS VALUE	100	
DATE/TIME	10.27.2021 18:12:02	

! MID EVENT LOG	|	S-135MID@5
TYPE	**CONFIG. CHANGE**	
PARAMETERS	VT PRIMARY	
NEW VALUE	347	
PREVIOUS VALUE	100	
DATE/TIME	10.27.2021 18:12:02	

• **Load status change (Enable/Disable)**

If a load is disabled in the DIRIS Digiware S-xxMID / I-xxMID module, energy readings will no longer be returned by the module.

The MID EVENT LOG provides more details such as the date/time at which the event occurred:

! MID EVENT LOG	|	I-35MID@3
TYPE	**CONFIG. CHANGE**	
PARAMETERS	LOAD STATUS	
NEW VALUE	ENABLED	
PREVIOUS VALUE	DISABLED	
START	11.10.2021 13:18:44	
DATE/TIME		

• **Load name**

A load name modification in the DIRIS Digiware S-xxMID / I-xxMID may result in an improper allocation of energy data.

The MID EVENT LOG provides more details such as the previous load name configured in the DIRIS Digiware S-xxMID / I-xxMID module and the date/time at which the event occurred:

! MID EVENT LOG	|	S-135MID@5
TYPE	**CONFIG. CHANGE**	
PARAMETERS	LOAD NAME	
LOAD NAME	LOAD 1	
DATE/TIME	10.27.2021 18:25:51	

• Load type

Modifying the load type in the DIRIS Digiware S-xxMID / I-xxMID may result in inconsistent measurements including energy readings.

The MID EVENT LOG provides more details such as the load impacted, the previous and new configuration state and the date/time at which the event occurred:

! MID EVENT LOG		S-135MID@5
TYPE		**CONFIG. CHANGE**
PARAMETERS		LOAD TYPE
LOAD NAME		LOAD 1
NEW VALUE		2P+N_2CT
PREVIOUS VALUE		3P+N_3CT
DATE/TIME		10.27.2021 18:45:03

• Rating of current sensor

A change in the rating of a current sensor connected to the DIRIS Digiware I-xxMID module may result in inconsistent measurements including energy readings.

The MID EVENT LOG provides more details such as the load impacted, the previous and new current rating, and the date/time at which the event occurred:

! MID EVENT LOG		I-35MID@3
TYPE		**CONFIG. CHANGE**
PARAMETERS		I01 - RATING
NEW VALUE		30 A
PREVIOUS VALUE		63 A
DATE/TIME		11.03.2021 23:01:18

• Orientation of current sensor

Modifying the orientation of a current sensor connected to a DIRIS Digiware I-xxMID module may result in inconsistent measurements including energy readings.

The MID EVENT LOG provides more details such as the current input impacted (I01 to I03 for I-3x or S-xx and I01 to I06 for I-6x), the previous and new orientation, and the date/time at which the event occurred:

! MID EVENT LOG		S-135MID@5
TYPE		**CONFIG. CHANGE**
PARAMETERS		I01 - WAY
NEW VALUE		-/INV
PREVIOUS VALUE		+/DIRECT
DATE/TIME		10.27.2021 18:57:57

• Associated voltage of current sensor

Modifying the associated voltage of a current sensor connected to a DIRIS Digiware I-xxMID module may result in inconsistent measurements including energy readings.

The MID EVENT LOG provides more details such as the current input impacted (I01 to I03 for I-3x or S-xx and I01 to I06 for I-6x), the previous and new associated voltage, and the date/time at which the event occurred:

! MID EVENT LOG		S-135MID@5
TYPE		**CONFIG. CHANGE**
PARAMETERS		I01 - ASSOC. VOLTAGE
NEW VALUE		V2
PREVIOUS VALUE		V1
DATE/TIME		10.27.2021 19:01:34

The number of configuration changes can be consulted: PARAMETERS ➜ DEVICE ACTIONS and select the DIRIS Digiware MID module as below:

PARAMETERS		
DISPLAY SETTINGS		
AUTODETECT SERIAL DEVICES		
ADD NEW DEVICE MANUALLY		
DEVICE ACTIONS		

OK ➜

PARAMETERS		
U-30@6 ID:D503BA	@006	
I-35@5 ID:E34C91	@004	
I0-20@5 ID:76D5A	@005	
I0-10@7 ID:C0E45D	@007	
I-35@8 ID:7E229C	@008	
S-135MID@2 ID:E83CAA	**@002**	

OK ➜

PROD. MENU	| S-135MID@2 ID:E83CAA
SOFT VERSION	V1.0
OPERATING HOURS	32d 05h 06mn 32s
MID CRC	76C73C7E
CONFIG CHANGES	91
◄CONFIGURE►	

18.4.3. Inconsistent current sensor

Connecting a different current sensor from the one initially connected to the DIRIS Digiware I-xxMID module may result in inconsistent measurements including energy readings.

The MID EVENT LOG provides more details such as the current input impacted (I01 to I03 for I-3x and I01 to I06 for I-6x), the configured rating and detected rating of the current sensor connected, and the date/time at which the sensor replacement occurred:

MID EVENT LOG	|	I-35MID@5
TYPE	**CONFIG. CHANGE**	
PARAMETERS	I01 - CT INCONSISTENT	
CONFIG	630 A	
DIAG	63 A	
DATE/TIME	12.03.2021 13:25:35	

18.4.4. Disconnection of current sensor

Disconnecting a current sensor from the DIRIS Digiware I-xxMID module may result in inconsistent measurements including energy readings.

The MID EVENT LOG provides more details such as the current input impacted (I01 to I03 for I-3x and I01 to I06 for I-6x), and the date/time at which the disconnection occurred.

MID EVENT LOG	|	I-35MID@5
I01 - CT INCONSISTENT	07.29.22	11:28
I01 - CT DISCONNECTED	**07.29.22**	**11:28**
I01 - CT INCONSISTENT	07.29.22	11:21
LOAD NAME	07.29.22	11:21
CT3 - CT SETTINGS	07.29.22	11:21
CT2 - CT SETTINGS	07.29.22	11:21

18.4.5. Power Cycle

A power cycle* of the DIRIS Digiware I-xxMID / S-xxMID module mainly results from the external power supply outage. It may result in a lack of allocation of energy readings.

The MID EVENT LOG provides more details such as the date/time at which the power cycle occurred along with its duration:

```
MID EVENT LOG        |        S-135MID@2

   TYPE                    POWER CYCLE
   DURATION                00h 00mn 14s
   DATE/TIME               12.02.2021  18:25:19
```

- DATE/TIME : Time when the external power supply outage occurs
- DURATION : Duration of the external power supply outage

(*) A power cycle mainly results from the external power supply outage.

18.4.6. Alteration of Digiware bus

Altering the Digiware bus upstream a DIRIS Digiware I-xxMID / S-xxMID module so that it no longer transmits the voltage sampling from the DIRIS Digiware U-xx module may result in inconsistent measurements including energy readings.

The MID EVENT LOG provides more details such as the date/time at which the alteration of the Digiware Bus occurred.

```
! MID SYSTEM ALARM  |        I-61MID@5

   TYPE                    DGW BUS ALTERATION
   START                   11.24.2022  18:03:22
   STATUS                  FINISHED NOT ACK.
                    ACKNOWLEDGEMENT
```

18.4.7. Replacement of DIRIS Digiware U-xx module

Swapping the DIRIS Digiware U-xx module with a different one may result in inconsistent measurements including energy readings.

The MID EVENT LOG provides more details such as the ID of the initial DIRIS Digiware U-xx module and of the new DIRIS Digiware U-xx module (ID is marked on the nose of the module) and the date/time at which the replacement occurred:

```
! MID EVENT LOG      |        I-35MID@5

   TYPE                    CONFIG. CHANGE
   PARAMETERS              U-XX MODULE SWAP
   NEW VALUE               ID:8F90A6
   PREVIOUS VALUE          ID:D503BA
   DATE/TIME               12.03.2021  12:38:50
```

18.4.8. Date and time change

Modifying the date/time in the DIRIS Digiware D-xx display or DIRIS Digiware U-xx module may result in the inconsistent allocation of energy consumption.

The MID EVENT LOG provides more details such as the time difference (Delta) between the initial date/time and the new date/time configured, and the date/time at which the date or time change occurred:

MID EVENT LOG		S-135MID@2
TYPE		CONFIG. CHANGE
PARAMETERS		DATE/TIME
DELTA		+ 23h 59mn 45s
DATE/TIME		12.03.2021 23:17:24

18.4.9. MID CRC periodic check failure

Several checksums are verified periodically for protection against unintentional changes.

The MID EVENT LOG provides more details such as the type of CRC ERROR (see below), and the date/time at which the CRC ERROR occurred.

• SOFTWARE ID

A firmware corruption may result in inconsistent measurements including energy readings.

A firmware identifier (CRC32) called MID CRC verifies the integrity of the entire firmware loaded in the flash memory.

It can be consulted in DEVICE ACTIONS, here the MID CRC is D1E0FD27:

PARAMETERS		
DISPLAY SETTINGS		
AUTODETECT SERIAL DEVICES		
ADD NEW DEVICE MANUALLY		
DEVICE ACTIONS		

OK →

PROD LIST	
D-70 ID:E5BCE5	@001
U-10@6 ID:8F90A6	@006
S-135MID@3 ID:E83CAA	@003
I-35@4 ID:E34C91	@004
I-35MID@5 ID:DCB5E9	@005
I0-10@7 ID:C0E45D	@007

OK →

PROD. MENU		I-35MID@5 ID:DCB5E9
SOFT VERSION		V1.0
OPERATING HOURS		23d 04h 32mn 00s
MID CRC		D1E0FD27
CONFIG CHANGES		79
◀CONFIGURE▶		
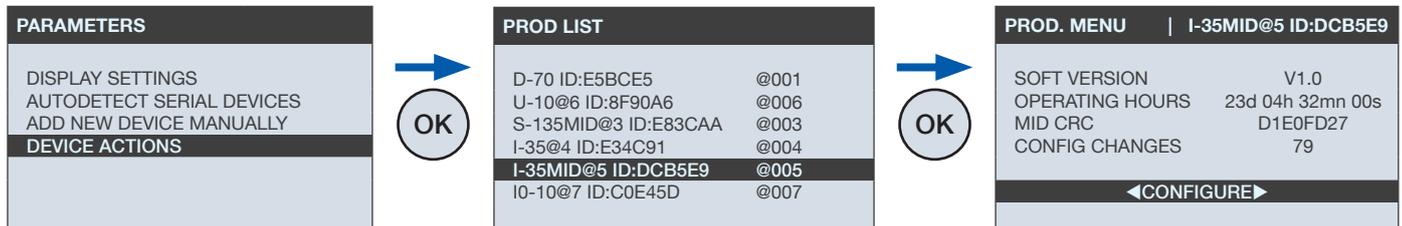
Details are given in the MID EVENT LOG in case of a firmware corruption:

MID EVENT LOG		I-30MID@5
TYPE		MID CRC ERROR
SOFTWARE ID		
DATE/TIME		06/12/2021 10:49:37

- **Calibration values**

A corruption of calibration values may result in inconsistent measurements including energy readings.

A CRC protects calibration values in case a corruption is detected:

MID EVENT LOG		I-30MID@5
TYPE		**MID CRC ERROR**
CALIBRATION VALUES		
DATE/TIME		06/12/2021 10:49:53

- **Energy Meters**

An Energy Meter CRC verifies the integrity of energy meters every time energy is incremented to guarantee no corruption has been introduced in the readings:

MID EVENT LOG		I-30MID@5
TYPE		**MID CRC ERROR**
ENERGY METERS		
DATE/TIME		06/12/2021 10:50:07

- **Legal parameters**

A corruption of legally relevant settings may result in inconsistent measurements including energy readings. A CRC protects legally relevant settings in case any unwanted corruption affecting the energy calculation is detected:

MID EVENT LOG		I-30MID@5
TYPE		**MID CRC ERROR**
LEGAL PARAMETERS		
DATE/TIME		06/12/2021 10:50:21

⚠️ Up to 50 MID events can be displayed on the DIRIS Digiware D-xx display via the "MID EVENT" menu.

18.5. MID SYSTEM ALARM acknowledgement

The MID SYSTEM ALARM requires a manual acknowledgement from the user in order for the ALARM LED on the DIRIS Digiware S-xxMID / I-xxMID or on the DIRIS Digiware D-xx display to stop blinking.

Once the system is fully configured and its functioning is correct, it is important to acknowledge the MID SYSTEM ALARM to clear it from the "IN PROGRESS" alarm menu.

Go to "EVENTS" ➜ "IN PROGRESS" ➜ "MID SYSTEM ALARMS" ➜ "ACKNOWLEDGEMENT" to acknowledge the MID System Alarm:

! ALARM		I-35MID@3
MID SYSTEM ALARM		
START	11.03.2021 23:01:18	
STATUS	FINISHED	
TYPE	RATING	
CRITICALITY	INFORMATION	
ACKNOWLEDGEMENT		

The acknowledgement has to be validated by entering the password (Refer to section 10.2 for more information).

Once the MID SYSTEM ALARM is acknowledged, the red ALARM LED on the DIRIS Digiware I-xxMID / S-xxMID modules and on the DIRIS Digiware D-xx display stops blinking after a few seconds.

When the DIRIS Digiware MID system is in operating condition, the activation of a MID System Alarm leads the user to consult their MID EVENT LOG to verify the reason for the MID alarm activation.

Go to "EVENTS" ➜ "MID EVENT LOG" to consult the MID Event log:

! EVENTS		S-135MID@5
IN PROGRESS		
HISTORY		
MID EVENT LOG		

(i) Note: the MID EVENT log cannot be reset.

18.6. Visualisation of energy readings

Ea+ and Ea- energy readings from DIRIS Digiware S-xxMID/I-xxMID meters are identified with the [M] symbol (*).
This allows to distinguish between energy measured from standard DIRIS Digiware meters and legally relevant energy measured from DIRIS Digiware MID meters:

Energy meters from standard DIRIS Digiware I-xx / S-xx	Energy meters from DIRIS Digiware I-xxMID / S-xxMID
ACTIVE+ | Load 1 - E34C91 >> TOTAL 0.442500 kWh ◄PART► RAZ PARTIEL PART 0.247000 kWh	**ACTIVE+** | Load 1 - E83CAA >> TOTAL 0.000000 kWh [M] ◄PART► RAZ PARTIEL PART 0.000000 kWh

(*) Only load types covered by MID certification (refer to paragraph x.x.x. Measuring characteristics)

(i) Note: TOTAL Energy meters cannot be reset.

18.7. MID accuracy verification report

The accuracy verification report according to 2014/32/EU MID directive is accessible at the following link:

midcertificate.socomec.com

- Enter the ID of the module (marked on the front face of your DIRIS Digiware I-xxMID or S-xxMID module.
- Enter your contact information
- Download the verification report

18.8. Interface and LEDs

18.8.1. DIRIS Digiware S-xxMID
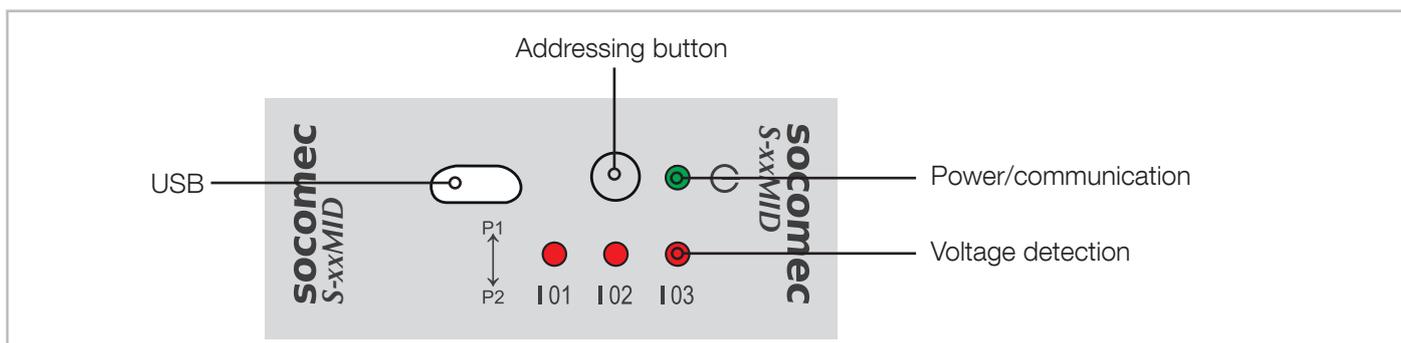
Main LED	Fixed	Blinking
Green	Product operating normally	Product communicating and During 10 seconds, if an identification command is initiated from the Easy Config System software
Red	Indicates the presence of a measurement alarm	Presence of a system alarm: - MID Alarm - Incorrect V/I association
Orange	Address conflict during Auto-Discovery process	Not available

I01, I02 & I03 LEDs (*)	Fixed	Pulse
Red	Indicates that no voltage is detected on a phase.	Corresponds to the metrological pulse weight (1Wh by default)

(*) By default, I01, I02, I03 LEDs are configured in voltage detection mode.
   Settings can be changed to metrological LED mode from the Easy Config System configuration software.

18.8.2. DIRIS Digiware I-xxMID

LED state	Fixed	Blinking	Pulse
ON	Product operating normally	10 seconds - on request via a Modbus control to identify the device (remote screen, etc.)	1 second during power-on
ALARM	Presence of a measurement alarm	Presence of a system alarm: - MID Alarm - Disconnected CT - Incorrect V/I association - Incorrect CT primary	1 second during power-on
COM	Addressing conflict during Auto-Discovery process	Address OK	1 second during power-on and when a communication frame is received is processed
⊓	Not available	Not available	I - xx: Corresponds to the metrological pulse weight (0.1 Wh x the nominal current In of current sensor used, refer to last column of table in 18.9.2.2)

18.9. TECHNICAL CHARACTERISTICS – DIRIS Digiware I-xxMID / S-xxMID

18.9.1. Mechanical characteristics

Casing type	DIN-rail mounting module and base
Casing protection index	IP20
Front face protection index	IP51 with DIRIS Digiware D-xx
Mechanical environment	M1
Mechanical strength	IK02
Vibration	10 Hz ...150 Hz according IEC 60068-2-6 with < 60 Hz: 0.075 mm (constant displacement) > 60 Hz: 10 m/s² (constant acceleration)
Shock	300 m/s², 18 ms according IEC 60068-2-27
Glow wire flammability	960°C for terminals plastic parts 650°C for other plastic parts according IEC 60695-2-11 in conjunction with IEC 60695-2-10
Weight	DIRIS Digiware I-30MID / I-35MID: 63 g DIRIS Digiware I-60MID / I-61MID: 83 g DIRIS Digiware S-130MID / S-135MID: 54 g

18.9.2. Electrical characteristics

18.9.2.1. Measuring characteristics

Load types covered by MID certification	1P+N – 1CT (1P2W) 3P+N – 3CT (3P4W) 3P – 3CT (3P3W)
Metrological Constant (LED)	DIRIS Digiware I-xxMID: 0.1 Wh x the nominal current of the current sensor used (refer to the last column of table in chapter 18.9.2.2) DIRIS Digiware S-xxMID: 1 Wh
Voltage Level	230 V Ph-N / 400 V Ph-Ph
Frequency	50 Hz
Accuracy Class	C
Ist	DIRIS Digiware I-xxMID: Depends on current sensor used, see table in 18.8.2.2 DIRIS Digiware S-xxMID: 0.04 A
Imin	DIRIS Digiware I-xxMID: Depends on current sensor type, see table in 18.8.2.2 DIRIS Digiware S-xxMID: 0.2 A
Itr	DIRIS Digiware I-xxMID: Depends on current sensor type, see table in 18.8.2.2 DIRIS Digiware S-xxMID: 1 A
In	DIRIS Digiware I-xxMID: Depends on current sensor type, see table in 18.8.2.2
10 Itr	DIRIS Digiware S-xxMID: 10 A
Imax	DIRIS Digiware I-xxMID: Depends on current sensor type, see table in 18.8.2.2 DIRIS Digiware S-xxMID: 63 A

Current sensor Type		Primary current values (A) / Secondary values (mV) current sensors					Pulse weight for primary current
Reference	Name	Ist (0,1 mV)	Imin (1 mV)	Itr (5 mV)	In (100 mV)	Imax (120 mV)	
48290499	5A Adaptor	0.005 A	0.05 A	0.25 A	5 A	6 A	0.5 Wh/pulse
48290500	TE-18	0.02 A	0.2 A	1 A	20 A	24 A	2 Wh/pulse
48290501	TE-18	0.063 A	0.63 A	3.15 A	63 A	75.6 A	6.3 Wh/pulse
48290502	TE-25	0.16 A	1.6 A	8 A	160 A	192 A	16 Wh/pulse
48290503	TE-35	0.25 A	2.5 A	12.5 A	250 A	300 A	25 Wh/pulse
48290504	TE-45	0.63 A	6.3 A	31.5 A	630 A	756 A	63 Wh/pulse
48290505	TE-55	1 A	10 A	50 A	1000 A	1200 A	100 Wh/pulse
48290506	TE-90	2 A	20 A	100 A	2000 A	2400 A	200 Wh/pulse
48290555	TR-10	0.063 A	0.63 A	3.15 A	63 A	75,6 A	6.3 Wh/pulse
48290655	iTR-10	0.063 A	0.63 A	3.15 A	63 A	75,6 A	6.3 Wh/pulse
48290556	TR-14	0.16 A	1.6 A	8 A	160 A	192 A	16 Wh/pulse
48290656	iTR-14	0.16 A	1.6 A	8 A	160 A	192 A	16 Wh/pulse
48290557	TR-21	0.25 A	2.5 A	12.5 A	250 A	300 A	25 Wh/pulse
48290657	iTR-21	0.25 A	2,5 A	12.5 A	250 A	300 A	25 Wh/pulse
48290558	TR-32	0.6 A	6 A	30 A	600 A	720 A	60 Wh/pulse
48290658	iTR-32	0.6 A	6 A	30 A	600 A	720 A	60 Wh/pulse
48290573	TF-40	0.4 A	4 A	20 A	400 A	480 A	40 Wh/pulse
48290574	TF-80	0.6 A	6 A	30 A	600 A	720 A	60 Wh/pulse
48290575	TF-120	2 A	20 A	100 A	2000 A	2400 A	200 Wh/pulse
48290576	TF-200	4 A	40 A	200 A	4000 A	4800 A	400 Wh/pulse
48290577	TF-300	6 A	60 A	300 A	6000 A	7200 A	600 Wh/pulse
48290578	TF-600	6 A	60 A	300 A	6000 A	7200 A	600 Wh/pulse

18.9.3. Environmental characteristics

Use	Indoor
Installation	DIRIS Digiware S-xxMID and I-xxMID must be installed inside an electrical cabinet
Protective class	II
Degree of protection	2
Operating temperature range	-10°C … +70°C for DIRIS Digiware I-xxMID -10°C … +55°C for DIRIS Digiware S-xxMID
Storage temperature range	-25°C … +70°C according to IEC 60068-2-1 & IEC 60068-2-2
Humidity	90% … 100% RH at +40°C according to IEC 60068-2-30

18.9.4. EMC characteristics

Electromagnetic environment	E2

Phenomenom	Basic Standard	Test Level	Performance Criterion
Immunity to electrostatic discharges (ESD)	IEC 61000-4-2	Level IV	B B
Immunity to radiated radio-frequency electromagnetic fields	IEC 61000-4-3	Level III	A
		Level IV	B
Immunity to electrical fast transients/bursts	IEC 61000-4-4	Level IV Level III	B B
Immunity to surges	IEC 61000-4-5	Level IV Level II	B B
Immunity to conducted disturbances, induced by RF fields	IEC 61000-4-6	Level III	A
Immunity to continuous magnetic fields of external origin	EN 50470-1	-	A
Immunity to power frequency magnetic fields of external origin	IEC 61000-4-8	> Level V	A
Radiated emissions	EN 55022	-	Class B

18.9.5. Standards and safety

Product standard	- EN 50470-3: Class C - IEC 61557-12: see chapter 17.1 - IEC 62053-21: Class 0,5 - IEC 62053-22: Class 0,5S - IEC 62053-23: Class 2 ((Accuracy measurements compliant with Class 1 of IEC 62053-24)
Directive	• Measuring Instrument Directive: 2014/32/EU Flash the QR code or go to https://midcertificate.socomec.com, then follow the instructions to access the accuracy verification report according to the EN 50470 3 standard. • Low Voltage Directive: 2014/35/EU • Electromagnetic Compatibility Directive: 2014/30/EU • Restriction of the use of certain Hazardous Substances Directive: 2011/65/EU and 2015/863

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