

# DIRIS B-30

## Wireless power monitoring devices

new

*Configuration with EasyConfig, see page 142.*




***DIRIS B-30***
*Radio frequency (wireless)*




***DIRIS B-30***
*RS485*

## Function

The **DIRIS B-30** is a power monitoring device in a modular format that communicates wirelessly or via RS485. The 4 RJ12 independent current inputs of the device allow it to manage several types and number of circuits: for example, 4 single-phase loads or 1 three-phase load + 1 single-phase load.

The DIRIS B-30 is connected to current sensors(1) (RJ12 connection) that are suitable for all types of installation: solid TE, split-core TR, and flexible TF current sensors.

*(1) See page 32.*

## Advantages

### Plug & Play

A rapid RJ12 connection makes wiring easy and reliable and prevents wiring errors. Automatically addressing and configuring the product (communication address, load type, type and ratio of current sensor) allow you to simplify implementation and to save time.

### Class 0.5 in accordance with IEC 61557-12

- Class 0.2 for the meter alone.
- Class 0.5 from 2% to 120% of nominal current for the global measurement chain (associated with TE/TF current sensors).

### Multi-circuit

- 4 current measurement inputs allow you to configure multiple circuits in order to optimise the number of measurement devices per installation.

### Communication

- The DIRIS B-30 can be connected to:
  - a remote DIRIS D-30 screen for displaying measurement and metering data.
  - a DIRIS G(1) gateway for centralisation and communication of data wirelessly or via RS485 and Ethernet.
  - optional modules to communicate in BACnet IP, BACnet MSTP and PROFIBUS DP protocol. Digital or analogue input/ output modules can also be connected.

*(1) See page 124.*

## The solution for

- Industry
- Building
- Infrastructure
- Local authority



## Strong points

- Plug & Play
- Global accuracy class 0.5 in accordance with IEC 61557-12
- Multi-circuit
- Communication

## Conformity to standards

- IEC 61557-12
- EN 50160
- ISO 14025

PEP ecoPASSPORT®

## Selection guide

| DIRIS B-30 | |
|---|---|
| DIRIS B-30 RS | RS485 MODBUS communication |
| DIRIS B-30 RF | Radio frequency Communication (wireless) |
| **Optional modules** | |
| DIRIS O-iod | 2 digital inputs / 2 digital outputs |
| DIRIS O-ioa | 2 analogue inputs / 2 analogue outputs |
| DIRIS O-it | 3 temperature inputs |
| DIRIS O-m | Additional RS485 communication |
| DIRIS O-p | PROFIBUS communication |
| DIRIS O-b/ip | BACnet IP communication |
| DIRIS O-b/mstp | BACnet MSTP communication |

## Functions

**Multi-measurement**
- Currents
  - I1, I2, I3, In, Isystem
- Voltages & frequency
  - V1, V2, V3, VN, Vsystem, U12, U23, U31, Usystem, f
- Power
  - P1, P2, P3, ΣP, Q1, Q2, Q3, ΣQ, S1, S2, S3, ΣS
  - Predictive power ΣP, ΣQ, ΣS
- Power factor
  - PF1, PF2, PF3, ΣPF
- Cos φ & tanφ
  - Instantaneous values per phase

**Metering**
- Active energy: +/- kWh
- Reactive energy: +/- kvarh
- Apparent energy: kVAh
- Multi-tariff (8 max.)

**Quality**
- Voltage Unbalance
  - Vdir, Vinv, Vhom, Udir, Uinv, Unba, Vnba, Vnb, Unb
- Current unbalance
  - Idir, Iinv, Ihom, Inba, Inb
- Total harmonic distortion
  - Currents THDi1, THDi2, THDi3,THDiN
  - Phase-to-neutral voltage THDv1, THDv2, THDv3
  - Phase-to-phase voltage THDu12, THDu23, THDu31
- Individual harmonics up to rank 63
  - Currents: I1h, I2h, I3h, INh
  - Phase-to-neutral voltage: V1h, V2h, V3h
  - Phase-to-phase voltage: U12h, U23h, U31h
- Active (according to EN 50160)
  - Dips, interruptions, swells

**Load curves and history logs (130 days max.)**
- Active, reactive and apparent power
- Currents, voltages and frequency

**Alarms**
- Alarms for all electrical values, events and input status changes, possibility of boolean combination

**Communication**
- DIRIS B-30 RF: Radio frequency Communication (wireless)
- DIRIS B-30 RS: RS485 Modbus,
- Optional modules: RS485, BACnet IP, BACnet MSTP, PROFIBUS DPV1

**Inputs**
- 2 digital inputs
  - Supply by the DIRIS B-30 or external supply
  - Function: logic status, circuit breaker status, pulse meter or synchronisation pulse

## DIRIS B-30 display

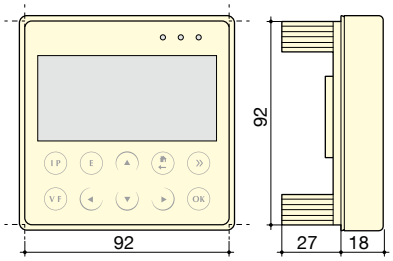
### DIRIS D-30

diris-d_001_a_1_cat



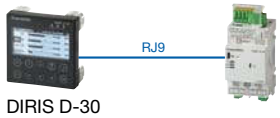
### Dimensions

diris-dw_037_b_1_x_cat




### Connection

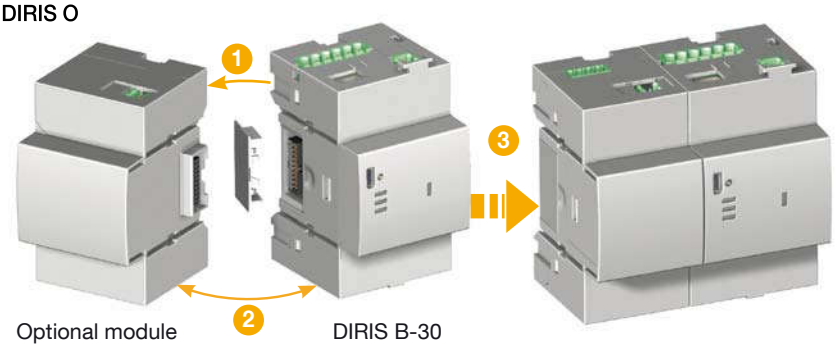
diris-d_004_a_1_x_cat




## Optional modules

### DIRIS O

diris-b_008_a_1_gb_cat




**Optional modules (4 max.)***

- Digital inputs/outputs
- Analogue inputs/outputs
- Temperature inputs
- Communication protocols

** maximum 4 optional modules with maximum 1 temperature module and 1 communication module (Modbus, PROFIBUS, BACnet IP or BACnet MSTP).*

diris-o_002_a_1_cat



**DIRIS O-iod**

- 2 digital inputs centralises the metering pulses or the input status changes of the auxiliary contacts.
- 2 digital outputs can be connected to configurable alarms warning of exceeded thresholds (power, current, etc.) or can be piloted remotely.

diris-o_003_a_1_cat



**DIRIS O-ioa**

- 2 inputs (4-20 mA) centralise analogue sensors (pressure, humidity, temperature, etc.)
- 2 outputs (4/-20 mA) report the measurements (power, currents, etc.) to PLCs.

diris-o_004_a_1_cat



**DIRIS O-it**

- 3 temperature inputs to be connected to PT100 or PT1000 sensors.
- Ambient air temperature:

diris-o_005_a_1_cat



**DIRIS O-m**

- Provides a second RS485 Modbus communication port to the DIRIS B-30 for simultaneous sending of information via RS485 to two supervision stations.

diris-o_006_a_1_cat



**DIRIS O-p**

- Adds a PROFIBUS DPV1 communication port to the DIRIS B-30.

diris-o_007_a_1_cat



**DIRIS O-b/ip**

- Adds a BACnet IP communication port to the DIRIS B-30.

diris-o_008_a_1_cat



**DIRIS O-b/mstp**

- Adds a BACnet MSTP communication port to the DIRIS B-30.

## Accessories

**Remote radio antenna**

- Mounted outside the enclosure of the DIRIS B-30 monitoring device to increase the transmission distance.

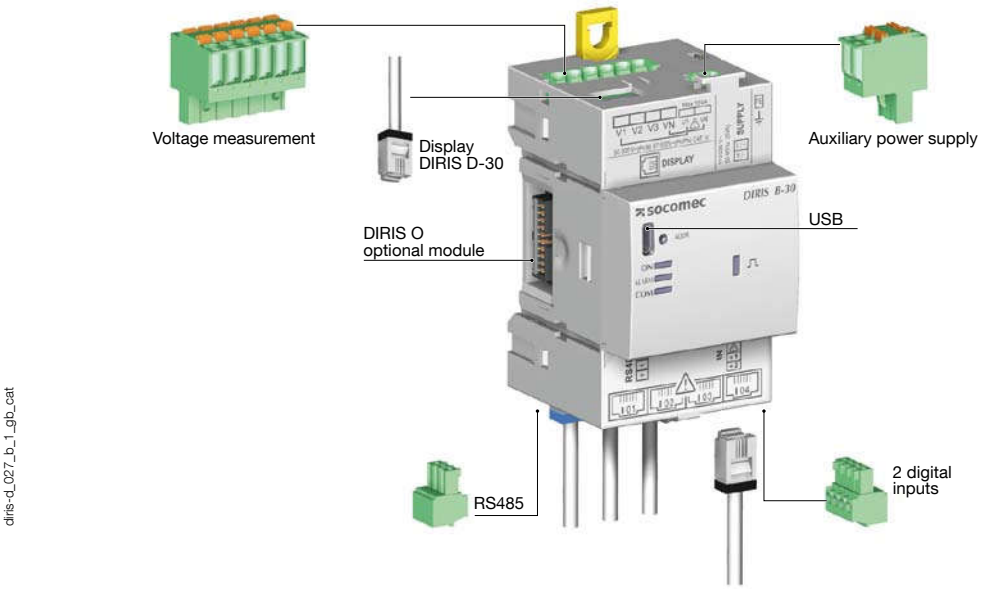
**DIRIS B-30 sealing cover**

- Prevents access to the cabling of the monitoring device.

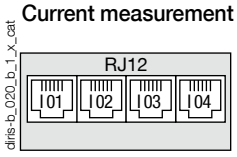
**USB configuration cable (2 m)**

- Advanced configuration of DIRIS B-30 gateways can be achieved using the EASY CONFIG software via Ethernet or direct USB connection.

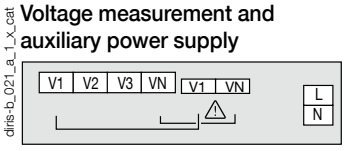
## DIRIS B-30 terminals




### Current measurement

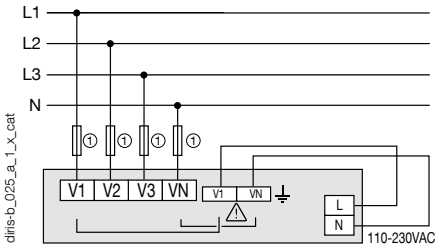



### Voltage measurement and auxiliary power supply



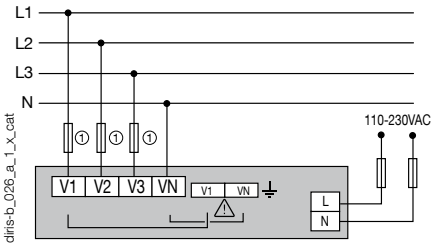

### Self supply

Easy connection of the power supply from the measurement terminal (specific terminals)



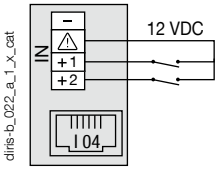

*1. Fuses 0.5 A gG / 0.5 A class CC.*

### Separate power supply

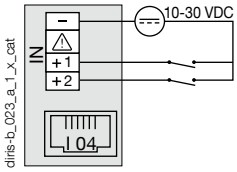



*1. Fuses 0.5 A gG / 0.5 A class CC.*

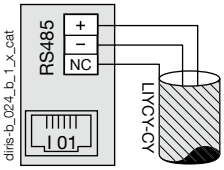
### 2 inputs supplied by the product




### 2 inputs with external power supply

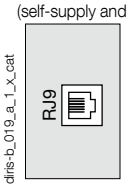



### RS485



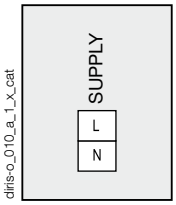

### RJ9 for DIRIS D-30

(self-supply and data)

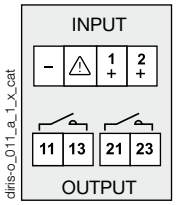



## Terminals of optional DIRIS O modules

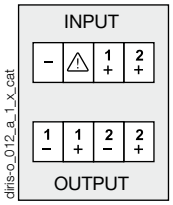
### Optional module power supply



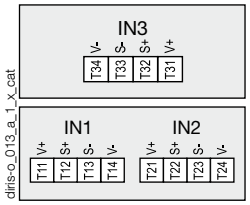

### DIRIS O-iod



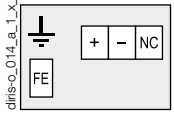

### DIRIS O-ioa



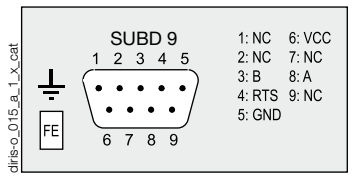

### DIRIS O-it



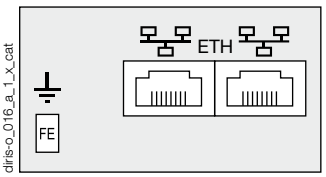

### DIRIS O-m RS485



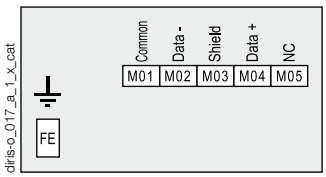

### DIRIS O-p




### DIRIS O-b/ip




### DIRIS O-b/mstp



## Connections

### Associated current sensors

Various types of current sensors can be connected to the DIRIS Digiware: Solid TE , split-core TR , flexible TF current sensors. This range of sensors can be adapted to all types of new or existing installations. A rapid RJ12 connection makes wiring easy and reliable and prevents wiring errors. The DIRIS B-30 automatically recognises the sensor size and type. This guarantees the overall accuracy of the DIRIS B-30 + current sensor measurement chain.

*For more information: see page 32.*

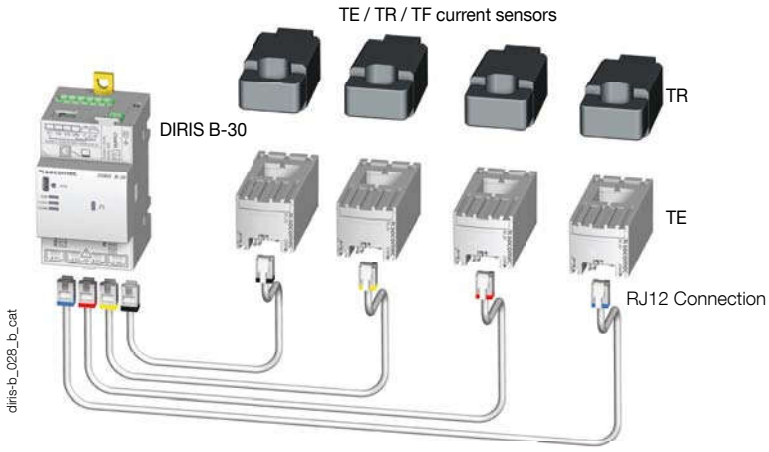
TE solid current sensors




TR Split-core current sensors

TF Flexible current sensors

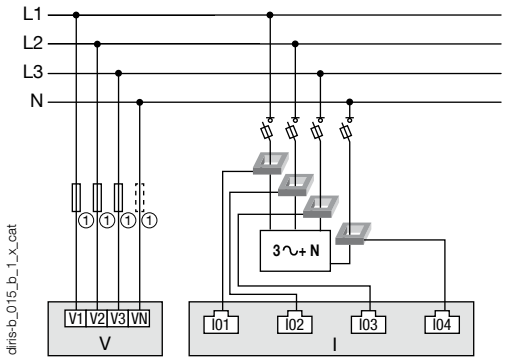



### Network and connection examples

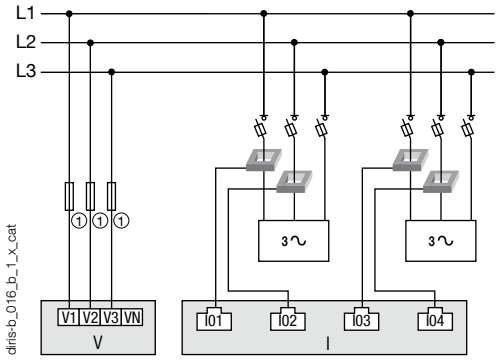
**Three phase + neutral**

3P+N - 4CTs (measurement for 1 three-phase load + Neutral)



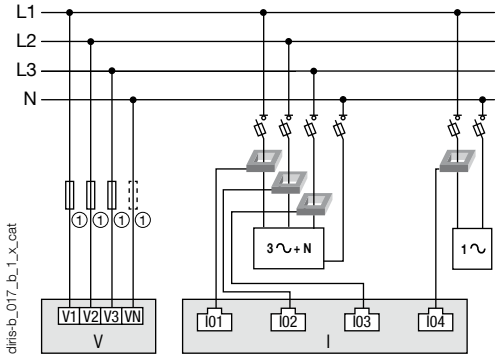

**Three-phase**

3P - 2CTs (2 three-phase loads without neutral)



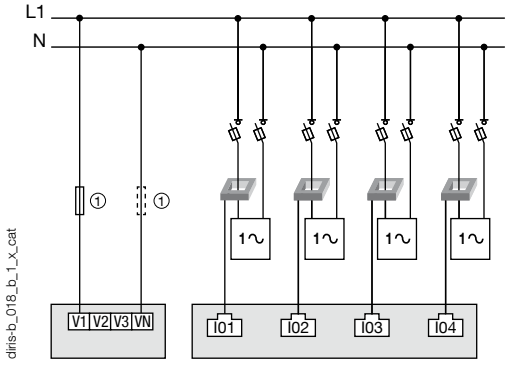

**Three-phase**

3P+N - 3CTs & 1P+N - 1CT (1 three-phase load & 1 single-phase load)




**Single-phase**

1P+N-1CT (4 single-phase loads)

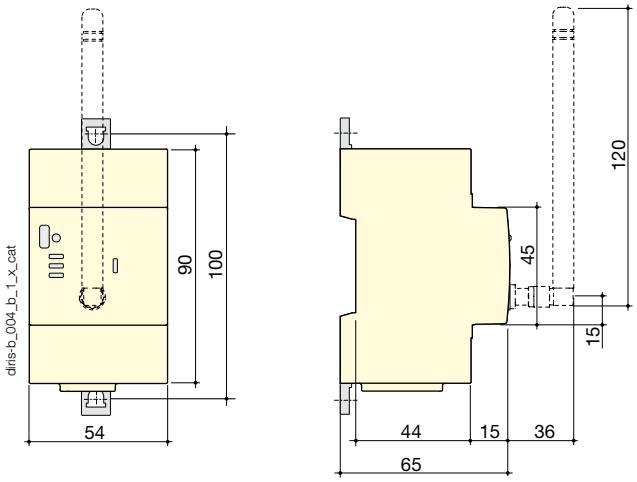



*1. Fuses 0.5 A gG / 0.5 A class CC.*
*In case of self-supply, a fuse must be added on the neutral.*

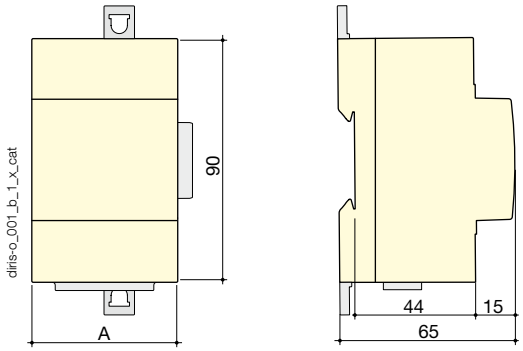
CT: Current sensors  3~ Load

## Dimensions (mm)

### DIRIS B-30




### DIRIS O optional modules

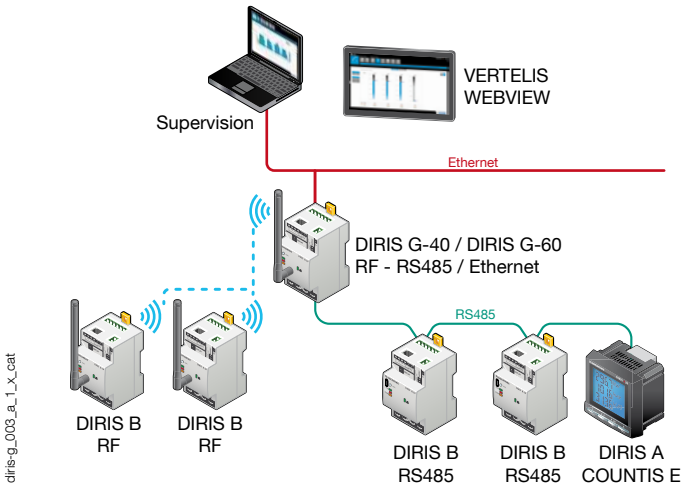



| DIRIS O optional modules | A |
|---|---|
| DIRIS O-iod - DIRIS O-ioa - DIRIS O-it | 45 mm |
| DIRIS O-m - DIRIS O-p - DIRIS O-b/ip - DIRIS O-b/mstp | 54 mm |

## Communication architecture

**Example of communication architecture with DIRIS G gateway and WEBVIEW embedded WEB server**

For more information about DIRIS G, see page 124.




## References

| DIRIS B-30 monitoring devices | | Reference |
|---|---|---|
| DIRIS B-30 | RS485 - Modbus - 230VAC | 4829 **0000** |
| DIRIS B-30 | RF - Modbus - 230 VAC | 4829 **0002** |

| DIRIS O optional modules | | Reference |
|---|---|---|
| DIRIS O-iod | 2 digital inputs / 2 digital outputs | 4829 **0030** |
| DIRIS O-ioa | 2 analogue inputs/2 analogue outputs 4-20 mA | 4829 **0031** |
| DIRIS O-it | 3 temperature inputs PT 100 / PT 1000 | 4829 **0032** |
| DIRIS O-m | RS485 Modbus communication | 4829 **0033** |
| DIRIS O-p | PROFIBUS communication | 4829 **0034** |
| DIRIS O-b/ip | BACnet IP communication | 4829 **0035** |
| DIRIS O-b/mstp | BACnet MSTP communication | 4829 **0036** |

| Accessories | Reference |
|---|---|
| DIRIS D-30 - Single-point display | 4829 **0200** |
| RJ9 cable for DIRIS D-30 display - 1.5 m | 4829 **0280** |
| RJ9 cable for DIRIS D-30 display - 3 m | 4829 **0281** |
| Wireless remote antenna, 868 MHz - 210 mm height | 4854 **0126** |
| Cable for remote antenna - SMA connector - 3 meter length | 4854 **0127** |
| DIRIS B-30 sealing cover for I/O terminals | 4829 **0049** |
| USB configuration cable | 4829 **0050** |

## DIRIS B-30 characteristics

### Electrical characteristics

| **Auxiliary power supply** | |
|---|---|
| AC voltage | 110-230VAC ±15 % (Ph/N ou Ph/Ph) Cat III |
| Frequency | 50/60 Hz |
| Consumption | < 2VA without display < 6VA with display |
| Connection | Removable spring-cage terminal, 2 x 2 positions, 0.5 … 2.5 mm² solid cable or 0.25 … 1.5 mm² stranded cable with ferrule |

### Measurement characteristics

| **Energy and power measurement** | |
|---|---|
| Accuracy<br>Active energy and active power | Class 0.2 DIRIS B-30 alone<br>Class 0.5 with TE or TF current sensors<br>Class 1 with TR current sensors |
| Reactive energy accuracy | Class 2 with TE, TR or TF current sensors |
| **Power factor measurement** | |
| Accuracy | Class 0.5 with TE or TF current sensors<br>Class 1 with TR current sensors |
| **Voltage measurement** | |
| Network characteristics measured | 50-300VAC (Ph/N) - 87-520VAC (Ph/Ph) - CAT III |
| Frequency range | 45 … 65Hz |
| 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<br>Secondary: 60, 100, 110, 173, 190 VAC |
| Input consumption | ≤ 0.1 VA |
| Permanent overload | 300VAC Ph/N |
| Voltage measurement accuracy | Class 0.2 |
| Connection | Removable spring-cage terminal,<br>2 x 6 positions, 0.5 … 2.5 mm² solid cable<br>or 0.25 … 1.5 mm² stranded cable with ferrule |
| **Current measurement** | |
| Number of current inputs | 4 |
| Associated current sensors | Solid TE , split-core TR , flexible TF current sensors |
| Accuracy | Class 0.2 DIRIS B-30 alone<br>Class 0.5 with TE or TF current sensors<br>Class 1 with TR current sensors |
| Connection | RJ12 connectors with specific SOCOMEC cable |

### Input characteristics

| | |
|---|---|
| Number | 2 |
| Type / Power supply | Optocoupler internal polarisation (12 VDC ± 10 %)<br>or external polarisation (10-30 VDC ± 10%) |
| Input function | Logic status, pulse meter or synchronisation pulse status (input 1) |

### Communication characteristics

| **DIRIS B-30 RS485** | |
|---|---|
| Link | RS485 |
| Connection type | 2 … 3 half duplex wires |
| Protocol | Modbus RTU |
| Speed | 1200 … 115200 bauds |
| USB | DIRIS B-30 RS485 configuration |
| **DIRIS B-30 RF** | |
| Link | Wireless radio frequency |
| Frequency band | 868 MHz (low frequency: 868.1 MHz and high frequency: 869.5875 MHz) |
| Speed | 38400 bauds |
| USB | DIRIS B-30 RF configuration |

### Environment characteristics

| | |
|---|---|
| Operating temperature | -10 … +70 °C |
| Storage temperature | -25 … +85 °C |
| Operating humidity | 55 °C / 97% relative humidity |
| Operating altitude | 2000 m |
| Vibration | 1G from 10 Hz to 100Hz |

## DIRIS D-30 display characteristics

| **Mechanical characteristics** | |
|---|---|
| Screen type | Capacitive touch-screen technology, 10 keys |
| Screen resolution | 350 x 160 pixels |
| **Single product connection** | |
| RJ9 | Self-supply and data |
| Micro-USB | Updating |
| Degree of protection | IP65 (front face) |
| **Electrical characteristics** | |
| Power supply | 24 VDC +10 % / -20 % |
| Consumption | 2 VA |
| **Environment** | |
| Storage temperature (°C) | -20/+55 |
| Operating temperature (°C) | -20/+55 |
| Humidity | 95 % to 40°C |
| Installation category | CAT III |
| Degree of pollution | 2 |

## DIRIS O optional modules characteristics

| **Power supply(1)** | |
|---|---|
| AC voltage | 110-230 VAC ±15 % |
| Frequency | 50/60 Hz |

*(1) No power supply on DIRIS O-it.*

| **DIRIS O-iod - 2 digital inputs/2 digital outputs** | |
|---|---|
| Number of inputs | 2 per optional modules - max. 4 optional modules |
| Type | Optocoupler internal polarisation (12 VDC ± 10 %)<br>or external polarisation (10-30 VDC ± 10%) |
| Function | Logic status or pulse meter |
| Number of outputs | 2 per optional modules - max. 4 optional modules |
| Type | Relay / 230VAC ±15 % - 1 A |
| Function | Configurable alarm (current, power,…) on threshold overruns or remote controlled status |
| Inputs/Outputs connection | Removable screw terminal, 4 positions,<br>0.14 to 1.5 mm² stranded or solid cable |
| **DIRIS O-ioa - 2 analogue inputs/2 analogue outputs** | |
| Number of inputs | 2 per optional modules - max. 4 optional modules |
| Type | 4-20 mA |
| Function | Connection of analogue sensors<br>(pressure, humidity, temperature…) |
| Number of outputs | 2 per optional modules - max. 4 optional modules |
| Type | 4-20 mA |
| Function | Transmission of measurement image (current, power…) to PLCs |
| **DIRIS O-it - 3 temperature inputs** | |
| Number of inputs | 3 external inputs + 1 measurement for ambient temperature |
| Dynamic | -20 °C to 150 °C |
| Type | PT100 or PT1000 |
| Function inputs 1, 2 and 3 | Temperature measurement |
| **DIRIS O-m - RS485 communication** | |
| Link | RS485 2 … 3 half duplex wires |
| Protocol | Modbus RTU |
| Speed | 1200 … 115200 bauds |
| Connection | Removable screw terminal, 3 positions,<br>0.14 to 1.5 mm² stranded or solid cable |
| **DIRIS O-p - PROFIBUS communication** | |
| Protocol | PROFIBUS DPV1 |
| **DIRIS O-b/ip - BACnet IP communication** | |
| Protocol | BACnet IP |
| Speed | 10 … 100 Mbit/s |
| **DIRIS O-b/mstp - BACnet MSTP communication** | |
| Protocol | BACnet MSTP |
| Speed | 9600 … 76800 bauds |