



DIRIS B-30

RS485 power monitoring devices

Measurement & wireless metering



DIRIS B-30
RS485

diris-b_009_a_1_cat

Function

The DIRIS B-30 is a power monitoring device in a modular format that communicates 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.

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 ANSI C12.20 and 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).

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 42.

Multi-circuit

- 4 current measurement inputs allow you to configure multiple circuits in order to optimize 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 centralization and communication of data via RS485 and Ethernet.
 - optional modules can be used to add digital, analog or temperature inputs/outputs.

(1) See page 37.

The solution for

- > Industry
- > Building
- > Infrastructure
- > Local authority



Strong points

- > Plug & Play
- > Accuracy class 0.2 ANSI C12.20
- > Multi-circuit
- > Communication

Conformity to standards

- > UL E257746
- > IEC 61557-12
- > EN 50160
- > ISO 14025



Selection guide

DIRIS B-30	
DIRIS B-30 RS	RS485 MODBUS communication
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

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, linv, 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)
 - Sags, interruptions, swells

Demand profiles 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 RS: RS485 Modbus,

Inputs

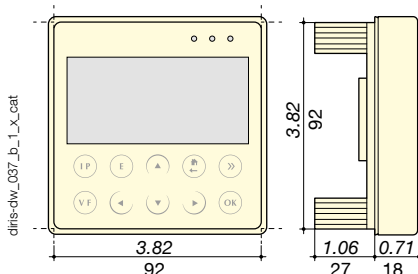
- 2 digital inputs
 - Supply by the DIRIS B-30 or external supply
 - Function: logic status, circuit breaker status, pulse meter or synchronization pulse

DIRIS B-30 display

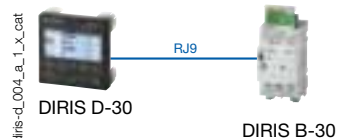
DIRIS D-30



Dimensions (in/mm)



Connection



Optional modules

DIRIS O



Optional module **DIRIS B-30**

Optional modules (4 max.)*

- Digital inputs/outputs
- Analogue inputs/outputs
- Temperature inputs

* maximum 4 optional modules with maximum 1 temperature module.



DIRIS O-iod

- 2 digital inputs centralizes 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-it

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



DIRIS O-ioa

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

Accessories

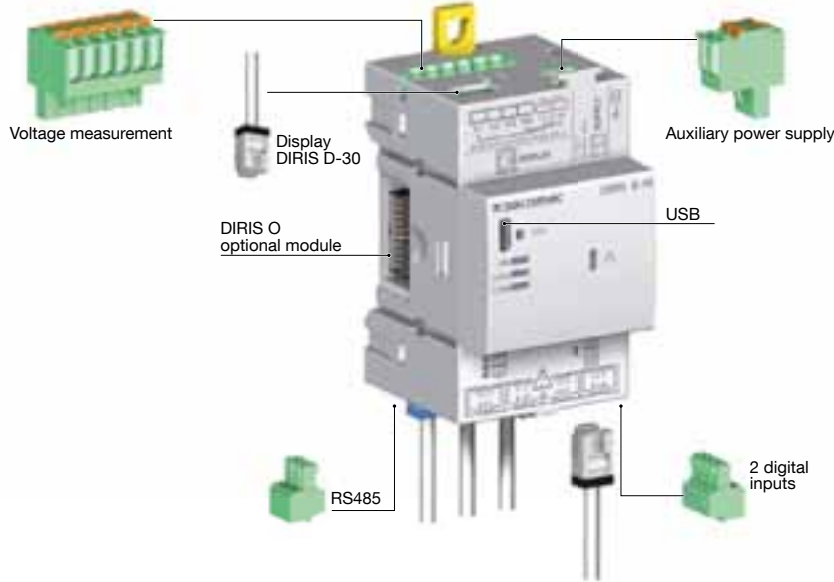
DIRIS B-30 sealing cover

- Prevents access to the cabling of the monitoring device.

USB configuration cable (6.5 feet/2 m)

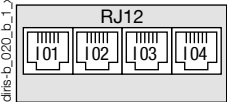
- Advanced configuration of DIRIS B-30 gateways can be achieved using the EASY CONFIG software via Ethernet or direct USB connection.

DIRIS B-30 terminals

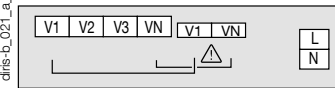


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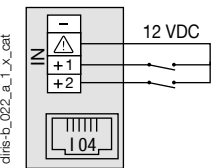
Current measurement



Voltage measurement and auxiliary power supply



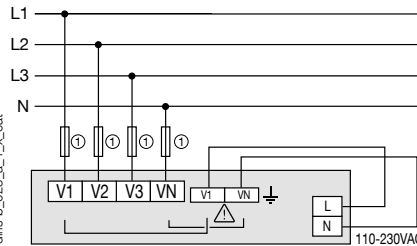
2 inputs supplied by the product



dfiris-o_022_a_1_x_cat

Self supply

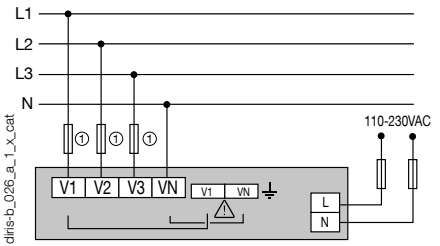
Easy connection of the power supply from the measurement terminal (specific terminals)



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

dfiris-b_025_a_1_x_cat

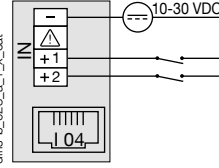
Separate power supply



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

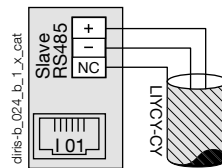
dfiris-b_026_a_1_x_cat

2 inputs with external power supply



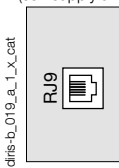
dfiris-b_023_a_1_x_cat

RS485



dfiris-b_024_b_1_x_cat

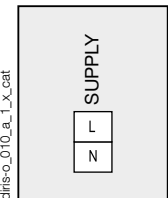
RJ9 for DIRIS D-30 (self-supply and data)



dfiris-b_019_a_1_x_cat

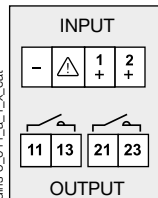
Terminals of optional DIRIS O modules

Optional module power supply



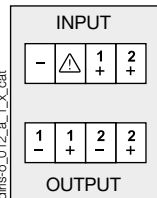
dfiris-o_010_a_1_x_cat

DIRIS O-iod



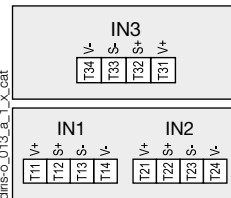
dfiris-o_011_a_1_x_cat

DIRIS O-ioa



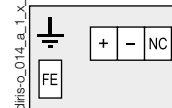
dfiris-o_012_a_1_x_cat

DIRIS O-it



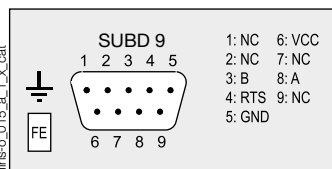
dfiris-o_013_a_1_x_cat

DIRIS O-m RS485



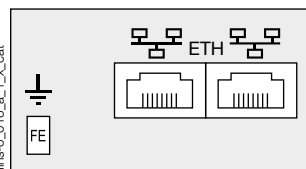
dfiris-o_014_a_1_x_cat

DIRIS O-p



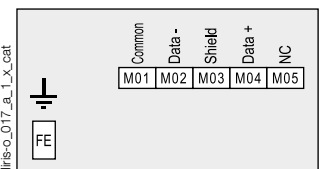
dfiris-o_015_a_1_x_cat

DIRIS O-b/ip



dfiris-o_016_a_1_x_cat

DIRIS O-b/mstp



dfiris-o_017_a_1_x_cat

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 recognizes the sensor size and type. This guarantees the overall accuracy of the DIRIS B-30 + current sensor measurement chain.
For more information: see page 42.

TE solid current sensors



TR Split-core current sensors



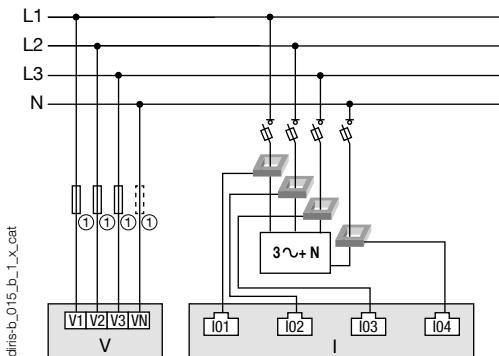
TF Flexible current sensors



Network and connection examples

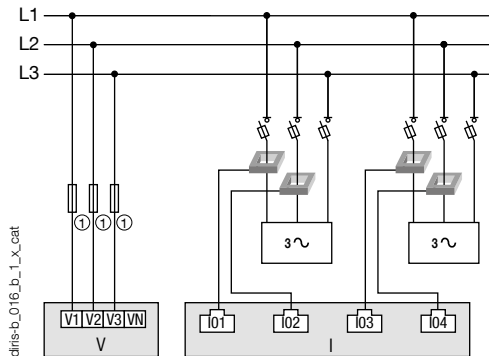
Three phase + neutral

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



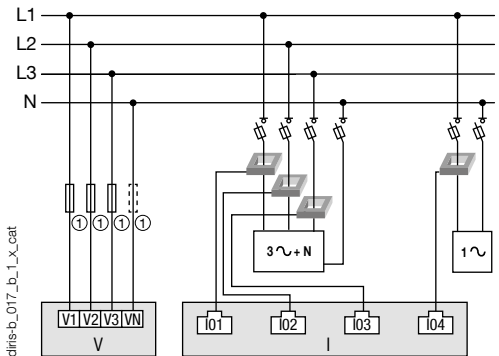
Three-phase

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



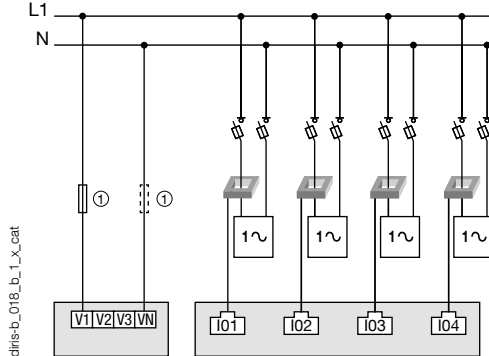
Three-phase

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.

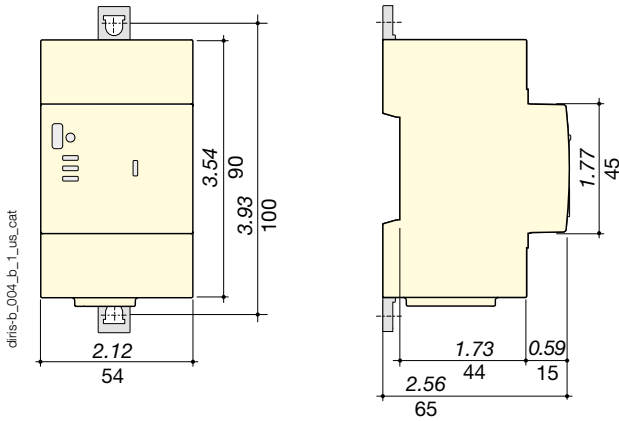
CT: Current sensors Load

DIRIS B-30

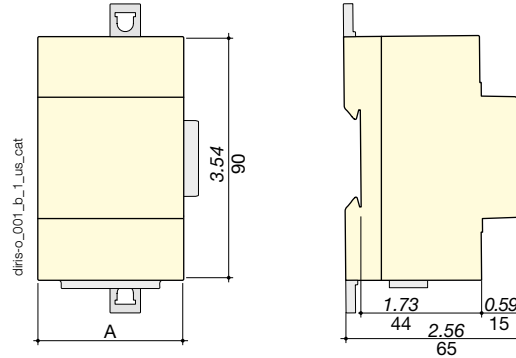
RS485 power monitoring devices

Dimensions (in/mm)

DIRIS B-30



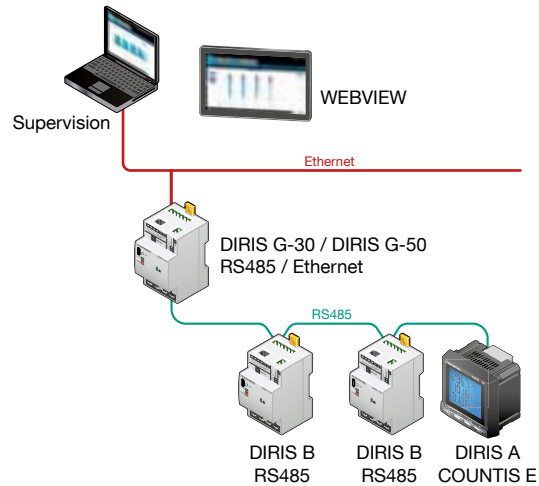
DIRIS O optional modules



DIRIS O optional modules	A
DIRIS O-iod - DIRIS O-iaa - DIRIS O-it	45 mm

Communication architecture

Example of communication architecture with DIRIS G gateway and WEBVIEW embedded WEB server
For more information about DIRIS G, see page 120.



References

DIRIS B-30 monitoring devices		Reference
DIRIS B-30	RS485 - Modbus - 230VAC	4829 0000
DIRIS O optional modules		Reference
DIRIS O-iod	2 digital inputs / 2 digital outputs	4829 0030
DIRIS O-iaa	2 analogue inputs/2 analogue outputs 4-20 mA	4829 0031
DIRIS O-it	3 temperature inputs PT 100 / PT 1000	4829 0032
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
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, AWG 10 ... 24 / 0.5 ... 2.5 mm ² solid cable or AWG 15 ... 30 / 0.25 ... 1.5 mm ² stranded cable with ferrule

Measurement characteristics

Energy and power measurement	
Accuracy	Class 0.2 DIRIS B-30 alone
Active energy and active power	Class 0.5 with TE or TF current sensors 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 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 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, 2 x 6 positions, AWG 10 ... 24 / 0.5 ... 2.5 mm ² solid cable or AWG 15 ... 30 / 0.25 ... 1.5 mm ² 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 Class 0.5 with TE or TF current sensors Class 1 with TR current sensors
Connection	RJ12 connectors with specific SOCOMEC cable

Input characteristics

Number	2
Type / Power supply	Optocoupler internal polarization (12 VDC ± 10 %) or external polarization (10-30 VDC ± 10%)
Input function	Logic status, pulse meter or synchronization 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

Environment characteristics

Operating temperature	-10 ... +70 °C / +14 °F ... +158 °F
Storage temperature	-25 ... +85 °C / -13 °F ... +185 °F
Operating humidity	55 °C / 131 °F / 97% relative humidity
Operating altitude	6560 feet / 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)
Environment	
Storage temperature (°C)	-20 ... +70°C / -4 °F ... +158 °F
Operating temperature (°C)	-20 ... +70°C / -4 °F ... +158 °F
Humidity	95 % to 40°C / 104 °F
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 polarization (12 VDC ± 10 %) or external polarization (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, AWG 15 ... 35 / 0.14 to 1.5 mm ² 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 (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 / -4 °F ... 302 °F
Type	PT100 or PT1000
Function inputs 1, 2 and 3	Temperature measurement