Multi-circuit metering & measurement

DIRIS Digiware

Measurement and monitoring system for electrical installations

new

DIRIS Digiware D-50

DIRIS Digiware U-30

DIRIS Digiware I-35

The solution for

- Industry
- Building
- Infrastructure
- Local authority

Strong points

- Multi-circuit
- Global accuracy class 0.5 in accordance with IEC 61557-12
- Cost effective and flexible
- Plug & Play

Conformity to standards

- IEC 61557-12

Function

The **DIRIS Digiware** system is a hub of technological innovations that revolutionises the world of measurements, bringing a high degree of flexibility to installations and making connection and configuration easy.

These innovations, together with unrivaled performance in terms of accuracy and functionality, make DIRIS Digiware the most effective solution for metering consumption, measuring and monitoring the quality of electrical energy in industrial and commercial applications.

- Management and optimisation of the power installed: DIRIS Digiware allows you to identify most demanding loads and monitor abnormal electrical values, providing you with a perfectly-managed electrical network.
- Simplified network maintenance: the electrical energy quality monitoring functions offered by DIRIS Digiware make it easier to anticipate electrical malfunctions.

Advantages

Multi-circuit

Can monitor several circuits via a single current measurement module thanks to independent current inputs.

Accuracy as per standard IEC 61557-12

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

Cost effective and flexible

- Implementation in a quarter of the time vs existing technologies.
- Installation of modules and sensors at the closest point to the load.
- Mutualised functions:
  - Centralised display.
  - A single voltage measurement for the entire system.
  - Auxiliary power supply.
- Compact design: suitable for new, existing or installations with space restrictions.
- Large range of current sensors.

Plug & Play

- RJ12 current sensor connection
  - Automatic detection of ratings.
  - Identification of cables by color-coding.
  - Disconnection of the current sensor secondary under load.
- RJ45 interconnection of I and U modules via Digiware bus.
- Auto-configuration of parameters: Network and load type - addressing of devices connected to the bus.

socomec Innovative Power Solutions

DIRIS Digiware System

- 1 display
- 1 voltage measurement module
- current measurement modules
- current sensors

diris-dw_011_a_cat

Control and power supply interface (24 VDC)

DIRIS Digiware D-50

- High-resolution LCD display
- Centralisation of measurement points:
  - circuit selection,
  - data display.
- Keys on the front face for direct access to:
  - measurement data,
  - circuits selection,
  - device configuration.
- 24 VDC power supply
- Communication
  - Digiware Bus,
  - RS485 Modbus,
  - Ethernet (Modbus TCP).

DIRIS Digiware C-31

- No-display mode
- Centralisation of DIRIS Digiware measurement data on RS485 Modbus
- 24 VDC power supply
- Communication
  - Digiware Bus,
  - RS485 Modbus.

+

Voltage measurement module

DIRIS Digiware U-xx

U-10
- U12, U23, U31, V1, V2, V3, F

U-20
- U12, U23, U31, V1, V2, V3, F
- THDu12, THDu23, THDu31

U-30
- U12, U23, U31, V1, V2, V3, F
- Vn, U system, V system
- Ph/N unbalance (Vnb, Vnba, Vdir, Vinv, Vhom,)
- Ph/Ph unbalance (Unb, Unba, Udir, Uinv)
- THDu12, THDu23, THDu31
- Individual harmonics U & V (up to rank 63)
- Voltage dips, cut-offs and surges (EN50160)
- Alarms
- History of average values

+

Current measurement modules

DIRIS Digiware I-3x
3 inputs

DIRIS Digiware I-4x
4 inputs

DIRIS Digiware I-6x
6 inputs

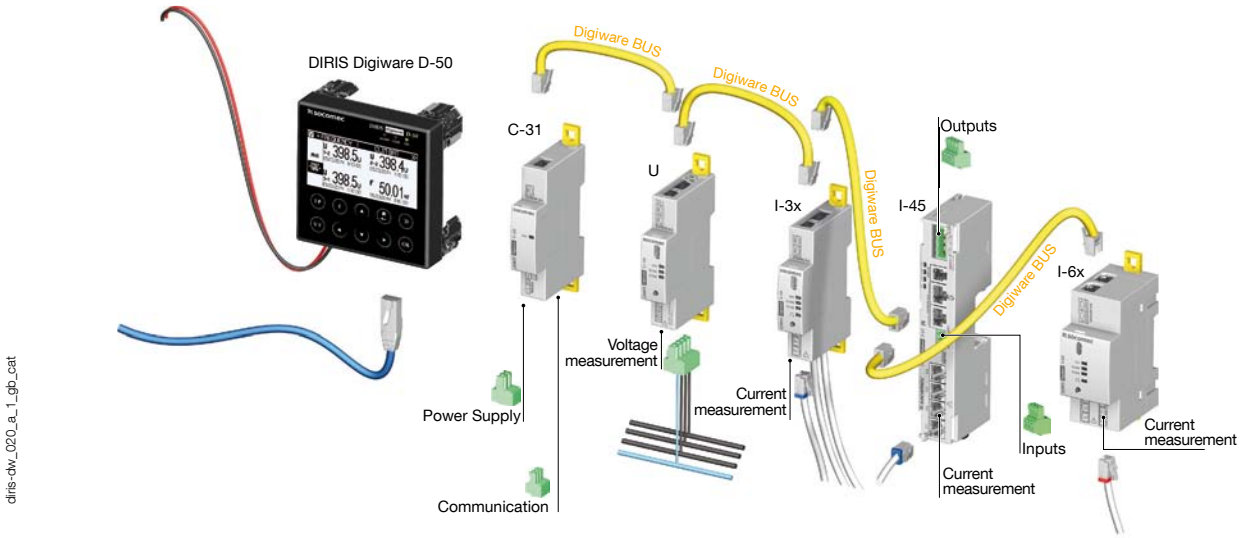
I-30 / I-60
- +/- kWh, +/- kvarh, kVAh
I1, I2, I3, In, ΣP, ΣQ, ΣS, ΣPF

I-31 / I-61
- +/- kWh, +/- kvarh, kVAh
- Load curves
- I1, I2, I3, In, ΣP, ΣQ, ΣS, ΣPF

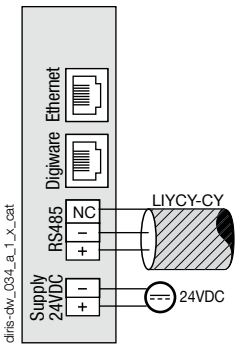
I-33
- +/- kWh, +/- kvarh, kVAh
I1, I2, I3, In, ΣP, ΣQ, ΣS, ΣPF
- P, Q, S, PF per phase
THDi1, THDi2, THDi3, THDin

I-35 / I-45
- +/- kWh, +/- kvarh, kVAh
- Load curves
- I1, I2, I3, In, ΣP, ΣQ, ΣS, ΣPF
- P, Q, S, PF per phase
- Predictive power (ΣQ, ΣS, ΣPF)
- I System
- Current unbalance (Inba, Idir, Iinv, Ihom, Inb)
- Phi, cos Phi, tan Phi
- THDi1, THDi2, THDi3, THDin
- Individual harmonics I (up to rank 63)
- Overcurrents
- Alarms
- 2 inputs / 2 outputs (I-45)
- History of average values

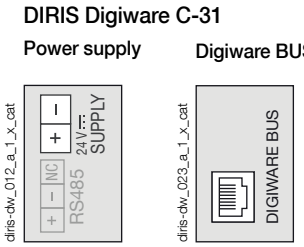
Terminals

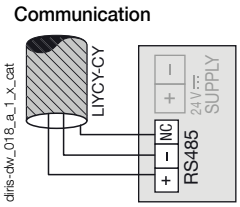


DIRIS Digiware D-50

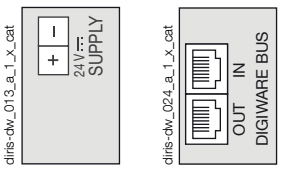


DIRIS Digiware C-31

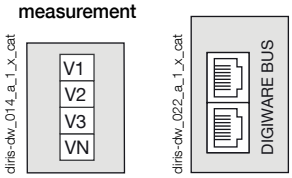




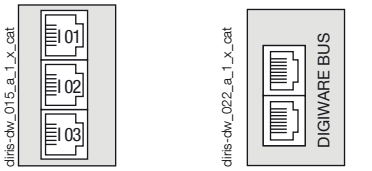
DIRIS Digiware C-32



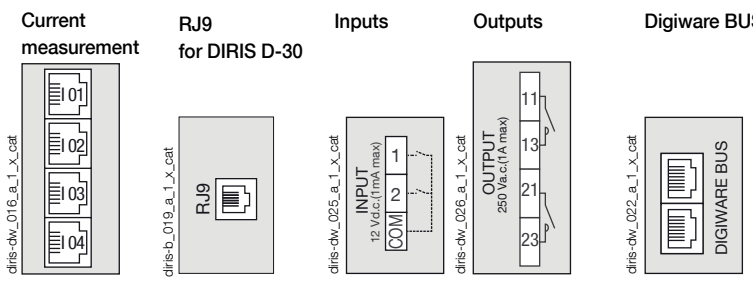
DIRIS Digiware U



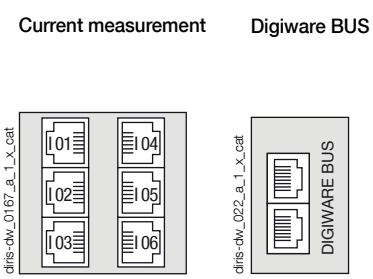
DIRIS Digiware I-3x



DIRIS Digiware I-45



DIRIS Digiware I-6x



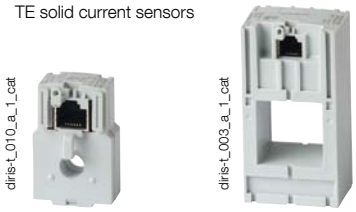
Connections

Associated current sensors

Various types of current sensors can be connected to the DIRIS Digiware: current sensors can be either closed (TE), split-core (TR) or flexible (TF). 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 recognises the sensor size and type. This guarantees the overall accuracy of the DIRIS B30 + current sensor measurement chain.

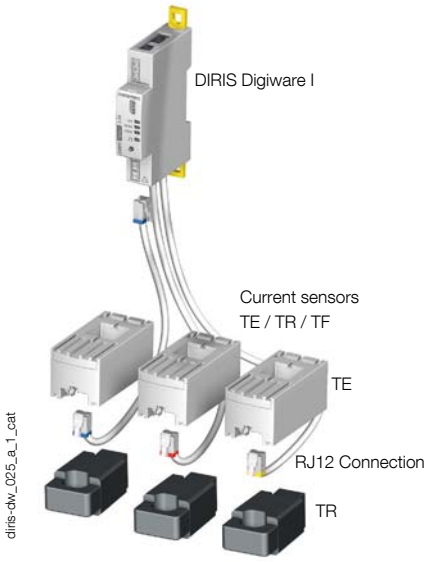
For more information: see page 16.

TE solid current sensors



TR Split-core current sensors

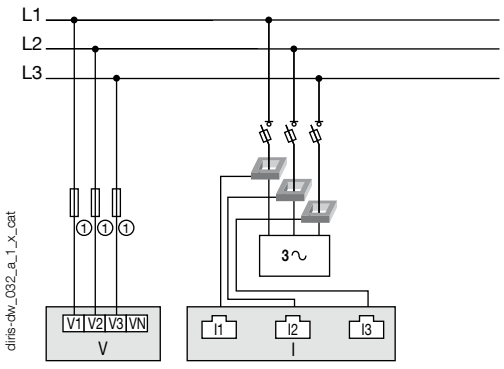
TF Flexible current sensors



Network and connection examples

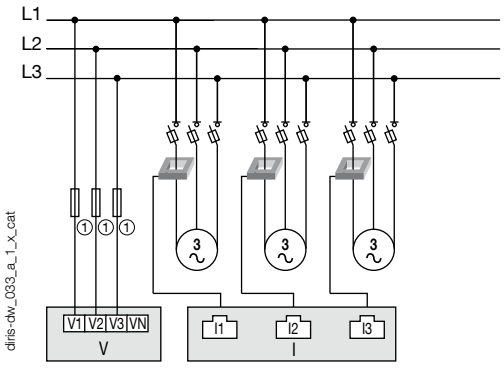
Three-phase

3P - 3CT (1 three-phase load)



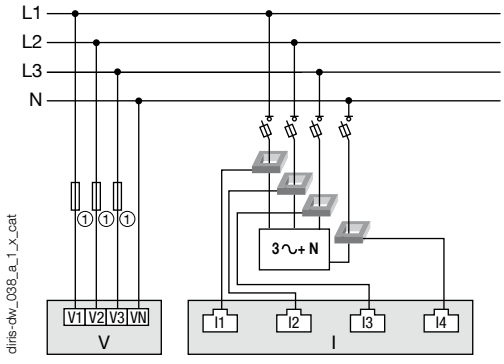
Three-phase

3P - 1CT (3 three-phase balanced loads)



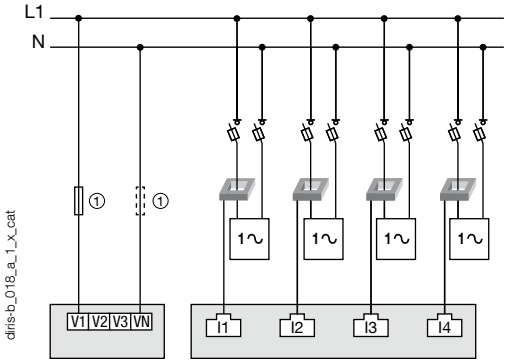
Three phase + neutral

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



Single-phase

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

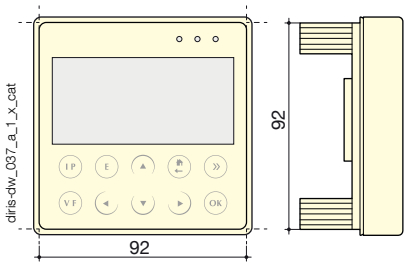


1. Fuses 0.5 A gG / 0.5 A class CC.

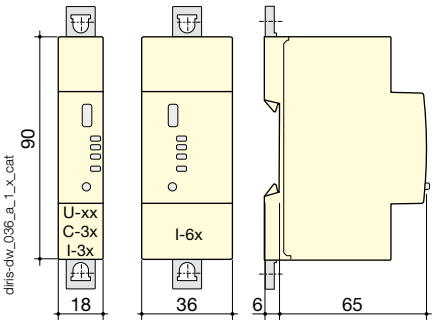
CT: Current transformer Load

Dimensions

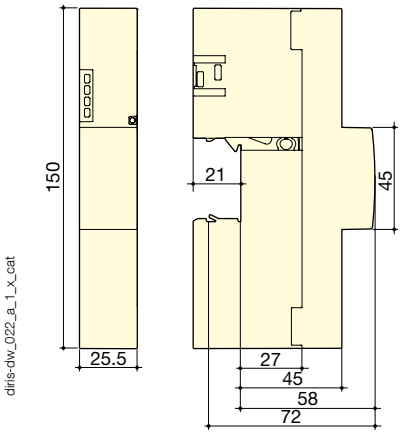
DIRIS Digiware D-50



DIRIS Digiware U / C / I-3x / I-6x



DIRIS Digiware I-45

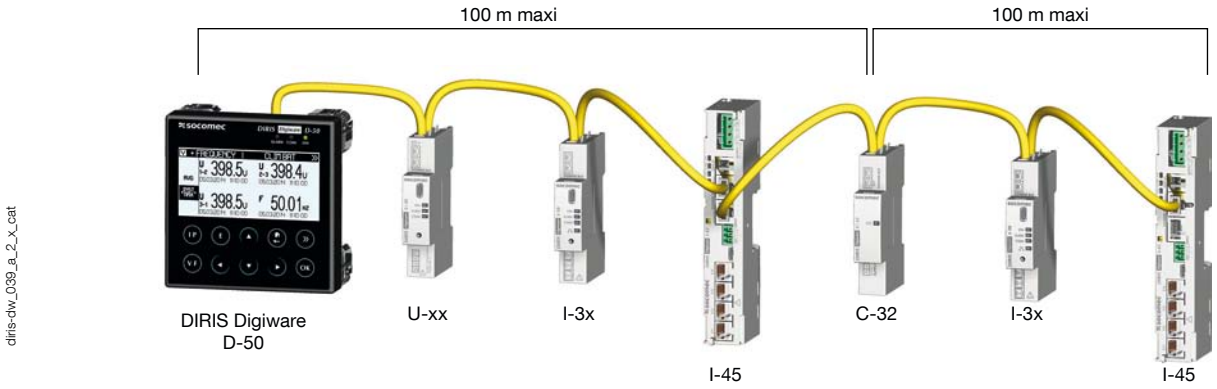


Configuration

DIRIS Digiware C-32 repeater

A Digiware bus can be limited by the power supply or by a distance over 100m (for example: > 32 DIRIS Digiware I-3x or > 16 DIRIS Digiware I-45). To extend the operating conditions, two DIRIS Digiware C32 repeaters can be used.

Example of configuration



Power consumption of devices

Components	Power supplied (W)	Power consumption (W)
Transformer		
P15 230V/24V	15	
Cables		
50 metre package		1.5
System interface		
DIRIS Digiware C-31		0.8
DIRIS Digiware C-32		1.5
Display		
DIRIS Digiware D-50		2
Voltages modules		
DIRIS Digiware U-xx		0.72
Currents modules		
DIRIS Digiware I-3x		0.52
DIRIS Digiware I-45		1.125
DIRIS Digiware I-6x		0.7

Example:

A P15 230V/24 transformer can be used:

- with 1 DIRIS Digiware D-50 display, 1 U-10 / U-30 voltage measurement module and a 50 meter cable

and

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

or

- 8 DIRIS Digiware I-45 modules

A P15 230V/24 transformateur can also be used:

- without DIRIS Digiware D-50 display, 1 C-31 system interface, U-10 / U-30 voltage measurement module and a 50 meter cable

and

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

or

- 9 DIRIS Digiware I-45 modules

Technical characteristics

Electrical characteristics

Power supply - DIRIS Digiware C	
Input voltage	24 VDC ± 20 %
Energy measurement	
Active energy accuracy	Class 0.2 DIRIS B only - range 10 % … 120% In Class 0.5 with TE or TF - range 2 % … 120% In Class 1 with TR - range 2 % … 120% In
reactive energy accuracy	Class 2 with TE, TR or TF - range 5 % … 120% In
Power measurement	
Active power accuracy	Class 0.2 DIRIS Digiware alone - range 10 % … 120% In Class 0.5 with TE or TF - range 2 % … 120% In Class 1 with TR - range 2 % … 120% In
Power factor measurement	
Accuracy	Class 0.5 with TE or TF - 0.5 inductive to 0.8 capacitive Class 1 with TR - 0.5 inductive to 0.8 capacitive
Voltage measurement - DIRIS Digiware U	
Network characteristics measured	50-300VAC (Ph/N) - 87-520VAC (Ph/Ph) - CAT III
Frequency range	45…65Hz
Network type	Single-phase / Two-phase / Two-phase with neutral / Three-phase / Three-phase with neutral
VT primary / secondary	400 000 VAC / 60, 100, 110, 173, 190 VAC
Input consumption	≤ 0.1 VA
Permanent overload	300 VAC Ph/N
Voltage measurement accuracy	Class 0.2
Frequency	
Range	45 … 65 Hz
Accuracy	Class 0.02
Current measurement - DIRIS Digiware I	
Number of current inputs	I-3x: 3 / I-45: 4 / I-6x: 6
Associated current sensors	Solid TE , split-core TR , flexible TF current sensors
Current measurement accuracy	Class 0.2 DIRIS Digiware only - range 5 % … 120% In Class 0.5 with TE or TF - range 10 % … 120% In Class 1 with TR - range 10 % … 120% In
Connection	RJ12 connector and specific cable
Inputs - DIRIS Digiware I-45	
Number of inputs	2
Type / Power supply	Optocoupler with internal polarisation (12VDC)
Input functions	Logic status or pulse meter
Outputs - DIRIS Digiware I-45	
Number of outputs	2
Relay type	230 V ±15 % - 1 A
Function	Configurable alarm (current, power,…) on threshold overruns or remote controlled status

Communication characteristics

Digiware BUS	
Function	Connection between DIRIS Digiware modules
Type of cable	RJ45 connector with specific SOCOMEC cable
RS485	
Connection type	2 … 3 half duplex wires
Protocol	Modbus RTU
Speed	1200 … 115200 bauds
Function	Configuration and data reading-out
Location	Single-point on DIRIS Digiware C
USB	
Protocol	Modbus RTU over USB
Function	Configuration of DIRIS Digiware U and I modules
Location	On each DIRIS Digiware U and I measuring module
Connection	via B-type micro USB connector

Mechanical characteristics

Types of casing	Modular for DIN-rail or back plate mounting
Casing degree of protection	IP20 / IK06
Front face degree of protection	IP40 (panel face with modular mounting) / IK06

Environment characteristics

Operating temperature	-10 … +70 °C
Storage temperature	-25 … +70 °C
Operating humidity	55 °C / 97% relative humidity
Operating altitude	2000 m

DIRIS Digiware D-50 characteristics

Mechanical characteristics	
10 buttons	Capacitive touch-screen technology
Screen resolution	350 x 160 pixels
Front face degree of protection	IP52
Communication	
Ethernet RJ45 10/100 Mbs	Modbus TCP gateway function
RJ45 Digiware	max 32 devices
RS485 2-3 wires	max 32 devices
USB	Diagnosis via B-type micro USB connector
Electrical characteristics	
Power supply	24 VDC +10% / -20%
Consumption	2 VA
Environment characteristics	
Storage temperature	-20 … +70 °C
Operating temperature	-10 … +55 °C
Humidity	95 % to 40°C
Installation category - degree of pollution	CAT III, 2

References

DIRIS D		**Reference**
D-30	Single-point display	4829 **0200**
Digiware D-50	Multi-point display	4829 **0201**
DIRIS Digiware C		**Reference**
C-31	System interface	4829 **0101**
C-32	Repeater(1)	4829 **0103**
DIRIS Digiware U		**Reference**
U-10	Metering	4829 **0105**
U-20	Monitoring	4829 **0106**
U-30	Analysis	4829 **0102**

(1) Used for DIRIS Digiware bus length > 100 m or for more devices, example: > 32 DIRIS Digiware I-3x or > 16 DIRIS Digiware I-45.

DIRIS Digiware I		**Reference**
I-30	Metering - 3 current inputs	4829 **0110**
I-31	Metering + load curve - 3 current inputs	4829 **0111**
I-33	Monitoring - 3 current inputs	4829 **0128**
I-35	Analysis - 3 current inputs	4829 **0130**
I-45	Analysis 2 inputs / 2 outputs - 4 current inputs	4829 **0131**
I-60	Metering - 6 current inputs	4829 **0112**
I-61	Metering + load curve - 6 current inputs	4829 **0113**
Power supply		**Reference**
P15	Transformer 230V/24V 15W	4829 **0120**
Digiware connection cables		**Reference**
RJ45	0.10 m length	4829 **0181**
RJ45	0.50 m length	4829 **0182**
RJ45	1 m length	4829 **0183**
RJ45	2 m length	4829 **0184**
RJ45 termination resistor		4829 **0180**
USB configuration cable		4829 **0050**