

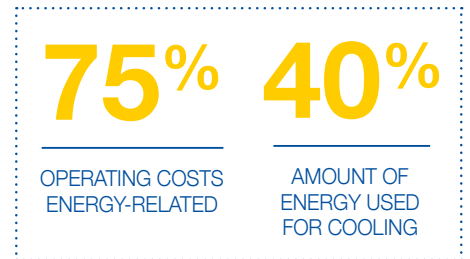
# Master the monitoring of your data centre to reduce operational costs



When **energy** matters

# Why should you implement power monitoring within your data centre?

Improving the energy efficiency of your data centre allows you to get an accurate understanding of how much energy is entering through the mains of the facility and how much is being consumed by the various equipments. Energy metering can be implemented to give the breakdown of consumptions throughout a data centre which will help identify where savings can be made in order to reduce monthly utility bills for the data centre.



## PUE, a key performance indicator

The PUE is defined in EN 50600-4-2: Data processing centre facilities and infrastructure, part 4-2: Power Usage Effectiveness.

The PUE represents the ratio between the total energy consumed by the data centre and the energy needed for IT equipment.

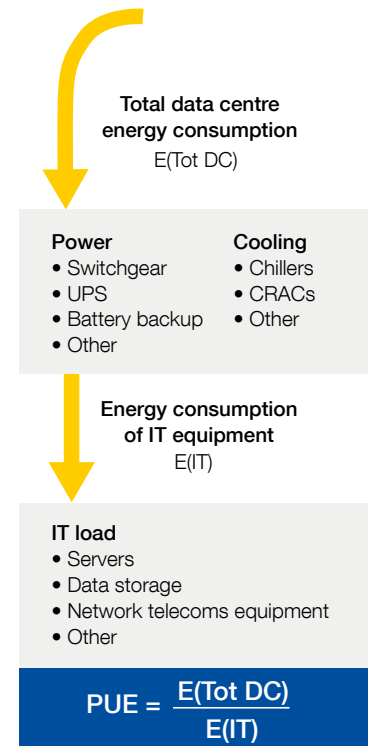
To accurately assess the actual performance of a data centre, the consumption monitoring device for the IT servers must be positioned as close as possible to the installed equipment.

The PUE **identifies areas for improvement** specific to processes, design, and operational efficiency.

A target value will be set for the design of new data centres and used as a target for **energy management**.

In 2020, the average PUE for all data centres is 1.6. The design of the latest generation of data centres can achieve values of less than 1.4.

## How is the PUE calculated?



### Collect information

Power sources, electrical distribution, consumption of IT servers



### Monitor the installation

- Ensuring the best power quality for IT equipment
- Power Monitoring across the electrical installation
- Analysis and correlation with other parameters

# What are your biggest challenges?



## Power availability

Real-time monitoring with Power Quality Meters will guarantee power continuity and protect critical assets.



## Embedded web server

Power monitoring systems will align your usage with your needs – saving energy and reducing costs.



## Capacity management

Permanent power monitoring systems provide visibility in real time – for upgrades and additions without changing your power distribution architecture.



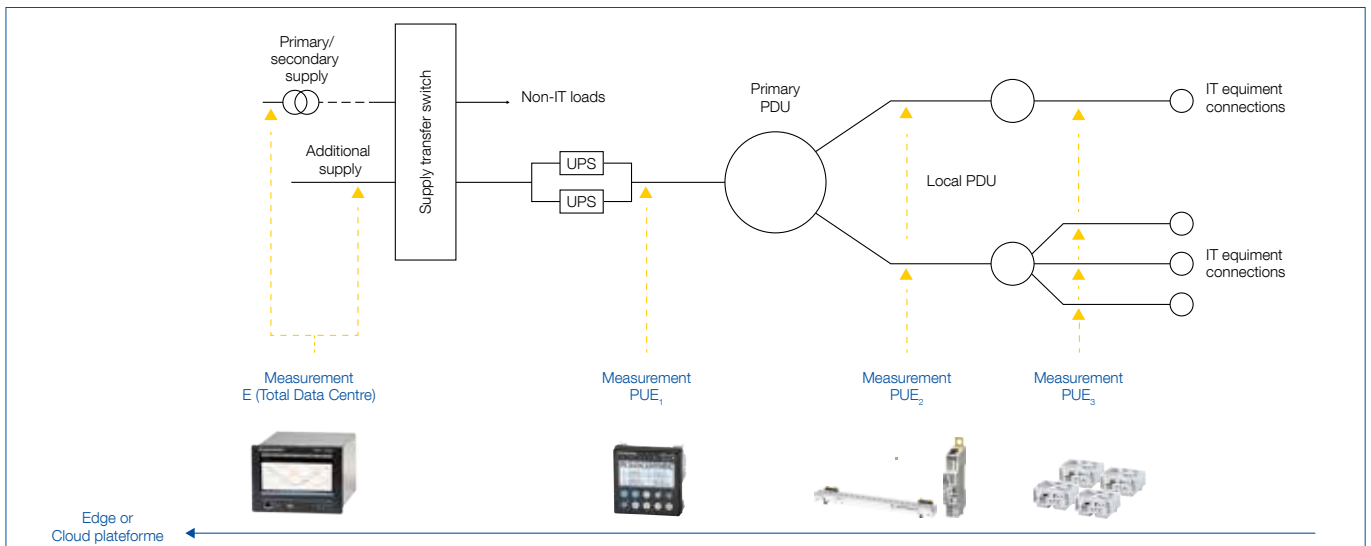
## Tailored billing

Tracks the power usage of individual tenants down to rack level for accurate and fairly billing.



## Sustainability

By reducing carbon footprint, you are assured of minimising your environmental impact and building a reputation for sustainability.



## PUE categories according to EN 50600-4-2

### Category 1 (PUE1)

Basic level of resolution of energy performance data.

### Category 2 (PUE2)

Intermediate level of resolution of energy performance data.

### Category 3 (PUE3)

Advanced level of resolution of energy performance data.



## Analyse

Identify equipment that drives up energy consumptions, losses, power capacity



## Improve performances

Keep monitoring continuously to quantify savings due to equipment upgrade, etc.

# Ensuring the best power quality for your data centre

Service continuity is the most important challenge for data centres. To achieve this, the reliability, quality and maintainability of the power supply are key factors. The mains must be continuously monitored in order to detect deviations or abnormal events and make well-informed decisions about which corrective action to pursue. This will help prevent premature aging of the electrical installation or equipment, optimise costs and avoid data losses.

## Why every data centre needs Power Quality Meters (PQM)

### 1 To evaluate responsibilities in case of power quality events

Most utilities must comply with EN50160 to guarantee the best service to their customers. The standard sets minimum power quality levels to follow which means that PQM able to create EN50160 reports can be used as a proof to the utility if they failed to fulfil power quality obligations (e.g harmonic levels too high, too many dips or swells etc.).

### 2 To make sure it is safe IT equipment to use UPSs in offline mode

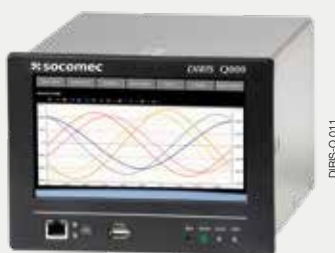
For energy efficiency and cost reasons, many data centres are using offline UPSs. Offline UPSs do not isolate the loads from the supply voltage, which means upstream pollution could damage and shorten the lifespan of IT equipment.

### 3 To monitor the quality of renewable energy production equipment

Many data centres, setting green energy goals are now powering most of their facility with renewable energy. But renewable power generation can have negative effects on the distribution network particularly causing voltage variations, frequency fluctuations, and even harmonics pollution.

## DIRIS Q800

The next generation network analyser. Even greater precision, even simpler to use.



Generally installed at the LV switchgear level, the DIRIS Q800 is a high-end PQM continuously monitoring the quality of the incoming supply. All power quality measurements and events such as dips, swells, interruptions, harmonics, transients, frequency variations and voltage changes are reported, time stamped, and archived in the device's memory. If an equipment is suddenly damaged, it can be correlated to an event on the electrical network.



High level of accuracy

Accuracy of class A for voltage and current and class 0,2S for energy.

- Certified according to IEC 61000-4 30:2015 Ed. 3 and designed and tested according to IEC 62586-1 and IEC 62586-2.
- Certified according to IEC 62053 22.



Real-time alarms

The DIRIS Q800 is equipped with an alarm system to monitor the status and activity of your equipment and thus reduce the risk of downtime.

Receipt of e-mail linked to:

- voltage and current events,
- functionality events,
- configuration changes.

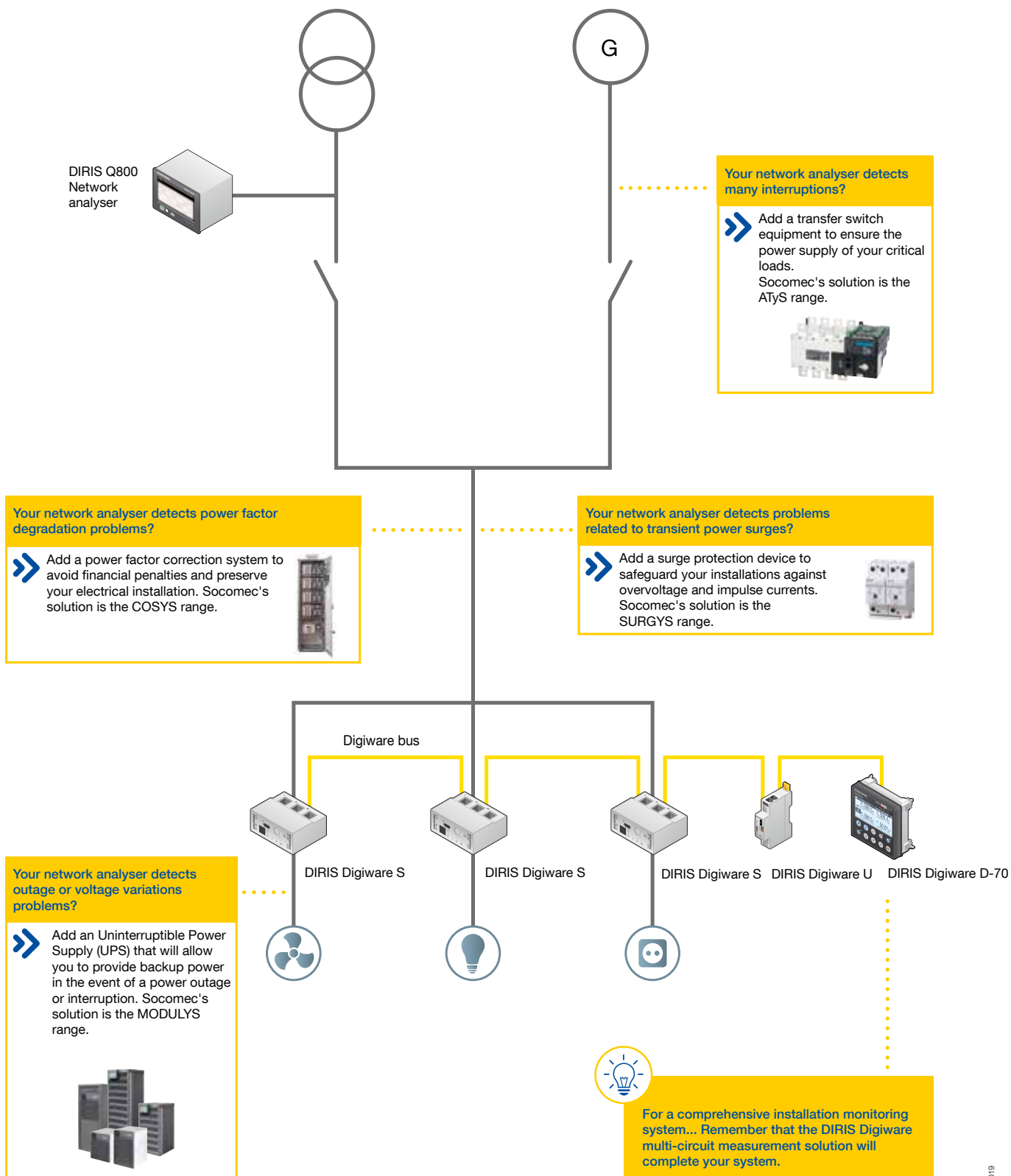


Embedded web server

Directly integrated and identical to the DIRIS Q800 screen, the web server will enable you to analyse the quality of your network in real-time from an Internet browser.

- Display waveforms.
- View the curves of recorded events.
- View measurements in real-time.
- Configure your product.

# Follow the advice of your network analyser...

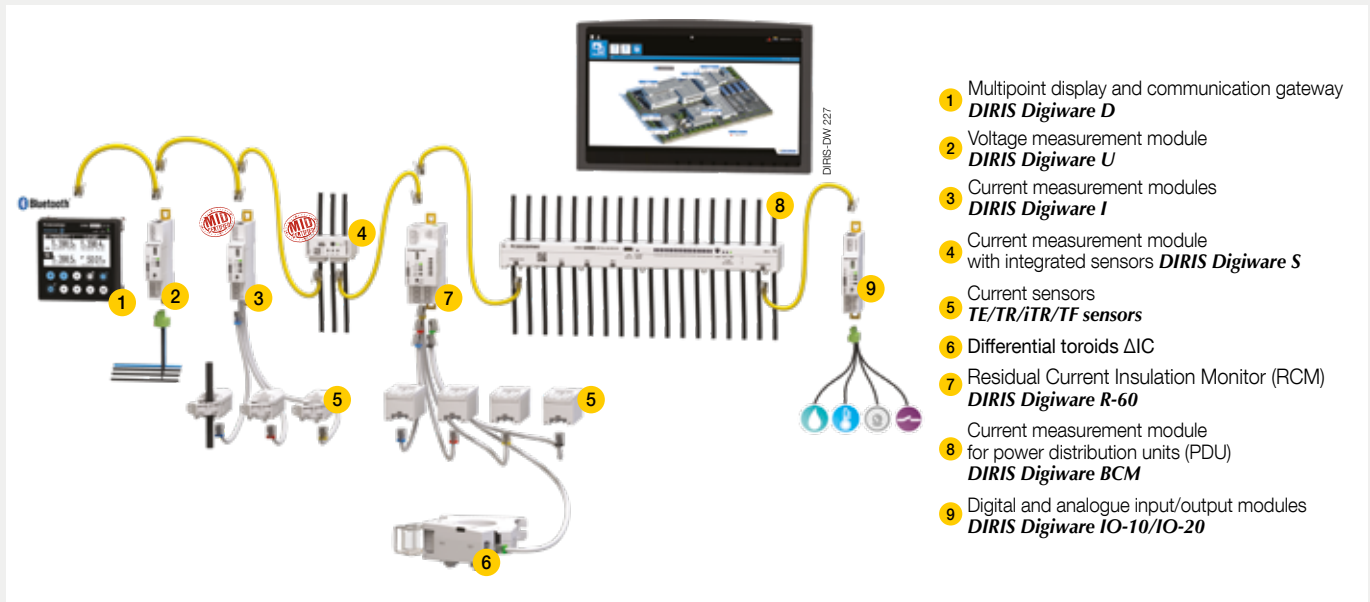


DIRIS-C-019

# DIRIS Digiware

Elevating power monitoring to a new level. Infinite scalability. Unique versatility. Unrivaled intelligence.

In addition to Power Quality Metering at the incoming level, DIRIS Digiware is a great fit throughout the distribution, from low-voltage switchboards to PDUs, RPPs and tap-off units.



- 1 Multipoint display and communication gateway **DIRIS Digiware D**
- 2 Voltage measurement module **DIRIS Digiware U**
- 3 Current measurement modules **DIRIS Digiware I**
- 4 Current measurement module with integrated sensors **DIRIS Digiware S**
- 5 Current sensors **TE/TR/iTR/TF sensors**
- 6 Differential toroids  $\Delta$ IC
- 7 Residual Current Insulation Monitor (RCM) **DIRIS Digiware R-60**
- 8 Current measurement module for power distribution units (PDU) **DIRIS Digiware BCM**
- 9 Digital and analogue input/output modules **DIRIS Digiware IO-10/IO-20**



Easy

Trouble-free integration into any existing DCIM or BMS software via multiple communication protocols.



Reactive

Real time alarms via email to alert the facility's management teams and prevent problems on any circuit before they occur.



Secure

Data communication via secured protocols (FTPS, SNMPv3).



Versatile

One unique system simplifying purchasing, integration/commissioning and maintenance. Also suitable for existing systems thanks to our wide range of sensors.



Flexible

Minimised wiring and set-up time in case of expansion of your data centre.



Energy cost allocation

The first MID system offering a multi-circuit, scalable approach for tailored sub billing at all levels.

## For DC data centres

DIRIS Digiware is also available for DC power monitoring. DIRIS Digiware DC offers a compact and powerful solution to track power usage of main and individual circuits:

- for any current rating,
- for a large number of circuits,
- for new or existing panels using solidcore or split-core current sensors.

Thanks to DIRIS Digiware voltage adaptors, the system is suitable for both legacy data centres (48 VDC) and more recent data centres operated at higher voltages (380 VDC, etc.).



SITE 666



SITE 1019

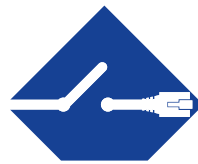
# Groundbreaking technologies for greater simplicity and performance\*



## PreciSense

Be guaranteed of the accuracy  
of your measurements

- For the global measurement chain.
- For reliable measurements.
- For relevant corrective actions.



## VirtualMonitor

Access the monitoring  
of your protective devices

- On your entire electrical installation.
- Remotely and in real-time.
- Without additional hardware or wiring.



## AutoCorrect

Be guaranteed your measurement  
system is working correctly

- Automatic wiring control.
- Correction of errors.
- Feature available off-load.

VirtualMonitor and AutoCorrect are available with:



DIRIS 989 - DIRIS-DW 004 - TORE 074

**DIRIS A-40** and  
**DIRIS Digiware I**  
Associated with ITR sensors



DIRIS-DW 127

**DIRIS Digiware S**

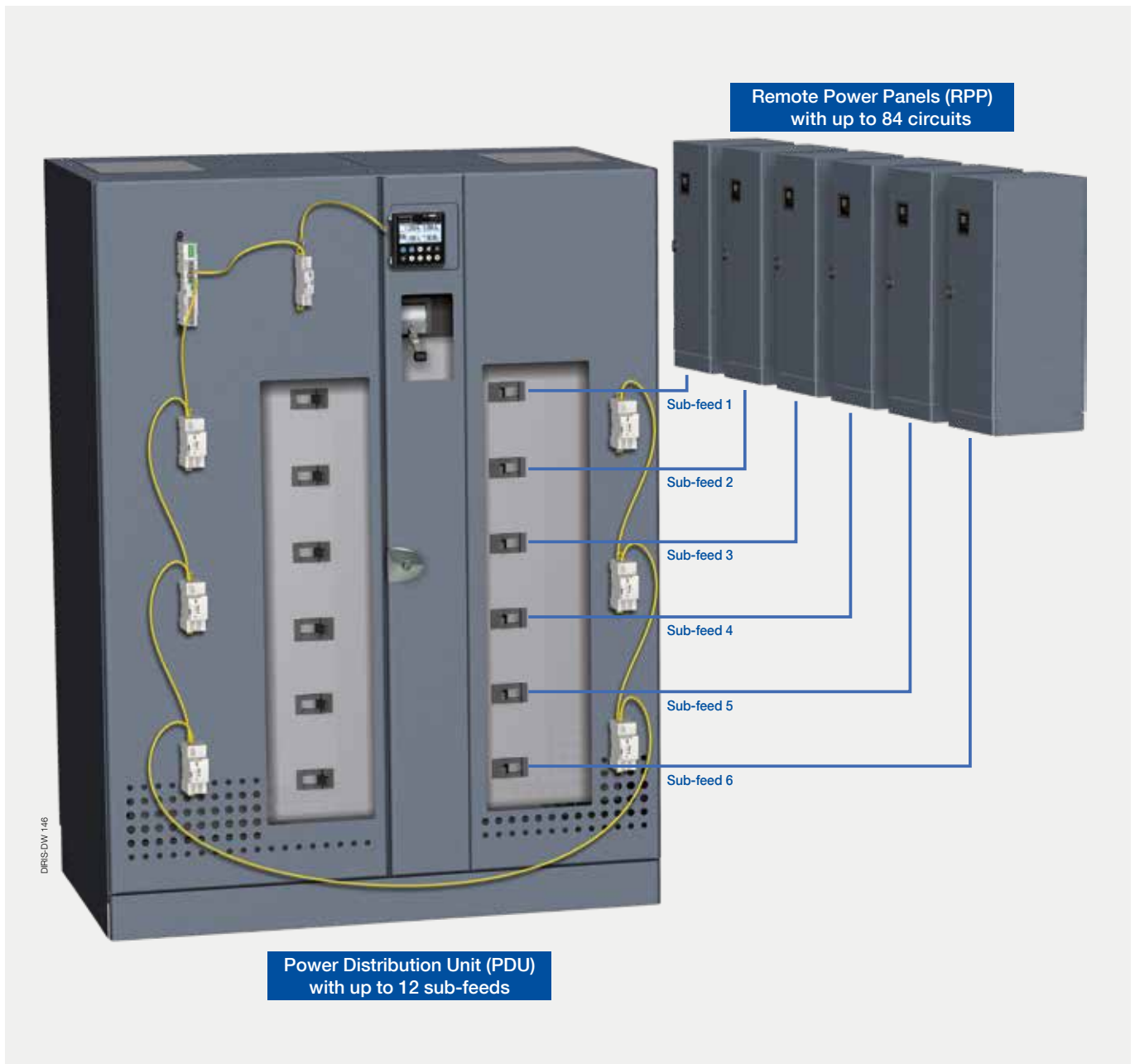


DIRIS-DW 201 / 202

**DIRIS Digiware BCM**

# Everywhere across your electrical distribution

## 1 Sub-feed circuit monitoring



### Typical DIRIS Digiware monitoring system for MAIN + 12 sub-feeds

#### MAIN-feed circuit 2000 A

- U-30 voltage measurement module.
- I-45 current measurement modules for three-phases & neutral.
- 3 x TF-120.

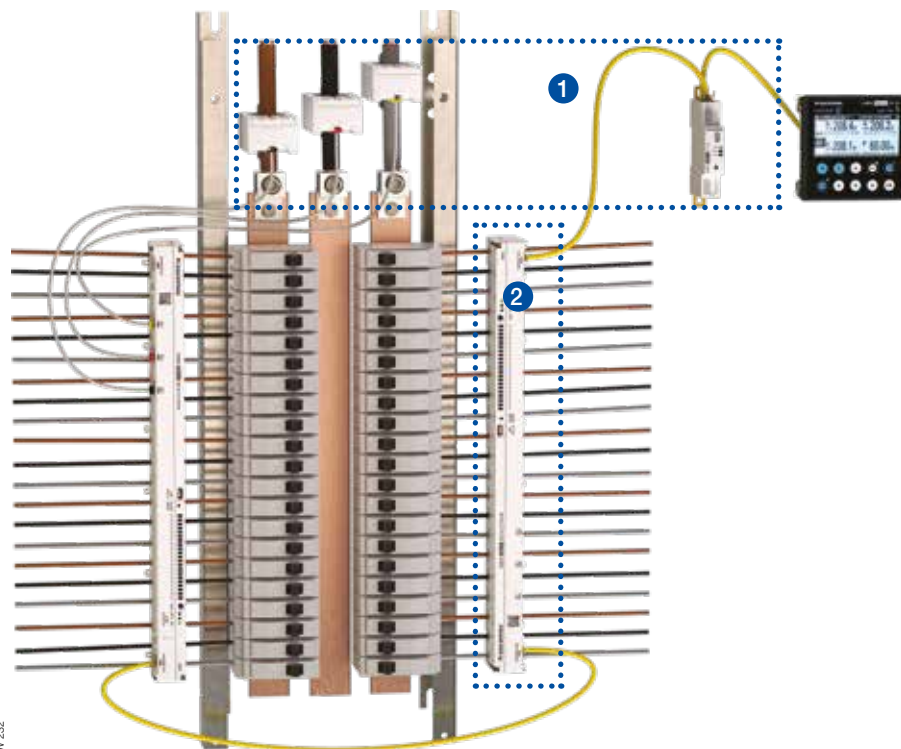
#### Sub-feed circuits 400 A

- 6 x I-60 module.
- 18 x current sensors (TE-45 solid core or TR-32 split core).



# Everywhere throughout your electrical distribution

## 2 Monitoring individual outgoing ways



### DIRIS Digiware BCM

is a perfect match within distribution cabinets using 1P, 3P, 3P+N circuit breakers with fishbone architecture.

### Typical pan-assembly distribution

#### 1 Main incomer 400A

Power quality at incoming feed level U-30 voltage measurement and 3 x TE-45 current sensors for accurate measurements from 3.2 A up to 756 A, connected to one DIRIS Digiware BCM module.

#### 2 Outgoing ways

Individual load management, energy and power monitoring. For a 36-way distribution cabinet, 2 DIRIS Digiware BCM-1818 modules with integrated sensors measuring up to 80 A.

DIRIS-DW 232

For all other electrical panels, using 1P+N, 2P, 2P+N circuit breakers, regular DIRIS Digiware I-30 or I-60 modules associated with external TE or TR / ITR sensors are the right pick.

### Typical flat-type distribution

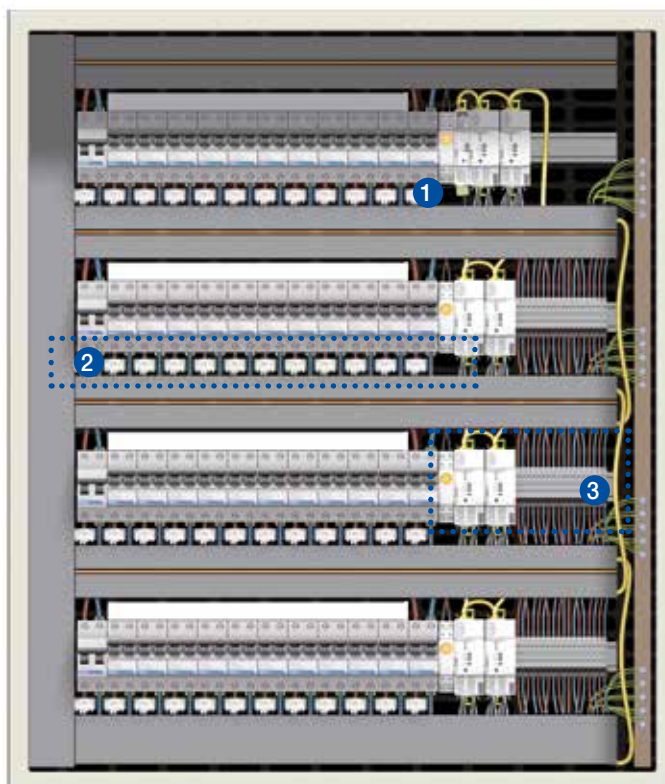
#### 1 Main incomer 400 A

One unique U-10 voltage measurement module.

#### 2 Two I-60 current measurement modules per row.

#### 3 12 TE-18 sensors per row.

The overall system enables the monitoring of 48 single-phase outgoing ways up to 75 A.



DIRIS-DW 160

# Everywhere throughout your electrical distribution

## 3 Busway monitoring

A typical busway monitoring solution uses a standard multifunction meter on each tap-off box high above the server racks which makes local readings impossible. A standard solution also repeats the voltage measurement on each box, even though voltage is the same for the whole bus.

Socomec's approach is different:



APPLU 1085 / 1086

### 1 DIRIS Digiware D-70

One dedicated display for the whole monitoring system. Communication and control power is centralised by the display and transmitted to all DIRIS Digiware modules through the RJ45 Digiware bus.

### 2 DIRIS Digiware U

One module inside the master tap-off unit measures voltage parameters of the incoming supply. The voltage information is then transmitted to all slave tap-off boxes for power and energy monitoring.

#### Data measured:

- U, V,
- voltage harmonics,
- voltage unbalance,
- power quality (swells, dips, interruptions).

### 3 DIRIS Digiware S

current modules measure single-phase or three-phase circuits up to 63 Amps. With 3 integrated current sensors, they can be fitted directly on the MCBs inside each tap-off box. Using the VirtualMonitor technology, the status of all breakers can be accessed remotely and in real time with no additional hardware.

#### Data measured:

- Amps, kW, kVar, kVA, PF,
- kWh, kVarh, kVAh,
- current harmonics,
- overcurrents,
- breaker status.

# Going further

## Monitor environmental parameters

Ensuring proper environmental conditions such as temperature and humidity levels within a data centre is crucial because it directly affects energy consumption, operation costs and the lifespan of equipment.

- Improve cooling on areas with higher needs.
- Identify wasted airflow and improve the efficiency of cooling systems.
- Humidity must be present, but only in the right proportion. Too much humidity can lead to excessive corrosion, malfunctions and can damage equipment. On the other hand, too little humidity can lead to a buildup of electrostatic discharge which can damage electronics when discharging.

## Analog input modules

By adding DIRIS Digiware IO-20 modules to your Digiware system where needed, you can keep track of temperature and humidity levels within your data halls and make sure your data centre needs are accurately satisfied.



SITE 1168



Discover all our solutions to ensure the power availability and energy performance of your data centre

# Socomec: our innovations supporting your energy performance

**1** independent manufacturer

**3,900** employees  
worldwide

**8** % of sales revenue  
dedicated to R&D

**400** experts  
dedicated to service provision

## Your power management expert



POWER  
SWITCHING



POWER  
MONITORING



POWER  
CONVERSION



ENERGY  
STORAGE



EXPERT  
SERVICES

## The specialist for critical applications

- Control, command of LV facilities
- Safety of persons and assets
- Measurement of electrical parameters
- Energy management
- Energy quality
- Energy availability
- Energy storage
- Prevention and repairs
- Measurement and analysis
- Optimisation
- Consultancy, commissioning and training

## A worldwide presence

**12** production sites

- France (x3)
- Italy (x2)
- Tunisia
- India
- China (x2)
- USA (x2)
- Canada

**30** subsidiaries and commercial locations

- Algeria • Australia • Austria • Belgium • China
- Canada • Dubai (United Arab Emirates) • France
- Germany • India • Indonesia • Italy • Ivory Coast
- Netherlands • Poland • Portugal • Romania • Serbia
- Singapore • Slovenia • South Africa • Spain • Sweden
- Switzerland • Thailand • Tunisia • Turkey • UK • USA

**80** countries

where our brand is distributed

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OF SHARED ENERGY

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