



Master the monitoring of your data centre thanks to innovation



# 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.

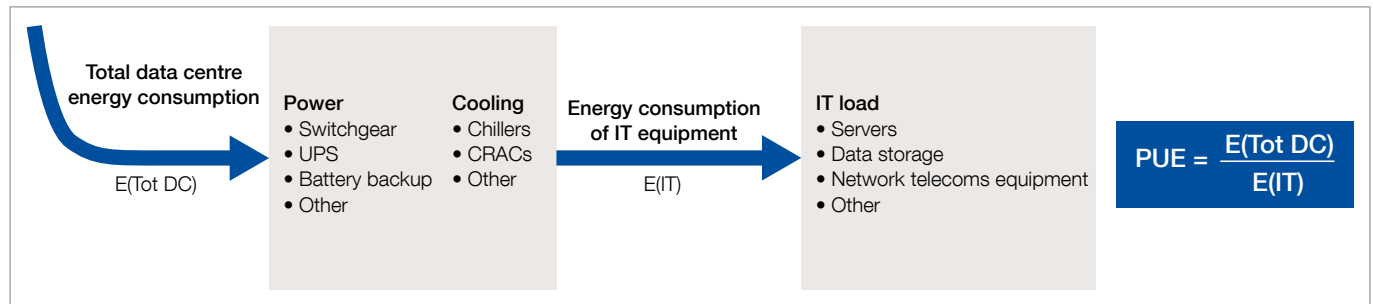
Energy metering can be implemented to give the breakdown of consumptions throughout a data centre which will help identify where savings can be made in order to reduce monthly utility bills for the data centre.

**75 %**  
of the data centre's operating costs are due to electricity and particularly to the consumption of IT equipment

Cooling can represent up to  
**40 %**  
of the total energy used to operate any data centre

## The Power Usage Effectiveness (PUE) to track and measure the Energy Efficiency of your data centre

The PUE is the industry-accepted energy efficiency metric, defined in the ISO/IEC 30134-2: 2016 standard Information Technology – Data centres – Key performance indicators - Part 2, as the ratio of the total power consumption of the data centre and the power consumption of IT equipments.



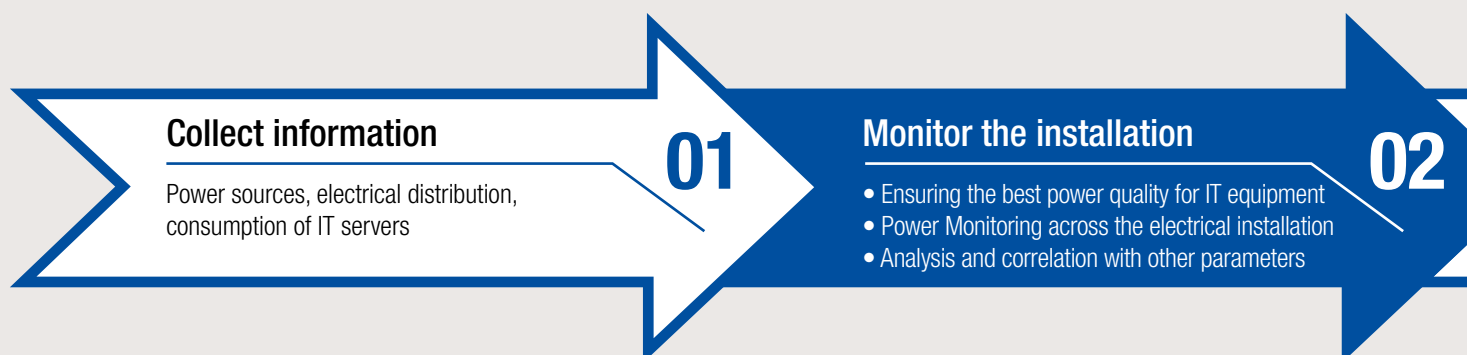
The closer to 1 the PUE is the more efficient the data centre. This means that most of the power is used to support IT servers. PUE evolution has to be correlated to other data (Power quality, environmental information etc.). For instance, a lower PUE in the winter is considered as normal as the season's low temperatures. The measurement of PUE by area or application must be done as close to the final IT loads as possible in order to help understand where efforts need to be made and where to prioritise.

## More granularity, more functionality for better corrective actions

Chapter 8 of EN 50600-2-2 introduces the granularity concept data centre designers should follow while implementing Power monitoring devices throughout the facility.

Granular Power monitoring is a must-have to account for all the consumptions, break them down according to strategic criteria making it easy for facilities managers to analyse and uncover problems early-on.

In addition, data centre operators must use devices that are able to gather more information than basic energy readings. Just having general data is not enough to take relevant actions; power quality measurements such as harmonics, unbalance etc. should be offered to identify weak points, prevent constant deterioration of equipment and adjust maintenance operations. Lastly, the monitoring of each individual protective device (on/off/trip) allows the user to quickly reset in the event of a trip to minimise downtime.



# Overcoming challenges in data centres



## Power availability

To guarantee the business continuity and protection of a data centre's critical assets, the use of Power Quality Meters, with the implementation of a real-time alerts enables to monitor the health of the electrical distribution and to detect drifts in measurements.



## Energy efficiency

Manage IT or cooling equipments efficiently by lowering their energy consumption and adapting the power demand to what is actually needed. This can give rise to substantial cost savings. Installing power monitoring systems across multiple data halls enables staff to benchmark which hall is the most efficient and to use it as a reference.



## Capacity management

With the expansion of a data centre, the use of permanent power monitoring to collect real time data instead of random measurement campaigns gives a better visibility into the data centre's overall capacity. Find out where customer equipment can be added without changing the power distribution architecture due to overloaded circuits and if an upgrade of the cooling system is needed.



## Tailored billing

Branch-circuit monitoring offers the possibility to track the power usage of individual tenants down to the rack level and to charge them accordingly. Highly accurate energy and power monitoring devices are needed to ensure that customers are invoiced fairly and standard revenue grade meters are not reliable enough to guarantee trustworthy invoicing. As power will be fluctuating depending on the loading of server racks, the accuracy must be guaranteed even at very low load current.



## Sustainability

By reducing the carbon footprint, one can guarantee that they are complying with responsibility guidelines by minimizing environmental impact. Promoting an environmentally friendly data centre enhances its reputation and brand value which can help to earn customer loyalty.

### Analyse

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

03

### Improve performances

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

04

# 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 incoming supply 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 for 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

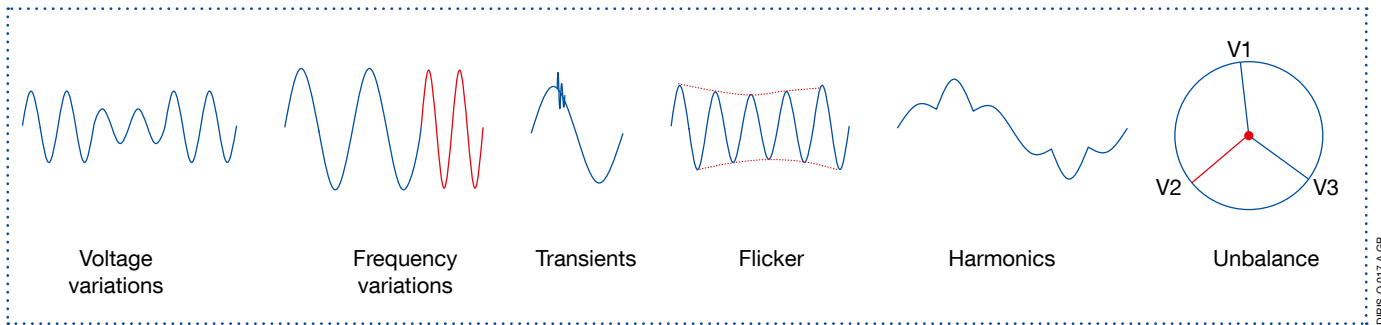
Many data centres, setting green energy goals are now powering most of their facility with renewable energy. But renewable power generation can have negative effects on the distribution network particularly causing voltage variations, frequency fluctuations, and even harmonics pollution.



# DIRIS Q800

## Engineered for accuracy, designed for ease

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.



## Advantages

DIRIS Q 011 A



### Certified product

The measuring features of the DIRIS Q800 were developed to comply with standard IEC 61000-4-30 Class A. The product is also certified according to product standard IEC 62586-2 Class A, guaranteeing a top-of-the-range device.

### EN50160 conformity

With the DIRIS Q800 you can compile and issue EN 50160 conformity reports. With these reports you can quickly check the quality of the energy supplied by your provider.

### Advanced connectivity

To interface with every kind of supervision or DCIM, the unit features a number of communication ports (WiFi, Ethernet, RS485, USB, GPS) and various protocols (SNTP, HTTP, HTTPS, FTP, Modbus TCP, Modbus RTU, PQDIF).

### Secure operation

The internal battery secures the operation of the device even if power is lost. The data is stored for 5 years on its 16 GB internal memory.

## Related software



SOFTWARE

The DIRIS Q800 comes with the following related software:

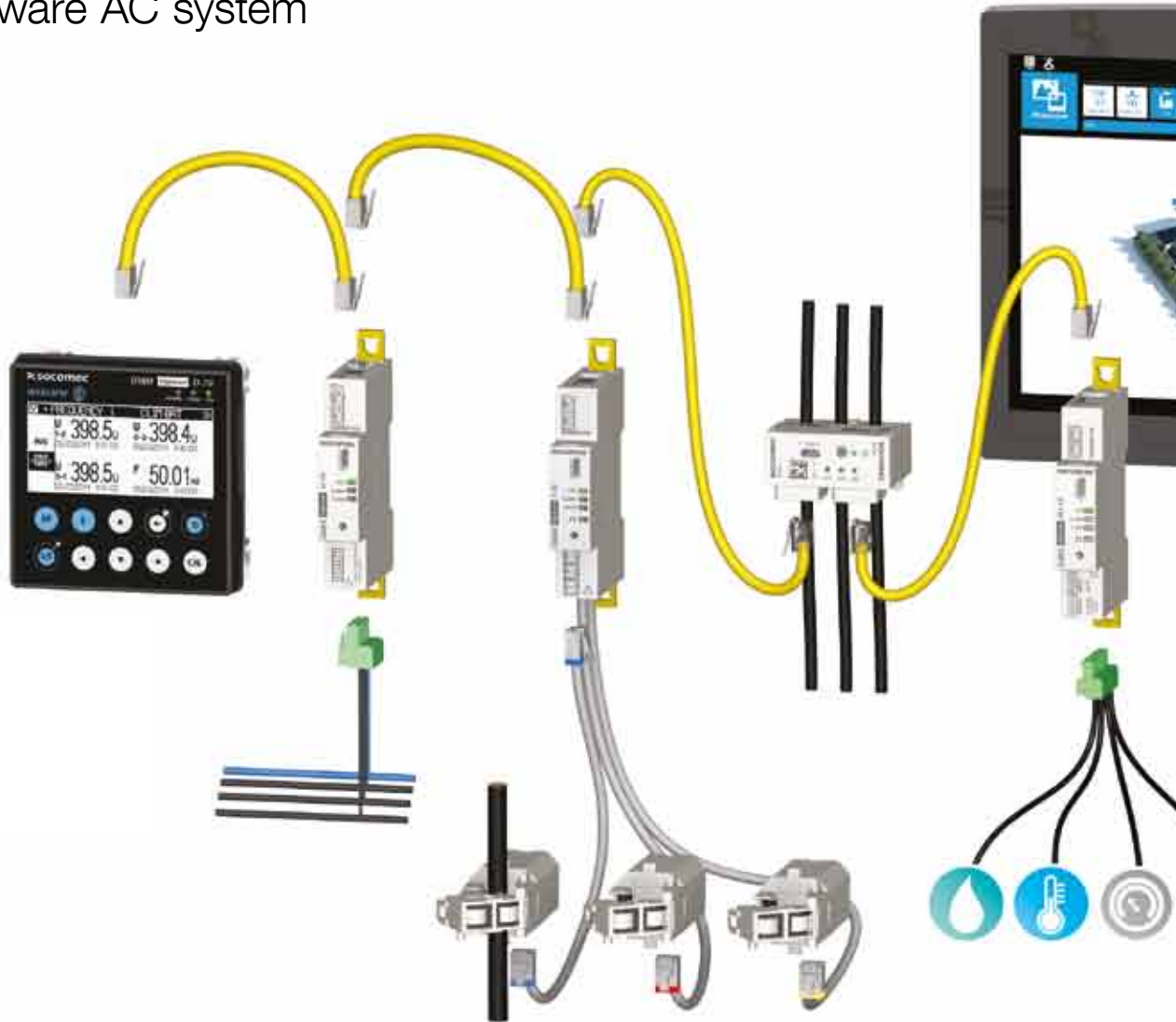
- **DIRIS Q800 - EN50160 Analyser:** produces the EN50160 conformity report,
- **DIRIS Q800 Monitoring tool:** Delivers a detailed analysis of the qualimetric data provided by the device.

# DIRIS Digiware

## Power monitoring at all levels using the world's

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.

### DIRIS Digiware AC system



### Advantages



#### 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).

# smartest system



DIRIS DW 143 B

## For DC data centres



SITE 8807 A

DIRIS Digiware is now 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 solid-core 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.).



GAMME 710 A



## Versatile

One unique system simplifying purchasing, integration/commissioning and maintenance.

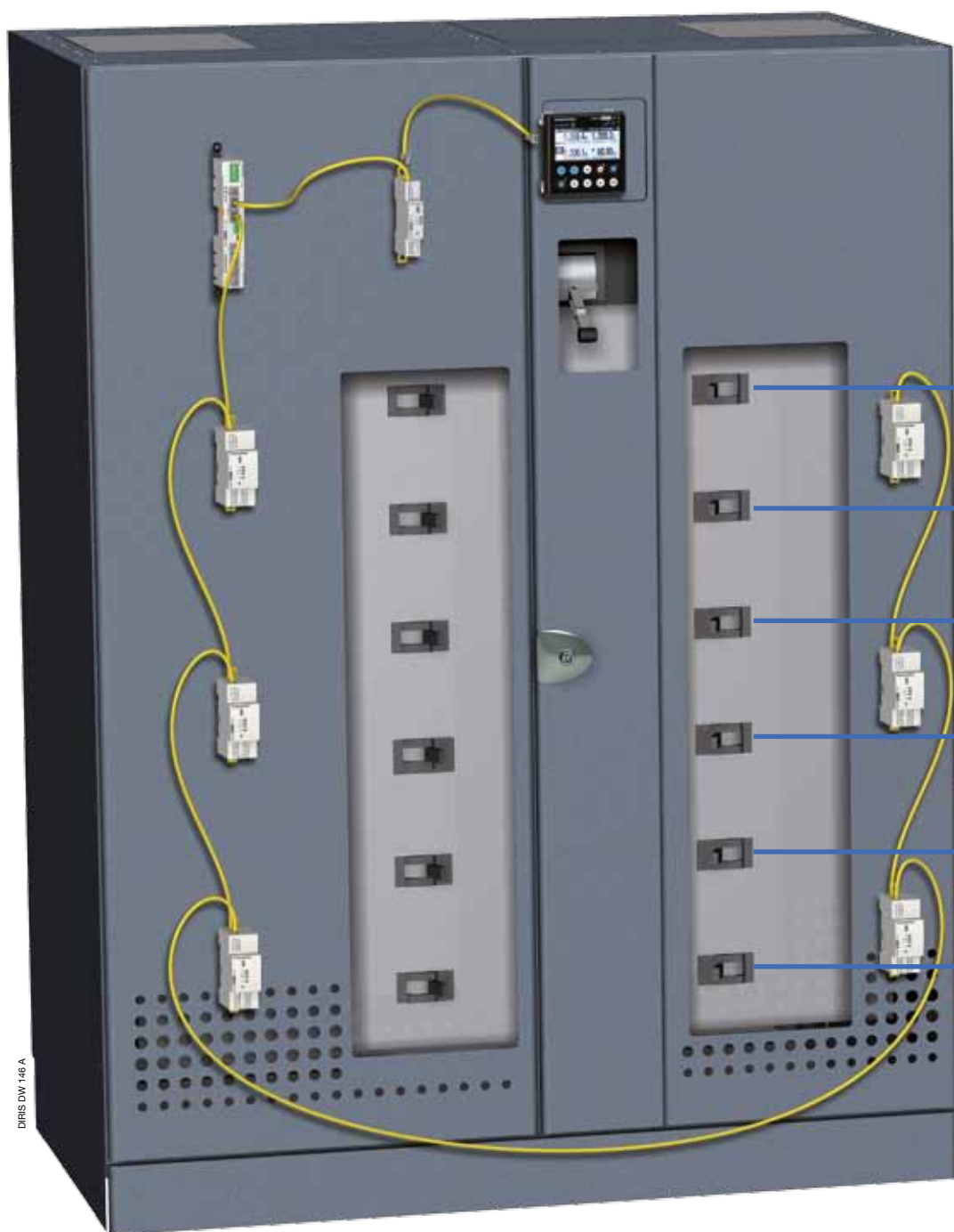


## Flexible

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

# Everywhere across your electrical distribution

## 1 Sub-feed circuit monitoring



Remote Power  
with up to

Sub-feed 1

Sub-feed 2

Sub-feed 3

Sub-feed 4

Sub-feed 5

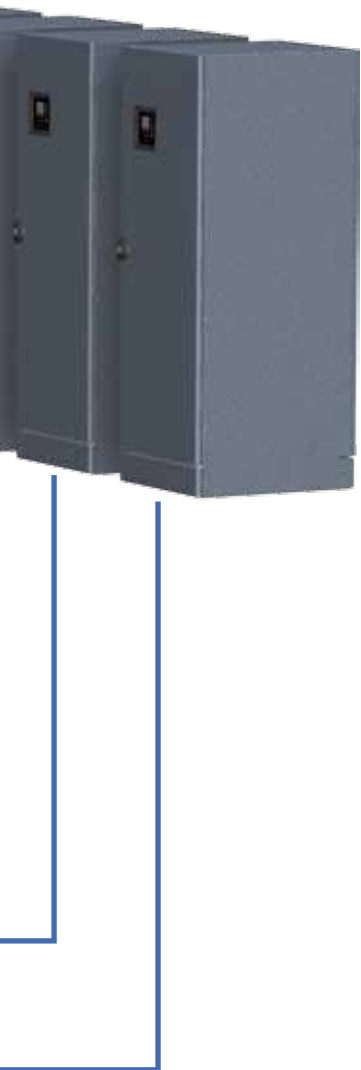
Sub-feed 6

**Power Distribution Unit (PDU)  
with up to 12 sub-feeds**

DRRS DW 146 A



## Panels (RPP) 84 circuits



### Need flexibility?

The DIRIS Digiware system can be customised to monitor main incomers including any number of sub-feeds regardless of their current ratings: simply add the right number of DIRIS Digiware I modules.

### Need an accurate measurement system?

Class 0.5 on the full scale for the entire system including current sensors.

### Need to monitor the power quality of the distribution?

DIRIS Digiware allows the detection of dips, swells and interruptions which is important to take relevant actions in case of power quality events on a circuit.

### Need to monitor existing panels?

The DIRIS Digiware system is suitable for both new or existing panels thanks to the variety of current sensors offered by Socomec: TE (solid-core), TR (split-core) or TF (flexible). The use of split-core sensors enables an easy implementation of Power monitoring with no interruption of power.

### Need both local and remote visualisation?

One unique HMI part of the Digiware system centralising measurements for the main incoming circuit, all subfeeds & branch-circuits locally and communicating them to DCIM/EMS/SCADA/BMS software solutions over multiple open protocols (MODBUS, SNMP OIDs & TRAP alarming, BACnet).

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

#### MAIN-feed circuit 2000 A

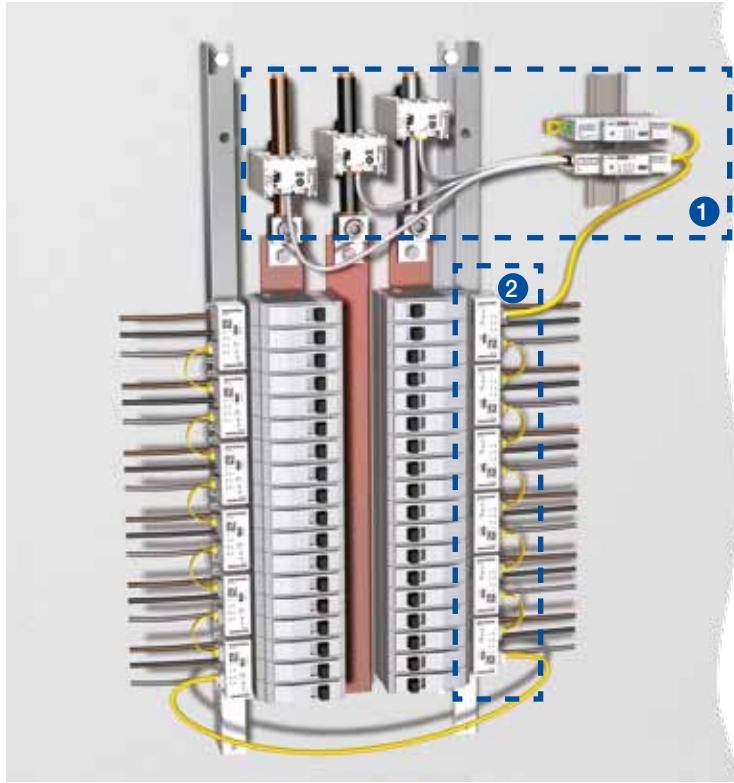
- U-30 voltage measurement module.
- I-45 current measurement modules for three-phases & neutral.
- 3 x TF-120.

#### 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 S is a perfect match within distribution cabinets using 1P, 3P, 3P+N circuit breakers.

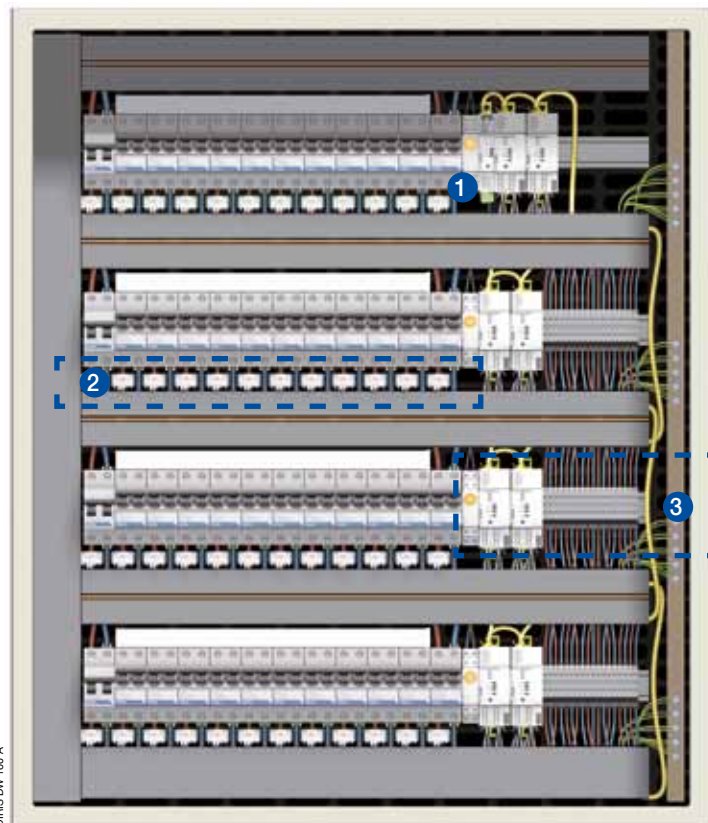
### Typical pan-assembly distribution

- 1 Main incomer 400A**  
Power quality at incoming feed level  
U-30 voltage measurement module  
I-35 current measurement module  
3 x TE-45 current sensors for accurate measurements from 3.2 A up to 756 A.
- 2 Outgoing ways**  
Individual load management, energy and power monitoring.  
For a 36-way distribution cabinet, 14 DIRIS Digiware S modules with integrated sensors measuring up to 63 A.

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.



The scalability of DIRIS Digiware makes it the perfect match, no matter the number of circuits you need to measure (36, 42, 72, 84-pole panelboards etc.) with an easy circuit naming for a quick and error free integration with new or existing management software solutions.

### Need more visibility?

Branch-circuit monitoring allows data centre managers to track real time total load vs. available power for a better capacity planning than rack mount PDUs. This level of granularity is also necessary to get a better insight into a data centre's monthly utility bill and to invoice back individual customers at the rack level.

### Need help managing your critical loads?

DIRIS Digiware S-Data centre has pre configured threshold alarms to alert you when the current approaches a breaker's limit. This enables an easy and responsive load management to prevent unexpected failures and downtime due to circuit overloads.

### Need to monitor consumptions accurately?

DIRIS Digiware S is the most accurate power monitoring device on the market. Contrary to most solutions, the accuracy is guaranteed over a wide current range: class 0.5 from 0.2 A up to 63 A.

### Can you guarantee the reliability of your protective devices?

The VirtualMonitor technology provides advanced monitoring of branch circuit breakers, without use of any auxiliary contacts, by sending timestamped alerts in the event of an opening or a trip. All this without using any auxiliary contacts. Data centre operators can now receive real time alerts to quickly reset their breakers if servers are no longer powered with redundancy.

### Do you wish to reduce maintenance needs?

The AutoCorrect technology allows DIRIS Digiware S measurement modules to identify wiring errors, even off-load. This avoids the need for on-site counter visits due to non-consistent power readings.

### What if the IT infrastructure evolves over time?

In colocation data centres, the layout of IT infrastructure is likely to evolve in time, meaning whatever equipment installed will too. Contrary to rack mount PDUs local at the server rack level, DIRIS Digiware is directly installed inside electrical panels where changes are much rarer.

#### For existing panels



With Socomec's range of iTR split-core current sensors, you can retrofit any existing panel and still benefit from the VirtualMonitor and AutoCorrect technologies.

#### Integrated technology



##### PreciSense

Be guaranteed of the accuracy of your measurements



##### VirtualMonitor

Access the monitoring of your protective devices



##### AutoCorrect

Be guaranteed your measurement system is working correctly

More information : [https://www.socomec.com/energy-efficiency-technologies\\_en.html](https://www.socomec.com/energy-efficiency-technologies_en.html)

# 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:**



Standard solution from competition.



### 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

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.



Accessible readings

Choose where to position your remote display for the entire power bus.



Plug & Play

Plug in/out connector for easy tap-off withdrawal with no power interruption of the monitoring system.



Compact

The compactness of Digiware S modules solves space constraints inside tap-off boxes. Our range of split core TR sensors make the integration into existing tap-off units possible without interrupting outgoing feeders.



# 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.



DIRIS DW 093 B



APPLI 081 A

## Analyse to undertake relevant corrective actions

### WEBVIEW-L solution

Use the WEBVIEW-L Power and environmental monitoring software directly embedded with DATALOG H80/H81 to easily track your consumptions and measurements over time, analyse improvements and where further savings can be made:

- no special skills or installation required,
- automatic detection of devices on the network,
- easy to integrate existing third-party Modbus devices,
- all energy consumption and measurement data stored for over 1 year,
- breakdown of consumptions per circuit, per area, or per usage (IT, HVAC, etc.),
- easy and secure export of measurements (FTPS),
- real time alerts and transmission via emails (SMTPS).



SOFT 083 A



# Socomec: our innovations supporting your energy performance

**1** independent manufacturer

**3,200** employees  
worldwide

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

**400** experts  
dedicated to service provision

## Your power management expert



POWER  
SWITCHING



POWER  
MONITORING



POWER  
CONVERSION



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 (x3)

**27** subsidiaries

- Australia • Belgium • China • France
- Germany • India • Italy • Netherlands
- Poland • Romania • Singapore
- Slovenia • Spain • Switzerland • Thailand
- Tunisia • Turkey • UK • USA

**80** countries

where our brand is distributed

### HEAD OFFICE

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