

**INSTRUCTION
MANUAL**

DIRIS D-30

DIRIS Digiware D-40 / D-50 / D-70

Control and power supply interface

EN



www.socomec.com/en/diris-d

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1. DOCUMENTATION

All documentation on DIRIS D-30 and DIRIS Digiware D-40/
D-50/D-70 is available on the SOCOMEC website:
www.socomec.com/en/diris-d



2. HAZARDS AND WARNINGS

The term "device" used in this document covers both DIRIS D-30 and DIRIS Digiware D-40, D-50 and D-70.

The assembly, use, servicing and maintenance of this equipment must only be carried out by trained, qualified professionals.

SOCOMECC shall not be held responsible for failure to comply with the instructions in this manual.

2.1. Risk of electrocution, burns or explosion

- This device must only be installed and serviced by qualified personnel who have in-depth knowledge of installing, commissioning and operating the device and who have had appropriate training. He or she should have read and understood the various safety measures and warnings stated in the instructions.
- Before carrying out any work on the device, switch off the power supply to the device.
- Always use an appropriate voltage detection device to confirm the absence of voltage.
- Replace all devices, doors and covers before turning on power to this equipment.
- Always power the device with the correct rated voltage.
- Install the device following the recommended installation instructions and in a suitable electrical cabinet.

Failure to take these precautions could cause death or serious injuries.

2.2. Risk of damaging the device

To ensure that the device operates correctly, make sure that:

- The device is correctly installed.
- The auxiliary power supply voltage indicated on the product is observed: 24 VDC \pm 10% (for D-40, D-50 and D-70 only).
- Use 230 VAC / 24 VDC SOCOMECC or use a 1 A 24 VDC safety fuse.

Failure to respect these precautions could cause damage to the device.

2.3. Liability

- Assembly, connection and use must be carried out in accordance with the installation standards currently in force.
- The device must be installed in accordance with the rules given in this manual.
- Failure to observe the rules for installing this device may compromise the device's intrinsic protection.
- The device must be positioned within an installation which complies with the standards currently in force.
- Any cable which needs to be replaced may only be replaced with a cable having the correct rating.

3. PRELIMINARY OPERATIONS





To ensure the safety of personnel and the product, please carefully read the contents of these instructions before installation.

Check the following points as soon as you receive the package containing the device:

- The packaging is in good condition
- The device has not been damaged during transportation
- The device reference number conforms to your order
- The packaging includes the device fitted with removable terminal blocks and a Quick start guide.

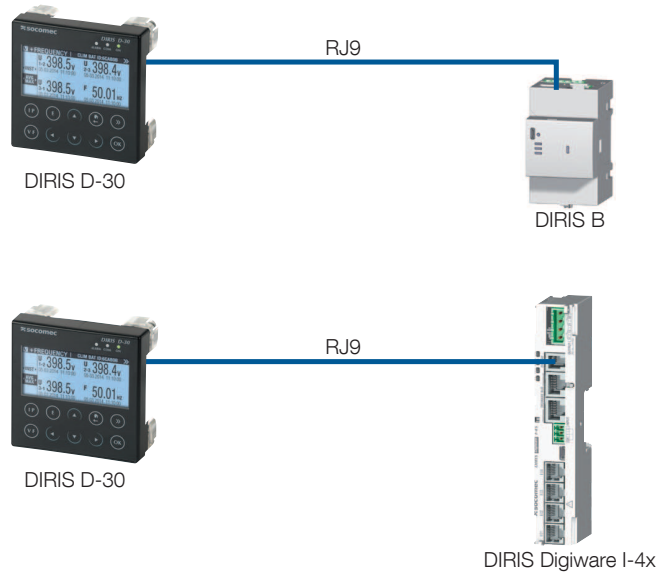
4. INTRODUCTION

4.1. Range

			
DIRIS D-30 Single-point display Ref. 4829 0200	DIRIS Digiware D-40 Multipoint display Ref. 4829 0199	DIRIS Digiware D-50 Multipoint display Ref. 4829 0201	DIRIS Digiware D-70 Multipoint display Ref. 4829 0202
-	RS485 output Modbus RTU	Ethernet output Modbus TCP	Ethernet output Modbus TCP BACnet IP SNMP v1, v2 & v3
-	-	-	Webview embedded web server Power & Energy Monitoring

4.2. DIRIS D-30 - introduction

DIRIS D-30 is a local single-point display connected to the measuring device DIRIS B or DIRIS Digiware I-4x via an RJ9 cable (1.50m cable reference: 4829 0280 - 3m cable: 4829 0281). The screen is powered through the RJ9 cable.



4.3. Introduction to DIRIS Digiware D

The DIRIS Digiware D-40, D-50 and D-70 displays are shared between DIRIS Digiware meters and measuring devices.

They can also display measurements from other SOCOMEC meters and measuring devices: COUNTIS, DIRIS A, DIRIS B (with the exception of DIRIS Digiware D-40).

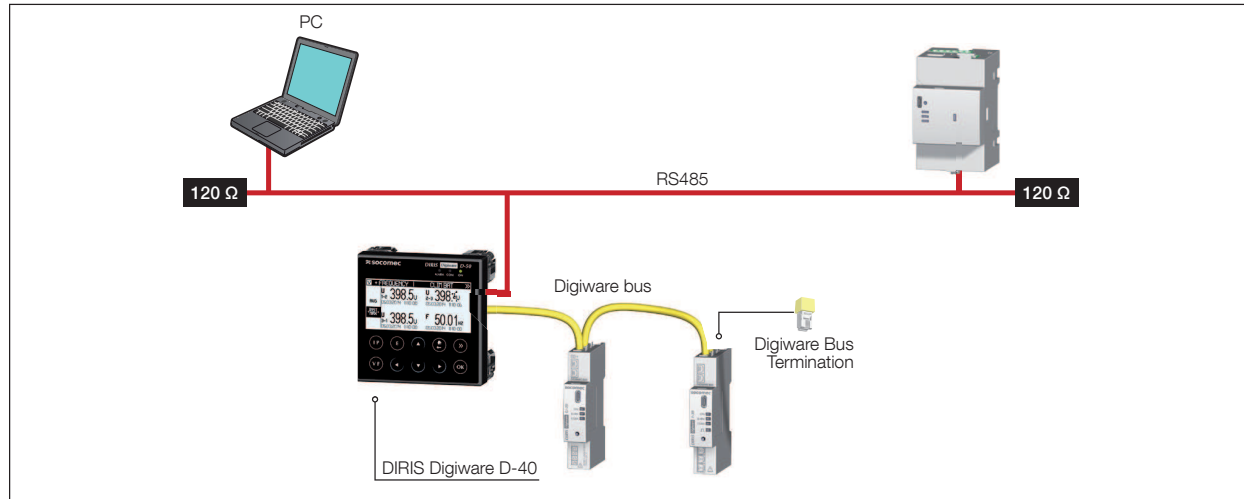
They centralise data from up to 32 devices (a maximum of 186 outputs).

These products may be connected by a Digiware bus and/or an RS485 bus.

Centralised products can be shown as well as configured by DIRIS Digiware D displays.

4.3.1. Introduction to DIRIS Digiware D-40

A DIRIS Digiware D-40 display is a slave device on the RS485 bus and master on the DIRIS Digiware bus.

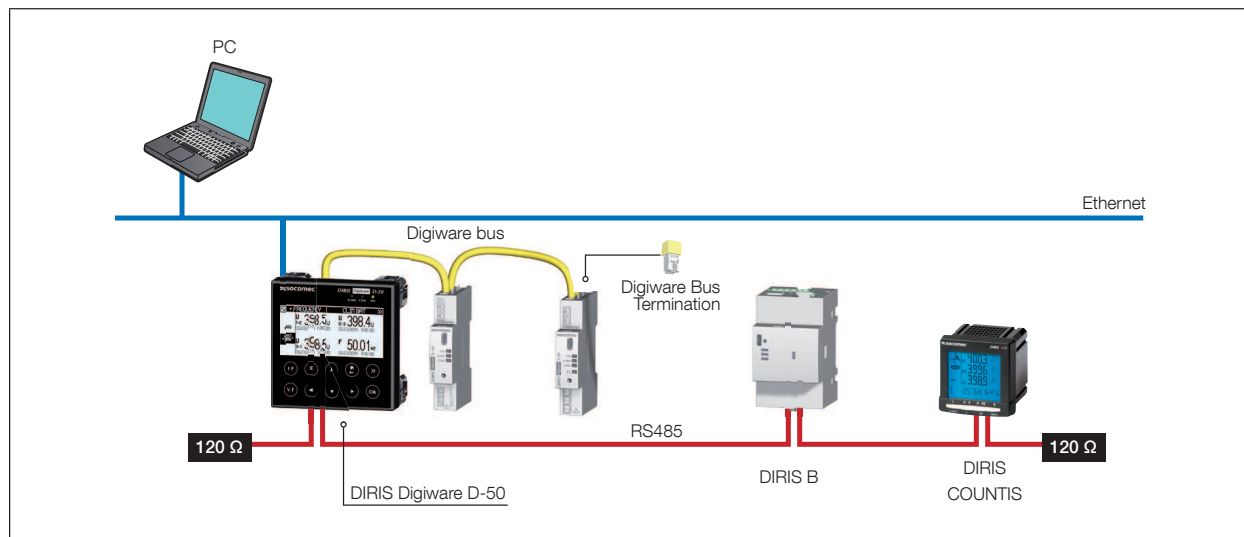


4.3.2. Introduction to DIRIS Digiware D-50

A DIRIS Digiware D-50 display is a master device on the RS485 bus and master on the DIRIS Digiware bus. It is used like an Ethernet gateway.

The Ethernet port is for:

- Using the Ethernet network in ModbusTCP (max. 4 simultaneous connections) to share all the data taken from the meters and measuring devices connected to its Digiware and RS485 ports.
- Displaying on DIRIS Digiware D-50 the data taken from remote products connected to the local Ethernet network.

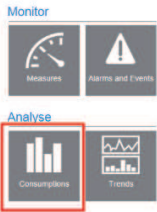
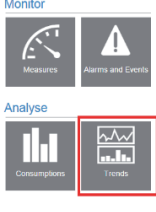
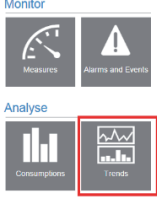


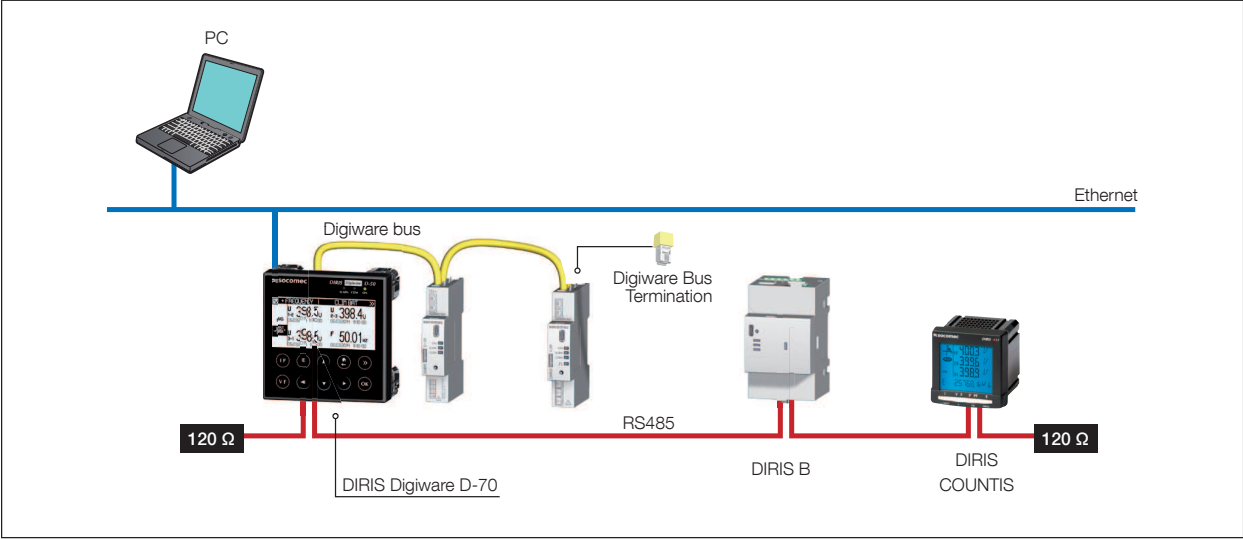
4.3.3. Introduction to DIRIS Digiware D-70

A DIRIS Digiware D-70 display is a master device on the RS485 bus and master on the DIRIS Digiware bus. It is used like an Ethernet gateway.

The Ethernet port is for:




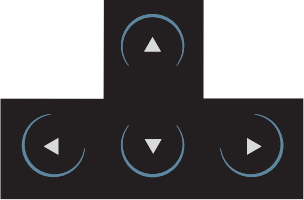



- Sharing on the Ethernet network in ModbusTCP (max. 32 simultaneous connections) all the data taken from the meters and measuring devices connected to its Digiware and RS485 ports.
- Displaying on the DIRIS Digiware D-70 the data taken from remote products connected to the local Ethernet network
- Providing the data measured and archived on the embedded web server, Webview
- Providing the data in protocols SNMP and BACNET IP
- Automatically exporting data via FTP(s)
- Automatically sending notification emails via SMTP(s)
- For archiving data, see the table below

	Consumption curves	Load curves	Measuring logs
Logged data	Energy: kWh, kvarh, kVAh	Power: kW, kvar, kVA	Average measurements: U, V, I, P, Q, S, PF, Temperature...
Compatible products	COUNTIS Exx (all) DIRIS Axx (all) DIRIS Bxx (all) DIRIS Digiware XXX (all)	Countis Eci , Countis E3x DIRIS A40 + MEM / A60/A80 DIRIS B-30 DIRIS Digiware I-31 / I-61 /I-35 / I-45	DIRIS B30 DIRIS Digiware I-35 / I-45 / U-30
Integration period	10 min to 60 min	1 min to 60 min	
Archiving period in D-70	1 year with a 60-min integration period. Proportional for different values: For example: 3 months with a 15-min integration period. This applies no matter how many devices (1 to 32) are connected to the D-70. The level of detail of the log is not linked to the number of devices connected:		
Operation	Readings taken every 10 min / 60 min in the meter/PMD.	The data is recorded in a cache memory on the meter and then downloaded by the D-70. If communication is interrupted, the missing data is recovered by the D-70 once the connection is restored so that recording continues.	
Data backup	NO	YES (in the meter's cache memory)	
Export to the FTP server	YES	YES	YES
Webview link			
Specific configuration	Nothing to configure (data is recorded automatically).	Load curves must be activated on the meters (via Easy Config). Load curves are then automatically downloaded from the meter's cache memory to the D-70.	Measuring logs must be activated on the meters (via Easy Config). The logs are then automatically downloaded from the meter's cache memory to the D-70.




4.4. Touchscreens

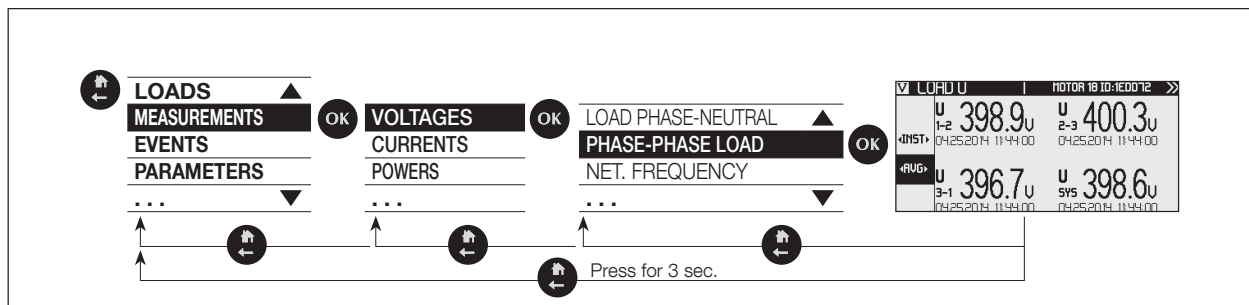
The display consists of a screen and 10 shortcut keys:

	Shortcut keys for load measurements: current, active power, reactive power, apparent power, power factor, cosinus phi
	Shortcut keys for electrical network measurements: single voltage, composite voltage, frequency
	Shortcut keys for active, reactive, apparent energy meters (total and partial readings)
	Arrow keys for navigation
	Use this to go up a level in the display navigation menus
	Use this to go to the previous/next product (to scroll through all your meters and centralised measuring devices)
	Use this to confirm your navigation or entry selection

4.5. LED display

	<p>ALARM</p> <ul style="list-style-type: none"> - Off: no alerts in progress. - Solid: alarm (logical/analogue...) is active or finished and not reset on one device connected to the display - Flashing: system alarm is active on one device connected to the display <p>COM</p> <ul style="list-style-type: none"> - Off: no communication. - Flashing: communication in progress on the RS485 and/DIGIWARE bus. <p>ON</p> <ul style="list-style-type: none"> - Off: device is off. - On: device working OK.
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4.6. Navigation

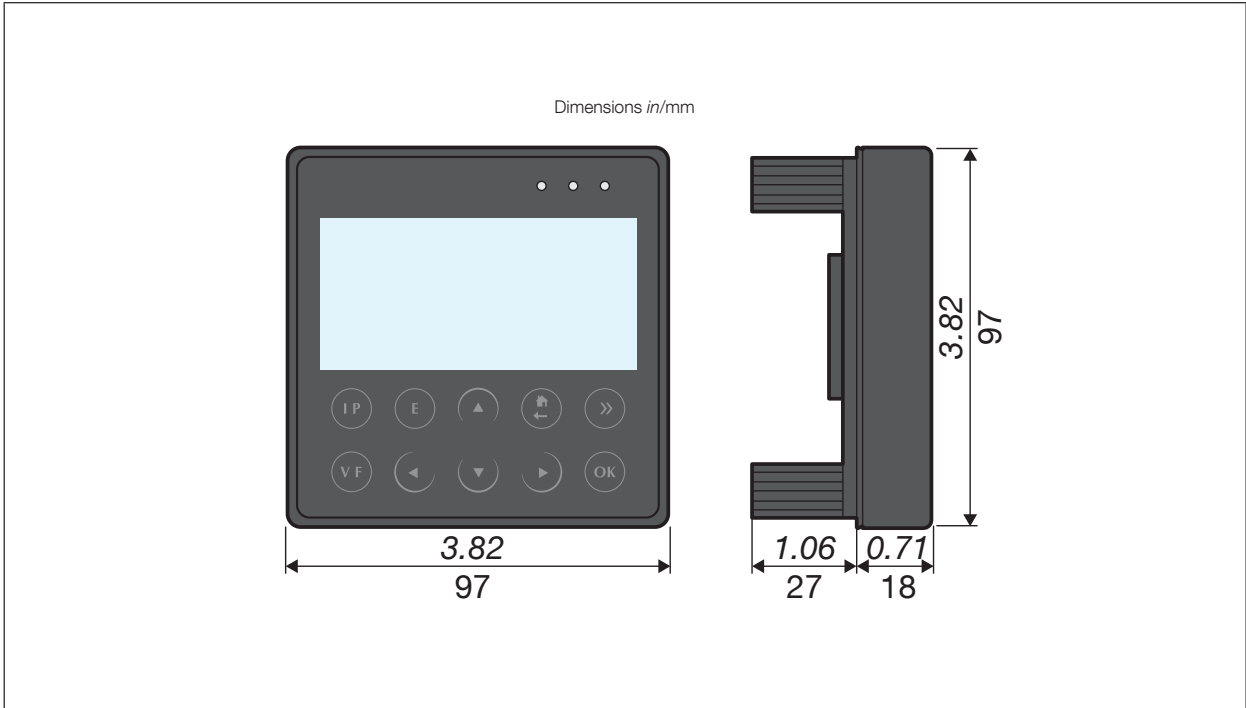


4.7. Menu structure

Menu structure			D-30	D-40	D-50 D-70	
Load			•	•	•	
Measurements	Voltages	Load phase-neutral	•	•	•	
		Phase-phase load	•	•	•	
		Net. frequency	•	•	•	
		Net. phase-neutral	•	•	•	
		Net. phase-neutral unbalanced	•	•	•	
		Net. phase-neutral THD	•	•	•	
		Net. phase-neutral harmonic	•	•	•	
		Net. phase-neutral crest factor	•	•	•	
		Net. phase-phase	•	•	•	
		Net. phase-phase unbalanced	•	•	•	
		Net. phase-phase THD	•	•	•	
		Net. phase-phase harmonic	•	•	•	
		Net. phase-phase crest factor	•	•	•	
		Currents	Currents	•	•	•
	Currents system		•	•	•	
	Unbalanced currents		•	•	•	
	Currents THD		•	•	•	
	Currents K factor		•	•	•	
	Currents harmonics		•	•	•	
	Current crest factor		•	•	•	
	Powers	Active powers	•	•	•	
		Reactive powers	•	•	•	
		Apparent powers	•	•	•	
		Predictive power	•	•	•	
		Power factors	•	•	•	
		Cos Phi	•	•	•	
	Energies	Tan Phi	•	•	•	
		Positive active energies	•	•	•	
		Negative active energies	•	•	•	
		Positive reactive energies	•	•	•	
		Negative reactive energies	•	•	•	
	Positive/negative inductive/capacitive reactive energies	•	•	•		
	Apparent energies	•	•	•		
		RESET all Min/Max values	•	•	•	
	Events	In progress	•	•	•	
		History	Alarms, quality	•	•	•
	Parameters	Display	Language	•	•	•
			Date format	•	•	•
			Digiware Addressing Range		•	
			Slave RS485: <i>Baudrate, stop, parity, address</i>		•	
			Master RS485: <i>Baudrate, stop, parity, address</i>			•
			Ethernet communication: <i>DHCP, IP address, mask, gateway</i>			•
			Setting the date/time on the remote product Date/Time: <i>Activation - manual setting</i>	•	•	•
			<i>SNTP (server IP address, server port, time zone, Send settings)</i>			•
			Change password	•	•	•
		Configure a device	<i>Network, loads</i>	•	•	•
		Autodetect serial devices	Status, found devices, address conflicts, start		•	•
		List products			•	•
		Add new device	Type of device, address		•	•
		Remove device			•	•
	Restore device's factory settings		•	•	•	
	Device software version		•	•	•	
	About	IP address			•	
		MAC address			•	
Serial number			•	•		
Software version			•	•		
Reboot			•	•		

Note: the menus available depend on the product features.

4.8. Dimensions



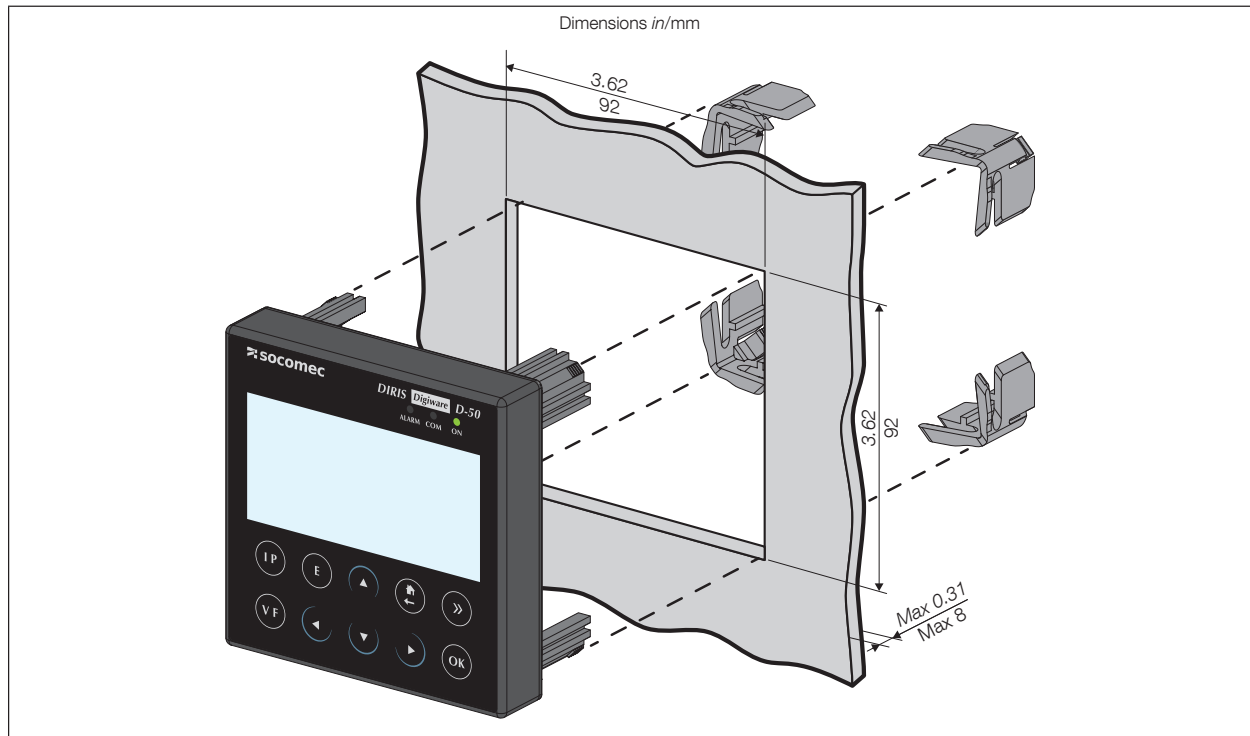
5. MOUNTING

5.1. Recommendations and safety

Refer to the safety instructions (section “2. Hazards and warnings”, page 5)

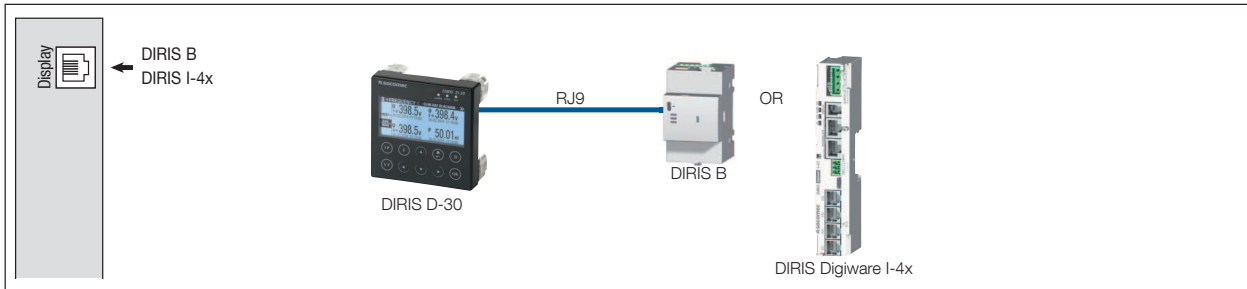
5.2. Back-plate mounting

DIRIS D-30 and DIRIS Digiware D are board-mounted (slot: 92x92mm). The display is secured with clips.

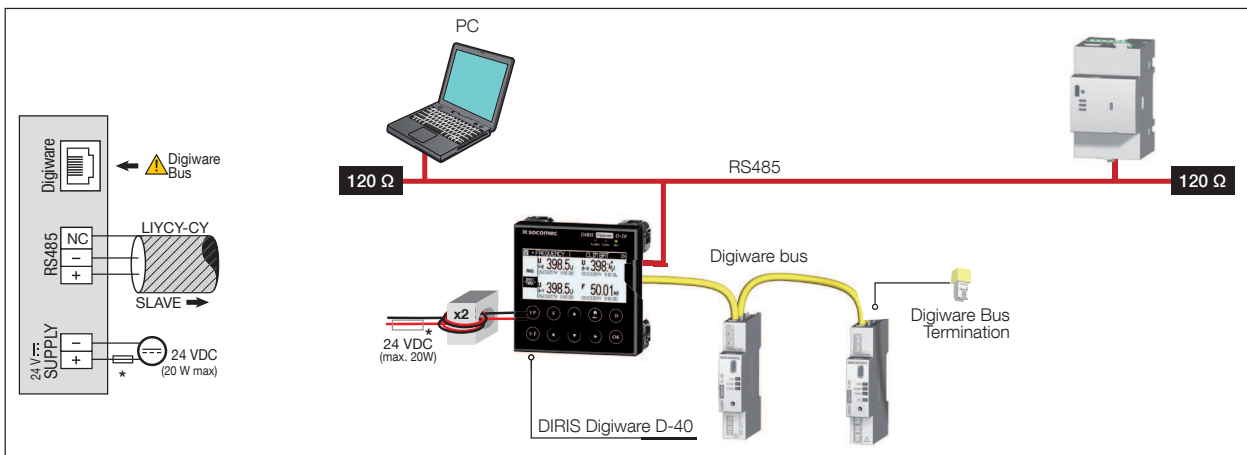


6. CONNECTION

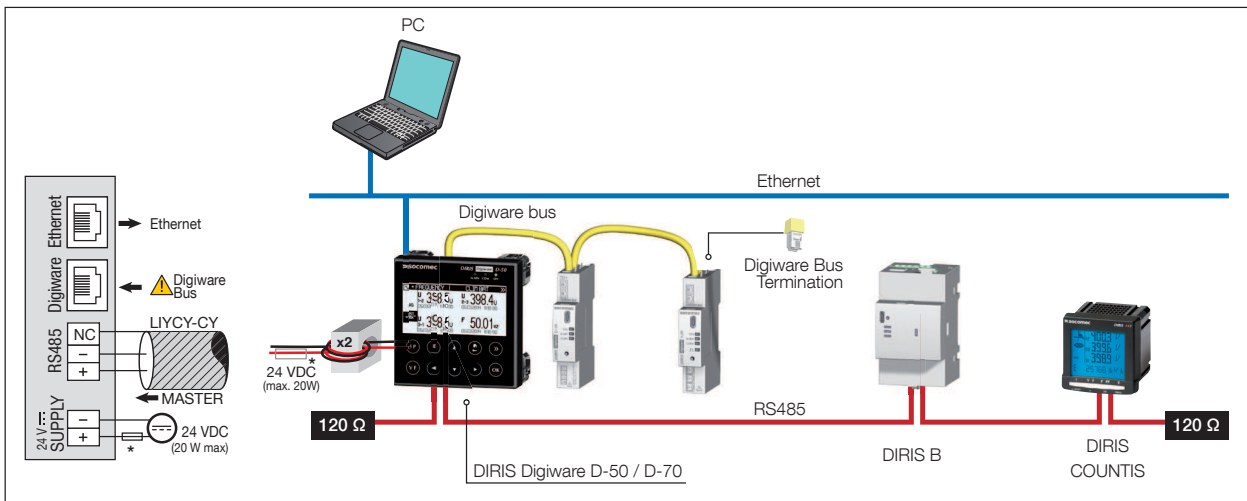
6.1. DIRIS D-30 - wiring



6.2. DIRIS Digiware D-40 - wiring



6.3. DIRIS Digiware D-50 / D-70 - wiring



Note: DIRIS Digiware D-40 and D-50, class B in radiated power is obtained using ferrites (ref. 4829 0048) on the power cable (two rounds): The ferrites are not supplied with the DIRIS Digiware D-70 which is Class A in radiated power.

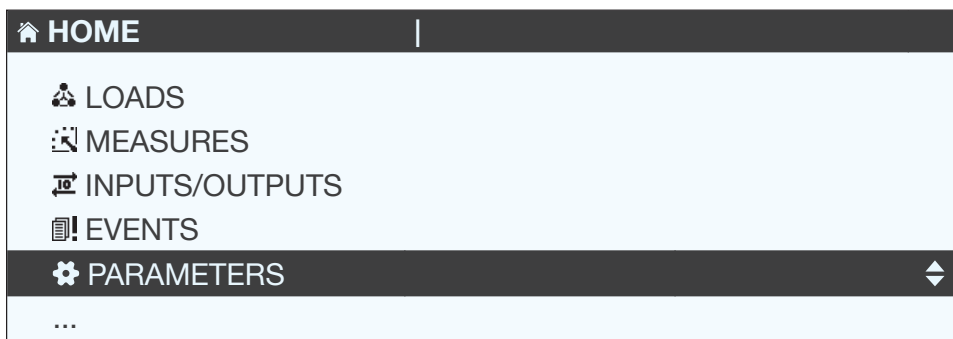
(*) 24 VDC 1A fuse if using a non-SOCOMECC supply

7. CONFIGURATION

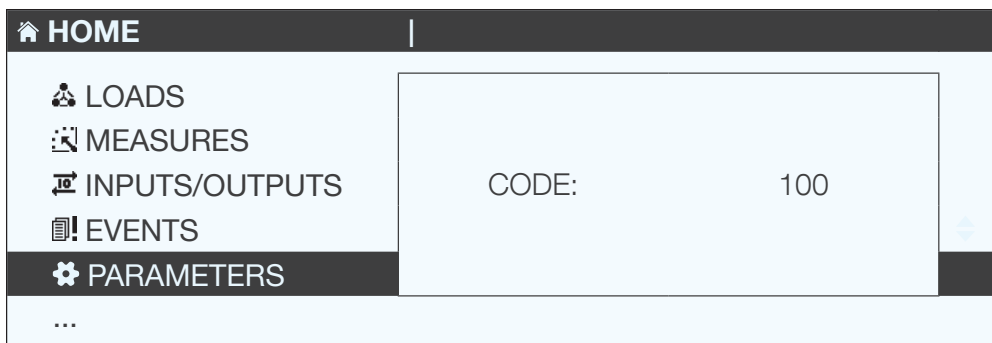
To return to the navigation menu, press "OK" to call up the various menus:



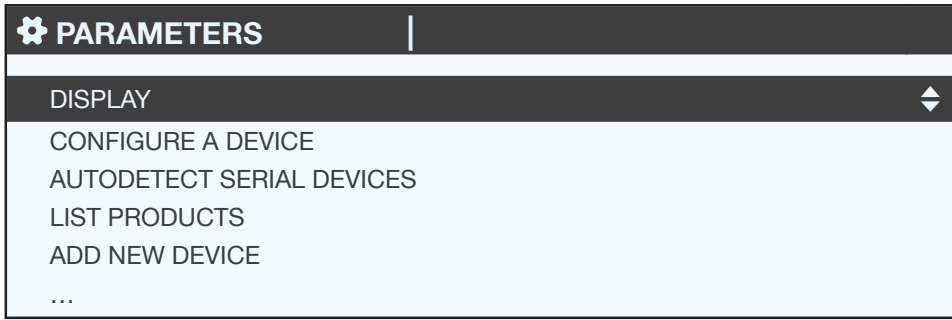
Select the "PARAMETERS" menu by using the navigation key "DOWN ARROW" 3x and confirm with "OK":



Enter the password "100" using the arrow pad (4 arrow keys) and confirm with "OK":



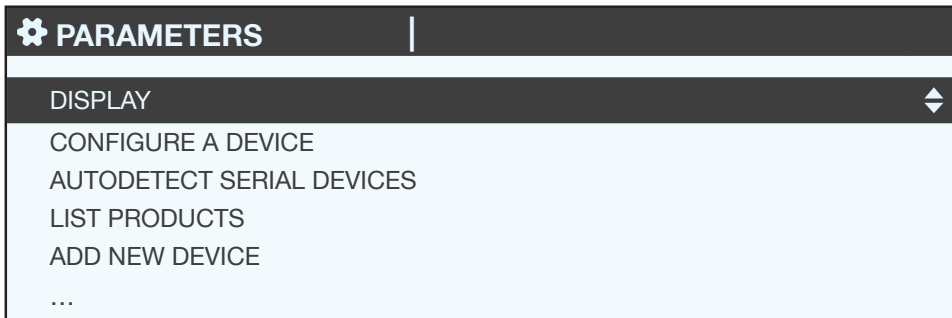
You can access 3 main settings:



- Display-specific settings
- List of meters and measuring devices to centralise on the DIRIS Digiware D display
- Settings of the meters and centralised measuring devices

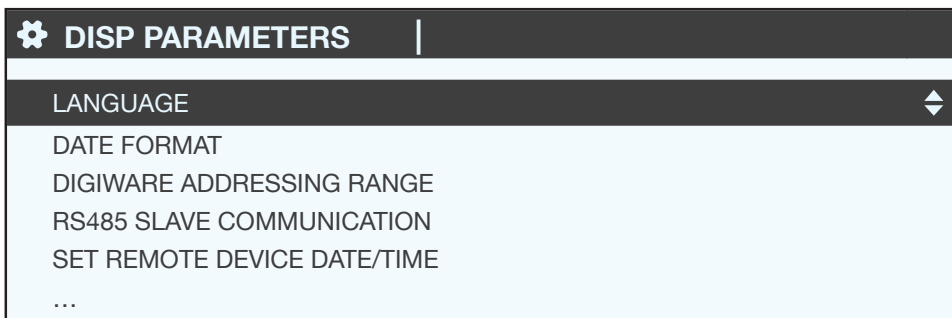
7.1. Specific display settings

When going back to the "DISPLAY" menu, press "OK" to confirm.



7.1.1. DIRIS Digiware D-40

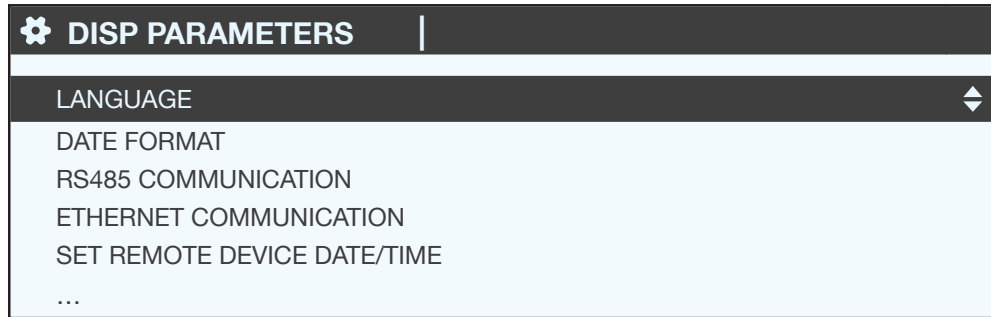
To access the various specific display settings:



- LANGUAGE: to set the display's navigation language
- DATE FORMAT: to set the date/time format
- DIGIWARE ADDRESSING RANGE: this setting is described in section "7.2.2. DIRIS Digiware D-40", page 30
- RS485 SLAVE COMMUNICATION: to set the RS485 bus communication as the slave
- SET REMOTE DEVICE DATE/TIME: to set the date and time
- CHANGE PASSWORD: to change the password to access the settings menu (default: "100")

7.1.2. DIRIS Digiware D-50 / D-70

To access the various specific display settings:



- LANGUAGE: to set the display's navigation language
- DATE FORMAT: to set the date/time format
- RS485 COMMUNICATION: to set the RS485 bus communication and Digiware as master
- ETHERNET COMMUNICATION: to set the display's IP address
- SET REMOTE DEVICE DATE/TIME: to set the date and time
- CHANGE PASSWORD: to change the password to access the settings menu (default: "100")

7.1.3. Language

You can change the display's navigation language here.

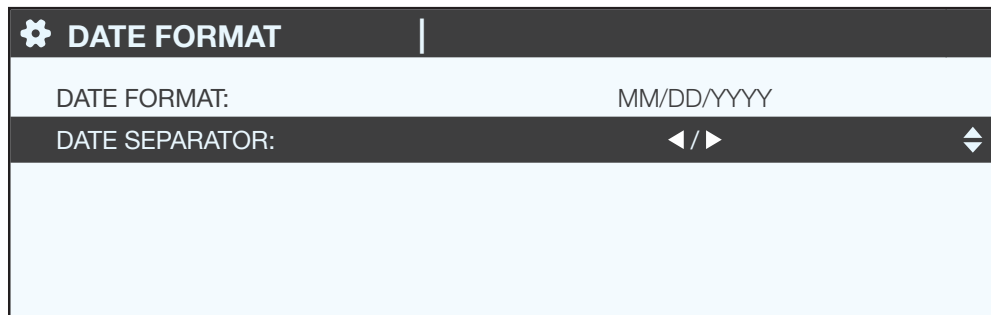
Choose from: English, French, German, Italian, Spanish, Flemish, Polish, Turkish and Chinese.

Select your language with the arrow pad and confirm with "OK".



7.1.4. Date format

You can select the display's date format, including the separator between the day, month and year:



7.1.5. RS485 communication

Configure the display's Modbus address.

Configure the baudrate, stop bits, parity of the RS485 and Digiware bus.



Caution: these settings must be identical on the RS485 and Digiware buses, which are centralised on DIRIS Digiware D-50 / D-70 displays.

DIRIS Digiware D-40 is a slave device on the RS485 bus and master on the Digiware bus (2 different buses in terms of baudrate, parity, stop bits).

DIRIS D-50 / D-70 are master devices on the RS485 bus (baudrate, parity, stop bits).

PARAMETERS	
BAUDRATE:	◀ 38400 ▶
STOP:	1BIT
PARITY:	NONE
ADDRESS:	001

7.1.6. Ethernet communication

You can configure the Ethernet settings of DIRIS Digiware D-50 / D-70 displays:

- DHCP (automatic address location via the Ethernet network) ON/OFF
- IP address
- Subnet mask
- LAN gateway

PARAMETERS	
DHCP:	◀ DISABLED ▶
IP ADDRESS:	192.168.000.003
MASK:	255.255.255.000
GATEWAY:	000.000.000.000

7.1.7. Setting the date/time on the remote product

You can configure the time on the DIRIS Digiware D display:

- Manually by entering the hour, minute, second, month, day, year
- Automatically (like a computer) by NTP server (DIRIS Digiware D-50 / D-70 only)

If the D-50/D-70 clock is set by the SNTP, the display sends the date and time to all the meters and measuring devices on the network, to synchronise all your devices.

CONF. DATE/TIME	
AUTO. REMOTE DATE/TIME SET	◀ MANUAL ▶
YEAR	00
MONTH	01
DAY	01
TIME	00
...	

To configure the SNTP you need advanced IT knowledge (see your IT Department) to enter the following fields:

- SNTP server IP address
- SNTP server port

⚙️ CONF. DATE/TIME	
AUTO. REMOTE DATE/TIME SET	◀ SNTP ▶
SERVER IP ADDRESS:	000.000.000.000
SERVER PORT:	00123
TIME ZONE:	GMT +9:00
OK	

- Configuring meters and centralised measuring devices

You can automatically detect and assign the addresses of the meters and measuring devices connected to the DIRIS Digiware D display.

You can also automatically set the key parameters of the DIRIS Digiware and DIRIS B meters and measuring devices with the DIRIS Digiware D display.

7.1.8. Configuring SNMP - BACNET - FTP - SMTP (DIRIS Digiware D-70)

DIRIS Digiware D-70 devices act as a gateway:

- Digiware => Ethernet
- RS485 => Ethernet

Access the data via this Ethernet port in a variety of formats :

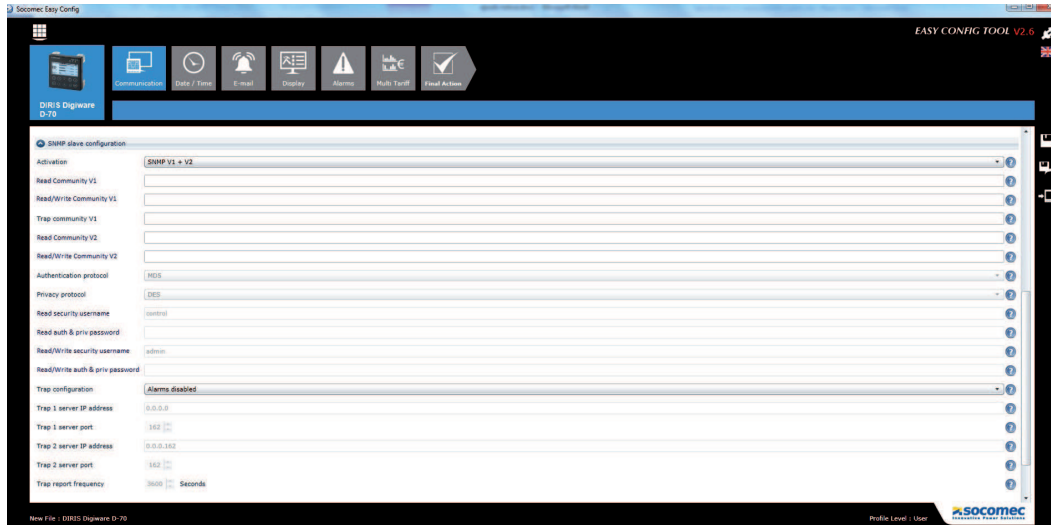
- Modbus TCP
- SNMP
- Bacnet IP
- SMTP(s): Secure or non-secure SMTP: automatic notification emails
- FTP(s): Secure or non-secure FTP: logged data automatic exported

Bacnet IP, SNMP, SMTP and FTP settings are not accessible via the onscreen interface of the device and are only available on a PC:

- SNMP => via the configuration software Easy Config which connects via USB or Ethernet to the DIRIS Digiware D-70 (for more, see the notes on Easy Config)
- Bacnet IP => via the configuration software Easy Config which connects via USB or Ethernet to the DIRIS Digiware D-70 (for more, see the notes on Easy Config)
- SMTP(s) => via the configuration software Easy Config which connects via USB or Ethernet to the DIRIS Digiware D-70 (for more, see the notes on Easy Config)
- FTP => via the embedded web interface Webview on the DIRIS Digiware D-70

7.1.8.1. SNMP

After logging into Easy Config on the DIRIS Digiware D-70, you can find the SNMP settings in the following menu:



- Community configuration SNMP v1 & v2:

Read Community V1: Read-only community string for SNMP v1. Default community string is “public”. It allows a manager to retrieve read-only data from a device connected to the D-70.

Read-Write Community V1: Read-Write community string for SNMP v1. Default Read/Write community string is “private”. It allows a manager to change a setting (ex: position of a Digital output) in a device connected to the D-70.

Trap Community V1: The Trap community string allows the manager to receive notifications in case of an event or alarm

Read Community V2: Read-only community string for SNMP v2. Default community string is “publicv2”. It allows a manager to retrieve read-only data from a device connected to the D-70.

Read-Write Community V2: Read-Write community string for SNMP v2. Default Read/Write community string is “privatev2”. It allows a manager to change a setting (ex: position of a Digital output) in a device connected to the D-70.

- SNMP v3 configuration:

Authentication protocol: If SNMP v3 is activated, you can choose an authentication protocol (MD5 or SHA) to hash your password. For no authentication, select “None”.

Privacy Protocol: Choose between DES or AES privacy protocols for the encryption of data messages. For no encryption, select “None”.

Read security username: Username enabling authentication for read-only functions.

Read authentication & privacy password: Password (also passphrase) accompanying the authentication and privacy protocols, and allowing read-only functions. The length of the Read-only authentication & privacy password must be between 8 and 16 characters.

Read-Write security username: Username enabling authentication for read and write functions

Read-Write authentication & privacy password: Password (also called passphrase) accompanying the authentication and privacy protocols and allowing read and write functions. The length of the Read-Write authentication & privacy password must be between 8 and 16 characters.

- Trap configuration:

Choose to deactivate or activate the traps. For activation, you can choose to broadcast trap notifications to all supervisors on the network or to notify only specific host stations (up to 2).

Trap 1 server IP address: enter the IP address of the 1st host station which will receive trap notifications.

Trap 1 server port: enter the port used to send traps for the 1st host station.

Trap 2 server IP address: enter the IP address of the 2nd host station which will receive trap notifications.

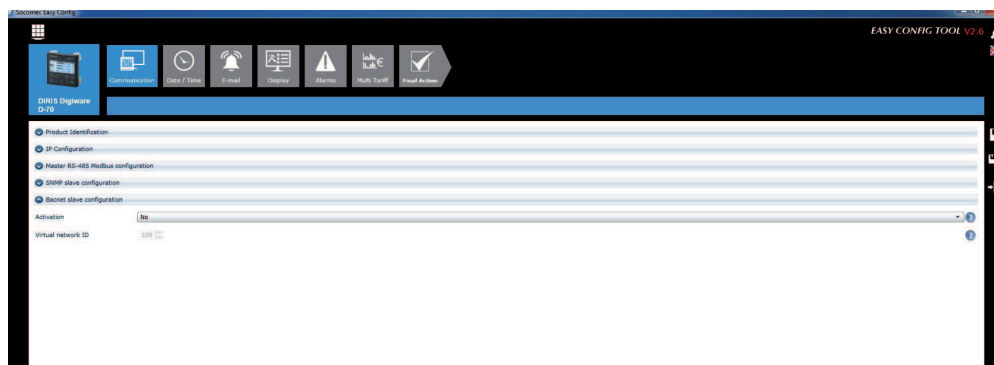
Trap 2 server port: enter the port used to send traps for the 2nd host station.

Trap report frequency: enter the time after which a trap reminder will be sent for on-going alarms. By default, it is set to 60min.

7.1.8.2. Bacnet IP

The PICS file (Protocol Implementation Conformance Statement) is available at www.socomec.com

After logging into Easy Config on the DIRIS Digiware D-70, you can find the BACNET IP settings on the following page:



Activation: enable or disable the Bacnet IP function

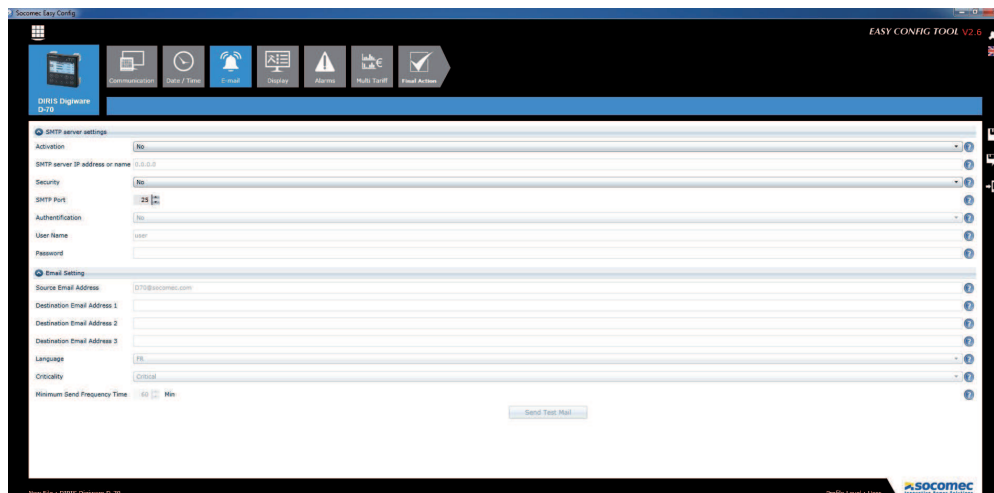
Virtual network ID: set the virtual network ID

The port used by the DIRIS Digiware D-70 for BACnet IP communication is set to 47808 (BAC0 in hexadecimal) and cannot be changed.

7.1.8.3. SMTP(s):

automatic alarm notification emails. Available as standard and secure SMTP.

After logging into Easy Config on the DIRIS Digiware D-70, you can find the SNMP settings on the following page:



Setting up the SMTP server

Activation: enable/disable the SMTP email export function

SMTP server IP address or name: IP address of the SMTP server or name (backup for configured DNS server)

Security: enable or disable security (SMTPs)

SMTP Port: enter the standard unencrypted SMTP port

Secured port: enter the port number for a secured connection. Default port number is 465

Authentication: enable or disable SMTP authentication

User name: enter the user name for the authentication

Password: enter the password for the authentication

Email settings:

Source Email Address:: email address shown when sending emails.

Destination Email Address 1: email address #1 to send email notifications to.

Destination Email Address 2: email address #2 to send email notifications to.

Destination Email Address 3: email address #3 to send email notifications to.

Language: language in which emails are sent.

Criticality: set the degree of criticality to email alerts with just a minimum level of criticality.

Minimum send frequency time: Time after which the email notification is sent by the D-70. This limits the number of emails sent by the D-70, especially when the same alarm changes state repeatedly.

7.1.8.4. FTP(s)

Historical measurement data (see “4.3.3. Introduction to DIRIS Digiware D-70”, page 9) can be automatically exported via FTP.

Go to the FTP configuration using the embedded web server Webview of the DIRIS Digiware D-70.



FTP system: configure FTP server settings

Planning: set how often data needs to be exported

FTP system

Activation

Activate FTP Yes No

Activate Logs Yes No

Activate FTPS Yes No

Files

Destination folder
data

File format
CSV

Identification

Site ID
SITE

Gateway ID

FTP server network settings

Host
0.0.0.0

Port
21

Secured Port
990

Login
-

Password
•••••

Connection test

Activation

Activate FTP: required to activate automatic data export

Activate LOGS: can be useful for troubleshooting in case of a problem

Activate FTPS: activate secure FTP data export

Identification

Site ID and gateway ID: used to identify from which DIRIS Digiware D-70 the files are being exported.

If the file format is configured to “EMS”, the site ID must be changed.

Files

Destination folder: tree view of the FTP server folder in which you want to place the files

File format: there are two different types of data file;

- CSV: file in a .csv format in which data is in a user-friendly layout
- EMS: file in .csv format whose layout is more practical to integrate into monitoring or energy management software

In EMS mode, the exported files are named according to the following:
Site ID_Gateway Id_Device name_Data type_date_time

Example: if an export file is named socomec_8AD4A2_I35_LoadCurve_2017-08-15_20-00-00.csv, it means it contains Load curves (Demand Power) from a device named I35 from a gateway whose ID is 8AD4A2 and site ID is socomec.

FTP server network settings

This shows the login details for the FTP server (standard or secure).

Host: enter the IP address of your FTP server

Port: enter the non-secure port to use for FTP export

Secured port: enter the secured port to use for FTP(s) export

Login: enter your login

Password: enter your password

Planning

Load Curves

Deactivated

Every Hours

Every at Hours Minutes

Index

Deactivated

Every Hours

Every at Hours Minutes

Trends

Deactivated

Every Hours

Every at Hours Minutes

DIRIS Digiware D-70 devices can log 3 types of data:

- The energy counters => INDEX
- The load curves (Demand power) => LOAD CURVES
- Historical measurements (archived data: I, U, P, FP, T °C...) => TRENDS

Data can also be exported separately, manually specifying their time intervals.

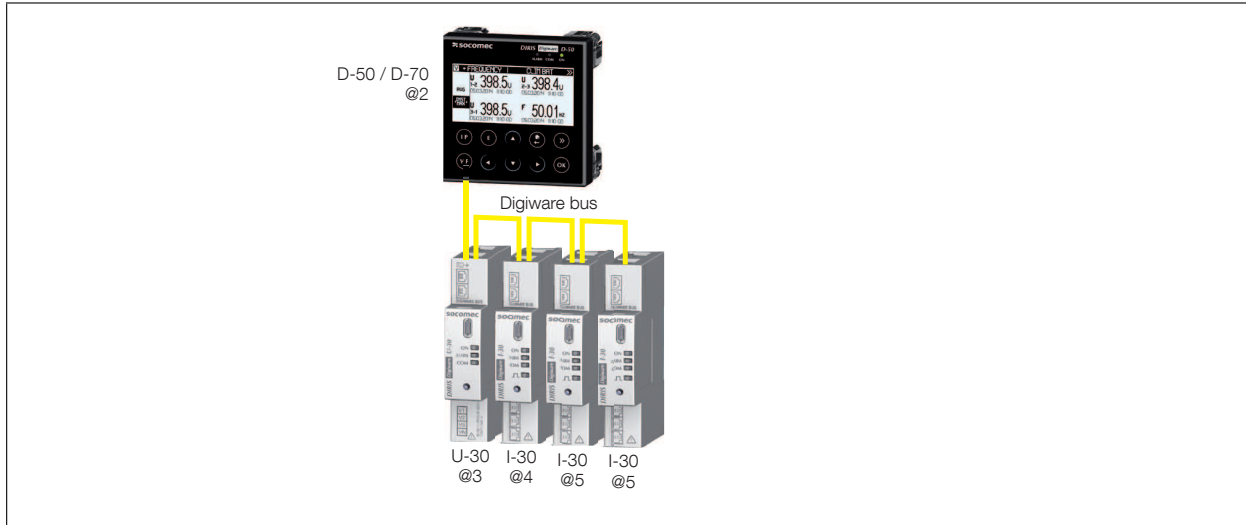
7.2. Detecting and addressing

With auto-addressing mode you can have the system automatically assign addresses to devices connected to the DIRIS Digiware D. This mode is only compatible with DIRIS B and Digiware PMDs. The addresses will be allocated manually on the other PMD (DIRIS A) and meters (COUNTIS).

7.2.1. DIRIS Digiware D-50 / D-70

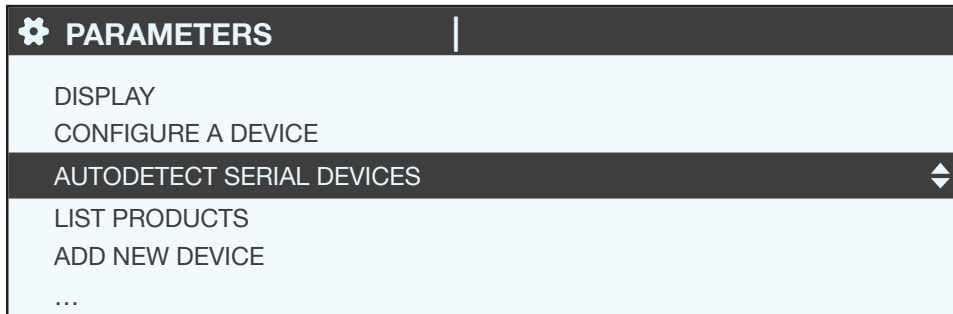
Example of auto-addressing on the D-50 / D-70.

Four products are connected to the D-50 / D-70. Two are addressed correctly, the other two have an identical address.



To resolve address conflicts, go to PARAMETERS / AUTODETECT SERIAL DEVICES:

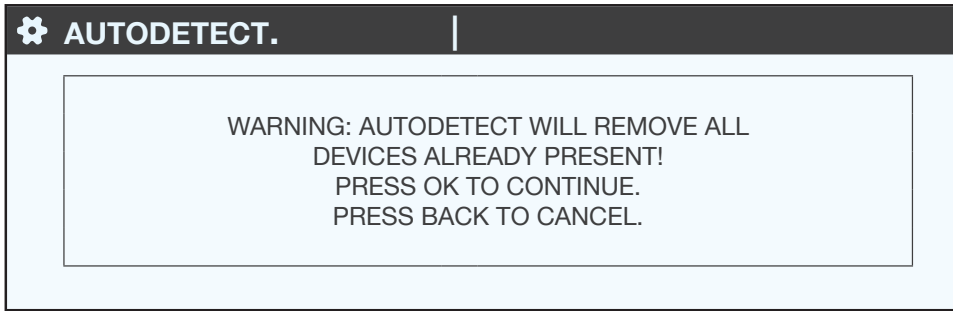
With this function you can detect all the products connected with the Digiware bus and/or the RS485 bus to the DIRIS Digiware D display. This function does not apply to DIRIS D-30.



Select "START" then "OK" to start the scan/detection process (this can take up to 3 minutes).



Please be aware that this removes all previously found devices (if they are still there they will be found again).



The different stages follow automatically:

- DETECTING ADDRESS

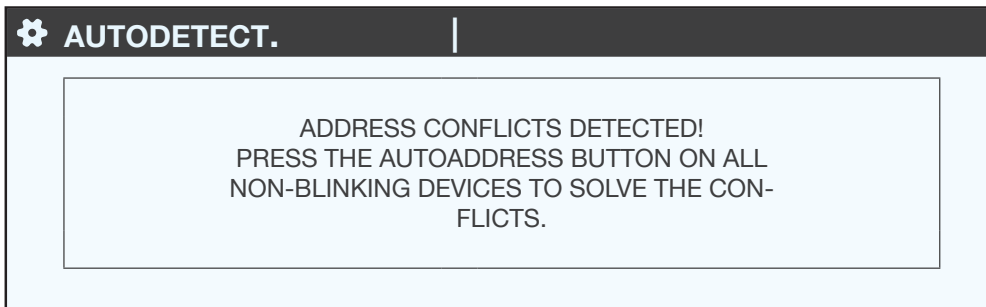


- ADDR SCANNING



When the STATUS "STOPPED" appears, the system has ended its search.

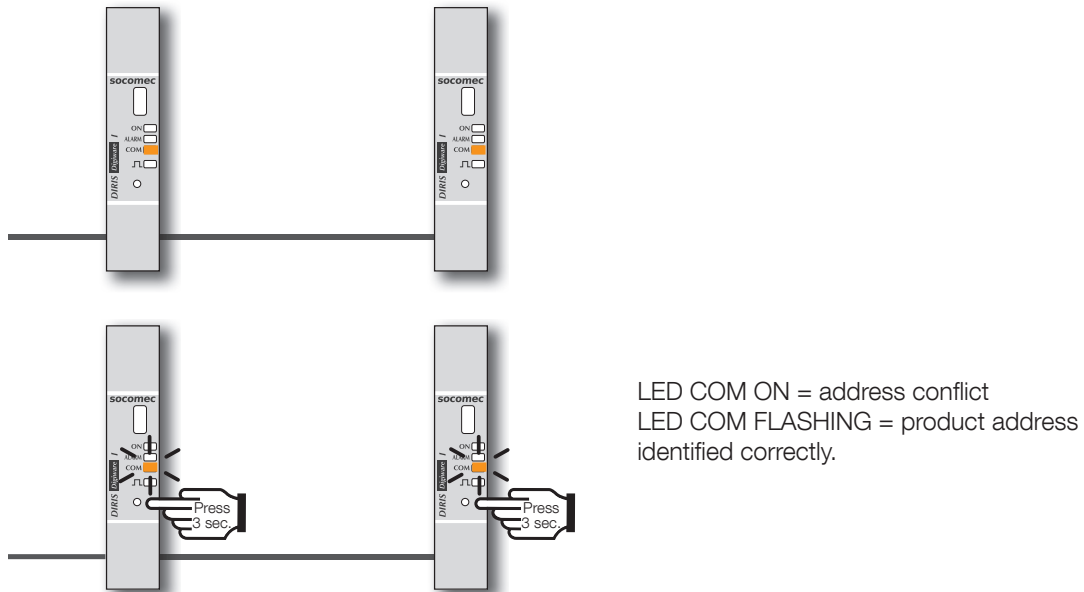
The number of found devices is the number of devices that have been correctly located (two in this example). If there is an address conflict (if 10 products have the same address, this is taken as a single conflict, not 10 conflicts), this means multiple products have the same address (two in this example). In this case, assign them individual and unique addresses.



Press "OK".

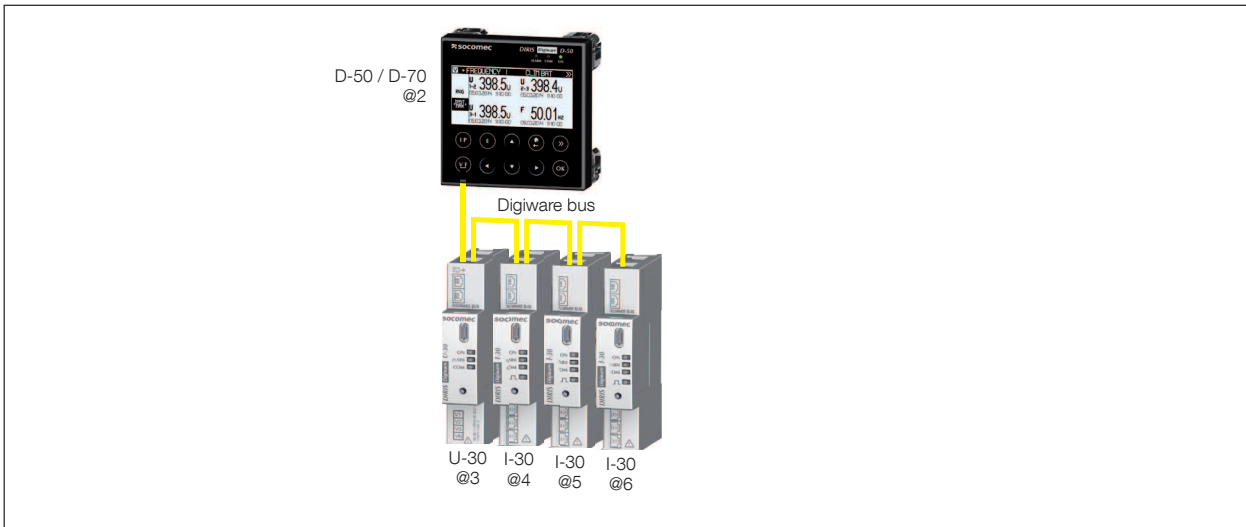
AUTODETECT.	
STATUS:	SET ADDRESSES
FOUND DEVICES	002
ADDR CONFLICTS	001
STOP	

To go to this address, locate the lit "COM" LED on the front of each product. Press and hold down this button for a few seconds until the LED flashes:



AUTODETECT.	
STATUS:	STOPPED
FOUND DEVICES	004
ADDR CONFLICTS	000
START	

The display now shows the number of detected products increase and the number of conflicts decrease to reach zero once all products have a unique address.



You can then check the list of found products along with their addresses.

PARAMETERS	LOAD1
DISPLAY	
CONFIGURE A DEVICE	
AUTODETECT SERIAL DEVICES	
LIST PRODUCTS	◆
ADD NEW DEVICE	
...	

Example:

LIST PROD.	LOAD1
Diris U30 ID:545434	@003 ◆
Diris I30 ID:F0C1D2	@004
Diris I30 ID:F0C1D3	@005
Diris I30 ID:F0C1D4	@006

You can find the codes on the marking on the products (546434 on U-30 and F0C1D2 on one of the I-30s) in the photo:



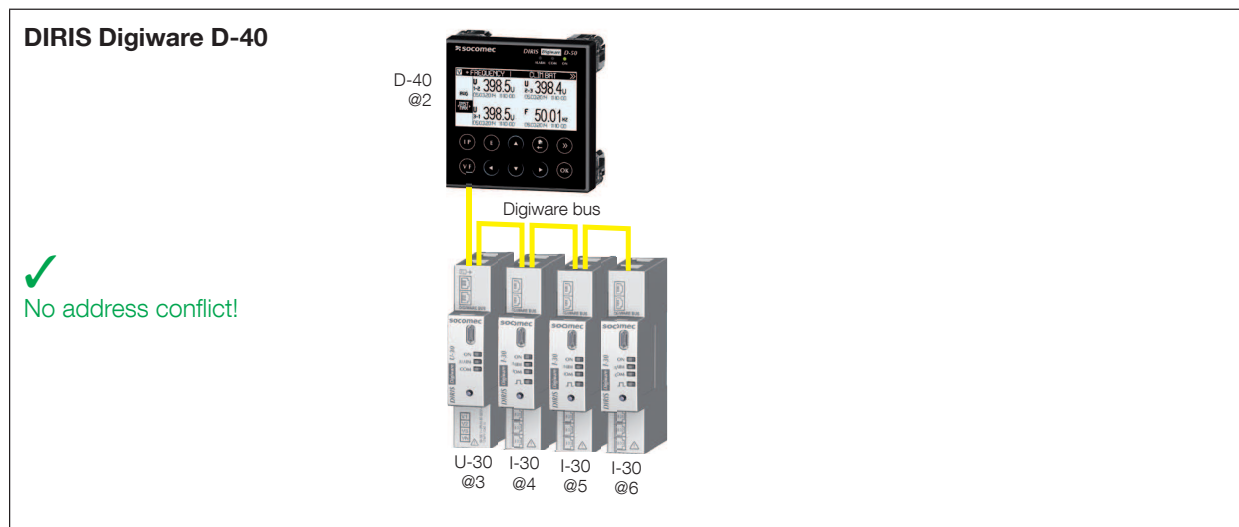
We can now configure the products individually.

7.2.2. DIRIS Digiware D-40

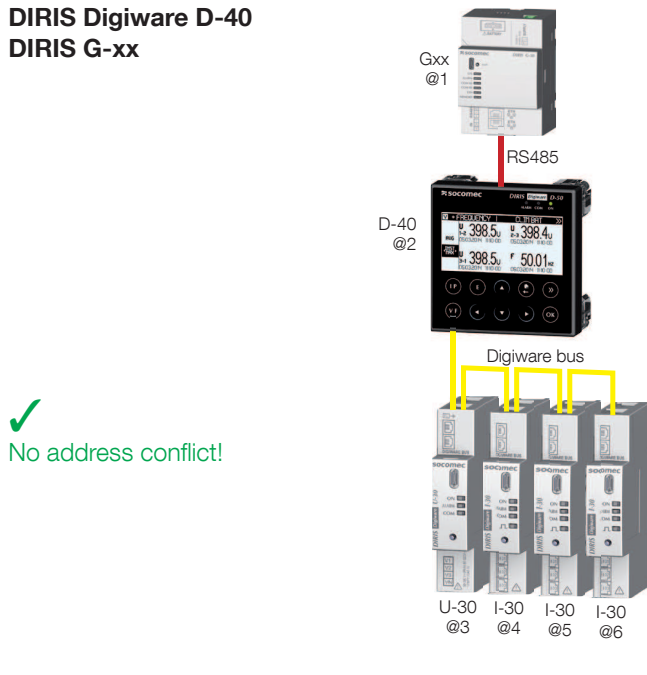
7.2.2.1. Addressing range

To avoid a conflict of addresses, first define a range of addresses that can be assigned to auto-detected when products.

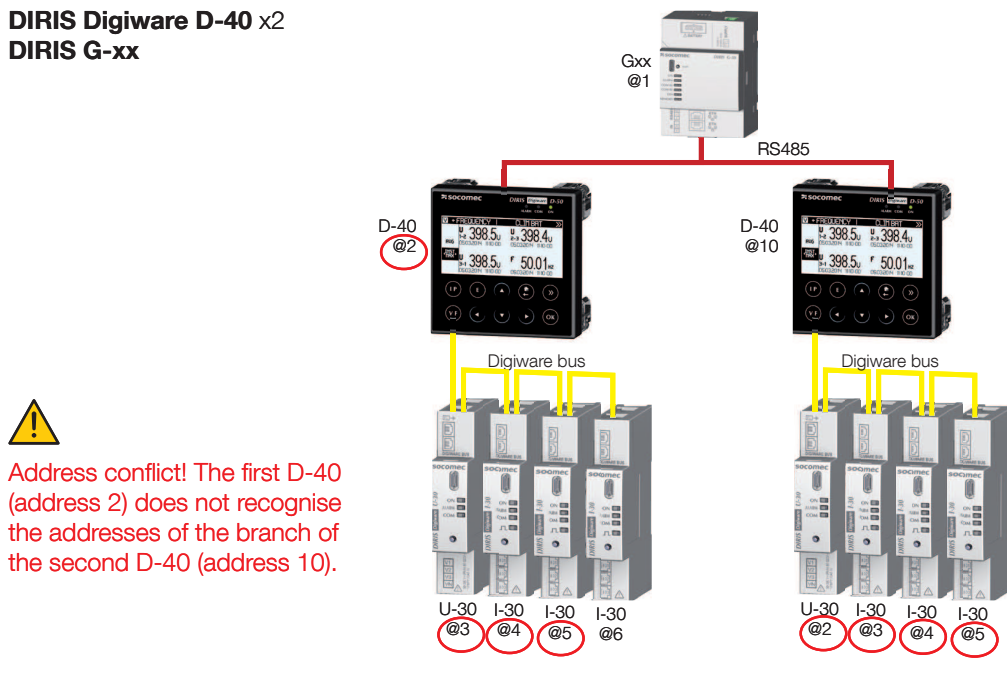
Below are some examples of communication architecture.



**DIRIS Digiware D-40
DIRIS G-xx**



**DIRIS Digiware D-40 x2
DIRIS G-xx**

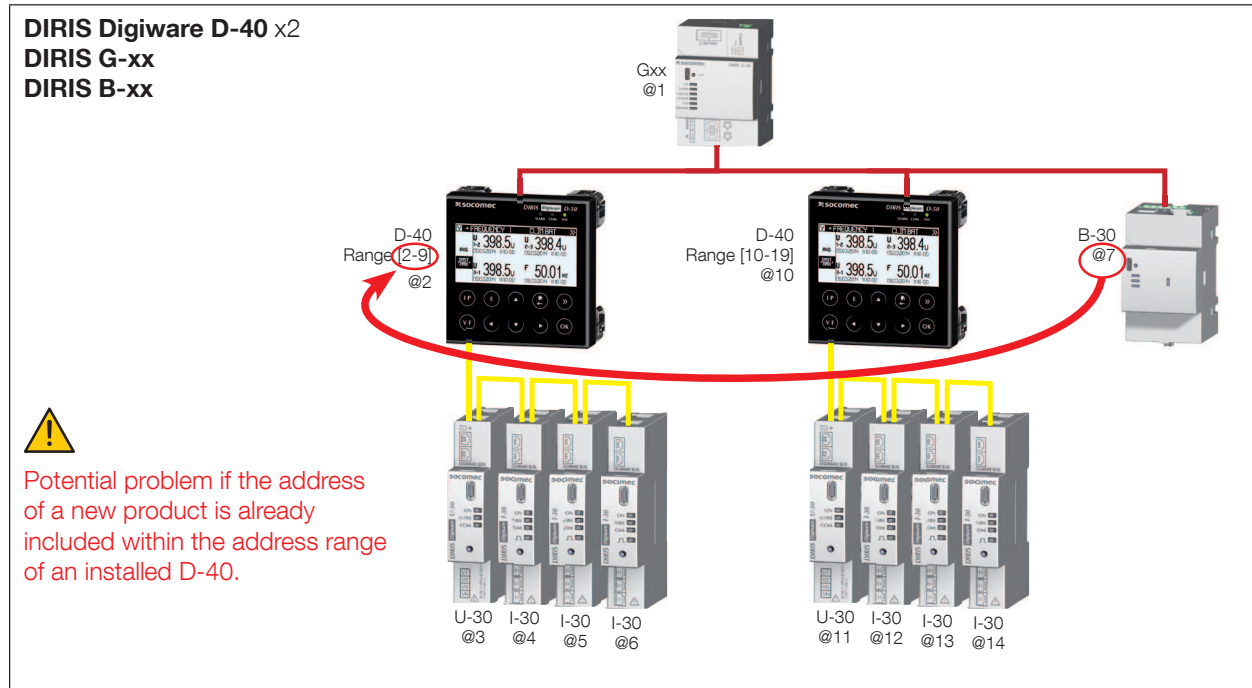
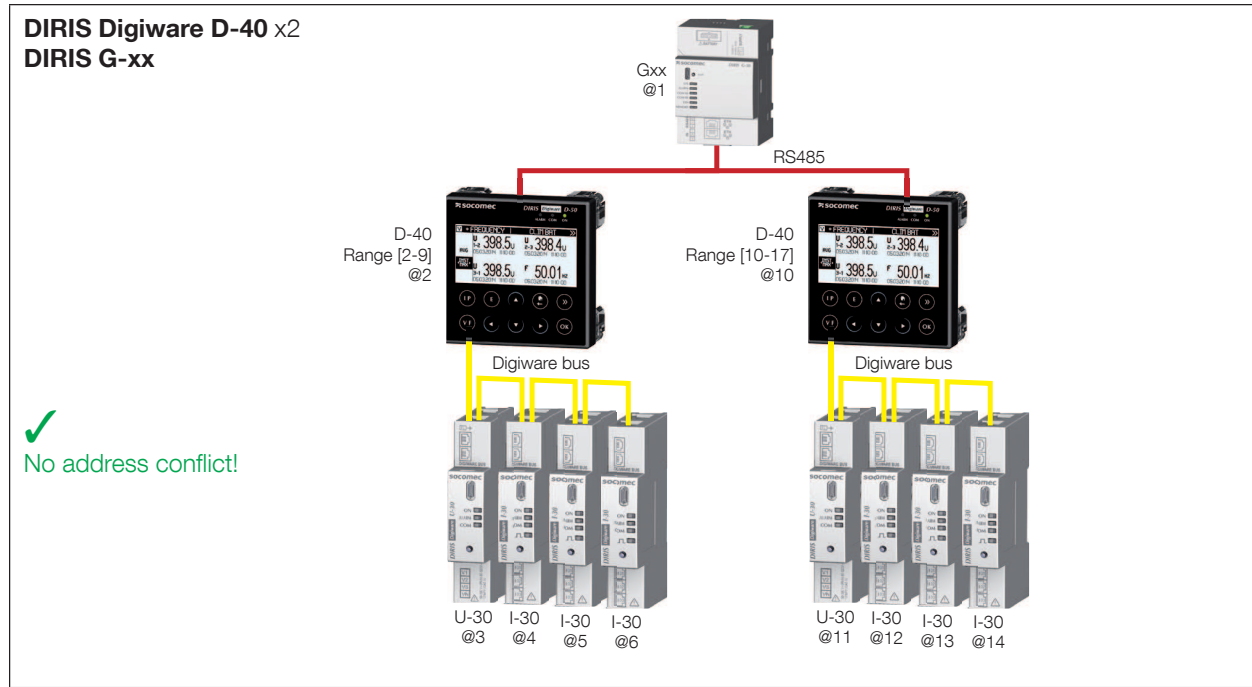


With this communication architecture, each DIRIS Digiware D-40 allocates addresses to the products on its branch, but it ignores addresses of devices from a different branch where there is a potential risk of conflicting addresses! The RS485 communication parameters upstream of the D-40 devices are separate from the Digiware parameters downstream of the D-40 devices. This means that the communication baudrate is also separate, and may vary between the upstream RS485 bus and the downstream Digiware bus.

To avoid these conflicts:

- The user must first define a different range of addresses for each Digiware D-40 DIRIS branch.
- The smallest address is assigned to the D-40.
- The following addresses are assigned to products connected to the D-40.

Example address selection:



The user must also take into account the addresses of other products connected to the RS485 network.

7.2.2.2. Setting the addressing range

HOME

- LOADS
- MEASURES
- INPUTS/OUTPUTS
- EVENTS
- PARAMETERS**
- ...

PARAMETERS

- DISPLAY**
- CONFIGURE A DEVICE
- AUTODETECT SERIAL DEVICES
- LIST PRODUCTS
- ADD NEW DEVICE
- ...

PARAM AFF

- LANGUAGE
- DATE FORMAT
- DIGIWARE ADDRESSING RANGE**
- RS485 SLAVE COMMUNICATION
- CONF. DATE ON REMOTE PRODUCT
- ...

DIGIWARE ADDR

START ADDRESS	002	◆
END ADDRESS	035	
D40 ADDRESS	002	
NB ADDR. POSSIBLE	032	
APPLY SETTINGS		

DIGIWARE ADDR

START ADDRESS	002	
END ADDRESS	009	◆
D40 ADDRESS	002	
NB ADDR. POSSIBLE	007	
APPLY SETTINGS		

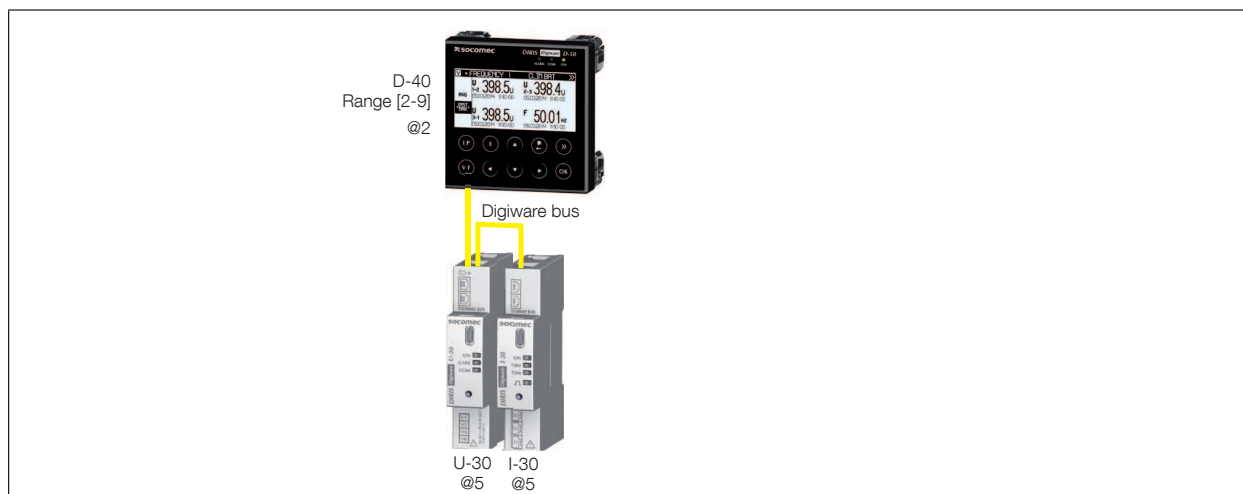
⚙️ DIGIWARE ADDR	
START ADDRESS	002
END ADDRESS	009
D40 ADDRESS	002
NB ADDR. POSSIBLE	007
APPLY SETTINGS ↕	

7.2.2.3. Auto-addressing

Once the address ranges are configured on the D-40, you can launch the auto-addressing process for connected products.

Example of auto-addressing on the D-40.

Two products are connected to the D-40. They have an identical address.



To resolve address conflicts, go to PARAMETERS / AUTODETECT SERIAL DEVICES:

With this function you can detect all the products connected with the DIGIWARE bus and/or the RS485 bus to the DIRIS Digeware D display.

⚙️ PARAMETERS	
DISPLAY	
CONFIGURE A DEVICE	
AUTODETECT SERIAL DEVICES ↕	
LIST PRODUCTS	
ADD NEW DEVICE	
...	

Select "START" then "OK" to start the scan/detection process (this can take up to 3 minutes).

AUTODETECT.	
STATUS	STOPPED
FOUND DEVICES	000
ADDR CONFLICTS	000
DIGIWARE ADDRESSING RANGE	002-009
START	

Caution: this removes all previously found products (if they are still there they will be found again).

AUTODETECT.	
WARNING: AUTODETECT WILL REMOVE ALL DEVICES ALREADY PRESENT! PRESS OK TO CONTINUE. PRESS BACK TO CANCEL.	

Press "OK".

The different stages follow automatically:

- DETECTING ADDRESS

AUTODETECT.	
STATUS:	DETEC. ADDRESS
FOUND DEVICES	000
ADDR CONFLICTS	000
DIGIWARE ADDRESSING RANGE	002-009
STOP	

- ADDR SCANNING

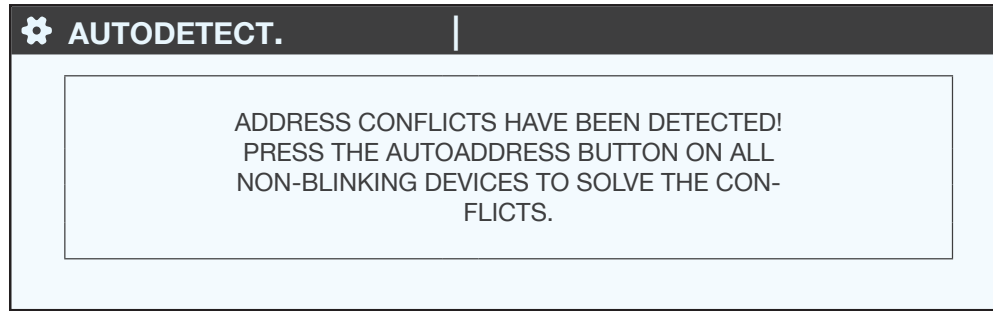
AUTODETECT.	
STATUS:	ADDR SCANNING
FOUND DEVICES	000
ADDR CONFLICTS	001
DIGIWARE ADDRESSING RANGE	002-009
STOP	

When the STATUS "STOPPED" appears, the system has ended its search.

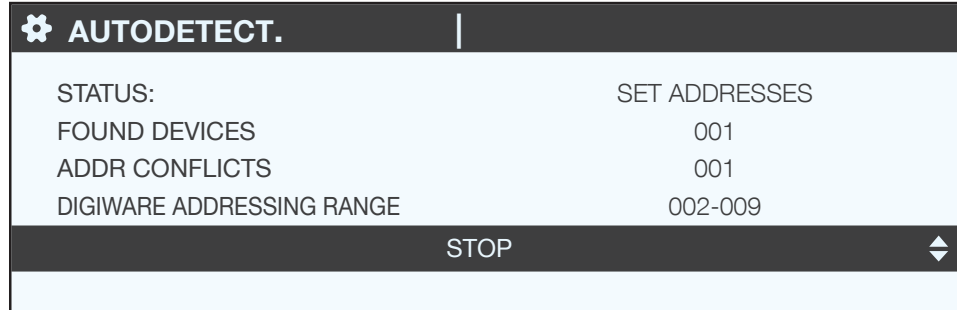
The number of found devices is the number of devices that have been correctly located.

If there is an address conflict (if 10 products have the same address, this is taken as a single conflict, not 10 conflicts), this means multiple products have the same address (two in this example). In this case, assign them

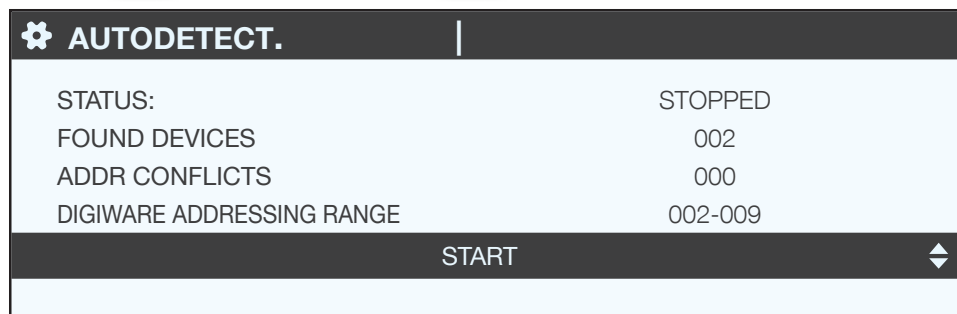
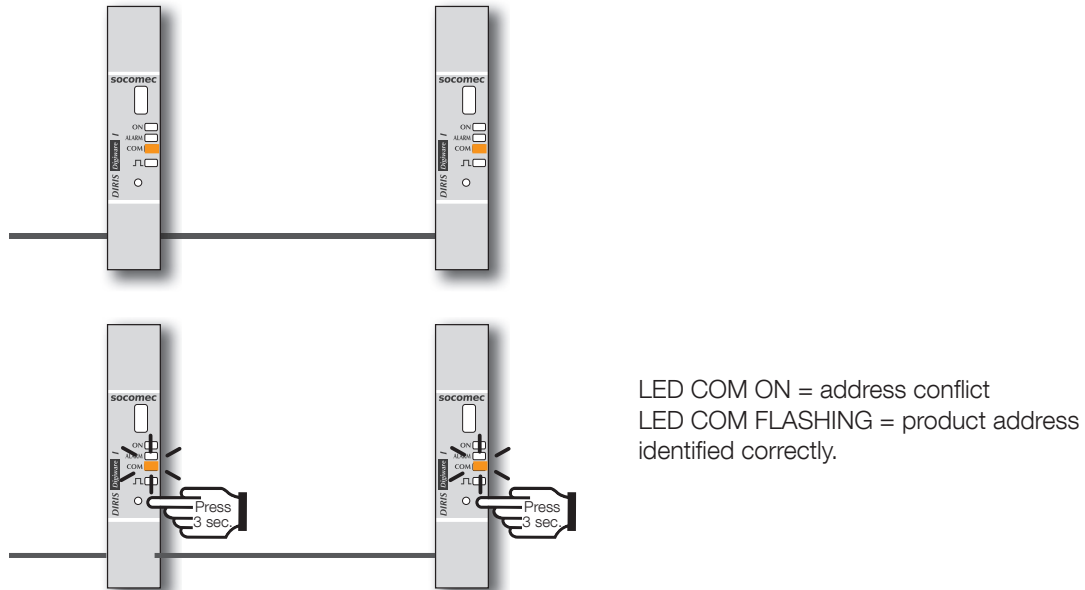
individual and unique addresses.



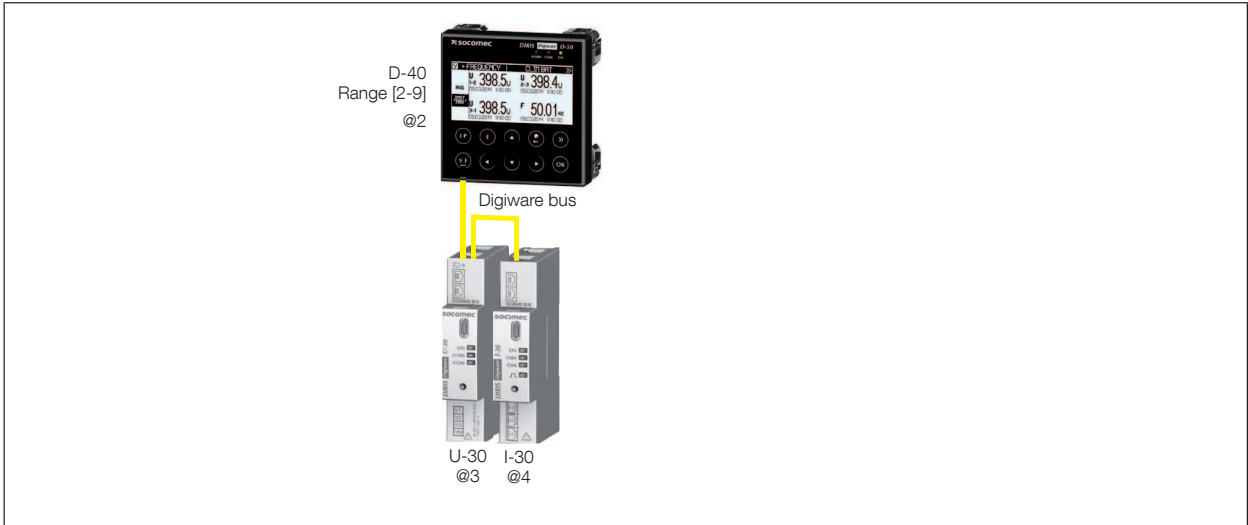
Press "OK". The following screen appears:



To go to this address, locate the lit "COM" LED on the front of each product. Press and hold down this button for a few seconds until the LED flashes:



The display now shows the number of detected products increase and the number of conflicts decrease to reach zero once all products have a unique address.



You can then check the list of found products along with their addresses.

PARAMETERS	LOAD1
<ul style="list-style-type: none"> DISPLAY CONFIGURE A DEVICE AUTODETECT SERIAL DEVICES 	
LIST PRODUCTS	◆
ADD NEW DEVICE	
...	

Example:

LIST PROD.	LOAD1
Diris U30 ID:545434	@003 ◆
Diris I30 ID:F0C1D2	@004

7.3. Configuring each meter and measuring device

You can also set the DIRIS Digiware range and the DIRIS B range with the display.

"Parameters" > "Configure a device".

PARAMETERS	LOAD1
DISPLAY	
CONFIGURE A DEVICE	◆
AUTODETECT SERIAL DEVICES	
LIST PRODUCTS	
ADD NEW DEVICE	
...	

There are two stages to electrically configuring the various devices:

- **Network:** setting the type of voltage network: single-phase (1P+N), two-phase (2P), three-phase without neutral (3P), three-phase with neutral (3P+N).
- **Load:** configuring all the loads/outputs used. You can, for example, have a three-phase network voltage, on which three-phase and single-phase loads are measured.

With DIRIS Digiware U-xx you can configure the network

LIST PROD.	
Diris I30 ID:FOC1D2	@004
Diris U30 ID:546434	@006



SELECT PROD.	Diris U30 ID:546434
NETWORK	◆

With DIRIS Digiware I-XX you can configure the loads

SELECT PROD..	
Diris I30 ID:FOC1D2	@004
Diris U30 ID:546434	@006



SELECT PROD.	Diris I30 ID:FOC1D2
LOADS	

With DIRIS B you can configure the network and loads at the same time.

7.3.1. Network configuration

You can configure the various network voltage parameters:

- Nominal voltage:
This is the phase-phase voltage (usually 400 V) for three-phase networks
This is the phase-neutral voltage (usually 230 V) for single-phase networks
- Network type: single-phase (1P+N), two-phase (2P), three-phase without neutral (3P), three-phase+neutral (3P+N)
- Nominal frequency: 50 or 60 Hz depending on the country

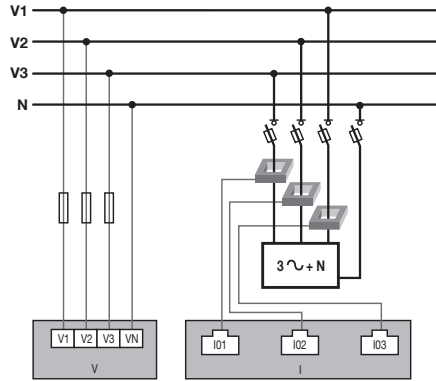
PARAMETERS	Diris U30 ID:546434
NOMINAL VOLTAGE	00400
NETWORK TYPE	3P + N
NOMINAL FREQUENCY	50HZ
PRESS OK TO CONFIRM	

7.3.2. Configuring loads

You can simultaneously measure multiple single-phase, two-phase and three-phase loads on a DIRIS B or DIRIS Digiware display.

7.3.2.1. Example of a load configuration

This example shows a DIRIS Digiware I-30 measuring a three-phase + neutral load using 3 current transducers.



⚙️ OUTPUT		Diris I30 ID:FOC1D2		
LINES		I1	I2	I3
TC		250 A	250 A	250 A
DIRECTION		+/DIRECT	+/DIRECT	+/DIRECT
LINE V		V3	V2	V1
OUTPUT		L1	L1	L1
TYPE		3P+N_3CT	3P+N_3CT	3P+N_3CT

PRESS OK TO ENTER SETTINGS



The transducer connected to the current 1 input measures the current of phase 3 (V3)
 The transducer connected to the current 2 input measures the current of phase 2 (V2)
 The transducer connected to the current 3 input measures the current of phase 1 (V1)

⚙️ OUTPUT		Diris I30 ID:FOC1D2		
LINES		I1	I2	I3
TC		250 A	250 A	250 A
DIRECTION		+/DIRECT	+/DIRECT	+/DIRECT
LINE V		V3	V2	V1
OUTPUT		L1	L1	L1
TYPE		3P+N_3CT	3P+N_3CT	3P+N_3CT

PRESS OK TO ENTER SETTINGS

The 3 current inputs I1, I2, I3 are assigned to the same output / three-phase load no. 1 (L1).

⚙️ OUTPUT		Diris I30 ID:FOC1D2		
LINES		I1	I2	I3
TC		250 A	250 A	250 A
DIRECTION		+/DIRECT	+/DIRECT	+/DIRECT
LINE V		V3	V2	V1
OUTPUT		L1	L1	L1
TYPE		3P+N_3CT	3P+N_3CT	3P+N_3CT
PRESS OK TO ENTER SETTINGS				

The TC field indicates the type of earth fault connected and the direction shows if it was mounted upright or inverted (upright gives a good overview of the positive powers rather than the negative powers shown when inverted: see +100 kW instead of -100 kW, for example):

⚙️ OUTPUT		Diris I30 ID:FOC1D2		
LINES		I1	I2	I3
TC		250 A	250 A	250 A
DIRECTION		+/DIRECT	+/DIRECT	+/DIRECT
LINE V		V3	V2	V1
OUTPUT		L1	L1	L1
TYPE		3P+N_3CT	3P+N_3CT	3P+N_3CT
PRESS OK TO ENTER SETTINGS				

7.3.2.2. Changing the load settings

Following the example above, to change the settings, press "OK".

⚙️ OUTPUT		Diris I30 ID:FOC1D2		
LINES		I1	I2	I3
TC		250 A	250 A	250 A
DIRECTION		+/DIRECT	+/DIRECT	+/DIRECT
LINE V		V3	V2	V1
OUTPUT		L1	L1	L1
TYPE		3P+N_3CT	3P+N_3CT	3P+N_3CT
PRESS OK TO ENTER SETTINGS				

You can change each parameter to configure each of the loads (the values shown onscreen are shown in bold - see the example below).

- OUTPUT -> configure load 1: **L1** - load 2: L2 - load 3: L3
- NAME -> name of the load: **LOAD 1** (edit with max. 16 characters)
- TYPE -> type of load: single-phase (1P+N), two-phase (2P), three-phase (3P), **three-phase+neutral (3P+N)**
- I RATED -> set the rated current of the load: **20A** (caution: the rated current of the load may differ from the transducer (CT1) used: you can have a 63A transducer monitoring a 20A circuit breaker output.
- CT1 -> current measured by the transducer: **I1**, I2, I3.

PARAMETERS		Diris I30 ID:FOC1D2
OUTPUT		◀ L1 ▶
NAME		LOAD 1
TYPE		3P+N_3CT
I NOMINAL		00020
CT1		I1
...		

Go back to "CONFIG CT" to make detailed settings for the current transducer:

PARAMETERS		Diris I30 ID:FOC1D2
...		
NAME		LOAD 1
TYPE		3P+N_3CT
I NOMINAL		00020
CT1		I1
		CONFIG. CT
...		

Configure:

- DIRECTION -> Direction of the transducer (**+ / DIRECT**, - / REVERSE)
- LINE V -> V1, V2, **V3** (is the transducer positioned on phase 1, phase 2, phase 3?).
- TC -> change report. If a transducer is connected to the product, press "DETECT" to configure it automatically

Complete the process by selecting "OK" then "OK" again

CONFIG LINES		Diris I30 ID:FOC1D2
DIRECTION		+ / DIRECT
LINE V		V3
TC		0600
		DETECT
		OK

If a load is configured as three-phase or three-phase+neutral, for example, you would have to configure multiple current transducers (e.g. 3 transducers for one three-phase load):

⚙️ CONFIG LINES		Diris I30 ID:FOC1D2	
...			
CT2	CONFIG. CT	I2	
CT3	CONFIG. CT	I3	
	CONFIG. CT		⬆️
...			

When you have finished configuring the entire load (L1) (type of load, name, rated current, all configured transducers), set the following loads (L2, L3) from the "OUTPUT" line:

⚙️ PARAMETERS		Diris I30 ID:FOC1D2	
OUTPUT		◀L1▶	⬆️
NAME		LOAD 1	
TYPE		3P+N_3CT	
I NOMINAL		00020	
CT1		I1	
...			

For example, a DIRIS Digiware I-30 with 3 current inputs is best for measuring:

- 1 three-phase load (1 three-phase load L1 using the current inputs I1, I2, I3)
- 3 single-phase loads (1 L1 single-phase load with a transducer connected to the I1 current input, 1 L2 single-phase load with a transducer connected to the I2 current input, 1 L3 single-phase load with a transducer connected to the I3 current input).

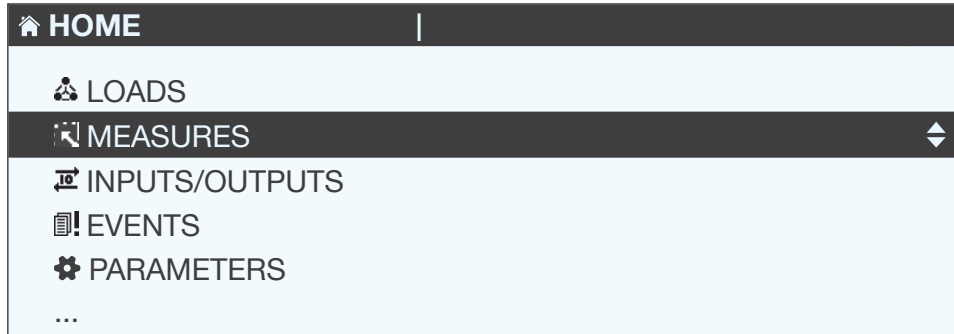
There are a number of other possible load combinations.

When all the outputs/loads are configured (maximum 3 on one DIRIS Digiware I-30), apply your settings by selecting "SEND SETTINGS" and click "OK".

⚙️ CONFIG LINES		Diris I30 ID:FOC1D2	
...			
CT3		I3	
	CONFIG. CT		
CT4		I1	
	CONFIG. CT		
	SEND SETTINGS		⬆️

8. USE

Once the loads are configured, you can view the measures of each load on the "MEASURES" menu. You can view active and past alerts on the "EVENTS" menu. If an alert is active, the "ALARM" LED is on.



9. SNMP COMMUNICATION WITH THE DIRIS DIGIWARE D-70

9.1. SNMP generalities

SNMP stands for Simple Network Management Protocol and is widely used by administrators for an easy network monitoring of devices on IP networks. It works in a client-server communication mode on an Ethernet physical layer.

Once enabled from the Easy Config configuration software, the DIRIS Digiware D-70 display supports SNMP v1, v2 and v3. The D-70 is an agent SNMP v1, v2, v3 which responds to queries from managers (also called management stations or supervisors).

The D-70 allows access through SNMP of measurement data from SOCOMEC slaves connected via the RS485 bus or the Digiware bus.

Data from the slaves can be reached through a file called "MIB" ("Management Information Base") under a hierarchical and pre-defined structure. The MIB file of the D-70 is named "socomec-diris-products-mib" and is available from www.socomec.com

The file must be uploaded in the Management station managing your metering system.

The Tree structure of the MIB contains multiple OIDs (Object Identifiers). An OID uniquely identifies and labels a managed object (=parameter from metering devices) in the MIB.

For example, the electrical parameter "Current Inst I1" is identified by one OID. "Current Inst I2" is identified by another one.

Common SNMP terms	Consumption curves
Agent	Corresponds to the D-70: Interface between the PMDs and the manager
Managed device	The PMDs connected downstream the D-70 (ex: I-35, DIRIS B, DIRIS A...)
MIB	Management information base where the OIDs are organized in a hierarchical tree
OID	An object identifier that uniquely identifies and labels a managed object in the MIB hierarchy
Community strings	A text that enables the authentication between an agent and the manager
Traps	Notifications sent by the agent and received by the manager

9.2. SNMP functions supported

There are 4 types of SNMP requests supported by the D-70:

- **GetRequest:** to retrieve the variable of an OID (I1 Inst for example)
- **GetNextRequest:** to retrieve the variable of the next OID (I2 Inst in this case)
- **GetBulk:** to retrieve multiple variables gathered together
- **SetRequest:** to change the value of one variable. In the D-70, only used to change the state of a Digital output (for an IO-10 for example).
- **Traps:** Unlike the above commands which are initiated by the SNMP manager, Traps are initiated by the Agents with no solicitation from the Manager. Traps are notifications to the Manager by the Agent of the occurrence of an event.

Traps are sent by the agent in case one of the following alarms occurs:

- Alarm on a measurement
- Logical alarm (change of status of a Digital input)
- Combination alarms
- PQ events (inrush, voltage swells, voltage sags/dips, voltage interruptions)
- System alarms (Phase Rotation, CT disconnect, VI association)

Traps are sent automatically when the alarm occurs. They will be sent again once the “Trap report frequency” time (entered in Easy Config) is elapsed.

The alarm must be activated in the product (using the configuration software Easy Config) in order for the Traps to be sent.

Traps can either be configured for specific hosts or “broadcast” to the whole network. Up to two server IP addresses can be entered in Easy Config for SNMP trap notification of specific hosts.

9.3. SNMP versions supported

The DIRIS Digiware D-70 can use all three versions of SNMP: SNMPv1, v2 and v3.

- **SNMPv1 and v2:**

The identification is based on Read-only and Read-Write Community passwords. They are non-encrypted and are passed over the network in plaintext.

Both passwords have to be entered in the Agent (D-70) and the Manager and must be identical.

A matching Read Community allows the Get functions to be executed on the agent.

A matching Read-Write Community also allows the Set function to be executed on the agent.

- The default Read Community V1 password is “public” and the default Read-Write Community V1 password is “Private”.
- The default Read Community V2 password is “publicv2” and the Read-Write Community V2 is “privatev2”.

- **SNMPv3:**

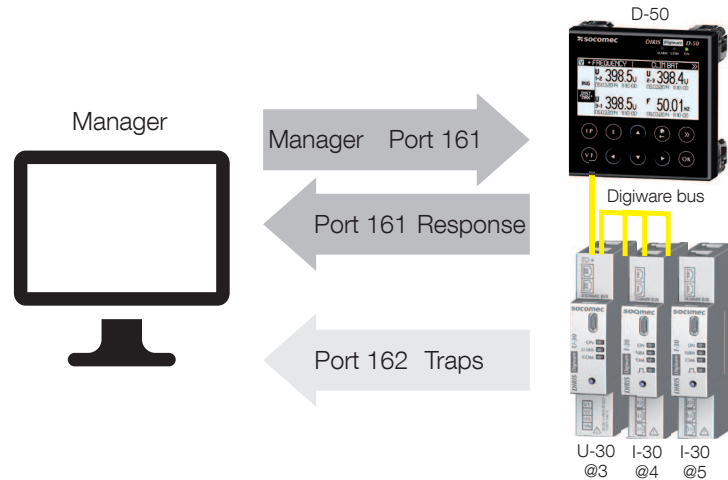
SNMPv3 uses the USM (User-based Security Module) for controlling access to information available via SNMP. This version offers more security using three important features to prevent the interception and deciphering of data:

- A username (called security username)
- MD5 and SHA1 authentication protocols to hash the passwords
- DES and AES Privacy protocols to encrypt the data

9.4. SNMP ports

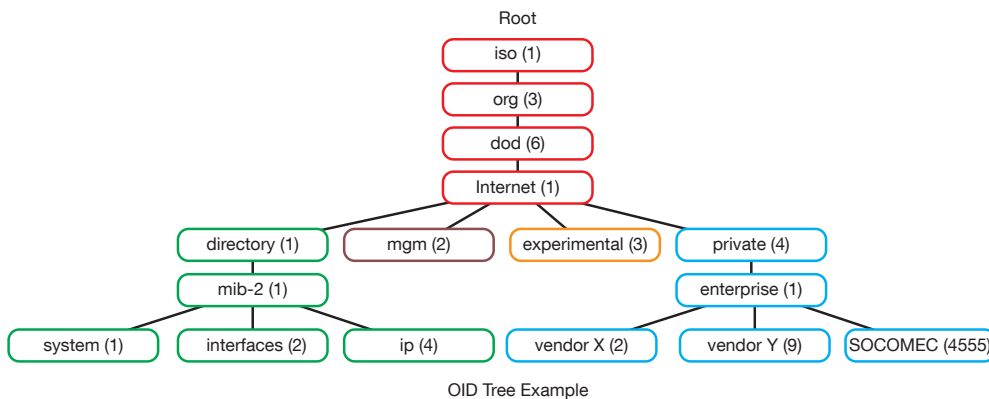
The D-70 is configured with standard SNMP ports to receive requests and send notifications:

Port	Description
161	Used to send and receive requests from the manager.
162	Used by the manager to receive notifications from the agent



9.5. Retrieving data using the D-70 MIB file

The D-70 is compliant with MIB-II defined by the MIB standard RFC 1213 which defines the following structure:



The standard branches are under the same parent branch structure: 1.3.6.1.4.1

The “Private (4)” group enables vendors to define private branches including the MIB OIDs of their own products. Data related to SOCOME metering devices is located under the SOCOME enterprise category identified by OID 1.3.6.1.4.1.4555. This implies that all queries from a manager to SOCOME agents will start by the base path 1.3.6.1.4.1.4555.

Because the Digiware system is a multi-circuit system, the D-70 creates a dynamic table which depends on the products connected downstream compatible with the D-70 and the loads configured on each product. After adding/deleting a downstream device or a load, make sure to update the topology of the D-70 display. This can be done either directly from the display or from Webview:

- Add or delete a device
- Refresh the loads

Example: The OID for “Current Inst I1” will return a value for all I-xx, B-xx, DIRIS A etc.. On the contrary, the OID for “THD Inst I1” will return “0” for an I-30 or an I-31 module.

This implies that each OID can be associated with several products and several loads.

For example the OID for instCurrentI1 is represented by the sequence 1.3.6.1.4.1.4555.10.20.20.1.10000.

OID sequence	Description
4555	“SOCOMECEC” enterprise branch
10	“SocomecProducts” table
20	“ProductMetrology” table
20	“InstantaneousTable”
1	Entry (always = 1)
10000	Service ID

This OID is associated with the multiple devices connected downstream the D-70.

To identify those multiple devices, the Modbus address and the load number are added to the end of the OID.

Example: Let us consider the following architecture:



Product	I-30	I-30
Modbus address	4	5
Load type	Load 1: 3P + N - 3CT	Load 1: 1P + N - 1CT Load 2: 1P + N - 1CT Load 3: 1P + N - 1CT

The final OID to get the instantaneous current I1 for the I-30 module @ Modbus address 4 for load 1 is:

1.3.6.1.4.1.4555.10.20.1.10000.4.1

For the I-30 module @ address 5, there are multiple loads configured. This implies that the Modbus address must be followed by the Load number in the OID.

Therefore, the final OID used to request I1 Inst for load 1 of the I-30 @ address 5 is:

1.3.6.1.4.1.4555.10.20.1.10000.5.1

The final OID to request I1 Inst for load 2 of the I-30 @ address 5 is **1.3.6.1.4.1.4555.10.20.1.10000.5.2**

The final OID to request I1 Inst for load 3 of the I-30 @ address 5 is **1.3.6.1.4.1.4555.10.20.1.10000.5.3**

OID sequence	Description
4555	“SOCOMECEC” enterprise branch
10	“SocomecProducts” table
20	“ProductMetrology” table
20	“InstantaneousTable”
1	Entry (always = 1)
10000	Service ID
5	Modbus Address
3	Load number

Note: A request to OID 1.3.6.1.4.1.4555.10.20.1.10001.5 will return “0” because only single-phase loads are configured in the I-30 module @ address 5, which means currents I2 and I3 parameters aren’t used.

10. BACNET COMMUNICATION WITH THE DIRIS DIGIWARE D-70

The DIRIS Digiware D-70 supports the BACnet IP protocol, once enabled from the Easy Config software (see 7.1.8.2).

It acts as a BACnet IP gateway to all devices compatible and connected downstream via RS485 or the Digiware Bus.

The PICS (Protocol Implementation Conformance Statement) of the D-70 is available on the Socomec website at www.socomec.com.

10.1. BACnet Generalities

BACnet provides a method for computer-based control equipment from different manufacturers to be interoperable. BACnet is designed to handle many types of building controls, including HVAC, lighting, security, fire, access control, maintenance, waste management and so forth.

Common terms used in BACnet communication:

Object: Represents a device and its data. Multiple objects type can be available for each device (*analog input, binary input...). Each object has a number of properties which fully describe the BACnet object to the network.

Object identifier: Uniquely identifies an object within a BACnet device.

Property: A property describes a BACnet object to the network.

Present value: It is one of the properties of the Analog_Input Object. It represents the current value of an analog input object.

Service: Message type between one BACnet device to another.

BACnet uses a client/server communication mode between devices. Devices communicate between each other using services describing the type of exchange.

A BACnet client is a device that requests a service, and a BACnet server is a device that executes a service. Data inside a BACnet device is organized as a series of objects, each composed of multiple properties.

Ex: the analog_input object defines a property for present_value, a property for average_value etc...

A BACnet client initiates a request to a BACnet server using a service (ex: read_property) to a specific property (ex: present_value) contained in a BACnet object (ex: analog_input).

10.2. BACnet Objects

BACnet defines a standard set of "Objects", each of which has a standard set of "Properties" describing the object and its current status to other devices on the BACnet internetwork. The properties allow for the object to be controlled by other BACnet devices.

BACnet defines 54 objects. Each element of the building control system is represented by one or more objects. The DIRIS Digiware D-70 supports the below Objects:

Object type	Exemple of use
Device	To describe the device to the BACnet network.
Analog input	Instantaneous current for phase 1 (I1) measured by a DIRIS Digiware I-xx current module with associated current sensor
Binary input	Status (ON/OFF) of an auxiliary contact
Binary output	Change of status of the output of a DIRIS Digiware IO-20

A list of properties defines each BACnet Object. Properties can be:

- Required by the BACnet specification.
- Optional. In this case, vendors can choose whether to implement them for their devices.
- Proprietary. Vendors can add their own created properties.

Device Object:

Every BACnet device compatible with the DIRIS Digiware D-70 must have the Device Object and its associated required properties that fully describe the BACnet device to the network

Example for the Device Object of the DIRIS Digiware D-70:

Property	BACnet
Object_Identifier (OID)	Required
Object_Name	Required
Object_Type	Required
System_Status	Required
Vendor_Name	Required
Vendor_Identifier	Required
Model_Name	Required
Firmware_Revision	Required
Application_Software_Version	Required
Protocol_Version	Required
Protocol_Conformance_Class	Required
Protocol_Services_Supported	Required
Protocol_Object_Types_Supported	Required
Object_List	Required
Max_APDU_Length_Supported	Required
Segmentation_Supported	Required
APDU_Timeout	Required
Location	Optional
Description	Optional
Local_Time	Optional
Utc_Offset	Optional
Local_Date	Optional
Daylight_Saving_Status	Optional
Active_COV_Subscriptions	Optional
Serial_Number	Optional
Property_List	Optional
Version_Build_Date	Proprietary
Operating_Hour_Counter	Proprietary

The way the OID is assigned to a device (instance number) is the following:

OID = Main OID (= default 100) + ModbusAddress

- Device with Main OID (100) is the D-70 display itself
- The device with OID (1xx) is the device with the Modbus address xx.

Analog Input Object:

The DIRIS Digiware D-70 acts as a BACnet gateway. It provides a number of Analog Input objects which may be available from the devices compatible and connected to the D-70.

Whether a device supports an AI object depends on its measurement functionalities.

Ex: The OID for THD_I1 will return 0 for a DIRIS Digiware I-30 module because this parameter is not handled.

The AI object defines 25 properties. The devices compatible and connected downstream the D-70 support the following properties:

Property	BACnet
Object_Identifier	Required
Object_Name	Required
Object_Type	Required
Present_Value	Required
Status_Flags	Required
Event_State	Required
Out_Of_Service	Required
Units	Required
Description	Optional
Reliability	Optional
Min_Pres_Value	Optional
Minimum_Value_Stamp	Optional
Max_Pres_Value	Optional
Maximum_Value_Stamp	Optional
Average_Value	Optional
Instantaneous_Stamp	Proprietary
Average_Stamp	Proprietary
Max_Average_Value	Proprietary
Max_Average_Stamp	Proprietary
Min_Average_Value	Proprietary
Min_Average_Stamp	Proprietary
Harmonics_Row_02	Proprietary
Harmonics_Row_03	Proprietary
Harmonics_Row_04	Proprietary
Harmonics_Row_05	Proprietary
Harmonics_Row_06	Proprietary
Harmonics_Row_07	Proprietary
Harmonics_Row_08	Proprietary
Harmonics_Row_09	Proprietary
Harmonics_Row_10	Proprietary

Energy_Total_Residual	Proprietary
Energy_Total_Hourmeter	Proprietary
Energy_Partial	Proprietary
Energy_Partial_Residual	Proprietary
Energy_Partial_Hourmeter	Proprietary
Energy_Total_Lagging	Proprietary
Energy_Total_Lagging_Res	Proprietary
Energy_Total_Leading	Proprietary
Energy_Total_Leading_Res	Proprietary
Energy_Last_Partial	Proprietary
Energy_Last_Partial_Res	Proprietary
Energy_Last_Partial_Timestamp	Proprietary
Multifluid_Partial	Proprietary
Multifluid_Weight	Proprietary
Instant_Min_Max_Reset	Proprietary
Average_Min_Max_Reset	Proprietary

The way the OID is assigned to an Analog Input Object (instance number) is the following:

OID = LLMM

- with LL = Load # of the device (starting at 1)
- with MM = Index of the measurement type (see Analog Input Measurement List).

For example, Analog Input with OID 204 reflects Phasis/Neutral Voltage V1 of Load 2 of corresponding device.

The table with indexes of the analog input measurement list is given below:

Index	Object Name	Object Description	Unit	Type	Present + Timestamp	Present Min/Max + Timestamp	Average + Timestamp	Average Min/Max + Timestamp	Harmonics 2 -> 10	Energies Total + Partial + LastPartial	Energies Total Lagging/Leading	Multifluid	Reset Min/Max
0	VystPhN	System Ph-N Voltage	V	Unsigned	•								•
1	VystPhPh	System Ph-Ph Voltage	V	Unsigned	•								•
2	CurrentSyst	System Current	A	Unsigned	•								•
3	Frequency	System Frequency	Hz	Unsigned	•	•	•	•					•
4	VoltPhNV1	Ph-N Voltage V1	V	Unsigned	•	•	•	•					•
5	VoltPhNV2	Ph-N Voltage V2	V	Unsigned	•	•	•	•					•
6	VoltPhNV3	Ph-N Voltage V3	V	Unsigned	•	•	•	•					•
7	VoltPhNVn	Ph-N Voltage Vn	V	Unsigned	•	•	•	•					•
8	VoltPhPhU12	Ph-Ph Voltage U12	V	Unsigned	•	•	•	•					•
9	VoltPhPhU23	Ph-Ph Voltage U23	V	Unsigned	•	•	•	•					•

10	VoltPhPhU31	Ph-Ph Voltage U31	V	Unsigned	•	•	•	•									•
11	CurrentI1	Current I1	A	Unsigned	•	•	•	•									•
12	CurrentI2	Current I2	A	Unsigned	•	•	•	•									•
13	CurrentI3	Current I3	A	Unsigned	•	•	•	•									•
14	CurrentIn	Current In	A	Unsigned	•	•	•	•									•
15	CurrentInba	Current Inba	%	Unsigned	•												•
16	CurrentIdir	Current Idir	A	Unsigned	•												•
17	CurrentIinv	Current Iinv	A	Unsigned	•												•
18	CurrentIhom	Current Ihom	A	Unsigned	•												•
19	CurrentInb	Current Inb	%	Unsigned	•												•
20	PowerApparentNom	Nominal Apparent Power	VA	Unsigned	•												•
21	TotalPowerActive	Total Active Power	W	Signed	•	•	•	•									•
22	TotalPowerRActive	Total Reactive Power	VAr	Signed	•	•	•	•									•
23	TotalPowerApparent	Total Apparent Power	VA	Unsigned	•	•	•	•									•
24	TotalPowerFactor	Total Power Factor	-	Signed	•	•	•	•									•
25	TotalPowerFactorType	Total Power Factor Type	-	Unsigned	•	•	•	•									•
26	PowerActiveP1	P1 Active Power	W	Signed	•	•	•	•									•
27	PowerActiveP2	P2 Active Power	W	Signed	•	•	•	•									•
28	PowerActiveP3	P3 Active Power	W	Signed	•	•	•	•									•
29	PowerRActiveQ1	Q1 Reactive Power	VAr	Signed	•	•	•	•									•
30	PowerRActiveQ2	Q2 Reactive Power	VAr	Signed	•	•	•	•									•
31	PowerRActiveQ3	Q3 Reactive Power	VAr	Signed	•	•	•	•									•
32	PowerApparentS1	S1 Apparent Power	VA	Unsigned	•	•	•	•									•
33	PowerApparentS2	S2 Apparent Power	VA	Unsigned	•	•	•	•									•
34	PowerApparentS3	S3 Apparent Power	VA	Unsigned	•	•	•	•									•
35	PowerFactorPF1	PF1 Power Factor	-	Signed	•	•	•	•									•
36	PowerFactorTypeSPF1	sPF1 Power Factor Type	-	Unsigned	•	•	•	•									•
37	PowerFactorPF2	PF2 Power Factor	-	Signed	•	•	•	•									•
38	PowerFactorTypeSPF2	sPF1 Power Factor Type	-	Unsigned	•	•	•	•									•
39	PowerFactorPF3	PF3 Power Factor	-	Signed	•	•	•	•									•
40	PowerFactorTypeSPF3	sPF1 Power Factor Type	-	Unsigned	•	•	•	•									•
41	LoadCurve_P+	Load Curve Positive Active Power	W	Unsigned	•												•
42	LoadCurve_P-	Load Curve Negative Active Power	W	Unsigned	•												•

43	LoadCurve_Q+	Load Curve Positive Reactive Power	VAr	Unsigned	•									•
44	LoadCurve_Q-	Load Curve Negative Reactive Power	VAr	Unsigned	•									•
45	LoadCurve_S	Load Curve Apparent Power	VA	Unsigned	•									•
46	THD_I1	THD I1	%	Unsigned	•	•			•					•
47	THD_I2	THD I2	%	Unsigned	•	•			•					•
48	THD_I3	THD I3	%	Unsigned	•	•			•					•
49	THD_In	THD In	%	Unsigned	•	•			•					•
50	THD_V1	THD V1	%	Unsigned	•	•			•					•
51	THD_V2	THD V2	%	Unsigned	•	•			•					•
52	THD_V3	THD V3	%	Unsigned	•	•			•					•
53	THD_U12	THD U12	%	Unsigned	•	•			•					•
54	THD_U23	THD U23	%	Unsigned	•	•			•					•
55	THD_U31	THD U31	%	Unsigned	•	•			•					•
56	A+	Positive Active Energy	Wh	Unsigned	•					•				•
57	A-	Negative Active Energy	Wh	Unsigned	•					•				•
58	ER+	Positive Reactive Energy	VArh	Unsigned	•					•	•			•
59	ER-	Negative Reactive Energy	VArh	Unsigned	•					•	•			•
60	ES	Apparent Energy	VAh	Unsigned	•					•				•
61	Mff	Multifluid feeder	-	Signed	•								•	•

10.3. BACnet Services

The services define methods for BACnet devices to communicate and exchange data with one another. The D-70 supports the following services:

Service list	Description
readProperty	Used by a BACnet device (the client) to ask another BACnet device (the server) to provide the value of one of its object properties
readPropertyMultiple	Used by a BACnet device (the client) to ask another BACnet device (the server) to provide the values of multiple object properties
writeProperty	Used by a BACnet device (the client) to ask another BACnet device (the server) to change the value of one of its object properties
timeSynchronization	Used to broadcast the current time to one or more BACnet servers
who_Has	Asks which BACnet devices contain a particular Object
who_Is	Used by a BACnet client to ask the presence of BACnet servers

11. CHARACTERISTICS

11.1. DIRIS D-30 and DIRIS Digiware D-40/D-50/D-70 - characteristics

11.1.1. Mechanical features

Type of screen	Capacitive touch-screen technology, 10 keys
Screen resolution	350 x 160 pixels
Front panel protection index	IP65
Weight of the DIRIS D-30 / DIRIS Digiware D-40/D-50/D-70	160g / 180g

11.1.2. DIRIS D-30 communication characteristics

Type of screen	Local single-point screen for DIRIS Digiware I-4x and DIRIS B
RJ9	Self-powered and data
USB	Upgrade and configuration via type B micro USB connector

11.1.3. DIRIS Digiware D-40 communication characteristics

Type of screen	Multipoint remote screen
RJ45 Digiware	Control and power supply interface function
RS485 2-3 wires	Modbus RTU slave communication function
USB	Upgrade and configuration via type B micro USB connector

11.1.4. DIRIS Digiware D-50 communication characteristics

Type of screen	Multipoint remote screen
Ethernet RJ45 10/100 Mbs	Modbus TCP gateway function (max.4 simultaneous connections)
RJ45 Digiware	Control and power supply interface function
RS485 2-3 wires	Modbus RTU master communication function
USB	Upgrade and configuration via type B micro USB connector

11.1.5. DIRIS Digiware D-70 communication characteristics

Type of screen	Multipoint remote screen
Ethernet RJ45 10/100 Mbs (use a shielded Ethernet cable)	Gateway function: - Modbus TCP (max. 32 simultaneous connections) - Webview embedded web server (Power & Energy Monitoring version) - BACnet IP - SNMP v1, v2 & v3
SNTP protocol	Updates the screen from an NTP server. The display updates the connected devices.
SMTP protocol(s)	Sends email notifications from the display.
FTP protocol(s)	Automatically exports data via FTP standard or secure server (consumption curves, load curves, measurement logs)
RJ45 Digiware	Control and power supply interface function
RS485 2-3 wires	Modbus RTU master communication function
USB	Upgrade and configuration via type B micro USB connector

11.1.6. Electrical characteristics

Power supply	24 VDC +10% / -20%
Power consumption	2 VA
Battery life (D-70 only)	3 days

11.1.7. Environmental specifications

Storage temperature	-20 to +70°C
Operating temperature	-10 to +55°C
Humidity	95% at 40°C
Installation category - degree of pollution	CAT III, 2

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