

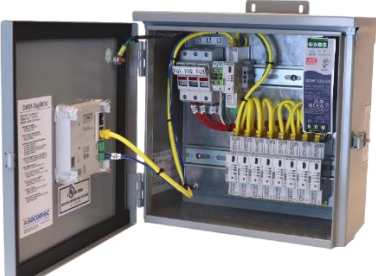
UL/CSA
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DIRIS DigiBOX M (with D-50 display)

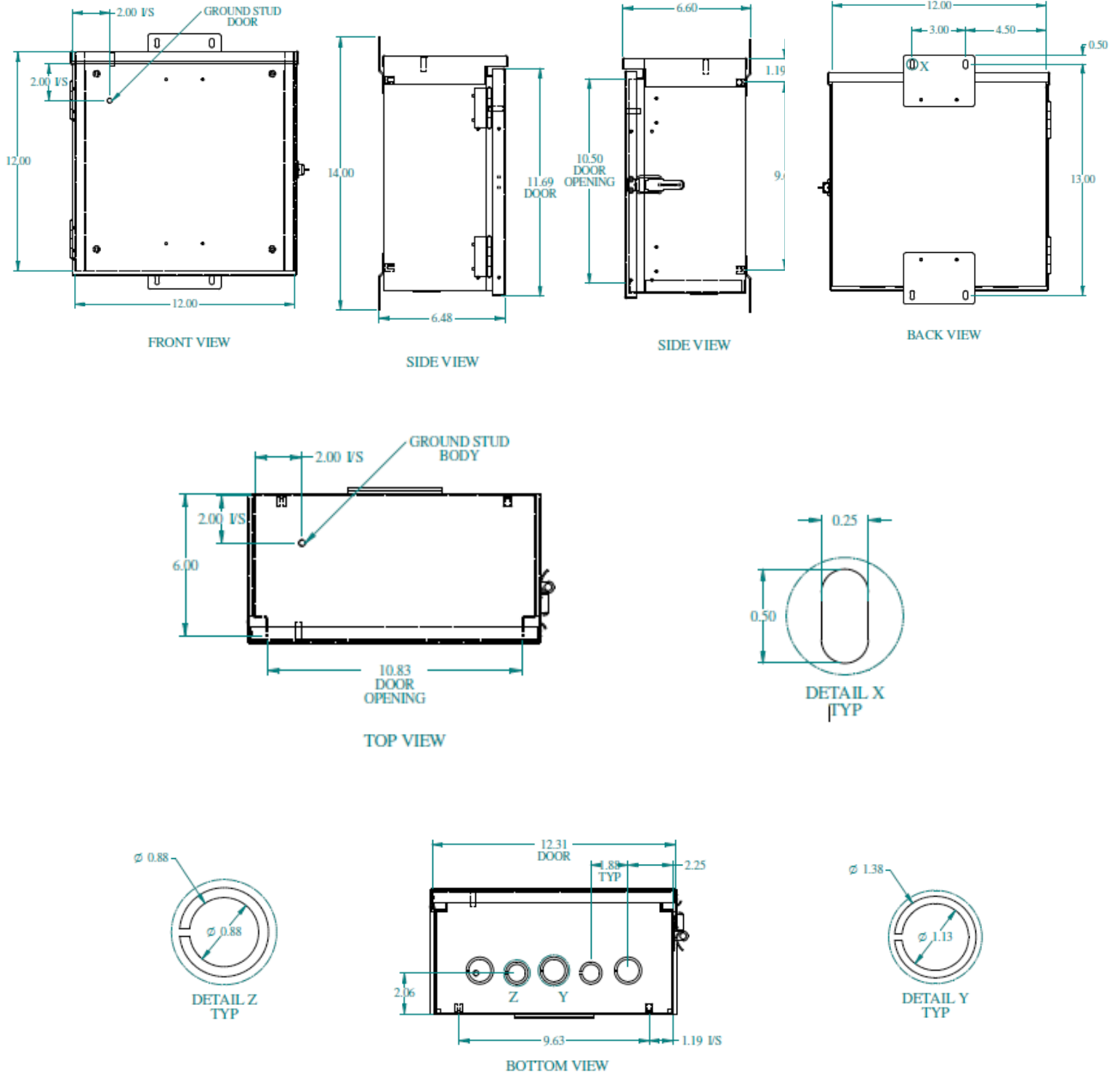


Introduction:

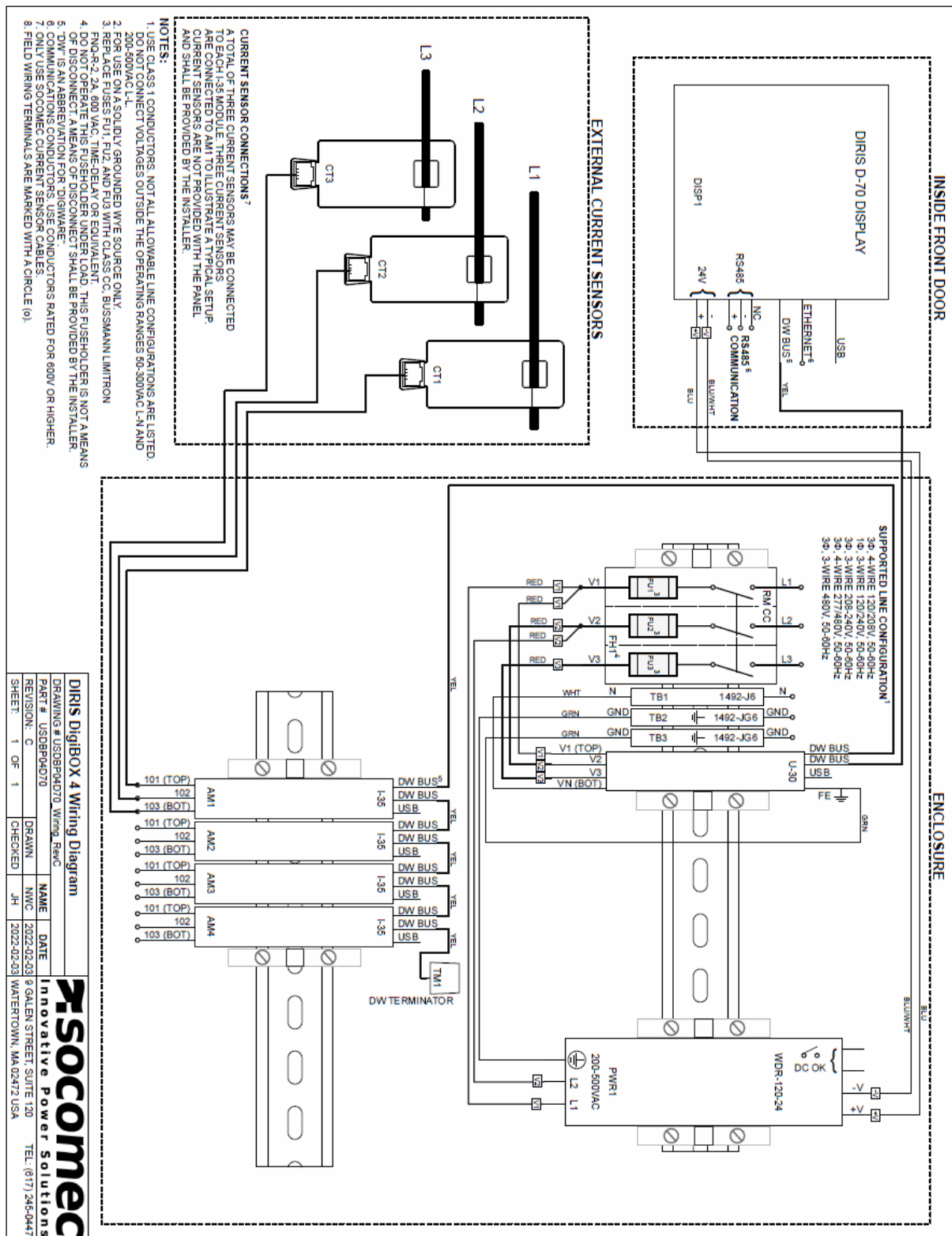
The purpose of this document is to explain the steps of installing and configuring the DIRIS DigiBOX M.

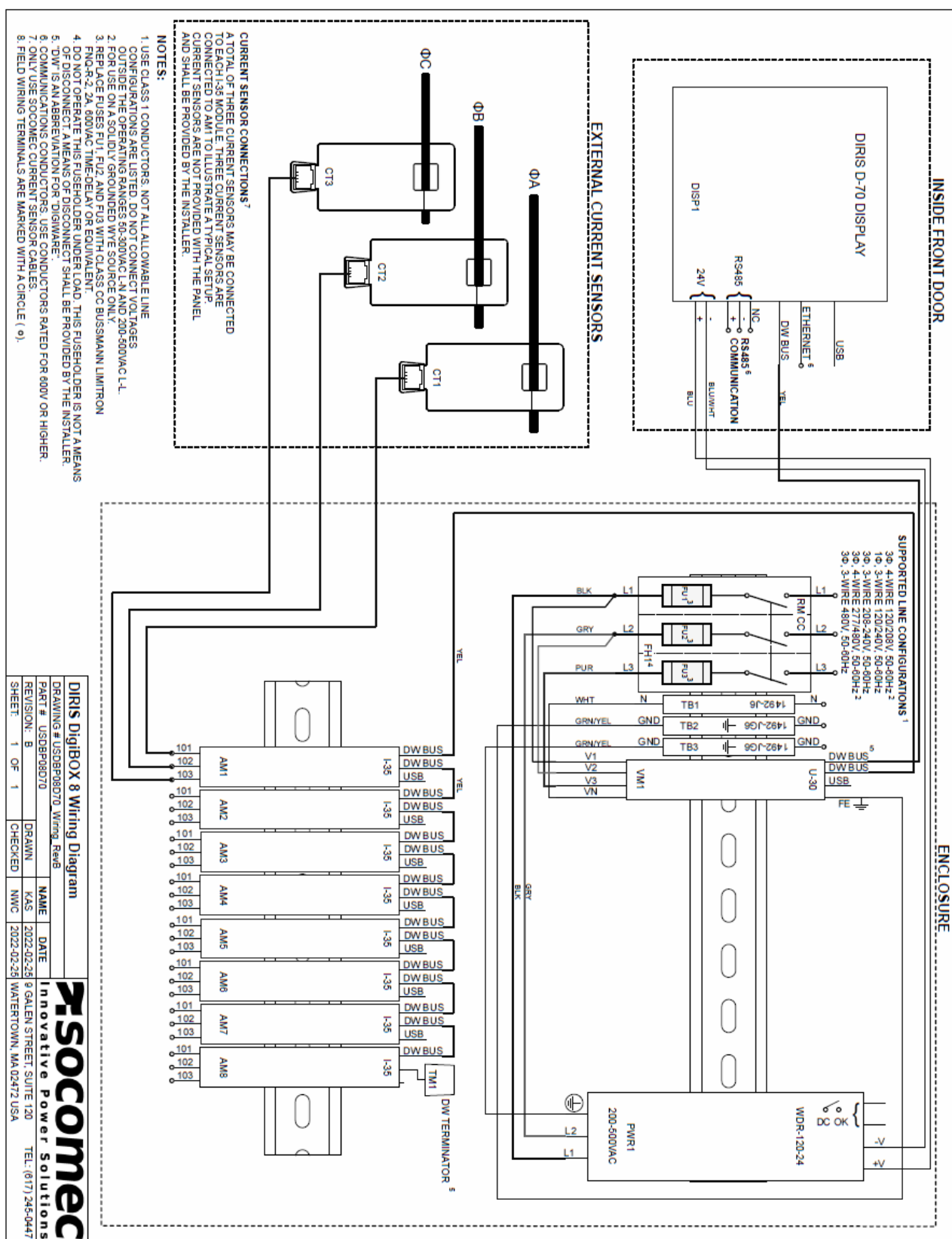
Part Number	Description	
USDBB04D50	DIRIS DigiBOX M4; D-50 display; 4 metering points/12 CT channels; Steel NEMA 12/3R enclosure; RS485 + Ethernet communication; 200 – 500 VAC Power supply; prewired with fused voltage connections	
USDBB08D50	DIRIS DigiBOX M8; D-50 display; 8 metering points/24 CT channels; Steel NEMA 12/3R enclosure; RS485 + Ethernet communication; 200 – 500 VAC Power supply; prewired with fused voltage connections	

Dimensions (in):



> USDBB04D50





Technical characteristics:

Electrical characteristics

Auxiliary power supply	
Voltage input	200-500 VAC
Frequency	50/60 Hz

Measurement characteristics

Power and energy measurement	
Accuracy active energy and active power	Class 0.2, DigiBOX M alone Class 0.5 with TE, iTR, TF sensors Class 1 with TR sensors
Accuracy reactive energy	Class 1 with TE, iTR, TF sensors
Power factor measurement	
Accuracy	Class 0.5 with TE, iTR, TF sensors Class 1 with TR sensors
Voltage measurement	
Electrical network type	Single-phase (1P2W) / Two-phase (2P2W) / Two-phase with neutral (2P3W) / Three-phase (3P3W) / Three-phase with neutral (3P4W)
Voltage measurement rating	500-300 VAC (Ph-N) / 87-520 VAC (Ph-Ph) – CAT III
Voltage accuracy	Class 0.2
Voltage input consumption	≤ 1 VA
Frequency range	45 – 65 Hz
Frequency accuracy	Class 0.02
Current measurement	
Number of current inputs	DigiBOX M4: 12 DigiBOX M8: 24
Associated current sensors	Solid-core TE, split-core TR/iTR, flexible Rogowski TF
Connection	Socomec RJ12 cables
Accuracy	Class 0.2 DigiBOX M alone Class 0.5 with TE, iTR, TF sensors Class 1 with TR sensors

Mechanical characteristics

Application	Indoor installations
Enclosure	Steel, finished in ANSI 61 gray powder coating
Enclosure dimensions (in)	12 (H) x 12 (W) x 6 (D)
Protection rating	NEMA 12/3R; IP24
Operational temperature	+14 ... +158 °F / -10 °C ... +70 °C
Altitude	≤ 9840 ft / 3000 m

Communication characteristics

RS485	
Link	RS485
Connection type	2 to 3 half duplex wires
Protocol	Modbus RTU
Baudrate	9600 – 115200 baud
Ethernet	
Link	Ethernet
Connection type	RJ45 10/100 Mbps
Protocol	Modbus TCP/IP, BACnet IP, SNMP v1, v2, v3
USB	
Link	Micro USB Type b
Protocol	Modbus RTU
Use	Configuration via Easy Config System and firmware upgrade via Product Upgrade Tool

Table of Contents:

1. Hazards and Warnings.....	8
1.1 Risk of electrocution, burns or explosion	8
1.2 Risk of Damaging the Device.....	9
1.3 Responsibility	9
2. Conduit Hole.....	10
3. Mounting the DIRIS DigiBOX M	11
4. Wiring of the system	12
5. Configuring the DigiBOX M	14
5.1 Making sure firmware is up to date.....	14
5.2 Configuration via the D-50 display.....	18
5.3 Installing Easy Config System	18
5.4 Configuration of the DIRIS DigiBOX M using Easy Config System.....	21
5.4.1 Configuring the DIRIS Digiware D-50 display	21
5.4.2 Configuring the DIRIS Digiware U-10 module.....	24
5.4.3 Configuring the DIRIS Digiware I-31 modules.....	25
6. Accessing the webserver (WEB-CONFIG) embedded in D-50	27

1. Hazards and Warnings

The term "device" used in the following paragraphs refers to the DigiBOX M and its associated current sensors (TE, TR/iTR or TF). The assembly, use, servicing and maintenance of this equipment must only be carried out by trained, qualified professionals.

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

1.1 Risk of electrocution, burns or explosion

	Caution: risk of electric shock	Ref. ISO 7000-0434B (2004-01)
	Caution: refer to the accompanying documentation each time this symbol is shown	Ref. ISO 7000-0434B (2004-01)

- Only duly authorized and qualified personnel may work or install/uninstall the device.
- The instructions are valid together with the specific instructions for the device.
- The device is designed only for its intended purpose as set out in the instructions.
- Only accessories authorized or recommended by SOCOMEc may be used in association with the device.
- Before proceeding with installation, maintenance, cleaning, disassembly, connection, or maintenance work, the device and system must be cut off from the mains to avoid electrocution and damaging the system and device.
- This device is not designed to be repaired by the user.
- For any questions related to the disposal of the device, please contact SOCOMEc



Do NOT clamp or pull out NON-INSULATED conductors carrying DANGEROUS VOLTAGE which could cause an electric shock, burn or arc flash.
Ref. IEC 61010-2-032

Failure to comply with the instructions of the device and this safety information can cause bodily injury, electric shock, burns, death or damage to property.

1.2 Risk of Damaging the Device

	Caution: risk of electric shock	Ref. ISO 7000-0434B (2004-01)
	Caution: refer to the accompanying documentation each time this symbol is shown	Ref. ISO 7000-0434B (2004-01)

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

- The device is correctly installed.
- The network frequency indicated on the device is observed: 50 or 60 Hz.
- A maximum voltage at the voltage input terminals of 520 VAC phase/phase or 300 VAC phase/neutral is observed.
- Always connect the TE, TR/iTR or TF current sensors using Socomec RJ12 cables and observing the maximum prescribed currents.
- Only use RJ45 SOCOMEC cables to interconnect the modules via the Digiware bus

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

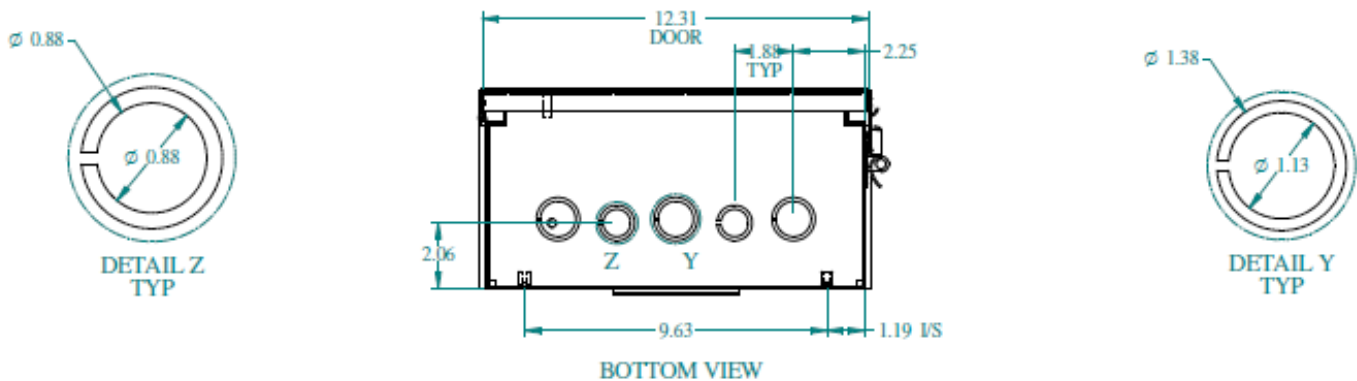
1.3 Responsibility

- 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 placed in a system which itself complies with the applicable standards and safety regulations of the country of installation
- Any cable which needs to be replaced may only be replaced with a cable having the correct rating.
- Despite constantly striving for quality in preparing this manual, errors or omissions are always a possibility and are not the responsibility of SOCOMEC.

2. Conduit Hole

The DIRIS DigiBOX M is shipped with conduit holes which will need to be knocked out on the bottom of the enclosure. See the below drawings for conduit hole locations.

1. Open the enclosure door.
2. Only remove the tab from the desired conduit hole, where the conduit fittings will be installed.
3. To maintain the enclosure's environmental rating, the installer must use conduit hubs/fittings with the same environmental rating as the enclosure.
4. Maintain spacing of at least ½ inch between conduit hubs/fittings and uninsulated live conductors.
5. Use "Grounding" conduit fittings with built-in set screws. Run insulated copper conductors, 16awg or thicker, from fittings to spare ground terminal blocks.
6. Route incoming voltage conductors at least ¼ inch away from current sensor and signal conductors. Route current sensor conductors at least ¼ inch away from communication conductors.
7. Use cable ties to secure conductors to each other and to maintain spacing



3. Mounting the DIRIS DigiBOX M

1. Position the DIRIS DigiBOX M on the desired mounting surfaces.
2. Using the appropriate hardware fasten the DigiBOX M to the desired surface by placing the appropriate fastening hardware through the DigiBOX M mounting tabs.



Figure 2: Top and Bottom DigiBOX M mounting Tabs

4. Wiring of the system



Before wiring the system, make sure that the fuses are NOT installed. The fuses are to be installed AFTER all wiring is complete.

Use class 1 conductors and the input voltage must be 200 -520VAC L-L.

Behind the enclosure door the prewired components and the components that need to be wired can be seen.

1. Wire the voltage according to the designated fuse holder (L1, L2, L3, and N) and feed the cables out of a conduit hole.



Figure 3: Wire the voltage based on the labeled fuse holders (note that the fuse holders are empty).

2. Plug in the RJ12 cables to the DIRIS Digiware I-31 meter modules and feed the RJ12 cables out of a conduit hole. Each DIRIS Digiware I-31 meter module has 3 CT inputs, allowing to monitor a 3-phase load or 3 x single-phase loads.

Note: For a three-phase system

- Current sensor on phase A should be connected to I01 RJ12 port of DIRIS Digiware I-31,
- Current sensor on phase B should be connected to I02 RJ12 port of DIRIS Digiware I-31,
- Current sensor on phase C should be connected to I03 RJ12 port of DIRIS Digiware I-31.

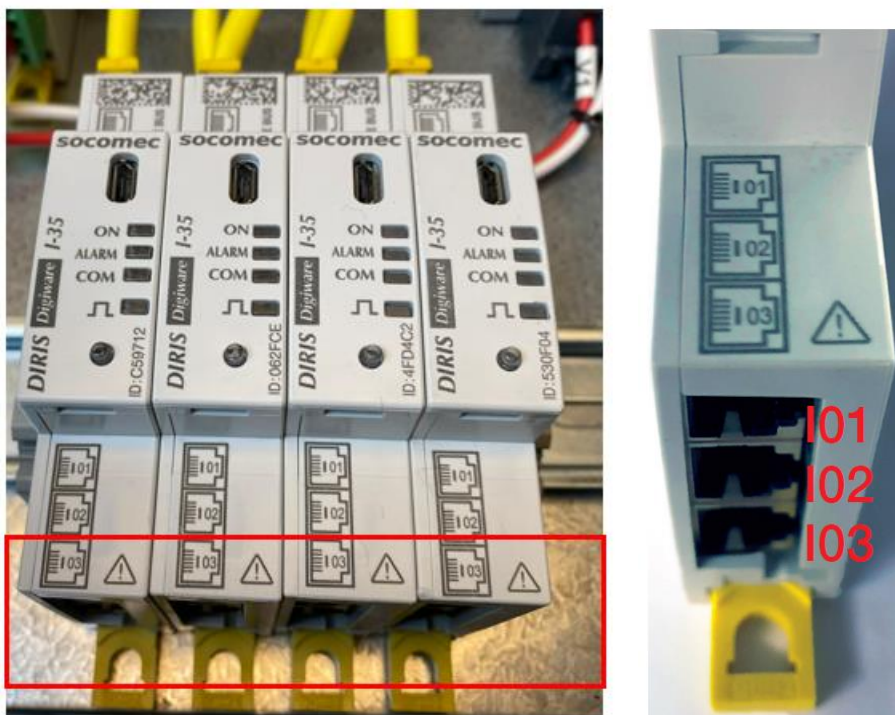


Figure 4: The boxed area is where the RJ12 cables are inserted on DIRIS Digiware I-31.

In case of wiring errors (orientation of current sensor or phase association), software correction is possible without physically changing the wiring of current sensors (refer to **5.4.3, paragraph 2** to change current sensor settings).

3. Connect the current sensors to the load and plug the current sensors into the RJ12 cables connected to the DIRIS Digiware I-31 modules.
4. Plug in the Ethernet or RS485 bus depending on which communication protocol will be used, and feed the cables out of a conduit hole.
5. Maintain spacing of at least ½ inch between conduit hubs/fittings and uninsulated live conductors. Use cable ties to secure conductors to each other and to maintain spacing.
6. Put fuses provided in the black bag into the fuse holders
7. The products should now be on.

5. Configuring the DigiBOX M

5.1 Making sure firmware is up to date

1. Before commissioning your DIRIS DigiBOX M, make sure the associated devices DIRIS Digiware D-50, U-10, I-31 operate under the latest firmware versions.

The latest firmware versions are available on the Socomec website and firmware upgrade is done using the Product Upgrade Tool software, by connecting a laptop to the Micro USB port of the desired device.

Go to the website to download the Product Upgraded Tool:

<https://www.socomec.us/en-us/product-upgrade-tool>

2. Product firmware is accessible from the Resource Center at the following link:
<https://www.socomec.us/en-us/resource-center/resource-type/firmware-266#main-wrapper>
Use the filter section on the left to find and download firmware pertaining to the product being upgraded (DIRIS Digiware D-50, U-10, and I-31).

Please note that the firmware downloaded from the website is a zip file. DO NOT unzip the file, just directly upload the file into Product Upgrade Tool.

3. Plug in a micro USB cable to the back of the DIRIS Digiware D-50 or associated module (U-10 module, I-31 module).

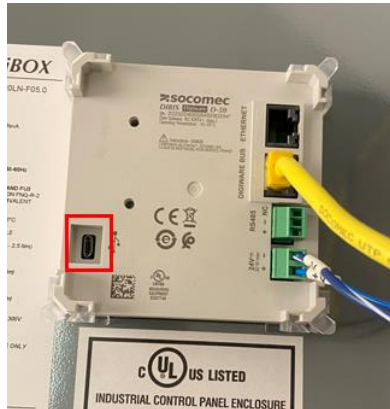


Figure 6: The micro USB port on the DIRIS Digiware D-50.

4. Open the Product Upgrade Tool software to get the below screen:

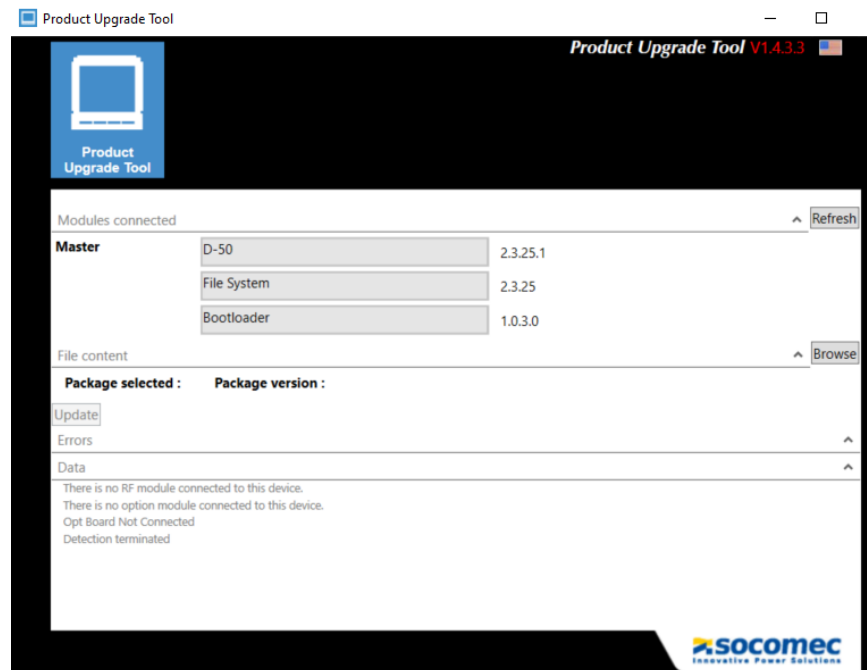


Figure 7: Product Upgrade tool home screen.

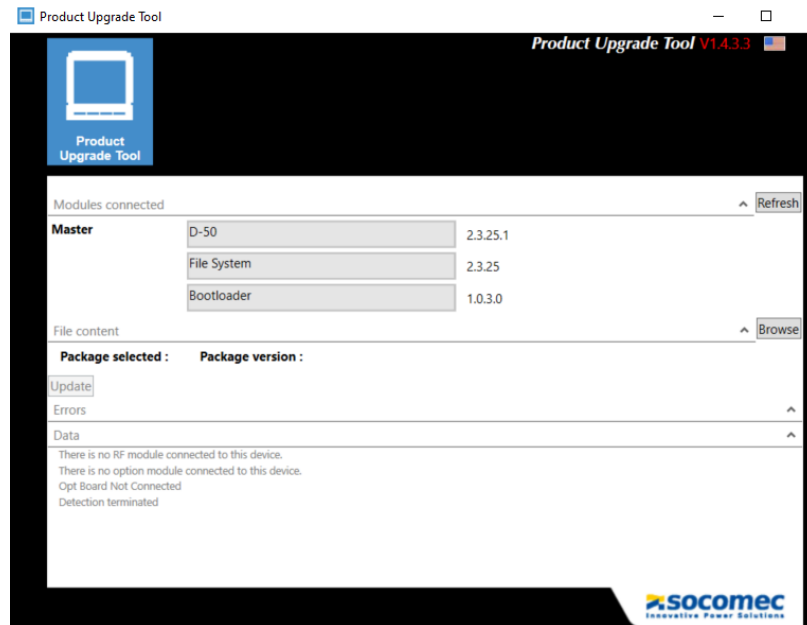


Figure 8: Screen after the refresh button is pressed.

5. Click “Browse” and select the firmware folder that was downloaded.
 - An orange symbol means the firmware selected is the same as the one on the DIRIS Digiware D-50.
 - A green symbol means that the firmware selected is more recent than the one currently on the DIRIS Digiware D-50 and an upgrade is possible.
 - A red symbol means that the firmware selected is a lower version than the one currently on the DIRIS Digiware D-50.

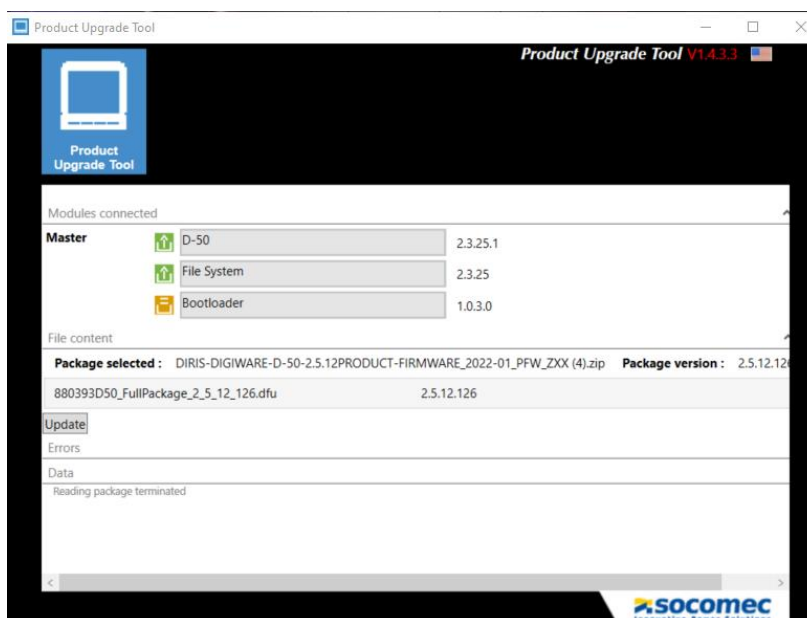


Figure 9: Product upgrade tool screen once the firmware is selected.

- 6.** Click “Update” if needed. Once the firmware is up to date you will see the following screen

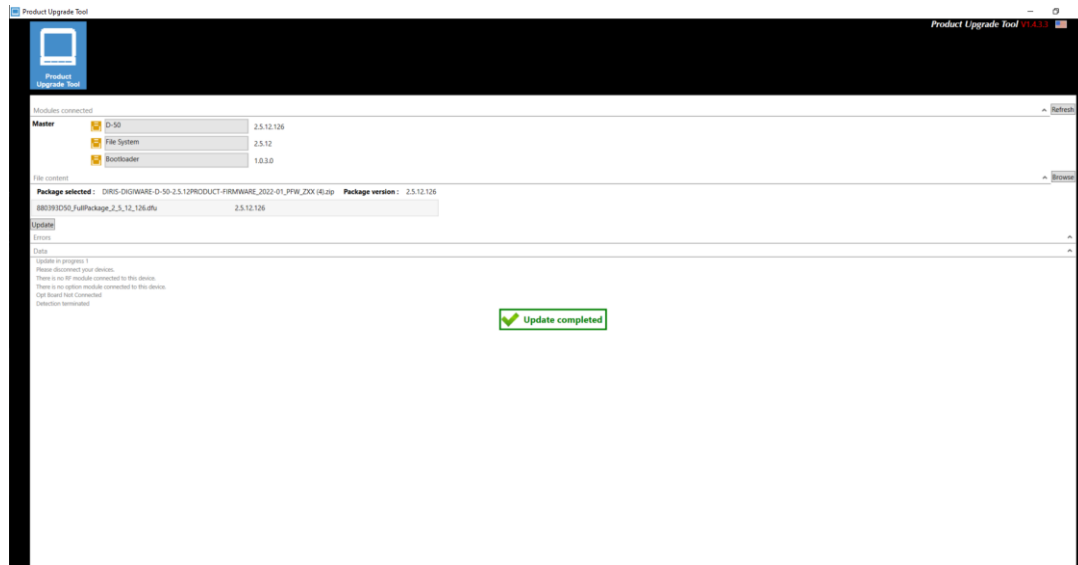


Figure 10: Product Upgrade Tool screen once update is complete.

- 7.** Repeat the same operation for DIRIS Digiware U-10 and I-31 modules if necessary.



Figure 4: The micro USB port on the DIRIS Digiware U-10

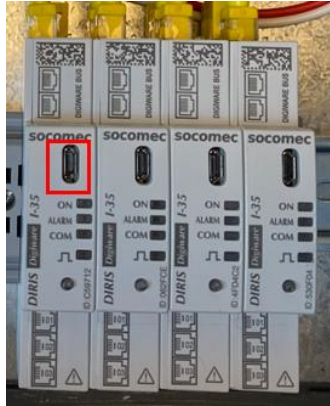


Figure 5: The micro USB port on the DIRIS Digiware I-31

5.2 Configuration via the D-50 display

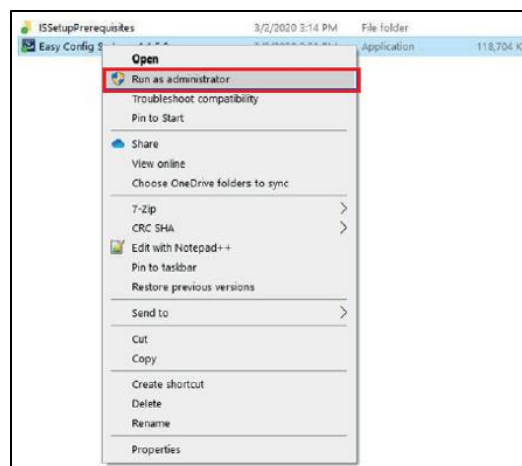
For instructions on configuring your DIRIS DigiBOX M via the DIRIS Digiware D-50 interface refer to Section 9 of the DIRIS Digiware D-50_D-70 Display and Power Supply Interface Installation and Operating Manual

https://www.socomec.us/sites/default/files/2022-01/DIRIS-DIGIWARE-D-50_D-70---DISPLAY-AND-POWER-SUPPLY-INTERFACE_INSTALLATION-AND-OPERATING-MANUAL_2022-01_548088C_EN.pdf

5.3 Installing Easy Config System

Easy Config System is a free software used for configuring Socomec Power metering devices from a computer.

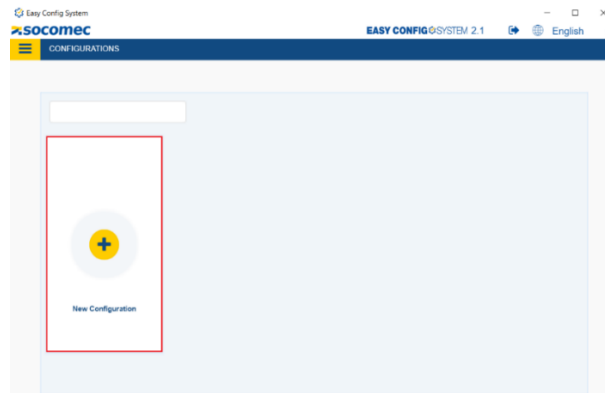
1. Download Easy Config System from the following link:
<https://www.socomec.us/en-us/easy-config-system-software>
2. Once the Easy Config System folder is saved on your computer, right click on the setup file and **Run as administrator**.



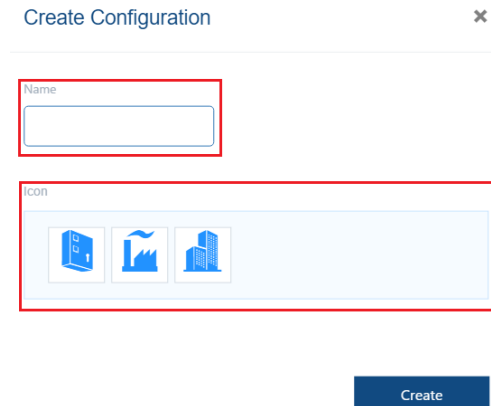
3. Open **Easy Config System** to configure your DIRIS DigiBOX M.
4. When logging in, choose the Admin profile and complete the verification using the information below. Each profile provides a different level of access.

Profile	Default Password	Capabilities
User	No Password	• Visualization • Basic Configuration
Admin	Admin	• Visualization • Full Configuration • Save System • Open System • Save Template • Upload Template • Template Management Password Modification

5. Create a new configuration by selecting **New Configuration**.

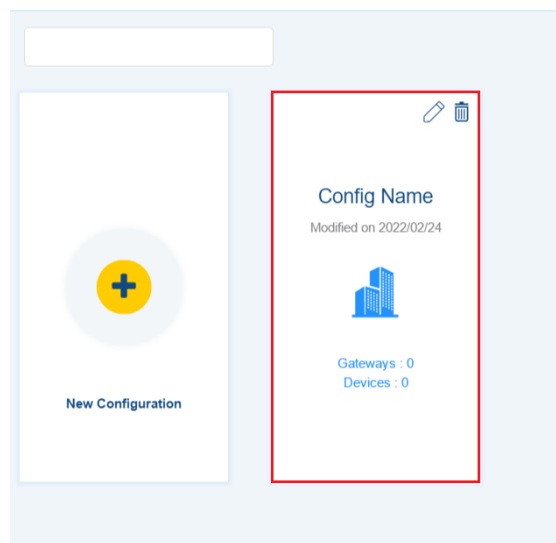


6. In the pop up window name your configuration and choose an icon.



A dialog box titled "Create Configuration" with a close button (X) in the top right corner. It contains two main sections: "Name" with a text input field, and "Icon" with a selection area containing three icons: a server rack, a factory, and a building. Below these sections is a blue "Create" button.

7. Select the recently created configuration from the list.



8. Plug the micro USB cable to the slot on the back of the DIRIS Digiware D-50. Plug the USB end of the cable to the computer.

 *The DIRIS Digiware D-50 display should be configured first.*

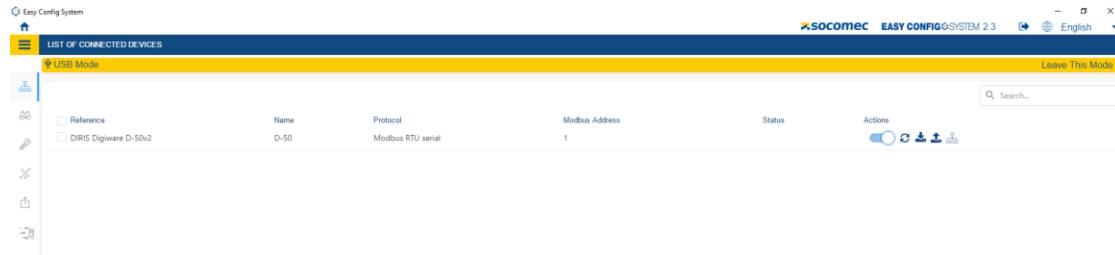
9. Click on the **Device List** icon



10. Navigate to and select **USB mode** on the top right corner to connect to the D-50 display and access configuration menus.



The D-50 display will be automatically be detected by **Easy Config System** (shown in the image below). If not, try disconnecting and reconnecting the cable and again clicking on **USB Mode**.



5.4 Configuration of the DIRIS DigiBOX M using Easy Config System

5.4.1 Configuring the DIRIS Digiware D-50 display

1. Navigate to and select **Device Configuration**.



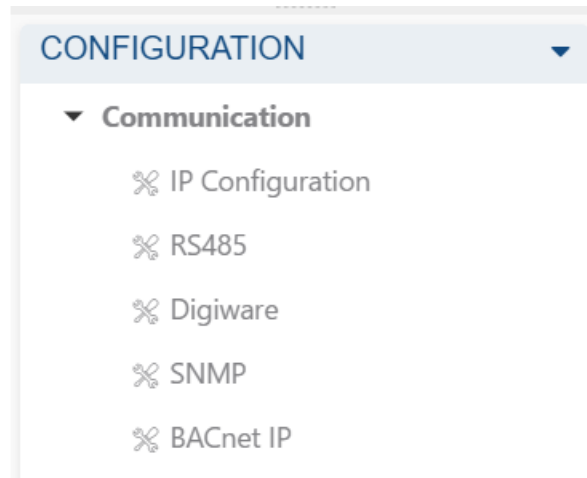
Display Settings

2. The **Display Settings** section in the **General** tab on the bottom left side of the screen contains information about the D-50 display (language, backlight settings etc.)

Once you have entered your parameters, click on **Program** at the top right side of the screen and this will immediately update the DIRIS Digiware D-50. When you click on **Program**, it flashes the parameters **of the tab that you are currently working on** to the device.

Communication

3. The **Communication** section will show the different communication parameters (IP Address, MODBUS Address, Baud rate, etc.).

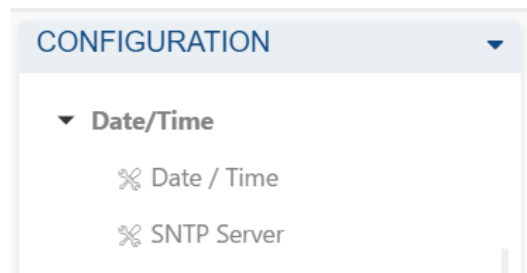


The IP address and the Modbus address will give you the capability to connect and communicate with the product. The RS485 port can be configured as a master or a slave under the **RS485** section.

- i** *Each Device on the Digiware Bus has its own MODBUS/JBUS ID. This unique ID is a number between 1 and 247. The default JBUS/MODBUS address of devices is as follows:*
- *DIRIS Digiware D-50/D-70 displays and M-50/M-70 gateways: ID 001*
 - *U-10 Modules: ID 006*
 - *I-31 Modules: ID 005*

Date/Time

8. Next, click on the **Date/Time** section. You can synchronize the date/time of the DigiBOX M to the Date/time of your computer manually, or set up an SNTP server for an automatic time synchronization to an SNTP server. Ask your IT department for SNTP server credentials.



9. Continue to go through each menu, and configure the D-70 as needed for your application.

10. Click on the **Real Time Visualization** icon on the left side bar.



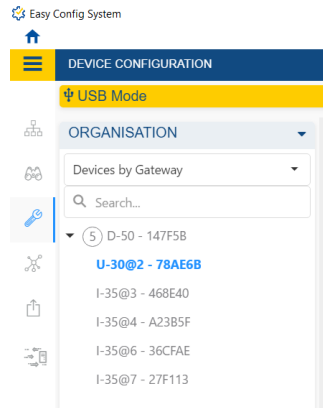
11. Navigate to and click on **Auto-discovery** in the middle of the screen. The Auto discovery will scan and detect all Digiware modules on the Digiware bus (and other Socomec meters such as DIRIS B, DIRIS A-40 connected via RS485).

The screenshot shows the Socomec Easy Config System 2.3 interface. The left sidebar has a 'Real Time Visualization' icon. The main area displays the configuration for a 'DIRIS Digiware D-50v2@255'. The 'Auto-Discovery' tab is active, showing a table of discovered devices.

Bus	Type	Name	ID	Modbus Address	T1	Version	Date/Time	Com. Status	Actions
Digiware	DIRIS Digiware U-30	U-30@2	78AE6B	2		1.11.5	01/12/2022 08:24:03	Good	⌵
Digiware	DIRIS Digiware I-35	I-35@3	46BE40	3		1.11.3	01/12/2022 08:24:03	Good	⌵
Digiware	DIRIS Digiware I-35	I-35@4	A2385F	4		1.5.1	01/12/2022 08:24:03	Good	⌵
Digiware	DIRIS Digiware I-35	I-35@6	36CFAE	6		1.11.3	01/12/2022 08:24:03	Good	⌵
Digiware	DIRIS Digiware I-35	I-35@7	27F113	7		1.5.1	01/12/2022 08:24:02	Good	⌵

After a few minutes, the product list will be displayed. If this is the first time you configure the modules, a Modbus ID will be automatically assigned to each DIRIS Digiware U/I module. You can change the Modbus ID by clicking on **Edit Modbus Addresses**.

Once the Auto-discovery is done, all downstream Digiware modules will appear in the “Organization” section under the D-50:



You can now configure the slave modules (U-10 and I-31 modules) without disconnecting the USB cables from the D-50.

5.4.2 Configuring the DIRIS Digiware U-10 module

The DIRIS Digiware U-10 module should be configured before the DIRIS Digiware I-31 modules.

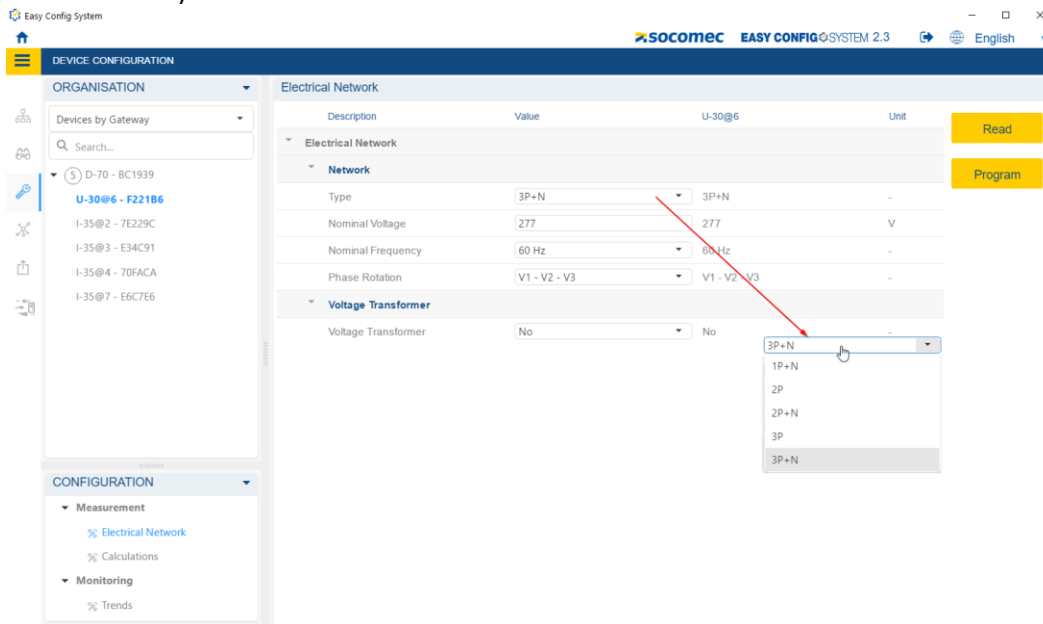
1. Navigate to and select **Device Configuration**.



2. In the “Organization” section on the left side of the screen, select the U-10 module

Measurement

3. **Electrical Network:** select the network **Type** being measured based on where the voltage is measured by the U-10 module as well as the nominal voltage and nominal frequency (60 Hz in North America)



4. The **Reset** tab allows you to do a reset on specific memory categories of the device. You can also restore the device to its default factory settings.

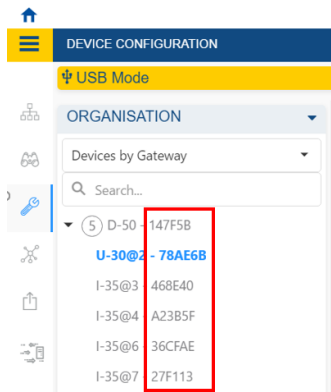
The configuration of your DIRIS Digiware U-10 module is now complete!

5.4.3 Configuring the DIRIS Digiware I-31 modules

Remain in the **Device Configuration** tab and select the I-31 meter module you wish to configure.

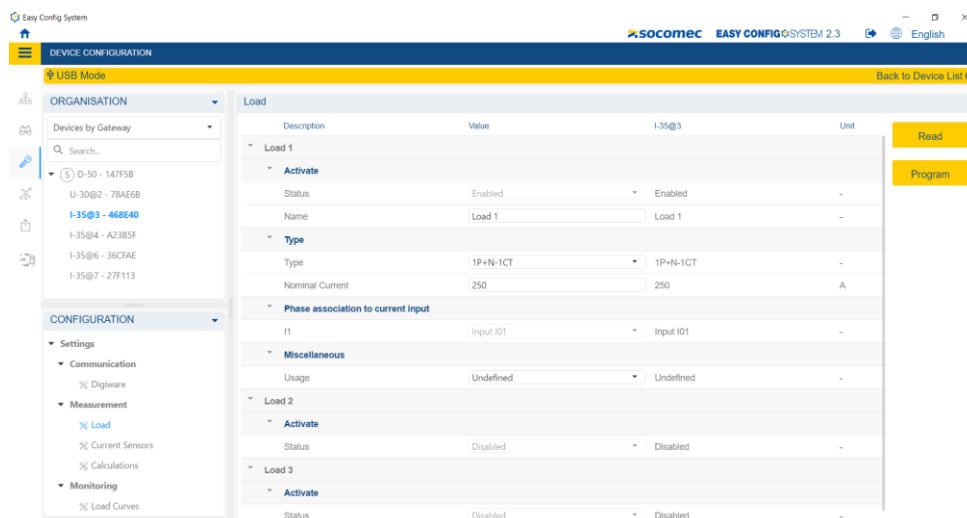


To assist you identifying which module you are configuring, refer the 6-character ID which is the same as the one marked on the front face of each module:



Measurement

1. **Load:** This section allows you to configure the different load(s) monitored by the I-31 meter module. You must configure the number of loads, and for each load:
 - The load name (this name will be synchronized on the D-50 display)
 - The load type (single-phase, three-phase etc.)
 - The nominal current (this can be the protective device rating for example)



Note: Supported load types: 1P+N – 1CT, 2P – 1CT, 2P+N - 2CT, 3P – 3CT / 3P – 2CT / 3P – 1CT, 3P+N – 3CT / 3P+N – 1CT

2. The **Current Sensors** menu allows you to configure the current sensors connected to the I-31 meter module.

The rating of current sensors is automatically detected thanks to the RJ12 technology.

For each current sensor, you can change:

- Its orientation: Positive = P1 → P2 on TE/TR/iTR current sensors and in the same direction as arrow for TF current sensors
- Its phase voltage association. This is particularly useful if a wiring mistake has been made during installation

Alarms

5. The **Alarms** tab allows you to set up alarms:

- Measurement alarms are based on custom measurement for total power values (Ptot, Qtot and Stot)
- System alarms are based on commissioning errors (CT disconnected, inconsistent CT rating etc.)

▼ Alarms

✖ Measurement Alarm

✖ Protection Alarm

✖ System Alarm

Reset

6. The **Reset** tab allows you to do a reset on specific memory categories of the device. You can also restore the device to its default factory settings.
7. Repeat the process in paragraph 5.4.3 for other remaining I-31 meter modules within the DigiBOX M.

Once all modules are configured, the system is ready to read correct values and to communicate through Modbus to an external EMS/BMS.

8. You can use the **Real Time visualization** tab to visualize live measurements and phasor diagrams. You will be able to verify that the readings are consistent and approve that there is no wiring error.



You may notice a red ALARM LED flashing on the D-50 display. For cyber security reasons, it is also recommended to change default passwords of Cyber Security, Administrator and Advanced User profiles. Until default passwords for all 3 profiles have been changed, the Password Alert alarm will remain active and **the ALARM LED on the D-50 will be flashing.**

The Password Alert alarm can also be disabled from Easy Config System from Alarm menu of the D-50 display.

6. Accessing the webserver (WEB-CONFIG) embedded in D-50

The webserver embedded in the D-50 display allows to configure the communication protocols and services of the D-50 and to create a custom cyber security policy.

1. To access the webserver, connect to the DIRIS Digiware D-50 with an Ethernet cable to a router or PC in the same network.
2. In any Web Browser, type the IP address of the D-50 to access the Webserver. The Default IP configuration is shown below.

IP Configuration	
IP Address	192.168.0.4
Subnet Mask	255.255.255.0
Gateway	192.168.0.1

3. Log in as Administrator with the default password “Admin”.
Choose a new password. Your password must be changed at least once a year to access the setup menu of the webserver.



Repeat the same for the Cyber security and Advanced User profiles.

From the “**Protocols**” menu, you can enable/disable and configure communication protocols and services:

- Field protocols (Modbus TCP, RTU, BACnet IP, SNMP)
- Data push to a remote FTP server
- SMTP email notifications





Congratulations! Your configuration is now complete.

If you need any assistance, please email our support team at tech.us@socomec.com.
For all other inquiries, contact info.us@socomec.com.

For more information on our other products and solutions, visit our website at www.socomec.us

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