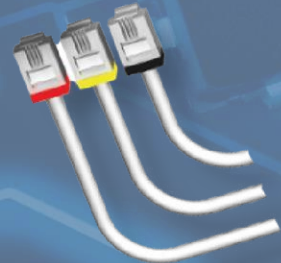


DIRIS DigiBOX A-40

UL/CSA
Ed.2

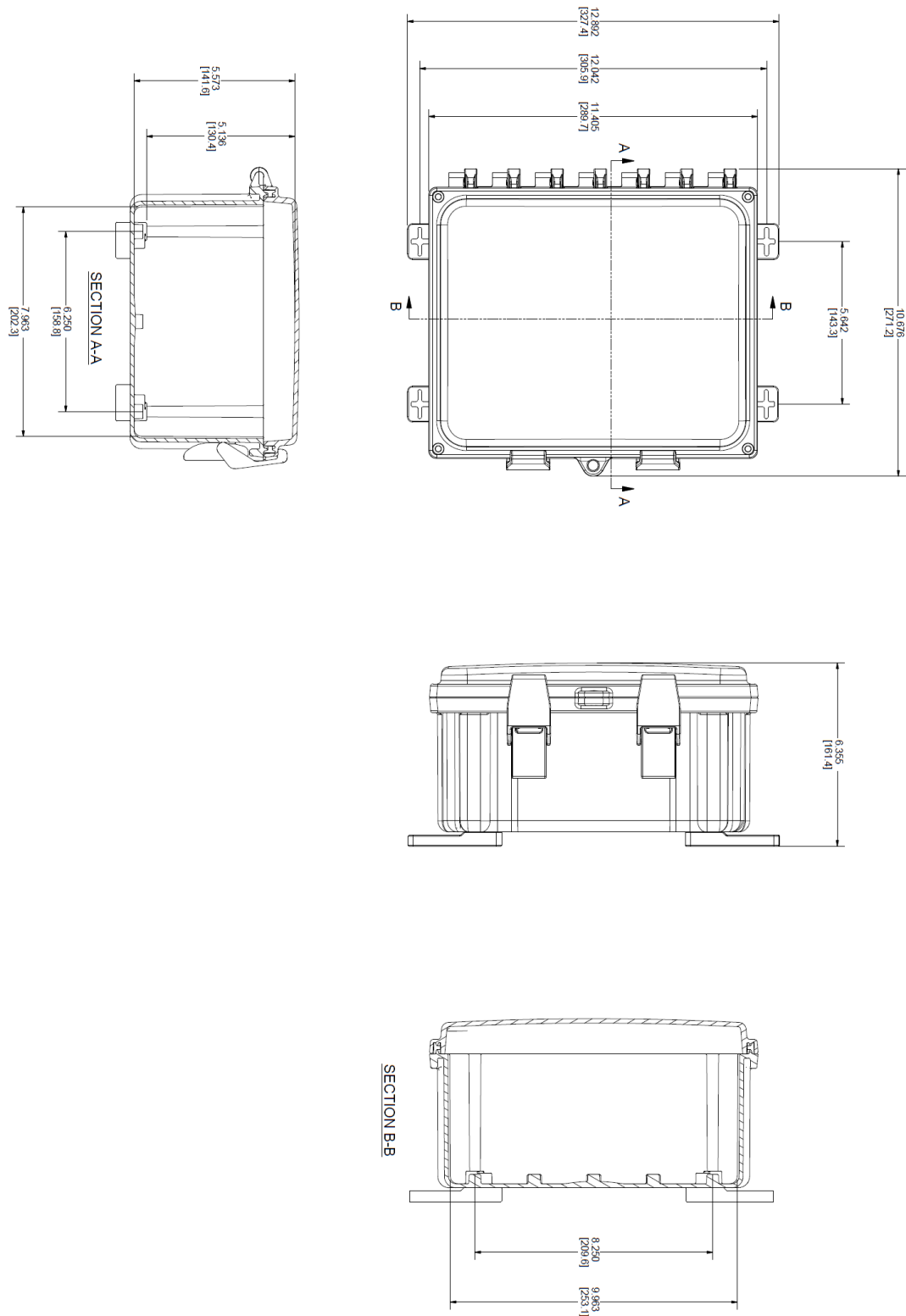


Introduction:

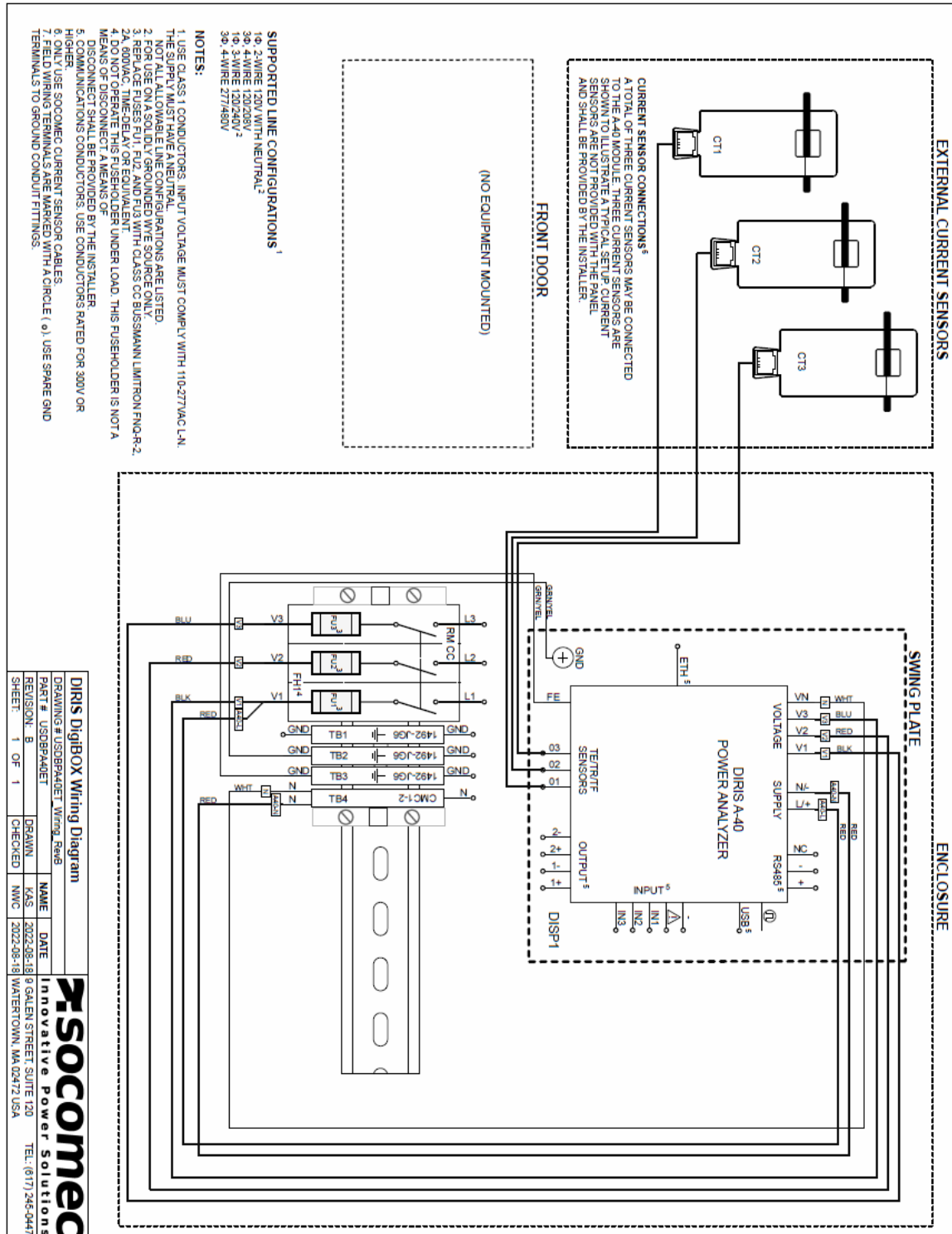
The purpose of this document is to explain the steps of installing and configuring the DIRIS DigiBOX A-40.

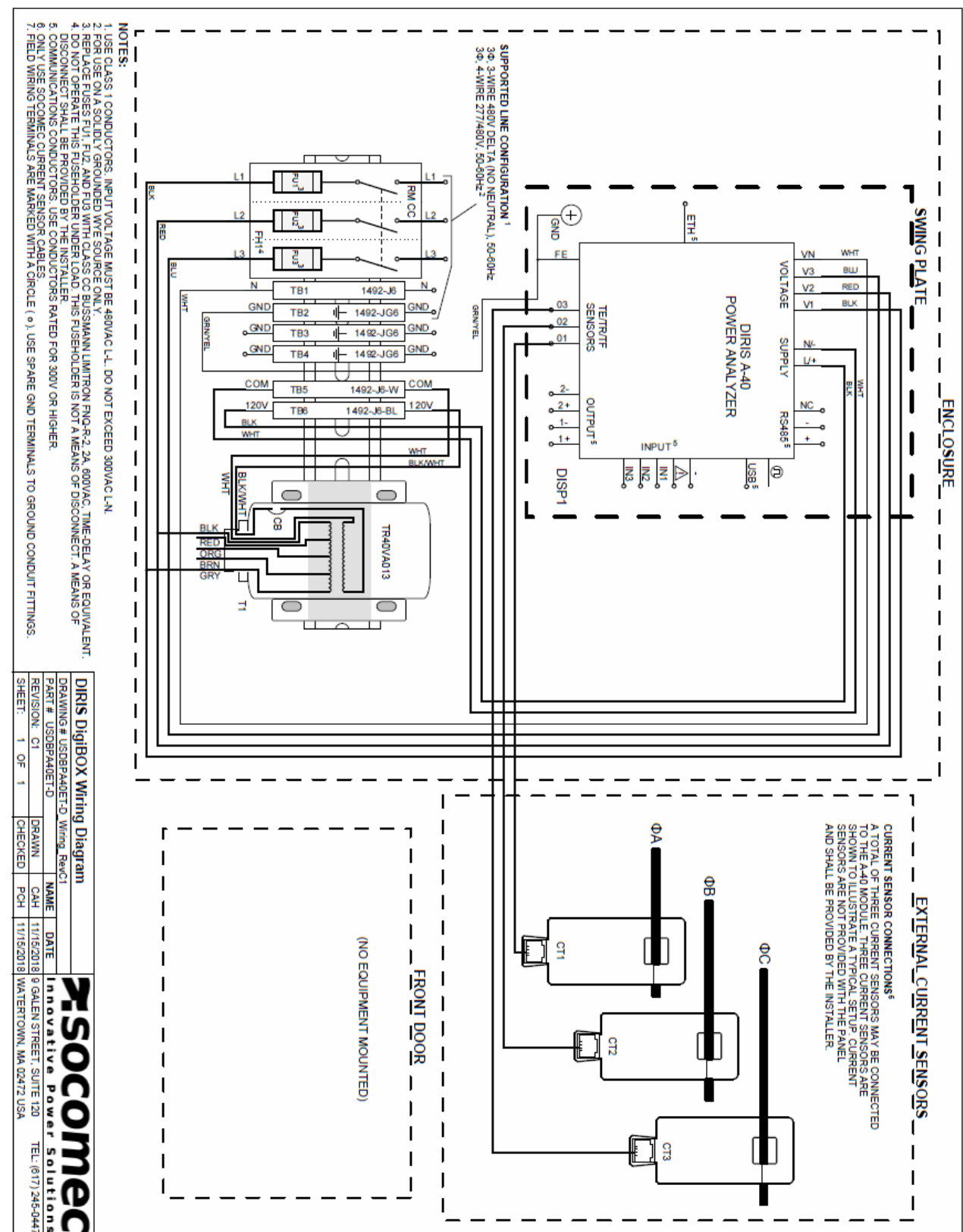
Part Number	Description	
USDBPA40ET	DIRIS DigiBOX A-40 enclosed single-point power meter; 3 CT channels; Polycarbonate NEMA 4X enclosure; RS485 Modbus RTU and Ethernet Modbus TCP/IP + BACnet IP communication; internally pre-wired with fused voltage connections; 110 – 277 VAC power supply	
USDBPA40ET-D	DIRIS DigiBOX A-40 enclosed single-point power meter; 3 CT channels; Polycarbonate NEMA 4X enclosure; RS485 Modbus RTU and Ethernet Modbus TCP/IP + BACnet IP communication; internally pre-wired with fused voltage connections; 110 – 480 VAC power supply	

Dimensions in / [mm]:



> USDBPA40ET





Technical characteristics:

Electrical characteristics

Auxiliary power supply	
Voltage	• 110-277 VAC with USDBPA40ET • 110-480 VAC with USDBPA40ET-D
Frequency	50/60 Hz

Measurement characteristics

Power and energy measurement	
Accuracy active energy and active power	Class 0.2, DigiBOX A 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	3
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 or outdoor installations
Enclosure	Polycarbonate with UV inhibitors UL94-5VA flammability rating
Enclosure dimensions (in)	12 (H) x 10 (W) x 6 (D)
Protection rating	NEMA 4X / IP66
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
USB	
Link	Micro USB Type b
Protocol	Modbus RTU
Use	Configuration via Easy Config System and firmware upgrade via Product Upgrade Tool

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1.2 Risk of Damaging the Device.....	9
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1. Hazards and Warnings

The term "device" used in the paragraphs below refers to the DIRIS A-40. The assembly, use, servicing and maintenance of this product must only be carried out by trained, qualified professionals.

SOCOMEK 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 7010-W001 (2011-05)

- 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 SOCOMEK 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

	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
---	--

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 SOCOMEK.

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 7010-W001 (2011-05)

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

- The device is correctly installed.
- There is a maximum voltage at the voltage measurement input terminals of 520 VAC phase-phase or 300 VAC phase-neutral.
- There is a maximum voltage at the auxiliary power supply input terminals of 400 V AC.
- The network frequency indicated on the device is observed: 50 or 60 Hz.
- Always connect the TE, TR/iTR or TF current sensors using Socomec RJ12 cables and observing the maximum prescribed currents.
- When the ambient temperature exceeds +50°C, the minimum temperature rating of the copper cable to be connected to terminal must be +85°C.

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 unit 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.
- 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 A is shipped with no conduit holes; they can be cut on the left side, right side, and/or the top. See the below drawings for recommended conduit hole locations.

1. Open the enclosure door, unscrew the two right side screws, and lift the metal plate.
2. Cut the conduit holes only in the locations where conduit fittings will be installed. Conduit hole templates can be found within the black bag that comes in the box.
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 $\frac{1}{2}$ 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 spar ground terminal blocks.
6. Route incoming voltage conductors at least $\frac{1}{4}$ inch away from current sensor and signal conductors. Route current sensor conductors at least $\frac{1}{4}$ inch away from communication conductors.
7. Use cable ties to secure conductors to each other and to maintain spacing

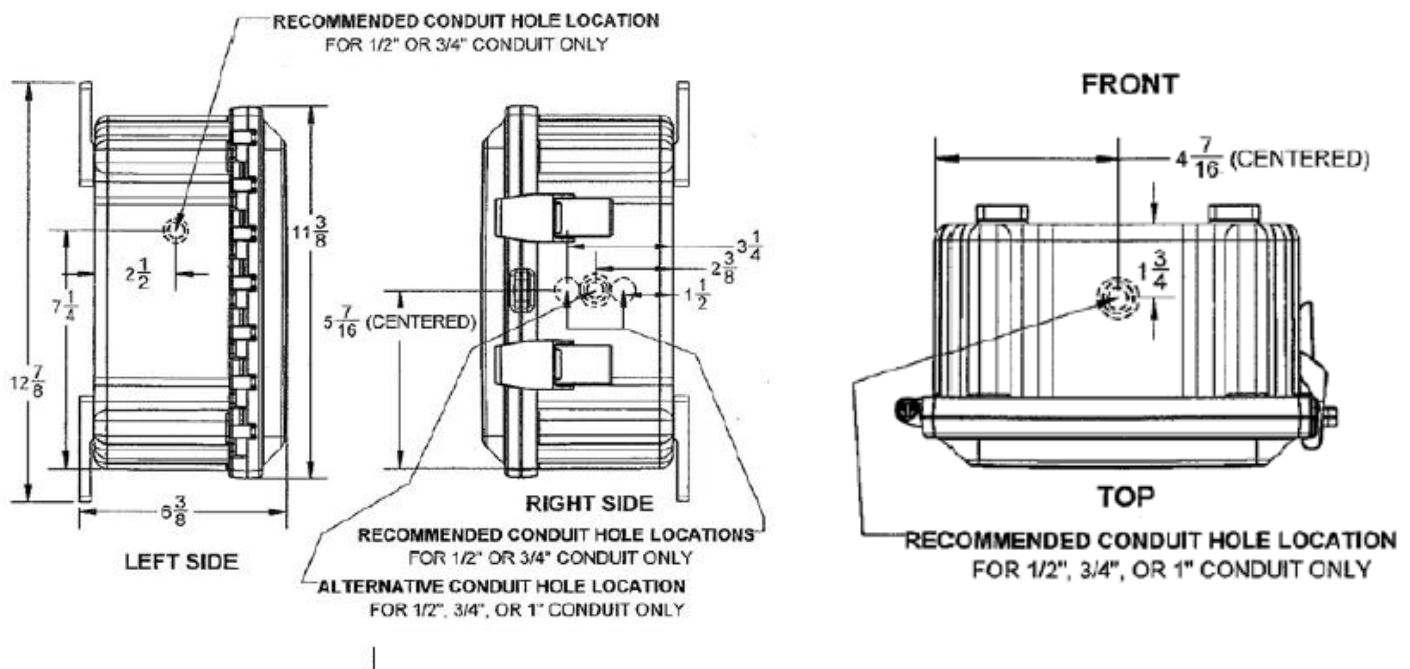


Figure 1: Recommended conduit hole locations

3. Install Mounting Feet to the Back of the Enclosure

1. A mounting feet and screw pack is provided with the DIRIS DigiBox A.



Figure 2: Mounting feet and hardware provided with the DIRIS DigiBOX A.

2. Turn the enclosure upside down on a flat surface so the back side is visible. Then place the mounting feet over the octagon pieces either horizontally, diagonally, or vertically and fasten them with the ¼ inch -20 x 0.25 inch SS, countersunk Phillips drive screws (torque limit is 30 in. lbs.).



Figure 3: Three ways to place the mounting feet on the enclosure (vertical, horizontal, and diagonal).

3. The enclosure is now ready to be mounted vertically (i.e. on a wall) or horizontally (i.e. on a table top).
4. To mount the unit, use #10-32 ¼ inch pan head screws and screw directly in the center of the cross on the mounting feet.



Figure 4: Red dot indicates where to screw when mounting on surface.

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 480VAC L-L. Make sure that the metal cover is still open inside the DIRIS DigiBox A.

1. Behind the metal plate the prewired and the components that need to be wired can be seen.
2. Wire the voltage according to the designated fuse holder (L1, L2, L3, and N).

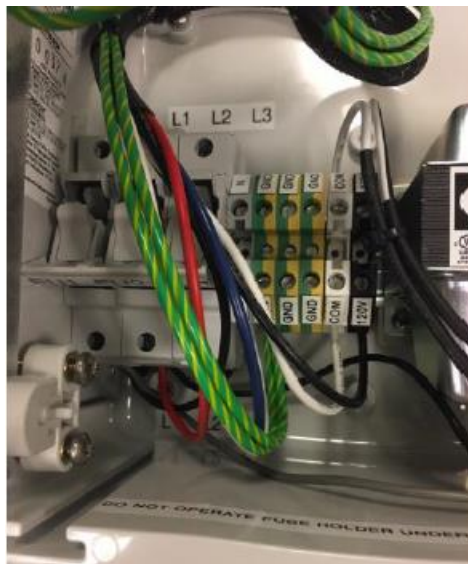


Figure 5: Wire the voltage based on the labeled fuse holders (note that the fuse holders are empty).

3. Plug in the RJ12 cables to the DIRIS A-40 and feed the RJ12 cables out of a conduit hole.

Note: For a three-phase system

- Current sensor on phase A should be connected to I01 RJ12 port of DIRIS A-40,
- Current sensor on phase B should be connected to I02 RJ12 port of DIRIS A-40,
- Current sensor on phase C should be connected to I03 RJ12 port of DIRIS A-40.

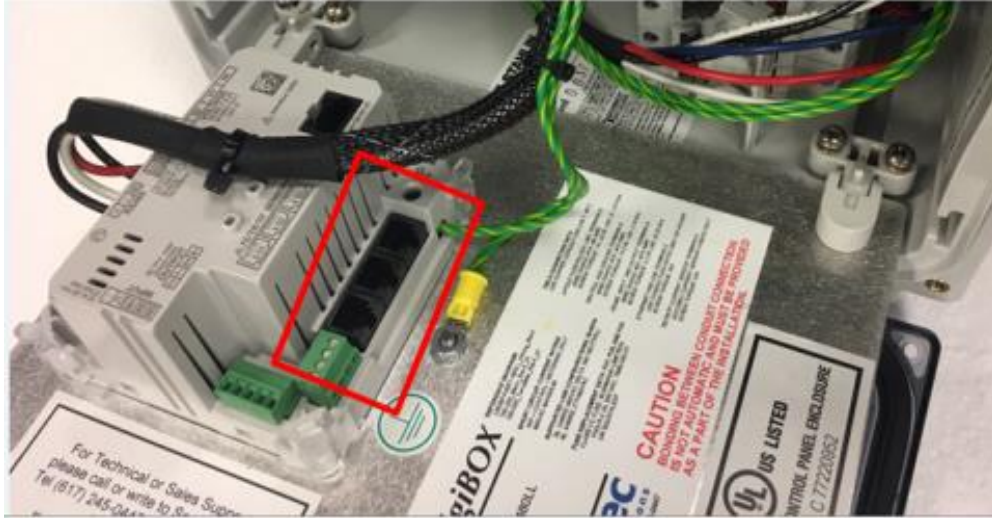


Figure 6: The boxed area is where the RJ12 cables are inserted on the DIRIS A-40.

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, paragraph 6** to change current sensor settings).

4. Connect the current sensor to the load and plug the current sensor into the RJ12 cable connected to the DIRIS A-40
5. Plug in the Ethernet or RS485 bus depending on which communication protocol will be used, and feed the cable out of a conduit hole.
6. 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.
7. Put fuses provided in the black bag into the fuse holders
8. Close the metal plate and screw it back down. The DIRIS A-40 should now be on.

5. Configuring the DigiBOX A-40

5.1 Making sure firmware is up to date

1. Before commissioning your DIRIS DigiBOX A, make sure the DIRIS A-40 operates under the latest firmware version.

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 DIRIS A-40.

Go to the website to download the Product Upgraded Tool:

https://www.socomec.com/product-upgrade-tool-software_en.html

2. Under the “Firmware” section, download the DIRIS A-40 firmware. **Please note that the firmware downloaded from the website is a zip file. DO NOT unzip the file, just upload the file directly into Product Upgrade Tool.**

Firmware

Select the product to download the firmware



ATyS C55 - Ref 16000055 - v2.1
ATyS C65 - Ref 16000065 - v2.1
DIRIS Digiware D-30 - Ref 48290200 - v1.10
DIRIS Digiware D-40 - Ref 48290199 - v1.6
DIRIS Digiware D-50v2 - Ref 48290204 - v2.5 (upgrade via PUT software)
DIRIS Digiware D-50v2 - Ref 48290204 - v2.5 (upgrade via web interface)
DIRIS Digiware D-70v2 - Ref 48290203 - v2.5 (upgrade via PUT software)
DIRIS Digiware D-70v2 - Ref 48290203 - v2.5 (upgrade via web interface)
DIRIS Digiware M-50 - Ref 48290221 - v1.2 (upgrade via PUT software)
DIRIS Digiware M-50 - Ref 48290221 - v1.2 (upgrade via web interface)
DIRIS Digiware M-70 - Ref 48290222 - v1.2 (upgrade via PUT software)
DIRIS Digiware M-70 - Ref 48290222 - v1.2 (upgrade via web interface)
DIRIS Digiware U-10 - Ref 48290105 - v1.9
DIRIS Digiware U-20 - Ref 48290106 - v1.7
DIRIS Digiware U-30 - Ref 48290102 - v1.11
DIRIS Digiware U-31dc - Ref 48290150 - v1.2
DIRIS Digiware U-32dc - Ref 48290151 - v1.2
DIRIS Digiware I-30 - Ref 48290110 - v1.11
DIRIS Digiware I-30dc - Ref 48290156 - v1.1
DIRIS Digiware I-31 - Ref 48290111 - v1.9
DIRIS Digiware I-33 - Ref 48290128 - v1.9
DIRIS Digiware I-35 - Ref 48290130 - v1.11
DIRIS Digiware I-35dc - Ref 48290157 - v1.1
DIRIS Digiware I-43 - Ref 48290129 - v1.6
DIRIS Digiware I-45 - Ref 48290131 - v1.9
DIRIS Digiware I-60v2 - Ref 48290112 - v2.1
DIRIS Digiware I-61v2 - Ref 48290113 - v2.1
DIRIS Digiware IO-10 - Ref 48290140 - v1.3
DIRIS Digiware IO-20 - Ref 48290145 - v1.2
DIRIS Digiware R-60 - v1.1
DIRIS Digiware S-130 - Ref 48290160 - v1.3
DIRIS Digiware S-135 - Ref 48290161 - v1.3
DIRIS Digiware S-Datcenter - Ref 48290162 - v1.3
DIRIS G-30 / G-40 - Ref 48290300 / 48290301 - v1.8
DIRIS G-50 / G-60 - Ref 48290302 / 48290303 - v1.8
DIRIS B-10 - Ref 48290010 - v1.4
DIRIS B-30 RS - Ref 48290000 - v1.9
DIRIS B-30 RF - Ref 48290002 - v1.8
DIRIS A-40 - Ref 48250500 / 48250501 / 48250502 - v1.7

Figure 7: The firmware to be downloaded is labeled DIRIS A-40.

3. Plug in a micro USB cable to the back of the DIRIS A-40.



Figure 8: The micro USB port on the DIRIS A-40

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

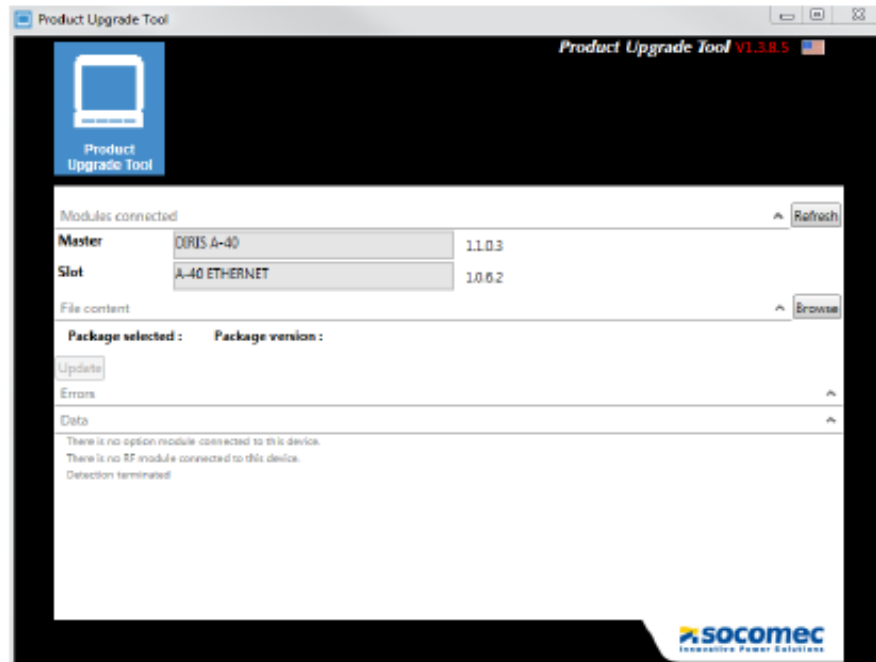


Figure 9: Product Upgrade tool home screen.

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 A-40.
 - A green symbol means that the firmware selected is more recent than the one currently on the DIRIS A-40 and an upgrade is possible.
 - A red symbol means that the firmware selected is a lower version than the one currently on the DIRIS A-40.

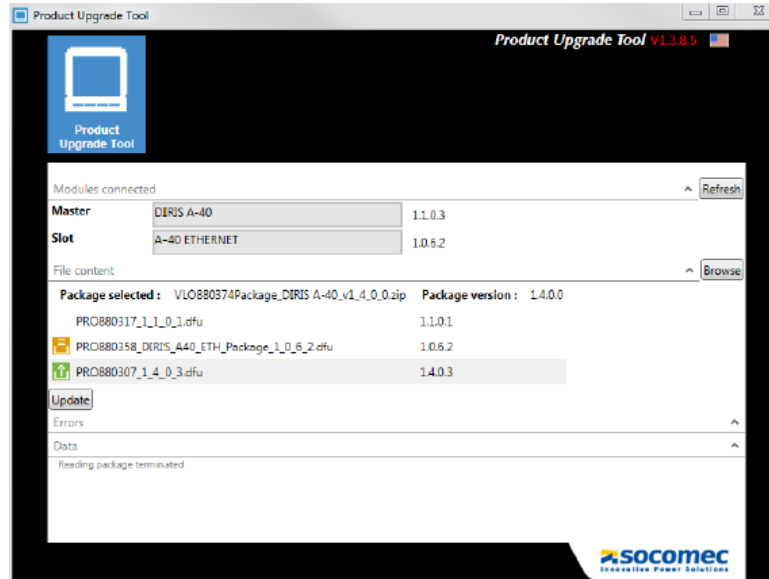


Figure 10: Product upgrade tool screen once the firmware is selected.

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

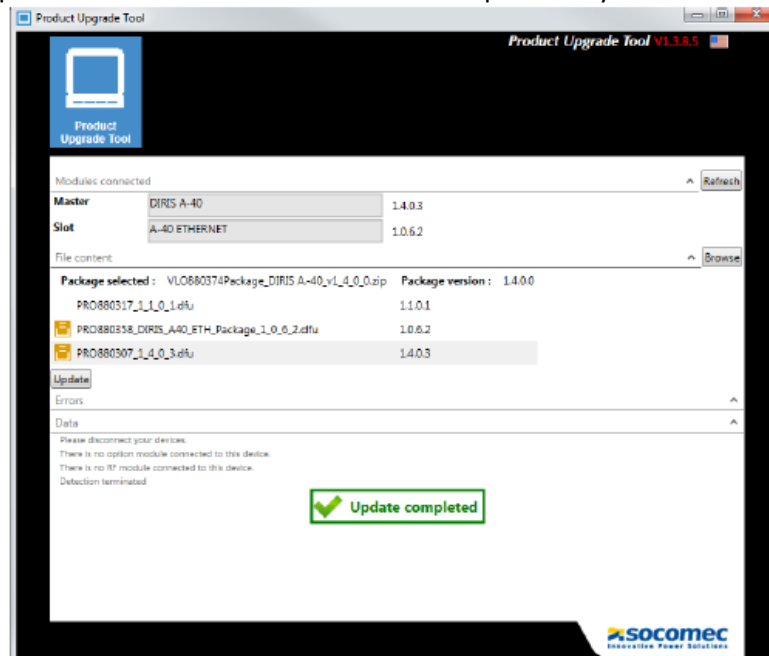


Figure 1: Product Upgrade Tool screen once update is complete.

5.2 Configuration Wizard

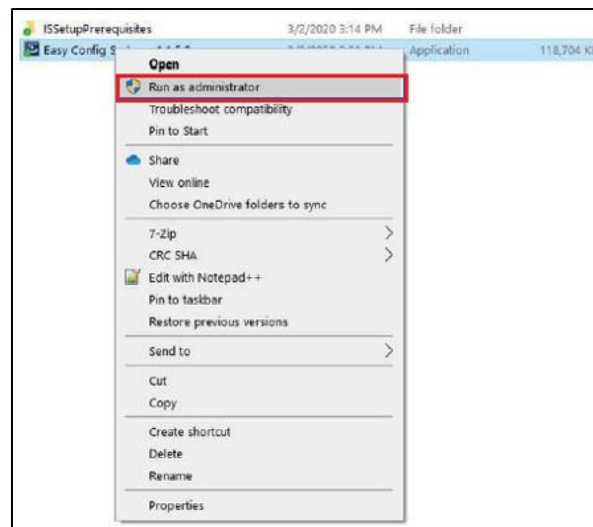
The DIRIS A-40 can be configured using the display configuration setup “Wizard”. When using the Wizard the DIRIS A-40 provides step by step assistance from its screen. Follow the on screen instructions.

Complete configuration of the DIRIS DigiBOX A can also be performed from the Easy Config System software.

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.com/easy-config-system_en.html
2. Once the Easy Config System folder is saved on your computer, right click on the setup file and **Run as administrator**.



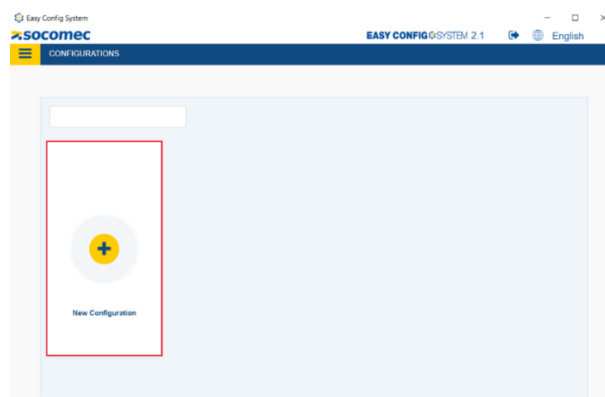
3. Plug the micro USB cable to the slot on the back of the A-40 module. Plug the USB end of the cable to the computer.



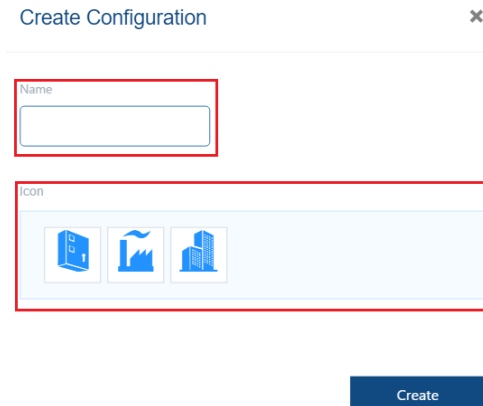
4. Open **Easy Config System** to configure the DIRIS A-40 power meter.
5. When logging in, choose the Admin profile and complete the verification using the information below. Each profile provides a different level of access.

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

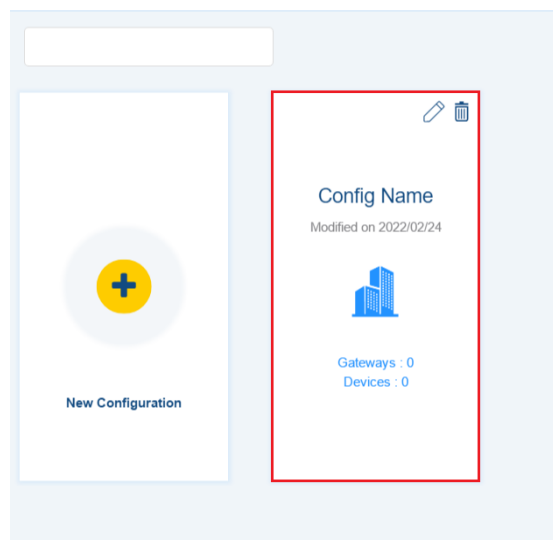
6. Create a new configuration by selecting **New Configuration**.



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



8. Select the recently created configuration from the list.



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



10. Navigate to and select **USB mode** on the top right corner to connect to the A-40 Module and access configuration menus.



The DIRIS DigiBOX A will be automatically 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 A-40 using Easy Config System

1. Once connected to the DIRIS A-40 navigate to and select **Device Configuration**.



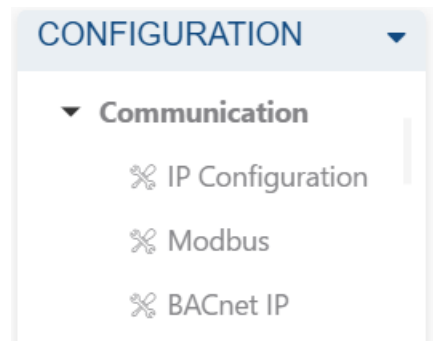
Display Settings

2. The **Display Settings** section in the **General** tab on the bottom left side of the screen contains information about the DIRIS A-40's screen (language, backlight settings etc.).

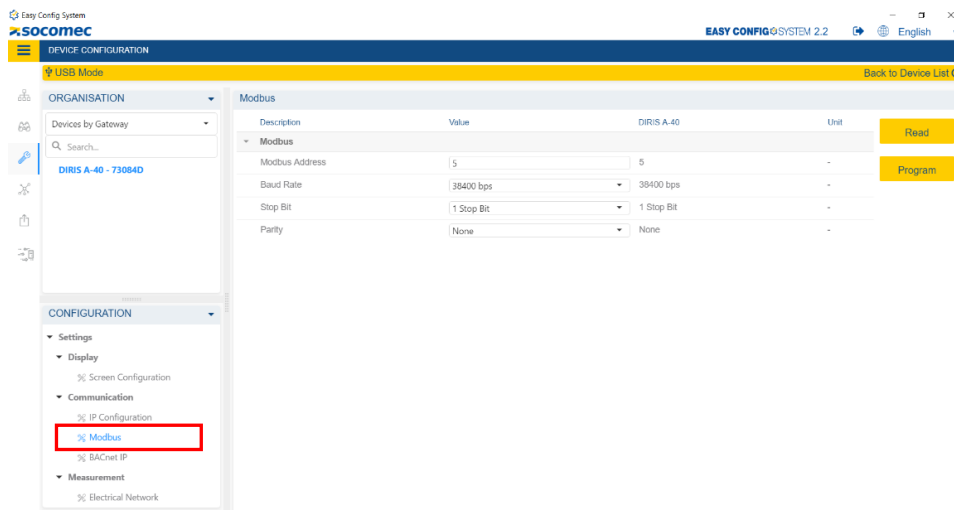
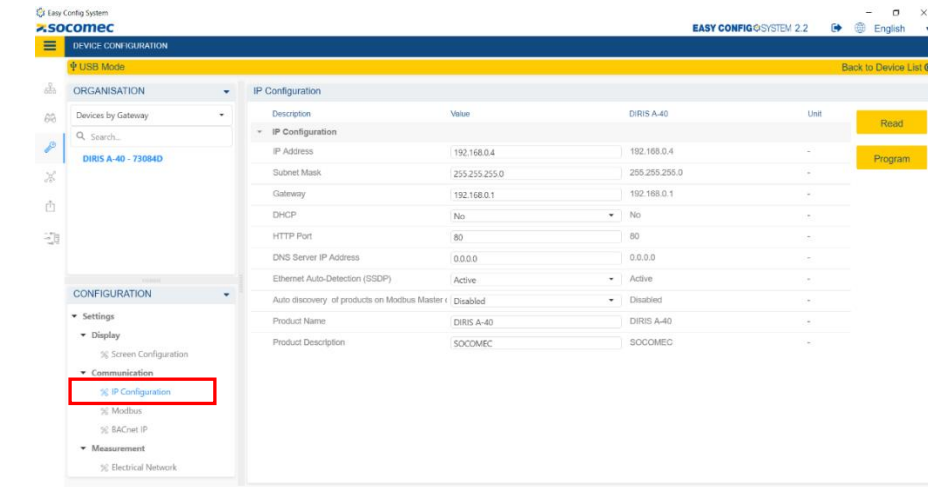
Once you have entered your parameters, click on **Program** at the top right side of the screen and this will immediately update the DigiBOX A-40. Clicking on **Program**, only flashes the parameters of the tab that you are currently working on to the DigiBOX A-40.

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. Set all desired IP values. Once complete, click on **Program** to flash all values to the DigiBOX A-40.



Measurement

- Electrical Network:** select the Network Type being measured based on where the voltage is measured by the DigiBOX A-40 as well as the nominal voltage and nominal frequency (60 Hz in North America)

The screenshot shows the 'EASY CONFIG SYSTEM 2.2' interface. On the left, the 'CONFIGURATION' menu has 'Electrical Network' highlighted with a red box. The main panel is titled 'Electrical Network' and contains a table with the following data:

Description	Value	DIRIS A-40	Unit
Electrical Network			
Network			
Type	3P+N	3P+N	-
Nominal Voltage	480	480	V
Nominal Frequency	60 Hz	60 Hz	-
Phase Rotation	V1 - V2 - V3	V1 - V2 - V3	-
Voltage Transformer			
Voltage Transformer	No	No	-

Buttons for 'Read' and 'Program' are visible on the right side of the table.

- Load:** Define the Load Type being measured and provide the Nominal Current. You can also name the Load and define the energy usage.

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

The screenshot shows the 'EASY CONFIG SYSTEM 2.2' interface. On the left, the 'CONFIGURATION' menu has 'Load' highlighted with a red box. The main panel is titled 'Load' and contains a table with the following data:

Description	Value	DIRIS A-40	Unit
Load 1			
Activate			
Name	My circuit	My circuit	-
Type			
Load Type	3P+N-3CT	3P+N-3CT	-
Nominal Current	1200	1200	A
Info			
Usage	Undefined	Undefined	-

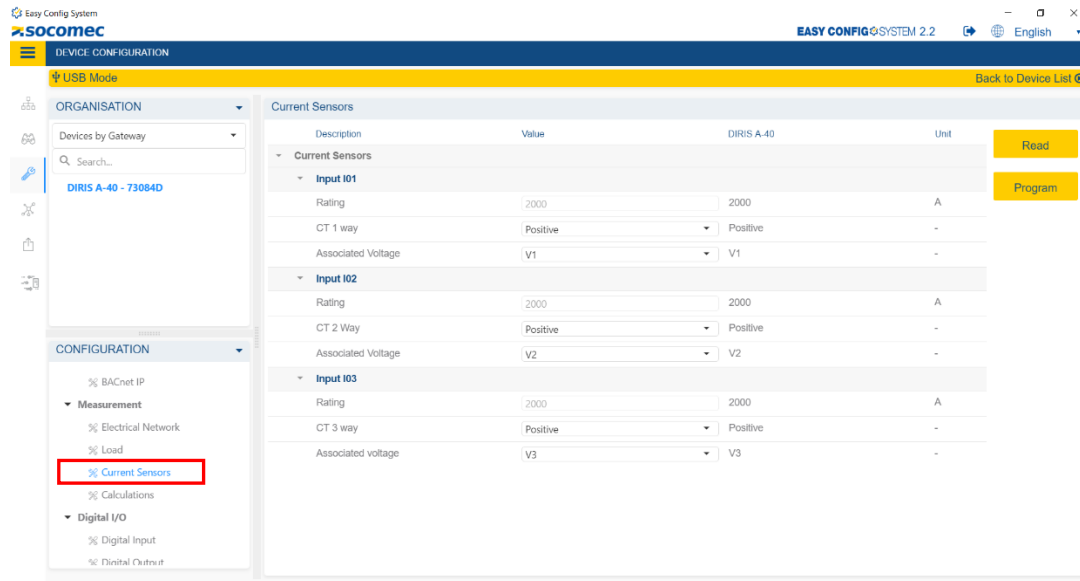
Buttons for 'Read' and 'Program' are visible on the right side of the table.

6. The **Current Sensors** menu allows you to configure the current sensors connected to the DigiBOX A-40.

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

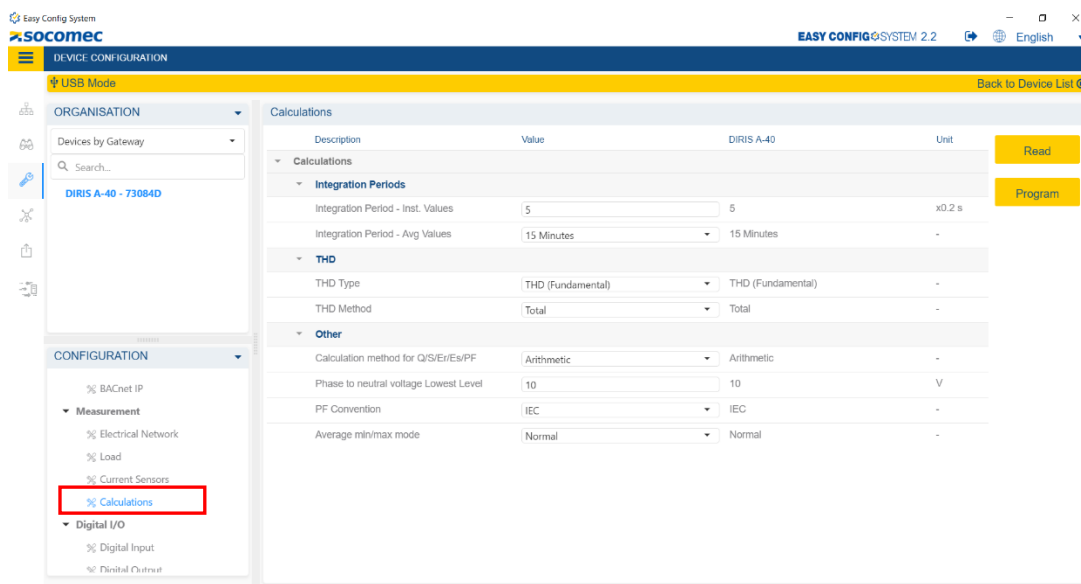


7. **Calculations:** Set the integration period for instantaneous and average values of the different electrical parameters.

Notes:

The integration period of average values determines the reading interval of Trends displayed on WEBVIEW-S, the webserver embedded in the DigiBOX A.

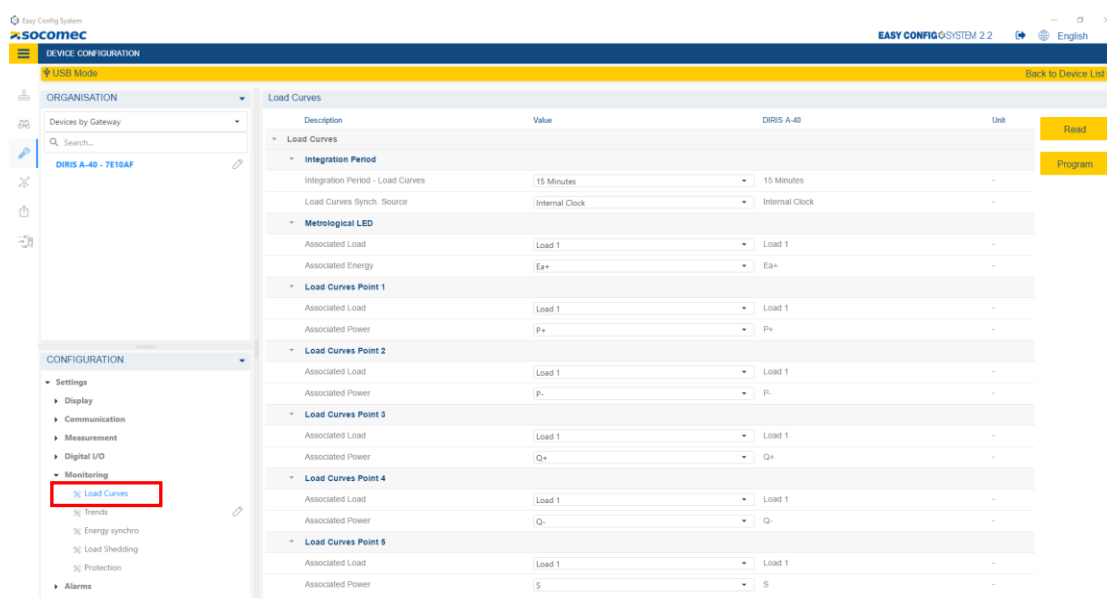
Refer to step 9 to choose the electrical parameters you wish to record for Trends curves on WEBVIEW-M.



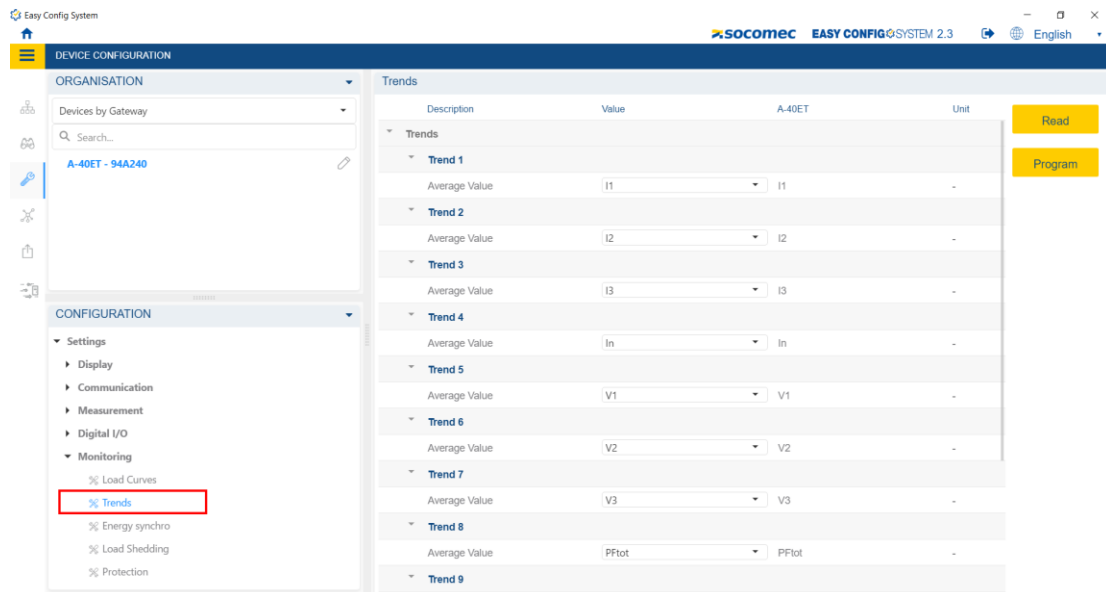
Monitoring

- Load Curves:** Set the integration period of Load curves, then select which power values you wish to log and their associated load. Load curves can be visualized on the embedded webserver WEBVIEW-S.

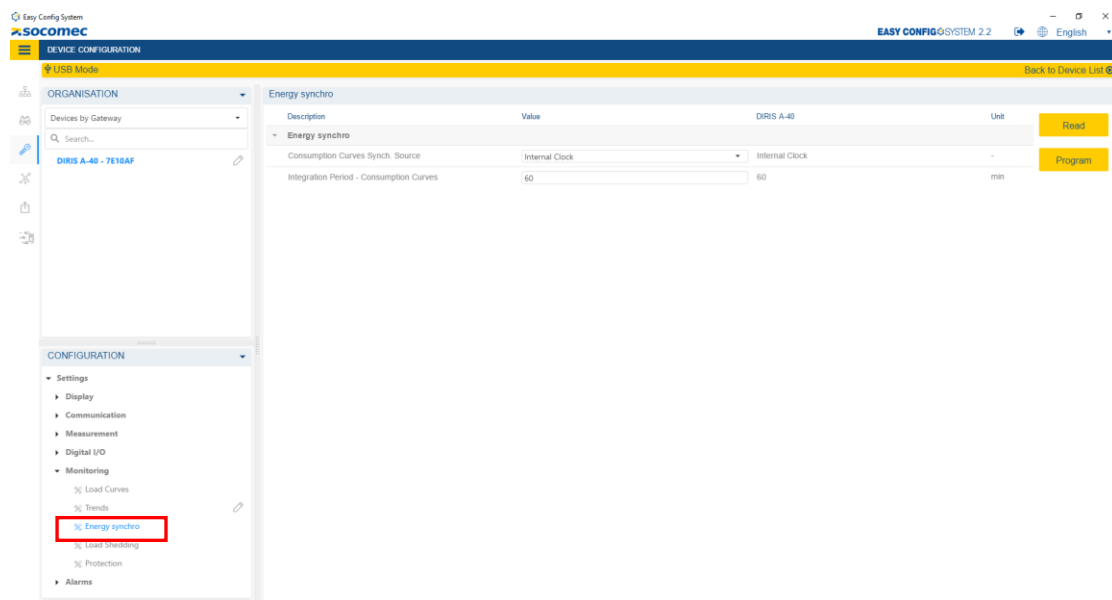
Note: It is recommended to set the integration period of Load curves at 15 min (default value), so it matches most utility meter reading intervals.



- Trends:** Choose and select the different parameters you want to record and be able to visualize trends (historical view) on WEBVIEW.

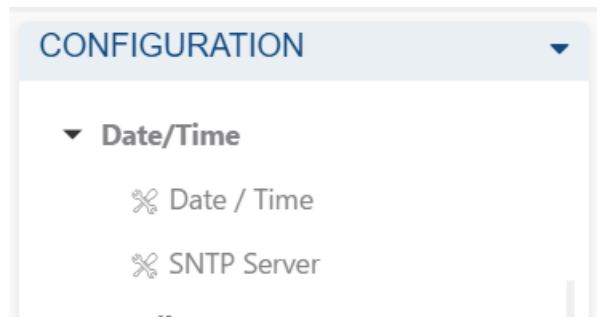


- Energy Synchro:** Set the desired integration period for consumption curves. Consumption curves can be visualized on the embedded webserver WEBVIEW-S.



Date/Time

- Next, click on the **Date/Time** tab. You can synchronize the date/time of the DigiBOX A-40 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.



Continue to navigate through the remaining settings menus (*Digital I/O, Monitoring, Alarms and Emails (SMTP)*) and set all parameters per your application.

Please note that additional assistance from your IT department may be required when it comes to configuring communication protocols and services.

Once the configuration is done in Easy Config System, follow the steps in chapter 6 to set up WEBVIEW-S to be able to visualize measurements from a web browser.

6. WEBVIEW-S

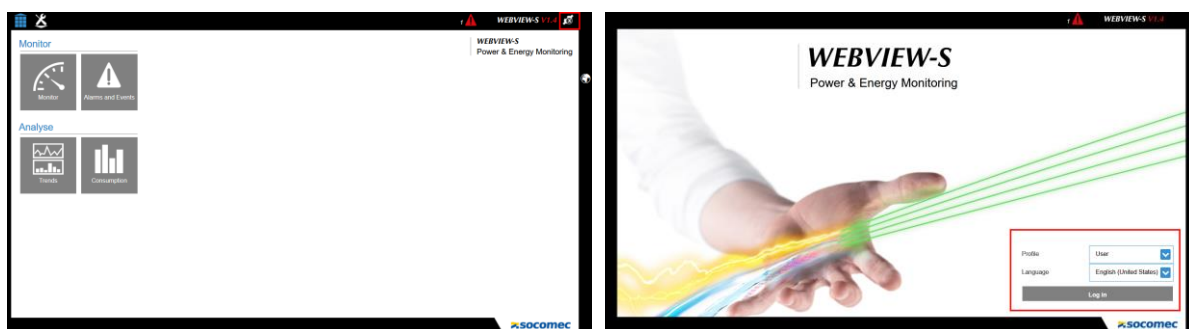
WEBVIEW-S is a free webserver, embedded to the DigiBOX A-40 and provides visualization of real-time measurements and monitoring of energy consumption and demand profiles. It is intended for use by those who wish to have a complete and user-friendly tool to quickly analyze malfunctions within their electrical installation to guarantee energy-related performance.

1. Open the internet browser and type in the IP address of the DIRIS DigiBOX A-40.

The default IP address for the DIRIS DigiBOX A-40 is the following: 192.168.0.4



2. Change the user profile to **Admin**. To do this click on the **X** at the top right hand corner to get the home screen where you can login as a different user.



3. Default passwords are listed below:

Profile	Default Password
User	No password
Admin	Admin
Advanced User	UserAdvanced

4. Click on the wrench/screwdriver icon on the top left corner to access setup menu:



5. From the setup menu:



- **Profile:** allows you to change profile passwords
- **FTP:** allows you to configure FTP settings to export measurement data cyclically to a remote FTP(S) server
- **Diagnosis:** shows product and communication information



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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