

DIRIS DigiBox **B-30**

UL/CSA
Ed.1



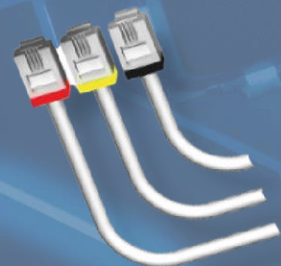
CAUTION
HAZARD OF
ELECTRIC
SHOCK, BURN,
OR EXPLOSION

This equipment must be
installed and serviced only by
qualified electrical personnel.
Turn off all power supplying this
equipment before working on or
inside equipment.

Always use a properly rated
voltage sensing device to
confirm power is off.

Replace all devices, doors, and
covers before turning on power
to this equipment.

Failure to follow these
instructions will result in death
or serious injury.



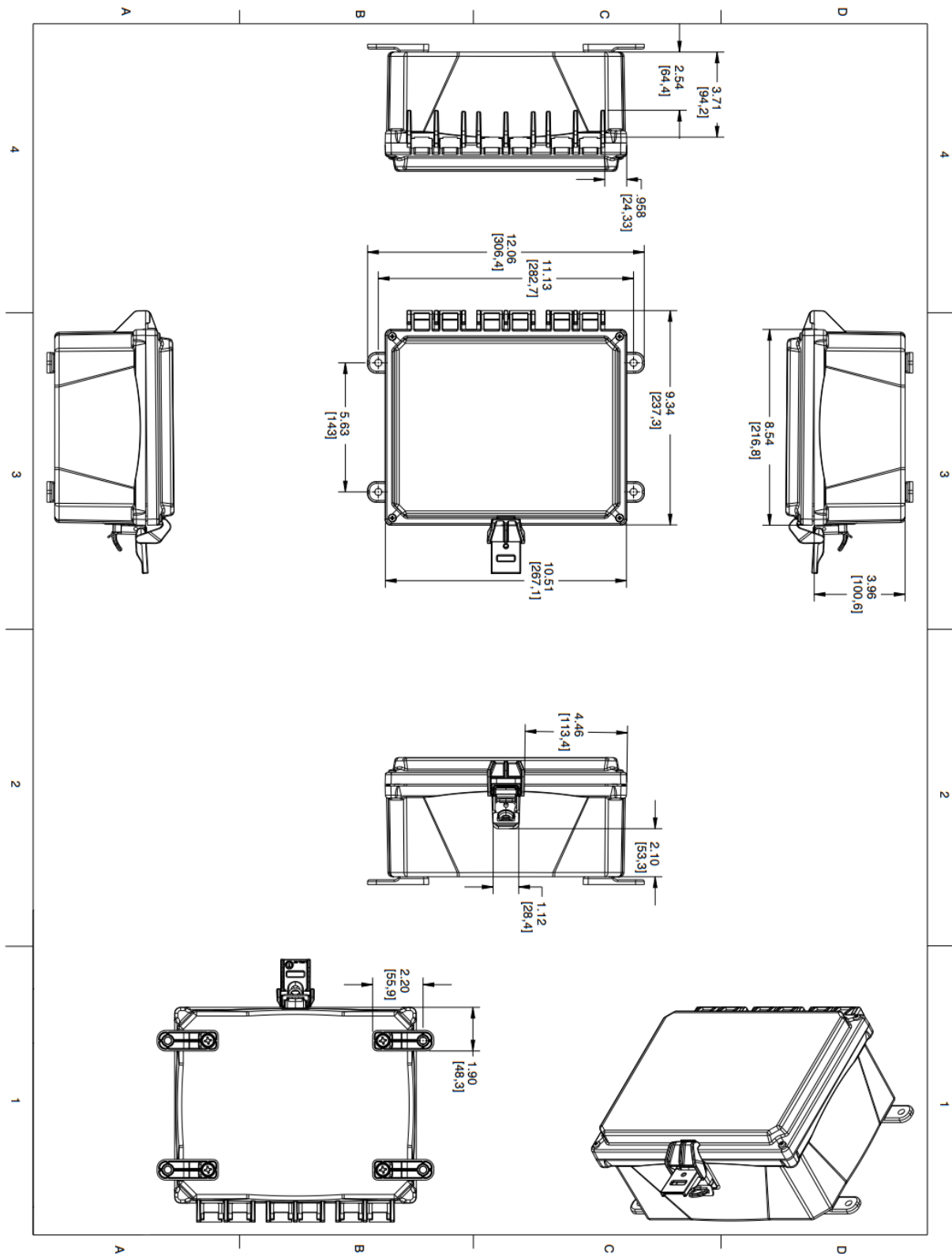
Introduction:

The purpose of this document is to explain the steps of installing and configuring the DIRIS DigiBOX B-30.



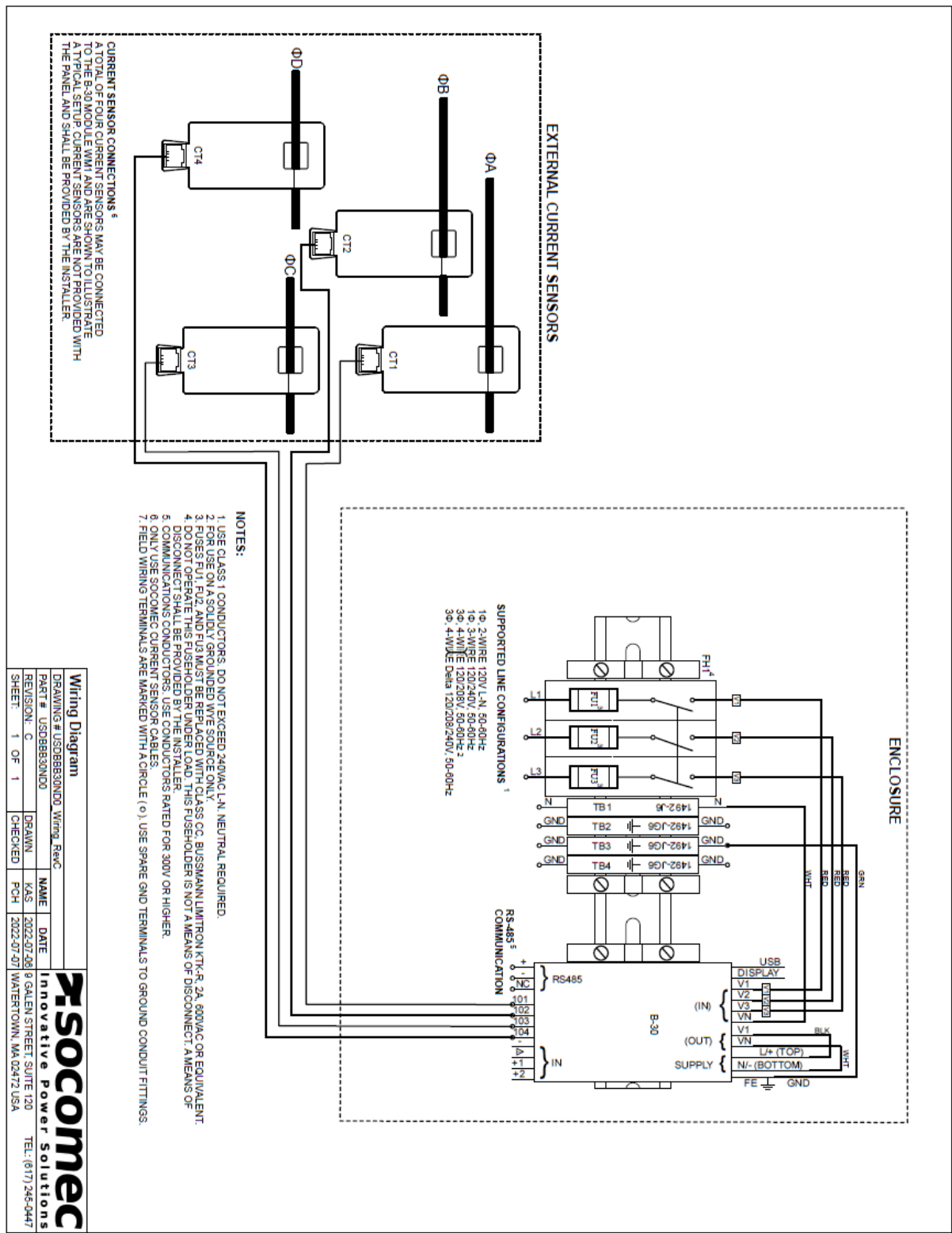
Part Number	Description	
USDBBB30ND0	DIRIS DigiBOX B-30 enclosed single-point power meter; 4 CT channels; Polycarbonate NEMA 4X enclosure; RS485 Modbus RTU communication; internally pre-wired with fused voltage connections; 110 – 240VAC power supply	
USDBPB30ND0	DIRIS DigiBOX B-30 enclosed single-point power meter; 4 CT channels; Polycarbonate NEMA 4X enclosure; RS485 Modbus RTU communication; internally pre-wired with fused voltage connections; 110 – 480 VAC power supply	

Dimensions in / [mm]:

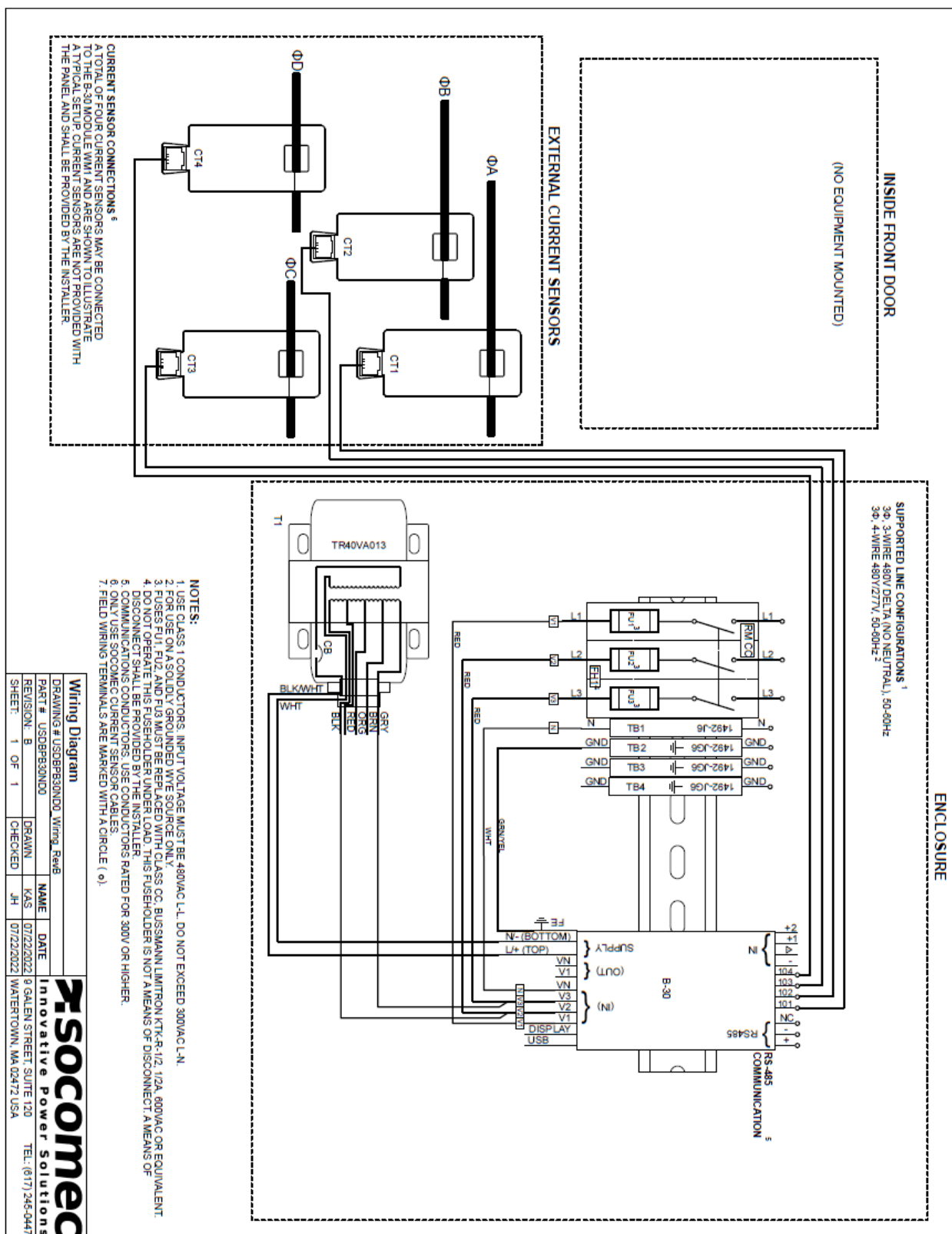


Wiring diagrams:

> USDBBB30NDO



> USDBPB30ND0



Technical characteristics:

Electrical characteristics

Auxiliary power supply	
Voltage	110 - 240 VAC with USDBBB30NDO 110 - 480 VAC with USDBPB30NDO
Frequency	50/60 Hz

Measurement characteristics

Power and energy measurement	
Accuracy active energy and active power	Class 0.2, DigiBOX B alone Class 0.5 with TE, iTR, TF sensors Class 1 with TR sensors
Accuracy reactive energy	Class 2 with TE, TR/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	≤ 0.1 VA
Frequency range	45 – 65 Hz
Frequency accuracy	Class 0.02
Current measurement	
Number of current inputs	4
Associated current sensors	Solid-core TE, split-core TR/iTR, flexible Rogowski TF
Connection	Socomec RJ12 cables
Accuracy	Class 0.2 DigiBOX B alone Class 0.5 with TE, iTR, TF sensors Class 1 with TR sensors

Mechanical characteristics

Enclosure	Polycarbonate
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	1200 – 115200 baud
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. Hazards and Warnings

The term "device" used in the paragraphs below refers to the DigiBOX B. The assembly, use, servicing and maintenance of this product 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 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 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

	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
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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.

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.
- 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 B-30 is shipped with no conduit holes; they can be cut using standard hole saws on the left side, right side, and/or the top but we recommend. Refer to the conduit hole template provided with the DigiBOX B-30 for recommended conduit hole locations.

1. Open the enclosure door.
2. Cut the conduit holes only in the locations where conduit fittings will be installed. A conduit hole template is provided with the DigiBOX B-30.
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 spar 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. Install Mounting Brackets to the Back of the Enclosure

1. A mounting bracket and screw pack are provided with the DigiBOX B-30.



Figure 1: Mounting brackets and hardware provided with the DIRIS DigiBox B-30.

2. Turn the enclosure upside down on a flat surface so the back side is visible. Then place the mounting bracket over the square boss either horizontally or vertically, and fasten the mounting bracket with the ¼"-20 x 0.5" SS, countersunk Phillips drive screws (torque limit = 32 in. lbs. maximum).



Figure 2: two ways to place the mounting bracket on the enclosure (vertical, horizontal, and diagonal).

3. The enclosure can be mounted either horizontally or vertically, with the mounting brackets in any configuration, using any acceptable fastening technique.



Figure 3: 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.

1. Inside the DigiBOX B-30, 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).

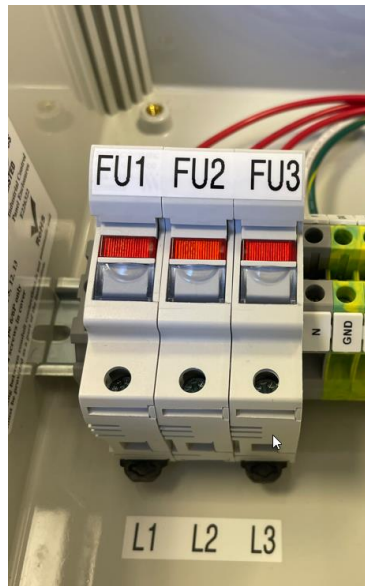


Figure 4: Wire the voltage based on the labeled fuse holders (note that the fuse holders are empty).

3. Plug in the RJ12 cables to the DIRIS B-30 and feed the cable 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 B-30,
- Current sensor on phase B should be connected to I02 RJ12 port of DIRIS B-30,
- Current sensor on phase C should be connected to I03 RJ12 port of DIRIS B-30.

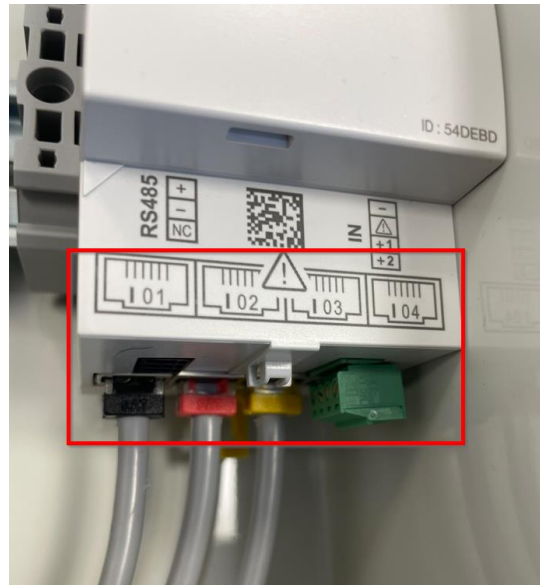


Figure 5: The boxed area is where the RJ12 cables are inserted on the DIRIS B-30.

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 **5.3, paragraph 5** 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 B-30
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 DigiBOX B-30 should now be on.

5. Configuring the DigiBOX B-30 from Easy Config System

5.1. Making sure firmware is up to date

1. Before commissioning your DIRIS DigiBox B, make sure the DIRIS B-30 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 B-30.

Go to the website to download the Product Upgraded Tool:

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

1. 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 the DIRIS B-30 firmware.

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.

2. Plug in a micro USB cable to the DIRIS B-30.

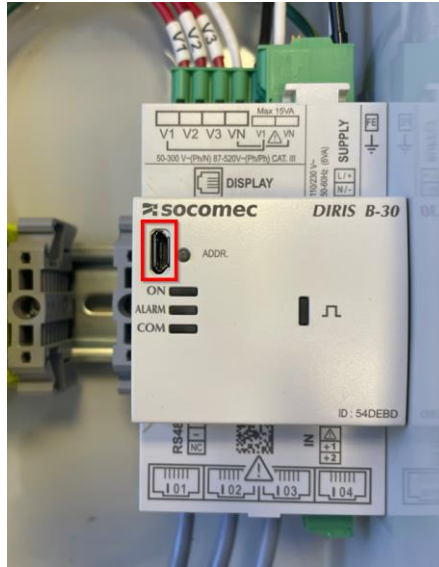


Figure 7: The micro USB port on the DIRIS B-30

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

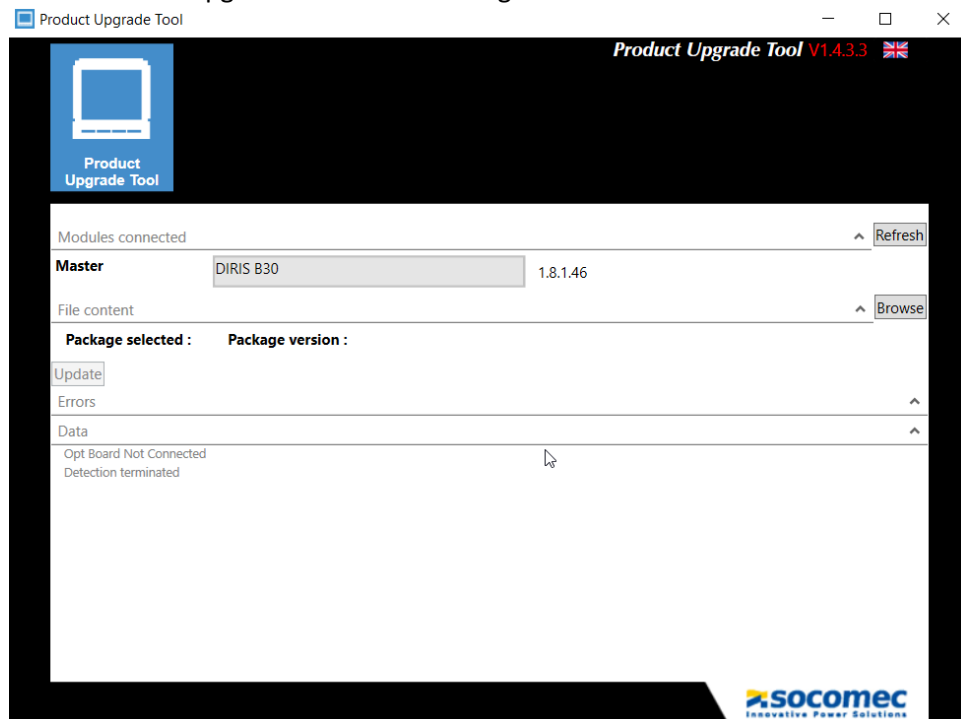


Figure 8: Product Upgrade tool home screen.

4. 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 B-30.
 - A green symbol means that the firmware selected is more recent than the one currently on the DIRIS B-30 and an upgrade is possible.
 - A red symbol means that the firmware selected is a lower version than the one currently on the DIRIS B-30.

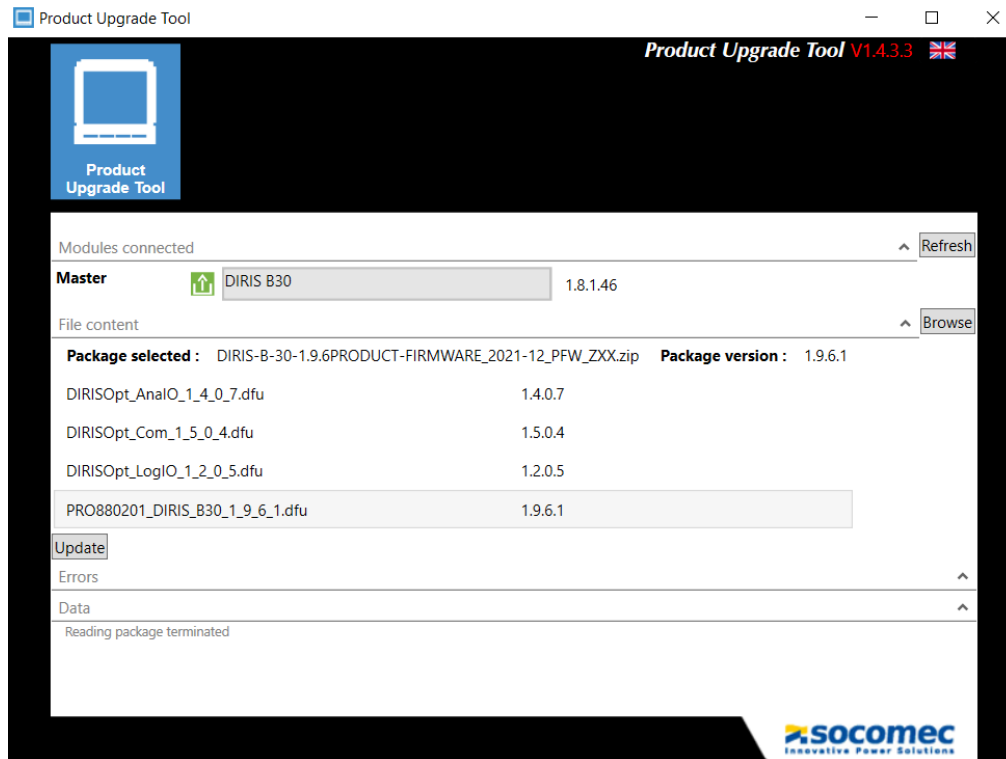


Figure 9: Product upgrade tool screen once the firmware is selected.

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

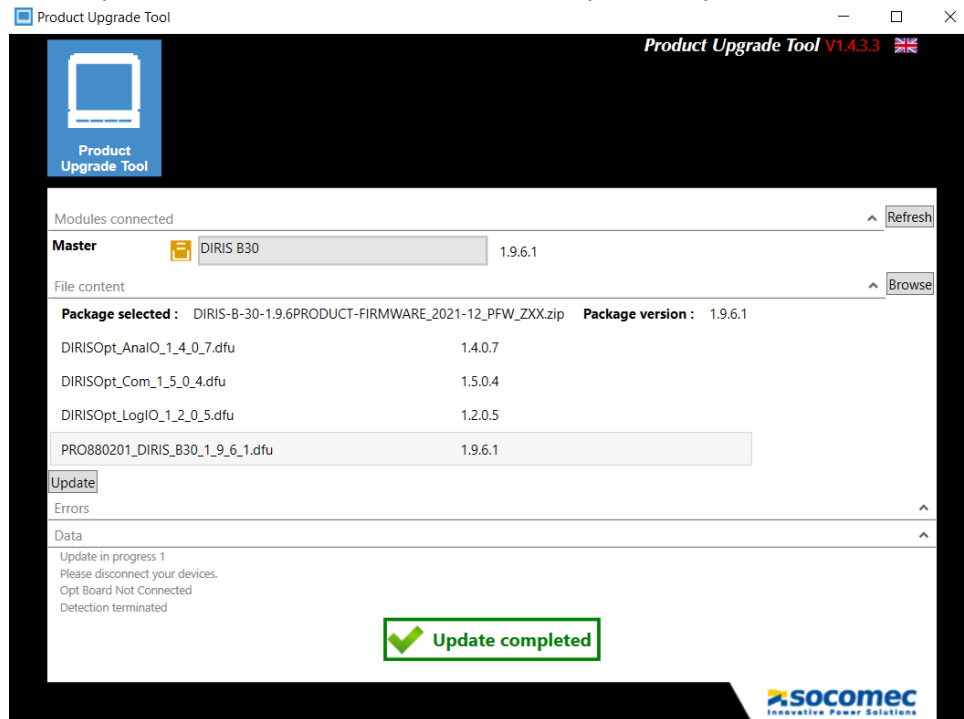


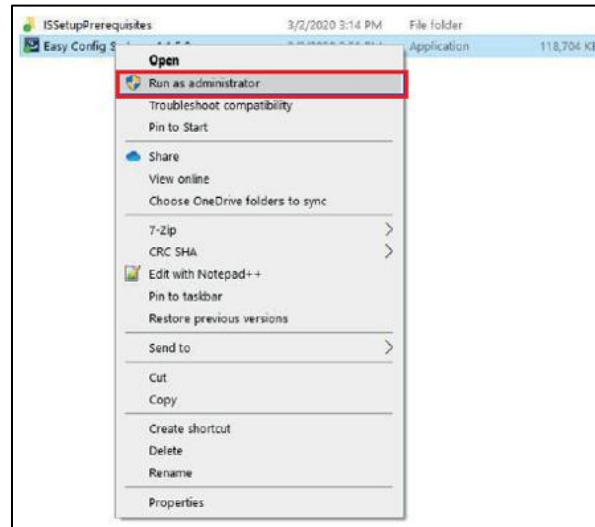
Figure 10: Product Upgrade Tool screen once update is complete.

5.2. Installing and Connecting to Easy Config System

The Easy Config System software 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**.



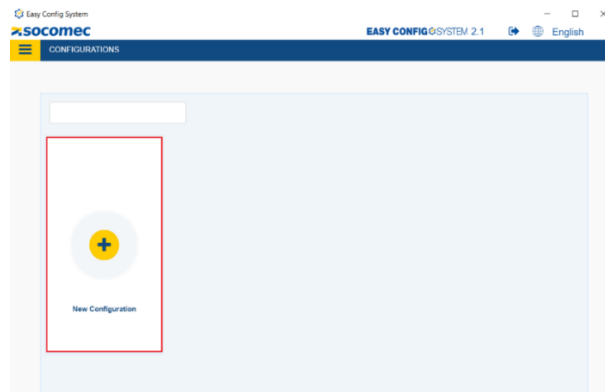
3. Plug the micro USB cable to the slot on the front of the DIRIS B-30. Plug the USB end of the cable to the computer.



4. Open **Easy Config System** to configure the DigiBOX B-30 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

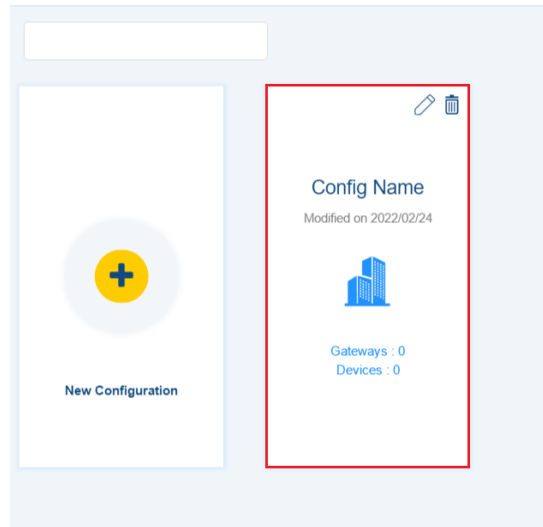
6. Create a new configuration by selecting **New Configuration**.



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

 A screenshot of a 'Create Configuration' pop-up window. The window has a title bar with 'Create Configuration' and a close button (X). Inside, there are two main sections: 'Name' and 'Icon'. The 'Name' section has a text input field, which is highlighted with a red rectangular box. The 'Icon' section shows three icons: a server rack, a factory, and a building, each in a small square. This entire section is also highlighted with a red rectangular box. At the bottom right of the window is a blue button labeled 'Create'.

8. Select the recently created configuration from the list.



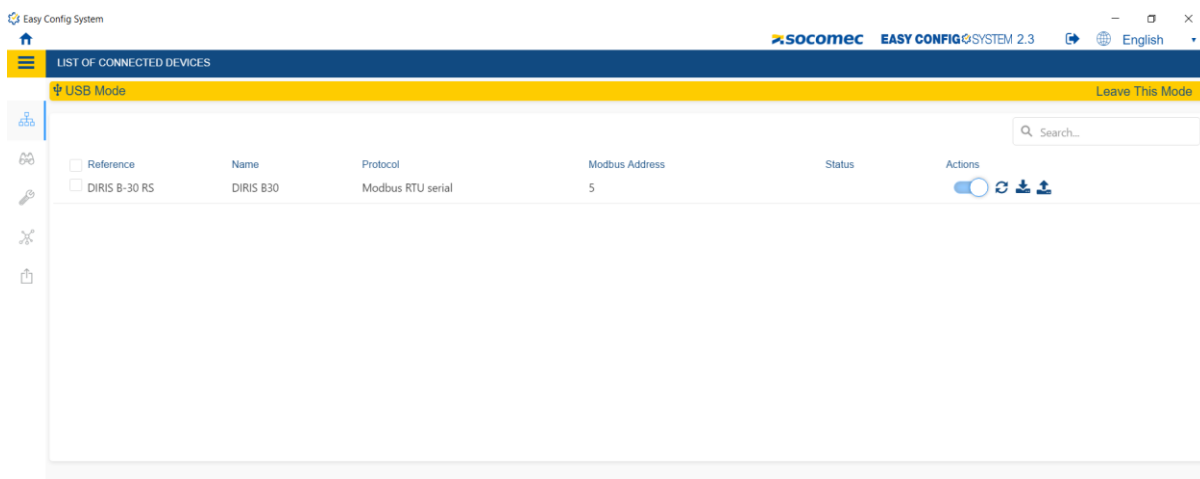
9. Click on the **Device List** icon



10. Navigate to and select **USB mode** on the top right corner to connect to the DigiBOX B-30 and access configuration menus.



The DIRIS DigiBOX B-30 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**.



5.3. Configuration of the DIRIS DigiBOX B using Easy Config System

1. Once connected to the DigiBOX B-30, navigate to and select **Device Configuration**.



Once you have entered your parameters, click on **Program** at the top right side of the screen and this will immediately update the DigiBOX B-30.

When you click on **Program**, be aware that this will only flash the parameters of the tab that you are currently working on to the DigiBOX B-30.

Communication

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

CONFIGURATION

▼ Communication

✕ Modbus

Measurement

3. Electrical Network: select the Network Type being measured based on where the voltage is measured by the DigiBOX B-30 as well as the nominal voltage and nominal frequency (60 Hz in North America)

The screenshot shows the 'Easy Config System' interface for the 'DIRIS B30 - 54DEBD' device. The 'CONFIGURATION' menu on the left has 'Electrical Network' selected. The main configuration area is titled 'Electrical Network' and contains the following table:

Description	Value	DIRIS B30	Unit
Electrical Network			
Network			
Type	3P+N	3P+N	-
Nominal Voltage	240	240	V
Nominal Frequency	60 Hz	60 Hz	-
Phase Rotation	V1 - V2 - V3	V1 - V2 - V3	-
Voltage Transformer			
Voltage Transformer	No	No	-

4. Load: This section allows you to configure the different load(s) monitored by the DigiBOX B-30. You must configure the number of loads, and for each load:

- The load name
- 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

The screenshot shows the 'Easy Config System' interface for the 'DIRIS B30 - 54DEBD' device. The 'CONFIGURATION' menu on the left has 'Load' selected. The main configuration area is titled 'Load' and contains the following table:

Description	Value	DIRIS B30	Unit
Load 1			
Activate			
Status	Enabled	Enabled	-
Name	My circuit	My circuit	-
Type			
Type	3P+N-3CT	3P+N-3CT	-
Nominal Current	600	600	A
Phase association to current input			
I1	Input I01	Input I01	-
I2	Input I02	Input I02	-
I3	Input I03	Input I03	-
Miscellaneous			
Load 2			
Load 3			
Load 4			

5. The **Current Sensors** menu allows you to configure the current sensors connected to the DigiBOX B-30.

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

The screenshot shows the 'Easy Config System' interface for 'DIRIS B30 - S4DEBD'. The 'CONFIGURATION' menu on the left has 'Current Sensors' selected. The main panel shows the 'Current Sensors' configuration table:

Description	Value	DIRIS B30	Unit
Input I01			
Rating	630	630	A
CT 1 way	Positive	Positive	-
Associated Voltage	V1	V1	-
Input I02			
Rating	630	630	A
CT 2 Way	Positive	Positive	-
Associated Voltage	V2	V2	-
Input I03			
Rating	630	630	A
CT 3 way	Positive	Positive	-
Associated voltage	V3	V3	-

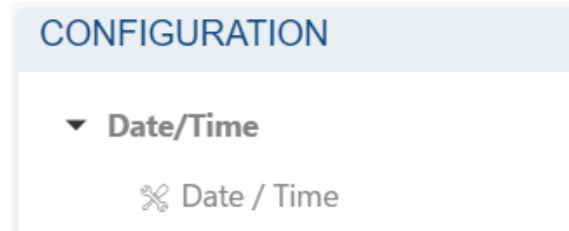
6. **Calculations:** Set the integration period for instantaneous and average values of the different electrical parameters.

The screenshot shows the 'Easy Config System' interface for 'DIRIS B30 - S4DEBD'. The 'CONFIGURATION' menu on the left has 'Calculations' selected. The main panel shows the 'Calculations' configuration table:

Description	Value	DIRIS B30	Unit
Integration Periods			
Integration Period - Inst. Values	5	5	x0.2 s
Integration Period - Avg Values	15 Minutes	15 Minutes	min
THD			
THD Type	THD (Fundamental)	THD (Fundamental)	-
THD Method	Total	Total	-
Other			
Calculation method for Q/S/Er/Es/PF	Vector	Vector	-
Phase to neutral voltage Lowest Level	0	0	V
PF Convention	IEC	IEC	-

Date/Time

7. Next click on the **Date/Time** tab. You can synchronize the date/time of the DigiBOX B-30 to the Date/time of your computer.



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



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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