TCP-485 Ver.04

SERIAL CONVERTER / ETHERNET

Sitrad — Supervisory system
RS 485 — Serial communication
Ethernet

⚠ Have this manual in your hands using the **FG Finder** application.

TCP485V04-04T-16955-2609

WARNING

⚠ **BEFORE THE INSTALLATION OF THE CONVERTER, WE RECOMMEND READING THE INSTRUCTION MANUAL IN FULL TO PREVENT POSSIBLE DAMAGE TO THE PRODUCT.**

PRODUCT INSTALLATION PRECAUTIONS:
Before performing any procedure on this instrument, disconnect it from the power grid;
Ensure that it has adequate ventilation, avoiding installation on control panels containing devices that could cause it to operate outside its specified temperature range;
Install the product away from sources that may generate eletromagnetic disturbances, such as : motors, contactors, relays, electrovalves, etc.;

AUTHORIZED SERVICES:
The installation and maintenance of the product must be performed only by qualified personnel;

ACCESSORIES
Use only Full Gauge Controls original accessories.
If you have any questions, please contact our technical support

THROUGH CONTINUOUS DEVELOPMENT, FULL GAUGE CONTROLS RESERVES THE RIGHT TO CHANGE THE INFORMATION IN THIS MANUAL AT ANY TIME, WITHOUT PRIOR NOTICE.

1. DESCRIPTION

The Serial/ Ethernet converter **TCP-485** allows interconnecting Full Gauge controllers with the supervisory software Sitrad through an Ethernet data network using the TCP/IP communication standard.
Currently, many companies have the Ethernet cabling ready in their facilities. With the **TCP-485** converter, you can use the cabling already installed, making it unnecessary to create a new cabling for the RS-485 network of the controllers.
The system consists of an Ethernet/RS-485 converter connected to the Ethernet network (be it by internet, intranet, or directly to the computer) and Sitrad, which makes a direct TCP/IP connection to the Ethernet/ RS-485 converter, allowing communication with the controllers connected to it.
The converter transforms the RS-485 electrical standard used by the controllers into the TCP/IP communications protocol used in the interconnection of computer networks.

2. APPLICATIONS

- Facilities without conditions to install new cabling, and with an Ethernet structure already in place.
- Centralize data collection from multiple remote locations onto one server without needing a computer dedicated to each remote location.

NOTE: The **TCP-485** converter is designed to work specifically with Full Gauge Controls instruments.

3. TECHNICAL SPECIFICATIONS

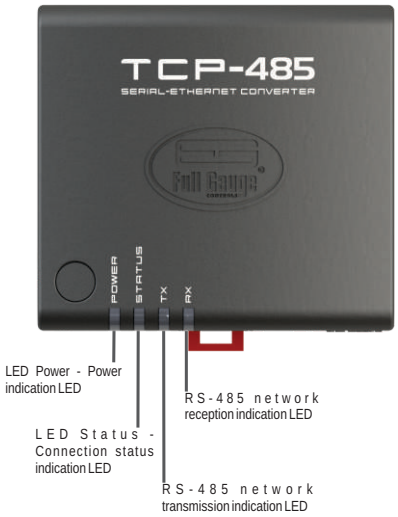
Converter power	External power supply 5.1 Vdc / 2A
Power supply provided with the converter	Input - 100-240Vac (50/60Hz) Output -5.1Vdc / 2A
Operating temperature	0 to 50ºC / 32 to 122ºF
Operating humidity	10 to 90% UR (without condensation)
Number of instruments supported per converter in the RS-485 network	32
Ethernet speed	10Mbps
Connections	-Connection type RJ-45 for connections to a PC using the twisted-pair cable supplied along with the converter; - One insulated RS-485 port to connect up to 32 instruments without the need of termination; - Direct 80 cm Ethernet cable (no crossover) supplied along with the converted.
Product dimensions	91,0 x 91,1 x 37,1 mm (WxHxP)

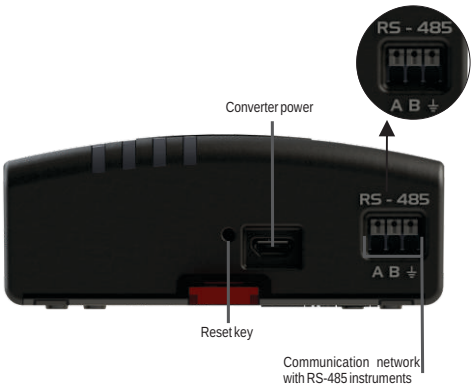
⚠ **IMPORTANT INFORMATION:**
If the "LAN" LED indicator in the RJ-45 connector does not light up upon connecting the TCP-485 converter directly to the network adapter of the computer, you may possibly need to use a crossover cable (not supplied by Full Gauge) or connect the computer and the converter via a HUB or a Switch.

⚠ **STANDARD OPERATING MODE:**
The factory's default operation of TCP-485 is DHCP Mode. See item 7 - Restoring the default settings of the converter/ Changing IP Mode to switch the operation Mode.

⚠ **IMPORTANT:**
For a correct and robust installation of the RS-485 network, see item 9 - *Interconnecting the controllers and TCP-485.*

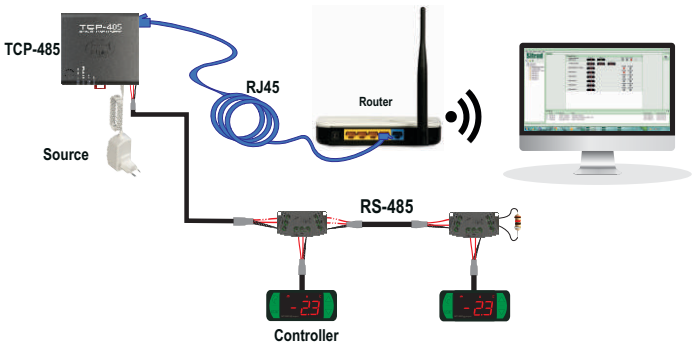
4. WIRING DIAGRAM





5. INSTALLATION AND OPERATION (DHCP MODE - DEFAULT CONFIGURATION)

Connect interface terminals **A**,**B** and ⏚ with the respective **A**,**B** and ⏚ terminals on connecting blocks and instruments;
With the **TCP-485** powered on, use an Ethernet cable to connect it to a router (switch) in the RJ-45 connectors according to the picture.

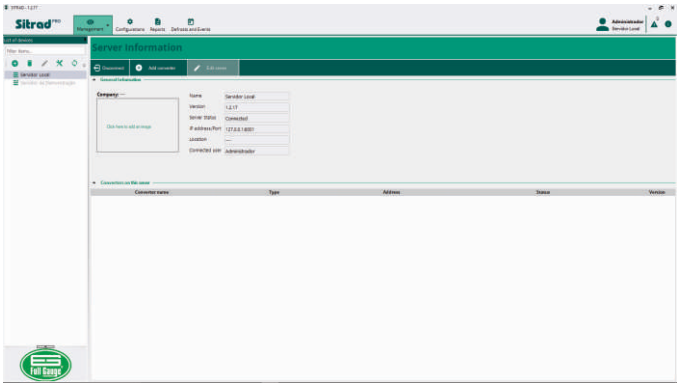


5.1. SITRAD PRO

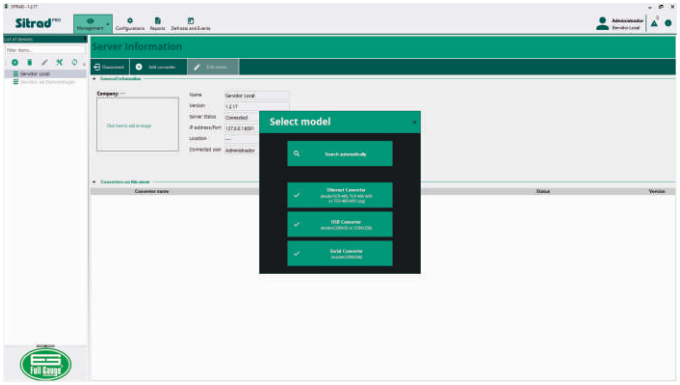
Download the compatible version from: http://www.sitrad.com

5.1.1 Register converter

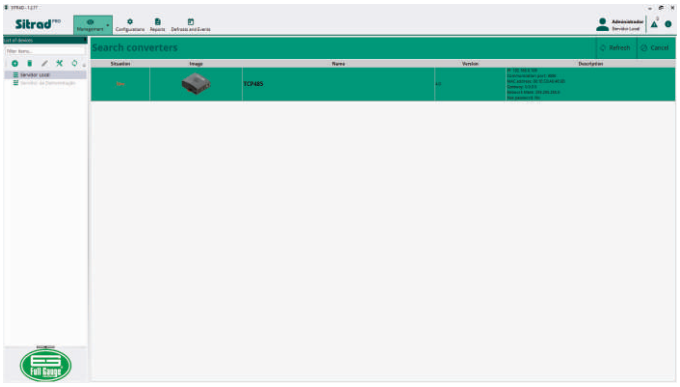
Step 1: After the **TCP-485** is configured, run Sitrad. Select the server where the converter is configured from the list on the left hand side and click on **"Add Converter"** on the right hand side.



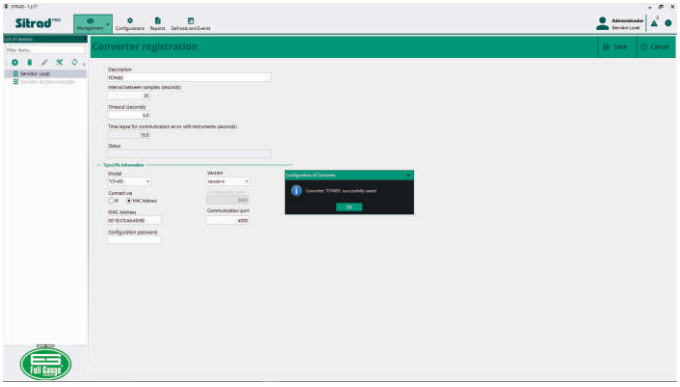
Step 2: At this stage, you can choose the option you want. As an example, we will use **"Automatic search"** option.



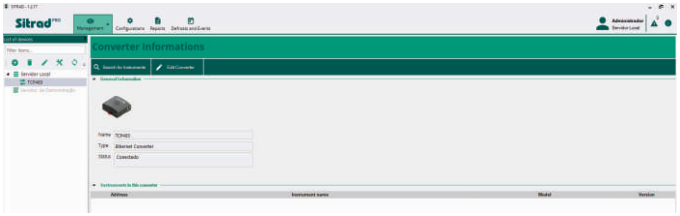
Step 3: The **TCP-485** default name should show up. If not, the **"Refresh"** button starts a new search for the converter in the network.



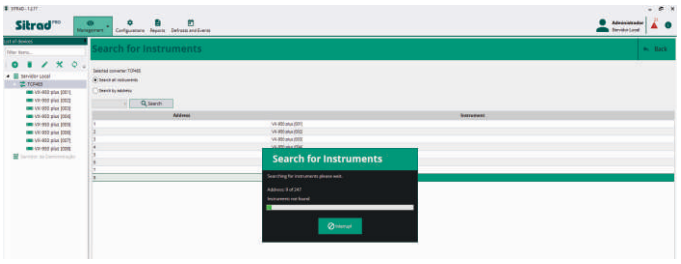
Step 4: Click on **"Select"** to register the new converter. Check that everything is okay in the configurations and click **"Save"**. After saving, the converter will appear in the list on the left hand side.



Step 5: To register the instruments that are in the RS-485 network of the new converter, select the new converter from the list on the left and click **"Search Instruments"** on the right hand side



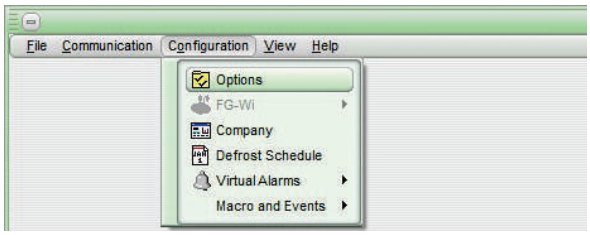
Step 6: On this screen, you can automatically search all instruments that are in the network RS-485, or manually enter the network address of each controller, as shown in the figure below.



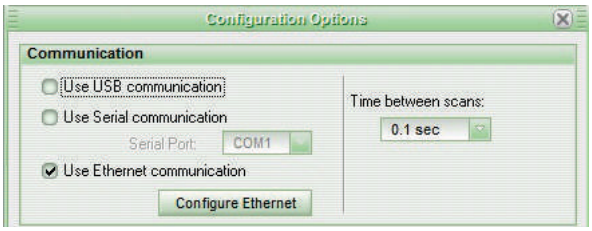
5.2 SITRAD 4.13

⚠**Download the compatible version from: http://www.sitrad.com**

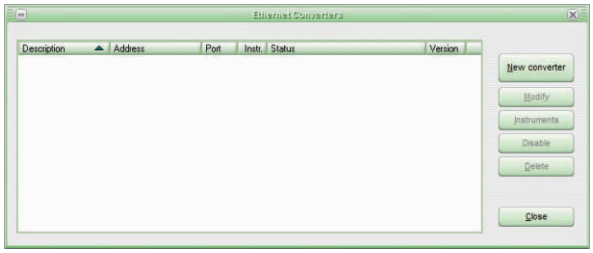
Step 1 : With the TCP configured, run Sitrad, click **"Configuration"** and then **"Options"**.



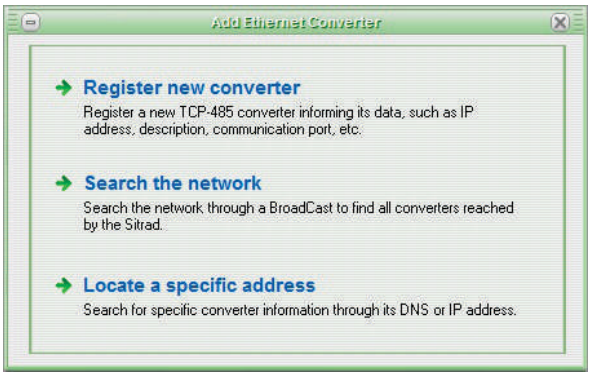
Step 2 : Select the option **"Use Ethernet communication"**. Then click on **"Configure Ethernet"** button below.



Step 3 : Click on **"New converter"** button.



Step 4 : Choose the desired option. As an example, we will use the option **"Scan the network"**.

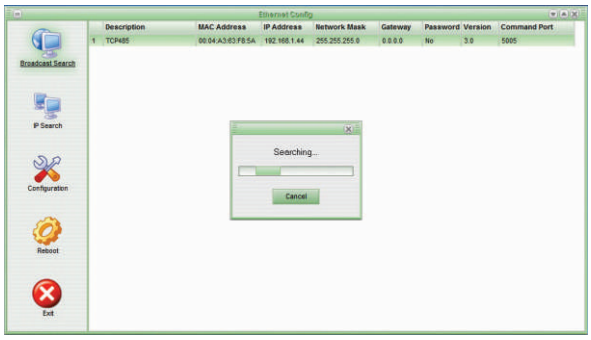


Step 5: Once it has been located, select the **TCP-485** and then click on **"Register converter"** button, select version 4 and click **"OK"**.
If the user has the **TCP-485** configured with a fixed IP, follow the steps below to connect it to a computer:

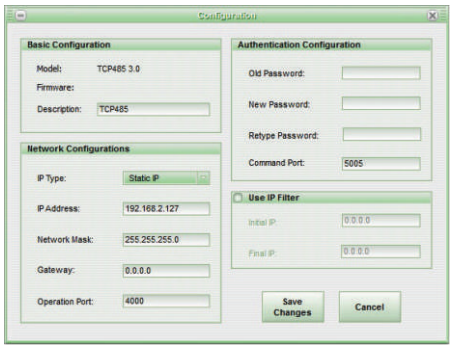
6. NETWORK CONFIGURATION IN STATIC IP MODE

For direct configuration with a PC, the IP mode must be changed to static. See the step-by-step procedure below:
Step 1 : Using a computer connected to the same network as the **TCP-485** (cable or wireless) ,download the **EthernetConfig** program (Windows version only) from the site:
htttp:// www.sitrad.com/atualizacaoresp.asp

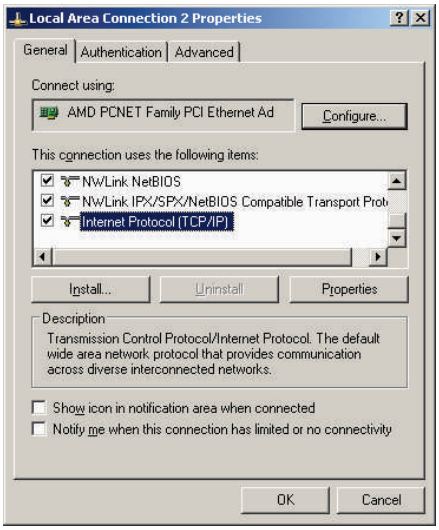
Step 2 : Run the **EthernetConfig** program and click on the **"Search Broadcast"** icon. The **TCP-485** connected to the network will show up after the search is done. See the image below:



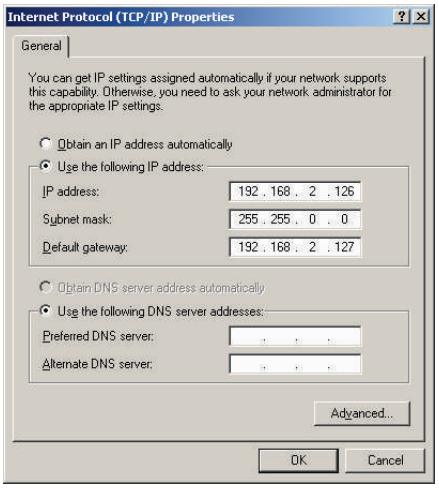
Step 3 : Click on the **"Configuration"** menu and then on the **"Network Configuration"**, box on the following screen, change the **IP Mode** to static, and then click **"Save Changes"**.



Step 4 :
The **TCP-485** converter is delivered with the following default values configured:
IP address: 192.168.2.127
Network mask : 255.255.0.0
Gateway : 0.0.0.0
Configuration port : 5005
Configuration port : 4000
If your computer is not configured to access the IP range from 192.168.2.0 to 192.168.2.255, you need to perform a direct access to the converter to configure it with some of your computer network IP addresses.
To access the converter directly, follow the steps below:
- Connect the converter network cable directly in the computer network card. If it is a computer with an old network card, you may possibly need to use a crossover cable, which is not provided by Full Gauge. While doing this, your machine becomes unable to access the network or the Internet.
- Access your computer network connections.
In Windows XP, open the OS Control Panel, choose **"Internet and Network Connections"**, then **" Sharing and Network Center"** and then, at the menu on the left of the screen, choose **"Change adapter settings"** option.
- Right- click on the connection you are using and choose **"Properties"**.
- Select **"TCP/IP Protocol"** or **"TCP/IP version 4 protocol"**. In the list as shown on the screen below:



- After selecting the item, click on **" Properties"**;
- In the following screen, write down the current settings so you can reset them later;
- Check **"Use the following IP address"** option and configure the fields with the following values:
IP address : 192.168.2.126
Subnet mask: 255.255.0.0
Default gateway : 192.168.2.127



- Click **"OK"** to exit;
- Click **"OK"** on the Properties screen to save the changes.
Your computer is now configured to communicate in the same **TCP-485** converter network. Access your converter through the **EthernetConfig** program and change the converter IP address to a valid address in your network.
After performing the configuration in the converter, reset the properties settings of the network card back to the correct values.

7. RESTORING THE DEFAULT SETTINGS OF THE CONVERTER / CHANGING IP MODE

There are two ways to restore the default settings depending on the IP Mode:

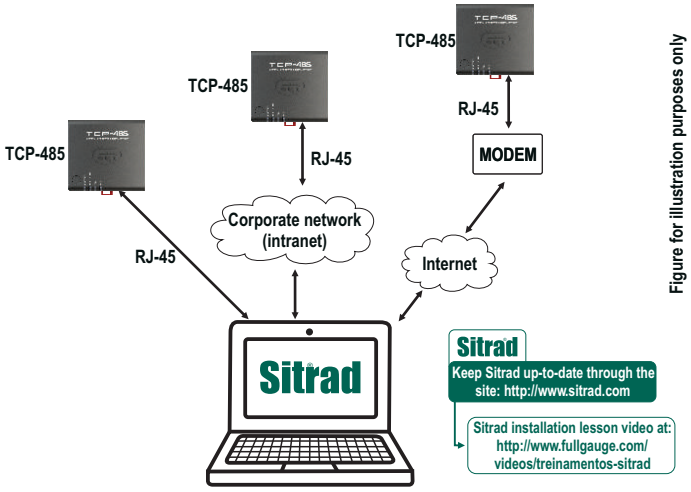
7.1 STANDARD RESTORE DHCP MODE

In order to restore the default configurations of the converter, you must hold down the reset button in the panel for five seconds. After that, all front LEDs must light up, indicating that the values have been restored. After releasing the buttonm the converter will reboot with the factory default values.

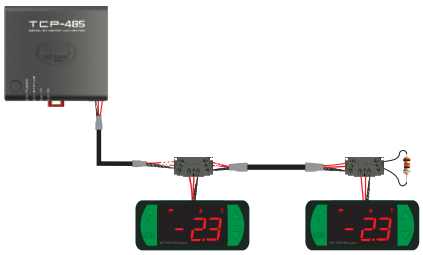
7.2 STANDARD RESTORE STATIC IP MODE

In order to restore the default settings of the converter and change the IP mode to static, you must hold down the reset button for 10 seconds until the front LEDs flash rapidly. After releasing the button, the converter will reboot with the factory default values and the IP mode will change to static.

8. INTERCONNECTING TCP-485 CONVERTER AND COMPUTER



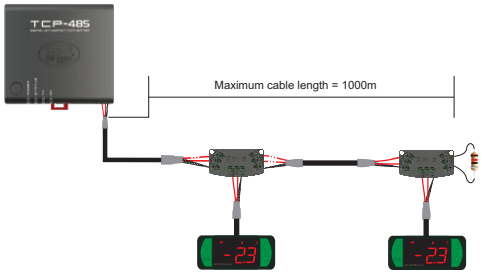
9. INTERCONNECTING THE CONTROLLERS AND TCP-485



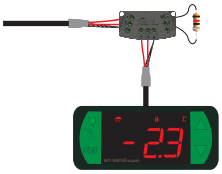
9.1 FOR A ROBUST ELECTRICAL INSTALLATION, FOLLOW THE RECONMMEDATIONS BELOW:

- Use a 2-way cable, minimum 24AWG;
- Preferably, use cables with mesh shielding to protect the communication line from outside interference;
- Avoid splicing the cable;
- Use the junction boxes provided by Full Gauge to connect the taps to the controllers. Besides facilitating the connection, they also have a protection function;
- Avoid connections longer than 2 meters between the junction box and the controller;
- Use a maximum of **32 devices** connected to each Interface.

- Size networks with maximum length of **1000 meters** between the Interface and the last controller.

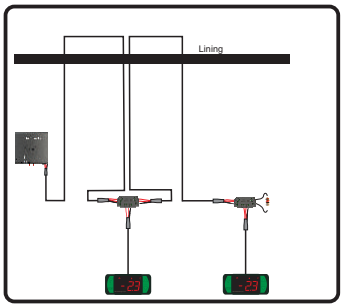


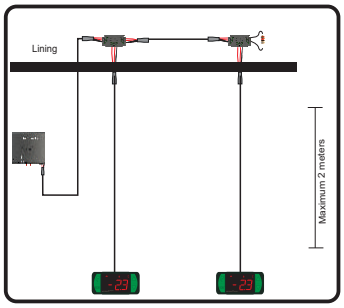
- Connect a 120 ohm termination resistor between terminals **A** and **B** at the end of the line when using a cable with a length greater than **100m**.



9.2 RECOMMENDED TOPOLOGIES

- Use one of the following arrangements to create a well-defined path.

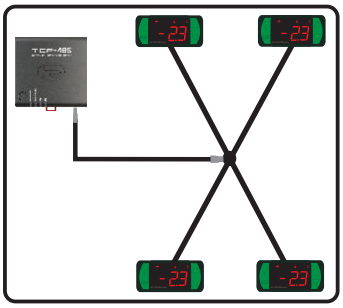


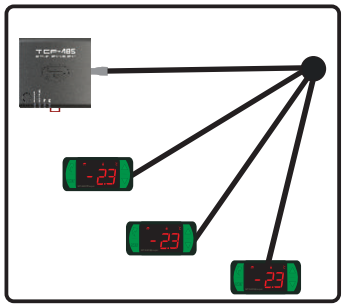


CORRECT

9.3 NON-RECOMMENDED TOPOLOGIES

- Avoid creating long network branches.



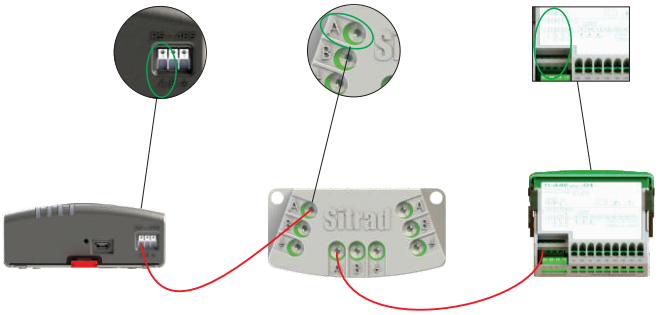


INCORRECT

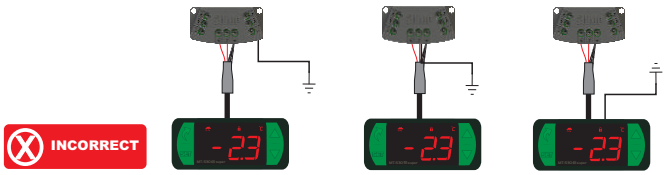
9.4 CONNECTION BLOCK FOR SERIAL COMMUNICATION

**Sold separately*

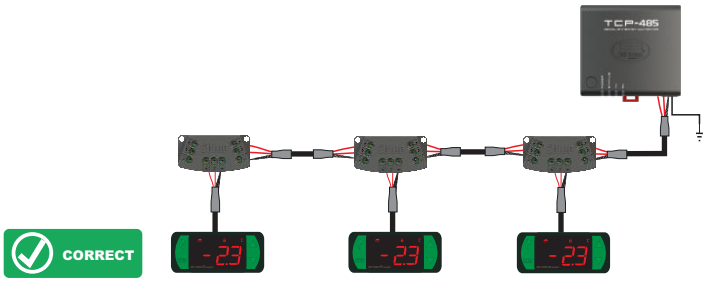
It is used to interconnect more than one controller to the Interface. The wires must be connected as follows: Terminal **A** of the controller connected to Terminal **A** of the connection block, which in turn must be connected to Terminal **A** of the Interface. Repeat the procedure for Terminals **B** and ⏚, with ⏚ being the cable mesh.
The terminal ⏚ of the connection block must be connected to the respective terminals ⏚ of each controller.



- Do not ground independent controllers.

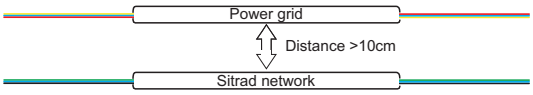


- Ground the cable shield at one point only, preferably near the Interface.



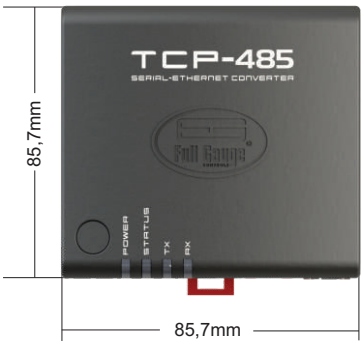
9.5 IMPORTANT

According to chapters of NBR 5410 standard:
1. Install surge protectors on the power line.
2. Serial communication sensor cables can be installed together but not in the same conduit where power supply and load drive cables are installed.

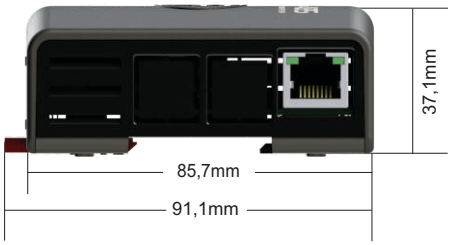


10. ANNEXES - REFERENCE IMAGES

Top view



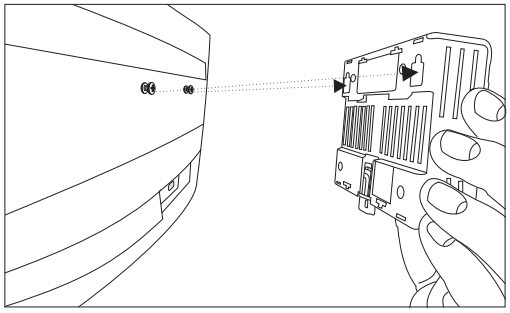
Rear view



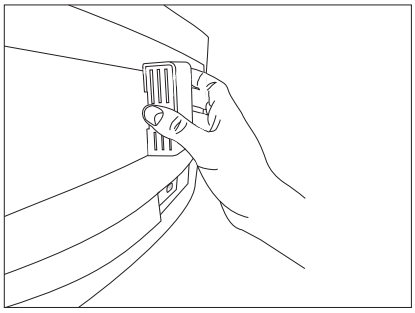
11. INTERFACE INSTALLATION

11.1 FASTENING WITH SCREWS.

11.1.1 - To attach the Interface next to the monitor or the wall, use the Vesa fastening system with a 75mm dimension. The screw used must be: M4 cylindrical head (slotted or Philips) at least 8mm long.

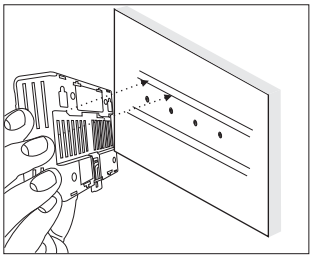


11.1.2 - After positioning the Interface, push it down to secure it.

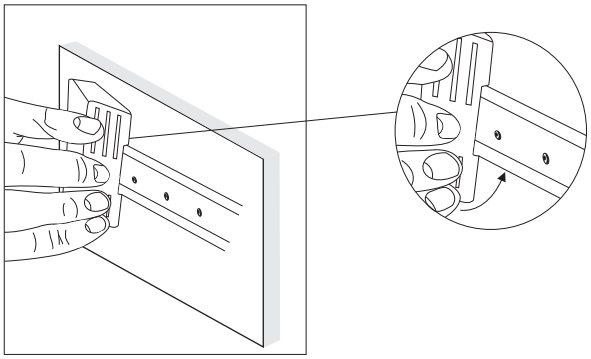


11.2 FASTENING BY DIN RAIL.

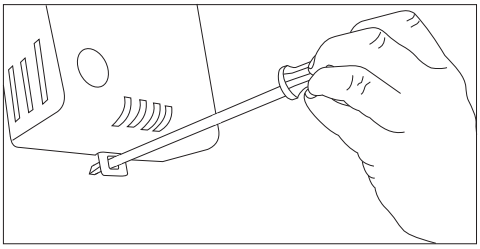
11.2.1 - To attach the Interface to a DIN rail, place the Interface according to the picture and insert the top.



11.2.2 - Then, insert the bottom and check that the lock is blocked.



11.2.3 - To remove the Interface from the DIN rail, use a screwdriver that is compatible with the size of the lock as a lever.



ENVIRONMENTAL INFORMATION

Packaging:

Materials used in the packaging of Full Gauge products are 100% recycable. Be sure to dispose of using specialized recycling facilities.

Product:

The components used in Full Gauge controllers may be recycled and reused if disassembled by specialized companies.

Disposal:

Do not incinerate or dispose of the controllers that reached the end of their service life in household waste. Check the legislation in your region regarding the disposal of the product. In the event of doubt, please contact Full Gauge Controls.

WARRANTY - FULL GAUGE CONTROLS

Products manufactured by Full Gauge Controls as of May 2005 have a ten (10)- year warranty directly with the factory and one (1) year before the reseller network, counted as of the date of consigned sale as stated on the invoice. After this said year before the reseller network, the warranty shall continue to be executed if the instrument is sent directly to Full Gauge Controls. The products are warranted in case of defects in the workmanship, making them unsuitable or inadequate for the intended applications. The warranty is limited to maintenance of instruments manufactured by Full Gauge Controls, disregarding other kinds of expenses, such as indemnity for damages caused to other equipment.

EXCEPTIONS TO WARRANTY

The warranty does not cover expenses incurred for freight and/or insurance for sending the products with signs of defect or malfunctioning to the provider of Technical Support Services. The following events are also excluded from warranty: natural wear and tear of parts, external damages caused by falls or inadequate packaging of products.

INVALIDATION OF WARRANTY

The product warranty shall automatically lose validity if:

- The instructions for use and assembly contained in the technical description and the installation procedures described in Standard NBR5410 are not followed;
- The product is submitted to conditions beyond the limits specified in its technical description;
- The product is violated or repaired by a person not integrating the technical team of Full Gauge Controls;
- The damages are due to a fall, blow and/or impact, water damage, overload and/or atmospheric discharge.

USE OF WARRANTY

To use the warranty, the customer should send the adequately packaged product, along with the respective Invoice to Full Gauge Controls. The customer will bear the freight cost for sending of the products. Also, as much information as possible with regard to the defect verified should be sent in order to facilitate the analysis, testing and performance of the service.

Those processes and any product maintenance shall only be performed by the Technical Support Services of Full Gauge Controls, at the Company headquarters - Rua Júlio de Castilhos, 250 - CEP 92120-030 - Canoas - Rio Grande do Sul - Brazil

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