OPERATIVE MANUAL

SETHDIN/SETHNET

C232485:CONVERTER RS232/RS485

INDEX

1 INTRODUCTION

Device name	Functions
SETHDIN	Allows the following conversions: - RS232 ↔ ETHERNET - RS485 ↔ ETHERNET - RS422 ↔ ETHERNET - RS232 ↔ RS485 - RS232 ↔ RS422 - MODBUS TCP↔ETHERNET
SETHNET	Allows to share the archives between 2 3590E/EGT-AF03
C232485	It 'a serial converter that allows you to convert RS232/RS485

2 IDENTIFICATION OF THE DEVICE ON THE NETWORK

The SETH module increase uses the technology UPnP (Universal Plug and Play), which allows to use a device when it connects at the network. This means that, when they are connected at the network, the SETHDIN devices should automatically appear on the Windows Network Resources , where it will also shows the IP address associated from the DHCP server (or the configured fixed address).

The SETHDIN module has the **default address 192.168.16.205** and the default password "**Password**".

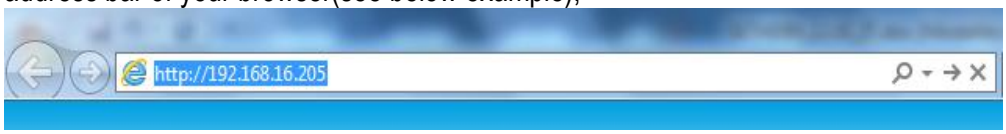
To establish a communication with a computer or any other device connected at the network it is necessary that the module belongs to the same class of network(in our case the network should have the addresses of this type **192.168.16.xxx**), otherwise must assign to SETHDIN an IP address that belongs to the class of network or device to which you connect. The steps required to perform these operations by the computer are:

- Assigned to the PC an IP address that belongs to the class of the module(standard **192.168.16.xxx**).
- Connect the module to the computer through ethernet cable.
- Enter the home page of module and assign a free IP address that belongs to the class of network when will be used.

3 PARAMETERS CONFIGURATION THROUGH *WEB SERVER*

3.1 STATUS AND CONFIGURATION (*Home page*)

By making double-click on the SETHDIN module (listed on the Network Resources), or digit the IP address on the address bar of your browser(see below example),



the *home page* of the web server will appears on the default browser, which will shows the status and the configuration of the module.

Status & Configuration

Home

Port 0 (RS232) Settings

Port 1 (RS485/422) Settings

Miscellaneous Settings

Password Setting

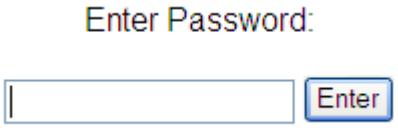
Name:	***SETH-DIN: Serial 2 Ethernet***
Firmware Revision:	**02.00.03.0046D**
IP Address:	192.168.16.205
MAC Address:	00-50-c2-ab-71-da
Serial Port 1 Option Switch:	2-wire
Operating Mode:	**Serial To Ethernet**

Current port settings:

	Port 0 (RS232)	Port 1 (RS485/422)
Baud Rate:	9600 bits/second	9600 bits/second
Data Size:	8 bits/character	8 bits/character
Parity:	None	None
Stop Bits:	1bit(s)	1bit(s)
Flow Control:	None	None
Local UDP Port Number:	3001	3002
Remote UDP Port Number:	3001	3002
UDP Trigger Char:	10 decimal ASCII	10 decimal ASCII
UDP Trigger Idle Timeout:	100 ms	100 ms
UDP Remote IP Address:	0.0.0.0	0.0.0.0
Local TCP Port Number:	23	26
Remote TCP Port Number:	N/A	N/A
TCP Mode:	Server	Server
TCP Server IP:	N/A	N/A
TCP Timeout:	0 s	0 s
Modbus Mode:	RTU	RTU

3.2 SETTING OF THE PROTECTION PASSWORD

It's possible to protect the device configuration (from writing and reading) through a password.
Choose the *Password Setting* option from the menu; Type two times the desidered password and click on **Submit!** and it will be permanently memorized from the module. If the two boxes are empty, the password protection will be disabled.
After which, to access at the *home page*, it will necessary to insert the correct password and click on **Enter**:



If the inserted password is wrong, the same page will appear.

3.3 TUNNELING FUNCTIONING MODE

The t*unneling* mode allows to turn away a device (for example a repeater or a printer) connected at the instrument, everywhere there is an node of the Ethernet network. In this way one can easily overcome the limits of the typical serial connections. Of course one needs two SETHDIN modules, one to be connect at the serial of the instrument and the other one at the serial port of the device.
Over every module one has to configure the **UDP Remote IP Address** and **UDP Remote Port** parameter (who indicates the input data destination over the serial), with the IP address and the UDP local port of the other module.
Example:

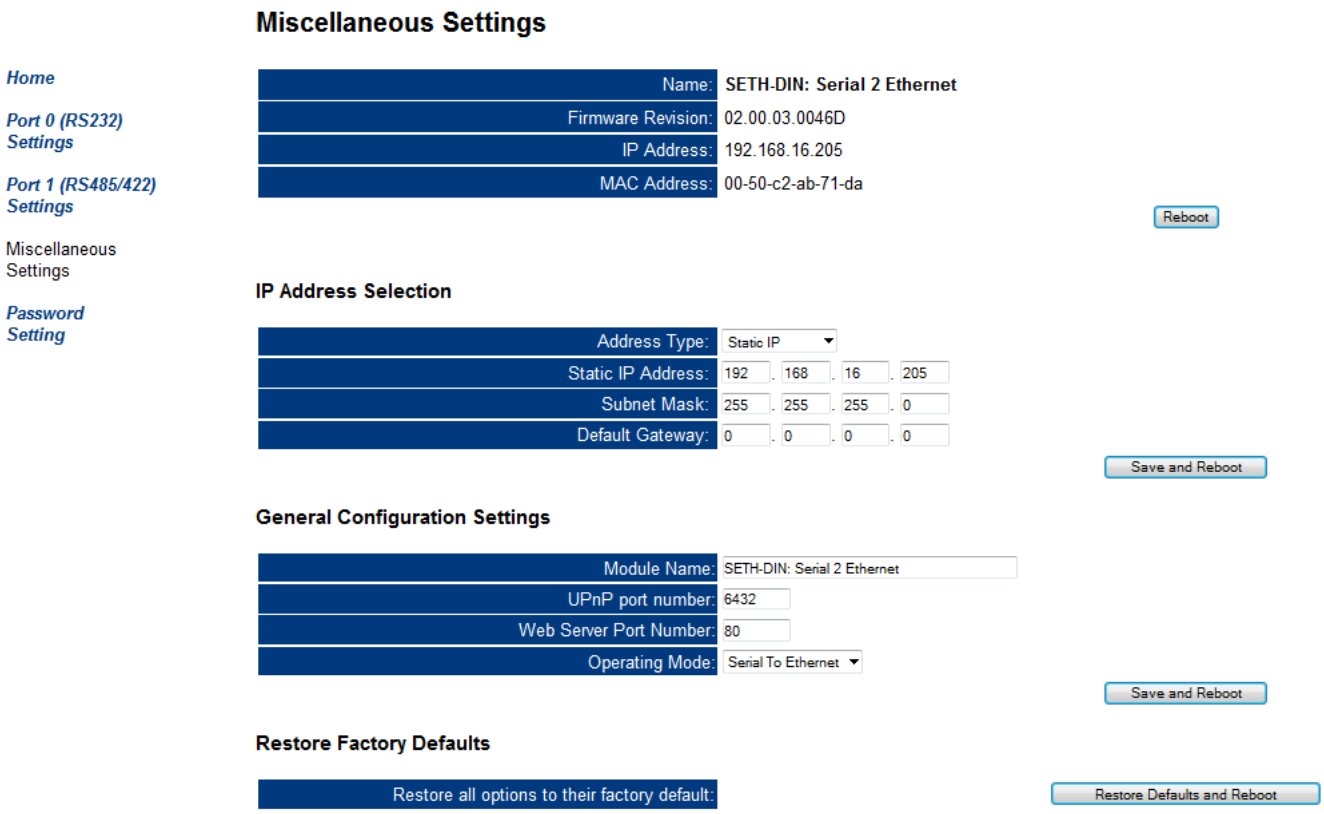
	MODULE 1	**MODULE 2**
IP address	192.168.16.205	192.168.16.204
UDP Remote IP Address	192.168.16.204	192.168.16.205
UDP Remote Port	3001	3001

3.3.1 DOUBLE TUNNELING

The *SETH* can manage two *tunneling* processes simultaneously, one for every serial port.
Two virtual connections will be created, one for the *Port 0* of the modules and the other one for the *Port 1*.
This association is fixed, so it is not possible to connect the *Port 1* of one module with the *Port 1* of the other one, or vice versa.
To activate this modality is enough to set the **UDP Remote IP Address** parameter at the same value (so the address of the other module) for both serial ports. Set this address to **0.0.0.0** to disable the *tunneling* function over the relative serial port.

3.4 GENERAL SETTINGS

The ***Miscellaneous Settings*** page allows to set some general parameters of the *SETHDIN* module, mostly concerning its function mode and connections to the network.



The pages **Port0(RS232)Settings and Port1(RS485/422)Settings** allow to set the communications parameters of the ports 232 and 485/422.

4 SETHDIN

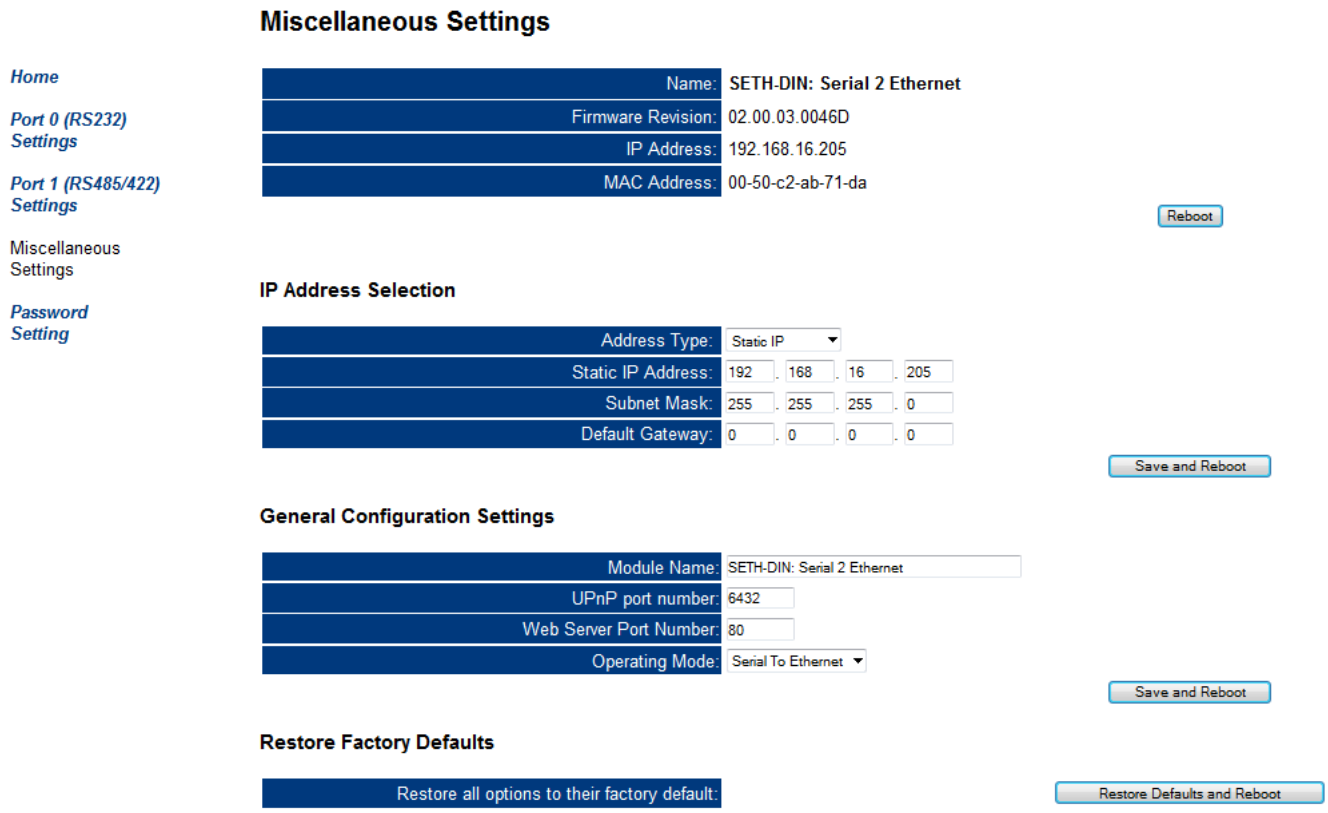
4.1 SERIAL TO ETHERNET

To set this function mode is necessary do:
- Select the page ***Miscellaneous Settings***;
- Change the parameter ***Operating Mode*** in ***Serial To Ethernet***;
- Click on ***Save and Reboot*** to save the configuration and restart the module;

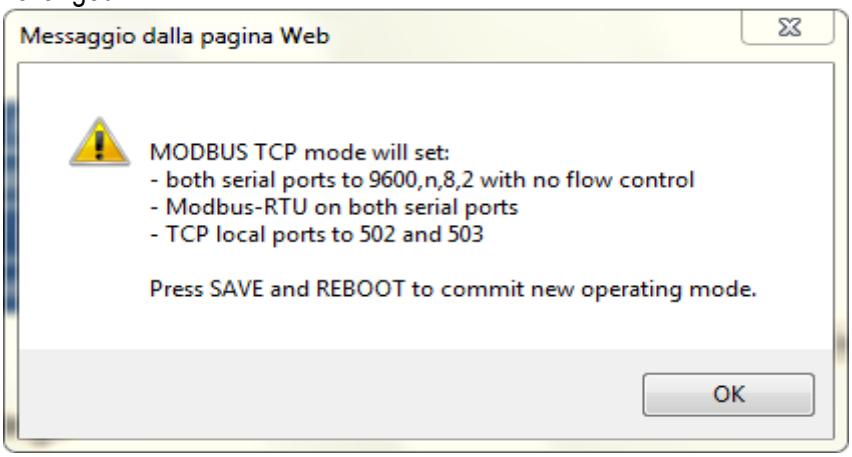
In this function mode you can choose the following conversions:

- RS232←→ETHERNET
- RS485←→ETHERNET
- RS422←→ETHERNET

As follow its will be necessary set the DIP-SWITCH present on the board to perform the various conversions(see cap. **8.3 DIP-SWITCH**).

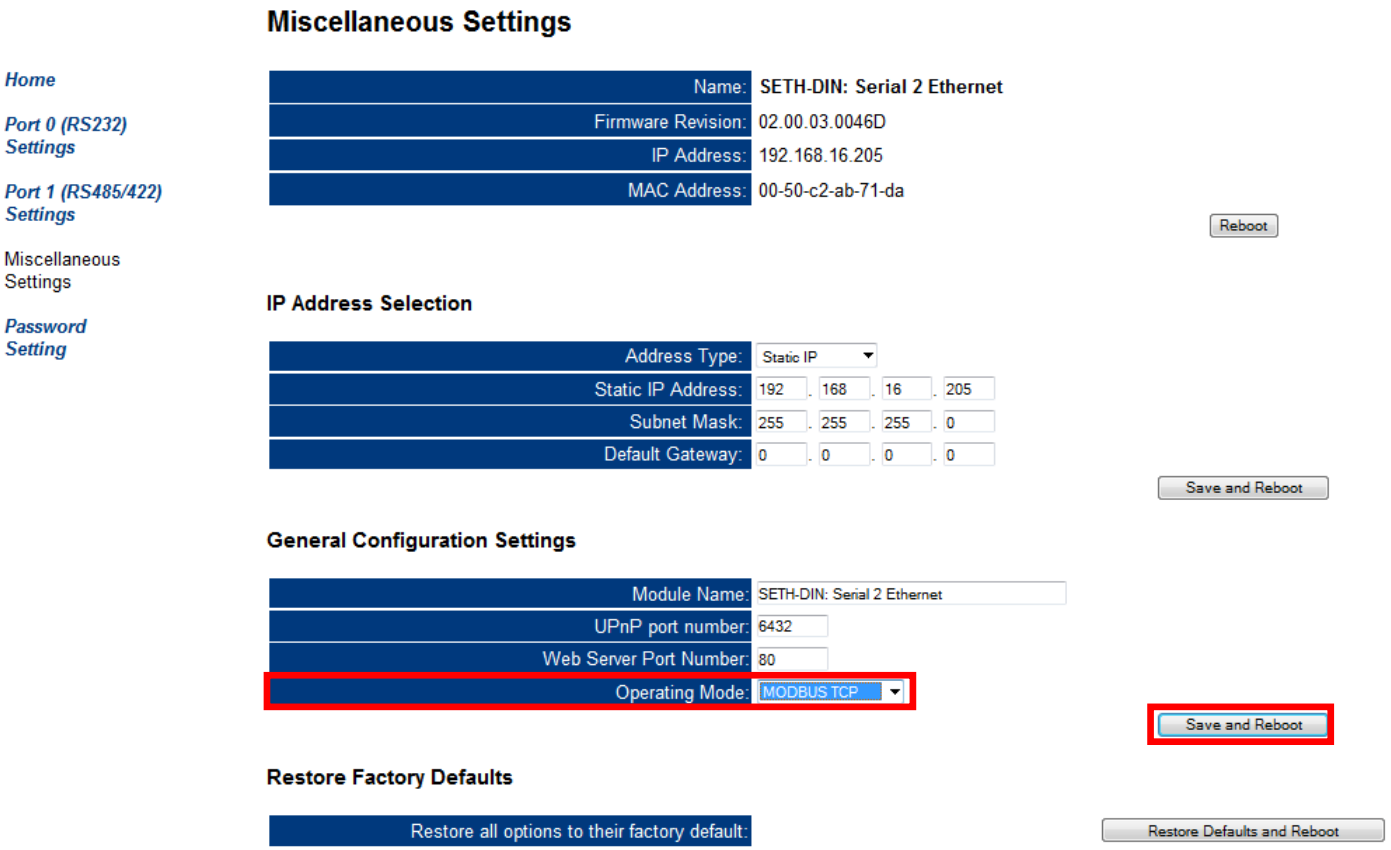


When you change the function mode of module the browser will show a message window where you can see the parameters that had been changed.



4.2 MODBUS TCP ←→ ETHERNET CONVERSION

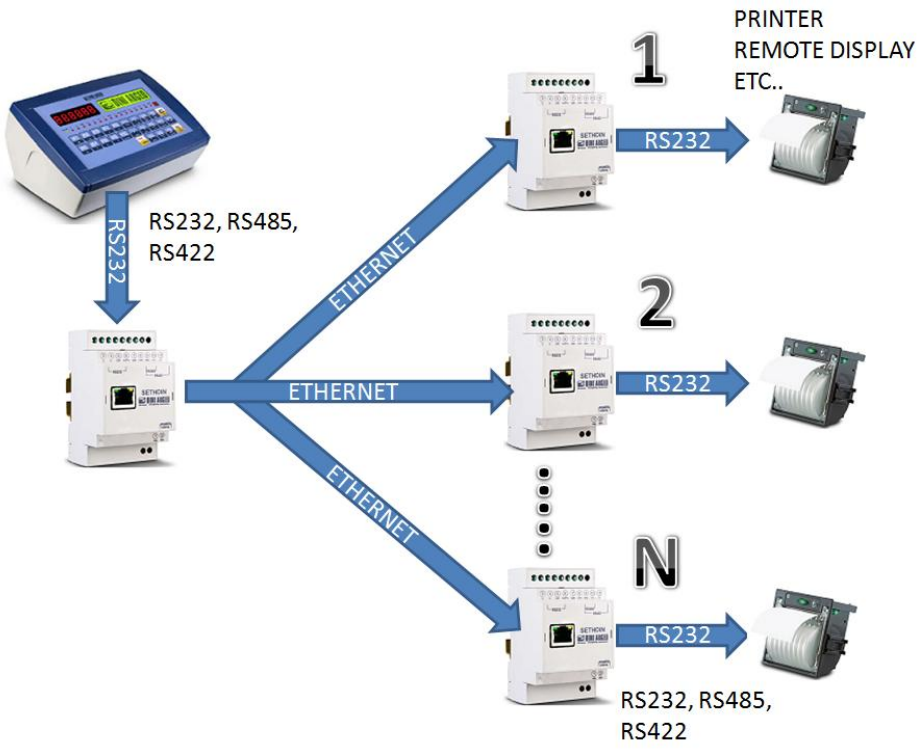
The SETHDIN module permits to do the conversions MODBUS TCP←→ETHERNET.
To set the module:
- Select the page the ***Miscellaneous Settings.***
- Change the parameter ***Operating Mode*** in ***MODBUS TCP***
- Click on ***Save and Reboot*** to save the configuration and restart the module



The function mode MODBUS TCP requires a network connection that uses the TCP / IP protocols. In order to establish a communication using the Modbus protocol is sufficient connect the module on RS232/485 to a tool that supports the Modbus RTU or Modbus ASCII.

4.3 SETH BROADCAST FUNCTION MODE

It is possible set the function mode **BROADCAST** on module.
This configuration allows to have a module (**MASTER**) that sends the data to N modules setted on the same UDP port.



In this type of application, in addition to setting the same UDP port of MASTER on all modules that must receive the data, it is necessary set “255.255.255.255” as broadcast address on MASTER.

UDP Settings

	Current	Updated
Local UDP Port Number:	3001	3001
Remote UDP Port Number:	3001	3001
UDP Trigger Char:	10 decimal ASCII code	10 char (0 for no trigger char)
UDP Trigger Idle Timeout:	100 milliseconds	100 milliseconds (0 for no timeout)
UDP Remote IP Address:	0.0.0.0	255 . 255 . 255 . 255

Save

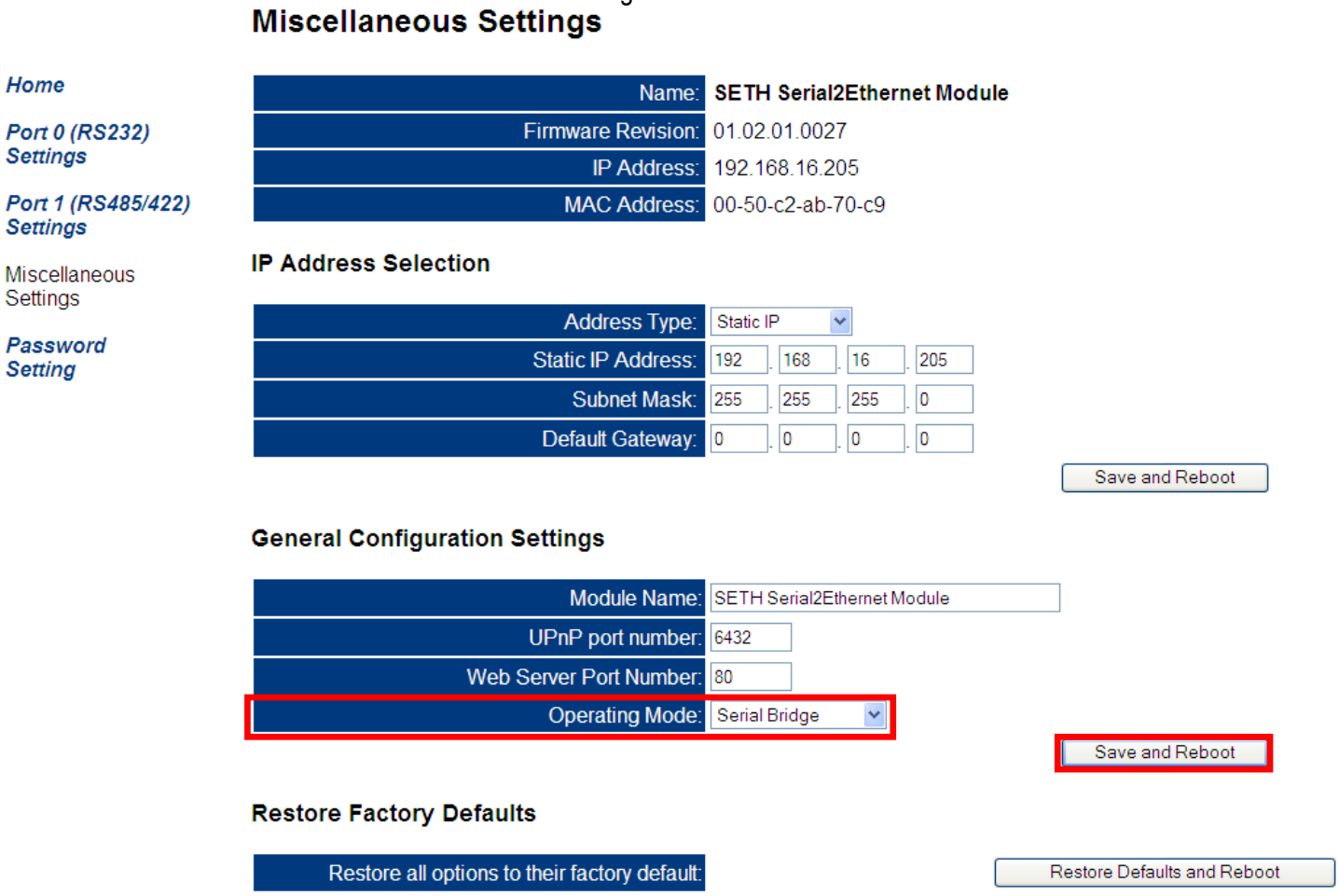
Make these settings permanent.

5 C232485

5.1 RS432← → RS485/422 CONVERSION

SETHDIN allows to make a conversion from RS232 to RS485/RS422 by avoiding the Ethernet connection.
To configure the module:

- Select the ***Miscellaneous Settings*** page
- Change the ***Operating Mode*** in ***Serial Bridge*** item like marked in figure
- Click on ***Save and Reboot*** to save the configuration and restart the module



These are the standard parameters of C232485 converter, that allow the convertions :

- RS232→RS485 (default configuration of DIP-SWITCH)
- RS232→RS422

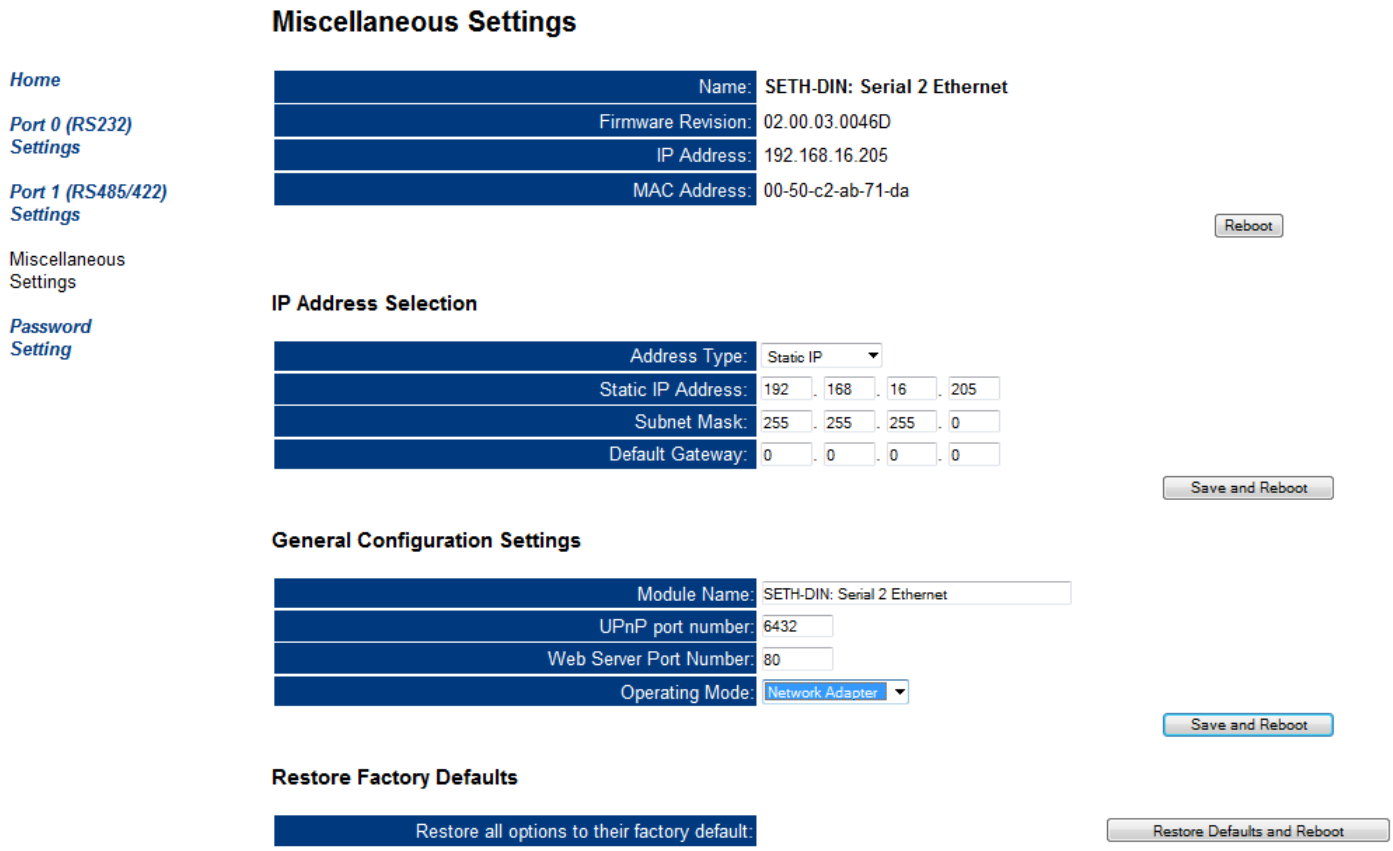
Then it will be necessary to configure the DIP-SWITCHES of the board to make the conversion (see the chapter **8.3 DIP-SWITCH**)

6 SETHNET

6.1 NETWORK ADAPTER FUNCTION MODE

To set this function mode:

- Change the parameter ***Operating Mode*** in ***Network Adapter***
- Click on ***Save and Reboot*** to save the configuration and restart the module



This function mode currently is adapted only to DiniArgeo indicators.
This function premise to share the archives between 2 3590E/EGT-AF03 indicators(for more information see the technical manual of E-AF03)

7 MAIN TECHNICAL SPECIFICATIONS

POWER SUPPLY	SETHDIN: + 8-36 Vdc C232485 BOX: 12 Vdc with internal 100 ÷ 240 Vac (50÷60 Hz) / 12 Vdc adapter.
MAX ABSORPTION	200 mA, 5W at 24Vdc.
OPERATING TEMPERATURE	-10°C + 50°C
CASE	SETHDIN: In plastic suitable for mounting on DIN bar or on the wall C232485 BOX : in ABS with IP 67 protection

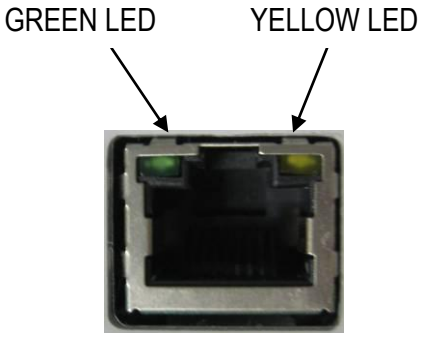
Ethernet interface

PROTOCOLS	TCP, UDP, DHCP, SNMP, SSL 3.0/TLS 1.0, HTTP, SMTP, ICMP, IGMP,
CONNECTION	Through RJ45 standard connector.
WEB INTERFACE	10/100 Base-T.
SPEED COMMUNICATION	10-100Mbps.

Available conversions

RS232 ↔ ETHERNET
RS485 ↔ ETHERNET
RS422 ↔ ETHERNET
RS232 ↔ RS485
RS232 ↔ RS422

LED meaning:



	GREEN	YELLOW
SOME CONSECUTIVE BLINKINGS	- At the start-up, indicates that the module is ON. - When the module is on indicates the presence of serial activities.	
OFF	Network cable not connected	-
FIXED	Device connected at the network	-
BLINKING	-	Presence of network activity.

8 SETHDIN CONNECTIONS

POWER SUPPLY

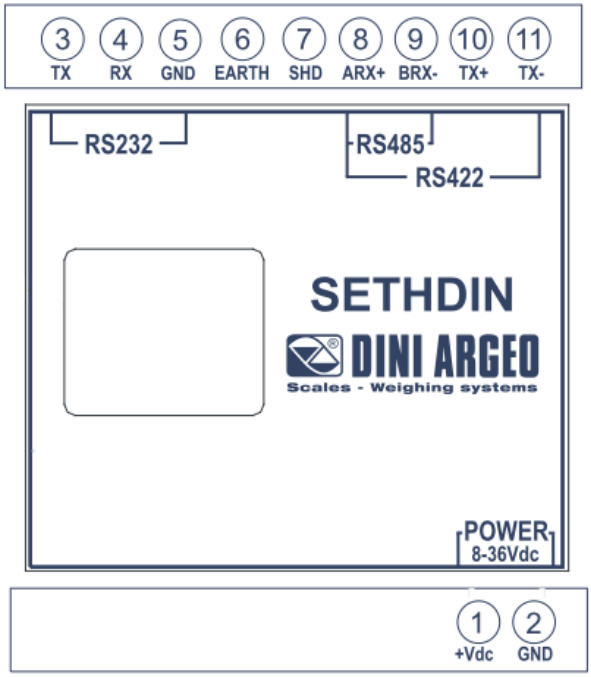
1 +Vdc + 8Vdc÷36Vdc
2 GND GND
6 EARTH Earth

SERIALS

RS232
3 TXD TX
4 RXD RX
5 GND GND

RS485
7 SHD Shield
8 ARX+ A(+)
9 BRX- B(-)
DIP-SWITCH (*):
2-3-4 ON

RS422
7 SHD Shield
8 ARX+ A(+)1
9 BRX- B(-)1
10 TX+ A(+)2
11 TX- A(-)2
DIP-SWITCH (*):
2-3-4 OFF



8.1 RS 232 CONNECTION

	PC 9 pin (male)	SETHDIN RS232	STANDARD CABLE
RX	2	3 TX	Pink
TX	3	4 RX	Yellow
GND	5	5 GND	Grey

8.2 RS 485 CONNECTION

Below is the RS485 connection of the module:

Meaning	Modue Serial line
TX+/RX+	**8 A(+)**
TX-/RX-	**9 B(-)**

On the same RS 485 line it's possibile to connect up to 32 devices.

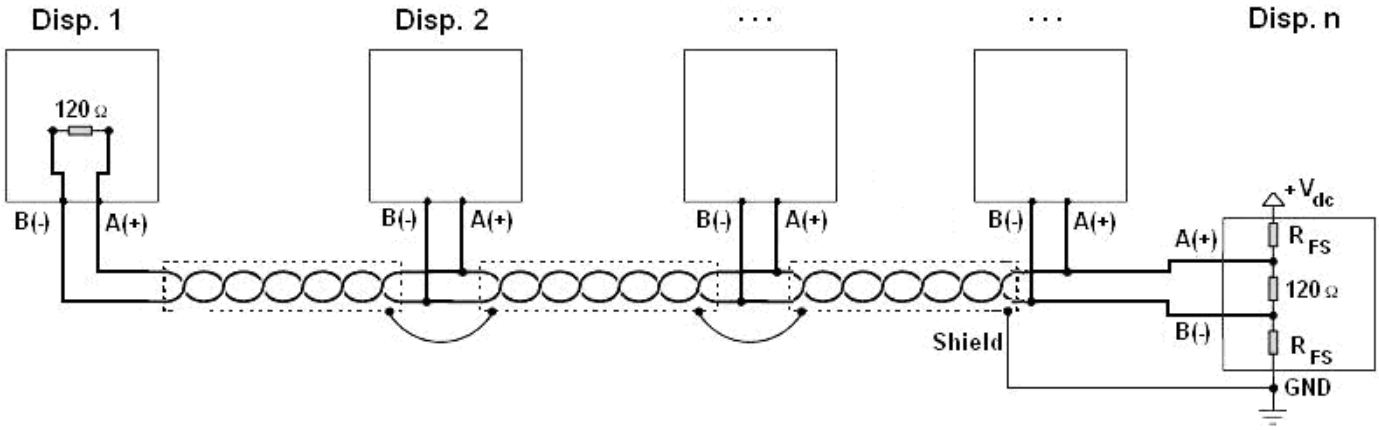


Figure 1: electrical diagram of RS485 connections.

- Use a **STP** (Shielded Twisted Pair) cable in order to make the connection (twisted and shielded pair/s with single shielding for each pair through aluminium band and total shielding through external sheathing).

- The maximum reachable length from the line with the use of the appropriate cable for RS 485 connections, the twisted 2x24 AWG duplex cable, shielded with external sheathing + aluminium band, is of about 1200 meters (see section 1.1.3)

- With very long cables, the cable capacity (normally near 50pF/m) starts being a dominant factor in the power consumption and increases with the increase of speed.

This implies that **the maximum distance can't be covered with the maximum possible speed**. For an approximate value, one can consult the following table:

Baud rate	Total capacity of the cable (pF)
1200	400000
2400	200000
4800	100000
9600	50000
19200	25000
38400	12000
57600	8000
115200	4000

As a general rule, if one has any doubts, it is always preferable to **choose the cable with a greater section.**

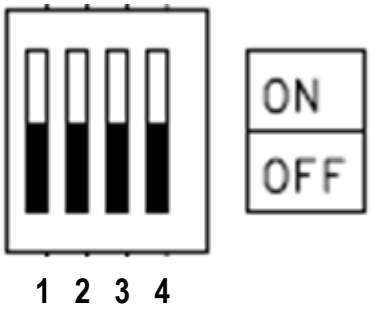
- On the RS485 network normally one connects 2 **termination resistances** equal to the characteristic impedance of the cable (tipically 120 Ω, see Figure 1), **ONLY** on the 2 devices **which are at the 2 ends of the ring connection.**

- The difference of potential between the A(+) and B(-) terminals in rest conditions (for example with instrument in set-up phase), **must be of at least 0,2 V**.
  To create a resistive divider which maintains this difference of potential also when all the transmitters are disabled, inert in the RS485 port of the indicator where there are the termination resistances, the **polarisation** or **fail-safe resistences** (R_{FS} in Figure 1). The value of these resistances is between 390 Ω and 2,2 kΩ.

- In case of connection with non Dini Argeo devices, there may be different ways of line marking: generally one presumes that the A/B indication corresponds to the +/- and HI/LO markings, but this is not always true. Therefore, if the device does not function, one should try inverting the connections even if everything seems to be correct.

8.3 DIP-SWITCH (*)

For the connection RS485 and RS422, it's necessary to configure the DIP-SWITCHES of the board with the module so that to address the data on the desidered port:



The DIP-SWITCH 1 is used to enable the terminal resistance of 120Ω (RT), to be used only for RS485 comunication..

DIP-SWITCH FOR RS232→RS485/422, ETHERNET→RS485/422, ETHERNET→RS232 CONVERTION

Depending on the conversion that one wants execute, it is necessary to configure the DIP-SWITCHES in the following way:

FOR RS232→RS485 AND ETHERNET→RS485 CONVERSION:

2-3-4 ON

FOR RS232→RS422 AND E ETHERNET→RS422 CONVERSION:

2-3-4 OFF

For RS232→ETHERNET convention the configuration of DIP-SWITCH is irrelevant.

9 RESET OF MODULE

To reset the module and return at initial settings is necessary do the following operations:
- switch off the instrument
- open the tool so as to be able to close the jumper J2;
- close the jumper J2;
- switch on the tool;
- now the 2 cpu card LEDs (red and green) flash repeatedly;
- to complete the reset open the jumper and restart the instrument.