Modbus Ethernet Wi-Fi Gateways

G11 - G13 Modbus Ethernet Wi-Fi Gateways documentation

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  - Hardware
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  - Configuration by the Telnet Console
  - Configuration by the Serial Console
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- Common Resources
  - Introduction

Data Sheet

Modbus Ethernet Wi-Fi Gateways (G11 - G13)

Features

- 2-mode Ethernet/Wi-Fi Modbus Gateway
- Ethernet/Wi-Fi converter to RS232/RS485
- ESD protection for the RS485 data line
- Power supply: +12 to +30 VDC
- Transmission speed up to 115200 bps
- Tx, Rx and power LED indicators
- RS485 embedded termination 120 ohm
- Operating temperatures: -40°C to +75°C
- DIN rail mounting
- Dimensions: 90x56.4x22.5 mm
- 3 years warranty
- Customization of OEM is welcomed

Introduction

Devices are based on G11 - G13 gateways (**ESP32 Xtensa LX6 microcontroller**) depending on needed ports and interfaces.

Dedicated EMC integrated circuits guarantee improved connection quality by limiting the impact of interference typical for an industrial environment.

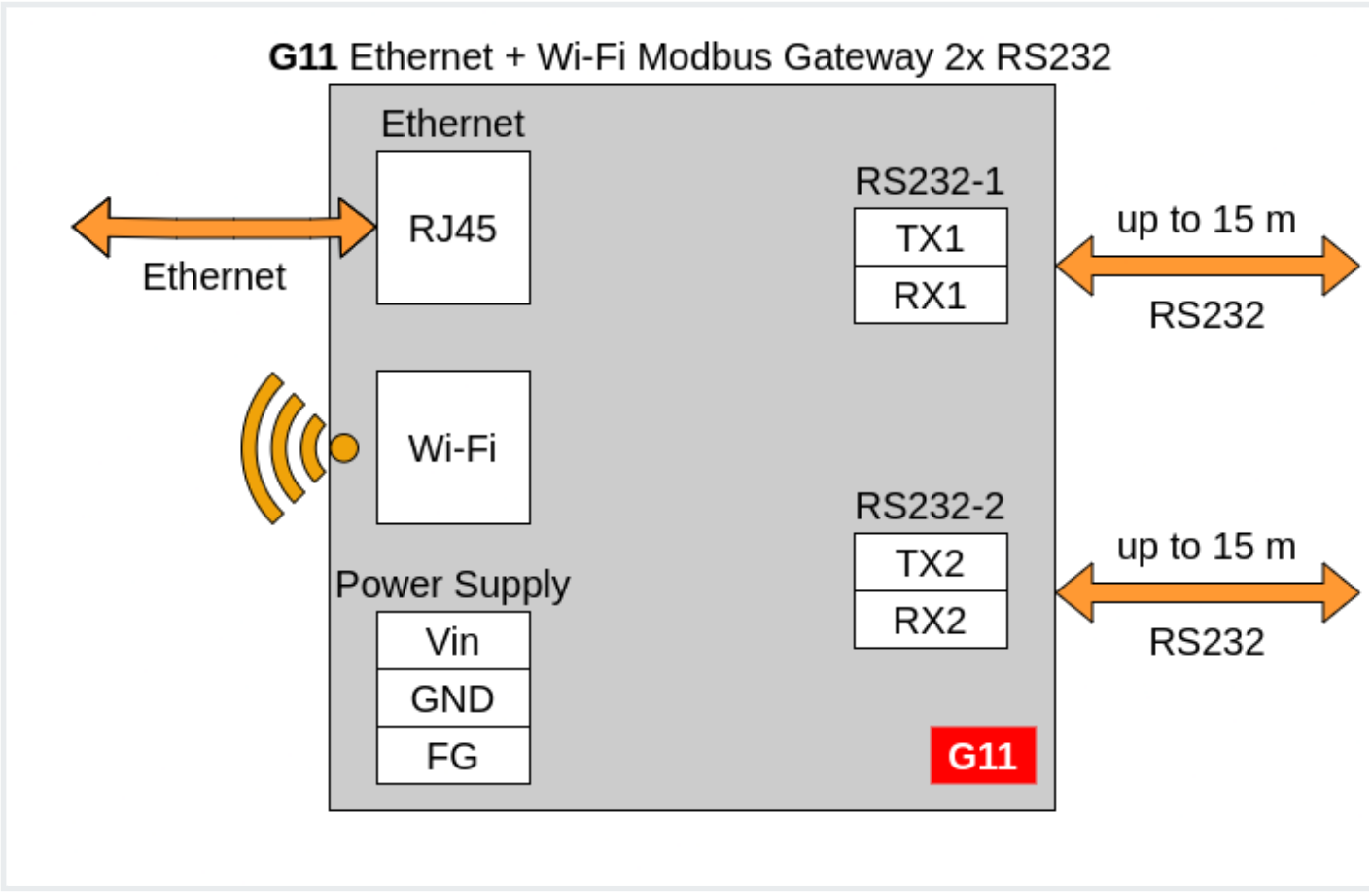
Specification

Redisage PN		G11	G12	G13
Ports	RS232	2x	-	-
	RS485	-	1x	-

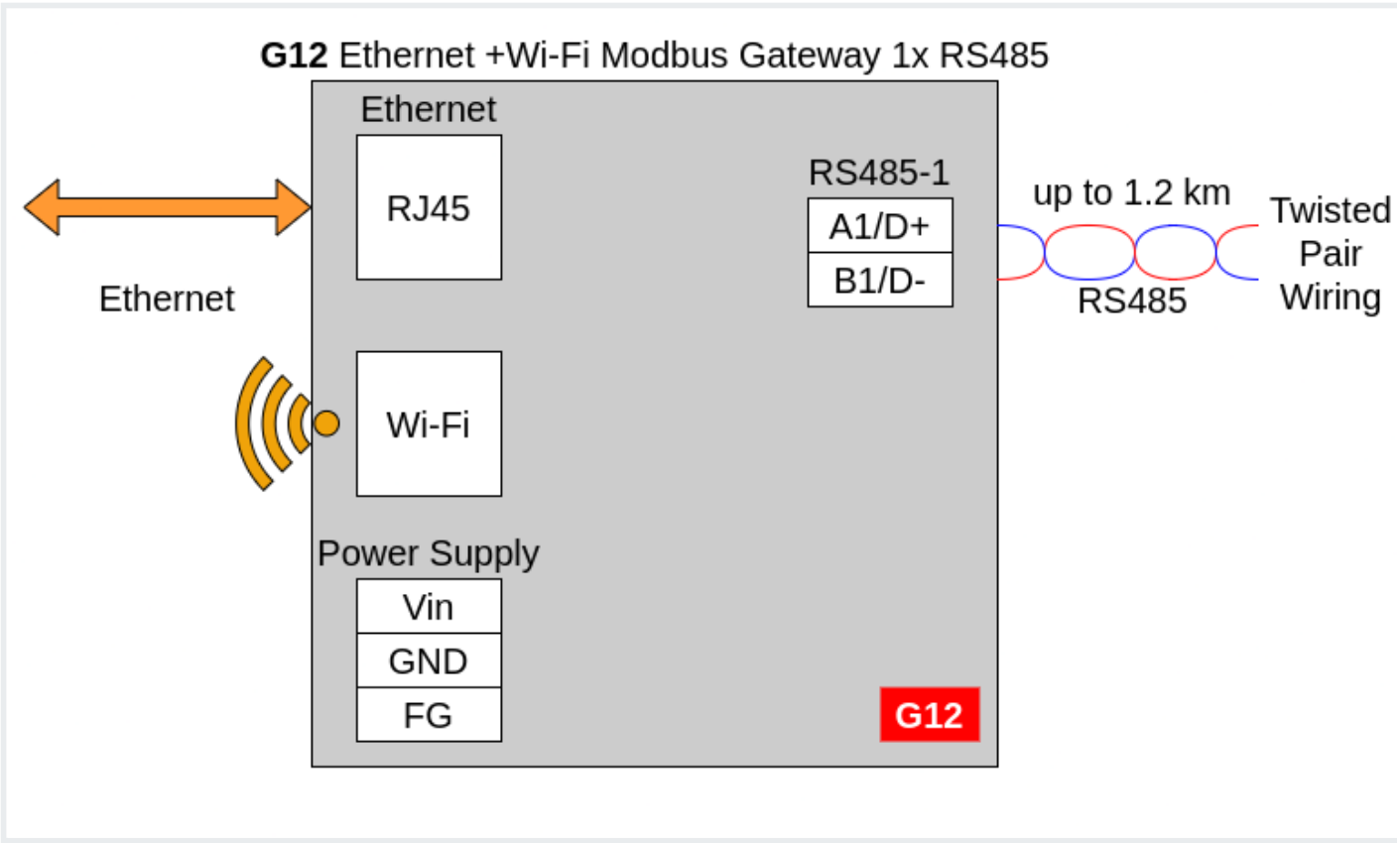
Redisage PN		G11	G12	G13
RS232/RS485	-	-	2x	
Microcontroller		ESP32		
WiFi		2.4 GHz b/g/n		
Power	Voltage	12-30 VDC		
	Power	< 1 W		
Frame ground connection		yes		
Baud rate		up to 115200 bps		
LED indicators		communication Tx, Rx and power		
RS485 termination		120 ohm manually enabled		
Connector	RS232/RS485	8-pin terminal block max. 2.5 mm^2 wire		
	Power	3-pin terminal block max. 2.5 mm^2 wire		
	Ethernet	RJ45		
Transmission distance	RS485	max. 1,200 m at 9.6 kbps; max. 400 m at 115.2 kbps (Belden 9841 2P twisted-pair cable, if different cables are used, the transmission distance may change)		
	RS232	max. 15 m at 115.2 kbps		
Mounting and enclosure		DIN rail, plastic PA - UL 94 V0, black/green		
Temperatures		-40°C to +75°C operating and storage		
Humidity		10 - 90% RH, non-condensing		
ESD protection		±4 kV contact discharge / ±8 kV air discharge		
Certification		CE, RoHS		

Variants

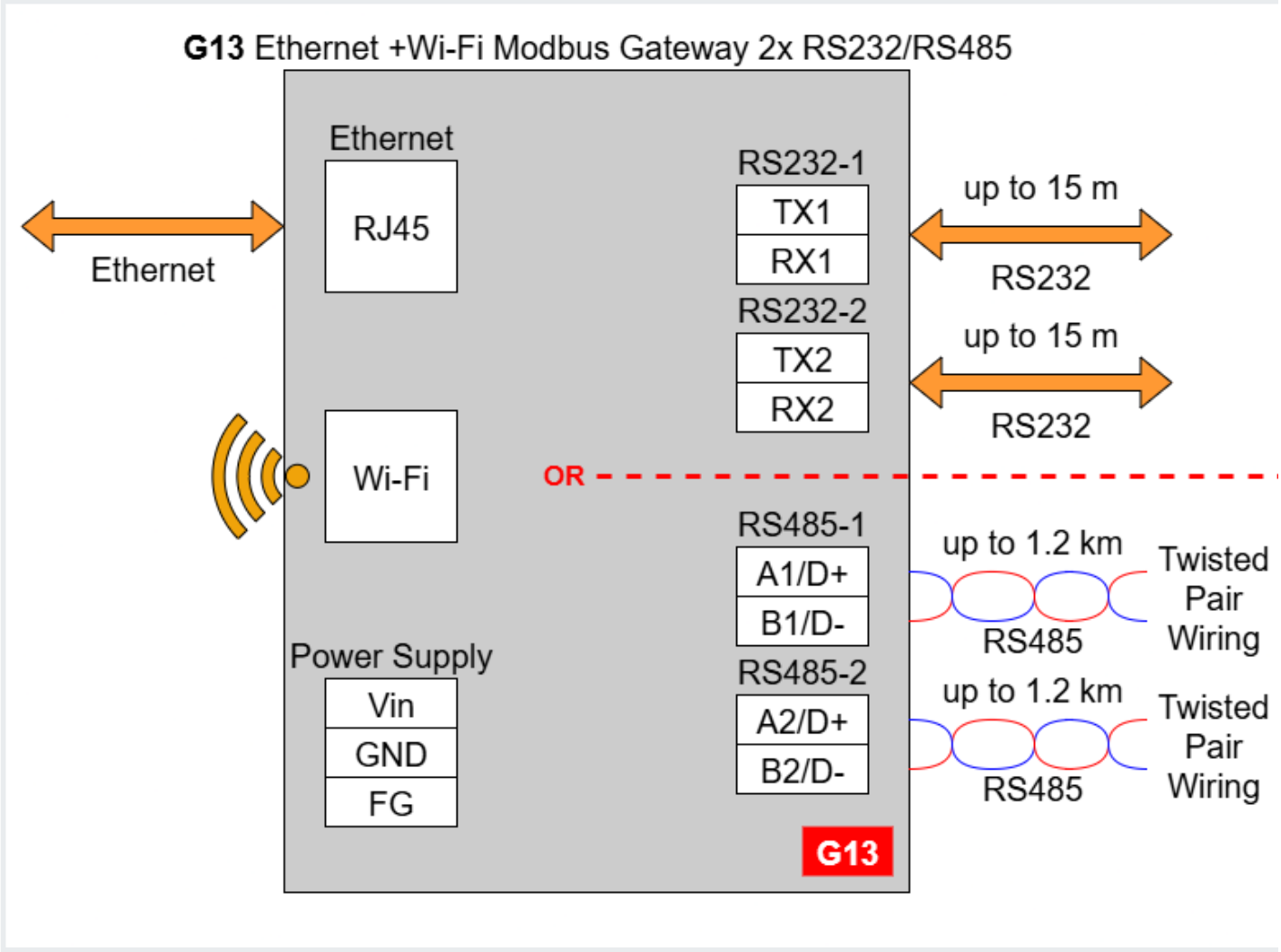
G11 - Ethernet + Wi-Fi Modbus Gateway 2 x RS232



G12 - Ethernet + Wi-Fi Modbus Gateway 1 x RS485



G13 - Ethernet Modbus Gateway 2 x RS232/RS485

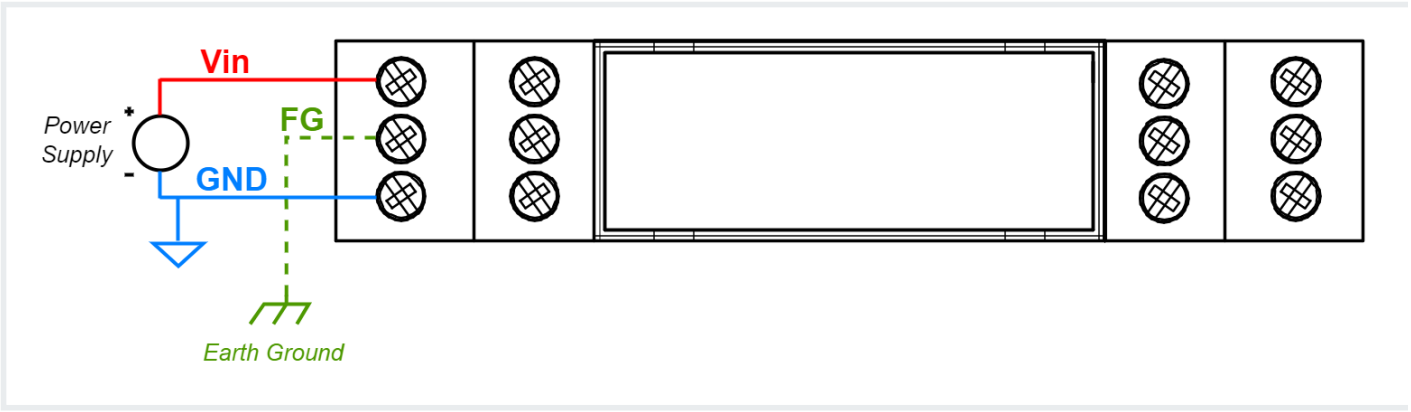


In the G13 gateway user should use only RS232 or only RS485 interface of one port as they occupy the same internal bus of the device.

Frame ground FG

Electronic circuits are constantly prone to electrostatic discharge ESD. Redisage Electronics modules feature a design for the frame ground terminal block FG. The frame ground provides a path for bypassing ESD, which provides enhanced static protection ESD abilities and ensures the module is more reliable. Connecting FG terminal block to the earth ground will bypass the ESD disturbances outside the device so will provide a better level of protection against ESD.

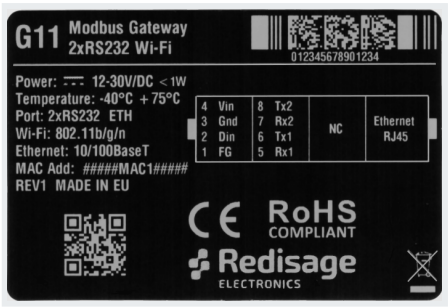
Frame Ground FG connection reference drawing is provided below.



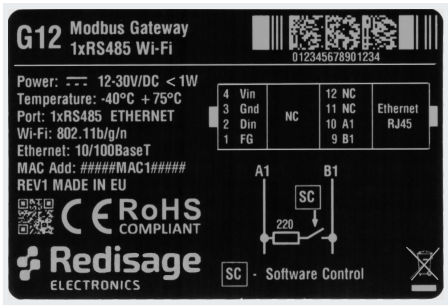
If earth ground is not available FG can be left floating or it can be connected with the power supply GND.

Pin assignments

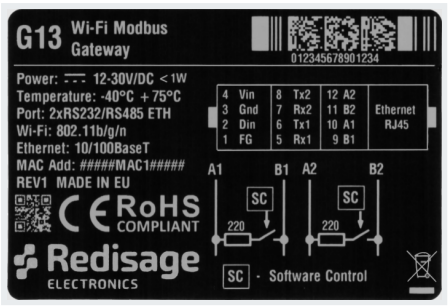
G11



G12

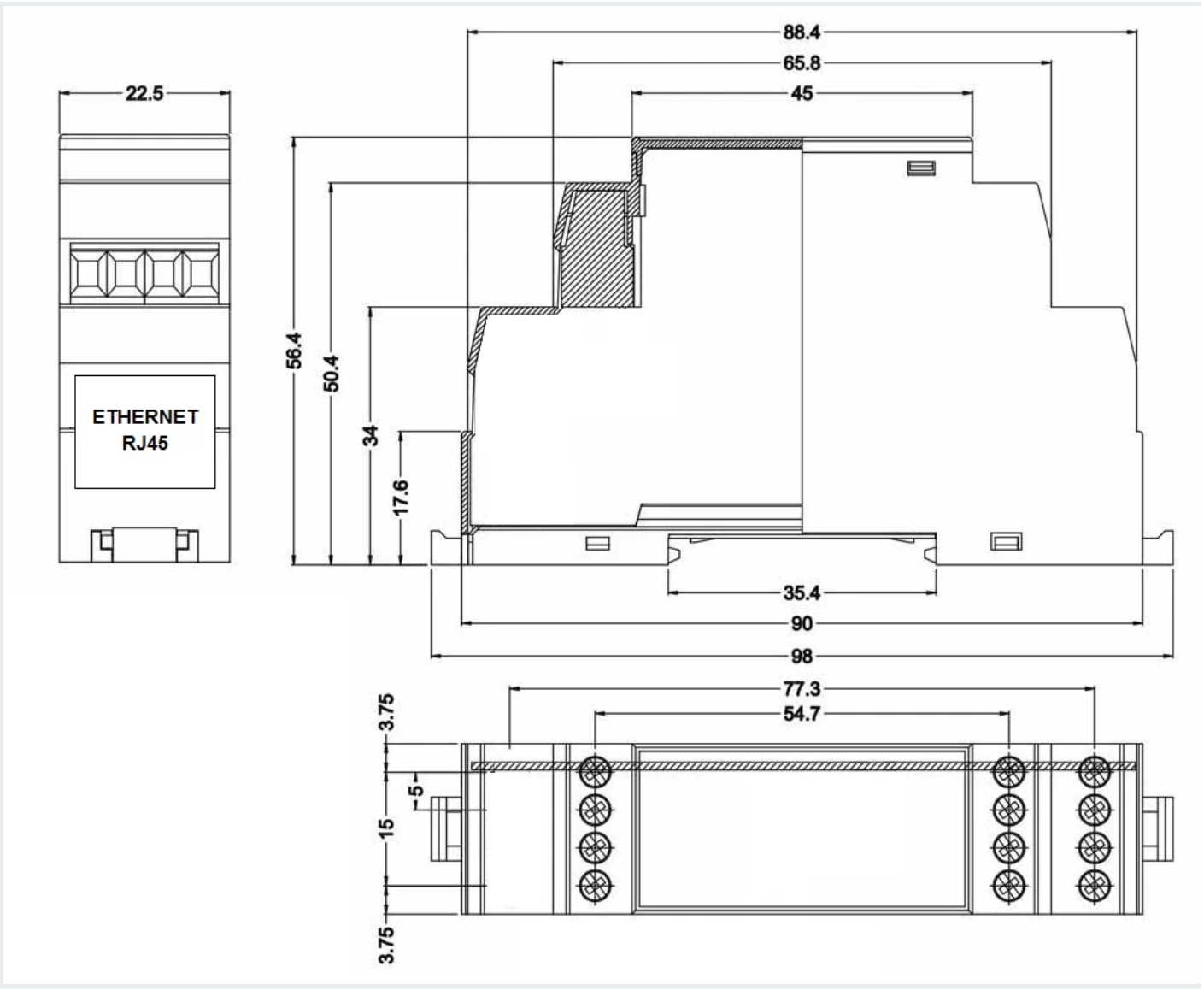


G13



Enclosure dimensions

2U Module Enclosure
98 x 22.5 x 56.4
Units: mm



Getting started

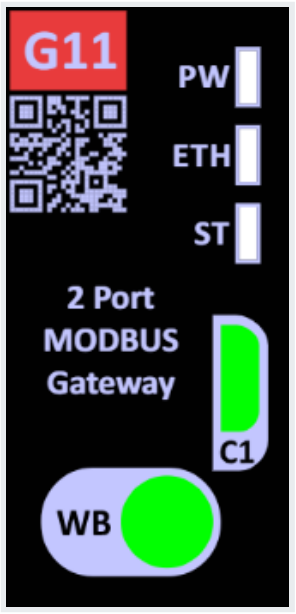
Power supply

Ethernet Modbus gateways G01 - G03 and G14 - G16 have wide voltage power input (12 - 30 VDC). The power consumption is less than 1 W.

LED indicators

Ethernet Modbus gateways G11 - G13 have 3 LED indicators:

- PW LED Blue - Power
- ETH LED Green - Network activity
- ST LED Orange - USB-UART Serial console mode



Additional notes

Related information and links		
Ordering information	Accessories	Similar products

Products family sample photo

https://redisage.com

DISCLAMER NOTES
ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Datasheet-ID:

SR-D

User Manual

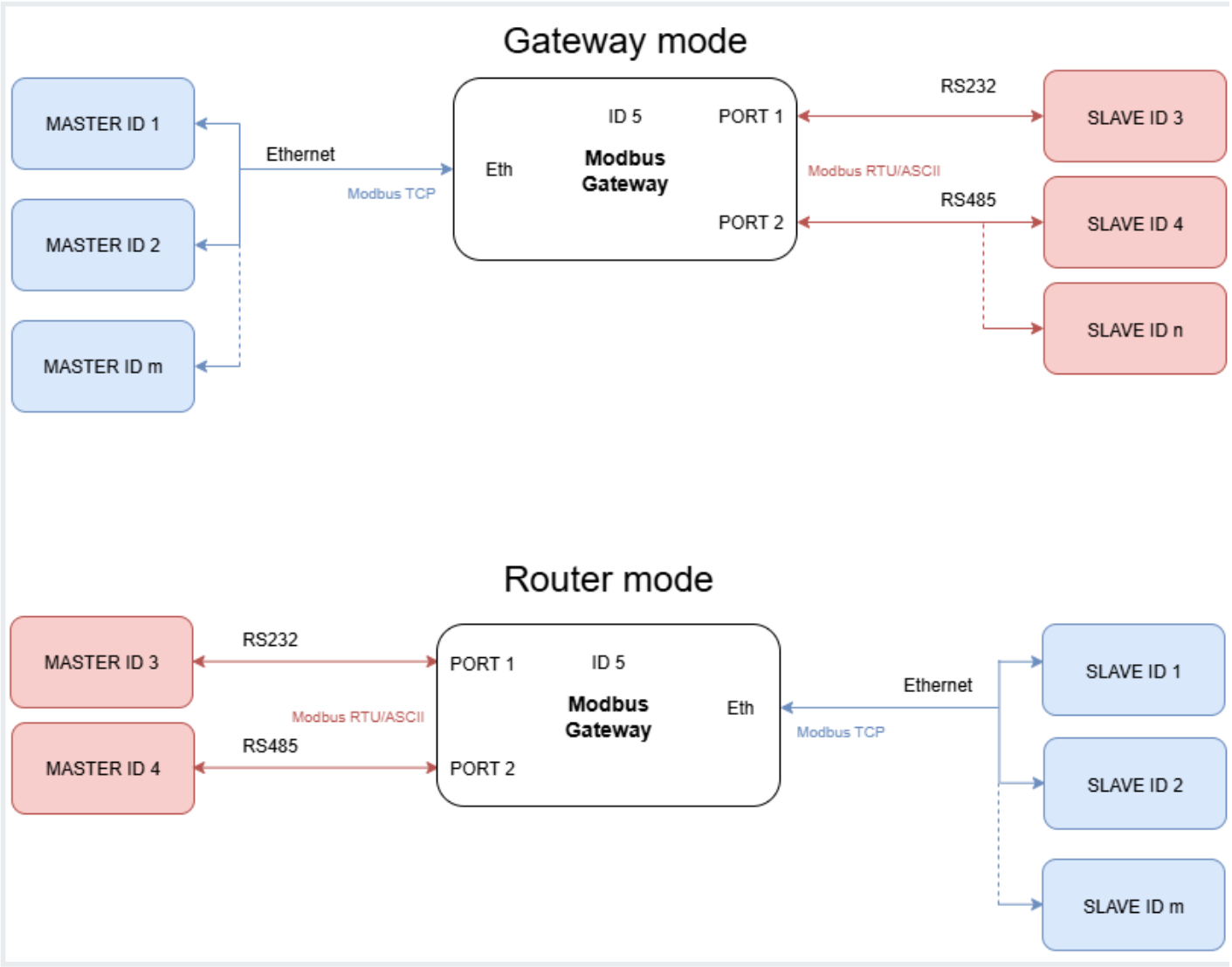
Modbus Ethernet Gateways (G11 - G13)

Introduction

Modbus Ethernet Wi-Fi Gateways (G11 - G13)

Modbus gateways allow data transmission between LAN hosts, Wi-Fi hosts, and serial devices by converting Modbus protocols (Modbus TCP and Modbus RTU/ASCII). They are intended to be used in industrial networks especially in the field of Industry 4.0 but not only. Apart from extending the capabilities of industrial devices, they can be also adapted up to user’s requirements and needs.

Transmission is carried out by two modes: Gateway and Router. In the Gateway mode, the port is used to communicate with Slave devices, but in the Router mode with Master devices. It is also possible to set up different modes on every port. Block diagrams below describe how each of these modes works.



The device has max 20 sockets open in Gateway mode and max 8 in Router mode. It is possible to increase this value at client's request.

Hardware

Modbus Ethernet Wi-Fi Gateways (G11 - G13)

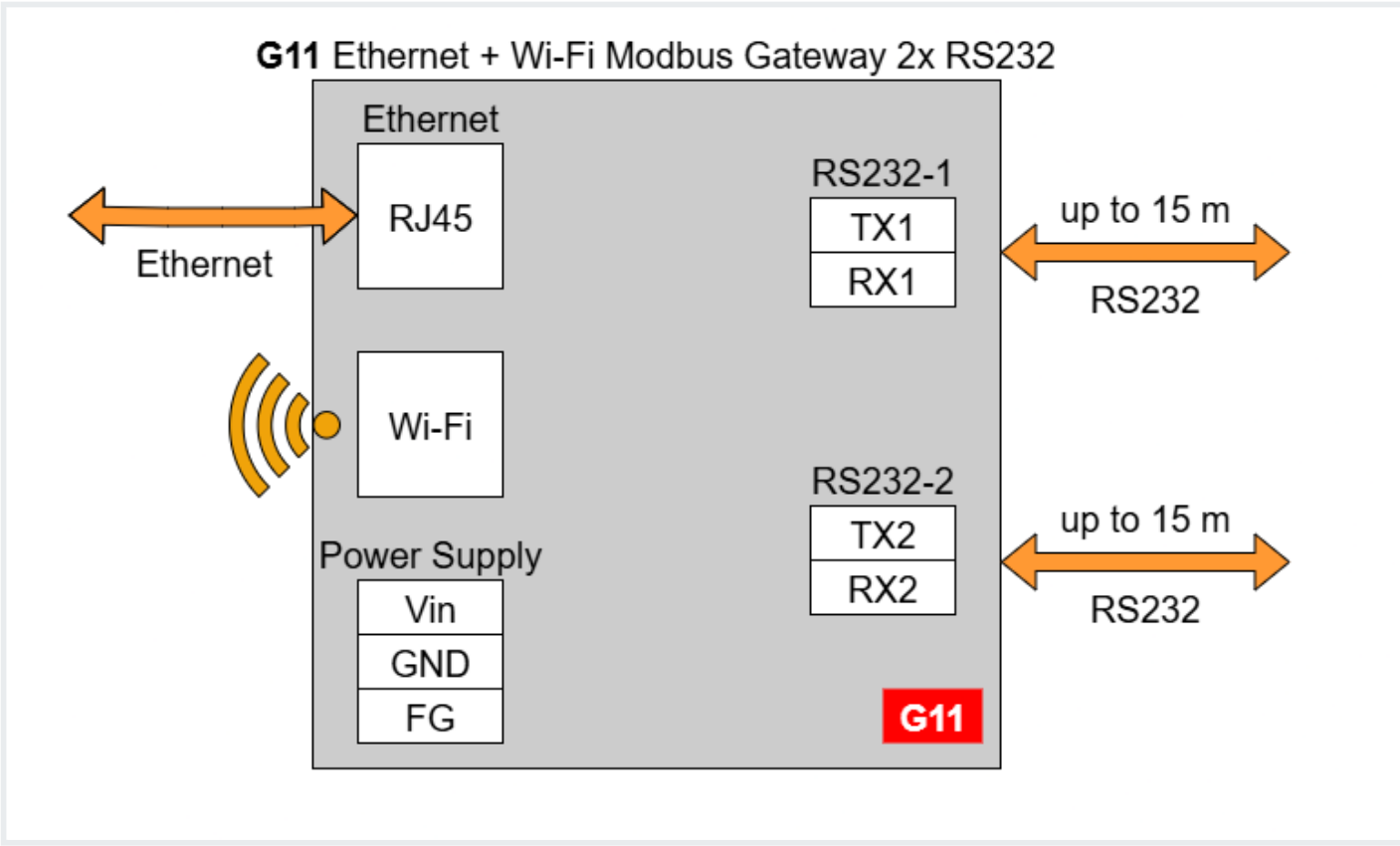
Modbus Gateway can be installed on any device from Redisage G11 - G13 Modbus Gateways family.

Features

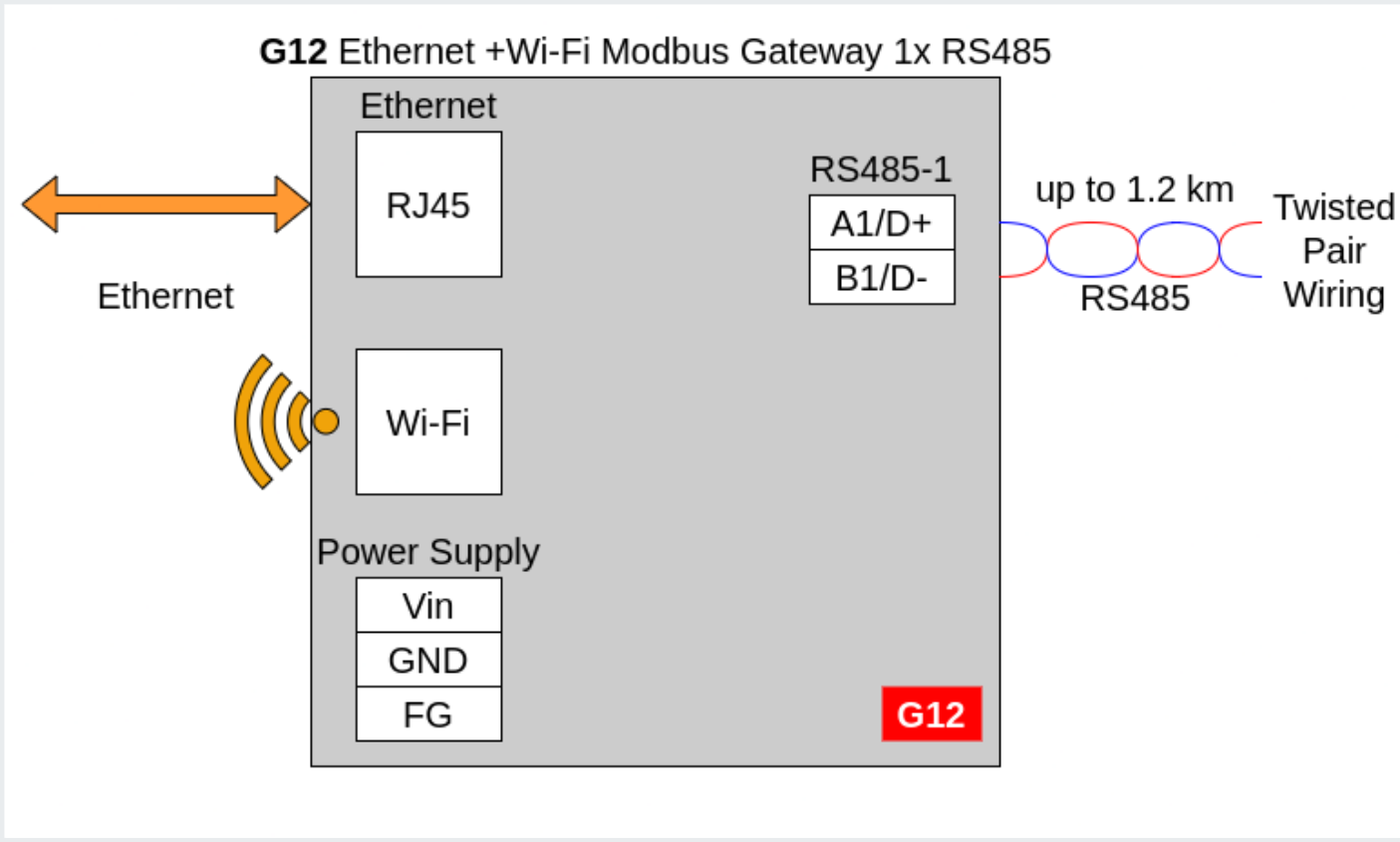
Features
2-mode Ethernet + Wi-Fi Modbus Gateway
ESD protection for the RS485 data line
Power supply: +12 to +30 VDC
Transmission speed up to 115200 bps
Tx, Rx and power LED indicators
RS485 embedded termination 120 ohm
Operating temperatures: -40°C to +75°C
DIN rail mounting
Dimensions: 90x56.4x22.5 mm
3 years warranty
Customization of OEM is welcomed

Variants

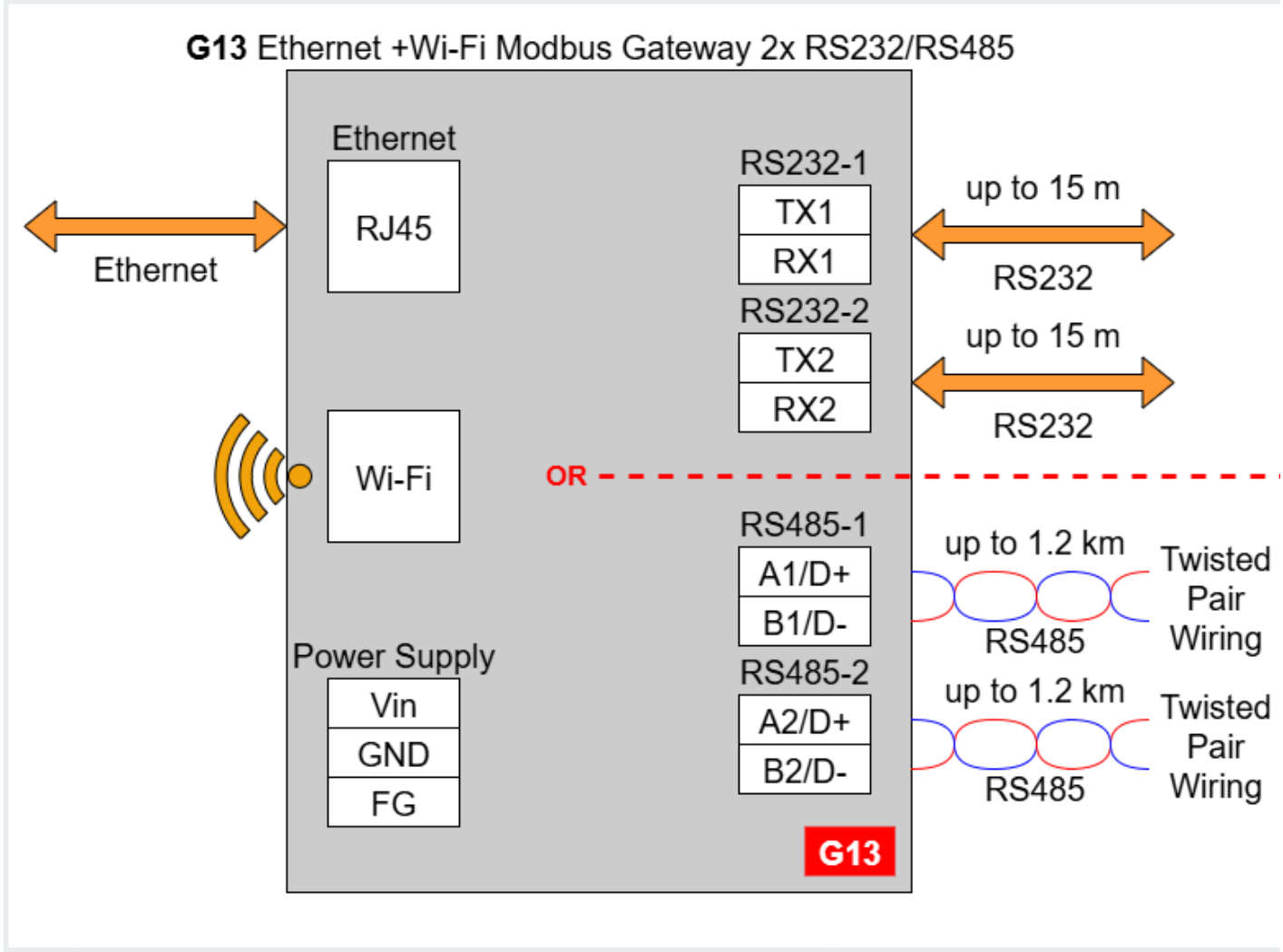
G11 - Ethernet + Wi-Fi Modbus Gateway 2 x RS232



G12 - Ethernet + Wi-Fi Modbus Gateway 1 x RS485



G13 - Ethernet Modbus Gateway 2 x RS232/RS485

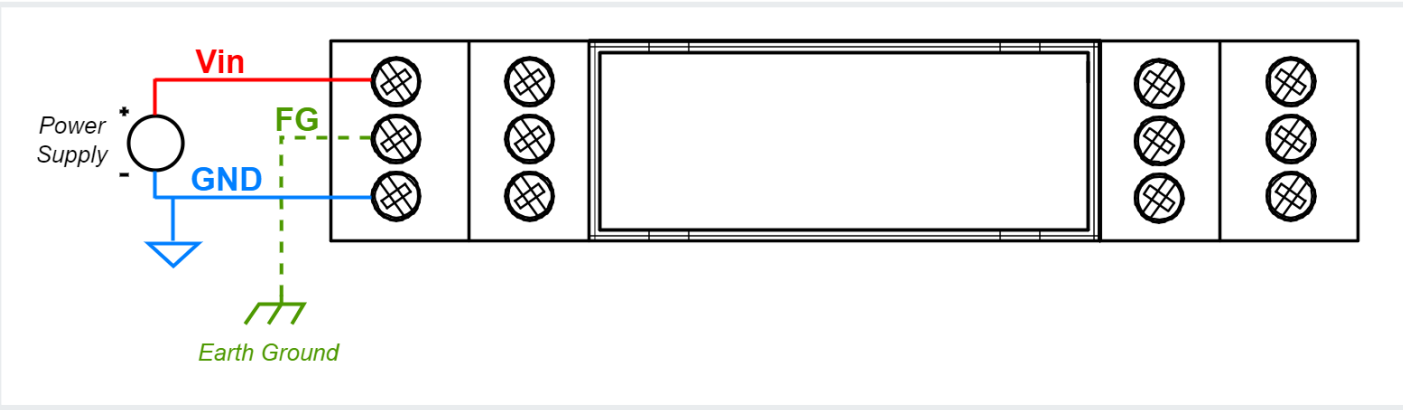


In the G13 gateway user should use only RS232 or only RS485 interface of one port as they occupy the same internal bus of the device.

Frame ground FG

Electronic circuits are constantly prone to electrostatic discharge ESD. Redisage Electronics modules feature a design for the frame ground terminal block FG. The frame ground provides a path for bypassing ESD, which provides enhanced static protection ESD abilities and ensures the module is more reliable. Connecting FG terminal block to the earth ground will bypass the ESD disturbances outside the device, so will provide a better level of protection against ESD.

Frame Ground FG connection reference drawing is provided below.



If earth ground is not available FG can be left floating or it can be connected with the power supply GND.

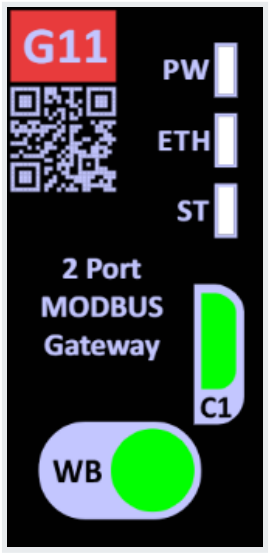
Specification

Redisage PN		G01	G02	G03
Ports	RS232	2x	-	-
	RS485	-	1x	-
	RS232/RS485	-	-	2x
Microcontroller		ESP32		
WiFi		2,4 GHz b/g/n		
Power	Voltage	12-30 VDC		
	Power	< 1 W		
Frame ground connection		yes		
Baud rate		up to 115200 bps		
LED indicators		communication Tx, Rx and power		
RS485 termination		120 ohm manually enabled		
Connector	RS232/RS485	8-pin terminal block max. 2.5 mm^2 wire		
	Power	3-pin terminal block max. 2.5 mm^2 wire		
	Ethernet	RJ45		
Transmission distance	RS485	max. 1,200 m at 9.6 kbps; max. 400 m at 115.2 kbps (Belden 9841 2P twisted-pair cable, if different cables are used, the transmission distance may change)		
	RS232	max. 15 m at 115.2 kbps		
Mounting and enclosure		DIN rail, plastic PA - UL 94 V0, black/green		
Temperatures		-40°C to +75°C operating and storage		

Redisage PN	G01	G02	G03
Humidity	10 - 90% RH, non-condensing		
ESD protection	±4 kV contact discharge / ±8 kV air discharge		
Certification	CE, RoHS, EMC, LVD		
Norms	61000-6-2 - Immunity standard for industrial environments 61000-6-4 - Emission standard for industrial environments		

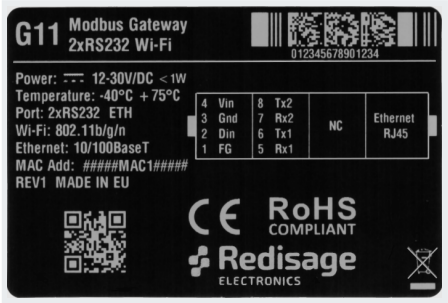
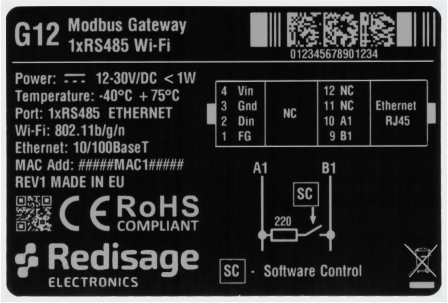
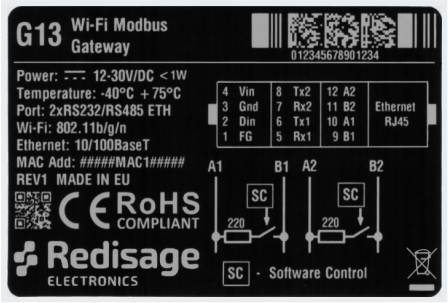
LED indicators

Modbus Gateways G11 - G13



LED indicator	Color	Function
PW	Blue	Power
ETH	Green	Network activity
ST	Orange	Console mode
	Red	Service mode

Pin assignments

G11	G12	G13
		

> In the G13 gateway user should use only RS232 or only RS485 interface of one port as they occupy the same internal bus of the device.

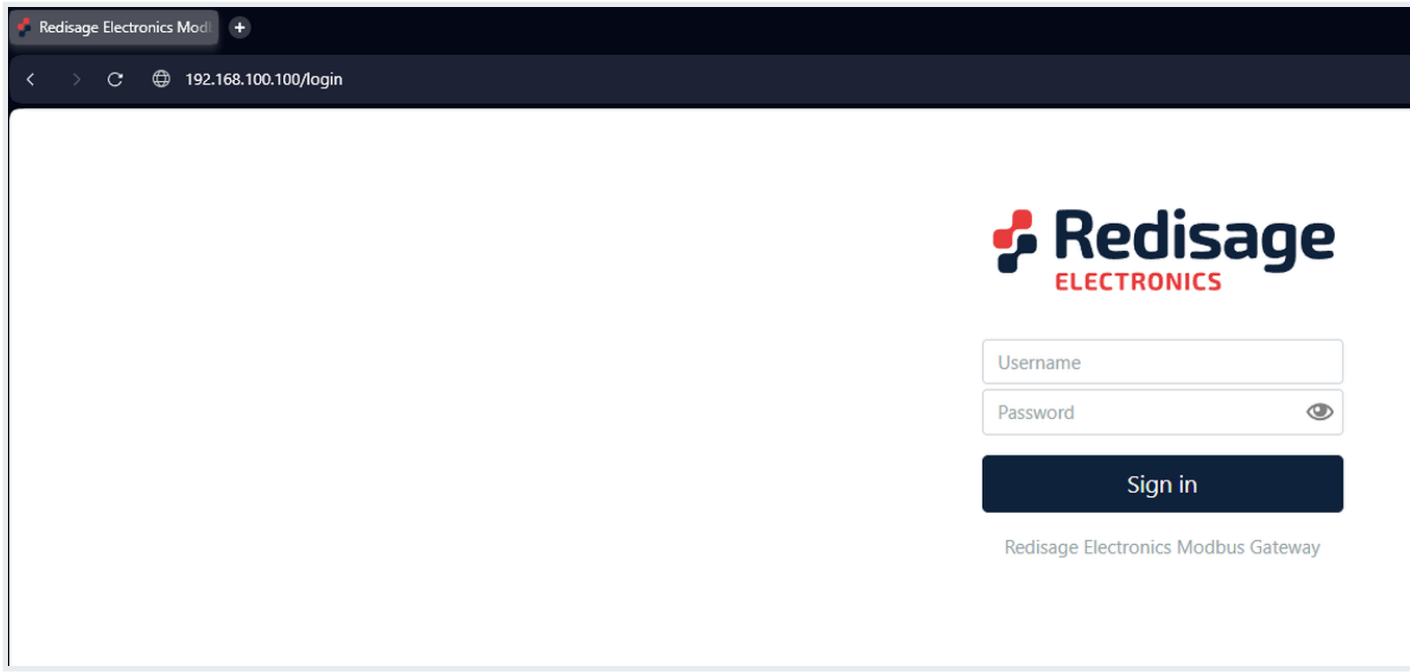
Configuration by the Web Page

Modbus Ethernet Wi-Fi Gateways (G11 - G13)

This page presents capabilities of the Ethernet Converters configuration. First, make sure that the converter is connected to the power supply and to the LAN using a patchcord or wireless via Wi-Fi. If the device has no static IP set up, it will be necessary to obtain its IP address in the local network. User interface is mostly similar for all gateways, but some subpages might be different for several models depending on amount of interfaces. In order to avoid issues, click on a “Help” button in the top right corner on every page.

Login

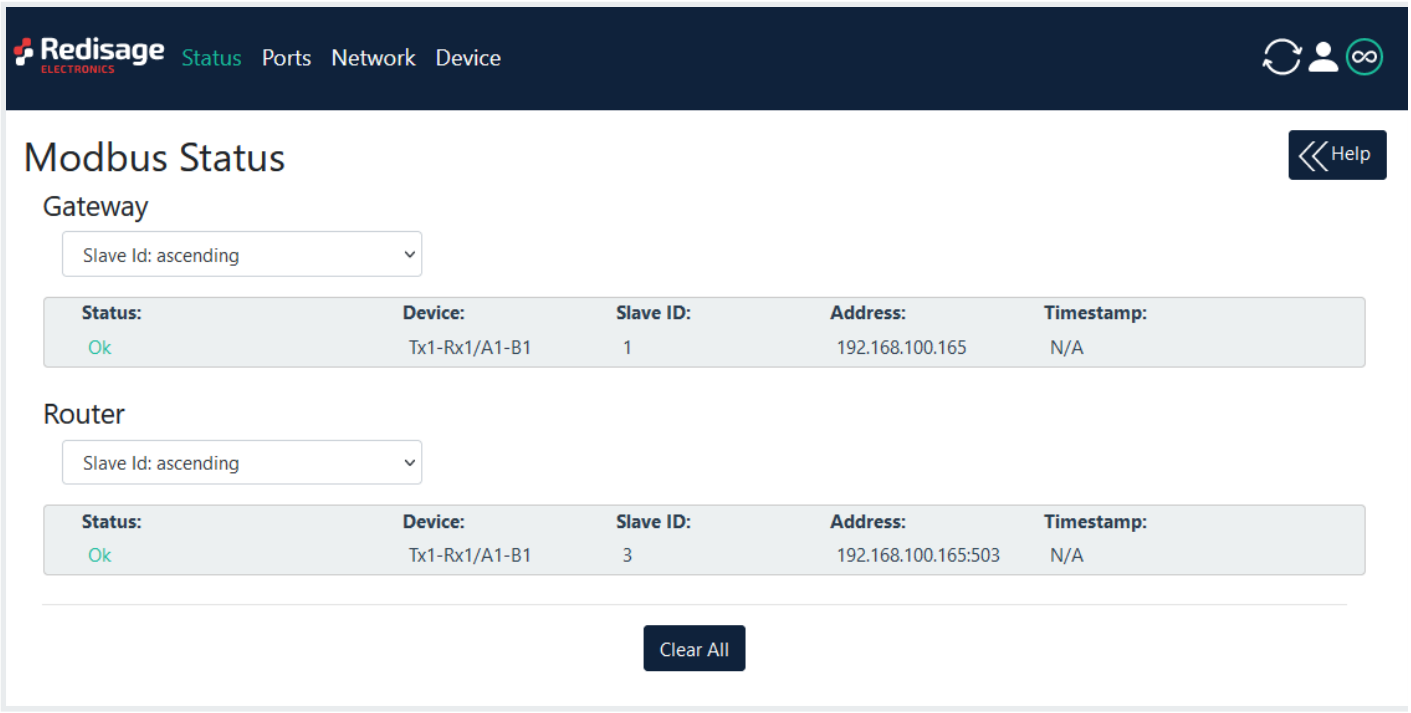
To access the web page, open the browser, type the device’s IP address of the converter (default is **192.168.100.100**). Then log in using user’s personal credentials. If it is a first configuration or the converter had a factory reset, use default login details (login: **admin**, password: **admin123**).



> The configuration is available only if devices are connected to the same Local Area Network as the computer used for it.

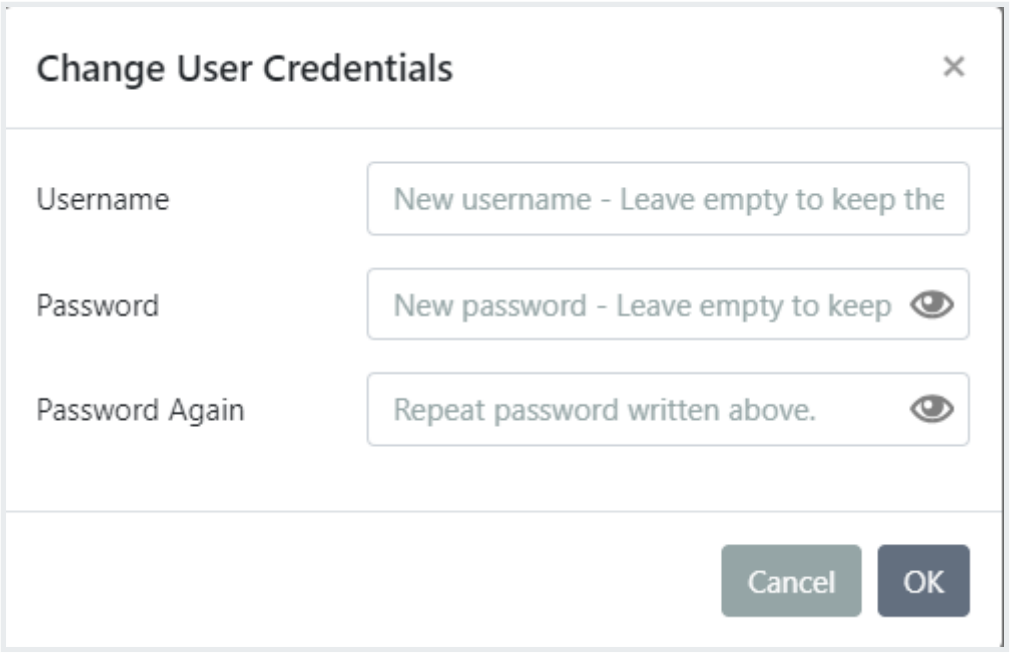
Status page

After a successful login, there should be an insight to a list of available connections. If there is more than one connection, it is possible to sort them by ID, timestamp or status.



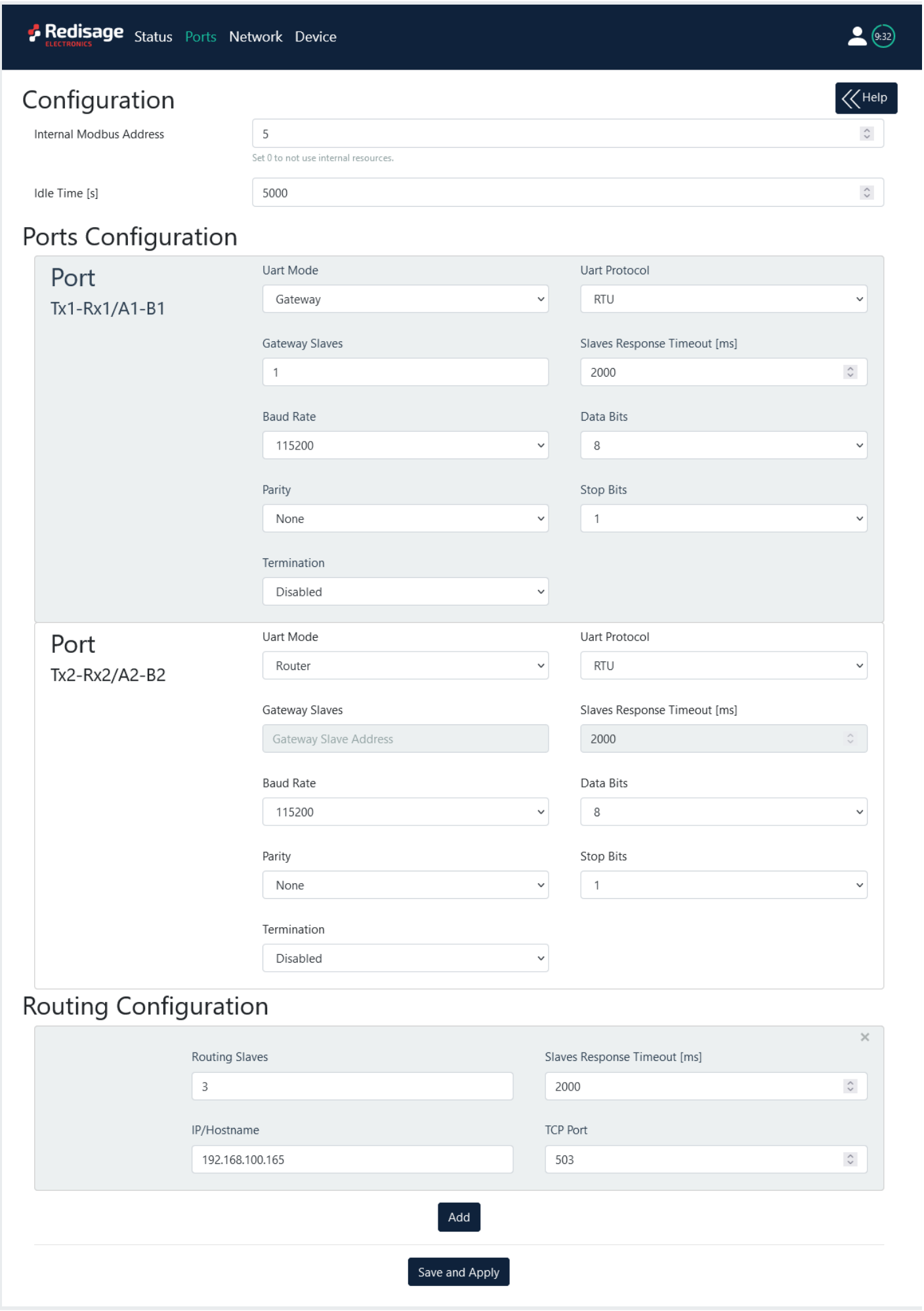
Changing username or password

After clicking “Edit User” under the user icon, it is possible to change the username or the password.



If login details were forgotten, it would be necessary to do a factory reset via a USB/UART converter and a serial console.

Ports configuration


Redisage
ELECTRONICS
Status
Ports
Network
Device
9:32
Configuration
Help
Internal Modbus Address
5
Set 0 to not use internal resources.
Idle Time [s]
5000
Ports Configuration
Port
Tx1-Rx1/A1-B1
Uart Mode
Gateway
Uart Protocol
RTU
Gateway Slaves
1
Slaves Response Timeout [ms]
2000
Baud Rate
115200
Data Bits
8
Parity
None
Stop Bits
1
Termination
Disabled
Port
Tx2-Rx2/A2-B2
Uart Mode
Router
Uart Protocol
RTU
Gateway Slaves
Gateway Slave Address
Slaves Response Timeout [ms]
2000
Baud Rate
115200
Data Bits
8
Parity
None
Stop Bits
1
Termination
Disabled
Routing Configuration
Routing Slaves
3
Slaves Response Timeout [ms]
2000
IP/Hostname
192.168.100.165
TCP Port
503
Add
Save and Apply

Item		Description
Internal Modbus Address		An Internal Modbus Address is qualified by the Gateway/Router as a request for internal resources. The Internal Modbus Address has a higher priority than the Gateway Slave Address.
Idle Time [s]		Determine a time thread waits for the TCP connection. If time expired, the connection and thread are closed. **Used only in Gateway Mode.**
UART Mode	Gateway	Define the port's role in the system. In the Gateway Mode, the port is used to communicate with a Modbus Slave.
	Router	Define the port's role in the system. In the Router Mode, the port is used to communicate with Modbus Master. Note the Routing Configuration section below if the Router Mode is chosen.
	Disabled	Disable the port.
UART Protocol		Determine a protocol used for a communication.
Gateway Slaves		Addresses of Modbus Slave Devices connected to Gateway UART ports. Multiple addresses can be written in one field, e.g. *9;11;14-17;80*. This field is available only in the Gateway Mode. Use * to select all not assigned addresses.
Slaves Response Timeout [ms]		Specify how long the device will wait for response from Modbus Slave.
Baud Rate		Determine the port's transmission speed over the data channel.
Data Bits		Determine the number of data bits in the port's message frame.
Parity		Enable/disable the parity check in the port's message frame.
Stop Bits		Determine the number of stop bits in the port's message frame.
Termination		Enable/disable termination on RS line.
Routing Slaves		Addresses of Modbus Slaves connected to Modbus Router. Multiple addresses can be written in one field, e.g. 9;11;14-17;80. Use * to select all not assigned addresses.

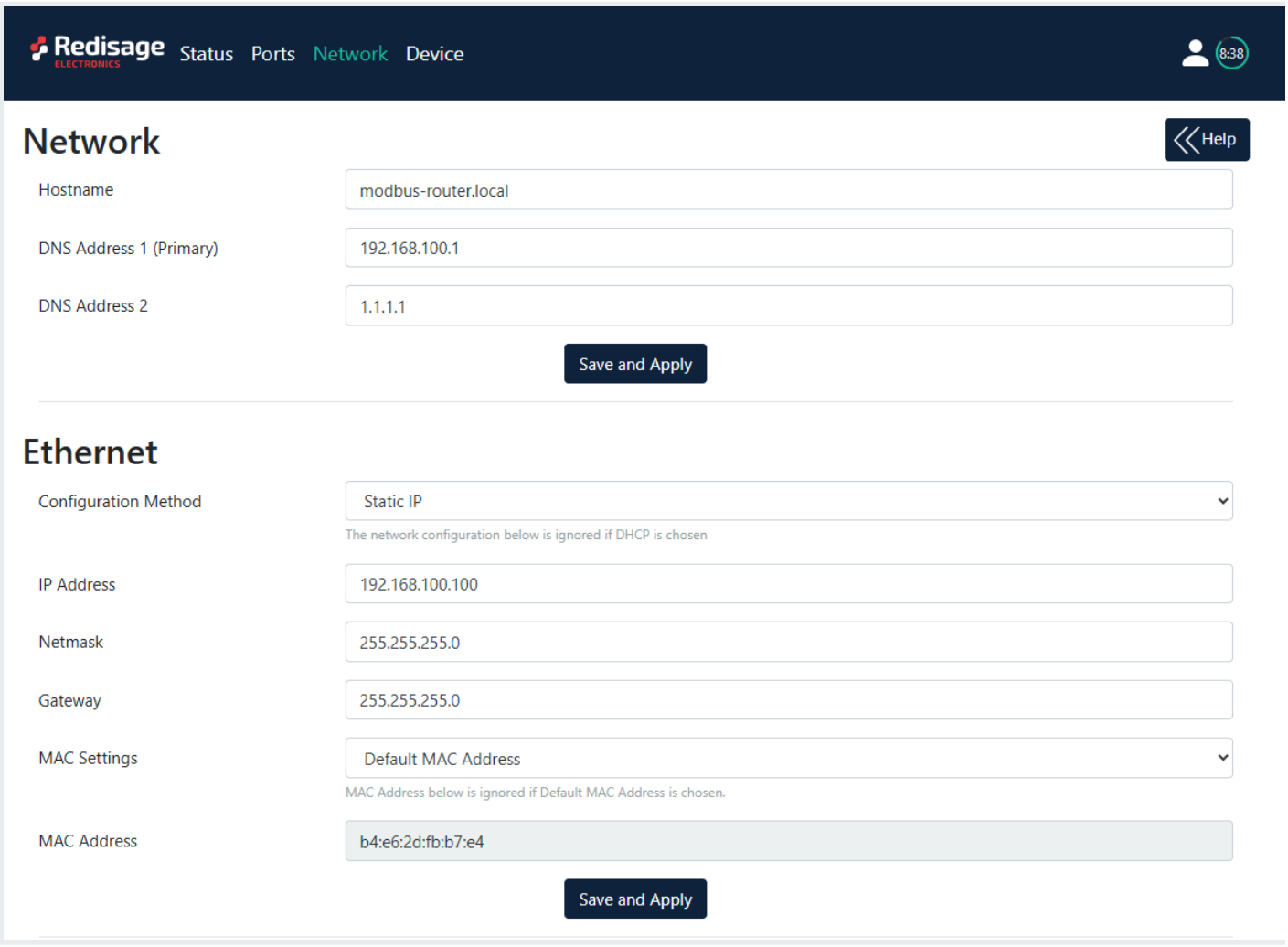
Item	Description
Slaves Response Timeout [ms]	Specify how long the device will wait for response from Modbus Slave.
IP/Hostname	Determine IP address or Hostname of Modbus Slave.
TCP Port	Determine TCP port of Modbus Slave.

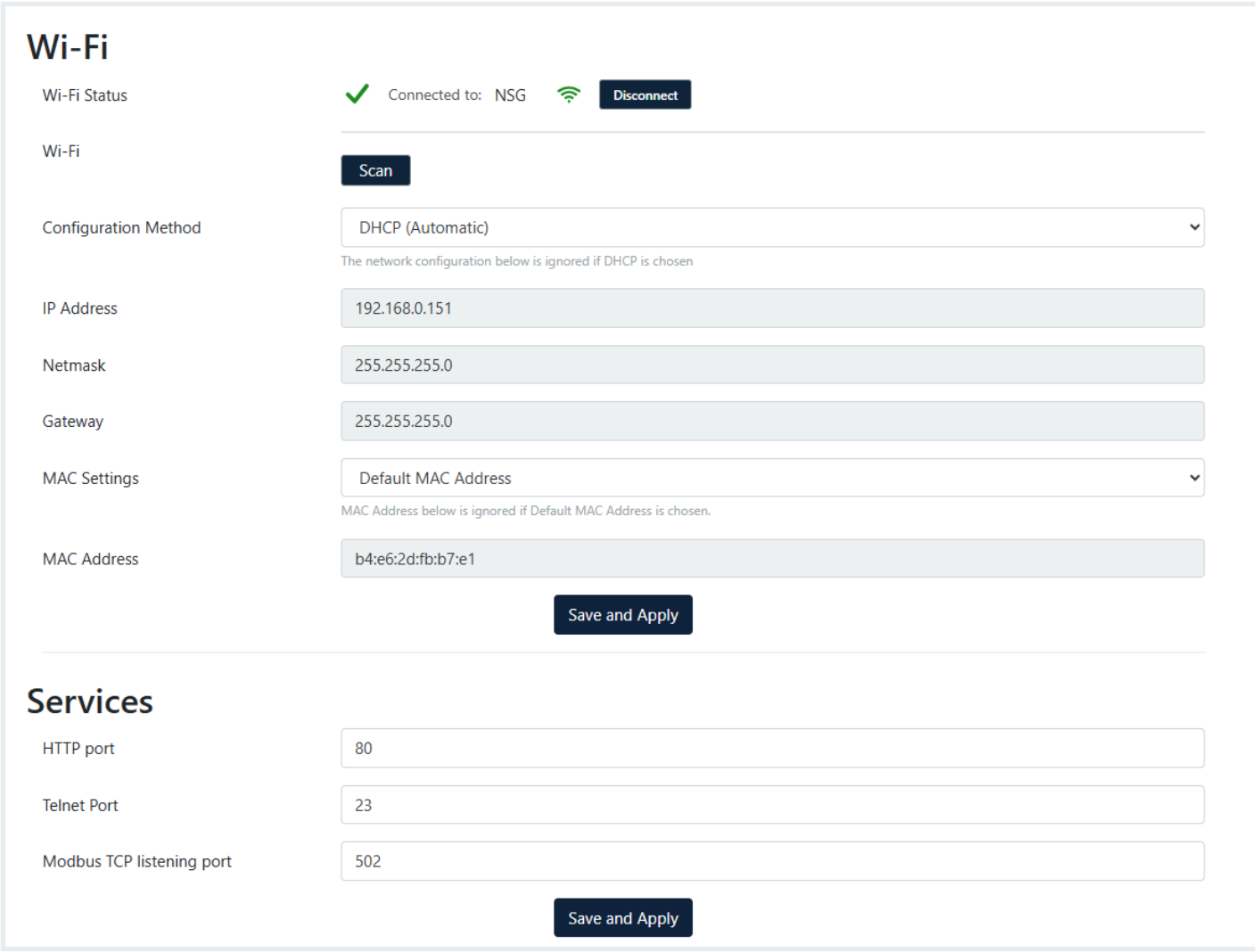
> Make sure to save all the changes with “Save and Apply” button located on the bottom of the page.

> In the UDP mode, port number 15051 is reserved for UDP broadcast service.

Network settings

In this section, network settings can be changed according to target LAN parameters.


Redisage
ELECTRONICS
Status
Ports
Network
Device
8:38
Network
Help
Hostname
modbus-router.local
DNS Address 1 (Primary)
192.168.100.1
DNS Address 2
1.1.1.1
Save and Apply
Ethernet
Configuration Method
Static IP
The network configuration below is ignored if DHCP is chosen
IP Address
192.168.100.100
Netmask
255.255.255.0
Gateway
255.255.255.0
MAC Settings
Default MAC Address
MAC Address below is ignored if Default MAC Address is chosen.
MAC Address
b4:e6:2d:fb:b7:e4
Save and Apply



Item	Description
Hostname	Label that is assigned to the device.
Configuration Method	Enable/disable the DHCP server. If the DHCP server is disabled, the IP address of the device has to be set manually.
IP Address	IP address of the device.
Netmask	Netmask associated with the IP address.
Gateway	Gateway address currently used by the device.
DNS Address	Domain Name System used by the device.
MAC Settings	Allow setting the default MAC address or typing it manually.
MAC Address	Allow changing the physical address of the device.
HTTP Port	Determine the port of the control panel.
Telnet Port	Allow connection with the device via Telnet.

Item	Description
Modbus TCP Listening Port	Used as an entry point for new Modbus TCP connections.

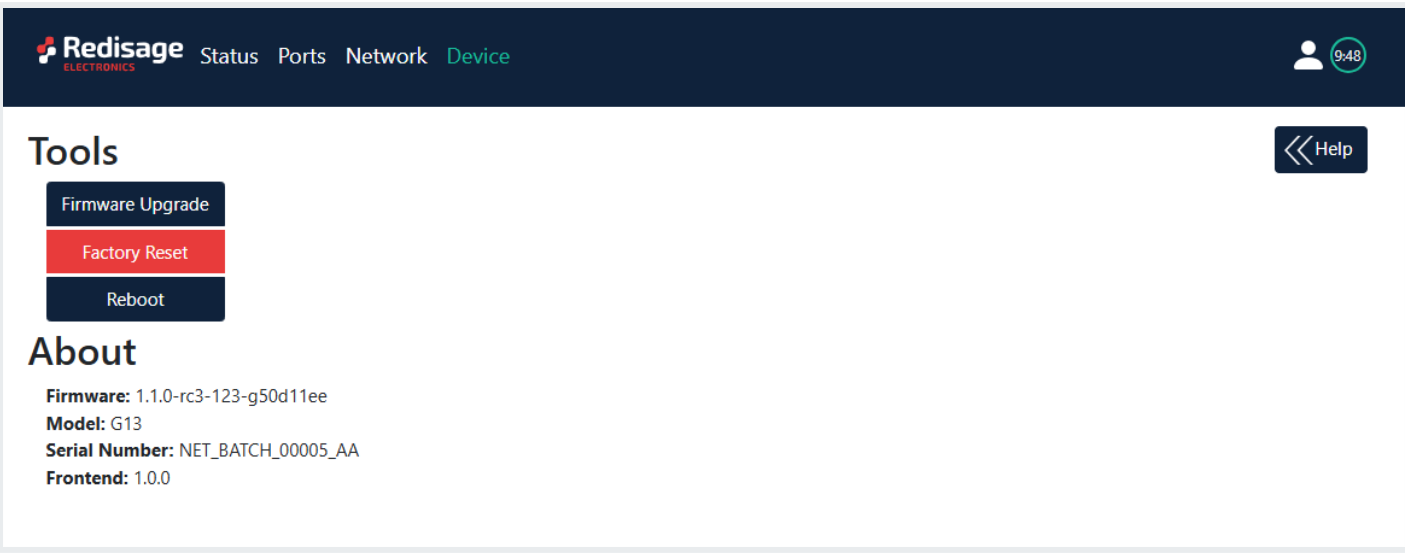
It is possible to obtain dynamic IP address. Just switch configuration method from static IP to DHCP (automatic). This process may cause some issues with identifying converters in LAN unless there is access to the device which is responsible for allocating IP addresses.

Keep in mind that in case of changed IP address, user needs to type new IP in the address bar and log in again.

> Make sure to save all the changes with “Save and Apply” button located on the bottom of the page.

Device page

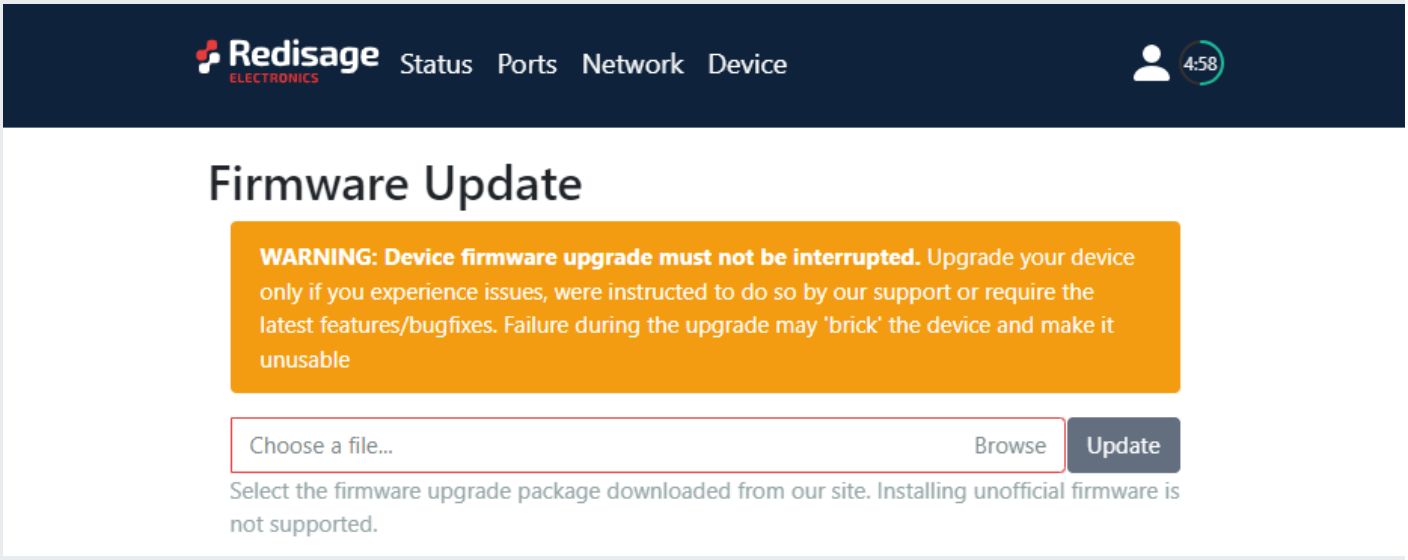
On the device page there are tools used to a firmware update, a factory reset and a device reboot. There are also some information about the device.



Item	Description
Firmware Update	Update firmware.
Factory Reset	Restore default ports settings and default network configuration.
Reboot	Reboot the device.
About	Basic information about the device.

Firmware update

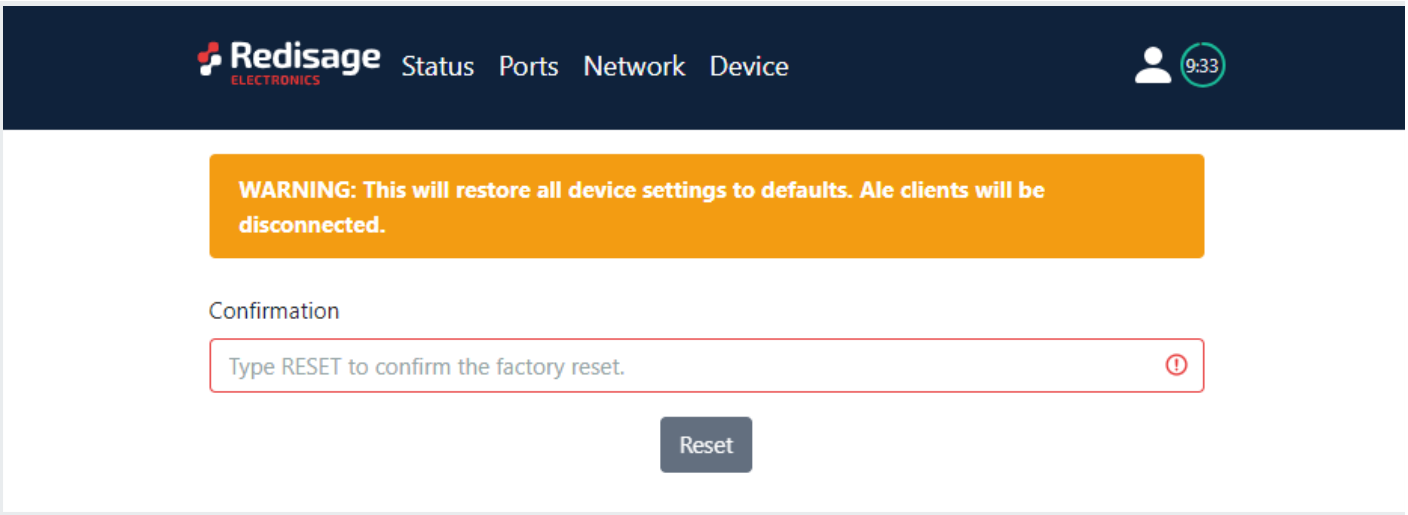
The device firmware update must not be interrupted. Update the device only if experiencing issues, being instructed to do so by our support or requiring the latest features/bugfixes. Failure during the update may 'brick' the device and make it unusable.



> Use the **modbus-gateway-mcu-esp32.fir** file for a firmware update.

Factory reset

To restore default settings, press the red button. After that, user will be asked to type “RESET”. Then it will take a few seconds to reload the web page and restart the device. After reset, use default login details (login: **admin**, password: **admin123;** default IP: **192.168.100.100**).



Configuration by the Telnet Console

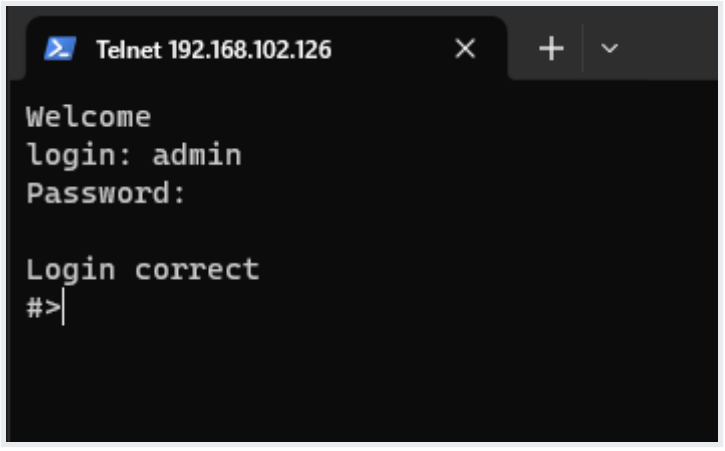
Modbus Ethernet Wi-Fi Gateways (G11 - G13)

The device can be also configured via the Telnet Console. Firstly, make sure that converter is connected to the power supply and to the LAN using a patch cord. Knowledge of the device’s IP address (default is **192.168.100.100**) and Telnet port number (default is **23**) is necessary to establish a connection.

Use command below in a terminal window to connect to the device:

telnet <ip_address> <port_number>

If the connection is successful there will be login prompt visible. Login using user's personal credentials or the default login details (login: **admin**, password: **admin123**). If login is successful, it will be possible to start typing configuration commands.



> The configuration is available only if devices are connected to the same Local Area Network as the computer used for it.

List of all commands

Command	Description
help	Print the help.
conn	Print active TCP connections.
net_stat	Print lwIP statistics.
eth_mac	Print or change MAC address.
wifi_mac	Print or change Wi-Fi MAC address
ipconfig	Print or change the network configuration.
http_port	Print or change default http port.
telnet_port	Print or change default telnet port.
modbus_tcp_port	Print or change modbus port.
ping	Check internet connection with the desired host.
defaults	Reset application variables to defaults
restart	Restart the system.
user	Print or change user configuration.
sys_heap_usage	Print current heap usage.
modbus	Print or changes modbus settings.
modbus_ports	Print or changes modbus ports settings.
modbus_routing	Print or change modbus routing settings.
wificonf	Wi-Fi interface configuration
exit	Exit console.

Modbus ports configuration commands

- **modbus**
  - **modbus help**
    Print command help.

  - **modbus int_addr VALUE**
    Shows or sets internal Modbus address.

    Example:
    modbus int_addr 5

- **modbus idlet VALUE**
  Show or set the idle TIME (in seconds) of the TCP connection after which the TCP connection is terminated by the converter and the TCP socket is released.

  Example:
  modbus idlet 720

  If a subcommand that normally sets a value is not given an argument, it will print the current value.

  Example:
  modbus idlet
  Set idle time is 5000

- **modbus_ports**
  - **modbus_ports help**
    Print command help, does not require com_number.

  - **modbus_ports PORT_NUMBER add_slaves [SLAVE_ADDR ;/- SLAVE_ADDR, *]**
    Set all addresses of slaves connected to com_port. A star in value means fill rest free slaves. It means all slaves that are not set to other ports will be set to this one.

    Example:
    modbus_ports 1 addslaves 124

    Example:
    modbus_ports 1 addslaves 12-124

    Example:
    modbus_ports 1 addslaves 12;14;18

    Example:
    modbus_ports 1 addslaves 12;14-17;150-200

    Example:
    modbus_ports 1 addslaves 12;14-17;150-200, *

  - **modbus_ports PORT_NUMBER show_slaves**
    Show addresses of slaves connected to com_port.

    Example:
    modbus_ports 1 showslaves

  - **modbus_ports PORT_NUMBER mode [ascii/rtu]**
    Set Modbus port mode to ASCII or RTU.

Example:
modbus_ports 2 mode ascii

- **modbus_ports PORT_NUMBER baud [RATE]**
  Set the baud rate to RATE. For a list of acceptable baud rates, please refer to the manual.

  Example:
  modbus_ports 1 baud 9600

- **modbus_ports PORT_NUMBER bits [CPS]**
  Set bit count to C, parity to P, and stop bits to S. Valid values are:
  C: 7, 8 or 9
  P: N, E or O (N- none, E- even, O- odd)
  S: 1 or 2

  Example:
  modbus_ports 1 bits 8N1

  Example:
  modbus_ports 2 bits 7O1

- **modbus_ports PORT_NUMBER state [GATEWAY/ROUTER/DISABLE]**
  Enable or disable uart functionality.

  Example:
  modbus_ports 1 state GATEWAY

  Example:
  modbus_ports 2 state DISABLE

- **modbus_ports PORT_NUMBER termination [on/off]**
  Enable or disable termination on RS485 port.

  Example:
  modbus_ports 1 termination on

- **modbus_ports PORT_NUMBER slave_response_timeout TIMEOUT**
  Set response timeout (serial slave) in ms. When this timeout expires, delayed frames are dropped.

  Example:
  modbus_ports 1 slave_response_timeout 2000

  If a subcommand that normally sets a value is not given an argument, it will print the current value.

Example:
modbus_ports 2 baud
Set baud rate is 115200

> PORT_NUMBER is a number of ports in modbus gateway and it is counted from 0.

- **modbus_routing**
  - **modbus_routing help**
    Print routing's help.

  - **modbus_routing show**
    Display all active routing table in system.
    [LP]: [SLAVES NUMBERS] [IP/HOSTNAME] [PORT] [TIMEOUT]

  - **modbus_routing add SLAVE_ADDR HOSTNAME PORT TIMEOUT**
    SLAVE_ADDR with HOSTNAME PORT is used by uarts working in Modbus router mode. TIMEOUT (in ms) is used to close the connection if a slave is not responding. The maximum records is 8. One record for one address/ip.

    Example:
    modbus_routing add 18 192.168.0.10 502 2000

    Example:
    modbus_routing add 18;25 192.168.0.10 502 2000

    Example:
    modbus_routing add 18-25 192.168.0.10 502 2000

    Example:
    modbus_routing add 18-25;* 192.168.0.10 502 2000

    Example:
    modbus_routing add 18-25 modbus.local 502 2000

  - **modbus_routing remove [HOSTNAME_NUMBER/all]**
    Remove Modbus Routing Table record. HOSTNAME_NUMBER is line number from /show/ command.

    Example:
    modbus_routing remove 2

    Example:
    modbus_routing remove all

Network settings

The following commands might be helpful to change network settings according to target LAN parameters,

- **ipconfig**
  - **ipconfig addr ADDRESS**
    Set IP address to ADDRESS.

    Example:
    ipconfig addr 192.168.0.10

  - **ipconfig mask NETMASK**
    Set subnet mask to NETMASK (in dot-decimal format).

    Example:
    ipconfig mask 255.255.255.0

  - **ipconfig mask BIT_COUNT**
    Set subnet mask to BIT_COUNT bits.

    Example:
    ipconfig mask 24

  - **ipconfig gateway GATEWAY_IP**
    Set network gateway to GATEWAY_IP.

    Example:
    ipconfig gateway 192.168.0.1

  - **ipconfig dhcp [enable/disable]**
    Enable or disable DHCP client.

    Example:
    ipconfig dhcp enable

  - **ipconfig dns1 ADDRESS**
    Set primary DNS to ADDRESS, disable getting DNS from DHCP if enabled.

    Example:
    ipconfig dns1 192.168.100.1

  - **ipconfig dns2 ADDRESS**
    Set secondary DNS to ADDRESS, disable getting DNS from DHCP if enabled.

    Example:
    ipconfig dns2 1.1.1.1

- **wificonf**
  - **wificonf stassid SSID**
    SSID of target AP (Access Point).
    Example:
    wificonf ssid SSID
  - **wificonf stapass PASSWORD**
    Password of target AP.
    Example:
    wificonf stapass PASSWORD

  - **wificonf connect**
    Try to connect to the configured AP

  - **wificonf disconnect**
    Disconnect from the AP.

  - **wificonf scan**
    Scan Wi-Fi networks

  - **wificonf restore**
    Restore factory Wi-Fi settings.

- **eth_mac**
  - **eth_mac help**
    Print the help message.

  - **eth_mac default**
    Set device’s MAC address to factory-default one.

  - **eth_mac set MAC_ADDR**
    Set device’s MAC address to MAC_ADDR. Accepts both dash and colon-separated formats.

    Example:
    eth_mac set 01-02-03-04-05-06

    Example:
    eth_mac set 01:02:03:04:05:06
- **wifi_mac**
  - **wifi_mac help**
    Print the help message.

    - **wifi_mac default**
      Set device’s MAC address to factory-default one.

- **wifi_mac set MAC_ADDR**
  Set device's MAC address to MAC_ADDR. Accepts both dash and colon-separated formats.

  Example:
  eth_mac set 01-02-03-04-05-06

  Example:
  eth_mac set 01:02:03:04:05:06

- **http_port**
  - **http_port help**
    Print the help message.

  - **http_port PORT_NUMBER**
    Set http port to PORT_NUMBER. A PORT_NUMBER value must be in range: 1-65535.

    Example:
    http_port 80

  - **http_port status**
    Print current http port.

    Example:
    http_port status
    A current http port is 80

- **telnet_port**
  - **telnet_port help**
    Print the help message.

  - **telnet_port PORT_NUMBER**
    Set Telnet port to PORT_NUMBER. A PORT_NUMBER value must be in range: 1-65535.

    Example:
    telnet_port 23

  - **telnet_port status**
    Print current Telnet port.

    Example:
    telnet_port status
    A current telnet port is 23

- **modbus_tcp_port**

- **modbus_tcp_port help**
  Print the help message.

- **modbus_tcp_port PORT_NUMBER**
  Set http port to PORT_NUMBER. A PORT_NUMBER value must be in range: 1-65535.

  Example:
  modbus_tcp_port 502

- **modbus_tcp_port status**
  Print current Modbus port.

  Example:
  modbus_tcp_port status
  A current modbus port is 502

Changing username or password

To change username or password, use user command. Available commands:

- **user help**
  Print the help message.

- **user mod_name USER_NAME NEW_NAME**
  Change the user name to NEW_NAME. It fails if the name is used by another user.

  Example:
  user mod_name admin NEW_NAME

- **user passwd USER_NAME**
  Change USER_NAME's password.

  Example:
  user passwd admin
  ****** <- here is entered password, but '*' appears instead

  Note: Everyone can change the password for themselves.

Additional notes

After some time of inactivity, session will be disconnected automatically.

In order to avoid issues like connecting to host, type “help” to get more information.

To get more details about every particular command, append “help” after each commands (example: "ipconfig help").

Factory reset is not available from the Telnet Console level.

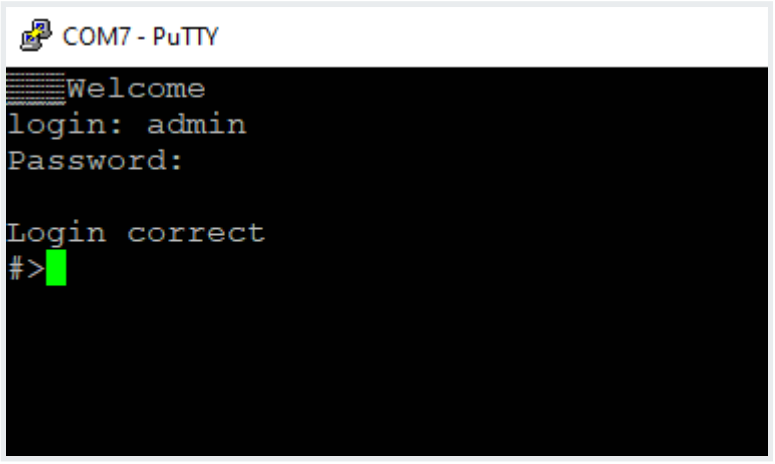
Configuration by the Serial Console

Modbus Ethernet Wi-Fi Gateways (G11 - G13)

Another way to configure the device is via a serial console. In case of the G11 - G13 Modbus gateways an additional USB/UART converter is needed.

Procedure to enter serial console mode

- Turn off the power of the device.
- Connect Ethernet converter to the dedicated USB/UART converter via the microUSB port.
- Connect the USB/UART converter to the PC.
- Open the serial console (default baud rate is 115200 bps).
- Press and hold the S1 button.
- Turn on the power.
- Wait until the ST indicator (orange LED) lights up (it should light up after red light - service mode).
- Release the S1 button.
- Login using user’s personal credentials or default login details.
- If the process is successful, configuration command can be typed into the terminal.



List of all commands

Command	Description
help	Print the help.
conn	Print active TCP connections.
net_stat	Print lwIP statistics.
eth_mac	Print or change MAC address.
wifi_mac	Print or change Wi-Fi MAC address
ipconfig	Print or change the network configuration.
http_port	Print or change default http port.
telnet_port	Print or change default telnet port.
modbus_tcp_port	Print or change modbus port.
ping	Check internet connection with the desired host.
defaults	Reset application variables to defaults
restart	Restart the system.
user	Print or change user configuration.
sys_heap_usage	Print current heap usage.
modbus	Print or changes modbus settings.
modbus_ports	Print or changes modbus ports settings.
modbus_routing	Print or change modbus routing settings.
wificonf	Wi-Fi interface configuration
exit	Exit console.

Modbus ports configuration commands

- **modbus**
  - **modbus help**
    Print command help.

  - **modbus int_addr VALUE**
    Shows or sets internal Modbus address.

    Example:
    modbus int_addr 5

- **modbus idlet VALUE**
  Show or set the idle TIME (in seconds) of the TCP connection after which the TCP connection is terminated by the converter and the TCP socket is released.

  Example:
  modbus idlet 720

  If a subcommand that normally sets a value is not given an argument, it will print the current value.

  Example:
  modbus idlet
  Set idle time is 5000

- **modbus_ports**
  - **modbus_ports help**
    Print command help, does not require com_number.

  - **modbus_ports PORT_NUMBER add_slaves [SLAVE_ADDR ;/- SLAVE_ADDR, *]**
    Set all addresses of slaves connected to com_port. A star in value means fill rest free slaves. It means all slaves that are not set to other ports will be set to this one.

    Example:
    modbus_ports 1 addslaves 124

    Example:
    modbus_ports 1 addslaves 12-124

    Example:
    modbus_ports 1 addslaves 12;14;18

    Example:
    modbus_ports 1 addslaves 12;14-17;150-200

    Example:
    modbus_ports 1 addslaves 12;14-17;150-200, *

  - **modbus_ports PORT_NUMBER show_slaves**
    Show addresses of slaves connected to com_port.

    Example:
    modbus_ports 1 showslaves

  - **modbus_ports PORT_NUMBER mode [ascii/rtu]**
    Set Modbus port mode to ASCII or RTU.

Example:
modbus_ports 2 mode ascii

- **modbus_ports PORT_NUMBER baud [RATE]**
  Set the baud rate to RATE. For a list of acceptable baud rates, please refer to the manual.

  Example:
  modbus_ports 1 baud 9600

- **modbus_ports PORT_NUMBER bits [CPS]**
  Set bit count to C, parity to P, and stop bits to S. Valid values are:
  C: 7, 8 or 9
  P: N, E or O (N- none, E- even, O- odd)
  S: 1 or 2

  Example:
  modbus_ports 1 bits 8N1

  Example:
  modbus_ports 2 bits 7O1

- **modbus_ports PORT_NUMBER state [GATEWAY/ROUTER/DISABLE]**
  Enable or disable uart functionality.

  Example:
  modbus_ports 1 state GATEWAY

  Example:
  modbus_ports 2 state DISABLE

- **modbus_ports PORT_NUMBER termination [on/off]**
  Enable or disable termination on RS485 port.

  Example:
  modbus_ports 1 termination on

- **modbus_ports PORT_NUMBER slave_response_timeout TIMEOUT**
  Set response timeout (serial slave) in ms. When this timeout expires, delayed frames are dropped.

  Example:
  modbus_ports 1 slave_response_timeout 2000

  If a subcommand that normally sets a value is not given an argument, it will print the current value.

Example:
modbus_ports 2 baud
Set baud rate is 115200

> PORT_NUMBER is a number of ports in modbus gateway and it is counted from 0.

- **modbus_routing**
  - **modbus_routing help**
    Print routing's help.

  - **modbus_routing show**
    Display all active routing table in system.
    [LP]: [SLAVES NUMBERS] [IP/HOSTNAME] [PORT] [TIMEOUT]

  - **modbus_routing add SLAVE_ADDR HOSTNAME PORT TIMEOUT**
    SLAVE_ADDR with HOSTNAME PORT is used by uarts working in Modbus router mode. TIMEOUT (in ms) is used to close the connection if a slave is not responding. The maximum records is 8. One record for one address/ip.

    Example:
    modbus_routing add 18 192.168.0.10 502 2000

    Example:
    modbus_routing add 18;25 192.168.0.10 502 2000

    Example:
    modbus_routing add 18-25 192.168.0.10 502 2000

    Example:
    modbus_routing add 18-25;* 192.168.0.10 502 2000

    Example:
    modbus_routing add 18-25 modbus.local 502 2000

  - **modbus_routing remove [HOSTNAME_NUMBER/all]**
    Remove Modbus Routing Table record. HOSTNAME_NUMBER is line number from /show/ command.

    Example:
    modbus_routing remove 2

    Example:
    modbus_routing remove all

Network settings

The following commands might be helpful to change network settings according to target LAN parameters,

- **ipconfig**
  - **ipconfig addr ADDRESS**
    Set IP address to ADDRESS.

    Example:
    ipconfig addr 192.168.0.10

  - **ipconfig mask NETMASK**
    Set subnet mask to NETMASK (in dot-decimal format).

    Example:
    ipconfig mask 255.255.255.0

  - **ipconfig mask BIT_COUNT**
    Set subnet mask to BIT_COUNT bits.

    Example:
    ipconfig mask 24

  - **ipconfig gateway GATEWAY_IP**
    Set network gateway to GATEWAY_IP.

    Example:
    ipconfig gateway 192.168.0.1

  - **ipconfig dhcp [enable/disable]**
    Enable or disable DHCP client.

    Example:
    ipconfig dhcp enable

  - **ipconfig dns1 ADDRESS**
    Set primary DNS to ADDRESS, disable getting DNS from DHCP if enabled.

    Example:
    ipconfig dns1 192.168.100.1

  - **ipconfig dns2 ADDRESS**
    Set secondary DNS to ADDRESS, disable getting DNS from DHCP if enabled.

    Example:
    ipconfig dns2 1.1.1.1

- **wificonf**
  - **wificonf stassid SSID**
    SSID of target AP (Access Point).
    Example:
    wificonf ssid SSID
  - **wificonf stapass PASSWORD**
    Password of target AP.
    Example:
    wificonf stapass PASSWORD

  - **wificonf connect**
    Try to connect to the configured AP

  - **wificonf disconnect**
    Disconnect from the AP.

  - **wificonf scan**
    Scan Wi-Fi networks

  - **wificonf restore**
    Restore factory Wi-Fi settings.

- **eth_mac**
  - **eth_mac help**
    Print the help message.

  - **eth_mac default**
    Set device’s MAC address to factory-default one.

  - **eth_mac set MAC_ADDR**
    Set device’s MAC address to MAC_ADDR. Accepts both dash and colon-separated formats.

    Example:
    eth_mac set 01-02-03-04-05-06

    Example:
    eth_mac set 01:02:03:04:05:06
- **wifi_mac**
  - **wifi_mac help**
    Print the help message.

    - **wifi_mac default**
      Set device’s MAC address to factory-default one.

- **wifi_mac set MAC_ADDR**
  Set device's MAC address to MAC_ADDR. Accepts both dash and colon-separated formats.

  Example:
  eth_mac set 01-02-03-04-05-06

  Example:
  eth_mac set 01:02:03:04:05:06

- **http_port**
  - **http_port help**
    Print the help message.

  - **http_port PORT_NUMBER**
    Set http port to PORT_NUMBER. A PORT_NUMBER value must be in range: 1-65535.

    Example:
    http_port 80

  - **http_port status**
    Print current http port.

    Example:
    http_port status
    A current http port is 80

- **telnet_port**
  - **telnet_port help**
    Print the help message.

  - **telnet_port PORT_NUMBER**
    Set Telnet port to PORT_NUMBER. A PORT_NUMBER value must be in range: 1-65535.

    Example:
    telnet_port 23

  - **telnet_port status**
    Print current Telnet port.

    Example:
    telnet_port status
    A current telnet port is 23

- **modbus_tcp_port**

- **modbus_tcp_port help**
  Print the help message.

- **modbus_tcp_port PORT_NUMBER**
  Set http port to PORT_NUMBER. A PORT_NUMBER value must be in range: 1-65535.

  Example:
  modbus_tcp_port 502

- **modbus_tcp_port status**
  Print current Modbus port.

  Example:
  modbus_tcp_port status
  A current modbus port is 502

Changing username or password

To change username or password, use user command. Available commands:

- **user help**
  Print the help message.

- **user mod_name USER_NAME NEW_NAME**
  Change the user name to NEW_NAME. It fails if the name is used by another user.

  Example:
  user mod_name admin NEW_NAME

- **user passwd USER_NAME**
  Change USER_NAME's password.

  Example:
  user passwd admin
  ****** <- here is entered password, but '*' appears instead

  Note: Everyone can change the password for themselves.

Service mode

Procedure to enter service mode

- Turn off the power of the device.

- Connect Ethernet converter to the dedicated USB/UART converter via the microUSB port.
- Connect the USB/UART converter to the PC.
- Open the serial console (default baud rate is 115200 bps).
- Press and hold the S1 button.
- Turn on the power.
- Wait until the ST indicator (red LED) lights up.
- Release the S1 button.
- If the process is successful, service commands can be typed into the terminal.

List of commands in the service mode

Command	Description
help	Print the help.
credits	Print current credits value for this device.
dev_ident	Print the device identification value.
restart	Restart the system.
serial_num	Print the serial number of this device.
version	Display the bootloader version.
xmodem	Download image to the internal flash using xmodem.
defaults	Reset application variables to defaults.
ipconfig	Print or change the network configuration.
flash_read	Read bytes from flash memory.
md	Read bytes from memory address.

> In the service mode, the “ipconfig” command can only show a last static IP address.

Factory reset

To restore default settings, type “defaults”. After that, user will be asked for type “default network” to reset the network settings as well. Then user will be informed if the process is successful.
Default login details:
- login: **admin**
- password: **admin123**
- IP: **192.168.100.100**

Additional notes

In order to avoid issues like connecting to host, type “help” to get more information.

To get more details about every particular command, append “help” after each commands (example: "ipconfig help").

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Common Resources

Source of common resources used across the Modbus Ethernet Wi-Fi Gateways documentation

Introduction

Modbus Ethernet Wi-Fi Gateways (G11 - G13)