SimpLinx

SMX-RNS02 Remote Access Module

User's Guide

07/2020
man-en-smx-rns02.docx
Version 1.3

Legal Notices

Warning Notice System

The document contains alerts and information indications for the safety of you and your devices. The symbols and meanings used to draw your attention to these notifications are listed below.

Danger: Indicates the death or severe personal injury will result if proper precautions are not taken.

Warning: Indicates that death or severe personal injury may result if proper precautions are not taken.

Info: Indicates advice or **information**.

Qualified Personnel

It is assumed that what is described in this document will be applied by qualified personnel for the specific task.

Disclaimer

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency.

The information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

Change Log

Version	Date	Description
V1.0	07/2020	Draft
V1.1	07/2020	Typos
V1.2	07/2020	Typos
V1.3	01/2021	New Features
V1.4	12/2025	Power

Preface

Purpose of the Document

This document contains information about the following topics;

- SMX-RNS02 Product Information
- SMX-RNS02 Setup
- Use of SMX-RNS02
- SMX-N1559 (Optional)
- SMX-RS01 (Optional)

Required Level of Knowledge

In order to fully understand and apply this document, it is necessary to have knowledge of IT, Automation and Electricity.

Contents

1. Product Description and Certificates

The SMX-RNS02 module is an Industrial Remote Connection device that provides the infrastructure needed for Industry 4.0, allowing you to connect to your remote field devices under high security measures and collect data from your devices.

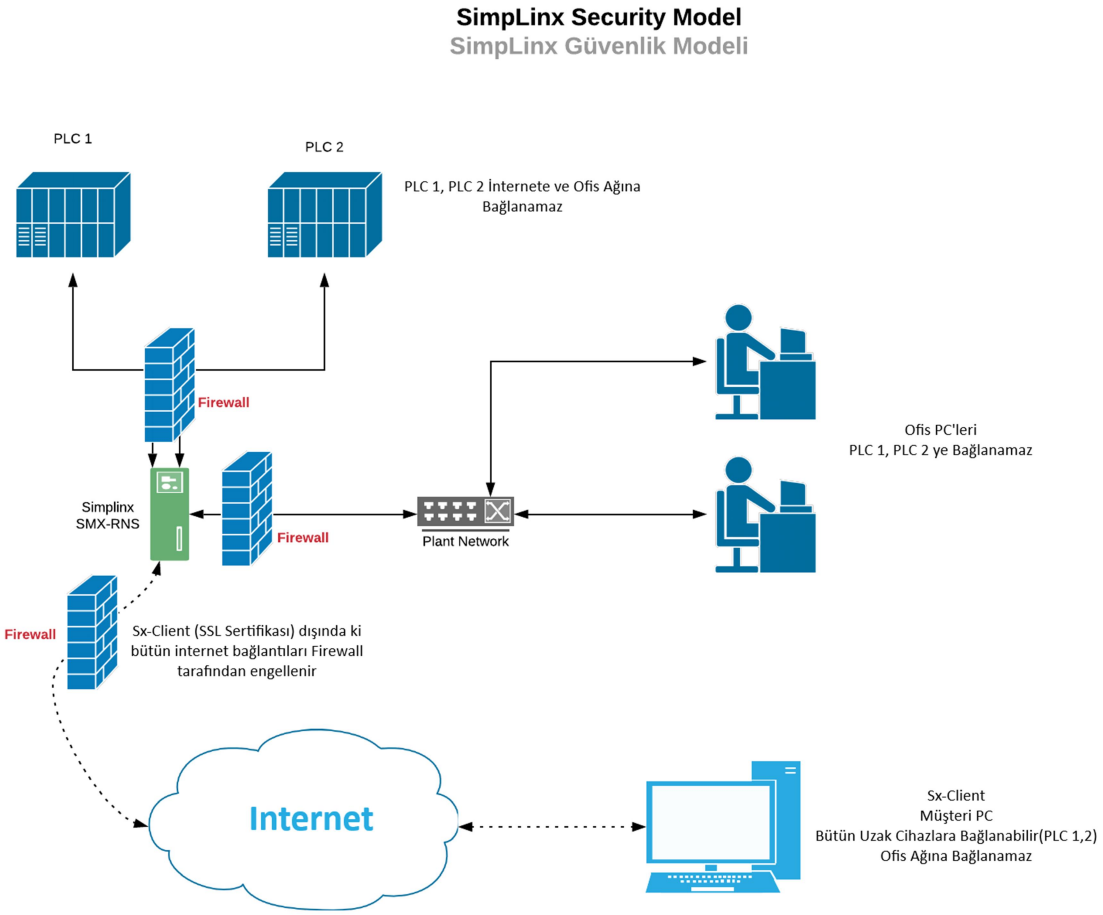
	SMX-RNS02
Processor	BCM2837 1.2 GHz Quad Core
Ram	1 GB LPDDR2 400MHz
eMMC	4 GB
Storage	2 GB

1.1. Properties

- High degree of robustness.
- The SMX-RNS02 module is approved for indoor use only.
- Compact design.
- Ethernet and USB interfaces.

1.2. Security

- Integrated Firewall.
- Certificate-based protection (4096 Bit Certificate / SHA256)
- All traffic to the module without being encrypted with the certificate is blocked by the Firewall.
- Access to the module from the office network where the SMX-RNS02 module is located is blocked by the Firewall.
- Access of devices connected to the SMX-RNS02 module to the office network is blocked by the Firewall.



1.3. Approvals / CE

The SMX-RNS02 module has received approval from the CE standards tests listed below.

Electromagnetic Compatibility

- EN 55032:2015 Emissions (Diffusion) Tests
- EN 55024:2010/A1:2016 Immunity Tests
  - EN 61000-4-2: 2009
  - EN 61000-4-3: 2006/A2:2010
  - EN 61000-4-4: 2012
  - EN 61000-4-5: 2014/A1:2017
  - EN 61000-4-6: 2014/AC:2015

Electrical Security

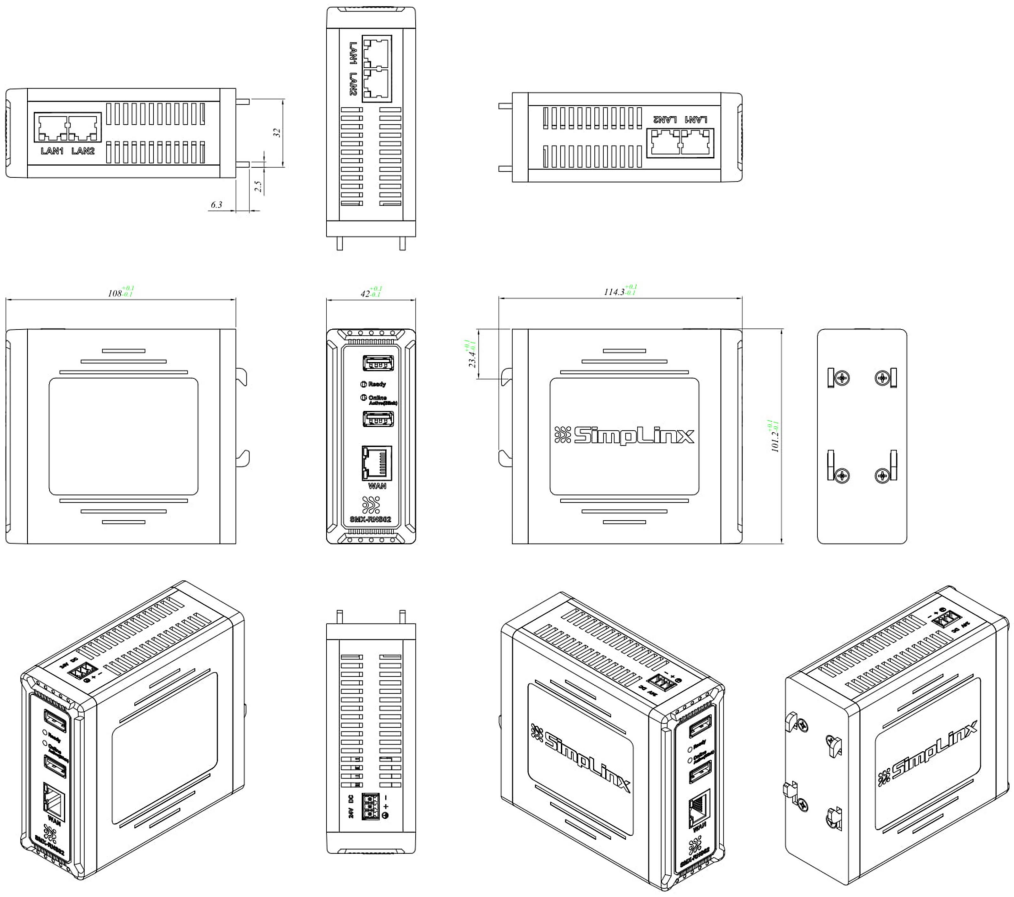
- EN 62368-1:2014+A11:2017

CE

2. Physical Properties and Drawings

Power Supply	24 V DC	Minimum = 15V DC Maximum = 30 VDC
Power Consumption	200mA	
Connection Slots	2xUSB 2.0	
	1xRj54 WAN	100 Mb/s
	2xRj45 LAN	100 Mb/s
Box	DIN Rail Mounted	
Temperature	0 °C to 70 °C	Work
	-40 °C to 85 °C	Storage
Dimensions (mm)	Width : 42 Height : 101 Depth : 114	
Weight (Kg)	0.202	

2.1. Drawings



3. Setup

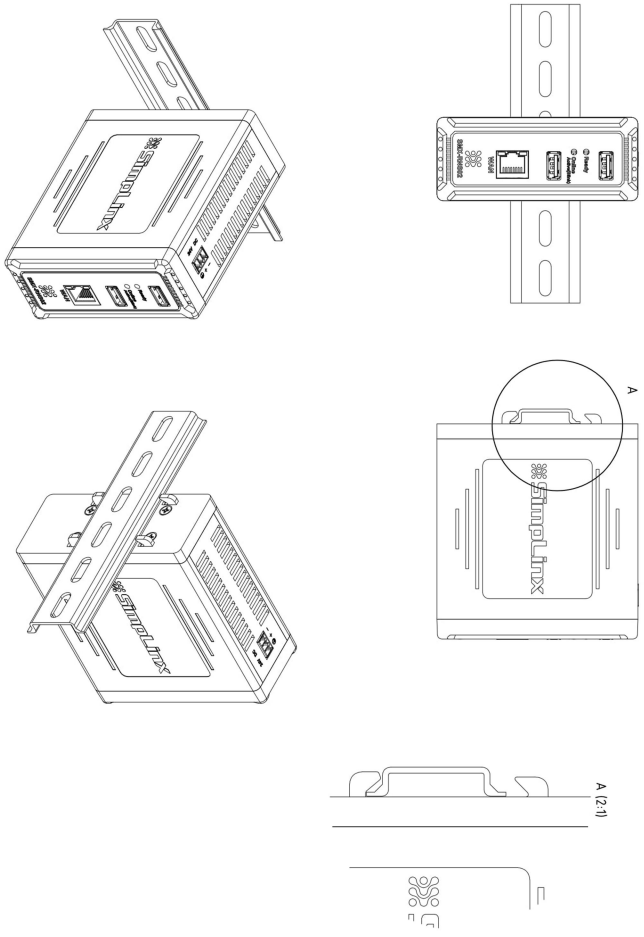
The SMX-RNS02 module can be mounted to DIN rail. It is recommended to be mounted vertically to increase the performance of the device and to provide space advantage.

3.1. Mounting

- Bring the top of the device to the top edge of the standard profile rail and place the device on the rail track.
- Push the device towards the standard profile rail. You will hear the device sitting in place with the click sound.

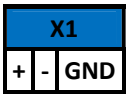
3.2. Removing

- With the help of a screwdriver, pull down the locking spring from the bottom of the device.
- Separate the screwdriver from the rail line without separating it from its position, pulling the clight towards yourself.



4. Electrical Connection

The SMX-RNS02 module has 1 terminal group. The terminal group is called X1. The X1 terminal group has 3 terminals. These are as follows respectively;



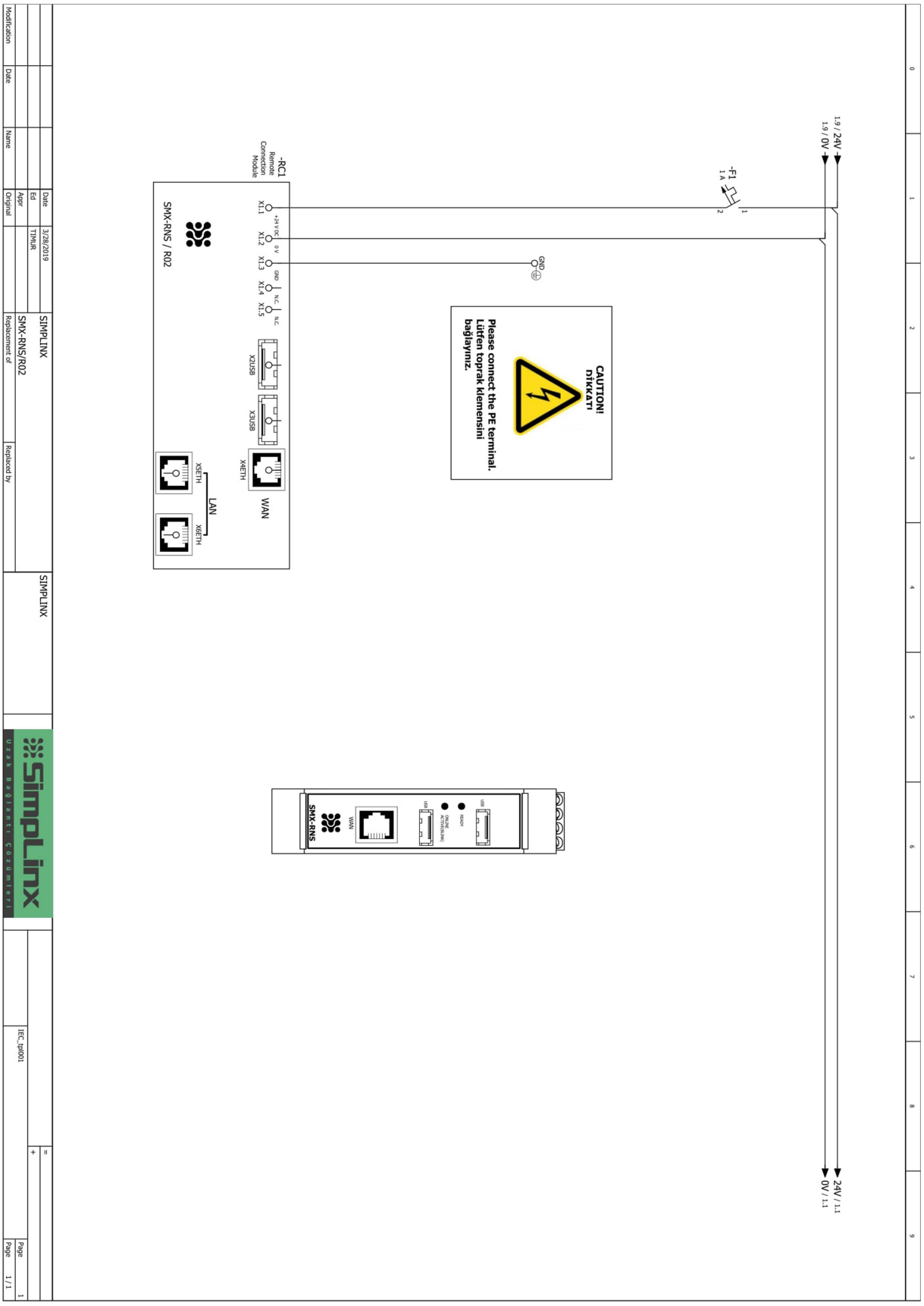
After you have completed the physical installation of your device, you can run your device by connecting the device (+), (-), and GND terminals to the appropriate terminals at the power supply output.

There are 2 USB connections on the SMX-RNS02. The USB connection requires (-) to be short circuited to GND by design. For this reason, GND and (-) on SMX-RNS02 are short circuited.

Faulty or incomplete connection may damage you, those around you, or devices.

See the relevant documents for detailed information and electrical drawings.

4.1. Schema


1.9 / 24V
1.9 / 0V
-F1
1 A
-RC1
Remote Connection Module
X1.1
X1.2
X1.3
X1.4
X1.5
X2USB
X3USB
X4ETH
SMX-RNS / R02
X5ETH
X6ETH
LAN
WAN
GND
CAUTION!
DİKKATI
Please connect the PE terminal.
Lütfen toprak klemensini bağlayınız.
SMX-RNS
24V / 1.1
0V / 1.1
Modification
Date
Name
Original
Ed
Appr
3/28/2019
TIMUR
SIMPLINX
SMX-RNS/R02
Replacement of
Replaced by
SIMPLINX
IEC_tpl001
Page
1 / 1

5. Device Connections

5.1. Ethernet Devices

To connect your Ethernet devices to the SMX-RNS02 module, you must set up an IP in the IP range that you have given to the SMX-RNS02 module.

✓ **Example**

If your SMX-RNS02 module is in the following settings

- IP: 192.168.168.254
- Subnet Mask: 255.255.255.0
- IP (PC): 192.168.168.250

In this case, you must provide an IP address for your devices in the range of [192.168.168.1 – 192.168.168.249] and [192.168.168.251 - 192.168.168.253]

After you adjust your field device's IP addresses, you can connect your devices to 2 Ethernet ports on the SMX-RNS02. You do not need to make any adjustments other than IP address.

Faulty or incomplete connection may damage you, those around you, or devices.

5.2. Use of Ethernet Ports as a Switch

With the "KSZ8895" Microchip used in the SMX-RNS02 module, your Ethernet devices that you connect to module can communicate with each other.

✓ **Device 1**

- IP: 192.168.168.100

✓ **Device 2**

- IP: 192.168.168.101

✓ **SMX-RNS02**

- IP: 192.168.168.254

If your devices and module are set up as above and connections have been made (IP addresses are used as examples) these connections are possible;

- Device 1 to Device 2
- Device 2 to Device 1

Also If you connect to the SMX-RNS02 module by using Wi-Fi as AP than you can access to Device 1 and Device 2.

Switch Chipset Features

Chipset	KSZ8895
Macs	5
Interface	MII/RMII
VLAN Support	Yes (up to 128 Pieces)
Programmable Speed Limitation	Yes
Static Mac	Yes (Up to 32 Admissions)
RSTP Support	Yes
Maximum Packet Size	2000 Bytes
Advanced Features	• VLAN IDENTITY Labeling/Sticker Removal Option by Port • Add or Remove IEEE 802.1p/q Tags per Port Based on Input Port • Percentage Controlled Broadcast Storm Protection (Global and Per Port) • Queue Tag Mode • 1.4Gbps High Performance Memory Bandwidth and Shared Memory-Based Switch Fabric with Completely Unblocked Configuration • GMP v1/v2 Surveillance (IPv4) Support for Multi-ArcPacket Filtering • IPv4 / IPv6 QoS Support • Unknown Unicast/Multicast Address and Unknown VID Packet Filtering Support • Self-Address Filtering • T-push-free (Jitter-Free) Pre-Package Speed Rate Support

5.3. USB Devices

The SMX-RNS02 module has 2 USB slots. You can plug storage devices, SMX-N1559 Wi-Fi module or SMX-RS001 (USB to RS-232) converter. You can increase your number of slots by using an intermediate device, such as a USB Hub.

Usb	2.0
Type	A
Total Maximum Output Current	500 mA

For more information about the SMX-N1559 and SMX-RS001 devices, see the relevant documentation.

Faulty or incomplete connection may damage you, those around you, or devices.

The total maximum output current of usb slots on the SMX-RNS02 Module is 500 mA.

6. Registering SMX-RNS02

The **"Welcome"** screen will open after login in to the system. The screen has two parts. The page structure is in the form of menu on the left and page content on the right.

In order to use the SMX-RNS02 device, the device must be registered first.

Each device has a **"Register Info"** card. This card has a serial number and registration password. For example,

Register Info

Model	SMX-RNS02
Serial No.	SRX-XXXXX-XXXXX
Password	XXXXX-XXXXX-XXXXX

- From the Left Menu, go to the "**SX-Node**"--->"**SX-Node - List**" page.
- Your existing devices are listed in the Table in the Page. If you're logging into the system for the first time, the list will be empty.
- Press the icon from Toolbar to **+.** You will be redirected to the "**Add New Device**" page.
- Enter all information by using the **"Register Info"** card, complete and error-free.
- Press the Save button.
- If all information is correct, the device will be registered & displayed in the list.

If your HW Key or SW Key is a subkey (slave), the new added devices will be saved to the master account.

All information on the **"Register info"** card is specific to you.
For your safety, it is recommended that you do not share it with anyone.

After the device registration, it is recommended that you type your customer name or reference in the relevant section on the "**Register Info**" card and keep the card.

7. Preparing SMX-RNS02

WARNING: Don't energize your device until you get to the relevant step.

7.1. Internet Connection Options

The Internet can be supplied in 3 different ways to the SMX-RNS02 device.

- **WAN port**
  - ✓ Plug the ethernet cable with an Internet connection into your device's WAN port. DHCP or IP settings will be made in the next steps.
- **Phone USB Connection**
  - ✓ Plug your iPhone or Android phone into your device's USB port with a charging/data cable.
  - ✓ Turn on mobile access from phone settings.
  - ✓ After energizing your device and the "Ready LED" is ON, you may need to turn the mobile access setting OFF and ON on your phone.
- **Wi-Fi Connection**
  - ✓ This option requires the SMX-N1559 module. See "**Installation of the SMX-N1559 USB WiFi Module**"section.

7.2. Device LEDs and Meanings

The front cover of the SMX-RNS02 module has 2 LEDs. These are, respectively from the top;

- **Ready LED (Ready LED)**
  - ✓ **OFF:** It is OFF when the device is first energized.
  - ✓ **ON:** When the device is booted and ready, this LED lights up and remains in this state.
- **Online LED**
  - ✓ **OFF:** No Internet connection
  - ✓ **ON :** Internet connection ready
  - ✓ **BLINK:** There is currently an active remote connection

7.3. Installation of SMX-N1559 USB Wi-Fi Module (Optional)

- Place and tighten the antenna if it is un-mounted.
- Plug the USB Wi-Fi module into an empty USB slot on the SMX-RNS02.
- Your SMX-N1559 module is ready for use

7.4. Ethernet Connection with PC (Service IP) (Optional)

There are three methods to access the device settings.

- Connection over Wi-Fi
- Physical connection from the service port with Ethernet Cable
- After a remote connection is made, by accessing the web interface

If you have a Wi-Fi module and want to make settings over Wi-Fi, you can skip this step.

- Connect one end of the Ethernet Cable to the SMX-RNS02 LAN port (one of the 2 ports at the bottom), and the other end to your PC's Ethernet port.
- Go to Ethernet Adapter settings on your PC
- Double-press on your adapter to go to the detail page
- Press the Properties button
- Double-press**" Internet Protocol Version 4 (TCP/IPv4)**" option
- Select "**Manual IP Adjustment**" from the page that opens and enter the following information
  - ✓ IP : 192.168.169.100
  - ✓ Subnet Mask: 255.255.255.0
- Close by confirming changes

7.5. Energizing your device

Turn on the power supply or adapter to which the SMX-RNS02 is connected. Make sure that your USB or Ethernet devices that you want to make a remote connection are also turned on.

- When given the first energy, the **"Ready LED"** will light up off. About 30 seconds later "**Ready LED**" will switch to ON position.
- If the Internet connection is ready, the **“Online LED”** will turn ON after a short while.
- If you are trying to provide internet to your device by phone you may need to turn the mobile access setting off and on after the **“Ready LED”** lights up.
- If you want to use the IP option manually from WAN or if you want to provide internet with Wi-Fi, your device will connect to the internet after making your settings in the next section.

Faulty or incomplete connection may damage you, those around you, or devices.

See the relevant documents for detailed information and electrical drawings.

7.6. Making Basic Settings

If the device settings will be accessed with the SMX-N1559 Wi-Fi module;

- View the Wi-Fi networks around you with the Network Icon at the Bottom Right on your PC.
- The SMX-RNS02 device will be broadcasting Wi-Fi with serial code.
- From the list, select the network in the format "**SRX-XXXXX-XXXXX**" that matches your device's serial number and press "**Connect**"
- Enter wifi password

Predefined Wi-Fi login password is "**simplinx**"

If you have a wired or Wi-Fi connection ready;

- Open your browser
- On the Address bar, enter **" http://192.168.169.254:3000"** and press ENTER
- The login screen will open for the SimpLinx device settings.
- Enter your password and press ENTER

Predefined web login password is "**simplinx**"

- Enter the required internet settings from the "**WAN**" and "**Wireless Settings**" pages.
- Go to the "**LAN Settings**" page.
  - ✓ In order to connect to your field devices, your Ethernet field devices and SMX-RNS02 device must be on the same IP network. Enter the settings correctly.
  - ✓ **Example 1 (Predefined)**
    - IP: 192.168.168.254
    - Subnet Mask: 255.255.255.0
    - IP (PC): 192.168.168.250
    - In this case, you can use all IP addresses in the range of [192.168.168.1 - 192.168.168.249] and [192.168.168.251 - 192.168.168.253] for field devices.
  - ✓ **Example 2**
    - IP: 192.168.0.1
    - Subnet Mask: 255.255.255.0
    - IP (PC): 192.168.0.2
    - In this case, you can use all IP addresses in the range [192.168.0.3 - 192.168.0.254] for your field devices.
  - ✓ **Example 3**
    - IP: 10.0.0.1
    - Subnet Mask: 255.255.255.0
    - IP (PC): 10.0.0.2
    - In this case, you can use all IP addresses in the range [10.0.0.3 - 10.0.0.254] for your field devices.

8. How to Get Device Status via Communication?

You can get the device status in 2 different ways by communication. These are respectively

- TCP Socket
- Modbus TCP

8.1 TCP Socket

By connecting to the TCP server running on the port number "3200" on the device, you can get the device status as shown below

“**STATUS;<SERIAL_NO>;<1 OR 0>;<ONLINE_ OR OFFLINE>**“

8.2 Modbus TCP

You can get the device status by connecting to the Modbus Server running on port number “502” of the device. Device information is sent over Modbus as follows.

Holding Register

40001-40008: Serial No (16 Byte)

40009: EMPTY

40010: Status / 10:Offline, 11:Online

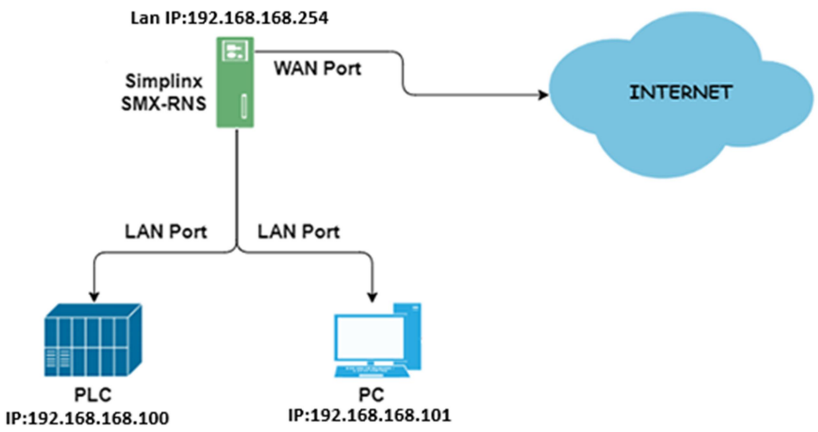
9. Web Interface

9.1. LAN Settings Page

On the LAN Settings page, you can define the IP address, network mask and the IP address of your PC when you make a remote connection. The network mask value you have entered will determine the IP range of your devices which you will connect to your SMX-RNS02 module.

✓ **Example (Predefined)**

- IP: 192.168.168.254
- Subnet Mask: 255.255.255.0
- IP (PC): 192.168.168.250
- In this case, you can assign all IP addresses in the range [192.168.168.1 – 192.168.168.249] and [192.168.168.251 - 192.168.168.253] for your field devices.



If you change the settings, you must restart the device for the new settings to take effect.

The IP address you will provide to your SMX-RNS02 Device & PC must be IP addresses that are not used by other devices.

9.2. WAN Settings Page

There are two options for WAN connection;

- With DHCP, the device receives all configuration(Including IP address) (Recommended)
- If you turn off DHCP, you can provide IP, Network Mask, Gateway and DNS configurations manually.

If you change these settings, you must restart the device for the new settings to take effect.

9.3. Wireless Settings Page

You can access Wireless Client and Wireless Hotspot settings from this page.

Bu using the Wireless Client setting, you can connect your device to a wireless network and take your device online. There are two options;

- You must select the wireless and DHCP options as active and enter the SSID, SSID Password information for the network you want to connect to.
- If you turn off DHCP, you can provide network configuration manually by entering the IP, Network Mask, Gateway and DNS in addition to SSID and SSID Password information.

For wireless Hotspot connection;

- With the Wireless Hotspot setting, you can enable your device to broadcast Wi-Fi. By checking the “Hotspot Active” option and entering your Hotspot Password you want to set, you can enable your device to broadcast Wi-Fi with its serial number.

If you change these settings, you must restart the device for the new settings to take effect.

The Hotspot SSID is the same as your device's serial number.

9.4. Proxy Settings

For a proxy connection;

- To use proxy, you must enter the Proxy Server Address and port number. If you need Proxy Server user login, you can enter your username and password in the relevant field.

As an example, you can use these values;

- Proxy Server Address: 192.168.5.10 or proxy.server.com
- Proxy Server Port: 8080
- User Name: (Proxy Server User Name)
- Password: (Your Password)

If you change these settings, you must restart the device for the new settings to take effect.

Proxy settings affect both WAN and WLAN connections of the device.

9.5. Advanced Settings Page

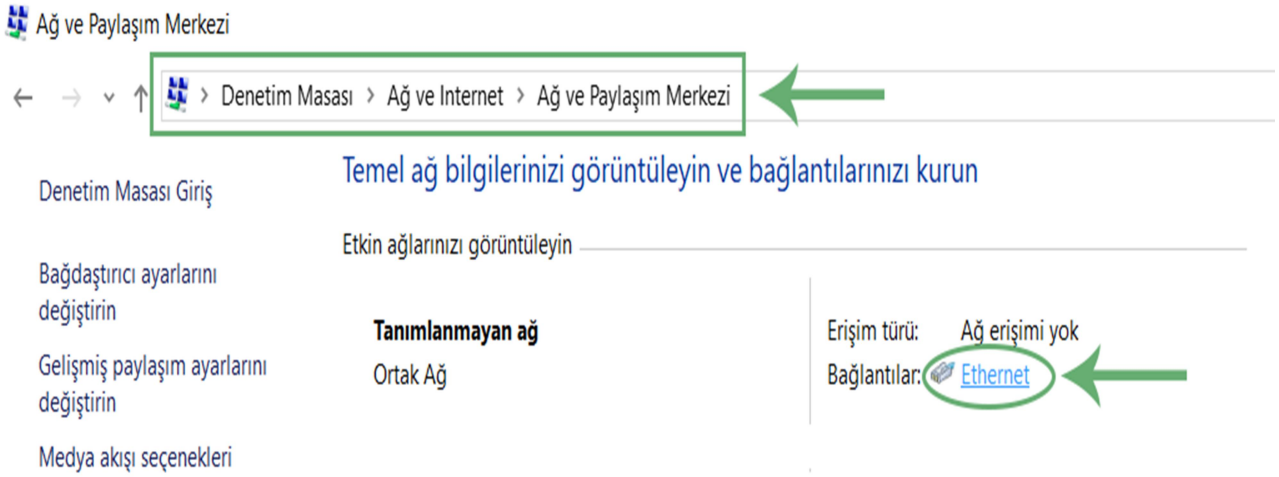
You can modify these settings; Internet sharing to LAN Devices, Bridge WAN&LAN Port, Remote IO Password Reset, Reset Device Settings, and Reset Remote IO Database.

There are 3 options for Internet Sharing;

- By checking the LAN-> WAN pass-through permission option, you can distribute the internet connection coming from the WAN to your devices in the LAN and enable your devices in the LAN to access the internet.
- By checking the LAN-> WLAN pass-through permission option, you can distribute the internet connection coming from the WLAN to your devices in the LAN and enable your devices in the LAN to access the internet.
- By checking the LAN-> USB pass-through permission option, you can distribute the internet connection coming from the USB (Phone) to your devices in the LAN and enable your devices in the LAN to access the internet.

After activating the internet sharing option you want to use;

- Go to "Control Panel" on the PC (Or Devices on LAN)
- Go to the "Network and Internet" > "Network and Sharing Center" page and click on the "Links"



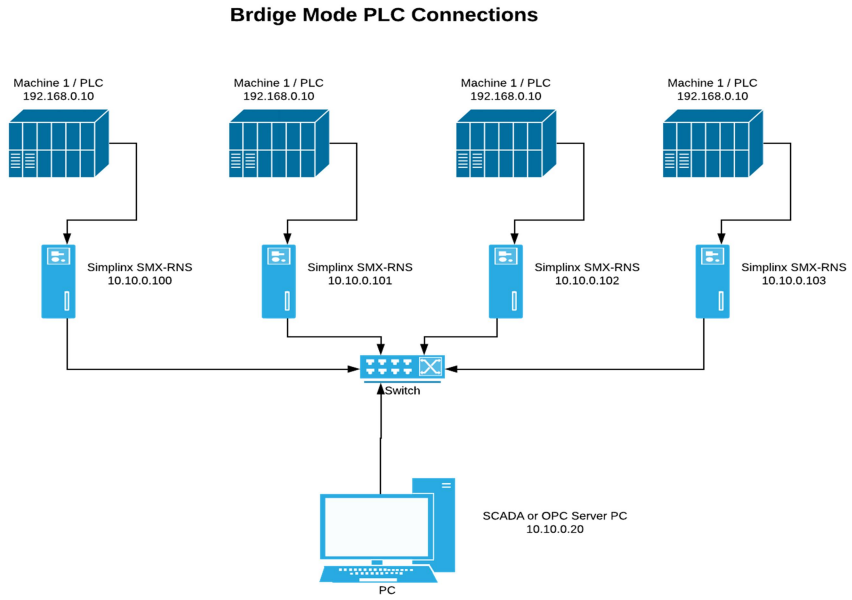
- Press the "Properties" button in the pop-up window
- **Select TCP/IPv4** and press the "Properties" button again
- **Use the following IP address**: select and specify the values as follows
    - **IP Address**: It must be in the LAN IP block of your SMX-RNS02 module.
    - **Subnet Mask**: Must be the same as the LAN MASK of your SMX-RNS02 module.
    - **Default Gateway**: Must be the LAN IP of your SMX-RNS02 module.
    - **Preferred DNS Server**: Must be the LAN IP of your SMX-RNS02 module.

- Press the "OK" button.
- You can close other remaining windows by pressing the "OK" button.

If you change these settings, you must restart the device for the new settings to take effect.

Bridge WAN & LAN Port

- In the Bridge WAN&LAN Port setting, enter the IP address of the device you want to create a bridge.



- Turn off the "DCHP" option from the WAN settings page and enter the IP address, Mask and Gateway values. Example above;
  - IP addresses: 10.10.0.100 - 101 - 102 - 103
  - MASK address: 255.255.255.0
  - Gateway address: 10.10.0.1
  - DNS address: 10.10.0.1
- For Example; after activating Bridge Mode all connections you send to the IP address "10.10.0.100" via PC will be transferred to PLC with the address "192.168.0.10" in the image above.

Bridge WAN & LAN Port setting may prevent you to make a remote connection to the device.

If you change these settings, you must restart the device for the new settings to take effect.

- **By using the Remote IO Password Reset** setting, you can reset your Remote IO password to the factory setting.

With the Remote IO Password Reset setting, your passwords will be completely wiped out. This operation cannot be undone.

- **By using the Reset Device Settings** setting, you can reset your device settings to factory settings.

The Reset Device Settings will completely delete your device settings. This operation cannot be undone.

- **By using the Reset Remote IO Database** setting, you can reset/delete the Remote IO database.

The Reset Remote IO Database setting will completely delete your Remote IO database. This operation cannot be undone.

If you change these settings, you must restart the device for the new settings to take effect.

9.6. Import/Export Page

On the Import / Export page, you can export device settings or upload an existing settings file to your device.

You can download the device configuration file via the browser with the Export button.

There are 2 different options to import your settings:

- **With USB Disk;**
  - Put the downloaded configuration file on a USB disk.
  - Insert the USB disk with configuration file to any USB port of the device. The settings will be transferred automatically.
  - When the process is completed in a few seconds, the device turns off and on and is ready for use with new settings.
  - If your device does not turn off and on automatically, your settings are not loaded. Check the configuration file!

All settings on the device will be deleted and your new settings will be loaded. This action cannot be undone.

- **With Web Interface;**
  - Click the Browse button from the Import Settings section.
  - Select the configuration file on the screen that opens.
  - Click the Import button.
  - Restart the device for the new settings to take effect.

If you change these settings, you must restart the device for the new settings to take effect.

9.7. Change Password Page

On the Change Password page, you can change the password you use to login your device's configuration pages.

If you change these settings, you must restart the device for the new settings to take effect.

9.8. Status Page

You can view the following information on the status page and you can reboot the device;

- Serial Number of Your Device
- Up Time (in Minutes)
- Date and Time information of your device
- IP, MASK and MAC information of the LAN interface
- IP, MASK and MAC information of the WAN interface
- If the WLAN is plugged in and connected to a network, IP, MASK and MAC information of the interface
- If the WLAN Hotspot is connected and broadcasting, the IP, MASK and MAC information of the interface

10. Accessories

10.1. Installation of the SMX-N1599 USB WiFi Module

- Place and tighten the antenna if it is un-mounted.
- Plug the USB Wi-Fi module into an empty USB slot of the SMX-RNS02.
- Your SMX-N1559 module is ready for use.

See the relevant documentation for detailed information.

Faulty or incomplete connection may damage you, those around you, or devices.

10.2. SMX-RS01 Connection

- Plug the SMX-RS01 cable into an empty USB slot of the SMX-RNS02.
- Plug other side of the SMX-RS01 cable to the device you want to connect to.
- SMX-RS01 cable is ready for use.

See the relevant documents for detailed information and electrical drawings.

Faulty or incomplete connection may damage you, those around you, or devices.

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Version 1.3

SimpLinx Elektronik Ltd.

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