

IOT OPTIONS FOR ACS880 INDUSTRIAL DRIVES

InRouter 615-S

Commissioning guide

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1. Introduction

InRouter 615-S is a 4G to Ethernet (4 port) modem/router. This step-by-step guide instructs how to set up the modem securely for IoT gateway (NETA-21) connections. For technical data and the manufacturer's documentation, refer to www.inhandnetworks.com.

2. Scope of the document

This document is intended for use at ABB internal factory line, where the modem and the NETA-21 gateway are commissioned. The instructions can also be used for commissioning at the customer's site.

Note: To do the commissioning, the customer needs a SIM card with the mobile data service enabled and a data plan to avoid data charges from the teleoperator.



Warning!

Obey the safety instructions of the drive. If you ignore them, injury or death, or damage to the equipment can occur. If you are not a qualified electrical professional, do not do installation, commissioning, or maintenance work.

Repeat the Electrical safety precautions steps in the drive safety instructions before you start the work.

This document provides cybersecurity related deployment advice, but please note also the Cybersecurity disclaimer (Chapter 6).

3. Connecting the cabling

Connect the power, antenna and ethernet cabling to the modem.

1. Insert the SIM card into the modem.



Note: If the SIM card's PIN code is enabled, several start-ups may lock the SIM card. Use a SIM card with the PIN code disabled or insert the SIM card just before step 3 "Set up the SIM card" in Chapter 4.



2. Connect the antenna

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Connect the SMA antenna connector and tighten the connector by hand.



3. Plug in the power connector.

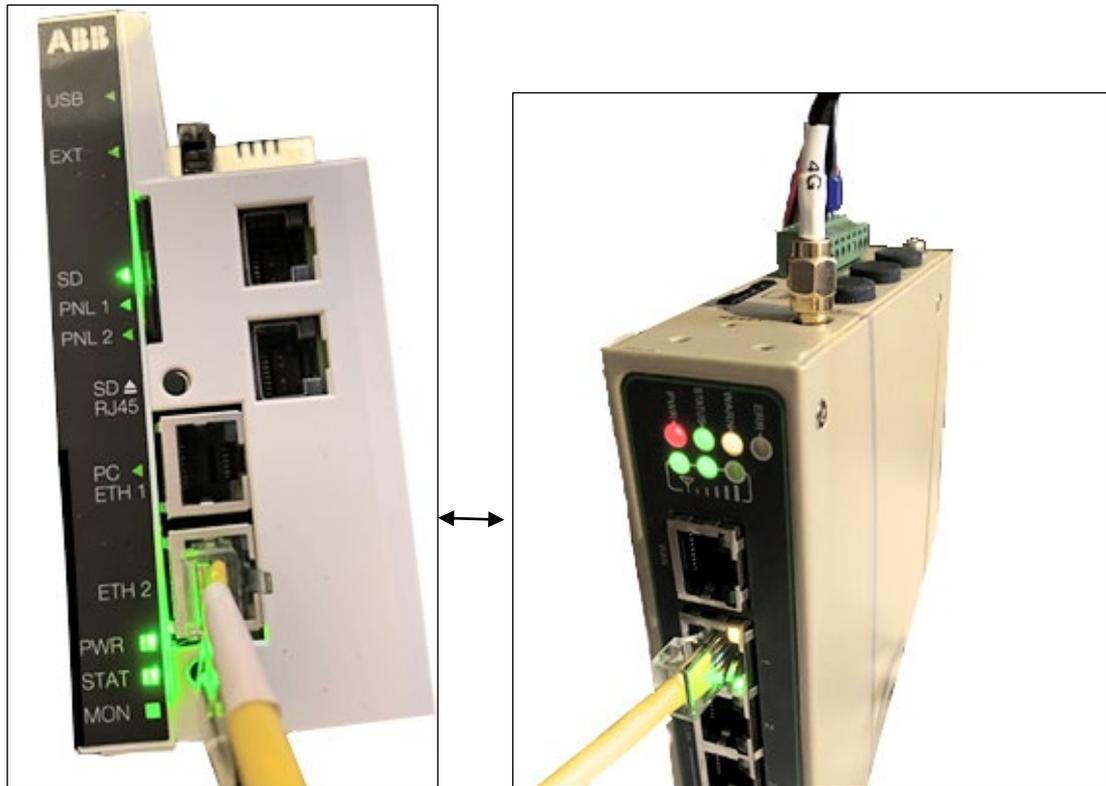
Connect 24V DC power to the power plug according to the markings on the modem.



4. Connect the NETA-21 to the modem and power it up.

- a) Connect the NETA-21 **ETH2 port** to InRouter port 1.
- b) Power on the NETA-21 and wait 1 minute before connecting the PC.

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5. Connect the PC Ethernet.

Connect the commissioning PC with an Ethernet cable to Ethernet port 4 (technically any available port 1, 2, 3, 4 works).

i **Note:** Leave the “WAN” port of the modem disconnected.



4. Logging in and setting up the modem

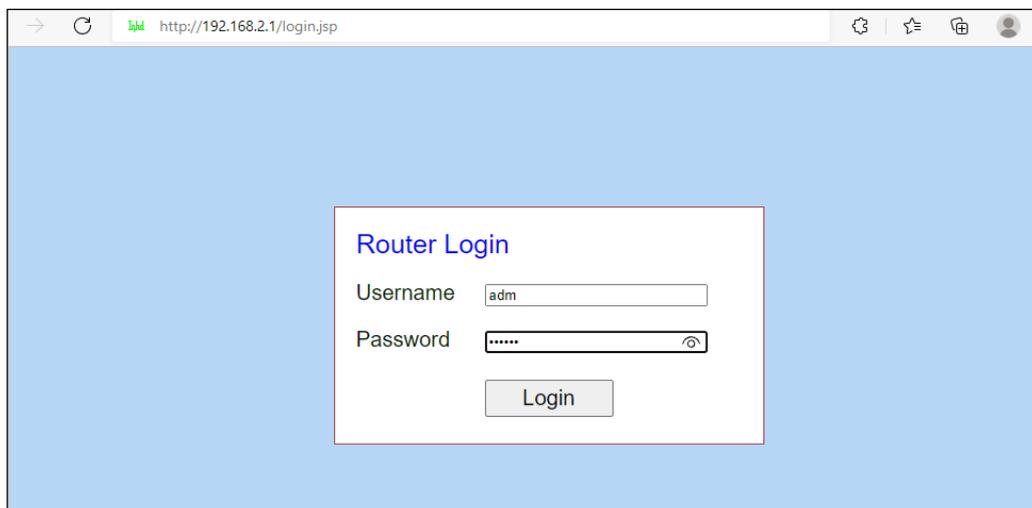
The following steps describe the basic settings of the InRouter for remote connectivity. The settings allow the NETA-21 gateway to push data to the Internet. For advanced configuration options, see the manufacturer's documentation at inhandgo.com.

1. First login

- a) When the PC is connected to the modem (step 5 on page 4), navigate to <http://192.168.2.1>.
- b) Login with the default credentials:
 - Username: adm
 - Password: 123456.



Note: This password works only for the first login. You will change the password to the MAC address in chapter 5 Security hardening and connection testing. The end user should change the password to a secure one and keep it in a safe place.



- c) After a successful login, you should see the modem configuration front page:

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The screenshot shows a web browser window with the URL 192.168.2.1/index.jsp. The page header includes the InHand Networks logo and a navigation menu with tabs for System, Network, Services, Firewall, QoS, VPN, Tools, Application, and Status. A yellow warning banner states: "Your password have security risk, please click here to change!". The main content area is titled "System Status" and displays the following information:

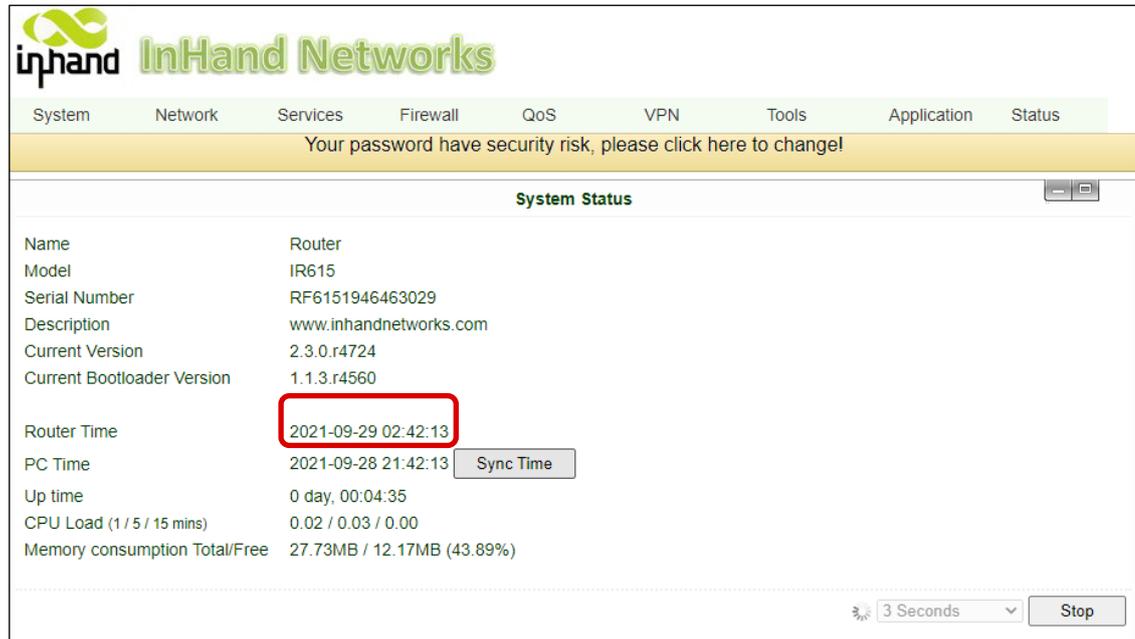
Name	Router
Model	IR615
Serial Number	RF6151946463029
Description	www.inhandnetworks.com
Current Version	2.3.0.r4724
Current Bootloader Version	1.1.3.r4560
Router Time	2019-01-01 08:03:46
PC Time	2021-09-28 21:41:28 <input type="button" value="Sync Time"/>
Up time	0 day, 00:03:49
CPU Load (1 / 5 / 15 mins)	0.04 / 0.04 / 0.01
Memory consumption Total/Free	27.73MB / 12.25MB (44.19%)

At the bottom right of the status section, there is a refresh icon, a dropdown menu set to "3 Seconds", and a "Stop" button.

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2. Set the time and date.

- a) Click the **Sync time** button to synchronize the time from the PC to the modem.
- b) Verify that the **Router time field** shows the correct date and time.



The screenshot shows the InHand Networks web interface. At the top, there is a navigation menu with tabs: System, Network, Services, Firewall, QoS, VPN, Tools, Application, and Status. Below the menu is a yellow warning banner: "Your password have security risk, please click here to change!". The main content area is titled "System Status" and contains the following information:

Name	Router
Model	IR615
Serial Number	RF6151946463029
Description	www.inhandnetworks.com
Current Version	2.3.0.r4724
Current Bootloader Version	1.1.3.r4560
Router Time	2021-09-29 02:42:13
PC Time	2021-09-28 21:42:13
Up time	0 day, 00:04:35
CPU Load (1 / 5 / 15 mins)	0.02 / 0.03 / 0.00
Memory consumption Total/Free	27.73MB / 12.17MB (43.89%)

At the bottom right, there is a refresh icon, a dropdown menu set to "3 Seconds", and a "Stop" button.

3. Set up the SIM card.

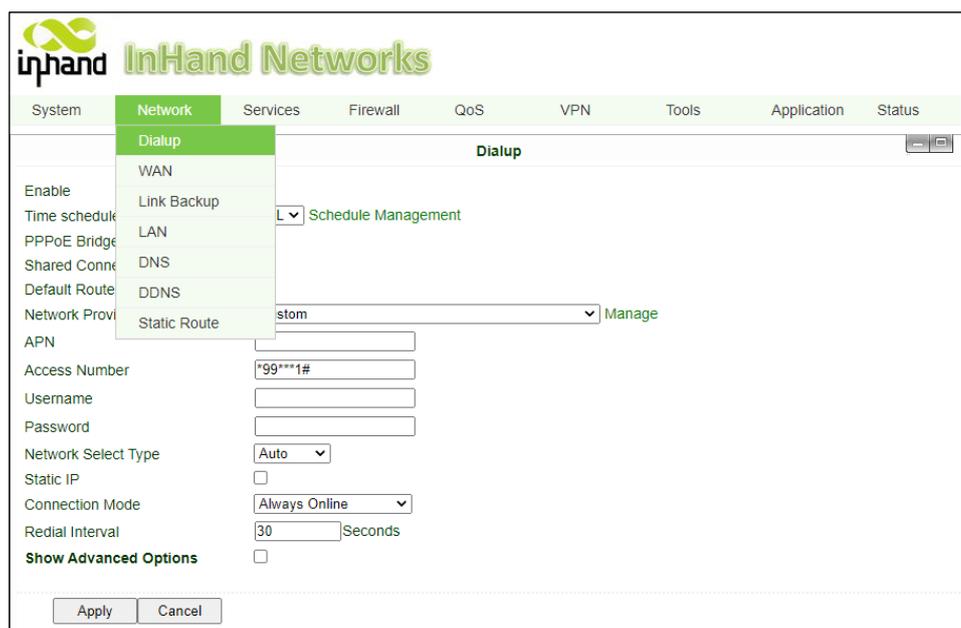
This step enables the Internet connectivity. Do step 5 immediately after this step, to block any unwanted external connections from the Internet.



Note: This step is done quite early, just to avoid locking up the SIM card with too many reboots, if there is a PIN code enabled on the SIM card.

On the production line where several modems are being set up using one SIM card, we recommend using a SIM card which has PIN code checking disabled. A customer SIM card may have a preferred PIN code.

- a) On the **Network** menu, select **Dialup**:



The screenshot shows the InHand Networks web interface with the "Network" menu selected. A dropdown menu is open, showing options: WAN, Link Backup, LAN, DNS, DDNS, and Static Route. The "Dialup" option is selected, and the "Dialup" configuration page is displayed. The page contains the following fields:

Enable	<input type="checkbox"/>
Time schedule	<input type="checkbox"/> Schedule Management
PPPoE Bridge	<input type="checkbox"/>
Shared Conn	<input type="checkbox"/>
Default Route	<input type="checkbox"/>
Network Provider	stom <input type="button" value="Manage"/>
APN	<input type="text"/>
Access Number	*99***1#
Username	<input type="text"/>
Password	<input type="text"/>
Network Select Type	Auto
Static IP	<input type="checkbox"/>
Connection Mode	Always Online
Redial Interval	30 Seconds
Show Advanced Options	<input type="checkbox"/>

At the bottom, there are "Apply" and "Cancel" buttons.

- b) Set up the teleoperator specific settings. These depend on the SIM card. (It is possible that the username and password fields are empty, and that the APN is “internet” or something else specific to the network provider). The modem provides predefined settings for some teleoperators. Other settings can be left as default.

Dialup

Enable	<input checked="" type="checkbox"/>
Time schedule	ALL ▼ Schedule Management
PPPoE Bridge	<input type="checkbox"/>
Shared Connection(NAT)	<input checked="" type="checkbox"/>
Default Route	<input checked="" type="checkbox"/>
Network Provider (ISP)	Custom ▼ Manage
APN	<input type="text"/>
Access Number	<input type="text" value="*99***1#"/>
Username	<input type="text"/>
Password	<input type="text"/>
Network Select Type	Auto ▼
Static IP	<input type="checkbox"/>
Connection Mode	Always Online ▼
Redial Interval	<input type="text" value="30"/> Seconds
Show Advanced Options	<input type="checkbox"/>

4. Update the firmware

- a) Check for any pending firmware updates.



Note: Refer to the manufacturer’s website

<https://inhandgo.com/pages/download-center> for the location of the latest modem firmware.

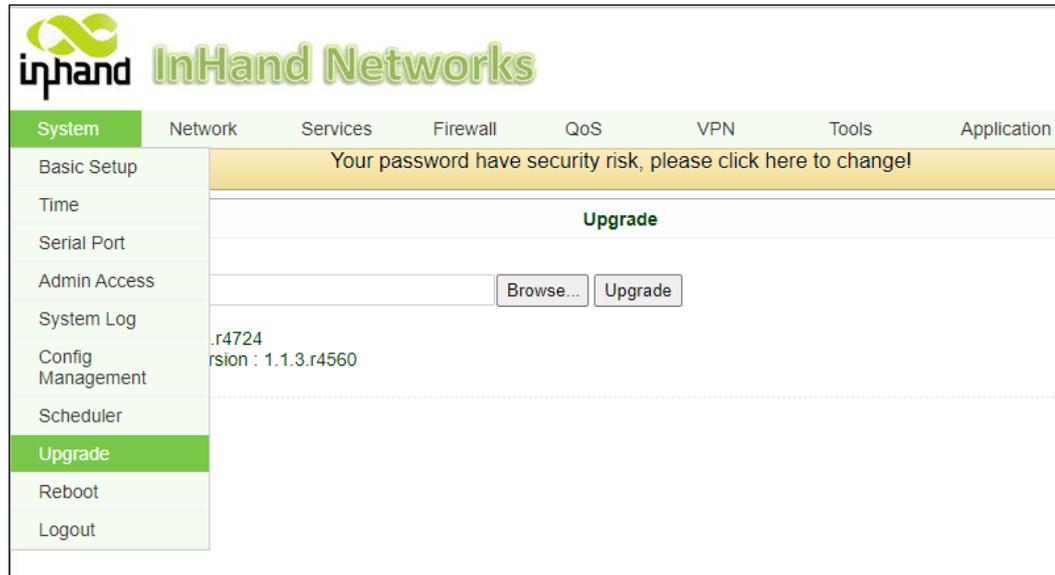
- b) Check for security updates in <https://inhandnetworks.com/product-security-advisories.html>.



Do the mandatory security update to all firmware versions prior to 2.3.0.r5484. The software patch was released in November 2021, but vulnerable software may also be included in modems delivered later.

- c) Select **System -> Upgrade** to do the updates:

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The screenshot shows the InHand Networks web interface. The top navigation bar includes System, Network, Services, Firewall, QoS, VPN, Tools, and Application. The System menu is open, showing options like Basic Setup, Time, Serial Port, Admin Access, System Log, Config Management, Scheduler, Upgrade (highlighted), Reboot, and Logout. A yellow warning banner at the top of the main content area reads: "Your password have security risk, please click here to change!". Below this, the "Upgrade" page is displayed, featuring a "Select the file to use:" label, a text input field containing "No file selected.", and "Browse..." and "Upgrade" buttons. The current version information is shown as "Current Version : 2.3.0.r4724" and "Current Bootloader Version : 1.1.3.r4560".

d) Click **Browse...**, select an upgrade file and click **Upgrade**.



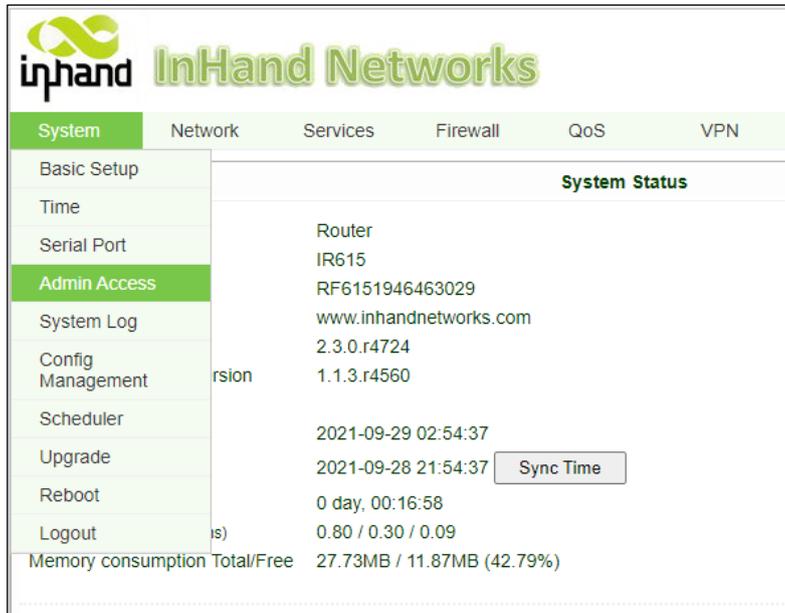
This is a close-up of the Upgrade page. It shows the "Upgrade" title in green. Below it, the text "Select the file to use:" is followed by a text input field that says "No file selected.". To the right of the input field are "Browse..." and "Upgrade" buttons. At the bottom, the current version information is displayed: "Current Version : 2.3.0.r4724" and "Current Bootloader Version : 1.1.3.r4560".

5. Security hardening and connection testing

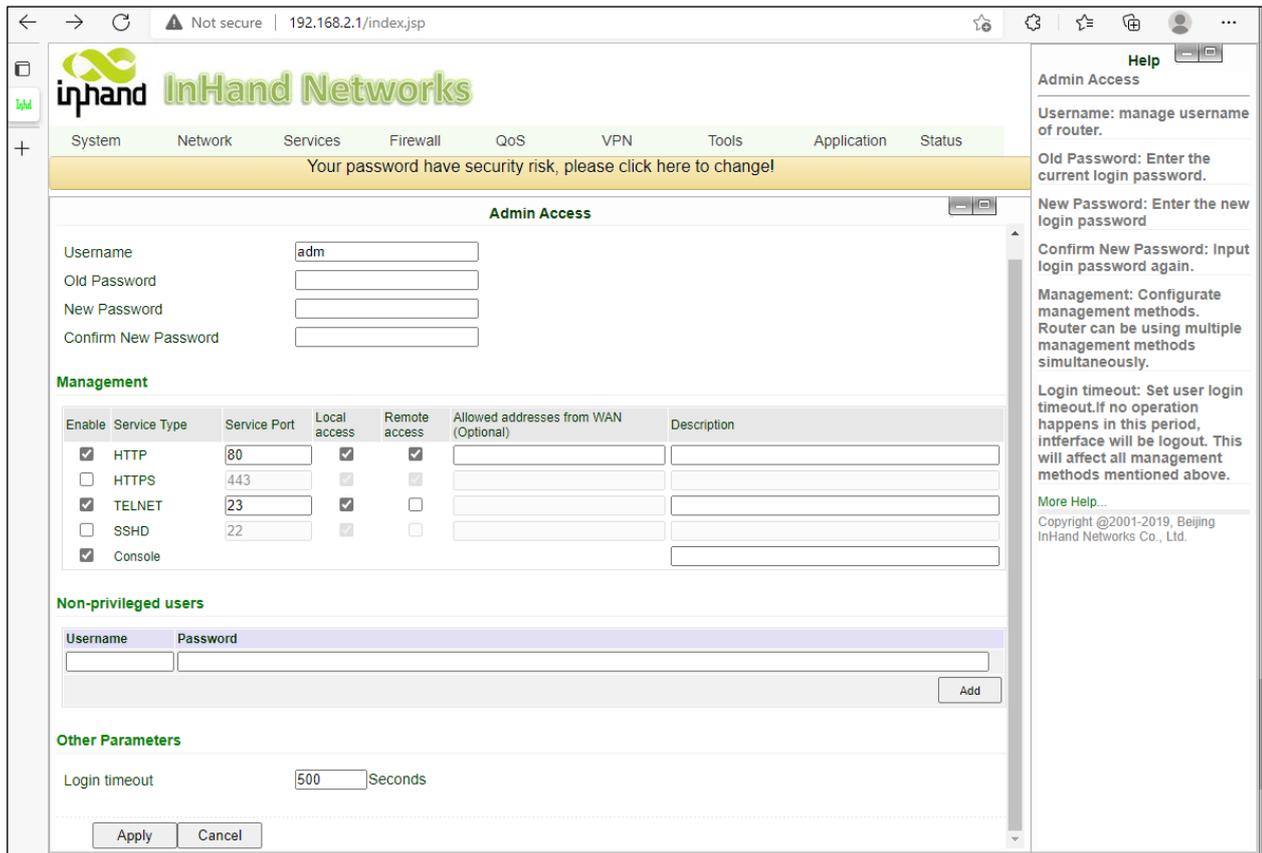
Security hardening protects the modem from external threats in case the customer's SIM card provides access from the Internet towards the modem. SIM cards with public/static IP addresses are not needed or recommended.

1. In the **System** menu, select **Admin Access**:

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The figure below shows the default settings of the **Admin Access** window (before modifications):



2. Configure the following:

- a) **Old password:** enter the default password 123456
- b) **New password:** locate the type label of the router and use the “MAC” address as the new password, including capital letters and special characters, for example 00:18:05:11:01:B4-B5 in the figure below.



Note: The MAC address is set as a temporary password at the factory to increase the security of the modem. The end customer must create a secure password for the modem.

- c) Uncheck (disable) **HTTP**
- d) Check (enable) the **HTTPS** (preferably also only “**Local access**” not “Remote Access”)
- e) Uncheck (disable) **TELNET**
- f) Uncheck (disable) **Console**

See the example below.

3. Click Apply.

Admin Access

Username:

Old Password:

New Password:

Confirm New Password:

Management

Enable	Service Type	Service Port	Local access	Remote access	Allowed addresses from WAN (Optional)	Description
<input type="checkbox"/>	HTTP	80	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
<input checked="" type="checkbox"/>	HTTPS	443	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
<input type="checkbox"/>	TELNET	23	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
<input type="checkbox"/>	SSHD	22	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
<input type="checkbox"/>	Console					

Non-privileged users

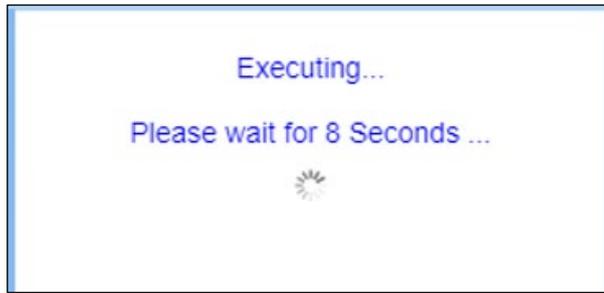
Username	Password
<input type="text"/>	<input type="password"/>

Other Parameters

Login timeout: Seconds

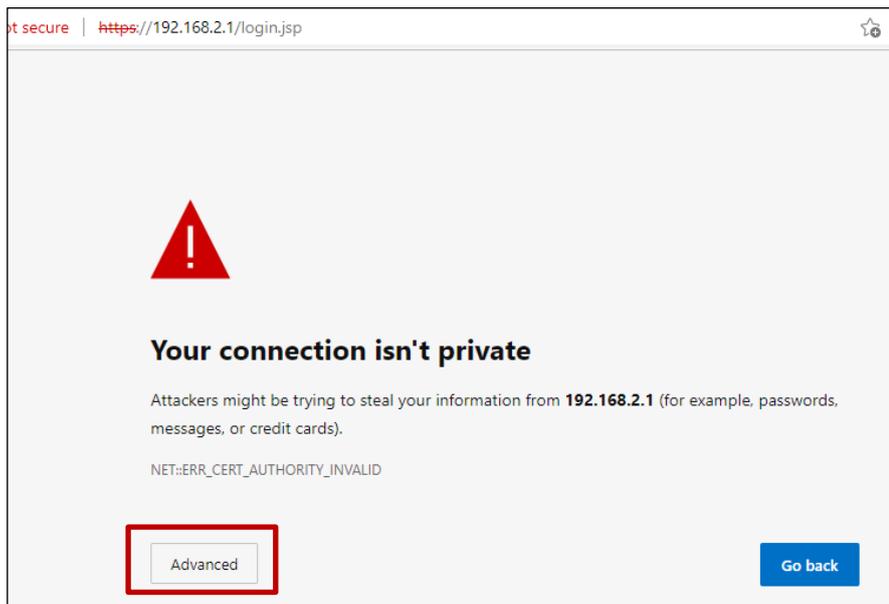
Applying the settings will take a moment:

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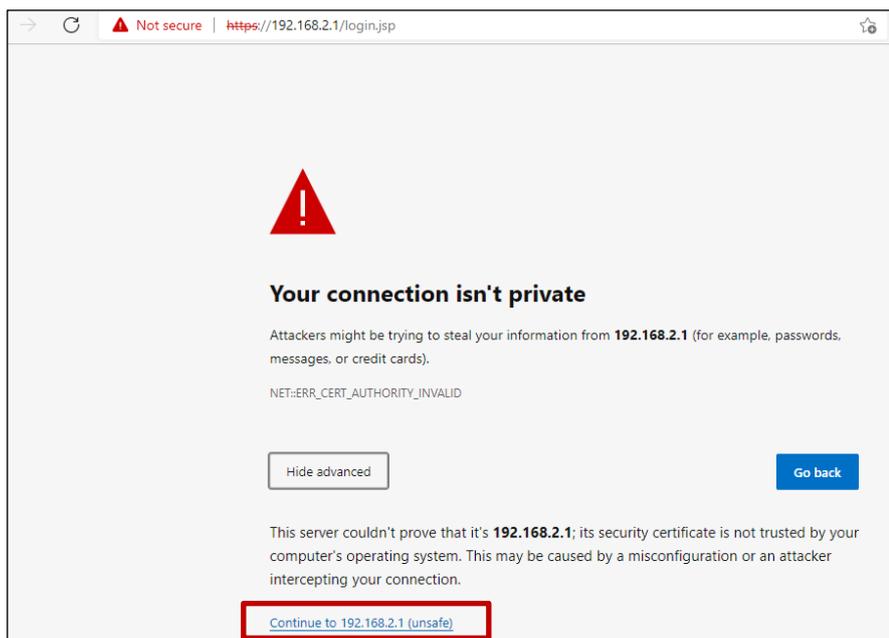


You will be redirected to the login page. Make sure that the web address starts with `https://`. You will see a web browser warning about a self-signed certificate.

4. Click **Advanced** (in Microsoft Edge browser).

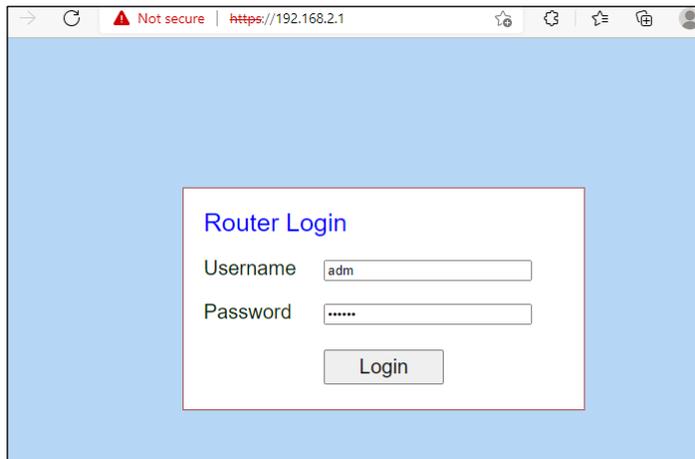


5. **Continue to 192.168.2.1 (Unsafe)** because you are connecting point-to-point (not through Internet) to a modem which we know to have a valid identity.



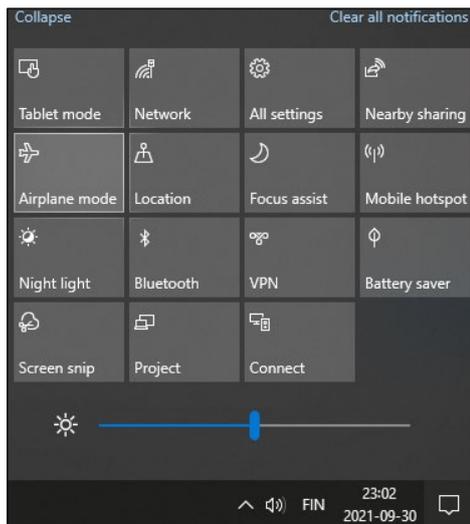
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6. Finally, you will be returned to the login page using HTTPS. Enter the changed password to make sure that it works.



7. Test the Internet with the web browser of the PC.
- a) When connected to the modem from a PC using wired Ethernet, disable the wireless network connection and try browsing the internet, for example <https://www.abb.com>.

You can disable the wireless network using a keyboard shortcut (Fn + the Wi-Fi function key) or with the “Airplane mode” button on the Windows 10 toolbar:



8. Make sure that NETA-21 can connect to the cloud.

Before this, make sure that the software and IPS packages have been preloaded to NETA-21 using an SD card, and that the Internet connection is working.

- a) Login to the NETA-21 web UI and check the portal status for 4 green ticks:

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Portal status display

- ✓ **Remote Service Portal package status**
07.11.2014 10:10 (13 days 18 hours ago) Installed OK Details...
- ✓ **Status of latest HTTP report to portal**
21.11.2014 10:14 (0 seconds ago) OK
- ✓ **RSP Connection**
Since 21.11.2014 01:29 (3 hours 15 minutes ago) Reconnect to portal
- ✓ **RSP Client latest contact to portal**
21.11.2014 10:15 (0 seconds ago)

InHand Networks

System Network Services Firewall QoS VPN Tools Application **Status**

Device List

Interface	MAC Address	IP Address	Host
lan0	00:1C:01:14:30:4F	192.168.2.35	*
lan0	98:FA:9B:D4:EA:70	192.168.2.98	*

3 Seconds

- System
- Modem
- Traffic Statistics
- Alarm
- Network Connections
- Route Table
- Device List**
- Log
- Third Party Software Notices

The MAC addresses starting with 00:1C:01:14: are NETA-21 modules.

- In the example above, since the IP address of the NETA-21 is 192.168.2.35, navigate with the web browser to <https://192.168.2.35> (check the exact IP address case by case).

6. Cybersecurity disclaimer

This product is designed to be connected to and to communicate information and data via a network interface. It is the customer's sole responsibility to provide and continuously ensure a secure connection between the product and the customer's network or any other network. The customer must establish and maintain any appropriate measures (such as but not limited to the installation of firewalls, application of authentication measures, encryption of data, installation of anti-virus programs, etc.) to protect the product, the network, its system and the interface against any kind of security breaches, unauthorized access, interference, intrusion, leakage and/or theft of data or information. ABB and its affiliates are not liable for damages and/or losses related to such security breaches, any unauthorized access, interference, intrusion, leakage and/or theft of data or information.

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