



## **ClimaCheck Gateway NX400 Hardware Manual**

Updated for Application v4

2022-03-08

## Safety Precautions



**Read the instruction manuals for all relevant equipment carefully before starting to use ClimaCheck Performance Analysing systems.**

If equipment is used in a way not specified by producer the protection and safety provided may be impaired.

For activities related to electrical systems, pressurised systems as well as systems charged with refrigerants certifications/licenses are required in most countries.

ClimaCheck products are only intended for use by competent technicians/engineers with on each market required certifications/licenses.

Any work with electricity, pressurised systems and refrigerant involve potential dangers to human health and system integrity if not conducted with caution. In many cases the value of products or cost of production loss represents great values. ClimaCheck do not assume any responsibility for injuries or costs occurring if failures are caused in connection with measurements. It is the user that must evaluate if an installation can be carried out without risks to cause injuries and/or damage. Installation should only be carried out when it can be done with proper safety margins.

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# 1 Overview

On the front of the ClimaCheck Gateway NX400 unit a display, 4 LEDs and the reset button can be found.

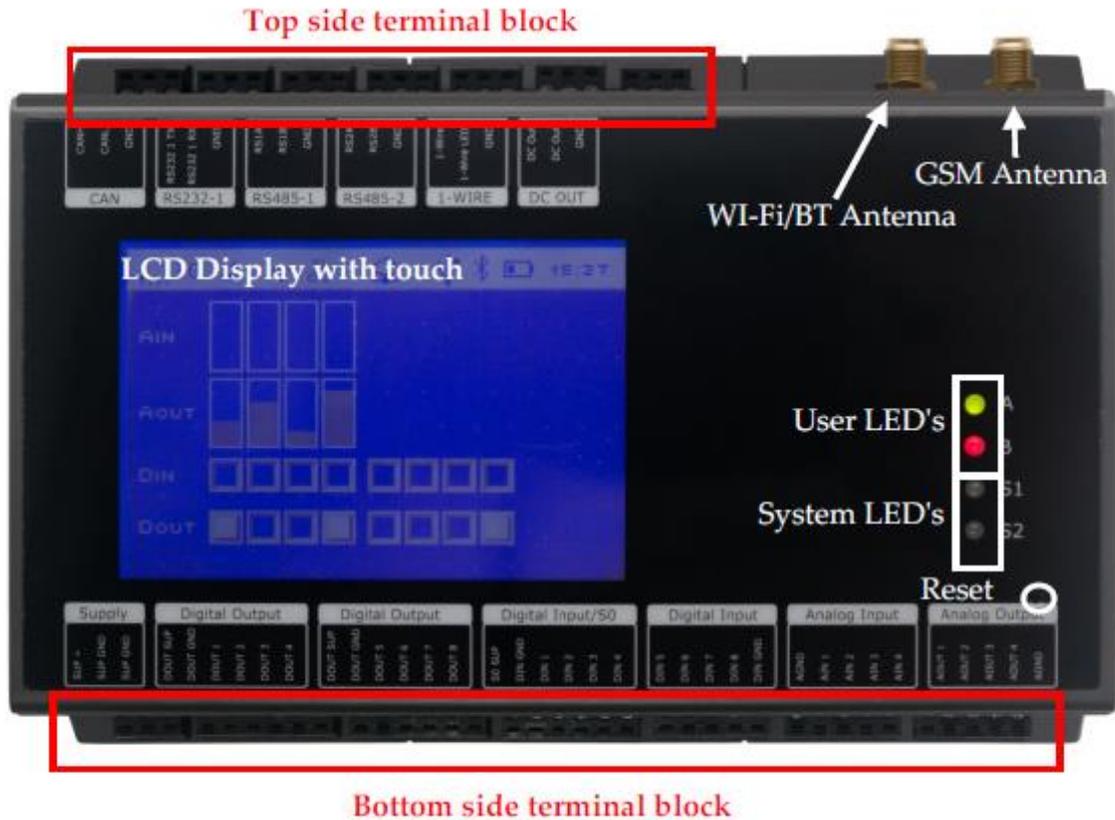


Figure 1 Front view of ClimaCheck Gateway NX400

## 1.1 LED indicators

The ClimaCheck Gateway NX400 has 4 LED indicators:

- A: ClimaCheck *online*
- B: 1-wire / Modbus
- S1: Status
- S2: Modem

The A LED indicates the status on contact with ClimaCheck *online* server.

A LED	Status
 900ms On, 900ms Off (Green)	Connection with ClimaCheck <i>online</i> OK (Normal operation)
 Fast blinking (Red)	NX400 unsuccessful to send data to ClimaCheck <i>online</i> server
 (Yellow)	-
Off	No connection e.g. no LAN or Modem connection to Internet

The B LED indicates Modbus and 1 wire communication status

B LED	Status
 900ms On, 900ms Off (Green)	All configured Modbus and 1-Wire units OK and no Alarms active (Normal operation)
 0.400ms On, 0.400ms Off (Red)	Modbus communication error (see display for additional information)
 Continuous On, Off (Red)	1-Wire communication error (see display for additional information)
 On (Red)	Alarms active in the Easycool controller, see alarm page on ClimaCheck <i>online</i>
 (Yellow)	-

When the Modbus or 1-Wire communication alarm is active, address and name of the unit can be seen in the display.

The S1 LED indicates the status on the internal ClimaCheck application.

S1 LED	Status
 500ms On, 500ms Off (Green)	Internal ClimaCheck application running OK (Normal operation)
 Fast blinking (Green)	The unit has been forced into recovery mode with the use of the system switch. The application is not executing.
 Fastest blinking (Green)	The unit is initializing, preparing to start the application.
 1500ms On, 500ms Off (Green)	The unit is executing the application program, while charging the internal back-up battery.
 75ms On / 925ms Off (Green)	Execution speed is different from full-speed.
 Fast blinking, (Red)	A runtime error has been detected in the program, contact ClimaCheck support
 Alternating Fast/Slow (Red)	The unit has lost its firmware, contact ClimaCheck support
 500ms On / 500ms Off (Yellow)	Communication with PC Software over USB established (Normal operation when logging direct to a computer)

The S2 LED indicates the modem status.

Communication status is shown as an icon in the display and with the S2 LED, see table below.

S2 LED	Status
Off	The GSM module is turned off
● 600 ms On / 600 ms Off (Yellow)	No SIM card inserted or no PIN code entered, or network search in progress, or ongoing user authentication, or network logon in progress.
● Single 75 ms On / 3 s Off (Yellow)	Logged to the network. No call in progress.
● Double 75 ms On / 3 s Off (Yellow)	A GPRS session is active (bars indicate signal strength)
● Flashing (Yellow)	Indicates GPRS data transfer.

## 1.2 Display

On the front of the ClimaCheck Gateway NX400 unit a 240x160 pixel, white on blue, LCD display with built in resistive touch sensing can be found.

The top part of the display is reserved for a status bar showing status of the different communication interfaces as well as the time and the battery status, see Figure 2

The main part of the display is reserved for internal ClimaCheck NX400 application showing menus and data. The lower and right side is used for virtual buttons to navigate.



Figure 2 Display with status bar and

The icons on the status bar are shown and described in Table 1.

**Table 1 Icons on status bar**

Icon	Status
<b>GSM Status</b>	
	GSM off
	GSM on
	Signal strength
<b>GSM network type</b>	
	2G
	3G
<b>Mobile network status</b>	
	Network connected
	Roaming
	Network connected while roaming
<b>Call Status</b>	
	Call active (not used in ClimaCheck application)
<b>Wi-Fi Status</b>	
	Wi-Fi Off
	Wi-Fi on
	Wi-Fi signal level
<b>LAN Status</b>	
	LAN off
	LAN on (disconnected)
	LAN connected
<b>RTCU Gateway Status</b>	
	RTCU Gateway not enabled
	RTCU Gateway enabled
	RTCU Gateway connected
<b>USB status</b>	
	USB host supported
<b>Bluetooth status</b>	
	Bluetooth off
	Bluetooth on
<b>Power status</b>	
	Battery level (animated while charging)

### 1.3 ClimaCheck Gateway NX400 internal application version and PA-ID

Each Gateway unit has a unique id number to identify it on the ClimaCheck *online* server, this number is set by ClimaCheck and can be seen in the display, on the second row, after the unit has booted up as "ID=XXXXXX".

The internal application version can be seen in the display on the same row as the PA-ID. Contact ClimaCheck support for information on the latest version.



Figure 3, NX400T default view with v 3.00

## 2 Communication

The Gateway has LAN, Wifi, modem for Mobile connections and USB to communicate with the ClimaCheck server or a local PC. It has Modbus TCP and Modbus RTU and can be configured both as Server/Slave and Client/Master.

### 2.1 Ports

The Gateway uses the following ports when communicating with the ClimaCheck *online* server:

- TCP port 443 (HTTPS) to receiver.climacheck.com: Send data as a text string (ID, Timestamp, data1, data2, ...) to ClimaCheck *online*
- Alternatively UDP port 2049 to online.climacheck.com: Send data as a text string (ID, Timestamp, data1, data2, ...) to ClimaCheck *online*
- TCP port 80 to integration.climacheck.com: Fetch configuration and analysed values
- TCP port 5001 to online.climacheck.com: Firmware and application updates and troubleshooting.

### 2.2 SMS Commands

SMS commands can be used to control the ClimaCheck Gateway. In Online Mode the modem in the unit is always active, except when "No Network" is selected. In PC Mode the modem can be activated and deactivated from the Network Setup menu, see section 3.13. When the modem is active SMS commands are executed regardless of which network interface is used to communicate (GPRS, LAN, WiFi) as long as an active sim card is inserted.

The SMS commands are listed and described in Table 2 below.

**Table 2 SMS Commands**

Command	Function
CFG	Fetch configuration from ClimaCheck <i>online</i> server
CMD	Check for new commands on ClimaCheck <i>online</i> server
RST	Reboot unit
APN new_apn	Changes the APN settings to "new_apn". If APN <i>internet.com</i> is sent it will change APN to internet.com
NET GPRS	Changes selected network interface to mobile/GPRS
NET LAN	Changes selected network interface to LAN
NET WLAN	Changes selected network interface WLAN / Wifi

There should be One space between the command (APN or NET) and the parameter (new\_APN, LAN, WLAN, GPRS).

The unit will respond with an SMS and then execute the command.

If selected network interface is changed with SMS commands make sure correct configuration (APN, SSID's or IP addresses) is set for the new network. To change network configuration like APN, SSID's or IP addresses for GPRS, LAN or WLAN use the PA Pro III Configurator, see section 4.

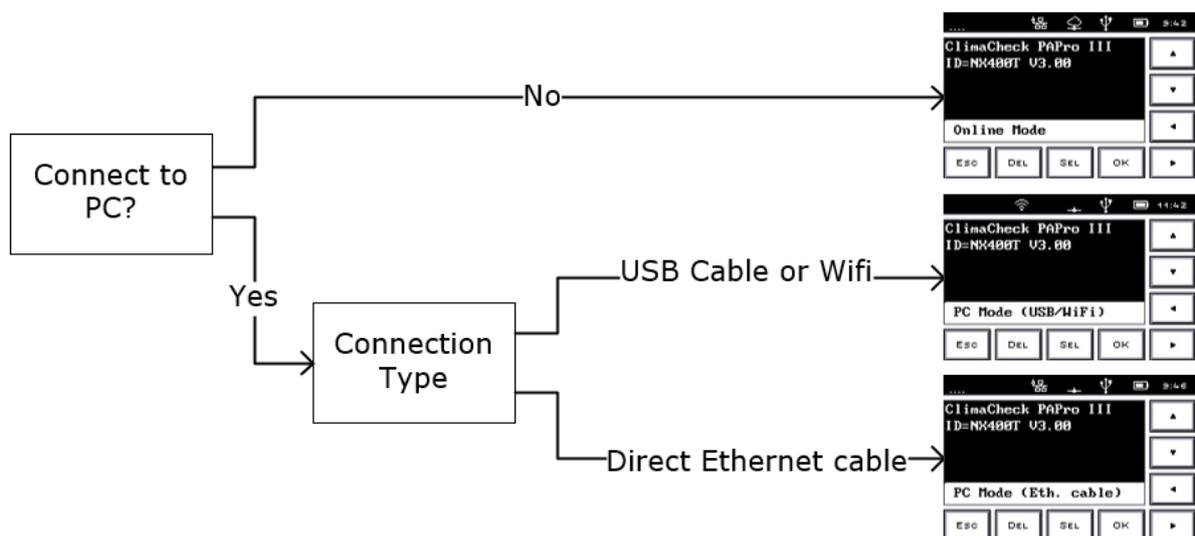
## 2.3 Connection Mode

The Gateway has two main connection modes, Online Mode and PC Mode. PC Mode is the default setting when logging data to the PC Software with ClimaCheck Onsite and Online Mode is default setting in permanent ClimaCheck *online* installations.

When booting up the Gateway asks "Connect to PC?", press No to enter Online Mode or Yes to enter PC Mode. For Online mode the preferred network interface to connect to the ClimaCheck *online* server can be changed between LAN, Wifi and GPRS, see section 3.11.

In PC Mode the unit will ask for "Connection type" to select how to connect the computer to the NX400. First option is USB Cable / WiFi and second option is Direct ethernet cable between computer and NX400, see Figure 4 and section 2.4 for more information on how to connect a PC.

If no selection is made the unit activates Online Mode or PC Mode (USB Cable / WiFi) automatically depending on the default setting. This default setting can be changed with the PAPro III configurator, see section 4.12. Selected connection mode is indicated on the bottom row of the display.



**Figure 4, Connection Mode**

The configuration of the network interfaces in the different connection modes can be seen in Table 3 below. USB connectivity is always available regardless of connection mode.

**Table 3, Default network interface configuration depending on Connection Mode**

	USB connectivity	Ethernet connectivity	WiFi Connectivity
Online Mode	Active	NX400 as Client	NX400 as Client
PC Mode (USB/WiFi)	Active	NX400 as Client	NX400 as DHCP server
PC Mode (Eth. Cable)	Active	NX400 as DHCP server	NX400 as Client

**Note, do not connect the Gateway to a network (LAN) via ethernet cable while in PC Mode (Eth. Cable), the unit's DHCP server is active which may cause IP conflicts on the network. Use Online Mode or PC Mode (USB/WiFi) instead if the unit is connected to a network.**

In PC Mode, the Gateway can be setup to try to connect to ClimaCheck *online* server. This can be used for example to log data to ClimaCheck onsite software with Wifi connection and send data to ClimaCheck *online* server with GPRS SIM connection. To switch on or off the online connection in PC Mode see section 3.13.

In Online Mode the Wifi access point is deactivated by default. See section 3.12 for instruction on how to activate it while still in Online Mode. This can be used to log data, over Wifi, to the ClimaCheck PC Software simultaneously as the unit sends data to ClimaCheck *online*.

## 2.4 PC Connection

When connecting a computer directly to the Gateway follow the sequence described below and make sure the computer is configured correctly. Logging to the PC software can be done with USB cable, ethernet cable or Wifi, see Figure 5. Configuration of sensors or external units with the PA Pro III configurator is only available when connected with USB.

### USB cable

- Connect USB cable between computer and Gateway
- Start the Gateway and select "Connect to PC" and then "USB Cable and Wifi"
- Start ClimaCheck software. See Field manual or Software manual for more information on how to log data with the USB cable.

### WiFi (Gateway as access point)

- Start the Gateway and select "Connect to PC" and press "OK"
- On the second screen select "USB cable or wifi" and press "OK"
- Connect the PC to the network (Wifi) with ssid PAPRO3\_XXXX where XXXX is the last 4 digits in the serial number of the unit. Default passphrase/security key is nacka@2019
- Start ClimaCheck software. See Field manual or Software manual for more information on how to log data over wifi.

When using Wifi make sure the computers network card is set to obtain an IP address automatically from a DHCP server. If the PAPRO3\_XXXX ssid doesn't show up in windows reboot both computer and ClimaCheck Gateway and then try again.

### Direct Ethernet cable

- Connect Ethernet cable between computer and Gateway
- Start the Gateway and select "Connect to PC" and press "OK"
- On the second screen select "Direct Ethernet cable" and press "OK"
- Start ClimaCheck software. See Field manual or Software manual for more information on how to log data with the Ethernet cable.

When using ethernet cable make sure the computers network card is set to obtain an IP address automatically from a DHCP server.

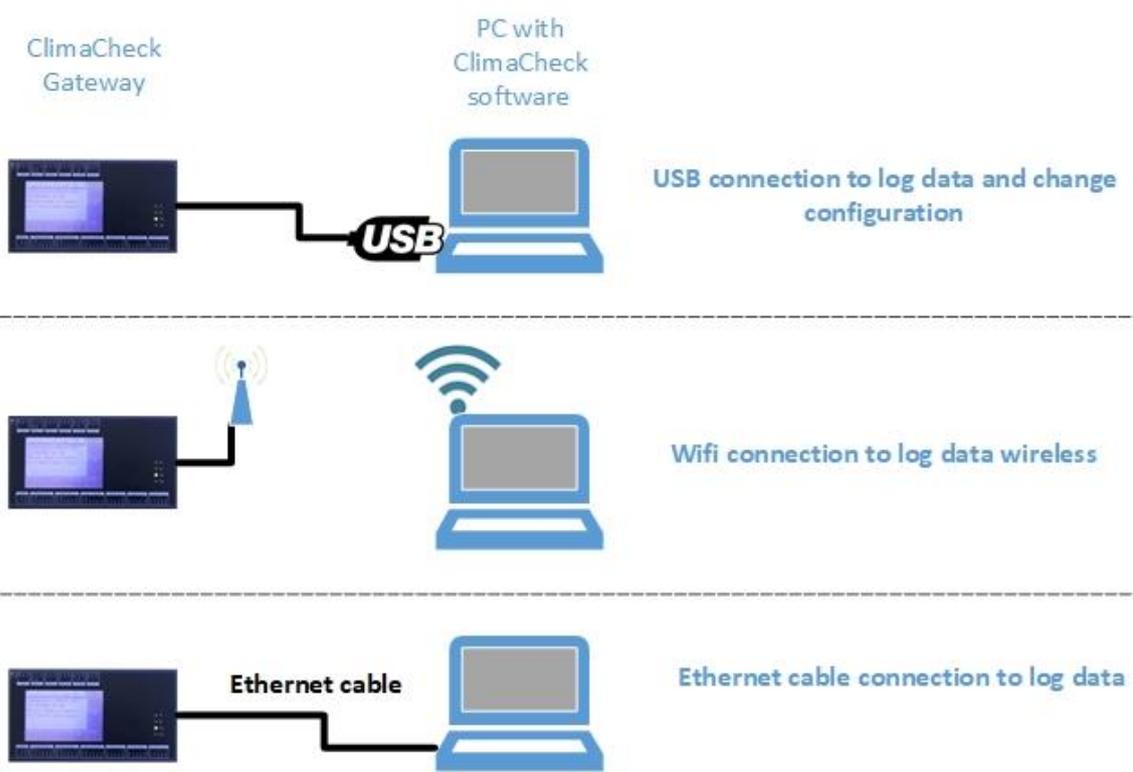


Figure 5, Direct connection to PC

### 3 ClimaCheck Gateway NX400 internal application

The chapter describes functions in the internal application of the ClimaCheck Gateway NX400 that are accessible through the display on the unit.

#### 3.1 Menu structure

The menu structure is shown in the figure below. To open a sub menu press the SEL button, to choose a function or confirm a configuration OK button is used. To go back press ESC.

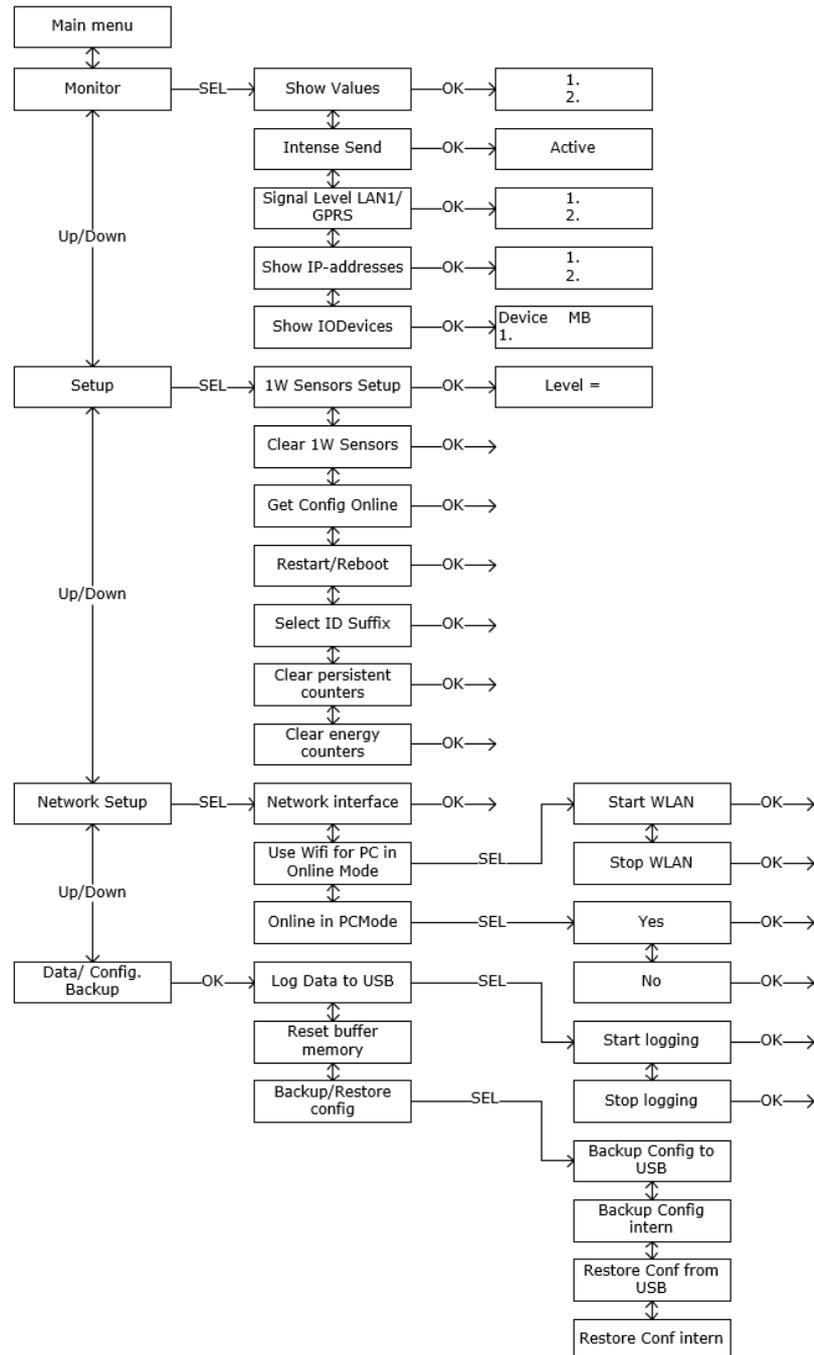


Figure 6 ClimaCheck Gateway NX400 Menu

### 3.2 View all values

All values, from internal inputs and external units connected through Modbus, can be seen on the Show values menu. The list of values varies depending on the number of power meters, R560 modules and other external units that are configured.

To view all values:

- Press ESC to enter the Main menu
- Press Down until "Monitor" appears in the display
- Press SEL to enter Monitor menu
- "Show values" appears in the display
- Press OK

Values are shown with one sensor/value on each row with Comment/Description, sensor reading and unit. Press Up/Down to step through the list of values.



Figure 7, "View all values" menu

### 3.3 Send interval / Intense send

When ClimaCheck *online* is used data is sent to the ClimaCheck server once every minute when the compressor is on and every 5 minutes when the compressor is off. To activate "intense send" and send data every 15 second:

- Press ESC to enter the Main menu
- Press Down until "Monitor" appears in the display
- Press SEL to enter Monitor menu
- Press down until "Intense send" is showed in the display
- Press OK
- "Intense Send Active" appears

Intense send is automatically switched off after 15 minutes.

### 3.4 Signal level

GPRS/WiFi signal strength can be seen in the display of the unit as bars, see section 0. To view the value in % or dBm:

- Press ESC to enter the Main menu
- Press Down until "Monitor" appears in the display
- Press SEL to enter Monitor menu
- Press Down until "Signal level GPRS" or "Signal level WiFi" is showed in the display
- Press OK

Signal strength is presented in dBm and %. For reliable data transmission a signal strength above 2 "bars", -80dBm or 40% is required.

### 3.5 Show IP-addresses

To show what IP-addresses the Gateway uses on LAN, WiFi and GPRS connections:

- Press ESC to enter the Main menu
- Press Down until "Monitor" appears in the display
- Press SEL to enter Monitor menu
- Press Down until "Show IP-addresses" is showed in the display
- Press OK

IP-addresses for all network interfaces is presented. To change communication settings, see section 3.11.

### 3.6 Show IODevices

To show status and address for all configured Modbus units:

- Press ESC to enter the Main menu
- Press Down until "Monitor" appears in the display
- Press SEL to enter Monitor menu
- Press Down until "Show IODevices" appears in the display
- Press OK

Device name, Modbus address and status are displayed. Status is OK when communication is working and Error if the unit can't connect to the IODevice. After a number of failed attempts, the device is disabled and get Status Disabl. The unit will enable the devices again once every hour to try to restore communication. The most common devices are listed in Table 4 below, see section 4.6 for more information about configuration of IODevices.

Table 4

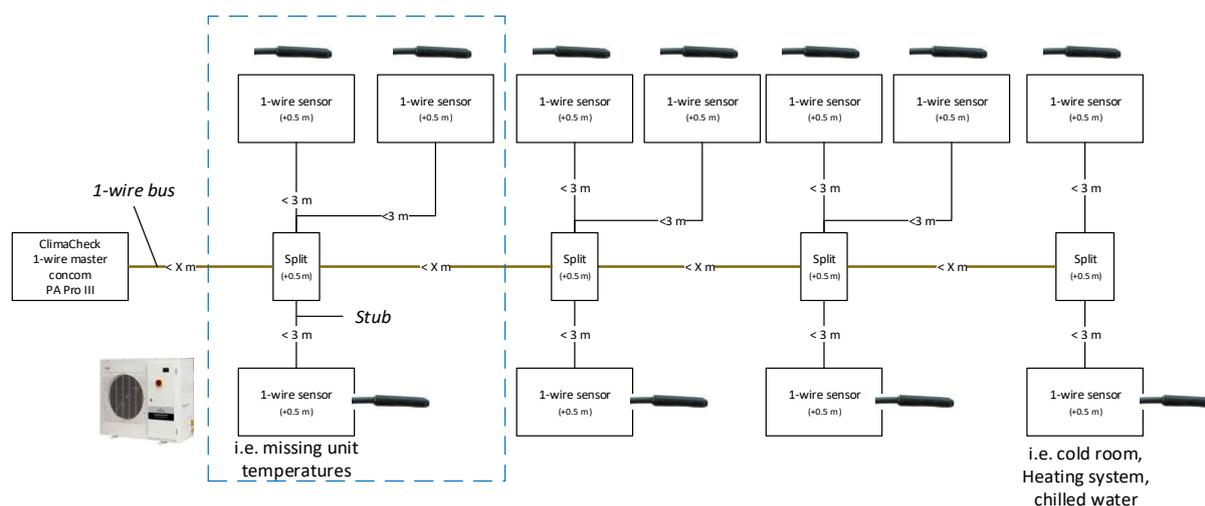
Device	Description
IAIO	Internal Analog Input and Output on the Gateway
R560	ClimaCheck R560 analog input module
PScout	Power Scout power meter
1W	Internal 1-Wire module



Figure 8, "Show IODevices" menu

### 3.7 1-Wire temperature sensors

A 1-Wire temperature sensor is a bus sensor and unlike Pt1000 sensors the measured value of the sensor is not affected by the resistance in the cable between the master (Gateway NX400) and the slave (sensor). Limitations in number of sensors and cable length as well as the preferred topology is described below.



**Figure 9 1-Wire preferred topology**

The preferred topology, Figure 9, is with the Gateway connected at one end of the 1-Wire bus and each sensor connected to the bus with branches or “stubs” where each stub is less than 3m. The Gateway can handle a total of 16 sensors and a total “weight” of 65 m. The weight is the length of all cables + 0.5m per sensor + 0.5m per split.

Weight = total cable length + 0.5\*sensor + 0.5\*split

Example: 3 sensors on 2 meter stubs that is located 5 meters from the NX400 with 1 split has a total weight of  $0.5*3+(2*3+5)+0.5*1=14$ .

**Do not run signal wires in parallel with power cables.**

#### 3.7.1 1-Wire temperature sensor setup

1-Wire sensors delivered with the system/logger will be configured and marked at shipment. Sensors added later have to be configured/connected.

The 1-Wire sensor has a unique ID to identify it on the 1-Wire bus and each sensor needs to be configured/connected in the Gateway. When a sensor has been connected to a specific position it will stay on this position regardless of where on the bus it is connected or which 3.5 mm 1-wire socket that is used.

#### 3.7.2 Connecting sensors

The sensors need to be connected and configured **one at a time**. Use the following sequence to setup and connect the sensors:

- Connect sensor. After a few seconds “Unknown 1-W sens found” is displayed
- Press ESC to enter the Main menu
- Press Down until “Setup” appears in the display
- Press SEL to enter setup menu
- “1W Sensor Setup” appears in the display
- Press OK to start setup

If this is the first setup, "T1 Sensor not conf" appears in the display, if sensors are already configured these will be listed.

- With the up and down arrows go to the position you want to save a sensor to
- Press SEL
- "TX New=xxxxxx OK" is showed in the display (Were TX is the position and xxxxxx is the id number of the sensor)
- Confirm with OK, "S-RID Saved" appears for 2 seconds
- Temperature reading and ID is appearing in the display "TX=XX.X ID=xxxxxx"
- Press ESC 4 times to go back to the main menu or start from the top to connect another sensor.

If "No new s-r found" appears while setting up a new sensor the NX400 cannot find any sensor on the bus that is not already configured, check connection and make sure the sensor has not been connected already.

### 3.7.3 Replace a 1-Wire sensor

To replace a sensor

- Disconnect old sensor
- Press ESC to enter the Main menu
- Press Down until "Setup" appears in the display
- Press SEL to enter setup menu
- "1W Sensor Setup" appears in the display
- Press OK
- select the sensor number in the list, it will say "Sensor missing".
- Connect new sensor and press SEL,
- "Tx NEW=xxxxxx OK" is showed in the display
- Confirm with OK, "S-RID Saved" appears for 2 seconds
- Temperature reading and ID is appearing in the display "TX=XX.X ID=xxxxxx"
- Press ESC 4 times to go back to the main menu.

### 3.7.4 Clear all 1-Wire sensors

To clear all configured 1-Wire sensors

- Press ESC to enter the Main menu
- Press Down until "Setup" appears in the display
- Press SEL to enter setup menu
- Press down until "Clear 1W Sensors" is showed in the display
- Press OK
- "Clearing.." appears and then your back in the setup menu

This will clear all sensor including preconfigured sensors. You can now connect the sensors again, see section 3.7.2.

### 3.7.5 Trouble shoot 1-Wire sensors

- "No tempensors or conn. Wrong. OK?" is showed while configuring sensors.

Check wiring and make sure all sensors are connected properly (Data, GND). If the wires from one (1) sensor is mixed up the whole 1-Wire bus stops.

- **"No new s-r found"** is showed when trying to connect/configure sensor.

Check wiring and make sure sensor is not already connected/configured on a different position.

- Sensors has been connected/configured on the wrong position  
Clear all configured sensors and connect them again, see section 3.7.4
- A configured 1-Wire sensor is showing -999.00  
NX400 has lost connection with the sensor, check wiring.

### 3.8 Reboot and Reload Configuration

Most of the configuration for external units can be done on the ClimaCheck server. Changes to Modbus addresses for external units such as energy meters or R560 modules can be done on the ClimaCheck *online* server and then downloaded to the unit. If the unit has an internet connection it will try to contact the server every 6 hour to check for commands to Reload configuration from the server or Restart.

The unit can also be restarted or forced to reload configuration from the Setup menu.

#### 3.8.1 Reload configuration from ClimaCheck *online* server

Make sure the unit has internet connection and then:

- Press ESC to enter the Main menu
- Press Down until "Setup" appears in the display
- Press SEL to enter setup menu
- Press Down until "Get Config Online" is showed in the display
- Press OK to load configuration from CC Online server
- "Waite for config, Loading.." appears in the display

After a few seconds, when the configuration has been updated, the unit will go back to the initial view.

All configuration made locally with the PA Pro Configurator, section 4, will be overwritten with the configuration from the server.

#### 3.8.2 Reboot

To restart the unit:

- Press ESC to enter the Main menu
- Press Down until "Setup" appears in the display
- Press SEL to enter setup menu
- Press Down until "Restart/Reboot" is showed in the display
- Press OK

The unit will reboot.

### 3.9 Send data to different process on ClimaCheck *online*

When sending data to ClimaCheck *online*, it is possible to choose which process the data should be sent to. This is done by checking the process ID on ClimaCheck *online* and choosing it from the PA Pro III display. The ID consists of the PA Pro III serial number and a suffix such as @1 or #1. To choose the suffix:

- Press ESC to enter the Main menu
- Press Down until "Setup" appears in the display
- Press SEL to enter setup menu
- Press Down until "Restart/Reboot" is showed in the display
- Press OK
- From the Setup menu, choose Select ID Suffix and select the corresponding suffix.

### 3.10 Clear counters

When using the digital inputs of the gateway as counters (for example volume or energy from pulse input), the gateway stores the counter value. To clear the stored value:

- Press ESC to enter the Main menu
- Press Down until "Setup" appears in the display
- Press SEL to enter setup menu
- Press Down until "Clear Persistent Counters" is showed in the display
- Press OK

When using the CPA meter on one phase, the gateway calculates the 3 phase energy and stores the value. To clear the stored value:

- Press ESC to enter the Main menu
- Press Down until "Setup" appears in the display
- Press SEL to enter setup menu
- Press Down until "Clear Energy Counters" is showed in the display
- Press OK

### 3.11 Set network interface

Network interface used by the Gateway to communicate with internet (ClimaCheck *online* server) can be set on the network interface menu. To enter it

- Press ESC to enter the Main menu
- Press down until "Network Setup" appears in the display
- Press SEL to enter Network Setup menu
- "Network Interface" appears in the display
- Press SEL

The Gateway will change view, at the top of the page the current selection is displayed as (Active XXXX) where XXXX is GPRS, LAN, WiFi, non or DIP. Below 6 options are listed:

Network	Description
GPRS	Use the built-in modem
LAN	Use the LAN connection to connect trough a local network
LAN2	Not present
WiFi	Use the Wi-Fi connection.
No network (Flight mode)	Unit is not connected to internet, all network interfaces (including modem/GPRS) are switched off. Only USB connection to a local computer is possible.
Use DIP-Switch	Changes network dependant on the DIP-switch setting, see section 5.2

- Choose network interface by pressing directly on the desired interface.
- Press OK to confirm

To change communication settings like APN, SSID's or IP addresses for GPRS, LAN or WiFi use the PA Pro III Configurator, see section 4.8 , 4.9 or 4.10.

### 3.12 WiFi connectivity for PC in Online Mode.

By default, the WiFi access point in the Gateway is deactivated in Online mode. To activate it without changing the connection mode or rebooting the system follow the steps below.

- Press ESC to enter the Main menu
- Press down until "Network Setup" appears in the display
- Press SEL to enter Network Setup menu
- Press Down until "Use WiFi for PC in Online Mode" appears in the display
- Press SEL to enter the menu
- Press Yes, and then confirm with OK,
- Press ESC until the start screen shows

A PC can now connect to the NX400 and log data over WiFi simultaneously as data is sent to ClimaCheck *online*. To deactivate the access point functionality again follow the steps below.

- Press ESC to enter the Main menu
- Press down until "Network Setup" appears in the display
- Press SEL to enter Network Setup menu
- Press Down until "Use WiFi for PC in Online Mode" appears in the display
- Press SEL to enter the menu
- Press No, and then confirm with OK,
- Press OK. "WiFi OFF" appears

The WiFi connection is switched off if the unit is rebooted and starts in Online Mode. See section 2.3 for more information about the Connection modes.

### 3.13 Online in PC Mode

The Gateway can be setup to connect with the ClimaCheck *online* server in PC Mode. If activated, this is done regardless of network interface settings except "No Network", see section 2.3 and 3.11.

To activate, follow the steps below

- Press ESC to enter the Main menu
- Press down until "Network Setup" appears in the display
- Press SEL to enter Network Setup menu
- Press Down until "Online in PCMode" appears in the display
- Press SEL to enter the menu
- Press Yes, and then confirm with OK.
- Press OK, "Online in PCMode On" appears

To deactivate

- Press ESC to enter the Main menu
- Press down until "Network Setup" appears in the display
- Press SEL to enter Network Setup menu
- Press Down until "Online in PCMode" appears in the display
- Press SEL to enter the menu
- Press No, and then confirm with OK
- Press OK, "Online in PCMode Off" appears

Note, if a sim card is inserted but not configured correctly (with APN and pin code) or if a deactivated sim card is inserted, the unit will try to connect each time the system boots up. After 60 seconds the connection times out and the Gateway will continue loading the application. For a faster boot up sequence the sim card can be removed or Online in PCMode can be deactivated.

### 3.14 Log data to USB memory

Data can be saved to a USB memory connected to the USB-port on the top side of the unit, see Figure 31. Data is saved with the same interval that is used to send data to the ClimaCheck *online* server i.e. once every minute when the compressor is running and every 5 minutes when it's off.

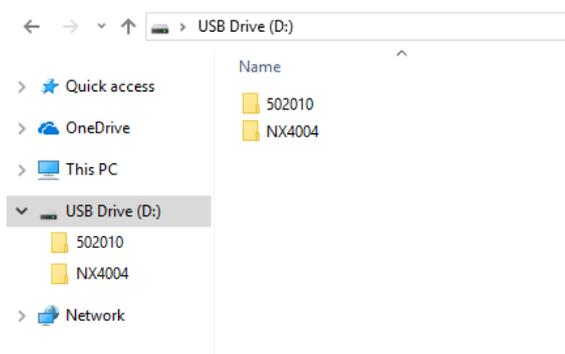
The USB memory needs to be formatted with the file system FAT or FAT32.

To activate logging to USB:

- Shut off logger by disconnecting power
- Connect the USB memory to the USB-A port on the top side of the unit.
- Start logger by connecting power again. Wait for the unit to start.
- Press ESC to enter the Main menu
- Press down until "Data/Config. Backup" appears in the display
- Press SEL to enter Data/Config. Backup menu
- "Log data to USB" appears in the display
- Press SEL to enter the menu,
- Press Yes and then confirm with OK

A folder is created on the USB memory with the PA-ID as name and the data is saved in \*.LOG files as comma separated values. A new file is created for each day and when the USB memory is full the logging stop.

For instructions on how to run \*.LOG files in the ClimaCheck software please see the ClimaCheck Software manual.



**Figure 10 USB memory with data from two different Gateways**

To deactivate logging to USB:

- Press ESC to enter the Main menu
- Press down until "Data/Config. Backup" appears in the display
- Press SEL to enter Data/Config. Backup menu
- "Log data to USB" appears in the display
- Press SEL to enter the menu,
- Press No and then confirm with OK

### **3.15 Backup and restore configuration**

The present configuration in the unit can be backed up to the internal memory or to a USB memory connected to the USB-port on the top side of the unit, see Figure 31. The configuration can then be loaded from internal or USB memory.

To save the configuration in the internal memory:

- Press ESC to enter the Main menu
- Press down until "Data/Config. Backup" appears in the display
- Press SEL to enter Data/Config. Backup menu
- Press down until "Backup/Restore config" appears in the display
- Press SEL to enter menu
- Press "Backup Config intern" and confirm with OK

To save the configuration to the USB memory:

- Shut off logger by disconnecting power
- Connect the USB memory to the USB-A port on top side of the unit.
- Start logger by connecting power again. Wait for the unit to start.
- Press ESC to enter the Main menu
- Press down until "Data/Config. Backup" appears in the display
- Press SEL to enter Data/Config. Backup menu
- Press down until "Backup/Restore config" appears in the display
- Press SEL to enter menu
- Press "Backup Config to USB" and confirm with OK

A \*.cfg file is created on the USB memory with the PA-id as name.

To load a configuration from the backup on the internal memory of the unit:

- Press ESC to enter the Main menu
- Press down until "Data/Config. Backup" appears in the display
- Press SEL to enter Data/Config. Backup menu
- Press down until "Backup/Restore config" appears in the display
- Press SEL to enter menu
- Press "Restore Conf Intern" and confirm with OK

To load a configuration from a \*.cfg configuration file on a USB memory connected to the USB-port on the top side of the unit, see Figure 31, follow the instructions below:

- Shut off logger by disconnecting power
- Connect the USB memory to the USB-A port on top side of the unit.
- Start logger by connecting power again. Wait for the unit to start.
- Press ESC to enter the Main menu
- Press down until "Data/Config. Backup" appears in the display
- Press SEL to enter Data/Config. Backup menu
- Press down until "Backup/Restore config" appears in the display
- Press SEL to enter menu
- Press "Restore Conf from USB" and confirm with OK

## 4 PA Pro III configurator

The chapter describes how to use the PA Pro III configurator for inputs, external units and communication settings. The ClimaCheck Gateway NX400 configuration tool can be found under the Performance Analyser Pro menu in the ClimaCheck software. To use the PA Pro III Configuration tool the computer needs to be connected with a **USB cable**. Ethernet or Wifi connection will not work.

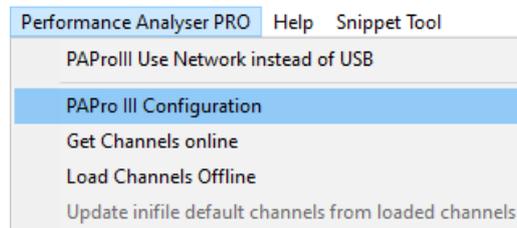


Figure 11

All Gateways have their default configuration on the ClimaCheck *online* server but with the configurator, settings can be changed offline without the need of an internet connection.

To exit the configurator, go to File menu and then Exit. The configurator will be stopped and the ClimaCheck software is opened again.

### 4.1 Overview

The Action menu contains functions for connecting, reboot and disconnecting from the device, adjust the internal clock, get and send configuration and to unlock the configurator to be able to change configuration. With the view menu Debug messages can be displayed.

The configurator has 7 tabs:

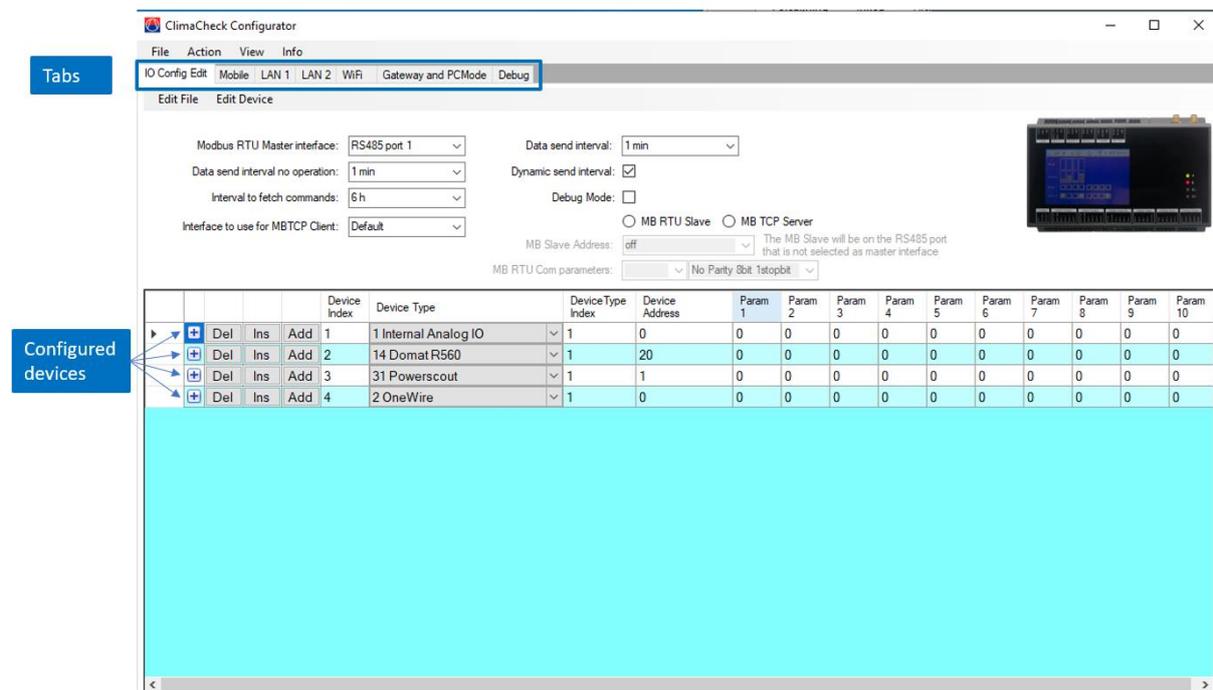


Figure 12, PA Pro III Configurator

## **IO Config Edit**

Handles configuration for analog inputs on the Gateway and external units connected through Modbus/RS485. Data send interval, interval to fetch commands from the ClimaCheck *online* server and Debug mode is also controlled from this tab.

### **Mobile**

APN, username and other settings for the built-in modem.

### **LAN 1**

IP address and other settings for the wired/ethernet network connection.

### **LAN 2**

IP address and other settings for the second wired/ethernet network connection through a USB-to-Ethernet converter, not included as standard. Contact ClimaCheck for more information.

### **Wifi**

SSID, passphrase and other settings for the wireless LAN (Wi-Fi) connection.

### **Gateway and PCMode**

Settings for the ClimaCheck RTCU Gateway and PC Mode as default setting.

### **Debug**

View debug information.

Functions on the different tabs are described in more detail in the below sections.

## **4.2 Password protection**

To be able to write a configuration to the Gateway from the configurator a password needs to be entered. All units are configured with a default password but this can easily be changed.

### **4.2.1 Connect to and unlock unit**

Follow the steps below to unlock the unite.

- On the Action menu choose Connect to Device, in the lower right corner the PAID of the connected device can be seen, Figure 12.
- On the Action menu go to Unlock for Write to Device
- Enter the password in the new window and press OK (default password: **ef56** )

When the correct password has been entered all menu options are accessible and a new option appears on the Action menu where the user password can be changed.

### **4.2.2 Change password**

To change password follow the steps below

- Connect to and unlock the device with present password, see 4.2.1
- On the Action menu go to Configure Password for unlock
- Enter the new password in the window and press OK

The new password is saved.

If password is lost it can be reset by ClimaCheck support.

### 4.3 Adjust Clock

The internal clock is synced with the ClimaCheck *online* server with the correct time zone of the unit. However, if unit has been moved, the clock can be set from the Action menu.

- Connect to and unlock the device with present password, see 4.2.1
- On the Action menu go to Adjust Clock
- A new window will appear where date and time can be set manually or by Applying the time from the PC.
- Press Apply to save changes in the device.

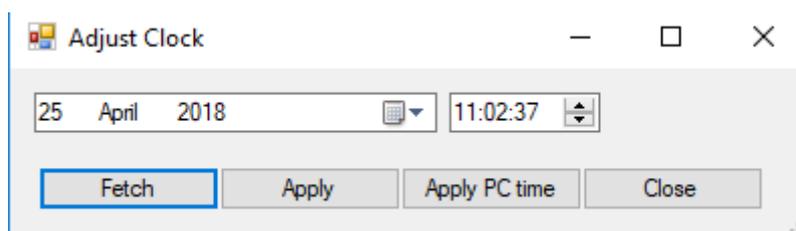


Figure 13, Clock settings in Configurator

### 4.4 Update Firmware and internal Application

If firmware or internal application updates are sent by ClimaCheck support these can be loaded to the unit from the Action menu. To see your present version of the application, see section 1.3.

#### 4.4.1 Update Firmware

If both Firmware and Application files are supplied by ClimaCheck support start with the Firmware files and then the Application files.

Firmware is supplied as 2 or 3 different \*.bin files called monitor, system and runtime. See Figure 14. The order in which these files are loaded to the unit is important, **always follow the sequence: first A, then B and (if supplied) last C.**

- A. Monitor file (first file to be loaded to the unit)
- B. System file (second file to be loaded to the unit)
- C. Runtime file (third file to be loaded to the unit, runtime file is not always needed)

 NX-400 monitor-firmware V1.40.00.bin	03/06/2019 08:18	BIN File
 NX-400 runtime-firmware V1.53.00.bin	19/12/2019 14:05	BIN File
 NX-400 system-firmware V1.06.00.bin	14/10/2019 14:48	BIN File

Figure 14, Firmware files

To updated Firmware follow the instructions below

- Connect to and unlock the device with present password, see 4.2.1
- On the Action menu go to Update Device and then Update Firmware
- Go to the folder where you have saved the firmware files and select the file to upload.
- Press Open.

The file is loaded to the unit and the progress can be seen on the lower edge of the Configurator,

see Figure 15. The unit will reboot automatically and install the update. **Do not disconnect USB cable or power supply during update process!**

- When the unit has booted up and shows the normal start page repeat the steps above for all supplied firmware files in the order described above.



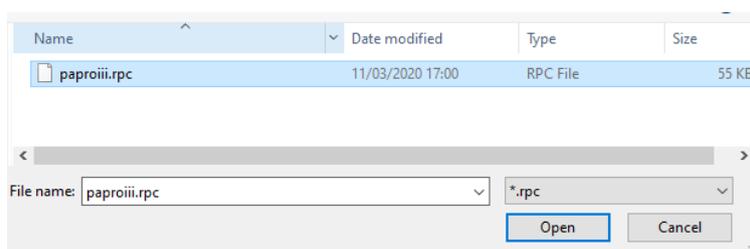
**Figure 15, Firmware update**

#### 4.4.2 Update Application

If both Firmware and Application files are supplied by ClimaCheck support start with the Firmware files and then the Application files.

The application is supplied as a compressed file with a folder inside. Extract the folder to a place on your computer and then:

- Connect to and unlock the device with present password, see 4.2.1
- On the Action menu go to Update Device and then Update Application
- Go to the folder where you have extracted the application files and select the paproiii.rpc file.
- Press Open.



**Figure 16, Application file**

The file is loaded to the unit and the unit will reboot automatically and install the update. **Do not disconnect USB cable or power supply during update process!**

### 4.5 Configuration files

All configuration can be saved to and loaded from configuration files, \*.CFG.

#### 4.5.1 Open Gateway NX400 configuration

To open the present configuration, follow the steps below

- Connect to and unlock the device with present password, see 4.2.1
- On the IO Config Edit tab go to Edit Device and then Open Configuration in device

The configuration is loaded and all settings are displayed on the IO Config Edit tab.

#### 4.5.2 Open and make a backup of the Gateway NX400 configuration

To open the present configuration and save it to a file follow the steps below

- Connect to and unlock the device with present password, see 4.2.1
- On the IO Config Edit tab go to Edit Device and then Open Configuration in device

The configuration is loaded and all settings are displayed on the IO Config Edit tab.

- Go to Edit File and Save File, choose a name and press save.

To use your backup and restore settings see section 4.5.3

### 4.5.3 Load configuration from file to Gateway NX400

Follow the steps below to load a configuration from a premade configuration file (\*.CFG) to the Gateway. In the ClimaCheck Software

- Connect to and unlock the device with present password, see 4.2.1
- On the IO Config Edit tab go to Edit File and then Open File
- Select the Configuration file in the new window and press Open.

The file is loaded and all settings are displayed on the IO Config Edit tab.

- Go to Edit Device menu and then Save configuration in device

All configuration in the Gateway will be replaced by the new configuration file. To make a backup of existing configuration see section 4.5.1

## 4.6 Edit Gateway input configuration

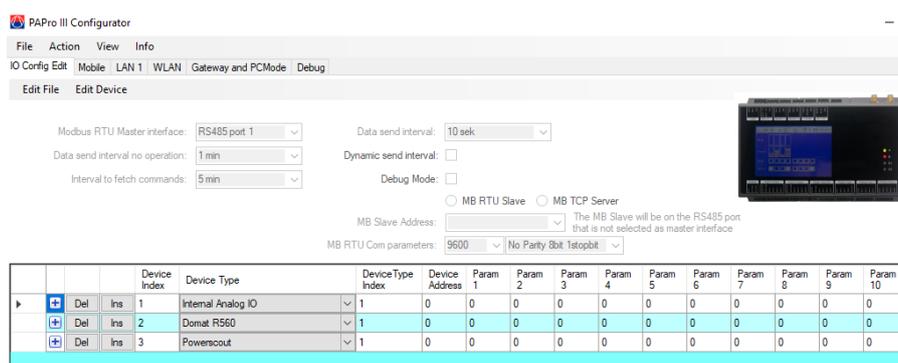


Figure 17

### 4.6.1 Change Analog input configuration

The analog inputs on the Gateway and Domat R560 module can be used for different 0-10V and 4-20mA sensors.

To change configuration, follow the steps below.

- Connect to and unlock the device with present password, see 4.2.1
- On the IO Config Edit tab go to Edit Device and then Open Configuration in device

The configuration is loaded and all settings are displayed on the IO Config Edit tab.

- Open the list with inputs for a device with the + to the left, see Figure 18
- Select new sensor type on the drop-down menu
- Write a Comment for the new sensor, this name is what will be showed in the Data source.
- On the IO Config Edit tab go to Edit Device and then Save Configuration in device, the unit will reboot.

Note that the Sensor Type list is the same for Gateway and R560 but the analog inputs on the Gateway can't handle Pt 1000 sensors.

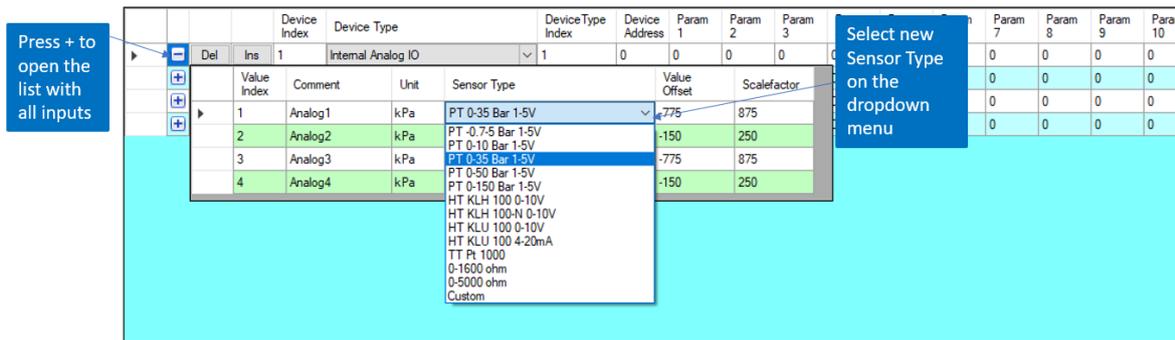


Figure 18

#### 4.6.2 Use a Custom sensor

Any sensor with a 0-10V or 0-20mA signal can be used with the Gateway. To use a custom sensor that is not preconfigured follow the steps below.

- Connect to and unlock the device with present password, see 4.2.1
- On the IO Config Edit tab go to Edit Device and then Open Configuration in device

The configuration is loaded and all settings are displayed on the IO Config Edit tab.

- Open the list with inputs for a device with the + to the left, see Figure 18
- Select Custom on the drop-down menu
- Enter Value Offset and Scale factor for the new sensor
- Write a Comment for the new sensor, this name is what will be showed in the Data source.
- On the IO Config Edit tab go to Edit Device and then Save Configuration in device, the unit will reboot.

All analog inputs are set to voltage input (0-10V) as default. To use a sensor with current signal (4-20mA) the input configuration needs to be changed see section 5.1.

#### 4.6.3 Add an external unit

To connect and use a new external unit such as a power meter, input module R560 or another device communicating with Modbus the configuration needs to be added to the Gateway. This can be done in three different ways.

##### Download configuration from ClimaCheck *online* server over internet

Contact ClimaCheck support and make sure the correct configuration is updated on the server then see section 3.8.1.

##### Load new configuration from a configuration file (\*.CFG)

Contact ClimaCheck support to get a configuration file with the new external device included then see section 4.5.3.

### Add a new unit using the ClimaCheck configurator

When the present configuration in the Gateway has been uploaded to the configurator it is displayed on the IO Config Edit tab, see section 4.5.1 for instructions.

Each row is a configured external unit with a Device index, Device Type Index and Device Address, see Figure 17 and Figure 19. The Device index is a unique number for each unit starting from 1. Device Type Index is used if more than 1 unit of the same type is configured. Device Address is the Modbus Address of the device.

To add a unit:

- Press Ins (to add on the row above) or Add (to add on the row below)
- Choose the unit you want to add on the Device Type menu
- Set Device Type Index
- Set Device Address

In Figure 19 a second Domat R560 unit with Modbus address 21 has been added. Since this is the second unit of that type Device Type Index is set to 2 for the new unit.

				Device Index	Device Type	Device Type Index	Device Address	Param 1	Param 2	Param 3	Param 4	Param 5	Param 6	Param 7	Param 8	Param 9	Param 10
	+	Del	Ins	Add	1	Internal Analog IO	1	0	0	0	0	0	0	0	0	0	0
	+	Del	Ins	Add	2	Domat R560	1	20	0	0	0	0	0	0	0	0	0
	+	Del	Ins	Add	3	Powerscout	1	1	0	0	0	0	0	0	0	0	0
	+	Del	Ins	Add	4	Domat R560	2	21	0	0	0	0	0	0	0	0	0
	+	Del	Ins	Add	5	OneWire	1	0	0	0	0	0	0	0	0	0	0

**Figure 19, External units**

Param 1-10 is parameters used to configure the device, see Table 5 for default settings and active parameters for each external unit.

**Table 5, Default parameters for external unit configuration**

Device	Param 1	Param 2	Param 3	Param 4	Param 5	Param 6	Param 7	Param 8	Param 9	Param 10
Power scout	0.5	0	0	0	0	0	0	0	0	0
	Param 1 - Limit for no operation (kW), see section 4.7.2 Param 2-10 - n/a									
Power scout no voltage	0.5	0	0	0	0	0	0	0	0	0
	Param 1 - Limit for no operation (kW), see section 4.7.2 Param 2-10 - n/a									
EM24 / EM26	0.5	0	0	0	0	0	0	0	0	0
	Param 1 - Limit for no operation (kW), see section 4.7.2 Param 2-10 - n/a									
EM24 / EM26 no voltage	0.5	0	0	0	0	0	0	0	0	0
	Param 1 - Limit for no operation (kW), see section 4.7.2 Param 2-10 - n/a									

EM210	0.5	0	0	0	0	0	0	0	0	0	0
	Param 1 - Limit for no operation (kW), see section 4.7.2 Param 2-10 - n/a										
EM210 No voltage	0.5	0	0	0	0	0	0	0	0	0	0
	Param 1 - Limit for no operation (kW), see section 4.7.2 Param 2-10 - n/a										
81 MB RTU16Bit (Master)	na	na	0	0	0	0	0	0	0	0	0
	Param 1 - Start register Param 2 - Number of registers to read Param 3-10 - n/a										
82 MB RTU32Bit (Master)	na	na	0	0	0	0	0	0	0	0	0
	Param 1 - Start register Param 2 - Number of registers to read Param 3-10 - n/a										
91 MB 16Bit in storage	0	0	0	0	0	0	0	0	0	0	0
	See ClimaCheck_NX400_ModBusRTU_TCP manual.										
92 MB 16Bit out storage	0	0	0	0	0	0	0	0	0	0	0
	See ClimaCheck_NX400_ModBusRTU_TCP manual.										
93 MBTCP16bit (Client)	na	na	0	0	0	0	0	0	0	0	0
	See ClimaCheck_NX400_ModBusRTU_TCP manual.										

## 4.7 Communication settings

Communication settings for Modbus and data sent to the ClimaCheck *online* server are found on the IO Config tab. To load and save your settings see section 4.5.1

The screenshot shows the 'IO Config Edit' tab with the following settings:

- Modbus RTU Master interface: RS485 port 1
- Data send interval: 1 min
- Data send interval no operation: 1 min
- Dynamic send interval:
- Interval to fetch commands: 6 h
- Debug Mode:
- Interface to use for MBTCP Client: Default
- MB RTU Slave Address: off
- MB RTU Com parameters: 9600, No Parity 8bit 1stopbit
- Radio buttons: MB RTU Slave (selected), MB TCP Server

A note states: "The MB RTU Slave will be on the RS485 port that is not selected as master interface"

Figure 20

### 4.7.1 Modbus interface

**Modbus RTU Master interface** sets the interface/port on the unit that is used to communicate with external Modbus units.

Default setting is RS485 port 1, this setting should not be changed if not instructed to do so by the ClimaCheck support.

### 4.7.2 Send interval

**Data send interval no operation**, **Data send interval** and the check box **Dynamic send interval** control how often data is sent to the ClimaCheck *online* server. When Dynamic send interval is selected measured power input is monitored and if any meter has a total power higher than the preset limit "Data send interval" is used. If all meters are below the preset limit "Data send interval no operation" is used.

The default values are 1 minute for "Data send interval" and 5 minutes for "Data send interval no operation". The default limit (0.5kW) can be changed in the configuration of the power meter, see section 4.6.3

### 4.7.3 Debug mode

Activates Debug mode which can be seen on the Debug tab.

### 4.7.4 MB RTU Slave and MB TCP Server

The Gateway can be configured to act as a Modbus RTU Slave or Modbus TCP Server.

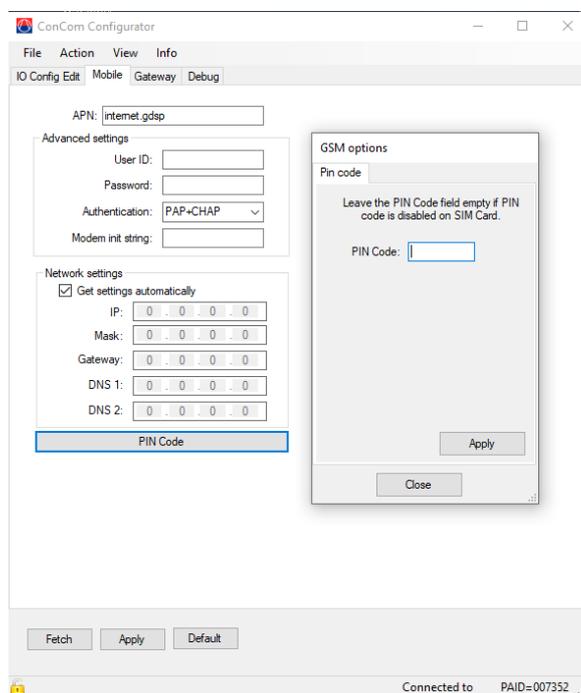
**MB RTU Slave Address** sets the address used when the unit is configured as Modbus Slave. The port used will automatically be selected as the port not used as master interface. It is also possible to set the communication parameters for the Modbus RTU. See separate NX400 - Modbus RTU Slave manual for details.

### 4.7.5 Interface to use for MBTCP Client

Choose network interface (Default, LAN1, LAN2 or Wifi) for Modbus TCP Client communication. This is used when the unit communicates with the ClimaCheck *online* server and the Modbus TCP Server on different networks. Default setting uses same network as is setup for ClimaCheck *online* communication.

## 4.8 Mobile tab

The Mobile tab contains all settings for APN, PIN code, User ID, password and other settings for the built-in modem. Read the present settings in the Gateway unit with the Fetch button and write settings to the unit with the Apply button.



**Figure 21 Mobile tab and PIN Code window**

Default settings with APN for the SIM card provided by ClimaCheck can be seen in Figure 21. To use a different SIM-card follow the instructions below.

- Unlock the configurator with the user password, see section 4.2
- Go to the Mobile tab
- Press Fetch to read the present configuration
- Enter APN for the new card
- Enter User ID and Password if this is required by the operator
- Press PIN Code and enter PIN code in the new window, leave empty if PIN code is disabled.
- Press Apply and then Close to go back to Mobile tab.
- Press Apply to store settings in the Gateway
- Got to Action and Restart Device

The Gateway will reboot and connect with the new settings. If the communication is changed from LAN or WiFi to Mobile, the selected network interface needs to be changed. This is done from the menu in the internal application, see section 3.11, or with DIP-switches, see section 5.2.

## 4.9 LAN 1 tab

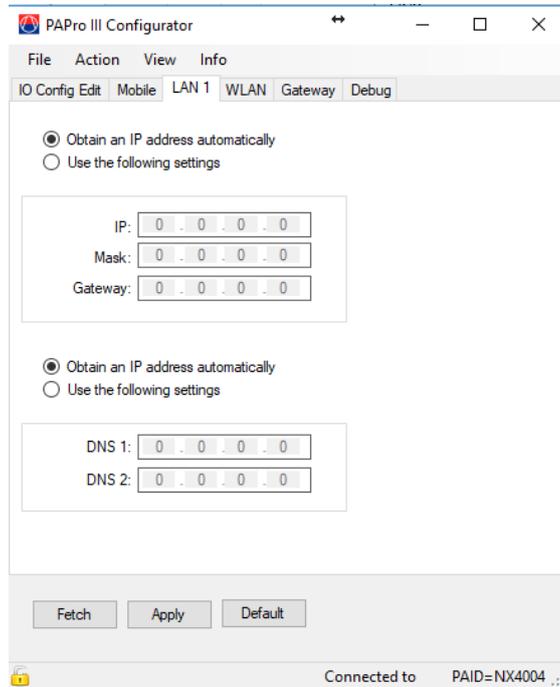
LAN 1 tab contains settings for the ethernet/LAN connection. Read the present settings in the Gateway with the Fetch button and write settings to the unit with the Apply button.

Default settings (Obtain IP address from DHCP server) can be seen in Figure 22. To change settings follow the instructions below.

- Unlock the configurator with the user password, see section 4.2
- Go to the LAN 1 tab
- Press Fetch to read the present configuration
- Enter settings for the Network the Gateway is connected to

- Press Apply to store settings in the Gateway
- Got to Action and Restart Device

The Gateway will reboot and connect with the new settings. If the communication is changed from Mobile or WiFi to LAN the selected network interface needs to be changed, this is done with DIP-switches, see section 5.2 or from the menu in the internal application, see section 3.11.



**Figure 22 LAN 1 tab**

#### 4.10 LAN 2 tab

LAN 2 tab contains settings for the second network connection through a USB-to-Ethernet converter, not included as standard. See section 4.9 for configuration or contact ClimaCheck for more information.

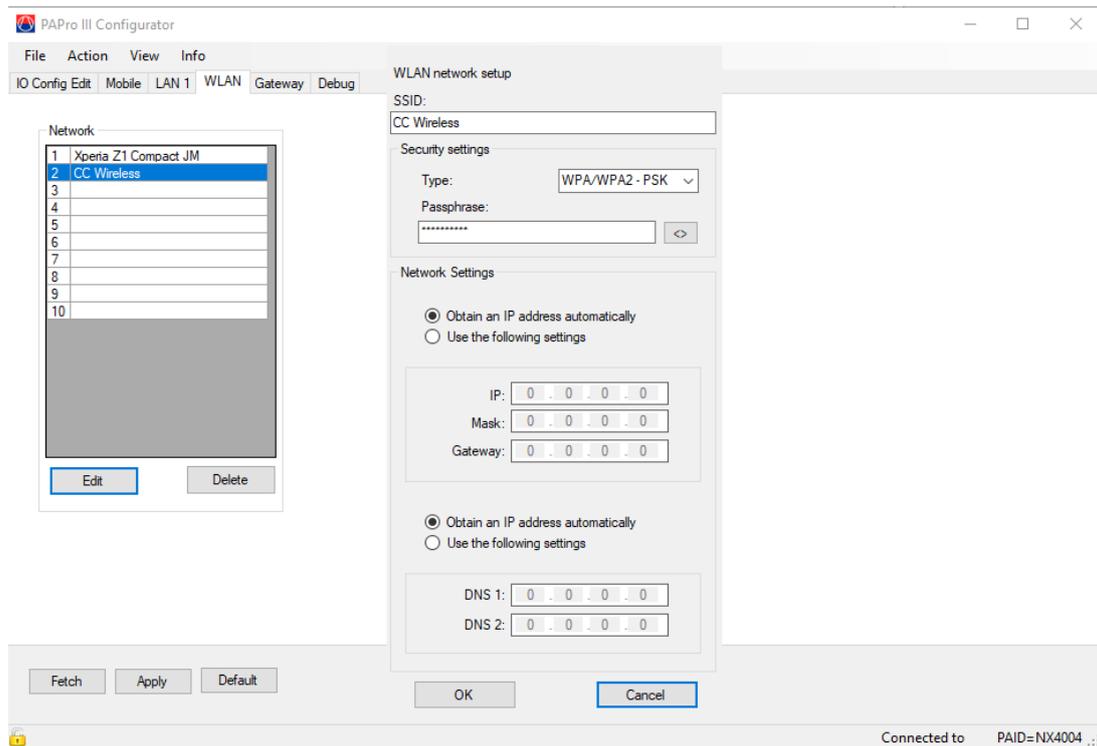
#### 4.11 WiFi tab

WiFi tab contains settings for the WiFi connection used for Internet access. Read the present settings in the Gateway with the Fetch button and write settings to the unit with the Apply button.

10 different networks/SSID's can be configured in the Gateway. To enter or change a connection follow the instructions below

- Unlock the configurator with the user password, see section 4.2
- Go to the WiFi tab
- Press Fetch to read the present configuration
- Select one of the ten positions and press Edit
- In the new window enter SSID and passphrase for the wireless network and then network settings (obtain automatically or enter manual), see Figure 23
- Press OK to save and close the window and then Apply to store settings in the Gateway
- Got to Action and Restart Device

The Gateway will reboot and connect with the new settings. If the communication is changed from Mobile or LAN to WiFi the selected network interface needs to be changed, this is done with DIP-switches, see section 5.2 or from the menu in the internal application, see section 3.11.



**Figure 23 WiFi tab with "CC Wireless" configuration open**

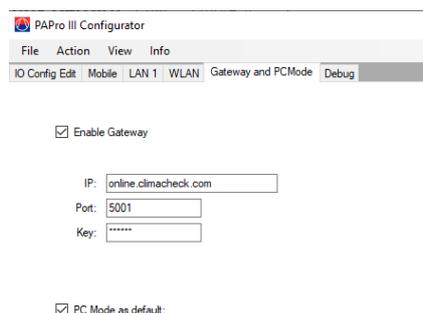
## 4.12 Gateway and PCMode tab

Firmware and internal application in the Gateway can be remotely updated through the ClimaCheck RTCU gateway.

Do not change settings if not instructed to do so by the ClimaCheck Support.

### PC Mode

The default communication mode described in section 2.3 can here be configured as PC Mode (tick the box) or Online Mode (no tick in the box), see Figure 24.



**Figure 24, Gateway and PCMode tab**

## 4.13 Debug tab

Displays debug information from the unit when this is activated on the IO Config tab, see section 4.7.3 and Figure 20.

## 5 External switches and connections

The chapter describes the external connections and DIP-switches on the ClimaCheck Gateway NX400. For a full description please refer to the supplier manual RTCU-NX400.

### 5.1 Analog Input Mode selection switches (mA/V)

To change the analog inputs on the Gateway between current and voltage input dipswitches on the back side of the unit is used, see Figure 25.

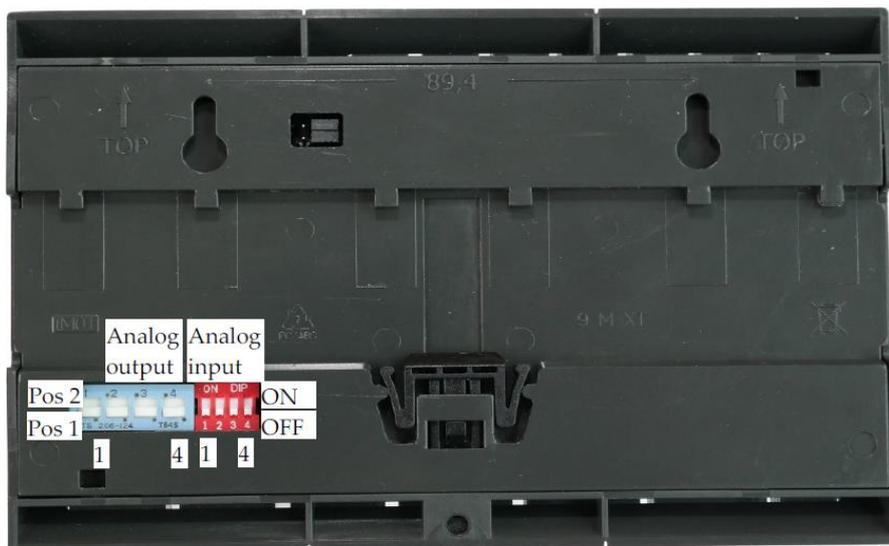


Figure 25 Back side view

The red DIP-switch block to the right controls analog input 1 to 4 where OFF means voltage input (0-10V) and ON means current input (0-20mA), see Figure 26.

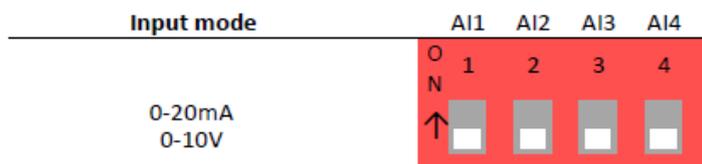


Figure 26 Analog input DIP-switch

### 5.2 Network interface selection switch

To select network interface between LAN, WiFi and mobile DIP-switch 1 and 2 on the top left side can be used, see Figure 27. The DIP-switch is only active if the setting under Network interface on the Network Setup menu in the internal application is set to Use DIP-Switches, see section 3.11.

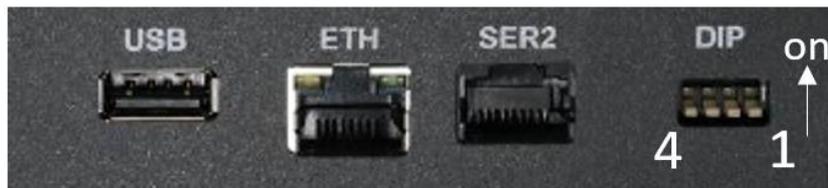
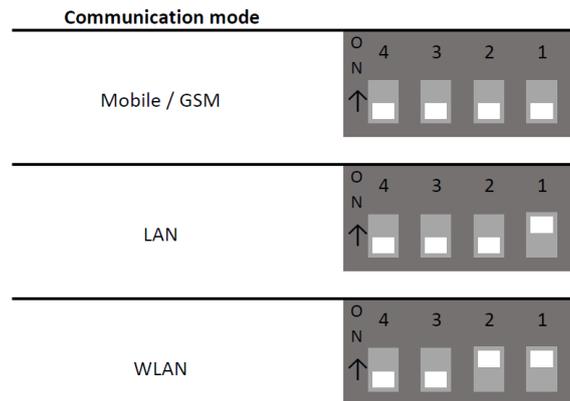


Figure 27 DIP-switches for communication

The DIP switches can be set as shown in Figure 28.



**Figure 28 Communication mode DIP-switch**

Reboot the unit for changes to take effect. DIP-switch 3 and 4 are reserved for future functions. Communication through USB is always active regardless of DIP-switch setting.

### 5.3 Digital inputs

The Gateway has 8 digital inputs, grouped in 2, located at the bottom of the unit, as shown in Figure 30. They can be activated by connecting a positive voltage (8-40 VDC) between the corresponding input (DINx) and the DIN GND on the corresponding terminal connector group.

### 5.4 A and B alarms to digital out

Alarms set on ClimaCheck *online* server can be categorised as A or B alarms and digital out 7 or 8 can be activated.

The digital outputs are supplied from DOUT SUP+ and DOUT GND and are independent of the system supply. When the output is active, DOUT SUP+ is connected to the output (DO).

**Table 6, Digital out specification**

Type	Min	Max	Unit
Solid state	5.5	36	VDC
	-	1.5	A
	-	280	mΩ

## 5.5 External connections

Connections to external equipment are done via pluggable screw terminals that are located on the top and bottom sides of the unit. All connections are available externally for easy access and maintenance.

### Front side

On the front side of the Gateway a large LCD display, with touch screen, is found that shows status of the device. For detailed information on the LCD display see section 0. Also found on the front side is the LED's and the reset switch. LED's are described in section 1.1.

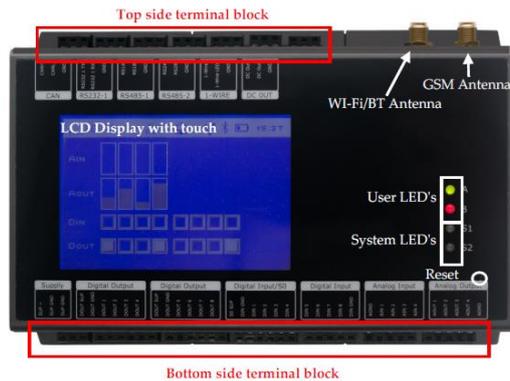


Figure 29 Front view

### Bottom side

On the bottom side terminal of the Gateway the following interfaces are found: Power, digital inputs, digital outputs, analog inputs and analog outputs, as shown in Figure 30. See Table 7 for more information of each terminal.

Above the terminal blocks the following interfaces are found: SD-Card, audio jacks, SIM-card reader and the mini-USB service port.



Figure 30 Bottom-side view

### Top side

On the top side of the Gateway the following interfaces are found: CAN bus, 1-Wire bus, RS485 ports, DC-out and connection for an optional external battery, as shown in Figure 31. See Table 7 for more information of each terminal.

Above the terminal blocks the following interfaces are found: SMA connector for UMTS/GSM, RP-SMA connector for Wi-Fi / Bluetooth, USB host port, Ethernet connector, RS232 port and finally DIP-switches.



**Figure 31 Top-side view**

Below is a list of the pin numbers and descriptions. The pins relevant to ClimaCheck application are highlighted in **yellow**.

**Table 7**

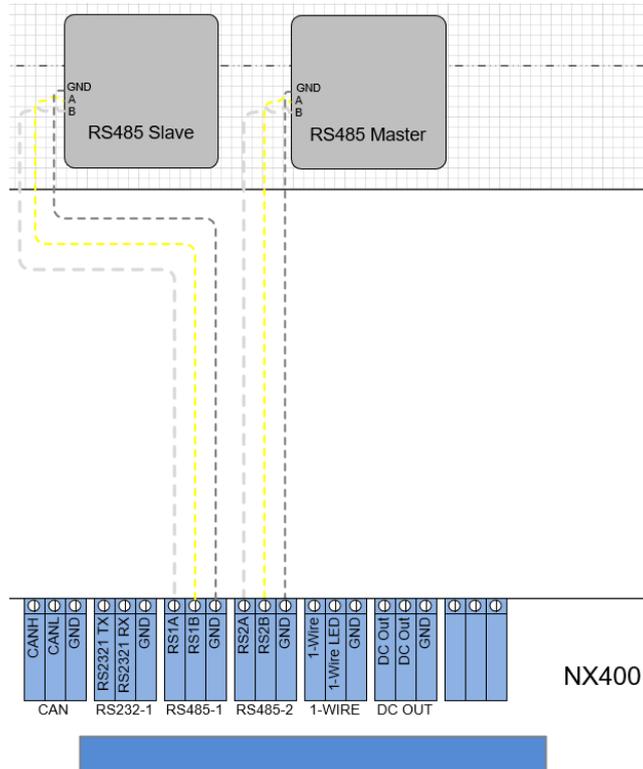
GRP	Pin	Name	Description
1	1	SUP+	Power supply, positive (+) connection
	2	SUP GND	Power ground, negative 1 (-) connection
	3	SUP GND	Power ground, negative (-) connection
2	4	DOUT SUPP	Digital output isolated supply for the digital outputs 1-4
	5	DOUT GND	Digital output isolated ground for the digital outputs 1-4
	6	DOUT1	Digital Output 1
	7	DOUT2	Digital Output 2
	8	DOUT3	Digital Output 3
	9	DOUT4	Digital Output 4
3	10	DOUT SUPP	Digital output isolated supply for the digital outputs 5-8
	11	DOUT GND	Digital output isolated ground for the digital outputs 5-8
	12	DOUT5	Digital Output 5
	13	DOUT6	Digital Output 6
	14	DOUT7	Digital Output 7
	15	DOUT8	Digital Output 8
4	16	S0 SUPP	S0 circuit isolated supply, positive (+) terminal
	17	DIN GND	S0 circuit isolated ground, negative (-) terminal
	18	DIN1	Digital input 1 / S0 input 1 / Wake-up (ignition) input
	19	DIN2	Digital input 2 / S0 input 2
	20	DIN3	Digital input 3 / S0 input 3
	21	DIN4	Digital input 4 / S0 input 4
5	22	DIN5	Digital input 5
	23	DIN6	Digital input 6
	24	DIN7	Digital input 7
	25	DIN8	Digital input 8
	26	DIN GND	Digital input isolated ground
6	27	AGND	Analog ground
	28	AIN 1	Analog input 1
	29	AIN 2	Analog input 2
	30	AIN 3	Analog input 3
	31	AIN 4	Analog input 4
7	32	AOUT1	Analog output 1

	33	AOUT2	Analog output 2
	34	AOUT3	Analog output 3
	35	AOUT4	Analog output 4
	36	AGND	Analog ground
8	37	CAN-H	CAN-bus H-signal
	38	CAN-L	CAN-Bus L-signal
	39	GND	Signal ground
9	40	RS232 1 TX	Transmit data from serial port 1, RS232 compatible
	41	RS232 1 RX	Receive data for serial port 1, RS232 compatible
	42	GND	Signal ground
10	43	RS1A	RS485 non-inverting signal for RS485 port 1
	44	RS1B	RS485 inverting signal for RS485 port 1
	45	SGND	Signal ground
11	46	RS2A	RS485 non-inverting signal for RS485 port 2
	47	RS2B	RS485 inverting signal for RS485 port 2
	48	SGND	Signal ground
12	49	1WIRE	1-Wire bus for accessories such as ID-button/temperature sensors
	50	1WIRE-LED	1-Wire ID-button LED
	51	GND	Signal ground
13	52	DCOUT	+5V / 300mA DC-OUT for external equipment (tied together internally)
	53	DCOUT	+5V / 300mA DC-OUT for external equipment (tied together internally)
	54	GND	Signal ground
14	55	-	External battery positive (+) connection
	56	-	External battery negative (-) connection
	57	-	External battery NTC temperature sensor connection

## 5.6 Modbus RS485 terminal

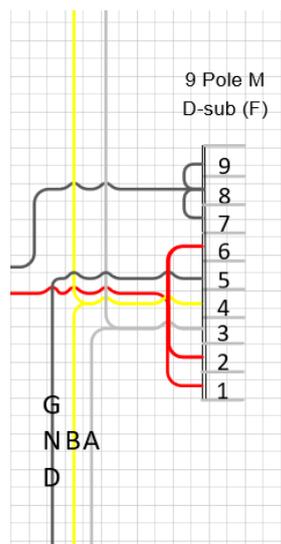
The Gateway has two RS485 terminals (RS485-1 and RS485-2). The primary interface will always be a MODBUS RTU master, see section 4.7.1.

For the fixed installed ClimaCheck *online* hardware, connections are made directly to screw terminals on the Gateway, see Figure 32.



**Figure 32, RS485 terminals on NX400**

For the portable ClimaCheck Onsite PA Pro III, the RS485-1 is connected to a D-Sub contact in the panel, see Figure 33. Connections to RS485-2 is done directly to the screw terminals.



**Figure 33, RS485-1 connections in D-sub**

Note that the labelling A and B is not standardized and the connection between the Gateway and the other system is sometimes A to B and B to A (as in Figure 32) and sometimes A to A and B to B.

Some of the external units, such as R560 and power meters, are powered with 24 VDC from the panel or main housing. The + and – connection for the power supply is using the wires not used for data transmission, connection 1,2,6,7,8 and 9 in Figure 33 above. If using communication cables other than supplied by ClimaCheck make sure that these not risk short circuiting the connection. **If 24VDC is supplied to any of the RS485 connections they will be damage.**