

NGXX USER MANUAL

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0.1 Description

Our system gateways communicate wirelessly with N series sensor/control devices, N series intelligent thermostats, and SC series sensors/ controls. The gateways are the wireless communication hub of the sensor monitoring, logging and control system and network of devices. The Gateways can be configured with an internal or external antenna. The external antenna provides extended wireless communication range and increased reliability at shorter distances. With 2 Gb of memory, our standard gateway can log up to 2 million sensor measurement samples.

N Series gateways utilize a secure RF wireless protocol to communicate with remote sensor and control devices throughout a building, campus or multiple locations. System gateways are accessed through a wired Ethernet network connection and are cloud accessible with Internet enabled network connections. Multiple gateways can be integrated into a single system to expand range, coverage or handle multiple building or location applications.

One gateway is required for each site, and oversees each wireless network of sensor and control devices. It also relays communications between all wireless devices and a connected PC or local network. On-board storage is used to store decades of logged data from the connected sensors in its wireless network. The gateway can be optionally configured to work with our HaloCloud service, allowing remote monitoring, control, and alarms for the entire system.

Gateways include internal storage for sensor data collection and logging, Ethernet connection for access, expansion ports for DB sensor and control modules, battery backup and require USB power. An AC/DC power supply with USB connection is included with every gateway. Available options for extended wireless range (external antenna), increased data storage through SD expansion card slot, Power over Ethernet (PoE) and increased number of expansion ports for DB sensor and control modules.

Our N-series monitoring, control, data logging systems and standalone devices provide a flexible, scaleable and customized solution to meet any of your application requirements. From complete multi-point wired and/or wireless cloud base systems to individual data loggers, our new design platform, features and modular sensor/ control options are the perfect choice for your needs. All of our systems include Paragon Robotics suite of customizable software tools including monitoring dashboards, data logging and charting, export/ import capabilities and individual alarm setpoint configurations and notifications. With a network internet connection to the system or individual data loggers, any devices is devices are securely accessible remotely via cloud from any device and location.

0.2 Features

- Create secure wireless sensor and control networks
- Single gateway range up to 250ft indoors, 1500ft line of sight
- Hundreds of sensors per a single gateway
- Data logging storage capability- 2 million samples and upgrade options of 128 and 256 million data points
- Built in temperature and humidity sensors
- Expansion ports for additional sensors/ controls with our DB modules
- Local digital display for measurement readout, status, and programming

- Advanced wireless and data security with frequency hopping and AES-256 encryption
- High performance and extended range RF transceiver – 0.3 Mile line of sight capability
- Fast 10Mbps Ethernet port for connection to local network router, PC or server
- Full HTTP/DNS/DHCP server and client stack for integration into 3rd party software and dashboards
- Bacnet and Modbus integration
- Power over Ethernet (PoE) configuration option
- Ruggedized polycarbonate plastic enclosure
- Compliant to RoHS directive 2002/95/EC
- Include Product Photo

0.3 Specs

Item	Value
Digital Display	Measurement readout, status and programming
Number of wireless devices	Unlimited
Configuration options	Gateway
Measurement channels	Temperature, Humidity
Built in sensor	Thermistor, Capacitive humidity
Measurement Range	-20 to 70°C (-4 to 158°F) 5 to 95% RH
Units	Temp Celsius, Fahrenheit, RH%
Sensor response time (90%)	Approx. 7 min
Resolution	RH 1% Temp 0.01°C (0.02°F)
Calibrated accuracy	RH ±3%, Temp ±0.5°C (±0.9°F)
Flash Memory	32GB via onboard flash
Data storage capability	Up to 2 million data points
Connectivity	Ethernet
Ethernet port	10Mbps, Connection to local network router, PC or server
Sample rate	10 HZ to 32Hrs
Wireless data security	AES-256 Encryption
Radio Power	250mW
RF carrier frequency	902-928 MHz
RF transmit data rate	Auto-adjusting 32-196kbps
Hopping channels	25
Modulation	GFSK
Transmit power	±20dBm
Receiver sensitivity	-110dBm typical
Range (line of sight)	Up to 1500'
Range (typical indoor)	Up to 250'
Power requirements	AC/DC power adapter with USB-C adapter, Direct USB power
Enclosure material	Ruggedized polycarbonate plastic

External antenna	Yes
Upgradable Firmware	Yes
Indoor/outdoor	Indoor
Operating environment	-40~+85°C(-40+°F); 0~95%RH non-condensing
Dimensions	90x65x18 (mm) (3.54 x 2.56 x 0.71) (in)
Weight	98g
Approvals	US (FCC), CA (IC), EU (CE)
Warranty	One (1) year parts and service

Table 1

0.4 Install

0.4.1 Placement (include range image)

- The gateway should ideally be placed in a central location relative to all the wireless devices it will communicate with. Outdoors, the gateway can wirelessly communicate up to 1000 feet with other devices. In noisy indoor environments, the gateway can cover 70,000 sq-ft of floor area (150' radius)
- **Elevate the gateway.** Placing the gateway in an elevated location can help in avoiding physical obstructions, which are generally found closer to the ground. Chairs, file cabinets, desks, etc. all are physical obstructions whose wireless-degrading effects can be minimized by placing the gateway in a higher location.
- **Install the gateway in a central location.** Placing the gateway in a central location, relative to all connected devices will help ensure robust wireless performance.
- **Avoid physical obstructions & reflective surfaces.** Metal, water, thick walls all degrade wireless performance, and care should be taken when placing the gateway in order to maximize wireless range. Range will be best when line of sight can be established between the gateway and devices. Likewise, reflective surfaces (sheet metal, windows, mirrors, etc.) can increase multi-path interference and degrade wireless performance and range. Place gateway and devices away from such surfaces if possible.

0.5 Power

- The N-Series gateway requires an external power source in order to fully function. Reserve power (AAA Batteries) are included and installed in every N-Series device and act as a backup power source in the case of a power failure. Batteries are estimated to provide power for (insert battery life here). Paragon Robotics recommends the use of the included AC wall adapter for best performance, as other USB-C AC wall adapters may not be able supply sufficient power to the device.
- Power over Ethernet (PoE)
- No power availability at the Gateway location, No problem. Our Model N-Series gateways come standard with Power Over Ethernet (POE) capability to operate on a compatible building network.

0.5.1 Power options

- The N-Series device offers three different power options – Normal, Power Saving and High Performance. Normal mode will balance performance and power consumption

evenly. Power Saving mode will prioritize power consumption over performance while High Performance mode will prioritize performance over power consumption.

0.6 Network Connection

0.6.1 Method #1: Direct connection with PC with wireless

- For many modern laptops and desktops with wireless, the gateway can be directly connected to the Ethernet port on the PC. With Windows 7+, your PC can typically still maintain a wireless connection to the Internet while simultaneously connecting to the gateway through the Ethernet cable. The typical procedure for Windows 7+ is as follows (Mac, Linux, and older Windows versions may require variations to this procedure).
1. Connect an Ethernet cable between the gateway and PC
 2. Confirm the connection signal on the onboard overview displayed on the gateway.
 3. On the PC, click on the network icon on the toolbar and confirm the wired network connects. This may take 30 seconds or more. You may see a message underneath the wired connection indicating there is no Internet connection present, which is okay. If you happen to be presented with any setup options, set the connection to "automatically obtain an IP address (DHCP)".
 4. If you aren't currently at the paragonrobotics.com website, open a browser (we recommend Firefox or Chrome), and go to <http://paragonrobotics.com>

0.6.2 Method #2: Direct Connection with PC without wireless

- For PCs without wireless, or using operating systems that don't allow simultaneous wireless+wired connection, you can still directly connect the gateway to the PC. The typical procedure for Windows 7+ is as follows (Mac, Linux, and older Windows versions may require variations to this procedure).
1. Connect an Ethernet cable between the gateway and PC
 2. Confirm the connection signal on the onboard overview displayed on the gateway.
 3. On the PC, click on the network icon on the toolbar and confirm the wired network connects. This may take 30 seconds or more. You may see a message underneath the wired connection indicating there is no Internet connection present, which is okay. If you happen to be presented with any setup options, set the connection to "automatically obtain an IP address (DHCP)".
 4. Open a browser (we recommend Firefox or Chrome) and type in paragonrobotics.com. If the browser cannot find the server, your PC network may have trouble finding the gateway. You can also try typing in paragonrobotics.local/ or embedded.paragonrobotics.com instead, and see if those options work. If either of those alternatives work, be sure to bookmark the web page so you can use the same address for future connections as well.

0.6.3 Method #3: Connection to a router (LAN)

- If your local network has a router with an available Ethernet port, you can also connect the gateway into the router. For HaloCloud access, either this connection method or method 4 is required, as the gateway will need to be able to connect to the Internet. By

connecting the gateway to a router, you may be able to freely communicate with it using any networked device (including any Wifi devices such as tablet or phone).

1. Connect an Ethernet cable between the gateway and router
2. Confirm the connection signal on the onboard overview displayed on the gateway.
3. On the PC, click on the network icon on the toolbar and confirm the wired network connects. This may take 30 seconds or more. You may see a message underneath the wired connection indicating there is no Internet connection present, which is okay. If you happen to be presented with any setup options, set the connection to "automatically obtain an IP address (DHCP)".
4. If you aren't currently at the paragonrobotics.com website, open a browser (we recommend Firefox or Chrome), and go to <http://paragonrobotics.com>

0.6.4 Method #4: Connection through internet

- Even with no direct local network connection to your gateway, you can still connect with it through the Internet using our HaloCloud service. By connecting the gateway to a router, you may be able to freely communicate with it using any networked device (including any Wifi devices such as tablet or phone).
1. Connect an Ethernet cable between the gateway and an Internet-connected router
 2. Confirm the connection signal on the onboard overview displayed on the gateway.
 3. Connect your PC or mobile device to the Internet
 4. If you aren't currently at the paragonrobotics.com website, open a browser (we recommend Firefox or Chrome), and go to <http://paragonrobotics.com>
 5. Click on the "Sign in" button at the top to sign in to your HaloCloud account. If you do not have an account, follow the instructions to register a new account.

0.7 Device Setup

0.7.1 Claiming your device

- **Claiming instructions** – Claiming your hardware can be done after successfully connecting your device to your network. To claim your hardware, you will need to be signed in to your HaloCloud account. Navigate to the hardware settings tab when signed in. Click “find and add”. Check the box of the device(s) you wish to claim and click “claim”. Your device should now show up under the “Claimed Hardware” section.

0.8 General Software Use

- Data Recorder
- Logging
- Data Analyzer
- Downloading Sensor Data

0.8.1 Data Recorder

- **Data Recorder** is the app used to view and manage any claimed sensors and devices. Logging, alarms, and other options can be configured in this application. Data Recorder

uses a device grid that displays all claimed devices in the current folder. Each device is displayed in its own box and lists any sensors on the device. (image)

- Note that for Nx devices with attached DBx devices attached, the name of the added DBx (along with the port it is attached to and a table of its sensors) will appear below the onboard sensors.

0.8.2 Logging

- Managing **Logging** data can be done through Data Reorder. To manage logging (start, stop, edit) for multiple devices simultaneously, click the "Manage Logging" option in the navbar. A table containing all sensors within the current working folder will be displayed. The following fields are available:
- **Sensor** - Displays the sensor name (read-only).
- **Logging** - When checked, logging is either currently active or will be started once saved. When unchecked, logging is either currently inactive or will be stopped when saved.
- **Resolution** - Logging data is compressed to save space. A larger data resolution will allow you to store more data, however the recorded data will have a lower precision.
- **Interval** - The amount of time between sensor readings.

Click Save changes when you have changed the logging settings. All logging changes will now be saved to the sensors (this may take some time if many changes have been made).

0.9 Alarms

- **Alarms** can be set for onboard sensors or any Paragon Robotics external sensors. While in the grid view of Data Recorder, navigate to the settings of the specific sensor you wish to set an alarm for. This settings option can be opened by clicking the "pencil" logo next to the sensor itself. From here the "Alarms" tab can be accessed and you can add multiple alarms with different conditions if needed. Alerts for these alarms can also be added so a notification can be sent via email or text message (sms).

0.9.1 Data Analyzer

- **Data Analyzer** is used to chart and view data. When you first launch Data Analyzer, you will see an empty chart. The first step to adding a series is to click either Add series or the "+" button on the left side of the screen. Note that logging must be enabled for the sensor you wish to view data for. You will next be prompted with a device selector and will now display any claimed devices. You may choose any of these that have logging enabled. Click Select after you have chosen one or more sensors.

0.10 Expansion Modules

Built in sensors

- All gateways have built in temperature and humidity sensors

DB Modules

- In addition to expanding your monitoring system by creating a wireless network of sensors and controls devices, Gateways come standard with two expansion ports for any of our DB sensor modules.

0.11 Operations and Functions

Start-up Device will power on when connected via the supplied USB-C cable and AC power adapter. Upon startup the Paragon Robotics logo will display on the LCD screen before transitioning to the onboard overview.

LCD Display (Onboard Overview) + photoLocal resolution display for onboard overview. Onboard overview will display temperature and humidity sensor readings, power source, battery life and wireless connection strength.

Buttons and Navigation All N-Series devices offer touch sensitive buttons for onboard overview and menu navigation. Note: Buttons are not pressure sensitive and require minimal to no force to operate.

Factory Reset

- To fully reset the device's settings back to the factory condition, a manual reset procedure can be performed. This full reset can be used if the internal settings have been incorrectly changed or corrupted, preventing any connection via software. This full reset will permanently erase any settings or saved data the gateway currently has.
- To preform a factory reset follow these options through the settings menu: Settings > System > Full Reset. You will then be prompted with “Are you sure you want to make this change?” Select YES or CANCEL using the directional arrows. A successful reset will prompt the Paragon Robotics logo.

Viewing IP address The IP address can be viewed from Hardware Settings while your device is currently connected to your network. Locate your device in the “Claimed Hardware” section and click the “settings” icon for the device. Navigate to the “Network” tab and the IP address can be viewed from here.

0.12 Regulatory Approval

United States
This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. Caution - To satisfy FCC RF exposure requirements for mobile and base station transmission devices, a separation distance of 20 cm or more should be maintained between the antenna of this device and persons during operation. To ensure compliance, operation at closer than this distance is not recommended. The antenna(s) used for this transmitter must not be co-located or

operating in conjunction with any other antenna or transmitter.

Table 2

Canada
This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.
Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.
Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

Table 3

0.13 Disclaimer

Disclaimer
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Table 4