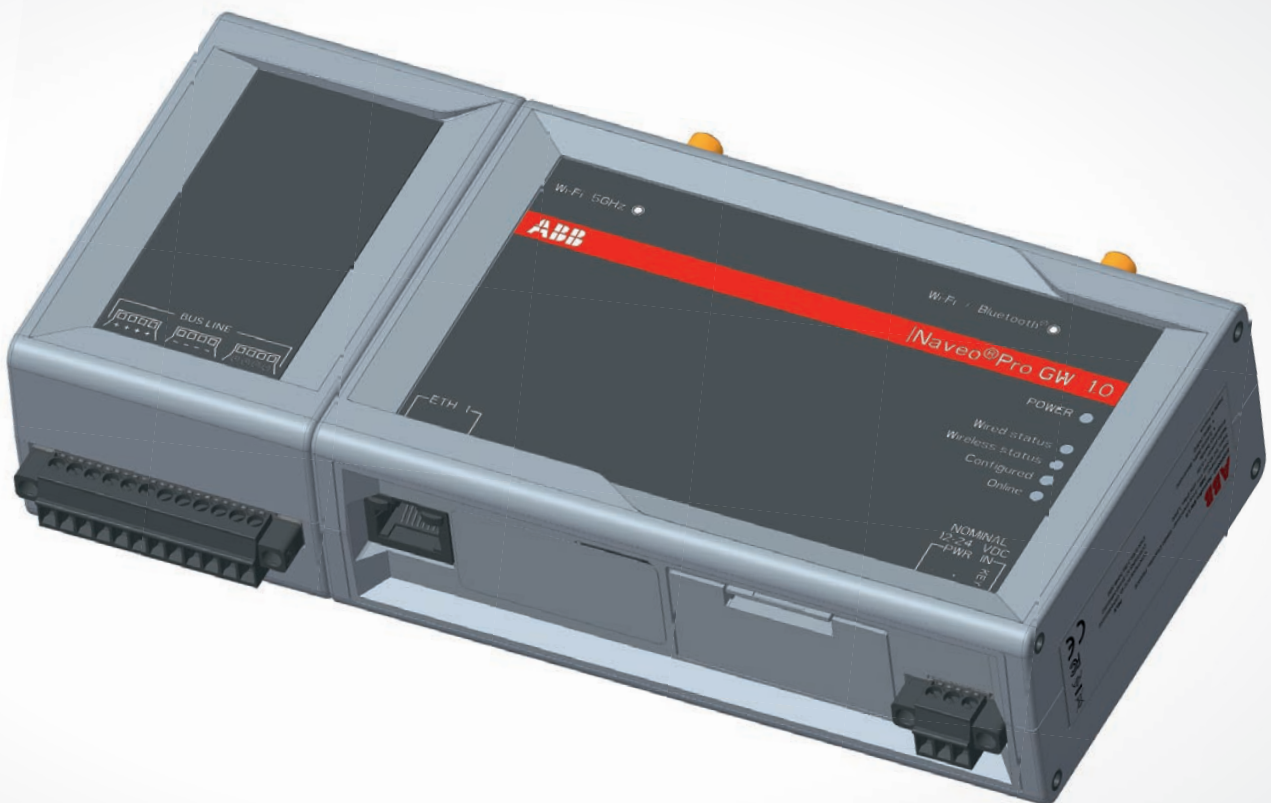


OPERATION MANUAL

ABB Ability™

Naveo®Pro Gateway



Naveo®Pro enables you to set up maintain and control the entire emergency lighting installation, whilst keeping a record of all activity safely in the cloud.

Naveo®Pro offers you a transparent and proactive way to inspect and maintain systems using only your smartphone or iPad/tablet.

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Trademarks

All trademarks, registered trademarks, logos, trade names, products names contained in this document are the property of their respective owners.

Intended Audience of this Document

This document is intended for system integrators: skilled persons with a thorough knowledge in linking together, physically or functionally, different computing systems and software applications to operate as a coordinated whole in compliance with the applicable regulations.

Revision History

07 January 2021

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Introduction

Overview

This manual describes the characteristics of Naveo®Pro Gateway, including:

1. Introduction
2. General view
3. Settings
4. Provision
5. Diagnostic
6. Troubleshooting

Recipients

In accordance with standard International Electrotechnical Vocabulary IEC 60050, this manual is aimed at two user profiles:

- **Competent, skilled or expert persons**
- **Persons with sufficient training and experience** in electric environment (IEV 195-04-01) to enable them to perceive the risks and avoid the hazards potentially created by electricity

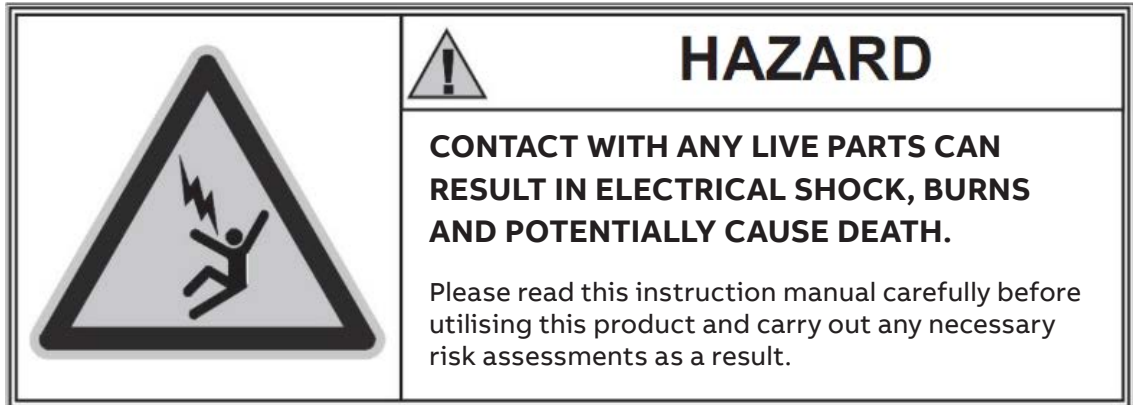
IMPORTANT: in this manual the tasks are specifically indicated that can be performed by competent or expert persons in an electrical environment. All the remaining tasks described in the manual must be performed by trained persons in an electrical environment.

ABB accepts no liability for damage to property or personal injury due to failure to comply with the instructions contained in this document.



Safety

Safety prescriptions



IMPORTANT: In these instructions the tasks are specifically indicated that can be performed by competent or expert persons in an electrical environment. All the remaining tasks described in the manual must be performed by trained persons in an electrical environment. ABB accepts no liability for damage to property or personal injury due to failure to comply with the instructions contained in this document.

HAZARD! ELECTRICAL SHOCK RISK!

In the case of persons who are not authorized to work on parts carrying live voltage in accordance with local legislation, in order to avoid any potential electrical risk during assembly, installation, maintenance or removal of the Naveo®Pro gateway from service, disconnect or lock out all electrical supplies.

WARNING

- It is important to note that this document contains safety and caution indications against certain methods (of installation, use and maintenance) that could harm persons, damage devices or make them less safe.
- These warnings do not encompass all conceivable installation, use and maintenance methods recommended or not recommended by ABB that could be applied and possible consequences and complications of each conceivable method. It is the responsibility of the expert and trained persons to ensure compliance with all applicable safety standards and comply with warnings made in this document. The warnings cannot fully assess each individual installation and the expert or trained person must ensure they carry out suitable risk assessments on their specific installation.
- Anyone who uses maintenance procedures or devices, whether recommended by ABB or not, has to check thoroughly that either personal safety or installation safety devices are not compromised by the installation.
- The safety procedures for this device have been written only for qualified, expert or trained persons and is not intended to be a substitute for a suitable course or experience.
- For products provided with communication, the purchaser, the installer or the final customer are responsible for applying all the IT security measures to prevent risks arising from the connection to communications networks; these risks comprise amongst other things the use of the product by unauthorized persons, the alterations of its normal operation, access to and modification of information.
- The purchaser, the installer or the final customer and person responsible for ensuring that safety warnings and notices are displayed and that all the access points and operating devices are safely locked when the switchgear is left unattended.
- All the information contained in this document is based on the latest information available at the time of publication. We reserve the right to modify the document at any moment without prior notice.

Warnings

Read carefully

WARNING! READ THE FOLLOWING MANUAL CAREFULLY BEFORE INSTALLING OR WORKING ON THE NAVEO PRO GATEWAY

- Store this manual carefully with all the other available documents, including: Getting Started for first installation, electrical diagrams, drawings and any descriptive notes pertinent to the installation.
- Keep these documents available during the Naveo®Pro Gateway installation, operating and maintenance step to facilitate the following operations.
- Install the unit in compliance with the environmental, electrical and mechanical limits described in the product documentation.
- The Naveo®Pro Gateway has been designed to operate with voltage and current values within the rated limits: do not install in systems that work at values exceeding these rated limits.
- Follow the safety procedures set by your company.
- Before accessing the device in its location, do not commence work on the device without disconnecting all circuits and checking that they are fully disconnected with a suitable measuring instrument.

Cyber security

Disclaimer

It is the sole responsibility of the customer to provide and continuously ensure a secure connection between the product and the customer network or any other network.


The customer is required to establish and maintain any appropriate measures (including 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 breach, unauthorized access, interference, intrusion, leakage and/or theft of data or information.

ABB and its affiliates are not liable for damage and/or losses related to such security breaches, unauthorized access, interference, intrusion, leakage and/or theft of data or information.


1 Warning messages used in this document

1.1 Warning messages for harm to persons


To indicate an immediate hazardous situation which, if not avoided, will result in death or serious injury, the following message is used:

	WARNING
Sign (if necessary)	TEXT THAT EXPLAINS THE HAZARD AND THE CONSEQUENCES OF NOT AVOIDING IT Text that explains how to avoid this hazard

To indicate a potentially hazardous situation which, if not avoided, could result in death or serious injury, the following message is used:

	WARNING
Sign (if necessary)	TEXT THAT EXPLAINS THE HAZARD AND THE CONSEQUENCES OF NOT AVOIDING IT Text that explains how to avoid this hazard

To indicate a potentially hazardous situation which, if not avoided, could result in minor or moderate injury, the following message is used:

	WARNING
Sign (if necessary)	TEXT THAT EXPLAINS THE HAZARD AND THE CONSEQUENCES OF NOT AVOIDING IT Text that explains how to avoid this hazard

1.1.1 Warning messages for damage to property

To indicate potential risks of damage to the supported product (or to other property), the following message is used:

NOTICE	
Sign (if necessary)	Text that explains how to avoid damaging the supported product (or other property)

1 Warning messages used in this document

1.2 Warning: Power supply safety



WARNING

ELECTRIC SHOCK HAZARD

Failure to supply power correctly or to follow all operating instructions correctly, may create an electric shock hazard, which could result in personal injury or loss of life, and / or damage the equipment or other property.

To avoid injuries and safely supply power to the product, complete the following steps:

1. Observe all the instructions for safety, installation, and operation
 2. Make sure your hands are dry
 3. Make sure that all the cables used:
 - Are in good condition before using them
 - Meet the product requirements and comply with the relevant standards and regulations
 4. Position cables with care. Do not position cables in places where they may be trampled or compressed by objects placed on them
 5. Make sure that the power-points and plugs are in good condition before using them
 6. Do not overload the power-points and plugs
 7. Make sure that the product maintains a proper grounding connection
 8. Use a power supply that meets the product requirements and complies with the relevant standards and regulations.
 9. Connect power after the installation of the system has been completed
 10. Never connect or disconnect the cables with the system or the external apparatus switched ON.
-

1.3 Caution: Wireless safety

The antennas used in the product must be installed with care, to avoid any interference with other electronic devices and to guarantee a minimum distance from the human body (20 cm). In case of this requirement cannot be satisfied, the system integrator must assess the final product against the Specific Absorption Rate (SAR) regulations.

The product is supplied with one antenna for Bluetooth®.

For installations that require the Gateway to be set up with WiFi 5 Ghz rather than by direct ethernet or WiFi 2.4 Ghz then a second 5 Ghz WiFi Antenna must be ordered as an accessory.

2 Conventions used in this document

2.1 Conventions for signal names

Convention	Description
GND	Ground
#	Active low signal
+	Positive signal; Positive signal in differential pair
-	Negative signal; Negative signal in differential pair
3.3	3.3 V signal level
5	5 V signal level
NC	No Connection
Reserved	Use is reserved to ABB

2.2 Conventions for signal types

Convention	Description
I	Signal is an input to the system
O	Signal is an output from the system
IO	Signal may be input or output
P	Power and Ground
A	Analog signal
NC	No Connection
Reserved	Use is reserved to ABB

3 Product overview

3.1 Product description

The Naveo®Pro Gateway is an IoT Gateway designed with 1GB of RAM and 8GB of eMMC. This gateway is low-power and suitable for demanding use cases. This product features the following range of connections: Wi-Fi, Bluetooth® and a fast Ethernet port.

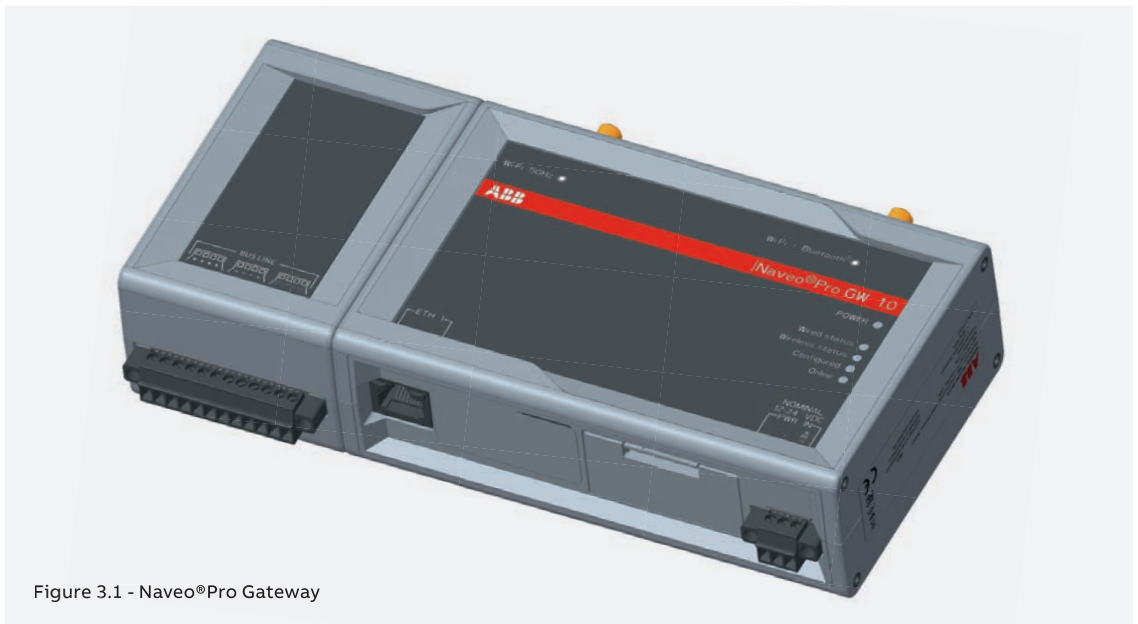


Figure 3.1 - Naveo®Pro Gateway

3.2 Intended use of the product

The product is intended for professional use and must be installed by qualified personnel only.

3.2.1 Intended use

The Naveo®Pro Gateway must:

- Be installed in a secure location, only accessible to authorised personnel and not exposed to atmospheric agents
- Be used indoors only
- Be used with appropriate interconnecting and power cables
- Be used with an external DC power supply source that:
 - Must meet the requirements stated on the identification label of the product
 - Must deliver a maximum current of 2 A

3 Product overview

3.3 Naveo®Pro technical specifications



According to the respective versions, the specifications are as follows:

Specifications		Naveo®Pro Gateway
Processor		TI AM3352, 1 GHz, 1 Core
Memory	RAM	1 GB, DDR3
Storage	Embedded	8 GB eMMC
Wired Interfaces	Ethernet	1x Fast Ethernet on RJ45 connectors
	USB	3x Host 2.0 (noise and surge protected) on Type A connectors
	Expansion	Yes, for Side Expansion Modules (used with SESAM protocol in EU)
Wireless Interfaces	Wi-Fi/Bluetooth®	802.11a,b,g,n / BLE 4.2
	Antennas ports (external)	2x RP-SMA Wi-Fi/Bluetooth®
	RTC	Yes (backup super cap)
	Watchdog	Yes (system level)
	TPM	TPM 2.0
	Sensors	Temperature (inside the product)
	LEDs	1x Power 4x Customized Function
Power	Input	Nominal: 12 or 24 VDC; Range: 9 to 30 VDC with transient protection
	Consumption	4 W typical; 15 W maximum
	Operating Temperature	0 to +40 °C
Environment	Storage Temperature	-20 to +85 °C
	Relative Humidity	5 to 95% (non-condensing) at +40°C
	Regulatory	FCC, ISED, CE
Certifications	Safety	EN 62368-1:2014+A11:2017
	Environmental	RoHS3; REACH
	Wi-Fi/Bluetooth® Radio	FCC, ISED, CE, RED 2014/53/EU
	Ingress	IP30
	MTBF	> 375.000 h (prediction method: IEC 62380 @ 25°C GF)
	Enclosure	Material: ABS - Color: Aluminum
Mechanical	Dimensions	139 (L) x 115 (W) x 46 (H); mm - Antennas Connectors and Mounting Bracket included
		210 g (without DIN Rail Mounting Clip/Bracket)
	Weight	Weight without SESAM box (for wireless applications) - 245g Weight with SESAM box (for wired applications) - 310g
Operating System		Linux with Verified Boot

3 Product overview

3.4 Product labels

According to the respective versions, the specifications are as follows:

Label example	Label type and content	Label position
	<p>Part Number Label</p> <ul style="list-style-type: none"> • ABB logo • Manufacturer name • Manufacturer address (EU versions only) • Product number • Model number (xx = product version) • Power supply specifications* • FCC information (US versions only) • SED information (NA versions only) 	<p>On the underside of the product</p>
	<p>Serial Number Label</p> <ul style="list-style-type: none"> • Serial number • MAC ID number • IMEI number • CE mark (EU versions only) • WEEE symbol (EU versions only) 	<p>On the underside of the product</p>

Note: These labels are for indicative purposes only.

4 Norms and certifications



4.1 CE Marking

Some versions of the product described in this document are CE marked; for more information see "Technical Specifications" on page 12.

ABB is not responsible for the use of this product together with equipment (for example: power supplies, personal computers, etc.) that are not CE marked and not compliant with the requirements specified in this document.

4.2 Directive RED 2014/53/EU

Some versions of the product described in this document meet the requirements of the Directive 2014/53/EU of the European Parliament and of the Council of 16 April 2014 on the harmonization of the laws of the Member States relating to the making available on the market of radio equipment.

4.2.1 Modification Statement

ABB has not approved any changes or modifications to this product by the user. Any changes or modifications could void the user's authority to operate the product.



4.3 FCC Marking

Some versions of the product described in this document are FCC marked; for more information see "Technical Specifications" on page 12.

ABB is not responsible for the use of this product together with equipment (for example: power supplies, personal computers, etc.) that are not FCC marked and not compliant with the requirements specified in this document.

4.4 FCC/ISED Regulatory Notices

4.4.1 Modification Statement

ABB has not approved any changes or modifications to this product by the user. Any changes or modifications could void the user's authority to operate the product. specified in this document.

4 Norms and certifications

4.4.2 ISED Canada Regulatory Notices

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada’s licence-exempt RSS(s). Operation is subject to the following two conditions:

1. This device may not cause interference.
2. This device must accept any interference, including interference that may cause undesired operation of the device

This radio transmitter 21442-MRG1012 has been approved by Innovation, Science and Economic Development Canada to operate with the antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device.

Antenna Types	Frequency Band	Antenna Gain
Wi-Fi / Bluetooth® 50Ω Dipole	2.5 GHz Wi-Fi 802.11a,b,g,n / BLE 4.2 BLE Bluetooth® 5 GHz Wi-Fi 802.11a,b,g,n	5.47 dBi 7.07 dBi

The Naveo®Pro Gateway has been certified with the following antennas:

Antenna Types	Manufacturer and Model	Notes
Wi-Fi/Bluetooth® 50Ω Dipole	<ul style="list-style-type: none"> • Linx Technologies ANT-DB1-RAF-RPS • Taoglas MA950.W.A.LBICG.005 	<p>Taoglas MA950.W.A.LBICG.005: Certified operation:</p> <ul style="list-style-type: none"> • 2.4GHz/5.8GHz MIMO_1 antenna is interfaced to • 2.4GHz WiFi/Bluetooth® RP-SMA • 2.4GHz/5.8GHz MIMO_2 antenna is interfaced to 5GHz WiFi RP-SMA <p>Opération certifiée:</p> <ul style="list-style-type: none"> • L’antenne 2.4GHz/5.8GHz MIMO_1 est connectée au RP-SMA WiFi / Bluetooth® à 2,4 GHz • L’antenne 2.4GHz/5.8GHz MIMO_2 est connectée au RP-SMA WiFi 5 GHz

4.4.3 RF Radiation Exposure Statement

This product complies with FCC and ISED radiation exposure limits set forth for an uncontrolled environment. The antenna should be installed and operated with minimum distance of 20 cm between the radiator and your body.

This device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter except in accordance with FCC multi-transmitter product procedures.

4 Norms and certifications

4.4.4 FCC Class B Digital Device Notice

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.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in all types of installation. This product generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this product does cause harmful interference to radio or television reception, which can be determined by turning the product OFF and ON, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the product and the receiver
- Connect the product into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help

4.4.5 ISED Class B Digital Device Notice

ICES-003 Class B Notice - Avis NMB-003, Classe B.

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

4.4.6 Labeling information

The following information is stated on the product labels:

- Contains FCC ID: RI7LE910NAV2
- Contains FCC ID: UKMMRG1012
- Contains IC ID: 5131A-LE910NAV2
- Contains IC ID: 21442-MRG1012
- CAN ICES-3 (B)/NMB-3(B)

4 Norms and certifications

4.5 Restrictions on 5 GHz

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.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This product generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this product does cause harmful interference to radio or television reception, which can be determined by turning the product OFF and ON, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the product and the receiver
- Connect the product into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help

Channel Number	Frequency (MHz)	Europe (ETSI)	North America (FCC)
36	5180	Indoor Usage Only	Indoor Usage Only
40	5200	Indoor Usage Only	Indoor Usage Only
44	5220	Indoor Usage Only	Indoor Usage Only
48	5240	Indoor Usage Only	Indoor Usage Only
52	5260	Not Supported	Not Supported
56	5280	Not Supported	Not Supported
60	5300	Not Supported	Not Supported
64	5320	Not Supported	Not Supported
100	5500	Not Supported	Not Supported
104	5520	Not Supported	Not Supported
108	5540	Not Supported	Not Supported
112	5560	Not Supported	Not Supported
116	5580	Not Supported	Not Supported
120	5600	Not Supported	Not Supported
124	5620	Not Supported	Not Supported
128	5640	Not Supported	Not Supported
132	5660	Not Supported	Not Supported
136	5680	Not Supported	Not Supported
140	5700	Not Supported	Not Supported
149	5745	Not Supported	Supported
153	5765	Not Supported	Supported
157	5785	Not Supported	Supported
161	5805	Not Supported	Supported
165	5825	Not Supported	Supported

4 Norms and certifications

4.5.1 EU Restrictions on 5 GHz Wi-Fi usage

Due to EU restrictions on 5 GHz Wi-Fi bands the Naveo®Pro Gateway is limited to indoor operation and should only be operated in the frequency band 5150 MHz – 5250 MHz (U-NII-1) covering 20 MHz channels (36,40,44,48) and 40 MHz channels (38,46).

Dynamic Frequency selection (DFS) as master or slave is not supported by the Naveo®Pro Gateway.

4.5.2 FCC Restrictions on 5 GHz Wi-Fi usage

Due to FCC restrictions on 5 GHz Wi-Fi bands the Naveo®Pro Gateway is limited to indoor operation within the frequency band 5150 MHz – 5250 MHz (U-NII-1) covering 20 MHz channels (36,40,44,48) and 40 MHz channels (38,46).

Dynamic Frequency selection (DFS) as master or slave is not supported by the Naveo®Pro Gateway.

4.6 Antennas list

One antenna is supplied with the Naveo®Pro gateway for Bluetooth® and a separate antenna can be ordered as an accessory for gateway WiFi connection if ethernet port direct connection is not being used. See Page 20 - Fig 5.1 for locations of antenna.

The Naveo®Pro Gateway has been certified with the following antennas:

Antenna Types	Manufacturer and Part Number
Wi-Fi / Bluetooth®	<ul style="list-style-type: none"> • Linx Technologies ANT-DB1-RAF-RPS • Taoglas MA950.W.A.LBICG.005

NOTICE

Within the EU, antennas must be used in compliance with the RED requirements.

Within the US/Canada, antennas must be used in compliance with the FCC/ISED requirements.

4 Norms and certifications

4.7 RoHS 3 Compliance

The product, including all its components and its sub-assemblies, have been manufactured in compliance with the Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

4.8 REACH Compliance

The product is certified according to the REACH Directive, taking in account Substances of Very High Concern (SVHC), as specified in the list published by ECHA (European Chemical Agency) at the time of the design.



4.9 WEEE Compliance

In compliance with the Directive 2012/19/EU of the European Parliament and of the Council of 4 July 2012 on waste electrical and electronic equipment (WEEE), the symbol on the left, shown on the product or within its literature, indicates separate collection for electrical and electronic equipment (EEE) that has been placed on the market after 2005.

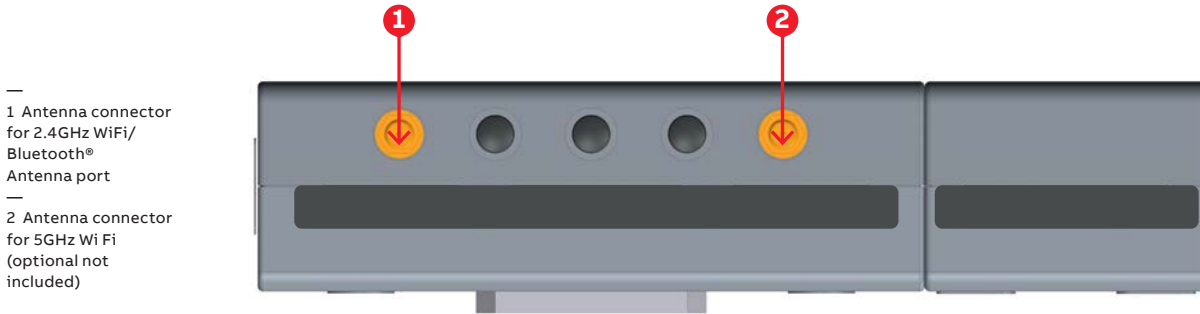
The product, at the end of its life cycle, must be collected separately and managed in accordance with the provisions of the current Directive on waste of electrical and electronic equipment.

Because of the substances present in the product, improper disposal can cause damage to human health and to the environment.

To avoid any possible legal implications, contact your local waste collection body for full collect and recycling information.

5 Interfaces overview

5.1 Top side interfaces overview



5.2 Bottom side interfaces overview



5.3 Schedule emergency lighting tests

The Naveo®Pro application manages the scheduling of mandatory and custom tests according to the standards. There are three types of test:

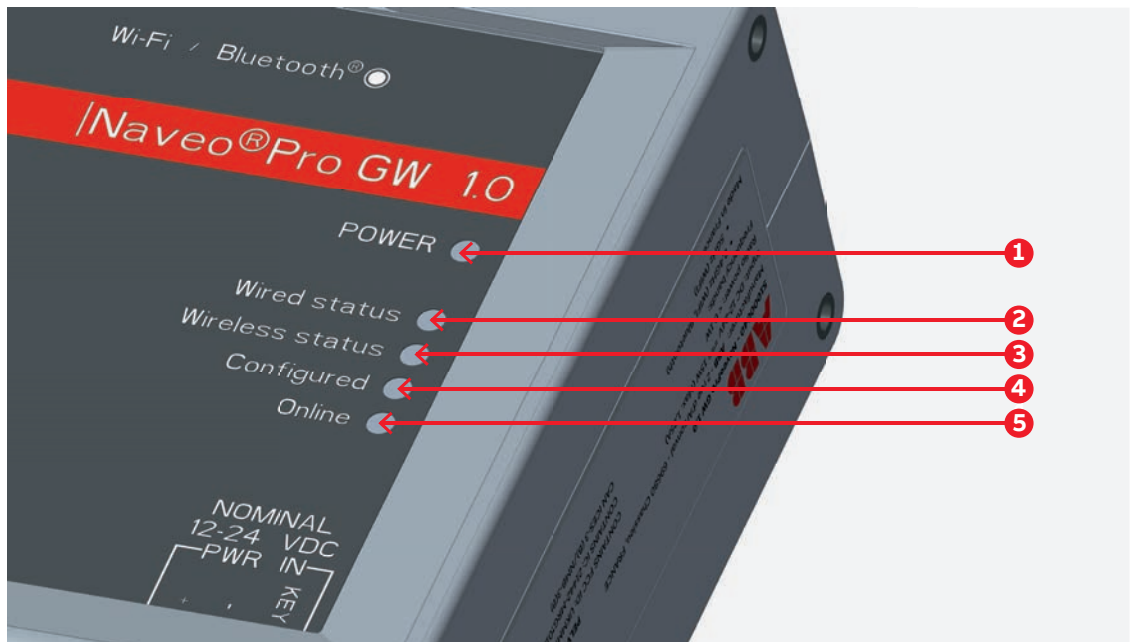
1. Autonomy tests: this type of test is mandatory. Twice a year the Gateway will launch a completed discharge. The user can schedule the date and time of test via the Naveo®Pro app
2. Weekly tests: this type of test is mandatory. The Gateway will launch a discharge of one minute every week. The user can schedule the date and time of test via the Naveo®Pro app
3. Custom tests: the customer can schedule other tests using the Naveo®Pro app

All test results are stored and accessible via the “Reports” tab in the Naveo®Pro app. Please refer to the specifications of the connected luminaires for more detailed information.

The NaveoPro gateway manages up to 500 Emergency Luminaires connected to the CIS/COM bus Line. The maximum bus cable length: 1000 m. With a cable cross section of 0.75mm² to 1.5 mm².

5 Interfaces overview

5.4 LED Indicators overview



The LED Indicators are as follows:

Ref#	Use and Status	Color
1	POWER <ul style="list-style-type: none"> LED ON: Product powered by the external source LED OFF: Product not powered by the external source 	Blue
2	“Wired Status” <ul style="list-style-type: none"> LED ON: No fault detected on the wired network LED BLINKING: At least one fault is present on the wired network (luminaire or communication fault) LED OFF: Wired network is offline 	Amber
3	“Wireless Status” <ul style="list-style-type: none"> LED ON: No fault detected on the wireless network LED BLINKING: At least 1 fault is present on the wireless network LED OFF: Wireless network is offline 	Amber
4	“Configured” (Gateway is commissioned) <ul style="list-style-type: none"> LED ON: Gateway is configured properly LED BLINKING: At least one fault is present on the wireless network (luminaire or communication fault) LED OFF: Gateway is not configured 	Green
5	“Online” (Cloud connection) <ul style="list-style-type: none"> LED ON: Gateway is connected to the Cloud LED BLINKING: Gateway has access to the intranet but not to the internet LED OFF: Gateway is offline 	Green

If LED Online = OFF & LED Configured = Green – it means GW works and is connected to EmLs but is not connected to the Cloud.

6 Interfaces in detail

6.1 Wi-Fi and Bluetooth®

The Naveo®Pro Gateway provides the following Wi-Fi / Bluetooth® function:

- 2.4 GHz Wi-Fi 802.11a,b,g,n / BLE 4.2 BLE Bluetooth®
- 5 GHz Wi-Fi 802.11a,b,g,n

The internal circuitry allows for 2.4 GHz Wi-Fi and Bluetooth® coexistence. The antennas connectors are placed on the front side.

6.1.1 Wi-Fi specifications

- Integrated 2.4 & 5G GHz Power Amplifier (PA) for WLAN solution
- WLAN Baseband Processor and RF transceiver supporting IEEE Std 802.11a/b/g/n
- WLAN 2.4/5 GHz SISO (20/40 MHz channels)
- Baseband Processor
 - IEEE Std 802.11a/b/g/n data rates and IEEE Std 802.11n data rates with 20 or 40 MHz SISO
- Fully calibrated system. Production calibration not required
- Medium Access Controller (MAC)
 - Embedded ARM™ Central Processing Unit (CPU)
 - Hardware Based Encryption/Decryption using 64 , 128 , and 256 Bit WEP, TKIP or AES Keys
 - Supports requirements for Wi-Fi Protected Access (WPA and WPA2.0) and IEEE Std 802.11i (includes hardware accelerated Advanced Encryption Standard (AES))
 - Designed to work with IEEE Std 802.1x
- IEEE Std 802.11d,e,h,i,k,r PICS compliant
- New advanced co-existence scheme with BT/BLE
- 2.4/5 GHz Radio
 - Internal LNA and PA
 - Supports: IEEE Std 802.11a, 802.11b, 802.11g and 802.11n
- Supports 4 bit SDIO host interface, including high speed (HS) and V3 modes.

6.1.1.1 2.4 GHz TX output power

Maximum RMS output power measured at 1dB from IEEE spectral mask or EVM.

Parameter	Value
Operation frequency range	2400MHz to 2483.5MHz
Output Power	17 dBm @ condition: 1 Mbps DSSS

6 Interfaces in detail

6.1.1.2 5 GHZ TX output power

Maximum RMS output power measured at 1dB from IEEE spectral mask or EVM.

Parameter	Value
Operation frequency range	4910 to 5825MHz
Output Power	16.8 dBm @ condition: 6 Mbps OFDM

6.1.2 Bluetooth® specifications

- Supports Bluetooth® 4.2
- Includes concurrent operation and built -in coexisting and prioritization handling of Bluetooth®, BLE, audio processing and WLAN
- Dedicated Audio processor supporting on chip SBC encoding + A2DP:
 - Assisted A2DP (A3DP) support - SBC encoding implemented internally
 - Assisted WB-Speech (AWBS) support - modified SBC codec implemented internally

6.1.3 BLE specifications

- Fully compliant with BT and BLE dual mode standard
- Support for all roles and role-combinations, mandatory as well as optional
- Supports up to 10 BLE connections
- Independent buffering for LE allows having large number of multiple connections without affecting BR/EDR performance

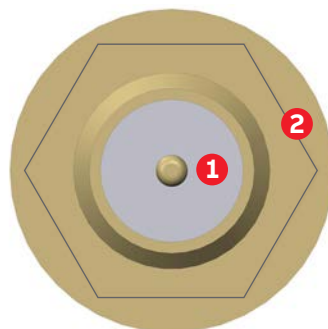
6.1.4 Antennas connectors specifications

Specifications are the same for both the following antennas connectors:

- 2.4 GHz Wi-Fi / Bluetooth®
- 5 GHz Wi-Fi

Antennas Connector

- 1 Male inner pin contact
- 2 Female connector body (outer thread)



Connector Specifications:

- RP-SMA connector
- Gender: Female

Mating Connector Specifications:

- RP-SMA connector
- Gender: Male

6 Interfaces in detail

6.2 Ethernet port

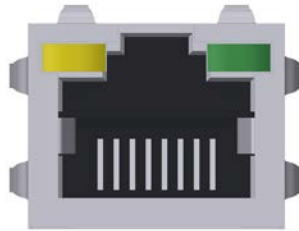
The Naveo®Pro Gateway provides 1x 10/100 Mbps Ethernet port:

- ETH 1 (The Ethernet connector is available on the rear side).

6.2.1 Ethernet specifications

Feature	Description
Network Standard	IEEE 802.3u 10/100-BaseTX. IEEE 802.3x full-duplex flow control.
Speeds	10/100-BaseTX interfaces with MAC
Notes	The interfaces are noise and surge protected. The RJ-45 connector has integrated magnetics.

Ethernet connector



Connector Specifications:

- RJ-45 socket
- Gender: Female

Mating Connector Specifications:

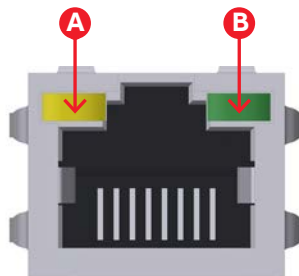
- RJ-45 plug
- Gender: Male

Connector Pinout (pins not listed are not connected):

Pin	Signal	Type	Description
1	TX+	O	Transmit Data +
2	TX-	O	Transmit Data -
3	RX+	I	Receive Data +
6	RX-	I	Receive Data -

Ethernet connector LED

- A Yellow - Activity
- B Green - Link



6.3 RTC (Real Time Clock)

The Naveo®Pro Gateway includes the following two RTC (Real Time Clocks) devices:

RTC device	Description	Use
/dev/rtc0	• Internal (in the CPU SoC)	IO
/dev/rtc1	• External (I2C-based RTC device) • Default RTC used by Linux • Accuracy: 25 minutes per year (at 25 °C)	IO

6 Interfaces in detail

6.4 CIS/COM BUS Line for Luminaire

Pin	Signal	Type	Description
1,2,3,4	CIS BUS +	I/O	Positive CIS BUS Line
5,6,7,8	CIS BUS -	I/O	Negative CIS BUS Line
9,10,11,12	CIS BUS Earth	I/O	Earth Cis BUS Line

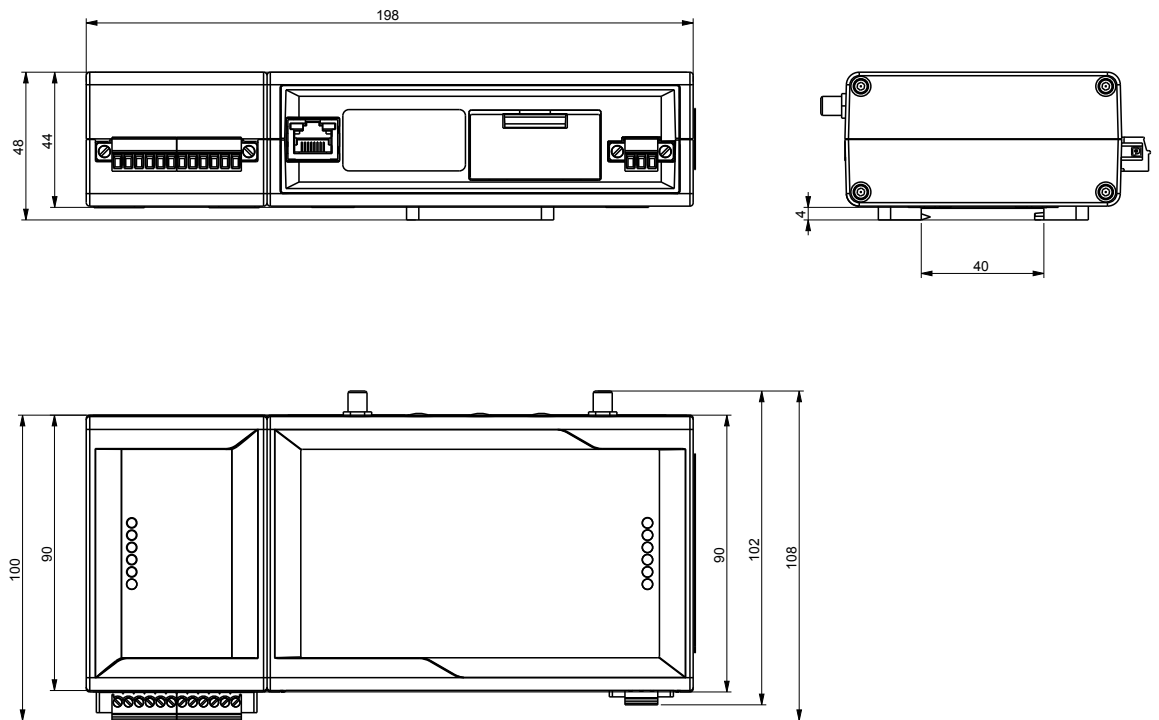
CIS/COM BUS Line



7 Mechanical specifications

7.1 Product mechanical dimensions

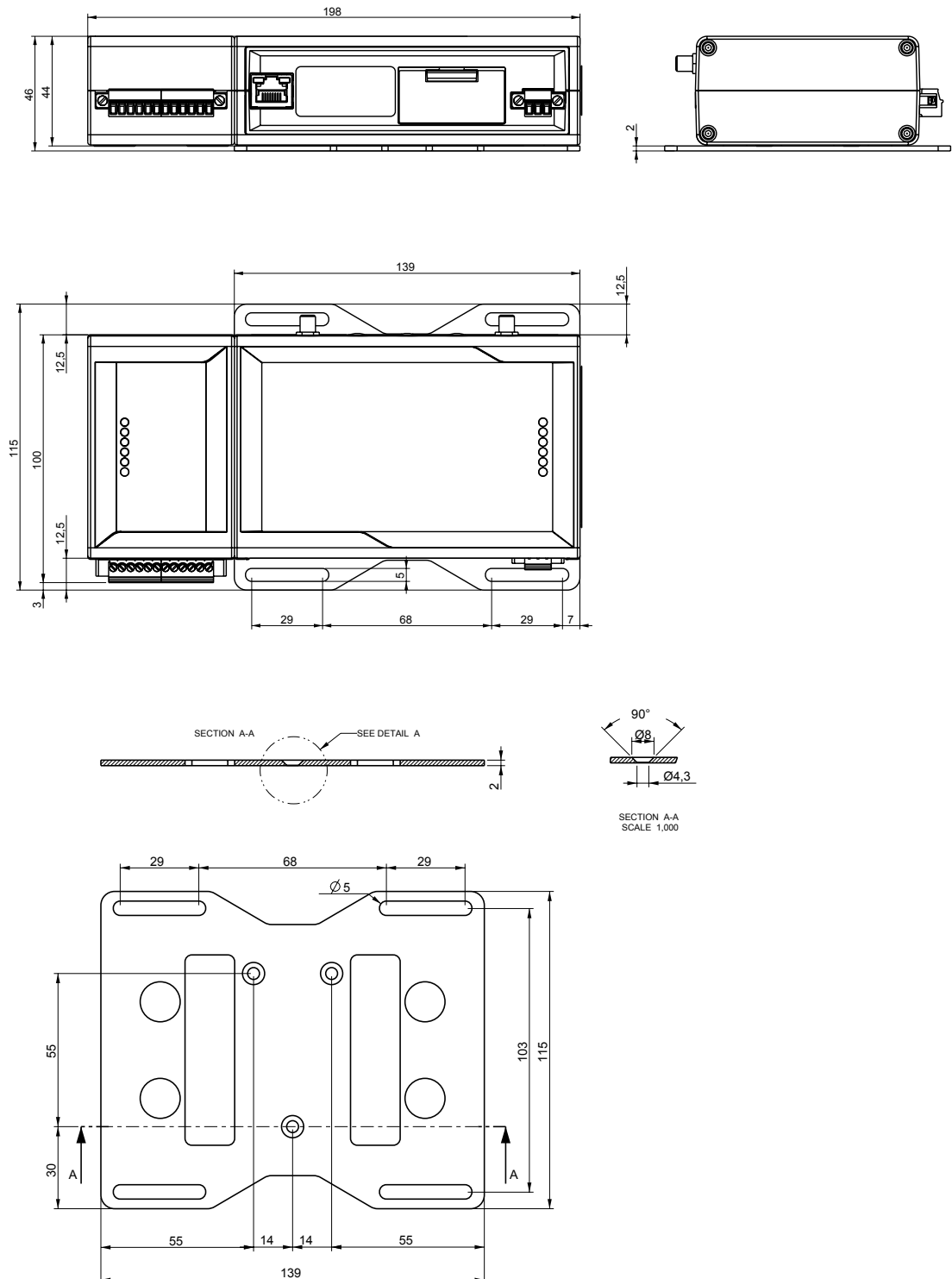
The product electronics are housed in an ABS enclosure having the following dimensions: 198 (L) x 108 (W) x 48 (H); mm - Antennas connectors included. All dimensions are in millimeters.



7 Mechanical specifications

7.2 Mounting Bracket mechanical dimensions (optional not included)

The Mounting Bracket fastened on the bottom side of the NaveoPro Gateway has the following dimensions. All dimensions are in millimeters.



8 Installation

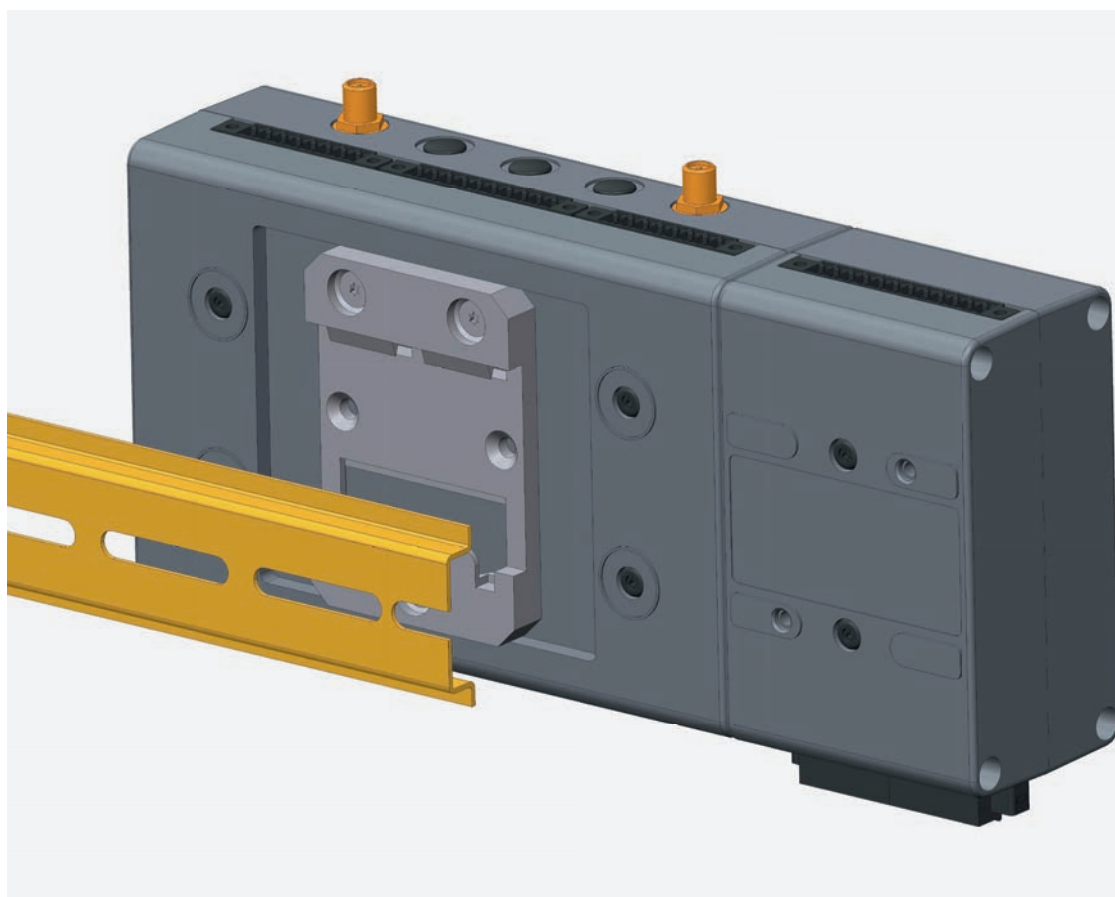
8.1 How to install the product

The product is intended for professional use and must be installed by qualified personnel only. The product must be installed in a secured location, accessible to authorized personnel only (for example in a cabinet / technical compartment).

By default, Naveo®Pro Gateway comes with a DIN rail mounting clip fastened on the bottom side. You can use this to install the Naveo®Pro Gateway. Optionally, you can replace the DIN Rail Mounting Clip with the Mounting bracket (optionally available).

See also:

- "How to install or remove the Product from a DIN Rail" on page 29

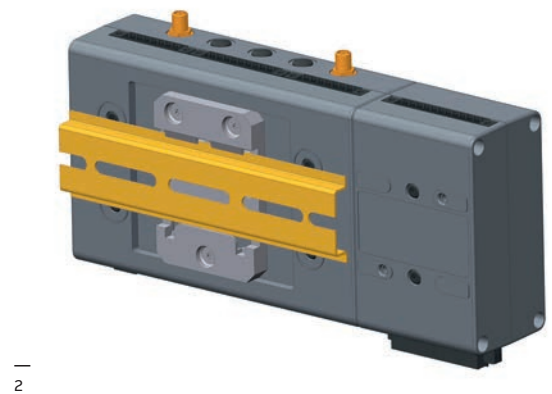
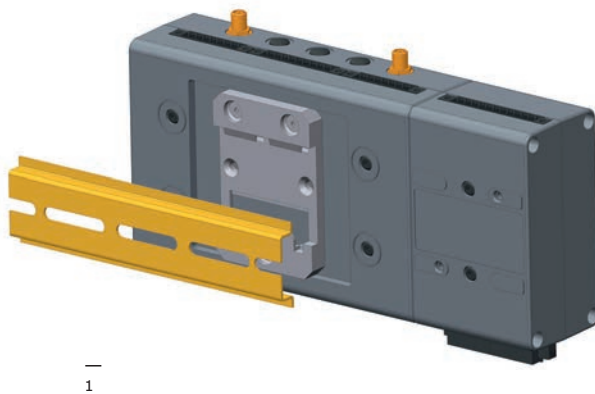


8 Installation

8.2 How to install the product on a DIN Rail

To install the product on a horizontal DIN rail, complete the following steps:

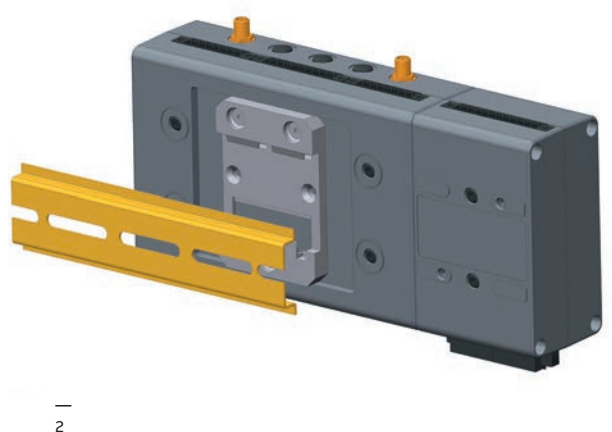
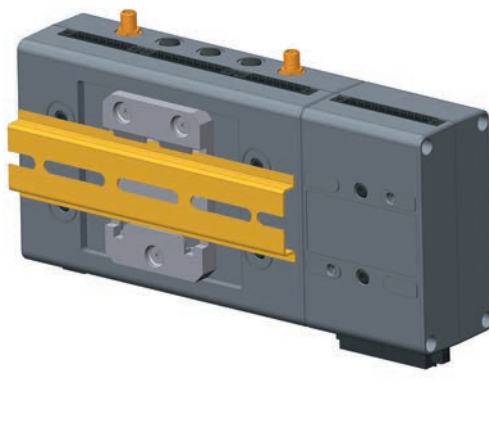
1. Hook the lower mobile latches of the DIN Rail Mounting Clip on the lower edge of the DIN rail
2. Push the product against the DIN rail. The upper latches of the DIN Rail Mounting Kit are locked on the DIN rail.



8.3 How to remove the product from a DIN Rail

To remove the product from a horizontal DIN rail, complete the following steps:

1. Push upwards the lower mobile latches of the DIN Rail Mounting Clip. The lower latches are released from the DIN rail
2. Pull the product out



8 Installation

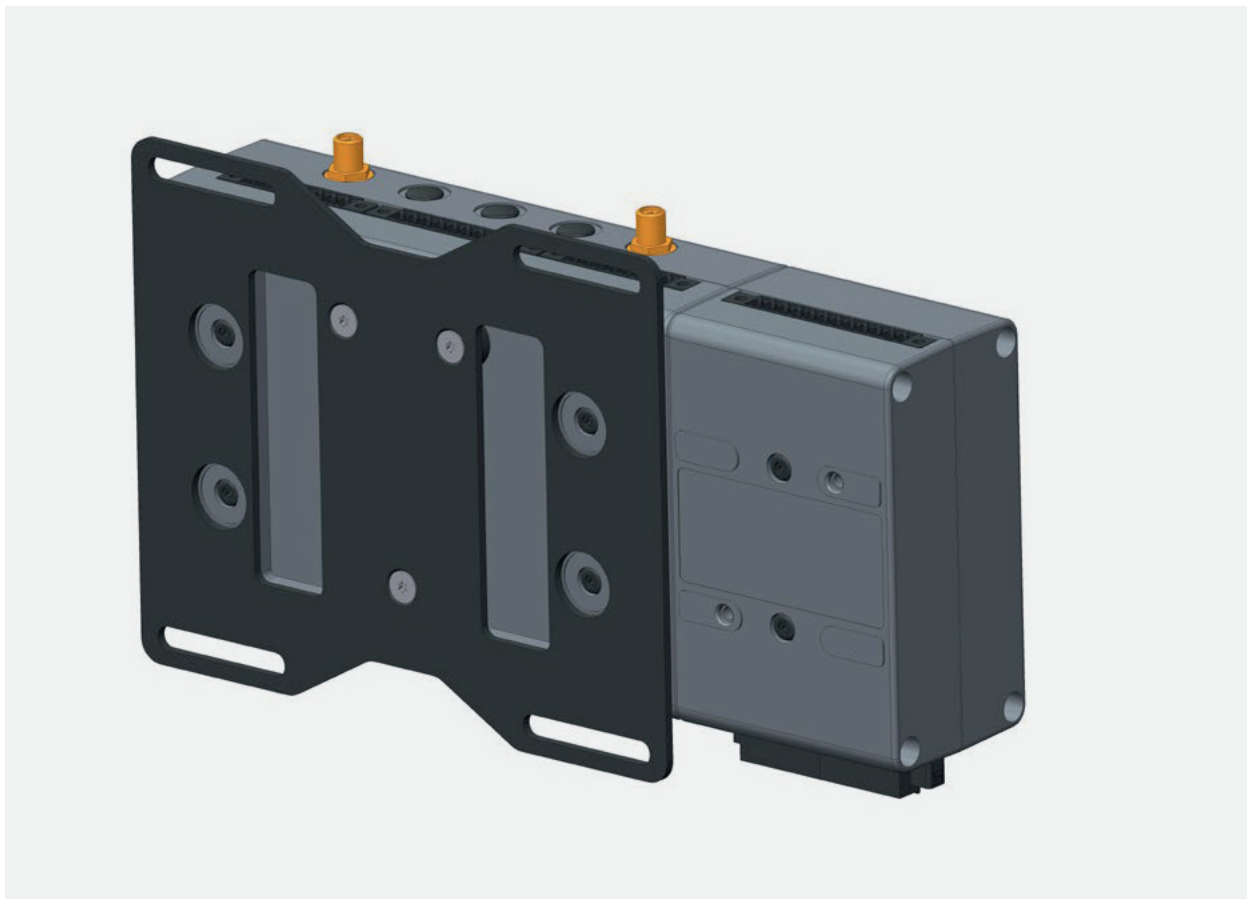
8.4 How to install the product using the Mounting Bracket

To install the product in place, complete the following steps:

1. See "Mechanical specifications" on page 26
2. Use the 4 slots available on the Mounting Bracket
3. Add all the necessary mounting hardware to safely fasten the NaveoPro Gateway in place according to your installation requirements (for example use 4x M5 screws, with a minimum length of 15 mm).

Material, type, and length of the screws, and the maximum torque applicable, depend on your installation requirements.

The Mounting Bracket is made of 2 mm aluminum alloy 6061 T6.

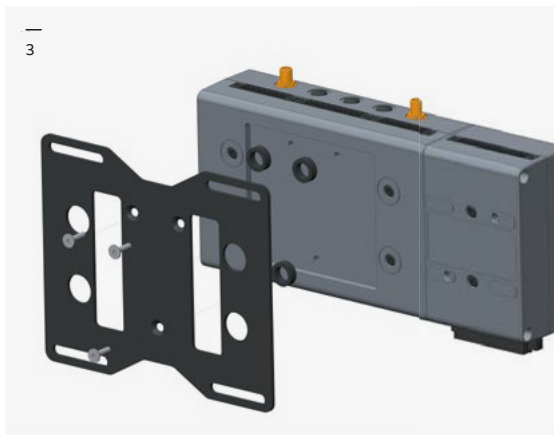
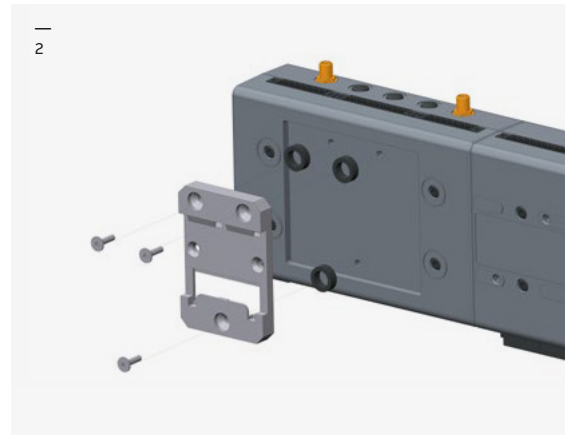


8 Installation

8.5 How to replace the DIN Rail Mounting Clip with the Mounting Bracket

To replace the DIN Rail Mounting Clip with the Mounting Bracket on the product, complete the following steps:

1. Remove the 3 screws that hold the DIN Rail Mounting Clip in place
2. Remove the DIN Rail Mounting Clip
3. Place the 3 spacers (H = 4mm; Ext. diam. = 14mm; Int. diam. = 7mm) and the Mounting Bracket
4. Tighten the 3 screws removed at step 1 by applying a torque of 0.7 Nm

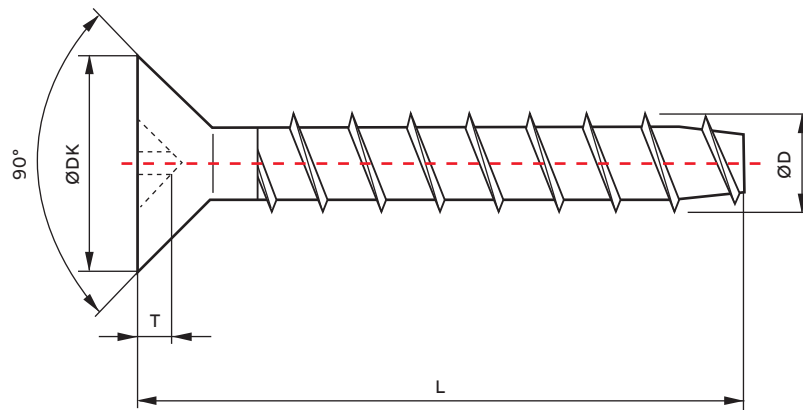


8 Installation

8.6 Screws are used with the DIN Rail Mounting Clip

The 3 screws that hold in place the DIN Rail Mounting Clip have the following features:

1. Phillips type H cross flat countersunk head screw KA35x12
2. Fully threaded
3. Stainless steel
4. Example of Manufacturer and Part Number: Bossard BN 13580 2000997



Reference	Value (mm)
ØDK	7.3
T	1.3
L	12
ØD	3.5

9 Power

9.1 How to supply power to the product

This product is not provided with any ON/OFF switch.

In order to disconnect the power, please simply remove the power supply connector from the Gateway.

9.2 Power supply (included in the package)

Power supply Nominal: 12 or 24 VDC; Range: 9 to 30 VDC with transient protection

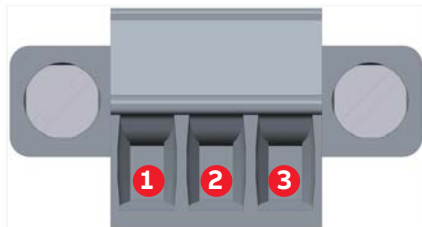
Power consumption 4 W typical; 15 W maximum

Peak demand < 15 W

The Power IN connector is NOT protected against short circuit.

Always include an external fuse to protect the product!

Pin	Signal	Type	Description
1	Power IN +	P	Positive power input from the 12-24V power
2	Power IN -	P	Negative power input from the 12-24V power
3	NC	NC	Not Connected



9 Power

To supply power and turn ON the Naveo®Pro Gateway, complete the following steps:

- Setup a DC power source that:
 - Meets the Naveo®Pro Gateway power requirements
- 1. Check the input voltage as close as possible to the Power IN connector. This is to compensate for any cable losses, caused by cable length and other cable characteristics
- 2. Make sure that the DC power source is turned OFF
- 3. Connect the DC power source terminals ("Power IN +" and "Power IN -") to Pins 1 and 2 of the Power IN connector



WARNING

ELECTRIC SHOCK HAZARD

Failure to supply power correctly or to follow all operating instructions correctly, may create an electric shock hazard, which could result in personal injury or loss of life, and / or damage the equipment or other property.

To avoid injuries and safely supply power to the product, complete the following steps:

1. Observe all the instructions for safety, installation, and operation
 2. Make sure your hands are dry
 3. Make sure that all the cables used:
 - Are in good condition before using them
 - Meet the product requirements and comply with the relevant standards and regulations
 4. Position cables with care. Do not position cables in places where they may be trampled or compressed by objects placed on them
 5. Make sure that the power-points and plugs are in good condition before using them
 6. Do not overload the power-points and plugs
 7. Make sure that the product maintains a proper grounding connection
 8. Use a power supply that meets the electrical requirements and complies with the relevant standards and regulations.
 9. Connect power after the installation of the system has been completed
-

10 Maintenance

10.1 How to maintain the product

Periodically inspect the product to verify its integrity and to ensure proper operation. To maintain the product, complete the following steps:

1. Carefully read and understand the instructions contained in the section "Safety Instructions" on page 8
2. Safely remove the power supply
3. Verify the installation of the product
4. Clean the product

10.2 How to safely remove the power supply



WARNING

ELECTRIC SHOCK HAZARD

Failure to supply power correctly or to follow all operating instructions correctly, may create an electric shock hazard, which could result in personal injury or loss of life, and / or damage the equipment or other property.

To avoid injuries and safely supply power to the product, complete the following steps:

1. Make sure your hands are dry
 2. Turn OFF all the power supply sources
 3. Disconnect all the cables
-

10.3 How to verify the installation of the product

To verify the installation of the product, complete the following steps:

1. Verify that the product is clean and not damaged
2. Verify that the LED indicators are visible and not damaged
3. Verify that all the locking parts (for example: screws, bolts, nuts) are correctly fastened

10.4 How to clean the product

To clean the product, complete the following steps:

1. Never use detergents, aerosol sprays, solvents or abrasive sponges
2. To remove dust from the case of the product, use a dry, lint-free, cloth
3. To remove the dirt, use water-based, non-flammable, cleaner products.

11 Gateway commissioning with the Naveo®Pro APP

11.1 New Installation

1. Download and open the NaveoPro app on your phone
2. Create an organisation name for the building in the App
3. Wire in and Install the Gateway and Power Up. Wire In, Install and commission the luminaires as per instructions for each luminaire
4. Commission the Gateway and Flash the QR code of the Gateway to add to the organisation
5. Add the luminaire to the organisation by flashing the QR codes located on each luminaire. You can either flash the QR code as you install or keep the spare QR code located in the product packaging box and add to the building plan and flash all the QR codes together at the end. This may be particularly advisable if a large number of your emergency lights are in high positions or in difficult to access locations
6. You also can add the luminaires to the Map view on Google Maps. You can add a building plan photographed by your mobile. Save the building plan into your mobile device files and overlay into Google Maps in the Map view as you install
7. This will add your luminaires to the organisation and to a precise position on the building plan that can be located by Google Maps
8. Select the Gateway from the dropdown

11.2 Existing installations with a Naveo DCP

1. Download and open the NaveoPro app on your phone
2. Create an organisation name for the building in the App
3. Wire in and Install the Gateway and Power Up
4. Commission the Gateway and Flash the QR code of the Gateway to add to the organisation.
5. Add luminaire from the App by selecting the model part number manually in the app from the dropdown list
6. ABB Service teams will export the file from the old system via specific tool to the Naveo®Pro Gateway
7. Upload file directly to the Cloud
8. You also can add the luminaires to the Map view on Google Maps. You can add a building plan photographed by your mobile. Save the building plan into your mobile device files and overlay into Google Maps in the Map view as you install
9. This will add your luminaires to the organisation and to a precise position on the building plan that can be located by Google Maps. Note: Points 6 & 7 can be completed via the Web browser application

12 Network configuration

12.1 Ethernet connection requirements

Nexus®Pro Gateway connection generally work even if a proxy or firewall is in place. This is because it uses ports 123 and 443 which are also used by all computers. In some situations connections are blocked over those ports. In this case make sure to contact your company IT service to make sure that those port are available.

12.2 Network port requirements for Nexus®Pro Gateway

Cloud access service

The cloud access service enables the Nexus®Pro Gateway to perform a secure authentication and bi-directional communication between the gateway and the cloud. Nexus®Pro Gateway supports the following secure communication between the gateway and the cloud: HTTPS and WSS. The HTTPS (Hypertext Transfer Protocol Secure) and WSS (Web Socket Secure) protocols are very similar, with both running on top of TLS/SSL over TCP connections.

HTTPS is the combination of HTTP HTTPS (Hypertext Transfer Protocol) running on a secure TLS/SSL connection. Commonly, HTTPS uses a different port than HTTP (HTTP's default port is 80 and HTTPS's default port is 443). HTTPS runs on TLS/SSL, which, in turn, runs on TCP.

The same thing is true for WSS connectivity. The WebSocket (WS) protocol runs on TCP (like HTTP), and the WSS connection runs on TLS/SSL, which, in turn, runs on TCP. The WSS protocol is compatible with HTTPS such that the WSS connection uses the same ports: the WebSocket Secure (WSS) uses port 443 by default.

Application protocol	Protocol	Ports
HTTPS	TCP	443
WSS	TCP	443

Time service

The cloud access service maintains date and time synchronization for the Nexus®Pro Gateway. This service uses Network Time Protocol (NTP) to synchronize gateway clock so that an accurate clock value, or time stamp, is assigned for all gateway validation and for resource access requests. The implementation of NTP and the integration of time service help make Nexus®Pro Gateway time a reliable and provide accurate time service for your Nexus®Pro System.

If NTP is not available, the time setting for Nexus®Pro Gateway is not be synchronized with the real time. NTP runs on UDP port 123.

Application protocol	Protocol	Ports
NTP	UDP	123

Additional information

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