

EN4080/EN7295/EN7380/EN7580/EN7581 IP Gateway Family Installation and Operation Manual


1 Overview


Inovonics IP gateways combine the functionality of an Inovonics receiver with the flexibility of an IP appliance. Each gateway kit starts with an EN4080 IP gateway, and is loaded with a license for your specific application. Kits may include additional hardware and/or accessories as described in the following sections.


Inovonics IP gateways are available in the following configurations:


Part #	Product name	Market
EN7580	TapWatch Gateway	Multi-Family Submetering
EN7581	TapWatch Gateway Lite	Multi-Family Submetering
EN7380	Senior Living Gateway	Senior Living
EN7295	Security Gateway	Commercial Security
EN4080	IP Gateway	Commercial Monitoring

1.1 Resources

 Unless otherwise specified, all documentation is available in the documentation library at www.inovonics.com/resources/technical-documents or by using the QR code below.



 For product and installation videos visit us at www.inovonics.com/videos or use the QR code below.



1.2 EN7580/EN7581 TapWatch Gateway

The EN7580 TapWatch gateway and EN7581 TapWatch gateway lite provide direct access reads data from Inovonics submetering sensors for integration into billing software via TapWatch APIs, as well as the manual access of reads data through the TapWatch application. Designed for large properties, the EN7580 TapWatch gateway supports up to 2000 submetering transmitters; supporting 50 transmitters and repeaters, the EN7581 TapWatch gateway lite is ideal for smaller residential or light commercial properties. This kit includes an ACC 610 transformer and power cable for installations using line power.

For TapWatch application information, see the *TapWatch Application User Manual* available under "Installation Instructions" in the documentation library.

1.3 EN7380 Senior Living Gateway

The EN7380 senior living gateway receives EchoStream messages from EchoStream senior living transmitters, locators and repeaters, filtering out unregistered transmitter IDs (TXIDs), and enabling cloud-based Inovonics senior living solutions to be delivered via API to your application software. This kit includes an ACC 610 transformer and power cable for installations using line power.

1.4 EN7295 Security Gateway

The EN7295 security gateway receives EchoStream messages from Inovonics security devices, filtering out unregistered transmitter IDs (TXIDs) before sending the data to Inovonics cloud services via API. This kit includes an EN2233S test pendant plus an ACC 610 transformer and power cable for installations using line power.

1.5 EN4080 IP Gateway

1.6 The EN4080 IP gateway allows for one of two licenses. With a message queuing telemetry transport (MQTT) license, the IP gateway outputs messages in the MQTT protocol; with a BACnet/IP license, the IP gateway outputs messages in the BACnet/IP protocol, which is widely used for building automation and control networks.

For MQTT license information, see the *E*4080 IP Gateway Amazon Web Services MQTT Quick Start Tech Note*; for BACnet license information, see the *E*4080 IP Gateway BACnet/IP Quick Start Tech Note*. Both are available under "Tech Notes" in the documentation library.

1.7 Inovonics Contact Information

If you have any problems with this procedure, contact Inovonics technical services:

- E-mail: support@inovonics.com.
- Phone: 1.800.782.2709, option 2.

2 Installation

1. Review all installation instructions, as well as section 3, "Tips and Notes" on page 3, before beginning installation to ensure you are familiar with the process and have everything you need to install the IP gateway.
2. Record the following information for future reference:
 - The appropriate MAC addresses from the label on the back of the housing.
 - The eight-character alphanumeric authorization code from the label on the lower right-hand portion of the printed circuit board, just above the Inovonics logo.
3. Use a Phillips screwdriver to open the IP gateway housing.

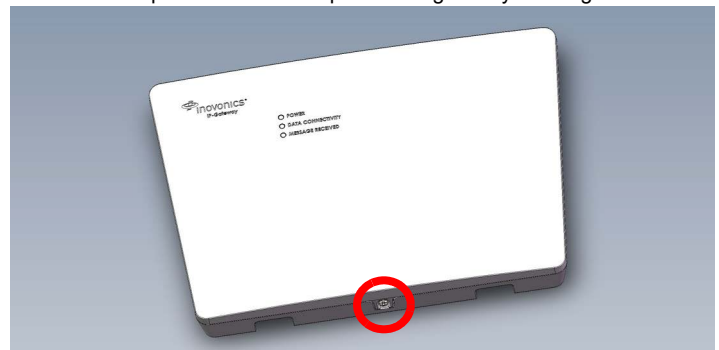


Figure 1 Open the IP gateway housing.



- Use the included screws and drywall anchors to flush-mount the IP gateway.

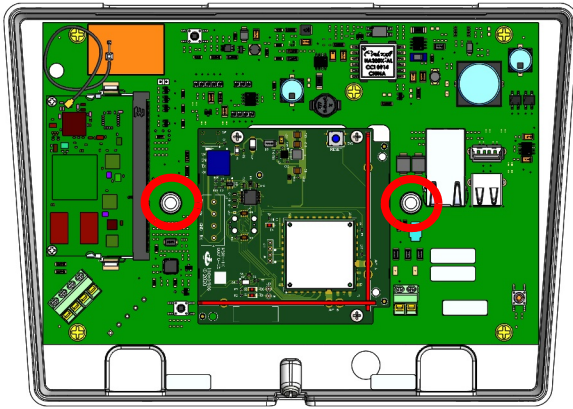


Figure 2 Mount the IP gateway.

- Connect power to the IP gateway, routing cabling through the IP gateway housing knockout.
 - If using line power, connect a power supply to the power terminal blocks per the power supply manufacturer's instructions. See section 4, "Specification" on page 3 for details.
 - If using Power over Ethernet (PoE), connect one end of a RJ45 Ethernet cable to the RJ45 Ethernet jack, and connect the other end to a PoE capable network switch. Ensure 10/100BASE-T Ethernet with Dynamic Host Configuration Protocol (DHCP) network management protocol.
 - Inovonics recommends an Internet connection with a minimum of 512 Kbps up and down, and no filtering or proxying of HTTP(S) outgoing connections.

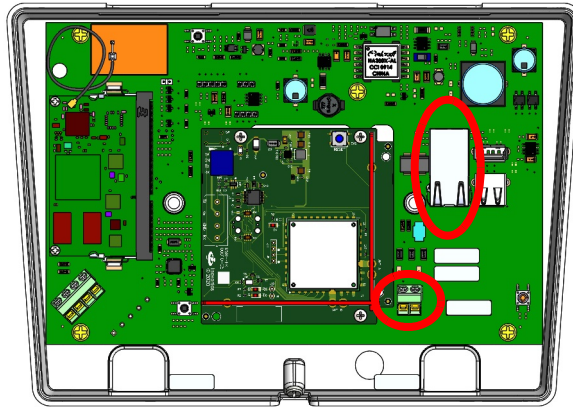


Figure 3 Connect power to the IP gateway.

- If using line power, connect one end of a RJ45 Ethernet cable to a RJ45 Ethernet jack, and connect the other end to your LAN to establish Internet connectivity.

- Ensure 10/100BASE-T Ethernet with DHCP network management protocol.

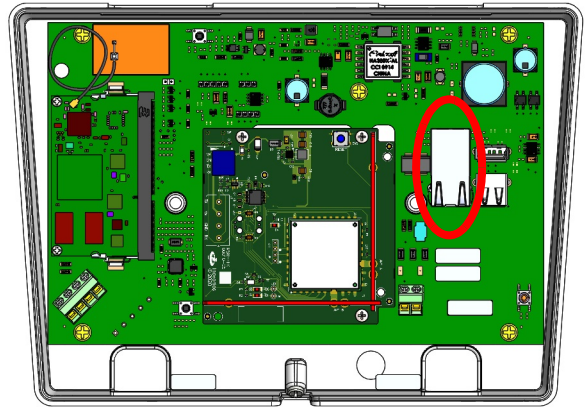


Figure 4 Connect to Ethernet if using line power.

- If deploying a TapWatch gateway on a site with Frequency Agile (FA) hardware, you will need to connect an FA403 receiver to the TapWatch gateway; if not deploying a TapWatch gateway on a site with FA hardware, skip to step 8.
 - You will wire the FA403 receiver to the EXT RECEIVER terminal blocks on the gateway shown below.

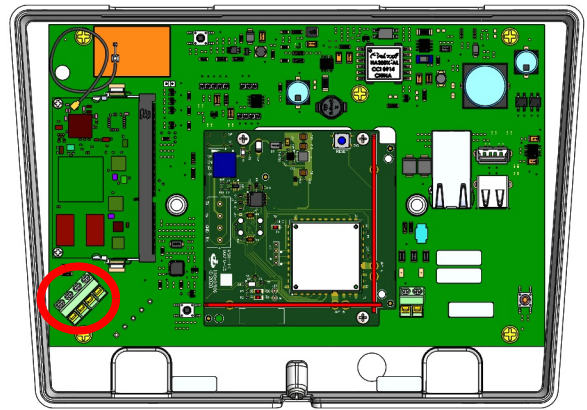


Figure 5 Use the IP gateway's external receiver terminal to connect to an FA403.

- Use the following wiring diagram to connect the FA403 to the TapWatch gateway:

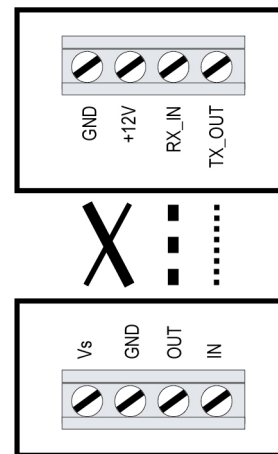


Figure 6 Connect an FA403 to the IP gateway using the wiring diagram.

Note: Steps 8 through 12 are generic configuration instructions for the IP gateway. For instructions for your individual license, see the manual for your specific license or application.

8. If using an existing EN4080 configuration file, open the configuration file and proceed to step 11; if using a new EN4080 configuration file:
 - a. Press the IP gateway's reset button.
 - b. Wait for the green LED to flash.
 - c. Insert a USB flash drive into either of the IP gateway's USB ports.
 - d. When the red LED is solidly lit, remove the USB drive.
 - e. Insert the USB drive into a PC.

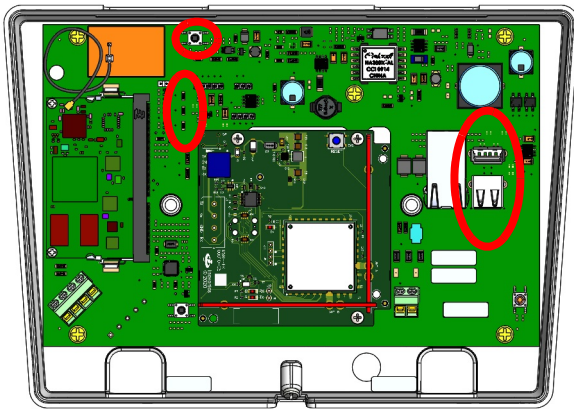


Figure 7 Load IP gateway's configuration file onto a USB drive.

9. On your PC, open the configuration file from the USB drive.
 - It will be named en4080-XX-config-YYYYMMDD-HHMMSS.yaml, where XX is the last two hex digits of the Ethernet MAC address, as shown on the label on the back of the house, and YYYYMMDD-HHMMSS is the current date and time.
10. Enter the configuration information into the .yaml file:
 - Enter TXIDs for the transmitters and any repeaters to be registered to the IP gateway, referring to and overwriting the examples provided in the file, separated by commas.

Note: Entering TXIDs in the config file is only necessary for the EN4080. The EN7295, EN7380, EN7580 and EN7581 will pull the TXIDs from Inovonics Cloud Services.

- Enter the desired hostname, port, and other configuration settings for the remote server where the IP-based application is running.
- Configure the network connectivity as desired. By default, only Ethernet is enabled with DHCP; WiFi is disabled. See the individual manual for your application for configuration details.
- Configure a senior living gateway for a directed network by setting the NID value in the .yaml file. The keyword NID and value are required in the radio section of the configuration file.

Note: When using an EN6040 network coordinator with a directed network, it needs to remain powered at all times to ensure continuous operation.

11. Save the configuration file onto the USB drive as en4080-config.yaml, ensuring no further hidden extensions on the file name.
12. Load the configuration file onto the IP gateway:
 - a. Safely eject the USB drive from the PC.
 - b. Press the IP gateway's reset button.
 - c. Wait for the green LED to flash.
 - d. Insert the USB flash drive into either of the IP gateway's USB ports.
 - e. When the red LED is solidly lit, indicating the gateway has finished processing the configuration file, remove the USB drive.

Note: If the red LED is not solidly lit, the yaml file did not load. Please check formatting, ensure you are using Notepad ++ or a similar yaml editor and use a yaml validator such as yamllint.com.

Note: An en4080-XX-status-YYYYMMDD-HHMMSS.txt file will be created on the USB drive with details about the configuration file load.

13. Use a Phillips screwdriver to close the IP gateway housing.

Note: The RF antennae are optimized for best performance with the cover closed.

Once the IP gateway is functional and all transmitter TXIDs have been registered, the LEDs will function as follows:

- Green: Blinks when powering up; solid when power up is complete.
- Orange: Blinks while establishing an IP connection; solid when IP connected.
- Red: Blinks upon message receipt from any transmitter.

3 Tips and Notes

3.1 Installation Notes

- These products are designed to be maintained by professional technicians.
- Products are tested for indoor use.
- Inovonics recommends registering and testing end devices prior to installation, using a floor plan or something similar to indicate installation locations. Consider marking or applying descriptive labels to the end device cases to ensure proper installation. Conduct a site survey with an Inovonics survey kit prior to installation to assist with RF gateway, repeater and end device placement.
- Inovonics recommends avoiding double-NAT and other non-standard network topologies, a business class Internet connection with a minimum of 512kbps up and down, and a business class (not residential class) router.
- Use a brand name USB flash drive with a FAT32 (vfat) filesystem for configuration.
- The IP gateway configuration file is YAML formatted. See yaml.org for details.
- If using line power, keep cable length to less than 10 feet to minimize noise pickup.
- The IP gateway has no open ports and uses very little bandwidth, only posting small messages periodically. Any significant bandwidth usage is transitory and brief, but does include reporting any buffered messages after an Internet connection disruption is resolved, occasional firmware updates, and a nightly Internet connection test (at a random time during the 08:00 UTC hour).
- Metal will reduce radio frequency (RF) range. Mount the IP gateway in a location removed from metal, including duct work, wire mesh screens, IT closets, metal boxes, etc. For additional information, see the "EchoStream Device Installation Recommendation" tech note at www.inovonics.com.
- The first time you connect an IP gateway to the Internet it will check for and initiate firmware updates. This will take up to 15 minutes and the gateway may experience a reboot cycle to complete the update.
- The EchoStream system should be tested regularly to ensure operation. To test, place the system in test mode, activate an end device, and ensure an appropriate response.

3.2 Internet Connectivity Troubleshooting

In the case of a connectivity issue, ensure the following:

- There is no loose or disconnected cabling.
- There is power to Ethernet routers and/or switches.
- Wired connectivity is 10/100 Ethernet.
- If using DHCP, the renewal time is greater than an hour, but less than infinite.
- WiFi is 802.11b/g/n using 2.4GHz, supporting WPA2 (personal).
- The router/firewall allows outbound connections without filtering or proxying on these ports: DNS (TCP/UDP 53); HTTPS (TCP 443); NTP (UDP 123); OTA (TCP 9000).

4 Specification

Dimensions: 9.556" x 6.65" x 1.208" (243 mm x 169 mm x 31 mm).

Power requirements: Line power: The Inovonics ACC610 transformer, or a 12-14V AC intrinsically safe power supply capable of supplying at least 16W, or a 12-15V DC power supply capable of supplying at least 15W; POE: IEEE 802.3af-2003 compliant.

Ethernet: 10/100 BASE-T, DHCP, static IP.

WiFi: 802.11b/g/n, 2.4GHz, WPA2-Personal, DHCP, static IP.

Operating frequencies: EchoStream: 902 - 928 MHz North America, 915 - 928 MHz Australia, 921 - 928 MHz New Zealand; 2.400 GHz to 2.485 GHz.

Operating environment: Temperature: 32°F to 140°F; humidity: Up to 90% non-condensing.

Regulatory certifications: FCC, RoHS, RCM, ISED.

Note: Specifications and data are subject to change without notice.

Note: Inovonics supports recycling and reuse whenever possible. Please recycle these parts using a certified electronics recycler.

5 Regulatory Compliance

5.1 Television and Radio Interference

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 equipment 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 equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Increase the separation between the equipment and receiver.
- Consult the dealer or an experienced radio/TV technician for help.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

5.2 FCC Part 15 and Innovation, Science and Economic Development Canada (ISED) Compliance

This device complies with part 15 of the FCC Rules, and ISED license-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 that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR Innovation, Sciences et Développement économique 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.

Note: Inovonics commercializes products utilizing open source third party software. For additional information, please visit: <https://www.inovonics.com/support/embedded-third-party-licenses/>.

Caution: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

5.3 Radiation Exposure Limits

FCC

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. In order to avoid the possibility of exceeding the FCC radio frequency exposure limits, human proximity to the antenna shall not be less than 20 cm during normal operation and must not be co-located or operating in conjunction with any other antenna or transmitter.

ISED

This equipment complies with ISED RSS-102 radiation exposure limits set forth for an uncontrolled environment. This transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

Cet équipement est conforme avec ISED RSS-102 des limites d'exposition aux rayonnements définies pour un environnement non contrôlé. Cet émetteur doit être installé à au moins 20 cm de toute personne et ne doit pas être colocalisé ou fonctionner en association avec une autre antenne ou émetteur.

5.4 Wi-Fi and Short Range Module

This device includes an LSR Sterling-LWB module (FCC ID: TFB-1003 / ISED ID: 5969A-1003) and an LSR FlexNotch 2 dBi Antenna, PN 001-0015.

The FCC requires the user to be notified that any changes or modifications made to this device that are not expressly approved by LSR may void the user's authority to operate the equipment.

To comply with FCC and ISED RF exposure limits for general population / uncontrolled expose, the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20cm from all persons and operating in conjunction with any other antenna or transmitter, except in accordance with FCC multi-transmitter product procedures.

6 Open Source Software Notice and Information

To obtain the source code under GPL, LGPL, MPL, and other open source licenses that are contained in this product, please contact Inovonics technical services. In addition to the source code, all referred license terms, warranty disclaimers and copyright notices are also available.