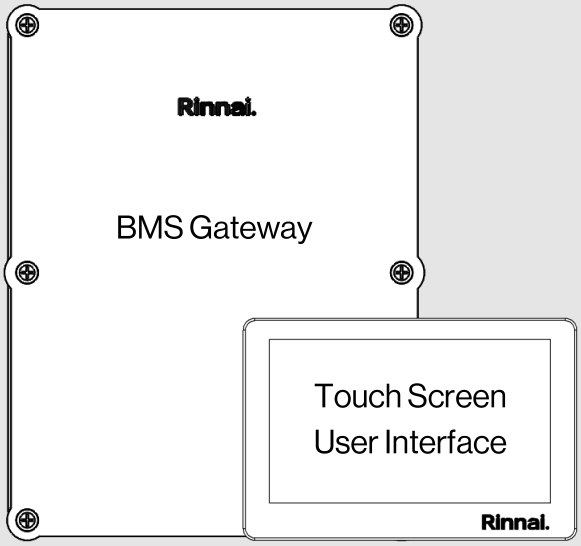
Indoor BMS Gateway (R-BMS-100)
Outdoor BMS Gateway (RBMS100E)
Touch Screen User Interface (R-BMS-101)



Building Management System (BMS) Gateway

Installation and Operation Manual

Rinnai®

IMPORTANT

Unless otherwise stated, images in this manual illustrate the indoor BMS Gateway model.

Contents

1. Welcome

Thank you for purchasing Rinnai's Building Management System (BMS) Gateway.

This manual provides information on the installation, operation, and maintenance of Rinnai's BMS Gateway and touch screen user interface. Read this manual completely before installing or operating the Rinnai BMS Gateway (referred to as "BMS Gateway" throughout this document).

1.1. To The Installer

- A trained and qualified professional must install the BMS Gateway. The warranty may be voided due to any improper installation.
- The trained and qualified professional should have an understanding of BMS components, including:
  - BMS hardware (cables, electrical wires, computers, etc.)
  - BMS software including network protocols: BACnet IP, BACnet MS/TP, and ModBus RTU
- Read all instructions in this manual before installing the BMS Gateway. The BMS Gateway must be installed according to the exact instructions in this manual.
- Proper installation is the responsibility of the installer.
- When installation is complete, leave this manual with the BMS Gateway or give the manual directly to the owner.

1.2 To The Owner

- You must read the entire manual to properly operate the BMS Gateway and understand maintenance requirements.
- Keep this manual for future reference.
- See section "2.2 Safety Precautions" for detailed safety precautions.
- Be sure the BMS Gateway is installed by a trained and qualified professional.

For Your Records

Dealer Name: _____

Dealer Phone #: _____

Purchase Date: _____

Acronyms and Abbreviations

Table 1 below lists common acronyms and abbreviations used in this manual:

Table 1. Acronyms and Abbreviations

APK	Android Package Kit
BMS	Building Management System
GPM	Gallons Per Minute
NEC	National Electrical Code
OSHA	Occupational Safety and Health Administration
TRS	Tankless Rack System
UI	User Interface
UL	Underwriters Laboratories

2. Safety

2.1 Safety Symbols

This manual contains the following important safety symbols. Always read and obey all safety messages.

Safety alert symbol. Alerts you to potential hazards that can kill or hurt you and others.

DANGER

Indicates an imminently hazardous situation which, if not avoided, will result in personal injury or death.

WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in personal injury or death.

CAUTION

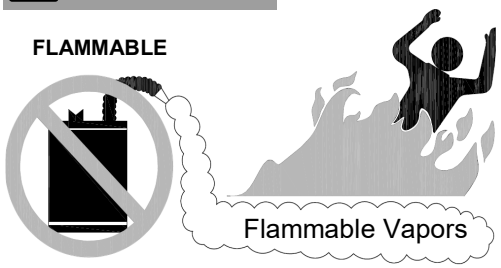
Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury. It may also be used to alert against unsafe practices.

2.2 Safety Precautions

The following precautions apply to the installer and consumer. Read and follow all instructions in this section.

- Before installation, it is imperative to observe all precautions as stated in this manual. Failure to follow all precautions may result in electric shock, fire and/or serious injury.
- Read these installation instructions carefully. Consult local building codes, Occupational Safety and Health Administration (OSHA), and National Electrical Code (NEC) for special requirements.
- It is recommended that a trained and qualified professional who has attended a Rinnai installation training class complete your installation.
- Improper installation, modification, service, maintenance or use of the BMS Gateway can cause electrical shock, burns or other conditions which may cause personal injury or property damage.
- Any alteration to the BMS Gateway or its controls can be dangerous and will void the warranty.
- If any part of the system appears damaged, do not attempt to use it.
- Do not use the BMS Gateway if any part has been under water. Immediately call a trained and qualified professional to inspect the system and replace any part that has been under water.
- Do not use substitute materials. Use only parts certified for the BMS Gateway.

WARNING



FOR YOUR SAFETY
Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.

WARNING

Electrical Shock:

- Disconnect power before servicing.
- In the event of a malfunction or breakdown, grounding provides a path of least resistance for electric current which reduces the risk of electrical shock. DO NOT remove the ground connection from the BMS Gateway's power plug.
- Disconnect power when accessing connections inside the BMS Gateway enclosure. Failure to do so may result in electrical shock.
- The power supply must be sized and protected according to section "3.4 Specifications" in this document.
- Prior to making any electrical connections, ensure that supply voltage, frequency, and phase are as specified in section "3.4 Specifications" in this document.
- DO NOT connect or disconnect cables during periods of lightning.
- Inspect factory wiring connections to be sure none were loosened in transit.
- All electrical connections and field wiring must comply with National Electrical Code (NEC) and applicable requirements of UL and local codes, where applicable.

3. About

3.1 Description

The Rinnai BMS Gateway remotely monitors and controls Rinnai Commercial Tankless Water Heaters[1] through an optional touch screen user interface and/or a customer-supplied BMS (optional).

3.1.1 How the Rinnai BMS Gateway Works

The illustration below (Fig 1) depicts the main components of a typical Rinnai BMS Gateway installation. Refer to section “3.3 Configurations” for additional configurations.

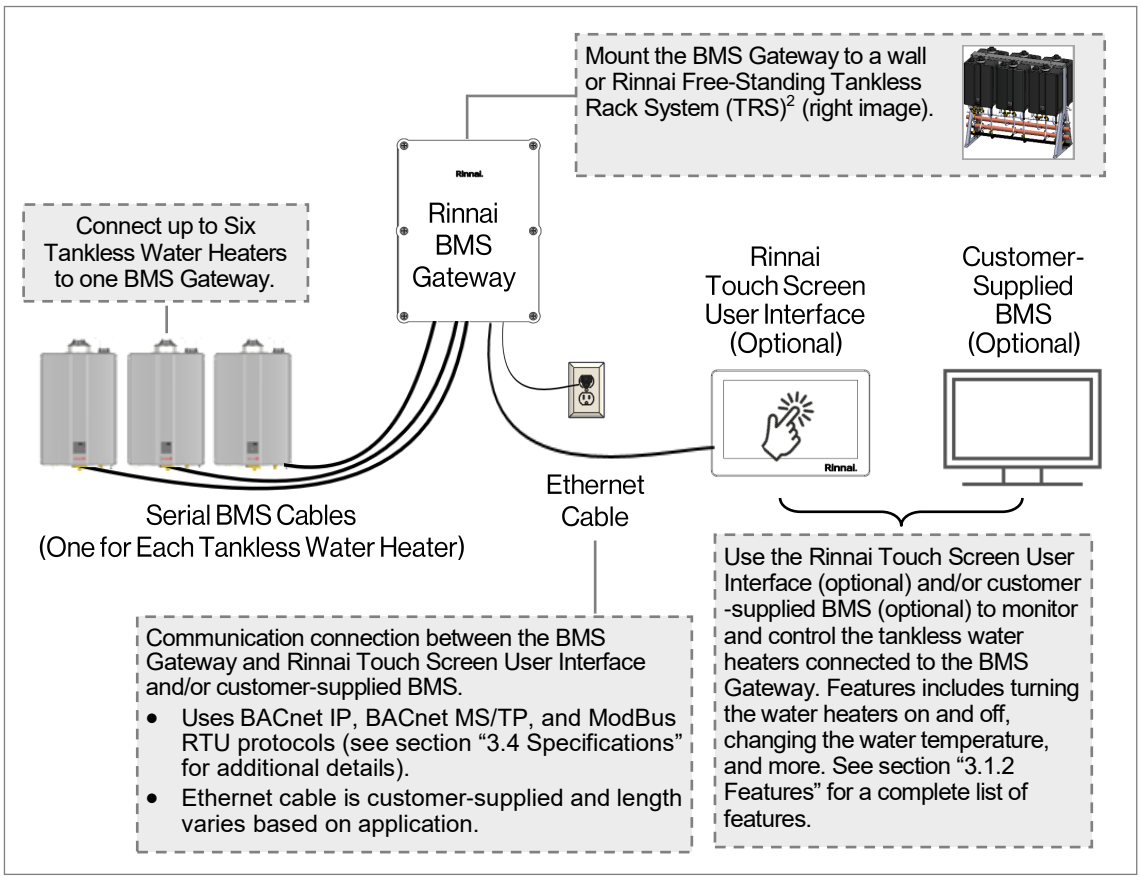


Fig 1. Main Components of Typical BMS Gateway Installation

[1] See section “3.1.3 Tankless Water Heaters” for applicable tankless water heater models.

[2] Image shown is a free-standing TRS rack with six Rinnai Tankless Water Heaters. Additional configurations are available. Product images are for illustrative purposes only.

3.1.2 Features

Monitor and control Rinnai Commercial Tankless Water Heaters (applicable models) to turn the tankless water heaters on or off, adjust the water temperature, monitor tankless water heater status, and more.

Table 2 below provides a complete list of parameters to view and/or edit using the optional touch screen user interface or customer-supplied BMS.

Table 2. Tankless Water Heater Parameters

Tankless Water Heater Parameter	View	Edit
Turn Water Heater On or Off	✓	✓
Temperature Set Point	✓	✓
Water Flow Servo Position	✓	
Water Flow Rate	✓	
Hot Water Outlet Temperature	✓	
Operation Hours	✓	
Combustion Cycles	✓	
Fan Speed	✓	
Cold Water Inlet Temperature	✓	
Fan Current	✓	
Bypass Servo Position	✓	
Exhaust Temperature	✓	
Freeze Protection Temperature	✓	
Burner State	✓	
Water Heater State	✓	
Current Error	✓	
Error Code History	✓	

3.1.3 Tankless Water Heaters

The BMS Gateway is compatible with the following Rinnai Commercial Condensing Tankless Water Heaters:

- KB C199
- SENSEI™ CU199
- SENSEI™ CU160
- SENSEI™ CX199
- SENSEI™ CX160

Note: The BMS Gateway is not compatible with Demand Duo® Hybrid Commercial Water Heating Systems.

IMPORTANT

The BMS Gateway is not compatible with SENSEI™ tankless water heaters manufactured before serial number LM.BA-152112.

For SENSEI™ tankless water heaters with a serial number manufactured before LM.BA-152112, the tankless water heater PC Board must be replaced for BMS Gateway compatibility.

Notes:

- The tankless water heater serial number is located on the left side panel label (Fig 2) of the tankless water heater.

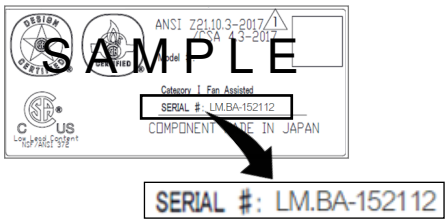


Fig 2. Sample Label with Serial Number. Label image is for illustrative purposes only. Your label may appear differently.

- To determine if your serial number is less than LM.BA-152112, compare the last six digits of your serial number to the last six digits of the above serial number: 152112.

  If the last six digits of your serial number are less than 152112, then your tankless water heater is manufactured before serial number LM.BA-152112.

IMPORTANT

Important Cable Information:

✓ **Compatible:** The BMS Gateway is compatible with Rinnai's Cascade Cable for SENSEI™ models only (not KB models).

Cascade Cable (SENSEI™ Models)

✗ **Not Compatible:** The BMS Gateway is not compatible with Rinnai's EZ Connect or MSB Cables.

EZ Connect or MSB Cables

3.2 Components

Indoor BMS Gateway

Main Components

Fig 3. Main Components

Internal View

(Front Cover Removed)

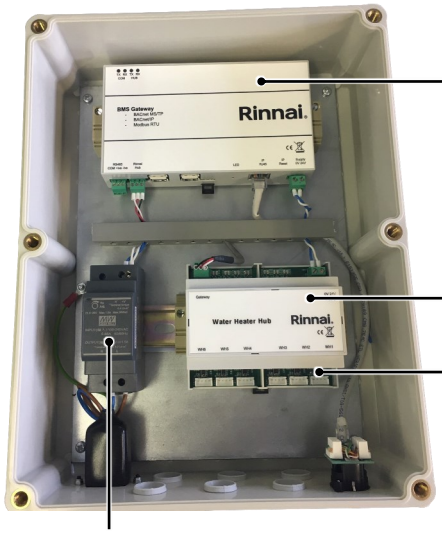


Fig 4. Internal View

Bottom and Back Views

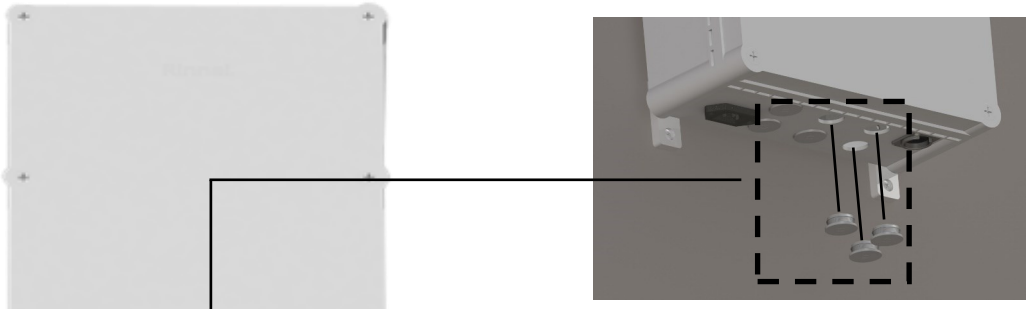


Fig 6. Cable Cord Openings (With Removable Cover Plugs)

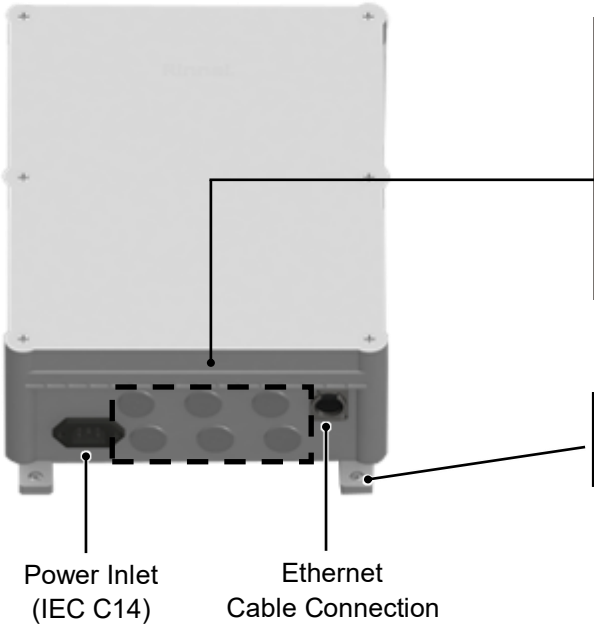


Fig 5. Bottom View

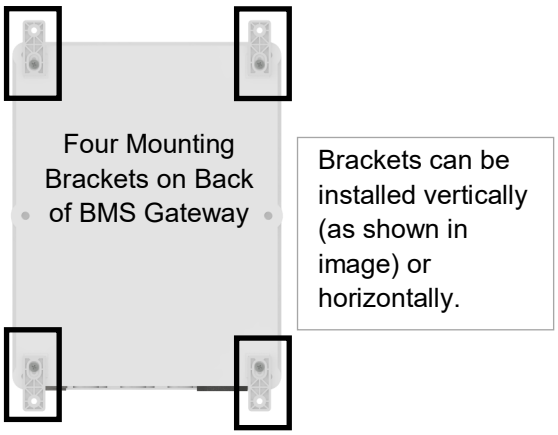


Fig 7. Mounting Brackets on Back of BMS Gateway

Outdoor BMS Gateway

Main Components

Fig 8. Main Components

Internal View
(Front Cover Opened)

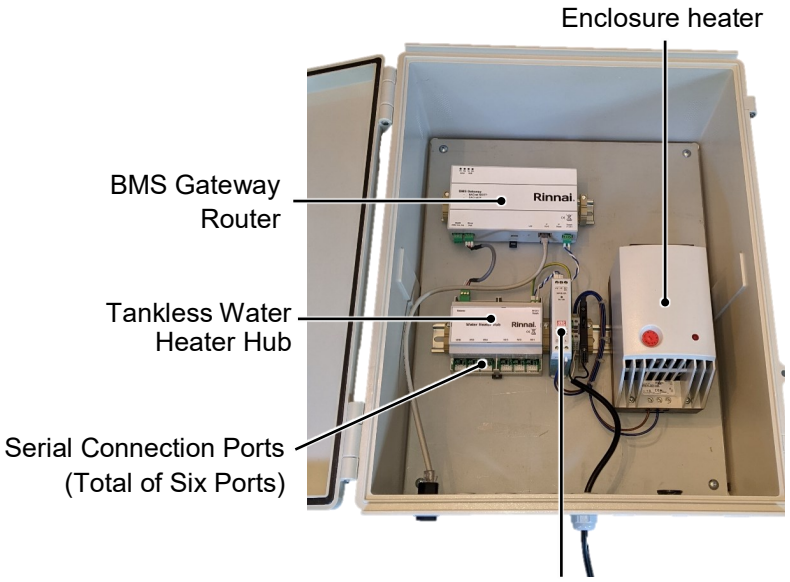


Fig 9. Internal View

Bottom and Back Views

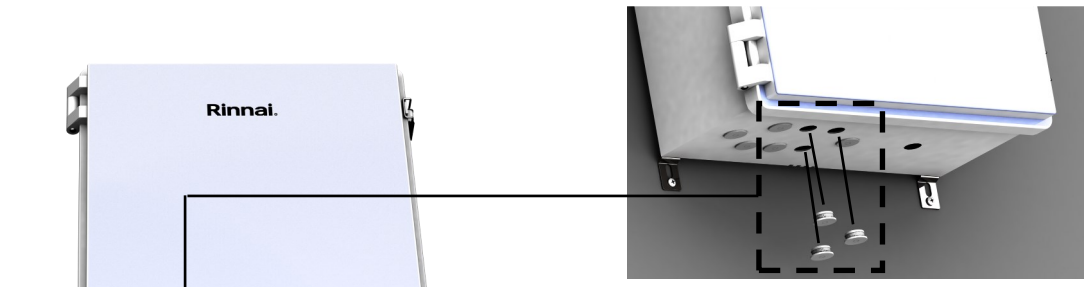


Fig 11. Cable Cord Openings (With Removable Cover Plugs)

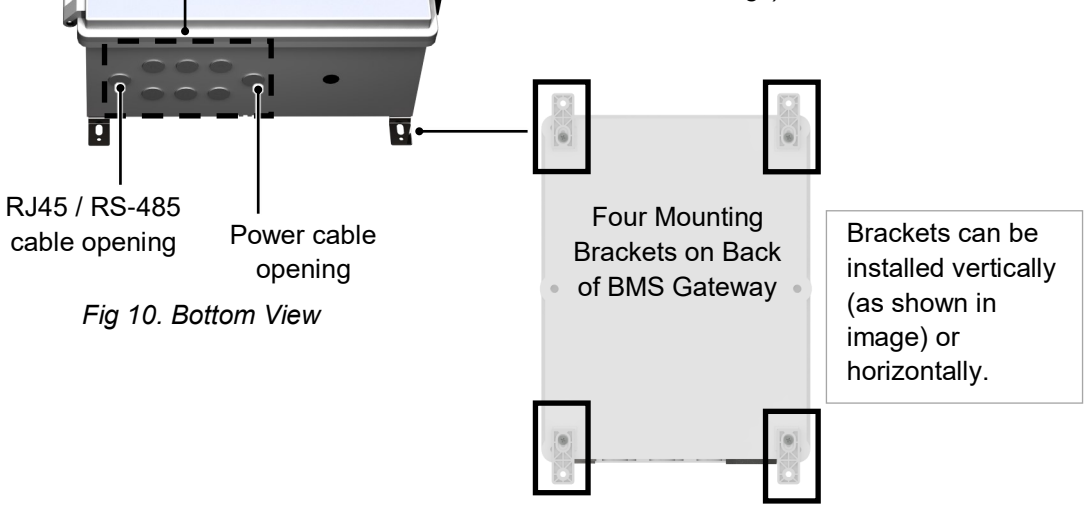


Fig 10. Bottom View

Fig 12. Mounting Brackets on Back of BMS Gateway

3.3 Configurations

Below are two example BMS Gateway configurations (Fig 13 and Fig 14). Refer to the following section for a complete list of configurations: “5.6 Connect BMS Gateway to Other System Components.”

Note: The front cover panel is removed on the BMS Gateway images to show internal components.

IMPORTANT

Refer to section “3.5 Parts List and Accessories” for part numbers of the items shown below (unless noted as customer-supplied).

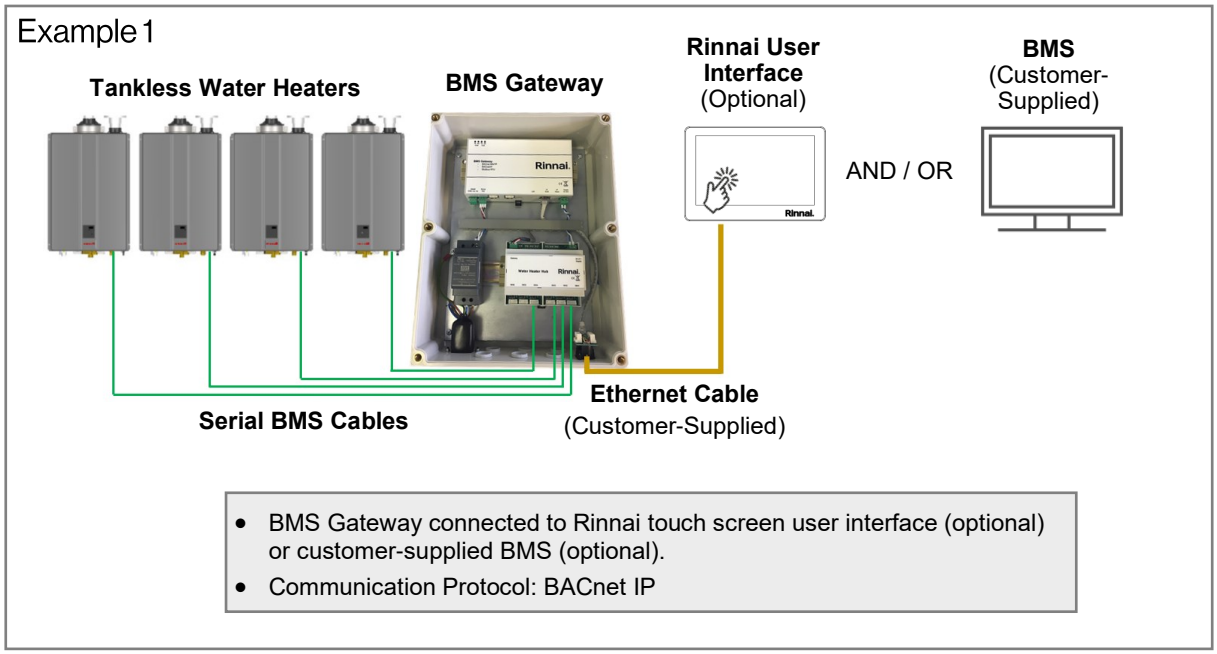


Fig 13. Example 1: BMS Gateway Connected to Rinnai Touch Screen User Interface (Optional) or Customer-Supplied BMS.

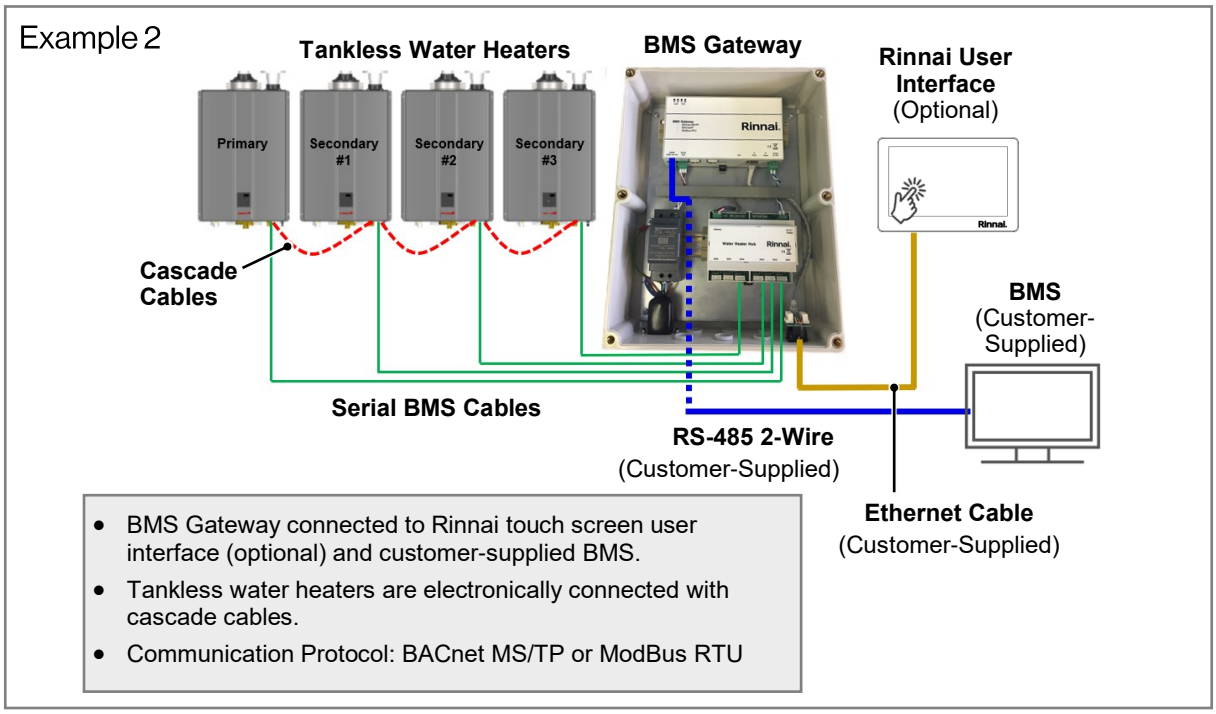


Fig 14. Example 2: BMS Gateway Connected to Rinnai Touch Screen User Interface (Optional) and Customer-Supplied BMS.

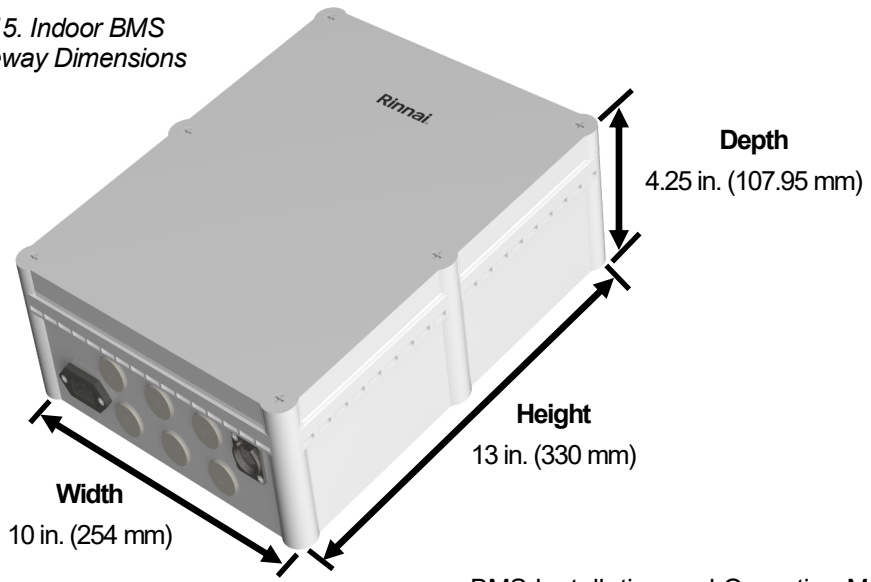
3.4 Specifications

3.4.1 Indoor BMS Gateway Specifications

Table 3. BMS Gateway Specifications

Product	Indoor BMS Gateway (Part Number: R-BMS-100)	
Installation Type	Indoor	
Installation Options	Mounts to a wall with supplied mounting hardware or to a Rinnai Tankless Rack System (TRS) free-standing rack with optional bracket.	
Orientation	This product is designed to be installed vertically but may be installed in other orientations if desired (horizontally, for example).	
Product Weight	7.5 lb (3.4 kg)	
Dimensions (Fig 15) (w, h, d)	Enclosure	10 in. x 13 in. x 4.25 in. (254 mm x 330 mm x 107.95 mm)
	Shipping Carton	10.25 in. x 13.75 in. x 5 in. (260.35 mm x 349.25 mm x 127 mm)
Environment Temp.	Minimum 40°F (4°C) Maximum 140°F (60°C)	
Construction	Constructed from polycarbonate material. IP66 flame retardant enclosure.	
Tankless Water Heaters	Pairing	Pairs up to 6 (maximum) Rinnai Commercial Condensing Tankless Water Heaters (models listed below).
	Models	• Indoor KB C199, SENSEI™ CU160, CU199, CX160 and CX199 Note: KB C199 water heaters cannot be used with both the BMS Gateway and MSB combined. • BMS Gateway is not compatible with: – Demand Duo® Hybrid Commercial Water Heating Systems. – SENSEI™ tankless water heaters manufactured before serial number LM.BA-152112. SENSEI™ tankless water heaters manufactured before serial number LM.BA-152112 must replace the PC Board for BMS Gateway compatibility.
Connections	Power	Single-phase. 60 Hz Frequency. 120V AC. 36W max power consumption. EIC C14/NEMA 5-15p power cord (included).
	Communication	RJ45 ethernet port, 6x serial hub connections, and RS-485 (two-wire) connection.
	Serial BMS Cable	Connects each Rinnai Tankless Water Heater to the BMS Gateway. One cable is required for each tankless water heater connected to the BMS Gateway. Part #: R-BMS-Cable-3M (10 ft. / 3 m)
BMS Communication Protocols	BACnet IP, BACnet MS/TP, and ModBus RTU. LonWorks connectivity is possible with a third-party BACnet to LonWorks Gateway device connected to a LonWorks network.	
Network Compatibility	Ethernet IP (RJ45) and RS-485 (two-wire)	
Approvals	An assembly of UL listed and UL recognized components.	

Fig 15. Indoor BMS Gateway Dimensions

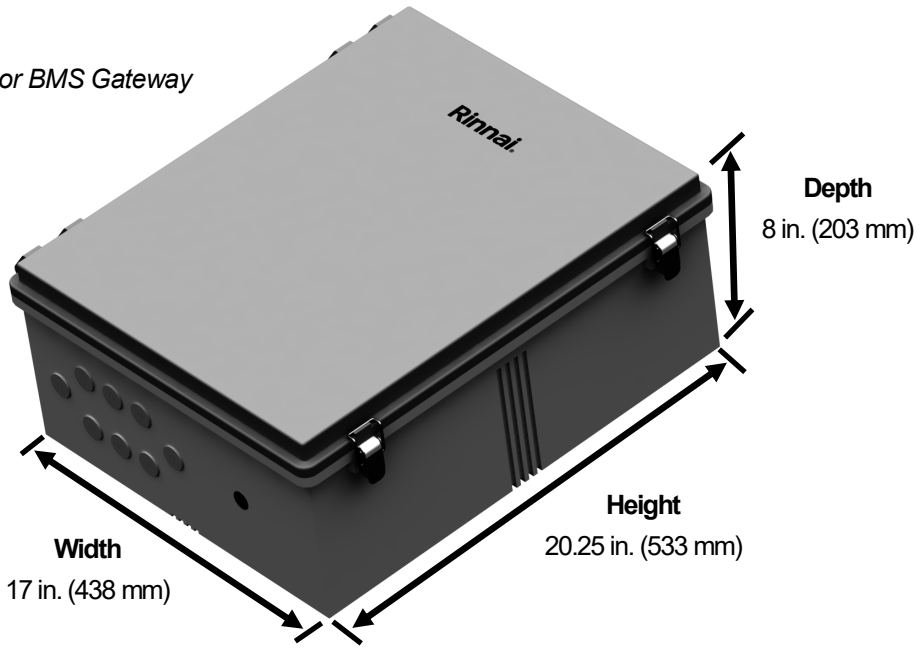


3.4.2 Outdoor BMS Gateway Specifications

Table 4. BMS Gateway Specifications

Product	Outdoor BMS Gateway (Part Number: RBMS100E)	
Installation Type	Outdoor and Indoor	
Installation Options	Mounts to a wall with supplied mounting hardware or to a Rinnai Tankless Rack System (TRS) free-standing rack with optional bracket.	
Orientation	This product is designed to be installed vertically but may be installed in other orientations if desired (horizontally, for example).	
Product Weight	16.2 lb (7.4 kg)	
Dimensions (Fig 16) (w, h, d)	Enclosure	17 in. x 20.25 in. x 8 in. (431.80 mm x 514.35 mm x 203.20 mm)
	Shipping Carton	17.25 in. x 21 in. x 8.75 in. (438.15 mm x 533.40 mm x 222.25 mm)
Environment Temp.	Minimum -4°F (-20°C) Maximum 140°F (60°C)	
Construction	Constructed from polycarbonate material. IP66 flame retardant enclosure.	
Tankless Water Heaters	Pairing	Pairs up to 6 (maximum) Rinnai Commercial Condensing Tankless Water Heaters (models listed below).
	Models	• Indoor KB C199, SENSEI™ CU160 and CU199 Note: KB C199 water heaters cannot be used with both the BMS Gateway and MSB combined. • BMS Gateway is not compatible with: – Demand Duo® Hybrid Commercial Water Heating Systems. – SENSEI™ tankless water heaters manufactured before serial number LM.BA-152112. SENSEI™ tankless water heaters manufactured before serial number LM.BA-152112 must replace the PC Board for BMS Gateway compatibility.
Connections	Power	Single-phase. 60 Hz Frequency. 120V AC. 690W max power consumption. NEMA 5-15p power cord (included).
	Communication	RJ45 ethernet port, 6x serial hub connections, and RS-485 (two-wire) connection.
	Serial BMS Cable	Connects each Rinnai Tankless Water Heater to the BMS Gateway. One cable is required for each tankless water heater connected to the BMS Gateway. Part #: R-BMS-Cable-3M (10 ft. / 3 m)
BMS Communication Protocols	BACnet IP, BACnet MS/TP, and ModBus RTU. LonWorks connectivity is possible with a third-party BACnet to LonWorks Gateway device connected to a LonWorks network.	
Network Compatibility	Ethernet IP (RJ45) and RS-485 (two-wire)	
Approvals	An assembly of UL listed and UL recognized components.	

Fig 16. Outdoor BMS Gateway Dimensions



3.4.3 Touch Screen User Interface Specifications

Table 5. Touch Screen User Interface Specifications

Product	7 in. (178 mm) IPS Touch Screen User Interface	
Part Number	R-BMS-101	
Supported Devices	Rinnai BMS Gateway	
Installation Type	Indoor	
Installation Options	Mounts to wall with supplied mounting brackets.	
Orientation	Horizonal	
Product Weight	1.5 lb (0.7 kg)	
Dimensions (Fig 17) (w, h, d)	User Interface	7.13 in. x 4.75 in. x 1.43 in. (181.10 mm x 120.65 mm x 36.22 mm)
	Shipping Carton	9 in. x 5 in. x 2 in. (228.6 mm x 127 mm x 50.8 mm)
Connections	Power	Single-phase. 60 Hz Frequency. 120V AC, 12V DC power adapter (included), 24W max power consumption
	Communication	RJ45 ethernet port, USB Type-A port, HDMI Type-A port
Network Compatibility	Ethernet IP (RJ45)	
Additional Features	• Connects directly to BMS Gateway or with a network hub using an Ethernet cable (customer-provided). • Pairs with up to 10 BMS Gateways on the same network • Android Package Kit (APK) graphical user interface	

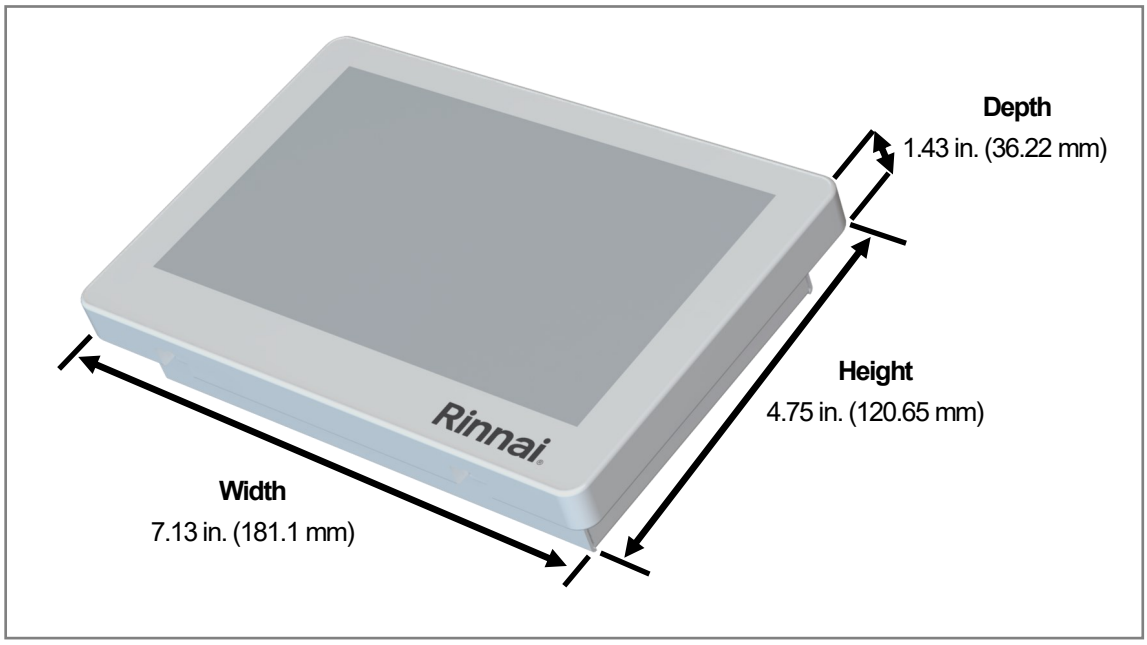


Fig 17. Touch Screen User Interface Dimensions

3.5 Parts List and Accessories

Refer to Table 6 for part numbers of Rinnai components shown in an example BMS Gateway installation (Fig 18).

Note: In Fig 18 below, the BMS Gateway (indoor model) front cover is removed for display purposes.

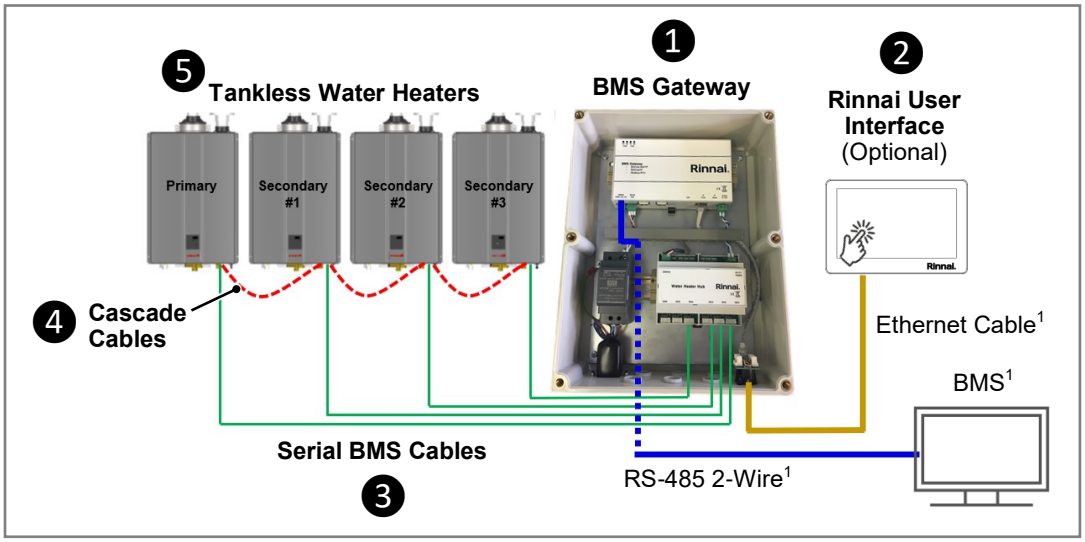


Fig 18. Example BMS Gateway Installation

Table 6. Parts List and Accessories

Item	Item	Description	Rinnai Part #
1	Rinnai BMS Gateway	Indoor	R-BMS-100
		Outdoor	RBMS100E
2	Rinnai Touch Screen User Interface	Optional item. See section “3.4 Specifications” for more information.	R-BMS-101
3	Serial BMS Cable	Connects each Rinnai Tankless Water Heater to the BMS Gateway. One cable is required for each tankless water heater connected to the BMS Gateway.	R-BMS-Cable-3M (10 ft. / 3 m)
4	Cascade Cable	Electronically connects up to 24 Rinnai Tankless Water Heaters. This connection rotates water heater operation order to ensure equal usage among the entire system and enables all tankless water heaters connected to modulate operation and function as one hot water source. Purchase includes one cascade cable and two cable jumpers.	• REU-CSA-C1 (10 ft. / 3 m) • REU-CSA-C2 (26 ft. / 8 m)
5	Rinnai Tankless Water Heater	See section “3.1.3 Tankless Water Heaters” for applicable tankless water heater models.	Contact Dealer/Distributor
N/A	Rinnai Free-Standing Tankless Rack System (TRS) 	Optional accessory. Rinnai’s TRS is designed to supply a packaged water heating solution as a fully assembled system. The TRS includes preassembled water and gas connections and manifolds under the tankless water heaters that are properly sized to maintain optimum performance. Numerous configurations are available. Contact your dealer or distributor for more information.	Contact Dealer/Distributor
N/A	TRS Rack Mounting Bracket	Mounts the BMS Gateway to a TRS rack. See section “10.1 Mount the BMS Gateway to TRS Rack” for more information on the mounting bracket.	• Rack for Indoor BMS Gateway: R-BMS-102 • Rack for Outdoor BMS Gateway: RBMS102E

[1] Item is customer-supplied.

Product images are for illustrative purposes only.

4. Installation Preparation

4.1 What You Will Need

Carefully unpack the system contents. If any part appears damaged, do not use it. Contact your local dealer/distributor.

The BMS Gateway is shipped with installation components inside the enclosure. To open the enclosure:

- **Indoor BMS Gateway:**

  Use a Phillips head screwdriver to remove the six plastic screws attaching the front cover to the enclosure. Then, remove the cover (Fig 19).

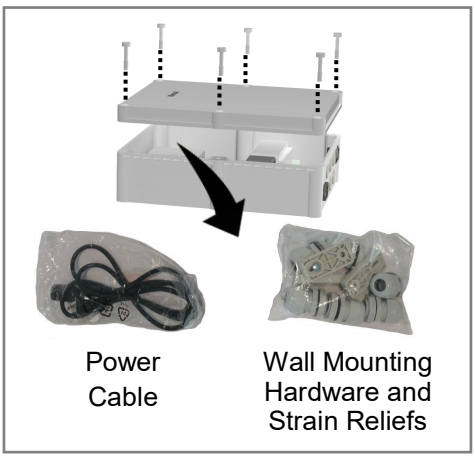


Fig 19. BMS Gateway Contents

- **Outdoor BMS Gateway:**

  Unlock the two latches and swing open the front cover (Fig 20).

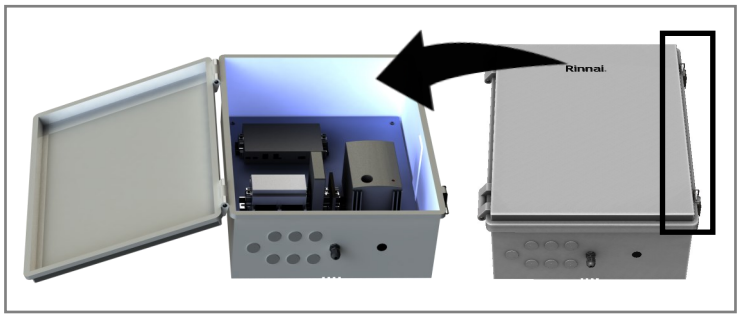


Fig 20. Open Outdoor BMS Gateway

4.1.1 Items Included

- **BMS Gateway**
  - Wall Mounting Hardware (4 wall mount brackets, 4 wall mount screws, and 4 bracket screws)
  - Wire Strain Reliefs (Qty 6)
  - IP67 RJ45 Strain Relief (Outdoor BMS Gateway Only)
  - 6 ft. (2 m) Three-Prong 120V AC Power Cord
  - BMS Gateway Installation and Operation Manual (this manual)
- **Touch Screen User Interface (Optional)**
  - Wall Mount Bracket
  - 12V DC Power Adapter
- **Serial BMS Cable**
  - 10 ft. (3 m) Cable with Integrated Fuse.
    One serial communication cable is required for each tankless water heater in the BMS Gateway system.

4.1.2 Items Needed (Customer-Supplied)

Gather the required parts and tools before starting installation. Read and follow the instructions provided with any tools listed below.

- One of the following devices for initial setup (not required after the BMS Gateway system is setup). Device must include an Internet browser.
  - Computer (desktop or laptop)
  - Smartphone or Tablet
  - Wireless Router
- Network Ethernet hub/switch/router
- Ethernet cables (standard or crossover depending on configuration). Quantity and lengths vary based on application.
- RS-485 2-Wire (if applicable to your configuration)
- #6 wall screws (Qty 4) and wall anchors (Qty 4) if needed for wall mount installation of the BMS Gateway.
- Tools: Phillips head screwdriver, adjustable wrench, level, drill and drill bit set.

4.2 Choose an Installation Location

Use the following guidelines to select a location for the BMS Gateway enclosure.

- Choose a location close enough to allow the BMS Gateway to connect to each tankless water heater using the Serial BMS Cables (see “A” in Fig 21). Each Serial BMS Cable is 10 ft. (3 m).
- Ensure the location has provisions for power supply to the BMS Gateway enclosure (see “B” in Fig 21). The provided three-prong 120V AC power cord is 6 ft. (2 m).
- Ensure that adequate space surrounds all sides (including the front panel) of the BMS Gateway for service and support needs. No minimum space clearances are required (see “C” in Fig 21).
- Consider the length of other cables (if applicable to your configuration), such as Ethernet cables, network cables, RS-485 2-wire cable, etc. (see “D” in Fig 21).

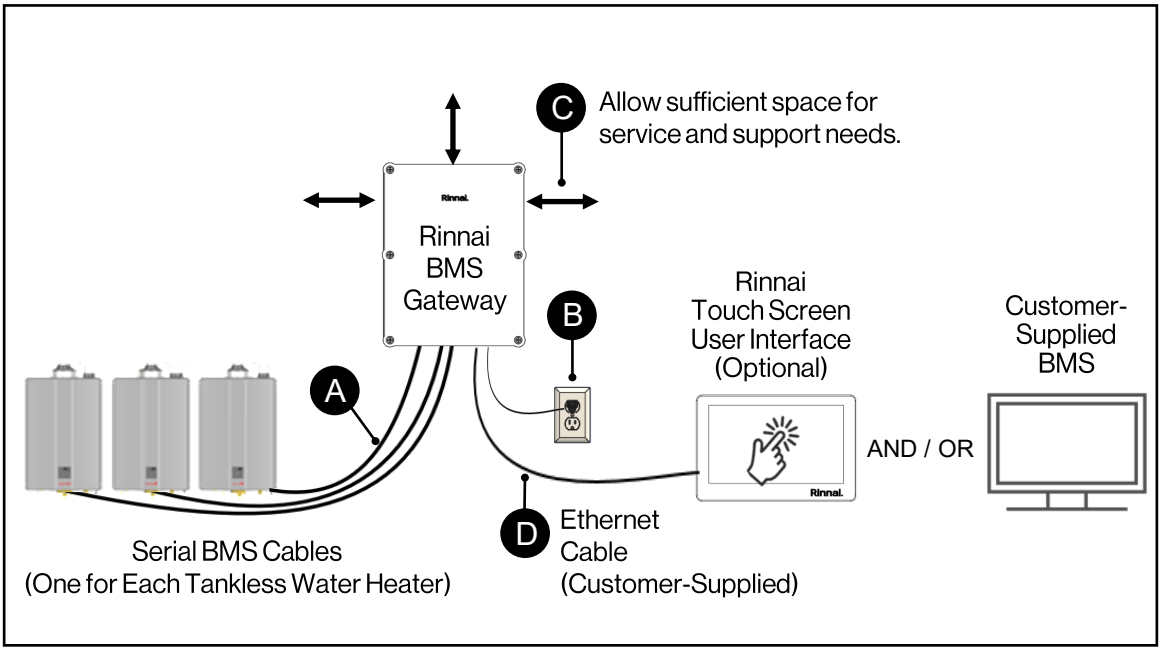


Fig 21. Installation Location Guidelines

IMPORTANT

Fig 21 above is for illustrative purposes only and is a sample configuration. The components of your configuration may differ from the illustration.

5. Installation

5.1 Installation Overview

Below is the general process for installing the main components of the BMS Gateway system:

- Mount the BMS Gateway to the wall (see “A” in Fig 22).
- Mount the Rinnai Touch Screen User Interface to the wall (If applicable to your configuration) (see “B” in Fig 22).
- Connect power to the BMS Gateway (see “C” in Fig 22).
- Connect the BMS Gateway to the Rinnai Tankless Water Heaters in the system (see “D” in Fig 22).

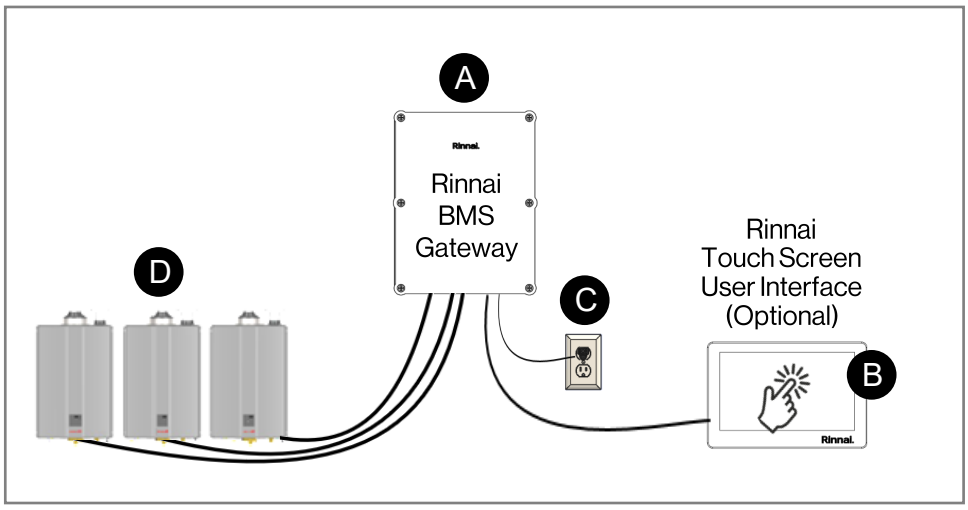


Fig 22. Main Components of BMS Gateway System

Refer to the following sections for instructions on each of the above steps.

IMPORTANT

Before you begin installation, you must know how all of the components in your system will be configured and have the components ready for installation.

Refer to the following section for example configurations: “5.6 Connect BMS Gateway to Other System Components.”

5.2 Mount BMS Gateway to Wall

Follow the instructions below to mount the BMS Gateway to a wall (see Fig 23 for example illustration).

NOTE

If mounting the BMS Gateway to a Rinnai Free-Standing TRS Rack, refer to section “10.1 Mount the BMS Gateway to a TRS Rack.”

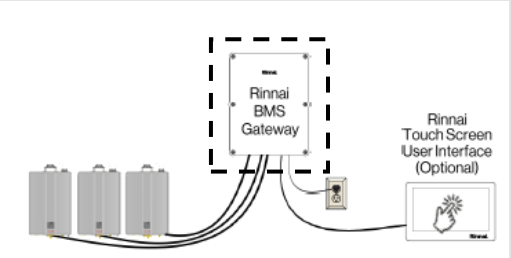


Fig 23. Mount BMS Gateway to Wall

1. The back of the BMS Gateway has four screw openings, one in each corner (Fig 24). For each corner, align the wall mount bracket with the screw hole and secure (using a Philips Head screwdriver) with the provided bracket screw (Fig 24). Do not overtighten.

   Wall mount brackets can be installed vertically (as shown in Fig 24) or horizontally.

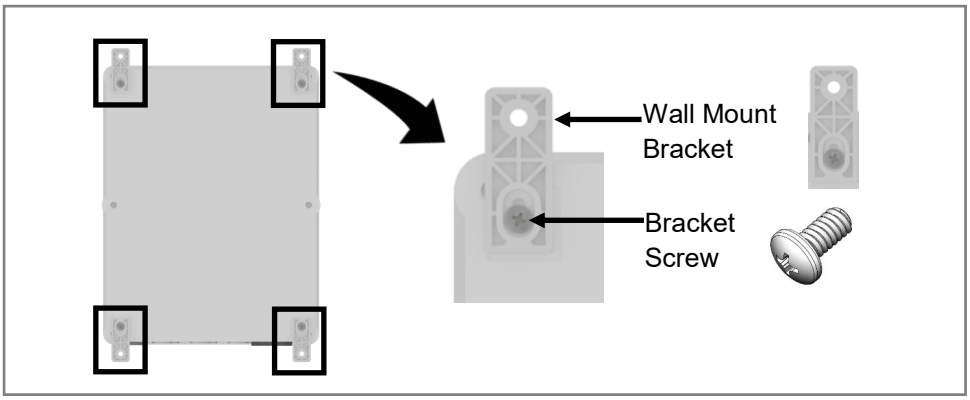


Fig 24. Install Wall Mount Brackets to BMS Gateway

2. Hold the BMS Gateway up against the wall and place a level on top to make sure the enclosure is even.
3. Secure the BMS to the wall using the four supplied wall mount screws (Fig 25).

   Make sure the screws are flush with the wall. Use wall anchors (customer-supplied) if needed.

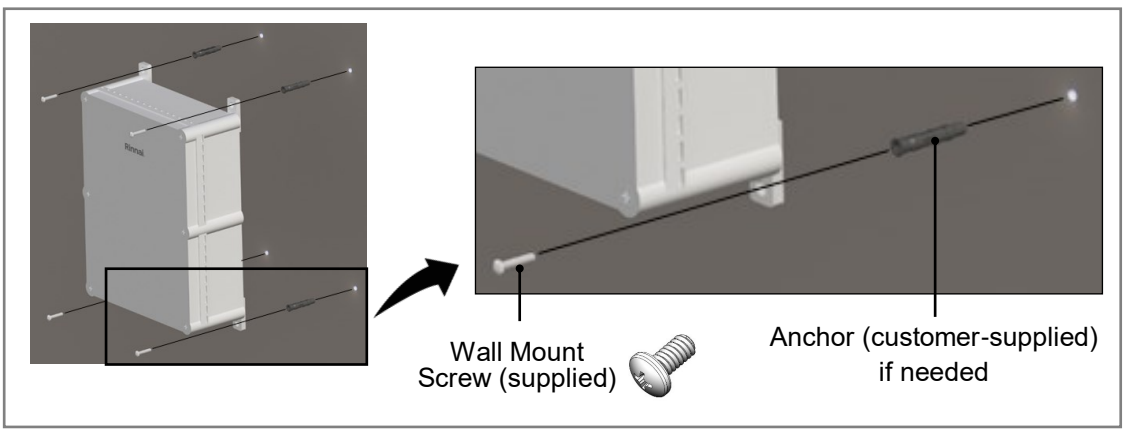


Fig 25. Mount the BMS Gateway to the Wall

5.3 Mount Rinnai Touch Screen User Interface to Wall (If Applicable)

Follow the instructions below to mount the optional Rinnai Touch Screen User Interface to a wall (see Fig 26 for example illustration).

NOTE

If you are not installing the Rinnai Touch Screen User Interface, skip this step and proceed to the next section: "5.4 Connect Power to BMS Gateway."

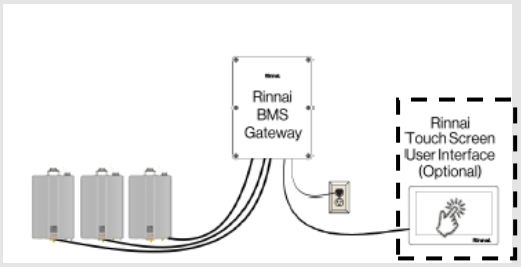


Fig 26. Rinnai Touch Screen User Interface

Guidelines:

- The Rinnai Touch Screen User Interface is for indoor installation only.
- The supplied wall mount bracket is intended for wall mount installation where the connecting wires are routed behind the wall. If this type of routing is not possible, such as with a concrete wall, a customer-supplied spacer must be used behind the user interface bracket to provide adequate clearance for connecting to the user interface.

Instructions:

1. Remove the bracket from the user interface screen (Fig 27).
   - Remove the two screws at the bottom of the user interface.
   - Detach the bracket hooks by pulling down on the bracket and angling away from the user interface.

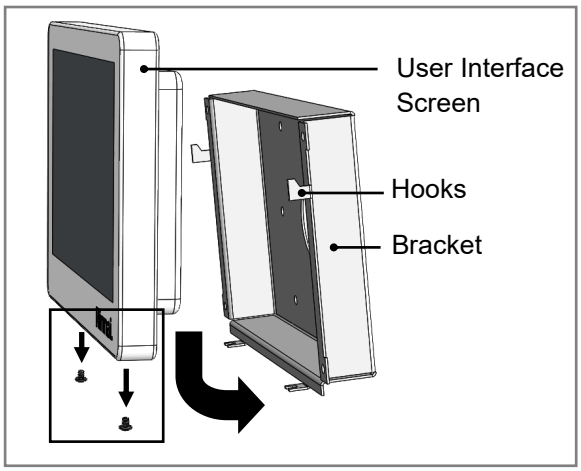


Fig 27. Remove the Bracket from the User Interface

2. Cut an area in the wall to route the connecting cables (Fig 28). Do not cut an area larger than the size of the user interface. See section "3.4 Specifications" for user interface dimensions.

IMPORTANT

If you are unable to cut an opening in the wall, insert a customer-supplied spacer behind the user interface bracket to provide adequate clearance for connecting to the user interface.

3. Hold the bracket over the opening. Place a level on top of the bracket to make sure it is even. Pre-drill four pilot holes into the wall (Fig 28).
4. Secure the bracket to the wall using four #6 screws (customer-supplied). Use wall anchors if needed (customer-supplied) (Fig 28).

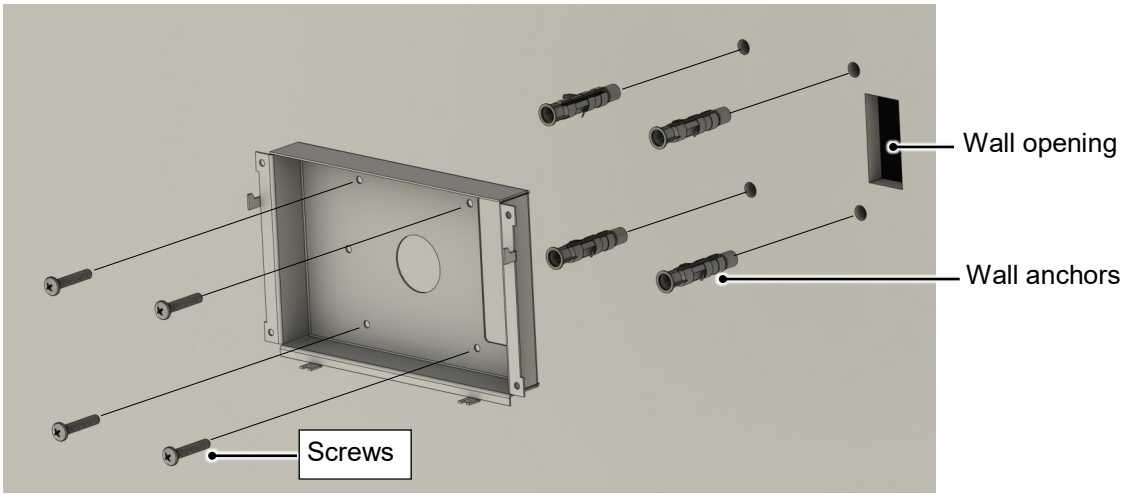


Fig 28. Secure the Bracket to the Wall

5. Route the 12V DC Power Adapter cable (supplied) and Ethernet cable (customer-supplied) behind the bracket before connecting to the user interface (Fig 29).

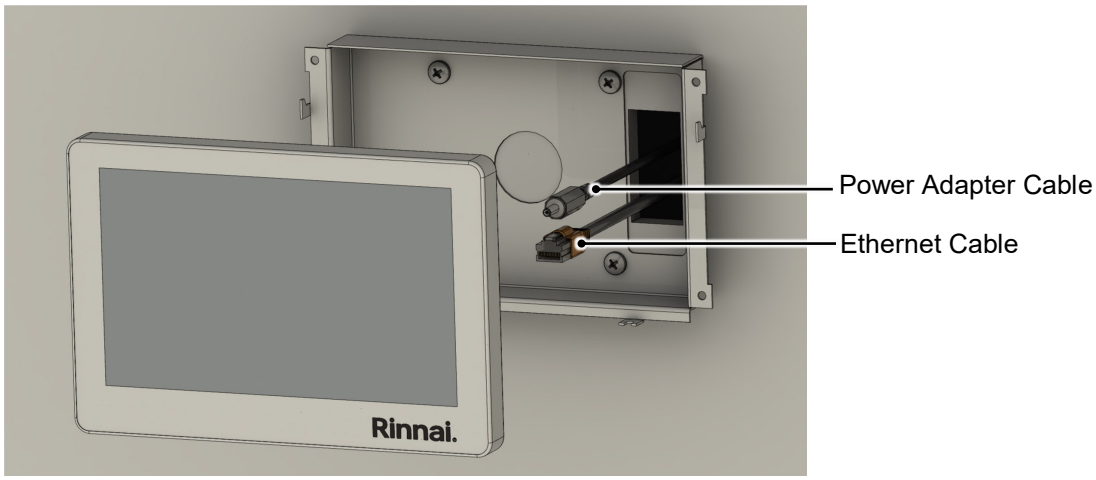


Fig 29. Route the Cables

6. Attach the user interface to the bracket by reinstalling the two screws removed in step #1 (Fig 30).

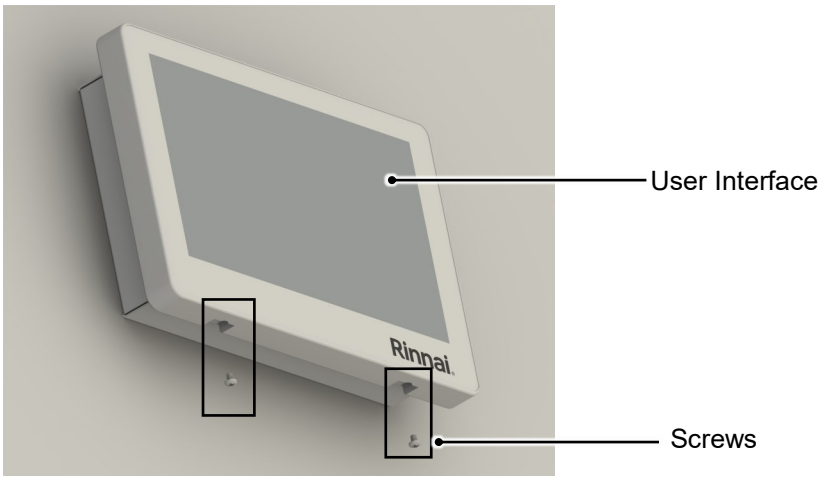


Fig 30. Attach the User Interface

5.4 Connect Power to BMS Gateway

Follow the instructions below to connect power to the BMS Gateway (see Fig 31 for example illustration).

⚠ WARNING

Before connecting power, be sure to read the electrical warnings in section "2.2 Safety Precautions."

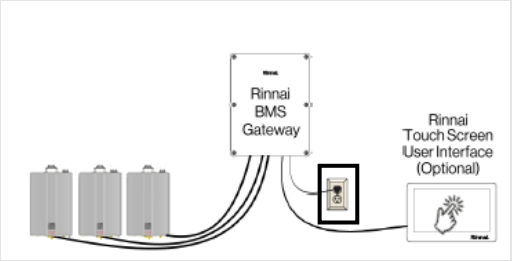


Fig 31. Connecting Power to BMS Gateway

5.4.1 Indoor BMS Gateway

1. Connect one end of the supplied 6 ft. (2 m) power cord to the power inlet of the BMS (Fig 32).
2. Connect the other end of the power cord to a standard three-prong 120V AC, 60 Hz properly grounded wall outlet (Fig 32).

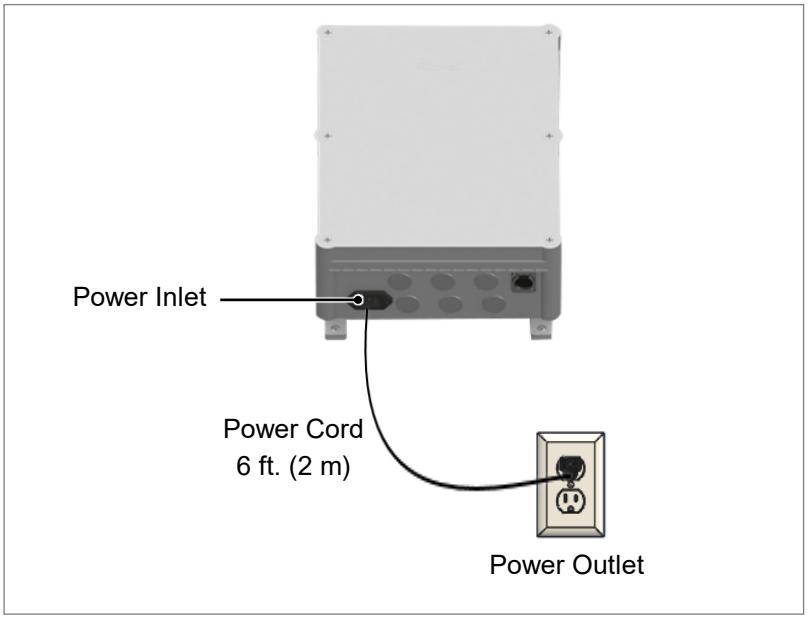


Fig 32. Connecting Power Cord from Indoor BMS Gateway to Power Outlet

5.4.2 Outdoor BMS Gateway

1. Route one end of the supplied 6 ft. (2 m) power cord into the enclosure using the supplied strain relief (Fig 33). A customer-supplied hard wire power supply may also be used.

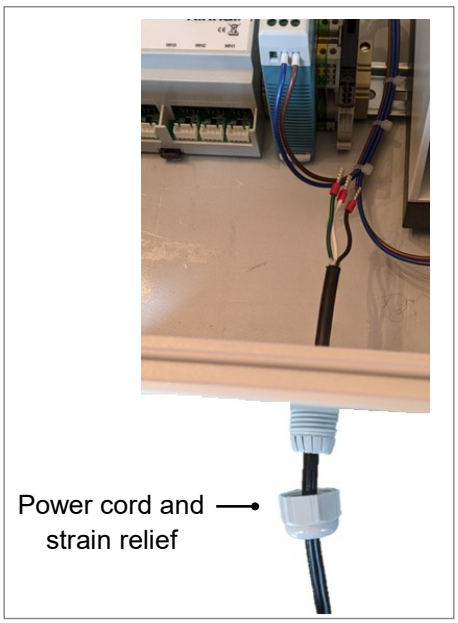


Fig 33. Power Cord and Strain Relief

2. Connect the three power cord wires to the three labeled terminals next to the power supply.

   Connecting from right to left the black live wire, the white neutral wire, and the green ground wire (Fig 34).

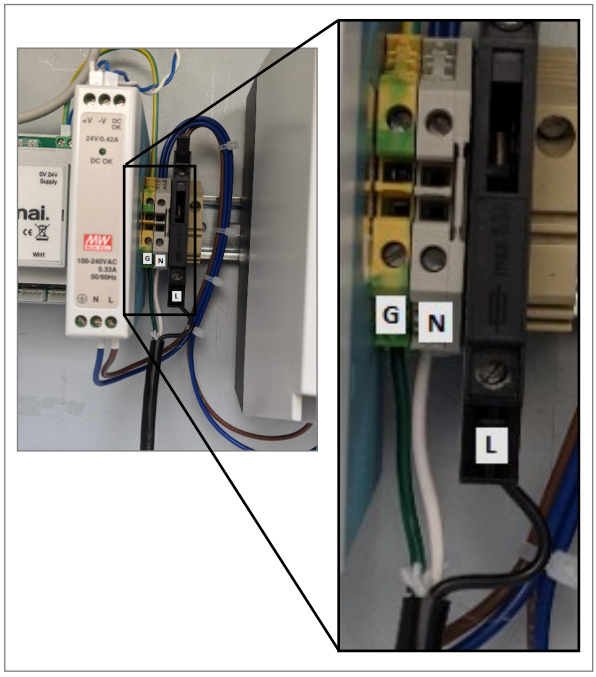


Fig 34. Connecting Power Cord Wires

3. Connect the other end of the power cord (if used) to a standard three-prong 120V AC, 60 Hz properly grounded, outdoor-rated power outlet (Fig 35).

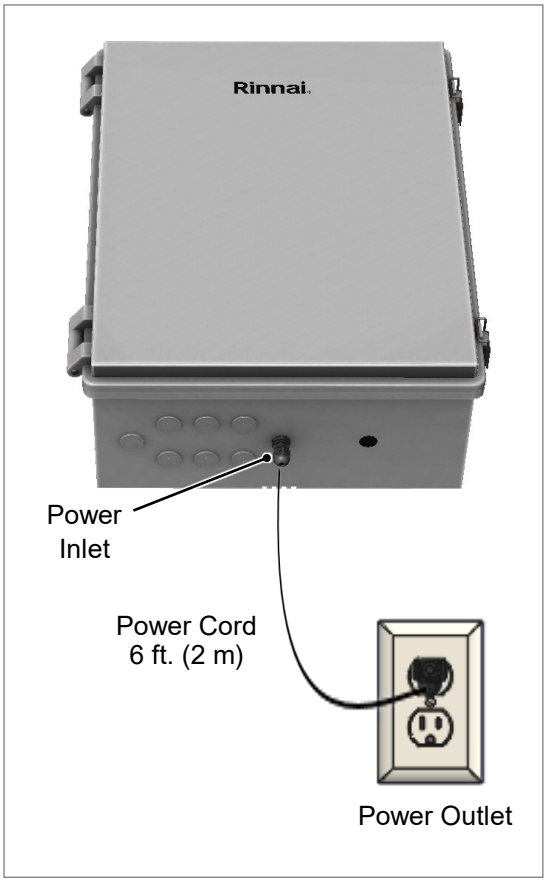


Fig 35. Connecting Power Cord from Outdoor BMS Gateway to Power Outlet

5.5 Connect BMS Gateway to Tankless Water Heaters

Follow the instructions below to connect the BMS Gateway to the Rinnai Tankless Water Heaters in the system (see Fig 36 for example illustration).

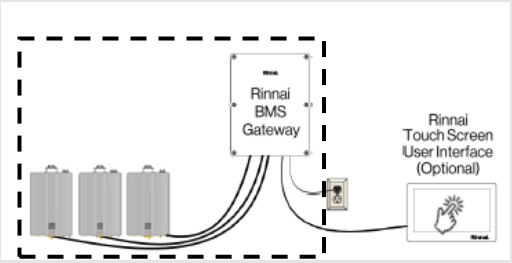


Fig 36. Connecting BMS Gateway to Tankless Water Heaters

1. Remove the front panel of the BMS Gateway:

Indoor BMS Gateway:

Use a Phillips head screwdriver to remove the six plastic screws attaching the front cover to the enclosure (Fig 37). **Note:** Keep the screws nearby as you will need them to reattach the front cover.

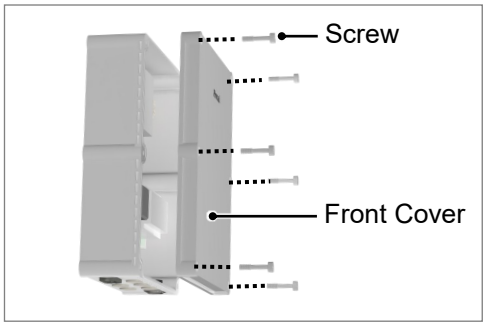


Fig 37. Remove Indoor BMS Gateway Front Panel

Outdoor BMS Gateway:

Unlock the two latches and swing open the front cover (Fig 38).

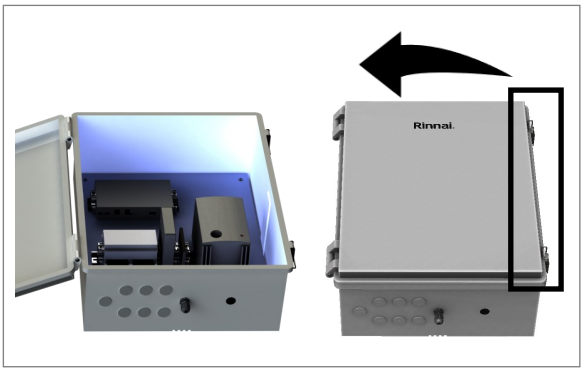


Fig 38. Swing Open Outdoor BMS Gateway Front Cover

2. At the bottom of the BMS Gateway, remove the rubber plugs from the cable openings as needed (Fig 39).

Fig 39. Remove Cable Cover Plugs

3. Remove the front panel of each tankless water heater in the system (Fig 40).

   Refer to the Tankless Water Heater Installation and Operation Manual for detailed instructions.

   Note: Fig 40 is a sample tankless water heater image for illustrative purposes only. Your tankless water heater may appear differently.

Fig 40. Front Panel Removed From Tankless Water Heater

4. Connect the tankless water heaters and BMS Gateway with the serial communication cable by following steps A and B below:

    A. Connect the inline fuse side of the serial communication cable to the tankless water heater PC Board (see “A” in Fig 41).

        - Route the serial communication cable through the rubber grommet at the bottom of the tankless water heater cabinet.
        - Connect to the green serial communication port on the tankless water heater PC Board.

    B. Route the other end of the serial communication cable through the BMS Gateway cable openings using the supplied strain reliefs and connect to the serial connection ports from right to left (see “B” in Fig 41).

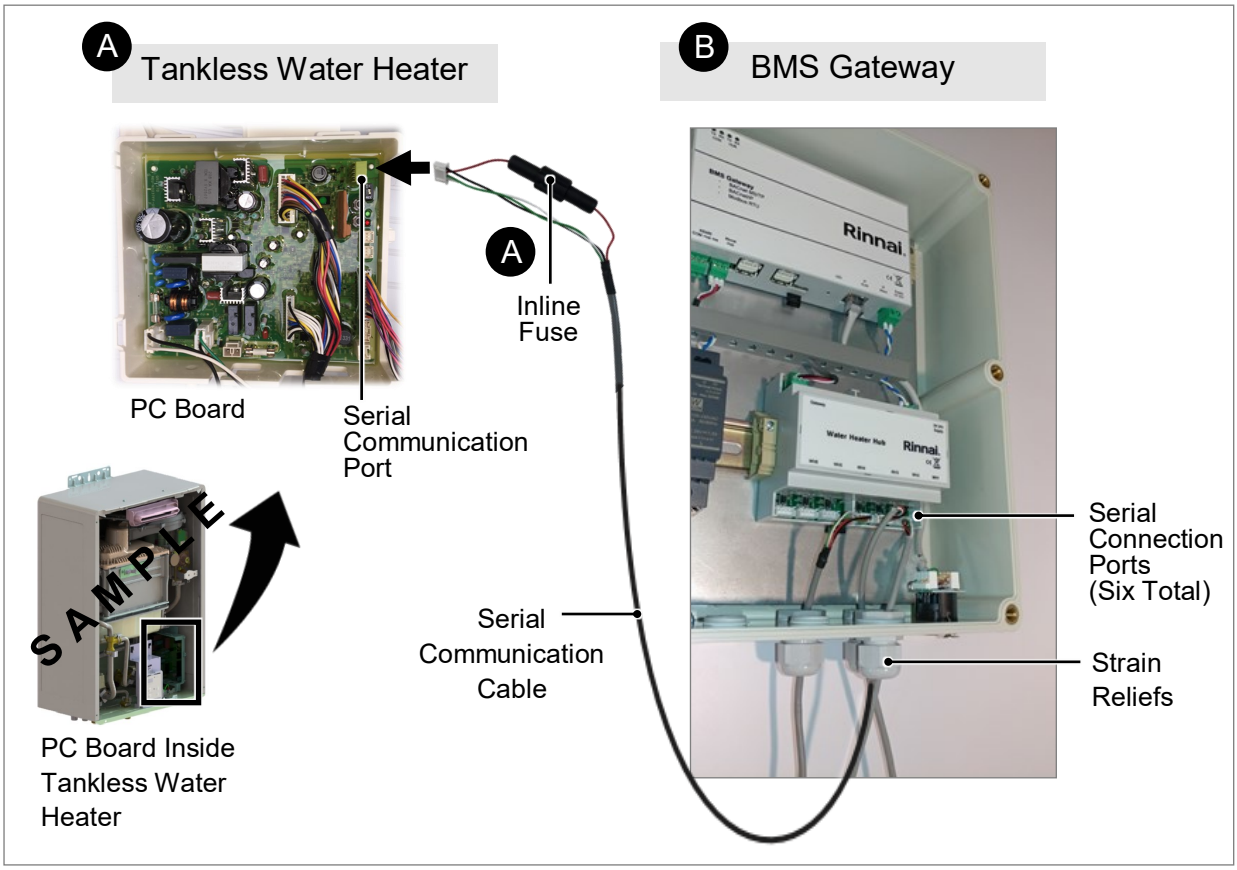


Fig 41. Sample Illustration of the Serial Communication Cable Connecting from the Tankless Water Heater to BMS Gateway.

IMPORTANT

When the BMS Gateway is connected to a tankless water heater, the tankless water heater controller (Fig 42) cannot be used to adjust the setpoint temperature or turn the water heaters on or off; these functions can only be performed through the Rinnai Touch Screen User Interface and/or customer-supplied BMS.

For temporary control of the above functions through the tankless water heater controller (for servicing as an example), the tankless water heater must first be disconnected from the BMS Gateway.

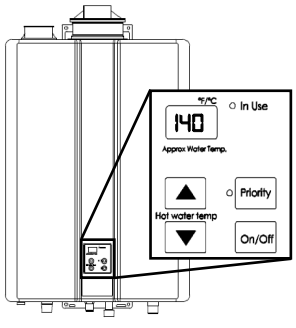


Fig 42. Sample Tankless Water Heater Controller

5.6 Connect BMS Gateway to Other System Components

The remaining steps will differ for each application. Example configurations include:

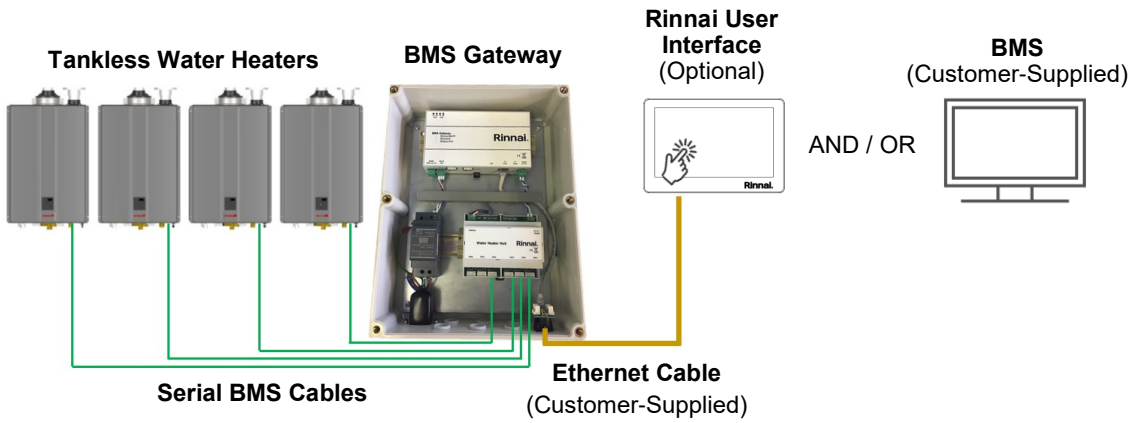
- Configuration 1: BMS Gateway Connected to User Interface or BMS
- Configuration 2: BMS Gateway Connected to User Interface and BMS
- Configuration 3: Two BMS Gateways Connected to User Interface and BMS With Network Switch
- Configuration 4: BMS Gateway Connected to Computer For System Configuration
- Configuration 5: BMS Gateway Connected to Computer and Network Switch For System Configuration
- Configuration 6: BMS Gateway Connected to Smartphone or Tablet and Wireless Router For System Configuration

See the remaining sections for illustrations and instructions of each configuration.

IMPORTANT

- After the BMS Gateway system is setup and complete, be sure to reinstall the BMS Gateway and tankless water heater front cover panels.
- Refer to section “3.5 Parts List and Accessories” for part numbers of items shown in the configurations (unless noted as customer-supplied).
- The front cover panel is removed on the BMS Gateway images to show internal components.

Configuration 1: BMS Gateway Connected to User Interface or BMS



- BMS Gateway connected to Rinnai touch screen user interface (optional) or customer-supplied BMS.
- Communication Protocol: BACnet IP

Fig 43. Configuration 1: BMS Gateway Connected to User Interface or BMS

Configuration 2: BMS Gateway Connected to User Interface and BMS

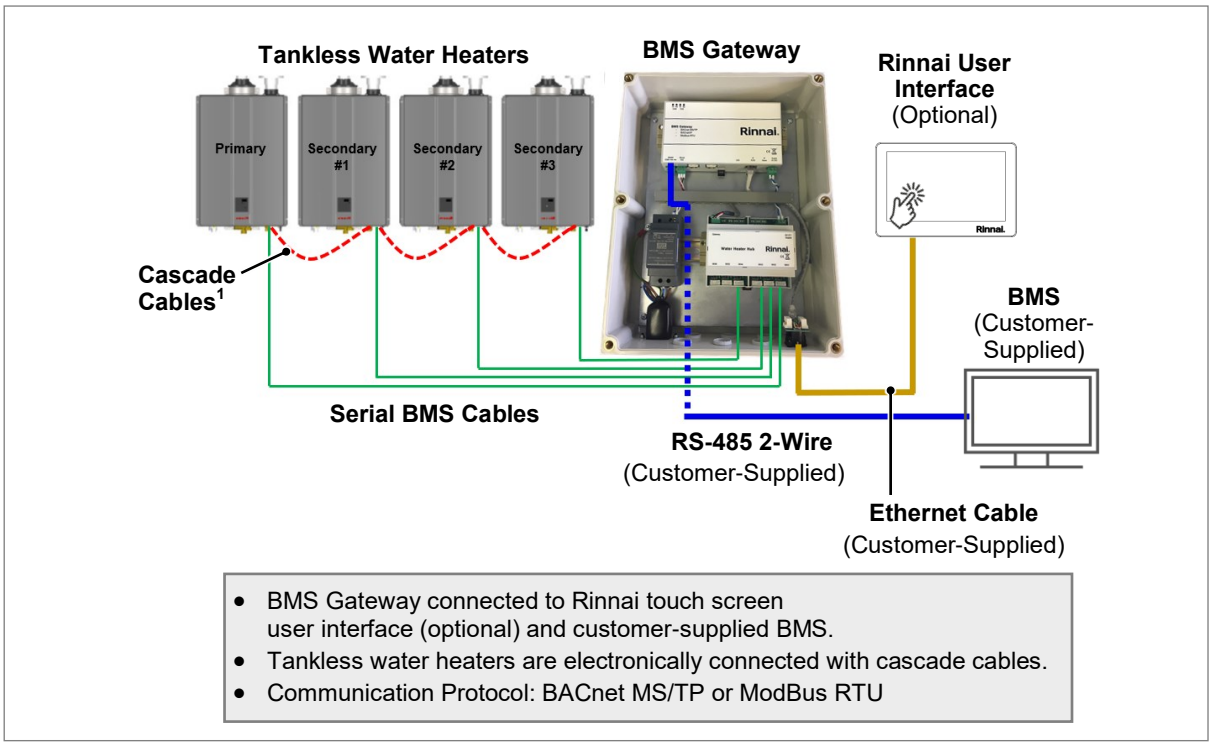


Fig 44. Configuration 2: BMS Gateway Connected to User Interface and BMS

Configuration 3: Two BMS Gateways Connected to User Interface and BMS With Network Switch

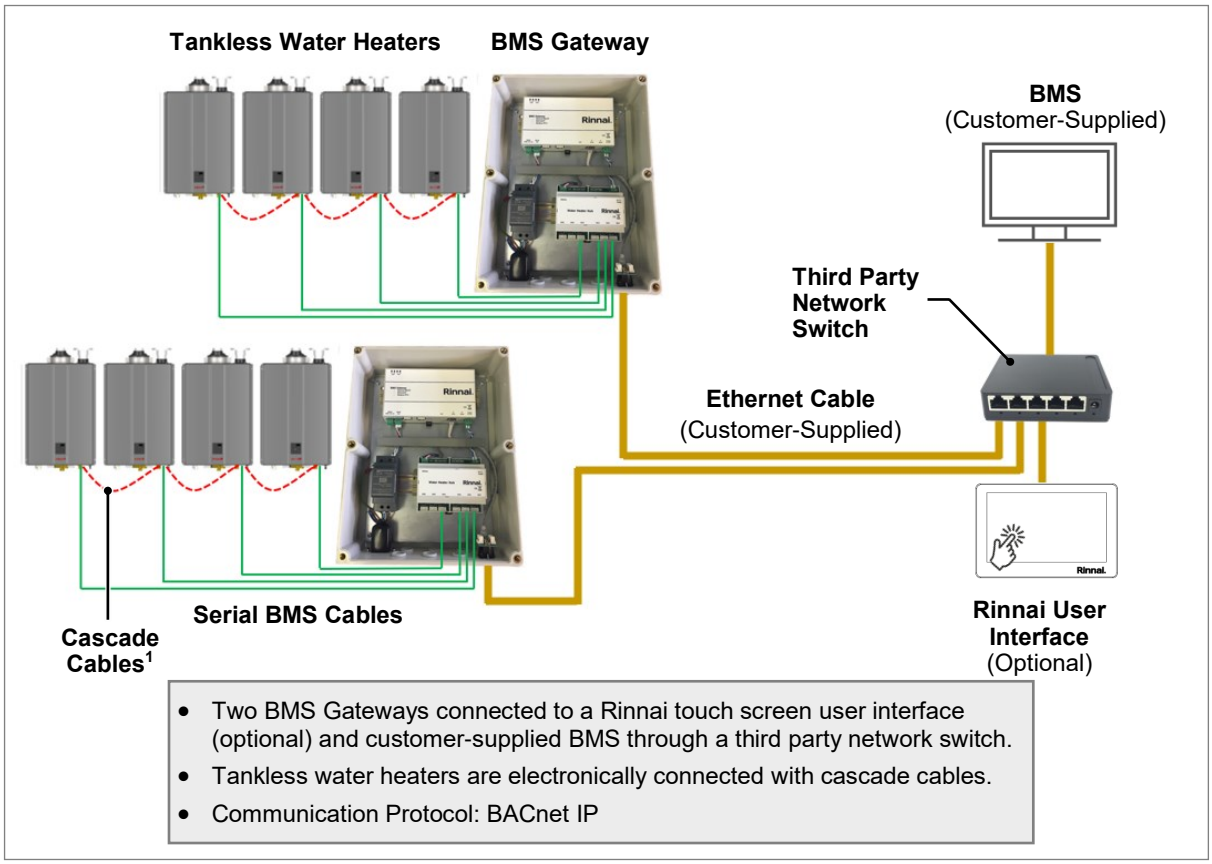


Fig 45. Configuration 3: Two BMS Gateways Connected to User Interface and BMS With Network Switch

[1]For instructions on connecting the cascade cables, refer to the instructions supplied inside the cascade cable package.

Configuration 4: BMS Gateway Connected to Computer For System Configuration

The illustration below (Fig 46) shows the BMS Gateway connected to a computer for initial configuration of the BMS Gateway system. The computer is not required after the BMS Gateway system is set up.

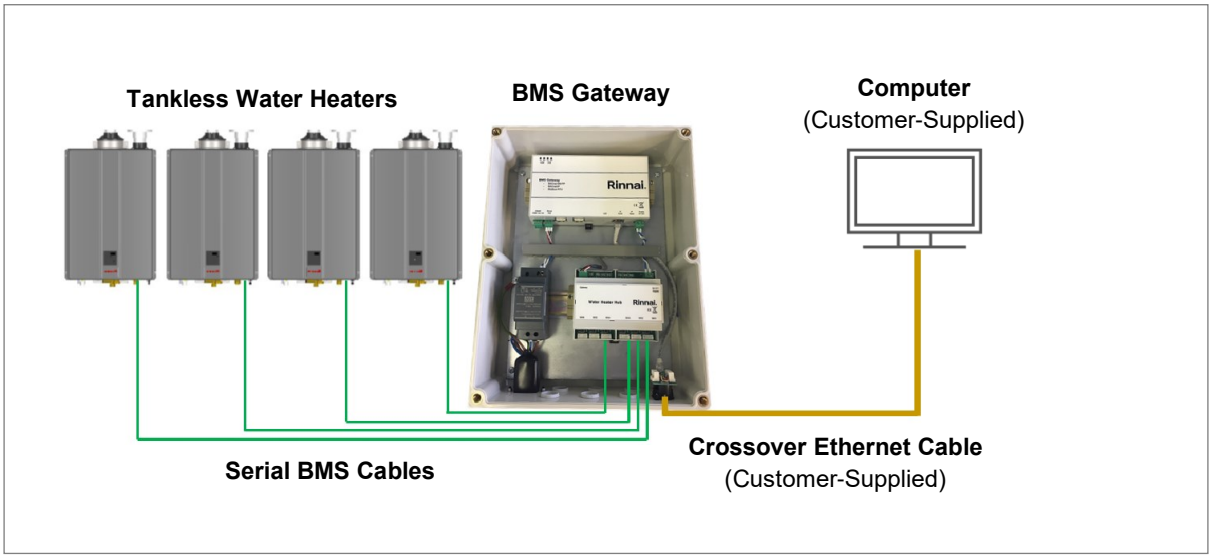


Fig 46. Configuration 4: BMS Gateway Connected to Computer For System Configuration

Configuration 5: BMS Gateway Connected to Computer and Network Switch For System Configuration

The illustration below shows the BMS Gateway connected to a network switch and computer for initial configuration of the BMS Gateway system. The network switch and computer are not required after the BMS Gateway system is set up.

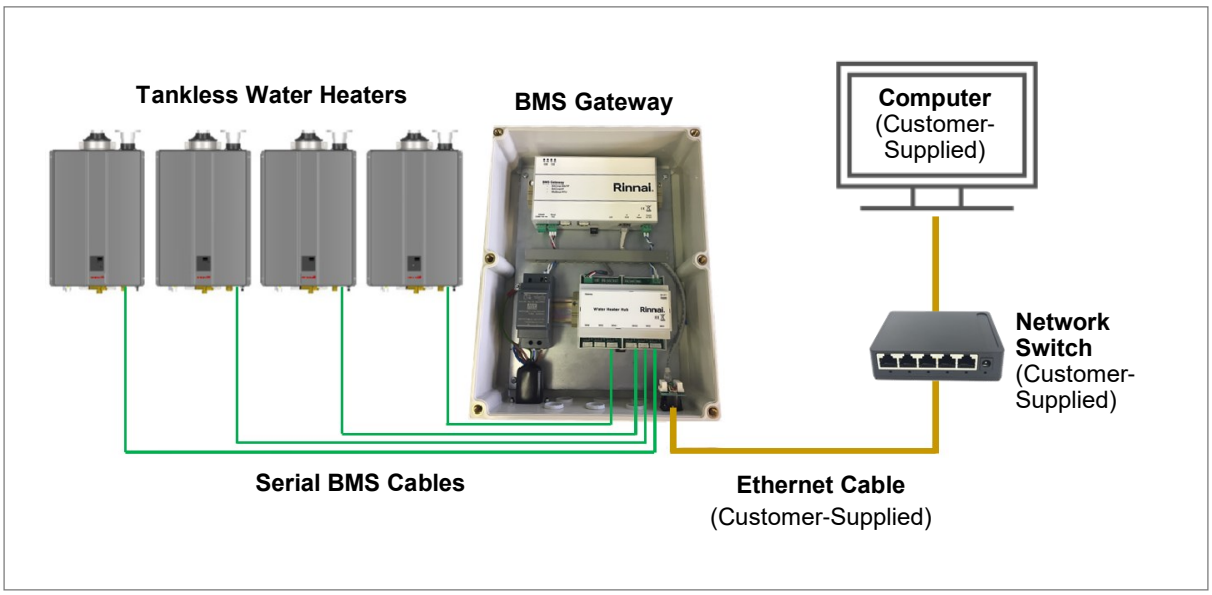


Fig 47. Configuration 5: BMS Gateway Connected to Computer and Network Switch For System Configuration

Configuration 6: BMS Gateway Connected to Smartphone or Tablet and Wireless Router For System Configuration

The illustration below shows the BMS Gateway connected to a wireless router and smartphone/ tablet for initial configuration of the BMS Gateway system. The wireless router and smartphone/ tablet are not required after the BMS Gateway system is set up.

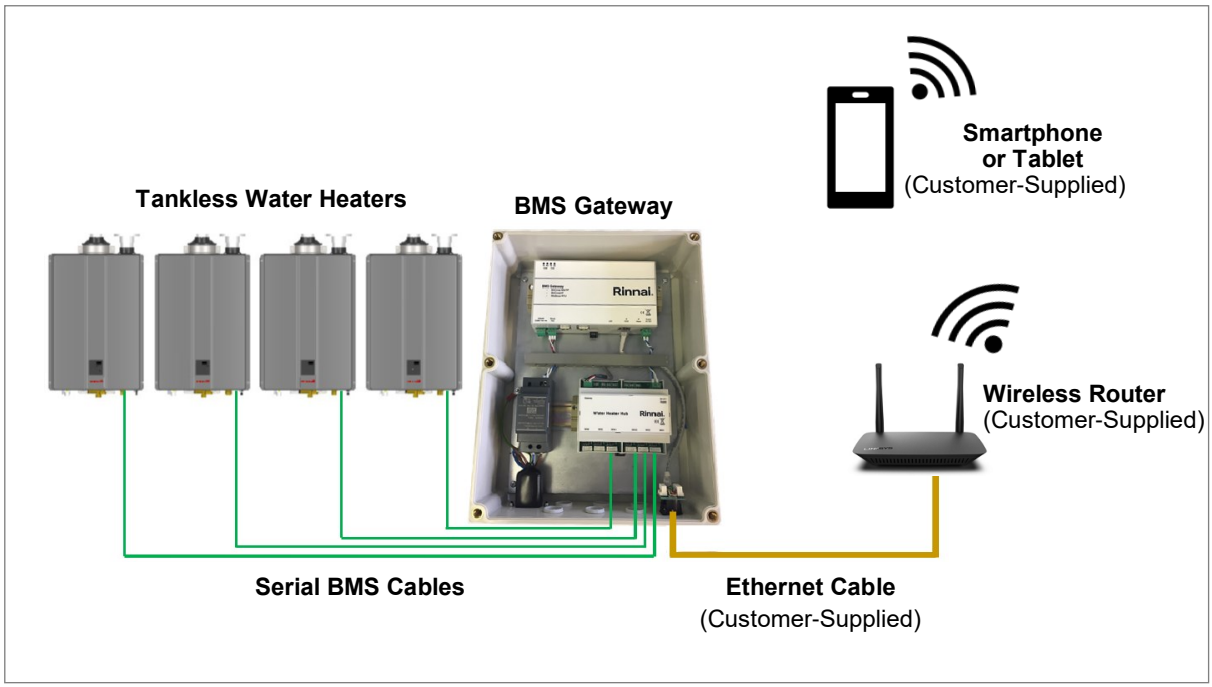


Fig 48. Configuration 6: BMS Gateway Connected to Smartphone or Tablet and Wireless Router For System Configuration

6. Software Setup

This section explains how to log on and configure the BMS Gateway software.

IMPORTANT

This section should be performed by a trained and qualified professional who understands network settings, IP configuration, and BMS software, terminology, and communication protocols such as BACnet IP, BACnet MS/TP, and ModBus RTU.

6.1 Log Into the BMS Gateway Software

1. Open an Internet browser on a device connected to the BMS Gateway, such as a computer, tablet or smartphone.

   Note: For details on how to ensure the IP addresses of both the BMS Gateway and connected computer, tablet or smartphone are setup correctly, see section “10.3 Verify Correct IP Address Settings.”

2. Type the following default IP address into the URL field: **192.168.1.151** (Fig 49).

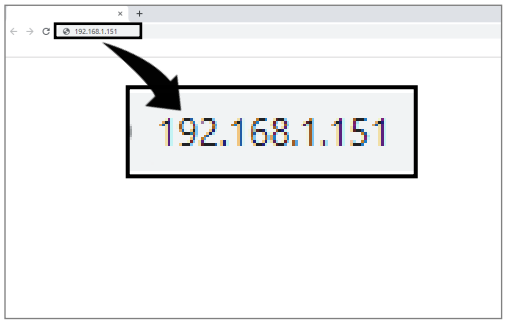


Fig 49. Type Default IP Address

3. On the “Windows Security” login window, enter “admin” (all lowercase letters) in both the “User Name” and “Password” fields. Then, click “OK” (Fig 50).

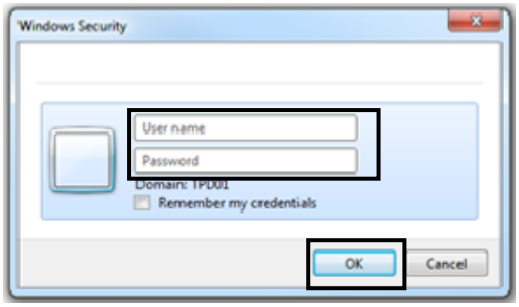


Fig 50. Windows Security Login Window

NOTE

- After logging into the software, it is recommended to change the password for security reasons. To change the password, see section “6.6 Screens Setup Tab.”
- To reset the password to factory default settings, see section “10.2 Reset IP Address and Password to Default.”

4. The following tabs are located across the top of the screen (Fig 51). Each tab is described in the following sections.
   - Home
   - Device Setup
   - Comms Setup
   - Water Heaters Setup
   - Screens Setup
   - Admin
   - Diagnostics

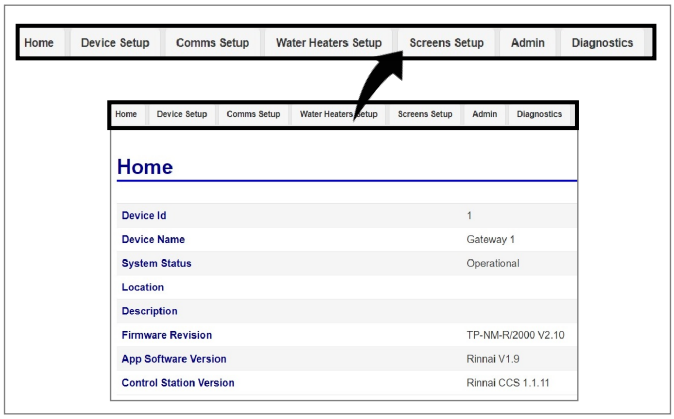


Fig 51. BMS Gateway Software Tabs

6.2 Home Tab

The “Home” tab screen (Fig 52) provides an overview of the BMS Gateway such as the device ID, name, location, and more. Each field on the screen is described in Table 7. All fields are required unless marked as optional.

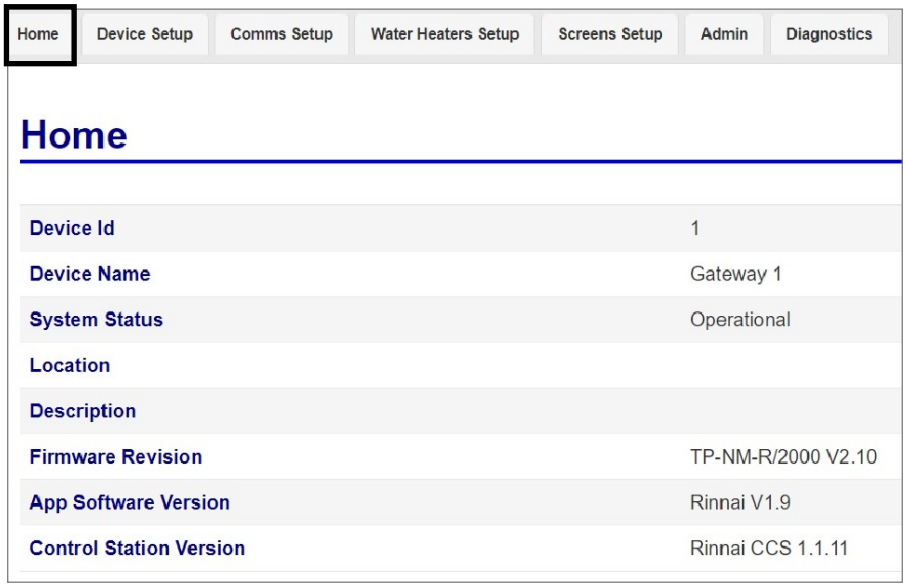


Fig 52. “Home” Tab Screen

Table 7. “Home” Tab Screen Fields

Field	Description
Device ID	Displays the ID that is entered in the “Device ID” field on the “Device Setup” tab.
Device Name	Displays the device name that is entered in the “Device Name” field on the “Device Setup” tab.
System Status	Displays the current system status of the BMS Gateway. Options include: • **Operational** - BMS Gateway is working correctly with no operational issues. • **Non-Operational** - BMS Gateway has encountered operational issues and is not working correctly.
Location	Displays the location of the BMS Gateway that is entered in the “Location” field on the “Device Setup” tab.
Description	Displays the description of the BMS Gateway that is entered in the “Description” field on the “Device Setup” tab.
Firmware Revision	Displays the current BMS Gateway firmware version.
App Software Version	Displays the current Rinnai App software version operating on the BMS Gateway.
Control Station Version	Displays the current BMS Gateway software version.

6.3 Device Setup Tab

The “Device Setup” tab screen (Fig 53) allows you to enter device information about the BMS Gateway, such as the device name, description, device location, and more. Each field on the screen is described in Table 8. All fields are required unless marked as optional.

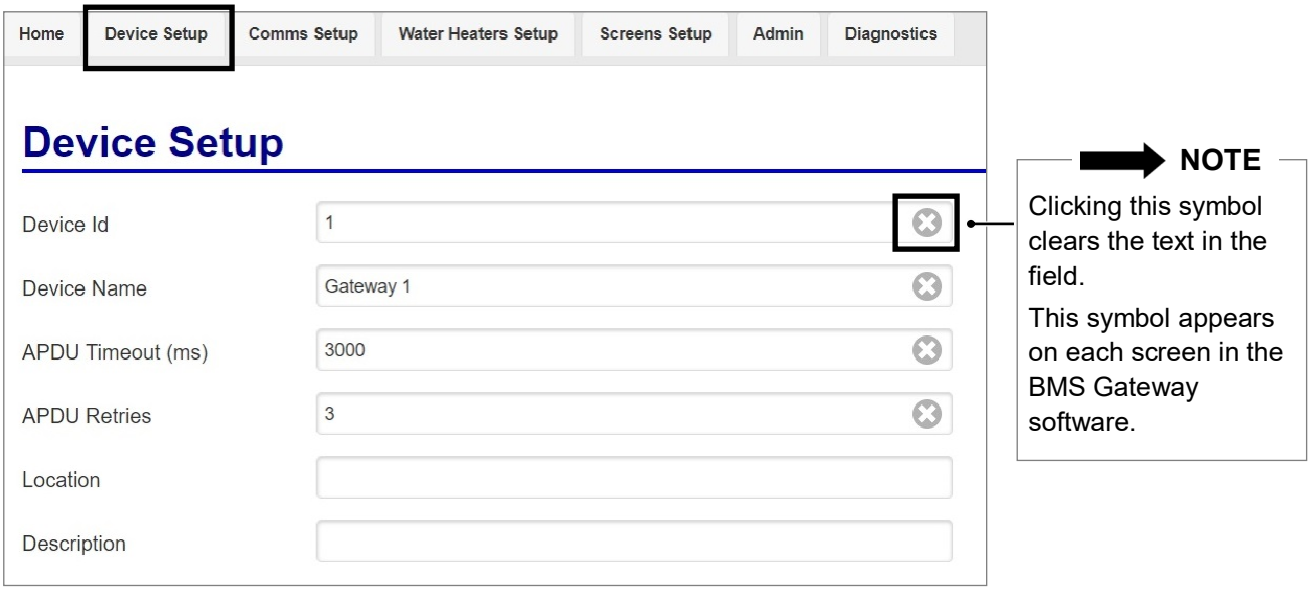


Fig 53. “Device Setup” Tab Screen

Table 8. “Device Setup” Tab Screen Fields

Field	Description
Device ID	Enter a unique, network-wide device number ranging from 0 to 4194302. This number must be unique to all other devices on the network.
Device Name	Enter a name for the BMS Gateway. The maximum number of characters allowed is 50, including spaces. The name can contain letters, numbers, spaces, symbols, and is not case-sensitive.
APDU Timeout (ms)	Enter the time to wait, in milliseconds, for an acknowledgement before retransmitting an unacknowledged message.
APDU Retries	Enter the maximum number of times an unacknowledged message is retransmitted. A maximum of four numbers are allowed.
Location	(Optional) Enter a physical location of the BMS Gateway. The maximum number of characters allowed is 50, including spaces. The name can contain letters, numbers, spaces, symbols, and is not case-sensitive.
Description	(Optional) Enter a description of the BMS Gateway. The maximum number of characters allowed is 50, including spaces.

6.4 Comms Setup Tab

The “Comms Setup” tab screen (Fig 54) allows you to configure the BMS Gateway IP settings and select the BMS communication protocol. Each field on the screen is described in the following sections. All fields are required unless marked as optional.

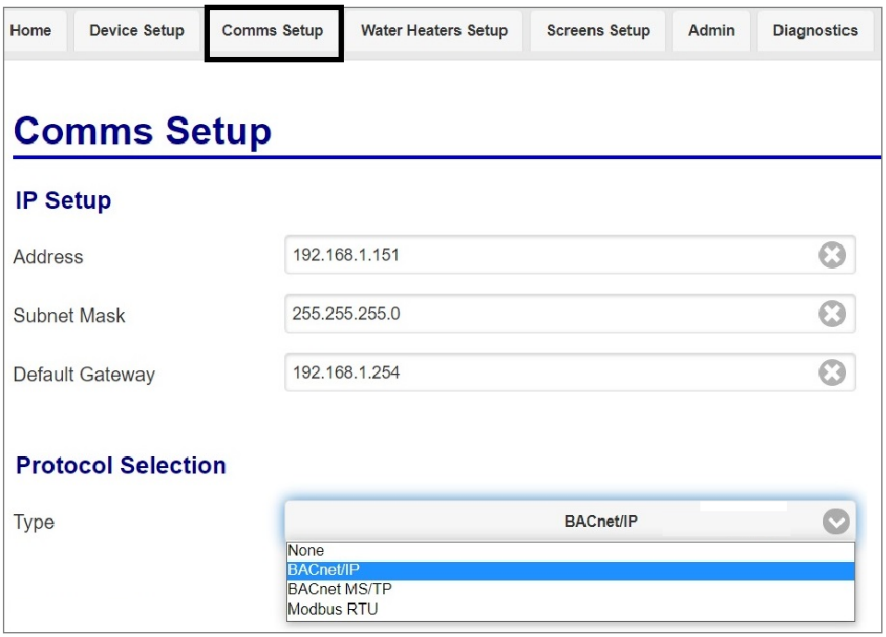


Fig 54. “Comms Setup” Tab Screen

6.4.1 IP Setup

The IP settings allow the BMS Gateway to be accessed via a computer, tablet or other IP networkable device. To configure IP settings, complete the following fields as described in Table 9.

Table 9. IP Setup Fields

Field	Description
Address	Enter the IP address of the BMS Gateway (default is 192.168.1.151). The address must be a valid IP address unique to the local network. Using the default network as an example (192.168.1.x), x must range from 0 to 254. If multiple BMS Gateways are on the same network, then each BMS Gateway should have its own IP address. Using sequential IP addresses for each BMS Gateway is recommended. For example, 192.168.1.152, 192.168.1.153, 192.168.1.154, etc.
Subnet Mask	Enter the subnet mask address of the router (default is 255.255.255.0). Devices on the same subnet should all use the same subnet mask.
Default Gateway	Enter the default BMS Gateway IP address (default is 192.168.1.254). The default BMS Gateway IP address should match the IP address of the network device that links the IP subnet of the Rinnai device to the Internet or other network segment. This could be a network router linking two IP networks together or a broadband router connecting the network to the Internet.

NOTE

To reset the IP address back to default settings, see section “10.2 Reset IP Address and Password to Default.”

6.4.2 Protocol Selection

Click the drop-down box and select one of the following communication protocols (Fig 55):

- BACnet/IP
- BACnet MS/TP
- Modbus RTU

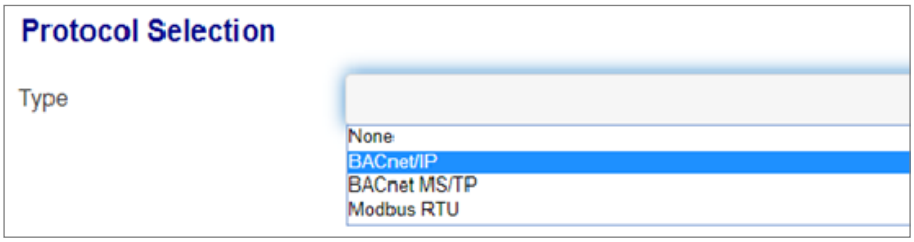


Fig 55. Protocol Selection

The remaining fields on the screen will vary based on the selected communication protocol.

6.4.2.1 BACnet/IP Setup

If selecting the “BACnet/IP” protocol (Fig 56), complete the fields in Table 10.

Fig 56. BACnet/IP Setup

Table 10. BACnet/IP Setup Fields

Field	Description
UDP Port	Enter the UDP port being used for the BACnet protocol. This port must match the other devices on the same BACnet network.
Multicast Address	(Optional) Enter a valid multicast address or leave blank if not required.

6.4.2.2 BACnet MS/TP Setup

If selecting the “BACnet MS/TP” protocol (Fig 57), complete the fields in Table 11.

All fields are required unless marked as optional.

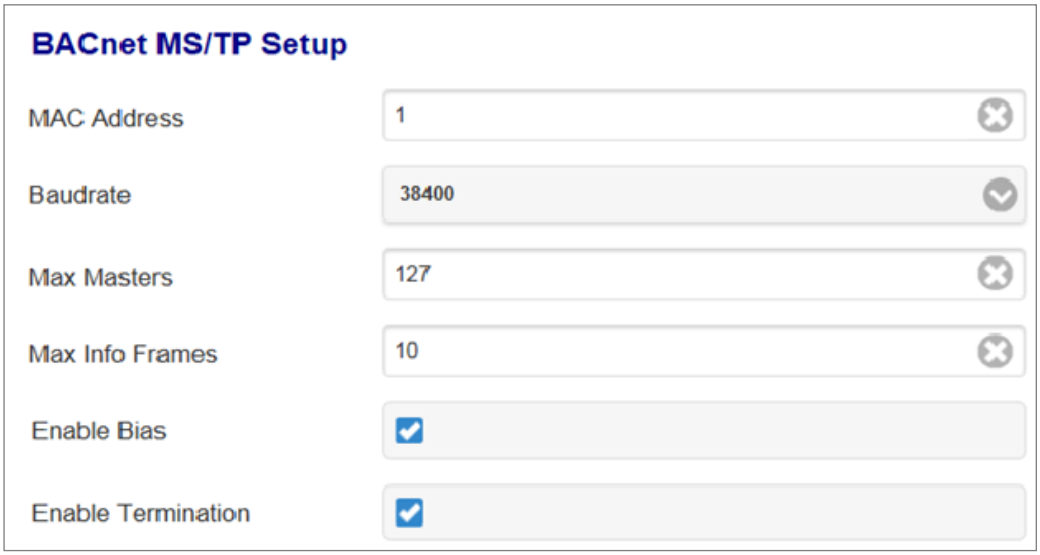


Fig 57. BACnet MS/TP Setup

Table 11. BACnet MS/TP Setup Fields

Field	Description
MAC Address	Enter a unique MAC reference from 0 to 127 for each device on the network.
Baud Rate	Select the baud rate from the drop-down selection. The baud rate should be the same for each device on the network.
Max Masters	Enter the maximum number of permitted MS/TP master device addresses. If unknown, or future devices are expected, leave this number at 127 (default).
Max Info Frames	Enter the number of messages that can be sent after a token is received. A value between 10 to 20 is recommended.
Enable Bias	Rinnai recommends to select this box which will bias the network at either a single point or at each end of a segment.
Enable Termination	Rinnai recommends to select this box which will terminate both ends of the network using 120 ohm resistors.

6.4.2.3 Modbus RTU Setup

If selecting the “Modbus RTU” protocol (Fig 58), complete the fields in Table 12.

All fields are required unless marked as optional.

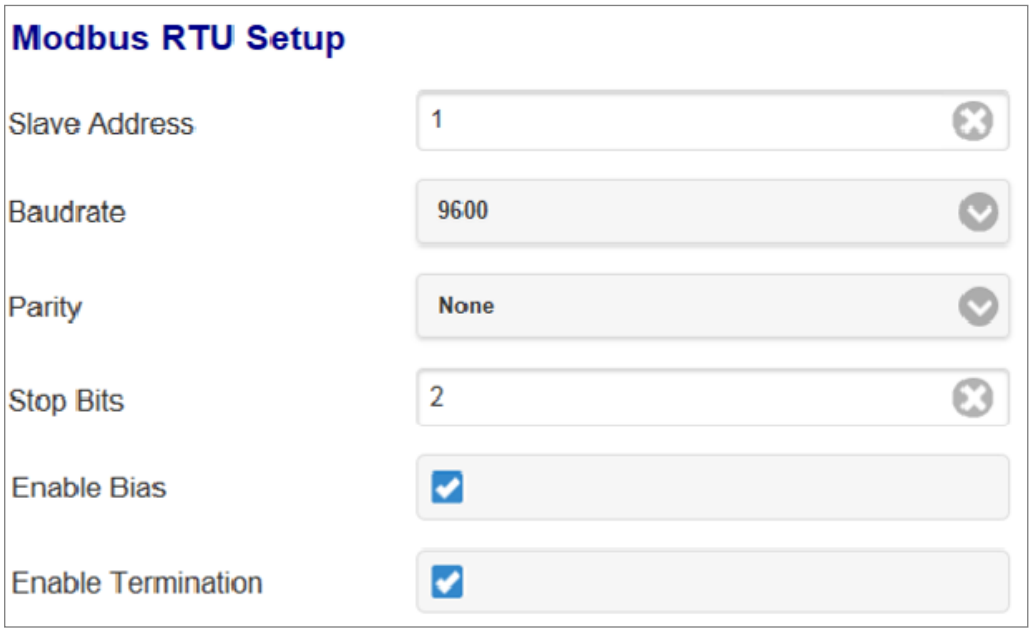


Fig 58. Modbus RTU Setup

Table 12. Modbus RTU Setup Fields

Field	Description
Slave Address	Enter a unique address from 1 to 247 for each slave Modbus RTU device on the network.
Baud Rate	Select the baud rate from the drop-down selection. The baud rate should be the same for each device on the network.
Parity	Select the network parity from the drop-down selection. The parity must match all other Modbus RTU devices on the network.
Stop Bits	Enter the number of stop bits for the device. This number must match the stop bit value for all other Modbus RTU devices on the network.
Enable Bias	Rinnai recommends to check this box which will bias the network at either a single point or at each end of a segment.
Enable Termination	Rinnai recommends to check this box which will terminate both ends of the network using 120 ohm resistors.

6.5 Water Heaters Setup Tab

The “Water Heaters Setup” tab screen (Fig 59) allows you to configure the Rinnai Tankless Water Heaters that are connected to the BMS Gateway. Each field on the screen is described in Table 13. All fields are required unless marked as optional.

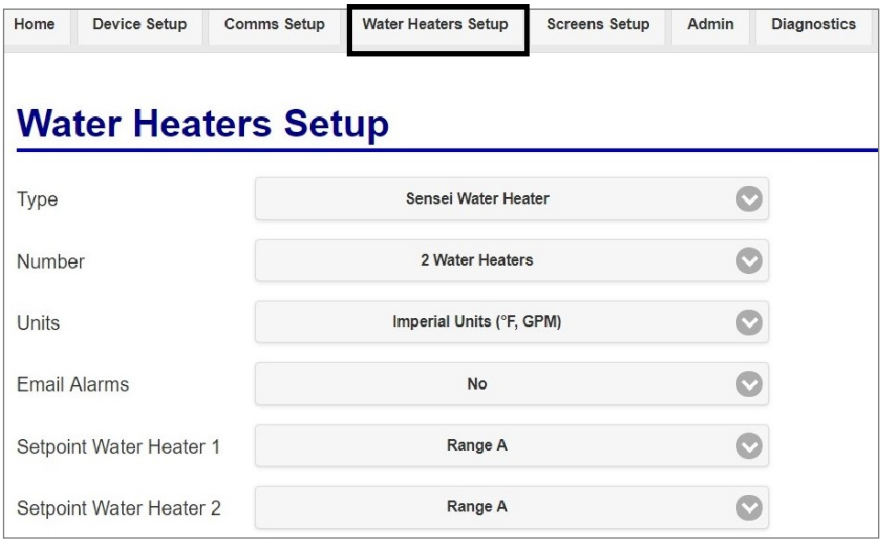


Fig 59. “Water Heaters Setup” Tab Screen

Table 13. “Water Heaters Setup” Tab Screen Fields

Field	Description
Type	From the drop-down list, select the tankless water heater models connected to the BMS Gateway. Options include: • Select “SENSEI” for the SENSEI™ CU160 or CU199 tankless water heater models. • Select “KB” for the KB C199 tankless water heater model. **Note:** The other models in the drop-down selection are not applicable to this BMS Gateway model.
Number	From the drop-down list, select the number of tankless water heaters (1 to 6) connected to the BMS Gateway.
Units	From the drop-down list, select the measurement units to display on the Rinnai Touch Screen User Interface and/or customer-supplied BMS screen. Options include: • SI Units (°C, L/min) • Imperial Units (°F, GPM) (Commonly used in the U.S.)
Email Alarms	From the drop-down list, select “Yes” or “No” to receive email notifications when an error occurs in the tankless water heaters.
Setpoint Water Heater 1	From the drop-down list, select the set point temperature of each tankless water heater connected to the BMS Gateway. Options include: • Range A: Set point temperatures up to 140°F (60°C) • Range B: Set point temperatures up to 185°F (85°C) Notes: • This field appears only if the “SENSEI” tankless water heater model is selected in the “Type” field. • Additional “Setpoint Water Heater” options will appear depending on the number of tankless water heaters selected in the “Number” field. For example, if “4” is selected in the “Number” field, then the following options will appear on the screen: Setpoint Heater 1, Setpoint Heater 2, Setpoint Heater 3, and Setpoint Heater 4.

6.6 Screens Setup Tab

The “Screens Setup” tab (Fig 60) is used when the Rinnai Touch Screen User Interface is connected to more than one BMS Gateway (Fig 61). Each field is described in Table 14. All fields are required unless marked as optional.

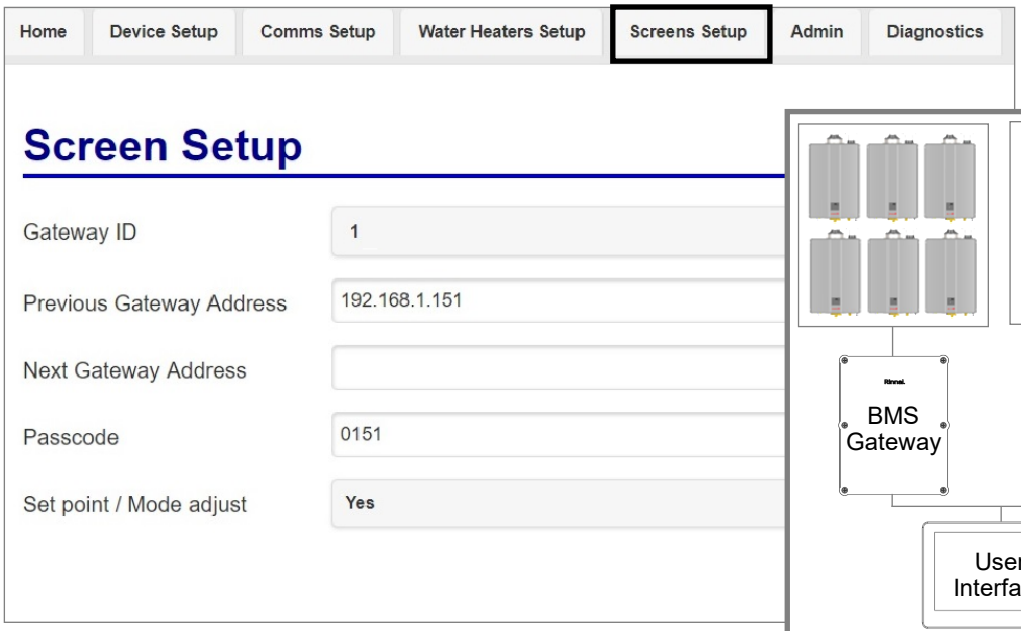


Fig 60. “Screens Setup” Tab Screen

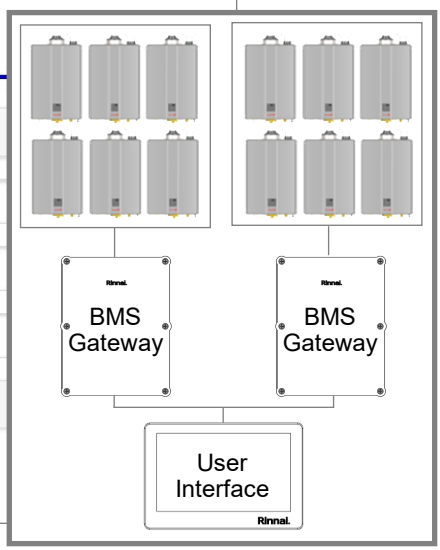


Fig 61. Example illustration of the Rinnai Touch Screen User Interface connected to two BMS Gateway enclosures. Images are for illustration purposes only and may not show all system components.

Table 14. “Screens Setup” Tab Fields

Field	Description
Gateway ID	Click the drop-down arrow to select the number of tankless water heaters (1 to 6) connected to the BMS Gateway.
Previous Gateway Address	Enter the Gateway ID of the previous BMS Gateway on the network. **Note:** Leave this field blank for the first BMS Gateway in the system that is connected to the Rinnai Touch Screen User Interface.
Next Gateway Address	Enter the Gateway ID of the next BMS Gateway on the network. **Note:** Leave this field blank for the last BMS Gateway in the system that is connected to the Rinnai Touch Screen User Interface.
Passcode	Enter a 4-digit passcode that will allow the user to perform the following functions on the Rinnai Touch Screen User Interface and/or customer-supplied BMS screen: • Adjust the tankless water heater set point temperature • Turn the tankless water heater on or off
Set point/Mode Adjust	From the drop-down list, select “Yes” or “No” to allow the following adjustments to occur through the Rinnai Touch Screen User Interface and/or customer-supplied BMS screen: • Adjust the tankless water heater set point temperature • Turn the tankless water heater on or off

When all fields are complete, click the “Submit” button.

6.7 Admin Tab

The “Admin” tab screen (Fig 62) allows you to configure administration settings such as:

- Local date and time settings
- Email settings and notifications
- Website access
- Update BMS Gateway firmware

Each field on the screen is described in the following sections.

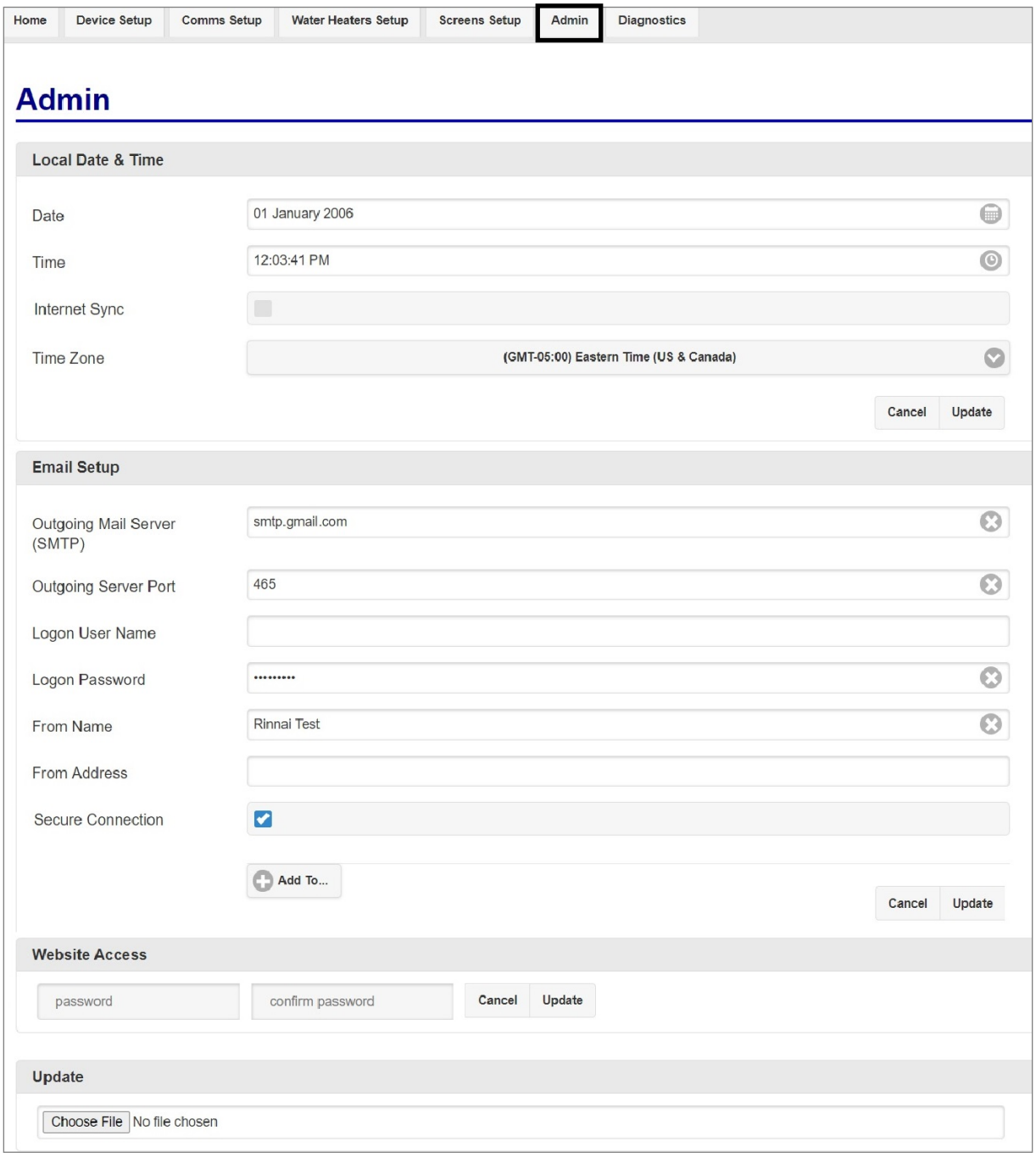


Fig 62. “Admin” Tab Screen

6.7.1 Local Date and Time

To set the date and time, complete the fields shown in Fig 63. Each field is described in Table 15.

All fields are optional but are recommended to ensure an accurate date and time are displayed on the optional touch screen user interface and/or customer-supplied BMS.

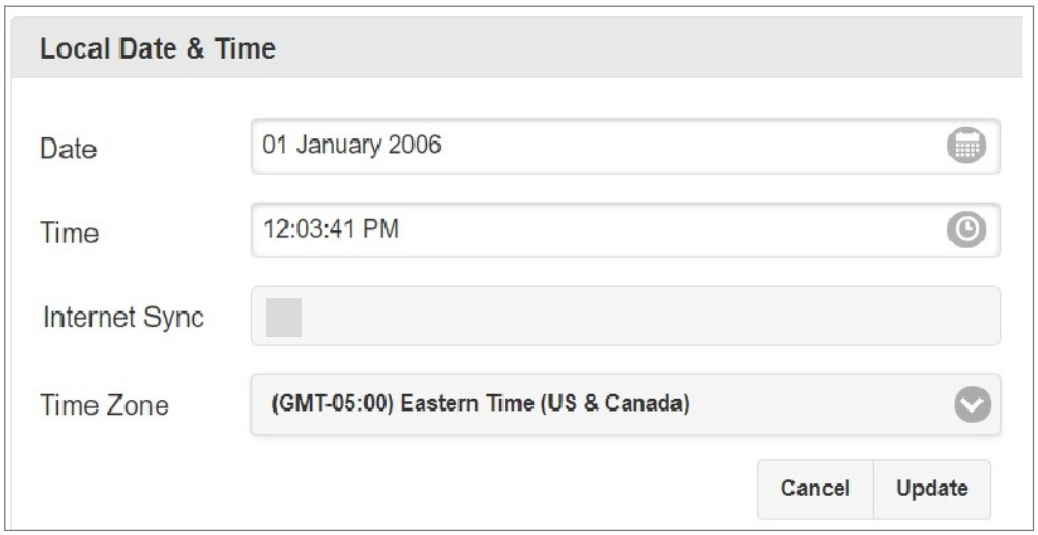


Fig 63. Local Date and Time

Table 15. Local Date and Time Fields

Field	Description
Date	Click the calendar icon to select the current date, or type the date in day-month-year format (example: 28 July 2020).
Time	Click the clock icon to select the current time.
Internet Sync	Click the checkbox to update the date and time through the Internet. The BMS Gateway must be connected to a network with Internet access to use this feature.
Time Zone	Select the current time zone from the drop-down selection.

When all fields are complete, click “Update” to save your changes or “Cancel” to discard your changes.

6.7.2 Email Setup

To allow the BMS Gateway to send email notifications when an error occurs in a tankless water heater, complete the fields shown in Fig 64. All fields are described in Table 16.

IMPORTANT

The BMS Gateway must be connected to a network with Internet access to use the email notification feature.

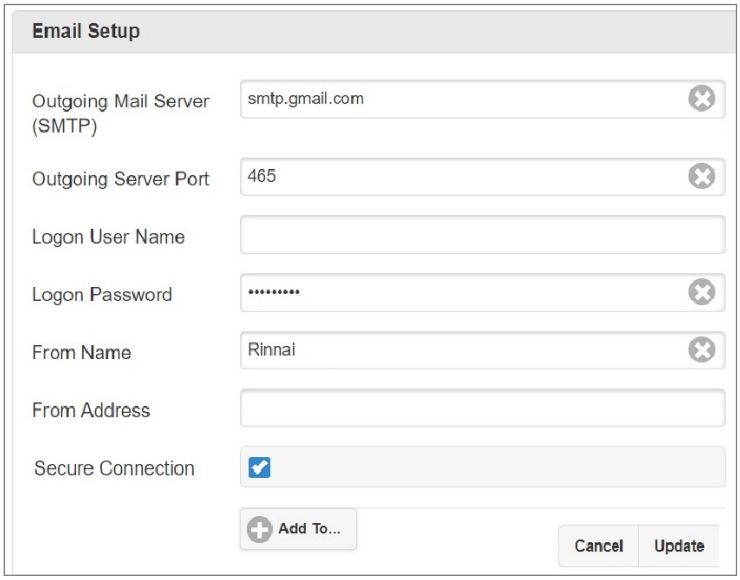
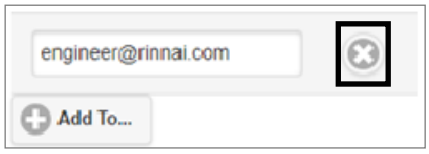


Fig 64. Email Setup

Table 16. Email Setup Fields

Field	Description
Outgoing Mail Server (SMTP)	Enter the outgoing SMTP server for the email provider. (example: smtp@example.com)
Outgoing Server Port	Enter the email provider's outgoing server port number.
Logon User Name	Enter the user name that is required to logon to the email provider's outgoing SMTP server. (example: engineer@rinnai.com)
Logon Password	Enter the password that is required to logon to the email provider's SMTP outgoing server.
From Name	Enter the name that will display as the sender on the received email.
From Address	Enter the email address that will display as the sender on the received email.
Secure Connection	Select the box if a secure connection is required to your email provider's outgoing SMTP server.
Add To	To enable email notifications when an error occurs in a tankless water heater connected to the BMS Gateway system, click "Add To" and enter the user's email address. To delete an email recipient, click the "X" next to their email address (Fig 65).  *Fig 65. Delete an Email Recipient*

When all changes are complete, click "Update" to save your changes or "Cancel" to discard your changes.

6.7.3 Website Access

Follow the instructions below to change the default password when logging onto the BMS Gateway:

1. Type the new password into the “password” and “confirm password” fields (Fig 66).

   The maximum number of characters allowed is 36, including spaces. The name can contain letters, numbers, spaces, symbols, and is not case-sensitive.

2. Click “Update” to save your changes (Fig 66) or “Cancel” to discard your changes.

Fig 66. Website Access Fields

IMPORTANT

The user name to log onto the BMS Gateway is “admin” and cannot be changed.

6.7.4 Update

Follow the instructions below to update the BMS Gateway Firmware:

1. Click the “Choose File’ button (Fig 67) and select the CAB file that was supplied to you by Rinnai.

2. A confirmation message appears when the update is complete.

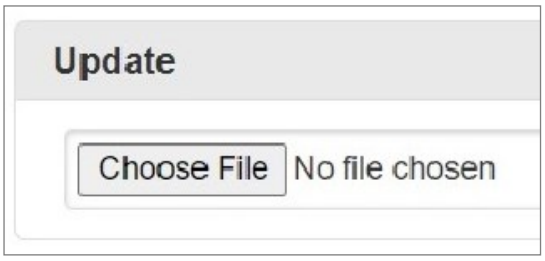


Fig 67. “Choose File” Button

6.8 Diagnostics Tab

The “Diagnostics” tab screen (Fig 68) is used to determine if the BMS Gateway is communicating with the tankless water heaters. Each column on the screen is described in Table 17.

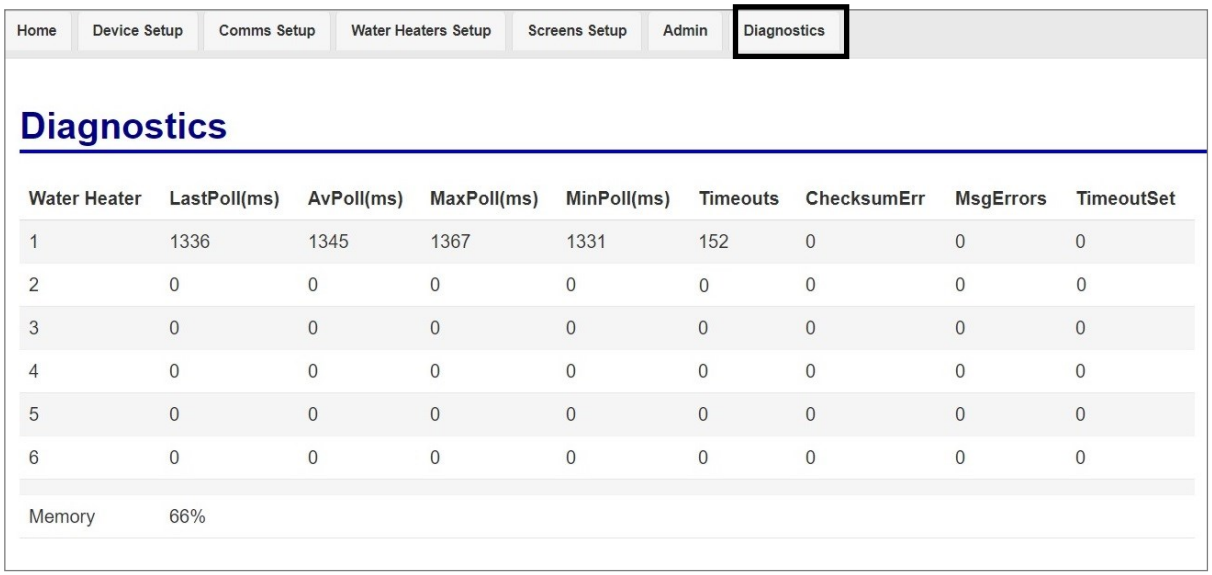


Fig 68. “Diagnostics” Tab Screen

Table 17. “Diagnostics” Tab Screen Fields

Field	Description
Water Heater	Corresponds to the serial connection port (1 to 6) on the tankless water heater hub located inside the BMG Gateway.
LastPoll(ms)	The latest time in milli seconds to read all the data from the tankless water heater.
AvPoll(ms)	The average time over the last x10 polls in milli seconds to read all the data from the tankless water heater.
MaxPoll(ms)	The maximum time over the last x10 polls in milli seconds to read all the data from the tankless water heater.
MinPoll(ms)	The minimum time over the last x10 polls in milli seconds to read all the data from the tankless water heater.
Timeouts	The number of times a message is sent and a response is not received after the BMS Gateway is powered “On.”
ChecksumErr	The number of messages received from a tankless water heater where a checksum error was detected in the response.
MsgErrors	The number of messages received from a tankless water heater where a problem is detected in the response.
TimeoutSet	Communications with a tankless water heater is marked as a comms failure after x10 consecutive message timeouts.
Memory	Percentage of memory that is being used by the BMS Gateway.

7. Touch Screen User Interface

This section explains how to use the optional touch screen user interface (Fig 69).

Fig 69. Touch Screen User Interface (Sample Image)

7.1 Main Screen Layout

Turn on the user interface by plugging the user interface power supply to a wall outlet. The main screen appears (Fig 70). The features on the screen are described in Table 18.

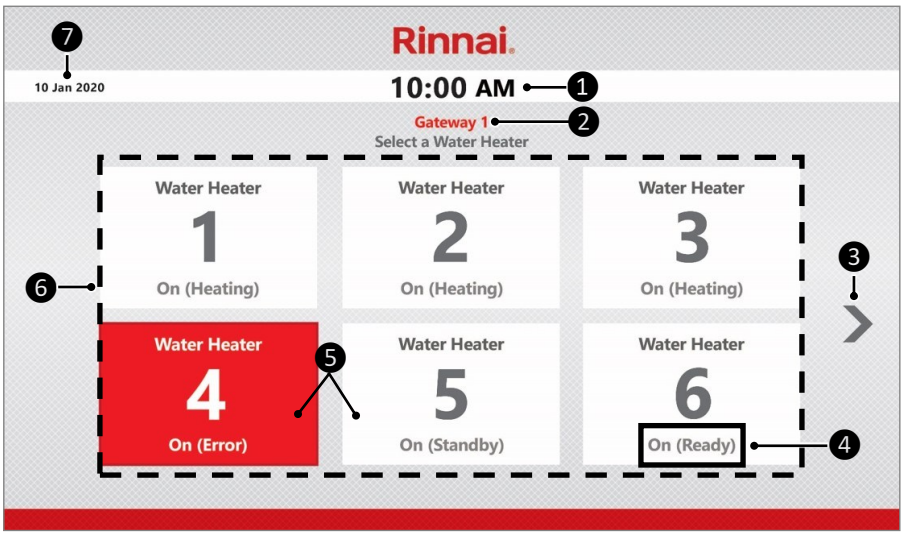


Fig 70. Main Screen

Table 18. Main Screen Features

Item	Description
❶	Current time.
❷	BMS Gateway number assigned to the tankless water heaters. The BMS Gateway number appears only if more than one BMS Gateway is in use.
❸	Click to the view the tankless water heaters associated with the next BMS Gateway (Gateway 2, for example).
❹	Tankless water heater status. Options include: • **On (Heating)** - Tankless water heater is on and heating. • **On (Standby)** - Tankless water heater is on and in standby mode. • **On (Ready)** - Applies only to tankless water heaters electronically connected by cascade cables. Tankless water heater is on and ready to heat when cascade control allows for activation. Cascade cable connection rotates water heater operation order to ensure equal usage among the entire system and enables all tankless water heaters connected to modulate operation and function as one hot water source. • **On (Error)** - Tankless water heater is on and has encountered an error. • **Off** - Tankless water heater is off.
❺	• A red box indicates the tankless water heater has encountered an error. • A white box indicates the tankless water heater is operating correctly with no errors.
❻	Tankless water heater selection. A maximum of six tankless water heaters can connect to one BMS Gateway.
❼	Current date.

7.2 Tankless Water Heater Parameter Screen

To view and adjust[1] the parameters of a tankless water heater, select the water heater number from the main screen (Fig 70 on previous page). The tankless water heater parameter screen appears (Fig 71). Each feature on the screen is described in Table 19.

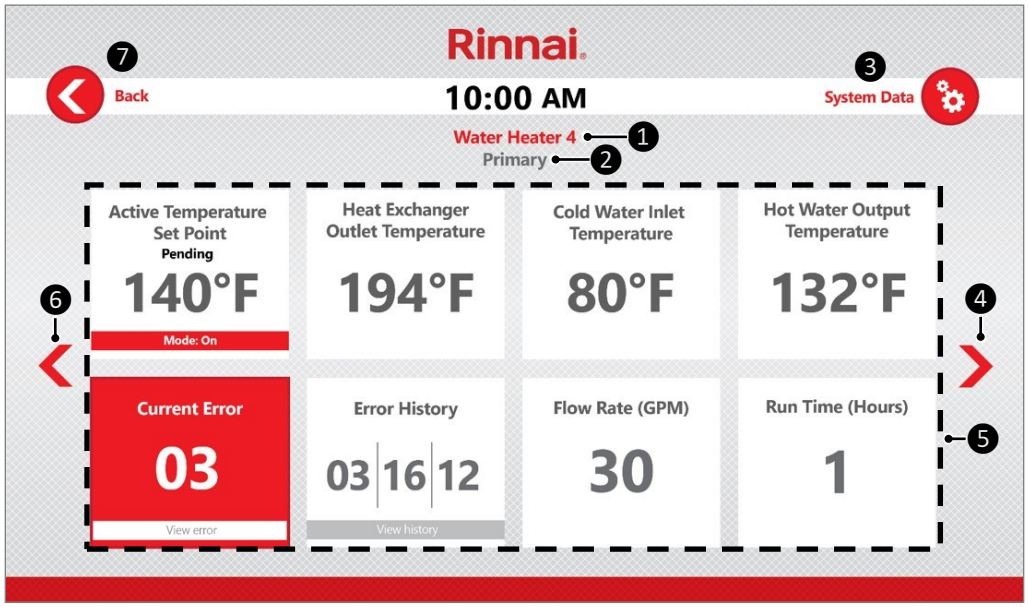


Fig 71. Tankless Water Heater Parameter Screen

Table 19. Tankless Water Heater Parameter Screen Features

Item	Description
❶	Tankless water heater number currently being viewed on the screen.
❷	Indicates the tankless water heater is the primary unit for cascade communication and appears only if a cascade cable is connected to the tankless water heaters.
❸	Press to view advanced system data, such as the tankless water heater fan speed, combustion frequency, exhaust temperature, and more (see section “7.2.2 System Data” for more information).
❹	Press to view the parameters of the next tankless water heater.
❺	Tankless water heater parameters (see section “7.2.1 Tankless Water Heater Parameters” for more information).
❻	Press to view the parameters of the previous tankless water heater.
❼	Press to return to the main screen (Fig 70 on previous page).

[1] The only parameters to adjust are changing the set point temperature and turning the water heater on/off; see the following section for steps on adjusting these parameters: “7.2.1.1 Adjust the Set Point Temperature or Turn the Tankless Water Heater On or Off.”

7.2.1 Tankless Water Heater Parameters

Tankless water heater parameters are shown below (Fig 72). Refer to Table 20 for a description of each parameter.

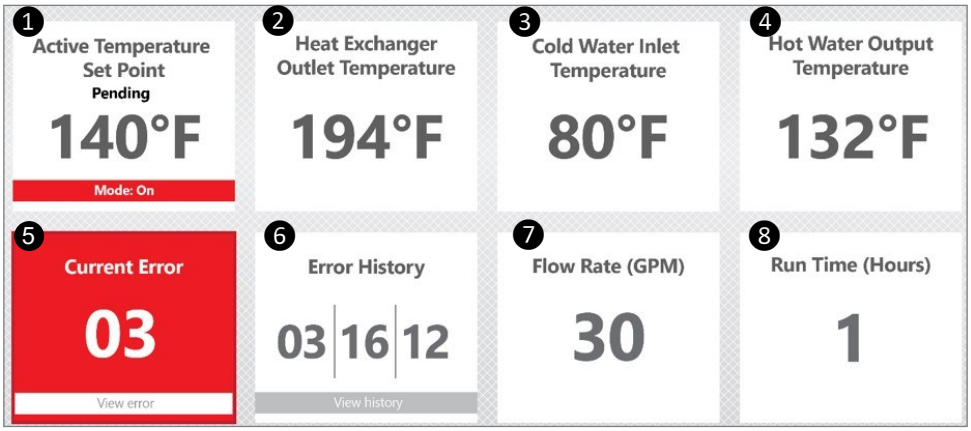


Fig 72. Tankless Water Heater Parameters

Table 20. Tankless Water Heater Parameters

Item	Parameter	View Parameter	Edit Parameter	Description
❶	Active Temperature Set Point	✓	✓	Current set point temperature. Press the box to view or adjust the set point temperature or turn the water heater on or off. For more information, see the following section: “7.2.1.1 Adjust the Set Point Temperature or Turn the Tankless Water Heater On or Off.”
❷	Heat Exchanger Outlet Temperature	✓		Temperature of water after it is heated by the heat exchanger and prior to being tempered with incoming cold water by the bypass valve. This temperature does not represent the water temperature entering the building (see “Hot Water Outlet Temperature” parameter below).
❸	Cold Water Inlet Temperature	✓		Temperature of cold water entering the tankless water heater.
❹	Hot Water Outlet Temperature	✓		Temperature of hot water exiting the tankless water heater and entering the building.
❺	Current Error	✓		Error status of the tankless water heater. Press the box to view additional error details. See section “7.2.1.2 Current Error Parameter” for more information.
❻	Error History	✓		Tankless water heater’s last three error codes. Press the box to view additional error history information. See section “7.2.1.3 Error History Parameter” for more information.
❼	Flow Rate (GPM)	✓		Flow rate (in gallons per minute) of water entering the tankless water heater.
❽	Run Time (Hours)	✓		Time in hours that the tankless water heater has operated in the “On (Heating)” mode.

7.2.1.1 Adjust the Set Point Temperature or Turn the Tankless Water Heater On or Off

1. On the tankless water heater parameter screen, press the “Active Temperature Set Point” box (Fig 73).

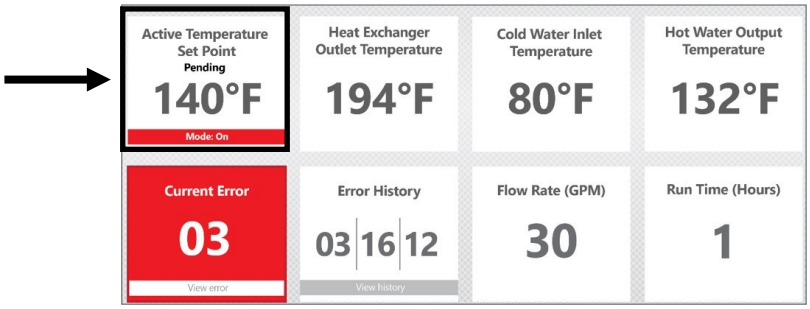


Fig 73. Active Temperature Set Point Box

2. Enter the passcode and then press “Enter” (Fig 74).

   The default passcode is “0151” and can be changed or disabled on the “Screens Setup” tab (see section “6.6 Screens Setup Tab” for more information).

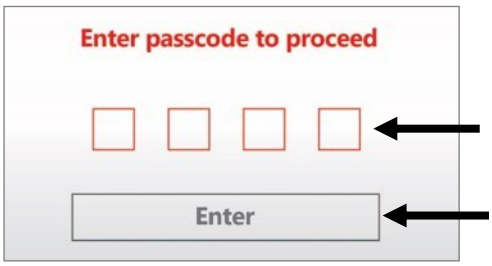


Fig 74. Enter Passcode

3. On the “Active Temperature Set Point” window (Fig 75), perform either of the following two options:

   Option 1: Turn the Tankless Water Heater On or Off (Fig 64)

   - Press “Unit On” to turn on the tankless water heater.
   - Press “Unit Off” to turn off the tankless water heater.

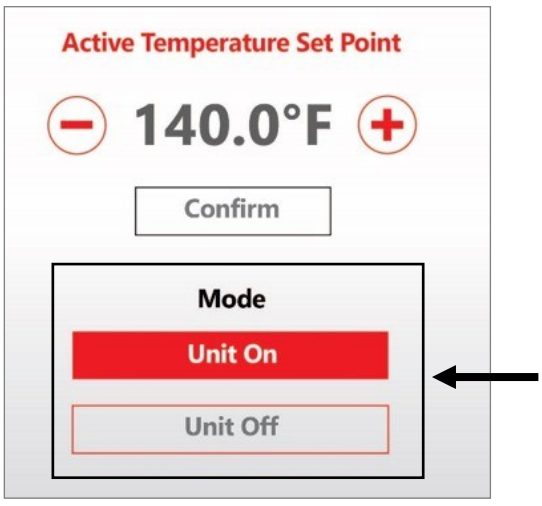


Fig 75. Turning the Tankless Water Heater On or Off on the “Active Temperature Set Point” Window

Option 2: Adjust the Set Point Temperature (Fig 76)

- Press ⊖ to decrease the temperate or ⊕ to increase the temperature.
- When the desired temperature appears in the window, press the “Confirm” button.

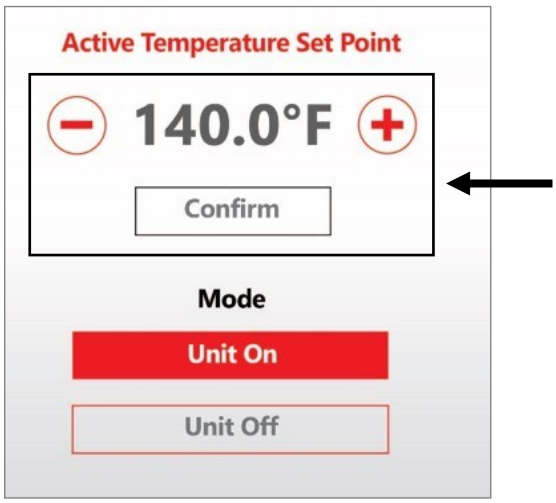


Fig 76. Adjusting the Set Point Temperature on the “Active Temperature Set Point” Window

IMPORTANT

After pressing the “Confirm” button, the following message appears (Fig 77) if the tankless water heater is currently turned on: “The set point will be altered when the water heater is next in off/standby mode. Continue?”

- Click “Yes” to allow the set point temperature to change when the tankless water heater is turned off or in standby mode.
- Click “No” to not allow the set point temperature to change when the tankless water heater is turned off on in standby mode.

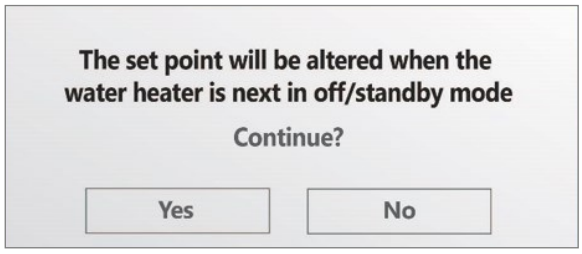


Fig 77. Set Point Temperature Confirmation Message

7.2.1.2 Current Error Parameter

The “Current Error” parameter box (Fig 78) indicates the error status of the tankless water heater.

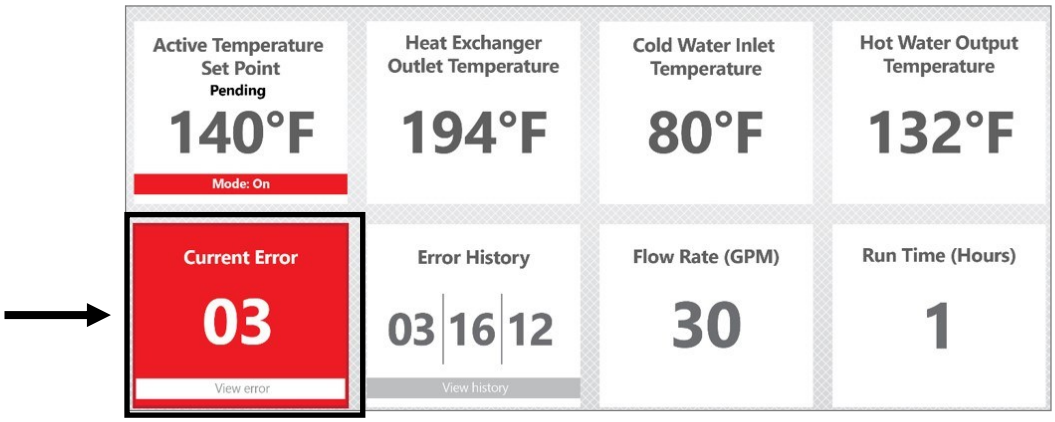


Fig 78. Current Error Parameter Box

- When the tankless water heater is functioning properly with no error codes, the “Current Error” box is white with a “No Error” message (Fig 79).

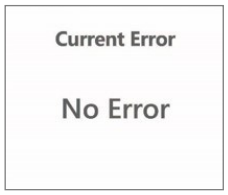
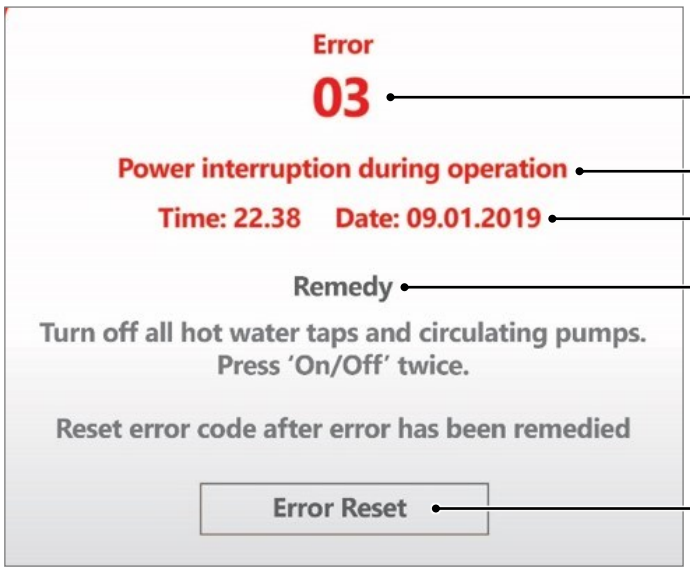


Fig 79. No Error

- When the tankless water heater has an error, the “Current Error” box turns red and displays the error code (Fig 80).

  Press the red box to view additional information about the error. The “Error” window appears (Fig 81).

Fig 80. Error Code 03



Error code

Error code description

Time and date when the error occurred

Potential remedy to resolve the error

After the error has been resolved at the tankless water heater, click the “Error Reset” button to clear the error from the BMS Gateway.

Note: Pressing this button clears the error from the BMS Gateway, not the tankless water heater. The error needs to be resolved at the tankless water heater before clicking this button.

Fig 81. Error Window

7.2.1.3 Error History Parameter

To view the error history of the tankless water heater, follow the step below.

1. Press the “Error History” parameter box (Fig 82).

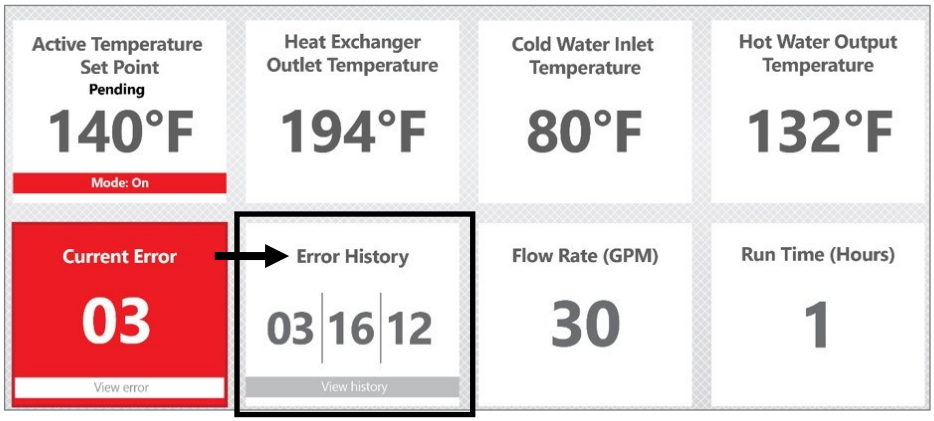


Fig 82. Error History Parameter Box

2. The “Error History” window appears, which lists the previous error codes and descriptions (Fig 83).

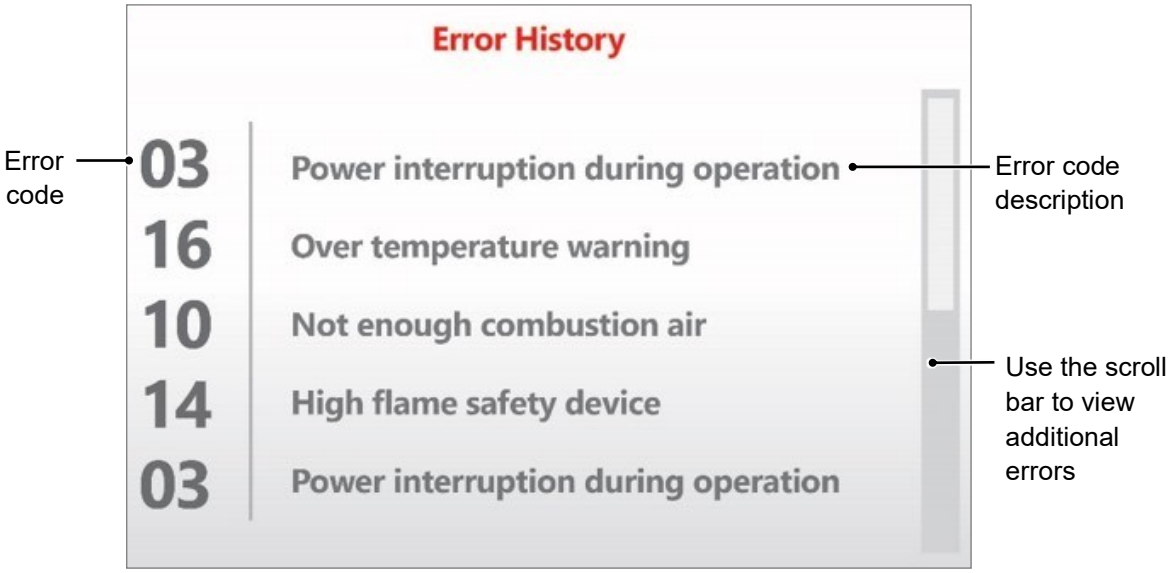


Fig 83. Error History Window

IMPORTANT

Refer to the Tankless Water Heater Installation and Operation Manual (supplied with each tankless water heater in the BMS Gateway system) for a complete list of error codes and descriptions. Or visit **www.rinnai.us** for an online version of the manual.

7.2.2 System Data

To view advanced system data, follow the step below.

1. On the tankless water heater parameter screen, press “System Data” (Fig 84).

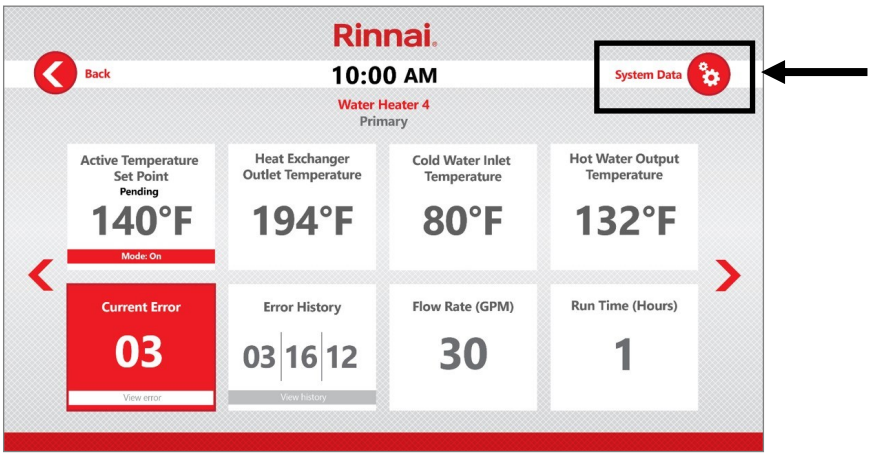
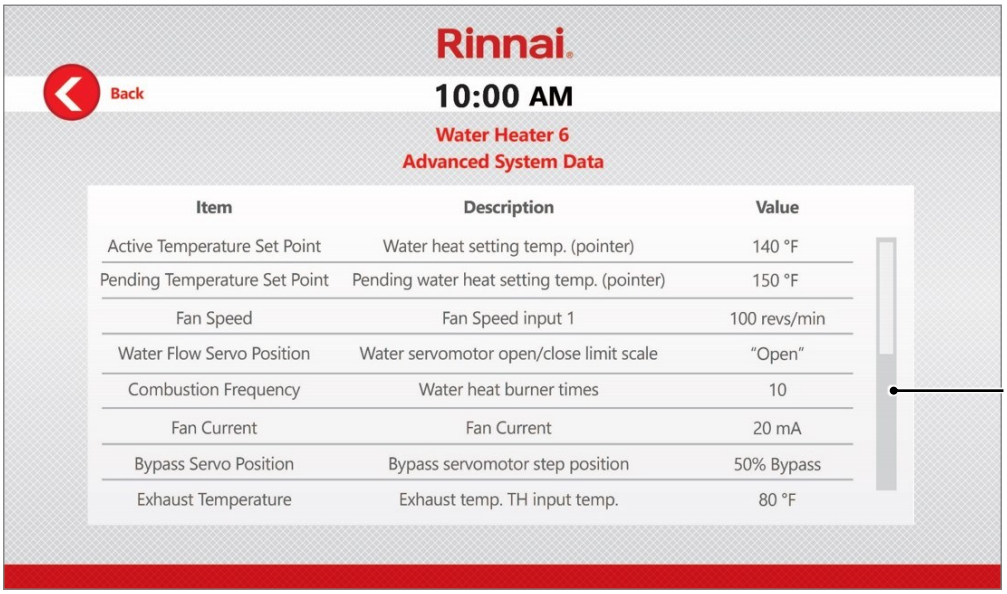


Fig 84. Press “System Data”

2. The “Advanced System Data” screen appears (Fig 85).



Use the scroll bar to view additional parameters.

Fig 85. “Advanced System Data” Screen

Parameters include:

- Active Temperature Set Point
- Pending Temperature Set Point
- Fan Speed
- Water Flow Servo Position
- Combustion Frequency
- Fan Current
- Bypass Servo Position
- Exhaust Temperature
- Freeze Protection Temperature
- Water Heater State
- Burner State
- Combustion Cycles

8. Troubleshooting

Refer to Table 21 to troubleshoot issues that may occur with the BMS Gateway.

Table 21. Troubleshooting Steps

Symptom	Possible Solution
The local BMS is not communicating with the Rinnai BMS Gateway.	• Ensure that the correct communication protocol (BACnet/IP, BACnew MS/TP, or Modbus RTU) is selected on the “Comms Setup” tab. Refer to section “6.4.2 Protocol Selection” for steps on selecting a communication protocol. • Ensure the network router (if used) is powered and properly functioning. • Ensure the communication cables inside the BMS Gateway are correctly connected. Refer to the following sections for additional details: – 5.5 Connect BMS Gateway to Tankless Water Heaters – 5.6 Connect BMS Gateway to Other System Components
The Rinnai BMS Gateway is not communicating with the Rinnai tankless water heaters.	• Ensure that the serial communication cables are properly connected to the tankless water heaters and BMS Gateway with no breaks within the wires. For steps on connecting the serial communication cables, see section “5.5 Connect BMS Gateway to Tankless Water Heaters.” • Ensure that the type and number of tankless water heaters are correctly configured on the “Water Heaters Setup” tab. Refer to section “6.5 Water Heaters Setup Tab” for steps on selecting the type and number of tankless water heaters.
Unable to log into the BMS Gateway setup screens.	• Confirm that the BMS Gateway is powered. • Confirm that the laptop or PC is on the same network as the BMS Gateway, or connected directly to the BMS Gateway with a crossover Ethernet cable (customer-supplied). • If using a crossover Ethernet cable, confirm settings as described in section “10.3.1.2 Crossover Ethernet Cable.” • Reset the BMS Gateway IP address and password to the default settings by following the steps is section “10.2 Reset IP Address and Password to Default.”

- For more information about the network hub, please contact network hub manufacturer.
- For more information about the BMS network, please contact the BMS provider.
- For all other questions, contact Rinnai Customer Care at 1-800-621-9419.

9. Service and Maintenance

⚠ WARNING

Electrical Shock:

- Disconnect power before servicing.
- In the event of a malfunction or breakdown, grounding provides a path of least resistance for electric current which reduces the risk of electrical shock. DO NOT remove the ground connection from the BMS Gateway's power plug.
- Disconnect power when accessing connections inside the BMS Gateway enclosure. Failure to do so may result in electrical shock.
- Prior to making any electrical connections, ensure that supply voltage, frequency, and phase are as specified in section "3.4 Specifications" of this document.
- DO NOT connect or disconnect cables during periods of lightning.

- This section applies to service and maintenance of the Rinnai BMS Gateway and optional touch screen user interface.
  For service and maintenance of the Rinnai Tankless Water Heaters, refer to the Installation and Operation Manual supplied with the tankless water heater or visit **www.rinnai.us** for an online copy of the manual.
- Service or maintenance must be performed by a trained and qualified professional.
- The trained and qualified professional must verify proper operation after service or maintenance.
- Do not use substitute parts. Use only parts certified or approved for the BMS Gateway.

Service:

To service the BMS Gateway, follow the steps below.

1. Disconnect power to the BMS Gateway.
2. Remove the six screws securing the front cover to the enclosure. Then, remove the cover.
3. Perform service to the BMS Gateway, and then reinstall the six screws to secure the front cover.

IMPORTANT

Important Note About the Tankless Water Heater Controller:

When the BMS Gateway is connected to a tankless water heater, the tankless water heater controller (Fig 86) cannot be used to adjust the setpoint temperature or turn the water heaters on or off; these functions can only be performed through the Rinnai Touch Screen User Interface and/or customer-supplied BMS.

For temporary control of the above functions through the tankless water heater controller (for servicing as an example), the tankless water heater must first be disconnected from the BMS Gateway.

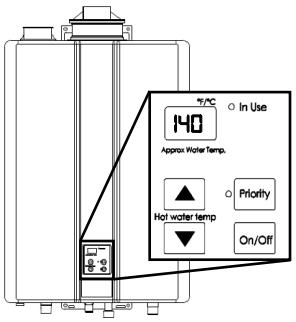


Fig 86. Sample Tankless Water Heater Controller

Recommended Annual Maintenance:

- Visually inspect all system components, making sure cords and cables are connected properly.
- Visually inspect the outside of the BMS Gateway enclosure for cracks or other evidence of impact damage.
- Remove the BMS Gateway front cover:
  - Look for signs of excessive dust or water ingress
  - Check internal electrical and communication connections and wires for signs of damage

10. Appendices

10.1 Mount the BMS Gateway to a TRS Rack

Follow the instructions below to mount the BMS Gateway to a TRS rack (Fig 88).

IMPORTANT

The TRS Rack Mounting Bracket (purchased separately) is required for installation (Fig 87).

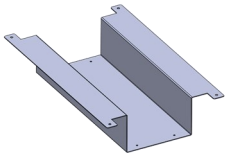


Fig 87. TRS Rack Mounting Bracket

- TRS Rack Mounting Bracket for *Indoor* BMS Gateway Models: **Part #: R-BMS-102**
- TRS Rack Mounting Bracket for *Outdoor* BMS Gateway Models: **Part #: RBMS102E**

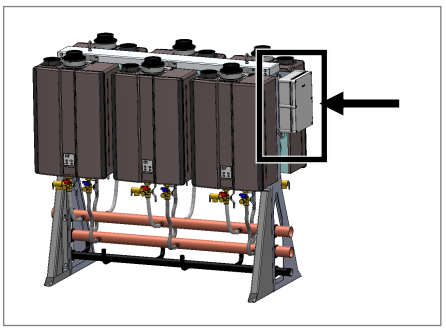


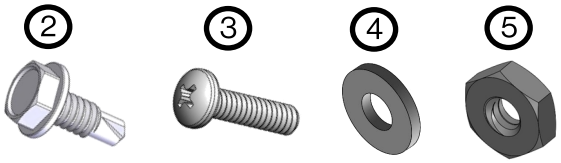
Fig 88. BMS Gateway Mounted to a 6-Unit TRS Rack. Other Rack Configurations are Available.

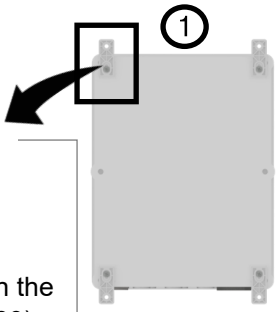
10.1.1 You Will Need

Supplied:

Table 22. Items Supplied with BMS Gateway

Item #	Item	Qty
1	BMS Gateway (See Note to Right)	1
2	#10 Drilling Hex Head Screw	4
3	10-24 Thread Rounded Head Screw	4
4	#10 Flat Washer	4
5	10-24 Thread Hex Nut	4





NOTE

For installation, the supplied wall mount brackets must be installed vertically on the BMS Gateway (Fig 89) as described in section "5.2 Mount BMS Gateway to Wall."

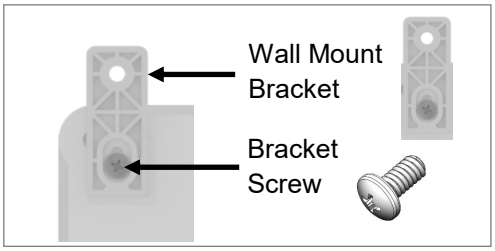


Fig 89. Wall Mount Brackets Vertically Attached to Back of BMS Gateway.

Purchased Separately:

- TRS Rack
- TRS Rack Mounting Bracket

Field-Supplied:

- Power Drill
- Phillips Head Screwdriver

10.1.2 Instructions

1. Select the preferred side (left or right) of the TRS rack for BMS Gateway mounting (Fig 90).

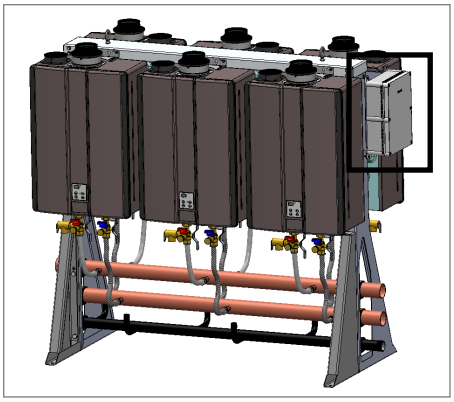


Fig 90. BMS Gateway Mounted to Right Side of TRS Rack.

2. Place the mounting bracket (vertically orientated) inside the rack channel, and align the top of the bracket to the top of the channel to level the bracket (Fig 91).

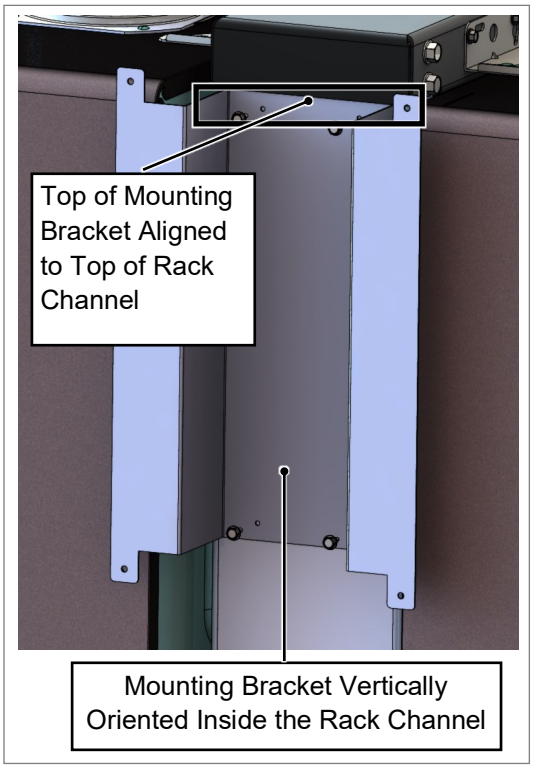
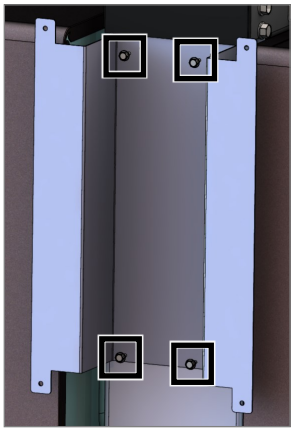


Fig 91. Position the Mounting Bracket into the Rack Channel.

3. Using a power drill, install the four (4) supplied Drilling Hex Head Screws to secure the bracket to the rack (Fig 92).



#10 Drilling Hex Head Screw (Supplied)

Fig 92. Install Drilling Hex Head Screws into Bracket.

4. Using a Phillips head screwdriver, mount the BMS Gateway to the bracket using the supplied rounded head screws (4), washers (4) and hex nuts (4) (Fig 93).

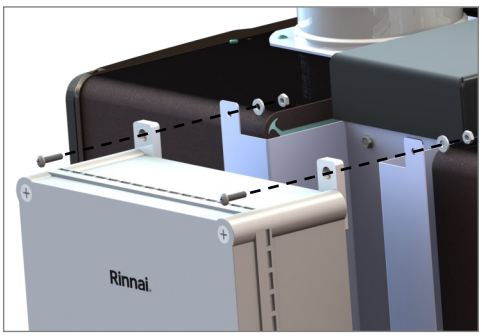


Fig 93. Mount the BMS Gateway to Bracket.

10-24 Thread Rounded Head Screw (Supplied)

#10 Flat Washer (Supplied)

10-24 Thread Hex Nut (Supplied)

5. The BMS Gateway is now mounted to the TRS rack (Fig 94).

Fig 94. BMS Gateway Mounted to TRS Rack.

10.2 Reset IP Address and Password to Default

To reset the IP address and Admin password back to the default settings, follow the steps below.

1. Remove the front panel of the BMS Gateway:
   - Use a Phillips head screwdriver to remove the six plastic screws attaching the front cover to the enclosure (Fig 95).

     Note: Keep the screws nearby as you will need them to reattach the front cover.

2. Locate the router inside the enclosure (Fig 96).

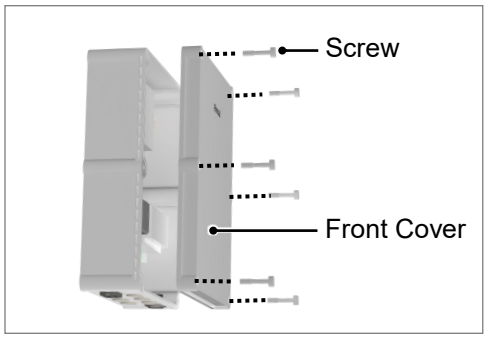


Fig 95. Remove Front Panel of BMS Gateway

3. On the bottom of the router, insert a pin or paperclip end into the “IP Reset” button, and then press and hold for approximately 10 seconds. The LED will slowly blink and then stop (Fig 97).

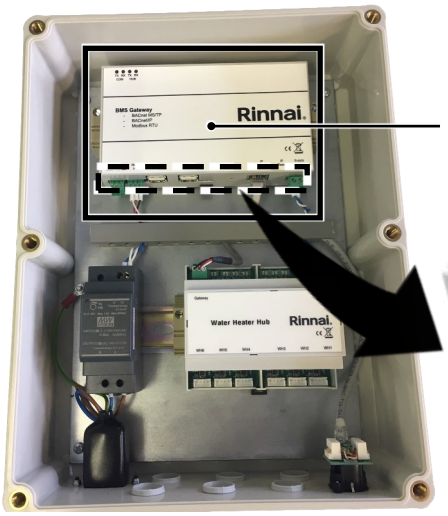


Fig 96. BMS Gateway Router

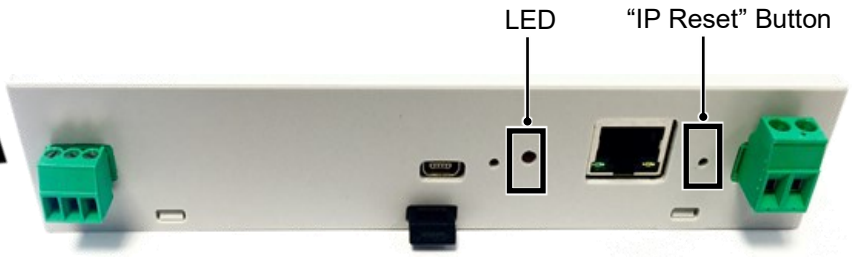


Fig 97. LED and “IP Reset” Button on Bottom of Router

4. When the LED stops blinking and turns off, release the “IP Reset” button. The default settings below will be restored:
   - IP Address: 192.168.1.151
   - Subnet Mask: 255.255.255.0
   - Default Gateway: 192.168.1.254
   - Admin Password: admin (all lowercase)
5. Power cycle the BMS Gateway.
6. Reattach the front panel on the BMS Gateway.

10.3 Verify Correct IP Address Settings

To verify the correct IP address settings, follow the steps below:

NOTE

- The purpose of this section is to:
  - Verify that the IP address of a local network can log into the BMS Gateway.
  - Add the IP address to your Building Management System (BMS) IP network, if required.
- The steps below assume the IP address format of the network is 192.168.1.x with the Rinnai BMS Gateway utilizing its default IP address of 192.168.1.151. Please alter the IP address of the BMS Gateway to suit your IP network configuration.

10.3.1 Access the Rinnai BMS Gateway

To access the BMS Gateway, your local network must be on the same subnet as the BMS Gateway (192.168.1.x, for example). This can be done by using a network router/switch/hub or a crossover Ethernet cable.

- If using a network router/switch/hub, follow the steps in section "10.3.1.1 Network Router/Switch/Hub."
- If using a crossover Ethernet cable, follow the steps in section "10.3.1.2 Crossover Ethernet Cable."

10.3.1.1 Network Router/Switch/Hub

To connect to the BMS Gateway using a network router/switch/hub, follow the steps below:

1. Make sure the router is setup for the network **192.168.1.x**. There must be no other device on the network with the IP address of **192.168.1.151**. (For instructions on setting up the network router, refer to the router manufacturer's manual.)
2. Connect the BMS Gateway to the router with an Ethernet cable (See "A" in Fig 98).
3. Connect the computer or laptop to the router either wirelessly or with an Ethernet cable (See "B" in Fig 98).
4. You should now be able to log into the Rinnai BMS Gateway. Refer to section "6. Software Setup" for steps on logging on and configuring the BMG Gateway software through the customer -supplied computer, smartphone or tablet.

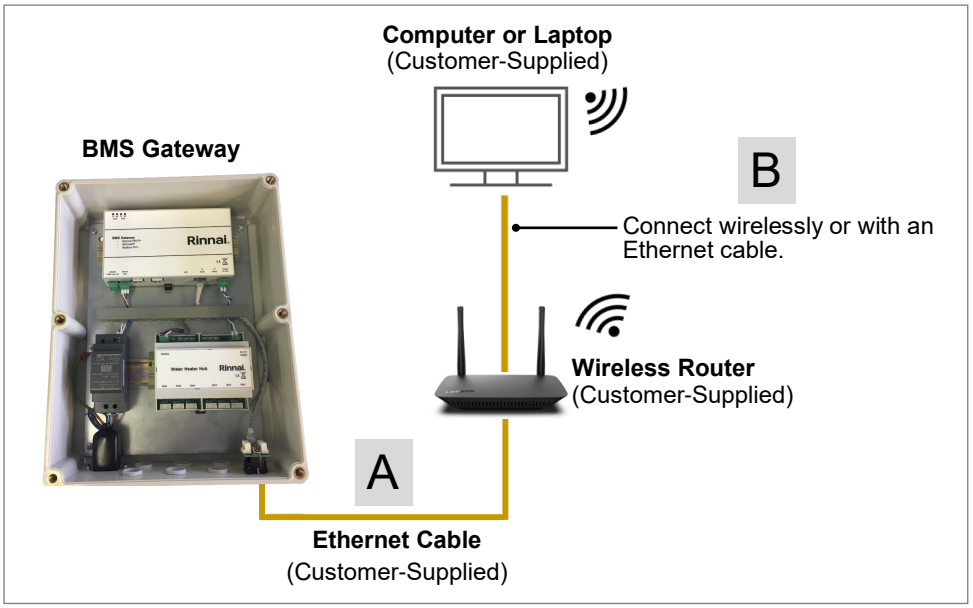


Fig 98. Connect to BMS Gateway Using a Network Router/Switch/Hub

10.3.1.2 Crossover Ethernet Cable

To connect to the BMS Gateway using a crossover Ethernet cable, follow the steps below:

1. Connect one end of the crossover Ethernet cable to the BMS Gateway ethernet port, and the other end to the computer ethernet port (Fig 99).

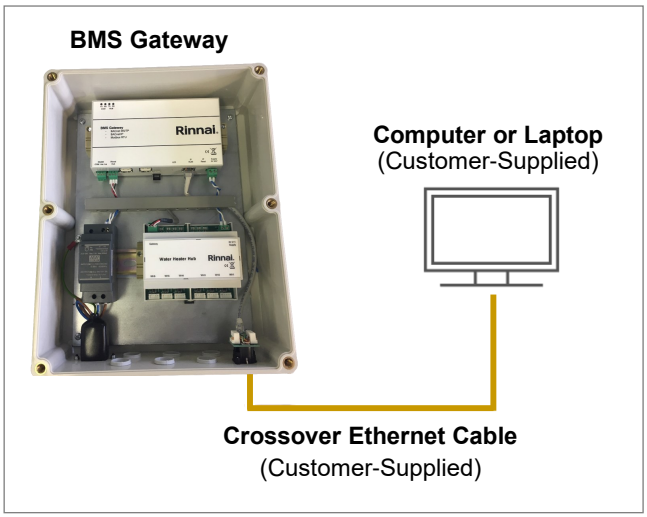


Fig 99. Connect to BMS Gateway Using a Crossover Ethernet Cable

2. Make sure your network adapter settings are setup to communicate with the BMS Gateway. To do this, open the “Control Panel” on the computer and select “Network and Sharing Center” (Fig 100).

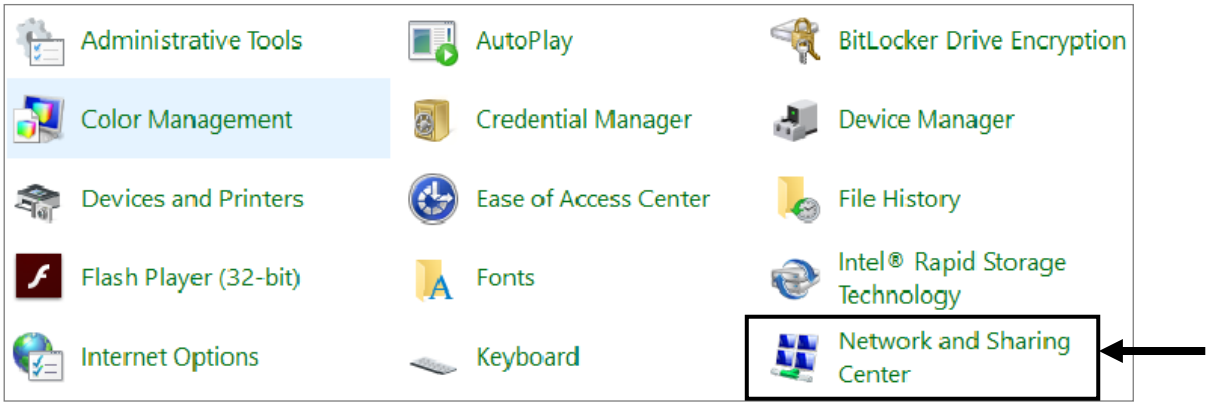


Fig 100. Select “Network and Sharing Center”

3. Click “Local Area Connection” (Fig 101).

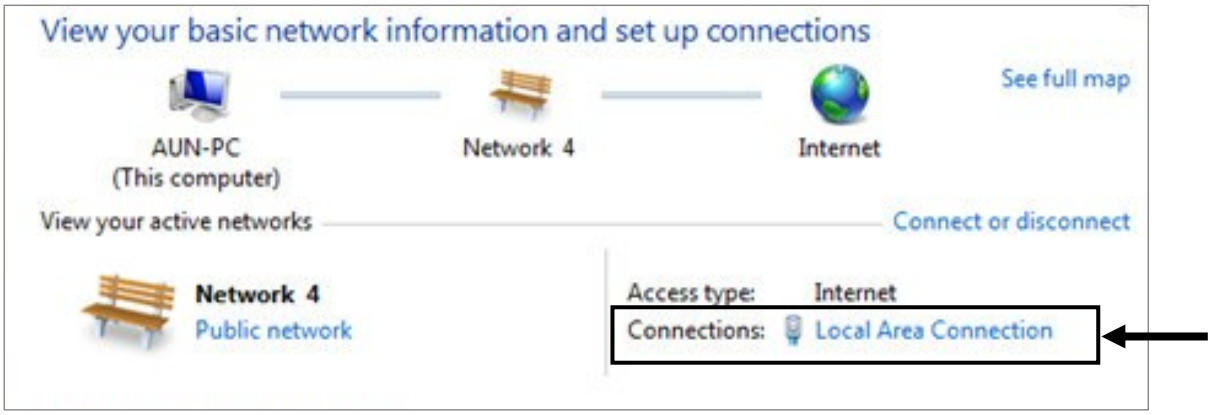


Fig 101. Click “Local Area Connection”

4. Click the “Properties” button (Fig 102). This will allow you to set the properties of the network adapter.

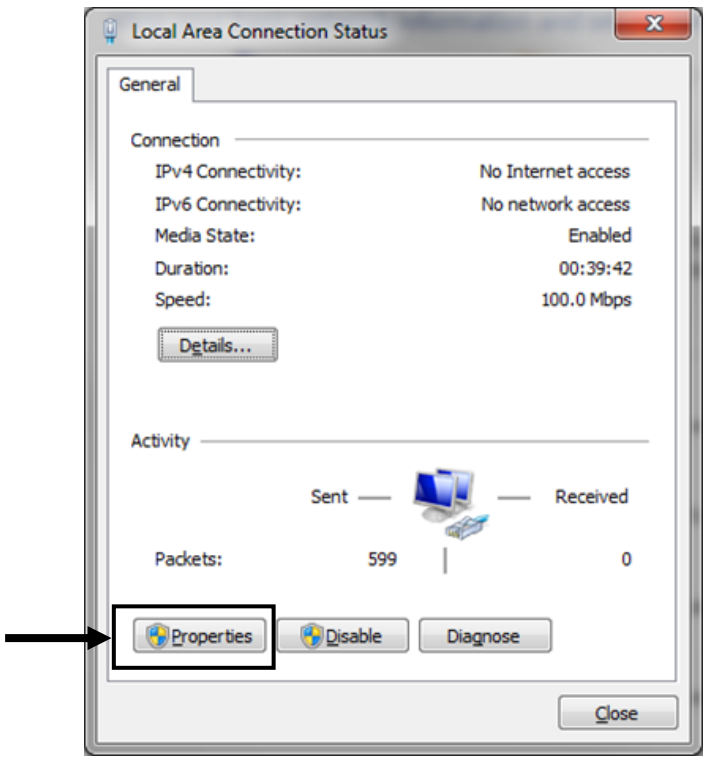


Fig 102. “Properties” Button

5. Select “Internet Protocol Version 4 (TCP/IPv4)” and then click the “Properties” button (Fig 103). This will allow you to set the IP settings for the adapter.

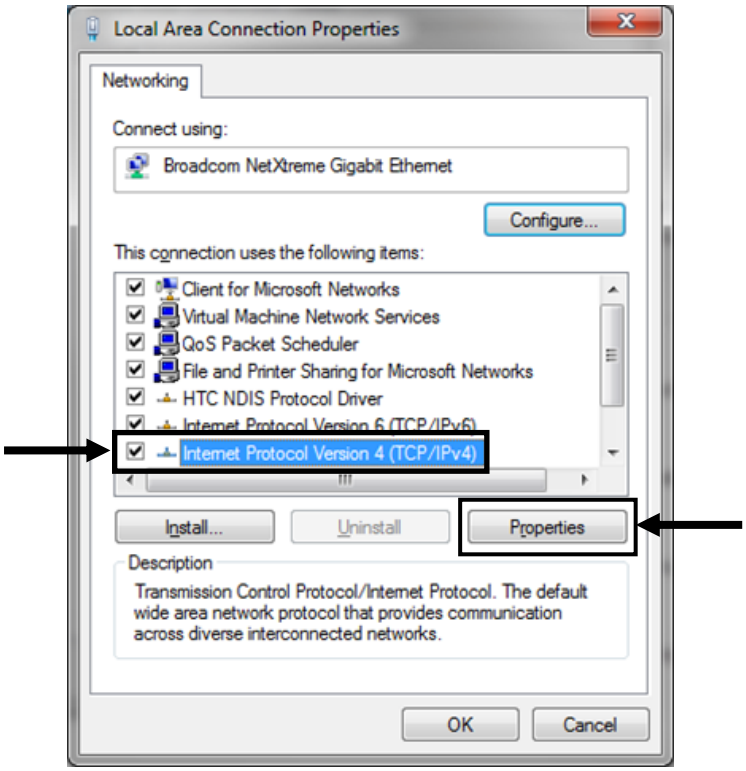


Fig 103. “Internet Protocol Version 4 (TCP/IPv4)” Button and “Properties” Button

6. Complete the following on the “General” tab window (Fig 104):

   - Select “Use the following IP address:”
   - For “IP Address,” enter: **192.168.1.1**
   - For “Subnet mask,” enter: **255.255.255.0**
   - Click the “OK” button.

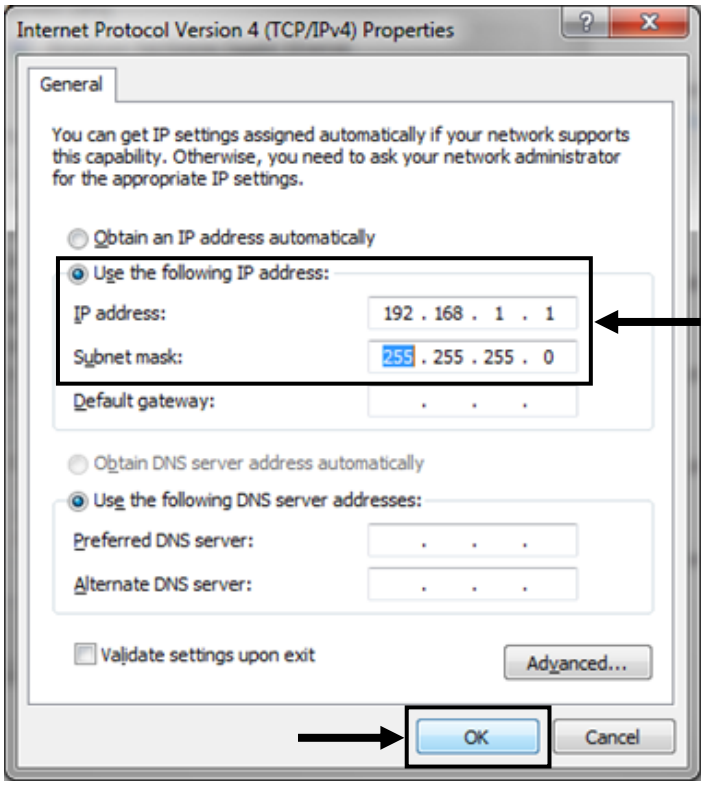


Fig 104. IP Address Fields

7. You should now be able to log into the Rinnai BMS Gateway.

   Refer to section “6. Software Setup” for steps on logging on and configuring the BMG Gateway software through the customer-supplied computer, smartphone or tablet.

Notes

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