RCB BACnet and LonWorks Adapters
ASSEMBLY INSTRUCTIONS

Kit Name	RCB BACnet Adapter & RCB BACnet with LonWorks Adapter
Kit Part Number	803000078 and 803000080
Compatible Rinnai Products	Rinnai Commercial Boiler Models: RCB301AN , RCB399AN, RCB500AN, RCB750AN, RCB1000AN

⚠ WARNING	Failure to correctly assemble the components according to these instructions may result in property damage, injury, or death.

Items Inside Product Box

Before you begin, please make sure all parts are located inside the product box.

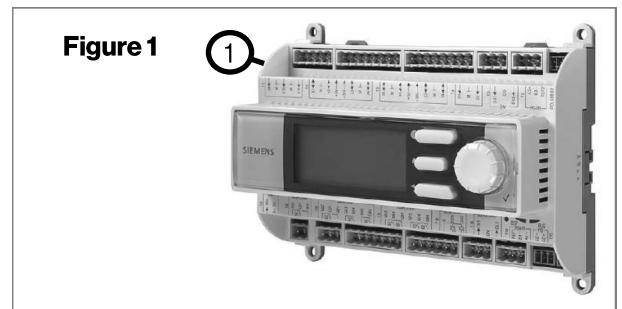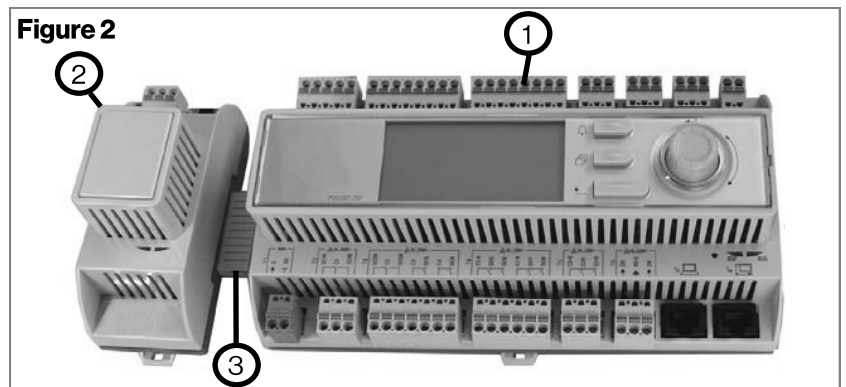Table 1. BACnet Adapter (803000078)

Item #	Item (Part Number)	Qty
1	BACnet Adapter	1

Figure 1

Table 2. BACnet with LonWorks Adpters (803000080)

Item #	Item (Part Number)	Qty
1	BACnet Adapter	1
2	LonWorks Adapter	2
3	COMM Interface Connector	3

TOOLS/MATERIALS REQUIRED

☐ Phillips Head Screw Driver

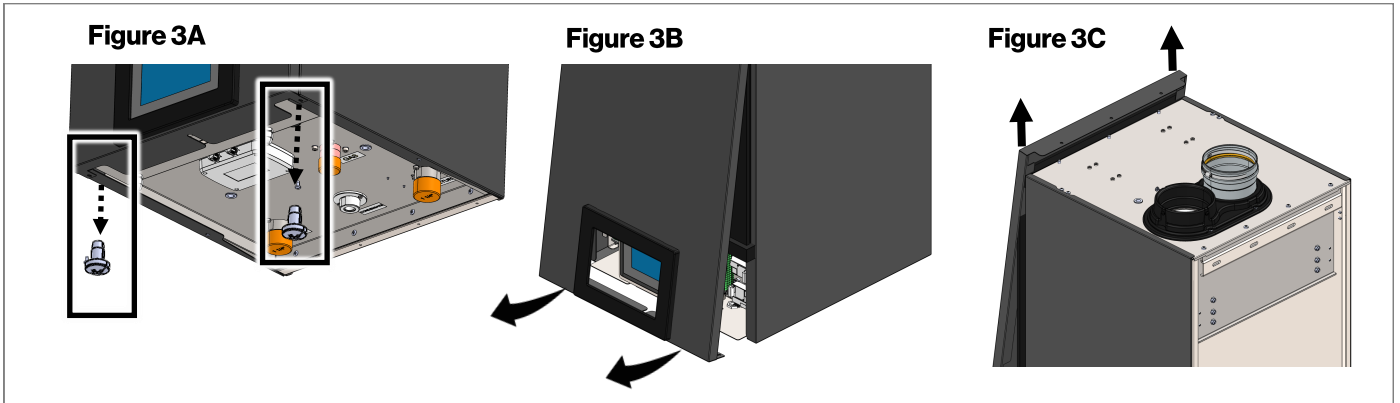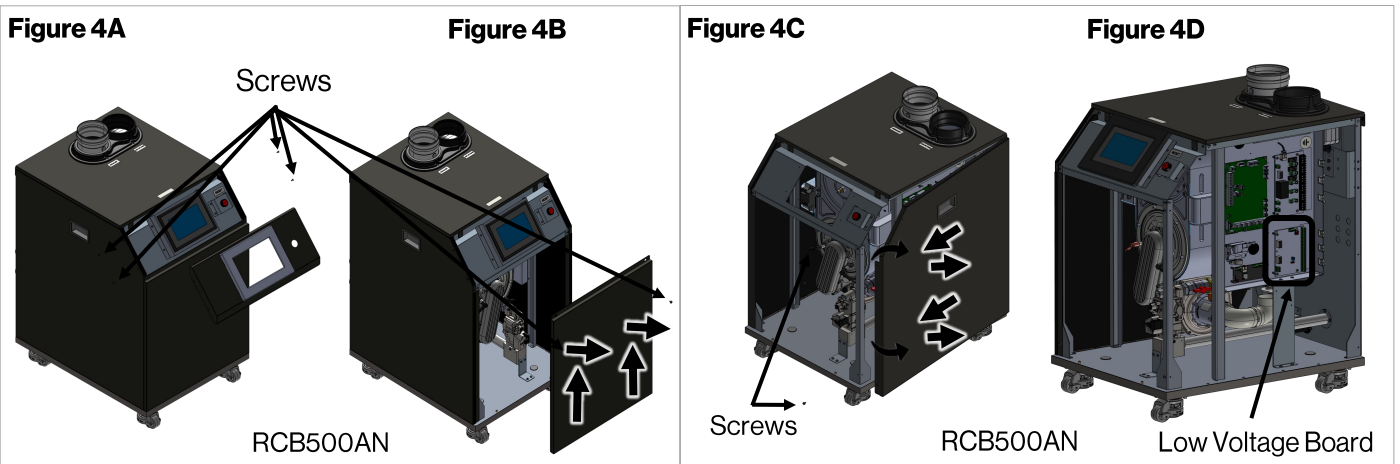☐ Flat Head Screw Driver

Figure 2

Instructions

1. Turn off and disconnect 120 V power supply.

2. Turn off water supply.

3. Turn off gas supply.

Rinnai

4. **RCB301AN/RCB399AN:** Use a Philips head screw driver to remove two screws located on the bottom of the appliance securing the front panel (Figure 3A). Pull out the bottom of the front panel to clear the display assembly (Figure 3B), then lift the front panel up to clear the pins located on top of the appliance (Figure 3C).

Figure 3A   **Figure 3B**   **Figure 3C**

5. **RCB500AN:** Use a Phillips head screwdriver to remove four (4) screws securing the angle panel around the display assembly (Figure 4A). Place the screws and panel in a safe location until they are needed for re-assembly.

6. **RCB500AN:** Use a Phillips head screwdriver to remove two (2) screws securing the front panel (Figure 4B). Slide the panel up to clear the pins on the bottom, then pull it out to remove it from the boiler. Place the screws and panel in a safe location until they are needed for re-assembly.

7. **RCB500AN:** Remove two (2) screws for right side panel from the front side of the boiler, then rotate the side panel out to clear the bottom part of the side panel (Figure 4C).

8. **RCB500AN:** Pull the panel forward to clear the locking mechanism on the back side then pull the panel out (Figure 4D). Place the screws and panel in a safe location until they are needed for re-assembly.

Figure 4A   **Figure 4B**   **Figure 4C**   **Figure 4D**

Screws

RCB500AN

Screws   RCB500AN   Low Voltage Board

9. **RCB 750AN & RCB 1000AN:** Use the provided key on the back of the boiler to turn the quarter turn locks toward the inside of the panel to unlock the right side panels (Figure 5A).

10. **RCB 750AN & RCB 1000AN:** Use handle to lift up both right side panels in order for the hooks to clear the slots holding the side panels in place (Figure 5B). Place it is safe location until it is needed for re-assembly.

11. **RCB 750AN & RCB 1000AN:** Pull the panels out and remove them from the boiler (Figure 5B). Place the panel in a safe location until it is needed for re-assembly.

Figure 5A   **Figure 5B**   **Figure 5C**

RCB750AN / RCB1000AN

Low Voltage Board
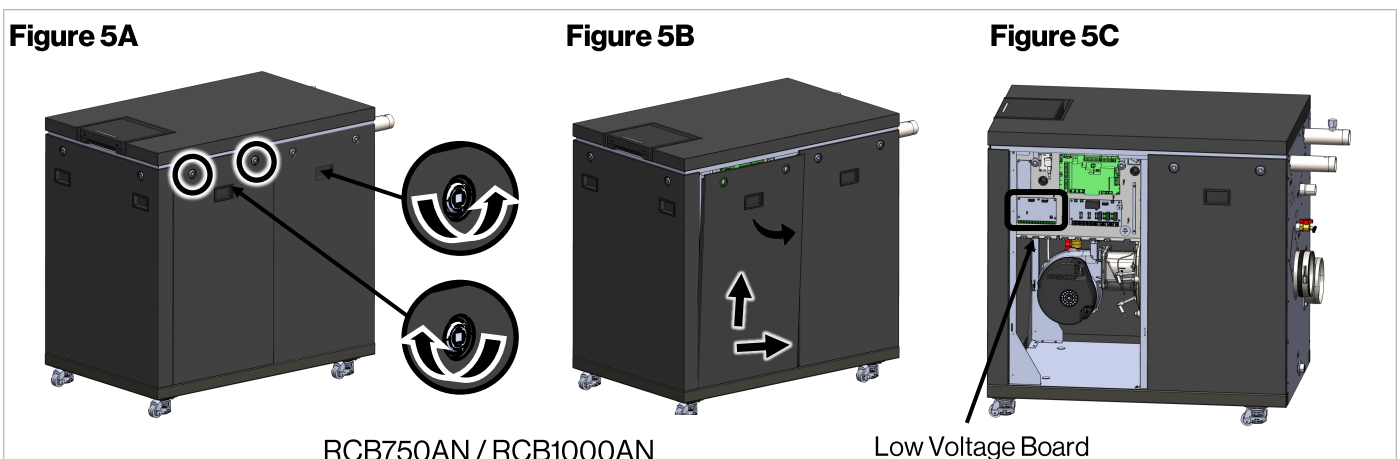
12. Find a suitable location to mount the BACnet adapter. NOTE: Leave enough space on the left side of the BACnet adapter in case a LonWorks adapter needs to be attached to the BACnet adapter.

Installation types:

- Secured to a flat surface using No.8 [4.2mm] sheet metal screws.
- On DIN rails per EN60715 TH 35-7.5 or TH 35-15 (attached with 4 screws).

Mounting position:

- Horizontal installation
- Vertical: The communication interface (left) on the controller must be top.

Not permitted:

- Suspended from the ceiling (above head)
- Laying unsecured on flat surfaces

Figure 6

DIN rail tabs (both sides)

Figure 7

6.63 In. [168.5mm]

4.89 In. [24.2mm]

Ø .18 In. [4.5mm]
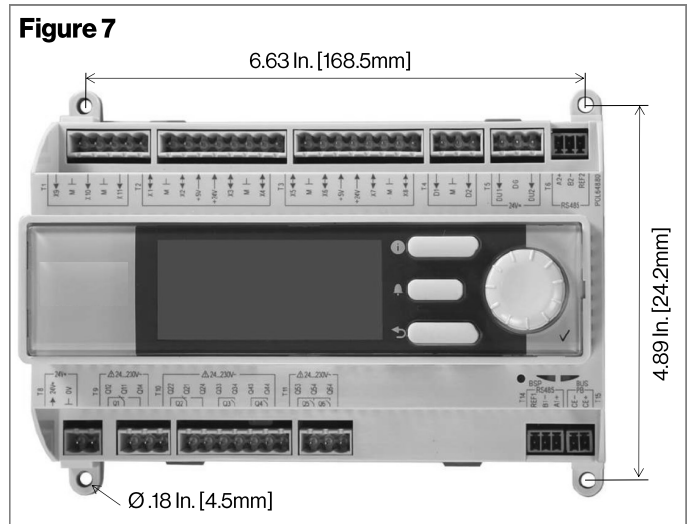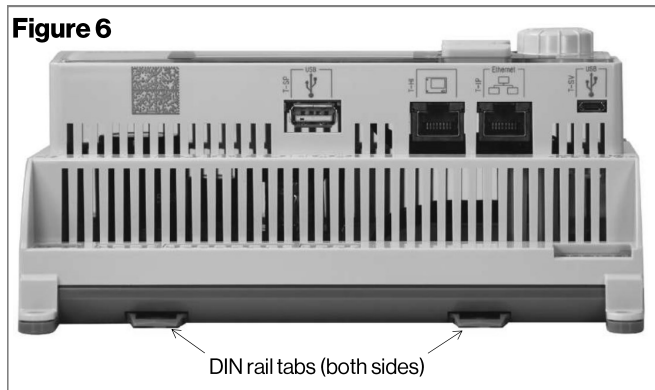
Mounting the controller:

A. Connect to DIN rails

- Move the 4 sliders with a flat head screwdriver to the extended position (Figure 8)
- Attach the controller to the DIN rails and press the 4 sliders to the retracted position (Figure 9)
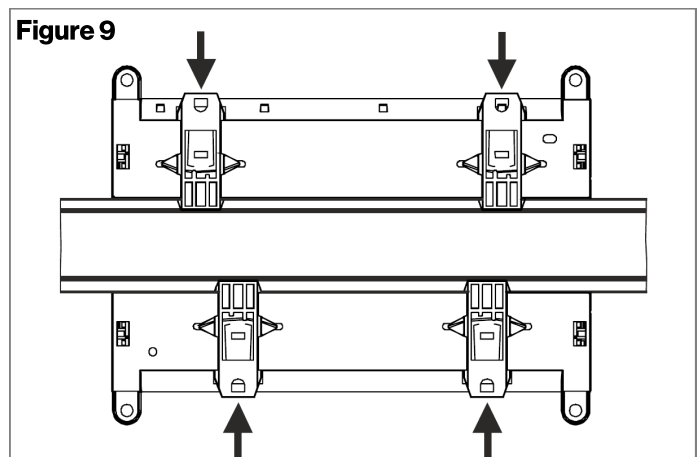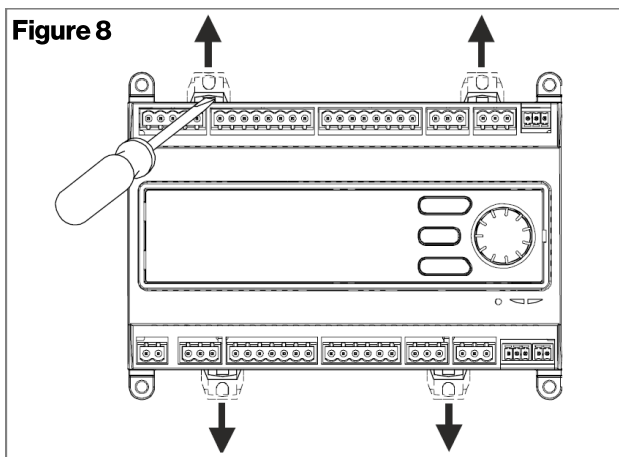
Figure 8

Figure 9

B. Screw to the surface

- Screw the controller at the 4 brackets (on the device corners) to the mounting surface (Figure 10).

Figure 10

13. **RCB301AN / RCB399AN:** Follow the wire diagram (Figure 11) to connect BACnet adapter to boiler low voltage terminals. Connect two (2) wires from boiler low voltage terminals S24 and S25 to BACnet terminals T8. This connection provides 24VDC power to the BACnet adapter. Connect three (3) wires fro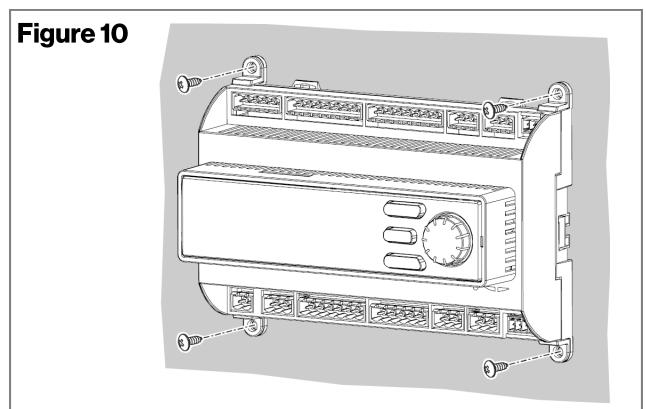m boiler low voltage terminal S13, S14, S15 to BACnet adapter terminals T14. These connections establish communication between the boiler main controller and BACnet adapter.
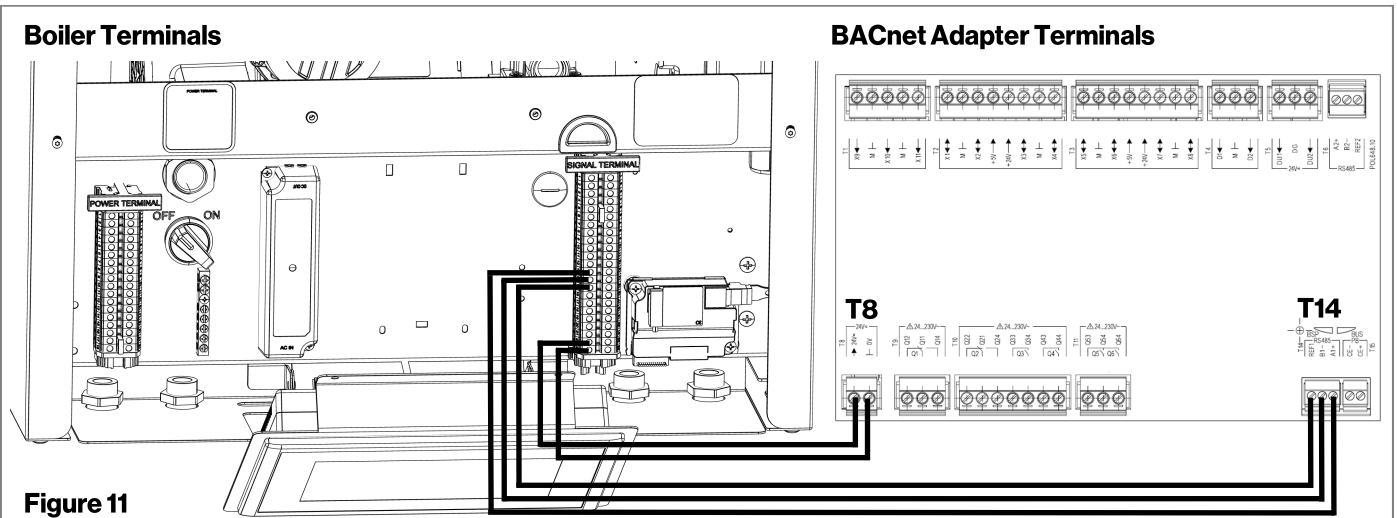
Boiler Terminals   **BACnet Adapter Terminals**

Figure 11

S13	BMS - A			RS485 - REF1
S14	BMS - B		T14	RS485 - B1 -
S15	BMS - G			RS485 - A1 +
S24	24 VDC OUTPUT (+)		T8	24 VDC INPUT (+)
S25	0 VDC OUTPUT (-)			0 VDC INPUT (-)

14. **RCB500N / RCB750AN / RCB1000AN:** Follow the wire diagram (Figure 12) to connect BACnet adapter to boiler Low and High Voltage Boards. Connect two (2) wires from boiler Low Voltage Board (24VDC) to BACnet terminals T8. This connection provides 24VDC power to the BACnet adapter. Connect three (3) wires from boiler Low Voltage Board (BMS) to BACnet adapter terminals T14. These connections establish communication between the boiler main controller and BACnet adapter.

Boiler High and Low Voltage Boards   **BACnet Adapter Terminals**
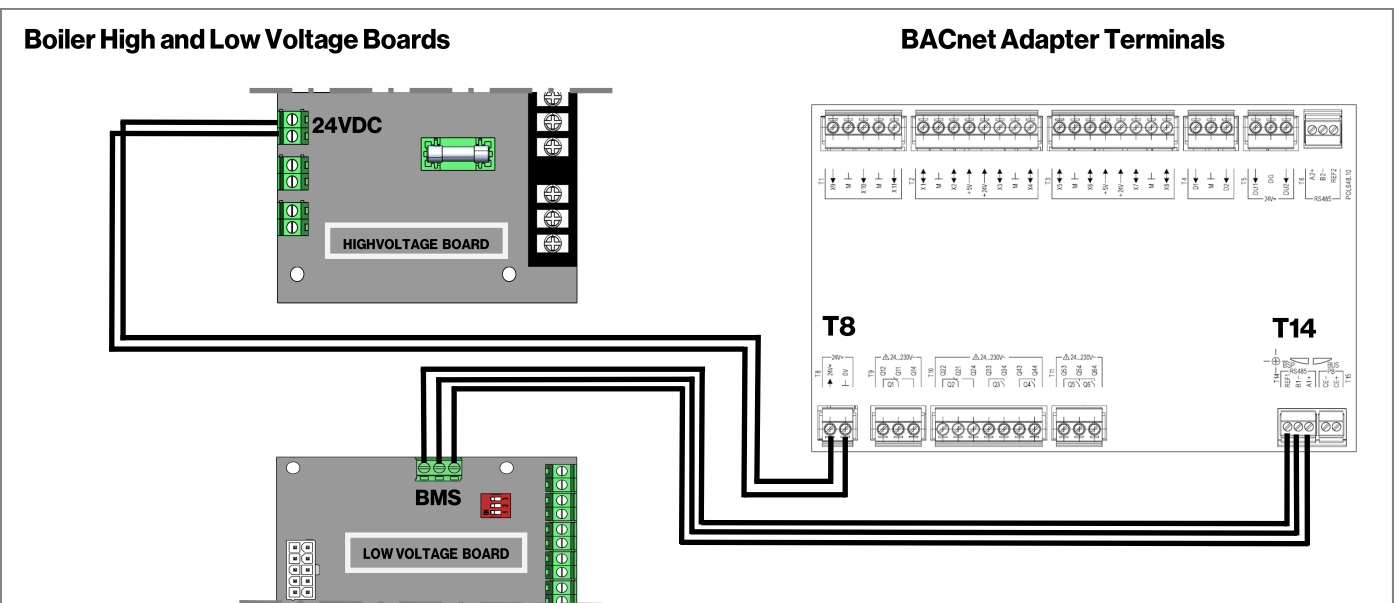
Figure 12

BMS	BMS - A			RS485 - REF1
	BMS - B		T14	RS485 - B1 -
	BMS - G			RS485 - A1 +
24VDC	24 VDC OUTPUT (+)		T8	24 VDC INPUT (+)
	0 VDC OUTPUT (-)			0 VDC INPUT (-)

15. Connect BACnet adapter to the BMS system using the ethernet port located on the bottom of the BACnet adapter (T-IP Ethernet). See Figure 13 below.

> **Cable type:**
> - Ethernet - 100 BASE-TX, category 5
> - Ethernet - 10BASE-T, category 4

Figure 13
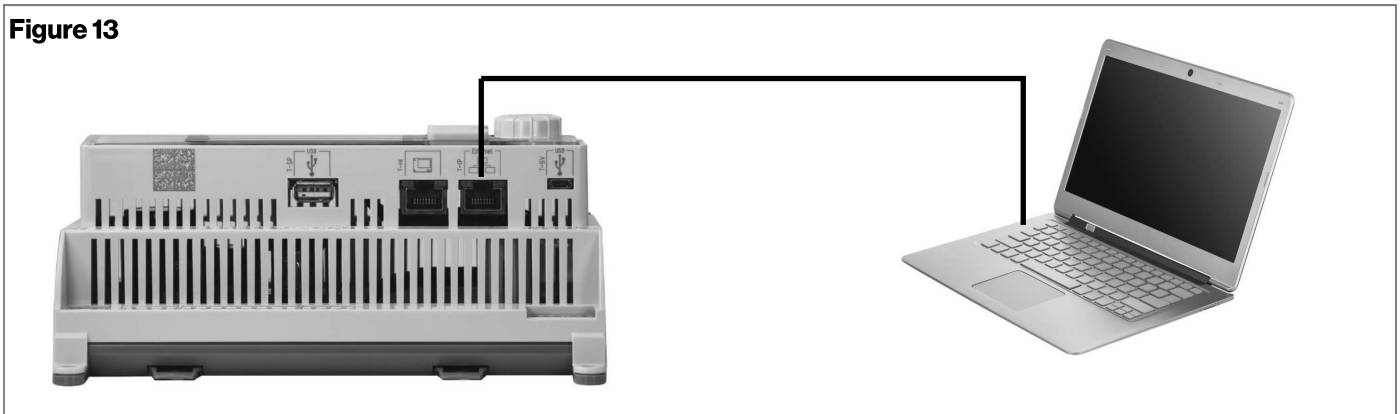
16. Re-install the boiler panels.

17. Restore water, gas, and electrical power to the boiler.

18. Once the power is restored, the BACnet adapter will display the information on the home screen (Figure 14).

Figure 14
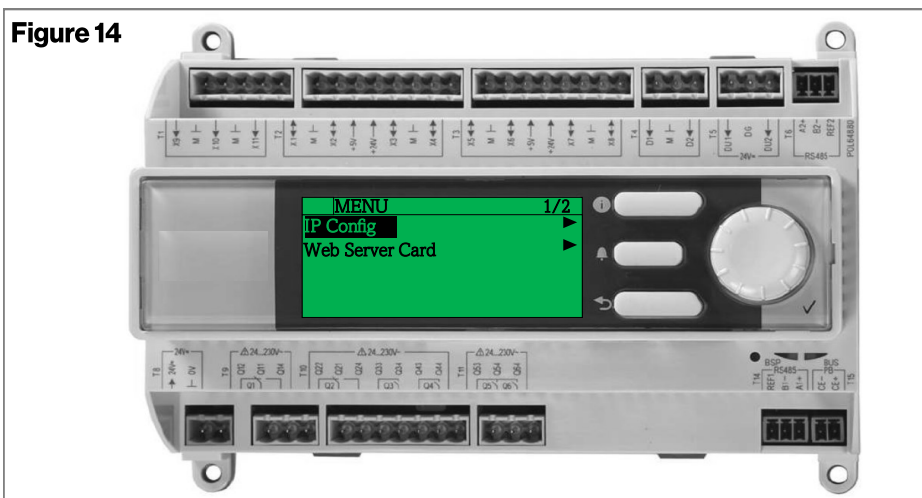
19. Use the dial to scroll to Web Server Card (WSC), then press the dial to make selection.

20. Set the WSC parameters on the screen to match the setting on the boiler screen. Refer to 'Rinnai Commercial Boiler Installation and Operation Manual' for information on how to navigate the boiler screen (Figure 15). Once all the settings have been configured, use the dial to scroll to 'Reset Passive', press the dial. Another screen will pop up with options to choose 'Reset Active'. Choose 'Active 'and press the dial.

Figure 15

21. Return to the main menu and use the dial to select 'IP Config'.

22. Match the settings of the BACnet adapter to the settings of the Building Management System (BMS).

    Given IP; Given Gateway; Given Mask.

Once all the settings have been configured, use the dial to scroll to 'Reset Passive', press the dial. Another screen will pop up with options to choose 'Reset Active'. Choose 'Active 'and press the dial.

Figure 16

BACnet Adapter Screen

IP Config	
Given Ip	
192. 168. 0. 24	▶
Given Gateway	
192. 168. 0. 1	▶
Given Mask	
255. 255. 255. 0	▶
Please Reset the Device After	
Reset Passive	▶

BMS Configuration
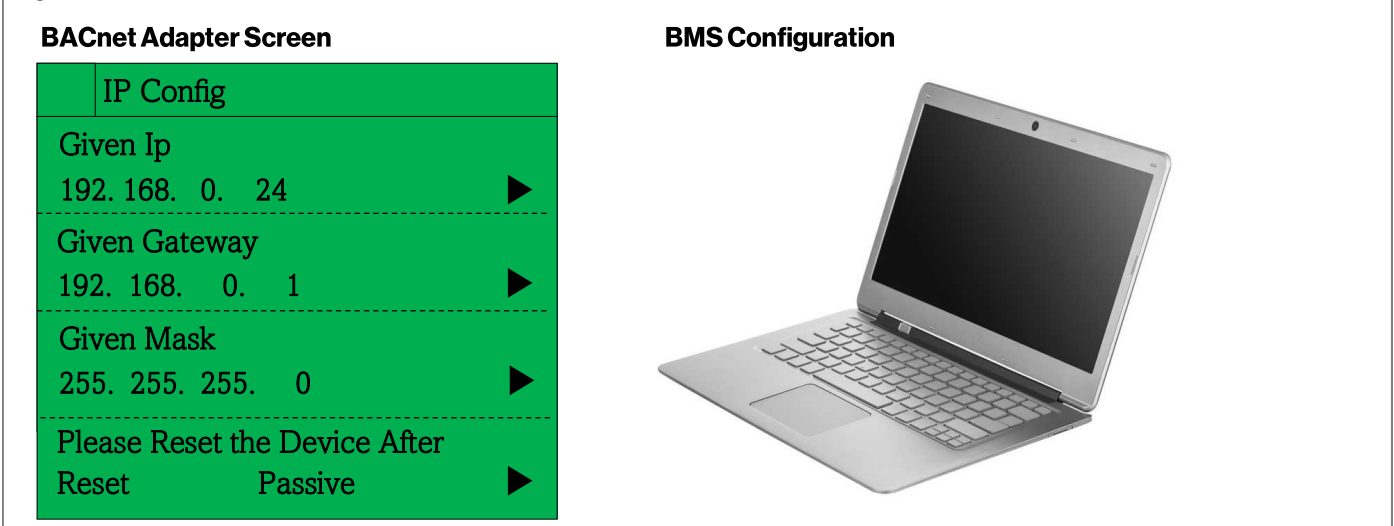
23. Confirm that the BACnet adapter communication has been established with the boiler and the BMS.

BSP - Internal communication status. This light should be green when it is communicating properly with the boiler.

BUS - External communication with the BMS. This should be green when it is communicating properly with the BMS.

Skip to step 22 if ONLY a BACnet adapter is being installed.

INSTALLING LONWORKS ADAPTER

24. Disconnect the electrical power before proceeding with the following steps.

25. LonWorks adapter get installed onto the BACnet adapter. ONLY the WSC parameters (step #18) need to be performed. The step for IP configuration can be skipped (this is only used for BACnet communication).

26. To mount the LonWorks adapter to the BACnet adapter, use a flat head screwdriver to break the plastic cover on the left side of the BACnet adapter and on the right side of the LonWorks adapter.

27. Attach the COMM interface adapter to the BACnet adapter. NOTE: This adapter is keyed and can only be installed one way.

28. Mount the LonWorks adapter to the DIN rail (if used), then slide the LonWorks adapter to attach to the BACnet adapter.

Figure 17

DIN rail

LonWorks Adapter   **COMM interface adapter**   **BACnet Adapter**

29. Connect a cable from LonWorks adapter (terminal T1 LON) to the BMS system. **NOTE:** This connection is not polarity sensitive.

Figure 18
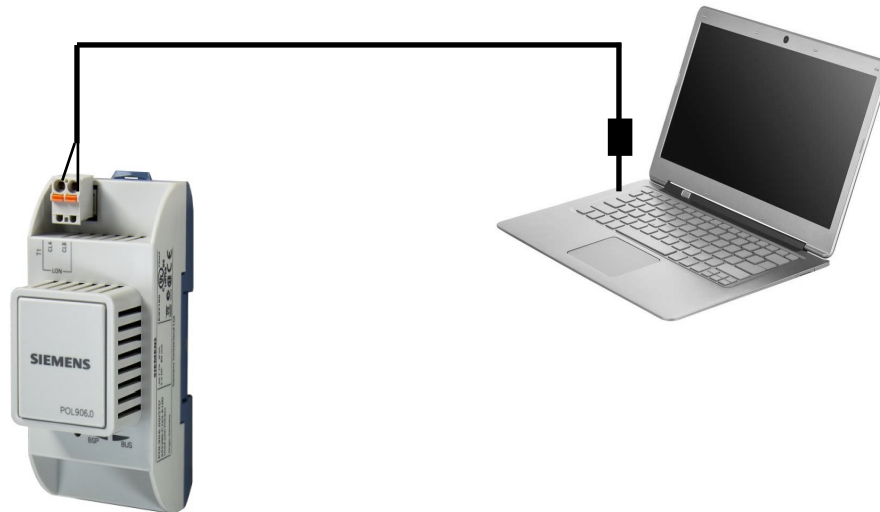
30. Restore electrical power and look for the status LED lights located on the bottom of the LON works adapter.

BSP - Internal communication status. This light should be green when it is communicating properly with the BACnet adapter.
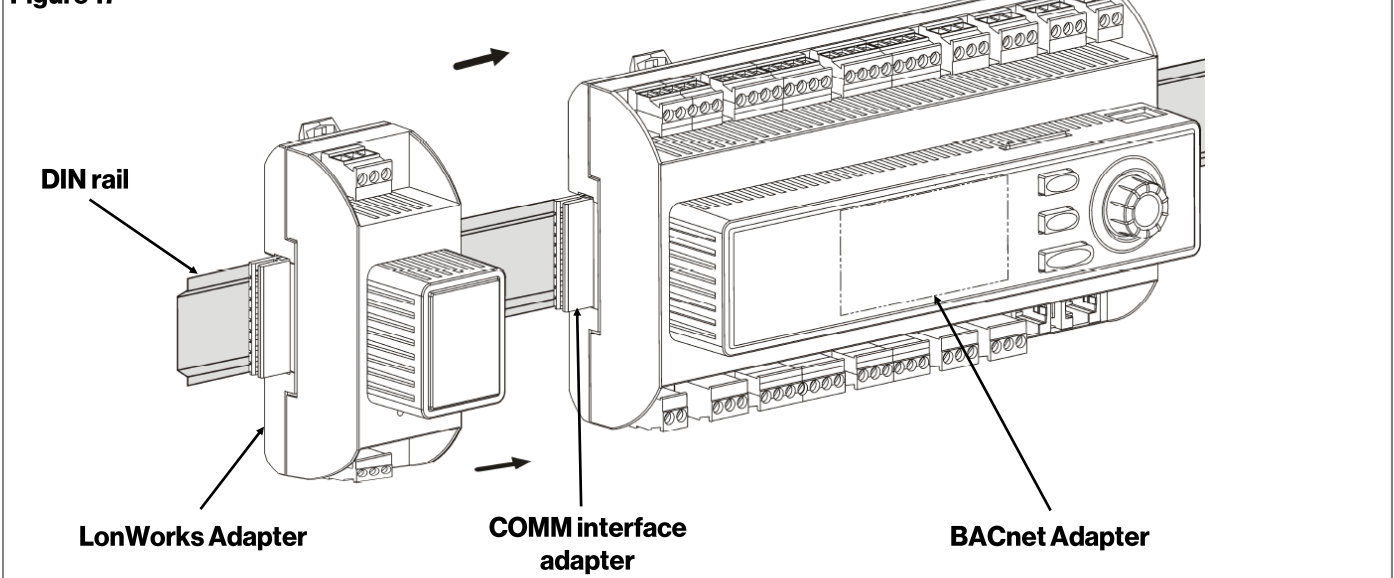**BUS** - External communication with the BMS. This should be green when it is communicating properly with the BMS

31. Check the BMS to ensure data are being received from the BACnet adapter. Refer to the boiler parameters table for parameters information.

Note: The data in the table below is only transferred thought Modbus or BACnet.

colspan=6 style=text-align:center	Boiler Parameters - Modbus and BACnet
MODBUS REGISTER	POINT NAME	POINT RESOLUTION	RELATED LINE NUMBER	READ (R) or WRITE(W)	UNIT
600	FLUE TEMPERATURE	x10	8316	R	°C | °F
601	SUPPLY TEMPERATURE	x10	8310	R	°C | °F
602	RETURN TEMPERATURE	x10	8314	R	°C | °F
603	WATER PRESSURE	x10	9005	R	BAR | PSI
604	BOILER SETPOINT	x10	8311	R	°C | °F
605	ERROR CODE	-	6700	R	-
606	DIAGNOSTIC CODE	-	6705	R	-
607	FLAME CURRENT	x10	8329	R	μA
608	CURRENT FAN SPEED	-	8323	R	RPM
609	OUTDOOR TEMPERATURE	x10	8700	R	°C | °F
610	SYSTEM TEMPERATURE ACTUAL	x10	8318	R	°C | °F
611	SYSTEM TEMPERATURE SETPOINT	x10	8319	R	°C | °F
612	DHW TEMPERATURE ACTUAL	x10	8830	R	°C | °F
613	DHW TEMPERATURE SETPOINT	x10	1610	R	°C | °F
614	BOILER STATE	-	8005	R	-
615	DHW STATE	-	8003	R	-
616	HC1 STATE	-	8000	R	-
617	HC2 STATE	-	8001	R	-
618	BURNER STATE	-	8009	R	-
619	MODULATION	-	8326	R	%
620	MINIMUM FAN SPEED LF	-	9524	R	rpm
621	MAXIMUM FAN SPEED HF	-	9529	R	rpm
622	IGNITION FAN SPEED	-	9512	R	rpm
623	FAN SETPOINT	-	8324	R.	rpm

Parameters List					
MODBUS REGISTER	POINT NAME	POINT RESOLUTION	RELATED LINE NUMBER	READ (R) or WRITE(W)	UNIT
624	CURRENT FAN CONTROL	-	8325	R	%
625	ROOM THERMOSTAT CH1	-	7865	R	-
626	ROOM THERMOSTAT CH2	-	7860	R	-
627	THERMOSTAT STATE CH1 DEMAND	-	8749	R	-
628	THERMOSTAT STATE CH2 DEMAND	-	8779	R	-
629	0-10V INPUT H3	x10	7854	R	V
630	WATER PRESSURE SENSOR H1	-	7841	R	-
631	WATER PRESSURE VOLTAGE	x10	7840	R	V
632	AIR PRESSURE SWITCH H7	-	7874	R	-
633	GAS PRESSURE SWITCH H6	-	7872	R	-
634	BURNER RUN HOURS	-	8330	R	h
635	IGNITION CYCLES	-	8331	R	-
636	RUN HOURS HEATING	-	8338	R	h
637	RUN HOURS DHW	-	8339	R	h
638	TOTAL GAS ENERGY HC	-	8378	R	kWh
639	TOTAL GAS ENERGY DHW	-	8379	R	kWh
640	TOTAL GAS ENERGY CH & DHW	-	8380	R	kWh
641	GAS ENERGY FOR CH	-	8381	R	kWh
642	GAS ENERGY FOR DHW	-	8382	R	kWh
643	GAS ENERGY FOR CH & DHW	-	8383	R	kWh
644	BOILER PUMP Q1	-	8031	R	-
645	BOILER PUMP Q1 SPEED	-	8308	R	%
646	CH PUMP Q2	-	9032	R	-
647	DHW PUMP Q3	-	9033	R	-
648	DHW PUMP Q3 SPEED	-	8825	R	%
649	UX2	-	7717 / 7719	R	V | %
650	UX3	-	7725 / 7726	R	V | %
651	P1	-	7714	R	%
652	CASCADE MASTER INFO	-	8101	R	-
653	CASCADE FOLLOWER 1 INFO	-	8103	R	-
654	CASCADE FOLLOWER 2 INFO	-	8105	R	-
655	CASCADE FOLLOWER 3 INFO	-	8107	R	-
656	CASCADE FOLLOWER 4 INFO	-	8109	R	-
657	CASCADE FOLLOWER 5 INFO	-	8111	R	-
658	CASCADE FOLLOWER 6 INFO	-	8113	R	-
659	CASCADE FOLLOWER 7 INFO	-	8115	R	-
660	WEB SERVER CARD VERSION	x1000	-	R	-
661	LMS PARAMETER VERSION 1	-	6230	R	-
662	LMS PARAMETER VERSION 2	-	6231	R	-
663	IMPERIAL/METRIC SELECTION	0-1	-	R	-

NOTE: For the switches state: 0 - Open ; 1 - Closed

Note: The data in the table below is only transferred thought LonWorks.

Boiler Parameters - LonWorks					
LONWORKS REGISTER	**POINT NAME**	**POINT RESOLUTION**	**RELATED LINE NUMBER**	**READ (R) or WRITE(W)**	**UNIT**
Flow00	N/A	-	-	R	-
Flow01	N/A	-	-	R	-
Press00	WATER PRESSURE	-	7841	R	BAR | PSI
Press01	N/A	-	-	R	-
Press02	N/A	-	-	R	-
Press_Flow00	N/A	-	-	R	-
Press_Flow01	N/A	-	-	R	-
Perc00	MODULATION	-	8326	R	%
Perc01	BOILER PUMP Q1 SPEED	-	8308	R	%
Perc02	BOILER PUMP Q3 SPEED	-	8825	R	%
Perc03	UX2	-	7717 / 7719	R	V | %
Perc04	UX3	-	7725 / 7726	R	V | %
Perc05	P1	-	7714	R	V | %
Perc06	0-10V INPUT H3	x10	7854	R	V
Perc07	WATER PRESSURE VOLTAGE	x10	7840	R	V
Perc08	CURRENT FAN CONTROL	-	8325	R	%
Perc09.	N/A	-	-	R	-
Perc10	N/A	-	-	R	-
Perc11	N/A	-	-	R	-
Perc12	N/A	-	-	R	-
Perc13	N/A	-	-	R	-
Perc14	N/A	-	-	R	-
Hum00	N/A	-	-	R	-
Hum01	N/A	-	-	R	-
Temp01	FLUE TEMPERATURE	x10	8316	R.	°C | °F
Temp02	SUPPLY TEMPERATURE	x10	8310	R	°C | °F
Temp03	RETURN TEMPERATURE	x10	8314	R	°C | °F
Temp04	BOILER SETPOINT	x10	8311	R	°C | °F
Temp05	OUTDOOR TEMPERATURE	x10	8700	R	°C | °F
Temp06	SYSTEM TEMPERATURE ACTUAL	x10	8318	R	°C | °F
Temp07	DHW SETPOINT	x10	1610	R	°C | °F
Temp08	DHW TEMPERATURE ACTUAL	x10	8830	R	°C | °F
Ppm00	N/A	-	-	R	-
OpMode	N/A	-	-	R	-
Switch00	N/A	-	-	R	-
State;0;6	BOILER STATE	-	8005	R	-
State;2;6	DHW STATE	-	8003	R	-
State;4;6	HC1 STATE	-	8000	R	-
State;6;6	HC2 STATE	-	8001	R	-
DI;0;6	ROOM THERMOSTAT CH1 DEMAND	-	7865	R	-
DI;2;6	ROOM THERMOSTAT CH2 DEMAND	-	7860	R	-
DI;4;6	AIR PRESSURE SWITCH H7	-	-	R	-.
DI;6;6	AIR PRESSURE SWITCH H6	-	-	R	-
DO;0;6	BOILER PUMP Q1	-	8031	R	-
DO;2;6	CH PUMP Q2	-	9032	R	-
DO;4;6	DHW PUMP Q3	-	9033	R	-
DO;6;6	N/A	-	-	R	-
Alarm;0;6	DIAGNOSTIC CODE	-	6705	R	-
Alarm;2;6	ERROR CODE	-	6700	R	-
Alarm;4;6	CASCADE STATUS	0-8	8101	R	-
Alarm;6;6	N/A	-	-	R	-