BACHARACH® MVR-SC

Refrigerant Leak Monitor
System Controller for MVR-300 Refrigerant Detectors

Refrigerant Leak Detection

P/N: 1100-2162 | June 2019 Revision 0

Quick Start Guide

1. Introduction

The MVR-SC Refrigerant Leak Monitor provides infomation and audio-visual alerts on the status of a network of refrigerant detectors in a centralized location outside of the monitored space. The MVR-SC displays comprehensive information about the status of all connected gas detectors and is compatible with Bacharach's MVR-300 VRF Refrigerant Leak Detector.

Additional resources *(including the user manual & floorplan spreadsheet)* are available online. To download these resources, scan here or visit **http://bit.ly/2MdIvyP**.

2. Safety Instructions

⚠ **DANGER:** This product <u>HAS NOT</u> been designed for use in hazardous locations. Failure to comply may result in personal injury or death.

⚡ **WARNING:** <u>NEVER</u> connect the product's 24V DC inputs directly to AC power supply.

⚡ **WARNING:** <u>DO NOT</u> apply power until all wiring has been completed.

⚠ **CAUTION:** The protection provided by this product may become impaired if it is used in a manner not specified by the manufacturer. Modifications to this instrument, not expressly approved, will void the warranty.

⚠ **CAUTION:** <u>DO NOT</u> continue to use this equipment if there are any symptoms of malfunction or failure. In the case of such occurrence, de-energize the power supply and contact a qualified repair technician or the nearest Bacharach Service Center.

ℹ **IMPORTANT:** Before using this product, carefully read and strictly <u>FOLLOW THE INSTRUCTIONS</u> in the user manual.

2. Safety Instructions *(Continued)*

ℹ **IMPORTANT:** The MVR-SC must be installed by a suitably qualified technician who will install this unit in accordance with these instructions and the standards in their particular industry / country. This document is only intended as a guide and the manufacturer bears no responsibility for the installation or operation of this unit.

ℹ **IMPORTANT:** Comply with all local and national laws, rules and regulations associated with this equipment. Operators should be aware of the regulations and standards in their industry / locality for the operation of the MVR-SC.

3. Component Overview
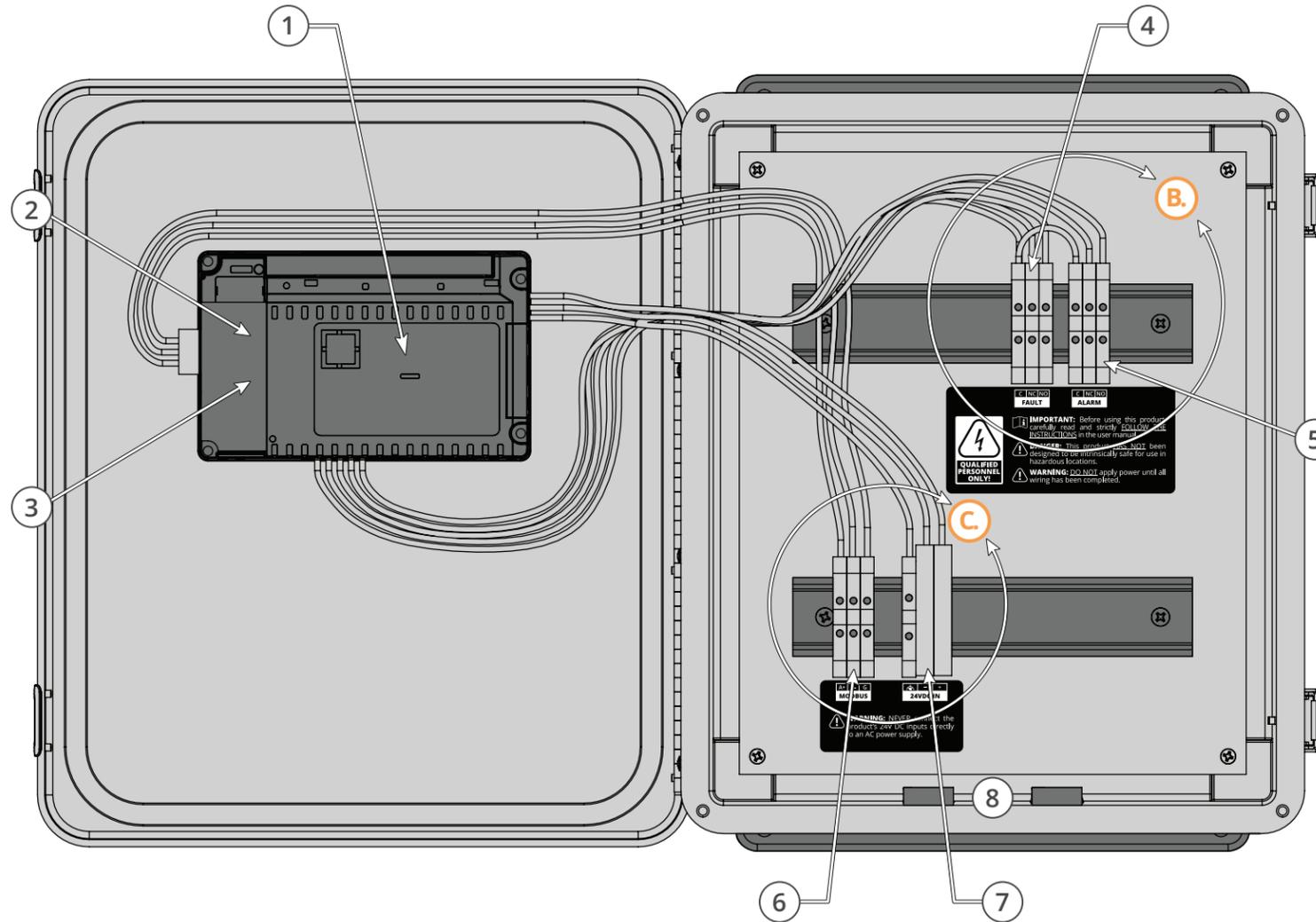
#	COMPONENT DESCRIPTION
1	PLC / Touch Screen
2	USB Port
3	Ethernet Port *(Requires Shielded Cat 6 Cable)*
4	Fault Relay *(250 VAC / 30 VDC, 2.0 AMP)*
5	Alarm Relay *(250 VAC / 30 VDC, 2.0 AMP)*
6	Modbus Terminal Block *(Requires Belden 3106 or Equivalent. Shielded 1.5 pair twisted)*
7	Power *(24 VDC IN)*
8	Cable Entries *(×4)*

4. Accessories

| Product	Description / Part Number	
Modbus Cable	Description	1,000' *(304.8 m)* spool of industrial-grade Modbus cable.
	P/N:	1100-2193
Ethernet Switch	Description	Connects the MVR-SC and individual gateways.
	P/N:	1100-2172
Modbus Gateway	Description	Each gateway supports a network of up to 15 MVR-300 VRF Refrigerant Leak Detectors.
	P/N:	1100-2198
Modbus EZ-Wire Kit	Description	Precisely stripped, pre-bonded wire provides faster, more consistent installation to the MVR-300 Modbus port.
	P/N:	1100-2190

5. Network Planning

ℹ **IMPORTANT:** Prior to installation, download the MVR-SC floorplan spreadsheet available from Bacharach. This sheet has editable fields for Floor / Room and non-editable fields for Modbus ID and Gateway IP address. These fields are to be completed during planning in order to ensure correct wiring and function:

☐ Floor / Room

☐ **Modbus** *(Slave)* **ID** – number between 2 and 16. Refer to the MVR-SC User Manual *(P/N: 1100-2184)* for more details on Modbus connectivity.

☐ **Gateway IP Address** – Each gateway has a unique, required IP address. *(The first should be 192.168.0.1, followed by 192.168.0.2 and so forth. A maximum of 7 gateways may be connected in a subnetwork.)*

☐ **CSV Spreadsheet** – file will need to be saved in a .CSV format in order to upload to the MVR-SC.

1. Save the floorplan spreadsheet as a .CSV format and upload onto the USB stick at the device root folder. The filename must be "data.csv."

2. Upload the floorplan spreadsheet to the MVR-SC from the USB stick using steps on the next page.

Figure A *(System Configuration)*
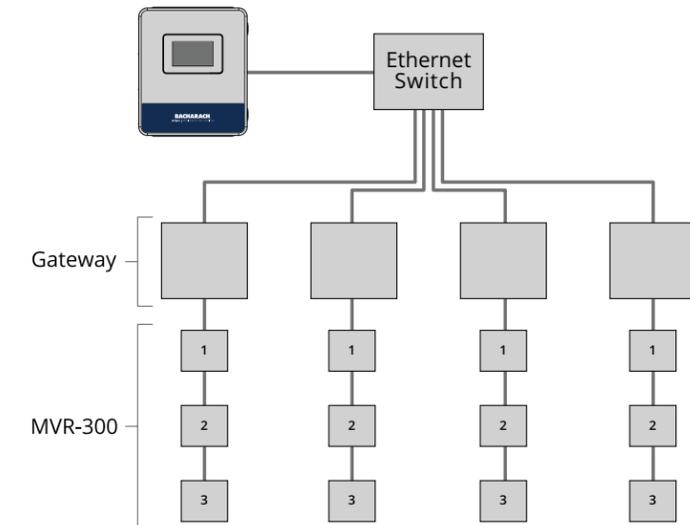
6. Installation

⚡ **WARNING:** <u>NEVER</u> connect the product's 24V DC inputs directly to AC power supply.

⚡ **WARNING:** <u>DO NOT</u> apply power until all wiring has been completed.

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STEP A | Mounting the MVR-SC Refrigerant Leak Monitor

1. Mount the MVR-SC according to the product dimensions and following considerations:
   - **Environment:** place the MVR-SC in an indoor setting free from the risk of exposure to water, high humidity or any hazardous conditions.
   - **Accessibility:** ensure that the MVR-SC's touch screen is readily accessible for viewing alerts and responding to alarm conditions.

2. Connect the controller to a 24V DC, rated power supply.

Figure B. *(Power & Modbus Connections)*
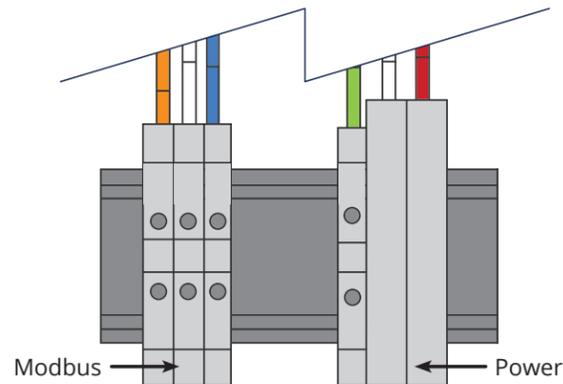
Modbus → ← Power

A+ *(Modbus)*		Orange
B- *(Modbus)*		White
G *(Modbus)*		Blue
⏚ *(Power)*		Green / Yellow
- *(Power)*		White
+ *(Power)*		Red

STEP B | Connecting Relays *(User Discretion)*

3. If used, connect the relay output(s) to equipment that will be triggered by the relay. *(Take care to ensure proper wiring for intended function: normally open and / or normally closed.)*

Figure C. *(Relay Connections)*

Fault Relay → ← Alarm Relay
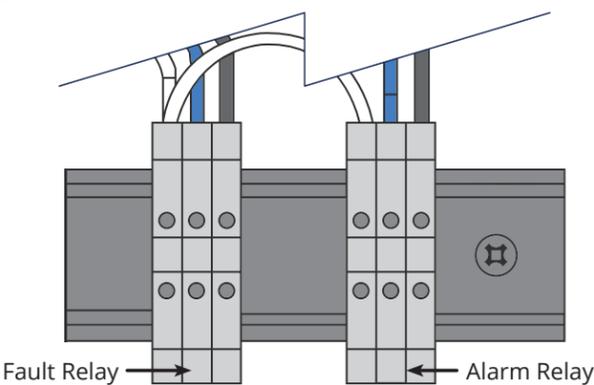
Common	White
Normally Closed	Blue
Normally Open	Black

STEP C | Connecting Gateways

4. Using Cat 6 cable, connect the Ethernet output from the controller to the gateway(s).

   If multiple gateways are in use, use an Ethernet switch to connect all gateways and the MVR-SC onto the same local subnetwork.

5. Connect the Modbus cable to the gateway output as depicted below.

Figure D. *(Modbus Connection to Ethernet Gateway)*

— Ethernet *(on side)*

5 4 3 2 1
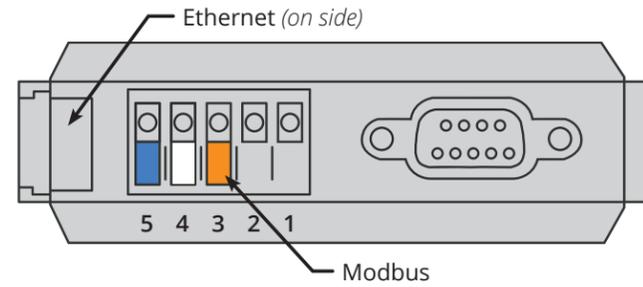
— Modbus

3	A+ *(Modbus)*	Orange
4	B- *(Modbus)*	White
5	G *(Modbus)*	Blue

Pins 1 and 2 are not used. The Modbus cable shield may be left floating or tied to G *(electrical ground)* at the gateway only.

6. Each gateway can support a **maximum of 15** MVR-300 leak detectors connected in a daisy chain fashion using Modbus network cable.

STEP D | Connecting MVR-300 VRF Refrigerant Leak Detectors

7. Leaving no more than 12" *(30.5 cm)* for the single wire tie-off to each MVR-300, connect to the Modbus port as depicted in the figure below.

   For faster, more consistent installation, use the Modbus EZ-wire kit *(P/N: 1100-2190)* to connect each MVR-300.

Figure E. *(Modbus Connection to MVR-300)*
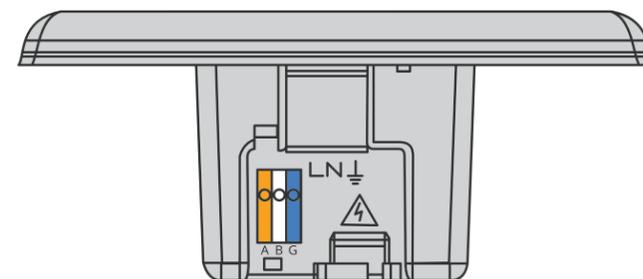
A+ *(Modbus)*		Orange
B- *(Modbus)*		White
G *(Modbus)*		Blue

Additional resources for the MVR-300 VRF Refrigerant Leak Detector are available online. To download these resources, scan here or visit **http://bit.ly/2wr9eMn**.
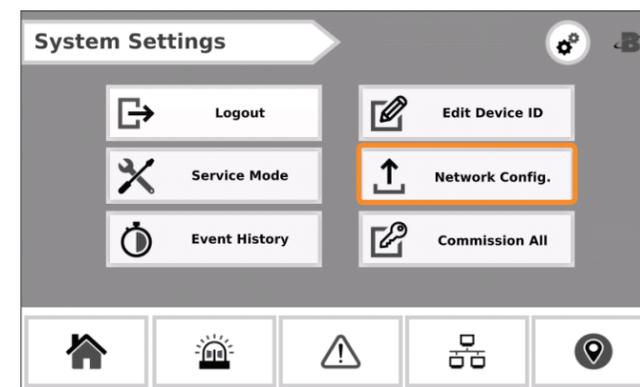
STEP A | Upload the Floorplan into Memory

1. Confirm that the display turns on. After the **First-time Setup Screen** appears, select the **Settings** icon (⚙). When prompted, enter the passcode *(default is "6388")*.
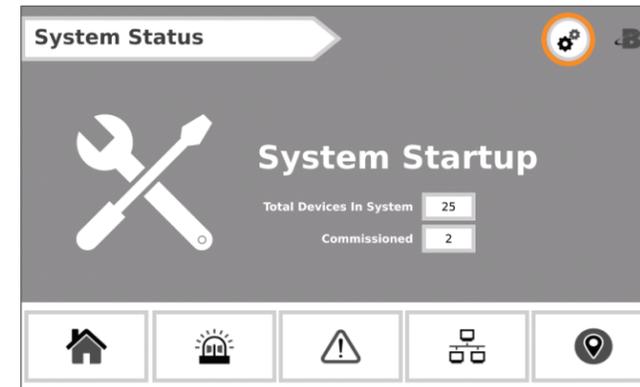
2. After the **Settings Screen** (⚙) appears, connect the USB stick which contains the planning spreadsheet to the controller.

3. Select **Network Configuration**.

4. After the **Network Configuration Screen** (⬆) appears, select **Upload CSV** to load the floorplan spreadsheet into memory and generate all floors / device groupings.

STEP B | Commission MVR-300s

5. Access the **Floors Screen** (⦿) and select the desired floor. Each room / device marked with the same floor name in the planning spreadsheet will be grouped onto that floor block.
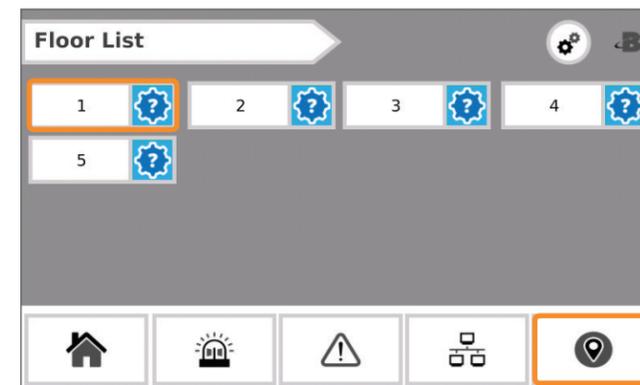

STEP B | Commission MVR-300s *(Continued)*

6. Working in coordination with a colleague, place one MVR-300 into "commissioning mode" by briefly *(less than 1 second)* tapping **Magnetic Switch A** (·).

Figure F. *(Magnetic Switch Locations)*

Magnetic Switch A
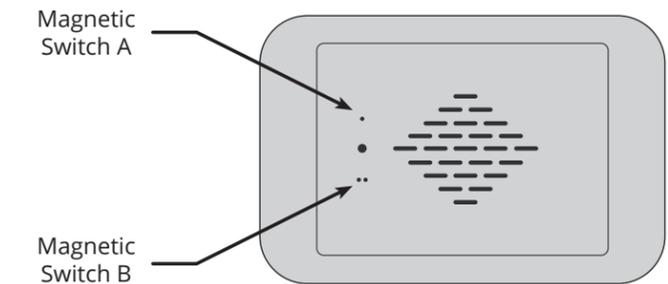
Magnetic Switch B

Optionally, the MVR-300 may be taken out of this mode by briefly tapping Magnetic Switch B (··).

7. Select the **Commission Button** (⚙) next to the appropriate room.
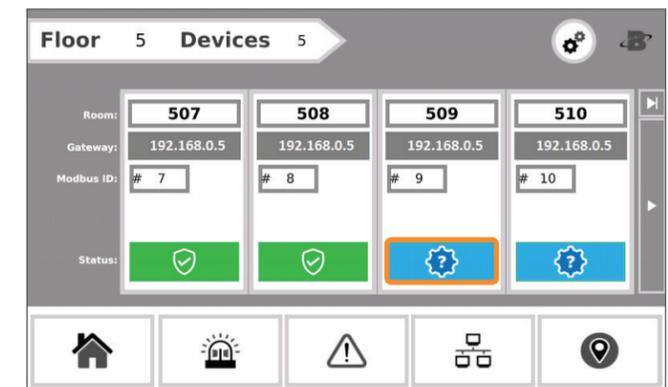
8. Select **Commission Device** to push the correct Modbus ID to the active MVR-300 and enable Modbus polling. *(A green checkmark will appear once the device has been paired.)*

   After activation, each room tile will display the following:
   - Floor / Room Number
   - Gateway IP Address
   - Assigned Modbus ID
   - Device Status *(Normal, Alarm, Fault, Comm. Error)*
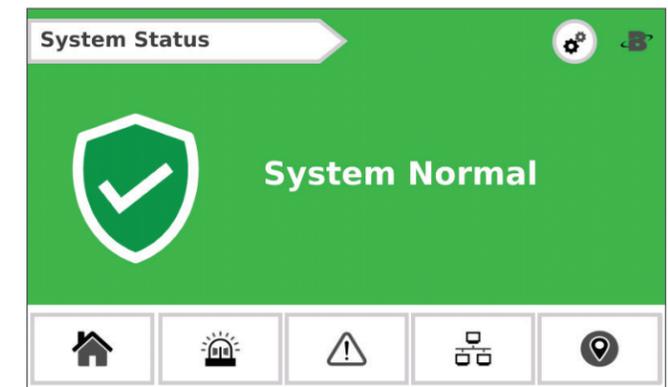
9. Repeat these steps for each room on a floor and each floor in the building until all MVR-300s have been commissioned.

   The **Home Screen** will display "System Normal" once all MVR-300s have been commissioned.