Beyond HMI

Reach Beyond Your Old HMI

Reach Remote Operator Interface

Version 1.0

Installation and Startup Guide

Publication Date: December 30, 2015

Contents

Revision History

Date	Version	Description
24 October, 2015	1.0	Original Release
30 December, 2015	1.01	Added Industry Canada Statement

While every effort has been made to maintain the accuracy of this document, product enhancements or revisions may result in minor differences between the product supplied to you and this manual. Please refer all questions about this manual to support@beyond-hmi.com.

FCC Part 15 Notice

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Industry Canada

This device complies with RSS-210 of the Industry Canada Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Ce dispositif est conforme à la norme CNR-210 d'Industrie Canada applicable aux appareils radio exempts de licence. Son fonctionnement est sujet aux deux conditions suivantes: (1) le dispositif ne doit pas produire de brouillage préjudiciable, et (2) ce dispositif doit accepter tout brouillage reçu, y compris un brouillage susceptible de provoquer un fonctionnement indésirable.

About This Guide

This document describes the installation and configuration of the Reach Remote Operator Interface Model R1.0.

Product Description

The Reach Remote Operator Interface (Reach ROI) provides remote monitoring and control of industrial process controllers such as Remote Terminal Units (RTUs) and Programmable Logic Controllers (PLCs). The Reach ROI allows an iOS® tablet device to serve as a touchscreen display for industrial controllers.

The Reach ROI replaces expensive industrial touchscreen displays. Instead, a Reach ROI module is installed in each industrial panel and the operator is equipped with an iOS tablet device. When the operator arrives in the vicinity of the industrial panel, he or she uses the iOS tablet device to monitor and adjust the industrial controller. If multiple industrial controllers are within range of the iOS tablet, the operator can select from a list of devices before connecting to one controller at a time.

The Reach ROI module is connected to the industrial controller via an industry-standard RS-232 connection. The Reach ROI module is loaded with an appropriate "project" file using the Reach Loader software installed on a Windows computer. The project file contains controller interface information, password information, and HMI screen layout information.

The Reach ROI module employs Bluetooth Low Energy (BLE) technology to communicate with an iOS tablet. This radio link permits a human operator to monitor and control the industrial controller from a range of about 30 meters. The radio link can even be sustained while the operator is within the cab of a motor vehicle. Effective range is dependent upon antenna selection and placement.

Screen layouts are designed using the Reach Editor program running on a Windows computer. The Reach Editor software allows construction and linking of multiple screens per project. Each screen can contain text boxes, labels, switch mimics, indicator light mimics, and more. These components are displayed on an iOS tablet device via the Reach Nomad app – available from the Apple App Store.

The Reach ROI module provides login security features. Based on logged in user identity and project file configuration, users can be restricted from accessing certain screens or specific controls. Permissions can also be limited to "read only."

Installation Planning

Mounting Considerations
The Reach ROI module should be installed inside an industrial enclosure for protection from the physical environment. Although results can vary depending upon cabling and the industrial controller's characteristics, it is recommended that the Reach ROI module be located within 7 meters (23 feet) of the RTU or PLC.

Orientation
The Reach ROI can be mounted in any orientation. The slot on the back of the enclosure allows the Reach ROI module to "straddle" a 35 mm DIN rail. Before selecting a mounting location, ensure access to the screw terminals, antenna connector, and USB Mini-A connector.

Antenna Placement
The Bluetooth Low Energy (BLE) signal used between the Reach ROI module and the iOS® tablet is significantly attenuated by metal enclosures. If installing the Reach ROI module within a metal enclosure, the antenna must be mounted outside the enclosure. External mounting is also recommended for synthetic enclosures – to assure maximum range. A short SMA-RP cable and a Bulkhead Adapter can be used for remotely mounting the antenna. Signal losses will occur in this cable so it is recommended that the cable length be minimized. To reduce antenna cable length, it is usually beneficial to install the Reach ROI module within a short distance of the antenna mounting location.

If the recommended 6 dBi "rubber duck" antenna is utilized, it is typically installed between 3 and 6 feet above ground level. If another antenna is used, the beam pattern of the antenna should be considered when choosing a mounting location such that the iOS® tablet will be within the beam pattern at desired distances from the industrial panel.

Project Loading Considerations
Each Reach ROI module must be loaded with an applicable "project" file. This project file contains:

- Communications parameters needed to support the RS-232 communications link with the RTU/PLC
- Password information
- Definition information for screens that are specifically applicable to the site

The project file can be developed and tested prior to installation of the Reach ROI module or the project can be loaded and modified "on site."

Project files are loaded on the Reach ROI module using a Windows® computer and a USB-B to USB Mini-A (M-M) cable. To install or modify project files, the installation must provide access to the USB Mini-A connector on the Reach ROI module.

Resetting to Factory Defaults

Communications between the Reach Loader program and the Reach ROI module are always performed using factory default settings. There is no need to reset the Reach ROI module to factory default settings. If a change to the project is required, this is accomplished by simply loading a new version of the project into the Reach ROI module – thereby deleting the previous project.

Installation Procedure

***Note:** Always comply with local electrical codes when installing the Reach ROI module.*

***Warning:** When mounting antennas, be attentive to overhead power lines.*

***Warning:** Do not connect or disconnect wiring from the Reach ROI module unless the area has been confirmed to be free of explosive vapors.*

Step 1: Mounting the Reach ROI module
Attach the Reach ROI module to the industrial enclosure back-panel using the screw holes provided at the corners of the housing. These holes are designed to accommodate machine screws up to size #8. See the *Installation Planning* section above for further suggestions.

Step 2: Mounting the Antenna
Mount an SMA-RP bulkhead adapter on the outside wall of the industrial enclosure. Install an SMA-RP, 6dBi "rubber duck" antenna on outside of the enclosure on the bulkhead connector. See the *Installation Planning* section above for further suggestions. Use an SMA-RP antenna cable of appropriate length to connect the SMA-RP connector on the Reach ROI module to the bulkhead connector.

Step 3: Connect the Automation Controller
Install wiring to enable the RS-232 connection between the Reach ROI module and the RTU/PLC. The Reach ROI is configured as a DCE device. Consult the terminal block pin information below for connections used on the Reach ROI module. Consult RTU/PLC documentation for proper wiring configuration on the industrial controller side of the interface. Use 16 AWG wire or smaller for this connection.

Adjust communications setting in the industrial controller as follows:

- Hardware handshaking: None
- Data Bits: 8
- Stop Bits: 1
- Start Bits: None
- Baud Rate: Same as baud rate specified when loading the project onto the Reach ROI module using the Reach Loader software

Step 4: Power
The Reach ROI module will function on DC power anywhere within the 8VDC to 36VDC range. Power is supplied through the terminal block. Use 16 AWG wire or smaller for this connection. Note that the power terminals are reverse-polarity protected. Apply power to the Reach ROI module.

Step 5: Check LEDs for Proper Operation
When power is applied, the first (green) LED should illuminate. The Reach ROI module is reverse-polarity protected. If you think you have applied power and the first (green) LED is not visible, check polarity of the power connection.

The second (yellow/orange) LED illuminates when the Reach ROI module has NOT been loaded with a project file. If this light is illuminated, a project file must be loaded before the module will function.

Step 6: Install a Project File
If the a project file was not previously loaded onto the Reach ROI module, use a Windows® computer running the Reach Loader program and a USB-B to USB Mini-A (M-M) cable to load a project file. Consult the Reach Loader Quick Start Guide for more details.

Step 7: Install the Reach Nomad App onto an iOS® Tablet Device
Load the free app from the Apple App Store.

Step 8: Check for Normal Operation

- Ensure that the the iOS® tablet is located within the beam path and within 15 meters of the antenna installed on the industrial panel. For initial testing, a "line-of-sight" path between the antenna and the the iOS® tablet should be established.
- Start the Reach Nomad App on the iOS® tablet.
- Press the "Connect" button
- A list of available Reach ROI modules will be displayed
- Tap on the desired device in the list
- You will be challenged for a password
- Enter the proper password
- The iOS® tablet should then display the first screen for the ROI module
- Navigate to a screen which displays RTU/PLC data
- The red and green LEDs on the Reach ROI module should begin blinking to indicate transmit/receive traffic between the ROI module and the RTU/PLC on the RS-232 port
- Data should begin to display on the iOS® tablet screen

Troubleshooting

Diagnostic LEDs

Position*	Color	Description	State During Normal Operation
1	Green	Unit is receiving adequate power	On
2	Yellow/Orange	No project file loaded	Off
3	Blue	Bluetooth connection with the iOS® tablet is active	On when connected, otherwise off
4	Red	ROI module is transmitting, PLC is receiving	Intermitting only when iOS® tablet is connected and displaying a screen which includes PLC data
5	Green	ROI module is receiving, PLC is transmitting	Intermitting when PLC is responding to ROI module communications
6	Red	Not used	Off
7	Green	Not used	Off

* position numbers indicated relative to screw terminals. LED closest to screw terminals is #1

Green (# 1) LED not illuminated

- Check that voltage on power terminals is between 8 and 36 VDC. Check polarity of voltage.

Yellow/Orange (# 2) LED *IS* illuminated

- No project file installed in the ROI module. Use the Reach Loader program to load a project file.

Reach Nomad app on iOS® tablet indicates "No Devices Found"

- Ensure that Reach ROI module is powered (Green LED is on)
- Ensure that a project file has been loaded into the Reach ROI module (Yellow/Orange LED is off)
- Ensure that antenna is properly connected
- Move iOS® tablet closer to antenna and within antenna beam path ("line-of-sight" may be required)

Red (# 4) blinks but no corresponding Green (#5) LED blink is noted

RS-232 connection between Reach ROI module and the controller is not functioning properly.

- Check communications settings in the industrial controller
  - Hardware handshaking: None
  - Data Bits: 8
  - Stop Bits: 1
  - Start Bits: None

- Check that baud rate setting in controller is the same as that entered in the Reach Loader when the project was loaded onto the Reach ROI module.
- Check RS-232 wiring
- Move iOS® tablet closer to antenna and within antenna beam path ("line-of-sight" may be required)

Poor Range

- Check antenna placement.
- Check specifications and antenna beam path to ensure that the iOS® tablet is located within the beam path.
- Check antenna cable connections.
- Ensure antenna cable is as short as possible.

iOS® tablet will not accept password

- Check passwords loaded in the Reach ROI device. Passwords are loaded onto the device when the project is loaded via the Reach Loader software program.

iOS® tablet connects to the ROI module and displays screens but data is incorrect

- Check project design – specifically mapping of controller database elements to screen controls.

iOS® tablet connects to the ROI module and displays screens but does not display expected screens or expected controls

- Use the correct password at connection time. Projects can be designed to permit/restrict access for specific passwords.
- Check project design – specifically the "visibility" settings for controls.

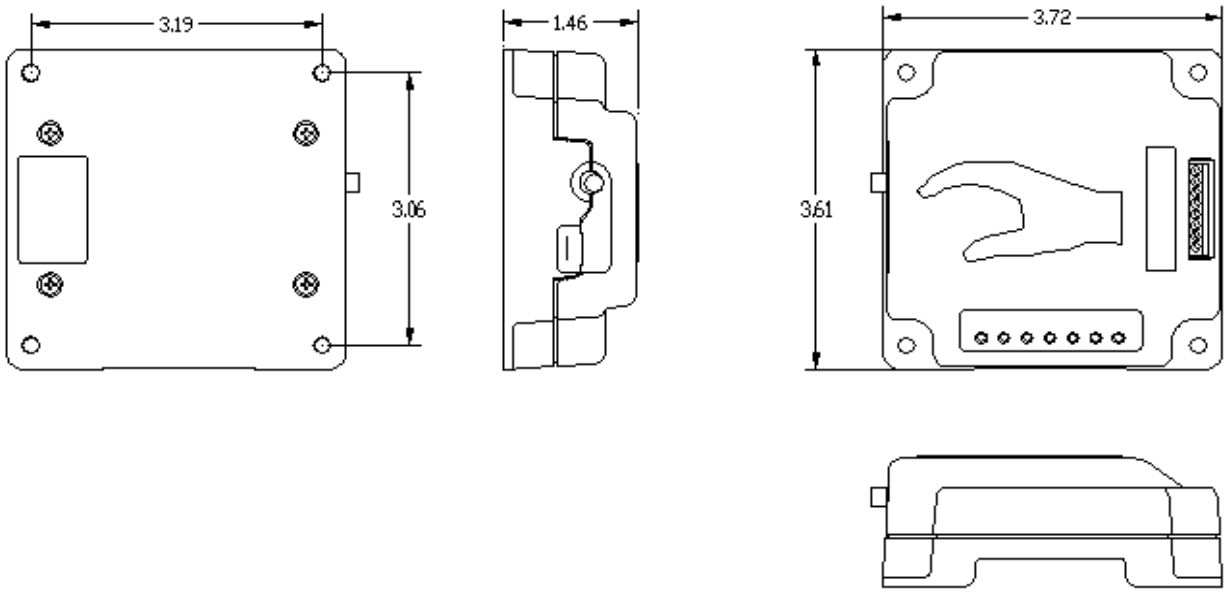
iOS® tablet connects to the ROI module and displays screens but does not permit editing of data values

- Use the correct password at connection time. When project is downloaded to the Reach ROI module using the Reach Loader software program, passwords can be entered to permit "read only" access or "read/write" access.

Specifications

Mechanical

Enclosure Material: PC/ABS, UL flammability recognition 94 V-0
Weight: 0.22 lb (0.10 Kg)
Terminal block: 2.5 mm screw terminals, 16 AWG Max
Antenna Connector: SMA – RP



Power

8.0 to 36.0 VDC
Reverse polarity protected
500 mW typical power consumption
550 mW maximum power consumption

Environmental

Storage temperature: -40C to +85C
Operating temperature: -40 to +85C
Operating Humidity: 0 to 85% (non-condensing)
Operating Altitude: Up to 3000 meters
Enclosure Rating: IP40

Communications

Programming Port: One (1) USB Mini-A. Complies with USB specification 2.0
PLC/RTU Port: One (1) RS232 (Rx, Tx, Gnd) with screw terminal connections. 300 to 115,200 BPS
Communications Protocols Supported:

- Emerson ROC
- Emerson ROC Plus
- MODBUS – including 32-bit extensions

Technical Assistance and Service

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