Radio Link
Starter Kit

Installation Manual

BARTLETT Instrument Co.
1032 Avenue H
Fort Madison, IA 52627
319-372-8366

www.bartinst.com

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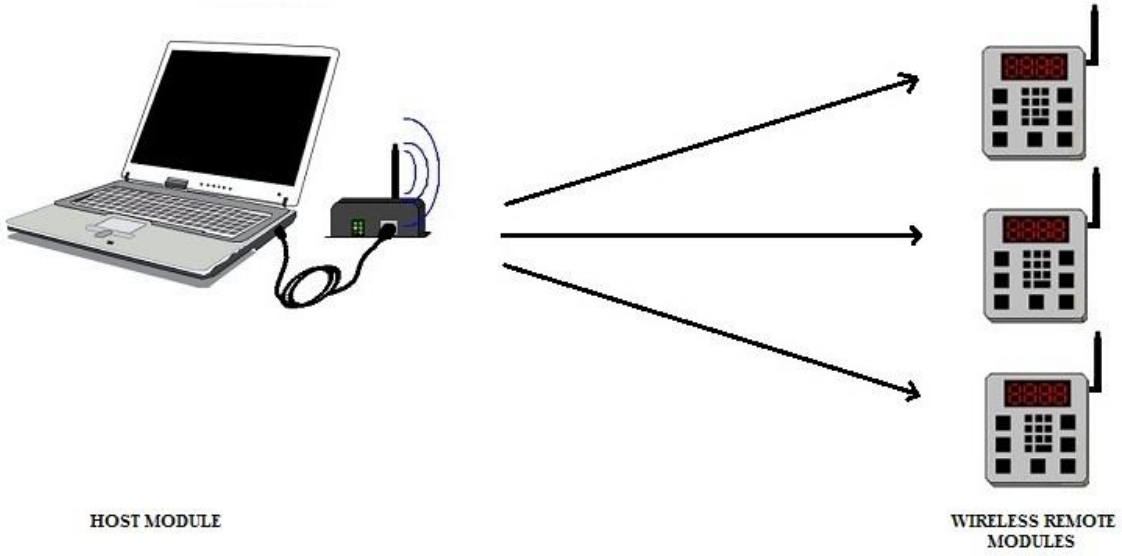
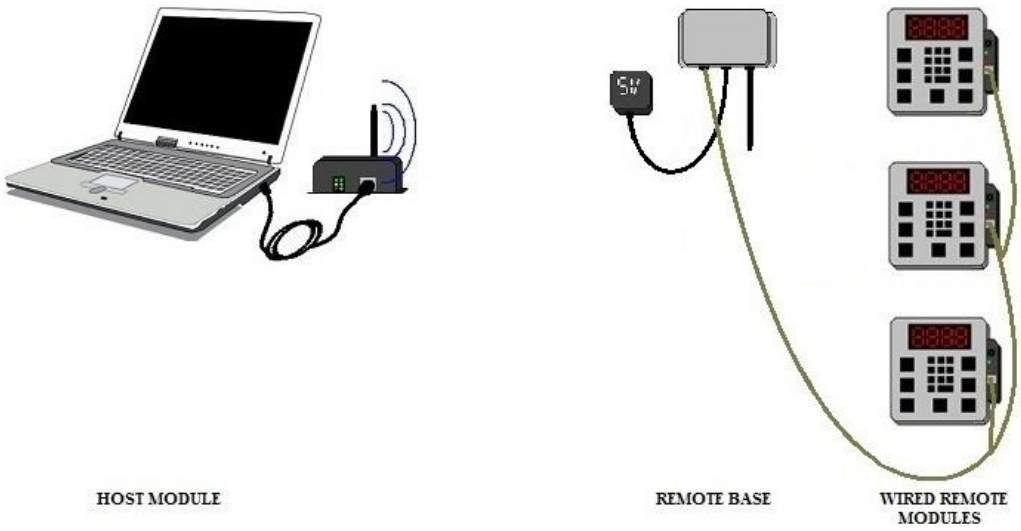
Radio Link Starter Kit Manual

Thank you for purchasing the Radio Link from Bartlett Instrument Company. **Figure 1** below shows the 2 configurations covered in this manual, wireless and hybrid. Each configuration requires a host modules and remote module. **Figure 1** shows a host model and 3 remote modules.



Wireless – radio to radio



Hybrid – radio to wired controller.
(Required for version 600 controllers)

Figure 1

This manual will guide you through the installation of the RADIO LINK. Refer to the KISS Operation manual for specific questions on the monitoring software.

As shown in **Figure 1**, Radio Link consists of a host end and a remote end. The host end is set up first. Next, the remote end is configured and tested using the range test software and hardware. Once the radios are functioning, refer to the KISS Installation manual for installation and use.

System Requirements

1. Windows XP with Service Pack 3 or higher
2. USB Port
3. CD Drive

Quick Installation

1. Install "USB serial driver" (CDM20830_Setup.exe) and Range Test software (Range Test 1.0.0.8) from the provided disc. The Range Test software requires Windows XP with Service Pack 3 or newer. For older windows, install XCTU software. When prompted for updates, click no.
2. Connect the RL9600-Host module to the computer.
3. Follow any "plug and play" installation steps required. (This will happen automatically on most computers)
4. In your computers "Start Menu", find and run the Range Test software.
5. Select the correct COM port from the list.
6. Start the **Remote Radio** (RL9600-ICKL) in the range test mode. (See pages 8, 9, and 10 for more details)
7. Click "Start Auto Test."
8. Hold down the switch on the range test board and the radios should communicate with LED's flashing at a regular rate on the remote radio.
9. Mount the **Host Radio** (RL9600-USB) in its final location.
10. Take the remote radio to the controller's location and make sure the radios are still communicating. (LED will flash and number of "Pass" transmissions will increase)
11. If range test passed (85% or higher), install the remote radio. To begin installing K.I.S.S., open the CD, double click KISS, and double click the Setup Application.

Part No. System

- RL9600-HostRT-KL – Computer End: USB to Radio, Range Test, and KISS
- RL9600-ICKL – In controller kiln radio
- RL9600-Host-KL – Computer End: USB to Radio and KISS
- RL9600-Base-KL – Controller End: Radio to RS485 and Power Supply
- RLEXT – Controller End: Radio Link Extension Kit

Required Tools

Wireless - 8mm wrench, ¼” bit (with depth gauge) and drill, 3/16” flat blade screwdriver

Hybrid - 3/16” flat blade screwdriver and, drill

Figure 2: Required tools for Wireless installation.

Module Contents

Radio Disc

- Kiln KISS – Bartlett Instrument Company’s control and monitoring program
- X-CTU – Software provided by Digi International; Range test feature used during setup to ensure maximum signal quality
- USB driver
- User Manuals and Guides

Hardware

Please check for all materials before beginning installation. Note the pictures and lists cover both types of remote modules and you may only have one type.

RL9600-Host-KL Module (Hybrid)

- RADIO LINK RL9600-USB
- Mounting Screws (2)
- Wall Anchors (2)
- Software/manual computer disc
- K.I.S.S. Registration Card

RL9600-HostRT-KL Module (Wireless)

- RADIO LINK RL9600-USB
- Mounting Screws (2)
- Wall Anchors (2)

Figure 3: RL9600-Host Module.

- Software/Manual Computer disc
- K.I.S.S. Registration Card
- Range Test Board (Required for wireless configuration)

RL9600-Base-KL Remote Module (Hybrid)

- RL9600 - 485 with 20’ of cable
- 5V Plug-in Power Supply
- RLEXT - Radio Extension Kit

Remote Module (Wireless)

- RADIO LINK RL9600 - ICKL
- DIPRIB connection kit (not needed in all instances, depends on controller model)

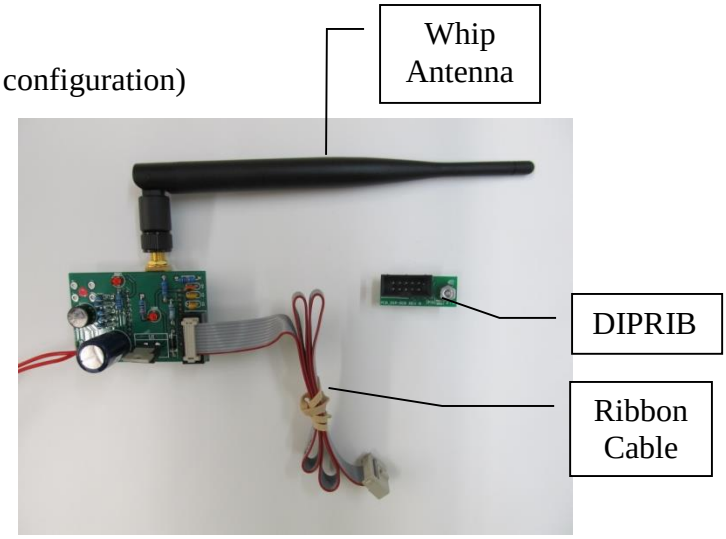


Figure 4: RL9600-ICKL

Guidelines & Suggestions

1. Maximum Cable Length (for Hybrid Configuration):

- From Controller to RADIO LINK: 700 ft. for 1 controller. Multiple controllers will decrease the maximum distance or require an additional RL9600-Base.

2. Create a drip loop when installing the module.

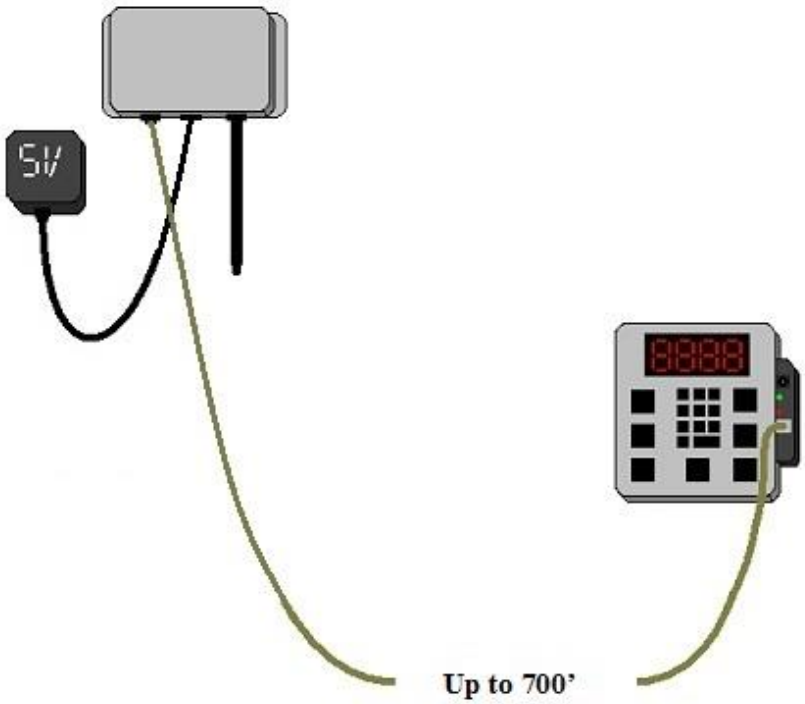


Figure 5: Maximum cable lengths from RL9600-Base to controller

To create a drip loop, leave a slack length of cable at each termination, allowing it to hang below the connector. This forms a low point that will carry any condensation away from the sensitive components.

Figure 6: Example of a drip loop.

3. Perform a range test before permanent installation.

The transmitted signal energy fills a football-shaped area between two radios. Floors and ceilings can block this energy; therefore radio placement is crucial to signal integrity. Try to avoid floors, ceilings, and other large objects when choosing a mounting location for your radio. Other concerns:

- Orient all antennas in the same direction. (Either vertical or horizontal)
- Place units at a convenient height between the floor and ceiling
- If thick walls interfere with signal, use cable to extend the Radio Link past the offending wall
- Use the Range Test Software to indicate the best position

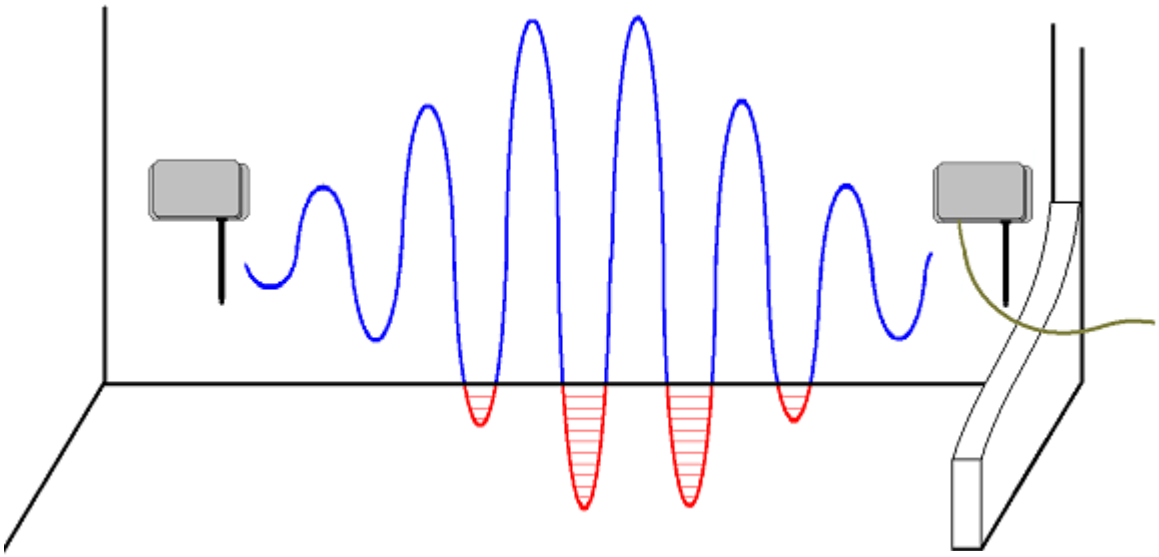


Figure 7: Radio range testing.

Detailed Installation Steps

1. Install the USB serial drive (CDM20830_Setup.exe) and Range Test software (Range Test 1.0.0.8) from the provided disc.
    a. Insert the provided KISS/Radio disc into your CD-ROM drive.
    b. Go to your start menu and open “My Computer.”
    c. Double click CD drive (KISS) and open the Radio Link folder
    d. Double click CDM20830_Setup.exe
        i. The FTDIChip CDM Drivers screen will come up, then click “Extract”.
        ii. The Device Driver Installation Wizard will come up, then click “Next”.
        iii. Wait until the drivers are installed on your computer, then click “Finish”.
    e. Go back to the Radio Link folder
    f. Double click range test folder.
        i. Double click set_up.exe
        ii. Depending on your computer, you will see either a License Agreement and click “Accept” or an Application Install screen and click “Install”.
        iii. The Range Test software installation process should be complete.
2. Plug in the RL9600-USB module to the computer.
3. Follow any “plug and play” installation steps required. (this will happen automatically on most computers)
4. Open your computers “Start Menu” and find the program called “Range Test”. Open and run the Range Test software.

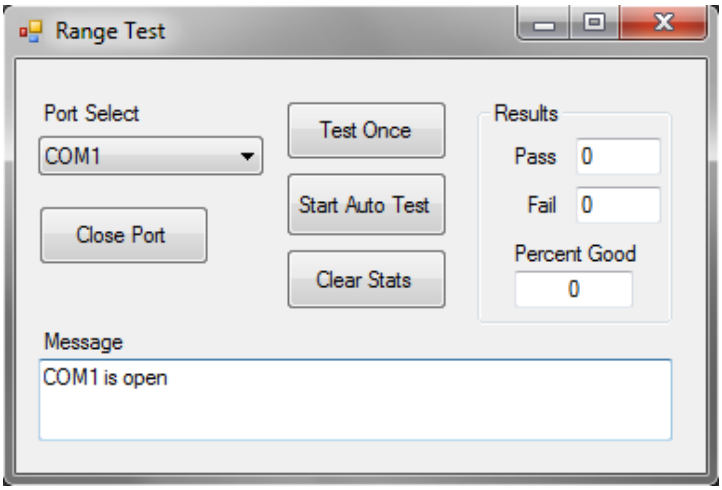


Figure 8: Range Test program.

5. Once the “Range Test” software is open, select the correct com port. To change the port number, click on the drop down menu under “Port Select” and select the appropriate port.

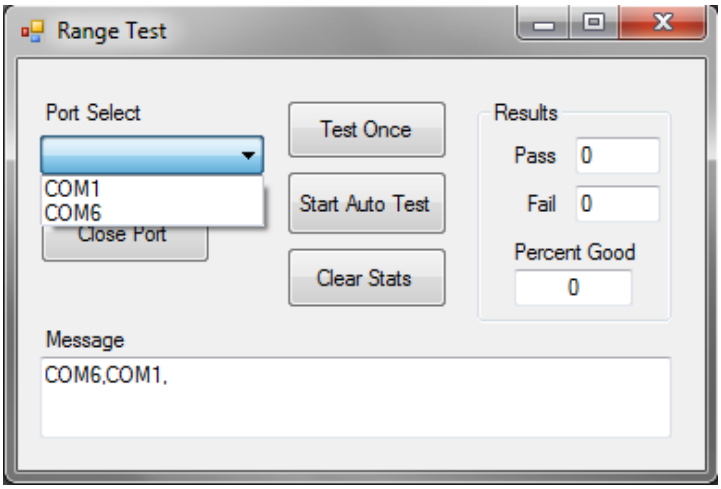


Figure 9: COM port selection.

6. Start the remote radio in the range test mode.
    a. Hybrid
        i. Open RL9600-Base-KL enclosure and place the jumper over both pins of R setting.
        ii. Plug in the power supply.
        iii. Click “Start Auto Test”
        iv. Check that the RL9600-Base is communicating with the host radio. The red light should be solid and the green light will flash at intervals on both the host and base radios.
    b. Wireless
        i. Connect the RL9600-ICKL to Range Test board (mounted in lid of the USB module) with the ribbon cable provided.

Figure 10: Range Test Board

ii. Set DIP switch 5 to “on” on the Range Test board. 1-4 should be off.

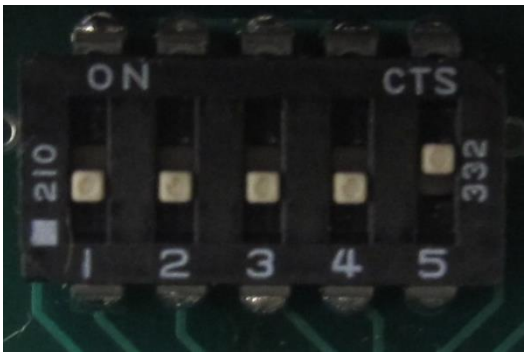


Figure 11: DIP switch 5 set to ON.

iii. Press and hold the switch on the range test board to operate. If the switch is not held, it will not transmit signal and the range test will not work. (See **Figure 12** below)

7. Click “Start Auto Test” on the Range Test program.

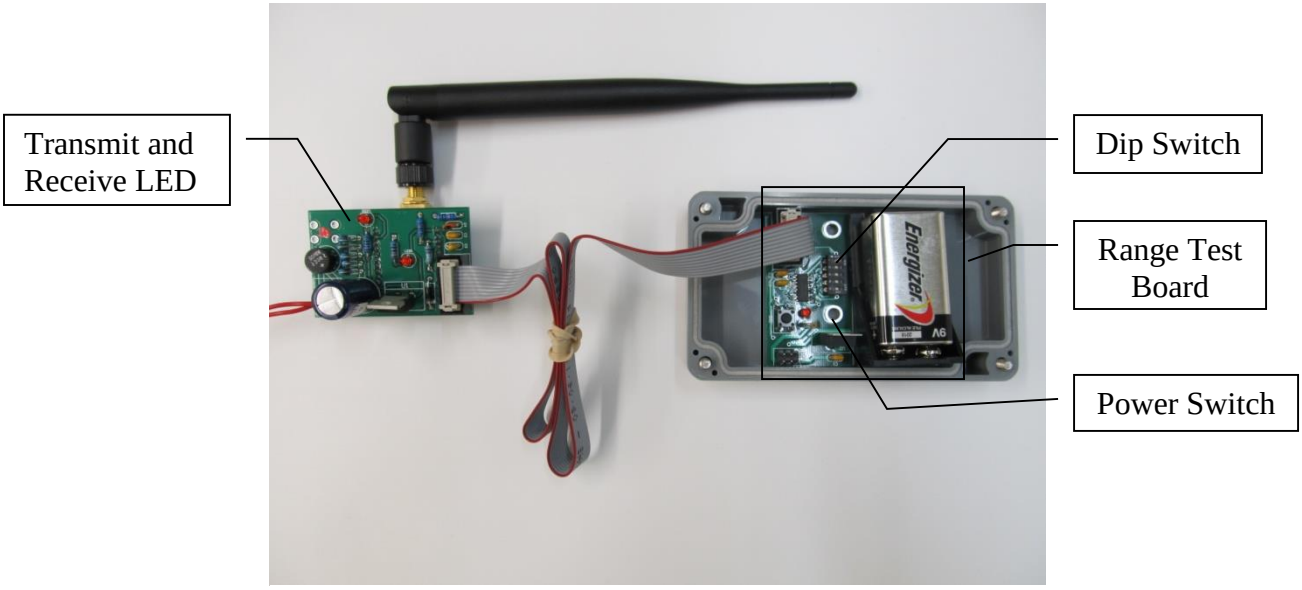


Figure 12: Wireless radio range test configuration.

8. The radios should communicate with LED’s flashing at a regular rate on the remote radio. LED 1 indicates power to the board and LED 2 should flash while running the test.
9. Mount the host radio in its final position. For mounting instructions, go to http://www.budind.com/pdf/hb1322mb.pdf.
10. Click the “Clear Stats” button on the Range Test program before continuing to the next step.

11. Take the remote radio to the controller's location. While holding the power switch on the range test board, make sure the radios are still communicating. See **Figure 13** below. (LED will flash and number of "pass" transmissions will increase at your computer)

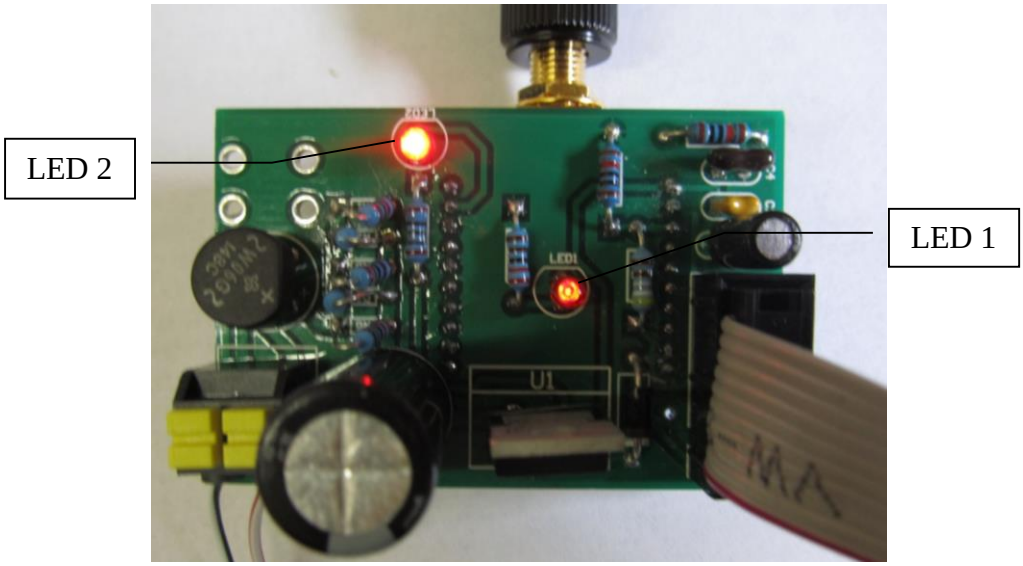


Figure 13: LED 2 will flash during the range test. LED 1 will light up when the switch is pushed to indicate power to the board.

12. If range test passed (Percent passed 85% or higher), proceed with installing the remote radio. Once completed, proceed with K.I.S.S. installation on your computer.

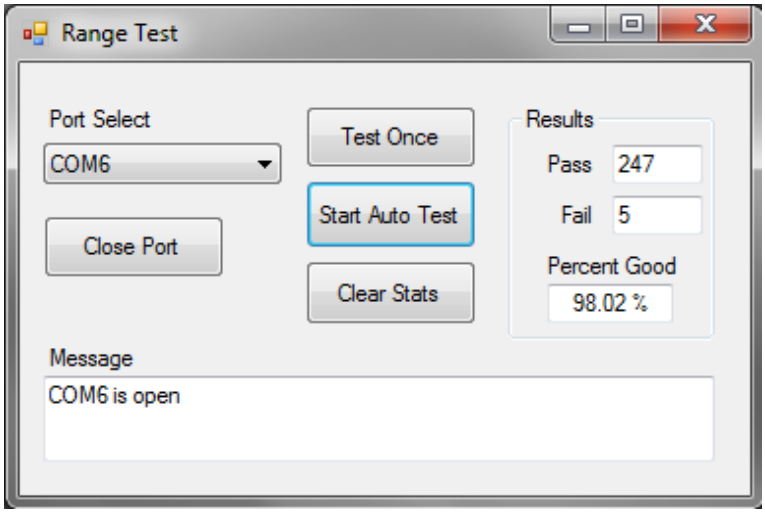


Figure 14: Successful range test.

a. HYBRID
   i. Replace jumper on single pin of R setting in RL9600-Base-KL.
   ii. Mount RL9600-Base-KL in best line of sight to HOST radio and near an outlet.

iii. Mount RLEXT in controller. Refer to separate instructions for KISS installation guide.
iv. Connect controller to RL9600-Base-KL.
    1. With modular cables
    2. With cat5 wire

b. WIRELESS
i. Disconnect RL9600-ICKL from range test board.
ii. Remove power from the controller.
iii. Remove the controller panel from the control box.
iv. Drill ¼" hole in right hand side of the control box. Use depth gauge to prevent damage to other parts. Make sure it is close enough to the controller and the wires from radio to controller will reach.
v. Mount DIPRIB to the controller display board. (Detailed instructions on page 7 in the K.I.S.S. Installation manual)
    1. Remove the nut from the top left hand corner of the display board.
    2. Replace the nut with the 5/16th male/female standoff.
    3. Mount the DIPRIB board by aligning the hole over the spacer and the pins on the DIPRIB board with the 8 pin socket on the display board.
    4. Tighten the nut onto the space. **Do not over tighten.
vi. Mount radio in controller by inserting the antenna connector through the ¼" hole you drilled, secure it with the nut and washer, and screw on the antenna to the antenna connector.
vii. Unhook the wires at AC1, Center Tap, and AC2 on the controller.
viii. Connect the two red wires from the radio board to AC1 and AC2 on the controller.
ix. Connect the black wire from the radio board to CENTER TAP on the controller. See **Figure 15** for connections.

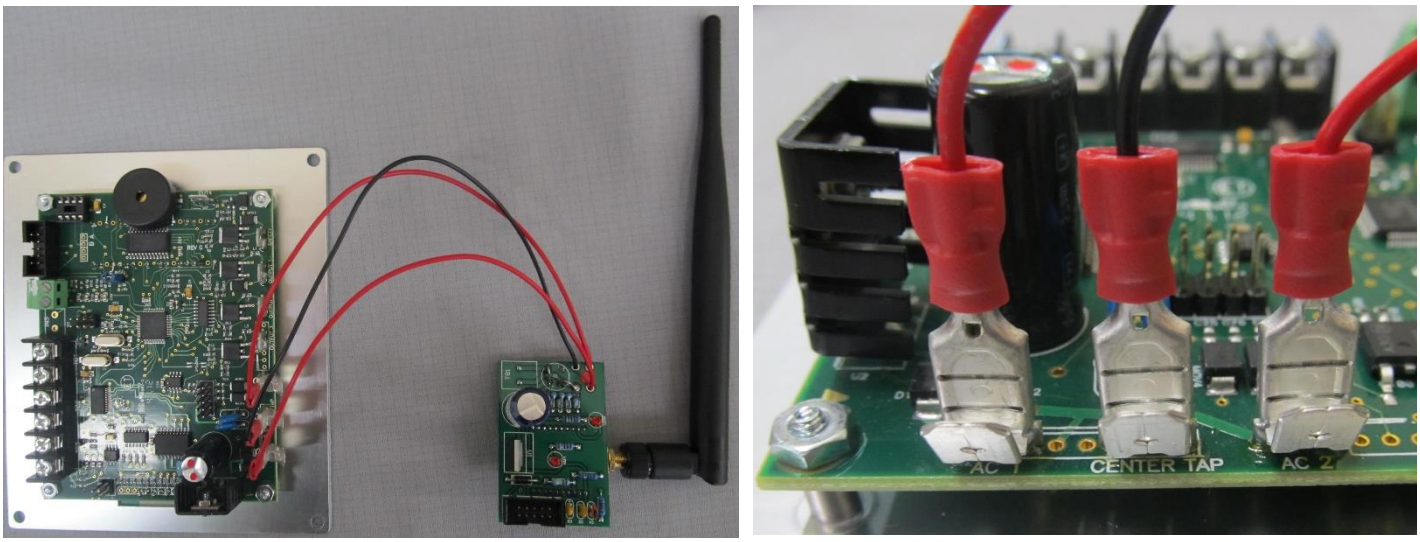


Figure 15: Radio connection to the controller.

x. Next, reattach the controller wires to the male tabs at on the controller connection at AC1, Center Tap, and AC2. The color code of your wires will vary with different kilns.

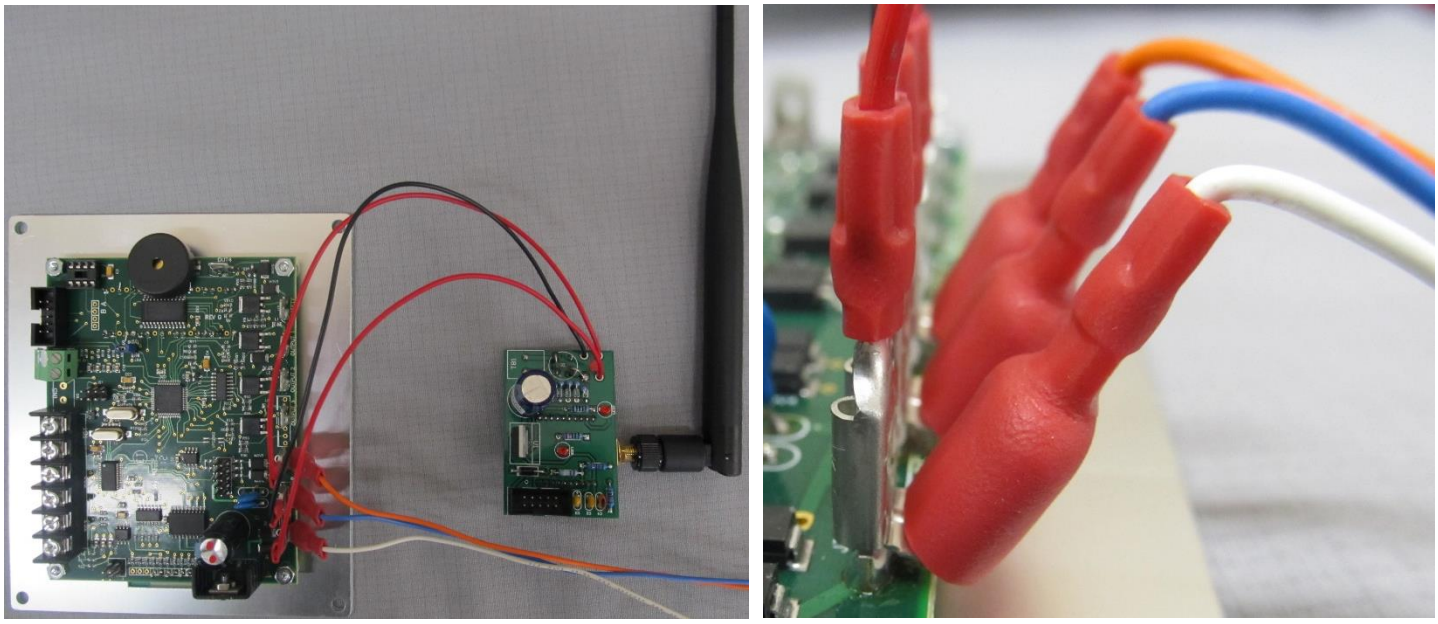


Figure 17: New controller connections at AC1, Center Tap, and AC2

xi. Attach the ribbon cable provided from the Radio board to the DIP RIB board you installed on controller display board.
xii. Screw the controller back into the control box and restore power.
xiii. Remember, you will need to change the controller's ID if this is not the first controller on the network.

Appendix A: Compliance Statement

Compliance Statement (Part 15.19)
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

Warning (Part 15.21)
Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

RF Exposure (OET Bulletin 65)
To comply with FCC RF exposure requirements for mobile transmitting devices, this transmitter should only be used or installed at locations where there is at least 20cm separation distance between the antenna and all persons.

Information to the User – Part 15.105(b)
This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy, and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help