RS-485 Communication Using Fiber Optic Modems for HomeWorks and RadioRA 2 Systems

1.0   Overview

HomeWorks Illumination, HomeWorks QS, and RadioRA 2 RS-485 link wiring is commonly implemented utilizing a four conductor cable consisting of one pair of 22AWG twisted and shielded (communication) and one pair of 18 AWG (power). It is possible, however, to use fiber optic cable and modems to extend RS-485 link communication for long distances and is often the standard for any new construction high end residence when running communication cabling between buildings. This application note details how to utilize a fiber infrastructure to connect RS-485 wired links and devices.

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2.0   Suggested Fiber Optic Modems

When fiber optic cable is used to connect HomeWorks or RadioRA 2 equipment between buildings, Lutron suggests using one of the following fiber optic modems from CommFront:

- FBR-SERIAL-2

These fiber optic modems are available in single mode and multi-mode. Single mode is for applications up to 24 miles and multi-mode for applications up to 1.2 miles. They also come available in ST, SC, and FC fiber optic cable connector types.

For CommFront product specification documents, visit the CommFront website at www.commfront.com.

These modems can be utilized on any of the HomeWorks RS-485 links and the RadioRA 2 Repeater Link:

HomeWorks Illumination

- Grafik Eye
- Wired Keypad
- D48
- Inter-Processor
- Module Interface
- H48

HomeWorks QS

- RF (wire run between Hybrid Repeaters)
- QS Wired
- Module Interface or Panel Link
- H48

RadioRA 2

- Repeater Link

3.0   Required Equipment

Equipment Required when using FBR-SERIAL-2:

- 2 FBR-SERIAL-2 Fiber Optic Modems for each point-to-point connection
- 2 9-30VDC Plug in Power Supply (provided with each modem)
- Required length of Fiber Optic cable

HomeWorks wired link keypads will require remote mounted power supplies in order to be powered. Power should not be wired between buildings and the fiber optic cabling is only for communication. Keypad power supply options are as follows:

HomeWorks Illumination

- PPS1-120-15DC-3A
- PPS2-120-15DC-3A
- T120-15DC-9-BL

HomeWorks QS

- QSPS-P1-10-60
- QSPS-P1-1-50
- QSPS-J-1-50

The Repeaters in RadioRA 2 and HomeWorks must be powered using the provided 9VDC plug in power supply.

4.0   HomeWorks and RadioRA 2 Device Baud Rates

The following tables contain the baud rates of all device types. The CommFront fiber optic modems automatically adjust to the baud rates. There is no need to adjust any resistor values or dip switch settings. These values are for reference only, in the event that a different type of fiber optic modem is being used which does require special manual settings.

HomeWorks Illumination

Device	Baud Rate
GRX	19.2k
Keypad, D48	38.4k
Inter-Processor, Module Interface, H48	115.2k

HomeWorks QS

Device	Baud Rate
RF Link	62.5k
QS Link	44.1k
Module Interface, H48	115.2k

RadioRA 2

Device	Baud Rate
Repeater Link	62.5k

5.0   FBR-SERIAL-2 Wiring Configurations
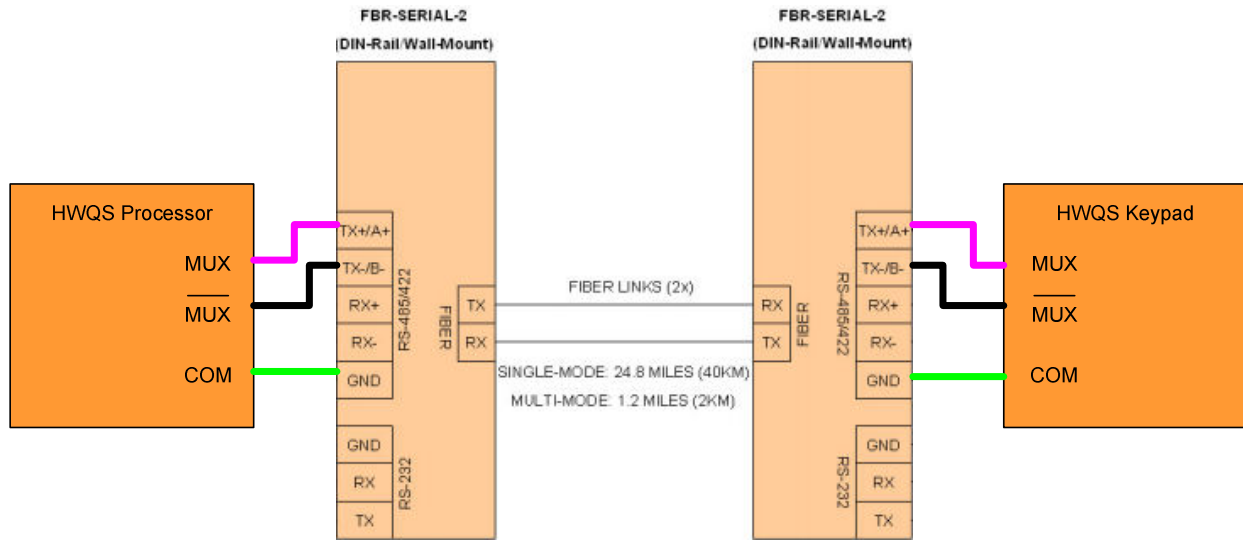
Lutron RS-485 Link Connector Pin Designations:

Pin 1: COM

Pin 2: V+ (not connected)

Pin 3: MUX

Pin 4: $\overline{\text{MUX}}$