Light-O-Rama

Front   Rear

LOR-REP – RS485 Network Topology Extender

User Manual
May 24, 2008
V1.00
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Introduction

The Light O Rama Repeater (*LOR-REP*) can be used to create network topologies other than the daisy-chain recommended by the RS485 specification. It can also be used to regenerate network signals for networks with a large number of controllers and/or very long total cable length.

"Daisy-chain" means that the network cable runs from the Show Director or PC to the first controller, the first controller to the second and so on. Creating a star network where there are spurs off the main network is not recommended without a Repeater because this creates multiple reflections that can garble the data.

Each controller on a network presents a load to the network thereby attenuating the data signal. The same is true for the cables between controllers. In a Light O Rama network, the theoretical maximum number of controllers is 240 and the maximum total length of cable is 4,000 feet. Less than perfect cables and connections prevent this from being realistic.

The Repeater regenerates signals that travel in either direction from the front jack of the Repeater to the rear jacks. It does not regenerate the signal between the two rear jacks. When using the rear jacks, these are simply daisy-chained together to allow the network to 'Y' after signal re-generation or to be daisy-chained into a network to create a spur network. See the examples that follow.

Be sure to read the *Important Considerations* section.

Creating Spur Networks

In some situations it is convenient to have a star network where there are spurs off the main network rather than having to run a cable out and back because of the daisy-chaining recommendation. In the diagram below, the Repeater is used to create a spur network. This spur is a new network that can be thousands of feet long.
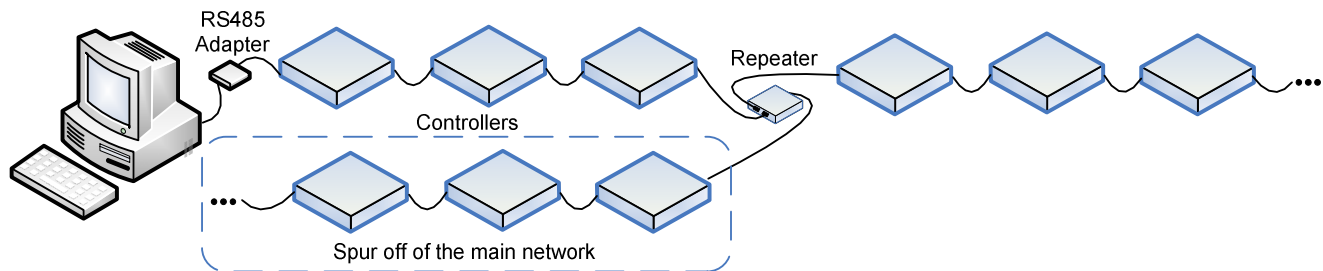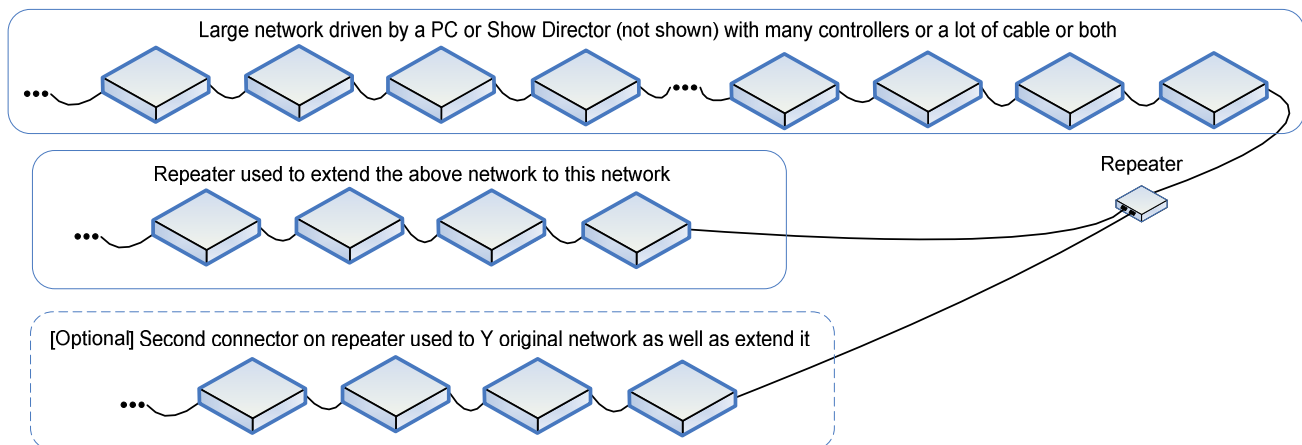
Note that the Repeater has the two jack side inserted into the main network daisy chain style and the spur network is cabled to the single jack side. You can insert multiple Repeaters in this fashion to create a number of spur networks.

Extending a Network

The diagram below shows a large network with many controllers and/or a lot of network cable. In this network, the Show Director or PC is not shown and could be connected at any of the ●●● points.

The Repeater shown at the right of the diagram is used to extend the network and optionally 'Y' the network. Since the Y'd network is a new network, the number of controllers and/or cable length is unaffected by the original network's configuration.

Note that the last controller on the main network is connected to the single jack side of the Repeater and the extended network is connected to the double jack side. If Y'ing is not required, then the Repeater could be inserted the other way.

Large Network

The following diagram show a fragment of a very large network employing multiple Repeaters. In this network, the Show Director or PC is not shown and could be connected at any of the ●●● points.

To provide some clarity each network is shown in a blue box.

Repeaters 1 and 2 are used to create spurs off of the top left network. Repeater 3 is used to extend the top left network and Y to a new network. Repeater 4 is at one end of the Y'd network and extends that network to yet another new network. Note that Repeaters 3 and 4 are cascaded, meaning the data signal is traversing these two Repeaters.
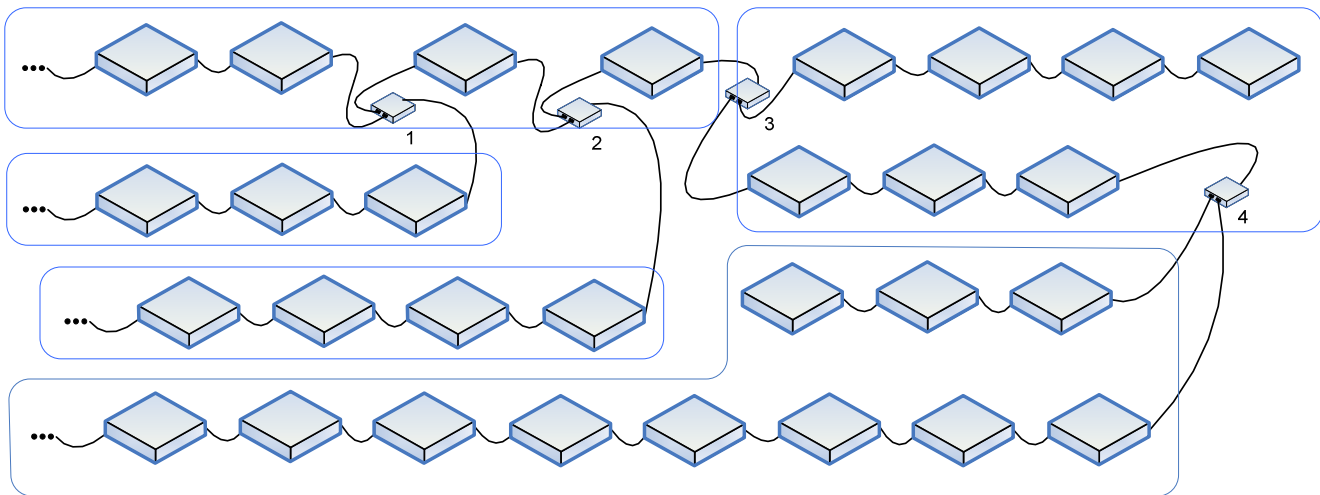
Important considerations

1. One of the network cables (50 feet long or less) coming from either side of a Repeater must be connected to a least one controller or a powered USB adapter. This will guaranty adequate power for the Repeater. The other one or two cables can be thousands of feet.

2. Accessory power is not passed through the Repeater from the jack on one side to the jacks on the other side. This means that you could not, for example, use a Repeater with a wireless unit on one side without a controller or powered USB adapter on that side.

3. The double jacks on one side of the Repeater are in parallel so data as well as accessory power is passed between these jacks. There is no signal regeneration between these two jacks.

4. Do not cascade Repeaters beyond 2 levels in interactive networks. There is a finite time required by the Repeater to reverse direction to handle interactive inputs. Going through too many Repeaters may miss an interactive input. Note that "going through" a Repeater means from one side to the other, not through the two jacks on one side.

5. Light O Rama *recommends* using a Repeater for networks longer than 2,000' or with more than 64 controllers — however, your mileage may vary so if your configuration with more than 2000' of cable and/or more than 64 controllers experiences no problems then do not bother with a Repeater.

6. A single controller or powered USB adapter can power up to 3 Repeaters. Keep this is mind when setting up spurs off the main network. I.e. putting ten Repeaters in series using the two-jack side and powering this arrangement with a USB adapter or single controller where the controllers on the spurs are greater than 50 feet away may not work.

7. Always use high quality, shielded cable for larger networks.

Physical Size

2 5/8"w x 1 1/8"h x 2 5/8"d

Status LED

Flashing –   The Repeater is powered but not seeing any network data
Solid On –   The Repeater is passing data

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