



# LNRP3

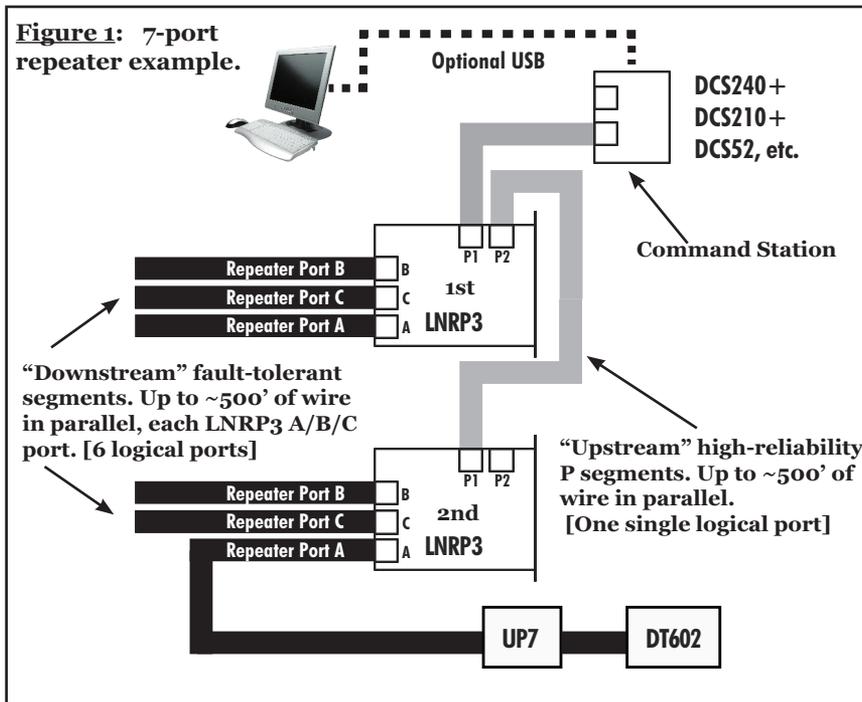
For Digitrax LocoNet systems

## LocoNet Repeater Module

Isolates and Protects LocoNet Segments  
Includes PS14 Power Supply

### Features:

- Primary P-port bi-directional LocoNet repeater to A/B/C expansion ports.
- Electrically isolates ports A/B/C/P from common faults from other ports.
- Fault-tolerant A/B/C ports automatically disconnect and reconnect faulted port segments, so all unfaulted ports still see LocoNet messages.
- Expands LocoNet installations, for greater area and distance coverage.
- Increased Railsync current, automatic shutdown and overcurrent protection.
- Color LCD with soft key menus and selection knob.
- Fast Clock monitor display selectable by Option Switches (OPSW).
- Useful Diagnostic and status tool if LocoNet or system issues occur.
- Includes PS14 Power Supply.
- Digitrax DoC: Tested as CE, and FCC Part 15, Class B RFI conformant.



### Parts List:

- 1 LNRP3 Repeater
- 1 Instruction Sheet
- 1 PS14 Power Supply

## **LNRP3 Installation:**

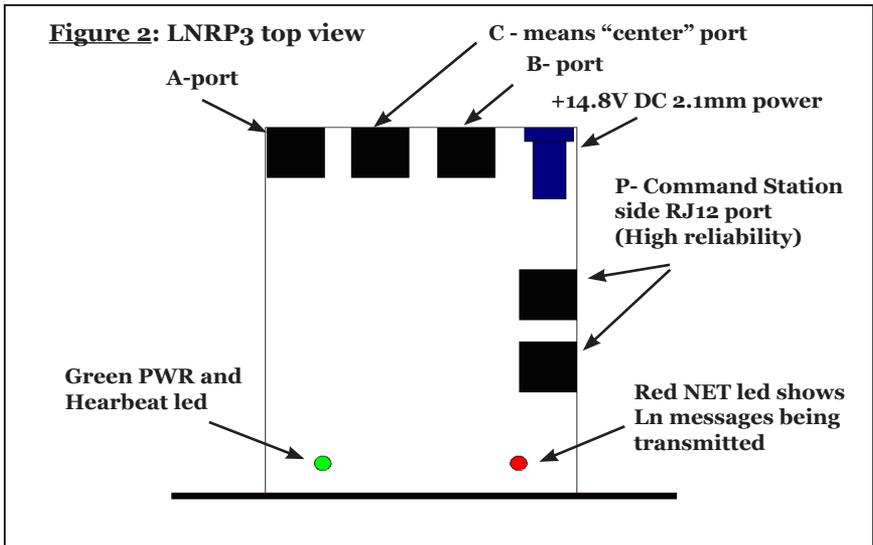
**Figure 1** shows the general arrangement for connecting one or more LNRP3 units to configure a LocoNet (Ln) based system for operation. The LNRP3 units drive the Ln data and Railsync (RS) signals on the A/B/C-port LocoNet wire segments. Each LNRP3 *must* have a powered PS14 DC plug (~ +14.8V/300mA) plugged into the rear DC power port.

The ‘shaded’ wire segments on the P-port **side** RJ12 connectors are the higher-reliability LocoNet part of the System connected to and powered by the Command Station. Faults on any P-port segments can be detected, but the LNRP3 cannot isolate P-port segment problems.

The ‘dark’ wire segments shown are separate A/B/C-port LocoNets that the LNRP3(s) fault detects and can isolate. Port faults here automatically trip a fault disconnect, and reconnect on fault clearance. This isolates faulted ports from interfering with operations on other unfaulted ports.

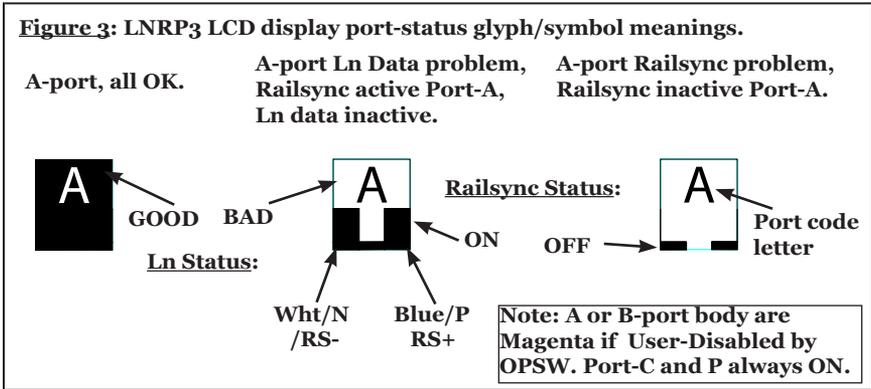
The LNRP3 LCD display provides continuous status of A/B/C and P-port segments with 4 high-visibility square black symbol glyphs on the lower line of the display. Figure 3 shows the status symbols and combinations that report Ln voltage problems and Railsync overload issues, etc. Four black glyphs with white port names A/C/B/P in order means ports OK.

Each A/B/C-ports are electrically *identical* and can drive a typical total UTP wire length of about 500’ (about 150m), so a much larger area of a layout can be wired into separate segments that can logically work together. Side P1 and P2 ports are identical and paralled as one electrical P-port.



<b>Table 1:</b> Led codes	<b>NET (Red, Ln activity) status LED</b>
One blink	Good LocoNet repeated transmit message event
Alternates with PWR	IPL mode, waiting for DMF file data on LocoNet
<b>PWR (Green, Hearbeat) status LED</b>	
Wink each ~2 secs	DC +12V power ON/ Heartbeat/Repeater active
Blink each ~2 secs	Track power is OFF (RS+ or RS-, or both static)

A Blink is defined as an led that's mostly off, and then on briefly.  
 A Wink is defined as an led that's mostly on, and then off briefly.



The status glyphs of Figure 3 are examples for Port-A status. Status for Ports C/B/P follow along the right LCD bottom, with the letter coding the port name.

Loss of either P-port source P/N railsyncs will show ports A/B/C with railsync off, so boosters on those ports typically power off.

The top LCD line shows “Sleep” when the P-port command station is put into sleep state, and the white wire/-Railsync/N lines go to full voltage to keep sleeping throttles alive.

**USER interface:** LCD and front panel keys.

**Menu key:** [key at top right] Allows selection of; Electrical, Data and Opsw display screens. *These screens refresh on any quick key press.*

**Electrical Screen:** Shows voltage/currents on A/B/C railsyncs as well as Ln risetime. P shows railsync and Ln voltages and risetime.

**Data Screen:** Shows Ln transmit message counts and gaps[ faults] for each port, and DCC packet counts of P-port Railsync DCC source. Push and hold down a port key to clear counts for *that port*. Knob hold down will clear ALL ports’ data.

**OPSW Screen:** To access product options press ‘Menu>Opw’ to get the Option edit screen. Use soft keys and knob to change any *available* options then press ‘EXIT’ to save settings. *Black text is Option ON/C and faded text is OFF/T.*

## Notes:

- (1) Figure1 shows a 1-level “flat” system example, with one parallel P-port and six A/B/C repeated ports. Each segment can typically support about 500’ of total wire length combinations. Depending on the layout and wire, you may be able cascade up to 2 levels of LNRP3’s by expanding extra “downstream” LNRP3 P-ports out of other “upstream” A/B/C ports. None of the P-port segments are fault tolerant, but all A/B/C port segments with *no direct P connections* are fault tolerant.
- (2) To update/IPL new firmware, best practice is to connect the IPL source device downloading the new .dmf file, and target, to the upstream P-port. If the LNRP3 powers up and detects a firmware problem (alternate PWR/NET leds blinking) it will wait for a new IPL *only on the P port*.
- (3) Port Electrical display of Ln risetime is an approximate measure of how far that port wiring can transmit Ln messages. This risetime to a pre-determined voltage, *with NO other devices on the segment* is converted to a typical UTP wire equivalent. This is *relative* and only an estimate due to e.g. different cable types.
- (4) The LNRP3 employs active short protection at ~100mA on the 6 separate A/B/C port +/- (or P/N) Railsync lines, as well as backup self-resetting thermal-fuse overload protection. Use safe wiring practices to minimize possible heat generation when shorts occur on these railsync lines.
- (5) If the LCD screen manufacturing protection film is still in place, there will be a small green plastic tab poking out of the LCD window. Pull on this tab gently towards the front to remove this protective film, so you can uncover a clean display front surface.
- (6) A fraction of a microsecond after a new Ln message start, the LNRP3 locks that port as the *source* port and the other 3 ports become repeater *destination* ports for that message duration. With 3 destination ports, the LNRP3 does not do collision detection, and all other LocoNet devices must perform normal collision detection and recovery.
- (7) The PortA/B/C Ln data and Railsync voltages are set by the power supply input port voltage; maximum +18 volts DC input/+10 volts minimum.

## Warranty & Repair

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Digitrax gives a one year *Warranty* against manufacturing defects for this product. Visit [www.digitrax.com](http://www.digitrax.com) for instructions for; tech support, current product information and returning items for repair.

**Please return warranty items directly to Digitrax - Do NOT return items to place of purchase.**

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