

**Release 3.9.34**

Release Date: 08/31/2016

Package Elements:	Revision:
OIB App1	3.9.5
OIB App2	3.9.5
OIB MCU	3.5.2
OIB DSP	3.8.5

**New Features Added in entraNET 220 Firmware**

The RCL220 System has been enhanced to support the use of Rail Road ID (RRID) to block an LCU from entering Infrastructure Mode on Repeater Systems that are not run by the same Rail Road Company (UP, BNSF, etc.). Reference “RR ID Requirements for RCL220 System” below.

The new Firmware enhances the RCS AP to implement the White List functionality and the LCU Radio (LCR) to correct the ellipse implementation and to support White List functionality. The LCR FW (3.9.34) should be loaded onto the LCU Radio only. This FW has not been tested on OCU Radios (OCRs) or Repeater PRMs.

**LCU Remote:**

- Works in conjunction with Repeater AP FW release 3.4.5 which should be loaded onto the RCS Repeater and any Satellite Repeater that may be switch in as the RCS.
- Corrects the interpretation of a yard ellipse,
- The LCR FW has been enhanced to support the White List functionality. Reference “RR ID Requirements for RCL220 System” below. The LCR will now “black List” a yard if its Slot Group Request to that yard is denied. The LCR will no longer attempt to gain a Slot Group from that yard. A “BL” (Black Listed) column has been added to the yard command output to indicate that that yard has been Black Listed (‘T’rue or ‘F’alse).
- The LCR will now learn the Channel 3 and 4 frequencies supported by the yard that it successfully enters infrastructure in.
  - The previous LCR code remembered Chan 3 and 4 frequencies from yards that it entered the ellipse of even if it wasn’t the correct yard.
  - The “repeaters clear” command can be used to zero out the Chan 3 and 4 frequencies.
  - The LCR will not use channels 3 or 4 the first time it enters infrastructure in a yard but, will learn and use channels 3 and 4 (if the yard supports them) from then on.

**LCR Upgrade NOTE:**

- To minimize the chances of an RCL220 radio “Bricking” during a FW Upgrade:
  - Use the login id ADMIN (Password ADMIN) for the Remote Upgrade Utility,
  - change the radio’s parameters as follows:
    - Set the LCR Mode to Calibration (“RADIO MODE=CAL”),
    - Set the TXSTART value to zero (“RADIO TXSTART=0”),
    - Set the COM2 default mode to command line (“com2 default=console”).
  - The original values may be restored manually once the upgrade is complete.

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COM20 19200
File Edit View Config Logging Scripts Servers Transfer uMon Help
entraNET> gps
FIX=Yes
SATS=4
LAT= +39.12196 Degrees
LON= -94.58788 Degrees

entraNET> yard
MODE=Normal Operation
COORDMODE=Centralized Coordination Mode
MINRSSI=-120
RSSI=-66
ID=15
SHAPE=Ellipse
ROT= +0.00000 Degrees
LAT= +39.12196 Degrees
LON= -94.58788 Degrees
XDIM= +13.23363 Miles
YDIM= +5.52558 Miles
COUNT=2

YARD          <Cached Yard Info>          TTL
ID | c1Lat | c1Lon | c2Lat | c2Lon | 2 x a | Cnt | BL
-----+-----+-----+-----+-----+-----+-----+
 2 | +39.1134 | -94.4764 | +39.1306 | -94.6994 | +21297.46 | 30 | T
15 | +39.1220 | -94.4758 | +39.1220 | -94.6999 | +21297.46 | 30 | F
entraNET>
entraNET>
COM20 19200 8-N-1  TELNET SRVR OFF  MYIP: 192.168.1.52  ROW/COL: 27/1  XFER: Idle

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## Bug Fixes in entraNET 220 Firmware

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### Access Point:

- None.

### LCU Remote:

- Corrected Yard Ellipse handling. The ellipse rotation is now implemented as a Clockwise rotation as indicated in the documentation and the ellipse geometry is properly maintained.
- Initialize the LCR Coordination Mode to “Direct Coordination Mode”. It previously defaulted to “Centralized Coordination Mode”.
- Zero GPS Satellite Count and coordinates if the GPS Fix is bad or no NMEA data has been received.

## Known Errata and Limitations in entraNET 220 Firmware

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### Access Point:

- If the user attempts to reboot to a corrupt inactive image, the user will not be able to reprogram the inactive image until rebooting to the active image again.

### Remote:

- None

RR ID Requirements for RCL220 System:

1. The Railroad ID shall be as described in "RCL Addressing Discussions.ppt" by UPRR as presented on March 31, 2004.
  - a. Note: This document provides RR IDs 1-7 for UPRR, 8-12 for BNSF, 13-16 for CSX, 17-20 for NS, 21-22 for CN, 23-24 for CP, 25 for KCS, 26 for Mexican Railroads, and 27 for Shortline railroads.
  - b. Currently, Laird uses RR IDs 17 and 18 for their deployments and GETS uses RR ID 1 universally, so these will have to change to make RR ID work.
2. The Unit Address of the LCR shall contain the Railroad ID.
3. Note: the Railroad must instruct the RCL integrator (Laird or GETS) what RR ID to use in any given locomotive. This process is outside of the scope of the communications system support.
4. The LCR shall continue to operate as it does today: It will attempt to get on infrastructure if it is within the advertised ellipse by transmitting messages to its OCUs in a free repeater timeslot.
5. The RCS shall be configured with a list of RR IDs that are permitted to join its infrastructure (format including comma-separated list of either single IDs or a range of IDs, e.g. 1-4,10,23). A list consisting only of 0 will permit any RR ID to join. This list format is similar to what we use for hopping channels in our iNET-II radio. We will try to match the functionality of list handling used there.
6. The RCS shall consult its list of permitted RR IDs and either send a GRANT to an LCR request to join if the RR ID is supported or a DENY if it is not.
  - a. Note: This process will increase the time to get on infrastructure in the case where the LCR is not permitted to join the first repeater it tries.
7. Note: RCSs for multiple channels in the same yard must have the same list of permitted RR IDs because the LCR considers a single entry in its yard table for matching Yard IDs and geometry, and the presumption is that when a channel 1 or 2 repeater is advertising a channel 3 and/or 4, they are matched. Bottom line: making the RR ID list (or any other yard parameters) different between the channels in a yard would be bad.
8. The LCR shall blacklist yard entries in its yard list for which it was denied access.
9. The LCR yard entry blacklist shall last until the LCR is power cycled.