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RCL-II Locomotive Remote Control System

Operating Instructions

9M02-7564-A002

REVISION HISTORY

Revision	Date	Changes
1.0		Initial Release
2.0	05/2014	Updated Styles Revised Content
3.0	09/2014	Added missing RCL-II features and OCU-III functionality.
3.1	12/2014	Updated images Updated product names New battery info Added "Serviceability" appendix
3.2	06/2015	Added note to battery sections about yearly replacement Minor content updates Updated cleaning warning
3.3	07/2015	Added a warning note for the OCU/LCU antenna connections

8 SYSTEM SUMMARY – TECHNICAL SPECIFICATIONS

8.1 LCU

Standard Enclosure	20"L x 20"H x 8"W (50.80cm x 50.80cm x 20.32cm), NEMA 4 (IP66) Steel.
Weight	Approximately 70 lbs (31.75 kg)
Environment	Outdoors, -22°F to 150°F (-30°C to 65°C), RH 0 to 95% non-condensing (-40°F units available – contact factory for details)
ELECTRICAL	
Input / Output Connections	Up to four quick connect/disconnect plugs and sockets Multiple circular disconnect plugs and sockets
Solid State Digital Outputs	Total of 80 rated at 100VDC with individual fusing at 5A
Solid State Digital Inputs	Total of 48 rated at 74VDC with individual fusing at 5A
Electromechanical Outputs	100VDC @ 10A
Output Termination	2 screw terminals per I/O position
Receive / Decoder Power Source	DC-DC converter; 24-78 VDC Input/13.8 VDC output @ 0.8 A with Under/Over Voltage protection
Minimum Locomotive Battery Voltage	62VDC
Microcontrollers	Qty 2 Coldfire MCF 5482 microprocessors
Serial Ports	Multiple RS-232 and RS-485
Frequency Range	VHF 220-222 MHz (FCC), 217-219 MHz (Industry Canada) <i>or</i> UHF 447-473 MHz
Channel Spacing	UHF 12.5 kHz, VHF 12.5 kHz & 15 kHz
Emission / Modulation	UHF 9K80F1D ±2.5 kHz deviation, VHF 8K50F1D ±1.85kHz deviation (12.5kHz channel spacing), VHF 10K1F1D ±2.66kHz deviation (15kHz channel spacing)
RF Transmit Power	UHF 1.6W, VHF 2.5W (both options factory set)
Range	1-mile line of site
Duty Cycle	2.5875%
Antennas:	Qty 1, mounted vertically for receive and transmit. Gain: UHF 5dB, VHF 3dB
Approvals	US FCC (Part 90) Industry Canada (RSS119)
Receiver Sensitivity	0.5 μV (20 dB quieting) typical
Frequency Stability	±0.0002% of reference frequency
Decoder Microprocessor Speed:	11.059 MHz
Axle Generator:	120 PPR Dual Phase.

8.2 EPI

Standard Enclosure	30"L x 24"H x 10"W (76.2cm x 61cm x 25.4cm), NEMA 4 (IP66) Steel
Weight	Approximately 120 lbs (54.43 kg)
Environment	Outdoors, -22°F to 150°F (-30°C to 65°C), RH 0 to 95% non-condensing)
Electro-mechanical Relay Outputs	Qty 1, 100VDC @ 10A
Electrical Input / Output Connections	Qty 3, quick connect/disconnect plugs and sockets
Pneumatic Input / Output Connections	1/2" & 1" NPT connectors

8.3 LJB

Enclosure	20"L x 20"H x 10"W (50.8cm x 50.8cm x 25.4cm), NEMA 4 (IP66) Steel.
Weight	Approximately 45 lbs (20.41 kg)
Environment	Outdoors, -22°F to 150°F (-30°C to 65°C), RH 0 to 95% non-condensing Electro-mechanical Relay
Outputs	Qty 5, 100VDC @ 10A
Electrical Input/Output Connections	Screw Terminal Block – 90 input/output screw terminals

8.4 Remote Display

Enclosure	2" x 5.5" x 9" Cast Aluminium
Weight	Approximately 2.8 lbs (1.27 kg)
Environment	Outdoors, -40°F to 158°F (-40°C to 70°C), RH 0 to 95% non-condensing

8.5 OCU (A010* Model)

Case Material	Cast Magnesium with high strength power-coat finish
Environment	Outdoors, -22° F to 122° F (-30° C to 50° C) RH 0 to 95% no-condensing Watertight NEMA 35 (IP65) (heavy rain, dust, oil resistant)
Weight	Approximately 4.5 lbs (2 kg) including battery
Size	Approximately 10" L x 3.5" W x 4.5" H (25.4 cm x 8.89 cm x 11.43 cm)
Battery	Industry standard 7.2 VDC Rechargeable Nickel Metal Hydride (Ni-MH) Battery Pack mounted externally to bottom of OCU
Battery Life	Ni-MH – approximately 12 hours continuous operation
Antenna	Externally mounted stubby whip antenna for optimum signal transmission
Frequency Range	VHF 220-222 MHz (FCC) 217-219 MHz (Industry Canada) or UHF 447-473 MHz

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Channel Spacing	UHF 12.5 kHz, VHF 12.5 kHz & 15 kHz
Emission/Modulation	UHF 9K00F1D ± 2.5 kHz deviation, VHF 8K50F1D ± 1.85 kHz deviation (12.5 kHz channel spacing), VHF 10K1F1D ± 2.66 kHz deviation (15 kHz channel spacing)
RF Transmit Power	UHF 500 mW, VHF 500 mW or 1 W (factory set)
Range	1 mile line-of-sight
Duty Cycle	2.5875%
Approvals	US FCC (Part 90) Industry Canada (RSS119)
Carrying Device	Tear away harness meeting FRA Safety Advisory 2001-01

8.6 OCU (OCU-III Model)

Case Material	Molded LEXAN™ EXL Enclosure
Environment	Outdoors, -22° F to 122° F (-30° C to 50° C) RH 0 to 95% no-condensing Watertight NEMA 35 (IP65)
Weight	Just under 3 lbs (1.3 kg)
Size	Approximately 10.5" x 4" x 3.5" (25.4 cm x 10.2 cm x 8.9 cm)
Battery Life	Approximately 12 hours of continuous operation with rechargeable Li-Ion battery.
Antenna	Internal
Frequency Range	VHF 217-219 MHz, 220-222 MHz or UHF 447-473 MHz
Channel Spacing	UHF 12.5 kHz, VHF 12.5 kHz
Emission/Modulation	UHF 9K00F1D ± 2.5 kHz deviation, VHF 8K50F1D ± 1.85 kHz deviation (12.5 kHz channel spacing)
RF Transmit Power	2 W
Range	1 mile line-of-sight
Duty Cycle	2.5875%
Approvals	US FCC (Part 90) Industry Canada (RSS119)
Carrying Device	Tear away harness meeting FRA Safety Advisory 2001-01

Note: As part of our continuous improvement policy, Laird reserves the right to change specifications without notice.