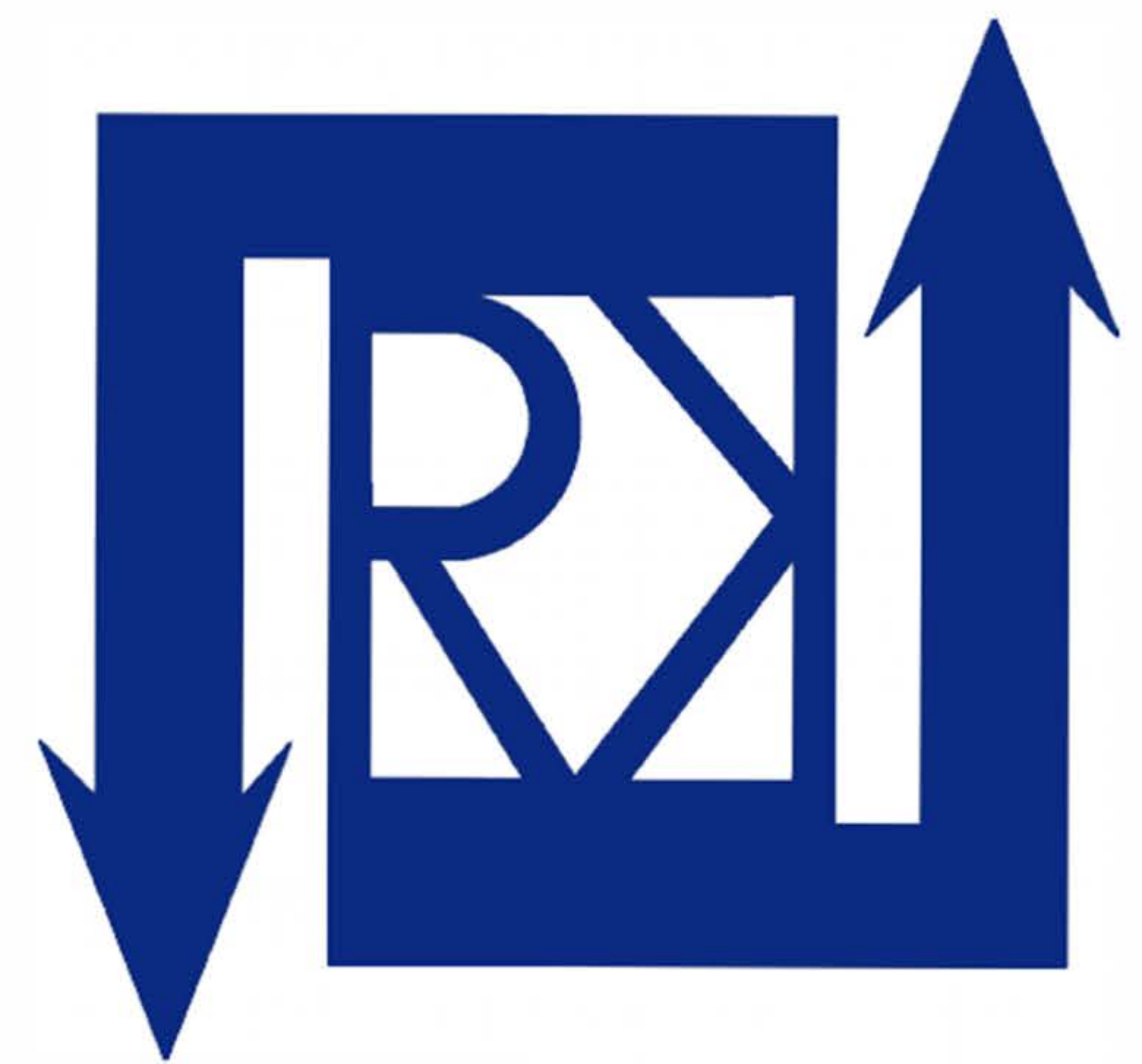




# RK-500

Track Circuit



Rajman Kabir Engineering  
Co.

[www.rajmankabir.com](http://www.rajmankabir.com)

021-22924203

## RK-500 Track Circuit

The RK-500 is a jointless audio frequency Track circuit that is used to detect the presence or absence of a train and rail fracture. As well as providing safe train detection, RK-500 can be also used to transmit data to the train in an occupied section. This data is fed to the transmitter via a serial link that provides ATP-encoded data. The track circuit operates in a frequency range 5 KHz to 9 KHz and is able to modulate carrier at rates up to 100Hz.

This system has 8 operating frequencies. This system includes indoor and outdoor equipment. The indoor equipment includes the transmitter, receiver, relay, matching unit, and power supply. The outdoor equipment includes Tuning unit, Loop feed unit, Impedance Bond, and Z bond.

### RK-500 TRACK CIRCUIT SPECIFICATION:

Supply Voltage: 24V-DC

Carrier Frequency: 5700Hz-8100Hz

Track circuit Length: 50m-500m

Traction: AC and DC

Transmitter max Output Power: 200W

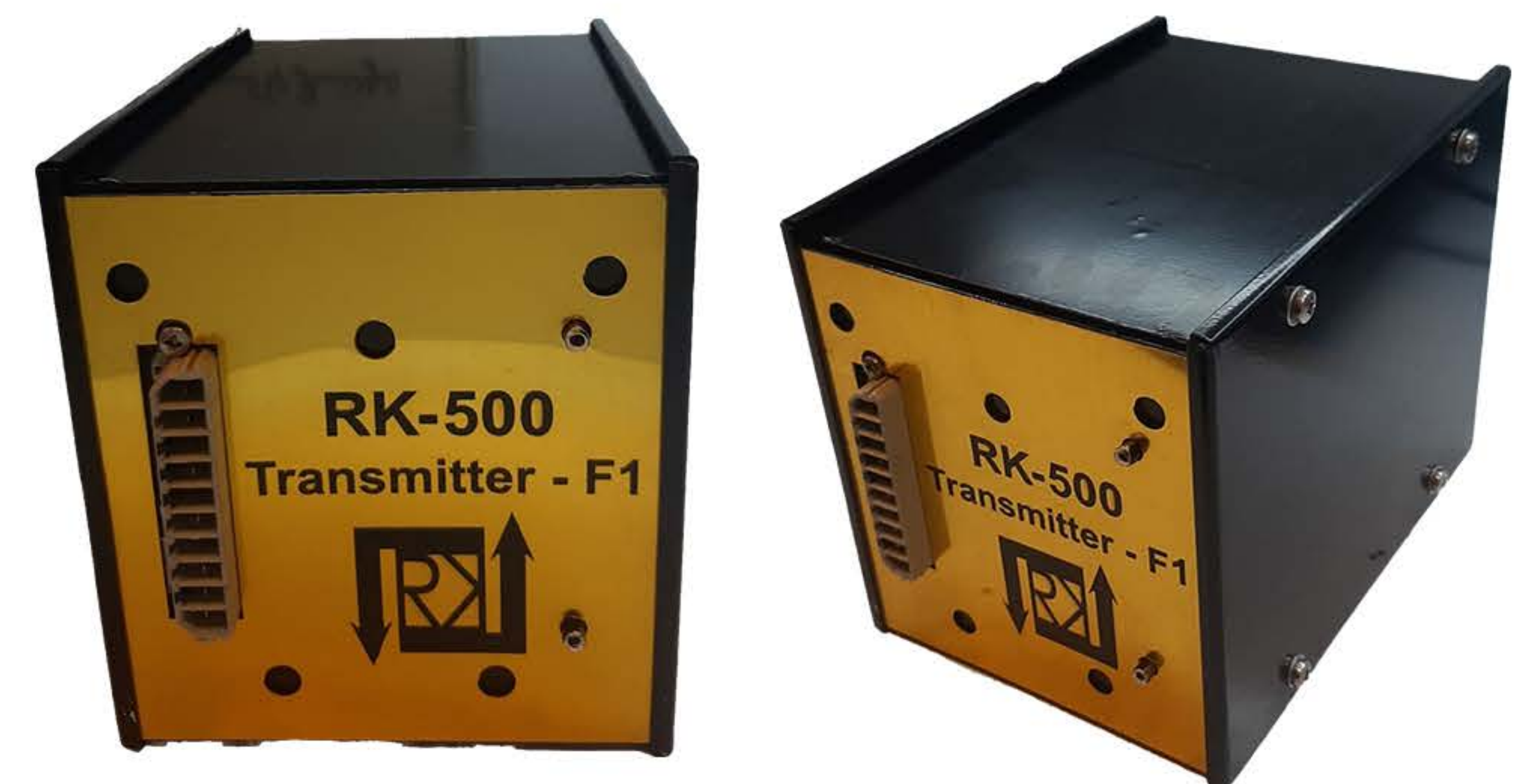
#### RK-500 Transmitter:

The transmitter generates a signal and sends it to the line. The generated signal is sent to the receiver by line equipment. The performance of the transmitter is based on FSK modulation. The transmitter has 2 modes:

- 1-Train detection mode
- 2-Data transmission mode

Normally the transmitter is in the train detection mode. When a transmitter detects the absence of track to train data from the interlocking, it generates modulation for train detection purposes at a specific frequency.

When the data is received from the interlocking the transmitter is in the data transmission mode.



#### RK-500 Receiver:

The receiver receives the signal sent to the line by the transmitter and thus detects the presence or absence of the train on the line. Filtering, demodulation, amplification, and excitation of the relay take place in the receiver. The RK-500 system uses relays to indicate the clearance or occupation of the track, as well as switching the transmit to the receive end of the track circuit.



#### RK-500 TUNING UNIT:

The track circuit is of the jointless type, electrical separation between track circuits is provided by the tuned areas of the track. Each Electrical Separation Joint (ESJ) is associated with 2 track circuit frequencies. The tuned area comprises a Z-bond and Tuning Unit (TU). There is a different TU for each frequency. TU consists of passive components. The tuning unit presents a low impedance across the rails in the frequency of the adjacent track circuit, and at nominal frequency shows high impedance and passes the signal related to the relevant track.



Track F2

Track F1

Track F2

### RK-500 MATCHING UNIT:

A matching unit (MU) is installed between the Tuning Unit and either the transmitter or receiver. The output of MU, thus the track circuit launch voltage can be adjusted by means of straps fitted to the connectors on the front of the unit.

### RK-500 IMPEDANCE BOND:

An Impedance Bond is an electrical component made of an iron core coil of low resistance and relatively high reactance. Traction return shall be provided by Impedance Bond and rail. The bonds are filled with oil or resin to provide moisture and corrosion protection, helping to cool the Bond.

### RK-500 LOOP FEED UNIT:

The loop feed unit is used to couple a signal from a transmitter into a loop of cable attached to the rail for the purpose of enabling track-to-train communication where it is impractical to use the track circuit as a carrier. One LFU is available which can operate at all RK-500 frequencies.

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