

Part 2. Technician's Manual

Chapter 1 General Characteristic

1 – 1 General Specifications

- Operation Frequency----- : 433.05 ~ 434.79MHz (set by software)
- Hamming Distance ----- : ≥ 4
- I.D. Code----- : More than 2^{32} sets (set by factory, never repeated)
- Temperature Range----- : -20℃ ~ +65℃
- Channel Spacing----- : 12.5KC
- Maximum Operation Range----- : Up to 100 Meters
- Structure----- : glass-fiber
- Protection Degree----- : IP 65

1 – 2 Transmitter Specifications

- Power Supply----- : Four 1.5volts Alkaline or Rechargeable Batteries (AA Size)
- RF Power----- : < 7.85 mW (3m)
- Modulation----- : $\leq \pm 2.5\text{KHz}$; NBFM
- Pushbutton Type----- : Two step mechanical switch
- Dimensions----- : 186x61x51mm (LxWxH)
- Weight----- : about 360g (including batteries)

1 – 3 Receiver Specifications

- Power Supply----- : 48/110VAC (50/60Hz),
 $\pm 10\%$
- Sensitivity----- : -110dBm (Data Error Rate < 10^{-3})
- Harmonic Ratio----- : $\leq 65\text{dB}$
- Output Relays----- : 10A/250VAC; 8A/30VDC
- Dimensions----- : 200x162x107mm (LxWxH)
- Weight----- : about 1640g(excluding wire cable)

Model: F21-6D

FCC ID: LWNF21-6D

Chapter 2. System Configuration

2-1 Transmitter Unit

Transmitter unit consists of Encoder Module and Transmitter RF Module, for transmitting "control data" to the receiver for remote control applications.

2-1-1 Encoder Module:

A micro control unit (MCU) is used for the main processing, MCU reads the pushbutton data and combines with the ID Code, Hamming Code, and Function Setting. After producing control data by encoding, it generates TXFSK signal to transmitter's RF module via FSK circuit.

2-1-2 Transmitter RF Module:

The sequence of RF module is shown as follows: Encoder → TXFSK → modulates a RF carrier → amplification → antenna.

This RF Module uses Phase Locked Loop (PLL), Voltage Controlled Oscillator (V.C.O.) with lowest side-band noise, SMT advanced technologies. It has power-saving, high efficiency, high reliability and low harmonic NBFM transmitting circuit.

2-1-3 Parts Name and Illustration

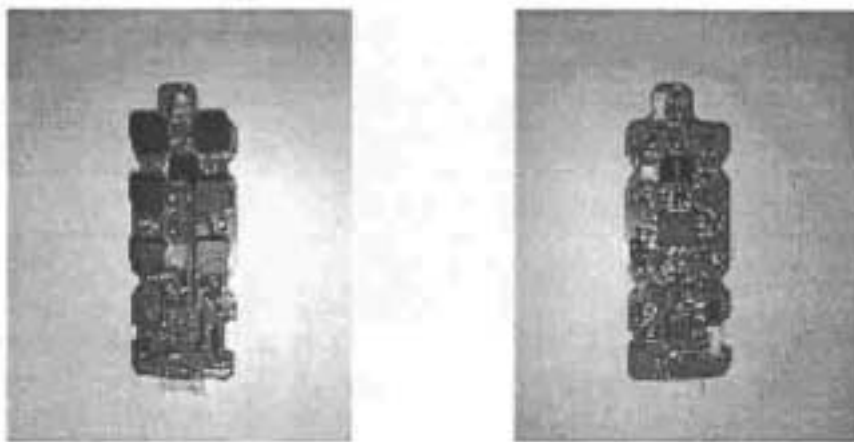


Figure 2-1-1 Encoder Module SU-0326



Figure 2-1-2 Transmitter RF Module LR-9359

2-2 Receiver Unit

Receiver unit consists of Receiver/Decoder Module and Relay Module. This unit receives the control data from the transmitter, decodes the data, generates control command, and drives relay circuit to control the motions of cranes (or the lifting machine).

2-2-1 Receiver/Decoder Module:

This module consists of Receiver /Decoder Module, LED Board, SQ Lamp Board, high frequency receiver circuit and micro control unit. Its main functions are to receive RF signal from transmitter, to detect and correct the received data message, to decode and to send commands to the relay module. This module has high-receiving gain, high-signal selectivity, high-image rejection rate, and low-noise figure. In addition, this module uses special design of "Diversity Reception" and "Frequency Deviation Direction Indicator" (FDDI) to eliminate communication dead spot and the adverse effect of environmental change, such as temperature.

2-2-2 Relay Module:

This module receive and process control commands to drive corresponding relay in order to control the motion of cranes (or the lifting machine). The operation safety is especially important. This module consists of relay contact jammed-detection circuit, relay coil test circuit, relay operating voltage test circuit, and the protection circuit for micro control unit, to ensure operation safety.

2-2-3 Parts Name and Illustration



Figure 2-2-1 "Receiver/Decoder" Module SU-0208

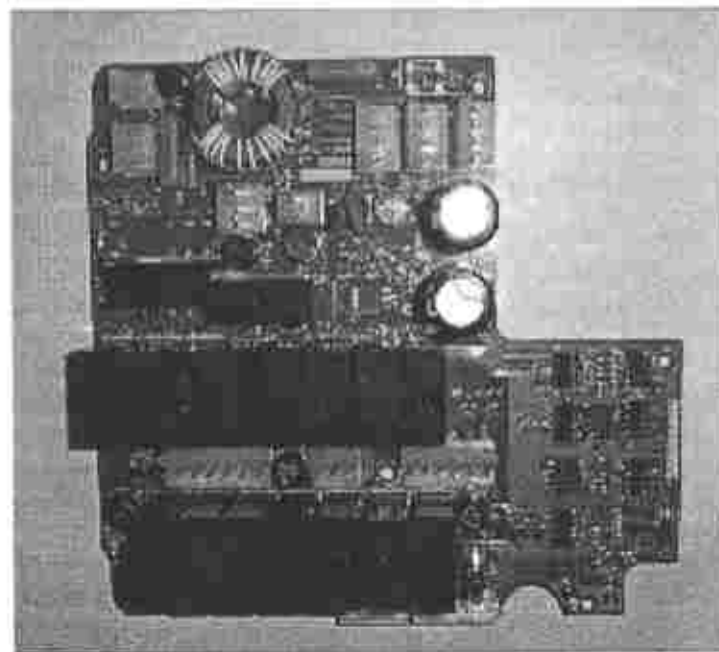
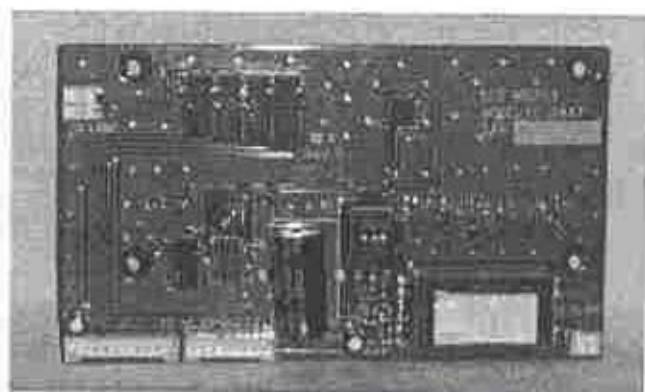


Figure 2-2-2 Relay Module CL-0438



LED Board



SQ Lamp Board