‘102 SERIES RADIO / IR ENCODER TRANSMITTERS

- Highly Secure KEELOQ CODE HOPPING Protocol
- QM, FM or Infra Red
- Frequency Options; 315, 433, 915MHz
- LED Indication Of Transmission
- 1,2 or 4 Switch Versions Expandable To 15
- Power Saving Auto Shut Off Feature
- Automatically Transmits Battery Low Condition
- IP40 Rated Enclosure
- User Customisable Overlay
- Board Level Programmable
- 315MHz versions FCC Compliant
- 433MHz versions EMC Compliant



The RF Solutions 102 range of transmitter encoders are available as either FM, FMNB radio or Infra Red.

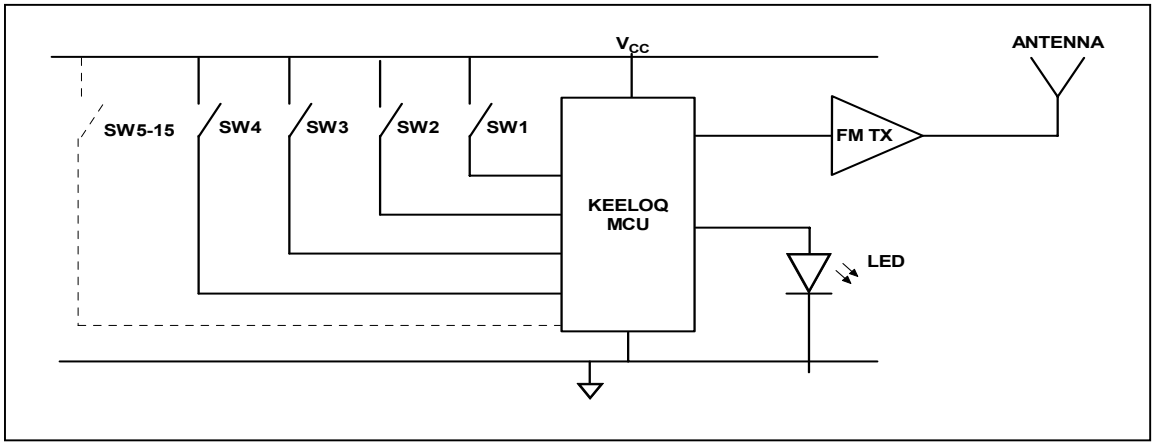
The encoders use the KEELOQ encryption algorithm providing the worlds most advanced high security protocol. Each encoder may be used with one of RF Solutions decoders, or with one of the KEELOQ decoder I/C’s.

Alternatively, the user may decode the KEELOQ algorithm and embed within a PIC Microcontrolller . (Please see datasheet DS600).

When paired with one of the KEELOQ Rx decoder boards, a complete high security “code hopping” remote control system may be achieved. The transmitter is supplied as a complete product with battery ready to operate (PP3). Each encoder can be board level programmed with a specific manufacturer’s ID code if required

Custom solutions may also be supplied unique to customer specific requirements. Please contact RF Solutions for further information.

Block Diagram



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Low Battery
When the unit measures a low battery voltage level, the data transmitted includes a 'Low battery' status flag to the receiver decoder.

Power Supply
The circuit has been designed to operate from a single PP3 battery supply. This will provide in excess of 1,000,000 transmissions.
Note: reverse voltage polarity connection may cause damage to the circuit.

License Exemption (Radio Transmitters)
Europe: The transmitter encoders use ECM compliant radio transmitter modules and complies with ETSI330-220 and ETSI300-683.

USA: This device complies with part 15 of the FCC Rules.
Operation is subject to the following two conditions:
1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation."

KEELOQ Protocol Configuration
Each encoder is supplied ready programmed with a unique random serial number. The decoder has the ability to memorise this serial number using a simple learn procedure (please see decoder datasheet).

How does KEELOQ technology work?
KEELOQ is based on a code hopping algorithm which provides Rock Solid Security. KEELOQ uses a programmable 64-bit encryption key that is unique to each device to generate 32-bit hopping code. The key length and hopping code combination reduces the possibility of unwanted access, due to code grabbing and code scanning, to essentially zero. Such CIA-like levels of security are desirable, but many manufacturers would expect them to be cost-prohibitive. KEELOQ offers the solution for affordable, Rock Solid Security that is the future of technology for the cars, homes and offices we wish to protect.

Adding Additional Switches
Additional switches may be added through Connector J1. The four connections of J1-1, 2, 3, & 4 represent the four input lines to the HCS360 encoder device. These may be connected to a binary coded decimal (bcd) input to obtain 1 of 16 states. Connection J1-6 is connected to V_{CC}.

Absolute Maximum Ratings
Supply Voltage (V_{CC} to GND)	+5.5 to +15.8 Volts
Storage Temperature	-10°C to +70°C
Operating Temperature	0°C to +55°C
Dimensions	110mm x 65mm x 24mm

Electrical Characteristics	Min	Typical	Max	Dimension
Supply Voltage	8	9	12	V
Supply Current	11	14	21	mA
Frequency 315MHz FM 433MHz QM / FM Wideband 433MHz FM Narrow band 915MHz Narrow band	 434.050 914.50	 315.00 433.92 434.075 914.50	 434.100 914.50	MHz
RF Output Power (ERP) @ 433 MHz	-		10	mW

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'FM102' QM Series Encoders (Red Transmit LED)

Part Number	Description	Freq (MHz)	Range** (Metres)	Compatible Decoders
102C1-433QR1	QM Encoder 1 Sw	433.92	150	FM-001B-433 FM-0011-433 FM-008C4B-433 U105C4A-433
102C2-433QR1	QM Encoder 2 Sw	433.92	150	
102C4-433QR1	QM Encoder 4 Sw	433.92	150	

'FM102' FM Series Encoders (Yellow Transmit LED)

Part Number	Description	Freq (MHz)	Range** (Metres)	Compatible Decoders
102C1-315FR1	FM Encoder 1 Sw	315	200	008-315FR1
102C2-315FR1	FM Encoder 2 Sw	315	200	
102C4-315FR1	FM Encoder 4 Sw	315	200	
102C1-433FR1	FM Encoder 1 Sw	433.92	200	001-433FR1 0011-433FR1 008-433FR4 009-433FR2 105-433FR2
102C2-433FR1	FM Encoder 2 Sw	433.92	200	
102C4-433FR1	FM Encoder 4 Sw	433.92	200	

'FM102' Narrow Band Series Encoders (Red Transmit LED)

Part Number	Description	Freq (MHz)	Range** (Metres)	Compatible Decoders
102C1-433NBFR2	FM Narrow Band Enc 1 Sw	434.075	1,000	105C4-433NBFR2
102C2-433NBFR2	FM Narrow Band Enc 2 Sw	434.075	1,000	
102C4-433NBFR2	FM Narrow Band Enc 4 Sw	434.075	1,000	

'IR102' Series Infra-Red Encoders (Red Transmit LED)

Part Number	Description	Range** (Metres)	Compatible Decoders
102C1-IR2	Infra Red Encoder 1 Sw	20	IR-105C4A
102C1-IR2	Infra Red Encoder 2 Sw	20	
102C1-IR2	Infra Red Encoder 4 Sw	20	

Should you require further assistance please contact

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В нашем ассортименте представлены ведущие мировые производители активных и пассивных электронных компонентов.

Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

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