



# 103 & 107 SERIES RADIO TRANSMITTER ENCODERS

- Highly Secure **KEELOQ** CODE HOPPING Protocol
- Frequency Options 433, 433NB, 458, 868MHz
- RF Power (ERP) From 0.25 To 500mW
- Range 100m To 6Km
- Led Indication of Transmission
- Directly Compatible With Keeloq Decoder
- Power Saving Auto Shut Off Feature
- Automatically Transmits Battery Low Condition.
- Range;
  - ⇒ 433MHz Upto 200 Metres
  - ⇒ 433NB Upto 1000 Metres
  - ⇒ 458MHz Upto 6,000 Metres

## 103 Series Encoders

- Aluminium IP65 Rated Enclosure
- Dimensions 164 x 82 x 32
- 4, 8 And 15 Switch Options
- Custom Membrane Option

## 107 Series Encoders

- Polypropylene IP65 Rated Enclosure
- Dimensions 250 x 90 x 45
- 4, 8 And 14 Switch Options
- Custom Membrane Option

The RF Solutions 103 and 107 series radio transmitter encoders may be supplied at one of several frequencies and with several different switch options.

Supplied in either a rugged aluminium or Polypropylene IP65 rated enclosures, these encoders are complete and ready to operate.

Power supply is by 2 x PP3 batteries.

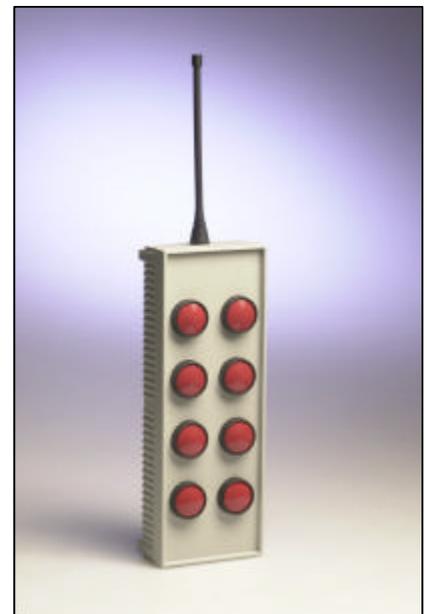
Each encoder may be used with one of RF Solutions decoders.

When paired with one of the RF Solutions Decoders, a complete high security "code hopping" remote control system may be achieved.

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



**103 Series**



**107 Series**



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## Operation

The Tx encoder transmits the KEELOQ code for as long as any push-button switch is depressed. Operation of the Tx encoder buttons will cause either a momentary or a latching action at the Rx decoder, depending on the configuration of the Rx decoder.

## Low Battery

When the unit measures a low battery voltage level, the transmit LED flashes during transmission, and the data transmitted includes a 'Low battery' status flag to the receiver decoder.

## Power Supply

The circuit has been designed to operate from 2 PP3 Batteries. Always use Alkaline for long battery life..  
**Note:** reverse voltage polarity connection will cause damage to the circuit.

## Antenna

An external ¼wave flexi antenna is supplied with this product. This has been optimised to provide maximum range.

## License Exemption

The transmitter encoders use ECM compliant radio transmitter modules and comply with ETSI330-220.

## KEELOQ Protocol Configuration

All devices are supplied with a RF Solutions manufacturers ID, directly compatible for use with RF Solutions decoders.

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.

## Programming the manufacturers ID / Custom Protocol Configuration

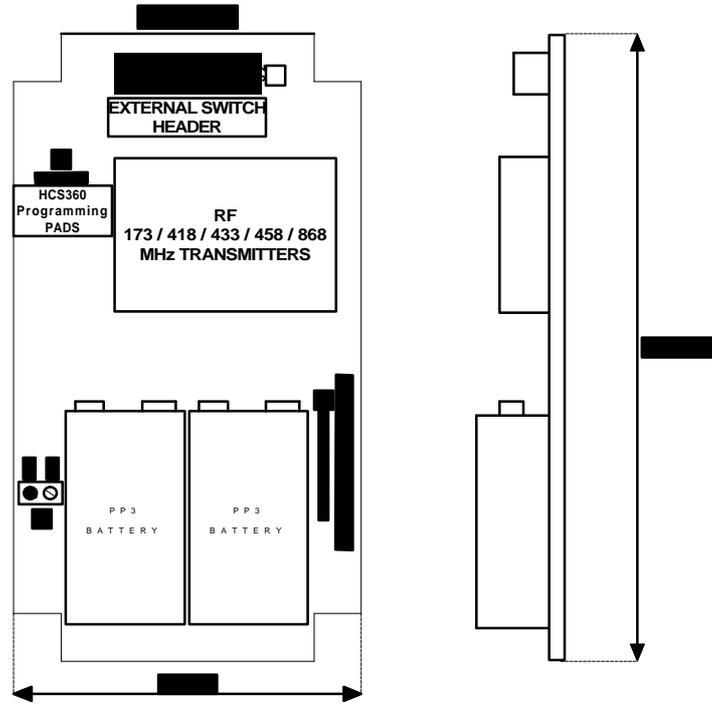
Access to the to the HCS360 KEELOQ encoder is through the connector J8.

For supply of custom programmed product please see the form 'KEELOQ configuration template' this is the information we require in order to supply custom programmed devices.



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## PCB Mechanical Details



## Absolute Maximum Ratings

Supply Voltage ( $V_{CC}$ to GND)	+5.5 to +25 Volts
Storage Temperature	-25°C to +80°C
Operating Temperature	0°C to +55°C

ELECTRICAL CHARACTERISTICS	MIN	TYPICAL	MAX	DIMENSION
Supply Voltage	8	13	24	V
Supply Current :				MA
433MHz	11	18	25	MA
458MHz	150	180	220	MA
Frequency for Std 433MHz	432.90	433.920	434.100	MHz
Frequency for 433NB Unit	434.475	434.525	434.575	MHz
Frequency		458.850		MHz
RF Output Power (ERP) @ 433 MHz	-		10	mW
RF Output Power (ERP) @ 433NB	-		10	mW
RF Output Power (ERP) @ 458 MHz	-		500	mW

## License Exemption

The radios transmitters used have been designed to meet ETSI300-220, EN50081-1, EN50082-1 EMC directive and are DTI approved under MPT1329 for licence free use.



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## Ordering Information

### Standard 433MHz Series Encoders

Part Number	Description	Freq (MHz)	Range** (Metres)	Compatible Decoders
FM-103C4-433	FM Encoder 4 Sw	433.92	200	001 Series 008 Series U105C4A
FM-103C8-433	FM Encoder 8 Sw	433.92	200	
FM-103C15433	FM Encoder 15 Sw	433.92	200	

### 433MHz Narrow Band Series Encoders

Part Number	Description	Freq (MHz)	Range** (Metres)	Compatible Decoders
FM-103C4-433NB	FM Narrow Band Enc 4 Sw	434.525	1000	105C4A-433NB series
FM-103C8-433NB	FM Narrow Band Enc 8 Sw	434.525	1000	
FM-103C15-433NB	FM Narrow Band Enc 15 Sw	434.525	1000	

### 458MHz Series Encoders

Part Number	Description	Freq (MHz)	Range** (Metres)	Compatible Decoders
FM-103C4-458NB	FM Encoder 4 Sw	458.850	6000	105C4A-458F series
FM-103C8-458NB	FM Encoder 8 Sw	458.850	6000	
FM-103C15-458NB	FM Encoder 15 Sw	458.850	6000	

\*\* Range stated is optimum, direct line of sight. In worst conditions this can be reduced by upto 50%

Should you require further assistance please contact

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