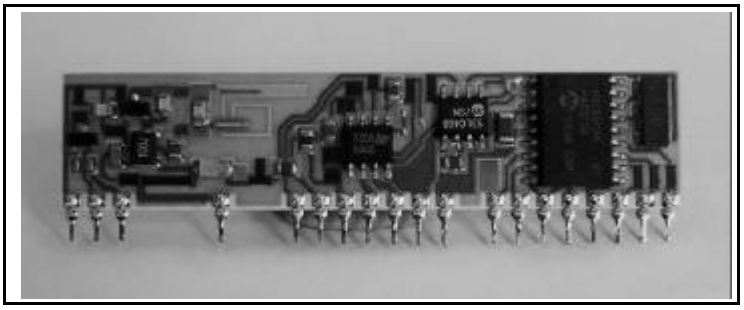
RS Order Codes : 262-2680, 262-2719, 262-2696, 262-2725

RF RECEIVER DECODER HYBRID RS VERSION AM-HIRX-XXXRS

FEATURES



- MINIATURE RF Rx/DECODER SYSTEM.
- ADVANCED LASER TRIMMED HYBRID
- RANGE UP TO 45 METRES
- EASY LEARN TRANSMITTER FEATURE.
- CMOS/TTL OUTPUTS, MOMENTARY OR LATCHING.
- DIRECT LED DRIVE DATA RECEPTION
- SINGLE SUPPLY 5V
- LOW POWER CONSUMPTION
- AVAILABLE AS 418 OR 433MHz
- COMPLIANT TO ETSI300-339
- REQUIRES NO RADIO LICENCE

APPLICATIONS

- GENERAL REMOTE CONTROL SYSTEMS.
- GARAGE DOOR OPENERS.
- CAR, CARAVAN, MOTORCYCLE ALARMS
- REMOTE SWITCHING.
- REMOTE GATES.
- PAGING.

DESCRIPTION

This miniature SIL hybrid module is a complete three channel RF Receiver/Decoder which can be used to generate a complete remote telemetry system.

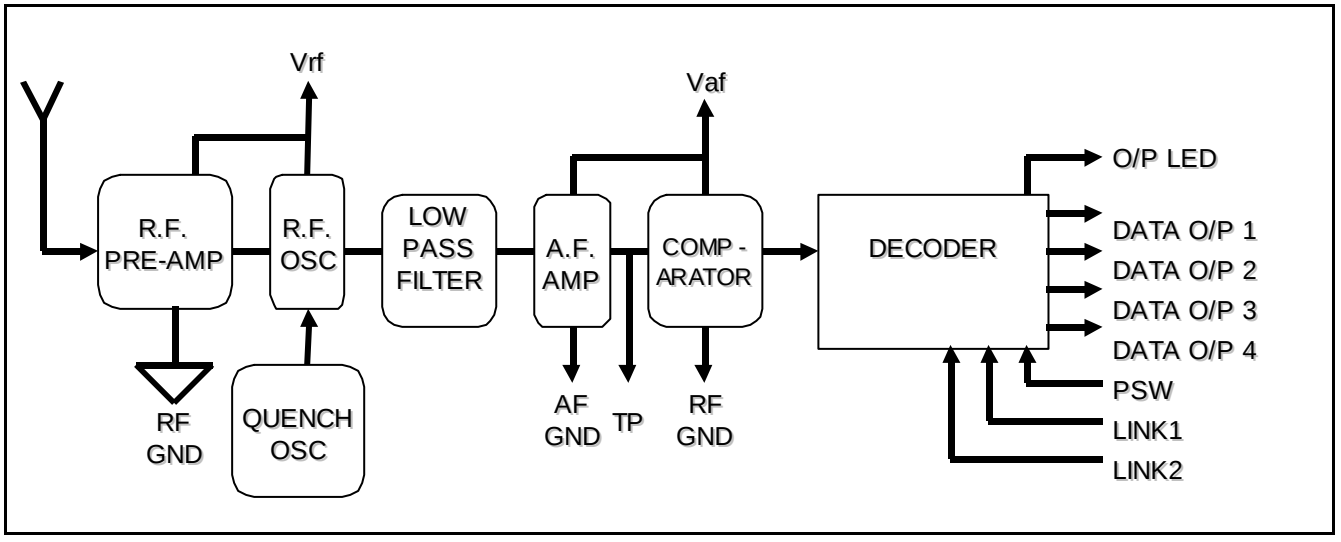
The module consists of a front end Super-regenerative receiver with an embedded controller providing all decoding functions.

The module shows a very high frequency stability thanks to a unique laser trimming process which has been patented to give a very accurate on board inductor removing the need for any moving components.

The decoder has an easy-to-use 'LEARN' facility to enable the user to program the decoder's outputs to correspond to a matching transmitter/encoder switch. Outputs may also be set to operate as momentary or latching via link 2.

It requires connections to the power supply, and provides four data outputs. The outputs may be programmed for momentary or latching configuration via a link input, a data reception direct LED drive is also provided

BLOCK DIAGRAM



TRANSMITTER / ENCODER PART NUMBERING

The HiRX is directly compatible with one of the following transmitter/ encoder keyfobs.

Part No	RS Order Code	Description
AM-TS1-418RS	226-3304	1 Switch (standard)
AM-TS2-418RS	226-3326	2 Switch (standard)
AM-TH1-418RS	226-3348	1 Switch (hopping)
AM-TH2-418RS	226-3354	2 Switch (hopping)
AM-TS1-433RS	250-0417	1 Switch (standard)
AM-TS2-433RS	250-0423	2 Switch (standard)
AM-TH1-433RS	250-0445	1 Switch (hopping)
AM-TH2-433RS	250-0451	2 Switch (hopping)

HYBRID MODULE PART NUMBERING

PART No	RS Order Code	DESCRIPTION
AM-HiRS-418RS	262-2680	AM Decoder - 1-3 Ch, Standard code
AM-HiRH-418RS	262-2696	AM Decoder - 1-3 Ch, Hopping Code
AM-HiRS-433RS	262-2719	AM Decoder - 1-3 Ch, Standard code
AM-HiRH-433RS	262-2725	AM Decoder - 1-3 Ch, Hopping Code

"STANDARD DATA FORMAT" DESCRIPTION (AM-HiRS)

The transmitter/encoders used in a standard system each have a unique signature code (pre-programmed at manufacture) from one in >16,000,000 combinations. Error checking techniques are also used to ensure data integrity.

These decoders are capable of learning 16 unique transmitter/Encoder signature codes.

"HOPPING DATA FORMAT" DESCRIPTION (AM-HiRH)

The transmitter/encoders used in a Code Hopping system each have a random number signature code, as in the standard format, and also transmit a unique signature code each time the switch is pressed. The number of possible codes is >16,000,000 combinations, the same code is never repeated, even if the batteries are changed.. Error checking techniques are also used to ensure data integrity.

These decoders are capable of learning 8 unique transmitter/Encoder signature codes.

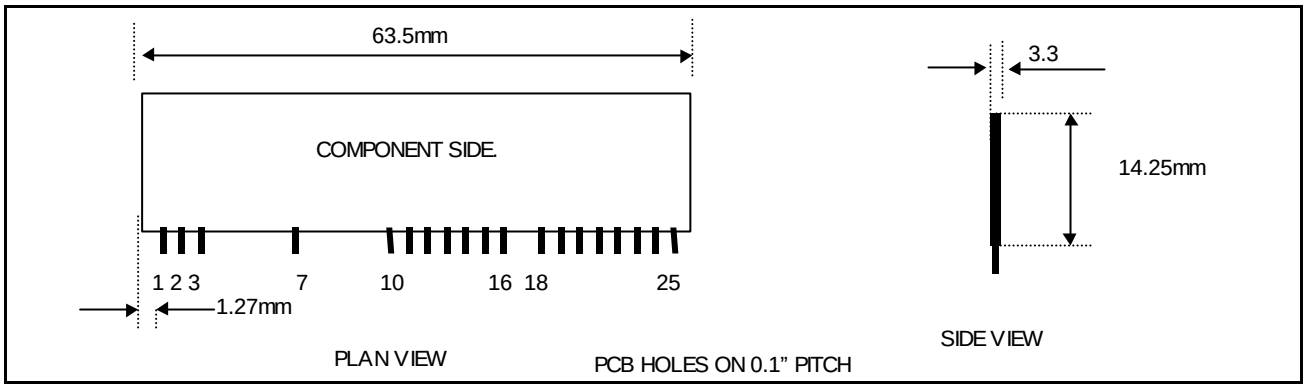
SYNCHRONISATION (Hopping Models only)

This equipment requires the transmitter and receiver to be synchronised. If the transmitter has been pressed more than 50 times outside the range of the receiver, the receiver will loose synchronisation with the transmitter. To re-synchronise:

Press the transmitter key for two seconds within range of the receiver,

Release the key momentarily, and press the key again.

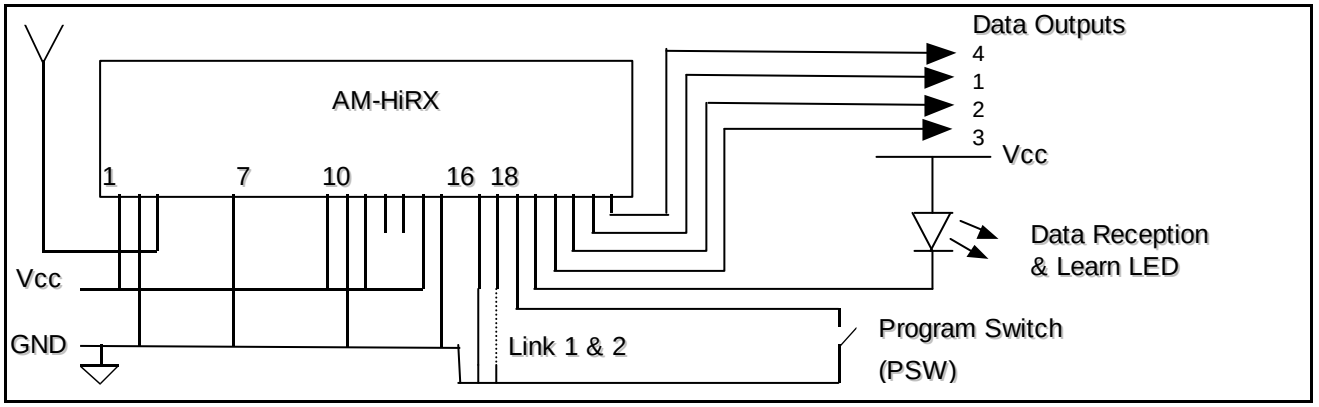
SIGNAL ALLOCATION



PIN DESCRIPTION

Pin No	*Name*	Description
1	***Vcc-RF***	+5V Supply Voltage
2	***GND-RF***	RF Ground
3	***ANT***	Connect Antenna to this input
7	***GND-RF***	RF Ground
10	***Vcc-AF***	+5V Supply Voltage
11	***GND-AF***	AF Ground
12	***Vcc-AF***	+5V Supply Voltage
13	***TP***	Test Point
14	***O/P-AF***	Data output from RF receiver (CMOS/TTL signal)
15	***Vcc-AF***	+5V Supply Voltage
16	***GND-AF***	AF Ground
18	***Link2***	Connect to GND to make Link, may be left O/C if not required
19	***Link1***	Connect to GND to make Link, MUST always be connected to GND
20	***PSW***	Programming Switch input, This is used when learning new transmitters.
21	***LED***	External LED sink output, can be connected directly to cathode of external LED. Connect Anode of the LED to +5V. Indicates Data reception, and programming status.
22	***O/P2***	Active Low data Output 2 (has a 220Ω series resistor)
23	***O/P3***	Active Low data Output 3 (has a 220Ω series resistor)
24	***O/P4***	Active Low data Output 4 (has a 220Ω series resistor)
25	***O/P1***	Active High data Output 1 (has a 220Ω series resistor)

APPLICATION CIRCUIT



LEARNING A NEW TRANSMITTER SWITCH

These decoders are capable of 'learning' the transmitter/Encoder signature code, and switch number.
The decoder allocates the transmitter/encoder switch against the chosen output. The decoder has a maximum memory capacity of learning up to eight switches. These may be from a single or many different encoders and be allocated to a single output on the decoder or a combination of all the outputs.

To learn a new transmitter switch follow these procedures;

1. Firstly determine which switch on the encoder and which output channel on the decoder you wish to allocate to each other.
2. In order to select the appropriate decoder output channel, the user must step through the outputs until the desired channel is selected (these may be 1, through 4).
3. Each time the decoders programming switch (PSW) is briefly pressed and released, the LED will flash a number of times to indicate which channel is currently selected.
4. If the desired channel is overstepped or missed, simply wait for 5 seconds and the decoder will start from channel 1 again, or step right through the outputs, and the decoder will automatically return to channel 1.
5. Note that after flashing 4 times to select channel 4, the decoder flashes 9 times. This is normal and is detailed below in the "Erase memory" section.
6. To enter "Programming mode" the user must hold down the programming switch whilst the desired channel (indicated by the appropriate number of flashes) is currently selected. After flashing the required number of flashes, the LED will go out for approx. 4 seconds and then illuminate. The decoder is now in learn mode. (Keep the programming switch depressed)
7. Depress the transmitter once, LED on the decoder will flash. (PSW is still depressed).
8. Wait for LED to stop flashing.
9. Depress the transmitter again, LED will turn off. (PSW is still depressed).
10. Release the programming switch (PSW).
11. The decoder has now learnt the encoder switch and will now operate the system.

Note:

1. Do not teach the same switch to more than one output of the same decoder!
2. These decoder modules are for use only with the RS range of encoders.

ERASING the Decoder Module Memory.

To completely erase the transmitters signature code form the decoder's memory;

1. Press the programming switch (PSW) briefly. (The LED will flash once).
2. Press the programming switch (PSW) again briefly. (The LED will flash twice).
3. Press the programming switch (PSW) again briefly. (The LED will flash three times).
4. Press the programming switch (PSW) again briefly. (The LED will flash four times).
5. Press the programming switch (PSW) and hold. (The LED will flash nine times, go out for several seconds then illuminate again.
6. The programming switch (PSW) may be released. (When the LED goes out, the decoder memory is erased)

ANTENNA DESIGN

For 99% of applications a 16.5cm piece of wire is quite adequate. The range achieved from the system is dependant on the choice and position of the antenna. The space around the antenna is as important as the antenna itself. The optimum position is to locate the antenna so that is protrudes directly out the top of the transmitter box. If this is not possible due to other design constraints, try to keep the antenna away from other metal in the system such as transformers, batteries and PCB tracks, especially ground planes. In particular, the 'HOT' end of the antenna should be kept as far away as possible from these.

For further information on Antenna design please see our full product catalogue.

DATA OUTPUTS

Outputs 1,2,3 & 4 are digital CMOS/TTL with a series 220 Ω protection resistor.
The outputs are configured by Link 2

Link 1	Link 2	O/P1	O/P2	O/P3	O/P4
Connected	Open	Latch	Latch	Mom	Mom
Connected	Connected	Mom	Mom	Mom	Mom

Note : The Links status is read ONLY at power-up. After changing either link position, remember to remove and re-apply the power.

ABSOLUTE MAXIMUM RATINGS

Supply Voltage (+5Vcc to GND).....-0.3 to + 6 Volts.
Storage Temperature.....-30 to +85° Celsius.
Operating Temperature..... 0 to +70° Celsius.

TECHNICAL SPECIFICATION

Ambient temperature = 25° Celsius.

ELECTRICAL CHARACTERISTICS	MIN	TYPICAL	MAX	DIMENSION	NOTE
Supply Voltage	4.5	5.0	5.5	V	
Supply Current (quiescent)		8	10	mA	
Working Frequency	200		450	MHz	Specific Freq available on request
Tuning Tolerance		+/- 0.2	+/- 0.5	MHz	
-3dB Bandwidth		+/- 2	+/- 3	MHz	
R.F Sensitivity (100% AM)	-100	-105		dBm	
Level of Emitted Spectrum		-65	-60	dBm	
Data output: (any data output)					
Logic Low	0	0.2	0.8	V	I out = 10mA
Logic High	3.5	3.8	5	V	I out = 10mA
Data output: (any data output)					
Logic Low			-25	mA	
Logic High			20	mA	
EMC Compliance	Complies to ETS300-339				

For more information or general enquiries, please call;

R F Solutions Ltd.,

Unit 21, Cliffe Industrial Estate,

South Street,

Lewes,

E. Sussex. BN8 6JL, England

Email : sales@rfsolutions.co.uk

http://rfsolutions.co.uk

Tel: +44 (0)1273 898 000 Fax: +44 (0)1273 480 661

RF Solutions is a member of the Low Power Radio Association.