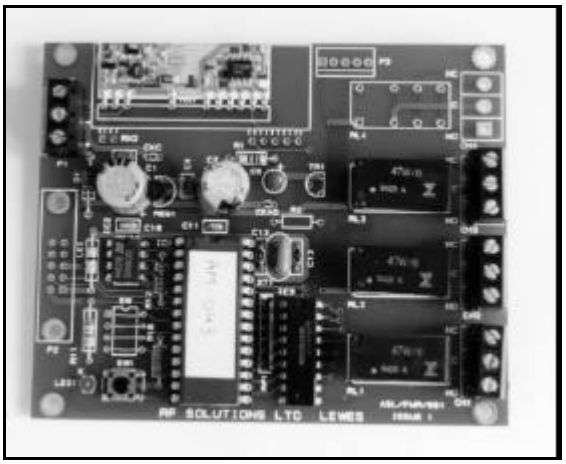
FARNELL ORDER CODE : 522 454
522 478

AM RECEIVER DECODERS, 3 RELAY O/P'S.

FEATURES

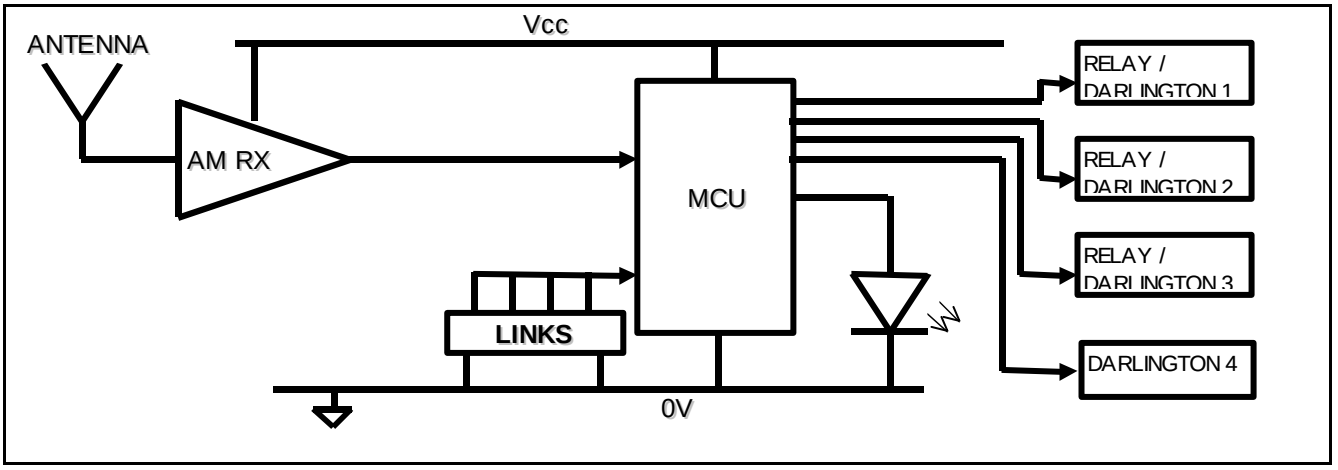


- COMPLETE DECODER/RECEIVER BOARD ASSEMBLY.
- OPTIONAL "CODE HOPPING" VERSION FOR HIGH SECURITY.
- USES HIGH ACCURACY HYBRID AM RECEIVER.
- AVAILABLE AS STANDARD EUROPEAN & US FREQUENCIES (224.5, 315, 418, 433.9MHz)
- LOW POWER.
- WIDE SUPPLY VOLTAGE: 9 - 16 VOLTS.
- 4 X DARLINGTON OPEN COLLECTOR AND 3 X RELAY OUTPUTS.
- DIRECTLY COMPATIBLE WITH R.F. SOLUTIONS AM TRANSMITTERS.

DESCRIPTION

The R.F. Solutions AM-DS3-XXX and AM-DH3-XXX are compact modular receiver/decoder boards containing an AM hybrid Receiver coupled to a microprocessor, which is used to capture and decode R.F. Data from the RF Solutions Transmitters (see AM Transmitters data sheet).
The standard version denoted with "S" is capable of being matched with any standard transmitter which transmits a random number from one in over 16,000,000 combinations.
The hopping version denoted with "H" is capable of being matched with any hopping transmitter which transmits a random number from one in over 16,000,000 combinations, each and every time the key is pressed on the transmitter. Once a code sequence has been transmitted, it will never be used again. This offers a very high security and high integrity communication link.
The Standard Decoder board can "learn" up to 16 different Transmitter/Encoders with its non-volatile memory. The Hopping Decoder board can "learn" up to 8 different Transmitter/Encoders. Relay outputs for each of the identified channels are configured by links on the PCB, to provide momentary or toggle action. Darlington open collector outputs are also provided for high current digital drive.
Both 418MHz and 433MHz versions are available "off the shelf", however operating frequencies, from 250-450MHz are available by special request, (this will depend on the application and country of use).
Custom Solutions to specific customer requirements are available. Please contact RF Solutions for further information.

BLOCK DIAGRAM



FUNCTIONAL DESCRIPTION

This decoder uses a hybrid super-regenerative data receiver module to capture the transmitted signal. The signal is then passed to the on-board microcontroller to be decoded. The microcontroller triggers the relay outputs according to the link configuration which is set by the user. The Darlington open collector outputs operate for pre-set time periods only, regardless of the link settings

RELAY OPERATION

The four links situated just above the programming SW1, are numbered to correspond to the four relay circuits. For this board only links 1,2,&3 are applicable. If a link is "made", the corresponding relay will work in toggle mode, otherwise it will work in momentary mode. In toggle mode, each activation of the transmitter will cause the relay to change state. In momentary mode, the relays are normally de-energised, but will be energised for the duration of the transmitter keypress.
All four relays have the same connection configuration. Each relay has two sets of contacts and each set of contacts has three connections; Common, Normally Closed, Normally Open

P2 CONNECTOR

For manufacturing use only

DARLINGTON OUTPUTS (output connector "P3")

Pin 1 (the leftmost pin, next to the RF module) on the Molex connector P3 supplies Vcc out via a silicon diode. Pins 2 to 5 (left to right) carry the Darlington open collector output signals for channels 1 to 4 respectively.
When a channel is activated, the corresponding Darlington open collector output will switch to ground for the following time periods:

Keyfob Switch	Channel No.	Period (sec)
RH	1	5
LH	2	10
EITHER	3	30

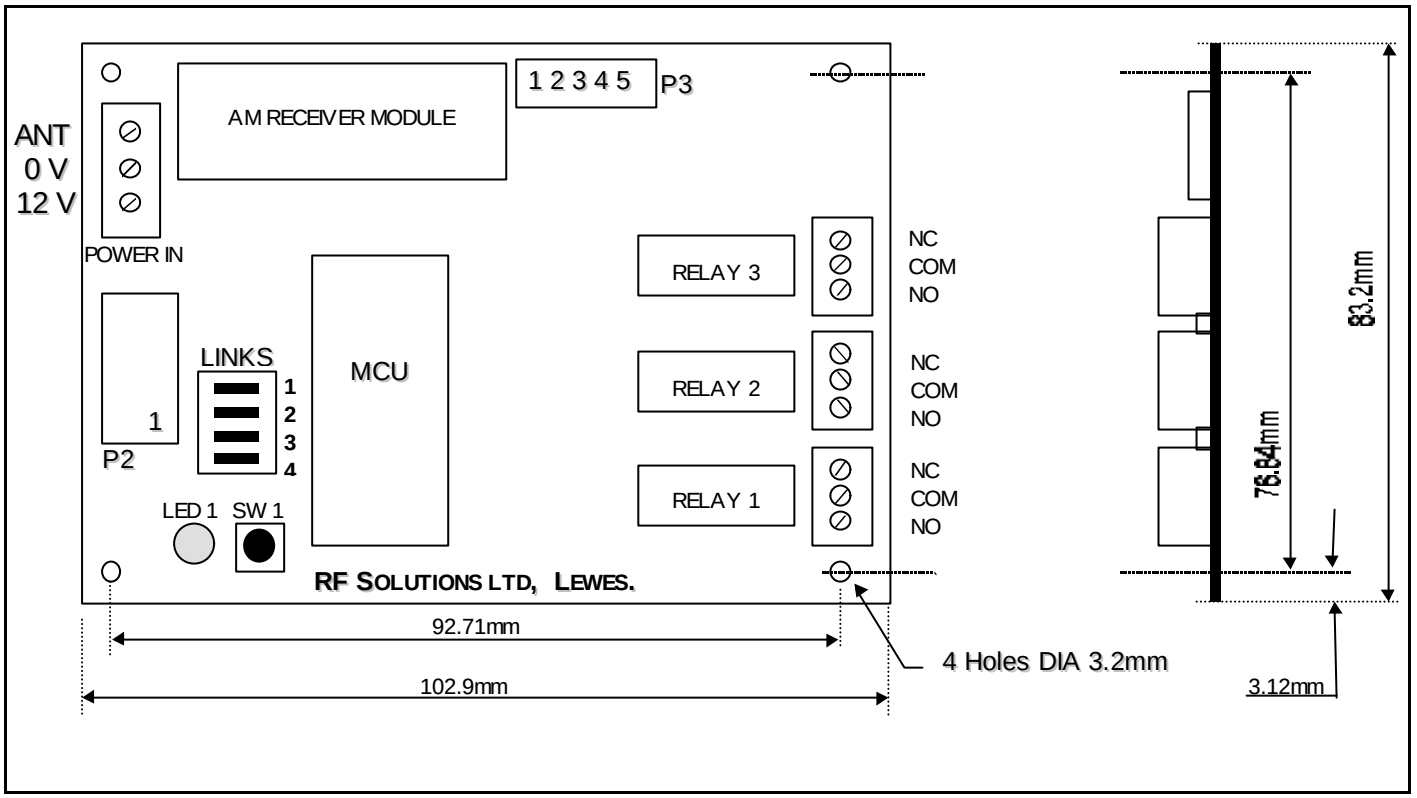
Note : When used with a one button transmitter Channel 1 is activated.

During the activation period, a further operation of that channel from the transmitter will cancel the activation (i.e. toggling is possible during the activation period).

ANTENNA DESIGN

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. We recommend a single whip antenna measuring 16.5cm. (a piece of wire is fine).
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 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.

MECHANICAL DETAILS



CONNECTION DETAILS

ANT	:	Connect to antenna.
0V	:	Connect to GND.
+12V	:	Connect to the positive of a 9 - 16 Volt DC power supply.

LEARNING NEW TRANSMITTERS

1. Hold down the programming switch on the Decoder board (SW1) throughout the following operations. The LED will light.
2. Depress any transmitter key once. The Decoder board LED will start a rapid flash, unless the transmitter is one which has previously been learnt, in which case the LED will go out (if this is the case, release the programming switch and start again with a different transmitter).
3. Wait 3 seconds. The LED will light continuously.
4. Press the transmitter button again. If the transmitter has now been learnt successfully, the LED will go out (otherwise it will start a slow flash, and the programming sequence should be re-started).
5. Release the programming switch.
6. The transmitter will now operate the system.

TO ERASE ALL TRANSMITTERS FROM MEMORY

Press the programming button 5 times in rapid succession until the LED lights continuously for about 3 seconds. All transmitters have then been erased from the decoder's memory.

ABSOLUTE MAXIMUM RATINGS

Supply Voltage (Vcc to GND).....-0.3 to +18Volts.
Storage Temperature.....-10 to +70°Celcius.
Operating Temperature.....0 to +55°Celcius.

TECHNICAL SPECIFICATION

Ambient temperature = 25°Celcius.
Supply Voltage Vcc = 12.0 Volts.

ELECTRICAL CHARACTERISTICS	MIN	TYPICAL	MAX	DIMENSION
Operating Temperature Range	0		70	°C
Supply Voltage	9	12.0	16.0	V
Supply Current (quiescent)		10		mA
Supply Current (operating 1 relay)		60	75	mA
Supply Current (operating 2 relays)		90	110	mA
Supply Current (operating 3 relays)		125	150	mA
Working Frequency	200		450	MHz
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
Digital Data output				
Open Collector Output Current			500	mA
Open Collector Output Voltage			Vcc	
Relay Rating (@ 50 V DC)			1	A

ORDERING INFORMATION		
PART No	**DESCRIPTION**	**F.E.C.**
AM-DS3-418	Standard Decoder Board, 3 channel.418MHz	522-454
AM-DS3-433	Standard Decoder Board, 3 channel.433MHz	917-310
AM-DH3-418	Hopping Decoder Board, 3 channel.418MHz	522-478
AM-DH3-433	Hopping Decoder Board, 3 channel.433MHz	917-333

Should you require further assistance, please call;

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