

## Latest Products from...

### Hand Held Transmitters



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## DIN Rail Remote Control

### 205 Series Hand Held Transmitters




A range of rugged radio transmitters for use with any of the 200 series receivers. Each transmitter is supplied with a rugged outer rubber boot and is IP65.

- Battery Type 2 x AAA (not supplied)

Mfrs. Number	Description	Range (M)	Freq (MHz)	Compatible Decoders
205C8-525N	FM Narrowband (NB) Transmitter 8 Switch	600	434.525	210-525N
205C16-525N	FM NB Transmitter 8/16 Switch	600	434.525	210-525N

419162

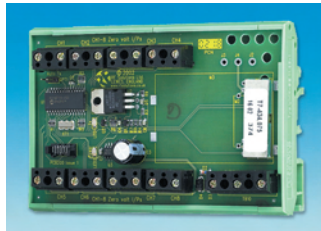
Transmitters	Order Code	Price Each		
		1+	5+	10+
205C8-525N	<b>109-6124</b>	122.29	116.62	112.28
205C16-525N	<b>109-6125</b>	303.06	290.38	279.61



## Spectrum Analysers

Turn to page 1415 for our range

### DIN Rail Transmitter Encoder 200 Series



This is an easy-to-use, radio transmitter module, which can accept 8 pairs of 'Volt free' contacts as inputs via screw terminals. When a contact closure occurs, the 200Tx transmitter will transmit a data packet over the RF link to an associated 210Rx receiver (that has been learnt by the 200Tx). The 200Tx module continually monitors the status of its 'inputs'. Whenever a change of state is seen on any input, the 200Tx will transmit the status of all inputs. Full configuration instructions are given in the user manual.

The transmitter encoder uses EMC compliant radio transmitter modules and complies with ETSI330-220.

- Up to 8 input channels
- Volt free contact inputs via screw terminals
- 12/24V dc supply
- Range: Up to 200m (433MHz), 1,000m (433MHz Narrow Band), 6,000m (458MHz)
- High security RF protocol
- Auto transmit mode
- Automatic 'Watchdog' transmission
- Supplied with 1/4 wave antenna

Dimensions	112x82mm (within DIN Rail) 109x72mm (PCB)	Operating Temperature	0° to +55°C
Storage Temperature	-10° to +70°C		

Electrical Characteristics	Min	Typical	Max
Supply Voltage: 12V Supply	10V	12V	16V
Supply Voltage: 24V Supply	21V	24V	30V
Antenna Output Lead Impedance		50Ω	
<b>433MHz/433MHz Narrow Band Version</b>			
Supply Current: Quiescent		10mA	
Supply Current: Transmitting Data	150mA	170mA	200mA
<b>458MHz Version</b>			
Supply Current: Quiescent		10mA	
Supply Current: Transmitting Data	240mA	250mA	270mA

336729

Operating Frequency	Order Code	Price Each		
		1+	5+	10+
433.92MHz	<b>416-8823</b>	78.16	75.36	72.75
434.525MHz Narrow Band	<b>491-5604</b>	143.27	139.27	133.66
458.85MHz	<b>416-8835</b>	315.20	306.47	296.78
Power Supply Unit	<b>120-0969</b>	20.45	19.65	18.90

### Hand Held Transmitter



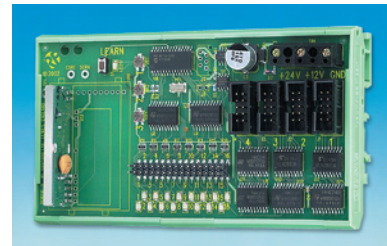
- Pocket fob with wall mounting holster
- 4, 8 and 16 switch options
- Range: 433MHz up to 100m
- 2 x 3V Lithium batteries
- LED indication of transmission
- Dimensions (WxHxD): 47x96x23mm

Frequency	Range	Compatible Decoders Series	Mfrs. List No.	Order Code
433.92MHz	100m	210-433 Series	204C16-433FR1	416-8847

240851

Order Code	Price Each		
	1+	5+	10+
<b>416-8847</b>	74.38	71.74	69.31

### DIN Rail Receiver Decoder 210 Series



This DIN rail module performs the radio reception and decoding. It has four output connectors, each with four digital outputs, and displays the output status on LEDs 1-16. DIN rail output modules, such as the 211, 215, 216 and 217 plug into connectors marked 1-4 (connecting cable supplied with output module).

**NOTE:** The 210Rx can only be configured to work with either a handheld 204 transmitter or a DIN rail 200 transmitter.

- RF receiver and decoder
- 16 digital outputs
- 3 timed outputs
- Easy Learn function
- 230V ac PSU available
- Supplied with 1/4 wave antenna

Dimensions	157x82mm (within DIN Rail) 155x72mm (PCB)
Storage Temperature	-10° to +70°C
Operating Temperature	0° to +55°C

Electrical Characteristics	Min	Typical	Max
Supply Voltage: 12V Supply	10V	12V	16V
Supply Voltage: 24V Supply	21V	24V	30V
Supply Current: Quiescent		25mA	
Time from Tx Switch depressed to 210Rx output			100mSecs
Time from Tx Switch release to Decoder output			200mSecs
Switched Output Voltage (I <sub>out</sub> = 1mA)			
Logic Low	0V	0.2V	0.8V
Logic High	3.5V	3.8V	5V

336730

Operating Frequency	Order Code	Price Each		
		1+	5+	10+
433MHz	<b>416-8859</b>	78.60	75.29	72.19
433MHz Narrow Band	<b>491-5616</b>	132.27	127.65	123.31
458MHz	<b>416-8860</b>	318.31	309.48	299.70
Power Supply Unit	<b>120-0969</b>	20.45	19.65	18.90

### 8 Relay Output Module 215 Series



W=112 H=77 Within DIN Rail

Supply voltage	From the 210 Rx Module
Relay Rating	1A Continuous 12A Peak

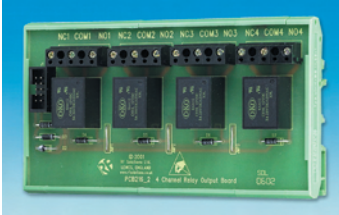
This DIN Rail module connects directly to any of the 210Rx output connectors and provides 8 relay switches rated 230Vac @ 1A continuous. The only connections required are:

- Connection to the 210 receiver via the ribbon cable supplied
  - Connection to each relay via screw terminals provided
- Power is supplied from the 210Rx module.

240853

Mfrs. List No.	Order Code	Price Each		
		1+	5+	10+
215R1	<b>416-8872</b>	45.88	44.16	42.34

### 4 Relay Output Module 216 Series



This DIN Rail module connects directly to the 210Rx and provides 4 relays rated 230Vac @ 12A peak, 5A continuous. The only connections required are:

- Connection to the 210 receiver via the ribbon cable supplied
- Connection to each relay output via screw terminals provided
- 4 relay outputs rated 5A @230Vac
- Connects directly to the 210 module
- No other connections required

W=135 H=77 Within DIN Rail

The module requires no other connections. Power is supplied from the 210Rx module.

Supply voltage From 210 Rx Module Relay Rating 12A continuous, 12A peak 240854

Mfrs. List No.	Order Code	1+	5+	10+
216R1	416-8884	42.51	41.00	39.57

## Wireless Switching

### PTM200 Wireless Transmitter

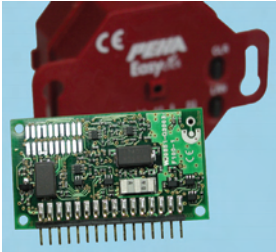


- Switch module for EnOcean system
- Includes generator powered by action of operation
- No batteries required
- unique transmission code to eliminate interference
- Ready for integration into your housing

492875

Mfrs. List No.	Order Code	1+	5+
TCM120	151-8018	41.36	38.16

### TCM110 Repeater Module



- Repeater to extend range of EnOcean system
- Automatically receives and re-transmits EnOcean telegrams
- Extend typical 100M range

492888

Mfrs. List No.	Order Code	1+	5+
TCM 110	151-8019	59.49	54.89

### Receiver Modules



- RM110
- EnOcean receiver module
  - Up to two channel control
  - Dimming (PWM) function
  - Simple to set up
- RM120
- All the above features plus:
- Optional setup as serial data receiver

492902

Description	Mfrs. List No.	Order Code	1+	5+
RCM110 Receiver	RCM110	151-8020	25.17	23.23
RCM120 Receiver	RCM120	151-8022	23.41	21.60

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### RCM250 - Mains Receiver



- Receiver for EnOcean
- Mains power input for controlling lights etc.
- Will switch up to 400W tungsten lighting
- Simple to configure

492958

Mfrs. List No.	Order Code	1+	5+
RCM250	151-8024	32.21	29.72

### Signal Survey Tools



- EPM100
- Survey tool for EnOcean
  - Shows telegram received and signal level
  - Ideal for non-technical installers
- EPM200
- Complete kit with EPM 100
  - Includes switch (PTM 200) to aid evaluation of range
  - Convenient carry / storage case

492971

Mfrs. List No.	Order Code	1+	5+
EPM200	151-8030	123.10	113.58

## Antennas

### Short Range 1/4 Wave Whip Antennae



A range of antennae designed specifically to work with low power short-range devices on 433-434MHz and 800-900MHz bands.

As well as optimising the performance of general-purpose UHF modules, these antennae are ready for use with Easy Radio and other intelligent devices.

- 1/4 wave whip offers better performance and coverage
- ≤ -17 dB return loss
- Omni-directional radiation pattern
- SMA connector type
- Rugged plastic coating
- Available in straight or right angle types

Dimensions (LxDia) 144x10mm (434MHz, straight)  
105x11mm (900MHz, straight)  
142x18mm (434MHz, right angle)  
104x19mm (900MHz, right angle)

461050.407338

Frequency	Order Code	1+	5+	10+	
Straight	434MHz	133-8623	6.33	6.03	5.73
	900MHz	133-8625	6.33	6.03	5.73
Right Angle	434MHz	133-8624	6.33	6.03	5.73
	900MHz	133-8627	6.33	6.03	5.73

### Direct Mount



A range of direct mount antennas designed for operation with low power, short range telemetry systems. Each antenna has 50 ohm impedance and is manufactured from moulded flexible plastic.

The antennas are supplied with either BNC connector or 4mm (M4) screw fixing (connection link to the RF module is generally via a solder tag washer).

Antennas - continued

Direct Mount - continued

1/4 Wave Whip Antenna

- Standard 1/4 wavelength whip antenna
- Provides maximum range performance
- Rugged plastic finish with flexible body
- Available with M4, BNC or SMA connection
- Available in 315MHz, 433MHz and 868MHz versions

Helical Antenna

- 1/4 wavelength helical antenna
- Helical coil antenna for space saving performance
- Rugged plastic finish
- Available with M4 or BNC mount
- Available in 315MHz and 433MHz versions

Compressed Helical Antenna

- 1/4 wavelength helical antenna
- Compressed helical miniature coil antenna
- Rugged plastic finish
- Available with M4 mount
- 433MHz only

Frequency	Dimensions (L x Dia.)			Compressed Helical
	1/4 Wave Whip	Helical		
315MHz	231x13mm	72x13mm		N/A
433MHz	162x13mm	55x14mm		35x14mm
868MHz	97x13mm	N/A		N/A

248422

Type	Fitting	Order Code	Price Each			
			1+	5+	10+	25+
<b>315MHz</b>						
Helical	M4	120-0974	4.81	4.46	4.24	4.01
<b>433MHz</b>						
1/4 Wave Whip	M4	120-0976	4.22	3.87	3.73	3.47
Helical	M4	120-0977	4.03	3.83	3.66	3.51
Compressed Helical	M4	120-0978	4.03	3.83	3.66	3.51
1/4 Wave Whip	BNC	120-0979	7.44	6.80	6.46	6.10
Helical	BNC	120-1005	7.65	7.24	6.84	6.41
1/4 Wave Whip	SMA	130-4036	4.49	4.18	4.08	3.96
<b>868MHz</b>						
1/4 Wave Whip	M4	120-0980	4.81	4.46	4.24	4.01
1/4 Wave Whip	BNC	120-0981	8.50	7.78	7.39	6.82
1/4 Wave Whip	SMA	130-4037	4.49	4.18	4.08	3.96

2.4GHz Antennas



130-4038



130-4039



130-4040

A range of quality cost effective antenna for general purpose use at 2.4GHz

- Provides excellent range
- Robust rubber moulding
- SMA plug connector

450665

Description	Mfrs. List No.	Order Code	Price Each			
			1+	5+	10+	25+
2.4GHz Whip with 90 Deg joint	ANT-24G-WHJ-SMA	130-4038	4.83	4.58	4.51	4.37
2.4GHz, Mini Helical with 90 Deg Joint	ANT-24G-HL90-SMA	130-4039	4.03	3.84	3.77	3.66
2.4GHz Mini Dipole	ANT-24G-DPL-FP	130-4040	6.02	5.71	5.61	5.45

Whip, Flying Lead



- +3dB gain
- For use with any receiver
- Supplied with wall mounting bracket
- 2 metre flying lead with BNC plug

L=440mm (antenna to base), 190 bracket

Note: In order to comply with DTI regulations, any gain antenna MUST NOT be used on a transmitter module

213012

Type	Order Code	Price Each			
		1+	5+	10+	25+
433 MHz	120-0960	51.76	49.52	47.05	44.44

Antenna

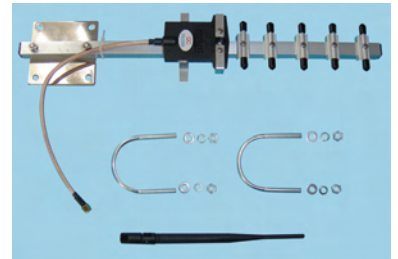


- Standard 1/4 Wavelength whip antenna
- Provides Maximum Range Performance
- Rugged Plastic finish with Flexible body
- BNC 90° connection
- 433MHz Version

419187

Mfrs. List No.	Order Code	Price Each		
		1+	5+	10+
FLEXI-BNC90-433	109-6141	10.38	10.01	9.58

2.4GHz Whip & Yagi Antennae



2.4GHz whip antennae designed to optimise performance of RF designs on the 2.4GHz Worldwide band. They offer ideal solutions for use with either telemetry applications or RF audio and video devices. The robust design offers both right angled and straight connection to SMA. A 2.4GHz YAGI antenna with 7 elements and SMA connector is also available.

2.4GHz Whip Antenna

- 1/2 wave whip offers better performance and coverage
- ≤ -17 dB return loss
- Omni-directional radiation pattern
- SMA connector type
- Rugged plastic coating
- Adjustable straight and right-angled
- Dimensions (LxDia): 201x13mm (straight), 180x36mm (right angled)

2.4GHz YAGI Antenna

- 2400-2500MHz frequency range
- 100MHz bandwidth
- 9dBi gain
- Vertical or horizontal polarisation
- 50Ω input impedance
- 100W maximum power
- SMA connector
- 7 elements

407339.461052

Description	Order Code	Price Each		
		1+	5+	10+
Whip Antenna	133-8628	7.48	7.17	6.81
YAGI Antenna	133-8631	37.15	36.25	35.30

SMB Antenna



The Buccaneer SMB Antenna is a robust and completely waterproof medium gain antenna specifically developed for the 2.4 to 2.5GHz frequency band. Integrating the antenna with a waterproof connector can reduce the total number of connectors in the RF chain, reducing insertion losses, effectively increasing the total system gain.

- Dust and Waterproof to IP68 when mated
- Secure screw thread locking
- Built-in sealed antenna
- Mates with SMB Buccaneer 1193778, 1193779 & 1193780

Over 480,000 products online





Sealing	IP68, EN60529, when mated
Operating Temperature	-20 to 65°C
Flammability	UL94V-0
Body Mouldings	PVC
UV Resistance	EN50021:1999
Frequency	2.4 - 2.5 GHz
Configuration	Quarter Wavelength
Typical Gain	2 dBi
Radiation	Omnidirectional
Polarization	Vertical
Impedance	50Ω nominal
VSWR	<2

478241

Description	Mfrs. List No.	Order Code	Price Each		
			1+	25+	50+
IP68 Rated, Buccaneer SMB Antenna	PX0407	142-7476	7.83	6.97	5.79

433 MHz Yagi Antenna

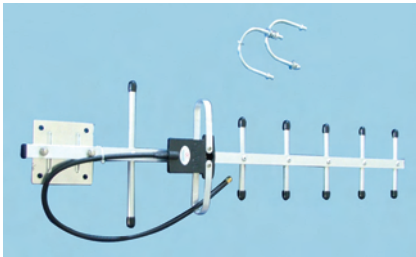


- Frequency: 433MHz
- VSWR: ≤1.5
- Gain: 10 dBi
- Front to back ratio: 14dB
- Polarization: Vertical or Horizontal
- Max Power: 150 W
- Input impedance: 50Ω
- Connector style: SMA
- Lead length: 750 mm
- Support pole: 38-55mm

461076.469091

Mfrs. List No.	Order Code	Price Each		
		1+	5+	10+
YAGI-434	133-8629	41.04	37.62	34.21

900 MHz Yagi Antenna



- Frequency: 868 to 914MHz
- VSWR: ≤1.5
- Gain: 10 dBi
- Front to back ratio: 14dB
- Polarization: Vertical or Horizontal
- Max Power: 150 W
- Input impedance: 50Ω
- Connector style: SMA
- Lead length: 600 mm
- Support pole: 38-55mm

461077.469092

Mfrs. List No.	Order Code	Price Each		
		1+	5+	10+
YAGI-869/914	133-8630	41.04	37.62	34.21

Puck Antenna

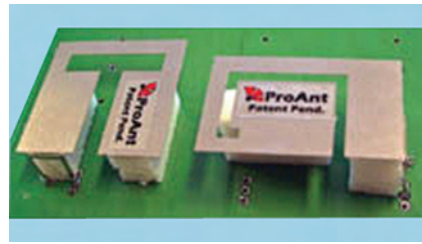


- Panel mounting puck antenna
- Rugged plastic finish
- Available with SMA connection

460984

Frequency	Mfrs. List No.	Order Code	Price Each		
			1+	5+	10+
868MHz	ANTPUK1-868-SMA	133-0088	39.74	38.25	36.72

PCB Mounting Antenna

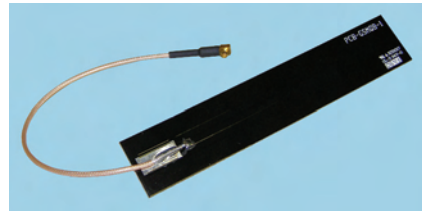


A PCB mounting antennas

460988

Frequency	Mfrs. List No.	Order Code	Price Each		
			1+	5+	10+
2.4 GHz HP	ANT-24G-PAOBHP	133-0090	3.68	3.57	3.47
2.4 GHz VP	ANT-24G-PAOBVP	133-0091	4.66	4.54	4.39
900/1800 MHz	ANT-GSMDB-PAOB	133-0094	5.30	5.14	5.00
434 MHz	ANT-433-PAOB	133-0095	5.89	5.71	5.56

GSM Embedded Antenna



A PCB quad band antenna (850/900/1800/1900MHz) for use with GSM applications.

- Unity gain
- 2W Max. power rating
- VSWR <1:2
- Supplied with 150mm RG178 coax cable with MMCX right angled connector
- Dimensions: 111x22x1.6mm

460987

Frequency	Mfrs. List No.	Order Code	Price Each		
			1+	5+	10+
850 / 900 / 1800 / 1900 MHz	ANT-GSMQB-MMCX	133-0089	4.59	4.34	4.18

GSM Embedded Antenna



- Embedded GSM antenna
- Tab mount design
- 880 - 960 MHz operating frequency
- Length = 36.6mm
- Width = 15.2mm

460407

Mfrs. List No.	Order Code	Price Each		
		1+	5+	10+
1513165-1	133-6303	2.52	2.46	2.41

GSM Embedded Antenna



- Embedded GSM antenna
- Surface mount design
- 880 - 960 MHz operating frequency
- Length = 37.59mm
- Width = 11.9mm

460410

Mfrs. List No.	Order Code	Price Each		
		1+	5+	10+
1513259-1	SMD133-6304	3.08	3.01	2.96

GPS Embedded Antenna



- Embedded GPS antenna
- Surface mount design
- Height = 6mm
- Diameter = 16mm

460377

Mfrs. List No.	Order Code	Price Each		
		1+	5+	10+
1513152-1	133-6301	0.91	0.84	0.81

Antennas - continued

Bluetooth Embedded Antenna



- Embedded Bluetooth™ antenna
- Surface mount design
- 2400 - 2500 MHz operating frequency
- Height = 6mm
- Diameter = 16mm

460402

Mfrs. List No.	Order Code	1+	5+	10+
1513151-1	133-6302 ●	1.26	1.16	1.12

Mica 2.4 GHz SMD Antenna



- SMD antenna for 2.4GHz
- Ideal for WLAN, Bluetooth etc.
- Small size
- Exceptional performance and stability

493271

Description	Mfrs. List No.	Order Code	1+	5+
Mica 2.4GHz Embedded Antenna	3030A5645-01	SMD151-8273 ●	3.90	3.38

Picea 2.4 GHz Swivel Antenna



- Whip antenna designed to clip to PCB
- Avoids need for expensive RF connectors
- High performance 2.4GHz antenna
- Ideal for Bluetooth, WLAN, ZigBee etc

493274

Description	Mfrs. List No.	Order Code	1+	5+
Picea 2.4GHz Embedded Antenna	2010B5771-04	SMD151-8274 ●	4.12	3.60

Titanis 2.4 GHz Swivel SMA Antenna



- External antenna with integral groundplane
- Simple to implement
- SMA connector
- Rotates around connector for different polarisation
- 2.4GHz, ideal for WLAN, Bluetooth, ZgiBee etc.

493285

Description	Mfrs. List No.	Order Code	1+	5+
Titanis 2.4GHz Embedded Antenna	2010B4844-01	SMD151-8275 ●	29.04	23.75

Fusca 2.4GHz SMD Antenna



- Smallest 2.4GHz antenna available
- Ideal for WLAN, Bluetooth etc.
- Exceptional performance and stability
- Low cost

493289

Description	Mfrs. List No.	Order Code	1+	5+
Fusca 2.4GHz Embedded Antenna	A10192-L	SMD151-8277 ●	2.85	2.33

Reference Evaluation Boards



- Reference boards for Antenova antenna
- Example of matching and layout
- Allow fast evaluation of SMD antennas
- Available for Mica, Comate, Rufa, Impexa, GPS & Fusca

493291

Description	Mfrs. List No.	Order Code	1+	5+
Mica 2.4GHz Evaluation Board	MICA REF BOARD	151-8278 ●	125.10	118.24

WS3910 GPS Active Antenna

High Gain, Low Noise



The WS3910 GPS antenna is unparalleled in quality and performance. It features a custom designed ceramic patch element that minimizes detuning effects caused by adjacent objects. This element, along with a low noise amplifier and SAW filter, enables the WS3910 to provide a consistent, clear signal while minimizing loss-of-lock if GPS conditions are less than ideal. With both a magnetic base and threaded holes for mounting screws, the WS3910 GPS antenna is ideal for vehicle mounted AVL applications.

Where other GPS antennas fail, the WS3910's superior out-of-band rejection and low noise characteristics can provide a reliable signal - which can be critical for improving acquisition times and minimizing outages.

- High gain: 28 dB @ 3.3 V
- Extremely low noise figure: 0.8 dB
- Excellent out-of-band signal rejection
- Wide range of connector types available
- High performance LNA (patented)
- Wide voltage input range (2.7 - 5 VDC)
- Excellent low elevation angle coverage

450359

Mfrs. List No.	Order Code	1+	25+
WS3910-3M-SMA	130-2946 ●	40.29	37.54

**WS3911-HR "No-Interference" GPS Antenna**  
with Dual SAW High Rejection Filter



The WS3911-HR No Interference" GPS Antenna with Dual SAW High Rejection Filter has the industry's best out-of-band filter performance.

The WS3911-HR features ESD circuit protection, a patented two-stage low noise amplifier and a dual SAW high rejection filter. It also features a custom designed ceramic patch element that minimizes detuning effects caused by adjacent objects. The WS3911-HR provides the most consistent, clear GPS signal reception while minimizing loss-of-lock in high-RF fields. Housed in a weatherproof magnetic or screw mount enclosure, the WS3911-HR GPS antenna is ideal for most demanding vehicle mounted GPS applications.

- Very high rejection dual SAW filter
- Patented high performance dual LNA
- High gain: 25.5 dB @ 5 V typ.
- Low current: 7.5 mA @ 3.3 V typ.
- 3.1 dB low noise figure
- 15KV ESD circuit protection
- Wide voltage input range (2.7 - 5 VDC)
- Weather proof housing

462500

Mfrs. List No.	Order Code	1+	25+	Price Each
WS3911-HR-3M-SMA	134-4628	46.35	43.09	

**WS3914 GPS Active Antenna**

Low Current



The WS3914 GPS antenna uses high performance advanced circuitry designed to operate on only 2 mA of current - setting a new standard for the industry. Performance is not sacrificed; the antenna still features a custom designed ceramic patch element along with a patented low noise amplifier and SAW filter, enabling the WS3914 to provide a consistent, clear signal while minimizing loss-of-lock even in difficult conditions.

The WS3914 antenna is ideal for portable or telematics applications using MONITOR, STANDBY or SLEEP modes, where low power operation is a necessity.

- Extremely low current: 2 mA @ 2.7 VDC
- Very low noise figure: 1dB
- Excellent out-of-band signal rejection
- High performance patented LNA
- Wide range of connector types available
- Wide voltage input range (2.5 - 3.3 VDC)

450375

Mfrs. List No.	Order Code	1+	25+	Price Each
WS3914-3M-SMA	130-2947	39.81	37.15	

**WS3917 GPS Active Antenna**

High Gain



The WS3917 GPS antenna is a high value antenna with a wide voltage range, optimum GPS performance, designed for a wide range of GPS devices. The WS3917 antenna is housed in durable PVC plastic for reliability in extreme weather conditions, and using internal magnets or screw mount holes, the antenna can be installed almost anywhere allowing great flexibility. The WS3917 antenna features a high gain (28 dB) low noise amplifier and a SAW filter. With a wide range of connectors and 2.7 to 5 volt operation, the antenna can be used with almost any GPS system available.

- Voltage range 2.7 - 5 V
- LNA 28 dB gain typical
- Low noise figure 1.5dB
- Great out-of-band signal rejection
- Magnet or screw mount
- Large range of connector types
- Value priced

450376

Mfrs. List No.	Order Code	1+	25+	Price Each
WS3917-3M-SMA	130-2948	29.17	27.28	

**WS3930 Quad Band Cellular & 3G Covert Antenna**



The WS3930 Covert Quad-band Cellular + 3G Antenna provides exceptional signal reception across public 2G and 3G Cellular wireless networks, virtually everywhere in the world.

The antenna is tuned to receive 824-894 MHz (cell), 890-960 MHz (GSM), 1710-1880 MHz (European), and 1850-1990 MHz (N. American) frequencies, as well as 1885-2200 MHz (US & Euro 3G/UMTS/W-CDMA) band.

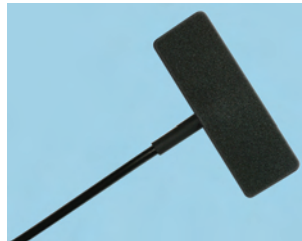
Housed in an ultra-thin, semi-flexible Lexan® covered urethane foam package for covert and dash-mount installations, the WS3930 Quad-band Cellular/3G is the perfect solution for cutting-edge TELEMATICS and M2M platforms.

- Quad-band Cellular and 3G (UMTS/W-CDMA) Reception
- Ultra-thin, semi-flexible package
- Embedded, Covert and Dash Mount
- Easy to install
- Wide range of connector types available
- Low price

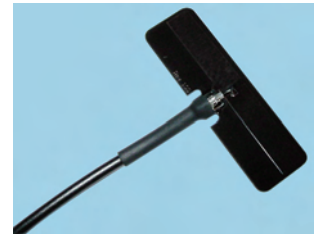
450380

Mfrs. List No.	Order Code	1+	25+	Price Each
WS3930-3M-SMA	130-2949	21.54	20.10	

**WS3938 Ultra Compact 2.4 GHz Embedded & Covert Mount Antenna**



134-4627



134-4632

The WS3938 Ultra Compact 2.4 GHz Embedded & Covert Mount Antenna provides exceptional signal reception on the 2.4 GHz ISM band.

The WS3938 is composed of an ultra compact semi flexible coated PCB for embedded OEM applications and is also available with a Lexan® covered urethane foam package for dash and covert installations. The WS3938 antenna is ideal for cutting edge TELEMATICS and M2M platforms.

- 2.4 GHz ISM Band reception
- Ultra-compact, semi-flexible PCB
- Coated PCB or packaged form factor
- Embedded, covert and dash mount
- Easy to install
- Wide range of connector types available
- Customization available

**Applications:-**

- 2.4 GHz Based Telematics
- M2M Wireless Applications using Wi-Fi, Bluetooth, Zigbee and proprietary 2.4 GHz
- In-Vehicle Covert Installations
- Wireless Remote Monitoring

462525

Description	Mfrs. List No.	Order Code	1+	25+	Price Each
Covert Mount	WS3938-C-15CM-MCX	134-4627	17.94	16.58	
Embedded Mount	WS3938-E-15CM-MCX	134-4632	17.94	16.58	

**Help us to help the environment**

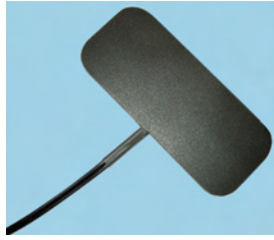


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Antennas - continued

WS3947 GPS + Quad Cell/3G/2.4 GHz Combined Covert/Dash or Glass Mount Antenna



The WS3947 GPS, Quad Cellular, 3G & 2.4 GHz ISM Band antenna is an excellent choice for Telematics systems requiring dependable and highly accurate positioning data, as well as clear and consistent host-to-vehicle communications via Quad band Cellular, 3G or 2.4 GHz ISM Band such as WiFi.

The WS3947's GPS antenna portion has excellent LHCP rejection for less multi-path effects, and it includes a low noise amplifier and a narrow band SAW filter, to provide a consistent and clear GPS signal while minimizing loss-of-lock when GPS conditions are less than ideal.

The Quad Cell/3G/2.4 GHz antenna portion is tuned to receive 824-894 MHz (cell), 890-960 MHz (GSM), 170-1880 MHz (European), and 1850-1990 MHz (N. American), as well as 1885-2200MHz (US & Euro 3G/UMTS/W-CDMA) and 2400-2500 MHz (2.4GHz ISM) frequencies.

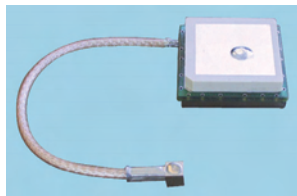
134-4630 Features:-

- GPS, Quad-band Cellular, 3G & 2.4 GHz band reception
- Telematics via Wi-Fi, ZigBee, Bluetooth and Proprietary 2.4 GHz
- Semi-flexible for embedded and covert installations
- Excellent out-of-band signal rejection
- High gain active GPS antenna
- Easy to install
- Security and Law Enforcement
- Automotive Navigation
- Fleet Management & Telematics
- Asset Tracking Systems
- Covert/Dash or Glass Mount Installations

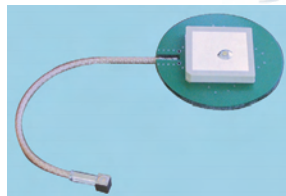
462522

Description	Mfrs. List No.	Order Code	Price Each	
			1+	25+
Glass Mount	WS3947-GM-3M-SMA/SMA	134-4630	46.68	43.22
Covert/Dash Mount	WS3947-C-3M-SMA/SMA	134-4631	46.68	43.22

WS3950/WS3960 Embedded GPS Antenna



130-2953



130-2955

The WS3950 / WS3960 GPS antennas are unparalleled in quality and performance, and ideal for embedded mobile applications. They feature a custom designed ceramic patch element that minimizes detuning effects caused by adjacent objects. This element, along with a low noise amplifier and SAW filter, enables these antennas to provide a consistent, clear signal while minimizing loss-of-lock when GPS conditions are less than ideal. The WS3950 comes in a compact square package and the WS3960 comes with a 1.85" mini-ground plane.

Where other GPS antennas fail, the WS3950/60's superior out-of-band rejection and low noise characteristics can provide a reliable signal, which can be critical for improving acquisition times and minimizing outages

- 28 dB gain @ 3.3 VDC
- Available with or without internal ground plane
- Extremely low noise figure: 0.8 dB
- Excellent out-of-band signal rejection
- Wide range of connector types available
- High performance patented LNA
- Excellent low elevation angle coverage

450387

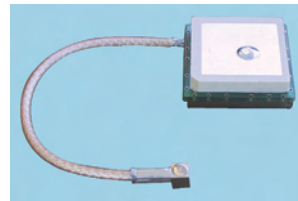
Mfrs. List No.	Order Code	Price Each	
		1+	25+
WS3950-15-MCX-RA	130-2953	22.87	22.04
WS3960-15-MCX-RA	130-2955	25.41	23.56

Technical information at your fingertips

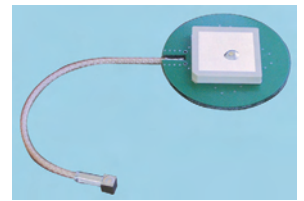
Over 352,000 technical datasheets available online.

Visit [www.farnell.co.uk](http://www.farnell.co.uk) and look for the Tech Info heading in your search results.

WS3954/WS3964 Embedded GPS Antenna



130-2956



130-2957

The WS3954 / WS3964 GPS antennas are ideal for personal GPS applications including handheld computers and PDAs. With an industry leading 2mA current, and compact size, the WS3954 / WS3964 series is perfectly suited for OEM applications. Performance is not sacrificed; the WS3954 / WS3964 features a custom designed ceramic patch element along with a low noise amplifier and SAW filter, enabling these antennas to provide a consistent, clear signal while minimizing loss-of-lock. The WS3954 comes in a compact, square package and the WS3964 comes with a 1.85" mini-ground plane.

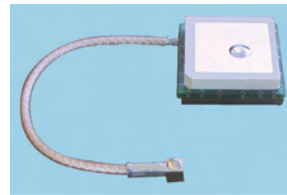
The antenna design and industry leading low current draw makes the WS3954/64 series ideal for portable or telematics applications using MONITOR, STANDBY or SLEEP modes.

- Extremely low current: 2 mA @ 2.7 VDC
- Extremely low noise figure: 1 dB
- Excellent out-of-band signal rejection
- High performance patented LNA
- Available with and without an internal ground plane
- Wide range of connector types available

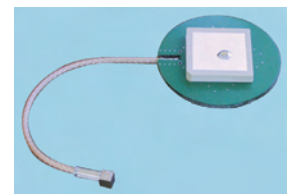
450389

Mfrs. List No.	Order Code	Price Each	
		1+	25+
WS3954-15-MCX-RA	130-2956	25.41	23.56
WS3964-15-MCX-RA	130-2957	25.41	23.56

WS3957/WS3967 Embedded GPS Antenna



130-2958



130-2959

The WS3957 / WS3967 GPS antenna series is designed for easy integration into a variety of OEM platforms and ideal for handheld GPS devices, mobile asset tracking equipment and GPS clock & timing applications. With its compact size and low price, the WS3957 / WS3967 series is perfectly suited for OEM applications. The WS3957 / WS3967 series features a custom designed ceramic patch element, a two-stage low noise amplifier and a SAW filter, enabling the WS3957/WS3967 series to provide great out-of-band signal rejection performance, consistent and clear signal while minimizing loss-of-lock. The WS3957 comes in a compact square package and the WS3967 comes with a 1.85" mini-ground plane.

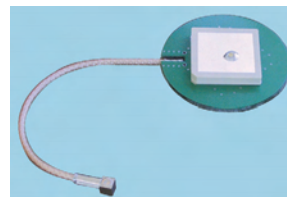
- 2.7 to 5 V operation
- Available with and without an internal ground plane
- Optional cable types and lengths available
- Wide range of connector types available
- Ideal for embedded applications
- Low price

450391

Mfrs. List No.	Order Code	Price Each	
		1+	25+
WS3957-15-MCX-RA	130-2958	21.81	20.23
WS3967-15-MCX-RA	130-2959	21.81	20.23

WS3967-P Encapsulatable GPS Antenna

For Marine & Submarine Applications



The WS3967-P Encapsulatable GPS antenna is especially designed for embedding in potting compound. It features a custom de-tuned ceramic patch element to compensate for the potting compound's detuning effect, as well as ESD circuit protection, a two stage low noise amplifier and a SAW filter, enabling the WS3967-P to provide great out-of-band signal rejection performance, consistent and clear signal while minimizing loss-of-lock. It also comes with a perforated RF shield for complete compound permeation and a 1.88" mini-ground plane for a sharper radiation pattern. The WS3967-P is the embedded GPS antenna of choice for marine, submarine and extreme weather technology OEMs.

loss-of-lock. It also comes with a perforated RF shield for complete compound permeation and a 1.88" mini-ground plane for a sharper radiation pattern. The WS3967-P is the embedded GPS antenna of choice for marine, submarine and extreme weather technology OEMs.



- Ideal for potted applications
- Detuned ceramic patch element
- Perforated RF Can
- ESD circuit protection
- Two stage LNA
- SAW filter
- 2.7 to 5 V operation
- Optional cable types and lengths available
- Wide range of connector types available
- Low price

450396

Mfrs. List No.	Order Code	1+	25+
WS3967-P-15-MCX-RA	130-2960	33.04	30.75

### WS4051/WS4061 Low Noise OEM GPS Antenna with Built-in MCX Connector



The WS4051 / WS4061 low noise OEM GPS Antenna series with built-in connector is unparalleled in quality and performance, and ideal for embedded OEM applications. The WS4051/WS4061 series features a custom designed ceramic patch element that minimizes detuning effects caused by adjacent objects, as well as a Low Noise Amplifier and a SAW filter that enable these antennas to provide a consistent, clear signal while

minimizing loss-of-lock when GPS conditions are less than ideal. Both models come equipped with an MCX connector. The WS4051 comes in a very compact 25 mm square package and the WS4061 comes with a 45.2 mm dia. mini-ground plane.

Where other GPS antennas fail, the WS4051/61 antennas' superior out-of-band rejection and low noise characteristics can provide a reliable signal, which can be critical for improving acquisition times and minimizing outages.

- Available with and without internal ground plane
- 28 dB gain @ 3.3 VDC
- Extremely low noise figure: 0.8 dB
- Excellent out-of-band signal rejection
- Built in MCX connector
- High performance patented LNA

450397

Mfrs. List No.	Order Code	1+	25+
WS4051-MCX	130-2961	34.73	32.37
WS4061-MCX	130-2962	34.73	32.37

### WS4055/WS4065 Low Current OEM GPS Antenna with Built-in MCX Connector



The WS4055 / WS4065 Low Current OEM GPS Antenna series with built-in connector is ideal for personal GPS applications including handheld computers and PDAs. With an industry leading 2mA current, and compact size, the WS4055 / WS4065 series is perfectly suited for OEM applications. Performance is not sacrificed; the WS4055 / WS4065 series features a custom designed ceramic patch element along with a low noise

amplifier and SAW filter, enabling these antennas to provide a consistent, clear signal while minimizing loss-of-lock. Both models come equipped with an MCX connector. The WS4055 comes in a very compact 25 mm square package and the WS4065 comes with a 45.2 mm dia. mini-ground plane.

The antenna design and industry leading low current draw makes the WS4055/65 series ideal for portable or telematics applications using MONITOR, STANDBY or SLEEP modes.

- Extremely low current: 2mA @ 2.7V
- Extremely low noise figure: 1dB
- 18 dB gain @ 3.3 VDC (typ.)
- Excellent out-of-band signal rejection
- Available with or without internal ground plane
- Built in MCX connector

450398

Mfrs. List No.	Order Code	1+	25+
WS4055-MCX	130-2963	34.73	32.37
WS4065-MCX	130-2964	34.73	32.37

### WS4057/WS4067 OEM GPS Antenna with Built-in MCX Connector



The WS4057 / WS4067 OEM GPS antenna series with built-in connector is ideal for handheld GPS devices, mobile asset tracking equipment and GPS clock & timing applications. With its compact size and low price, the WS4057/WS4067 series is perfectly suited for OEM applications. The WS4057/WS4067 series features a custom designed ceramic patch element, a two-stage low noise amplifier and a SAW filter, enabling the WS4057/WS4067 series to

provide great out-of-band signal rejection performance, consistent and clear signal while minimizing loss-of-lock. Both models come equipped with an MCX connector. The WS4057 comes in a very compact 25 mm square package and the WS4067 comes with a 45.2 mm dia. mini-ground plane.

- Available with and without internal ground plane
- 2.7 to 5.0 V operation
- 28 dB gain @ 3.3 VDC
- 1.5 dB noise figure
- Built in MCX connector
- Ideal for embedded applications
- Low price

450401

Mfrs. List No.	Order Code	1+	25+
WS4057-MCX	130-2965	24.03	22.23
WS4067-MCX	130-2967	25.57	23.66

### WS3977 Through-Hole Mount GPS Antenna



The WS3977 through-hole mount GPS Antenna provides very high out-of-band rejection performance. It features a custom designed ceramic patch element that minimizes detuning effects caused by adjacent objects. This element, along with a low noise amplifier and SAW filter, enables the WS3977 to provide a consistent, clear signal while minimizing loss-of-lock when GPS conditions are less than ideal. Housed in a compact all-plastic, non-corrosive low profile package. Designed for permanent mount installations, the WS3977 through-hole GPS Antenna is the optimum choice for dependable, clear and consistent GPS signal reception.

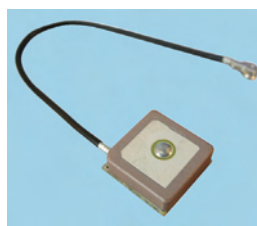
Where other GPS antennas fail, the WS3977's great out-of-band rejection and low noise characteristics can provide a very reliable signal - critical for improving acquisition times and minimizing outages.

- Rugged, compact all-plastic, non-corrosive housing
- 3/4" through-hole mount
- Voltage range 2.7 - 5 V
- LNA 28 dB gain typical
- Low noise figure 1.5dB
- Good out-of-band signal rejection
- Value priced

450402

Mfrs. List No.	Order Code	1+	25+
WS3977-TNC	130-2968	31.59	29.38

### WS1357 Ultra Compact Embedded GPS Antenna



The Ultra Compact WS1357 Embedded GPS antenna is most ideal for GPS Enabled mobile phones, PDAs, laptops and portable GPS Handhelds.

The WS1357 antenna series features a 13 mm x 13 mm x 3 mm ceramic patch element, ESD circuit protection, a low noise amplifier and a SAW filter, enabling the WS1357 series to provide great out-of-band signal rejection performance, consistent and clear signal while minimizing loss-of-lock, even in

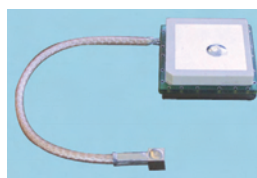
difficult conditions, in an extremely small form factor. With its very compact 13 mm x 13mm x 5.3 mm dimensions, the WS1357 antenna series is perfectly suited for OEM handheld platforms applications.

- 2.7 to 5 V operation
- Available with built-in 30mm ground plane (WS1367)
- Low power 18dB design also available (WS1356)
- Optional cable types and lengths available
- Other connector types available Ideal for embedded applications
- Low price

450404

Mfrs. List No.	Order Code	1+	25+
WS1357-15-HFL	130-2951	25.32	23.51

### WS1857 Compact Embedded GPS Antenna



The Very Compact WS1857 Embedded GPS antenna is ideal for GPS Enabled mobile phones, PDAs, laptops and portable GPS Handhelds.

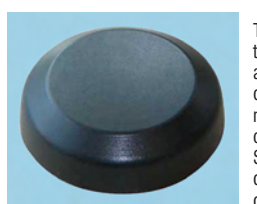
The WS1857 antenna features an 18 mm x 18 mm x 4 mm ceramic patch element, ESD circuit protection, a two stage low noise amplifier and a SAW filter, enabling the WS1857 to provide great out-of-band signal rejection performance, consistent and clear signal while minimizing loss-of-lock, even in difficult conditions, in a very small form factor. With its very compact 18 mm x 18 mm x 7 mm dimensions, the WS1857 antenna is perfectly suited for OEM handheld applications.

- 2.7 to 5 V operation
- Available with built-in ground plane (WS1867)
- Built-in MCX ground plane also available (WS2057)
- Optional cable types and lengths available
- Other connector types available
- Ideal for embedded applications
- Low price

450406

Mfrs. List No.	Order Code	1+	25+
WS1857-15-MCX-RA	130-2952	26.12	24.42

### WS3997 Low Profile Surface Mount GPS Antenna



The WS3997 surface mount GPS Antenna provides very high performance in a very small form factor. It features a custom designed ceramic patch element that minimizes detuning effects caused by adjacent objects. This element, along with a low noise amplifier and SAW filter, enables the WS3997 to provide a consistent, clear signal while minimizing loss-of-lock when GPS conditions are less than ideal. The WS3997 is housed in a

very compact all-plastic, non-corrosive low profile package. Designed for permanent mount installations, the WS3997's thru surface connector provides the lowest in-vehicle profile.

Antennas - continued

WS3997 Low Profile Surface Mount GPS Antenna - continued

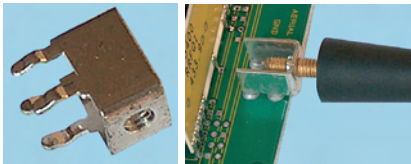
Truly is the optimum choice for dependable, clear and consistent GPS signal reception. The WS3997 comes with an MCX jack connector, and a flying cable option is also available.

- Extremely compact all-plastic, weather proof, non-corrosive housing
- Lowest external profile
- Lowest in-vehicle connector profile
- Small mounting holes
- Large, high performance patch element
- Voltage range 2.7 - 5 V
- LNA 28 dB gain typical

45047

Mfrs. List No.	Order Code	1+	25+	Price Each
WS3997-MCX	130-2969	31.02	29.01	

Antenna PCB Mount Terminal

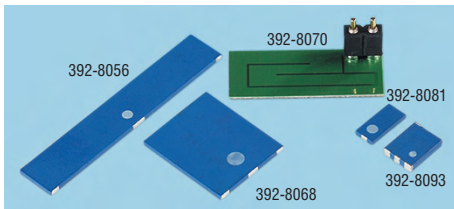


The SCRTM4RA is a PCB mounting terminal providing a simple method of attaching a low cost 4mm Screw thread antenna to a PCB.

419188

Mfrs. List No.	Order Code	1+	5+	10+	Price Each
SCRTM4RA	109-6142	0.72	0.69	0.66	

Surface Mount Ceramic Antennas



A range of some of the smallest surface mount Bluetooth/WLAN antennas.

- High Gain of 4 dBi
- Ceramic antennas optimized for 433MHz, and 870MHz.
- New 900/1800MHz dual-band antenna ideal for mobile phones.
- Bluetooth compatible 2.45MHz antenna, in both long and short versions
- Environmentally sound - manufactured using low-temperature co-fired ceramic (LTCC) with lead free terminations
- Operating temperature: -55°C to 125°C

Description	Order Code	Working Frequency	Bandwidth	Gain (dB)	Impedance
433MHz Antenna	392-8056	MHz433	20MHz	0.5	50Ω
870MHz Antenna	392-8068	MHz900	100MHz	1.5	50Ω
2.4GHz Bluetooth Antenna	392-8093	GHz2.45	≥100MHz	1.2	50Ω
0.9/1.8/1.9GHz Triple Band Antenna + IPEX	772-6082	GHz1.9	-	0.5	50Ω
0.9/1.8/1.9GHz Triple Band Antenna + MMCX	772-6090	GHz1.9	-	0.5	50Ω
ANTENNA, 5.3 X 2.0, 2.45GHZ	128-2672	GHz2.45	>100MHz	4	50Ω
ANTENNA, 3.2 X 1.6, 2.45GHZ	128-2673	GHz2.45	>100MHz	3.1	50Ω
ANTENNA, 12.0 X 4.0, 433MHZ	128-2674	MHz433	≥100MHz	0.5	50Ω

236430

Mfrs. List No.	Order Code	1+	10+	100+	Price Each
431312120043	SMD392-8056	11.00	9.46	8.80	
431111900087	SMD392-8068	4.87	3.48	3.39	
431311100245	SMD392-8093	3.72	2.47	2.22	
431333000919	772-6082	8.96	6.97	6.23	
431333001919	772-6090	12.40	9.65	8.62	
431115300245	SMD128-2672	2.14	1.42	1.27	
431171200245	SMD128-2673	1.65	1.09	0.98	
431112920043	SMD128-2674	4.82	3.35	2.99	

Coming soon



Register your interest for items that are 'Coming Soon' at [www.farnell.co.uk](http://www.farnell.co.uk) and we'll email you to let you know that they're in stock.

Industrial Remote Control Systems

'Rolling-Code' Keyfob System  
2 Channel



The 'Rolling-Code' keyfob system is a high security, high quality radio system at an exceptional price. The system is supplied complete with one keyfob. Simply supply power, connect load to relay output and the system is ready to operate. Pressing the appropriate button on the transmitter activates the corresponding relay in the receiver.

- High security rolling-code system, self learning
- 2 channels
- Up to 150m range with external aerial
- Momentary relay outputs
- 433MHz operation
- No license required

Transmitter

- Keyfob size
- 12V battery, type 23A

Receiver H=190, W=113, D=65  
Keyfob transmitter H=50, W=37, D=15

Receiver

- IP40 rated
- 12-24V dc (115V/230V ac optional)
- Relays rated at 1A@24V dc, 0.5A@115V ac
- Optional external aerial on 3m cable for extended range

Transmitter

Supply voltage 12V battery, type 23A  
Frequency 433MHz  
Operating range Up to 150m (using external aerial)  
Weight 20g

Receiver

Supply voltage 12-24V dc (115V/230V ac optional)  
Relay rating 1A@24V dc, 0.5A@115V ac  
Frequency 433.92MHz  
Weight 200g

338588

	Order Code	1+	5+	10+	Price Each
"Rolling-Code" System	120-1693	74.20	71.34	68.68	
2 Ch Keyfob	130-2526	19.53	17.42	15.84	
2 CH Keyfob, Veneered	130-2527	29.03	27.45	25.34	

The "Genie" System



The "Genie" keyfob radio controlled system is a low cost, high security, high quality radio system for domestic applications. The system is supplied complete with one keyfob; simply apply power, connect load to relay output/s and system is ready to operate. Pressing the appropriate button on the transmitter activates the corresponding relay in the receiver.

General Features:

- 2 channels
- High security rolling-code system, self learning
- Range of up to 150 metres (using external aerial)
- Momentary/Latching/Timed relay outputs
- 433MHz operation
- No licence required

Receiver

- Enclosure IP55 rated
- 240V ac (12V ac/dc and 110V ac optional)
- Dimensions: 140 x 110 x 80mm
- Weight: 200g
- Momentary or latching relay outputs, DIP switch selectable
- Channel 1 = C/O contacts, 2 Channel = NO contacts
- Built-in timer function, DIP switch selectable, for 5 mins, 15 mins or 30 mins
- Heavy duty 10A relay contacts for direct switching without additional circuitry
- Optional external aerial for extended range of up to 150 metres

Keyfobs

- Dimensions: 50 x 37 x 15mm
- 2 buttons
- 12V battery, Type 23A
- Weight: 20g
- Available in black or veneered finish

Headlamp Transmitter

- Fixes directly to vehicle headlamp
- Remotely operates receiver when main beam is flashed
- Ideal when using remote to switch on driveway lights

450287

Description	Mfrs. List No.	Order Code	1+	5+	10+	Price Each
"Genie" Keyfob System	GENIES/2/30/240	130-2525	145.69	131.96	121.41	
2 Ch Keyfob	DEA/273	130-2526	19.53	17.42	15.84	
2 CH Keyfob, Veneered	DEA/273L	130-2527	29.03	27.45	25.34	