ABACOM TECHNOLOGIES

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32 Blair Athol Crescent
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M9A 1X5
Canada

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Issue July '98

Welcome to a world of low power radio modules...

Over the years our customers have enjoyed the benefits of using our off-the-shelf low power radio data modules at the heart of their designs. They have recognized the considerable savings that can be made in time and development costs by opting for our high quality, reasonably priced modules, to take care of their RF design requirements.

ABACOM Technologies continue to bring new low power radio data products to the marketplace on an ongoing basis, in an effort to satisfy the needs of the industry and our customers.

Some Advantages...

- **Only minimal RF knowledge or experience is required**
- **Complex and Costly RF test/measurement equipment is not required**
- **Small production batches become viable**
- **Simple to interface into designs**
- **Low and stable costs**
- **No production tuning required**
- **Significant reduction in time-to-market**
- **Ideal for proof-of-concept**

Catalog

Set out in a 'Fact Sheet Format', our catalog includes our full product line, order form, ordering information and price list under the following headings:

Note:

TRANSMITTERS

AM-TX1-4xx Transmitter Module

FEATURES

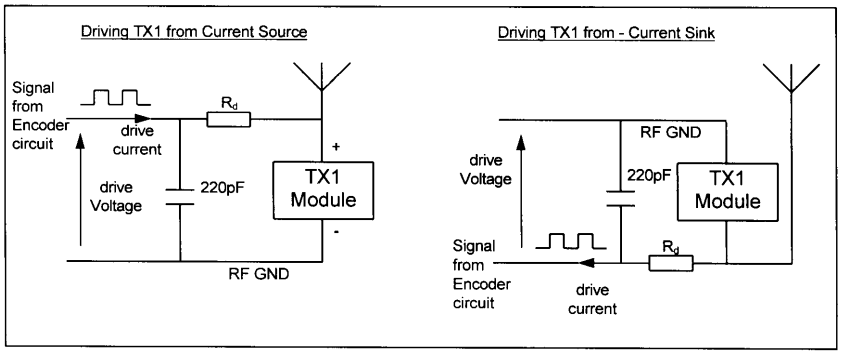
- MINIATURE MODULE (7.5 x 11.5 X 4.5mm)
- SAW CONTROLLED FREQUENCY STABILITY
- NO ADJUSTABLE COMPONENTS.
- TRANSMITTING RANGE UP TO 100 METRES.
- CMOS/TTL COMPATIBLE INPUT.
- CURRENT CONSUMPTION 2.5mA (typ).
- SINGLE SUPPLY VOLTAGE 2.5 -12V.
- COMPATIBLE WITH AM RECEIVER MODULES.
- AVAILABLE AS EITHER 418MHz OR 433MHz

TYPICAL APPLICATIONS

- CAR ALARM KEYFOBS
- REMOTE TRANSMITTER ENCODERS
- GARAGE DOOR OPENERS
- REMOTE GATE SYSTEMS

DESCRIPTION

The AM-TX1 Transmitter module offers a miniature hybrid modular RF transmitter providing on/off keyed (OOK) modulation, which can be used to transmit data from any standard CMOS/TTL source up to 1200 baud.
The module is very simple to operate, requiring only two connections (see application circuit below). The module is also very efficient, using only 2.3mA (typ) which means that it may be driven directly from an encoder I/C or microcontroller. The output impedance has been designed to give optimum performance when coupled with a small antenna such as a tuned loop or short whip.
The modules are compatible with the AM Receiver module (AM -HRX3-XXX).



Order Code: AM-TX1-4xx

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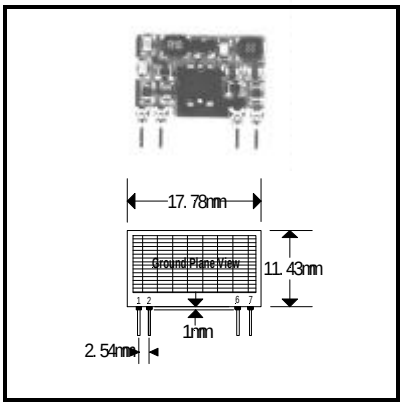
TRANSMITTERS

AM-RT4-xxx AM Transmitter Modules
AM-RT5-xxx

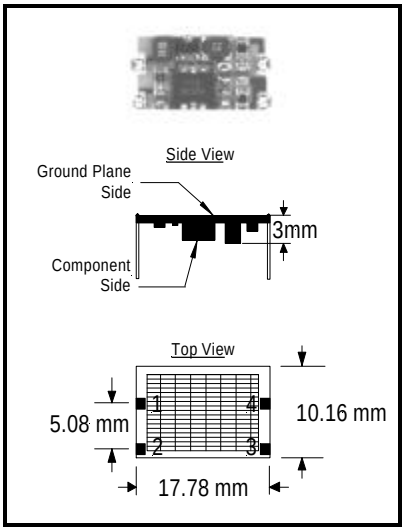
AM-TX5



FEATURES

- COMPLETE RF TRANSMITTER
- TRANSMIT RANGE UP TO 70m
- CMOS/TTL INPUT
- AVAILABLE IN DIL OR SIL PACKAGE
- NO ADJUSTABLE COMPONENTS
- VERY STABLE OPERATING FREQUENCY
- LOW CURRENT CONSUMPTION (TYP 4mA)
- LOW SPURIOUS EMISSIONS (-35dBc)
- WIDE OPERATING VOLTAGE (2-14V)
- AVAILABLE AS 418 MHz OR 433 MHz
- COMPATIBLE WITH AM-HRR1, AM-HRR3/6 AND THE AM-RSS2 AM RECEIVER MODULES

AM-TX4



APPLICATIONS

- WIRELESS SECURITY SYSTEMS
- CAR ALARMS
- REMOTE GATE CONTROLS
- REMOTE SENSING
- DATA CAPTURE
- SENSOR REPORTING

DESCRIPTION

Differing in package style, AM-RT4 and AM-RT5 AM hybrid transmitter modules provide complete RF transmitters which can be used to transmit data at up to 4 kHz from any standard CMOS/TTL source.

The modules are very simple to integrate into a design and offer low current consumption (typ. 4 mA). Data can be supplied directly from a microprocessor or data encoding device to the data input of the modules. The modules exhibit extremely stable electronic characteristics due to the use of 'Thick-Film' hybrid technology. They use no adjustable components resulting very reliable operation.

The AM-RT4 and AM-RT5 modules are compatible with all ABACOM Technologies' range of AM receivers to complete the RF data link.

RT4 Pin	RT5 Pin	DESCRIPTION
1	1	Vcc Supply
2	2	Ground, RF Ground
3	6	Data IN
4	7	External Antenna

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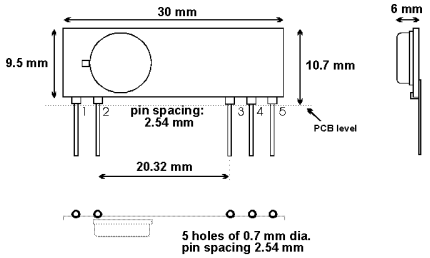
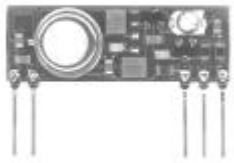
TRANSMITTERS

TXM-xxx-A/F FM Transmitter Module

Versatility combined with ease of use makes the TXM transmitter module a very powerful ingredient in any engineers "cook book". Through the simple addition of power to the modules supply pin, serial data to its data input, and the addition of an appropriate antenna, wire free products ranging from the simplest of remote controls through to complex data acquisition systems can be constructed, all at remarkably low cost.





PIN DESCRIPTION

pin 1 - RF GND
pin 2 - RF OUT
pin 3 - Vcc
pin 4 - Vss
pin 5 - DATA IN

FEATURES

- **PCB mounting, SIL style**
- **Vertical or horizontal placement**
- **Small Size**
- **SAW Controlled**
- **Analogue or Digital data input**
- **Up to 20k bps (-F- models)**
- **No further tuning required**
- **Available in 418MHz, 433.92MHz and 403MHz (exclusive for South Africa)**
- **Wide supply range**

TYPICAL APPLICATIONS INCLUDE:

- **Lone Worker Transmitters**
- **Environmental Monitoring**
- **Wire Free Security**
- **Hazardous Environment Data Transfer**
- **Remote Industrial Process Monitoring**
- **Fire Alarms**
- **Paging**
- **Disabled and Nurse Call Transmitters**
- **Remote Control Handsets**
- **Serial Data Links**
- **Computer Networking**
- **Lighting Control**
- **Garage Door Openers**
- **and more....**

SPECIFICATIONS

PARAMETER	TXM-418-A	TXM-418-F-5	TXM-418-F-3	TXM-433-A	TXM-433-F	TXM-433-HP
FREQUENCY	418MHz	418MHz	418MHz	433.92MHz	433.92MHz	433.92MHz
SUPPLY Vcc	6 - 9V < 10mA 12Vmax	3.6-5V microprocessor compatible. <10mA	2.7-3.6V <10mA	6 - 9V < 10mA 12Vmax	2.7-3.6V < 10mA	6-9V < 10mA 12Vmax
DATA	<10000bps Serial	<20000bps Serial	<20000bps Serial	<10000bps Serial	<20000bps Serial	<10000bps Serial
RADIATED POWER (ERP)	0.25mW	0.25mW	0.25mW	0.25mW	0.25mW	10mW

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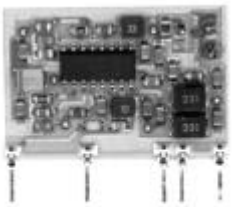
RECEIVERS

AM-RRS2-xxx AM SuperHetrodyne Receiver Module

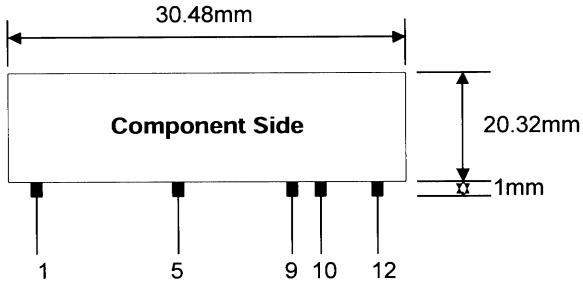
FEATURES

- COMPACT HYBRID MODULE.
- CERAMIC SUBSTRATE
- VERY HIGH FREQUENCY STABILITY
- SAW FILTER FRONT END.
- RECEIVING RANGE UP TO 300ft
- SENSITIVITY TYP -100dBm (2.2µVrms).
- CMOS/TTL COMPATIBLE OUTPUT.
- CURRENT CONSUMPTION 3.7mA.
- SINGLE SUPPLY VOLTAGE 5V.
- COMPATIBLE WITH AM TRANSMITTERS.



DESCRIPTION

The AM-RRS2 AM Superhet Receiver module offers a compact modular RF receiver, which can be used to capture undecoded data from any of the 418MHz or 433MHz AM Transmitter modules.
This superhetrodyne receiver manufactured on a ceramic substrate incorporates a SAW Filter front end for reduced EMC emissions, and uses an IF stage at 500KHz. These modules exhibit a very high frequency stability over a wide operating temperature even when subjected to mechanical vibrations or manual handling.



Component Height = 8mm

Pin No.	Pin Name
1	Data In (RFin)
5	GND
9	GND
10	Vcc
12	Data out

ELECTRICAL CHARACTERISTICS	MIN	TYPICAL	MAX	DIMENSION
Operating Temperature	-30		+85	°C
Supply Voltage (AF+Vcc)	4.5	5	5.5	V
Supply Current		3.7	5	mA
Operating Frequency		418/433		MHz
IF Frequency		500		KHz
Data rate			3	KHz
Sensitivity (100% AM)		-100		dBm
Low Level Output Voltage			0.6	V
High Level Output Voltage	4.5			V

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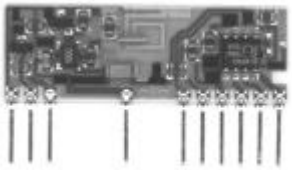
RECEIVERS

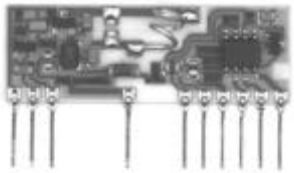
AM-HRR1-xxx AM SuperRegenerative Receiver Module
AM-HRR3-xxx
AM-HRR6-xxx

FEATURES

- COMPACT HYBRID MODULE
- VERY HIGH FREQUENCY STABILITY
- WITH NO ADJUSTABLE COMPONENTS
- RECEIVING RANGE UP TO 150 FEET
- CMOS/TTL COMPATIBLE OUTPUT
- SINGLE SUPPLY VOLTAGE 5V
- LOW CURRENT CONSUMPTION: AM-RR6 TYP 0.8mA
- PATENTED LASER TRIMMED INDUCTOR (AM-HRR3 &6)
- AVAILABLE ON 418MHz AND 433MHz



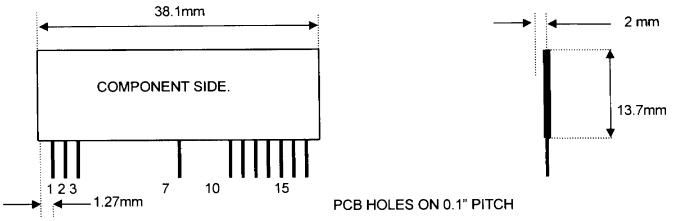
AM-HRR3
AM-HRR6



AM-HRR1

DESCRIPTION

The AM-HRR3/6 AM Receiver modules are compact hybrid RF receivers, which can be used to capture undecoded data from any 418 or 433MHz AM Transmitter, such as the AM-TX1 transmitters. These modules show a very high frequency stability over a wide operating temperature even when subjected to mechanical vibrations or manual handling. A unique laser trimming process (now patented) gives a highly accurate circuit inductor (AM-HHR3&6), eliminating the need for any adjustable components as found on most other regenerative receivers. All receivers are pin compatible, providing a CMOS/TTL output. They require connections to power and antenna only. These modules conform to EMC directive ETSI 300-220.



ELECTRICAL CHARACTERISTICS	MIN	TYPICAL	MAX	DIMENSION
RF Supply Voltage (RF+Vcc)	4.5	5	5.5	V
AF Supply Voltage (AF+Vcc)	4.5	5	5.5	V
Supply Current (HRR1, HRR3)		2.5	3	mA
Supply Current (HRR6)		0.8	1.0	mA
Operating Frequency	200		450	MHz
Tuning Tolerance		+/-0.2	+/-0.5	MHz
-3dB Bandwidth		+/-2	+/-3	KHz
Data rate			2	KHz
Sensitivity (100% AM)	-100	-105		dBm

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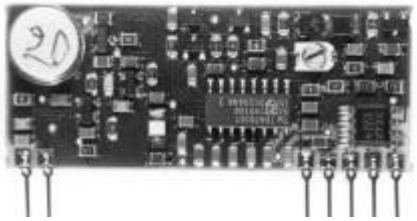
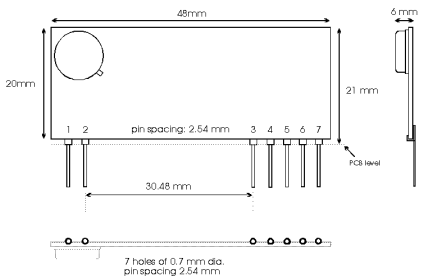
RECEIVERS

SILRX-xxx-A/F FM SuperHeterodyne Receiver Module

This range of receiver provides an ideal complement to our FM range of transmitters. All these receivers feature internal data recovery, giving a simple to use logic level data output for direct interfacing to decoding logic or a microcontroller. Besides the logic level data output, the SILRX receivers include a carrier detect (CD) output as well as an analog output.

To operate all that is needed is a clean power supply, antenna and an appropriate data decoding circuit. Through careful utilization of the receivers CD output, long term battery operation (power saving) is possible. For example a SILRX receiver operating on a 3mS on, and an 800mS standby cycle draws on average < 100µA.





PIN DESCRIPTION

pin 1 - RF IN
pin 2 - RF GND
pin 3 - CD
pin 4 - 0V
pin 5 - Vcc
pin 6 - AF
pin 7 - DATA

FEATURES

- **PCB mounting, SIL style**
- **Vertical or horizontal placement**
- **Small size**
- **SAW contolled double conversion superhet.**
- **Carrier detect output**
- **Both digital and audio ouputs**
- **Fast enable time**
- **Up to 20 000 bps**
- **Easy to use**
- **Supplied with data/application sheets**

TYPICAL APPLICATIONS INCLUDE:

- **Pager Receivers**
- **Remote Control Receivers**
- **Telemetry Base Stations**
- **Wire Free Security**
- **Disabled and Nurse Call Base Stations**
- **Access Control**
- **Modem**
- **Robotics**

SPECIFICATIONS

PARAMETER	SILRX-418-A	SILRX-433-A	SILRX-418-F	SILRX-433-F	SILRX-403-A
FREQUENCY	418MHz	433.92MHz	418MHz	433.92MHz	403MHz
SUPPLY	4.5V - 9V Iq < 13mA	4.5V - 9V Iq < 13mA	4.5V - 9V Iq < 13mA	4.5V - 9V Iq < 13mA	4.5V - 9V Iq < 13mA
DATA (serial)	10 Kbps max.	10 Kbps max.	20 Kbps max.	20 Kbps max.	10 Kbps max.

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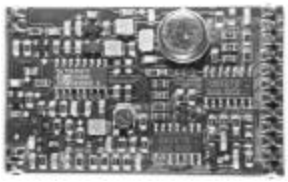
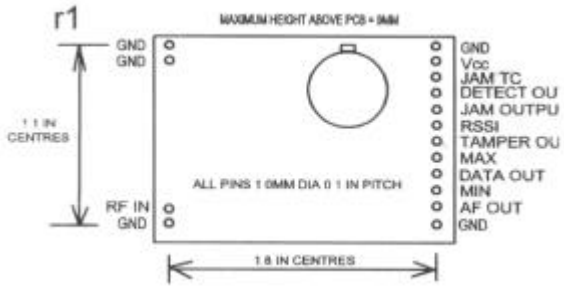
RECEIVERS

RXM-xxx-A FM SuperHeterodyne Receiver

The RXM range of receivers provides an ideal complement to our TXM transmitter modules. These receiver modules feature internal data recovery, giving a simple to use logic level data output for direct interfacing to decoding logic or a microcontroller. Besides having similar features to the SILRX receivers such analog (AF) and digital outputs, the RXM modules have additional features such as received signal strength indication (RSSI), signal jamming detection and antenna tamper sensing making it ideal for security related applications. To operate any of the receivers, all that is needed is a clean power supply, antenna and an appropriate data decoder circuit.



50 x 30 x 10mm



FEATURES

- **PCB mounting, DIL style**
- **Small size**
- **SAW Controlled Wide Band FM**
- **Selective double conversion superhet**
- **Fast enable time**
- **RSSI output**
- **Carrier Detect output**
- **Jamming Signal Detector**
- **Analog and Digital outputs**
- **Logic Compatible Supply**
- **Antenna Tamper Sensing**

TYPICAL APPLICATIONS

- **Domestic and Commercial Security**
- **Guard Patrol/Lone Worker protection**
- **Medic Alert/Nurse Call systems**
- **Valuables protection alarms**
- **Fire Alarms**
- **Control Applications**
- **Remote Process Monitoring**
- **Remote Panic Alarms**
- **Computer Networking**
- **General Telecommand & Telemetry**

SPECIFICATIONS

MODEL	SUPPLY	SENSITIVITY	FREQUENCY	DATA	ENABLE TIME
RXM-418-A	5V @20mA	typ. 0.35mV for 10dB S/N	418 MHz	10 Kbps max.	<5mS
RXM-433-A	5V @20mA	typ. 0.35mV for 10dB S/N	433.92MHz	10 Kbps max.	<5mS
RXM-403-A	5V @20mA	typ. 0.35mV for 10dB S/N	403MHz	10 Kbps max.	<5mS

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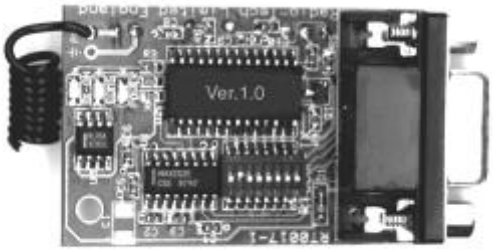
TRANSCEIVER

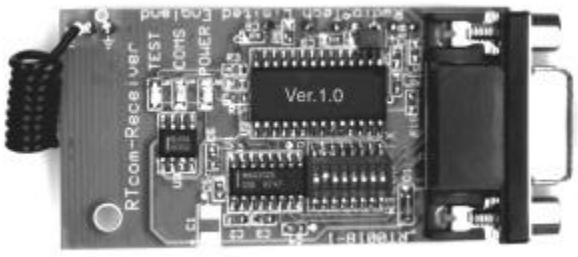
RTcomTx-RS232 Transmitter and RTcomRx-RS232 Receiver pair

- 2400, 4800 or 9600bps simplex
- 2-Wire RS232 Interface, TX(Data) and GND, Rx(data) and GND
- Microcontroller with watchdog
- Transmission range up to 200metres with 0.25mW ERP
- Available on 418MHz and 433.92MHz
- Status LED's - Power, Comms, Tx/Rx ON
- 7.5V to 15Vdc via DB-9 connector, <15mA
- Baud Rate and Data protocols set via on-board DIP switch
- Transparent data packetizing and automatic code balancing
- Standard DB9 or 6x1Pin header option for custom hookup or for through-hole PCB insertion
- 1/4 wave wire antenna on board (shown coiled)

RTcomTx (actual size)



RTcomRx (actual



Functional Overview

The RTcomTx and the RTcomRx contains all the hardware and firmware required to make a highly compact , user friendly and transparent wire free link to RS232 serial interfaced devices. External power is supplied via the DB9 connector and sourced typically from a PP3 type battery or a wall adaptor.

Data Protocols Supported

Single or multiple characters may be transmitted at data rates of 2400, 4800, and 9600. Code balancing is automatic. Both eight and nine bit data protocols are fully supported.

Transmitted data can take any format providing there are no pauses in the transmission. Pauses will cause data framing errors and should be avoided. For reliability we recommend that data packets are kept below 1K bytes per single transmission. Large files should be transmitted as multiple packets using, for example , Z-modem, Kermit or Xon-Xoff protocols.

Order Code:

RTcomTx- 4xx (4xx refers to the operating frequncy of **4**18MHz or **4**33.92MHz)
RTcomRx- 4xx
Data / Power cable (data cable with D-type connectors and external power supply feed cable)

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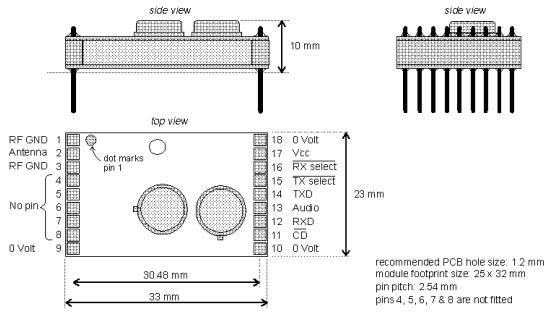
TRANSCEIVERS

BiM-4xx-F/HP FM Transceiver Module

The Radio Transceiver is probably the most versatile of all the Low Power Radio Products. Whenever an application requires two way communication or the acknowledgement of the data transfer, the transceiver provides the obvious wire free solution.

For hand held applications such as Electronic Point of Sale (EPOS), bar code reading, human traffic flow monitoring and hand held data terminals, the compact BIM Transceiver is the ideal candidate. It offers up to 40,000 bps half duplex data transmission and is supported with a development kit (see BIM-4xx-DEV), and for those wishing to avoid RF protocols, there is a simple packet controller chip (see BIM-4xx-RPC) option.



FEATURES

- **Direct interface with 5V CMOS Logic**
- **High Speed half duplex data**
- **Small Size. PCB mounting**
- **Fast enable time**
- **SAW controlled FM Transmission**
- **Auto TX/RX changeover**
- **On-board data slicer and supply switches**
- **Double Conversion Superhet Receiver**
- **User Manual**

TYPICAL APPLICATIONS INCLUDE:

- **EPOS Scanners and Terminals**
- **Radio Data Networks and LANS**
- **Telemetry Transceiver Stations**
- **Interactive Handheld Devices**
- **High Integrity Security /Fire Alarms**
- **Fail Safe Remote Controls**
- **Authorization / Access Control**
- **Laptop > PC > Printer Links**
- **Building Environment Control / Monitoring**

SPECIFICATIONS

	DATA	FREQUENCY	SUPPLY	ERP TRANSMIT	SESITIVITY RECEIVE	ENABLE TIME
BIM-418-F	40Kbps max.	418MHz	5V < 15mA	-6dBm	-107dBm	< 1mS
BIM-433-F BIM-433-HP	40Kbps max.	433.92MHz	5V < 15mA	-6dBm 0dBm for HP version	-107dBm	< 1mS

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BIM-4xx-F TRANSCEVER MODULE

Absolute maximum ratings

Supply voltage Vcc, pin 17	-0.1	to	+6 Volts
All input / output pins	-0.1	to	Vcc + 0.1 Volts
Operating temperature	-20°C	to	+55°C
Storage temperature	-40°C	to	+100°C

Performance Data

ambient temperature: 20°C
supply voltage: +5.0 volts, unless noted otherwise
Data applied to all frequency versions, except where noted.

Parameter	Min	Typ.	Max.	Units	Notes
DC Parameters					
Operating supply range, Vcc	4.5	-	5.5	volts	-
Supply current, transmit	8	12	15	mA	-
receive	10	12	16	mA	-
loop test	-	20	25	mA	-
stand-by	-	-	1	µA	-
RF Parameters - Transmit					
Radiated power (ERP)	-10	-6	-3	dBm	1
Transmit frequency (BIM-418-F)	-	418	-	MHz	-
Transmit frequency (BIM-433-F)	-	433.92	-	MHz	-
Initial frequency accuracy	-75	0	+75	KHz	-
Overall frequency accuracy	-95	0	+95	KHz	-
FM deviation (+/-)	15	20	30	Khz	-
Distortion	-	5	10	%	3
Modulation response @ -3dB	DC	-	32	KHz	-
RF Parameters - Receive					
Receive frequency (BIM-418-F)	-	418	-	MHz	-
Receive frequency (BIM-433-F)	-	433.92	-	MHz	-
Receiver sensitivity	-100	-107	-	dBm	-
AF bandwidth @ -3dB	0.1	-	22	KHz	-
AF output level, pin 13, p-p	-	400	-	mV	-
LO leakage, pin2	-	-57	-	dBm	-
IF bandwidth	-	200	-	KHz	-
AFC lock range (5µV signal)	-	200	-	KHz	
Timing					
RX select low to valid CD	-	-	1	mS	-
RX select low to valid RXD	-	-	3	mS	-
Transmit to Receive delay	-	-	1	mS	-
RF input (5µV) to valid CD	-	-	0.5	mS	-
RF input (5µV) to stable AF	-	-	0.5	mS	-

BIM-4xx-F TRANSCEVER MODULE (cont.)

Parameter	Min	Typ.	Max.	Units	Notes
Base band transfer function (through a pair of transceivers)					
Linear drive (4Vp-p, sine)					
AF response @ -3dB	0.1	-	17	Khz	-
Analog distortion	-	5	10	%	-
Digital drive					
Data rate (50:50)	-	-	40	Kbps	4
Time between transmissions	25	-	2000	µS	5
Average Mark:Space ratio	30	50	70	%	6
Preamble duration (10101010)	3	-	-	mS	-
data delay (TXD to RXD)	-	25	-	µS	-
Interface levels - inputs					
TX & RX select V high	Vcc-0.5		Vcc	Volts	-
V low	0		1	Volts	-
Source current @ V low = 0	0.5		1	mA	-
TXD V high	Vcc-0.5		Vcc	Volts	-
V low	0		0.5	Volts	-
Interface levels - outputs					
RXD & CD V high		Vcc-0.6		Volts	-
(no load) V low		0.2		Volts	-

Notes
1. module on 50mm square ground plane, 16cm whip antenna
2. Standard modulation: 2KHz square wave, 0 to Vcc
3. lKHz, 4V pk to pk. Sinewave centred on +2.5Volts at pin 14 (TXD)
4. Digital drive, 50:50 mark:space (over 4mS) data pattern.
5. High or Low pulse.
6. Averaged over any 4mS period

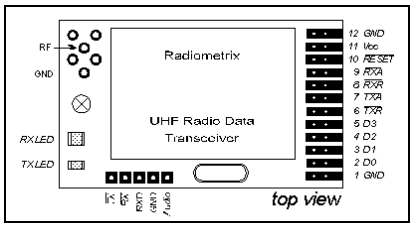
TRANSCEIVERS

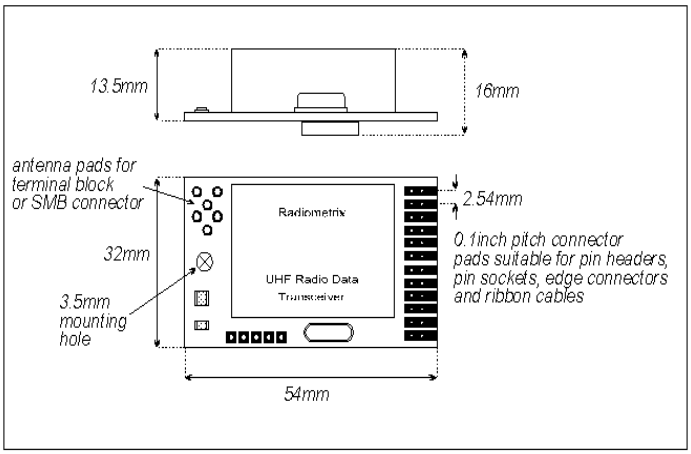
BIM-4xx-RPC Parallel Interface Transceiver Module

The RPC is a self-contained plug-on radio port which requires only a simple antenna, 5V supply and a byte-wide I/O port on a host microcontroller (or bi-directional PC port). The module provides all the RF circuits and processor intensive low level packet formatting and packet recovery functions required to inter-connect any number of microcontrollers in a radio network.

A data packet of 1 to 27 bytes downloaded by a Host microcontroller into the RPC's packet buffer is transmitted by the RPC's transceiver and will "appear" in the receive buffer of all the RPC's within radio range.

A data packet received by the RPC's transceiver is decoded, stored in a packet buffer and the Host microcontroller signalled that a valid packet is waiting to be uploaded.





FEATURES

- **SAW Controlled FM transmitter**
- **Superhet receiver**
- **Built-in self test / diagnostics / status LED's**
- **Single 5V supply @ < 20mA**
- **40Kbit/sec half duplex**
- **Free format packets of 1-27 bytes**
- **Collision avoidance (listen before transmit)**
- **Direct interface to 5V CMOS logic**
- **Power save mode**
- **418MHz and 433MHz versions**
- **1mW and 10mW versions**
- **Packet framing and error checking are user transparent**
- **Reliable 30m indoor range, 120m open ground**

The RPC accepts its data as parallel 5V TTL logic level nibbles making it compatible with all microprocessor technologies. The RPC can be used to set up communication links between computers via bi-directional parallel communication ports.

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TRANSCEIVERS

BIM-4xx-RS232 Transceiver Module

- 4,800 to 38,400 bits/s half duplex.
- 3-Wire RS232 Interface, TX(Data), RX(Data) and Ground
- RS232 Interface protected to +/-15kV ESD in accordance with EMC requirements
- Microcontroller with user data EEPROM
- Automatic Transmission Mode switching upon receipt of serial data from DTE
- Low profile SMD, LED's and switch design for ease of rear panel mounting.
- Comprehensive user manual
- Available on 418MHz and 433.92MHz
- Wide supply range: 7.5Vdc-15Vdc <30mA

FUNCTIONAL OVERVIEW

The BIM-4xx-RS232 contains all the hardware and firmware required to convert the BIM-4xx-F transceiver into a user friendly serial interfaced device with an ESD protected RS232 interface. The internal EEPROM based PIC microcontroller provides all the basic functions required for many applications obviating the need for further hardware or firmware development. In many applications nothing more than a simple software driver is required to put your DTE's serial port in control and ready to receive or transmit data.

For the more ambitious users, the BIM-4xx-RS232 is fully user programmable with the optional in-circuit programming adaptor. This permits reconfiguration of the interfaces internal EEPROM source code.

FUNCTIONAL DESCRIPTION

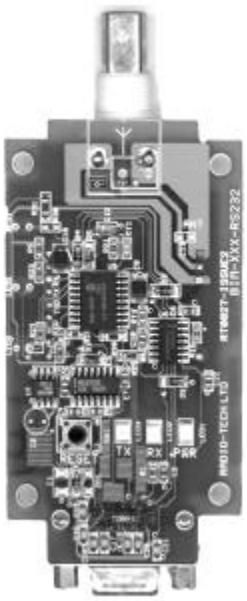
In standby, the BIM-4xx-RS232 continuously searches the ether for transmissions. On detection of a preamble or data the interface signals the host that the channel is busy using the CD line and opens the RX(data) output to the PC. The host can then look at the incoming data and respond as and if required.

Data transmission is initiated simply by sending a user formated data packet from the DTE to the interface. [Simply use Windows file send and select the packet you wish to send. The Windows status bar at the bottom of the screen will give the progress of the transfer.]

Upon detection of the start of a data packet (normally the start of the preamble) the interface automatically switches from receive to transmit mode and thereafter data is modulated onto the carrier.

The CD input to the host can be used within the host driver to prevent collisions with other users.

ORDER CODE: BIM-4xx-RS232
Data/Power cable (optional extra)
Antenna (optional extra)



48mm x 94mm x 20mm (excl. connectors)
48mm x 120mm x 20mm (incl. connectors)

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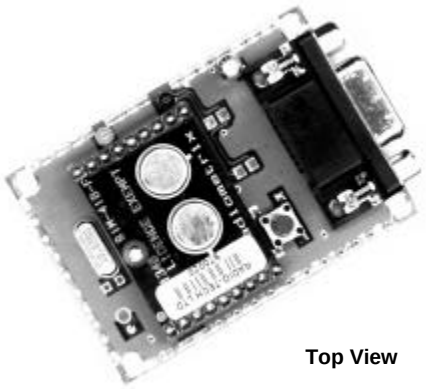
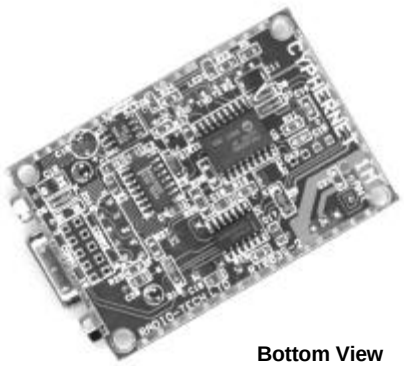
TRANSCEIVERS

CYPHERNET-xxx-RS232 FM Transceiver Module

- 4,800 to 19.2Kbps ASCII (half duplex).
- 2-Wire RS232 Interface, TX(Data), RX(Data) With CD(Carrier Detect) option
- RS232 Interface protected to +/-15kV ESD in accordance with EMC requirements
- Automatic power on reset local loop back test for both TX & RX
- Automatic Transmission Mode switching upon receipt of serial data from DTE
- 7.5V to 15V dc operation. <35mA .
- Optional user programmer for in-circuit microcontroller EPROM configuration
- Measures Only 58 x 40 x 15mm, Weight < 26g.
- Available on 418MHz and 433MHz
- Status LED's: TX on, RX Data (Carrier Detect) and Reset Switch.
- Options of 9pin D-Type (standard) or 10-way IDC (to order) header connections
- Includes 1/4 wave wire antenna. Pads available for external antenna hookup. Up to 400ft range.



Top View



Bottom View

OVERVIEW

The CYPHERNET contains all the hardware and firmware required to provide a low cost, compact user friendly serial interfaced radio data link with an ESD protected RS232 interface The internal EPROM based PIC microcontroller provides all the basic functions required for many applications obviating the need for further hardware or firmware development. In many applications nothing more than a simple data packetizingsoftware driver is required to put your DTE's serial port in control and ready to receive or transmit data.

For the more ambitious users, there is a user programmable version and optional in-circuit programming adaptor. This permits reconfiguration of the interfaces internal EEPROM source code.

ORDER CODE: CYPHERNET-xxx-RS232
DATA/POWER CABLE

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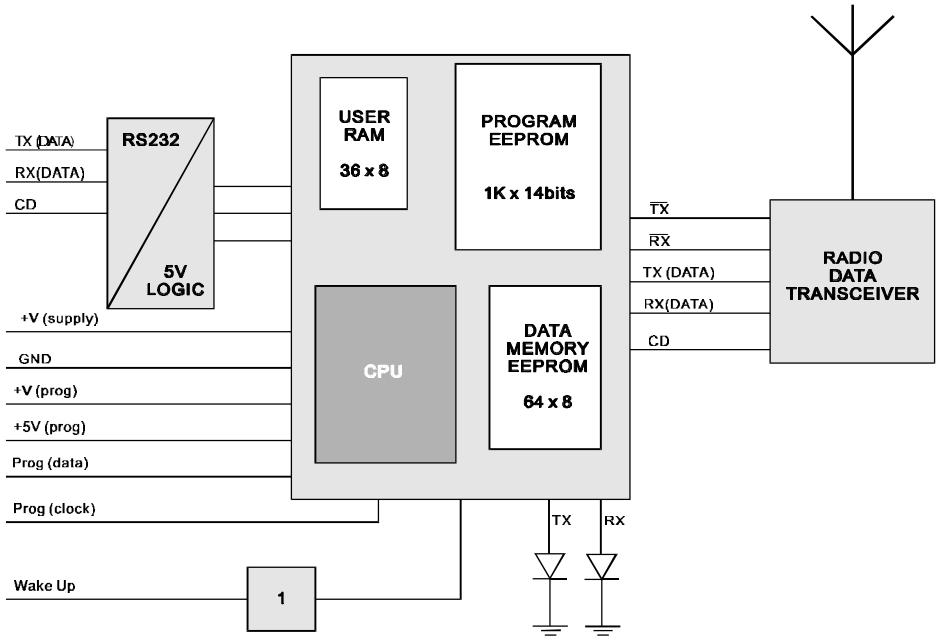
Cyphernet Radio Transceiver with RS232 Interface and Controller



Standard Firmware Description

The Cypernet comes complete with an EEPROM held firmware package giving the following operating performance.

In standby mode the unit continuously searches the ether for transmissions. On detection of preamble or data the interface signals the host that the channel is busy using the CD line and opens the RX(data) output to the PC. The host can then look at the incoming data and respond as and if required.
Data transmission is initiated simply by sending a data packet in the above format from the DTE to the interface. Upon detection of the start of a data packet (normally the start of the preamble 101010 pattern) the interface automatically switches from receive to transmit mode and thereafter data is modulated onto the RF carrier.

5ms Preamble UART Sync Character Data with or without CRC

User Programming Option

The user may purchase or construct their own in-circuit programming adaptor for the Cyphernet. This will permit the user to replace the firmware supplied with their own firmware package giving them a totally customised solution for their specific needs.

Files destined for the programmer need to be converted into binary format. This is simply ac-complished by using one of the many standard off the shelf PIC compilers. The programming adaptor is controlled via the parallel port of the PC. It comes complete with a DOS based package permitting both reading and writing to the EEPROM data and program memory via the Cyphernet 9-pin D-Type connector.

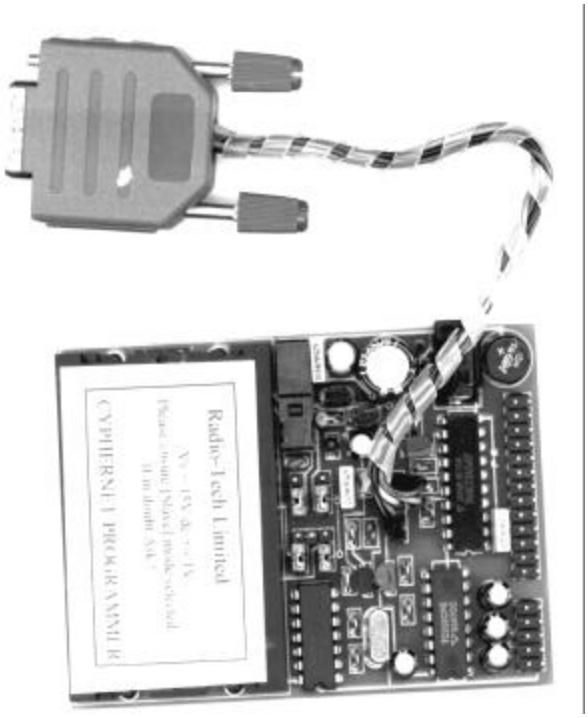
PROGRAMMER

In-Circuit Programming Adaptor

- Programs the CYPHERNET and the BIM-xxx-RS232 transceivers in-circuit via PC printer port
- Resets code protection fuses on the PIC16C84 microcontrollers
- Supplied with a 9 pin D-type connector
- ISO Smart Card programming option included
- Programming Software included

The programmer enables the user to replace the firmware supplied with the BIM-4xx-RS232 and the Cyphernet with their own firmware package giving them a totally customized solution to cater for their specific requirements.

Files destined for the programmer need to be converted to binary format. This is easily accomplished by using one of the many off-the-shelf PIC compilers. The programming adaptor is controlled via the parallel port of the PC. It comes complete with a DOS based software permitting both reading and writing to the EEPROM data and program memory via the CYPHERNET or BIM-4xx-RS232 9-pin D-type connector.



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TRANSCEIVERS

RTcom-RS232 Radio Modem Subassembly with RS232 Interface

- 2400bps to 19.2Kbps half duplex.
- 3-Wire RS232 Interface, TX(Data), RX(Data) and GND
- RS232 Interface protected to +/-15kV ESD in accordance with EMC requirements.
- Microcontroller with watchdog.
- Automatic Transmission Mode switching upon receipt of serial data from the DTE.
- Operates from WINDOWS or DOS under terminal mode.
- Transmission range up to 400ft with 0.25mW ERP
- Available on 418MHz and 433.92MHz
- Status LED's
- 7.5V to 15Vdc via DB-9 connector. <30mA
- Reset switch - activates Power On Test Routine
- Baud Rate and Data protocols configuration via on-board DIP switch.

Functional Overview

The RTcom-RS232 contains all the hardware and firmware required to make a wire free, user friendly connection to serial interfaced devices. TTL plus RS232 capability permits the Rtcom to replace existing wired data networks. The dual-standard interface also eliminates the need for interface cards permitting additional savings to be made. In polled networks system latency is typically better than 10ms, permitting standard network acknowledge messages to be received without need for any system timing modifications.

70mm x 65mm x 15mm

Data Protocols Supported

Single or multiple characters may be transmitted at data rates of 2400, 4800, 9600 and 19200bps. Code balancing is automatic. Both eight and nine bit data protocols are fully supported.

Transmitted data can take any format providing there are no pauses in the transmission. Pauses will cause data framing errors and should be avoided. For reliability we recommend that data packets are kept below 1K bytes per single transmission. Large files should be transmitted as multiple packets using for example Z-modem, Kermit or Xon-Xoff protocols.

Order Code:

RTcom-RS232- 4xx (4xx refers to the operating frequncy of **4**18MHz or **4**33.92MHz)
Data / Power cable (data cable with D-type connectors and external power supply feed cable)

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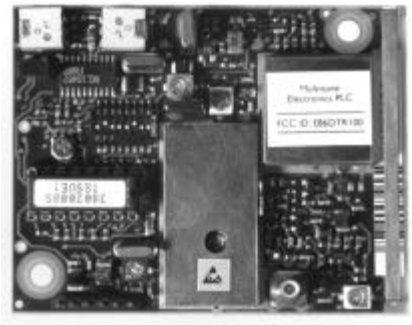
TRANCEIVERS

TXR-464-DTR100 64 Channel Synthesized FM Transceiver

The TXR-464-DTR100 is both a high quality and high performance fully Synthesized 64 channel, radio data transceiver specifically tailored and approved to meet the needs of the North American 462.075 - 464.850 & 465.100 - 465.875MHz FCC part 90 bands, high security, EPOS, hand held data terminal, industrial telemetry and telecommand markets.

It offers a data throughput of up to 4800bps and with full 10mW of output power achieves ranges of over 600m with its internal antenna and up to 5km with an optional external antenna. Optional control interfaces for the

- Simple 5V operation
- Internal antenna switch
- TTL logic level i/o
- Internal Antenna
- Optional external antenna



The DTR100 accepts serial TTL level logic inputs for both control and data via a 6-way connector. Inputs include TX (enable), SLEEP, DATA (in) and DATA (out). Channel selection is normally via the on board DIP switch, however with care this may be hard wired for external control . Data bit times should lie between 100µS and 300µS for optimum performance.

The DTR100 is also available on frequencies suitable for the UK, South African, Scandinavian, Australian and European ISM markets. Please consult our sales office for further details.

Channels	Up to 64 user selectable channels
RF IO	50Ω
RF Output	10mW into 50Ω or 10mW into internal loop antenna
Range	Up to 1800ft with integral loop antenna. Up to 1.5mile with external Yagi antenna
Data Rate	1.2Kbps to 5Kbps
Rx Data Squelch	Adjustable control (RSSI) based for received data output
Dimensions	70mm x 55mm x 18.5mm
Weight	<30g
Environment	-20◦C to +55◦C 95% RH non condensing
Power Supply	5Vdc, 60mA (Rx), 95mA (Tx) 10µA in standby mode

TRANSCEIVERS

TXR-2450-RS485 Spread Spectrum Transceiver

OVERVIEW

The TXR-2450-RS485 is a hyper performance microwave radio data transceiver employing state-of-the-art spread spectrum microwave communication techniques. With a permissible data rate of between 250Kbps and 1Mbps it is an ideal candidate for constructing high speed wire free data networks for applications as diverse as real time industrial processing and monitoring through to WANs

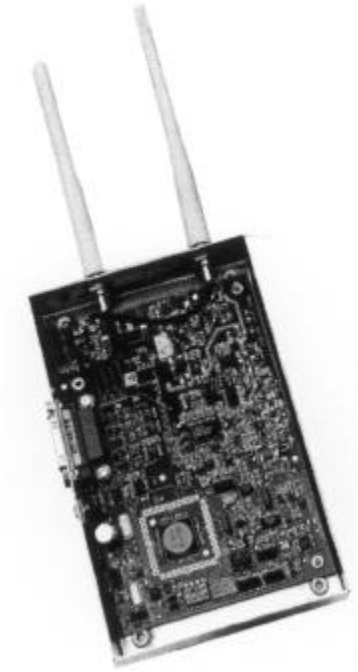
Operating on the near globally accepted 2.450GHz microwave communications band, the TXR-2450-RS485 is designed for easy implementation by OEM's and end users. Connection to the data interface is via a RS485 serial port with TX and RX flow control lines.

In application each receiving module within range will receive the messages sent from the transmitting module. The user equipment must provide a means for addressing the data so that the correct receiving equipment can identify messages intended for reception. Network operation can then be achieved by a suitable user protocol.

The TXR-2450-RS485 is supplied with either one or two dipole antennas which are connected to the SMA jacks on the top of the unit. Each of these antennas may be used for transmit or receive.

The TXR-2450-RS485 is split into two sections. The RF section contains all high frequency RF signal processing and analogue data recovery circuits. The control section contains power supply, interface, microcontroller and logic circuits.

The processor/controller handles various functions of the RF section including Tx/Rx switching in response to data sent to the SSRT. It can also select a power down mode (if enabled) when the data input/output stays inactive for a set period. The processor reads preset switches to determine operating channel and power saving enable. The processor displays various status conditions such as data flow on its status LEDs. The RS485 data input/output interface provides the link to the user's equipment.



PCB Size: 140 x 97 x 23 mm

Enclosure: 163 x 103 x 32 mm

APPLICATIONS INCLUDE:

- **Bar Code Scanners**
- **Wire-Free Video Data**
- **Warehousing**
- **Building Mangement**
- **SCADA Systems**
- **Data Debriefing**
- **High Level Security**
- **Robotics**
- **Telemetry**

FEATURES INCLUDE:

- **Up to 100mW ERP**
- **30m < Range < 1Km**
- **5V or 8-12V Operation**
- **250Kbps to 1Mbps**
- **RS485 interface**
- **Dual Receiver Diversity**
- **Automatic Antenna Switch**
- **Screened Enclosure**

continued

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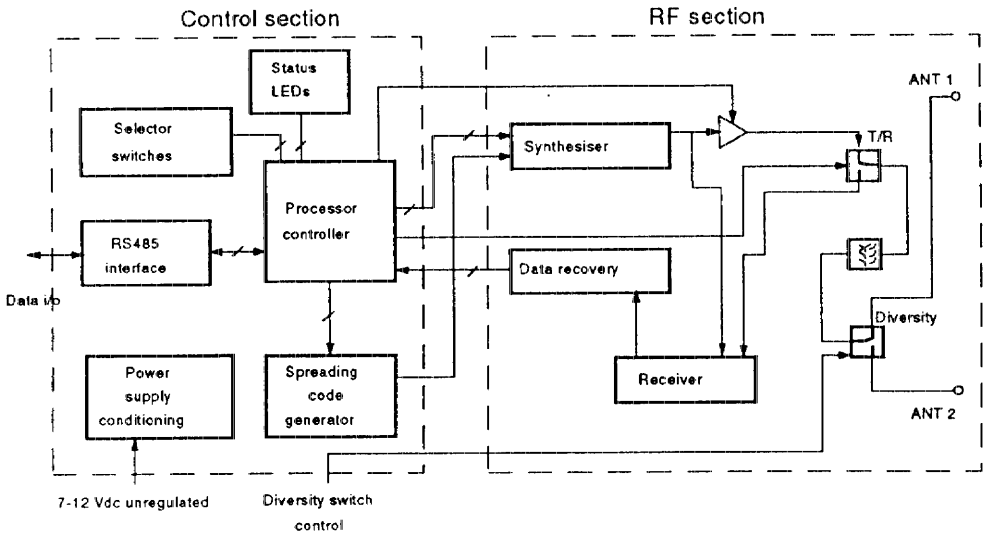
The power supply section takes 7-12 V unregulated dc. The code generator produces 16 MHz direct sequence spread spectrum signals, via a modulator in the RF section. The RF section generates frequencies directly in the 2.4 to 2.4835 GHz range to avoid spurious mixing products which are potentially troublesome with up-conversion techniques. This reduces the cost as no conversion stages or filters are required.

A diversity RF switch selects one of two antennas under user control and a Tx/Rx RF switch connects the selected antenna to either the transmitter or the receiver automatically (i.e. under processor control). The data recovery section removes the spreading code and converts the analogue receiver output to digital levels.

The fast hardware synchronization circuits provide initial synchronisation in less than 2 mS and subsequent tracking is maintained for the duration of the received data packet. The data packet format, error correction coding and network protocols are under the control of the user's equipment for maximum flexibility in application.

SMA coaxial jacks are fitted for external antennas as required by users. The data input/output, power supply lines and receiver inputs have built-in EMC protection for ESD immunity.



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TXR-2450-RS485 Specifications

Parameter	Value
Frequency Range	2.4 to 2.4835 GHz
Conforming to Standard	ETS 300 328
Line-of-sight range	up to 400m using whip antennas
Range in typical office	30 to 50m
Bit rates	250kbps to 1000kbps
Channel sub bands	three 32MHz-wide (DIP switch select)
Modulation	FSK direct sequence spread spectrum*
Maximum RF power output	60mW
Synchronisation time	less then 1.5ms
Spreading code sequence	00110100
Input supply voltage	7 to 12Vdc (unregulated)
Current consumption	300mA (Tx) 200mA (idle) <25mA (power saving)
Staus LEDs for	dc power, Tx, Rx
Serial data interface	RS485
RF connectors	two SMA jacks
Data/power connector	15-way chassis mounted D-type plug
Transceiver module dimensions (screened enclosure)	163mm X 103mm X 32mm
Weight (including screened enclosure)	400g
Transceiver PCB dimensions	140mm X 97mm X 23mm
Weight of populated PCB	78g
Operating temperature	-20 to 70°C
Humidity	8% to 90%
Electrical construction	surface mount

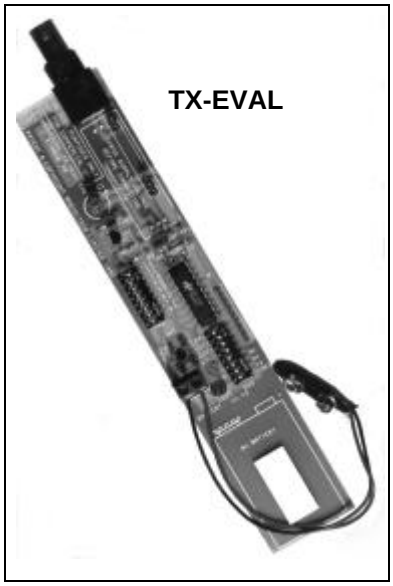
*Modulation is wideband non-coherent FSK. Spreading code and data modulation are added at baseband and then modulate the VCO. The spreading code is not synchronised to the data clock.

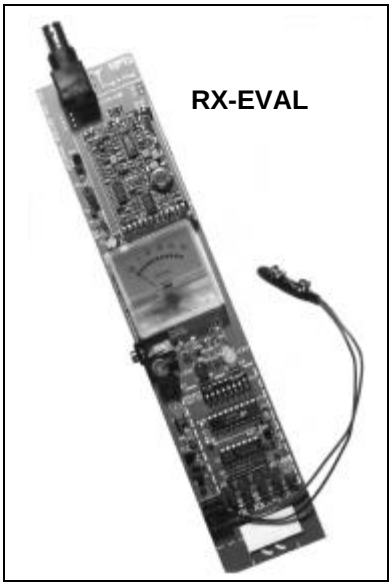
EVALUATION

TX/RX-EVAL FM Transmitter & Receiver Evaluation Boards

These boards have been designed specifically to enable the newcomer and experienced engineer alike to get a feel for the capabilities for each radio data module under both laboratory and field conditions. Their features provide an invaluable means for conducting range tests and for assisting in installation and the alignment of antenna.

The TX-EVAL transmitter evaluation kits permit the evaluation of and testing of all the TXM series transmitters. This unique board accommodates 3V, 5V and 9V operating transmitters at the flick of a switch. It also permits the transmission of data from an on-board HT-12-E data encoder, to which data bits D0 - D3 may be altered using a dip switch. Push to transmit or continuous transmission modes are also provided. Antenna connection is via a BNC socket permitting the connection and evaluation of a wide variety of antenna styles. Note it is up to the user to ensure that maximum ERP regulations are not exceeded.





The RX-EVAL receiver evaluation kit permits the evaluation and testing of the SILRX series and RXM series of receivers. It contains HT-12-D data decoder, for which LED's are provided corresponding to valid data received and data bits D0 - D3 and indicate POWER and RF CARRIER presence. A signal strength meter is also provided which is driven direcly by the RSSI output of the RXM receiver module. Note this facility is not provided on the SILRX receiver module. An earphone socket is available to listen to the received signal. As with the TX-EVAL, antenna connection is via a BNC socket permitting the connection and evaluation of a wide variety of antenna styles.

Both evaluation boards are powered by 9V batteries (not supplied). Sockets are provided enabling the module-under- evaluation to simply plug in, thus eliminating the need for soldering.

The respective transmitter and receiver modules are purchased seperately.

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EVALUATION

BIM-4xx-DEV Transceiver Evaluation/Development Kit

Exclusively designed for the evaluation of the BIM-418-F, BIM-433-F or BIM-433-HP transceiver modules. The BIM-4xx DEV is the ideal starting platform for those wishing to instantly evaluate the potential of the BIM transceiver, and eliminate the need to get involved in PCB or software design to do so.

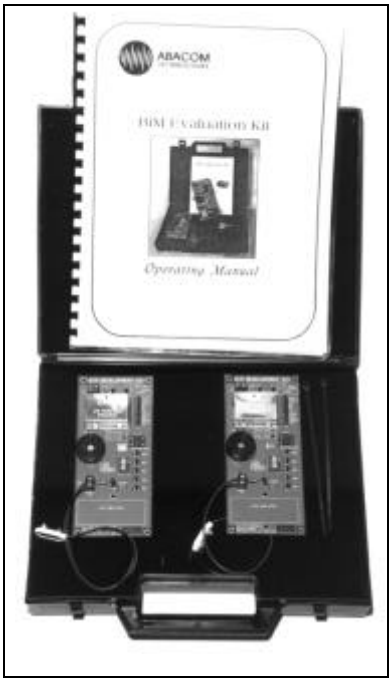
Supplied as a master and slave pair, the BIM-4xx-DEV generates test messages at various baud rates and transmits them, back and forth between the master and slave. Both acknowledge the receipt of a valid message with a bleep and display the resultant success rate on an active LED bar graph display.

Antenna connection is via a screw terminals permmitting the connection and evaluation of a wide variety of wire antenna styles. Note it is up to the user to ensure that maximum ERP regulations are not exceeded.

Includes: carry case, manual, 2 x soldered in BIM transceiver modules of choice, test firmware, user interface and two 1/4 wave whip antenna.

FEATURES

- **Variable Baud Rate: 2400-38400**
- **9V battery operation**
- **Bit Error LED bar graph**
- **Test Header**
- **Status LED's**
- **User i/o port**
- **Acknowledge beeper**
- **4 Operational Modes**
- **User manual**



A two channel oscilloscope (preferably with digital storage) is highly recommendable to visualize the units operation. For this purpose, two sync outputs are specially implemented for monitoring the units operation.

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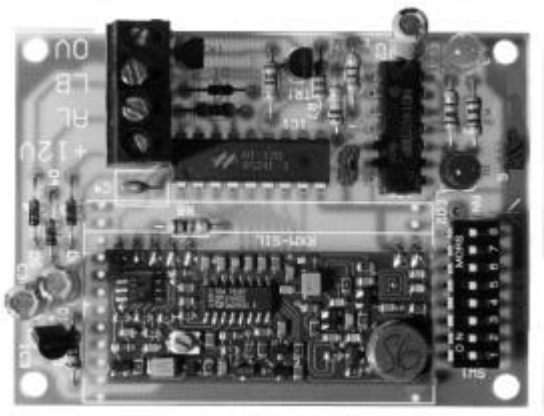
PLATFORMS

1CH-4xx-HT FM Receiver Module Remote Control Platform

This 1 channel receiver platform is intended to complement the TXM series transmitter modules. It is based on the HT-12-D decoder circuit and the SILRX or RXM series receiver modules. With open collector alarm and low battery outputs, it provides the basis for a wide variety control applications. The triggered condition, for example an alarm condition, is visible via a red LED and a green LED for a transmitter low battery condition. A link is also provided to invert the open collector outputs if required. The local address is set by means of an 8-way DIP switch permitting 1 of 256 possible address configurations.



55mm x 75mm x 17mm

The 12v dc supply input and the open collector outputs are available via a PCB terminal block.

Note: The 1CH-4xx-HT is supplied without the receiver module. The required receiver module must be ordered seperately.

Features:

- **Users Choice for FM receiver option**
- **Two normal / invert Open Collector outputs**
- **LED indication of received signal**
- **On board 8V regulator**
- **256, DIP switch configurable, address options**

Order Code:	**1CH-4xx-HT**
Receiver option:	**SILRX- 4xx-A** **RXM-4xx-A**

4xx refers to the receiver frequency of 418MHz or 433MHz or 403MHz

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PLATFORMS

1CH-4xx-HTLP FM Receiver Module Low Power Platform

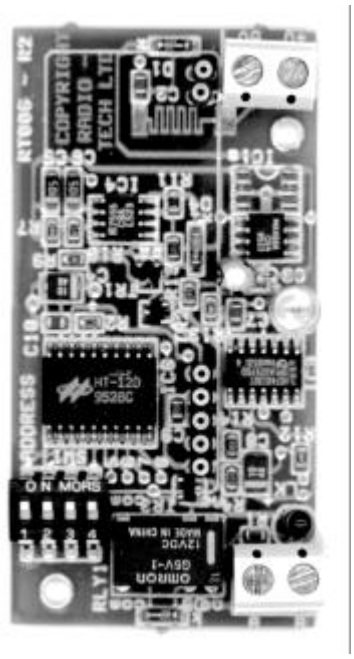
The 1CH-418/433-HTLP is a low power radio receiver platform designed to accommodate the SILRX range of receiver modules and to operate in conjunction with a transmitter design employing the TXM series FM transmitter module, together with the Holtek HT-12-E encoder IC. The unit has been specifically designed to operate at very low current levels, permitting its retro-fit to any system without the need for increased power supply capacity. Alternatively the receiver may be operated for considerable periods from batteries.

Three versions are available providing operation from 9, 12 or 24V dc supplies. High voltage operation from supplies above 24V is also possible as the receivers low current consumption permits excess voltage to be simply dropped using a series connected Zener diodes. The alarm output is fully isolated via a 125Vac 0.5A output relay with normally open contact.

The receiver platform is supplied in compact PCB format, with both power and alarm LED's. Received data is decoded using the Holtek HT-12-D. Address bits A0 to A3 are switch programmable and bits A4-A7 may be drill programmed to give the full 256 code combinations.

Applications include nurse call systems, panic attack alarms, lone worker systems and remote control systems.

SUPPLY VOLTAGE	10-14Vdc
STANDBY CURRENT	120mA
PEAK CURRENT	13mA
DIMENSIONS	65 x 35 x 15mm
MOUNTING HOLES	3.5mm Diameter
DECODER	HT-12D
ADDRESSES	16: DIP Switch Coded 256: DIP and Drill Coded
POWER LED	Standby: Blinks Full Power: ON TX batt. low: OFF
OUTPUT LED	Red : o/p active ON
RECEIVER OPTIONS	SILRX- 403/418/433MHz
RELAY RATING	125Vac 0.5A



Note: The 1CH-4xx-HTLP platform is supplied without the SILRX FM receiver module. The receiver module of the chosen frequency must be ordered seperately.

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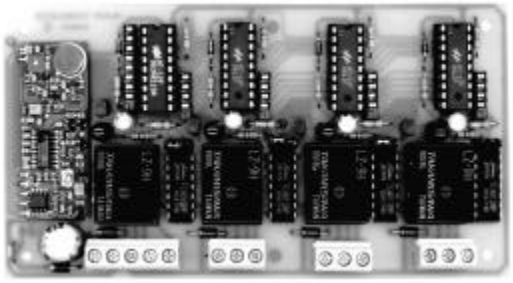
PLATFORMS

1,2 & 4CH-SRX Four Channel Remote Control Receiver Platform

The 1,2 & 4CH-SRX platforms provide one, two or four independently binary coded output channels. Each relay ouput is user configured through jumper settings to select either *latched* mode or *pulsed* mode. The four bit address for each output channel is user configured by means of SIP switches. The power supply input and channel output connections to external equipment are made via screw terminal connector blocks. The status of each channel is visualized by its corresponding LED. Received data is automatically error checked, therefore minimising the possibilities of false triggering.



Picture shows 4CH-SRX Model

The 4CH-SRX is also available in one and two channel versions; the 1CH-SRX and the 2CH-SRX.

All three -SRX- versions are suitable for pairing up with the 1-6CH-TXM platforms to complete the remote control link.

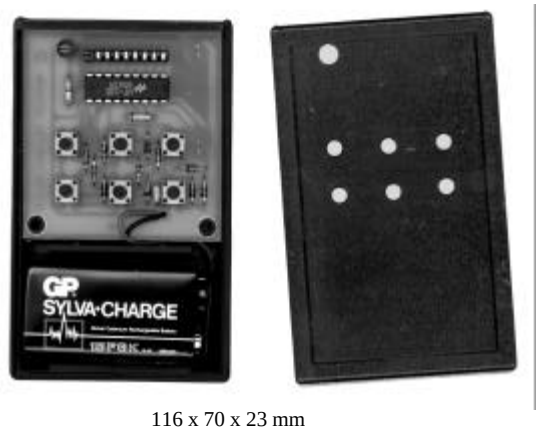
The platform address is set by means of an eight position SIP switch, providing up to 256 possible address combinations. Both the module address and channel addresses are decoded with a Holtek HT12F decoder IC and therefore will respond to similarly encoded bit patterns from a Holtek HT12E encoder IC or a microcontroller on the transmitter end. The antenna connection is via a PCB pad and is suitable for direct soldering either a 1/4 wave wire antenna or for taking 50Ω coaxial feed to a suitable external antenna connector.

Supply	10V-15V dc 15mA standby 250mA max. with 4 relays energized
Address	256 possible combinations. SIP switch setting.
Frequency	403MHz, 418MHz or 433.92MHz (see note)
Output Modes	Latched or Pulsed (1.5 seconds or custom configurable)
Relay Contacts	Common Normally Closed Normally Open
Contact Rating	5A @ 110Vac
Antenna	1/4 wave wire
Channel Status	5mm Red LED. ON=Relay energized. OFF=Relay de-energized
Dimensions	5.6" x 2.8" x 0.75"

NOTE: To preserve flexibility, the 1,2,or 4CH-SRX platform is designed to use, but does not include, the SILRX-4xx-A series receiver module. The SILRX-4xx-A module on the desired frequency must be ordered additionally. (see ' Receivers' for details)

PLATFORMS

1-6CH-TXM One to Six Channel FM Remote Control Platform



116 x 70 x 23 mm

DESCRIPTION

Available in 1 to 6 button versions, the 1-6CH-TXM remote control platform is designed to accommodate the TXM-4xx-A or HP FM transmitter modules. An 8bit address SIP switch configures the platform for 1 of 256 possible address codes.

Using the HT-12E encoder IC makes the 1-6CH-TXM suitable for use with the **1,2** and **4CH-SRX** receiver platforms providing an RF link to control up to 6 remote devices in either latched or pulsed modes at distances of up to 200metres. It is also suitable for use with the following receiver platforms: **1CH-4xx-HTLP** and **1CH-4xx-HT**

The assembled PCB is supplied with an enclosure, as shown, which includes a 9V (PP3) battery compartment with access door (the battery is not supplied).

The tactile switches and transmit LED protrude through the corresponding holes in the cover, ending flush with the outside surface of the enclosure. Surface 'catching' is therefore eliminated and the provision for a custom adhesive overlay is facilitated.

Note: The 1-6CH-TXM platforms do not include the TXM-4xx-A transmitter modules. The required transmitter module on the desired operating frequency must be ordered additionally. (see "Transmitters" section)

Order Code: 1-3CH-TXM (1,2 or 3 button option)
4-6CH-TXM (4,5 or 6 button option)

Transmitter Option: TXM-4xx-A or HP (where 4xx refers to the operating frequency of either 418MHz or 433MHz or 403MHz)

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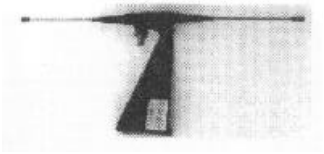
ANTENNA

Portable antenna are supplied with BNC connectors as standard. Other connectors or screw fittings may be supplied to order.

PART	DESCRIPTION	FREQUENCY
1/4-418-BNC or 1/4-433-BNC	Moulded 1/4 wave antenna with BNC connector	418MHz or 433MHz
HEL-418-BNC or HEL-433-BNC	Moulded helical stub antenna with BNC connector	418MHz or 433MHz
DIP-418-BNC or DIP-433-BNC	Dipole antenna with BNC terminated co-ax lead and mounting bracket	418Mhz or 433MHz

Moulded 1/4 wave

Helical Stub



Centre fed dipole

SHIELDING CANS		
BIM-CAN	Shielding Can for BIM Transceiver	Supplied flat with solder lugs
RXM-CAN-UHF	Shielding Can for RXM Receivers	Formed can with flange

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ENCLOSURES

TXM-CASES Keyfob Cases for FM or AM Transmitter Modules

Ergonomically designed cases available in 1,2,3,4,5 and 6 button formats. Each button is colour coded for clear function distinction. The buttons maintain the profile of the box so that 'catching' is eliminated.

Suitable for use with the our TXM and AM-TX1 range of transmitter modules and will accommodate a 12V alkaline type 23A battery.

Above the buttons is an aperture for a 3mm LED.

The case seperates into two halves , by hand, allowing for quick and easy battery changes, or for internal access, and then simply 'snap' closed by aligning and pressing the two sides together. Recommended PCB size of 59 x 29mm will allow space for a 12V type 23A battery. Typically, the battery would be located above the LED aperture.

	Length	Width	Height
Outside	82.5mm	36.5mm	14.5mm
Inside	69.5mm	29.5mm	11mm

Order Codes **TXM-1**
TXM-2
TXM-3
TXM-4
TXM-5

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High or low volume, we welcome all orders. A one-off is never a problem !

To place your order

- **Call: +(416)236-3858 9am - 7pm EST**
- **Fax: +(416)236-8866 24Hrs**
- **e-mail abacomtech@compuserve.com**

For your convenience a fax/mail order form is included in this catalog.

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Canada

Payment Methods

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- MasterCard
- Money Order (International if outside Canada)
- Bank Certified Check
- Electronic Funds Transfer

Shipping

- Add US$7.00 for air parcel postage to the USA.
- High value and/or quick turnaround orders can be shipped via FedEx UPS or a carrier of your choice.
- Overseas orders, please call our sales office. We can quote C&F, CIF and FOB prices.
- Canadian customers add CN$7.00 for regular parcel post within Canada.

Accounts

- Net 30 day accounts are welcome subject to satisfactory credit references. Mininmum order $250.

ORDER FORM

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CANADA

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First Name: Last Name:

Company:

Mailing Address:

Shipping Address:

ORDER CODE	DESCRIPTION	QUANTITY	PRICE

Payment Method:

☐ VISA ☐ MasterCard ☐ International Money Order

Card Number ☐☐☐☐ ☐☐☐☐ ☐☐☐☐ ☐☐☐☐

Expiry Date: ☐☐ ☐☐ Cardholder's Name: _____

Signature: _____

Subtotal	
S & H	7.00*
PST(Ontario)	
GST(Canada)	
TOTAL	$

* air parcel post

US $ PRICE LIST

ITEM	1+	20+	50+
TRANSMITTERS			
TXM-4xx-A	24.50	20.90	17.32
TXM-4xx-F (3Vor5V)	25.80	21.88	17.92
TXM-433-HP	25.80	21.88	17.92
AM-RT4-4xx	10.15	7.75	6.70
AM-RT5-433	12.10	8.30	7.38
AM-TX1-4xx	12.60	10.90	9.50
RTcomTX-RS232	87.15	82.00	76.86
RECEIVERS			
RXM-4xx-A	50.83	40.16	35.40
SILRX-4xx-A	39.38	34.10	29.75
SILRX-4xx-F	41.92	36.75	31.95
AM-RSS2-4xx	24.50	22.40	17.75
AM-HRR1-418	10.95	9.65	7.60
AM-HRR3-4xx	10.95	9.65	7.60
AM-HRR6-4xx	10.95	9.65	7.60
RTcomRX-RS232	105.52	99.30	93.10
TRANSCEIVERS			
BIM-4xx-F	87.36	72.41	61.10
BIM-4xx-RPC	139.30	122.36	104.95
BIM-4xx-RS232	139.30	122.36	104.95
RTcom-RS232	247.90	229.40	218.67
CYPHERNET	139.30	122.36	104.95
IN-CIRCUIT PROGRAMMER	195.00		
DATA/POWER CABLE	12.50	11.35	10.50
TXR-464-DTR100	313.50	295.75	260.75
TXR-2450-RS485	699.30	665.00	605.50
EVALUATION KITS			
BIM-4xx-DEV	262.42		
TX-EVAL	52.45		
RX-EVAL	69.95		
PLATFORMS			
1CH-SRX (excl. RF module)	31.50	27.30	
2CH-SRX (excl. RF module)	51.75	45.50	
4CH-SRX (excl. RF module)	76.95	65.00	
1CH-4xx-HT (excl. RF module)	31.50	27.30	
1CH-4xx-HTLP (excl. RF module)	34.30	29.40	
1-3CH-TXM (excl. RF module)	24.85	22.50	
4-6CH-TXM (excl. RF module)	27.00	23.75	
SHIELDING CANS			
BIM-CAN	3.45	2.63	2.30
RXM-CAN	4.38	3.85	3.40
ANTENNA			
1/4-4xx-BNC	10.80		
HEL-4xx-BNC	10.80		
DIP-4xx-BNC	40.25		
TRANSMITTER CASES			
TXM-1 (or -2,-3,-4,-5,-6)	3.50	3.36	3.00
HOLTEK ENCODERS / DECODERS			
HT12E, HT12D	2.18	2.18	1.66
HT12E, HT12D (SMT)	2.36	2.36	1.83
HT12F	2.36	2.36	2.00
HT12F (SMT)	2.70	2.70	2.17

- Please call for 100+ quantity prices
- Prices do not include S&H or any duties and taxes that may apply

NOTE: Replace "4xx" in the item code with your choice of frequency: 418 Mhz or 433 MHz

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