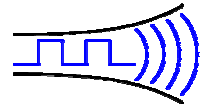


**NEW**

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**SMX2**

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## Small Multi-channel UHF Transceiver

**Standard:** SMX2-433-5 (10mW)  
**Variant:** SMX2-XXX-5 (2mW-25mW)

**SMX2 is small multi-channel UHF transceiver operating on 433.05MHz-434.79MHz European licence exempt band. SMX2 offers a fast-route to custom frequency on any UHF band from 431MHz to 436MHz with 25kHz channel spacing.**



Figure 1: SMX2-433-5

### Features

- Conforms to ETSI EN 300 220-3 and EN 301 489-3
- High performance double superhet, 128 channel PLL synthesizer
- Data rates up to 5 kbps for standard module
- Usable range over 500m
- Fully screened. Low profile
- Feature-rich interface (RSSI, analogue and digital baseband)
- Incorporate a 1200baud dumb modem
- Re-programmable via RS232 interface
- Low power requirements

### Applications

- Handheld terminals
- Heavy vehicle/machine remote controls
- EPOS equipment, barcode scanners
- Data loggers
- Industrial telemetry and telecommand
- In-building environmental monitoring and control
- High-end security and fire alarms
- Vehicle data up/download

### Technical Summary

- Operating frequency: 433.05 - 434.79MHz
- Custom variants from 431 - 436MHz on any 1MHz band
- 128 channels controlled via RS232 interface
- Transmit power: +10dBm (10mW) nominal. Adjustable 2 – 25mW
- Supply range: 4.2V - 15V
- Current consumption: 30mA (10mW) transmit, 25mA receive
- Data bit rate: 5kbps max. (standard module)
- Receiver sensitivity: -120dBm (for 12 dB SINAD)
- Size: 53 x 32 x 12mm





5. RS232 input pins (6a and 7a) tolerate true +/- levels. No buffering is required.
6. If analogue transmit modulation is needed, then connect a series 1µF cap + 500kΩ trimmer in the 'baseband in' circuit. Adjust trimmer for 90% of peak deviation (+/- 2.7KHz) at mean input level.
7. If parallel channel select is not wanted, the 4 pin connector 'b' can be removed

## SMX2 serial interface commands

2400 baud at RS232 level. 8 bit data, no parity, 1 start bit, 1 or 2 stop bits, No flow control. Transmit (pin 3 on DB9) and Signal Ground (pin 5 on DB9) should be connected to PGM and 0V respectively.

SINGLE	nnnnn	Set value of N for single channel operation (value not stored in eeprom)
GOCHAN	xx	Serial select of channel xx (0 to 127)
LOADMX	xx	Set highest permitted (serial selected) channel xx (others default to ch0)
LOADaa	nnnnn	Set value of N for channel aa (channels 0 to 15)
LOADTB	nnnnn	Set value of N for channel 16 (channels 17 to 127 then in sequence)
RVALUE	rrrr	Enter value for R register
SETPAR		Channel selected by 3 bit parallel input (0 to 7). Also disables modem
SETSER		Channel selected by most recent 'gochan' operation
SETMOD		Enable internal modem. Frequency selected by most recent 'gochan' or 'single'
<cr>		Process entry
/		Clear all buffers

xx = channel number from 00 to 127

aa = two digit channel number from 00 to 15

nnnnn = synthesizer N register value, (up to 65535)

rrrr = synthesizer R register value, (up to 16383)

$$N = \frac{f_{RF}}{f_{Channelspacing}} = \frac{433.05MHz}{25kHz} = 17322 \qquad R = \frac{f_{Xtal}}{f_{channelspacing}} = \frac{13MHz}{25kHz}, \text{ So } R=520$$

### Notes:

1. A pause of at least 50ms must be allowed between command strings (EEPROM programming time).  
*SINGLE mode does not store the N value in EEPROM. Therefore the unit is inoperative after a power down until either another valid SINGLE command is received, or mode is changed by a GOCHAN, SETPAR or SETSER command. SINGLE mode is intended for frequency agile applications.*
2. /SETPAR command should be issued at the end of channel programming to put the module back into parallel frequency select mode

## Condensed specifications

Frequency	433.05 - 434.79MHz (Any 1MHz band from 431 - 436MHz)
<i>Frequency stability</i>	±2kHz
<i>Channel spacing</i>	25kHz (12.5kHz by special order)
<i>Number of channels</i>	128 channels selected via serial RS232 interface 8 channels parallel selected (via 3 frequency select pins) in 433MHz band only 69 channels are used as standard
Supply	<i>voltage</i> 4.2V-15V
	<i>Current</i> 30mA @ 10mW transmit [ 25mW version @ 45mA] 25mA receive (or modem 'idle')
Operating temperature	-10 to +60 C (Storage -30 to +70 C)
Size	53 x 32 x 12 mm
Spurious radiations	Compliant with ETSI EN 300 220-3 and EN 301 489-3
Interface	
	<i>user</i> 8 pin 0.1" pitch molex
	<i>Power</i> 4 pin 0.1" pitch molex
	<i>RF</i> 3 pin 0.1" pitch molex
Recommended PCB hole size	1.2mm (min.)
<b>Transmitter</b>	
Output power	+10dBm(10mW) ± 1dB (factory adjustable: 2 - 25mW)
TX on switching time	<50 ms
Modulation type	FM, FSK (F1D, F3D)
TX modulation bandwidth	DC – 3kHz
Deviation	±3kHz
Adjacent channel TX power	-37dBm
TX spuri	<-45dBm
Inputs	Data (CMOS/TTL compatible)
<b>Receiver</b>	
Sensitivity	-120dBm for 12dB SINAD -112dBm for 1 part per 1000 BER
image / spurious	-60dB
blocking	-85dB
adjacent channel	-60dB (Tested per. ETSI EN 301 489-3)
Outputs	RSSI, Audio, Data
Power on to valid audio	28ms
Power on to stable data out	50ms (for 50:50 mark / space)

Notes: 1. The data slicer cannot be depended upon for data waveform frequencies below 250Hz

2. When RX is on and a transmitter keys up, again a 50ms period is required to stabilise data output mark/space. i.e. allow at least 50ms of preamble



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After 7 April 2001 the manufacturer can only place finished product on the market under the provisions of the R&TTE Directive. Equipment within the scope of the R&TTE Directive may demonstrate compliance to the essential requirements specified in Article 3 of the Directive, as appropriate to the particular equipment. Further details are available on The Office of Communications (Ofcom) web site:

<http://www.ofcom.org.uk/radiocomms/ifi/>

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