

Wireless Transmission of 4-20mA Signals



Features:

- 4-20mA Input / 4-20mA output via Radio Link.
- Eliminates cables.
- Ideal for remote locations.
- Simple to retrofit to any 4-20mA Sensor.
- Digital Transmission for ultimate reliability.
- No licence required in U.K. (Overseas approval available).
- High accuracy.
- No maintenance.
- Very easy to use.
- Microprocessor controlled.

Single Channel Transmitter Unit TR420 Single Channel Receiver Unit SR420

Description

The SIGTEL 420 Series is a new easy to use point to point radio telemetry system for wireless communication of 4-20mA instrumentation signals.

Sigtel TR420 Transmitters and SR420 Receivers offer a simple, low cost solution where **any** 4-20mA signal from remote sensors can be transmitted without using expensive cabling. An additional benefit is that data is digitally encoded, giving secure, error-free transmissions.

Typical applications include D.P., temperature, pressure, flow, level, position, vibration - and many more examples. Data received can be linked to any 4-20mA device.

Radio Telemetry and Telecommand Systems.

Operation

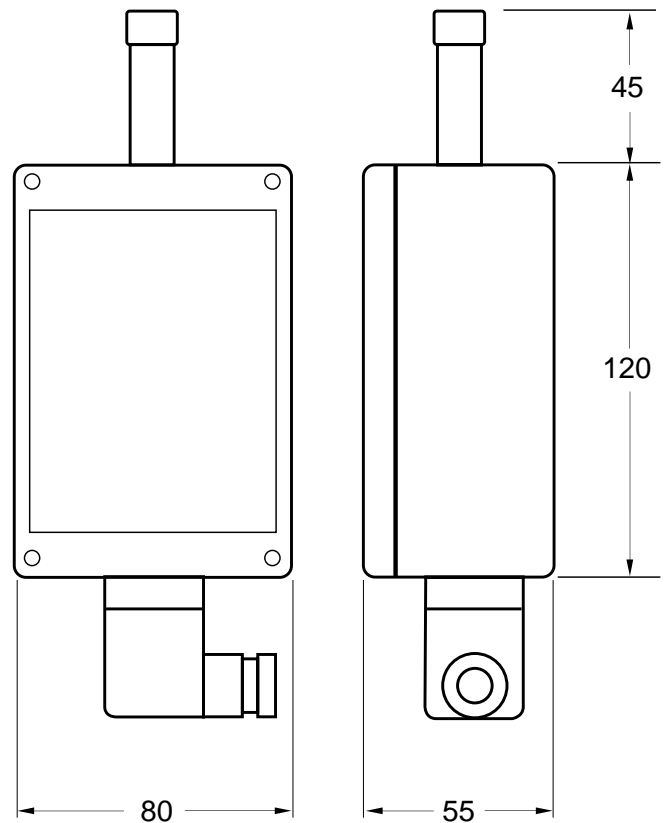
The TR420 transmitter unit converts the 4-20mA input signal to a digital code. This code is then processed to produce a data frame ready for transmission. The SIGTEL protocol for the data frame includes an address field and a number of advanced data error detection techniques which enables reliable data transfer.

In order to minimise signal collision between adjacent systems, a number of repeat transmissions are made, each separated by a random delay. The SR420 Receiver unit decodes the received data to produce a 4-20mA output signal. Each data frame is checked for the correct address match and data errors. If the data frame is not correctly validated, the data is discarded and the receiver waits for a new transmission.

Technical Specifications

	TR420 TRANSMITTER	SR420 RECEIVER
INPUT SIGNAL:	4-20mA	4-20mA
OUTPUT SIGNAL:		4-20mA
RESOLUTION:	Better than 0.05% (12 Bit)	Better than 0.05% (12 Bit)
FREQUENCIES:	418/433MHz	418/433MHz
OPERATING RANGE:	100-300mtrs	100-300mtrs
APPROVAL:	MPT 1340 ETS-300-200	MPT 1340 ETS-300-200
SUPPLY VOLTAGE:	12V to 30VDC	12V to 30VDC
CURRENT DRAIN:	4mA	26mA
TEMPERATURE:	-10 deg C to +55 deg C	-10 deg C to +55 deg C
ENCLOSURE:	High impact Polycarbonate	High impact Polycarbonate
RATING:	IP65	IP65
DIMENSIONS:	120 x 80 x 55mm	120 x 80 x 55mm
CONNECTOR:	DIN 43650	DIN 43650
ANTENNA:	42mm Fixed Helical	42mm Fixed Helical

(Dimensions Details)



A MEMBER OF



LOW POWER
RADIO ASSOCIATION

SIGTEL operate a policy of continuous development in design and manufacture. We reserve the right to change specifications without prior notice.

SIGTEL

Radio Telemetry and Telecommand Systems.



FEATURES

- UP TO 2 ANALOG AND 2 DIGITAL I/O CHANNELS.
- WIDE CHOICE OF INPUTS AND OUTPUTS, INCLUDING 4-20mA, 0-20mA, 0-1V, 0-5V, 0-10V, OPEN DRAIN or RELAY SWITCH CONTACTS.
- COMPETITIVELY PRICED, EASY TO INSTALL.
- USES LOW POWER, SYNTHESIZED UHF RADIO.
- FULLY TYPE APPROVED TO MPT1329, ETS300 220.
- DIGITAL ENCODING FOR SECURE DATA TRANSMISSION.
- NO LICENCE REQUIRED IN UK AND EUROPE.
- OVERSEAS APPROVAL AVAILABLE.
- MAINS OR BATTERY POWER.
- EXTERNAL TRANSDUCER SUPPLY.
- COMMUNICATIONS WATCHDOG MONITOR.

DESCRIPTION

The STX01 and SRX01, with a single analog input and output channel, and the STX2+2 and SRX2+2, with 2 analog and 2 digital input and output channels are two radio transmitter and receiver systems designed to produce a straight forward cost-effective solution for low complexity radio telemetry applications. Signal types can be, analog: 0-20mA, 4-20mA, 0-10V etc., and digital: open drain transistor switches or volt-free contacts and relays.

Both systems provide a simple, low cost solution, where signals from remote transducers can be received or remote equipment controlled, without the installation of expensive cabling or the requirement to lease telephone lines.

Both systems use synthesized UHF radio for high reliability and freedom from interference, and with RF powers of up to 500mW, ranges of 10-20Kms are possible given good conditions.

All Sigtel radio equipment meets current DTI specifications and may be used in the UK without a licence (overseas approvals and frequencies are also available).

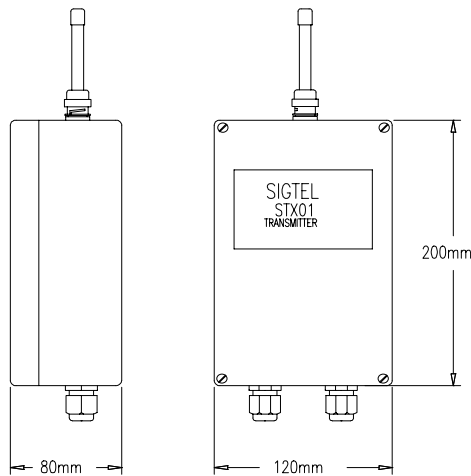
Power requirements are 115/230Vac mains or an external 12Vdc battery supply. The transmitter battery life can be extended with the 'Interval transmission' mode, which allows the unit to wake-up from a low power standby at pre-determined time intervals to transmit its data. An unregulated 12Vdc power supply is available for external transducers and a communications watchdog monitor and alarm is provided as standard.

Each unit is housed in identical high quality, industrial enclosures rated to IP65 standard, and are suitable for wall or panel mounting.

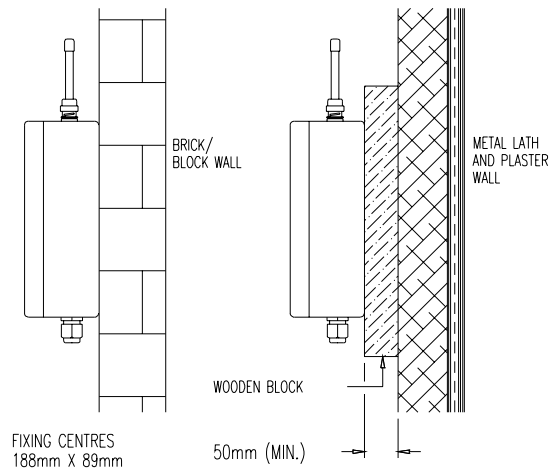
SPECIFICATION

FREQUENCY RANGES:	400-470MHz-Standard:458.5 – 458.8MHz (UK- low power telemetry band). 868-870MHz (Pan-European ISM telemetry band).
NUMBER OF RF CHANNELS:	8 by onboard switch selection. Up to 112 sequential – serially programmed from PC.
TRANSMITTER POWER:	Standard:100mW. Up to 500mW.
APPROVAL:	MPT1329 (UK), ETS 300 220 (Europe), contact sales office for overseas approval details.
ANALOG INPUTS:	Up to 2 analog inputs inc.; 0-20mA, 4-20mA, 0-5V, 0-10V, etc.
ANALOG OUTPUTS:	As inputs.
RESOLUTION:	Better than 0.05%FS (12 bit).
DIGITAL INPUTS:	Up to 2 opto-isolated inputs from 'volt free' contacts.
WETTING VOLTAGE:	10Vdc internal
DIGITAL OUTPUTS:	Up to 2 N/O solid state relay contacts or open drain switches, 0-400V, 0.12A max. load.
POWER REQUIREMENTS:	115/230V 50-60Hz or 10.5 to 30Vdc.
CURRENT REQUIREMENT:	13mA in 'Stand-by'
TRANSDUCER SUPPLY:	Unregulated 12VDC.
INTERVAL TRANSMISSION:	Selectable from 0 – 30 minutes.
WATCHDOG TIMER:	0-540 minute, communications link monitor.
LINK FAILURE ALARM:	Open drain switch, 250mA max. load.
USER I.D.:	Switch selectable 8 bit address.
HOUSING:	High impact polycarbonate, rated to IP65.
DIMENSIONS:	200 x 120 x 80 mm.
WEIGHT:	Approximately 1Kg
OPERATING TEMPERATURE:	-30°C TO +55°C
STORAGE TEMPERATURE:	-30°C TO +70°C
ANTENNA:	¼wave helical in plastic moulding
RF FEED:	BNC jack plug
CABLE ENTRY:	IP65 Nylon cable gland, for cable diameter 4 to 8mm.
ELECTRICAL CONNECTIONS:	Screw terminal plug and socket, wire size from 0.5 to 1.5mm ² .

DIMENSIONAL DETAIL



MOUNTING DETAIL



ORDERING INFORMATION

MODEL No.	TYPE	I/O DESCRIPTION
STX01	Radio Transmitter	1 analog input
SRX01	Radio Receiver	1 analog output
STX2+2	Radio Transmitter	2 analog + 2 digital inputs
SRX2+2	Radio Receiver	2 analog + 2 digital outputs



FEATURES

- 4 ANALOG AND 8 DIGITAL I/O CHANNELS.
- I/O INCLUDES 4-20mA,0-10V,SWITCH RELAY CONTACTS ETC.
- USES LOW POWER, SYNTHESIZED UHF RADIO.
- FULLY TYPE APPROVED TO MPT1329,ETS300 220.
- DIGITAL ENCODING FOR INTERFERENCE FREE OPERATION.
- NO LICENCE REQUIRED IN UK AND EUROPE.
- OVERSEAS APPROVAL AVAILABLE.
- UNI OR BI-DIRECTIONAL TRANSMISSION.
- MAINS OR BATTERY POWER.
- EXTERNAL TRANSDUCER SUPPLY.
- COMMUNICATIONS WATCHDOG MONITOR.

DESCRIPTION

The SIGTEL 4 + 8 Radio Telemetry system comprises of an STX 4 + 8 transmitter, an SRX 4 + 8 receiver and a STR 4 + 8 transceiver.

Each unit allows up to four analog and eight digital (on/off contact type) to be transmitted and received using internationally approved UHF radio telemetry bands. Additionally the option of just selecting the analogue or digital interface connections is available with the '04' and '08' versions, which reduces the amount of redundant interface channels for simpler systems.

Analogue inputs are 4-20mA, 0-10V, etc from external sources such as transducers. Digital inputs are any 'volt free' contacts such as switches, relays, etc. Corresponding analog output channels are as above (signal types may be mixed), while equivalent digital outputs are 'volt free' relay contacts or 'open drain' switches.

An unswitched 12 volts DC supply is available for powering external transducers, which can be selected to operate continuously, or on a power saving, timed duty cycle, with an 'ON-time' of 1 or 10 seconds.

The system is fully type approved to MPT1329 and ETS300 220 for use within the UK 458MHz, and European 868MHz, low power radio telemetry bands. Other frequencies, radio options and approvals are available for overseas operation. A license is not required for operating this equipment in the UK, and many other countries.

Power requirements are 115/230VAC or a 12V-battery supply. Using the 'INTERVAL TRANSMISSION' mode can conserve transmitter battery power. In this mode the unit transmits data at pre-determined, user selectable time intervals, chosen to suit the application. An integral battery trickle charger is an available option, together with a battery voltage monitor, which indicates if the transmitter battery voltage falls below 10.5V.

The receiver unit is provided with a 'WatchDog timer' function, which enables the radio communications link to be monitored for activity. If during a certain selectable time interval no activity is detected, an open drain alarm switch is opened to produce an alarm condition. During an alarm condition all outputs are returned to the default settings.

The units are housed in high quality, weatherproof enclosures rated to IP65. Enclosure dimensions are 280 x 200 x 130 mm.

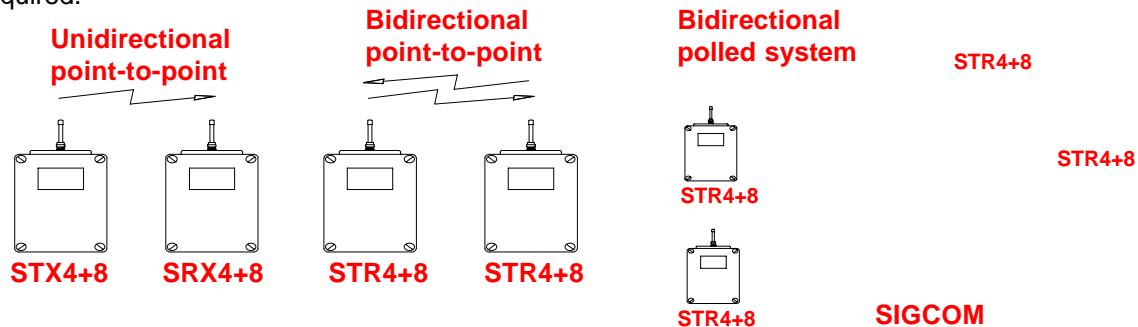
SPECIFICATION

FREQUENCY RANGES:	400-470MHz - Standard:458.5 – 458.8MHz (UK- low power telemetry band). 868-870MHz (Pan-European ISM telemetry band).
NUMBER OF RF CHANNELS:	8 by onboard switch selection. Up to 112 sequential – serially programmed from PC.
TRANSMITTER POWER:	Standard:100mW. Up to 500mW.
APPROVAL:	MPT1329 (UK), ETS 300 220 (Europe), contact sales office for overseas approval details.
ANALOG INPUTS:	Up to 4 analog inputs inc.; 0-20mA, 4-20mA, 0-5V, 0-10V, etc.
ANALOG OUTPUTS:	As inputs.
RESOLUTION:	Better than 0.05%FS (12 bit).
DIGITAL INPUTS:	Up to 8 opto-isolated inputs from 'volt free' contacts.
WETTING VOLTAGE:	10Vdc internal
DIGITAL OUTPUTS:	Up to 8 N/O solid state relay contacts, 0-400V, 0.12A max. load.
POWER REQUIREMENTS:	115/230V 50-60Hz or 10.5 to 30Vdc.
CURRENT REQUIREMENT:	13mA in 'Stand-by'
TRANSDUCER SUPPLY:	Unregulated 12VDC.
INTERVAL TRANSMISSION:	Selectable from 0 – 30 minutes.
WATCHDOG TIMER:	0-540 minute, communications link monitor.
LINK FAILURE ALARM:	Open drain switch, 250mA max. load.
USER I.D.:	Switch selectable 8 bit address.
HOUSING:	High impact polycarbonate, rated to IP65.
DIMENSIONS:	280 x 200 x 130 mm.
WEIGHT:	Approximately 2.5Kg
OPERATING TEMPERATURE:	-30°C TO +55°C
STORAGE TEMPERATURE:	-30°C TO +70°C
ANTENNA:	¼wave helical in plastic moulding
RF FEED:	BNC jack plug
CABLE ENTRY:	IP65 Nylon cable gland, for cable diameter 4 to 8mm.
ELECTRICAL CONNECTIONS:	Screw terminal plug and socket, wire size from 0.5 to 1.5mm ² .

SYSTEM CONFIGURATION

The 4 + 8 system can be configured as a simple 'one way', 'point-to-point' link using a transmitter and receiver unit or by using two transceiver units, signals can be transmitted in both directions.

For 'master/slave' operation, two or more STR 4 + 8 transmitted 'outstations' may be polled using a 'SIGCOM' base station transceiver, allowing monitoring and logging via a PC. Optional analog/digital I/O modules may be used where discrete signals are required.



ORDERING INFORMATION

MODEL No.	TYPE	I/O DESCRIPTION
STX4+8	Radio Transmitter	4 analog + 8 digital inputs
SRX4+8	Radio Receiver	4 analog + 8 digital outputs
STR4+8	Radio Transceiver	4 analog + 8 digital inputs or outputs
STX04	Radio Transmitter	4 analog inputs
SRX04	Radio Receiver	4 anaog outputs
STX08	Radio Transmitter	8 digital inputs
SRX08	Radio Receiver	8 digital outputs



FEATURES

- UP TO 32 ANALOG OR 64 DIGITAL I/O CHANNELS (WITH EXPANDABLE OPTION).
- OPTICALLY ISOLATED I/O CARDS.
- I/O INCLUDES 4-20mA, 0-10V, SWITCH RELAY CONTACTS ETC.
- SECURE DATA TRANSMISSION PROTOCOL.
- LICENCE EXEMPT SYNTHESIZED UHF RADIO.
- FULLY TYPE APPROVED TO MPT1329, ETS300 220.
- COMMUNICATIONS DIAGNOSTICS PORT.
- UNI OR BI-DIRECTIONAL, POINT-TO-POINT, POLLED NETWORK, STORE AND FORWARD RELAY LINKS.
- ROBUST, WEATHER-PROOF ENCLOSURE.
- MAINS OR BATTERY POWER.

DESCRIPTION

The Sigtel FLEXI-SYSTEM is a family of highly versatile radio telemetry units, designed to provide a variety of network and input/output interface configurations to suit most remote industrial measurement and control applications.

The basic FLEXI-SYSTEM outstation consists of a data collection unit, power supply, and synthesized UHF radio circuit. At the heart of this unit is a micro-controller, which manages the data collection from I/O cards and the radio communications protocol. The basic unit is available with 3 different radio types; a UHF radio transmitter or receiver for simple point-to-point uni-directional data transfer, or a UHF radio transceiver for bi-directional data transfer, or for networked system architectures. A variety of interface cards are available, which plug into 8 interface ports on the FLEXI-SYSTEM motherboard.

With the ability to select the number and type of I/O channels, the FLEXI-SYSTEM is a very cost effective and flexible system, enabling the hardware to be tailored to best suit each application. For standard outstations, up to 32 analog or 64 digital, input or output channels are available, with the ability to expand further if required.

Installation and configuration of the FLEXI-SYSTEM is straight forward and uncomplicated. Pre-programmed configurations and operation modes are selected by setting internal switches. A communications diagnostics port is provided, which allows radio communications to be monitored or analysed by a PC or laptop.

The integral radio unit is a high quality synthesized UHF radio circuit, which is fully type approved to MPT1329 and ETS300 220 and allows licence free operation in the UK and many other countries. Eight pre-programmed radio channels can be selected via an internal switch array, or for a wider selection, programmed through the diagnostics port.

Each FLEXI-SYSTEM outstation can be powered from 115/230Vac mains or a 12V-battery supply. When operating from battery supply, battery life is extended by a time-controlled stand-by and wake-up feature. For mains battery backup operation, an integral battery trickle charger is an available option. Units are housed in high quality weather-proof enclosures, rated to IP65, and dimensions 280x280x130mm.

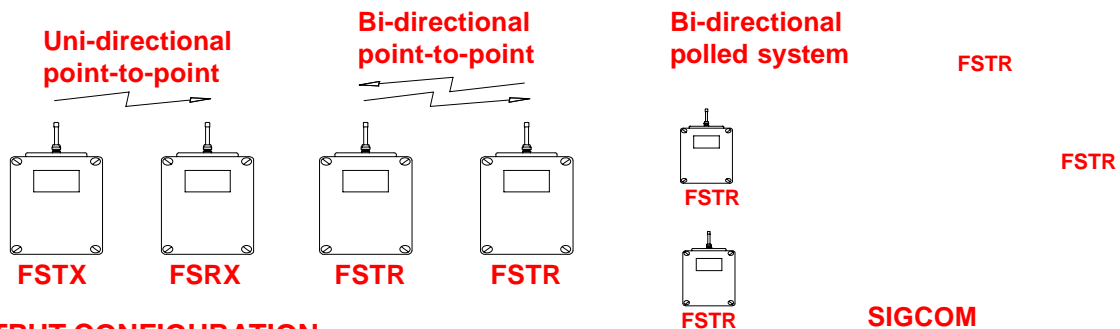
SPECIFICATION

<p>FREQUENCY RANGES:</p> <p>NUMBER OF RF CHANNELS:</p> <p>TRANSMITTER POWER:</p> <p>APPROVAL:</p> <p>ANALOG INPUT CARD:</p> <p>ANALOG OUTPUT CARD:</p> <p>ANALOG RESOLUTION:</p> <p>DIGITAL INPUT CARD:</p> <p>DIGITAL OUTPUT CARD:</p> <p>POWER REQUIREMENTS:</p> <p>TRANSDUCER SUPPLY:</p> <p>ISOLATED SUPPLY OUTPUT:</p> <p>INTERVAL TRANSMISSION:</p> <p>WATCHDOG TIMER:</p> <p>LINK FAILURE ALARM:</p> <p>USER I.D.:</p> <p>HOUSING:</p> <p>DIMENSIONS:</p> <p>WEIGHT:</p> <p>OPERATING TEMPERATURE:</p> <p>STORAGE TEMPERATURE:</p> <p>ANTENNA:</p> <p>RF FEED:</p> <p>CABLE ENTRY:</p> <p>ELECTRICAL CONNECTIONS:</p>	<p>400-470MHz - Standard:458.5 – 458.8MHz (UK- low power telemetry band). 868-870MHz (Pan-European ISM telemetry band).</p> <p>8 by onboard switch selection. Up to 112 sequential – serially programmed from PC.</p> <p>Standard:100mW. Up to 500mW.</p> <p>MPT1329 (UK), ETS 300 220 (Europe), contact sales office for overseas approval details.</p> <p>4 channel input: 4-20mA, 0-5Vdc. 4 channel output: 4-20mA, 0-5Vdc.</p> <p>better than 0.05%FS (12 bit).</p> <p>8 channel input: Volt-free contact.</p> <p>8 channel output: Normally open relay contact, 350Vrms @ 120mA.</p> <p>115/230V 50-60Hz or 10.5 to 30Vdc.</p> <p>Unregulated 12VDC.</p> <p>15V rms @ 400mA to power battery charger (not supplied).</p> <p>Selectable from 0 – 30 minutes.</p> <p>0-540 minute, communications link monitor.</p> <p>Open drain switch, 250mA max. load.</p> <p>Switch selectable 8 bit address.</p> <p>High impact polycarbonate, rated to IP65.</p> <p>280 x 280 x 130 mm.</p> <p>Approximately 3.3Kg</p> <p>-30°C TO +55°C</p> <p>-30°C TO +70°C</p> <p>¼wave helical in plastic moulding</p> <p>BNC jack plug</p> <p>IP65 Nylon cable gland, for cable diameter 4 to 8mm.</p> <p>Screw terminal plug and socket, wire size 0.5 to 1.5mm².</p> <p>I/O connections via spring clamp plug and socket, wire size 0.5 to 1.5mm².</p>
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SYSTEM CONFIGURATION

The FLEXI-SYSTEM can be configured as a simple 'one way', 'point-to-point' link using a transmitter and receiver unit or by using two transceiver units, signals can be transmitted in both directions.

For 'master/slave' operation, two or more transceiver 'outstations' may be polled using a 'SIGCOM' base station transceiver, allowing monitoring and logging via a PC. Optional analog/digital I/O modules may be used where discrete signals are required.



INPUT/ OUTPUT CONFIGURATION

The FLEXI-SYSTEM can accommodate up to 8 I/O interface cards from the available selection below. With the standard I/O cards, this allows up to 32 analog or 64 digital channels to be installed. Normally the FSTX transmitter unit would support input cards only, the FSRX receiver unit would support output cards only, whereas the FSTR transceiver unit can be configured for mixed input and output cards as required.

ORDERING INFORMATION

MODEL	DESCRIPTION	I/O CARDS	DESCRIPTION
FSTX-	RADIO TRANSMITTER OUTSTATION	-4AI-	4 CHANNEL ANALOG INPUT
FSRX-	RADIO RECEIVER OUTSTATION	-4AO-	4 CHANNEL ANALOG OUTPUT
FSTR-	RADIO TRANSCEIVER OUTSTATION	-8DI-	8 CHANNEL DIGITAL INPUT
		-8DO-	8 CHANNEL DIGITAL OUTPUT

**FEATURES**

- RF BAUD RATES UP TO 9600.
- HALF-DUPLEX OPERATION.
- USES LOW POWER, SYNTHESIZED UHF RADIO.
- 500mW RF OUTPUT POWER.
- FULLY TYPE APPROVED TO MPT1329, ETS300 220.
- DIGITAL ENCODING FOR SECURE DATA TRANSMISSION.
- NO LICENCE REQUIRED IN UK AND EUROPE.
- OVERSEAS APPROVAL AVAILABLE.
- MAINS OR BATTERY POWER.
- ROBUST WEATHERPROOF ENCLOSURE.

DESCRIPTION

The SMR01 is a high speed intelligent radio modem. The modem permits half duplex serial data transmission at rates of up to 9600 baud within 20KHz and 25 KHz channel spacing and 4800 baud within 12.5KHz channel spacing. Serial data is passed to the modem via an RS232 port at data rates of up to 19200 baud.

The communication between modems is based on Gaussian Minimum Shift Keying (GMSK) modulation. Data to and from the modem is controlled by an internal microprocessor and user configuration is achieved using proprietary set-up software.

At the heart of the radio modem is a high performance synthesized UHF radio transceiver, which provides high reliable and communication free from interference. The RF powers output is up to 500mW, which enables operating ranges of 10-20Kms to be achieved, given good conditions.

All Sigtel radio equipment meets current DTI specifications and may be used in the UK without a licence (overseas approvals and frequencies are also available).

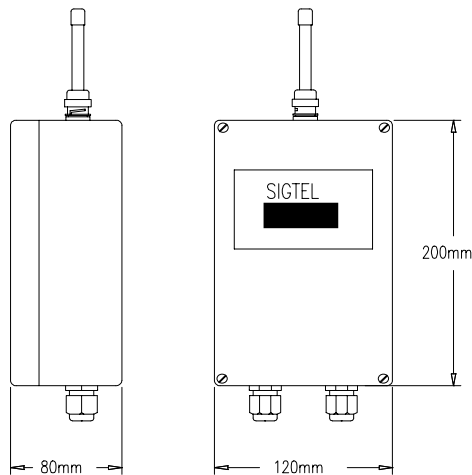
Power requirements are 115/230Vac mains or an external 12Vdc battery supply.

Each unit is housed in identical high quality, industrial enclosures rated to IP65 standard, and are suitable for wall or panel mounting.

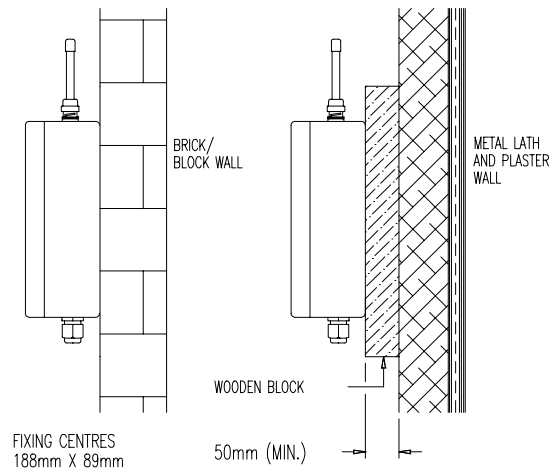
SPECIFICATION

FREQUENCY RANGES:	400-470MHz-Standard:458.5 – 458.8MHz (UK- low power telemetry band)
NUMBER OF RF CHANNELS:	80 – serially programmed from PC via setup software
CHANNEL SPACING:	12.5KHz/20KHz/25KHz available
DATA INPUT/OUTPUT:	RS232
RF BAUD RATE:	4800 for 12.5KHz channel spacing and 9600 for 20 and 25KHz channel spacing (configurable)
MODULATION TYPE:	GMSK
PACKET SIZE:	64 or 128 bytes(configurable)
ERROR CHECKING:	Built in CRC error detection
RS232 BAUD INPUT RATES:	300,600,1200,2400,4800,9600,19200 (configurable)
SOURCE ADDRESS:	0-255 (configurable)
DESTINATION ADDRESS:	0-255(configurable)
NUMBER OF DATA BITS:	Set to 8. For 7 data bits plus one parity bit, set modem parity to 'None'
PARITY:	None, odd, even (configurable)
HANDSHAKING:	RTS, CTS, DCD(squelch)
TX/RX SWITCHING TIME:	20mS
POWER:	500mW adjustable down to 5mW
APPROVAL:	MPT1329 (UK), ETS 300 220 (Europe), contact sales office for overseas approval details.
POWER REQUIREMENTS:	115/230V 50-60Hz or 9 to 15Vdc
HOUSING:	High impact polycarbonate, rated to IP65
DIMENSIONS:	200 x 120 x 80 mm.
WEIGHT:	Approximately 1Kg
OPERATING TEMPERATURE:	-30°C TO +55°C
STORAGE TEMPERATURE:	-30°C TO +70°C
ANTENNA:	¼wave helical in plastic moulding
RF FEED:	BNC jack plug
CABLE ENTRY:	IP65 Nylon cable gland, for cable diameter 4 to 8mm
ELECTRICAL CONNECTIONS:	Screw terminal plug and socket, wire size from 0.5 to 1.5mm ²

DIMENSIONAL DETAIL



MOUNTING DETAIL



ORDERING INFORMATION

MODEL No.	TYPE	RF DATA RATE
SMR01	Radio Transceiver modem	9200 baud