EXICOM

The EX5200 is a low cost, long range, multi-channel VHF/UHF radio link incorporating an internal multiplexer which combines two compressed voice circuits and two data circuits over a single narrow-band radio channel. The internal multiplexer is software configurable allowing user assignment of the available bandwidth between each physical circuit.

FEATURES

- Bandwidth configurable multiplexer
- User configurable interfaces
- Optional IP interface

INDUSTRY APPLICATIONS

- Telco - rural telephony + data
- Public Utility - voice and SCADA
- Mobile radio- Repeater linking

EX5200

2 + 2 VOICE and DATA WIRELESS TELECOMMUNICATIONS LINK

BENEFITS

- Multi-channel: 2 voice + 2 data circuits over a single link
- Proven RF technology
- Small 2U rackmount package
- Highly secure digital transmission

LOW COST OF OWNERSHIP

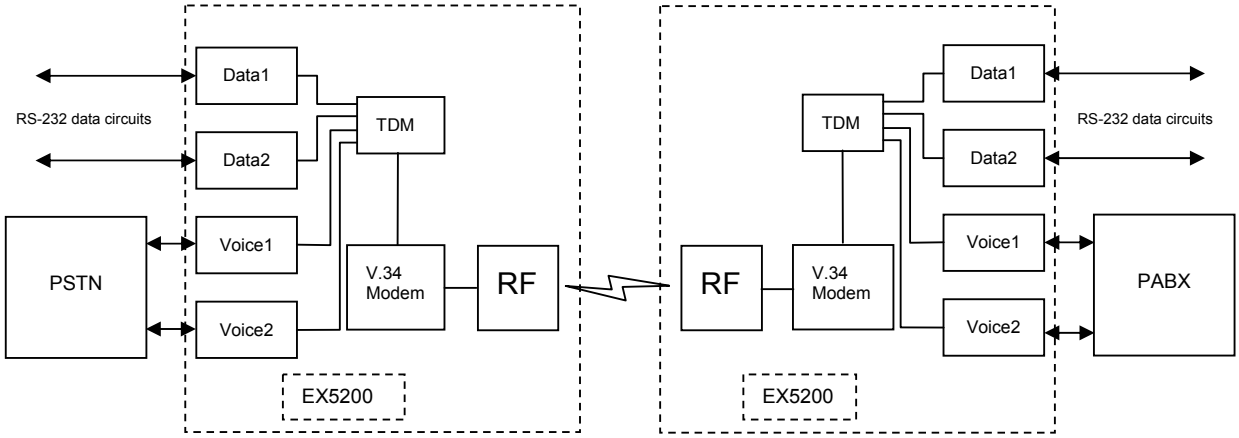
- Copper line replacement
- Minimal infrastructure required
- Solar power compatible
- Fast deployment
- Remote management

General

The EX5200 is a versatile radio link which can be configured in various ways using a software interface to provide up to two voice and two data channels. The voice channels use advanced compression algorithms with two compression options which allows maximum voice quality while maintaining low bandwidth.

The total available bandwidth can be proportioned to the voice and data circuits according to the user's priorities while the link can be supplied to operate in either a 12.5kHz radio channel or a 25kHz radio channel.

System End-to-End Block Diagram



The available channel capacity can be allocated to any combination of the following:

User circuit	Data rate with 25 kHz Channel		Data rate with 12.5 kHz Channel	
Voice1	5.3kbps	5.3kbps	6.3kbps	5.3kbps
Voice2	5.3kbps	5.3kbps	6.3kbps	5.3kbps
Data1	Up to 19.2kbps		Up to 14.4kbps	
Data2	Up to 19.2kbps		Up to 14.4kbps	
Total Available	Typically 24.0 kbps		Typically 16.0 kbps	

Note:

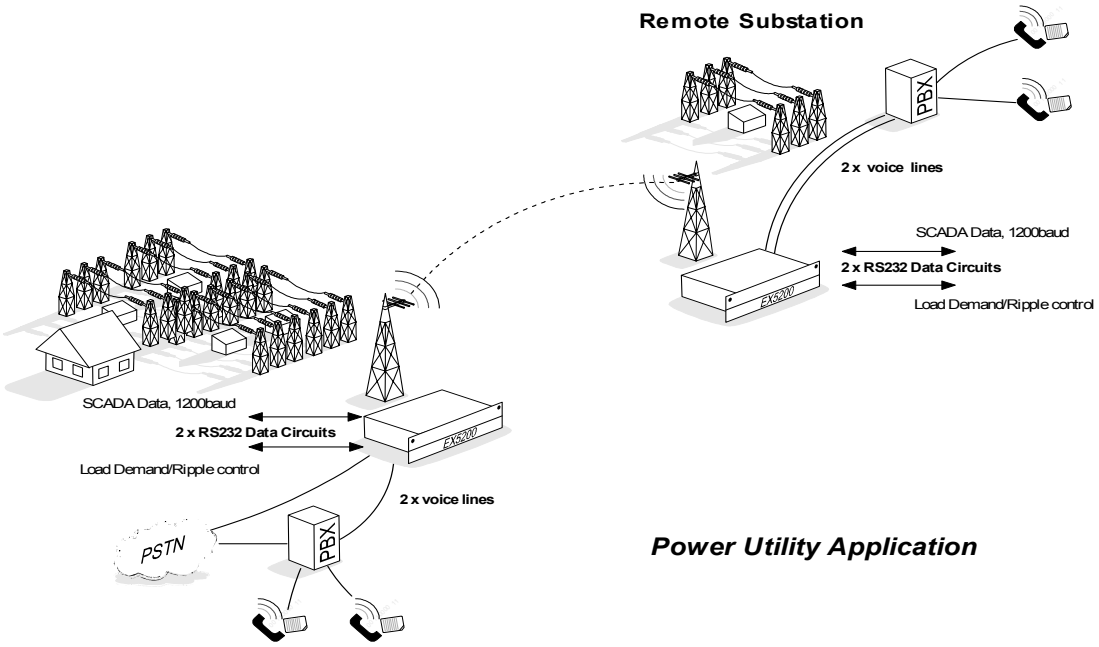
1) Maximum data rate per Data circuit=19.2kbps

2) Maximum combined (Voice+Data) system data rate=29.8kbps – typically 24.0kbps

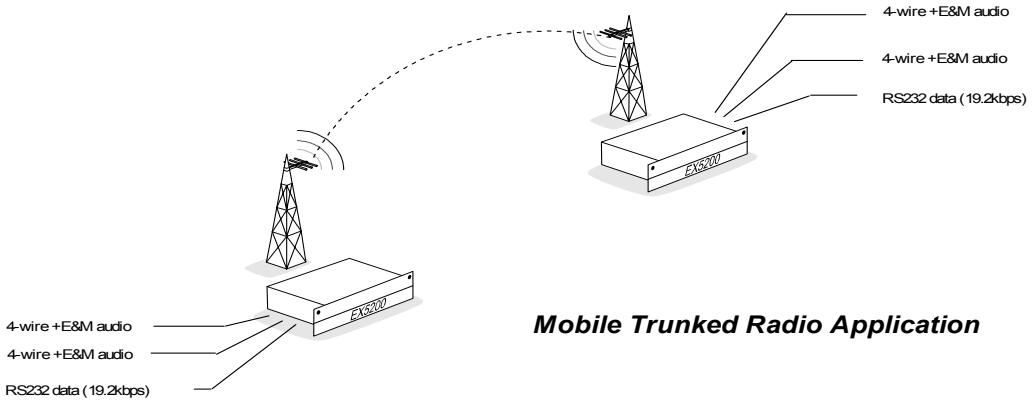
Note: The aggregated data speed depends on the received signal to noise ratio and this will vary at different receive signal levels.

Exicom recommends that the link be operated at a signal level of –70 to –75dBm to allow for a fade of 15dB. This will ensure that the full bandwidth can be maintained, i.e. no re-training of the modem. If the signal level drops below –90dBm, the modem within the link will re-train and consequently drop the call before retraining at a lower data speed. For longer radio paths a lower receive signal level is acceptable, with a corresponding decreased aggregate data speed.

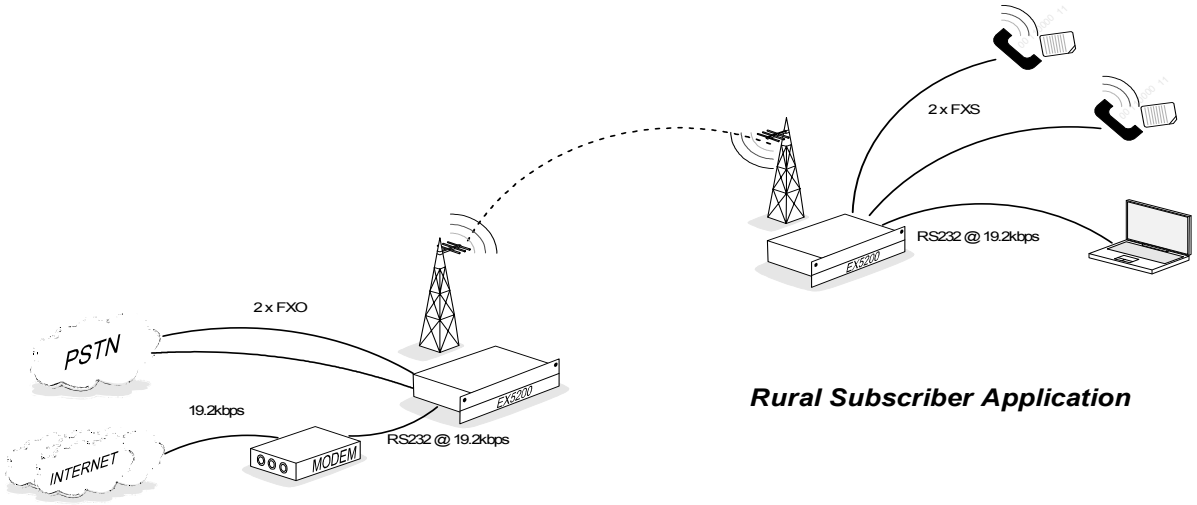
Application Diagrams



Power Utility Application



Mobile Trunked Radio Application



Rural Subscriber Application

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EX5200 2+2 Voice and Data Link

System Parameters

Frequency bands (MHz)

VHF	68 – 78, 72 – 82, 78 – 88 138 – 148, 148 – 162, 159 – 174, 240 – 260
UHF	380 – 403, 403 – 423, 410 – 430, 430 – 450 450 – 470, 470 – 490, 480 – 500, 490 – 512

Channel Bandwidth	25 or 12.5 kHz
Modulation Type	TDM over Direct Frequency Modulation
Duplexer Spacing	68 – 88 MHz 4.0 – 6.0 MHz 138 – 174 MHz 4.6 – 10.0 MHz 240 – 512 MHz 5.0 – 10.0 MHz
Frequency Selection	Synthesised, switchable, 5 or 6.25 kHz steps
System Deviation	Typically ± 2.5 kHz for 25kHz ± 1.1 kHz for 12.5kHz
Aggregate Data Speed	25kHz Typically 24.0kbps 12.5kHz Typically 16.8kbps
Duty Cycle	Continuous

Transmitter

Transmitter Power	(Adjustable, at duplexer antenna port)
<470MHz	1 - 10 W (30-40dBm), continuous
>470MHz	1 - 8 W (30-39dBm), continuous
Frequency Stability	±1.0 ppm
Spurious Emissions	< 1 μW (-30dBm)
Duty Cycle	100% (<3000m AMSL)
VSWR Protection	Withstands VSWR of 20:1, at any phase angle

Receiver

Sensitivity	(at Rx input, for 12dB SINAD)
25kHz bandwidth	>-116 dBm (0.35μV)
Intermodulation	>70 dB CEPT
Spurious Responses	UHF >70dB CEPT VHF >75dB CEPT

Note: The above is module sensitivity, typically minimum RSSI required for full bandwidth and allowing for a 15dB fade margin is –75dBm.

2 wire Telephone Interface

Connector	RJ-11
Impedance	600Ω, 900Ω or 1200Ω
Audio output level	0dBm
Audio input level	-4dBm
Frequency response	300 to 400Hz -0.2/+0.5dB 400 to 2400Hz -0.2/+0.3dB 2400 to 3400Hz-0.2/+0.5dB
Signal to Noise	-65dBr0p
Crosstalk	-65dBr0p
Distortion	<3.0%
Linearity Distortion	<0.3dB relative to –10dB @-40 to +3.5dB input
Return Loss	<14dB
Ringing Exchange end	Frequency detection 16 to 40 Hz Voltage detection 40-90Vrms
Subscriber end	Ring frequency 25Hz Line voltage -48V @24mA Up to 3REN

Digital Data Channels

Type	Asynchronous
Connector	DB25 female
Data Interface	RS-232, V.24/V.28
Flow control	None, Xon/Xoff, Hardware
Data rates	300bps-19200bps
Data channel delay	Typically 100mS
Ethernet	Optional single port (coming soon)

2/4 wire Interface

Type	4wire E&M, transformer isolated 2wire E&M, strap selectable Types I and IV E & M signalling Dual E&M selectable on 2W and 4W
Connector	RJ45
Impedance (Input and Output)	600Ω
Max audio input	+3dBm
Audio output range	-21 to +3dBm
Speech algorithm	ITU-T G.723.1
Voice coding rates	6.3, 5.3kbps
Voice quality: (ITU P.800 MOS)	6.3kbps = 3.8 5.3kbps = 3.5
Frequency response (Relative to 1.02kHz at 0dBm0)	
300 to 3000	-0.2dB
3300Hz	-0.35dB
3400Hz	-0.8dB
4000Hz	-14dB
Signal to Noise	-65dBr0p
Crosstalk	-65dBr0p
End to end delay (voice chann.)	180mS
Fax modem support	G3 – V.21, V.27ter
Fax transmission rates	2400bps, 4800bps
Modem data relay	V.32bis
Echo canceller	Maximum local echo path 25mS, compliant with G.165
DTMF detection	16 digits, compliant with TIA 464A

Link / Network Management

- Link / Network management via the *Boss 220* PC for Windows based application
- Async console port via male DB9 connector
- Configuration of operating parameters
- Monitoring of real-time and captured link performance statistics
- Viewing of event logs
- Download of new operating software if required
- Capture, download and display of configurations of individual units
- Password security control

Environmental

Ambient Operating Temp	0°C to +45°C
Humidity (at ambient)	Up to 95% RH, non-condensing

Power

Power Supply Voltage	10.0 to 16.0VDC, Negative earth Nominal 13.8VDC Optional 19 to 36 or 36 to 60 VDC
Power Consumption	(Tx o/p measured at antenna port, 13.8VDC in)
For 10W RF	Typically 45.0W
2W RF	Typically 23.0W
1W RF	Typically 17.5W

Mechanical

Physical mounting	2U 19 inch Rack mount
Size (W x D x H in mm)	483 x 370 x 88
Weight	Approximately 8.0kg

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