



AutoLog® WSN Radio Modem Series

S O P H I S T I C A T E D ® A U T O M A T I O N

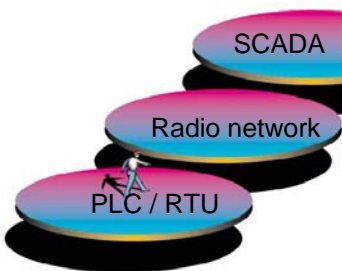
Introduction

Cost-effective
Radio modems to
any serial
communication
application



Low power models,
different frequency
ranges

RS232 / RS485 /
RS422 / 5V TTL
interface



Wireless
M2M

AutoLog WSN Radio modem series has been designed to meet high specifications. It offers very cost effective radio modems for stand alone applications or for integration into OEM products. The design has been optimized for reliability and low current consumption, making the WSN suitable for operation on remote sites without mains power.

Applications include security, command & control, data logging, SCADA, telemetry, remote switching or any similar applications where serial data needs to be transmitted and a cable is not the most practical solution. The WSN is available with two different transmit powers.



AutoLog® WSN Radio Modem Series
Multi Repeating

Specifications:

General

Frequency range	WSN170 138 - 175MHz WSN225 175 - 225MHz WSN450/470 406 - 512 MHz WSN869 869 -870MHz WSN870 820 - 950MHz
Power requirements	12VDC (10-15.5VDC)
Standby	<75uA
Receive	<70mA
Transmit	300mA-2.1A depend on Tx power
Number of channels	80 user programmable channels
Min. programmable channel step	6.25 or 5kHz
Channel spacing	12.5kHz, 20kHz, 25kHz
Frequency stability	2ppm (-30 to +60°C)
Construction	Milled aluminium enclosure
Size (W x H x D)	75mm x 130mm x 30mm
Mounting	Screws to flat surface
Weight	250g
Connectors	DC power 2-way Klippon type RS232 I/O 9-way D-type RF BNC (50 ohm)
LED indicators	TX, BUSY, TXD, RXD, SYSTEM
Approvals	ETS 300-220, ETS 300-113, ETS 300-489, AS4868.2-1995, FCC part 90/15, DOC

Receiver

Sensitivity	-120dBm for 12dB SINAD de-emph -117dBm for 12dB SINAD flat
Bandwith	VHF 5MHz without re-alignment UHF 12 MHz without re-alignment 870 20 MHz without re-alignment
Spurious response	WSN450/869 >65dB WSN170/470/870 >70dB
Blocking	WSN450/869 >85dBuV WSN170/470/870 >90dBuV
Intermodulation	WSN450/869 >60dB WSN170/470/870 >65dB
Adjacent channel	>65dB at 12.5kHz
IF frequencies	45MHz and 455kHz
Spurious emissions	WSN450/869 < ETS 300-220 WSN170/470/870 < ETS 300-113
Mute response time	< 2ms

Serial data

Serial interface	RS232, 5V TTL, or combined RS232/RS485/RS422
Format	Asynchronous (or synchronous with custom software). Programmable; Odd, even or No parity, 1/2 stop bits, 7/8 data bits
Interface rates	Programmable 150bps to 38400bps

WSN Radio Modem Series

THE AUTOLOG® FAMILY
 AUTOLOG®PLC AUTOLOG®GSM AUTOLOG®OEM
 AUTOLOG®RTU AUTOLOG®TETRA AUTOLOG®HMI



AutoLog® WSN Radio Modem Series

Transmitter

RF output power	WSN450/869 10mW-750mW WSN170/470/870 50mW-5W
Bandwidth	VHF 10MHz without re-alignment UHF 12 MHz without re-alignment 870 30 MHz without re-alignment
Internal modulation	FFSK, 2 level FSK, 4 level FSK & GMSK via the internal modem
Max. deviation	±7.5kHz max
Adj. channel power	>65dB at 12.5kHz
Transient response	As per ETS 300-113
Spurious emissions	<250nW and 4nW inspecial bands
Rize time	< 9ms

Internal modem

Radio baud rate	150 – 9600bps over-air
RF Bandwidth	12.5 kHz
Signal formats	Programmable for 12.5kHz channel: Up to 1200bps – FSK with V23 and Bell202 supported. 2400bps – coherent 1200/2400Hz or 1200/1800Hz FFSK. 4800bps –GMSK 9600bps – 4 level FSK.
NRZI	On or Off
Bit error rate	2400baud <1 in 10 ⁻³ at -120dBm 4800baud <1 in 10 ⁻³ at -117dBm 9600baud <1 in 10 ⁻³ at -115dBm (FEC on) 9600baud <1 in 10 ⁻³ at -112dBm (FEC Off)



Order Information

Model	Frequencies	Tx power
WSN169-1	169.4 – 169.8125MHz	10mW – 750mW
WSN470-1	406 – 465 MHz	10mW – 750mW
WSN869-1	863 – 870 MHz	10mW – 750mW
WSN170-5	138 – 172 MHz	100mW – 5W
WSN225-5	175 – 225 MHz	100mW – 5W
WSN470-5	406 – 465 MHz	100mW – 5W
WSN870-5	850 – 900 MHz	100mW – 5W

Add suffix "/RS232 only" for RS232 only with full handshaking. (default)

Add suffix "/RS485+232" for RS232/RS422/RS485 interface with looped back handshaking lines.

Add suffix "/TTL" for 5V TTL interface with full handshaking.

- Inform us also the used frequency channels when ordering!



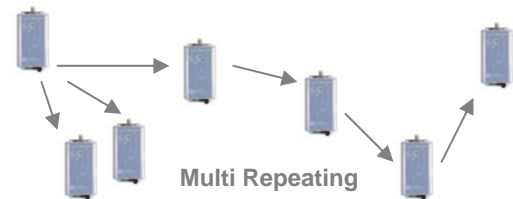
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AutoLog® WSN Radio Modem Series



SERIAL OPERATION

The WSN requires no knowledge of the data it is transmitting; data can simply be sent and received with minimal delay. Transmission control can either use RTS control signals or be configured for automatic initiation of transmission on receipt of serial data. In either case, the radio provides a CTS output which can optionally be used for flow control. The WSN incorporates an internal buffer to cope with situations where the interface data rate differs from the over-air rate.

INTERNAL SOFT MODEM

The WSN features an internal "soft modem" which offers unparalleled performance and flexibility over a wide range of speeds and formats and enables future formats to be handled by software upgrade.

Within a 12.5kHz channel, the over-air transmission from the unit can be user programmed for a range of speeds. If the maximum speed is not required, the unit can be configured for a lower speed to give an improved receiver threshold.

For 150, 300, 600, 1200 & 2400 baud, FSK/FFSK is used with both Bell202 and V.23 supported. At 4800bps GMSK modulation is used, while at 9600bps, the modulation is 4-level FSK.

CHANNEL SELECTION

The WSN can be programmed for simplex or semi-duplex operation with up to 80 discrete channels. Alternatively, complete band allocations like the UK MPT1329 and MPT1411 bands can be loaded.

Once programmed, the channels can then be selected via rotary switches on the front panel.

RF POWER

The transmit power can be accurately set using a locally connected PC with the supplied software. There are two transmit power ranges available. The low power WSN450 & WSN869 versions can be set between 10mW and 750mW, while the higher power WSN170, WSN470 & WSN870 versions can be set between 50mW and 5W.

PROGRAMMABILITY

The parameters of the WSN can be configured through the local serial port using DOS or Windows 95/98/2000/XP based software. The individual configurations can be stored on disc for future use or printed.

STATUS LEDs

The WSN has 5 LEDs to enable the operator to see at a glance the status of the radio and its interfaces. The System LED provides the operator with a quick visual health check and if the software detects an error, a code is flashed on the LED to indicate the error.

SQUELCH TAIL ELIMINATION

For old or non tolerant protocols, where the presence of a mute (squellch) tail may cause a problem at the end of a message, a simple packetisation option can be enabled using the configuration software.



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A U T O L O G ® D A T A S H E E T



AutoLog® WSN Radio Modem Series

FORWARD ERROR CORRECTION

Forward error correction is a programmable option at 9600bps, but as with all FECs, the associated overhead will reduce the effective data throughput rate when it is selected. Error correction offers insignificant performance improvements below 9600bps so the option is permanently disabled at those lower rates.

“RSSI” RECEIVE SIGNAL STRENGTH INDICATION

The RSSI signal is accurately measured by an internal A-D converter and compared to an individually calibrated RSSI graph within the processor. The signal strength can then be accurately read in engineering units from a PC connected to the serial port.

POWER SAVE MODE

The WSN has both internal and external power save modes.

Internal Power Save Mode

The microprocessor controls the on/off function of the receiver and after a pre-programmed time the MPU will switch on the receiver to look for a carrier. If a carrier is not detected then the transceiver goes back into sleep mode. If during the time the transceiver is awake a carrier is received, the unit will stay awake. After the carrier drops out, the receiver will stay awake until the programmed resume time elapses. Once the resume time has elapsed the transceiver will go back into sleep mode. The power-save, wake and resume times are all user programmable.

External Power Save Mode

In the external mode the ON/OFF function of the modem is controlled by the host via the DTR line.

OPERATION MODES

Transparent Operation

The WSN can operate transparently without packetising the data and without adding any other overheads, thereby maximising data throughput rates. It requires no knowledge of the data it is transmitting. Data is simply transmitted and received with minimal delay.

Protocol specific modem

The radio recognises a complete frame and only transmits and receives data conforming to that format. No addressing of radios or routing of data is performed. Protocols such as MODBUS & DNP3 can be supported in this way.

Routing modem

The radios recognise a protocol specific frame and the address to which the frame is to be sent. Routing information must be stored in each radio for each destination address that requires the use of repeaters. Any radio in the system can operate as a repeater. The radio does not perform any acknowledgement or retries. Any protocol using a fixed address field such as MODBUS can be supported.

PC SOFTWARE

Dedicated PC software running under DOS or Windows 95/98/2000/XP allows configuration of the radios. This software provides unrivalled versatility combined with ease of use for the operator.



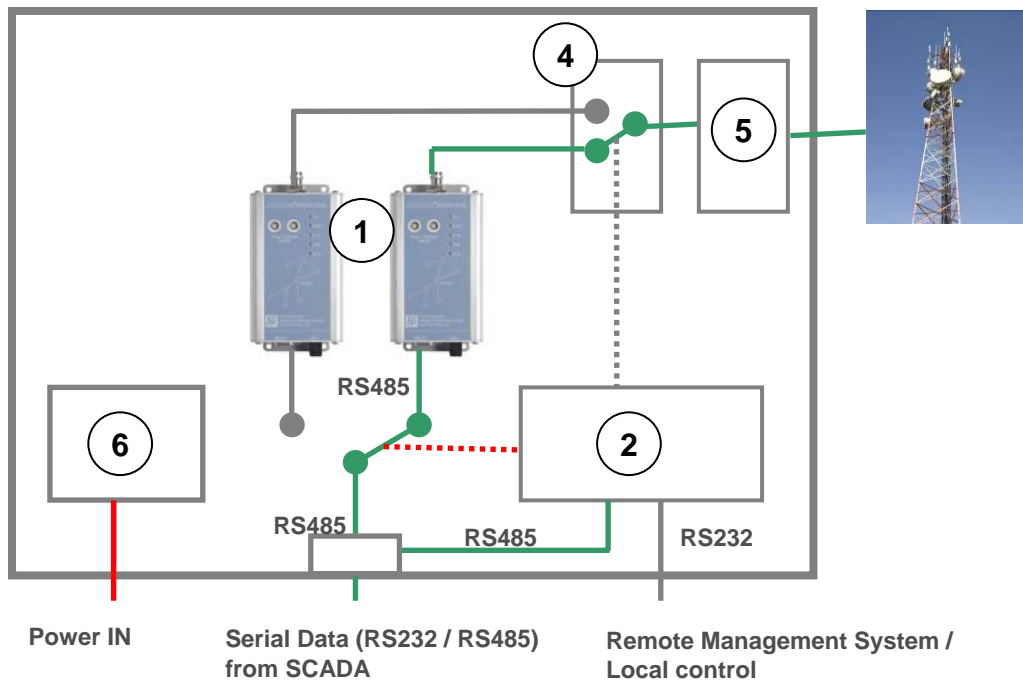
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AutoLog® Redundant Radio Modem System



1 Radio Modems	Two identical radio modems with same frequency configuration. Specify the Rx/Tx frequency pair in the order!
2 PLC Controller	Switches data flow to ACTIVE radio modem. Cuts off the power from STANDBY Radio modem. Controls coaxial cable switch. Remote controlling from SCADA etc using MODBUS RTU protocol. Local controlling using other serial port.
4 Coaxial cable switch	Switches antenna cable to active radio modem. Cuts off the antenna cable from standby Radio modem.
5 Lightning protector	Quarter wave lightning protector.
6 Power supply	e.g. 24/48VDC or 230VAC to 12VDC. Specify in the order!
Communication	With SCADA: Any protocol With Remote Management System: MODBUS RTU, Optional Modbus TCP. Specify in the order
Mounting	19" RACK. Specify in the order!



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