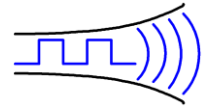


NEW

Radiometrix



HNM2

Issue A, 6 March 2017

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Category 1 High power Narrowband Radio Modem

The HNM2 radio modem offers a 500mW RF output 19200 data link with RS232, RS485 or USB interface. It meets the ETSI Category 1 high performance receiver specification to be used where the operation of a SRD may have inherent safety of human life implications.

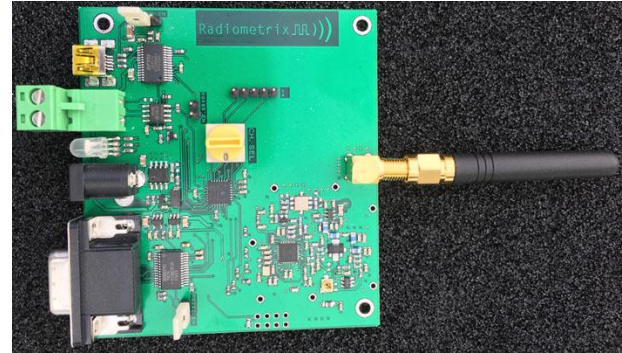


Figure 1: HNM 2-458-19

Features

- Standard band 458MHz (UK)
- Other bands available from 160MHz to 915MHz
- 25kHz channel spacing Narrow Band Multichannel
- Data rates up to 19200kbps
- ETSI EN 300 220-1 Category 1 High performance level receiver
- Low power requirements
- Frequency Programmable
- Range Test Mode

Applications

- Safety-critical wireless applications such as social alarms and healthcare monitoring
- High-end security and fire alarms
- Lone Worker Alarms
- Industrial/Commercial Telemetry and Telecommand
- In-building environmental monitoring and control
- Vehicle data up/download
- Automatic meter reading (AMR)

Technical Summary

- Size: 80 x 86 x 15mm
- Operating frequencies: CH0:458.525, CH1:458.550,...CH15:458.900MHz
- Supply range: 6V to 16V DC
- Current consumption: 280mA TX
- Current consumption: 40mA RX
- RF baud rate: 1200, 2400, 4800, 9600 (default), 19200bps.
- User baud rate: 600, 1200, 2400, 4800, 9600, 19200, 38400bps.
- Hardware flow control: RTS/CTS
- Modulation: 2, 4-level GFSK (default)
- Transmit power: +27dBm (500mW) nominal
- SAW front end filter
- Digital RSSI
- USB connectivity
- RS485 connectivity
- RS232 connectivity
- Can be USB powered or external supply

PCB Layout and connections

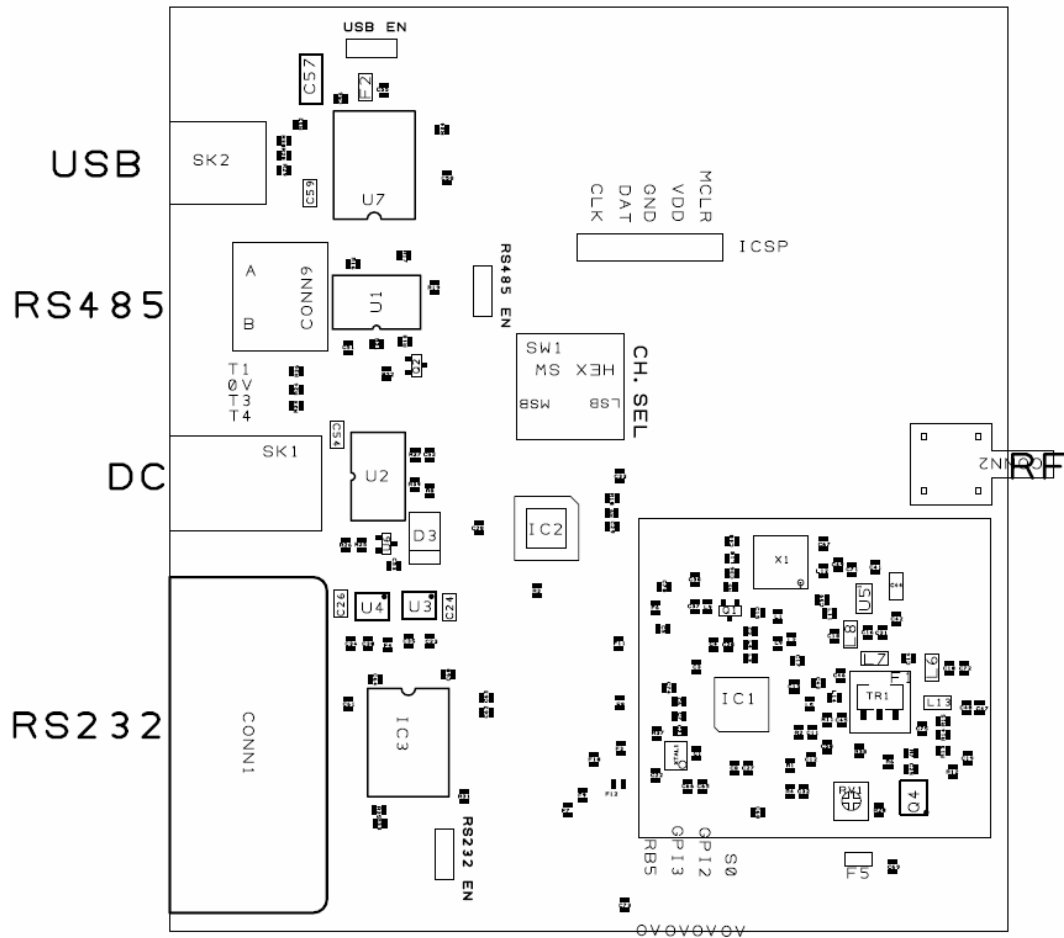


Figure 3: ENX1 block diagram

Figure 2: HNM2 Connections

NOTE	Name	Function
	RS232	DE9F serial connection
	DC	External DC input (centre pin +)
	RS485	2 pin screw terminal RS485 connection
	USB	Mini USB connection
	RF	SMA 50r antenna connection
	CH.SEL	Manual channel select switch (0 to F)
1	USB EN	USB jumper link enable
1	RS232 EN	RS232 jumper link enable
1	RS485	RS485 jumper link enable

NOTES:

1. Only one jumper link should be fitted at any time

Figure 2: ENX1

Absolute maximum ratings

Exceeding the values given below may cause permanent damage to the module.

Operating temperature -20°C to +60°C
 Storage temperature -30°C to +70°C

RF ±50V @ <10MHz, +13dBm @ >10MHz
 All other pins -0.3V to +5.5V

Performance specifications Transmitter:
 (Vcc = 6V / temperature = 20°C unless stated)

General	pin	min.	typ.	max.	units	notes
DC supply						
Supply voltage		4.8	6	16	V	6
TX Supply current @ 500mW			280mA		mA	
Antenna pin impedance			50		Ω	
Channel spacing			25		kHz	
Number of manual channels			16			5
RF						
RF power output		+25	+27		dBm	1
Spurious emissions					dBm	4
Adjacent channel TX power				-36	dBm	
Frequency accuracy		-1.5	0	+1.5	kHz	2
FM deviation (peak)					kHz	3
Dynamic timing						
TX select to full RF	2		2		ms	

Notes:

1. Measured into 50Ω resistive load, USB powered reduces output power.
2. Total over full supply and temperature range.
3. Dependant on data rate selected
4. Meets EN300-220
5. Programmable frequency through AT command and selected using on board switch.
6. Below 6v the TX output power will decrease.

Performance specifications Receiver:
(Vcc = 5V / temperature = 20 °C unless stated)

	min.	typ.	max	units	notes
<i>DC supply</i>					
Supply voltage	4.8	6.0	16	V	
Supply current		40		mA	
<i>RF/ IF</i>					
RF sensitivity for 1ppm BER	-	-117	-	dBm	1
RSSI range	-	TBD	-	dB	
LO leakage, conducted	-54	-95		dBm	
Adjacent channel rejection		TBD		dB	
Blocking		TBD		dB	
<i>DYNAMIC TIMING</i>					
Power up to stable data	-	2		ms	

Notes: 1. Dependant on data rate and modulation used.

Received Signal Strength Indicator (RSSI)

The module incorporates a wide range RSSI which measures the strength of an incoming signal which can be appended to the incoming data, (ATRA command see below).

AT command list

AT Function	Description	Commands	Detail
+++'	Enter Command mode	+++'	Command Mode Active
ATU	UART Baud Rate (Default is 9600) Max speed is 38400	ATU? Response ATU=<BAUD RATE> Response	Read UART Baud Rate 9600<CR> OK<CR> Write/Change the Baud Rate of UART Follow on screen prompts OK<CR>
ATRA	Append RSSI to Data packet	ATRA? Response ATRA=x<CR> Response	Read Append Status 0<CR> OK<CR> Change the Appending x=0,1 OK<CR>
ATC	Channels	ATC? Response	Read The Channel List (example) 00 - 458.525<CR> 01 - 458.550<CR> 02 - 458.575<CR> 03 - 458.600<CR> 04 - 458.625<CR> 05 - 458.650<CR> 06 - 458.675<CR> 07 - 458.700<CR> 08 - 458.725<CR> 09 - 458.750<CR> 10 - 458.775<CR> 11 - 458.800<CR> 12 - 458.825<CR> 13 - 458.850<CR> 14 - 458.875<CR> 15 - 458.900<CR>

		ATC=<xx,channel freq> Response	<CR> OK<CR> Channel freq= band channel frequency eg: 869.226 xx=Channel no, 00 to 15 must be double digit like 00, 01 OK<CR>
AT Function	Description	Commands	Detail
ATRB	RX Bandwidth	ATRB? ATRB=<Hz> Response	Read RX Bandwidth 15000<CR> OK<CR> Write RX Bandwidth in Hz OK<CR>
ATRD	RF Datarate	ATRD? ATRD=<baudrate> Response	Read RF Data Rate 1200<CR> OK<CR> Write RF Baud Rate OK<CR>
ATE	Exit Command Mode Returns to operating mode	ATE Response	Exit Command Mode OK<CR> This will save all the modifications in RF side
ATPER	Packet error rate mode enabling	ATPER<CR>	Enables packet error mode Displays the no of good and bad packet received
ATRM?<CR>	To exit this mode RF modulation format	ATRM?<CR> response ATRM=1<CR> response ATRM=X<CR>	use exit command read current modulation format 1<CR> OK<CR> set modulation format OK<CR> X - defines the modulation format 0 - 2FSK 1 - 2GFSK 2 - ASK

			3 - 4FSK 4 - 4GFSK
Range test		ATRG=X<CR>	
ATRG=X<CR>	Range TX	X=0	Transmitter sends packet at 500ms and prints "Tx succeed"
	Range RX	X=1	Acts as receiver, if good packet received prints "Rx succeed"
	Range Master (led lights to show Successful decode)	X=2	Bi directional communication acts as master
	Range Slave (led lights to show Successful decode)	X=3	Bi directional communication acts as Slave

Variants and ordering information

The HNM MODEM is manufactured in several variants:

HNM1-169-19	500mW	EU
HNM2-433-19	500mW	Germany
HNM2-458-19	500mW	UK
HNM3-869-9	500mW	EU

For other variants please contact the factory.

Other variants can be supplied to individual customer requirements at frequencies from 160MHz to 915MHz

Notes

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The Intrastat commodity code for all our modules is: 8542 6000

R&TTE Directive

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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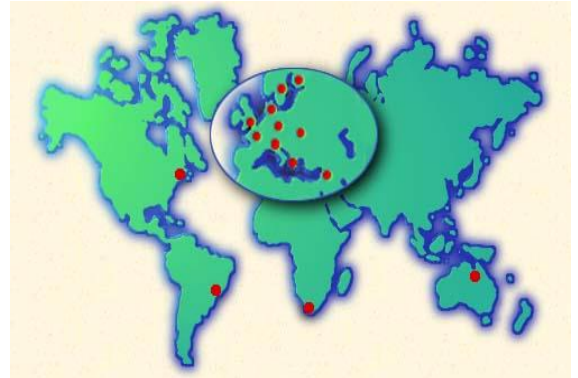
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