

# **SD-250NTG**

## **User Guide**

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# Introduction

The SD250NTG range is a 0.5 to 5 Watts RF data module at UHF frequencies.

The SD250NTG is housed in a rugged cast-aluminum box sealed to IEC 529 (IP54) making it suitable for a wide range of mobile and fixed applications.

The SD250 RF data module unit meets the essential requirements of the relevant directives. In order to maintain this compliance the installation and safety information must be adhered to at all times.

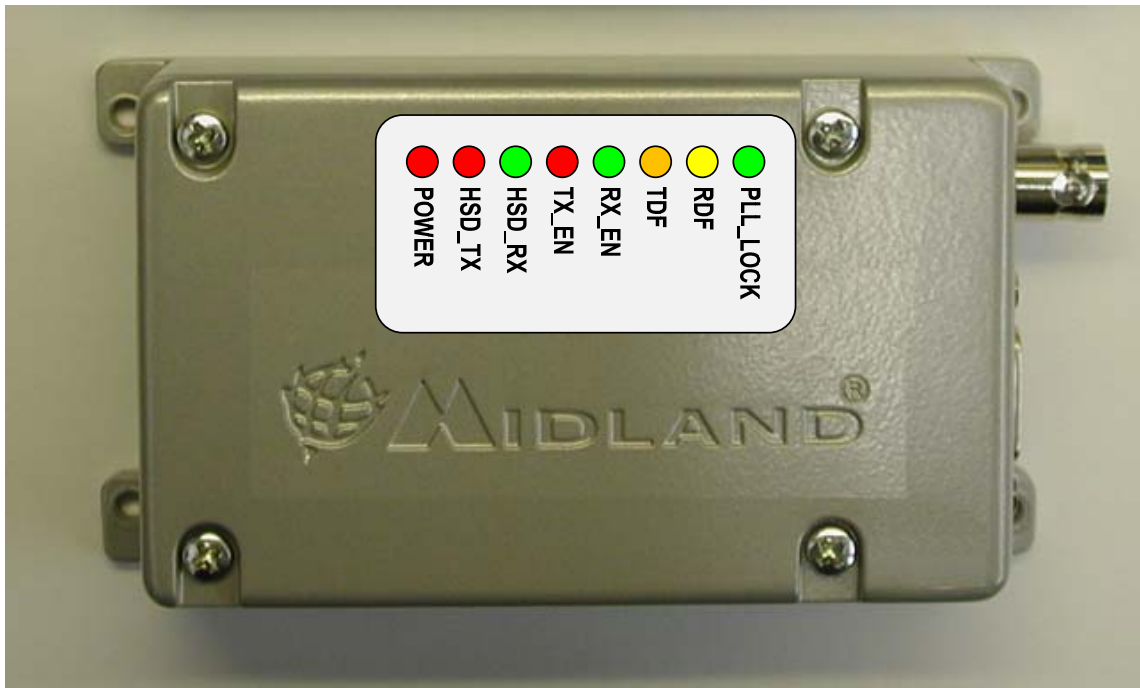
- The SD250 RF data module must only be installed where unintentional contact cannot be made. The surface of the device may be hot to touch under certain transmit conditions. The SD250 is not designed for permanent transmission. If prolonged transmission periods are used, the unit will become hot and will require an additional heat-sink to be fitted.
- When fitting the module into a fixed installation, care must be taken in the routing of all cabling such that the insulation cannot become damaged.
- The recommended supply sources for use with the SD250NTG is a standard 12V / 2A dc supply, but is capable of operating in the range 9V - 18V.

# Preparing for use

## Unpacking and inspection

Unpack the modem and check that you have received the following items:

- SD250NTG RF data modem
- User Guide (this document)



If any of these items are missing, please contact your supplier.

## Description of modem

The SD250NTG has been designed to be used in an advanced, highly robust, two-way fixed base meter reading solution that delivers comprehensive usage information through a secure, long-range wireless network.

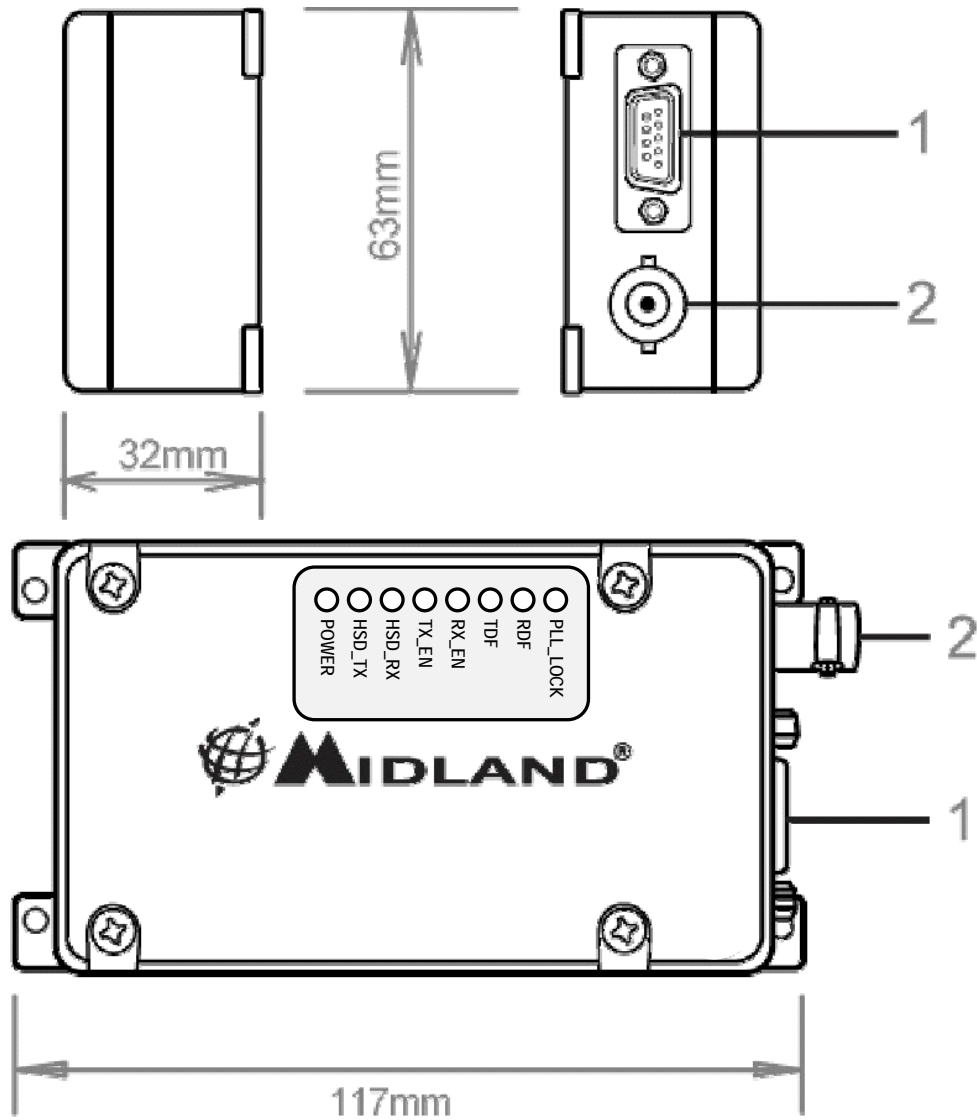
The SD250NTG is a network free, point to point RF data modem that offers great flexibility in varied applications where wireless data is needed. The modem supports 7,200 baud GMSK modulation over the narrow band channel spacing, 12.5 KHz, and high speed data communication through RS 232 serial port.

The internal modem allows communication with a pc using RS 232 for the data and control lines. For further details, please refer to the mini-collector manual.

## Features

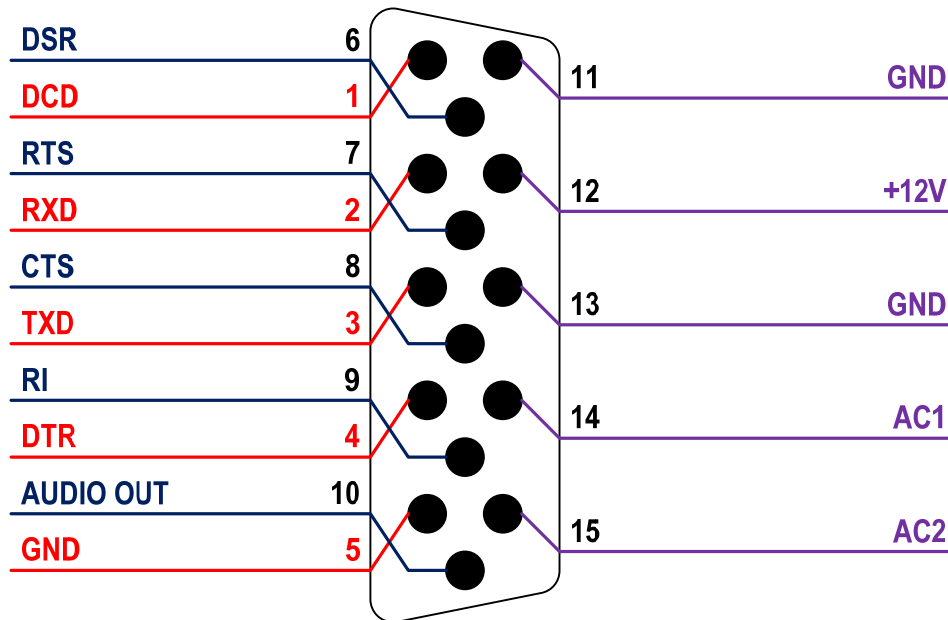
- Compact and rugged die cast box
- Resistant to dirt, dust and water ingress (IP54 rated)
- Network free, point to point communication
- 0.5 - 5 watt programmable output power
- Synthesized operation
- 12.5 channel spacing
- Internal GMSK modem
- Calibrated 'RSSI' output value
- 9 – 18 volt supply input

## External Connections



1. HD 15-way d-type (data, control signals and power supply)
2. BNC antenna connector

## Pin Outs



## DB-15 PIN OUT table with input and output levels

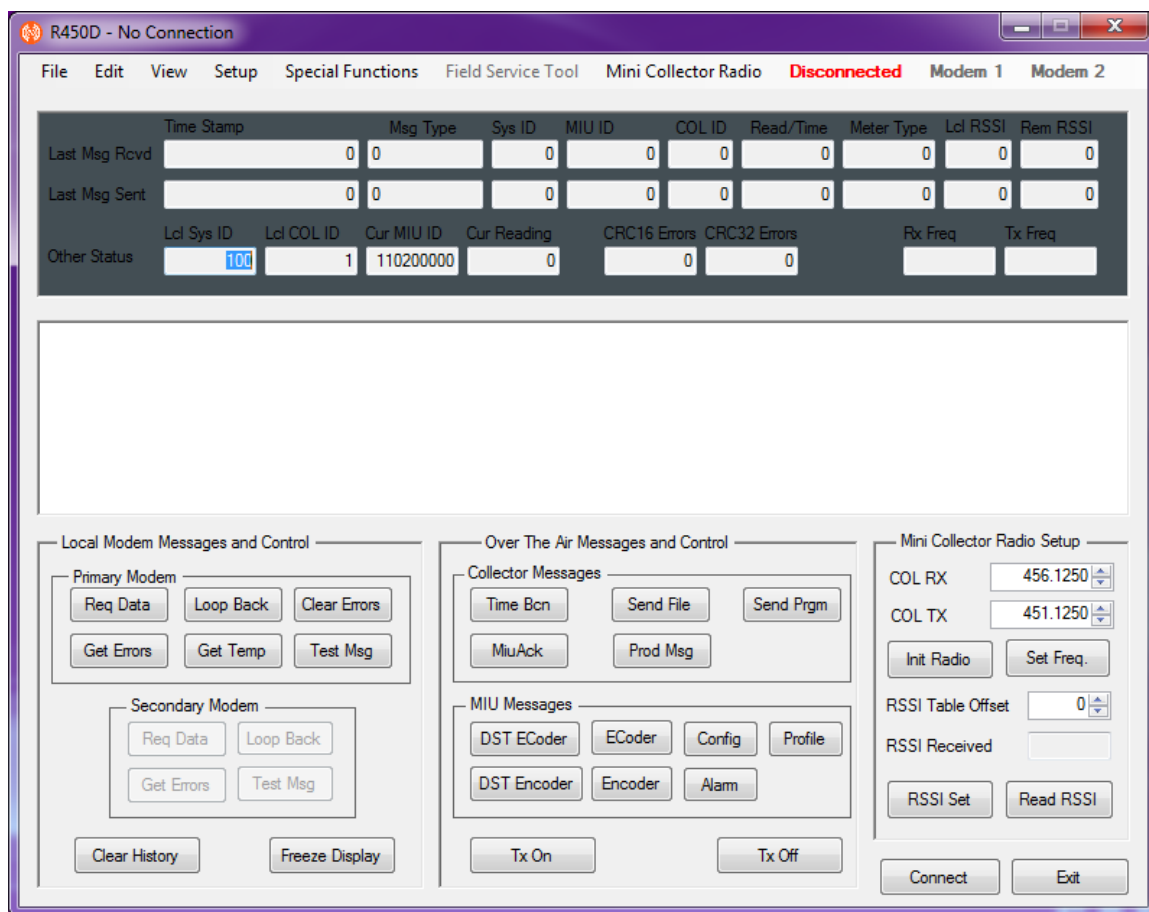
D-Type Pin No.	Function	Description	Signal Type	Input/ Output
1	DCD	Data Carrier Detect	RS-232	O/P
2	RXD	Received Data	RS-232	O/P
3	TXD	Transmitted Data	RS-232	I/P
4	DTR	Data Terminal Ready	RS-232	I/P
5	GND	Ground connection to chassis of the radio.	0V (Chassis)	
6	DSR	Data Set Ready	RS-232	O/P
7	RTS	Request To Send	RS-232	I/P
8	CTS	Clear To Send	RS-232	O/P
9	RI	Ring Indicator	RS-232	O/P
10	AUDIO OUT	Discriminated audio output	Analog	O/P
11	GND	Ground connection to chassis of the radio.	0V (Chassis)	
12	+12V	Power supply input (Nominal 12V)	9.0V – 18.0V DC	I/P
13	GND	Ground connection to chassis of the radio.	0V (Chassis)	
14	AC1	AC IN	Analog	I/P
15	AC2	AC IN	Analog	I/P



# Operation

## Radio program

Frequencies for receiver and transmitter are programmed by R450 Radio Diagnostic program. The program also allows for RSSI and Radio calibration, includes TX power output, Frequency error, FM modulation/balance and RX DC-offset cancellation.



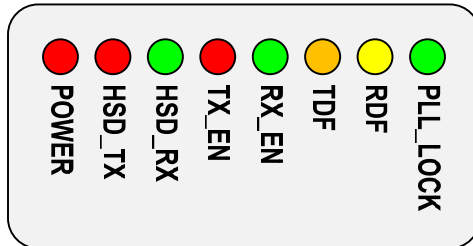
## Transmit/Receive Operation

The SD250NTG is put into transmit/receive by using RS 232 leveled data. The radio is controlled by existence of inputted data from a DTE. The data to be transmitted is automatically stored while the transmitter is turned on and transmitted after finishing preparation for transmission.

When the radio receives valid information over the air, then it is sent out to the data terminal.

## Status indicators

The LED indicates the current status. The details are shown below:



NO	DESCRIPTION	LED COLOR	STATUS	REMARK
1	POWER	RED	Power On	
2	HSD_TX	RED	Host Serial Data Transmission	
3	HSD_RX	GREEN	Host Serial Data Reception	
4	TX_EN	RED	RF transmitter Enable	
5	RX_EN	GREEN	RF receiver Enable	
6	TDF	ORANGE	Valid Message Transmission	
7	RDF	YELLOW	Valid Message Reception	
8	PLL_LOCK	GREEN	PLL frequency synthesizer Lock	

# Installation

## Antennas

It is important that any antennas are installed in a suitable location with an adequate ground plane. Ideally, multiple antennas should be separated by a minimum of a wavelength (at the lowest frequency), whilst still retaining a good ground plane for each antenna. Therefore, for a 400MHz system, the ideal separation should be a minimum of 0.75m.

Warning: If installing an antenna near people it is necessary to ensure the minimum separation is maintained. This is particularly important where prolonged exposure is likely.

## Power sources

It is important that a “clean” source of power is used for the 12V supply to the modem

## Cabling

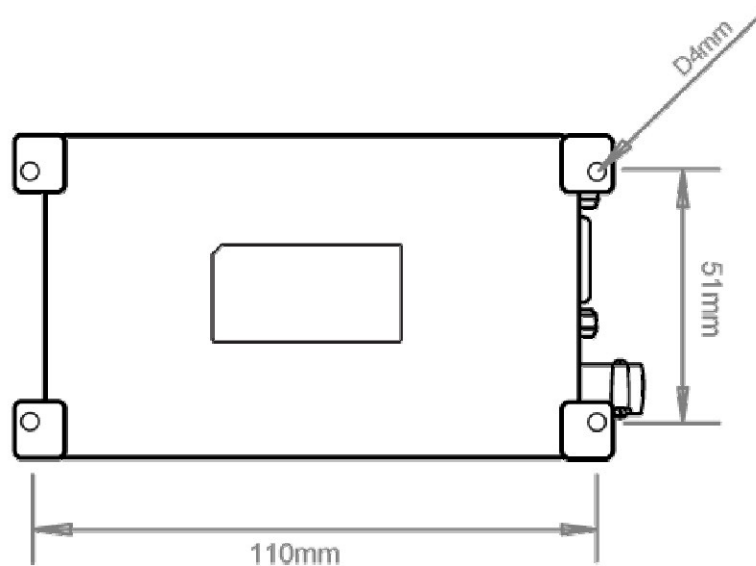
If possible, run RF cables separately from other cables and keep RF cables apart from one another to avoid interference / coupling.

When fitting the modem into a fixed installation care must be taken in the routing of all cabling such that the insulation cannot become damaged.

## Fixing

We recommend that the SD250 is securely fixed to a surface, either directly, or with a suitable bracket. The fixing hole center dimensions are as shown.

The modem can be attached to any surface by using suitable size screws through the M3 holes in the mounting flanges.



Note: We do not recommend that the SD250 is fixed by cable ties to any wiring looms.

# Safety and general information

Important information on safe and efficient use of your Radio device

## Exposure to radio frequency energy

Your modem is a high power radio transceiver. When it is on, it receives and also sends out radio frequency (RF) signals. To help minimize human exposure to RF electromagnetic energy, keep transmission time to 50% or less.

As with all radio devices, holding the antenna affects transmission quality and may cause the radio to operate at a higher power level than required. Do not hold the antenna when the radio is in use.

Do not use radios with damaged or modified antenna, this may violate compliance with relevant international standards.

Where prolonged human exposure is likely, the minimum separation from the antenna should be 0.8m.

## Electromagnetic interference/compatibility

Most modern electronic equipment is shielded from RF energy. However certain electronic equipment may not be shielded against RF signals. The modem needs to be switched off in any facility where posted notices instruct you to do so to avoid electromagnetic interference or compatibility conflicts. Special care should be taken near facilities such as hospitals or health care centers may be using equipment that is sensitive to external RF energy.

## Medical devices (Pacemakers)

If you use any personal medical device, consult the manufacturer of your device to determine it is adequately shielded from RF energy. Your physician may be able to assist you in obtaining this information.

## **Vehicles with airbags**

Air bags inflate with great force. Do not place a radio in the area over an airbag or in the airbag deployment area, any radio may be propelled with great force and cause serious injury to the occupant of the vehicle.

## **Potentially explosive atmospheres**

Turn off your modem prior to entering any area with a potentially explosive atmosphere, unless it is a radio type especially qualified for use in such areas. Do not remove install or charge batteries in such areas. Sparks in potentially explosive atmospheres can cause an explosion or fire resulting in bodily injury or death.

Potentially explosive atmospheres include fuelling areas such as petrol stations, below decks on boats, fuel or chemical transfer or storage facilities, vehicles using liquid petroleum gas (such as propane or butane); areas where the air contains chemicals or particles such as grain, dust or metal powders, and any other area where you would normally be advised to turn off your vehicle engine. Areas with potentially explosive atmospheres are often but not always posted.

## Warranty and repairs

The SD250 is a low maintenance device. Once installed it requires no ongoing maintenance.

In the event that your SD250 RF data module needs repair, return your radio to an authorized Midland Radio supplier. Do not disassemble, modify or repair the unit unless the work is carried out by a Midland Radio approved supplier. Incorrect assembly, modification or repair may cause irreparable damage to your unit and will invalidate any warranty.

## Care of the equipment

Do not immerse the SD250 RF data module in water or other fluids.

Do not use solvents or spirits for cleaning as this may cause damage to the case materials.

Do not over tighten connection to the modem.

## Disposal / Recycling

The SD250 is a Class 3 product in accordance with the Waste of Electrical and Electronic Equipment (WEEE) Directive. Disposal of this class of equipment must be carried out through an authorized recycling centre or contact your supplier.

FCC warnings:





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