

# **GD230B**

## **Wireless Data Transceiver**

### **Instruction Manual**



SHENZHEN ATC TECHNOLOGY CO., LTD

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## **1. INTRODUCTION**

GD-Series wireless data transceiver is an equipment consists of a semi-duplex transceiver and a wireless modem which is specially designs for data communications and serves as a transceiver to VHF FM bass station as well. It is a mature, state-of-art equipment to be used in SCADA system. There are 16 channels that can be used and the frequencies are controlled by a synthesizer system. The core of GD230B is a custom-designed MCU which made the transceiver highly intelligent, functional and reliable. It has a low “Bit Error Rate”, high stability and reliability in performance and low power consumption characteristic. Moreover, the unit is compact in size, and fully make use of SMT technology. Comes along a programmer and a software that made the manipulation, channel and interface programming of the unit become joys.

### ***Features***

- ◆ There are 16 working channels ready to use. Selection of channel can be done through computer signal and manual adjustment. A standard EIA-232 data communication port on the unit can be connected to either computers or custom-designed equipments for manipulation and transmission.

- ◆ The GD-series has an automatic protection feature that against power and antenna failure.

- ◆ GD-series works both in simplex and semi-duplex mode, the transmission power is adjustable in order to meet different requirement.

- ◆ Compact in size and easy of use. The unit has on it a EIA-232 or EIA-485 communication port, socket for condensed microphone and speaker, antenna connector and indicators.

- ◆ For data communication, GrandComm provides various internal modulation schemes as FSK, MSK and GMSK. Also an optional interface for connection to any external standard wireless modem is provided.

- ◆ Low power consumption is a main characteristic of the GD-series. The standby power consumption of the unit is 90mA. The power consumption when transmitting at 10W output power is 1.8A with a power supply of 12V DC.

- ◆ GD-Series has the ability in against dust, moisture, acid, vibration and frequency leakage.

- ◆ GD-series can be used in both data and voice transmission without any hardware alternation.

- ◆ Full line of accessories includes base station and mobile antennas, condensed microphone and speaker, programmer, power supply and software.

## **2. INSTALLATION**

### ***2.1 Antenna connection***

There is a female, 50  $\Omega$  antenna connector at the rear of the transceiver that connects to an antenna. The unit has a protection circuit preventing itself from damage from a mal-functioned antenna.

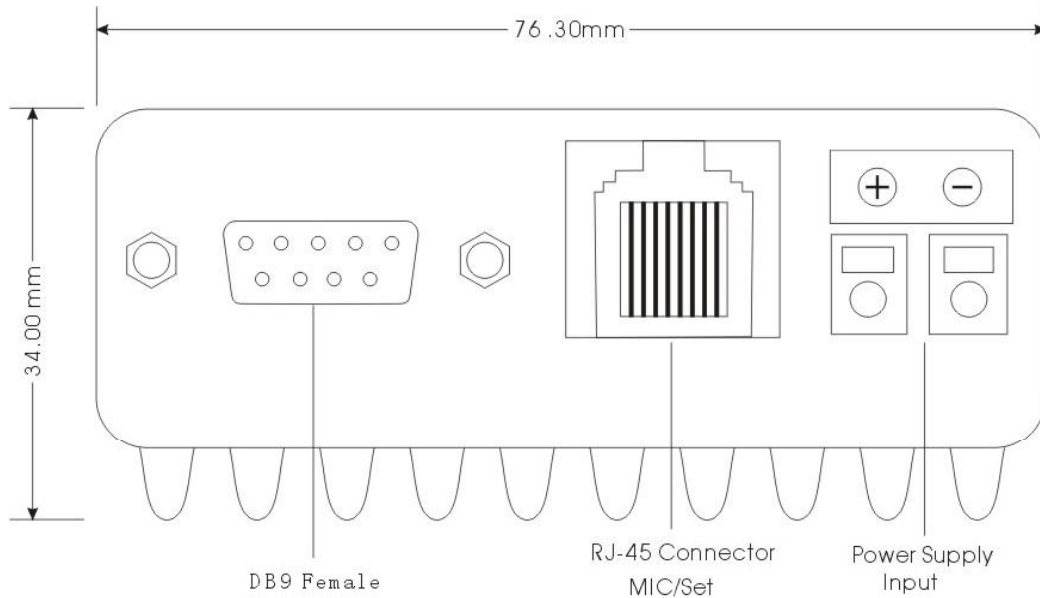


Fig.1 GD230B Front View

## 2.2 Power connection

GD230B requires external DC power supply of 12V and a maximum current of 3A. Connect the external power supply with the power cable with a correct polarization. There is a power protection circuit and a 3A fuse that may prevent the transceiver from damage of improper power supply.

## 2.3 Condensed MIC/SPK Connection

There is a RJ-45 socket at the front panel of the GD230B-Series marked "MIC / DATA IN" for GrandComm's unique condensed microphone and speaker.

## 2.4 Interface Connection

Use a standard EIA-232 interface cable to connect the transceiver with a computer. Switch on both the transceiver and the computer.

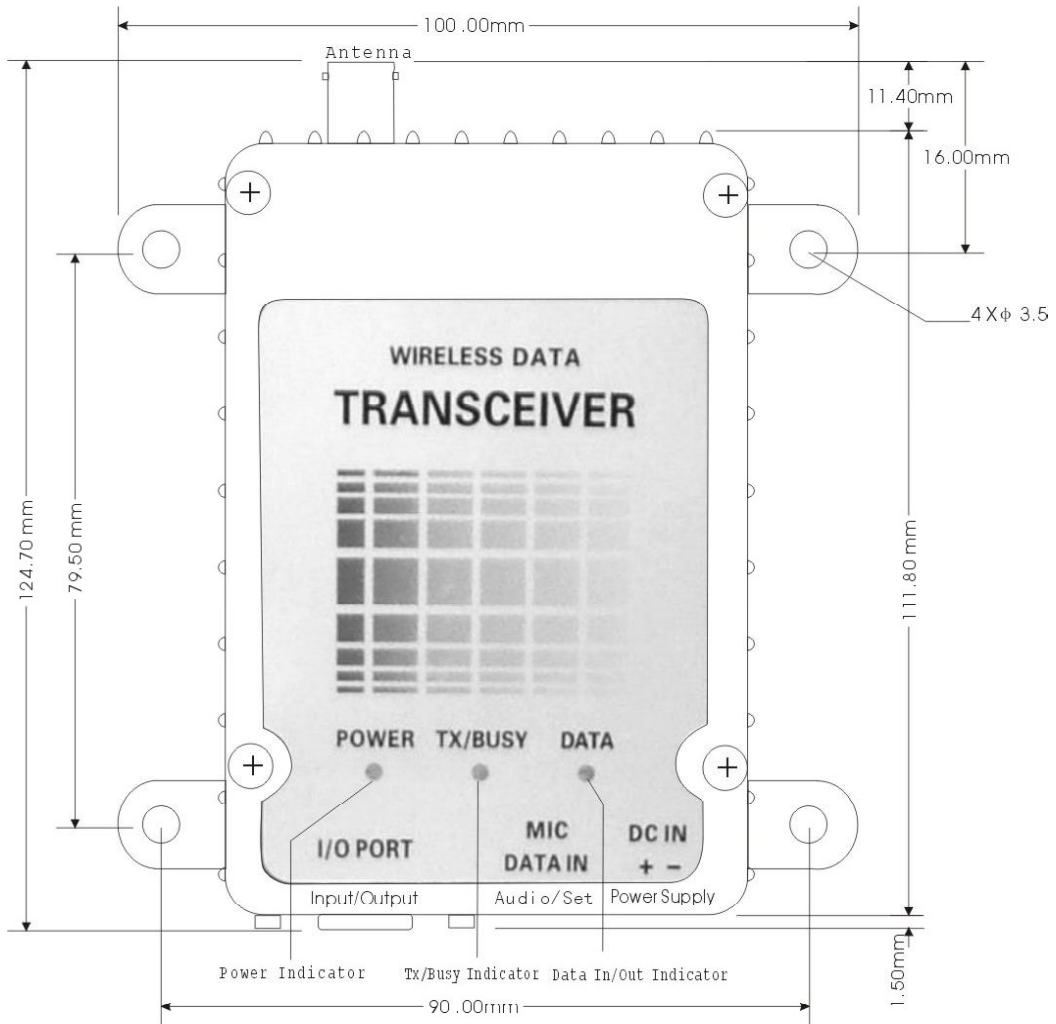


Fig.2 GD230B Top View

## 2.5 Computer Connection

GD230B equips with an EIA-232 communication port for data exchange with a computer. Use a cable provided by GrandComm or you can make your own cable configuring as the following table.

FUNCTION	GD230B DB9 Female	COMPUTER DB9 Male	COMPUTER DB25 Male
RxD	2	2	3
TxD	3	3	2
GND	5	5	7

## 2.6 Power On

Before applying power to the unit, make sure the followings:

1. have the unit connected to a proper power supply
2. the antenna system is in good condition and connected to the unit
3. the EIA-232 interface cable has connected the unit with the computer correctly

Switch on the power supply, a yellow LED labeled "POWER" at the front panel should be turned on and it should be the only one to be on. Then you can do a data transmit/receive test by using serial port test software.

## 2.7 Channel Selection

Channel can be switched from one to another by using following methods:

1. Executing programming software from the computer or other data terminals;
2. Issue a command from the hand-held programmer which can change channel, RF output power and squelch level. See GD230B Programmer's Manual for details.

## 3. SPECIFICATION OF GD230B

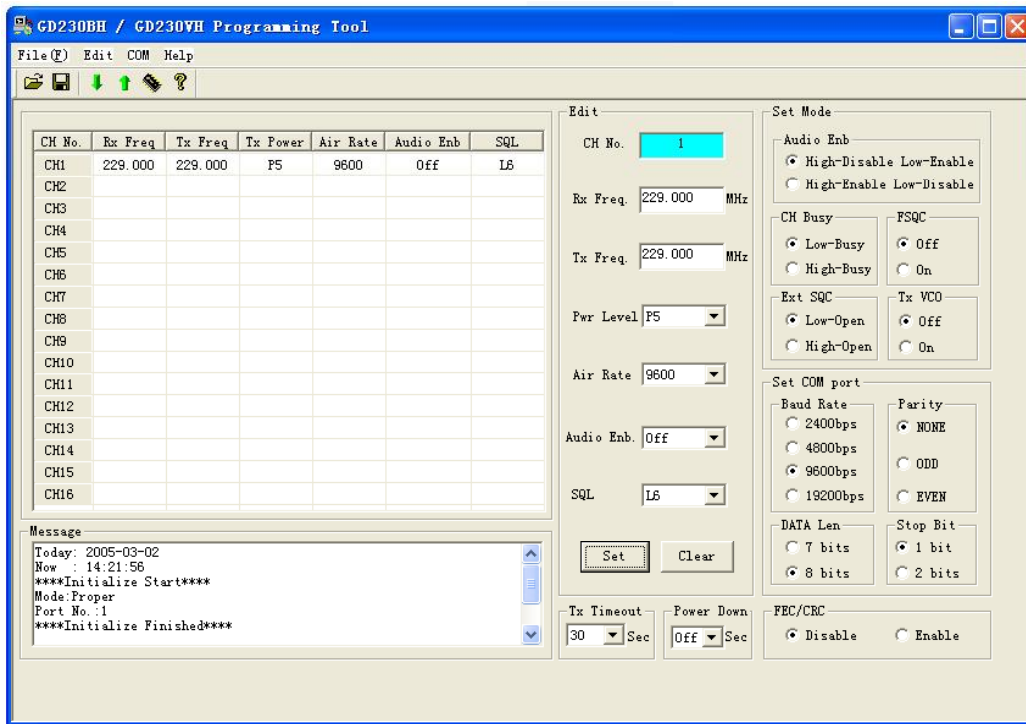
<b>GENERAL</b>	
OPERATING FREQUENCY RANGE	220 to 238MHz
CHANNEL SPACING	25KHz
NUMBER OF CHANNEL	16
ANTENNA IMPEDANCE	50 Ohm unbalanced
OPERATING TEMPERATURE	-40 to +70°C
FREQUENCY STABILITY	TCXO ±1.5ppm
OPERATION VOLTAGE RANGE	11V DC to 14V DC
STAND-BY CURRENT	90mA
<b>TRANSMITTER</b>	
RF POWER OUTPUT	1W to 10W programmable
OUTPUT 2 <sup>ND</sup> HARMONIC	less than -65dB
SPURIOUS EMISSIONS	less than 0.25uW (30MHz to 1GHz)
MAXIMUM FREQUENCY DEVIATION	± 5KHz
REFERENCE OSCILLATOR	TCXO
RF IMPEDANCE	50 Ohm unbalanced
CURRENT DRAIN	1.8A when transmitting with 10W power
FM HUM AND NOISE RATIO	greater than -50dB (under normal condition)
AUDIO FREQUENCY DISTORTION	3% 1KHz for 3KHz deviation (under normal test condition)
AUDIO FREQUENCY RANGE	300Hz to 3400Hz ± 2dB
TRANSMITTER ATTACK TIME	5ms
<b>RECEIVER</b>	
TYPE OF RECEIVER	Crystal controlled double, super heterodyne

INTERMEDIATE FREQ.	45MHz(1 <sup>st</sup> IF), 455KHz(2 <sup>nd</sup> IF)
SENSITIVITY(12 dB SINAD)	less than 0.2uV
SQUELCH SENSITIVITY	0.1uV to 1uV programmable
ADJACENT CHANNEL SELECTIVITY	greater than -70dB
SPURIOUS AND IMAGE REJECTION	greater than -65dB
OUTPUT AUDIO DISTORTION	3% at 1KHz for $\pm 5$ KHz deviation
RECEIVER ATTACK TIME	40ms max.
FM HUM AND NOISE RATIO	greater than 40dB
<b>Data and Interface</b>	
MODULATION	FSK, MSK or GMSK
AIR RATE	FSK: 0—1200bps MSK: 2400 or 1200bps programmable MSK: 4800bps GMSK: 9600 or 19200bps
INTERFACE BAUD RATE	FSK: same as air rate MSK: 1200 / 2400 / 4800 / 9600bps programmable GMSK: 2400 / 4800 / 9600 / 19200bps programmable
INTERFACE DATA BIT	7 or 8 bits for MSK and 8 bits for GMSK
INTERFACE PARITY BIT	None / Even / Odd
INTERFACE STOP BIT	1 or 2 bits for MSK and 1 bit for GMSK

#### **4. PROGRAMMING**

There are 16 channels that can be programmed. To enter your own frequency pairs into these channels, you need a "Programmer", a programming software and a computer. A programmer is an RJ-45 connector with two pins connected. After you have connected radio's EIA-232 port with the computer's EIA-232 port with programmer in the RJ-45 socket of the radio, turn the on the transceiver and start executing programming software from the computer.

ProgTool is an integrated software for GrandComm GD230B wireless data transceiver which is used to program the radio's parameters such as RX frequency, TX frequency, the RF output power and squelch level of each channel, the interface baud rate / data bit / parity bit / stop bit and so on. The software is a pull-down menu driven program which is divided into four categories: "File", "Edit", "COM" and "Version".



## 4.1 File

There are totally sixteen channels in the radio which can be programmed. Parameters can be saved under different file name, retrieved and most of all, uploaded from or downloaded to the radio.

On the "File" menu, use [UP], [DOWN] keys to highlight the item you need and press [RETURN] or simply move the mouse to the item you need and left-click it to access.

### 4.1.1 Open

Execute this item to load parameters from diskette. Click the name of the file you need to load and the contents of the file will be fetched into computer's memory. Then you can do any modification to it, but the file on your diskette still remains the same unless you have it be overwritten.

### 4.1.2 Save

Execute this item to save radio parameters in computer's memory into diskette. You may overwritten an old file with the same name or enter the name of a new file in full.

### 4.1.3 Save As

Execute this item to save radio parameters in computer's memory into diskette with a new name. You should select the path and enter the full name.

### 4.1.4 Printer Set

Execute this item to set up your printer.

### 4.1.5 Print



Execute this item to print radio parameters in computer's memory.

## 4.2 *Edit*

### 4.2.1 *Channel 1-16*

There are totally 16 channels and for each channel there are two frequencies, the "transmit" and "receive", can be entered. For each frequency, a value can be directly entered into this field. Frequencies effective only when it is within the frequency band.

You can program each channel's RF output power and / or squelch level separately.

Each "Tx Power" level corresponds to a certain Tx output power as listed below.

Tx Power Level	P5	P4	P3	P2	P1
Output Power	10W	7.5W	5W	2.5W	1W

Each "SQL" level also corresponds to a certain squelch sensitivity as the table below.

SQL	L1	L2	L3	L4	L5	L6	L7	L8	L9
SQ	ON	-128dBm	-125dBm	-122dBm	-119dBm	-116dBm	-113dBm	-110dBm	-107dBm

### 4.2.2 *Baud Rate*

Baud rate is the data transmission rate from one DTE (Data Terminal Equipment such as a computer) to another DTE or to a DCE (Data Communication Terminal ). Two connected equipment at both ends should have the same baud rate.

### 4.2.3 *Data Bit*

Data bit is the length of data to be used. It can be either 7 bits or 8 bits long for MSK modulation type and 8 bits for GMSK type.

### 4.2.4 *Parity Bit*

Parity bit is an error checking bit which can be either NONE, EVEN or ODD.

### 4.2.5 *Stop Bit*

A stop bit can be either 1 bit or 2 bits in length which adds to the end of a transmission byte for MSK model. For GMSK model, a stop bit can only be 1 bit.

## 4.3 *COM*

### 4.3.1 *Port*

This is to define the computer's COM port that connect to your radio. COM1 to COM4 can be selected. Before doing "Read", "Write" or "CH Set" process, you must be sure that there is a "programmer" connects your computer's COM port with the RJ-45 socket of the radio.

A programmer is an RJ-45 connector with two pins connected.

The PWR LED flashes indicating that the radio is in program mode as long as the programmer is connected to the RJ-45 socket of the radio and the radio is powered on.

#### **4.3.2 Read**

By invoking this function, parameters of the radio will be retrieved from the E<sup>2</sup>PROM inside the radio. You can make use of this function to read the parameters of the radio that you would like to know, or to check the information of a radio after the downloading of data for verification. But be caution that the existing data in computer's memory will be overwritten.

The read process takes only about 2 to 3 seconds.

#### **4.3.3 Write**

The parameters you enter, modify or retrieve from diskette stay only in your computer's memory. If you want them to be effected on the radio, you have to execute the write function. This process always overwrite the existing data in E<sup>2</sup>PROM in the radio. The write process takes about 10 seconds.

#### **4.3.4 CHSet**

Execute this item to read out the active channel and the corresponding SQL or to set a certain channel as the active channel and set the corresponding SQL of the channel.

### **4.5 Version**

This item displays version of the software.