



CG Antenna

GW-1000 APRS TOTAL SOLUTION

v1.3.1

User Manual

Version AUG 2016

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1. Introduction

GW-1000 has features of Digipeater, iGate, APRS data monitoring & Weather station report. In the future, it could extend to Telemetry by firmware upgrading.

Optional:

LCD monitoring screen

Bluetooth connection

1.1. Digipeater

Digipeater is short for "Digital Repeater"; a repeater for packet data rather than voice.

Digpeating is much more critical to APRS than to conventional packet because APRS heavily involves packet data transmission to and from moving vehicles. Traditional packet was overwhelmingly used between fixed locations, typically with better and higher antennas.

GW-1000 reads APRS data from RF transceiver, repacks it and send out via RF transceiver. GW-1000 supports only the new WIDEn-N path scheme.

1.2. iGate

iGate or "Internet Gateway", hears traffic, sends data to APRS-IS (APRS Internet Service). APRS-IS is a live stream of APRS traffic worldwide.

Without IS, website like aprs.fi would not be possible.

Setting up an iGate is an easy way to contribute to the strength and utility of the APRS network without overwhelming the RF side of things.

Thanks to iGate, the following features of APRS are possible:

- Families can check in on the progress of loved ones who are driving long distances and well beyond radio range.
- Travelers can check for repeater and net info for a city they plan on visiting in the future.
- APRS users can troubleshoot their equipment and identify coverage gaps in their area.
- APRS users can send short emails from their radios or send/receive text messages from well outside of normal RF range.

GW-1000 supports RF-IS and IS-RF both way data relay.

RF-IS, The APRS data from RF will be relayed to APRS IS network. So people can check these data on the internet.

IS-RF, the GW-1000 could read the APRS data from which IS server sent to it and relay to RF.

1.3. Weather station report

Currently 2 kinds of weather stations are supported.

1, Peetbros weather station in 'Complete record mode'

2, CG Antenna WX-01 simple weather station. It could detect temperature, humidity & air pressure. Possible to connect to 3rd party anemometer & rain gauge.

1.4. TNC

GW-1000 has an embedded KISS TNC. The speed is 1200 baud rate. It supports KISS control protocol. Using AFSK to modulate & de-modulate the signal. With extra Bluetooth installed, it could be used as a standalone APRS KISS TNC.

1.5 Bluetooth (Optional)

With the Bluetooth module installed, the Bluetooth indicator will blink. If it is paired with Bluetooth terminal (such as computer, tablet or smart phone), the indicator will light on solid.

** The device name is SPP-CA. The pairing passcode is 1234.*

2. Connectivity

There are 4 connectors on the back panel.

Power supply

Radio connection port

Ethernet port

Data extension port

2.1. Power supply

GW-1000 supports 9-15 VDC voltage. Current drain <0.8A

2.2. Radio connection port



Pin 1. AF OUT, GW-1000 audio output to radio input

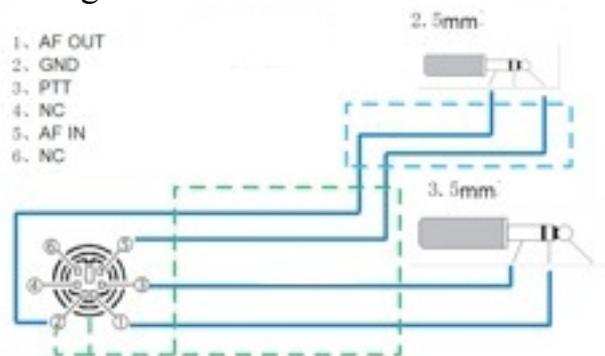
Pin 2. GND, ground

Pin 3. PTT, radio PTT

Pin 5. AF IN, GW-1000 audio input from radio output

For normal Kenwood and generic handheld radio which has a 3.5mm & 2.5mm microphone and speaker plug. The 3.5mm jack as microphone and the 2.5mm jack as speaker.

Wiring as



Mini din 6, pin 1 to the ring of 3.5mm jack (AF out)
Mini din 6, pin 3 to the sleeve of 3.5mm jack (PTT)
Mini din 6, pin 5 to the tip of 2.5mm jack (AF in)
Mini din 6, pin 2 to the sleeve of 2.5mm jack (GND)

For most of Yaesu, ICOM & Kenwood mobile radios that are using same mini din 6 data jack. Just one to one by straight connects 4 wires. Pin 1, pin 2, pin 3, pin 5.

For Yaesu handheld radio, there is no PTT wire. So user must open the GW-1000, locate the JP3 2-pin jumper that is beside the mini-din 6 socket. Put a jumper cap on it. Then GW-1000 could properly drive Yaesu handheld radio to transmit.

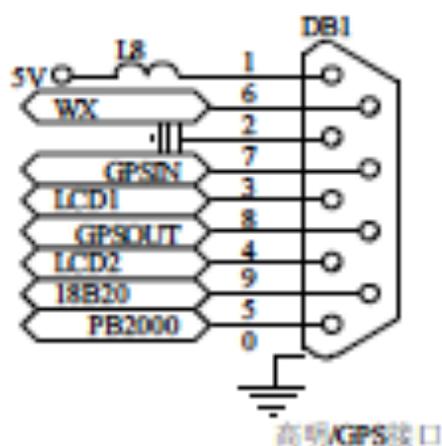
2.3. Ethernet port

802.11 Ethernet port for connecting to Internet network.

2.4. Data extension port

DB-9 data port for connecting weather station, LCD & external Telemetry data board (in future)

2.4.1. DB-9 port definition



pin-1 +5VDC
pin-2 GND
pin-3 LCD 1
pin-4 LCD 2
pin-5 PeetBros weather station
pin-6 WX-01 simple weather data board

2.4.2. For Peetbros Ultimeter connection

Connect pin 2 to the ground of PB data connector
Connect pin 5 to the data output of PB data connector

2.4.3. For WX-01 simple weather station connection

Connect pin 1 to the +5V of WX-01
Connect pin 2 to the ground of WX-01
Connect pin 6 to the data output of WX-01
Due to voltage decrease, please connect external +5VDC to the WX-01 if it is put more than 3 meters away from GW-1000.

2.4.4. For LCD connection

Refer to the wiring diagram at the back of GW-1000 LCD. The LCD is supplied separately.

3. Front indicators

There are 6 indicators at the front edge of the GW-1000.

Power, Internet, APRS receive, Decode/Encode, APRS transmit, Bluetooth

3.1. Power



This indicator is on when DC power is supplied.

3.2. Internet



This indicator is flash when GW-1000 trying to connect to APRS IS server. After connection is established, it goes to solid.

3.3. APRS receive



This indicator is on when GW-1000 is receiving APRS packet.

3.4. Decode/Encode



This indicator is on when GW-1000 is decoding or encoding APRS packet data.

3.5. APRS transmit



This indicator is on When GW-1000 is transmitting the APRS packet.

3.6. Bluetooth



Only working if the optional Bluetooth module is installed.

Flash – pairing with other Bluetooth terminal. Such as smartphone, table or computer.

Solid – paired with other side.

4. Software installation

The configuration software supports WinXP, Win 2000, Win 7, Win 8, Win 10

Minimal operation system requirement:

Win XP (service pack 3)

Microsoft .Net Framework client profile 4.

Client configuration software download link.

<http://www.cgantenna.be/gw1000.html>

Download this file and unzip it to your hard disk.

Step 1. Create a folder on your hard drive. E.g 'c:\gw1000'

Step 2. Copy all files into this folder.

Step 3. Click 'DOTNET40CLIENT.EXE'. It will install Microsoft .Net Framework client profile 4. If you have already installed this or higher version, you could ignore this step.

Now you can run the configuration software on your PC. Click 'APRS GW-1000 Configure.exe' in the 'C:\GW1000'

5. Basic configuration setting

At the top section of configuration software, you must input the IP address and passcode of the GW-1000 that would be connected.

** The default IP address is 192.168.1.120 and passcode is 00000000.*

5.1. Status tab

It shows the unit information. Such as firmware version, on board voltage, Network information and Weather station data.

5.2. General tab

GW-1000 IP

Default IP address is 192.168.1.120, netmask 255.255.255.0

In case, you forget the IP address or the configuration setting corrupted, you could choose to go back default setting by open the GW-1000 case (Please disconnect the power first). Locate the RESET button. Push and hold the button. Meanwhile connect the power. You will see all the lights flash. Then release the button. System does a hard reset. It will set GW-1000 to default IP address 192.168.1.120, netmask 255.255.255.0.

Router- the IP address of your router.

Callsign – Radio operator callsign.

SSID - This is the SSID for your iGate. Usually it is 10.

Passcode – The passcode for APRS IS login.

Filter – The APRS server side filter. E.g. ‘filter m/20’

APRS server IP

You could manually setup 3 different APRS server IP address

Polling – GW-1000 will try each server if one is not available

Always use Server A - Only connect to the 1st server.

Restart after connection overtime twice – GW-1000 will restart if it fails to connect to server twice

TX Delay- This value is the delay time in milliseconds before sending APRS packet. It is necessary for transmitter to stabilize the TX frequency, also for receiver to synchronize the session.

TX Skip – This value is the skip time in milliseconds between two APRS outgoing packets.

RX End – APRS packet contains at least one ‘7E’ code as end flag in the data frame. This value defines how many ‘7E’ ending flags that system should wait until finishing decoding. One end flag is about 10ms. Normally you could choose ‘10ms’. But in case if some APRS data incorrectly contains ‘7E’ flag in the middle of the packet. You need to choose ‘20ms’. Then system will finish decoding after detects at least 2 times ‘7E’ end flags.

LCD- The general switch of the LCD display (optional).

Data Output Format – This defines which data format is output from Bluetooth connection.

Change Passcode – If you like to change the passcode of the GW-1000, just type the current passcode and twice the new passcode.

5.3. Beacon tab

Activate the beacon to automatically report the position of the iGate or Digipeater. Either by radio RF or APRS IS.

SSID – SSID for beacon.

IS Report- APRS Internet service transmitting interval in seconds. 0 means no transmitting.

RF Report- Radio RF transmitting interval in seconds. 0 means no transmitting.

**For both IS and RF report, do not set transmitting interval too short. Otherwise it will flood the APRS network.*

PATH 1 & 2 – GW-1000 supports only WIDEn-N path structure. It consists with an area name as ‘WIDEn’ plus the times of repeating hop. The Hop must be greater than 0. Otherwise it is not activated.
e.g. WIDE1-1, WIDE2-2, WIDE3-1, BY4DX-2

Symbol – You could fill beacon icon type from the primary symbol table. This symbol will be presented as a special icon in the other APRS software.

For the detail symbol code, please refer to
<http://www.aprs.org/symbols.html>

Latitude – Latitude of the station.

Longitude – Longitude of the station.

** Format in datum WGS1984. E.g. 54 deg. 17.10 min N.*

Comment - The text in comment position of the APRS beacon packet.

Report Voltage – Report the GW-1000 running voltage.

5.4. Weather station tab

For Peetbros weather station, you must set up the weather station in 'Complete record Mode', speed rate 2400 bps.

SSID – SSID for weather station. Suggest using 13.

IS Report- APRS Internet service transmitting interval in seconds. 0 means no transmitting.

RF Report- Radio RF transmitting interval in seconds. 0 means no transmitting.

PATH 1 & 2 – GW-1000 supports only WIDEn-N path structure. It consists with an area name as 'WIDEn' plus the times of repeating hop. The Hop must be greater than 0. Otherwise it is not activated.
e.g. WIDE1-1, WIDE2-2, WIDE3-1, BY4DX-2

Latitude – Latitude of the station.

Longitude – Longitude of the station.

** Format in datum WGS1984. E.g. 54 deg. 17.10 min N.*

Comment - The text in comment position of the APRS weather report packet.

Display WX data on LCD – If you choose it, the weather information will be shown on the LCD screen after transmit out each time.

Report Voltage – Report the GW-1000 running voltage.

5.5. Digipeater tab

Relay PATH 1- Enable Digipeater on any APRS packet with this path.

Relay PATH 2- Enable Digipeater on any APRS packet with this path.

** GW-1000 doesn't support old 'Fill-in' type, such as 'RELAY'.*

Insert Gateway Name- Insert gateway name in the new forwarded APRS packet.

TX if channel free- Transmit the APRS packet when the channel is quiet.

TX wait- This value is the Digipeater waiting time in milliseconds before forwarding the packet.

Display Relay Data On LCD – Display Digipeater data on LCD.

5.6. iGate tab

RF-IS – Enable RF to IS. GW-1000 will upload the APRS data to APRS internet service once it receives the APRS packets from RF.

IS-RF – Enable IS to RF. GW-1000 will download the APRS data from APRS internet service and transmit out by radio RF.

** Be careful to switch on IS-RF, it will make your iGate very busy due to much data coming from IS.*

5.7. Monitor tab

Show all traffic information.

6. Bluetooth Extension (Optional)

With Bluetooth wireless extension, you could connect your smartphone, tablet or computer to GW-1000. Then you could do following tasks

1. GW-1000 could output the received station information in NMEA or KISS format
2. GW-1000 could be used as a 1200 bps packet TNC modem

If user installed the Bluetooth kit on the GW-1000, it could be turned into a Bluetooth TNC. The default Bluetooth device name is SPP-CA and the pairing code is 1234.

There are various software support Bluetooth TNC. These software could be run on computer, smartphone or tablet. Choose the right suitable software and do the next 2 steps to use the GW-1000 as Bluetooth TNC

Step 1. Bluetooth pairing your device with GW-1000

On your operating device, run the Bluetooth management software, search for the device named "SPP-CA". Pair it with code 1234.

Step 2. In your APRS or TNC software, normally there is an option for TNC. Then choose the Bluetooth device that is just paired.

Recommended software:

1. APRSdroid
It runs on Android system. APRSdroid could use GW-1000 as Bluetooth TNC.
2. Locus Map
Running on Android system. Locus Map directly support OpenstreetMap and several other popular free or open source map. In its Setting -> GPS and location -> Bluetooth GPS, there is NMEA READER function. It could read NMEA output data from GW-1000. Then point the station position on the map.

7. Reminds

For any further question, please email to info@cgantenna.com.