

G100 – External GPS Data Extraction



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1. INTRODUCTION

The G100 may be used in conjunction with external devices to extract and utilise GPS data. Through the use of the G100's 3G or 2G capabilities, GPS data can then be transmitted to the software program of your choice, including Digital Matter's own Telematics Guru.

This user manual provides integration information for compatible devices, and will be updated as more functionality becomes available and as the support knowledge base grows. Please check the website for the latest versions.

2. ICOM RADIOS

The G100 may be used in conjunction with digital Icom radios as a simple "plug and play" solution for extracting and utilising GPS data. Through the use of the G100's 3G or 2G capabilities, GPS data can then be transmitted to the software program of your choice, including Digital Matter's own Telematics Guru.

All that is required to collect and send the GPS data is:

- One G100 unit with the latest ICOM firmware (10.3 at time of writing)
- One Icom digital mobile transceiver
- Icom digital handheld transceivers
- One male D25 Connector

The G100 will collect GPS data whenever the mobile device detects a call, duress signal, man down signal (untested), or "heartbeat" message (continual GPS message sent at a set interval) from a compatible handheld radio. In order to set up the device, please consult your supplier, or program the radios yourself, and consult the FreshDesk article on programming Icom radios.

In order to be compatible with the G100, the Icom radios must be digital with inbuilt GPS functionality. The device supports NXDN (tested) and DPMR (untested). The following is a list of compatible devices as of the time of writing:

Mobile:

- IC-F5063/D/F6063/D Series (tested)
- IC-F5123D / IC-F6123D Series (untested)
- IC-F5400D/IC-F6400D Series (untested)

Handheld:

- IC-F3400D/IC-F4400D Series (3400D untested, 4400D tested)
- IC-F4263DS/T Series (untested)

2.1. Icom Mobile Station Setup

The standard harness for the G100 is a 24 way Molex connector, as depicted in figure 1. Two wire harness variations exist: the medium and the full harness. The medium harness has 18 wires and the full harness has 24 wires.

Pins 20, 21 and 22 (Ground, RX and TX) of the Molex connector should be wired into pins 7, 3 and 2 (Ground, RX and TX), respectively, of a male D25 connector. The D25 connector can then be plugged directly into the female D25 port located on the back panel of the Icom mobile transceiver.

In addition, pins 12 and 24 of the G100 should be wired to an external DC power source, between 8 and 45 Volts.



#	Colour	Medium Harness	Full Harness	Function	Notes
1	Grey	Y	Y	iButton	iButton input
2	Black	Y	Y	Ground	Optional ground point (useful for iButton)
3	Purple*	Y	Y	5V DM CAN Rail	Pin 3 of 4 way Molex. Powers peripherals
4	Brown	Y	Y	Digital Input 4	0 – 48 Volts DC
5	Grey	Y	Y	Digital Input 3	0 – 48 Volts DC
6	Not Defined	N	Y	FlexiCard IO 4	Line to the Flexi Card
7	Not Defined	N	Y	FlexiCard IO 3	Line to the Flexi Card
8	Not Defined	N	Y	FlexiCard IO 2	Line to the Flexi Card
9	Not Defined	N	Y	FlexiCard IO 1	Line to the Flexi Card
10	Green	Y	Y	Switched Ground 2	Low side switch. Use with a relay, LED, or buzzer.
11	Yellow	Y	Y	Switched Ground 1	Low side switch. Use with a relay, LED, or buzzer.
12	Black	Y	Y	Main Ground	Main ground point. Ensure grounded.
13	Yellow*	Y	Y	DM CAN_N	Pin 2 of 4 way Molex.
14	Green*	Y	Y	DM CAN_P	Pin 4 of 4 way Molex.
15	Black*	Y	Y	Ground	Pin 1 of 4 way Molex. Ground for peripherals
16	Blue	Y	Y	Digital Input 2	0 – 50 V DC
17	Pink	Y	Y	Digital Input 1	0 – 50 V DC
18	Not Defined	N	Y	FlexiCard IO 6	Line to the Flexi Card
19	Not Defined	N	Y	FlexiCard IO 5	Line to the Flexi Card
20	Black	Y	Y	Ground	Optional ground point
21	Purple	Y	Y	RS232 Rx	RS232 receive line
22	Brown	Y	Y	RS232 Tx	RS232 transmit line
23	White	Y	Y	Ignition	0 – 50 Volts DC, permanent internal pull down
24	Red	Y	Y	Voltage Input	8 - 45 Volts DC external power

* indicates that the wire is part of the 4 way Molex connector for DMCAN communication with peripheral

Figure 1: Molex connector

2.2. OEM Configuration

In order to access the data, add the ICOM Hand Held Settings parameter to your G100 device through OEM. As depicted in figure 2, the server requires that you input a 5 character device identifier, a default latitude, default longitude, and power and upload options.

Edit System Parameters		
+ Add Parameters - Remove Selected Tab		
GPS Settings ICOM Hand Held Settings		
5 Character Password	<input type="text" value="DM725"/>	A unique 5 character alphanumeric identifier for external devices.
Emergency Default Latitude	<input type="text" value="-30.9476850"/>	If there is no GPS fix in an emergency, this latitude is used
Emergency Default Longitude	<input type="text" value="115.8192367"/>	If there is no GPS fix in an emergency, this longitude is used
Power Always on	<input type="text" value="Yes"/>	WARNING! Turning off may cause the device to miss an emergency. Keeps unit awake and scanning continually.
Upload on Emergency	<input type="text" value="Yes"/>	Uploads if there is an emergency.
Upload on Man Down	<input type="text" value="Yes"/>	Uploads if there is a man down.
Upload When Gps Received	<input type="text" value="No"/>	Uploads when GPS data is received. Alternatively, it uploads during the heartbeat
Always Connected to the Server	<input type="text" value="No"/>	Only set this if you know what you are doing. Allows for faster uploads

Figure 2: OEM configuration

5 Character Password – This is a 5 character long password that will be used to view the data from your devices. You must include numbers and letters and it must be unique for every G100 device.

Emergency Default Latitude and Longitude – In the unlikely event that a person sends an emergency or man down signal from their device, and their radio does not have an accurate GPS fix, the G100 will use this default location as a medium for sending the emergency notice. It is advisable to set this location as the location of the G100 itself.

For example, if you set the default location as your office and the hand held radio user is inside a building without a GPS fix and presses the duress button, the G100 will send an emergency notice with the location set as your office. If you want to locate them, you should find their last recorded position and the time that it was logged.

Power Always On – This ensures the device does not go to sleep. If it does sleep, it may miss data (including emergency signals), however it will conserve power.

Upload on Emergency – Forces an upload when an emergency occurs. Otherwise, it will wait until the next heartbeat of the G100 (set on OEM).

Upload on Man Down – Forces an upload when a man down event occurs. Otherwise, it will wait until the next heartbeat of the G100 (set on OEM).

Upload When GPS Received – Forces an upload when any GPS data arrives. Otherwise, it will wait until the next heartbeat of the G100 (set on OEM).

Always connected to the Server – Remains connected to the server, which decreases upload time (as the system does not have to wait to connect), however it increases power and data usage (which may lead to extra data charges).

2.3. Icom Radio Serial Number

To access the GPS data, you will need to know the Id numbers of your handsets. In order to set these numbers, please refer to the relevant Icom hand held radio user manuals. However, you can check an Id number by pressing the call button on the handheld. The mobile radio should then display the Id number of the device. For example, the Id number depicted in figure 3, is 2.






Figure 3: Id Reading

The serial number for your handheld is comprised of the 5 character unique password that was set on OEM (refer to 2.2) and the Id of the device as a four digit number with leading zeros. For example, the 5 characters set in figure 2 are DM725 and if using a handheld with an Id of 2, the serial code will be DM7250002.

2.4. Icom Telematics Guru Configuration and Usage

Create two new assets on Telematics Guru. On the general page, set the device types as Icom Radio and G100, and input the handheld radio serial number (refer to section 2.3) and G100 serial number, respectively. Fill the remaining sections at your own discretion. Once the assets have been created, the handheld is ready for use.

Icom Radio   

Last Updated: 20 hrs, 42 mins
Project: ICOM test
Emergency: No
Man Down: No
Gps Data Origin : Radio
Speed: 0 km/h
GPS: -31.9477833, 115.819205

[Details](#) | [History](#) | [Telemetry \(IO\)](#) | [Timeline](#)

Figure 4: TG data

The data on TG is presented as in figure 4. Once again, if GPS Data Origin displays “Tower”, then the emergency GPS data is faulty thus, the GPS data displayed will be the default values set in OEM (the “Tower” values).