


System 1200 Newsletter – No. 24

System 1200, Bluetooth and Bluetooth Devices

SYSTEM 1200 AND BLUETOOTH

Bluetooth technology (BT) is an industry standard for  **Bluetooth**[®] cableless, short distance data transfer.

System 1200 instruments – both GPS1200 and TPS1200 support BT communications which allow cableless data transfer to be used in a variety of applications, for example:

- Using a BT DISTO with the GPS1200 Hidden Point application
- Streaming NMEA data from GPS1200 or measurement data from TPS1200 to a BT enabled lap-top
- Controlling a GPS1200 with OWI commands or a TPS1200 with GeoCOM commands from a BT enabled PC

But the most widely used application with System 1200 instruments is the use of BT enabled mobile cell phones (GSM/GPRS/CDMA devices) to receive RTK data.

Mobile phones are becoming more important for RTK communication – due to both continually expanding mobile phone networks and also due to ever-decreasing online costs for using mobile phones.

For maximum flexibility, System 1200 instruments support a variety of GSM/GPRS/CDMA devices - both those which are integrated into a GFU housing (which attach to System1200) and also all BT enabled GSM/GPRS/CDMA devices which can be steered via AT commands.

This newsletter gives some background information into Bluetooth technology and how to use Bluetooth devices with System 1200. The next newsletter will continue with Bluetooth communications but with a particular focus on the use of GSM/GPRS/CDMA devices with System 1200.

BLUETOOTH BASICS

This section gives background information as to how BT works and explains some BT terminology.

The transfer of data using Bluetooth is always between a **BT client** and a **BT Server**.

BT Client: The BT Client always connects to the BT Server. In most cases, the System 1200 instrument will act as a BT Client - this means that after turning on, System 1200 is active and will

try to connect to the BT Server (in our case, the mobile phone or other BT device).

BT Server: A BT Server will wait for a BT Client to try to establish connection and then decide if it wants to accept this connection. In most cases, the mobile phone is the BT Server and System 1200 will try to establish the connection. Note, if the external BT device cannot operate as a BT Server (eg – an Allegro datalogger) then System 1200 will operate as a BT Server (firmware v2.0 or above needed for this).

However, simply bringing two BT devices into range of each other does not mean the devices will connect and data transfer will begin - the BT devices first need to be identified and paired...

BT ID Address: All BT enabled devices have a unique identifier – the BT ID Address – which is necessary to define which BT devices should communicate with each other. The BT ID Address of the BT Server needs to be known by the BT Client since it is the BT Client which always tries to communicate with the BT Server.

BT Pairing: BT pairing means defining which BT devices should communicate with each other. During the initial pairing process (this only needs to be done once) at least one of the two BT devices will require a key-code to be entered relating to the other BT device. If this key-code is accepted, then the BT connection is established. The pairing is a kind of a security tool of BT and helps to assure that only selected BT devices will connect to BT server.

BT Profiles: All BT devices contain a **BT Module** – it is this module which controls the BT communications with other BT instruments. **BT Profiles** are properties of the BT Module and a BT device may contain one or more profiles – such as a Headset profile, Dial-up Networking profile, LAN Access profile, Hands-free profile, Serial Port profile etc...

Serial Port Profile: The Serial Port profile is important for System1200 since this profile provides the BT device with an emulation of a serial cable using RS232 control signalling. It is therefore necessary that the BT module on the device to be used with System 1200 supports the Serial Port profile - otherwise a BT connection between System 1200 and that device is not possible!

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BLUETOOTH ON AND SYSTEM1200

GPS1200 and TPS1200 currently provide 3 options for using BT devices:

GFU16 Bluetooth module: This is a BT module in a green housing – it can attach to both GPS1200 and SmartStation – but is likely only to be used with GPS1200 (since TPS1200 instruments have an integrated BT module in the optional communication side-cover – see below).

TPS1200 Communication Side-Cover: The BT module is installed in the communication side-cover of some TPS1200 instruments (look for the Bluetooth logo). Remember you could use this BT module for streaming TPS measurements to a BT enabled PC or remotely steering the instrument using GeoCOM commands – it is not limited to receiving RTK corrections for a SmartStation.

ATX SmartAntenna: A BT module is also installed in the ATX1230 SmartAntenna which means that it is possible to use an ATX SmartAntenna (with a GTX1230 sensor) with BT devices without the need for a GFU16 housing attached to the GTX sensor.

USING BLUETOOTH AND SYSTEM1200

This section describes in detail how to configure a System 1200 instrument to connect to and use a BT device as a BT Client. This covers the vast majority of use cases.

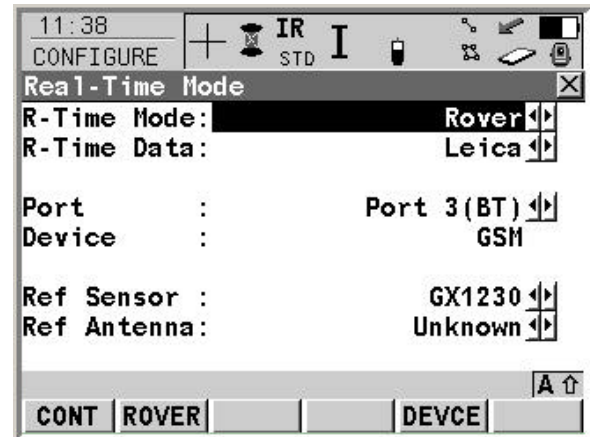
Remember, this only needs to be done once – once correctly configured then after switching on System1200, the instrument will try to establish a BT connection. No additional key press is required.

CONFIGURING SYSTEM 1200 FOR BLUETOOTH CONNECTION FOR THE FIRST TIME

1. Activate the BT functionality on the external device: Firstly ensure that the BT functionality on the external BT device is activated. This should be simple (and may already be activated), but if necessary then refer to the user manual of your device.

2. Configure System 1200 to use the correct port: For both GPS1200 and TPS1200, if using the GFU16 BT module then attach the module to the instrument before doing the next step.

We first need to configure the System 1200 instrument so that the BT device is assigned to be used with a port on the System 1200 instrument supporting BT. It can be easily seen if a port is configured to support BT functionality – **(BT)** will be shown as a suffix behind the port number.



On GPS1200 this is possible for the following ports:

- **Port 1(BT)** and **Port 3(BT)**: Only possible if a GFU 16 is attached to port 1 or port 3
- **Port 4(BT)**: Only available if using an ATX SmartAntenna in combination with a GTX sensor

On TPS1200 this is possible for the following ports (only possible if the communication side-cover is fitted):

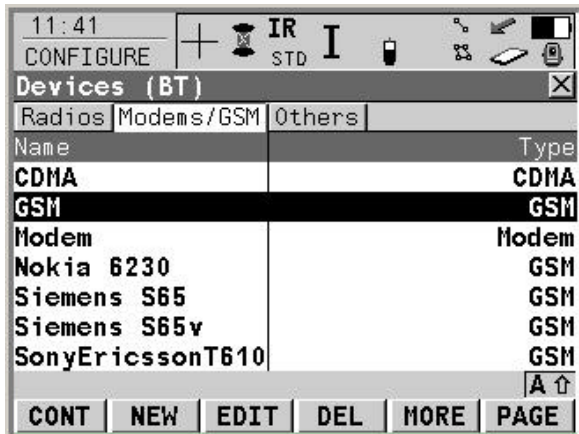
- **Port 2(BT)**: Only possible if a GFU16 is attached to Port 2 (this is the “handle” port)
- **Port 3(BT)**: Always available – the integrated BT in the communication side-cover

3. Configure System 1200 to use the correct device: We now need to choose the BT device which is to be used. Press **F5(DEVCE)** in the panel where an interface is configured (eg - the **CONFIGURE Real-Time Mode** panel) to access the **CONFIGURE Devices** panel.

All BT capable devices supported by System 1200 and which can be used with the interface being configured are displayed (you will not be able to choose the DISTO device for the Real-Time interface!).

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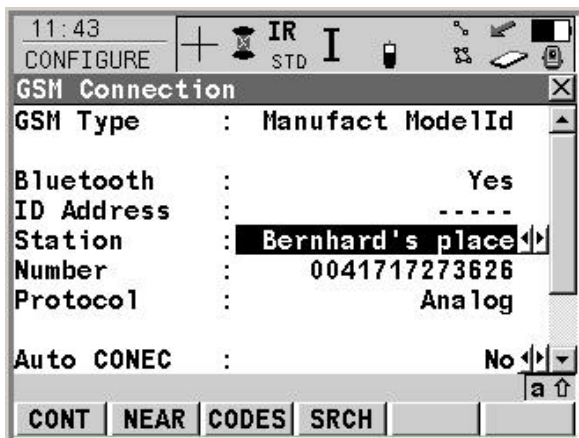


Note, if the device you need is not there, then maybe a “generic” device can be used or you can create new devices with **F2(NEW)** – this is explained in next weeks newsletter.

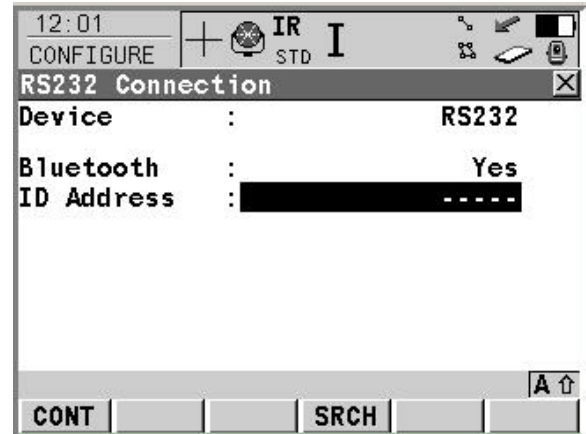
4. Search for external BT devices.

We now need to make the System 1200 instrument search for the BT device to be used. To do this, access the device connection panel – in the **CONFIGURE Interfaces** panel highlight the interface being configured and press **F4(CTRL)** to access the “connection” panel.

The appearance of the panel which is then accessed depends on the device which is being used – for example, the panel below is shown when configuring to use a GSM (mobile phone) device.



The panel below is shown when configuring to use a DISTO device. Note that in both cases, the **F4(SRCH)** button is available which starts the search for all BT devices in the area.



Once the search is complete then a list of the names and related BT ID Addresses of all BT devices which were found is shown

Select the device which is to be used and press **F1(CONT)**. The Bluetooth ID address is copied to the connection panel and the pairing process starts.

Note, if you press **F1(CONT)** but no ID Address is entered (you did not press **F4(SRCH)** or no BT devices could be found) then the System 1200 instrument is configured to be a BT Server. This means that the instrument is “visible” for all BT Clients which could then connect to System1200.

5. Complete the pairing process.

Many BT devices will now ask for the BT code of System 1200 – this needs to be entered on the client.

For all System 1200 BT modules this code is 0000.

Once this is done then System 1200 will automatically connect to the BT device.

Depending on the type and setting on your BT device, the device may ask if the connection should be established. The user then has to confirm on the BT device to establish the BT connection. Note also that some BT devices may allow System 1200 to be added to the paired device list.

SUBSEQUENT BLUETOOTH CONNECTIONS

Once the System 1200 instrument is correctly configured then the BT connection will be immediately and automatically established as soon the System 1200 instrument is switched on.

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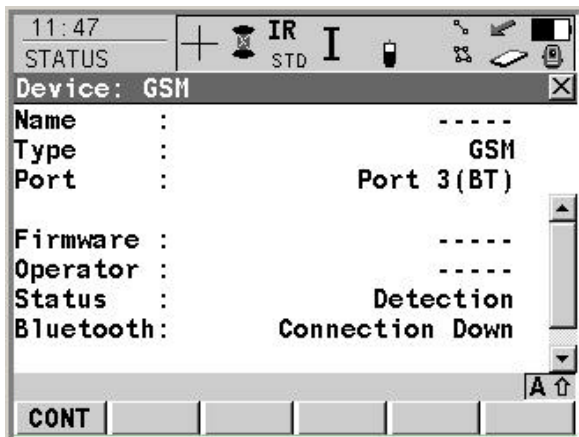
It is possible to view the status of the BT connection in several ways...

Message Line: Once a configured BT connection is established then the message line “**Bluetooth Connection OK**” is shown at the bottom of the screen. If the BT connection is lost then the message line “**Bluetooth Connection Lost**” is shown.

Bluetooth Icon: Once the BT connection is established, then the BT icon is shown. This icon remains visible as long as the BT connection is available.



Status panel: Access the **STATUS Device** panel for the interface configured to use a BT device – the status of the connection will be shown.



LED on GFU16 or ATX: The BT LED on GFU16 devices and the ATX SmartAntenna will show steady blue if a BT connection is available.

Note that depending on the BT module being used with the System 1200 instrument, not all status information is always available – this is summarised below.

	Msge Line	Icon	Status Panel	Blue Led
GFU16	Yes	Yes	Yes	Yes
ATX1230	No	No	No	Yes
TPS1200 Side Cover	Yes	Yes	Yes	No

So whichever way you use a BT device with System1200, is always possible to see the status of the BT connection.

SUMMARY

Bluetooth communications are supported by System 1200 in a variety of ways with GFU housings, the ATX SmartAntenna and the TPS1200 communication side cover.

It is always necessary to first configure System 1200 instruments to use a BT device – this is not only necessary for System 1200 – it is a general requirement when using BT connectivity between any BT devices.

Once configured, the BT connection will automatically be established after turning on the System 1200 instrument – there are no keys to press to establish the BT connection once properly configured.