

System 1200 Newsletter – No. 32

RTK Data, the Internet & System 1200

GETTING CONNECTED

The last newsletter provided “general” information about using the Internet to transfer RTK data to a GPS user and also described the features and benefits of using NTRIP.

This newsletter continues with this topic, but focuses on how to configure and use System1200 to receive RTK data via the Internet and NTRIP.

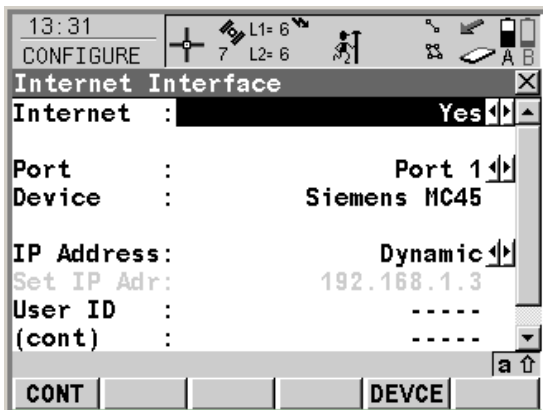
Remember that the procedure described below only needs to be performed once – after this, the instrument is configured and can simply be turned on and used. As ever, if one day you plan to use the Internet and NTRIP to receive RTK data and then the next day will use a normal radio modem, then use different configuration sets for these different ways of working.

This newsletter is divided into 3 main parts: how to connect to the Internet, how to connect to a server on the Internet and how to receive RTK data from NTRIP.

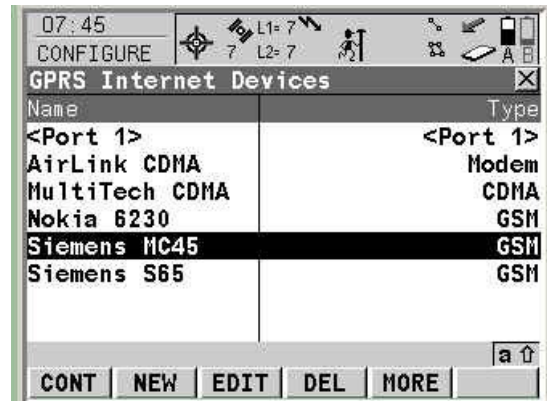
STEP 1: CONNECTING TO THE INTERNET

As described last week, a GPRS (General Packed Radio System) enabled device is normally used with System1200 to access the Internet. Almost any GPRS enabled device which can be operated using AT commands can be used with System1200. If you are using a Bluetooth enabled GPRS device then also use the notes in newsletters 24 and 25 which describes how to use Bluetooth devices with System1200.

In the **CONFIGURE Interfaces** panel, highlight the **Internet** interface and press **F3 (EDIT)** to access the **CONFIGURE Internet Interface** panel.



Ensure the **Internet** prompt is set to **Yes** and then select the port to which the GPRS device will be connected. You can now press **F5 (DEVCE)** to access the **CONFIGURE GPRS Internet Devices** panel which lists all default GPRS enabled devices supported by System1200. If necessary, create a new device using **F2 (NEW)**.



Having selected the appropriate device, press **F1 (CONT)** to return to the **CONFIGURE Internet Interface** panel.

As described in the last newsletter, some devices normally connect to the Internet using dynamic IP addresses, If so select **Dynamic** at the **IP Address** prompt. If your device has a Static IP Address, chose **Static** and then **Set IP Address** to the correct number. In The USA, the **Multi-Tech CDMA modem (GFU19)** with Verizon as the Service Provider, will require a Static IP address.

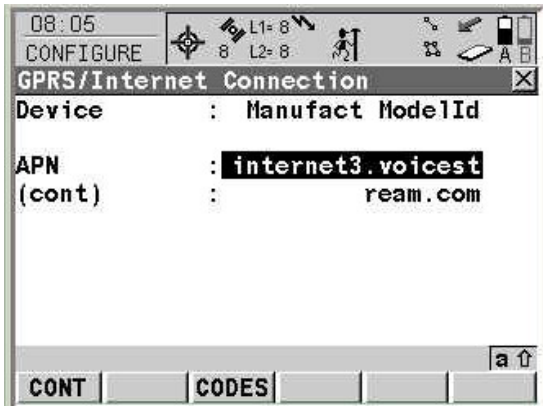
Some telecom providers require a **User Id** and **Password** to be used in order to connect to the Internet via GPRS. If necessary, contact your telecom provider and enter these details and the **User ID** and **Password** prompts.

Once all settings are made, press **F1 (CONT)** to return to the **CONFIGURE Interfaces** panel.

If a GPRS device is being used then the SIM card and the PIN code must be available and the so-called APN (Access Point Name) must be entered. To do this, highlight the **Internet** interface and press **F4 (CTRL)** to access the **CONFIGURE GPRS/Internet Connection** panel.

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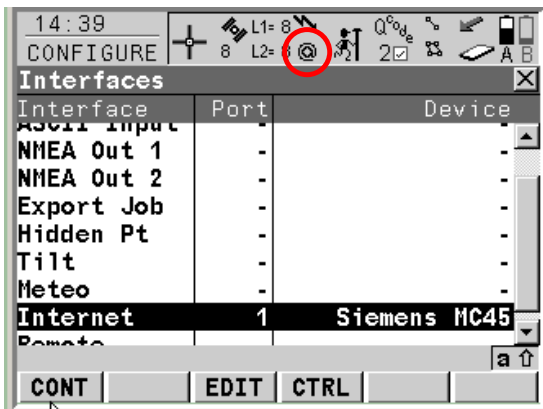
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The **APN** can be thought of as the “home page” of the telecom provider using GPRS for accessing the Internet and can be obtained from your telecom provider. For **T-Mobile** In the USA, the current APN is **internet3.voicestream.com**. For **Rogers Wireless** in Canada, the current APN is **internet.com**.

If it is necessary to enter the PIN and/or PUK code then press **F3 (CODES)** to access the **CONFIGURE GSM Codes** panel.

Having entered these parameters, press **F1 (CONT)** to return to the **CONFIGURE Interfaces** panel - the sensor will then automatically connect to the Internet. If successful, a message will display confirming that you are online and the Internet icon will also appear.



The sensor is now connected to the Internet, but since GPRS is being used, no data transfer has yet taken place.

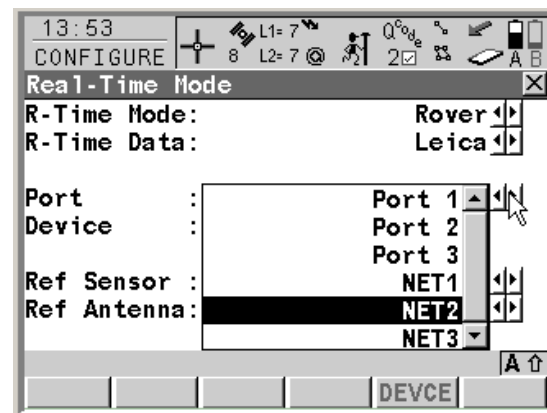
STEP 2: CONNECTING TO THE SERVER

The sensor is now connected to the Internet, but is not connected to the server from where we

want to receive RTK data. We now need to connect to a specific server on the Internet.

We have so far configured the Internet interface to use a GPRS device connected to a physical port on the System1200 instrument. This means there are now 3 additional “virtual” ports - NET1, NET2 and NET3 - which are available to be used by any interface on System1200. This means it is therefore possible for example to both receive RTK data as an RTK rover and send out NMEA messages simultaneously over the Internet. It also means that, on the other hand, each of the three NET virtual ports can be set up to connect to a different Reference Station, and receive Real Time Data from each in turn.

In the **CONFIGURE Interfaces** panel, highlight the **Real-Time** interface and press **F3 (EDIT)** to access the **CONFIGURE Real-Time Mode** panel and set the **R-Time Mode** to **Rover**.

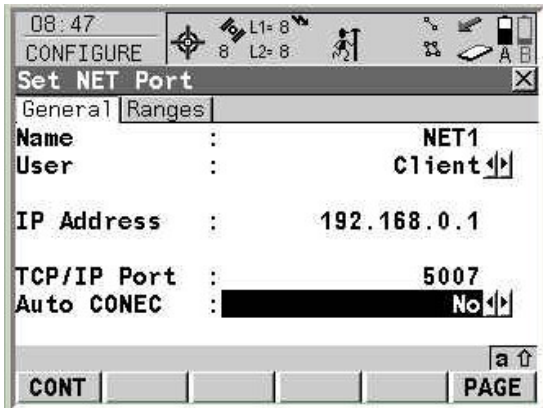


At the **Port** prompt you can now see that the additional net ports are available – select one of these ports and press **F1 (CONT)** to return to the **CONFIGURE Interfaces** panel.

We now need to configure the net port itself, so again highlight the **Real-Time** interface and press **F4 (CTRL)** to access the **CONFIGURE Set NET Port** panel.

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As already mentioned, when using GPRS to access the Internet, when a Dynamic IP is chosen, it is only possible for the sensor to act as a TCP/IP Client. Therefore set the **User** prompt to **Client** and enter the **IP Address** of the Server to where the NET port should connect.

The **TCP/IP Port** of the Server through which the data is provided now needs to be entered. Each Server can have a number of ports and behind each port a different service can be available.

The **Auto CONEC** functionality is the same as the auto connect functionality when using GSM. In the Survey application as soon as **F1 (OCUPY)** button is pressed the sensor will connect to the Server and RTK data will be received. **F1 (STOP)** then stops the data transmission. This functionality therefore minimises the amount of data received and therefore the cost of this service if your service provider charges by the amount of data that is transmitted. In North America, this is not usually the case, while in Europe, it usually is!

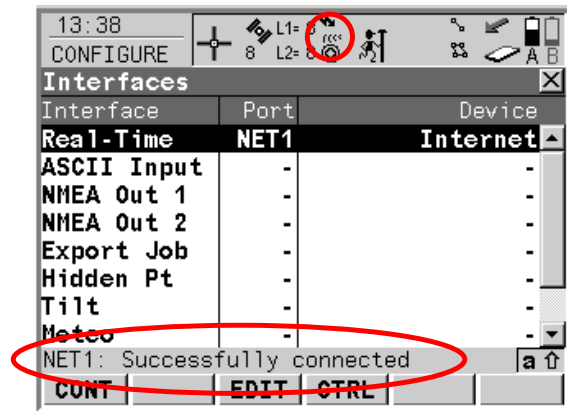
It is also possible to use this same GPRS Internet Device with a System 1200 Base receiver, by setting the **User** to **Server**, instead of **Client**.

However, for this to be successful, the device must have a **Static IP** assigned to it, so that the **GPS Rover** will have a known IP and port number to connect to.

And do not forget that for any of this to be successful, you must be subscribed to the **correct type of data service**. These providers often have several service plans. You will require the one that allows **Full Unlimited Internet Access**, with no restrictions, as some plans only allow certain types of data to pass, or they restrict your connectivity to the Internet. These limited plans may not work at all with the GPRS device.

Once all settings are made, press **F1 (CONT)** to store the settings and return to the **CONFIGURE Interfaces** panel.

It is now possible to connect to the server – highlight the **Real-Time** interface and press **shift F4 (CONEC)**.



If a connection is established, **Successfully connected** is displayed in the message line and the Internet Connection icon is shown.

STEP 3: CONFIGURING AN INTERFACE TO USE INTERNET AND USING NTRIP

So now the sensor is connected to the Internet and connected to a specific server. We now need to configure the sensor to access and use NTRIP services.

In the **CONFIGURE Interfaces** panel, again highlight the **Real-Time** interface and press **F3 (EDIT)** to access the **CONFIGURE Real-Time Mode** panel. We have already configured this interface to be a rover and to use a NET port – we only need to configure the NTRIP related settings.

Press **F2 (ROVER)** to access the **CONFIGURE Additional Rover Options** panel and select the **NTRIP** page. Set the **Use NTRIP** prompt to **Yes** and configure the NTRIP relevant settings.

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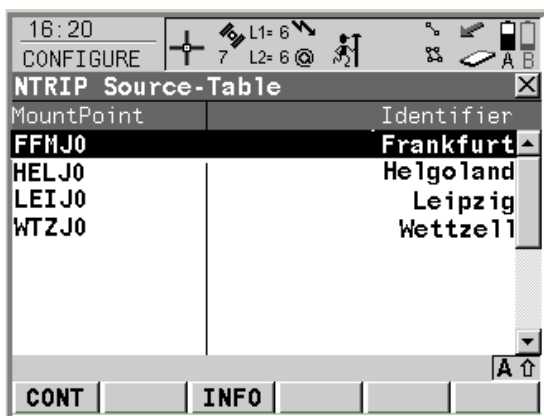
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In order to access and receive RTK data from the NTRIP Caster a **User Id** and **Password** needs to be entered. If necessary, contact your NTRIP administrator to obtain a User ID and password.

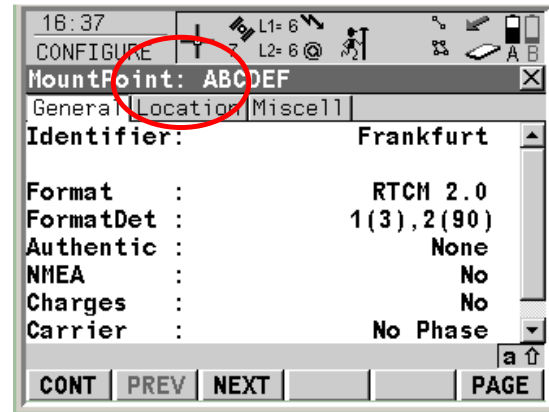
It is also necessary to tell the NTRIP Caster from which NTRIP Server RTK data is required. This is possible by entering the Mountpoint name at the **Mountpnt** prompt. As described in the last newsletter, the Mountpoint identifies the NTRIP Server (the RTK reference station), which provides the RTK data to the NTRIP Caster.

If the name of the Mountpoint is not known then the NTRIP Source-Table can be downloaded to the sensor by pressing the **F5 (SRCE)** button – the sensor will connect to the NTRIP Caster and request the NTRIP Source-Table. Once the download of the source-table is finished the connection to the NTRIP caster is closed and the **CONFIGURE NTRIP Source-Table** panel is automatically accessed which shows all available Mountpoints.



A Mountpoint can be selected with **F1 (CONT)**. To view information about a particular Mount-

point, press **F3 (INFO)** to access the **CONFIGURE Mountpoint** panel.



Some of this information is “general” information and some of it (such as the RTK format) can be used to correctly configure settings in the **CONFIGURE Real-Time Mode** panel. **F2 (PREV)** and **F3 (NEXT)** display information about the previous or next Mountpoint in the source-table.

Once the appropriate Mountpoint has been selected and the configuration of the real-time interface is complete, then surveying can begin.

The **shift F3 (CONEC)** and **shift F3 (DISCO)** button in the Survey and other applications (Stakeout, Reference Line, Reference Plane etc) allows the instrument to connect and disconnect to the NTRIP Caster Server.

Appropriate messages will be shown if connection is not possible due to a wrong User ID or password or if the sensor is not allowed to access the NTRIP services or if the chosen Mountpoint is not available.

Once the connection to the Caster is established and the user is authorized to receive RTK data, then RTK data will be streamed to the sensor and the RTK icon will flash to indicate data is being received – the same as when receiving RTK data via a radio or GSM modem.

SUMMARY

Perhaps the most important point to re-iterate here is that the configuration of the System1200 instrument to connect to the Internet and use NTRIP needs only to be made once.

After this, connection is as simple as pressing the **shift F3 (CONEC)** button (even this is not

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necessary if using the automatic connection functionality).

The useful web links which were provided in the last newsletter are repeated below:

More information on NTRIP can be found under:
http://igs.ifag.de/index_ntrip.htm

More information on LEICA Spider and Leica System1200 reference station sensors can be found under:

http://www.leica-geosys-tems.com/corporate/en/products/gps_systems/lgs_4229.htm

A useful set of notes, which give some more background information to NTRIP and in particular explain how to connect to the Internet with System1200 and use NTRIP will be available to be downloaded from the same web site where all System1200 newsletters can be obtained (download this or the previous newsletter):

GPS1200: http://www.leica-geosystems.com/site/en/downloads/lgs_page_catalog.htm?cid=4661

TPS1200: http://www.leica-geosystems.com/site/en/downloads/lgs_page_catalog.htm?cid=4773