

Overview

1.	PURPOSE OF THE DOCUMENT	. 3
2.	BACKGROUND	3
2.1	GPRS	. 3
2.2	Ntrip	. 4
2.3	Direct-IP	5
3.	DIRECT-IP TROUBLES	6
4.	NTRIP TROUBLES	13
5.	LIST OF GPRS OPERATORS TESTED WITH Z-MAX.NET	20

1. PURPOSE OF THE DOCUMENT

The purpose of this note is to help the Thales Navigation Engineering / Technical support to solve issues met by a client that wants to use Z-Max.Net in GPRS mode,

- In Ntrip mode
- In Direct IP mode.

2. BACKGROUND

What are Ntrip, Direct-IP and GPRS?

2.1 GPRS

The meaning of GPRS is General Packet Radio Services, and is an evolution of the very well known GSM standard.

For GSM, the basic mode is called CSD (for Circuit Switched Data). This mode allows the user to establish a connection between end users identified by their phone numbers. Only a point to point connection is possible, and usually billing is based on the duration of the connection. This mode is also known as "GSM Data" mode.

At the end of 90's, the GSM has moved toward a new standard called GPRS. The GPRS provides all services provided by GSM (voice, data in CSD, SMS, FAX), but also a new type of data transfer whose billing is based on the volume of data. Moreover, GPRS is able to establish a connection to the internet, and in this case the GSM operator is considered as an Internet access provider. Data rates are improved and depending on the mobile class (1 to 12), the end user data rate can reach about 50kbits/s.

From an end-user point of view, GPRS shall be considered like:

- A higher throughput radio solution compared to GSM that is using the GSM core network.
- A mean to access to the internet, though the GPRS operator that can be considered like a Internet access provider.



2.2 NTRIP

The meaning of Ntrip is Networked Transport of RTCM via Internet Protocol, and since September 2004 this protocol is a RTCM standard.

Ntrip is a protocol similar to the well known http, used for Internet navigation. This protocol needs the following components:



- Ntrip Servers: It is a firmware that is receiving data from Ntrip Sources. Usually, Ntrip Sources are GPS base that are sending corrections data. The function of this firmware is to allow an operator to manage the connection to the Ntrip caster.
- Ntrip caster: It is a firmware that is running on powerful and reliable computer. The function of this software is to permanently control the list of all Ntrip servers connected in the network. The list of all stations is maintained by the Ntrip caster, in a small database called: Sourcetable. According to the version of the Ntrip caster some functionalities can be remotely controlled though HTTP, or Telnet interface, for monitoring purposes.
- Ntrip Client: It is a firmware that is running in the rover equipment that is managing the connection to the caster. It can manage the access to the network (via username and password given by the GPS network operator). This firmware takes in charge the interpretation of the source table, and according to the selection done by the end user select the source (Sources are called mount points).

All this components are using TCP/IP protocol for communicating between each other. The physical link can be any GPRS, CDMA, xDSL or Ethernet link.



2.3 DIRECT-IP

Direct-IP is a mode defined in Z-Max which allows for a rover to be connected directly to a GPS base by using TCP/IP technology. No extra protocols are required for managing the list of GPS base available in the network.

The end user has "a priori" to know the IP address of the base, and the port numbers on which to be connected for receiving a specific format.

For instance, this mode allows one to directly connect a Z-Max rover to a GPS base like an iCGRS.



3. DIRECT-IP TROUBLES

This method can be used step by step, in order to progressively detect the origin of the problem, but first ask to the customer if in the area he is there is GSM signal and GPRS coverage. This test can be done very easily with a standard cell phone.





A problem is noticed by a customer

Essential customer information required for working on this issue:

- Customer's name
- Country
- GSM/GPRS network operator (carrier)
- GPRS parameters connection: APN, username, password (*)
- Type of antenna used (Grey or Black)
- GPS network and operator name
- IP address of the server, port number
- Z-Max firmware and FAST Survey software versions
- Brief description of the problem
- PIN code

(*) Depending on the operator, sometimes username and password can be blanked

The following form can be used:

Customer's name		
Country		
GSM/GPRS network operator		
GPRS parameters	APN:	
	Username:	
	Password:	
PIN code		
Type of antenna (Grey or Black)		
GPS network and operator name		
GPS base Server	IP address	
	Port number	
Z-Max Firmware version		
Fast Survey software version		
Description of the problem :		

GPS network test: Test to be done by the technical support

• Use HyperTerminal with connection parameters given by the customer, by using a connection through the Thales Navigation LAN network.

Select TCP/IP Winsock instead of the Com port

Propriétés de Z-max tes	its	? ×
Connexion à Paramètre	s]	
🧞 Z-max tests	Changer d'icône	
Adresse de l' <u>h</u> ôte :	134.20.11.149	
Numéro du <u>p</u> ort :	2101	
Co <u>n</u> necter en utilisant :	TCP/IP (Winsock)	
	OK A	nnuler

And click on the connect button:

🏀 Z-max tests - HyperTerminal				
Eichier Edition Affichage Appel Iransfert ?				
<pre></pre>				
00:00:09 connecté VT52 TCP/IP DÉFIL Maj Num Capturer Écho				

Messages shall appear on the HyperTerminal screen.

Test of Z-Max on the GPS network of the customer: Test to be done by the engineering (and then by technical support when the situation will be more stable).

- Take a Z-Max, with the same version that the customer has, and make a test of connection in Direct IP with the usual GSM operator used by the tech support / engineering
 - Orange operator in France, by using the APN "internet-enterprise", the username "orange", and the password "orange".
 - Cingular in USA, by using the APN "WAP.CINGULAR", the username "WAP@ CINGULARGPRS.COM", and the password "CINGULAR1".

---> This test allows one to confirm the compatibility of Z-Max with the GPS network, and conclude that the problem is probably due to the GPRS operator of the customer.

Connection GPRS: To be done by the customer (or its distributor)

Contact your GSM/GPRS operator (carrier), in order to get the right service. This service should allow one to get a connection on all IP port numbers, or at least the IP port numbers specified by the GPS network. Most of the time, these port numbers are 2101 or/and 8080.



- Be careful on APN for WAP (wireless application protocol) connections, very often the APN given for WAP is not open for port numbers 2101 or/and 8080 and many others.
- Be careful on APN, username and password, very often they are case sensitive.

The best thing to do is:

- to contact your local GSM operator, and **ask the right person** to change the subscription in order to have the right access. **Very often, we have to insist very heavily in order to have the right skilled person that understands our request.**
- to contact you local GPS network provider, to ask him advices on the type of GPRS subscription you need. He probably solved this problem for other customers.

For more information concerning APN, username, and password in the world you can have a look on the following web site:

http://www.piconews.com/apn.php?lg=fre-fra http://www.unlocks.co.uk/gprs_settings.php http://www.quickim.com/support/gprs-settings.html

More detailed investigations (should be rare)

To be done with the distributor by the engineering, by phone and through a web connection.

The distributor needs the following items for testing:

- A Z-Max connected to a computer through a serial link
- A Vnc server utility software installed on the computer (it can be found on o:\outils\utilitaires\vnc Thales Nav network)
- A Fast Survey software for Windows installed on the computer (it can be found on j:\Services\R&D\public\projets\XYZ2-Z-MaxV2\versions\)
- A web connection on the PC. A xDSL connection is preferred.

The Engineering department shall take in charge all these tests in a remote way, with the distributor.

These tests will check:

- Some hardware breakdown
- Firmware versions of Z-Max, Com module, modem
- The compatibility of the modem with the GSM/GPRS network
- Level of reception
- Configuration of Z-Max
- Configuration of fast Survey

4. NTRIP TROUBLES

This method can be used step by step, in order to progressively detect the origin of the problem, but first ask to the customer if in the area he is there is GSM signal and GPRS coverage. This test can be done very easily with a standard cell phone.





A problem is noticed by a customer

Essential customer information required for working on this issue:

- Customer's name
- Country
- GSM/GPRS network operator (carrier)
- GPRS parameters connection: APN, username, password (*)
- Type of antenna used (Grey or Black)
- GPS network and operator name
- IP address of the caster, port number, username, password.
- Z-Max firmware and FAST Survey software versions
- Brief description of the problem
- PIN code

(*) Depending on the operator, sometimes username and password can be blanked

The following form can be used:

Customer's name	
Country	
GSM/GPRS network operator	
GPRS parameters	APN:
	Username:
	Password:
PIN code	
Type of antenna (Grey or Black)	
GPS network and operator name	
Caster	IP address:
	Port number:
	Username:
	Password:
Z-Max Firmware version	
Fast Survey software version	
Description of the problem:	

GPS network test: Test to be done by technical support.

• Use GNSS Internet radio with connection parameters given by the customer, by using a connection through the Thales Navigation LAN network.

Execute this software and input caster parameters by clicking on Broadcaster button

💸 GNSS Internet	Radio 1.3.9	_ 🗆 🗵	
Broad	<u>Broadcaster</u>		
START	STOP	S <u>o</u> urce Table	
_	_	Bytes: 0	
Select Network:			
THALES_NAV			
Select Stream or Update:			
Nantes4/RTK/GP	S	•	
Adjust Settings or p	oress START.		

Input the caster parameters in the following form Host:Port and User-ID:Password, and the, OK

Broadcaster Settings	X		
Host:Port 81.255.195.106:2101	•		
User-ID:Password integtest:password			
Adaptive Congestion Control			
Tight	Loose		
Reconnection Settings	ОК		
Number of reconnection attempts: 10000			
Time between reconnection attempts: 30 seconds	Cancel		

And after that try to load the source table, and connect to a mountpoint.

🔌 GNSS Internet	Radio 1.3.9		_ 🗆 ×	
Broad	Broadcaster		S <u>e</u> ttings	
<u>s</u> tart	SIOP	S <u>o</u> urce Bytes:	Table 1,677	
		-		
Select Network:			-	
Select Stream or Up	odate:			
Nantes1/RTK/GP	S/THALES_NAV		~	
Reading data stream	m			

The GNSS internet radio software can freely found on the following web address:

http://igs.ifag.de/index_ntrip.htm

Test of Z-Max on the GPS network of the customer: Test to be done by technical support.

- Take a Z-Max, with the same version that the customer, and make a test of connection in Ntrip with the usual GSM operator used by the tech support / engineering
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- Level of reception
- Configuration of Z-Max
- Configuration of fast Survey

5. LIST OF GPRS OPERATORS TESTED WITH Z-MAX.NET

Country	GPRS operator (carrier)	Parameters	Status
France	Orange	APN:internet-entreprise	Tested
		Username :orange	April 2006
		Password :orange	
Germany	T-Mobile	APN:internet.t-d1.de	Tested
		Username :td1	March 2006
		Password :gprs	
USA	Cingular	APN: WAP.CINGULAR User Name: WAP@CINGULARGPRS.COM	Tested
		Password: CINGULAR1	May 2006
		or	
		APN: isp.cingular	
		Username: ISP@CINGULARGPRS.COM	
		Password: CINGULAR1	
USA	T-Mobile	APN: wap.voicestream.com	Tested
		Username: user	May 2006
		Password: wap	.,
Canada	Rogers	APN: internet.com	Tested
Canada	Rogers	Username:wapuser1	April 2006
		Password: wap	
Russia	Beeline	APN: internet.beeline.ru	Tested
		Username: beeline	April 2006
		Password: beeline	
Czech	Eurotel	APN: internet	Tested
Republic		Username: -Blank-	May 2006
		Password:-Blank-	
Hungary	Pannon	APN: net	To Be
		Username: -Blank-	Tested
		Password:-Blank-	
Ireland	Vodafone	APN: isp.vodafone.ie	Tested
		Username: vodafone	May 2006
		Password: vodafone	
Australia	Vodafone	APN:VFINTERNET.AU	Tested
		Username: gprs	May2006
		Password: gprs	
Portugal	Vodafone	APN: internet.vodafone.pt	Tested
		Username : vodafone	May2006
		Password : Vodafone	-
Netherland	KPN	APN:internet	To Be
		Username:-Blank-	Tested
		Password:-Blank-	
Netherland	KPN	APN:internet Username:-Blank- Password:-Blank-	To Be Tested

- For all carriers, respect the case.
- -Blank- means that no characters have to be input