FTP Connectivity Applications of the ProPak-6

1   Overview

This application note provides direction on utilizing the integrated FTP functionality of the ProPak6 for convenient data extraction from the internal memory. The OEM638 in the ProPak6 contains 4 GB of internal logging memory. Once configured as an FTP server, data can be transferred via Ethernet or Wi-Fi. This allows the ProPak6 to be used in remote environments as a monitoring station. Within this document, the means to add the ProPak6 to an established network through static IP are also explained.

The later portion of this Application Notes details the process involved to transfer data from the ProPak6 to a smart phone. Within this section both iOS and Android examples are provided including configuring either device for static IP to connect to a ProPak6 Access Point Wi-Fi network and configuring third party FTP client applications for connection.

2   Networking Features

2.1   Port Information

Since the ProPak6 is the first NovAtel receiver that contains both Cellular and WiFi, there has been a change made to the standard port configuration. There are now 4 ICOM ports that are shared between all network connections (Cellular, WiFi, and Ethernet), while COM4 is reserved for Bluetooth.

2.2   Default IP Configuration

The ProPak6 is **not** preconfigured with an IP address. Instead, the user must define a unique IP address. This is achieved through the **IPCONFIG** command. Once an address has been defined, it can be saved to the receiver via **SAVETHERNETDATA ETHA**. This command overrides the **SAVECONFIG** command, ensuring preservation of networking settings should the unit be installed at a remote location where the only access available is through a network; after factory reset, or firmware change, network communication will still be possible.

2.3   Configuring for Static Connection on an Existing Network

In order to configure your receiver with a Static IP address, without having to remove your PC from your existing network framework, you must set an acceptable address with a common network part and unique machine part.

Example 1:

The network portion of your PC IP address can be obtained by opening Command Prompt and sending IPCONFIG.

```
C:\Users>ipconfig
Windows IP Configuration
Ethernet adapter Local Area Connection:
    Connection-specific DNS Suffix   . : corp.novatel.ca
    Link-local IPv6 Address . . . . . :
    IPv4 Address. . . . . . . . . . . : 198.161.78.170
    Subnet Mask . . . . . . . . . . . : 255.255.255.0
    Default Gateway . . . . . . . . . : 198.161.78.1
Tunnel adapter Teredo Tunneling Pseudo-Interface:
    Media State . . . . . . . . . . . : Media disconnected
    Connection-specific DNS Suffix   . :
Tunnel adapter 6TO4 Adapter:

    Connection-specific DNS Suffix   . : corp.novatel.ca
    IPv6 Address. . . . . . . . . . . :
    Default Gateway . . . . . . . . . :
```

Figure 1: IPCONFIG from PC

The receiver must be set with the same Subnet Mask and Default Gateway as the PC:

Subnet mask: 255.255.255.0

Default Gateway: 198.161.78.1

From the highlighted line of the figure above, the IP address can be broken down into its two parts:

Network Part:
192.161.78

Machine Part:
170

The ProPak6 must be set with the identical network part and an acceptable machine part value (normally 2 – 254, and not already used by a different device).

Acceptable Configuration:

> **ETHCONFIG ETHA AUTO AUTO AUTO AUTO**
> **IPCONFIG ETHA STATIC 198.161.78.101 255.255.255.0 198.161.78.1**
> **ICOMCONFIG ICOM1 TCP :3001**

2.3.1   Setup for Windows FTP Client

Using the settings above, it is then possible to configure the receiver to accept Windows FTP Client access. First active the FTP Server on the ProPak6 using the following command:

IPSERVICE FTP_SERVER ENABLE

Now you will need to know the username and password. By default, the ProPak6 account is set to:

Username: admin

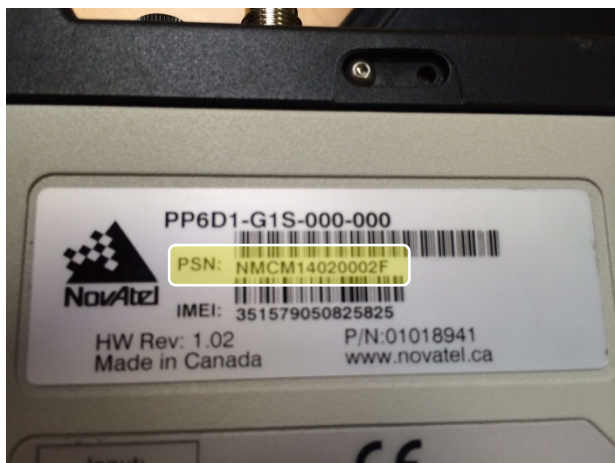Password: Enclosure PSN (found on the bottom of the receiver)

Figure 2: ProPak6 Enclosure PSN

This is also a good time to set your own unique password, especially if connecting the ProPak6 to a publically accessible network. This is possible through the following command:

SETADMINPASSWORD <old password> <newpassword>

➔ Replace **<oldpassword>** with your Enclosure PSN
➔ Replace **<newpassword>** with your own unique password

Once connected, the FTP service will use standard DOS commands to manipulate the data on the ProPak6. These messages can be found below:

!	exclamation point before a comma will cause execution on the local system instead of the remote system
?	request help or information about the FTP commands
Append	allows programs to open data files in specified directories as if they were in the current directory
ASCII	set the mode of file transfer to ASCII (this is the default and transmits seven bits per character)
Bell	turns bell mode on / off
Binary	set the mode of file transfer to binary (the binary mode transmits all eight bits per byte and thus provides less chance of a transmission error and must be used to transmit files other than ASCII files)
Bye	exit the FTP environment (same as quit)
Cd	change directory on the remote machine
Close	terminate a connection with another computer
Delete	remove a file in the current remote directory
Debug	Sets debugging on/off
Disconnect	terminate ftp session
Get	copy one file from the remote machine to the local machine
Glob	toggle metacharacter expansion of local file names
Hash	toggle printing `#' for each buffer transferred
Help	request a list of all available FTP commands
Lcd	change directory on your local machine
Literal	send an argument to the remote FTP Server (same as quote)
Ls	list the names of the files in the current remote directory
Mdelete	delete multiple files
Mdir	list contents of multiple remote directories
Mget	copy multiple files from the remote machine to the local machine; you are prompted for confirmation before transferring each file
Mkdir	make a new directory within the current remote directory
Mls	list contents of multiple remote directories
Mput	copy multiple files from the local machine to the remote machine; you are prompted for confirmation before transferring each file
Open	open a connection with FTP host
Prompt	force interactive prompting on multiple commands
Put	copy one file from the local machine to the remote machine
Pwd	find out the pathname of the current directory on the remote machine
Quit	exit the FTP environment (same as bye)
Quote	send an argument to the remote FTP Server (same as literal)
Recv	receive file
Remotehelp	get help from remote server
Rename	rename file
Rmdir	remove a directory in the current remote directory
Send	send one file
Status	show current status
Trace	toggles packet tracing
Type	set file transfer type
User	send new user information
Verbose	toggle verbose mode

Figure 3: DOS FTP Commands

Example Connection and Data Transfer:

```
C:\Users>ftp 198.161.78.101
Connected to 198.161.78.101.
220 Service ready.
User (198.161.78.101:(none)): admin
331 User name ok, need password.
Password:
230 User logged in.
ftp> binary
200 Command OK.
ftp> dir
200 Command OK.
150 Here it comes...
drwxrwxrwx    1    root    root         4096 Jan  1  1980 .
drwxrwxrwx    1    root    root         4096 Jan  1  1980 ..
drwxrwxrwx    1    root    root         4096 Jan  1  1970 LOST.DIR
-rwxrwxrwx    1    root    root    414784800 Jan  9  1980 MYLOGS_1.LOG
-rwxrwxrwx    1    root    root      2508428 Jun  6 16:36 TEST_LOGS.GPS
226 Transfer OK, Closing connection.
ftp: 348 bytes received in 0.00Seconds 87.00Kbytes/sec.
ftp> get TEST_LOGS.GPS
200 Command OK.
150 Here it comes...
226 Transfer OK, Closing connection.
ftp: 2517739 bytes received in 5.59Seconds 450.64Kbytes/sec.
ftp> bye
221 Bye.
```

Figure 4: Example Communication with CMD FTP

> When transferring binary data files, ensure FTP mode is set binary. If left in ascii mode, files are not successfully download and are corrupted.

3   Third Party Software

It is also possible to access the ProPak6 via third party FTP services. The Host is the IP address of the ProPak6, the username is admin, using the defined password. The Port number is to be left blank as it will default to the FTP server, port 21:

Figure 6: Connection Information - FileZilla

It is also important to remember to set to the transfer type in third party software to binary. Leaving the service in default (ASCII) may result in corruption of binary logs during download process.
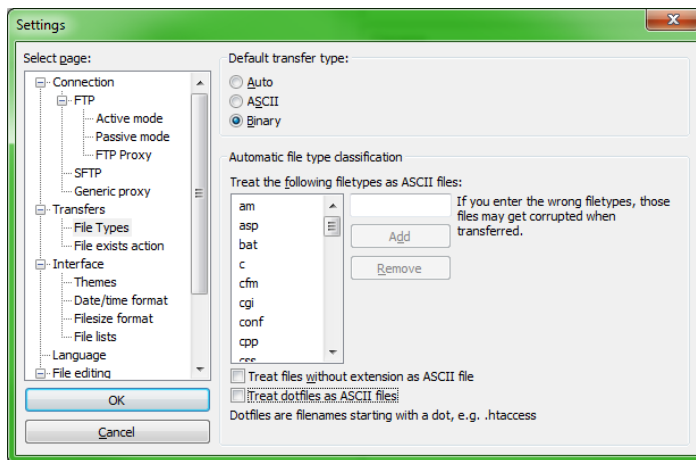
Figure 7: Binary Transfer Type Settings

Some users prefer this method of transfer to that of the standard FTP service built into Windows' Command Prompt because you are able to observe transfer status and messages. An example of an established connection and file transfer in FileZilla is available below:
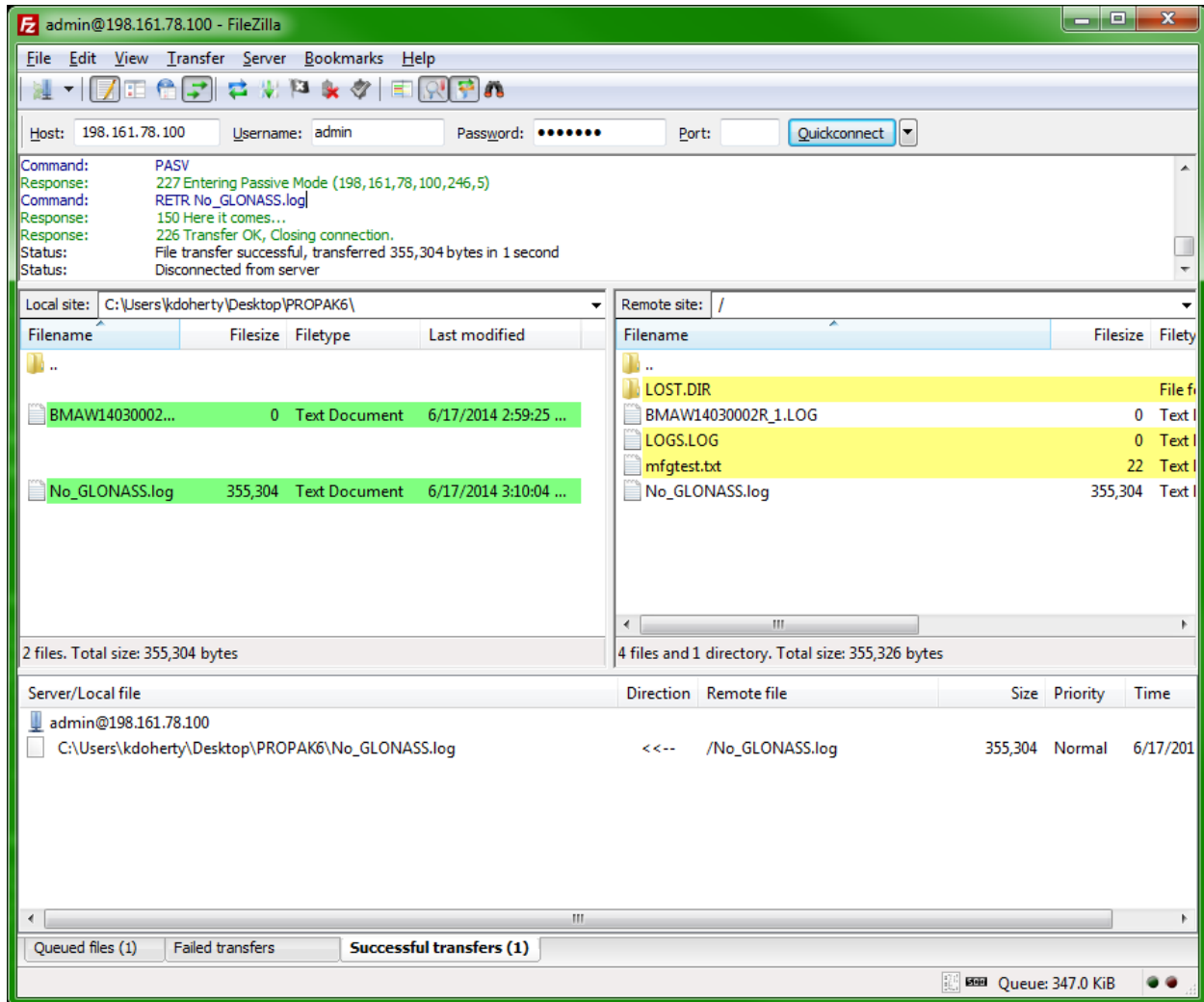

Figure 8: FileZilla File Transfer Example

4 Transferring Files to a Smart Phone

4.1 Wireless Access Point Configuration

To sync a smart phone with the ProPak6 for data transfer, configure the ProPak6 as an Access Point so that the cell phone can connect via Wi-Fi. This can be done via the following:

> **WIFICONFIG STATE ENABLED**
> **WIFICONFIG MODE AP**
> **WIFIAPCONFIG 1 AUTHENTICATION OPEN**
> **WIFIAPCONFIG 1 SSID "PROPAK6_NETWORK"**
> **WIFIAPCONFIG 1 ENCRYPTION NONE**
> **WIFIAPCONFIG 1 IPADDR 192.168.1.1**

Logging **IPSTATUS** will provide confirmation of the adapter IP, while logging **WIFIAPCONFIG** will reiterate the configuration that has been sent to the receiver:

> **LOG IPSTATUS**
> <OK
> [COM1]<IPSTATUS COM1 0 86.0 UNKNOWN 0 14973.220 004c4020 7fe2 12832
> <   3
> <   ETHA "192.168.1.101" "255.255.255.0" "192.168.1.1"
> <   WIFI "192.168.1.1" "255.255.255.0" ""
> <   CELL "" "" ""
> <   1
> <   "0.0.0.0"
>
> **LOG WIFIAPCONFIG**
> <OK
> [COM1]<WIFIAPCONFIG COM1 4 88.0 UNKNOWN 0 1.927 004c4020 dc65 12832
> <   1 AUTHENTICATION "open"
> <WIFIAPCONFIG COM1 3 88.0 UNKNOWN 0 1.940 004c4020 dc65 12832
> <   1 SSID "ProPak6_Network"
> <WIFIAPCONFIG COM1 2 88.0 UNKNOWN 0 1.944 004c4020 dc65 12832
> <   1 ENCRYPTION "none"
> <WIFIAPCONFIG COM1 0 88.0 UNKNOWN 0 6251.097 004c4020 dc65 12832
> <   1 IPADDR "192.168.1.1"
> [COM1]

4.2 Cell Phone Settings

Once Wi-Fi is enabled on the smart phone, search for the SSID assigned to the ProPak6. The cellular device must be set to a static IP address on the network, below are examples for Android and iPhone:
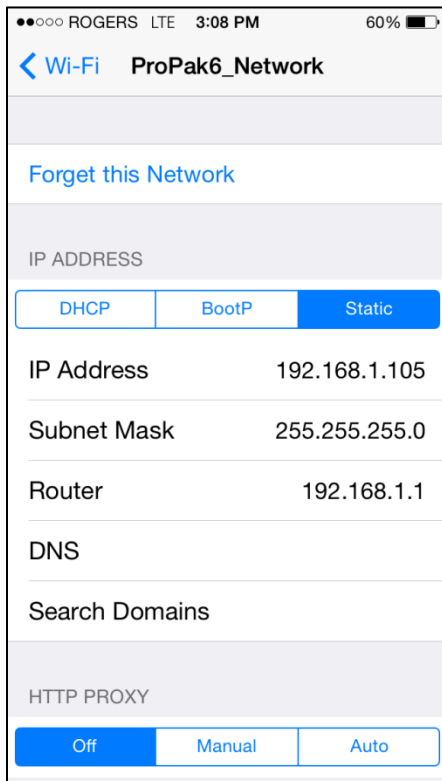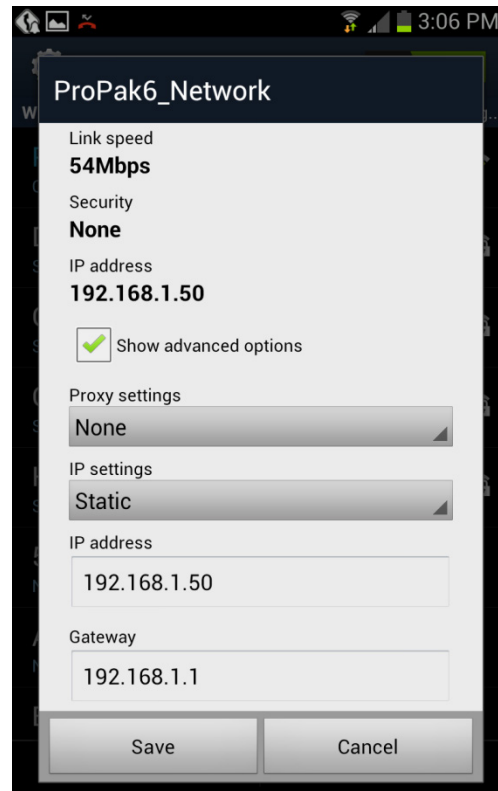

Figure 9: iOS Static IP Setup

Figure 10: Android Static IP Setup

Confirmation of connection can be found by logging WIFIAPSTATUS and observing that the MAC address is present on the network:

```
LOG WIFIAPSTATUS
<OK
[COM1]<WIFIAPSTATUS COM1 0 87.0 UNKNOWN 0 14178.313 004c4020 a895 12832
<     ENABLED "00:21:66:00:87:8A" 1 1
<        "D8:96:95:0D:0F:DE" 54.0
[COM1]
```

4.3 FTP Client Applications

In order to use a smart phone, an FTP client application must be present. There are various available through the application stores on major platforms. Once installed, the connection settings should follow the same general requirements as a PC based FTP client:
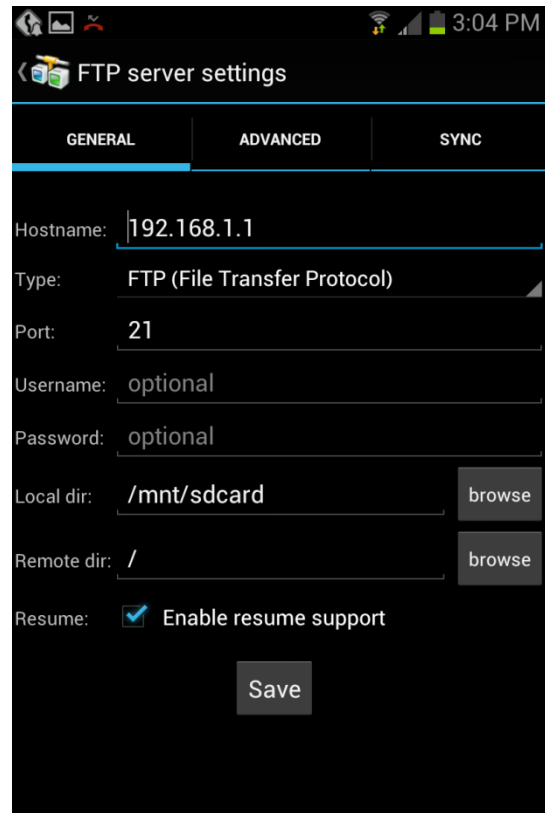

Figure 11: iOS FTP Client Setup

Figure 12: Android FTP Client Setup

4.4 Connection and Data Transfer Examples

Below are example connections established using both iOS and Android operating systems:
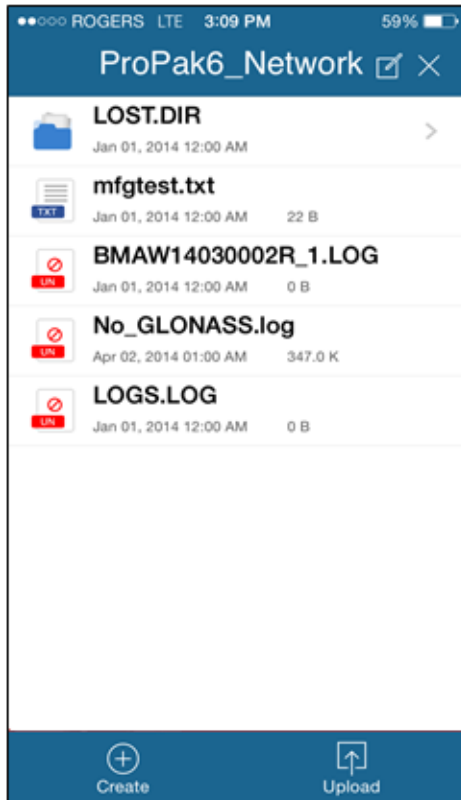

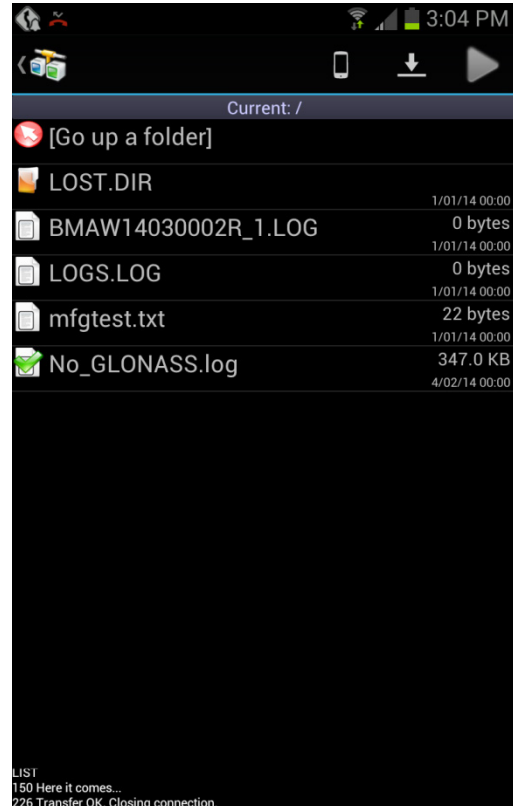**Figure 13: iOS FTP Connection to Propak6**

Figure 14: Android FTP Connection to ProPak6

Final Points

If you require any further information regarding the topics covered within this application, please contact:

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