

SKYWIRE™ GATEWAY M&C UPDATE PROCEDURE USING FTP UTILITY PROGRAM

**Firmware
Update
Procedure**

AN/SKYWIRE_FTP
Rev. -



**SkyWire™ Gateway
M&C Firmware Update Using FTP
Setup and Operational Procedure**

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SkyWire™ Gateway M&C Firmware Update Using FTP

1.0 Introduction

This document is a detailed firmware upgrade procedure for the Skywire Gateway using FTP via the Ethernet port. This document is organized in three sections, required items listing the hardware, software, and informational requirements, FTP Client Configuration example using the FTP utility program FileZilla© as a reference, and the File Transfer protocol procedure.

The embedded gateway software does not use a re-entrant file-system. During FTP updates changes to the configuration on the gateway are not allowed. Changing the operating configuration of the gateway via the terminal or Ethernet port of the device (e.g. network specs, code rate, etc.) will change the active directory of the file manager, and will result in failure of the FTP transfer process causing aberrant downloads.

The operator should not roam the remote directory structure while a FTP transfer is in process. Again, changing of directories by the FTP client will cause the active directory of the modem to change resulting in the files being downloaded to inappropriate locations generating a failure of the FTP transfer process causing aberrant downloads.

If a fatal error occurs during the upload process, the operator can revert back to the previous firmware in the ARCHIVE directory or manually removing and reformatting the flash card, and reinstalling the files on the compact flash card (using a compact flash card reader/programmer). Refer to the applicable product manual for the location of the compact flash card.

Whenever cycling power on the gateway, always allow the gateway to complete its boot cycle before initiating an FTP connection to the modem.

2.0 Required Items

The following Hardware and Software requirements are recommended to successfully implement the FTP file transfer process

2.1 Hardware/Software Requirements

1. A PC with the following:

- TCP/IP (Ethernet) capability
- FTP Client Utility installed on the PC such as FileZilla©
NOTE: Web Browsers such as Internet Explorer will not work as the configuration can not be changed to match the server requirements.
- Unzip Program (including but not limited to such as winzip or unrar)

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2. Cat-5 (minimum) Ethernet cable for connection between the PC and the Skywire Ethernet port.
 - Standard Ethernet cables connected from the PC to a Ethernet Hub/Switch, and connected from the Hub/Switch to the gateway.
NOTE: The operator should avoid going through corporate firewalls, must know the IP address of the target modem, and must know the ftp access name and password of the target gateway. The factory default values are “user” and “password” respectively.
3. RS-232 terminal cable

2.2 Installing the Firmware Upgrade Files onto a PC

1. Create a folder on the computer's hard drive named \skywire\rev-xx (where xx is the latest revision of firmware, for example \skywire\rev-e). Copy the mc.zip file to that newly created folder. Each Firmware Upgrade should be stored in it's own folder. This will allow for reverting back to the previous firmware revision should the need arise. Firmware is available on the Comtech EF Data's Radyne Web site at

<ftp://ftp.radn.com/Customer-Support/SkyWire/MDX420/Firmware/>

Contact Comtech EF Data for a username and password and further instructions at (480) 333-4357 if required.

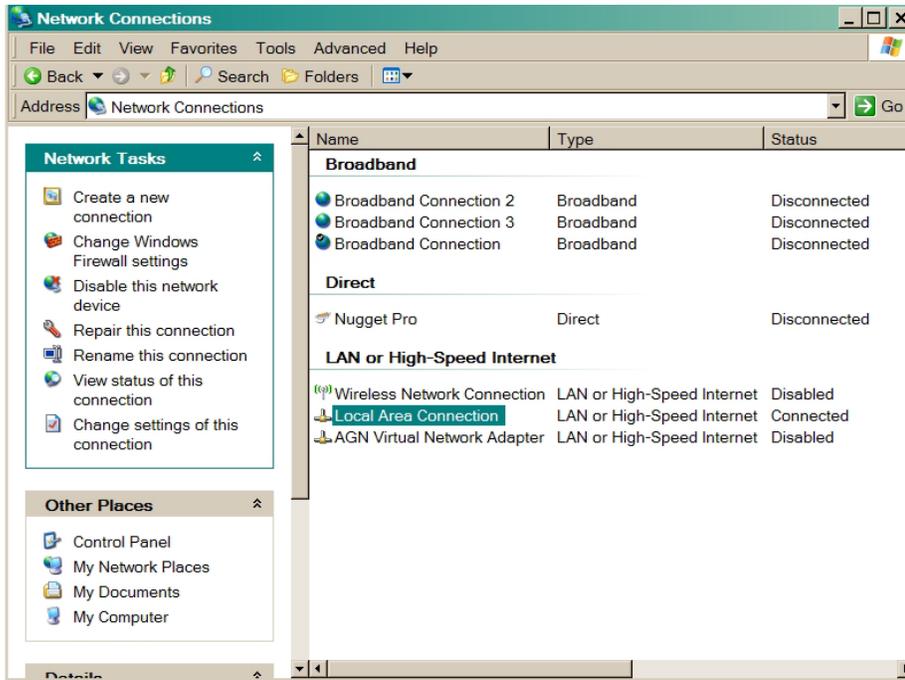
2. Extract the zip file into the \skywire\rev-xx folder. The zip file will extract into a folder called \skywire\rev-xx\MC. This folder contains the SkyWire™ firmware.
3. The following directory tree should be present in the folder:
 - a. Directories with subfiles
 - MC
 - MC/ARCHIVE
 - MC/ ARCHIVE /DEMODO
 - MC/ ARCHIVE /GENERAL
 - MC/ ARCHIVE /MOD
 - MC/ ARCHIVE /TERRINTF
 - b. Files of direct interest
 - The main startup file -- MC/ ARCHIVE /CHARLOTT.bin
 - MC/ARCHIVE/DIRDESC.TXT
 - MC/ARCHIVE/COMPLETE.IST

2.3 PC TCP/IP Configuration

The Computer TCP/IP must be properly configured in order to obtain connectivity. The following set-up procedure can be used as a guide to aide in this setup. The following instructions apply only to Windows® 2000 or Windows® XP.

1. Click on the Start Button. Select Settings and click on the Control Panel Icon. Double click the Network Connections Icon.
2. Select the Local Area Connection icon for the applicable Ethernet adapter (usually it is the first Local Area Connection listed). Double click the Local Area Connection.

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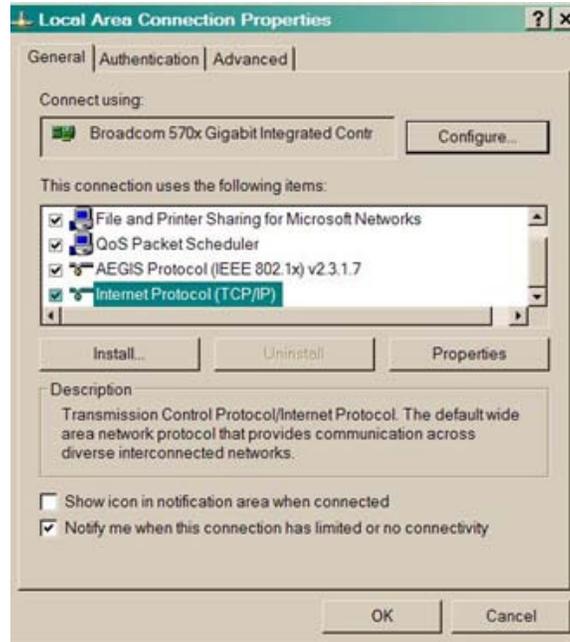


3. Click on the Properties icon.



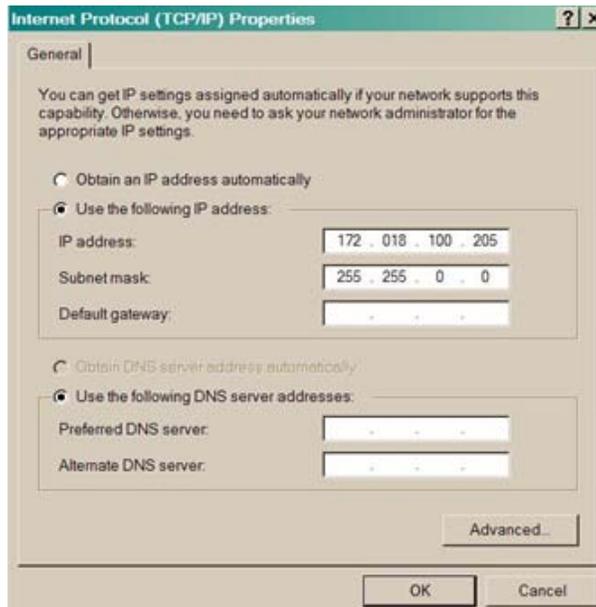
Local Area Connection Status Box

4. Make sure that the box next to the Internet Protocol (TCP/IP) is checked. Highlight Internet Protocol (TCP/IP) and click on the Properties button.



Local Area Connection Properties Box

5. Select “Use the following IP Address”. Enter in the IP Address that is offset by 5 or so numbers from the equipment address (the computer and the equipment that it is connecting to can not have identical addresses) and Subnet Mask (this is identical to the subnet mask programmed into the equipment) into the corresponding fields. Click the OK button to complete the PC Configuration. Note: some computers may require that the computer be restarted for the changes to take effect.



Internet Protocol (TCP/IP) Properties Box

6. To reconnect the computer to a network, select the “Obtain an IP address automatically” selection in the screen shown above.

2.3 Skywire Gateway Configuration

This section identifies the required network configuration settings using the gateway's terminal interface.

Refer to Section 6 of the MDX420 SkyWire™ Manual TM131 for connecting the Terminal to the Service Port.

2.4.1 IP Address Mask



In the mask (more clearly seen in the binary format), binary 1s indicate the position of the network and subnet portion of the IP Address while binary 0s identify bits that represent the individual interfaces. To recognize a subnet, each system in the subnet must have the same subnet mask. Please consult your network administrator for a valid address class mask.

1. At the TCP/IP/FTP terminal screen, type '33' to select the 'IP MASK'.
2. Enter the IP Address Mask and press <ENTER>. For example:
 - 255.255.0.0

2.4.2 Gateway IP Address



Note: This IP Address needs to be consistent with the defined IP Address Mask.

1. At the TCP/IP/FTP terminal screen, type '34' to select 'MODEM IP ADDR'.
2. Enter the gateway Internet Address and press <ENTER>. Please consult your network administrator for valid addresses. For example:

For the Modem IP Address of 172.18.100.215, enter

- IP Mask = 255.255.0.0
 - Modem IP Address = 172.18.100.215
3. Broadcast and loopback addresses will not be allowed.
 4. The IP Address that is selected will be used for the Ethernet Test that follows.

2.4.3 Server IP Address (Valid only if Boot Mode is set to BootP)



This section refers to the host that will be used to optionally boot the DMD Series on power-up and to the address of the SNMP Trap Server when SNMP is active. The host should be acceptable to the transport layer. In other words, the transport layer needs to be able to open a connection to the entity specified by the Server IP Address field.



This IP Address needs to be consistent with the Modem IP Address. If a router has been specified, the address is presumed to be reachable via the router. If the server is also within the same subnet as the modem, both the router and the server will receive the same IP packets. The router will relay the packets to a different subnet where they will be ignored.

1. At the TCP/IP/FTP terminal screen, type '35' to select 'SERVER IP ADDR'.
2. Enter the Server Internet Address and press <ENTER>. Consult your network administrator for valid addresses. For example:

For a no router specified and a Server IP Address of 172.18.4.250, enter

- IP Mask = 255.255.0.0
 - Modem IP Address = 172.18.100.215
 - Server IP Address = 172.18.4.250
 - Router IP Address = 10.0.0.1
4. Broadcast and loopback addresses will not be allowed.
 5. The IP Address that is selected will be used for the Ethernet Test that follows.

2.5 Skywire FTP Configuration

2.5.1 User ID

1. At the TCP/IP/FTP terminal screen, type '50' to select 'FTP User ID'.
2. Set the user ID to a maximum of 13 alphanumeric characters and press <ENTER> (default is "user").

2.5.2 Password

1. At the TCP/IP/FTP terminal screen, type '51' to select 'FTP Password'.
2. Set the FTP password to a maximum of 13 alphanumeric characters and press <ENTER> (default is "password").

2.6 Ethernet Test

2.6.1 Connecting the Ethernet Cable and Testing the Link

1. Connect the computer to the Skywire port, J1 or J2 using the RJ-45 to RJ-45 10 Base-T Cables via a hub for a network type connection using standard Ethernet cables.

2.6.2 Testing the Ethernet connection using the Ping Program

To verify that connectivity and settings are correct, use the Ping command to report if the Host (Equipment) is correctly responding. This is accomplished by opening the MSDOS Command Prompt and executing a Ping command as shown in the following example.



PING is an application that uses the ICMP Protocol to report if a host is responding.

1. Open MSDOS Command Prompt. The Screen will typically display:

```
Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.
```

```
C:\>
```

2. At the Command Prompt Enter “ping 172.18.100.215” (this needs to be the IP Address of the equipment to be tested). The screen will typically display:

```
Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.
```

```
C:\> ping 172.18.100.215
```

3. If the ping is successful the screen will typically display:

```
C:\>ping 172.18.100.215
```

```
Pinging 172.18.100.215 with 32 bytes of data:
```

```
Reply from 172.18.100.215: bytes=32 time=109ms TTL=64
Reply from 172.18.100.215: bytes=32 time<1ms TTL=64
Reply from 172.18.100.215: bytes=32 time=2ms TTL=64
Reply from 172.18.100.215: bytes=32 time=123ms TTL=64
```

```
Ping statistics for 172.18.100.215:
```

```
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 123ms, Average = 58ms
```

```
C:\>
```

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4. If the ping is unsuccessful the screen will display:

```
C:\>ping 172.18.100.215
```

```
Pinging 172.18.100.215 with 32 bytes of data:
```

```
Request timed out.  
Request timed out.  
Request timed out.  
Request timed out.
```

```
Ping statistics for 172.18.100.215:
```

```
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

```
C:\>
```

Check for the following items that may lead to an unsuccessful response:

- Verify that the correct cables are connected to the Ethernet port and that they are secured.
- The Link Light is illuminated.
- The IP Address that is used matches the Gateway's IP Address.
- The Server and Gateway are on the same subnet.

3.0 FTP Utility PC Installation

Many FTP utility programs are available as freeware or for demo (free) downloading shareware or purchase on the WWW. The free FTP program FileZilla© may be downloaded at this site: <http://filezilla-project.org/>

3.1 FTP Client Utility Configuration

Configuration of the FileZilla© FTP program is outlined below. If using a different FTP program, insure that the following parameters are set accordingly. The following general guidelines apply.

1. Only a single connection should be used, multiple connections should not be used. The embedded gateway software does not have or support a re-entrant file system and the maximum number of concurrent connections should be one (1). Only one FTP session can be open to any single unit at one time.
2. The FTP Client should not be configured to use PASV connections. These connections are much slower than active connections. The PASV methods used by clients are of the implemented in different ways as well. Some client's desire a single port and this is contrary to the specification but desired by some firewalls.
3. The FTP client does not need to query with a FEAT message. The server does not support it.
4. The FTP Client should not use encryption or compression options.
5. Multiple connections are often the default for many clients because they are presuming a non-embedded server.

The following screen captures are from the relevant configuration screens of FileZilla© FTP. The retries, timeouts and options may vary in different tools but the options are fairly consistent.



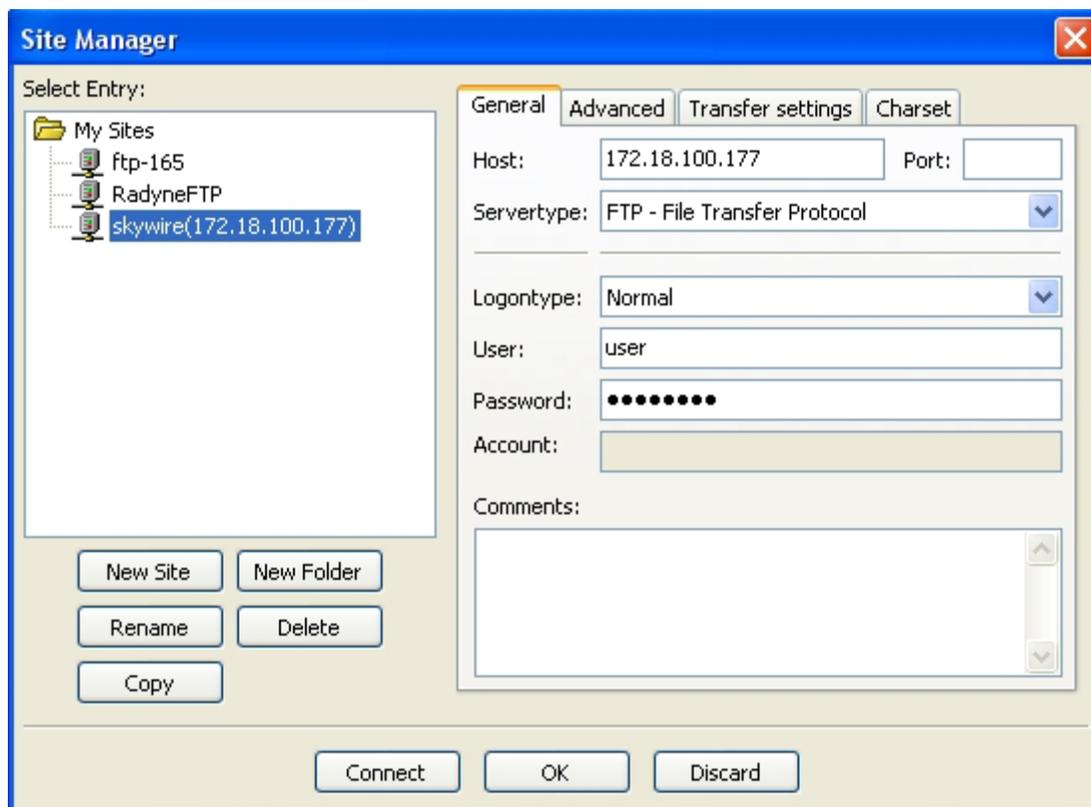
Start the FTP Client program and select File / Site Manager. The following screen will appear.

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Click on the “New Site” button and verify the following screens are configured as shown below.

General:

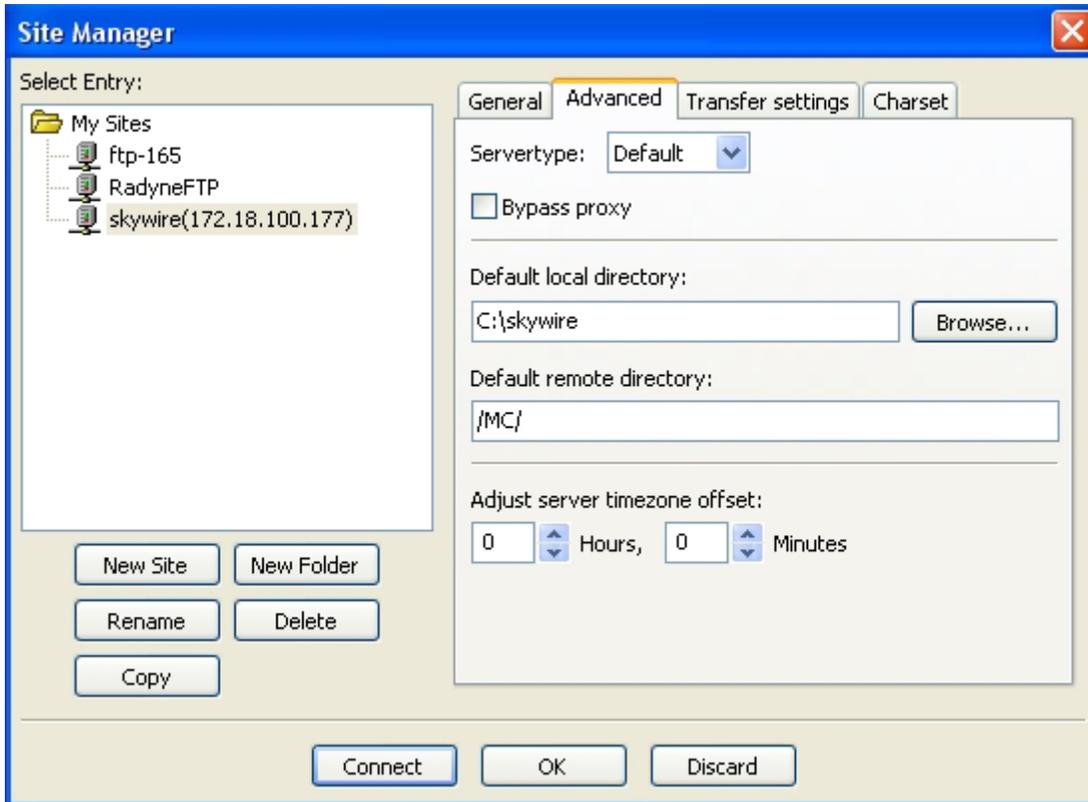
1. Set “Host” to the Gateway IP address.
2. Set “ServerType” to FTP – File Transfer Protocol
3. Set “LogonType” to Normal
4. Set “User” to the Gateway FTP User name. The default User name is “user”.
5. Set “Password” to the Gateway FTP Password. The default Password is “password”.



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Advanced:

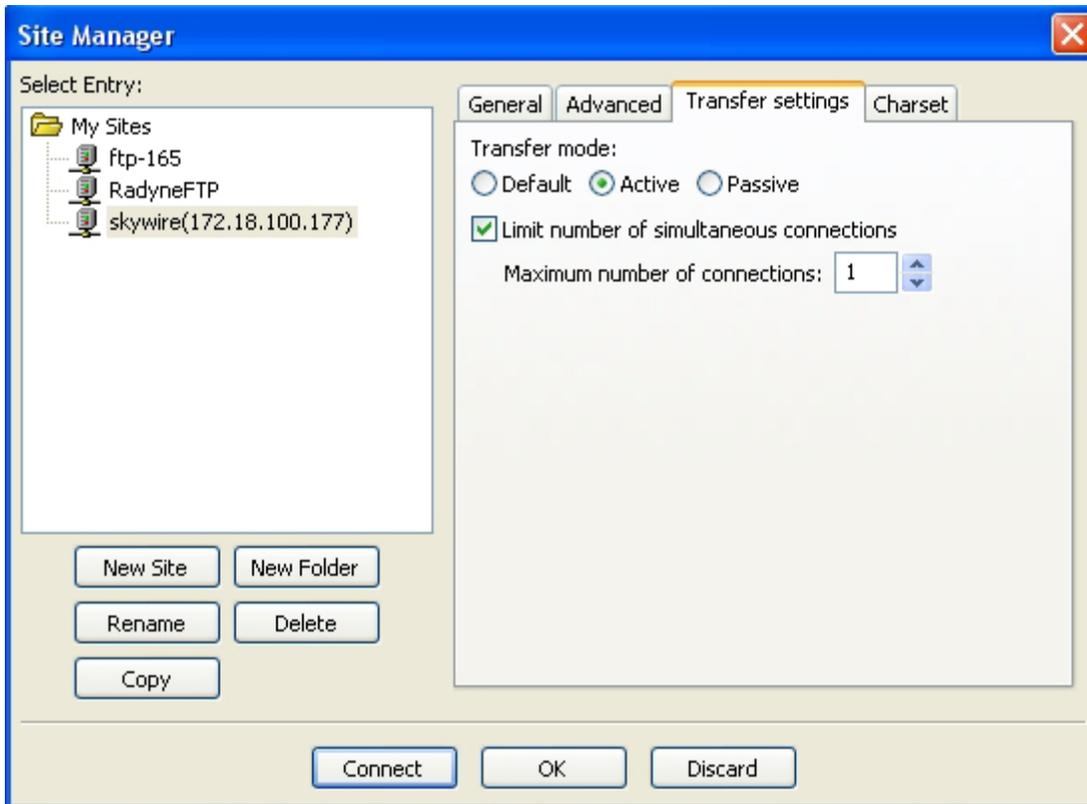
The user can specify the PC local directory where gateway firmware revision may be stored. Set the default remote directory to “/MC” as shown below. Set all other fields as shown.



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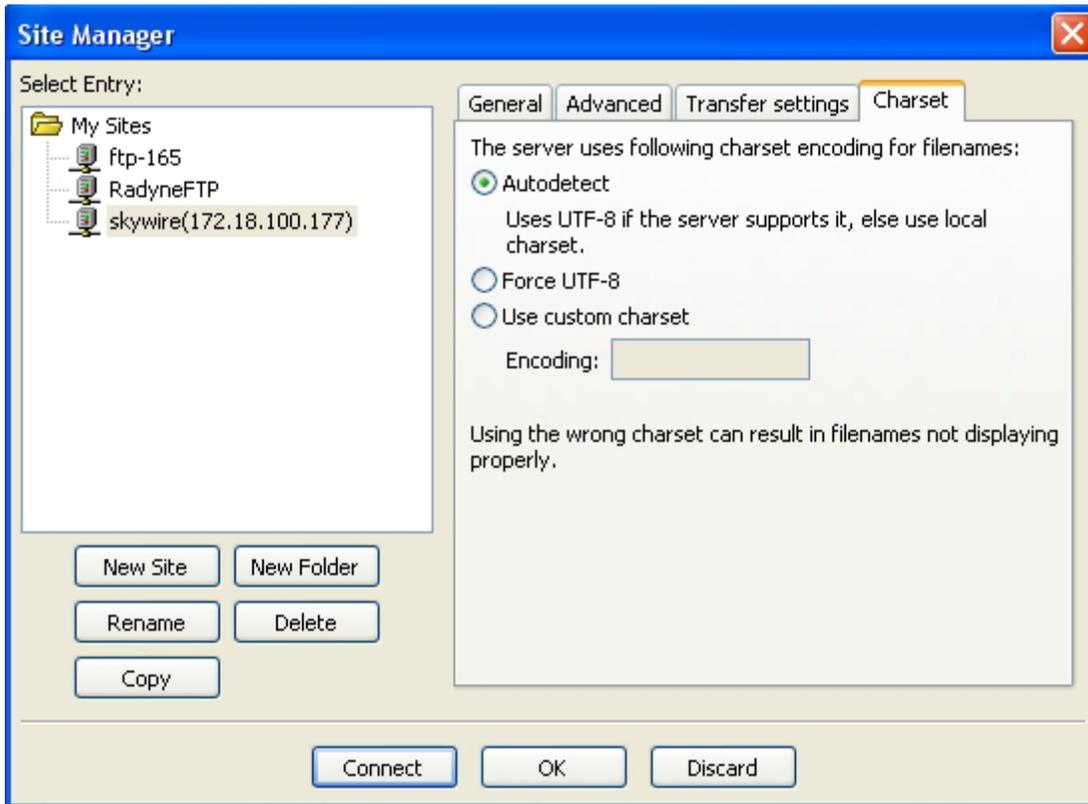
Transfer settings:

Set transfer mode to active and force a limit on the number of simultaneous connections. Set the maximum to 1.



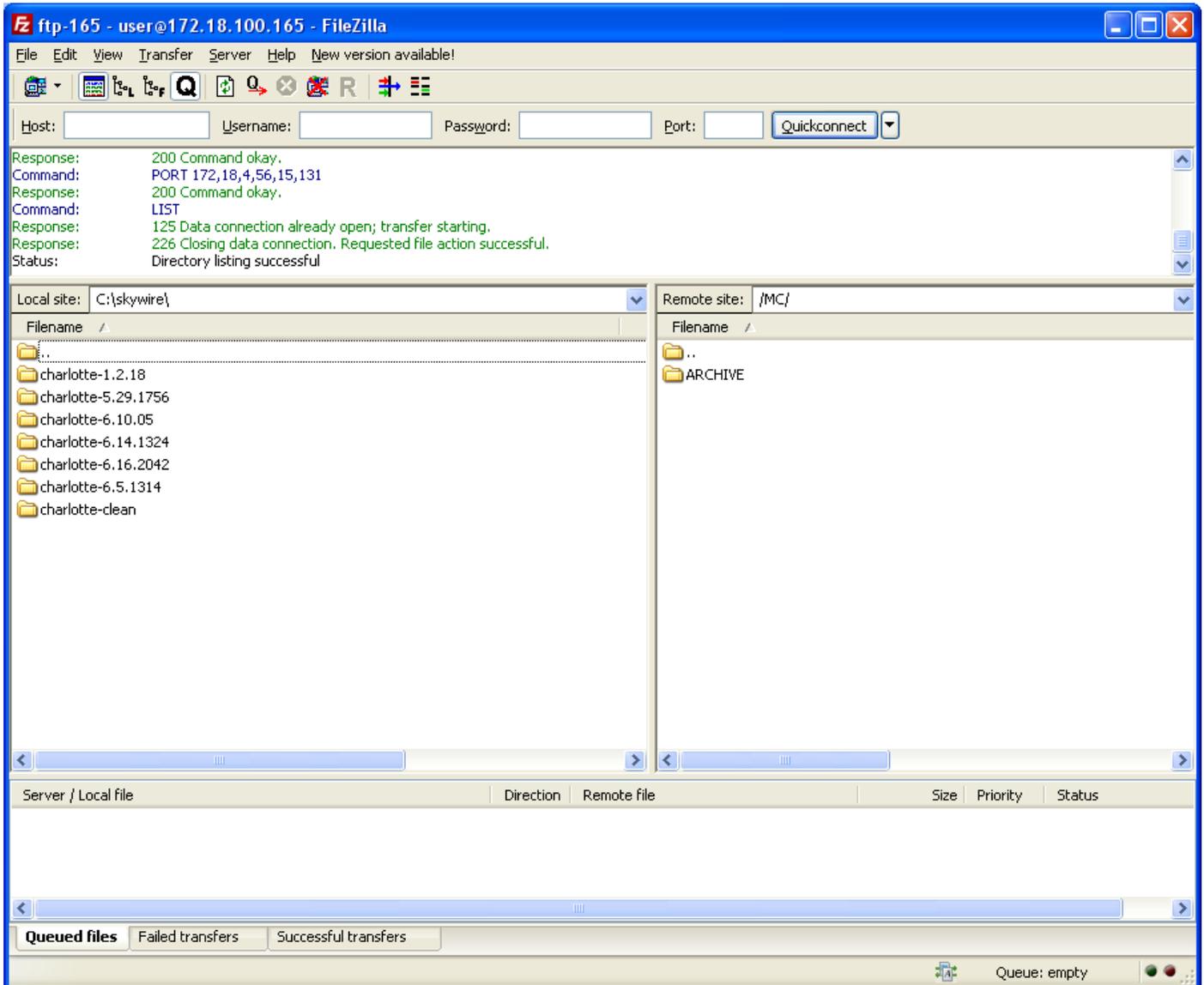
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Charset:



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From the Site Manager's "My Sites", select the Gateway you wish to connect to. Click the "Connect" button to initiate an FTP connection.



The top panel will list all commands and responses between the PC and the Gateway.

4.0 FTP Transfer



Verify that the SkyWire™ is reachable before proceeding (refer to Section 2.6).

The modem normally runs out of the ARCHIVE directory. All firmware uploads must be directed to the ACCEPTED directory. If the ACCEPTED directory exists and the user is satisfied with its contents, the user may promote the ACCEPTED directory to ARCHIVE prior to any firmware updates.

1. Make sure the Compact Flash is installed in the SkyWire™ (rear panel). Retrieve from the Comtech EF Data FTP site or from customer service the update which should be installed. This is distributed as a zip file and should be unzipped into a local update folder. Refer to Section 2.2
2. In this procedure the folder will be titled 'NewUpdate'. The following file directory tree should be present:
 - a. Directories with subfiles
 - MC
 - MC/ARCHIVE
 - MC/ ARCHIVE /DEMODO
 - MC/ ARCHIVE /GENERAL
 - MC/ ARCHIVE /MOD
 - MC/ ARCHIVE /TERRINTF
 - b. Files of direct interest
 - The main startup file – MC/ARCHIVE/CHARLOTT.bin
 - MC/ARCHIVE/DIRDESC.TXT
 - MC/ARCHIVE/COMPLETE.IST
3. On the client PC, rename NewUpdate/MC/ARCHIVE to NewUpdate/MC/ACCEPTED
4. On the client PC, rename NewUpdate/MC/ACCEPTED/COMPLETE.IST to NewUpdate/MC/ACCEPTED/_OMPLETE.IST
5. Using the FTP client Filezilla establish a control connection to the target gateway.
6. Change the remote directory to /MC.
7. Change the local site directory to NewUpdate/MC

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8. For each selected gateway, delete or promote ACCEPTED directory to ARCHIVE as follows.
 - a. If gateway is running out of the ARCHIVE directory, then
 - If ACCEPTED directory exists in the gateway MC folder, then
 - Rename \MC\ACCEPTED\COMPLETE.IST to _OMplete.IST
 - Delete MC\ACCEPTED*.*
 - b. Else if gateway is running out of the ACCEPTED directory, then
 - Promote ACCEPTED to ARCHIVE
 - Verify that gateway \MC\ACCEPTED directory is complete.
\MC\ACCEPTED\COMPLETE.IST exists
 - If \MC\ACCEPTED directory is complete,
 - Copy \MC\ACCEPTED*.* to \MC\ARCHIVE*.*
 - Copy gateway \MC\ACCEPTED*.* to the PC
 - Rename \MC\ACCEPTED on the PC to \MC\ARCHIVE
 - Copy \MC\ARCHIVE*.* from the PC to the gateway \MC\ARCHIVE directory
 - Verify identical with compare/diff
 - Delete \MC\ACCEPTED\COMPLETE.IST from the gateway
 - Reboot Gateway to start operating out of the ARCHIVE directory
 - Copy XRESET file from PC to the Gateway root directory.
 - Disconnect the FTP connection. The Gateway will reboot automatically as soon as the FTP control connection is disconnected and XRESET semaphore file exists at the root of the Gateway compact flash.
9. For each gateway that needs to be updated, upload software to MC\ACCEPTED directory as follows:
 - Transfer NewUpdate\MC\ACCEPTED directory from PC to gateway
 - Verify identical
 - Rename \MC\ACCEPTED_OMplete.IST in gateway to COMPLETE.IST.
10. Initiate entire network reboot as follows:
 - Connect the PC to the Gateway Service port through an RS-232 cable.
 - Start HyperTerminal on the PC and configure its properties for 19200 bits per sec, 8 data bits, no parity, and no flow control.
 - Press the “Esc” button to refresh the terminal screen and display the top level menu, “MAIN MENU”.
 - If any other lower level screen is showing, type “1” at the prompt to display the “MAIN MENU”.
 - Login into the Gateway terminal.
 - Type 19 at the command prompt of the “MAIN MENU”
 - Enter your administrative password. Default password is “password”.
 - Type “SGREBOOT” and press <ENTER> to initiate a reboot of the entire network.
11. Revert Criteria
 - **Either** 10 minutes without seeing network **OR** Seeing network with different MESH_PROTOCOL_REV being broadcast
 - **AND** The non-transmitting Skywire Gateway is operating from the \MC\ACCEPTED directory **AND** the \MC\ARCHIVE directory is complete (i.e., contains the file COMPLETE.IST), the gateway shall automatically reboot from the \MC\ARCHIVE directory.

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11. Dealing with partial revert

- Administrator must manually revert those gateways that converted to the new SW version successfully as follows:
 - For each gateway operating from the \MC\ACCEPTED directory
 - Delete MC\ACCEPTED\COMPLETE.IST
 - Delete MC\ACCEPTED*.*
- Connect the PC to the Gateway Service port through an RS-232 cable.
- Start HyperTerminal on the PC
- Login into the Gateway terminal.
 - Type 19 at the command prompt of the "MAIN MENU"
 - Enter your administrative password. Default password is "password".
- Enter your administrative password. Default password is "password". From the gateway terminal "MAIN MENU", type "SGREBOOT" and press <ENTER> to initiate a reboot of the entire network.



NOTE: While running from accepted, any subsequent reboots/power cycles etc. cause the MDX420 to be subject to (I.E. Reevaluate) Revert Criteria.