IndustrialPro™ Routers (SN/RAM Series)
Wireless Modems

Including SN/RAM-67xx, SN/RAM-69xx LTE
and RAM-9000 families

Migration and Advanced Firmware Update Procedures
Version 3.21/4.21

July 2015

CHANGE HISTORY

Version	Date	Description
3.21	July 15, 2015	SN/RAM Release 3.21
3.20	February 17, 2015	SN/RAM Release 3.20
3.19	October 20, 2014	SN/RAM Release 3.19
3.18	August 11, 2014	SN/RAM Release 3.18
3.13	December 20, 2012	SN/RAM Release 3.13
3.12	October 16, 2012	SN/RAM Release 3.12
3.11	June 22, 2012	SN/RAM Release 3.11
3.10	January 13, 2012	SN/RAM Release 3.10
3.09	June 24,2011	SN Release 3.09
3.08	March 16, 2011	SN Release 3.08
3.07	January 11, 2011	SN Release 3.07
3.06	October 12, 2010	SN Release 3.06
3.05	October 5, 2010	SN Release 3.05
3.04	May 8, 2010	SN Release 3.04 – Pre Release

Version	Date	Description
4.21	July 15, 2015	SN/RAM Release 4.21 – LTE / G25
4.20	February 17, 2015	SN/RAM Release 4.20 – LTE / G25
4.19	October 20, 2014	SN/RAM Release 4.19 – LTE / G25
4.18	August 11, 2014	SN/RAM Release 4.18 – LTE / G25
4.13	January 3, 2013	SN/RAM Release 4.13 – LTE / G25
4.01	November 30, 2012	SN/RAM Release 4.01 – LTE / G25
4.00	October 22, 2012	SN/RAM Release 4.00 – LTE / G25

TABLE OF CONTENTS

1   Related Products

This release applies to the following products:

- **Sixnet IndustrialPro™ Router** Wired/Wireless Routers (SN/RAM-6000 Series) with **3.xx** Versions:

    – SN/RAM 6400, 6401, 6401EB: GSM/EDGE Wireless Routers

    – SN/RAM 6600, 6601, 6601EB, SN-6621: CDMA EVDO A Wireless Routers

    – SN/RAM 6800, 6801, 6801EB, SN-6821: GSM/HSPA Wireless Routers

- **Sixnet IndustrialPro™ LTE Router** Wireless Routers (SN/RAM-6000 Series) with **4.xx** Versions:

    – SN/RAM 6700, 6701, 6701EB, SN-6721: LTE Wireless Routers

    – SN/RAM 6900, 6901, 6901EB, SN-6921: LTE Wireless Routers

- **Red Lion Controls RAM-9000 cellular RTU** with **4.xx** Versions:

    – RAM 9631,9611, 9601: 3G Cellular RTUs

    – RAM 9731, 9711, 9701: LTE Cellular RTUs

    – RAM 9931, 9911, 9901: LTE Cellular RTUs (multi-carrier)

- **Red Lion Controls RAM-6021 Wired Router** with **4.xx** Versions

2   Release Content

The release is composed of:

- **3.21_4.21_sn_reflash.zip**: This archive contains the files used for the SN/RAM- series advanced upgrade and a copy of the release notes.

- **SN_MigrationAndUpdateProcedures_2014-10-20.pdf**: this document in PDF format.

The remaining archive files shall be extracted on a local directory, preserving their path, prior to being used in the upgrade process.

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3   IndustrialPro™ Router and Cellular RTU Firmware Update Procedures

This procedure can be applied on IndustrialPro™ Router wireless modems (SN- Series) to update the installed firmware.

3.1   Normal update

Upgrade firmware using the router's web interface, as detailed in the User Guide The upgrade consists of first uploading the boot image file (available in 3.21_4.21_sn_reflash\Images\sn-bootfs.jffs2) and then the root image file (available in 3.21_4.21_sn_reflash\Images\sn-rootfs.jffs2). Version 3.xx files apply to non-LTE products.

Version 4.21 files are also available in the same location (3.21_4.21_sn_reflash\Images\sng25-bootfs.jffs2 and 3.21_4.21_sn_reflash\Images\sng25-rootfs.jffs2). Version 4.xx files apply to LTE products, SN/RAM-67xx series, SN/RAM-69xx and all RAM-9xxx series cellular RTUs.

Remote GUI reflashing in versions 3.09 to 3.12 have experienced some field issues. An updated reflashing package <u>is included in this release</u> that improves reliability. **It is highly recommended** that you apply this package before reflashing to a newer firmware version to add significant improvements in reliability of remote reflashing and unit stability.

"snpat20141003_reflashing_tools.zip" can be applied through the GUI screen "Admin->Package Installation", immediately prior to using the "Admin->Firmware Update" screen.

3.2   Advanced Firmware Update Procedure

This procedure reflashes the entire content of the modem non-volatile memory with images stored on a local TFTP server. This is equivalent to a complete reflash to factory defaults.

1. Connect PC and modem with an Ethernet cable
2. Optional: To preserve the /storage/ partition during a reflash, delete **sn-upgrade.flag** or **sng25-upgrade.flag** from your \Images directory. Certain older units may require this flag to be in place.
3. Double-click on **sn_reflash.bat** in the **3.21_4.21_sn_reflash** folder. Depending on your Windows PC configuration, you may need to run sn_reflash.bat with **Administrator**'s privileges by right clicking on the file and select "Run as administrator".
4. If the Windows PC has several Ethernet Adapter, the following screen will be displayed:

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```
Command Prompt - sn_reflash.bat                                    _ □ ×
reflash>sn_reflash.bat
Sixnet Advanced Firmware Update ...
======================================

This program is used to reflash an IndustrialPro Router (SN-6000) or
MobilityPro Router (SN-5000v2) Sixnet Wireless modems.

The modem non-volatile memory will be entirely re-written.

Attention: 2 ethernet adapters have been found on this PC:
=========
    1 "Local Area Connection 2:"
        PHY:                    00-1D-09-C6-9B-2D
        DHCP enabled:           No
        TFTP default IP configured: no

    2 "Wireless Network Connection 2:"
        PHY:                    00-16-44-82-32-26
        DHCP enabled:           Yes
        TFTP default IP configured: no

Please select which Ethernet adapter you want to use [1..2]:_
```

Select the interface you want to use for the modem advanced upgrade.

> 5. The sn_reflash warns to close any open network file since it will change network settings. Press any key to continue or <Ctrl>-C to stop the process.

```
Command Prompt - sn_reflash.bat                                    _ □ ×
The modem non-volatile memory will be entirely re-written.

Attention: 2 ethernet adapters have been found on this PC:
=========
    1 "Local Area Connection 2:"
        PHY:                    00-1D-09-C6-9B-2D
        DHCP enabled:           No
        TFTP default IP configured: no

    2 "Wireless Network Connection 2:"
        PHY:                    00-16-44-82-32-26
        DHCP enabled:           Yes
        TFTP default IP configured: no

Please select which Ethernet adapter you want to use [1..2]:1
Selected adapter is 1 "Local Area Connection 2"

1) Please save and close any network files you may currently have open.
2) Connect your modem to the computer with an RJ45 Ethernet cable.

Press any key to continue . . . _
```

> 6. If the selected interface, is already configured with the default IP address, the following message will be displayed:

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```
Command Prompt - sn_reflash.bat                                    _ □ ✕
========
    1 "Local Area Connection 2:"
        PHY:                        00-1D-09-C6-9B-2D
        DHCP enabled:               No
        TFTP default IP configured: yes

    2 "Wireless Network Connection 2:"
        PHY:                        00-16-44-82-32-26
        DHCP enabled:               Yes
        TFTP default IP configured: no

    3 "Local Area Connection 3:"
        PHY:                        26-DD-BA-36-7C-5E
        DHCP enabled:               Yes
        TFTP default IP configured: no

Please select which Ethernet adapter you want to use [1..3]:1
Selected adapter is 1 "Local Area Connection 2"

1) Please save and close any network files you may currently have open.
2) Connect your modem to the computer with an RJ45 Ethernet cable.

Press any key to continue . . .

Interface "Local Area Connection 2" appears already configured with IP address 1
92.168.88.180.
For most modems, having 192.168.88.180 is normally enough.
Shall the interface be configured for all possible IP addresses [Y/N]:
```

For most modems, choosing '**N**' is Ok. Some modems may need to have other IP addresses configured. In this case select 'Y'.

7. Wait while the program configures the network interface and launches TFTP.
8. The following screen indicates that the TFTP server is awaiting firmware requests from the modem:

```
Command Prompt - sn_reflash.bat                                    _ □ ✕
Release_3.05\3.05_sn_reflash\Images\
alias /gs\Administrator\Desktop\MarcTibout\Release_3.05\3.05_sn_reflash\Images\
is mapped to \Images\
listening On: 192.168.222.178:69
listening On: 192.168.222.168:69
listening On: 192.168.222.167:69
listening On: 192.168.88.180:69
listening On: 192.168.222.180:69
listening On: 192.168.111.2:69
listening On: 127.0.0.1:69
listening On: 192.168.222.122:69
permitted clients: all
server port range: all
max blksize: 65464
default blksize: 512
default timeout: 10
file read allowed: Yes
file create allowed: No
file overwrite allowed: No
thread pool size: 1

Reset your BlueTree modem to start the advanced firmware upgrade process ...
 - Press the RESET button of the modem for approximately 8 to 12 seconds
   then release it when only the WAN LED is flashing.

Press 'q' to quit.
```

If the TFTP server does not display the line "**listening On: 192.168.88.180:69**", you will need to restart it with Administrator's privileges.

9. On the SN/RAM-6xxx devices you may now press the **RESET** button and hold for between 10 and 15 seconds until the **WAN** LED starts flashing then release.
   On the RAM-9xxx devices the **MODE** button must be pressed and held within a few seconds of

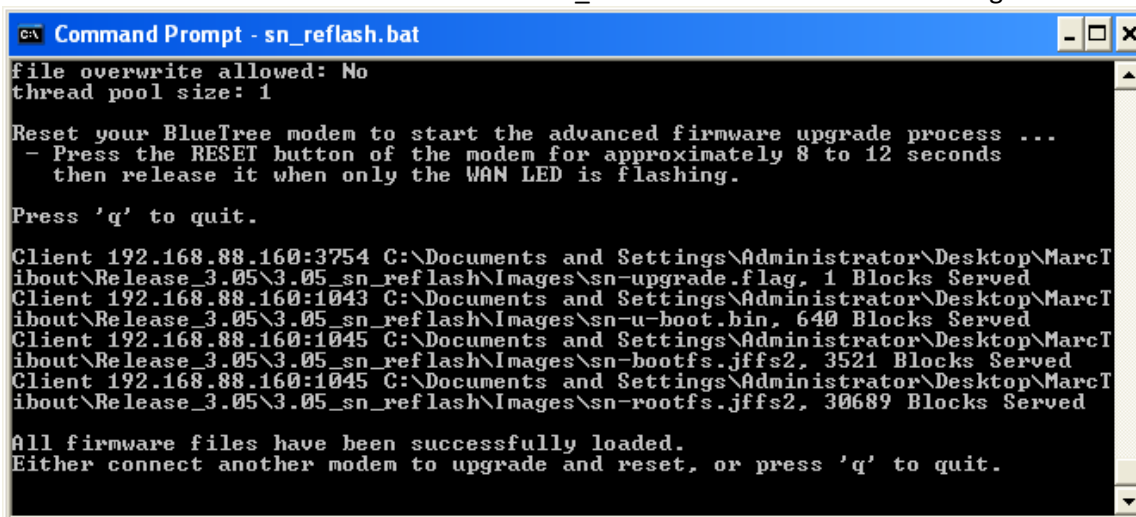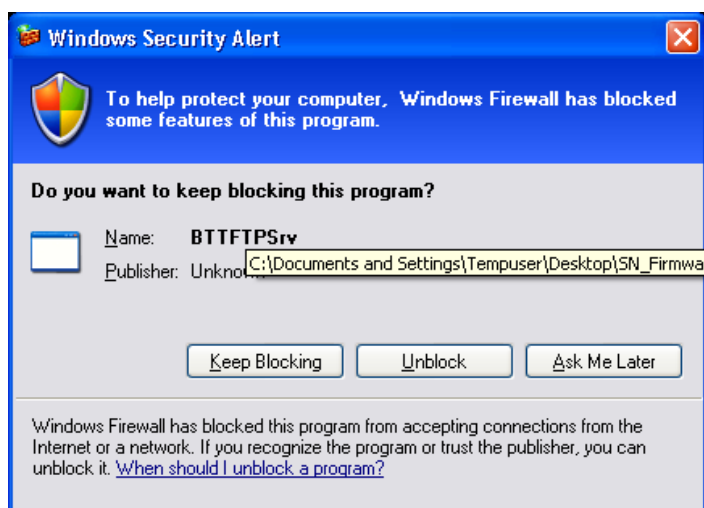**Sixnet, Inc.**
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initially powering on the device. If the device is already powered on you may push and hold the **RESET** button until the device reboots then immediately push and hold the **MODE** button until the **WAN** LED is lit, then release to start the upgrade procedure.

10. Monitor the modem reflash in the sn_reflash window. Four files should get served:

11. Wait for the reflash to complete ("All firmware files have been successfully loaded")
12. **Wait for the modem to restart.** Power and RS232 LEDs should be on. Modem has entirely restarted when the RS232 LED turns OFF.
13. Disconnect the modem from its power source. (If having difficulty, you may try again and wait for an additional minute after the RS232 LED turns OFF).
14. Quit the sn_reflash.bat program by pressing **q** in its window.

Notes:

- The `sn_reflash.bat` launches a TFTP server after reconfiguring the "Local Area Connection" interface to a static IP address. Setting the network interface may take a few minutes. The interface configuration is then restored when the program quits. If this is a problem, you may configure your Ethernet interface to the following static IP address 192.168.88.180 and run `bttftpsrv -v` in a DOS prompt of the Images directory.

- Launching the TFTP server may trigger a Windows firewall warning:

Select **Unblock** to continue.

- When performing the update procedure on multiple modems, do not quit the sn_reflash.bat program (skip point 13), and loop between points 8 to 12.

- Do not try to connect to the newly upgraded SN- Series modem unless the TFTP server (sn_reflash) is terminated (the LAN Ethernet interface has been specially configured for the TFTP operations). Once the TFTP server has been terminated, you may connect to your newly upgraded device using a web browser at http://192.168.0.1:10000.

- Please note, when flashing the /storage/ partition will be erased. If you have specific SDK programs or configs loaded in this partition, and you would not like the /storage/ partition to be erased, delete the **sn-upgrade.flag** file (for 4.xx it is **sng25-upgrade.flag**) from your \3.xx_sn_reflash\Images\ folder before running the tftp server.

4   Manual "Workaround" Advanced Firmware Upgrade Procedure

Windows XP PC Setup procedures:

- Click Start – Control Panel – Network Connections

- Highlight the Ethernet adapter that will be connected to the device, right click on the adapter and click properties.
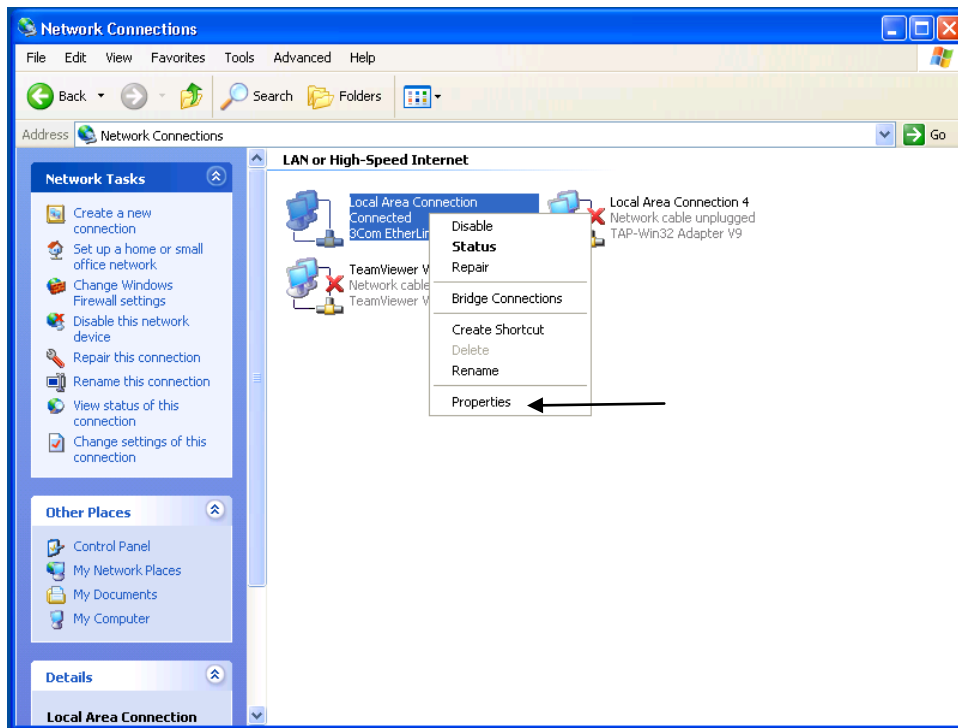
- Highlight Internet Protocol (TCP/IP) and click Properties.

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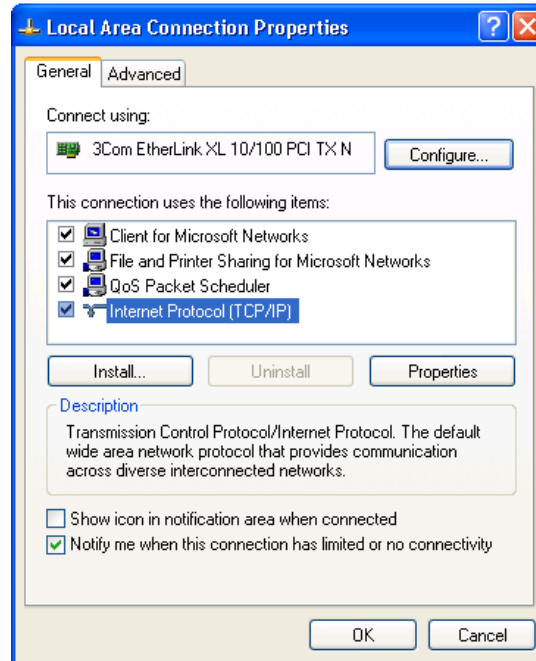
- Enter the following information:
    - IP address: 192.168.88.180
    - Subnet Mask: 255.255.255.0
    - Leave everything else blank

Note what the current settings are **before** changing in order to restore those settings later once firmware flash is complete.
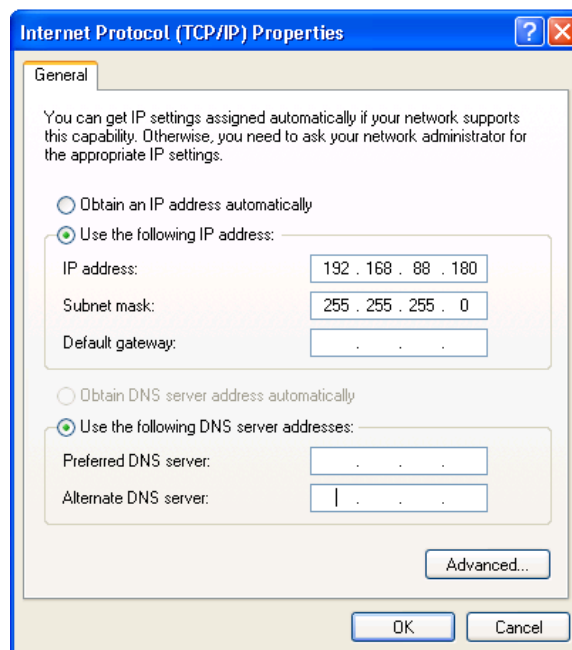
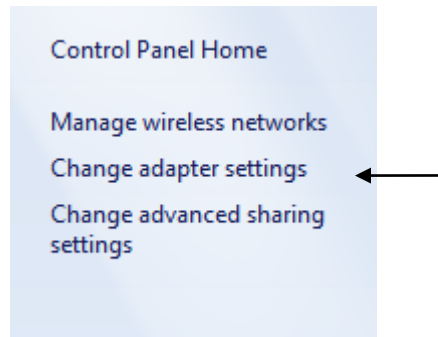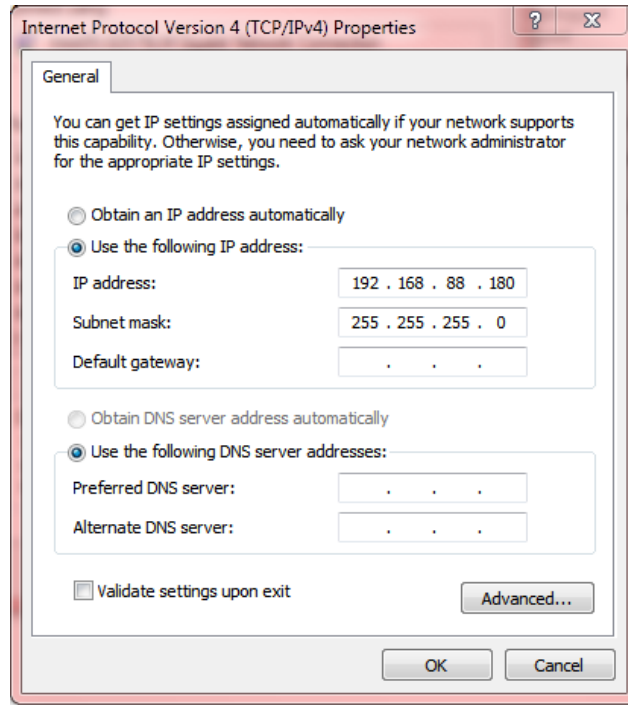CONNECT. MONITOR. CONTROL.
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- When complete click OK then OK again to return to Network Connections.

Windows 7 PC Setup procedures:

- Click the Windows button in lower left corner of screen – Control Panel.
  - o If in Category mode, click "View network status and tasks"
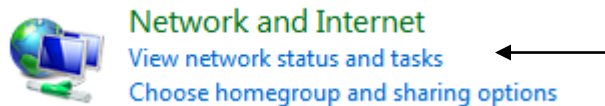
  - o If Control Panel is showing Icons, choose "Network and Sharing Center"

- The Network and Sharing Center window will be displayed. On the left side of window, click "Change adapter settings".

- Locate the Ethernet adapter the device will be connected to in the window. Right click onto the adapter and select properties.
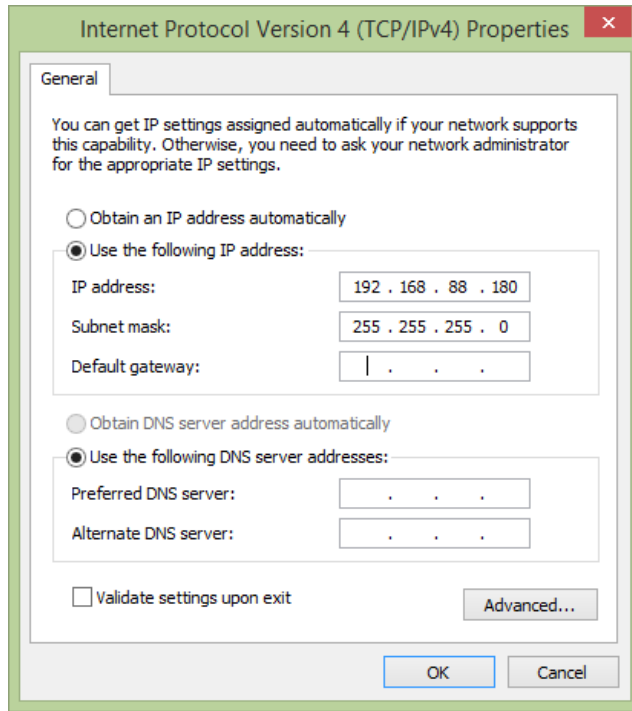- Inside the "This connection uses the following items:" window, look for Internet Protocol Version 4 (TCP/IPv4). Highlight and click Properties.

- Enter the following information:
  - o   IP address: 192.168.88.180
  - o   Subnet Mask: 255.255.255.0
  - o   Leave everything else blank

Note what the current settings are **before** changing in order to restore those settings once the firmware flash is completed.

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- When information is complete, click OK and then OK again to return to Network Connections window.

Windows 8 PC Setup procedures:

- On the windows 8 desktop, place mouse cursor in lower right corner of the screen. The windows sidebar will slide into view. Choose Settings followed by Control Panel.

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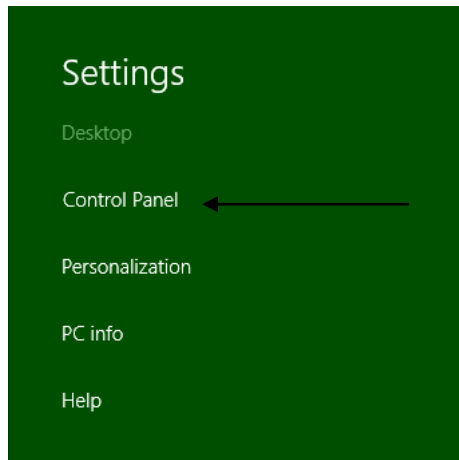
- The windows control panel will open. Choose "View network status and tasks"
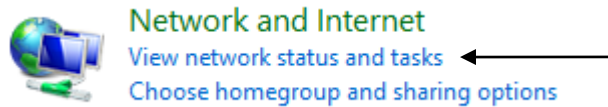

- On the left hand side of screen, click "Change adapter settings"

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Control Panel Home

Change adapter settings ◄──────

Change advanced sharing settings

- Locate the Ethernet adapter the device will be connected to in the window. Right click onto the adapter and select properties.

- Inside the "This connection uses the following items:" window, look for Internet Protocol Version 4 (TCP/IPv4). Highlight and click Properties.

- Enter the following information:

    o IP address: 192.168.88.180

    o Subnet Mask: 255.255.255.0

    o Leave everything else blank

Note what the current settings are **before** changing in order to restore those settings later once firmware flash is complete.

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- When information is complete, click OK and then OK again to return to Network Connections window.

Running Advanced Firmware Flash:

- Open a command prompt on the Windows PC:
    - From XP:
        - Start – Run.
        - Type cmd in the text box and hit enter.
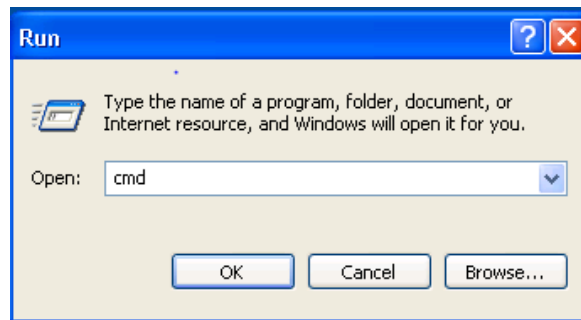
    - From 7:
        - Windows Icon in lower left corner – Run

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- Type cmd in the text box and hit enter.
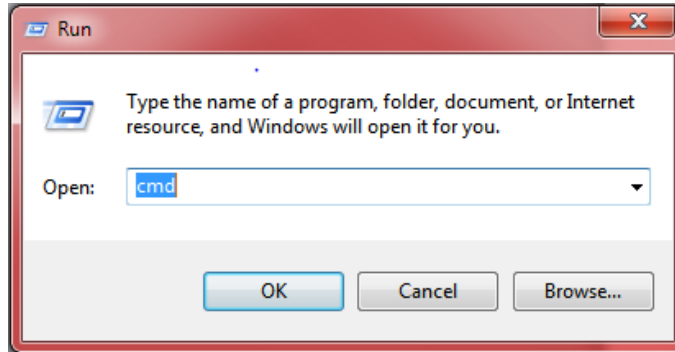
  - From 8:
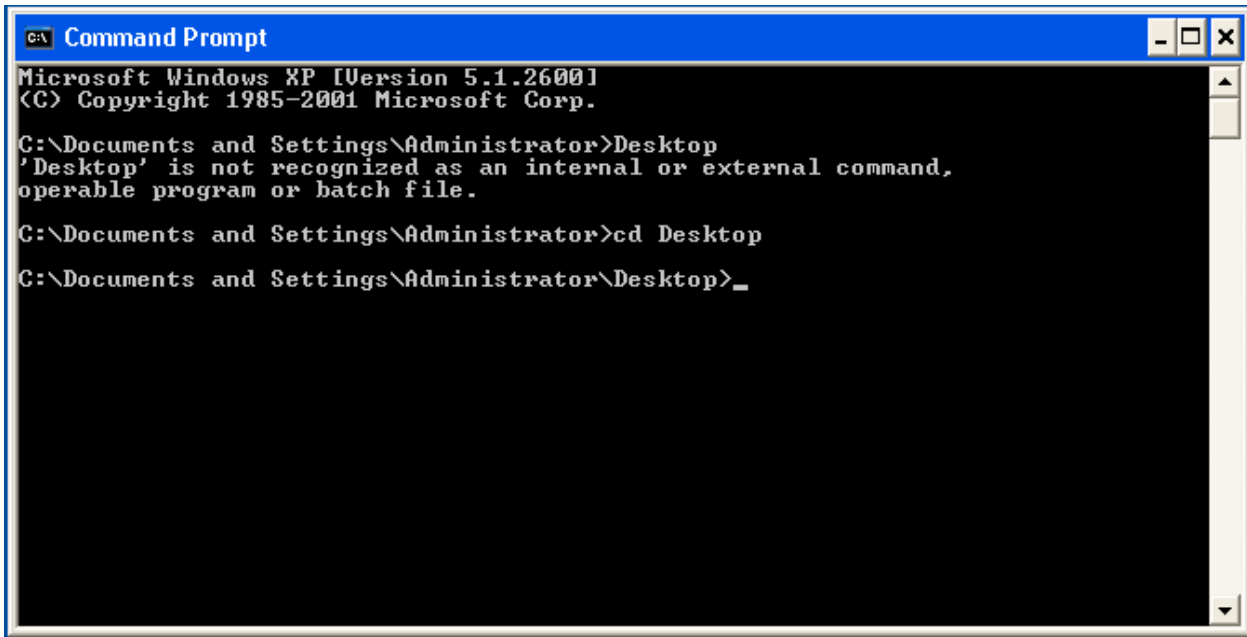
    - On the windows 8 desktop, place mouse cursor in lower right corner of the screen. The windows sidebar will slide into view. Click Search. In search box, type cmd. Double click the Command Prompt Icon.
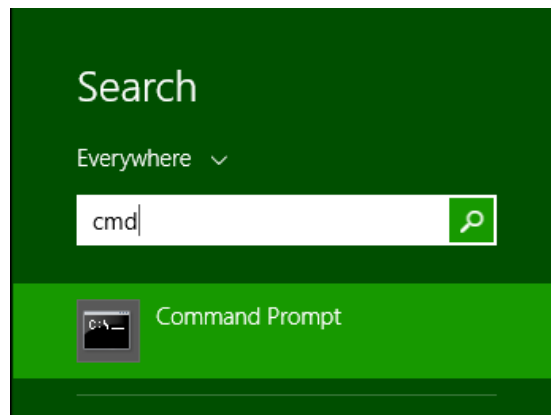
- At the command prompt, change directories up to the Images directory in the advanced reflash directory. For example, if the flash package is on the users desktop, the path would be as follows:

  - Windows XP:

    - C:\Documents and Settings\"username"\Desktop

    - Note: replace "username" with the current signed in user ie Administrator, etc

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- o Windows 7:
    - ▪ C:\Users\"username"\Desktop
    - ▪ Note: replace "username" with current signed in user ie Administrator, etc.

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- o Windows 8:

    - ▪ C:\Users\"username"\Desktop

    - ▪ Note: replace "username" with current signed in user ie Administrator, etc

- Once inside the advanced firmware directory, change directories into Images.

- Inside the Images folder, enter the following to start the TFTP server:

    - o BTTFTPSrv.exe –v

        - ▪ Note: If a windows firewall window pops up asking if the program should be allowed, ensure all three boxes are checked and "Allow access" chosen.
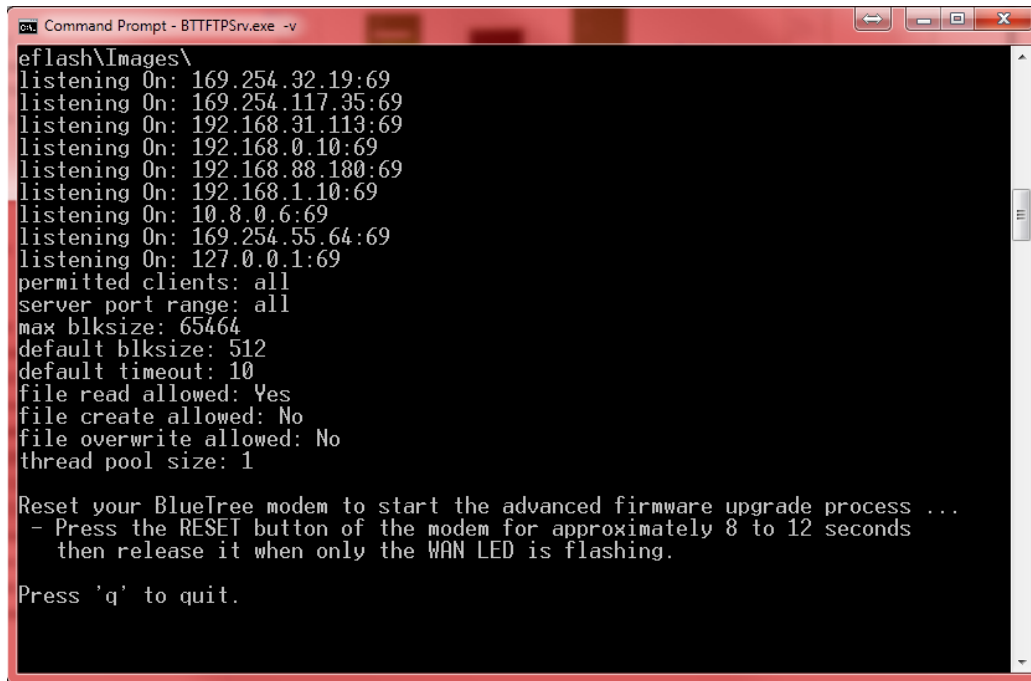
- The TFTP server will start.   In the window will be a list of IP's the TFTP server is listening on. Ensure 192.168.88.180:69 is listed. Once verified, hold the reset button on the device until the WAN LED begins to

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flash (between 10 – 12 seconds) then release.

- Observe blocks of files getting transferred to the device. Once all the files have been served, either connect another device to continue the flashing process or hit "q" to quit the program.

- **Restore the IP on the PC's Ethernet adapter to previous settings.**

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5   Support Information

Visit the Industrial Wireless Product Support section of Sixnet website to download product manuals, software updates and modem firmware updates.

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