# tSH-700 Series

Firmware Update via Ethernet

Version: 1.2/Updated: Jun. 2017

ICP DAS CO., LTD.
Website: http://www.icpdas.com

## SUPPORT

Models supported include tSH-722, tSH-732, tSH-725, tSH-735, tSH-724, tSH-734, tSH-722i, tSH-732i, tSH-725i, tSH-735i, tSH-724i and tSH-734i.

## WARRANTY

## WARNING

## COPYRIGHT

## TRADEMARKS

## CONTACT US

If you have any questions, please feel free to contact us via email at:

service@icpdas.com or service.icpdas@gmail.com

# 0. How to identify your tSH-700 type

Identify your tSH-700 type by module name on the front of tSH-700, when you need to update the firmware. If the module name shows **"RevB"**, please download **"tSH700_RevBxxx_xxxxxx.zip"** firmware file to update, on the contrary (the module name is **not "RevB"**), please download **"tSH700fw_vxxx_xxxxxx.zip"** firmware file to update, as following figures illustrate:



Module Name: **tSH-700** <sup>RevB</sup>
Firmware file: **tSH700_RevBxxx_xxxxxx.zip**

Module Name: **tSH-700**
Firmware file: **tSH700fw_vxxx_xxxxxx.zip**

# 1. Setting up the tSH-700

Before updating the firmware, ensure that the network settings for both your host computer and any tSH-700 modules are correctly configured, or the update procedures via the Ethernet network may not function correctly.

---

*Step 1: Connect the tSH-700 to the same hub or the same sub-network as your Host PC, and attach a power supply to the tSH-700. Do not connect the tSH-700 to a router or directly to the Internet as this may cause the update process to fail.*

---

Refer to "**Chapter 3-Connecting the Power and Host PC"** in the tSH-700 Quick Start Guide for more detailed information.
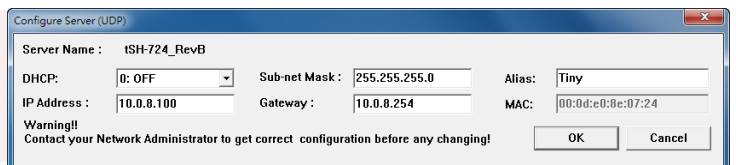
[Download the Quick Start Guide.](#)

*Step 2: Download and Install the eSearch Utility on your Host PC, and then run the Utility to search for any tSH-700 modules connected to the network.*
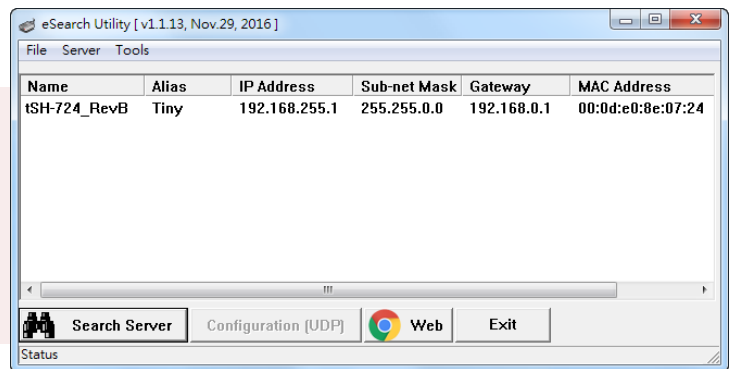
[Download the eSearch Utility.](#)

*Step 3: Configure the correct network settings for the required tSH-700 module.*

Refer to **"Chapter 5-Configuring the Correct Network Settings"** in the tSH-700 Quick Start Guide. If the IP address settings do not work correctly, refer to **note1 (Page 19)** below.

[Download the Quick Start Guide.](#)

# 2. Firmware Update Procedure

The firmware update can fail when the computer has multiple network interfaces (e.g., LAN and Wi-Fi). Therefore, enable only one network interface for updating the firmware, and temporarily turn off other network interfaces, firewalls, and anti-virus software first.

Two methods can be used to update the firmware: **"Local Firmware Update" (traditional)** and **"Remote Firmware Update" (TeamViewer)**. The Local Firmware Update method requires the user to manually adjust the position of the Init/Run Switch and reboot the module in order to initialize the of firmware update. Refer to Section 2.1 "Local Firmware Update" for more details. The Remote Firmware Update method allows the user to initialize the module via a web interface without needing to adjust the hardware switch. Initialization via the web interface is useful when the module is installed at a remote site and can be accessed via the TeamViewer application installed on a remote PC. Refer to Section 2.2 "Remote Firmware Update" for more details.

## 2.1   Local Firmware Update

*Step 1: In the eSearch Utility, click the "Search Servers" button to search for any tSH-700 modules connected to the network . (The network settings of the tSH-700 module are described in Step 3 of Chapter 1 above)*

*Step 2: Right click the name of the tSH-700 module to be updated.*

*Step 3: Select the "Firmware Update" item from the popup menu and the "Open" dialog box will be displayed.*
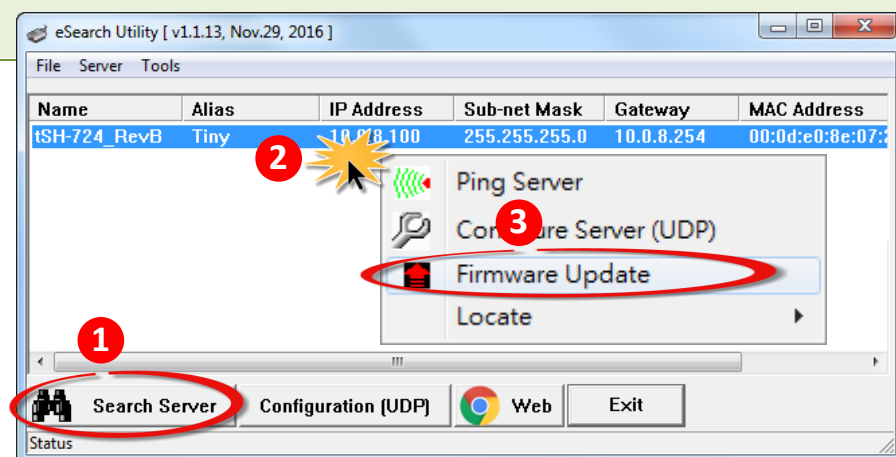
**Step 4: In the "Open" dialog box, select the firmware file (tSH700.dat /tSH700_RevB.dat) that will be used to update the module, and then click the "Open" button.**



Download the Firmware File.

| Firmware File | Supports tSH-700 module |
|---|---|
| tSH700.dat | tSH-700 Series |
| tSH700_RevB.dat | tSH-700 RevB Series |
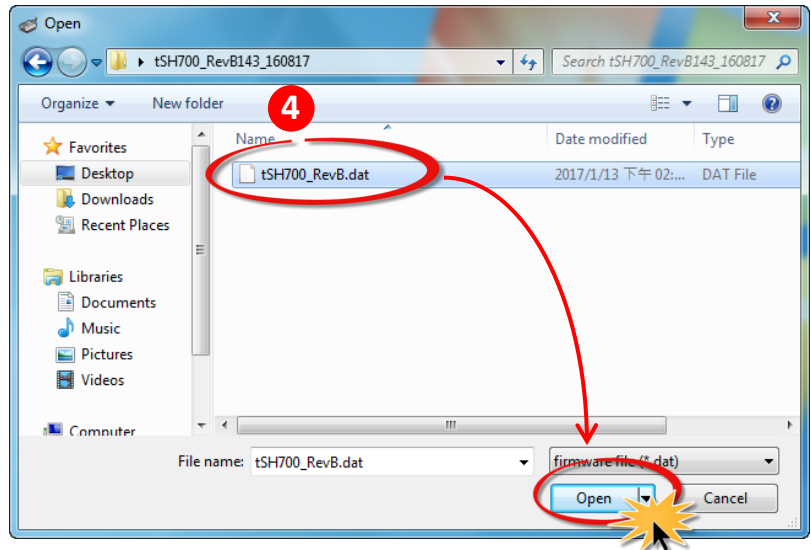


**Step 5: Assign a valid IP Address (can be different with the current IP) and the factory-default MAC Address for the tSH-700 module. If this IP address is invalid (e.g. IP Address: 0.0.0.0) or a user-defined MAC address is assigned, refer to note 2 (Page 19) and note 3 (Page 20) below for more details.**
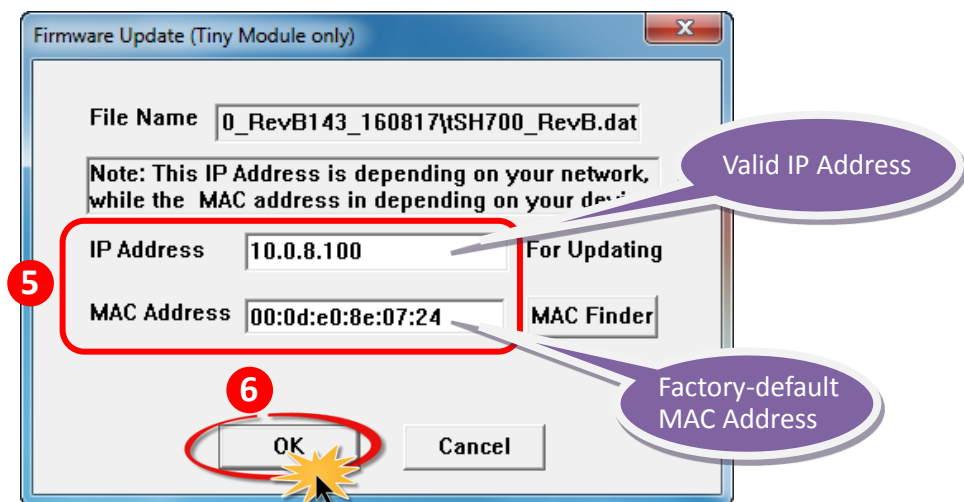
**Step 6: Click the "OK" button.**

**Step 7: The module is now ready for the firmware update. A Command Prompt window will be displayed to indicate the progress of the update.**



Waiting for a request from the tSH-700 module to begin updating the device
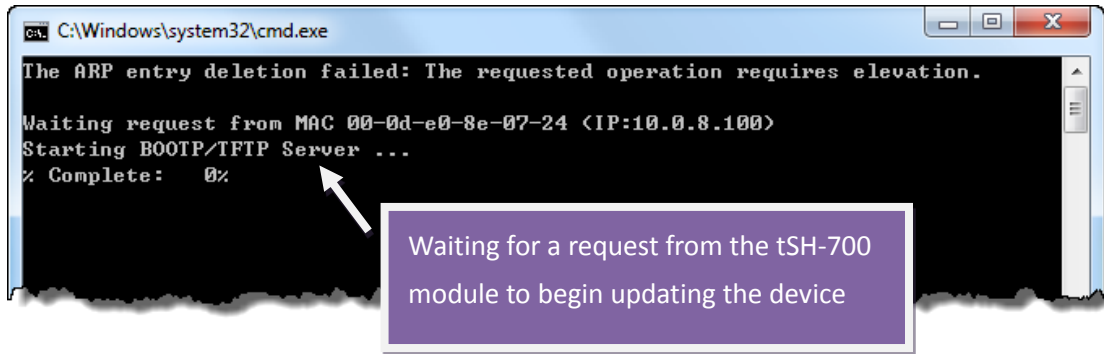
**Step 8: Set the "Init Switch" on the tSH-700 module to the "Init" position.**



**Step 9: Power-on reset the tSH-700 module in "Init Mode" to initiate the update.**

**Step 10: Confirm that the two MAC addresses (factory-default) listed in the Command Prompt window, "Waiting request from MAC x.x.x.x" and "BOOTPREQ from MAC: x.x.x.x", are the same, as indicated in the image below. If these addresses do not match, the update cannot proceed. Refer to note4 (Page 19) below for more details.**
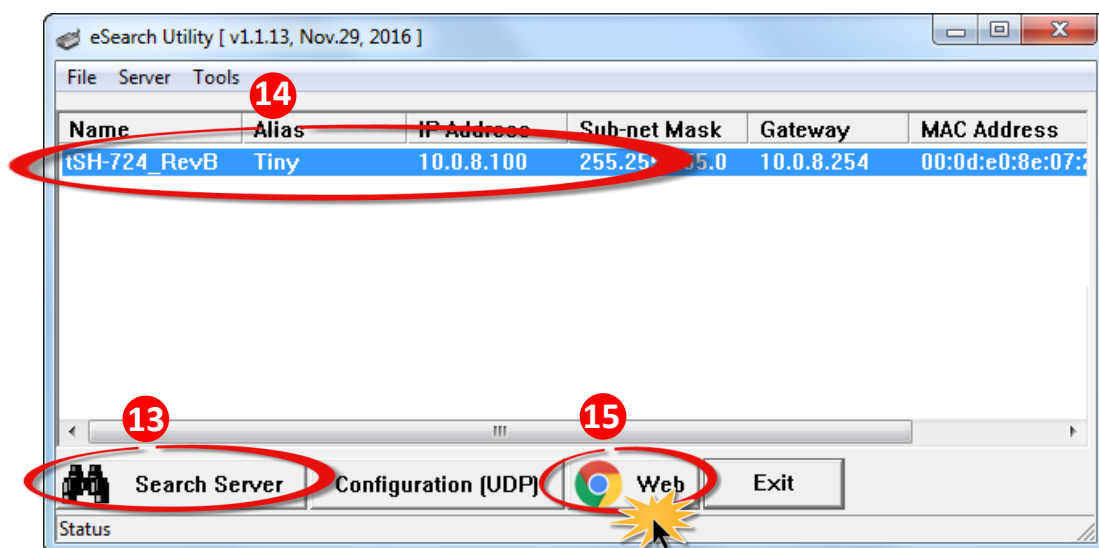


Waiting for a request from this MAC Address

Firmware update begins

Request received from this MAC Address
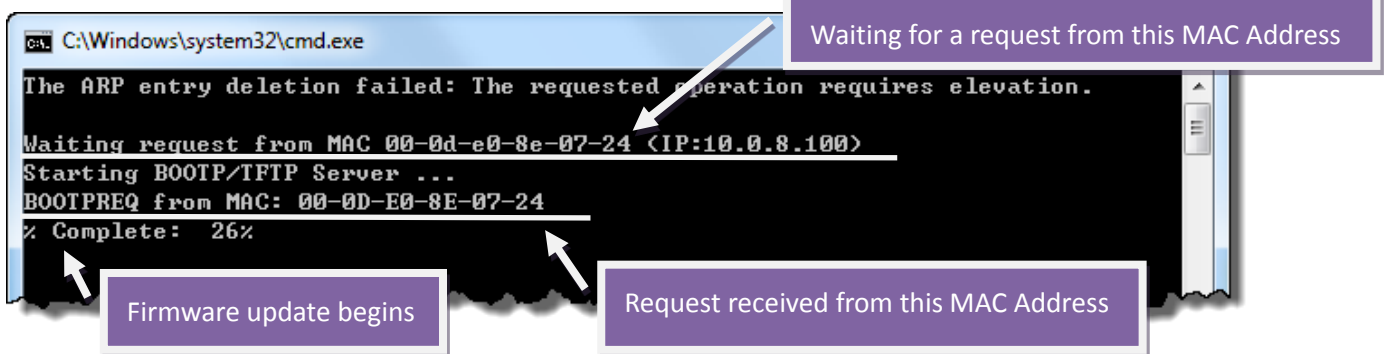
**Step 11:** Once the update is complete (i.e., when the progess indicator reaches 100%), set the "Init Switch" to the "Run" position.

**Step 12:** Power-on reset the tSH-700 module to operate the module in "Run Mode".

**Step 13:** In the eSearch Utility, search for the tSH-700 module again to verify that it is functioning correctly. Note that the network settings for the module may need to be reconfigured after updating the firmware. Refer to Step 3 in Chapter 1 above for more details.
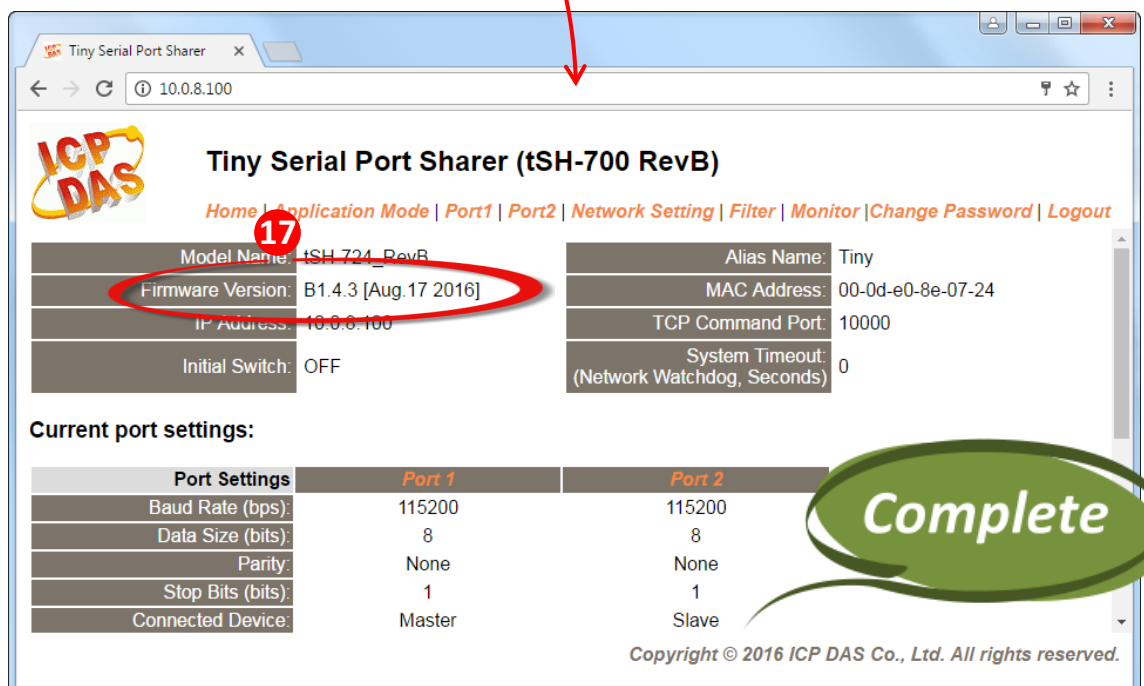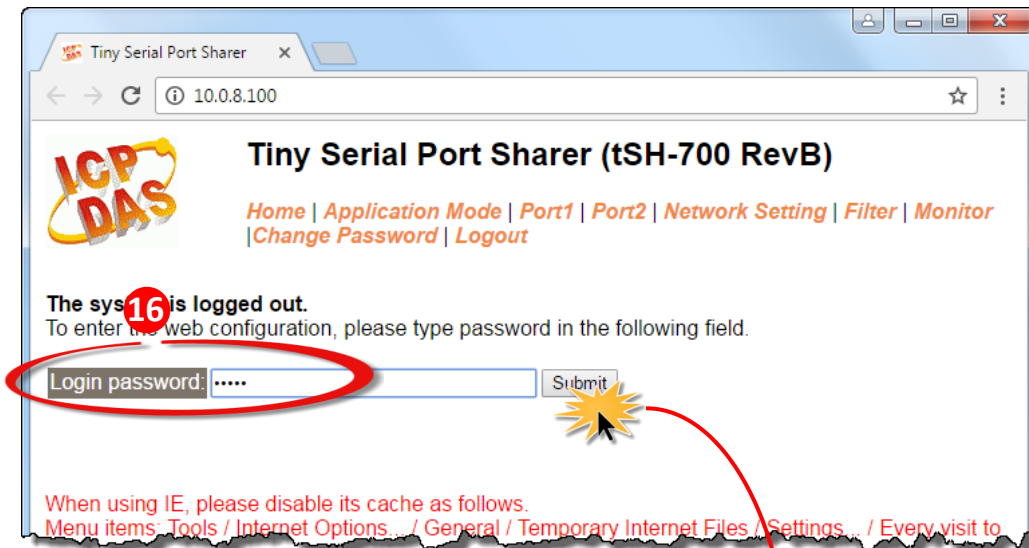
**Step 14:** Click the name of the tSH-700 module to highlight it.

**Step 15:** Click the "Web" button and the default web browser will be opened.

*Step 16: Log in to the web configuration pages for the tSH-700 (use the default password "admin").*

*Step 17: Verify that the version and date details for the firmware are correct.*
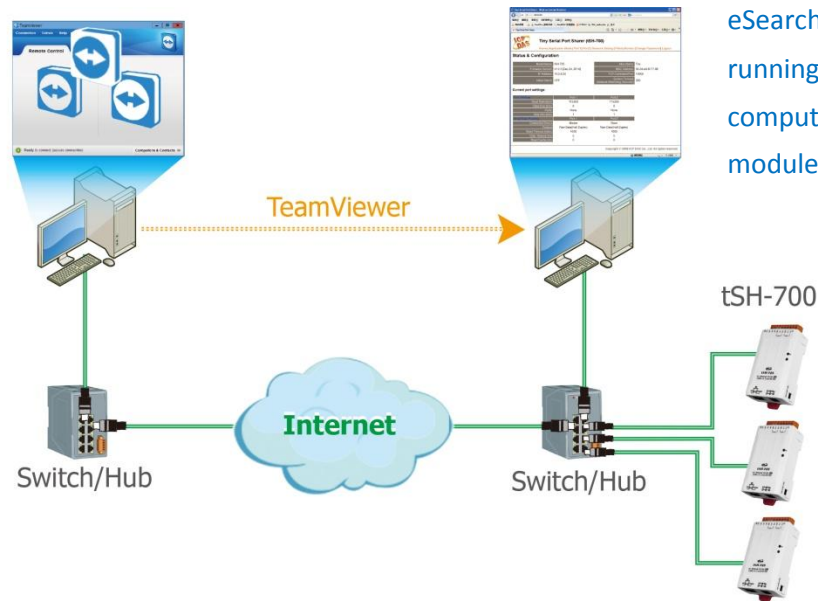
## 2.2   Remote Firmware Update

In order to perform a Remote Firmware Update, use an application that allows an external system to be remotely controlled, such as TeamViewer, in order to create a connection between the local and the remote system. **Note that all firmware update procedures need to be carried out on the remote system.**

User is there remotely controlling the firmware update procedures.



eSearch Utility is running on the computer to update module's firmware.

Follow the procedure described below to update firmware of the tSH-700 on the remote PC:

*Step 1: In the eSearch Utility, click the "Search Servers" button to search for any tSH-700 modules connected to the network . (The network settings the tSH-700 module are described in Step 3 of Chpater 1)*

*Step 2: Right click the name of the tSH-700 module to be updated.*

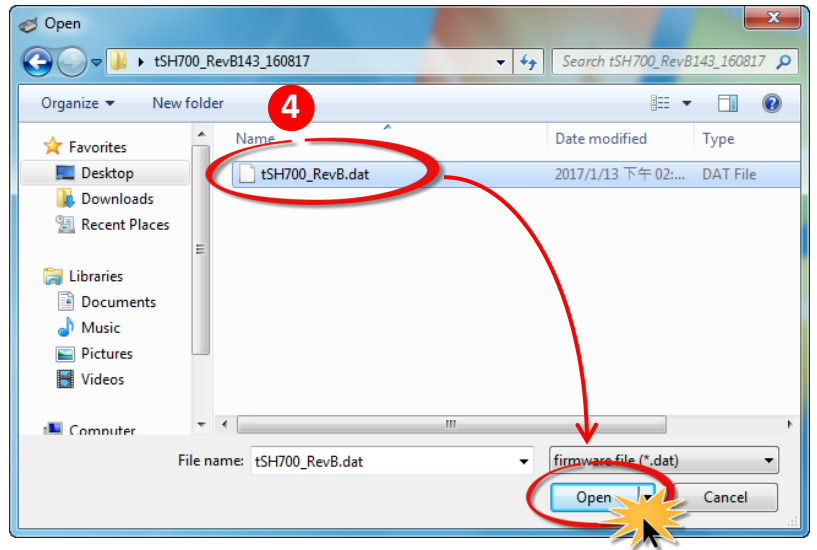*Step 3: Select the "Firmware Update" item from the popup menu and the "Open" dialog box will be displayed.*
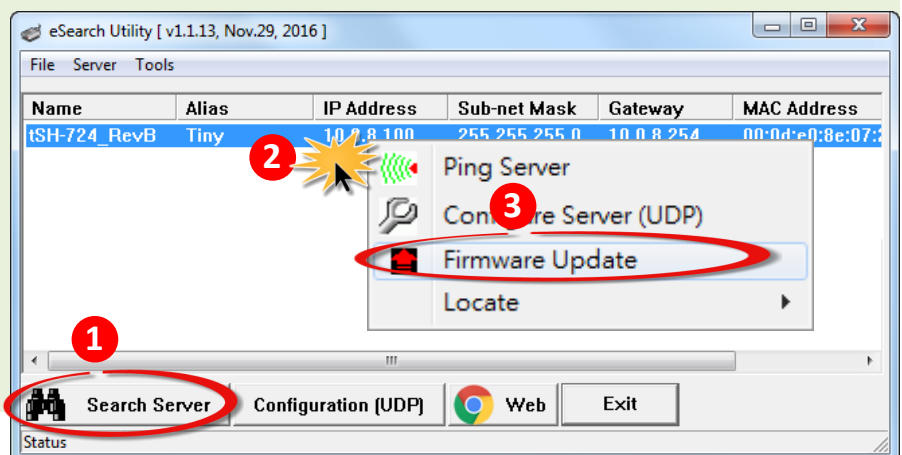
**Step 4: In the "Open" dialog box, select the firmware file (tSH700.dat) that will be used to update the module, and then click the "Open" button.**

Download the Firmware File.

| Firmware File | Supports tSH-700 module |
|---|---|
| **tSH700.dat** | tSH-700 Series |
| **tSH700_RevB.dat** | tSH-700 $^{RevB}$ Series |

**Step 5: Assign a valid IP Address (can be different with the current IP)and the factory-default MAC Address for the tSH-700 module. If this IP address is invalid (e.g. IP Address: 0.0.0.0) or a user-defined  MAC address is assigned, refer to note 2 (Page 19) and note 3 (Page 20) above for more details.**
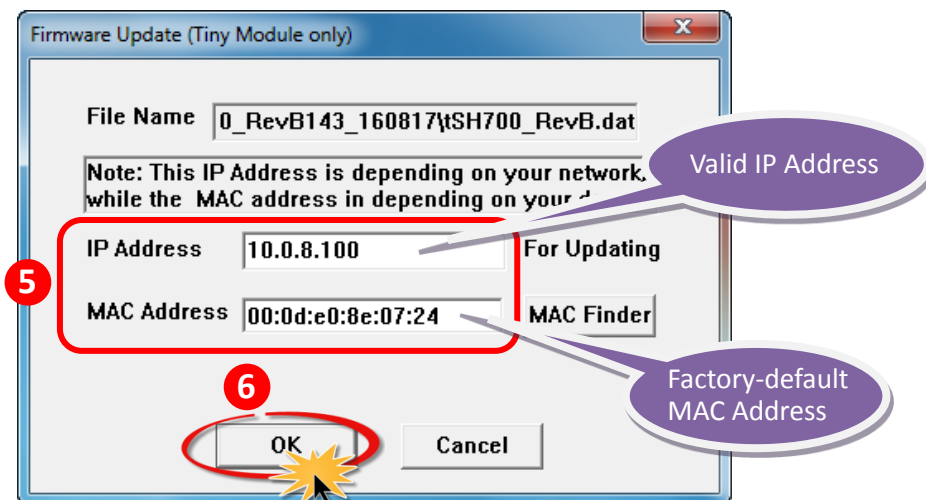
**Step 6: Click the "OK" button.**

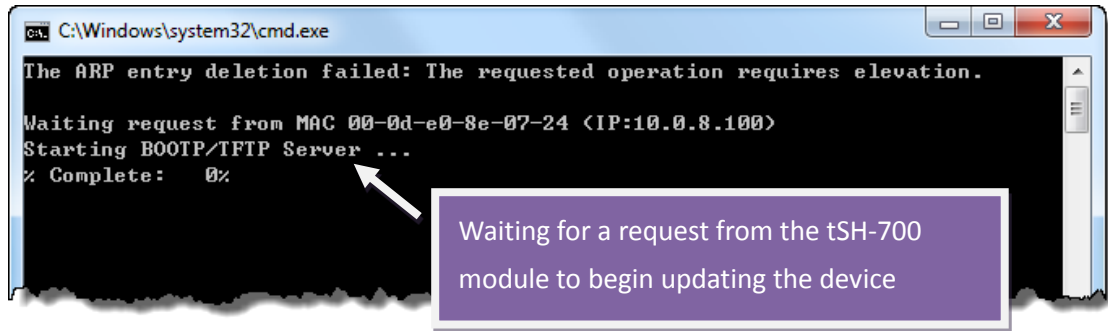**Step 7: The module is now ready for the firmware update. A Command Prompt window will be displayed to indicate the progress of the update.**



Waiting for a request from the tSH-700 module to begin updating the device

**Step 8: Open a web browser such as Internet Explorer or Firefox and enter the URL for the tSH-700 in the address bar of the browser and log in to the web configuration pages (use the default password "admin").**
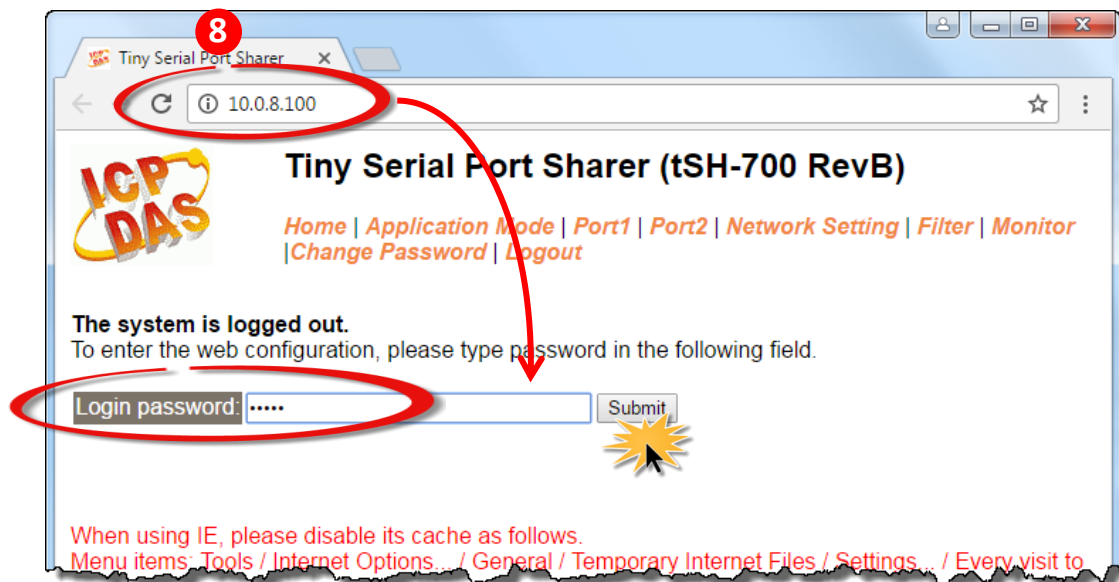
*Step 9: Click the "Network Setting" tab to display the Network and Miscellaneous Settings page.*

*Step 10: Click the "Update" button in the "Firmware Update" section to start the update.*



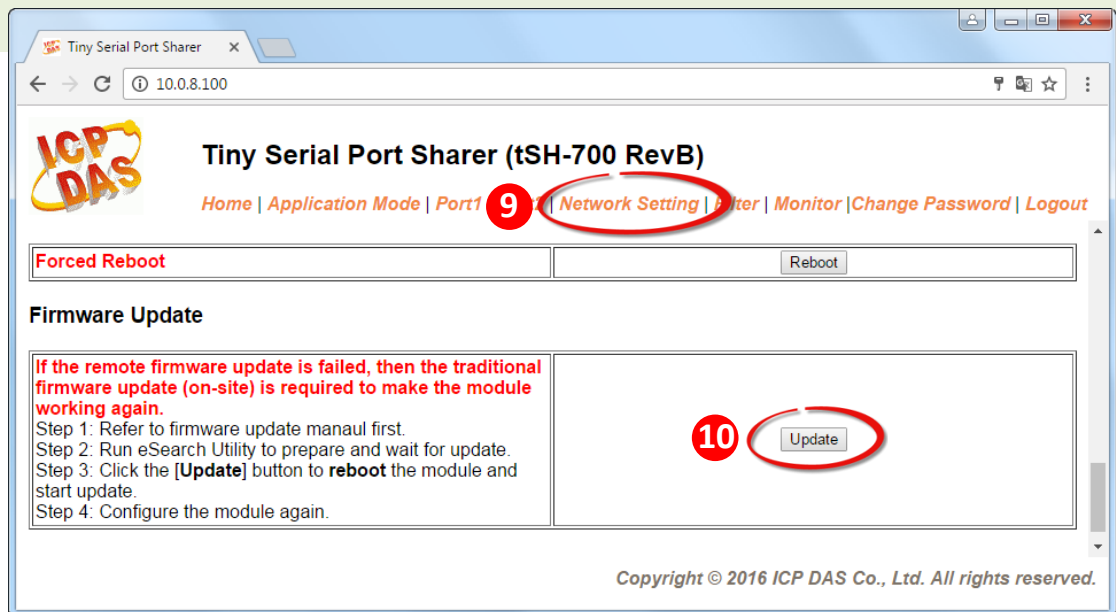*Step 11: Confirm that the two MAC addresses (factory-default) listed in the Command Prompt window, "Waiting request from MAC x.x.x.x" and "BOOTPREQ from MAC: x.x.x.x", are the same, as indicated in the image below. If these addresses do not match, the update cannot proceed. Refer to note4 (Page 19) below for more details.*

*Step 12: Once the update is complete (i.e., when the progess indicator reaches 100%), close the Command Prompt window.*



Waiting for a request from this MAC Address

Request received from this MAC Address

Firmware update begins
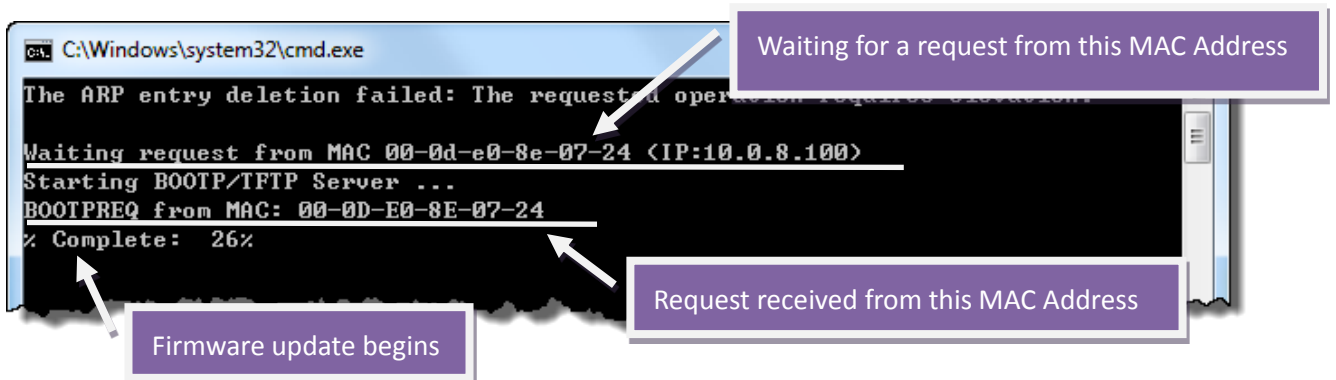
**Note: If the Remote Firmware Update method fails, please refer to** Section 3.1 Firmware update in BOOT mode **(local operation) to restore the module.**

**Step 13:** In the eSearch Utility, search for the tSH-700 module again to verify that it is functioning correctly. *Note that the network settings for the module may need to be reconfigured after updating the firmware. Refer to Step 3 in Chapter 1 above for more details.*
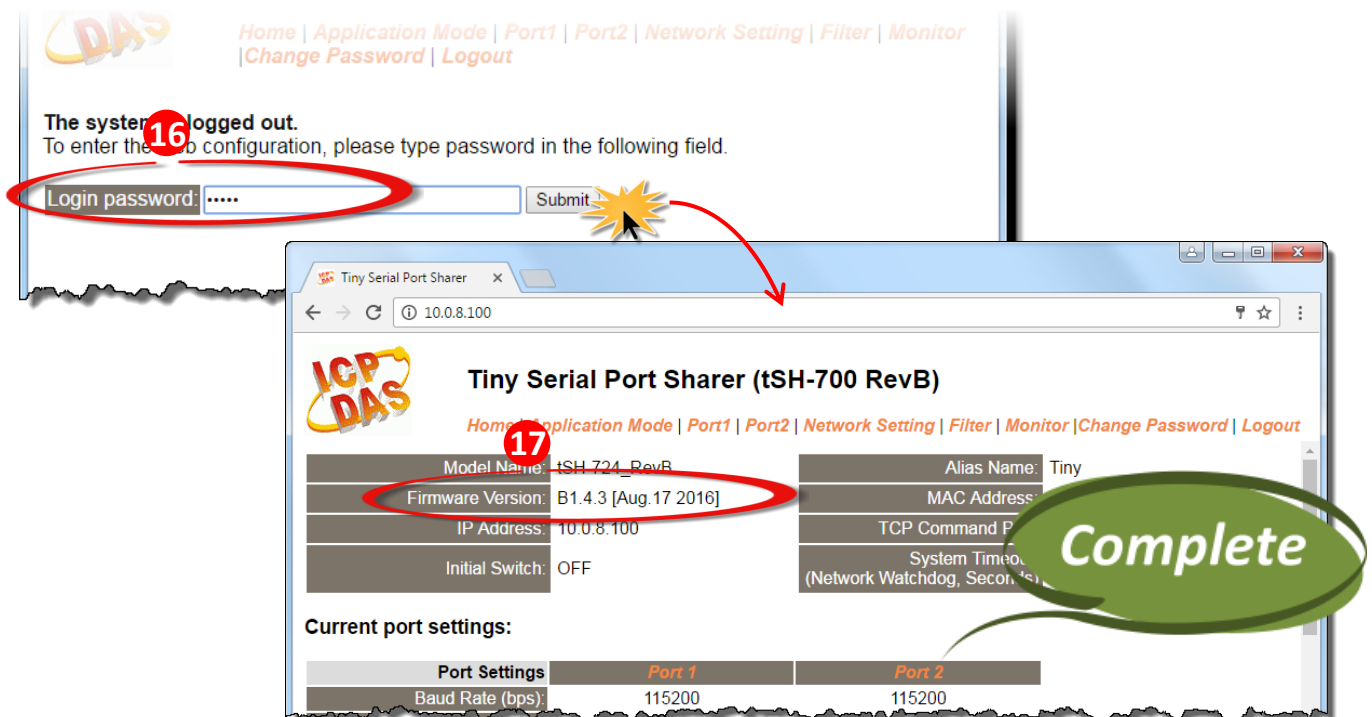
**Step 14:** Click the name of the tSH-700 module to highlight it.

**Step 15:** Click the *"Web"* button and the default web browser will be opened.
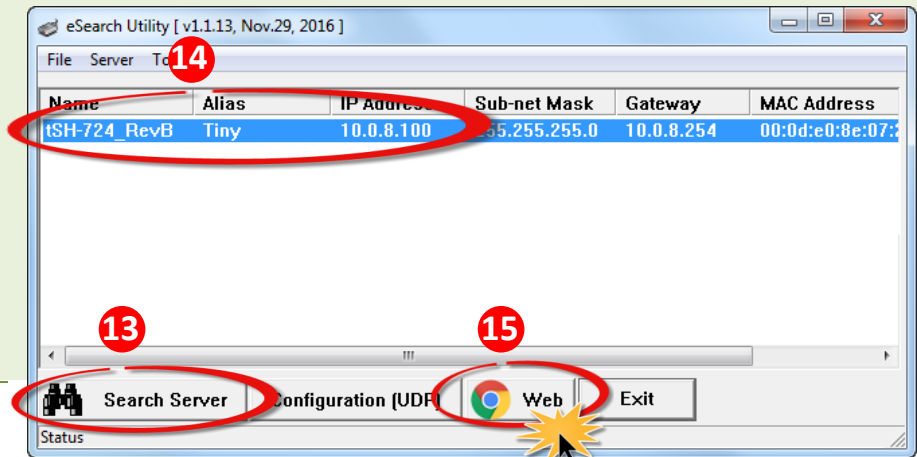


**Step 16:** Log in to the web configuration pages for the tSH-700 *(use the default password and "admin")*.

**Step 17:** Verify that the version and date details for the firmware are correct.

# 3. Troubleshooting

## 3.1  Firmware update in BOOTP mode

If the module is not functioning correctly (e.g., if there is no response to the search request, or if the system LED is  continuously either on or off), download a  new image of the firmware from the ICPDAS web site  and  then update the firmware for the module using the following procedure.

*Step 1: In the eSearch Utility, select the "BOOTP" item from the "Server" menu. A check mark should be displayed next to the item after it has been selected.*
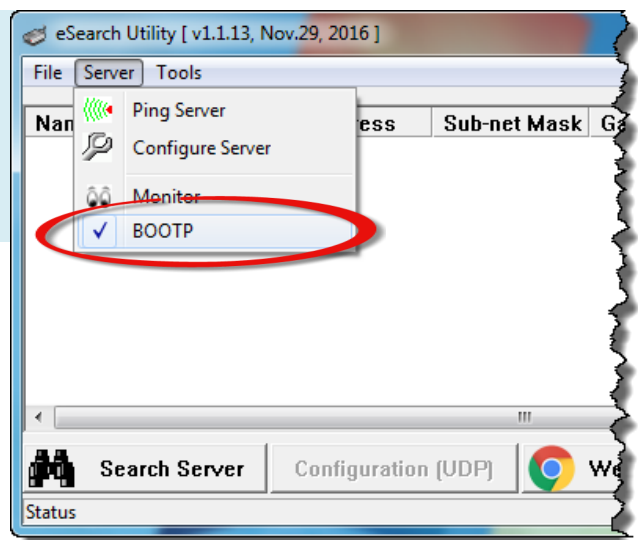


*Step 2: Set the "Init Switch" to the "Init" position.*

*Step 3: Power-on reset the tSH-700 module and then click the "Search Servers" button to search for the tSH-700 at the same time. Note, the module sends BOOTP messages about 5 seconds when booting in Init Mode. If this step is not successful, reboot the module and execute the search again.*

*Step 4: Right click the "BOOTP" entry in the Name field and then select the "Firmware Update" item from the popup menu.*
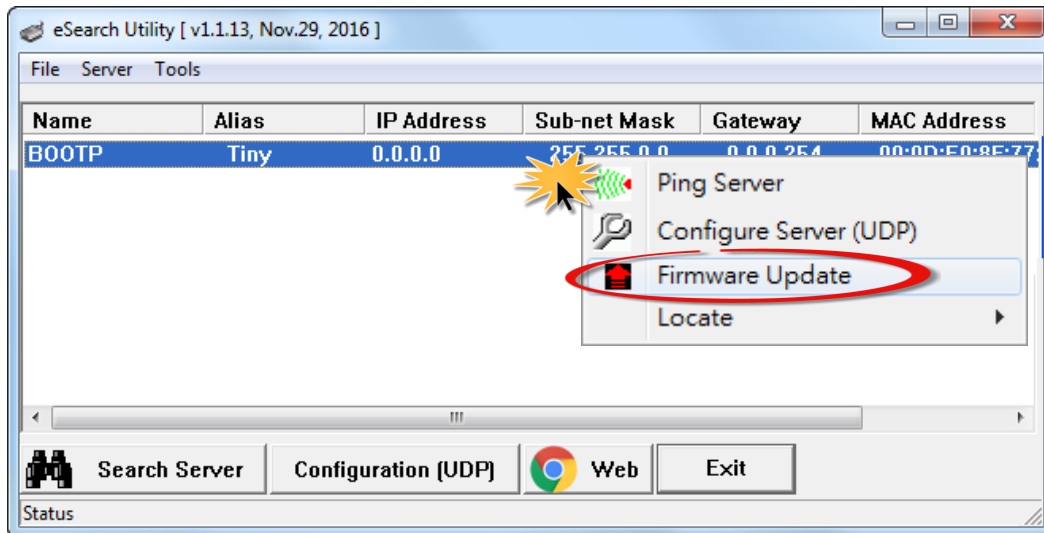


*Step 5: Refer to Steps 4 to 17 in "Chapter 2-Firmware Update Procedure" for details of how to complete the update process. Note, the module will response with no IP address in the BOOTP mode. User has to assign a valid IP manually in step 5 of page 4.*

*Step 6: After updating the firmware, disable BOOTP mode in the eSearch utility by unchecking the "BOOTP" item from the "Server" menu.*
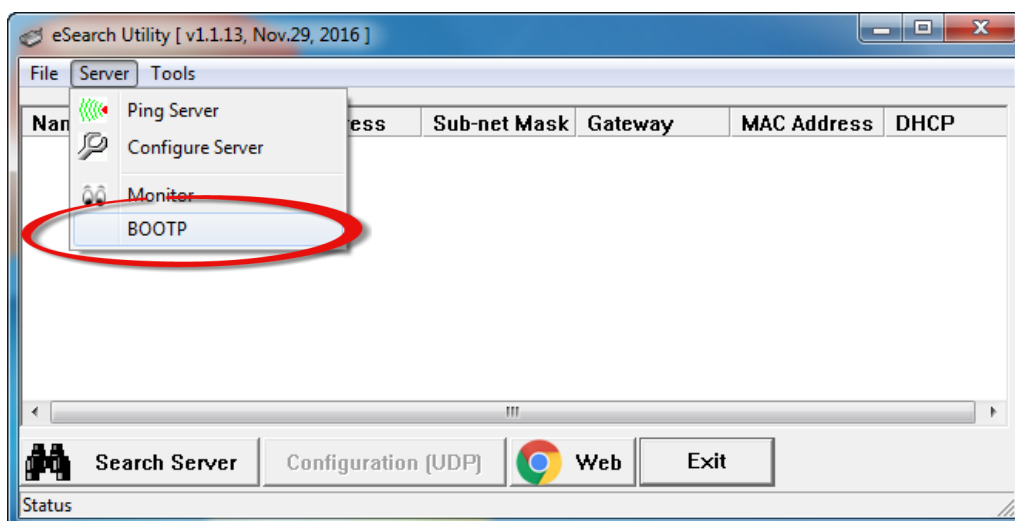
# 3.2 How to update Firmware when the Different Network Segment for IP Address of the tSH-700 and Host PC.

For example, the first time to get the tSH-700 module, the factory default IP address is 192.168.255.1, but the host PC IP address is 10.0.8.31, refer to the following two methods to update firmware.

**Method 1:** Using **"Dynamic Host Configuration Protocol (DHCP)"** to automatically assigns an IP address to tSH-700 module. Follow the procedure described below:

*Step 1: Run the eSearch Utility to search for any tSH-700 modules to the network*

*Step 2: Double click the name of tSH-700 to open the "Configure Server (UDP)" dialog box.*
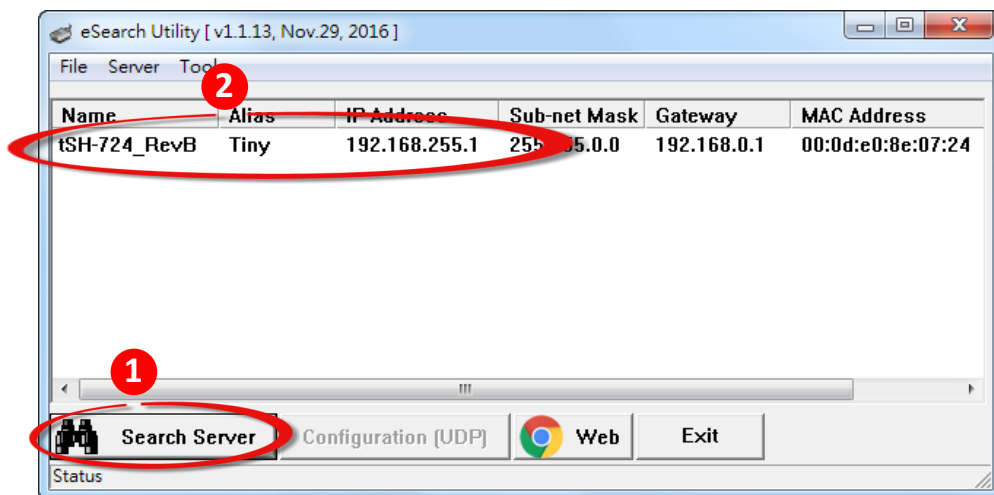


*Step 3: Select the "1: ON" option from the "DHCP:" drop-down menu and click the "OK" button.*
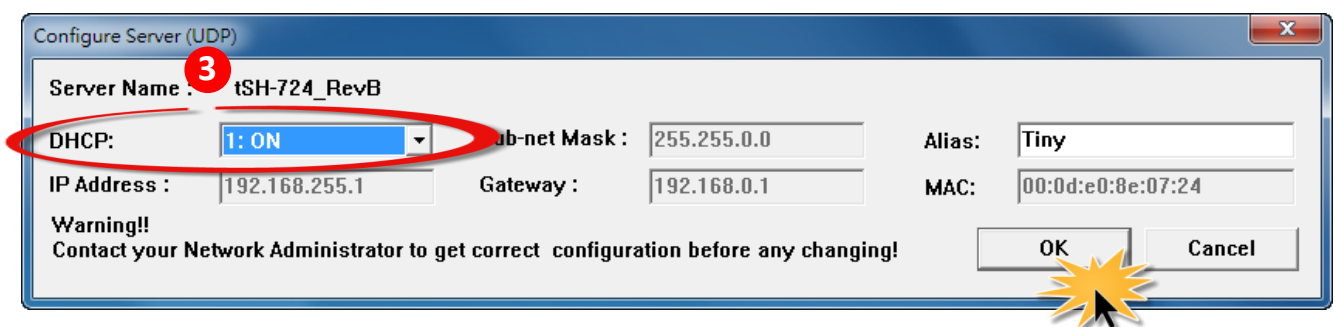
**Step 4: Wait 2 seconds and then click the "Search Servers" button again to ensure the tSH-700 is working well with new configuration.**



**Step 5: Refer to "Chapter 2-Firmware Update Procedure" for details of how to complete the update process.**

**Method 2:** Using **"Manual configuration"** to assigns an IP address to tSH-700 module. Follow the procedure described below:

**Step 1: Run the eSearch Utility to search for any tSH-700 modules to the network**

**Step 2: Double click the name of tSH-700 to open the "Configure Server (UDP)" dialog box.**



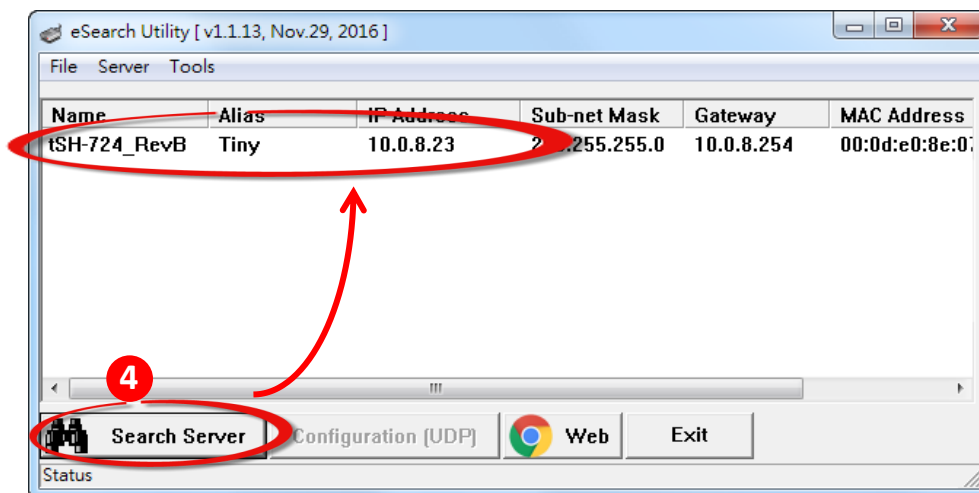**Step 3: Select the "0: OFF" option from the "DHCP:" drop-down menu.**

**Step 4: Contact your Network Administrator to obtain a correct network configuration (such as IP Address/Sub-net Mask/Gateway). Enter the network settings and click the "OK" button.**
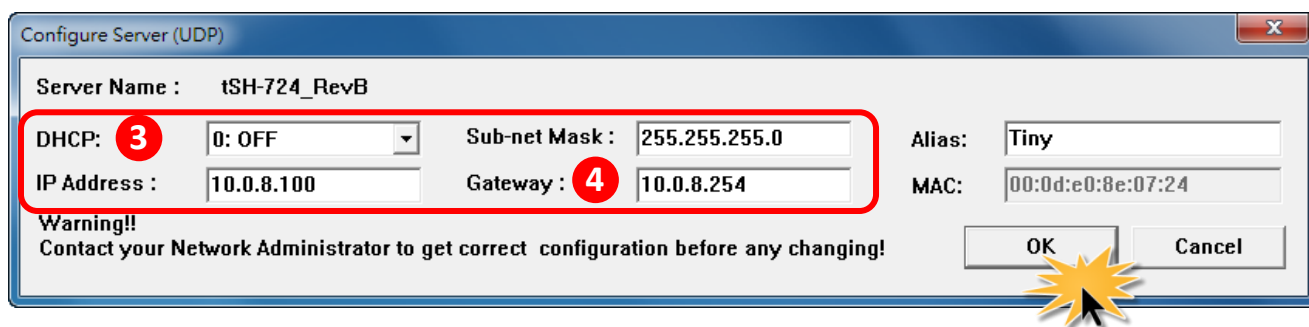
**Step 5:** *Wait 2 seconds and then click the* *"Search Servers"* *button again to ensure the tSH-700 is working well with new configuration.*
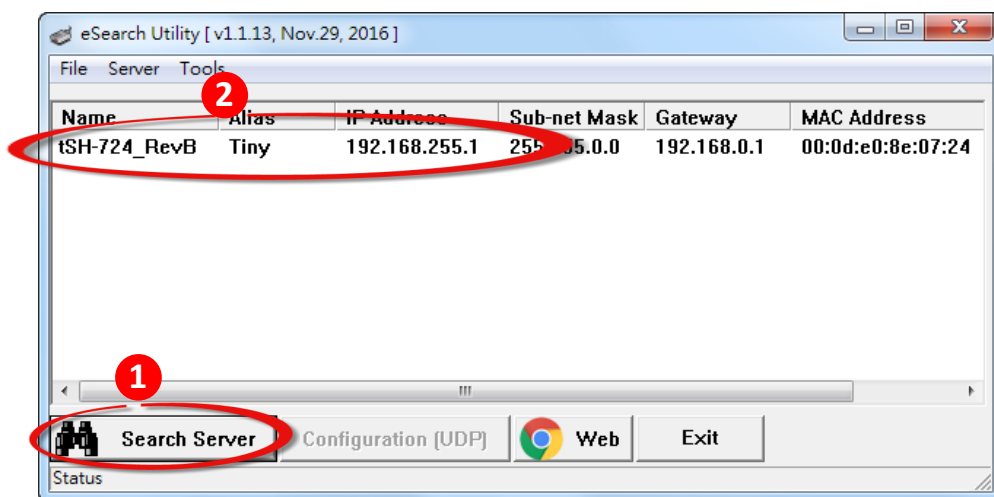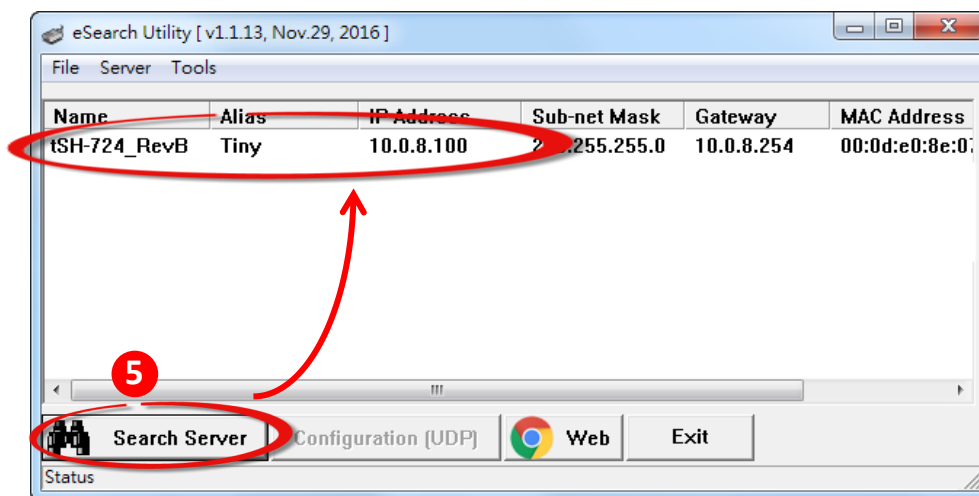


**Step 6:** *Refer to* *"Chapter 2-Firmware Update Procedure"* *for details of how to complete the update process.*

# 4. Additional Information

**The code contained in the boot loader, which is used to update the firmware image, is not part of the firmware it-self. This means that the firmware can still be updated even if the built-in firmware has been corrupted or does not exist. If the firmware update fails, simply execute the update procedure again in BOOTP mode, as described in Chapter 3, and the update should be successful.**

The tSH-700 series obtains the IP address assigned by the user and retrieves the firmware image through the utility program. *Note that when updating the firmware, the tSH-700 series uses the factory-default MAC address rather than any user-defined MAC addresses.* The tSH-700 has a built-in flash protection feature that prevents any modifications from being made to the firmware stored in the flash memory, so before attempting to update the firmware, the "**Init Switch**" should be set to the "**Init**" position and then the tSH-700 can be **Power-on reset** to disable the flash protection. Since the flash memory then becomes writable, the firmware can be updated via the Ethernet network.

| Mode | Flash Protection | Firmware Update | Configuration |
|------|------------------|-----------------|---------------|
| **Init** | No | **Yes** | Factory-default |
| Run | Yes | No | User-defined |

## Notes:

⚠️**Note 1:** If the IP address settings do not work correctly (e.g. there is no response to a ping command), contact the network administrator to obtain a valid IP address for the tSH-700 module. ……………………………………………………………………………………………………………………. back

⚠️**Note 2:** If the settings displayed in the IP address field of the firmware update window is incorrect or invalid (e.g., IP address: 0.0.0.0), a valid IP address must be manually specified for the tSH-700 in order to process the update operation. Contact the network administrator to obtain a valid IP address before proceeding.

………………………………………………………………………………………………………………………. back

⚠️ **Note 3:** When updating the firmware, the factory-default MAC address is used rather than any user-defined MAC address. Thus, the MAC address (user-defined) displayed in the firmware update window may not be the one required. If this is the case, the factory-default MAC address should be manually entered into the MAC Address field, or the MAC address should be restored to the factory-default settings via the web configuration pages.

..................................................................................................................... <u>back</u>

⚠️ **Note 4:** The **"BOOTPREQ from MAC: xx-xx-xx-xx-xx-xx"** message indicates there is a module with the factory-default MAC address "xx-xx…" that is asking for the firmware to be updated. The update process will not begin if a user-defined MAC address is assigned in the firmware update window, since the addresses do not match. If this situation occurs, repeat the update procedure and manually enter the factory-default MAC address in the firmware update window, as described in **Step 5 on Page 4**. The firmware update procedure is illustrated in the figure below.

| **tSH-700 Series** | | **eSearch Utility** |
|---|---|---|
| Broadcasts its **MAC address** (Note: Some routers can block packets) | **BOOTP** → | Checks whether the received **MAC address** is the same as the user-assigned **MAC address** |
| Applies this **IP address** | ← | Assigns the **IP address** to the tSH-700 |
| Establishes a connection | **TFTP** → | Accepts the connection |
| Receives the new firmware image | ← | Begins the firmware update process |

..................................................................................................... <u>back</u>

⚠️ **Note 5:** The Bootstrap Protocol (BOOTP) is defined in RFC-951 and uses UDP ports 67 and 68.

⚠️ **Note6:** The Trivial File Transfer Protocol (TFTP) is defined in RFC-1350 and uses UDP port 69.