Firmware Update via Ethernet

Version 1.0.0 Sep. 2018

LRA-900-E

(Ethernet to LoRa Radio Modem)



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1. Setting up the LRA-900-E

Before updating the firmware, please ensure thatthe network settings for both your host computer and any LRA-900-E modules are correctly configured, or the update procedures via the Ethernet network may not function correctly.

Step 1:

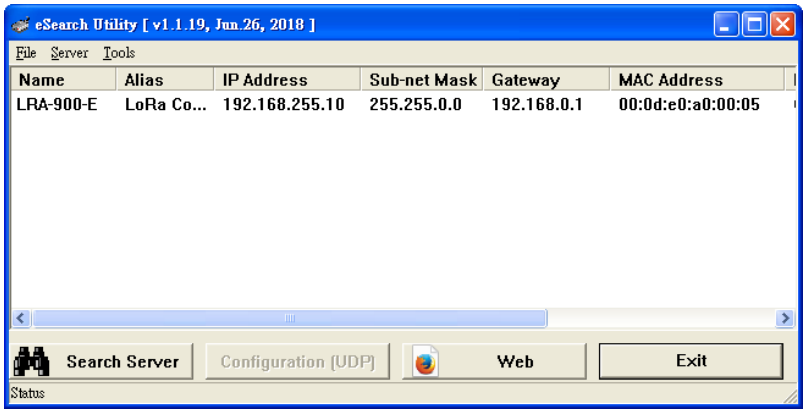
Connect the LRA-900-E to the same hub or the same sub-network as your Host PC, and attach a power supply to the LRA-900-E. Do not connect the LRA-900-E to a router or directly to the Internet as this may cause the update process to fail.

Please refer to "**Chapter3-Connecting the Power and Host PC"** in the LRA-900-E Quick Start Guide for more detailed information.
Download the Quick Start Guide.

Step 2:

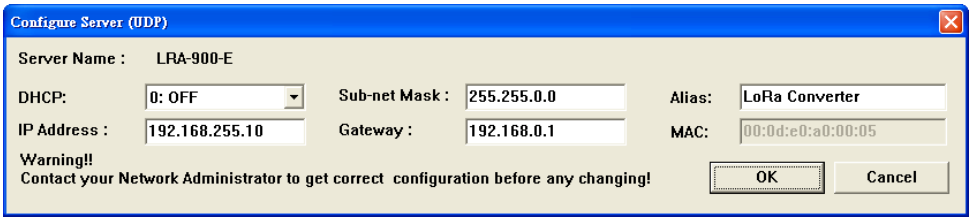
Install the eSearch Utility on your Host PC, and then run the Utility to search for any LRA-900-E modules connected to the network.

Download the eSearch Utility.



Step 3:

Configure the correct network settings for the required LRA-900-E module.



Please refer to **"Chapter4-Configuring Ethernet Settings"** in the LRA-900-E Quick Start Guide. If the IP address settings do not work correctly, please refer to **note1(Page 20)**.

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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.

2.1. Firmware Update

Two methods can be used to update the firmware: **"Local FirmwareUpdate"(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 firmware update. Refer to Section 2.1.1"Local Firmware Update" for more details. The Remote Firmware Update method allows the user toinitialize 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 a ccessed via the TeamViewer application installed on a remote PC. Refer to Section 2.1.2 "Remote Firmware Update" for more details.

2.1.1. Local Firmware Update

Step 1:

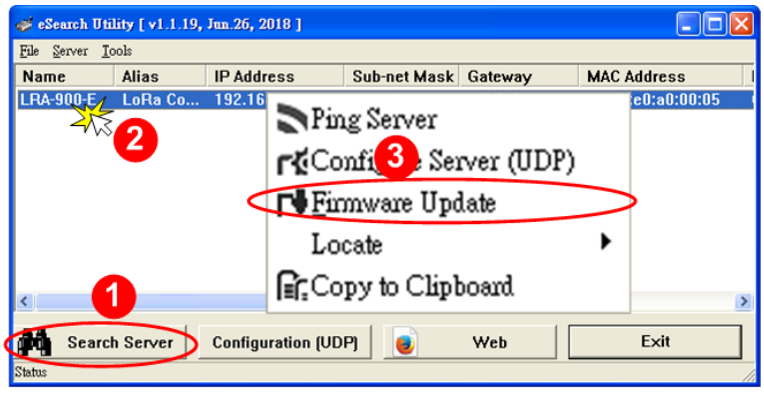
In the eSearch Utility, click the "Search Server" button to search for any LRA-900-E modules connected to the network. (The network settings of the LRA-900-E module as described in Step 3 on Chapter1)

Step 2:

Right click on the name of the LRA-900-E module to be updated.

Step 3:

Select the "Firmware Update" item from the popup menu and the "Open" dialog box will be displayed.



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Step 4:

In the "Open" dialog box, select the firmware file (*.dat) that will be used to update the module and then click the "Open"button.

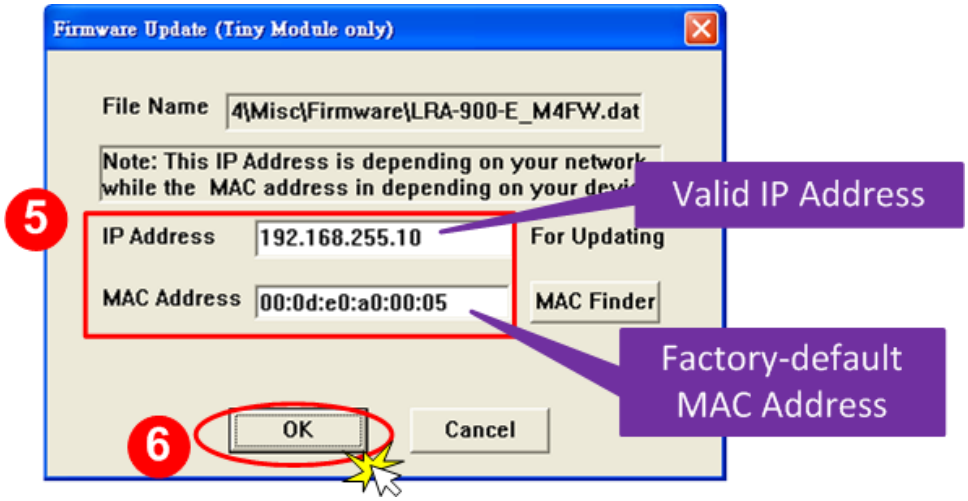
Download the Firmware File.

Step 5:

Assign a valid IP Address (can be different with the current IP) and the factory-default MAC Address for the LRA-900-E module. If this IP addressis invalid (e.g. IP Address: 0.0.0.0) or a user-defined MAC address is assigned. Refer to note2(Page 20) and note 3(Page21) for more details.

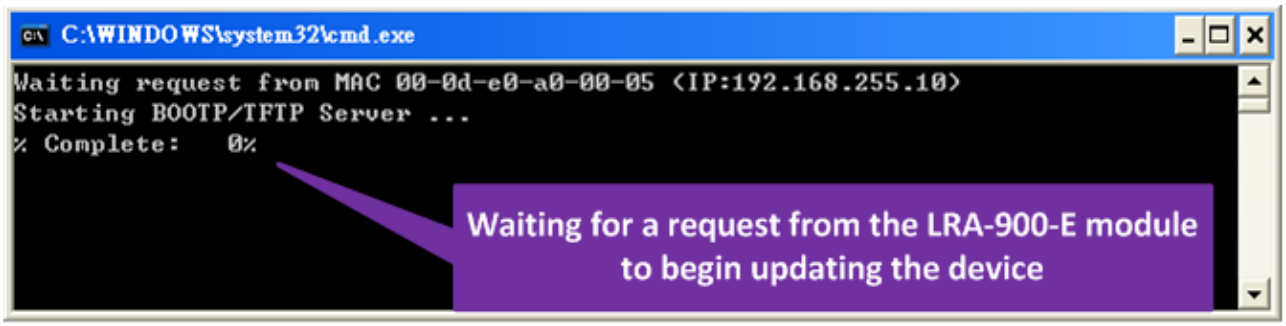
Step 6:

Click the "OK" button.



Step 7:

You are now ready to update the firmware. A Command Prompt windows will be displayed the progress of the update.



Step 8:

Set the "Init Switch" on theLRA-900-E module to the "Init" position.

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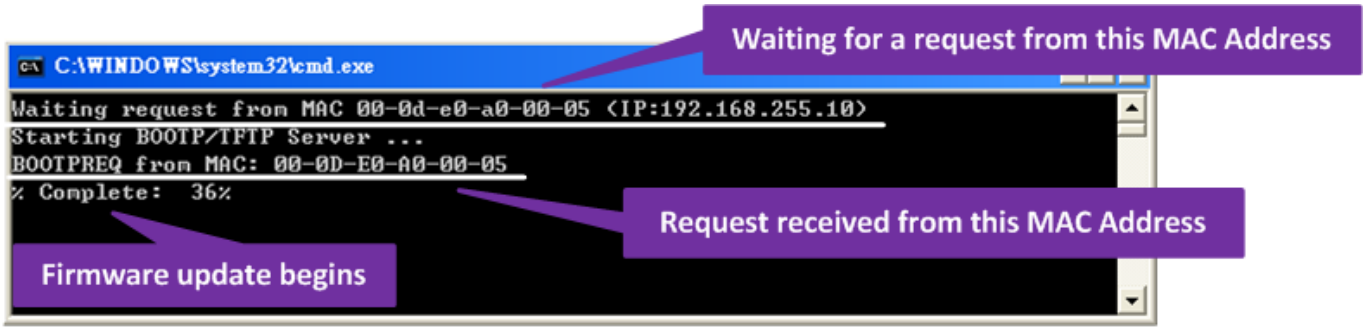
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Step 9:

Power-on reset the LRA-900-E 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 can not proceed. Refer to note4 (Page 21) below for more details.



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 LRA-900-E module to operate the module in "Run Mode".

Step 13:

In the eSearch Utility, search for the LRA-900-E 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 Chapter1 above for more details.

Step 14:

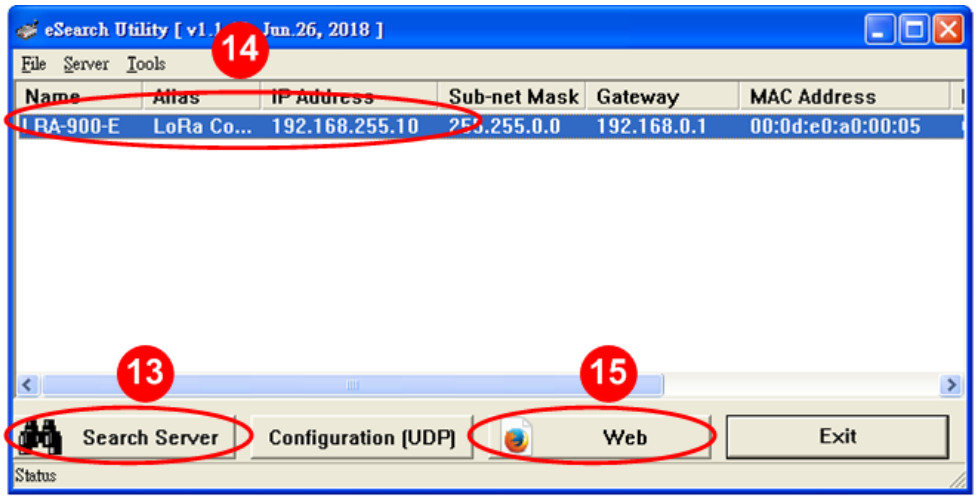
Click the name of the LRA-900-E module to highlight it.

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Step 15:

Click the "Web" button and the default web browser will be opened.

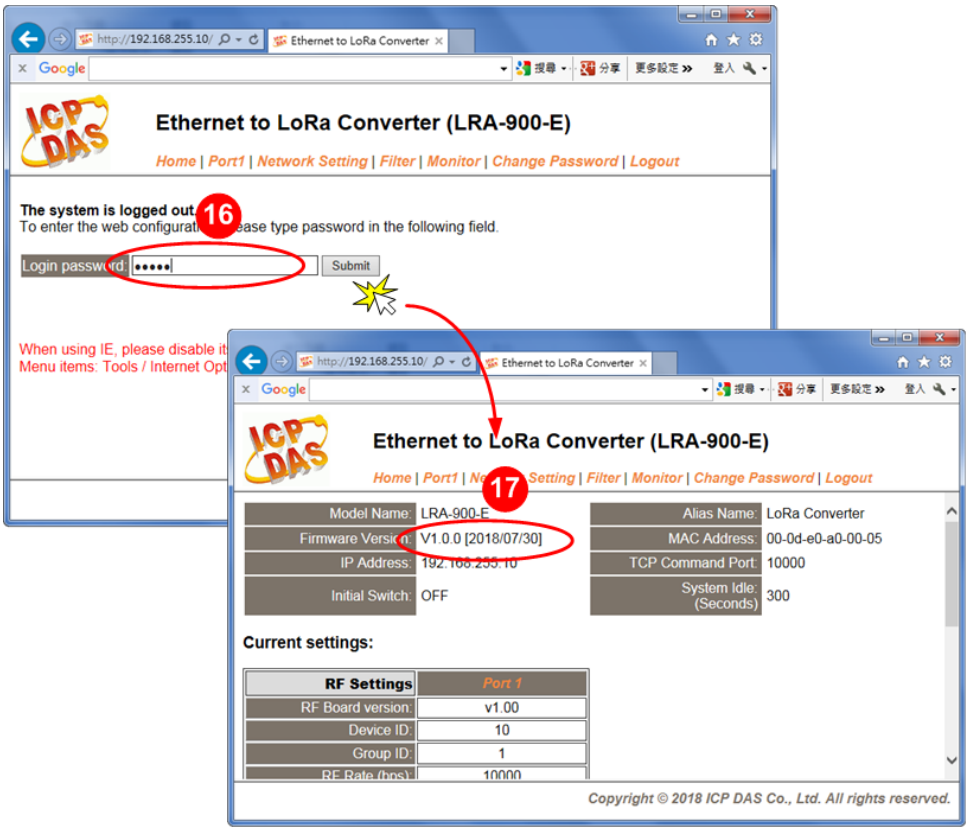


Step 16:

Login to the web configuration pages for the LRA-900-E (use the default password "admin").

Step 17:

Verify that the firmware version and date details are correct.

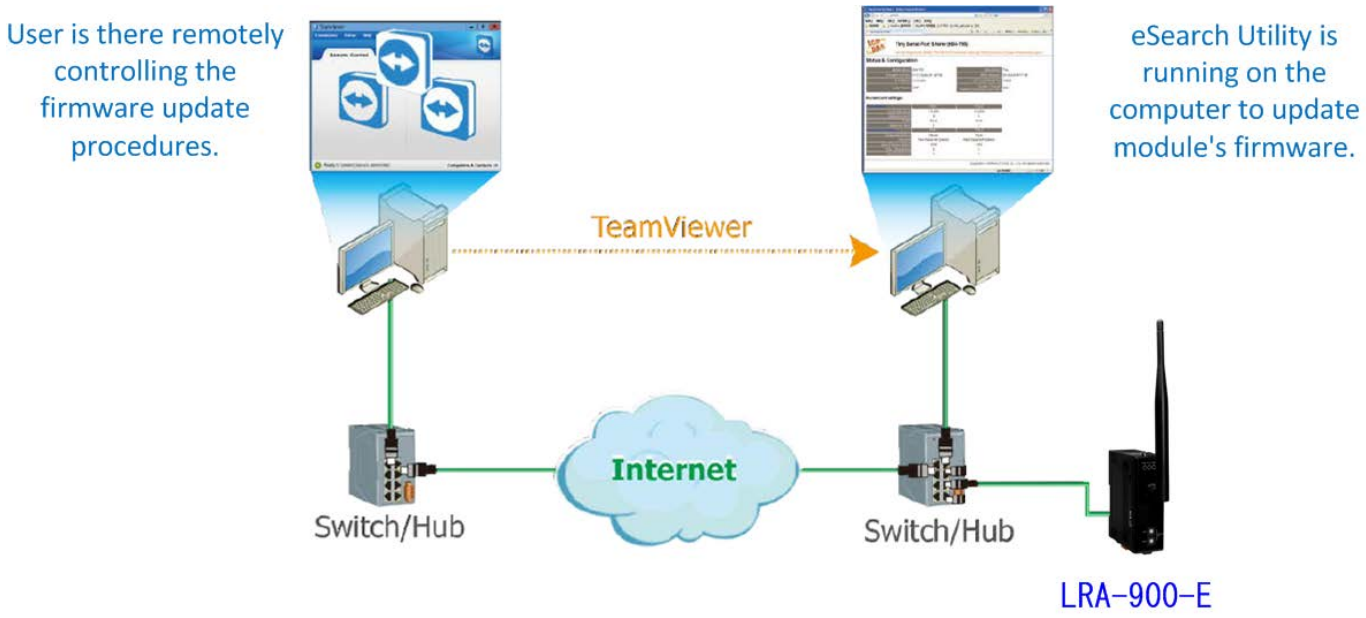


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2.1.2. Remote Firmware Update

In order to perform a Remote Firmware Update, use an application that allows an external system to be remotely controlled, such as TeamViewer, 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.**



Follow the procedure described below to update firmware of the LRA-900-E on the remote PC:

Step 1:

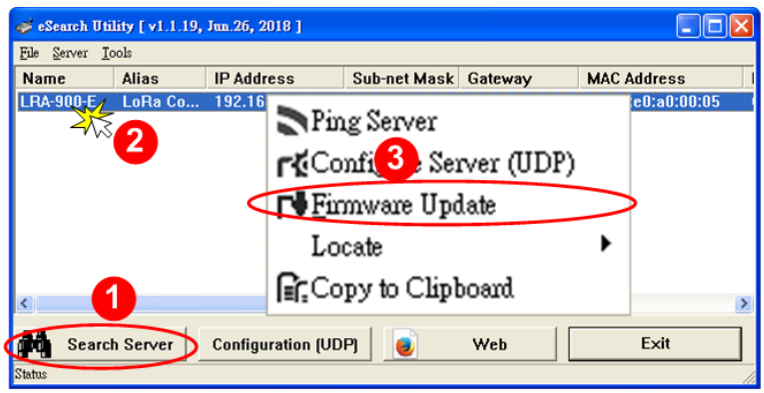
In the eSearch Utility, click the "Search Server" button to search for any LRA-900-E modules connected to the network. (The network settings of the LRA-900-E module as described in Step 3 on Chapter1)

Step 2:

Right click on the name of the LRA-900-E module to be updated.

Step 3:

Select the "Firmware Update" item from the popup menu and the "Open" dialog box will be displayed.



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Step 4:

In the "Open" dialog box, select the firmware file (*.dat) that will be used to update the module and then click the "Open"button.

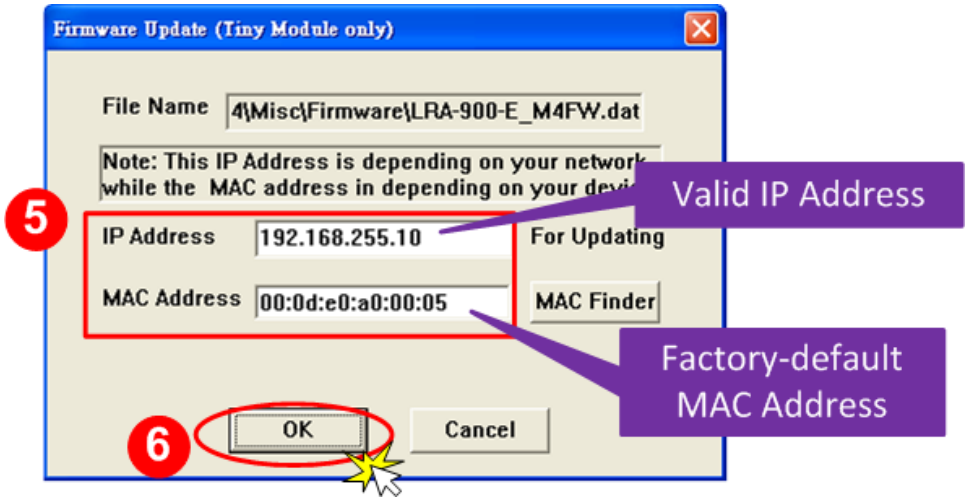
Download the Firmware File.

Step 5:

Assign a valid IP Address (canbe different with the current IP) and the factory-default MAC Address for the LRA-900-E module. If this IP addressis invalid (e.g. IP Address: 0.0.0.0) or a user-defined MAC address is assigned. Refer to note2(Page 20) and note 3(Page21) for more details.

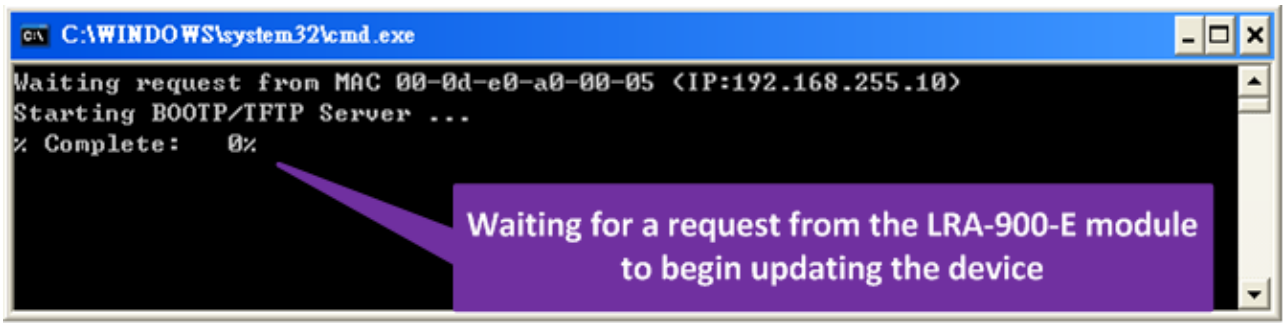
Step 6:

Click the "OK" button.



Step 7:

You are now ready to update the firmware. A Command Prompt windows will be displayed the progress of the update.

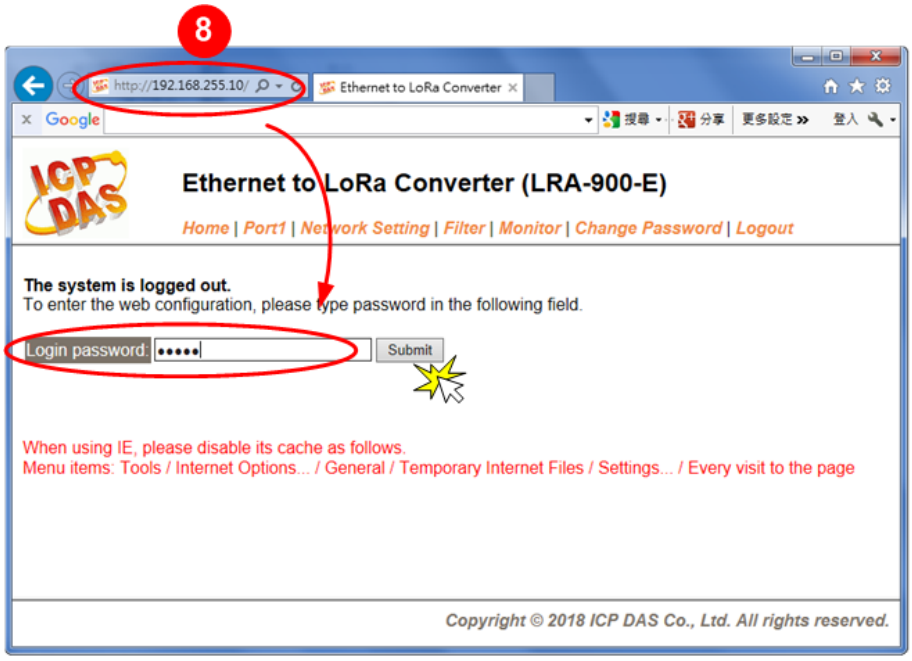


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Step 8:

Open a web browser such as Internet Explorer or Firefox and enter the URL for the LRA-900-E in the address bar of the browser and log in to the web configuration pages (use the default password "admin").

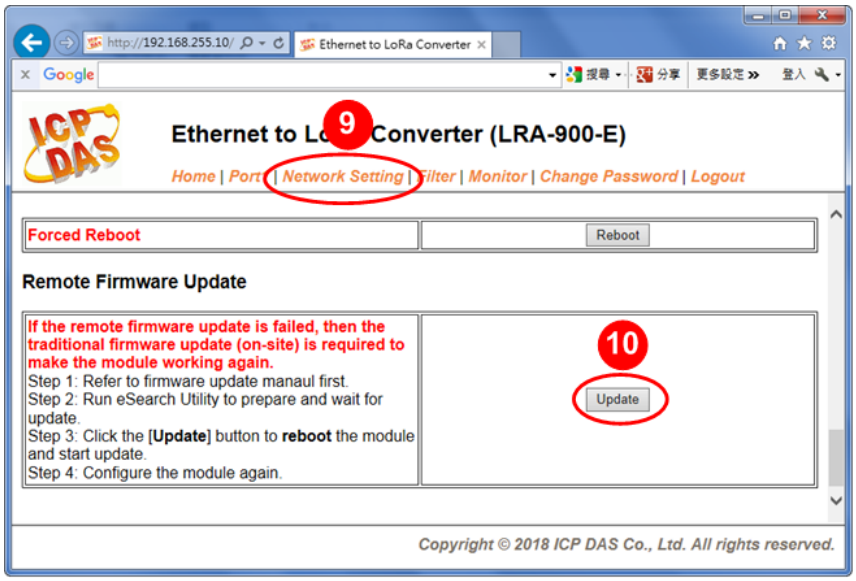


Step 9:

Click the "Network Setting" tab to display the Network Settings page.

Step 10:

Click the "Update" button in the "Remote Firmware Update" section to start the update.



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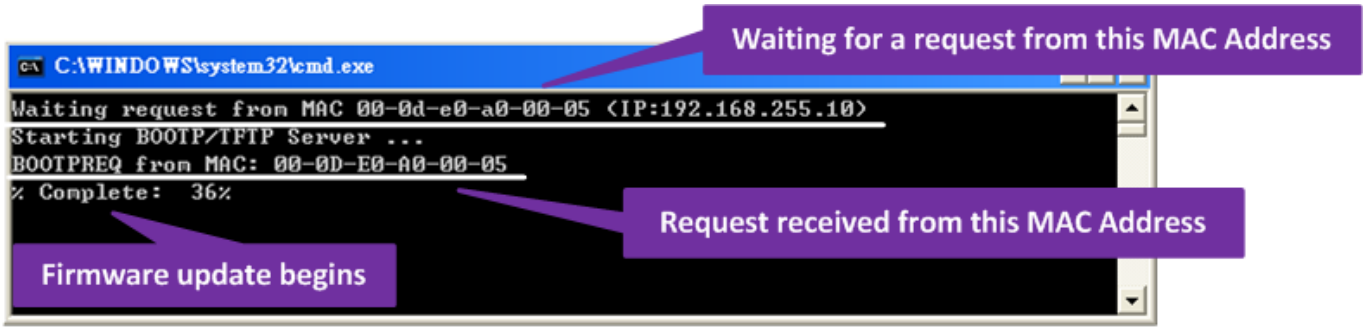
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Step 11:

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 can not proceed. Refer to note4 (Page 21) below for more details.

Step 12:

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



Step 13:

In the eSearch Utility, search for the LRA-900-E 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 Chapter1 above for more details.

Step 14:

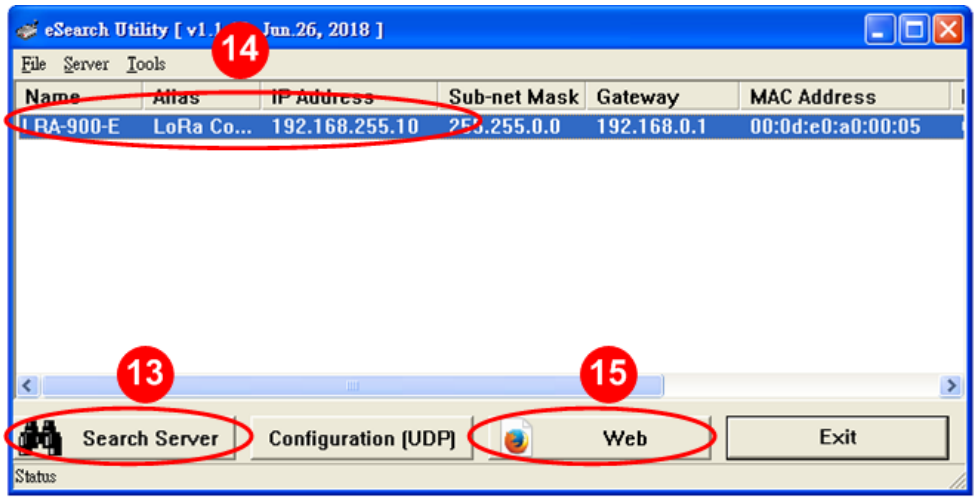
Click the name of the LRA-900-E module to highlight it.

Step 15:

Click the "Web" button and the default web browser will be opened.

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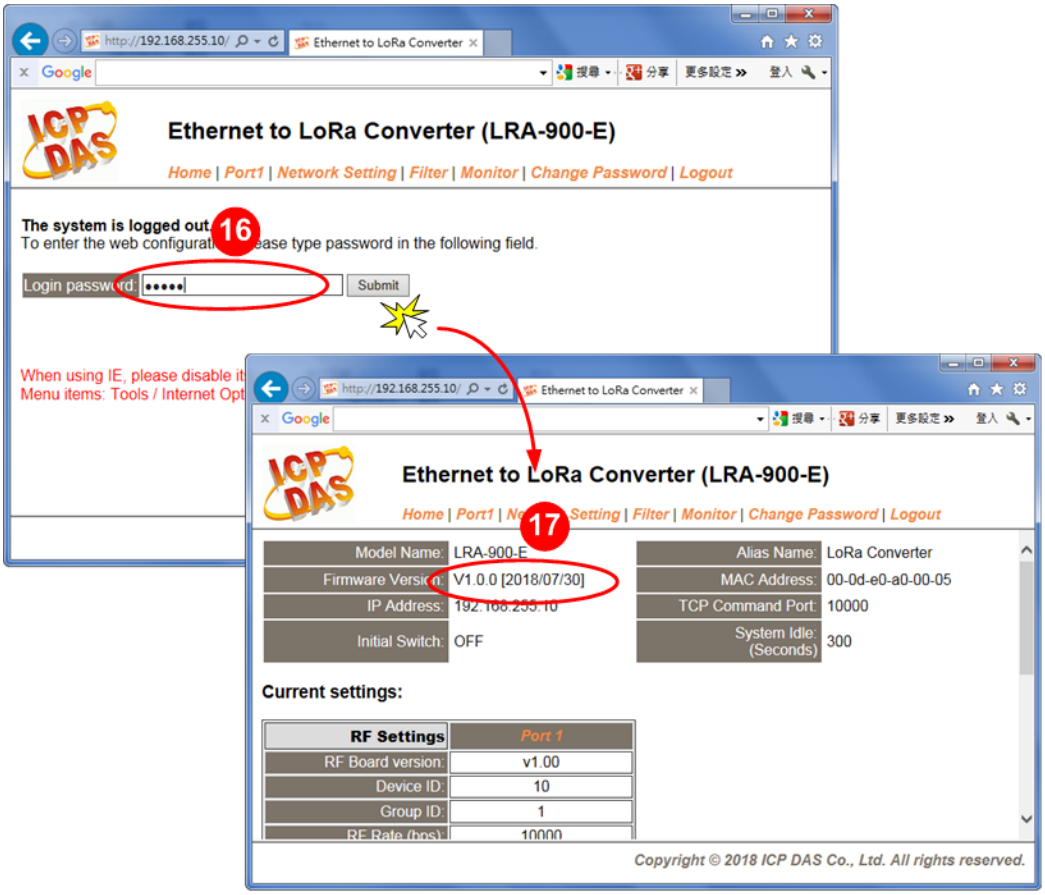


Step 16:

Login to the web configuration pages for the LRA-900-E (use the default password "admin").

Step 17:

Verify that the firmware version and date details are correct.



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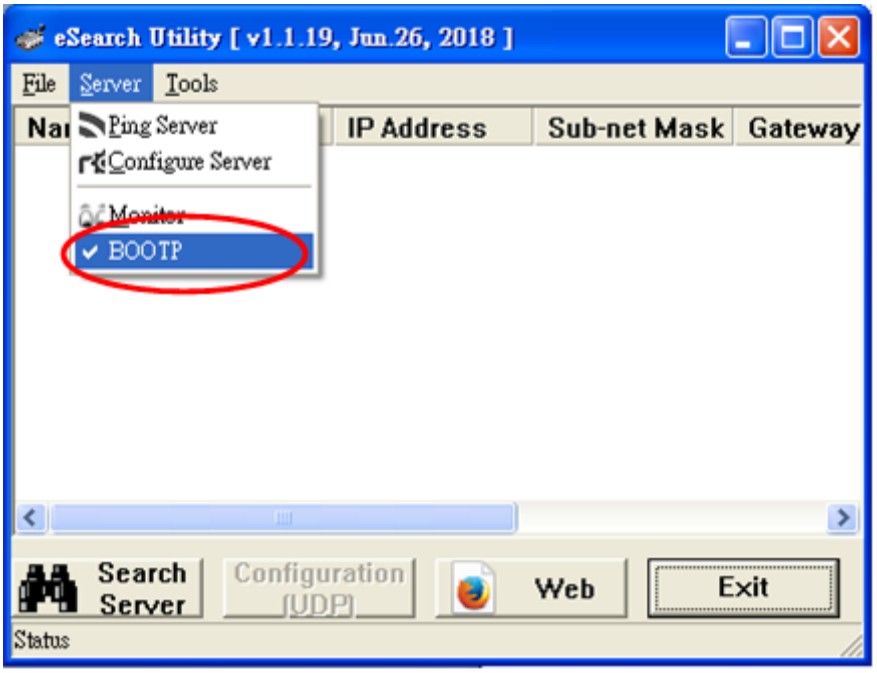
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3. Troubleshooting

3.1. Firmware update in BOOTP mode

If the module is not functioning correctly (e.g. there is no response to the search request, or if the PWR/RF_Tx/RF_Rx LEDs are alway displayed as either all off or all on), please 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 Mode" position.

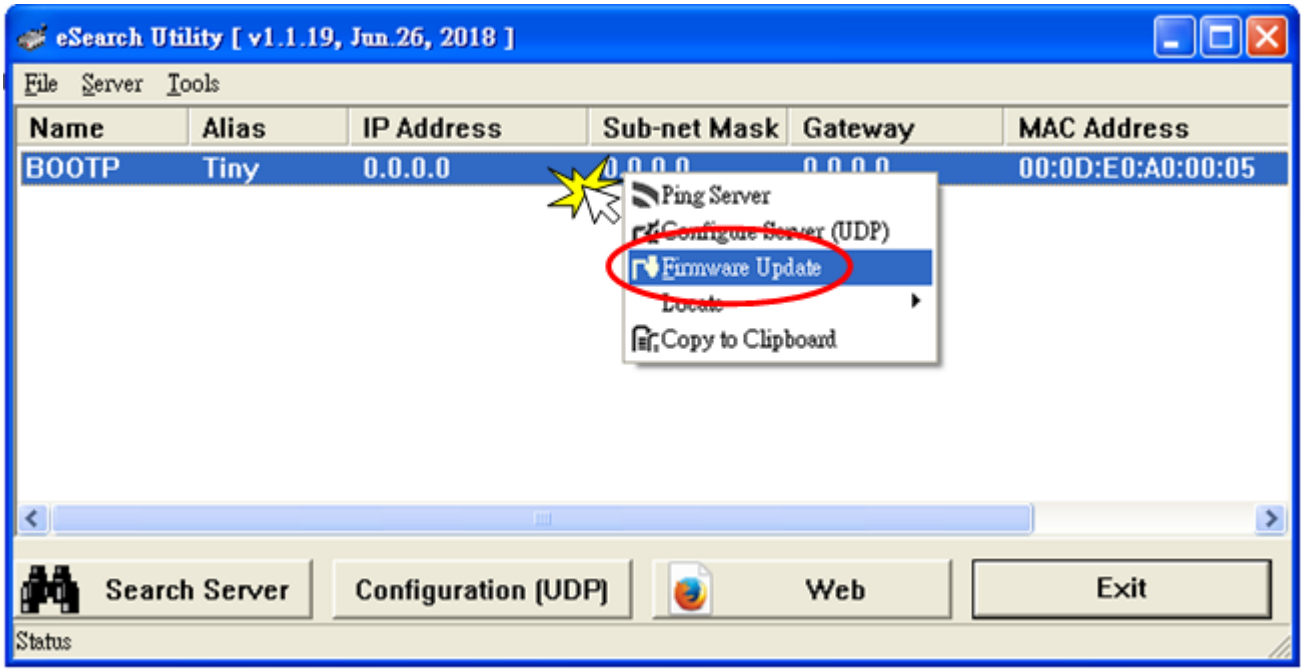
Step 3:

Power-on and reboot the LRA-900-E module and then click the "Search Server" button to search for the LRA-900-E 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.

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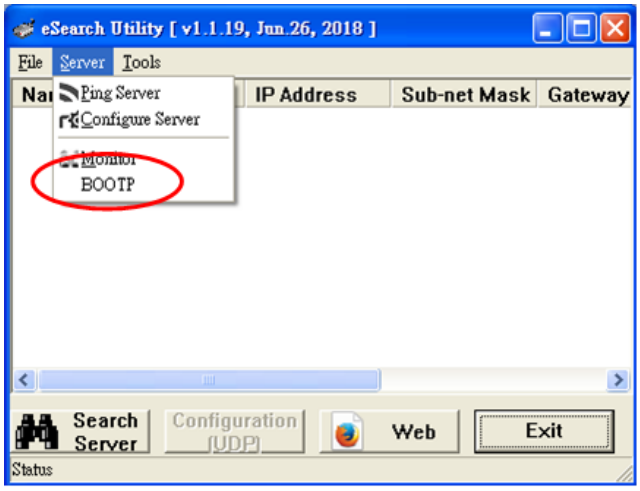
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Step 4: Right click on the name "BOOTP" and then select the "Firmware Update" item from the popup menu.



Step 5:

Refer to Steps 4 to 17 in "Chapter 2-Firmware Update Procedure" 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 page6.



Step 6: After updating the firmware, disable BOOTP mode from the eSearch utility. By selecting "BOOTP" item from the "Server" menu.

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3.2. How to update Firmware when the Different Network Segment for IP Address of the LRA-900-E and Host PC.

For example, the first time to get the LRA900-E module, the factory default IP address is 192.168.255.1, but the host PC IP address is 172.17.3.8, refer to the following two methods to update firmware.

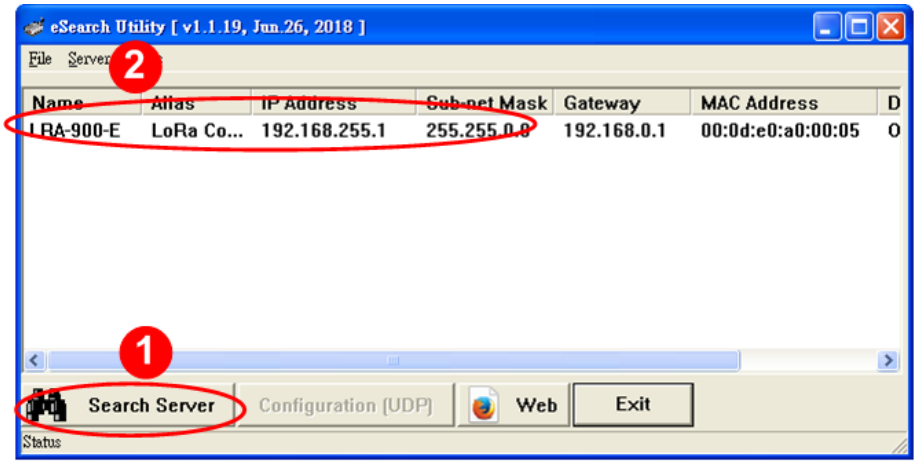
Method 1: Using **"Dynamic Host Configuration Protocol (DHCP)"** to automatically assigns an IP address to LRA-900-E module. Follow the procedure described below:

Step 1:

Run the eSearch Utility to search for any LRA-900-E modules in the network

Step2:

Double click the name of LRA-900-E 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.

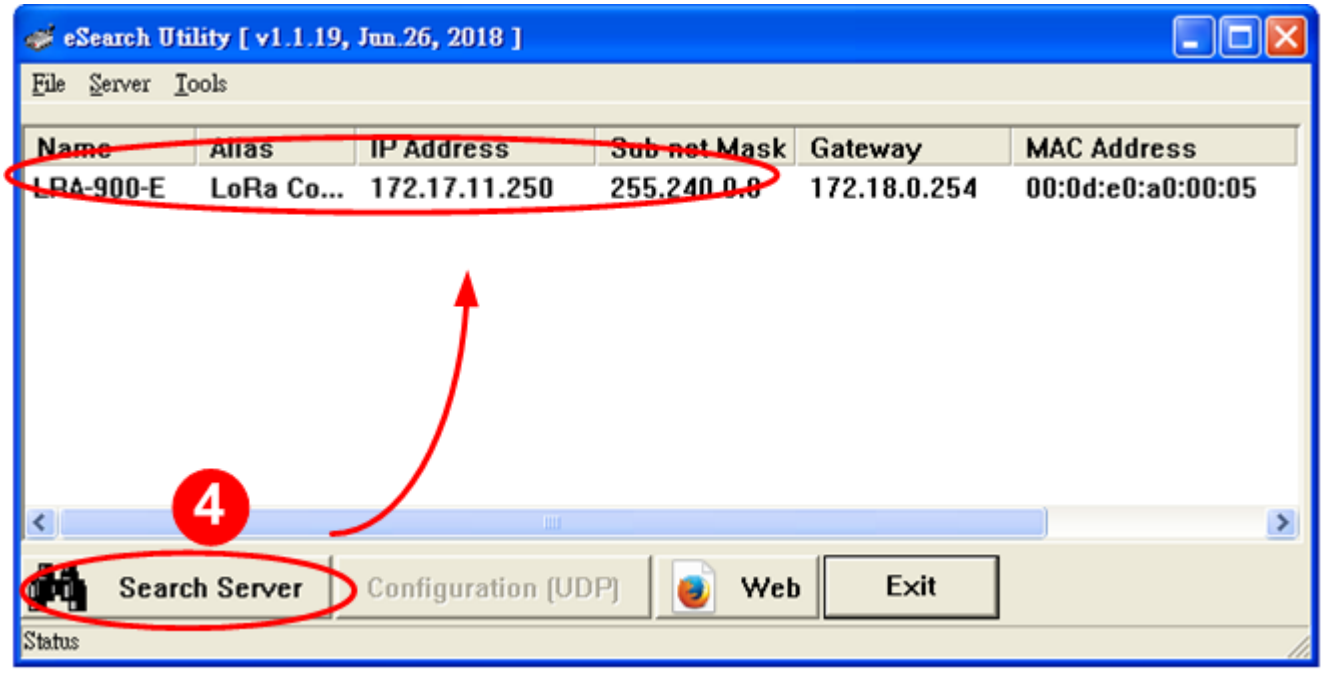


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Step 4:

Wait 2 seconds and then click the "Search Server" button again to ensure the LRA-900-E is working well with new configuration.



Step 5:

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

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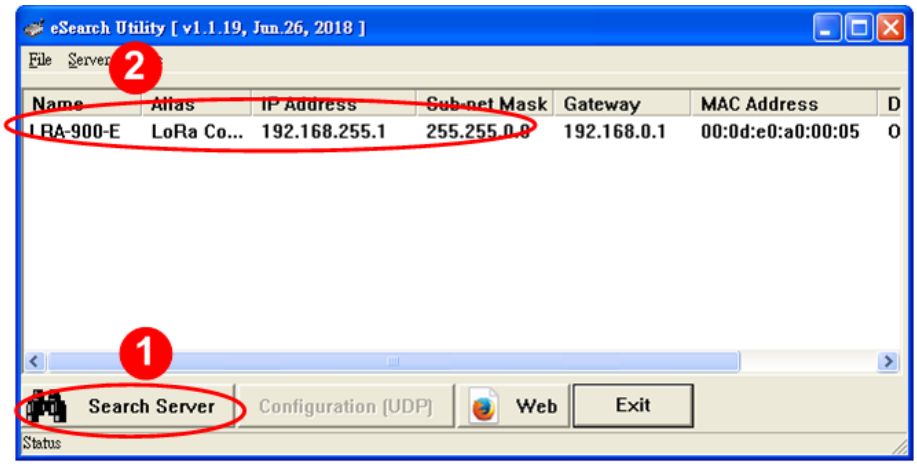
Method 2: Using **"Manual configuration"** to assigns an IP address to LRA-900-E module. Follow the procedure described below:

Step 1:

Run the eSearch Utility to search for any LRA-900-E modules in the network

Step2:

Double click the name of LRA-900-E to open the "Configure Server (UDP)" dialog box.

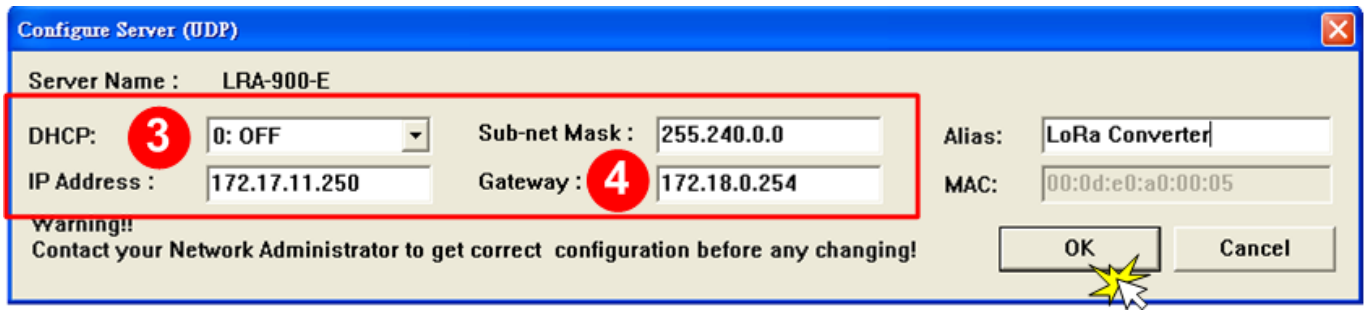


Step 3:

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 IPAddress/Sub-net Mask/Gateway). Enter the network settings and click the "OK" button.

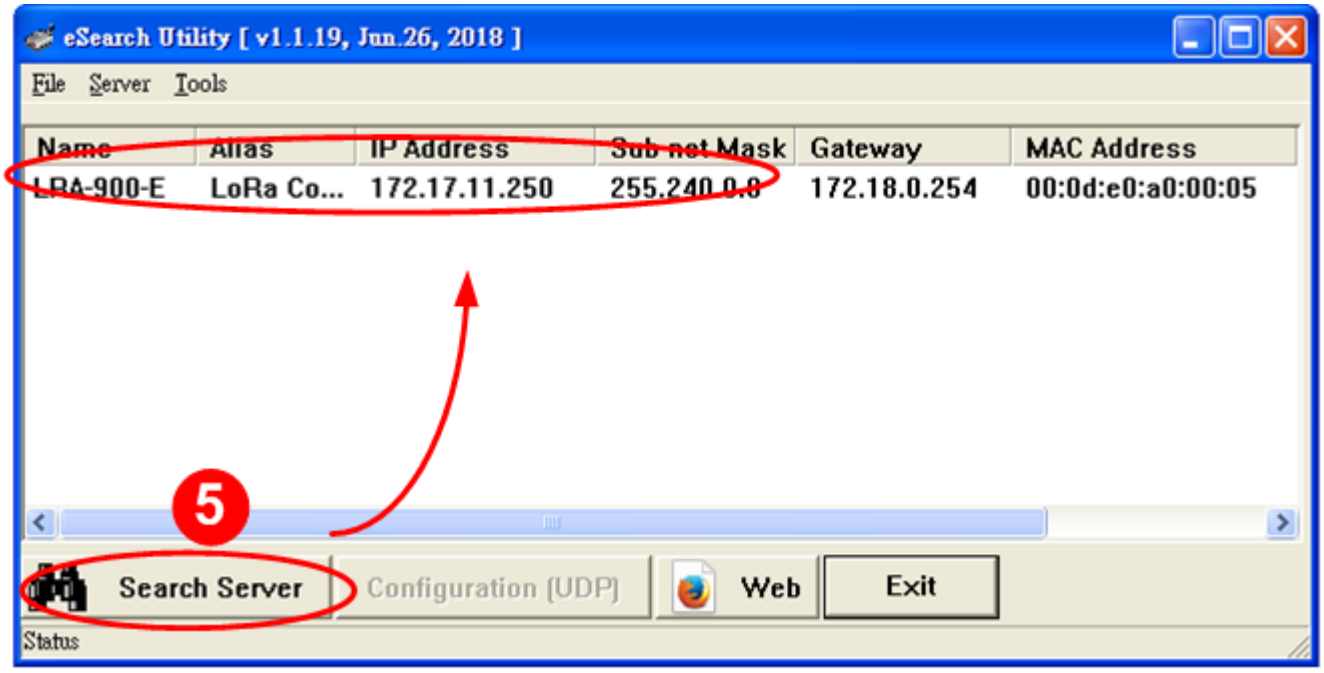


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Step 5:

Wait 2 seconds and then click the "Search Server" button again to ensure the LRA-900-E is working well with new configuration.



Step 6:

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

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4. Additional Information

The code contained in the boot loader, which isused 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 firmwarehas been corruptedor does not exist. If the firmware update fails, simply executethe update procedures again in BOOTP mode, as described in Chapter 3, and the update should be successful.

The LRA-900-E obtains the IP address assigned by the user and retrieves the firmware image through the utility program. ***Note that when updating the firmware, the LRA-900-E uses the factory-default MAC address rather than any user-defined MAC addresses.***The LRA-900-E has a built-in flash protection feature that prevents any modification to the firmware stored in the flash memory, before attempting to update the firmware, the "**Init Switch**" should be set to the"**Init**" position and then the LRA-900-E can be **powered-on and rebooted** to disable the flash protection. Since the flash memory then be comes 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:

Note1:

If the IP address settings do not work correctly (e.g. there is no response to a ping command), please contact your network administrator to obtaina valid IP address for the LRA-900-E module.

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), then a valid IP address must be manually specified for the LRA-900-E in order to process the update operation. Please contact your network administrator to obtain avalid IP address before proceeding.

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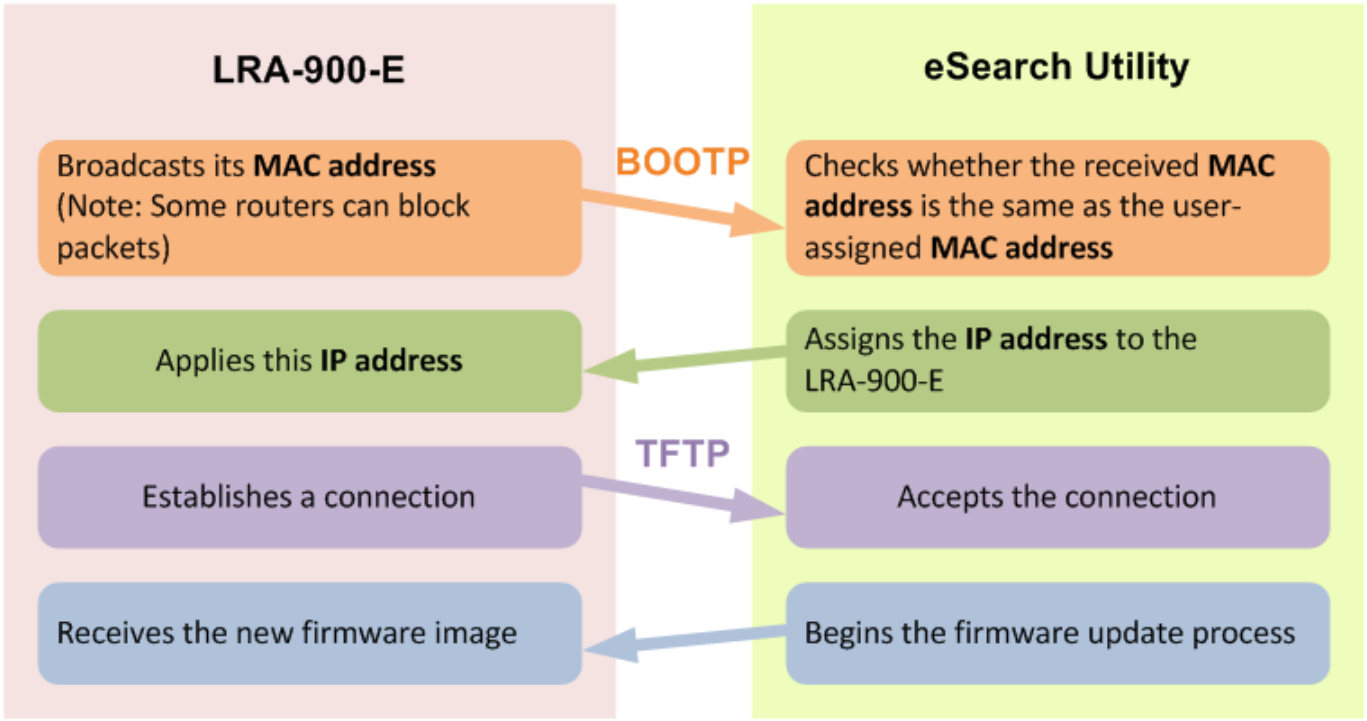
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Note 3:

When updating the firmware, the factory-default MAC address is used rather than the 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 restore the MAC address to the factory-default settings via the web configuration pages.

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 you assign a user-defined MAC address 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 6**.The firmware update procedure is illustrated in the figure below.



Note 5:

BOOTP (Bootstrap Protocol) is defined in RFC-951 and uses UDP ports 67 and 68.

Note6:

TFTP (Trivial File Transfer Protocol) is defined in RFC-1350 and uses UDP port 69.

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