



Hytera DMR Conventional Series Remote Upgrade Application Notes

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Revision History

Version	Release Date	Description
R3.0	03-2015	Used with R7.0. Add a restriction of the remote upgrade feature, and description of the repeater IP address while upgrading via the extranet.
R2.0	11-2014	Parallel upgrade and extranet upgrade are supported.
R1.1	04-2014	Firewall configuration method is added and Parallel Upgrade feature is deleted.
R1.0	04-2014	Initial Release.

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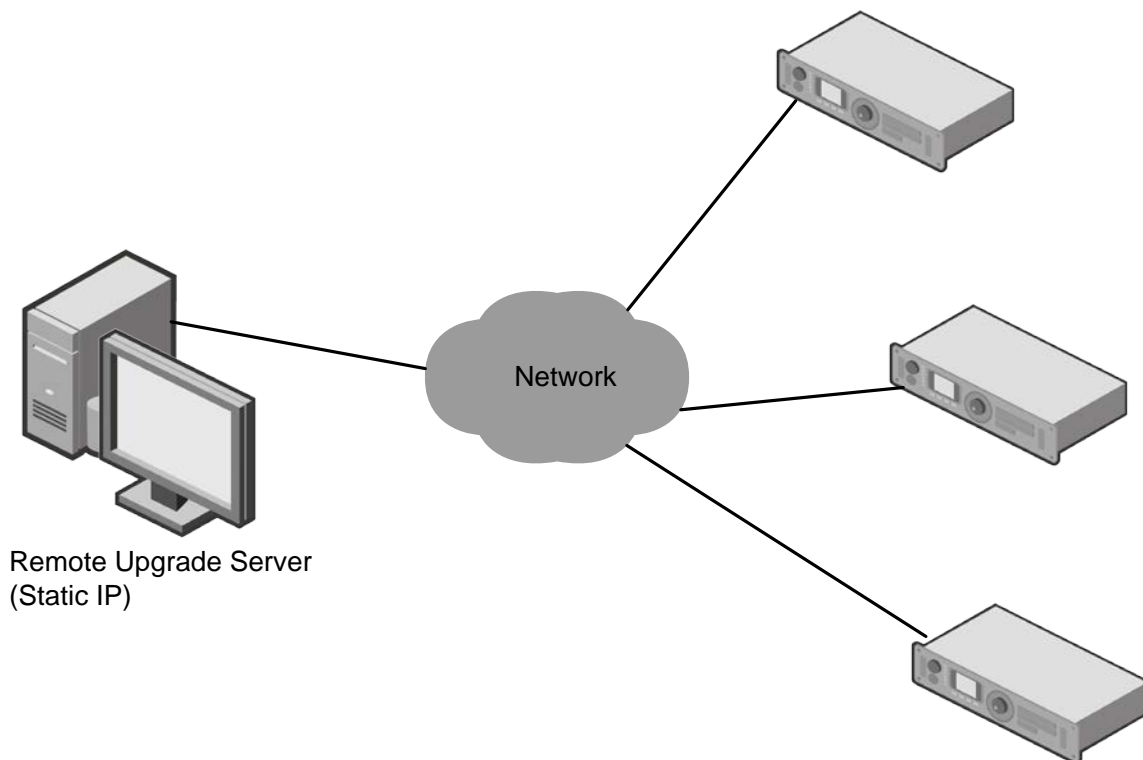
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1. Overview

1.1 Feature Description

In practical application, the repeaters/transceivers are usually placed in a remote equipment room or fixed to a specific location. For example, the repeaters are placed in the regional equipment rooms to realize the trans-regional communications; the repeaters are installed on high hills to realize the signal coverage of remote area. In such cases, repeaters upgrade requires site operation with computers, upgrade software and programming cables. Moreover, repeaters which are mounted on high places need to be uninstalled for upgrade, which is costly and inefficient.

Remote Upgrade feature is developed to reduce the upgrade cost of repeaters/transceivers. With this feature, after the repeaters/transceivers are connected to the network, operator can upgrade the repeaters/transceivers by using a computer which serves as the remote upgrade server (see the figure below). And a maximum of 5 repeaters/transceivers can be upgraded at a time.



Application Scenario 1

Issue: To ensure sufficient communication coverage, the patrol team installed a repeater on the top of a hill. Now the repeaters need to be upgraded, but the local upgrade method is inefficient. How to improve the repeater upgrade method?

Role: Operator A

Scenario

- The local upgrade method needs site operation using the computers and programming cables, thus the local upgrade procedure is complicated and inefficient.
- Operator A consults the customer service of the Company and decides to employ the Remote Upgrade feature.
- Operator A configures the Remote Upgrade feature and connects the repeater and the computer which serves as the remote upgrade server via the network.
- Afterwards, whenever the repeater firmware version is upgraded, Operator A can upgrade the repeater via the remote upgrade server.

Application Scenario 2

Issue: A police station employs the repeater IP Multi-site Connect feature to ensure the communication coverage over the city. The repeaters are placed in different substations. How to upgrade the repeaters efficiently?

Role: Operator B

Scenario

- If Operator B employs the local upgrade method, he has to go to different substations for upgrading. Assumes that there are 5 repeaters to be upgraded, and each repeater upgrade will take 1 day/manpower, the total manpower cost will be 5 day/manpower.
- If Operator B employs the Remote Upgrade feature, he can configure and connect the repeater with the remote upgrade server via the network before the repeater is put into use. Afterwards, Operator B can upgrade the repeaters via the server with a manpower cost of about 1 hour/manpower.
- Operator B decides to employ the Remote Upgrade feature.
- Whenever the repeater firmware version is upgraded, Operator B can upgrade the repeaters via the remote upgrade server.

1.2 Restriction

- Ensure proper network connection for successful remote upgrade.
- Customized repeaters do not support Remote Upgrade feature.
- The repeaters/transceivers to be upgraded via remote upgrade method must be configured with Remote Upgrade feature before they are put into use. See [Configuration](#).
- The remote upgrade server must employ Static IP Address.
- The repeaters/transceivers cannot employ IP Address provided by DHCP Server, and the fourth part of the IP address cannot be set to 127 and 224 – 239, such as 192.168.2.127.
- The Radio ID of each repeater/transceiver must be unique in a same LAN. Otherwise, only one repeater/transceiver can be found by the upgrade kit during scanning.

1.3 Device Requirements

Device	Requirements
Repeater/Transceivers	Applicable models: <ul style="list-style-type: none">● RD98X/RD96X with firmware version of 5.5 and above● RD62X with firmware version of 6.0 and above● RD98XS digital transceiver with firmware version of 1.1 and above● RD98XS analog transceiver with firmware version of 4.2 and above
Remote Upgrade Server	Win 7 32-bit/Win XP 32-bit operating system

1.4 Software Requirements

Before upgrade, you must install the corresponding remote upgrade software on the remote upgrade server.

2. Configuration

Caution

In this section, the repeater upgrade will be taken as example. The configuration below also applies to the transceiver upgrade.

2.1 Configuring the Repeater

Please configure the Remote Upgrade feature for the repeaters via the corresponding CPS before it is put into use.

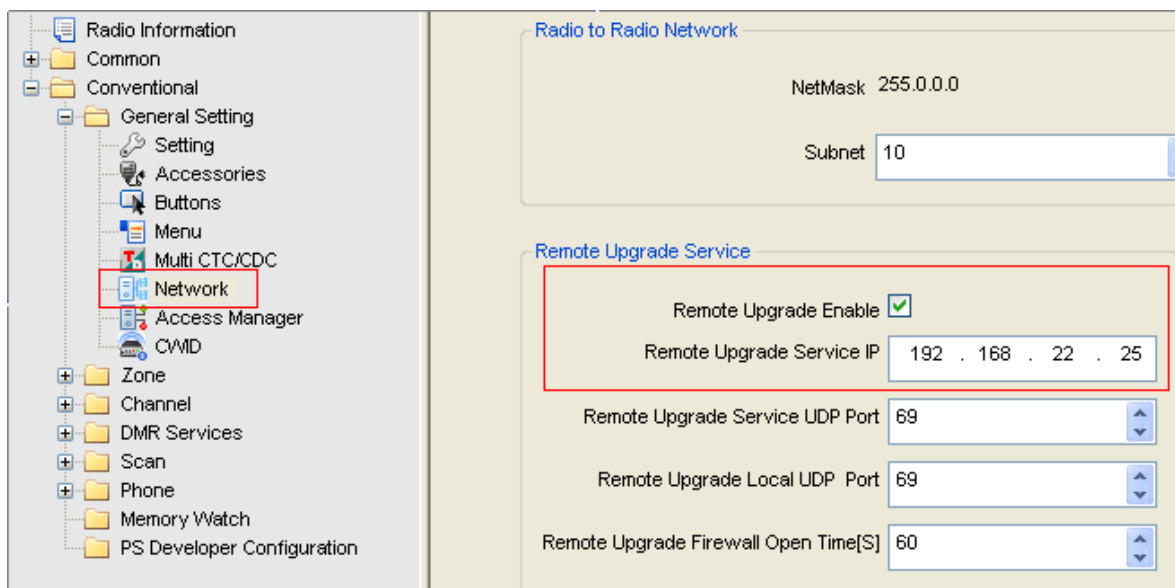
You need to:

- [Configure the Remote Upgrade feature](#), and assign the static IP address of the remote upgrade server.
- [Configure the repeater IP address](#), so the repeater can communicate with other devices via the network.

2.1.1 Configuring the Remote Upgrade Feature

The Remote Upgrade feature must be enabled and the Remote Upgrade Service parameters must be set accordingly for proper connection.

Method: After the repeater is read via CPS, go to “Conventional -> General Setting -> Network”. See the figure below.

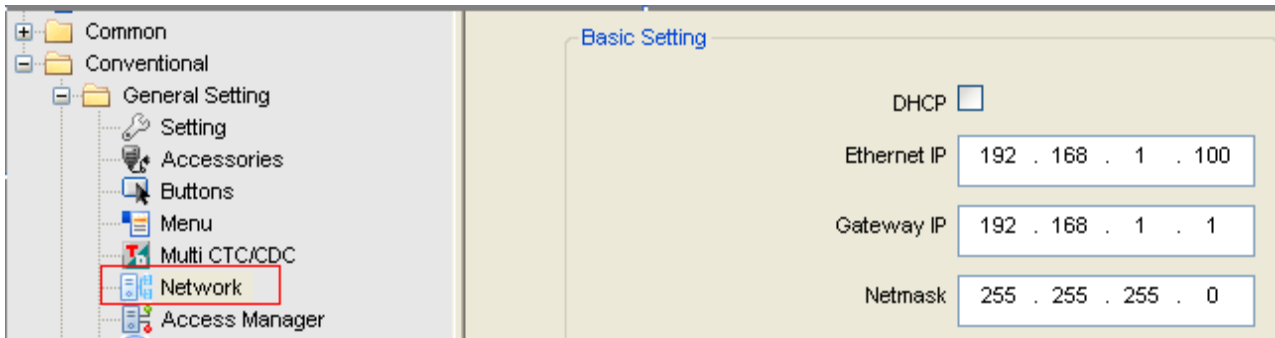


Parameters	Description	Setting
Remote Upgrade Enable	This parameter decides whether to enable the Remote Upgrade feature for the repeater.	Checked
Remote Upgrade Service IP	This parameter is used to set the static IP address of the remote upgrade server. For extranet repeater upgrade, the IP address of WAN side of the router connected to this computer must be an extranet IP address, and there must be a static mapping between this computer and the router.	Sets the static IP address of the remote upgrade server, which is the IP address set in Configuring the Server Network .
Remote Upgrade Service UDP Port	This parameter is used to set the UDP Port number of the remote upgrade server.	Sets the UDP Port of the remote upgrade server. To ensure the successful upgrade, the port number cannot be set to 32768 – 65535.
Remote Upgrade Local UDP Port	This parameter is used to set the UDP Port number of the repeater.	Sets according to actual conditions. To ensure the successful upgrade, the port number cannot be set to 32768 – 65535.
Remote Upgrade Firewall Open Time	This parameter is used to set the time within which the firewall of the router is opened after the router is connected to the repeaters to be upgraded.	It is recommended to keep the default value. If change is needed, the value is recommended to be less than or equal to 90 seconds.

2.1.2 Configuring the Repeater IP

Before the remote upgrade, the repeater IP address must be set properly for the repeater to communicate with the server via the network. Currently, DHCP is not supported.

Go to “Conventional -> General Setting -> Network”. See the figure below.



Parameters	Description	Setting
Ethernet IP	This parameter is used to set the static IP address of the repeater.	Sets the IP address of the repeater. To ensure the successful upgrade, the fourth part of the IP address cannot be set to 127 and 224 – 239, such as 192.168.2.127.
Gateway IP	This parameter is used to set the network Gateway IP of the repeater.	Sets according to actual conditions.
Netmask	This parameter is used to set the network netmask of the repeater.	Sets according to actual conditions.

2.2 Configuring the Server Network

Before the remote upgrade, the server network must be set properly for the repeater to communicate with the server via the network.

The IP address of the server must be set to a static IP address.

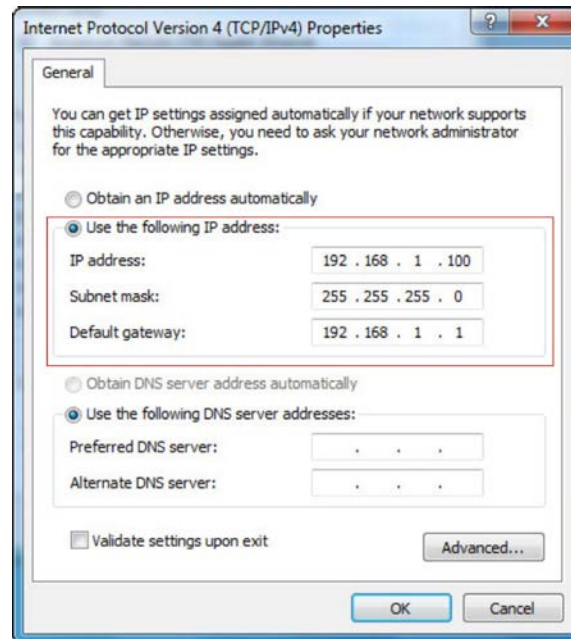


Note

For extranet repeater upgrade, the IP address of WAN side of the router connected to this computer must be an extranet IP address, and there must be a static mapping between this computer and the router. Please consult network manager or network service provider for detailed network information.

This section gives instructions on network requirements only.

Here takes the IP address setting of Win7 operating system as example to instruct the configuration of the IP address. See the figure below.



2.3 Installing the Remote Upgrade Kit

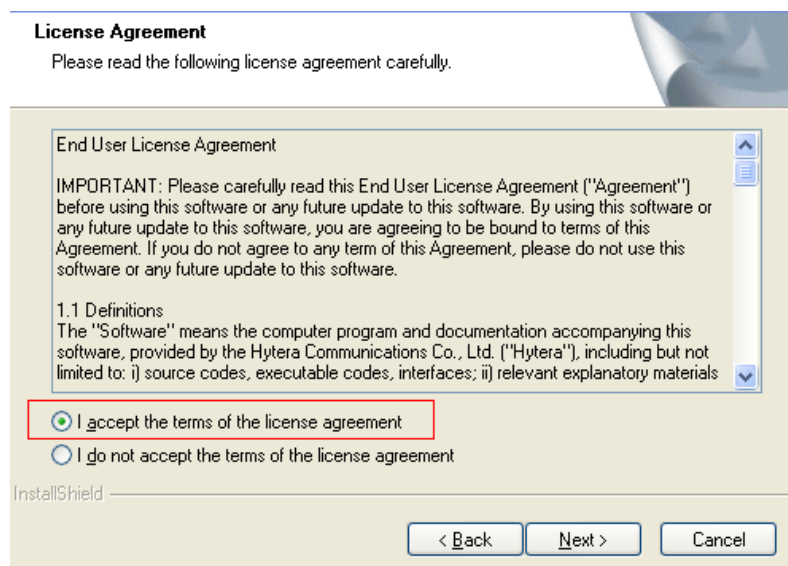
Before remote upgrade, you must install the corresponding remote upgrade kit on the server according to actual situations.

Caution

Due to the different version of the remote upgrade kit, the figures below are for reference only.

Run "setup.exe" in the file "EN" and follow the instructions to finish installation.

Select "I accept the terms of the license agreement" in the step below. For other steps, click "Next" to finish installation using default value.

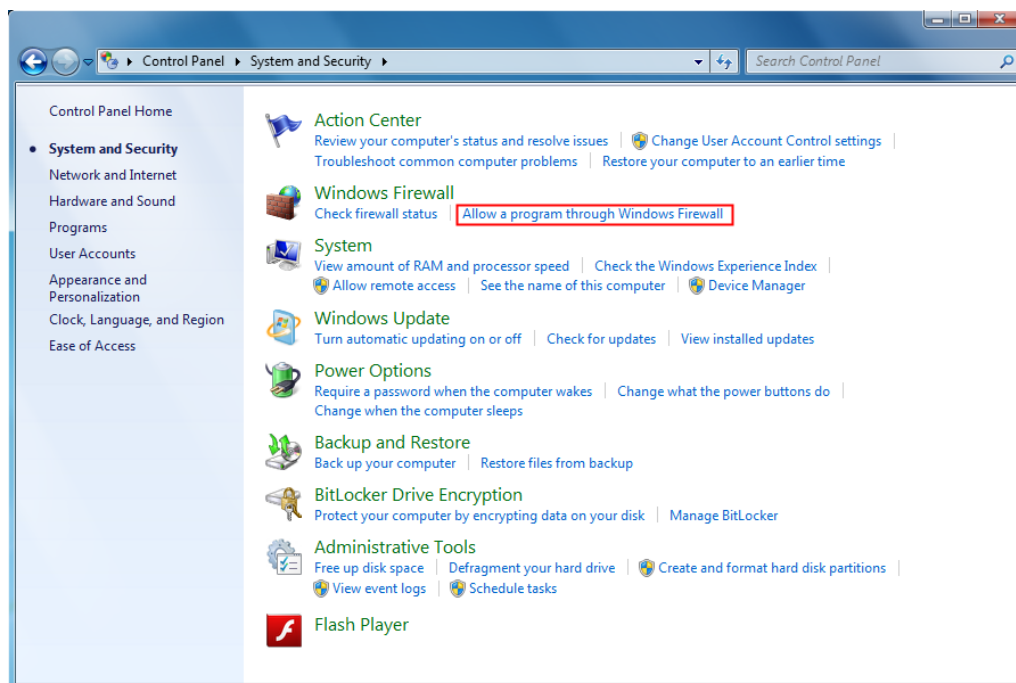


2.4 Configuring the Firewall

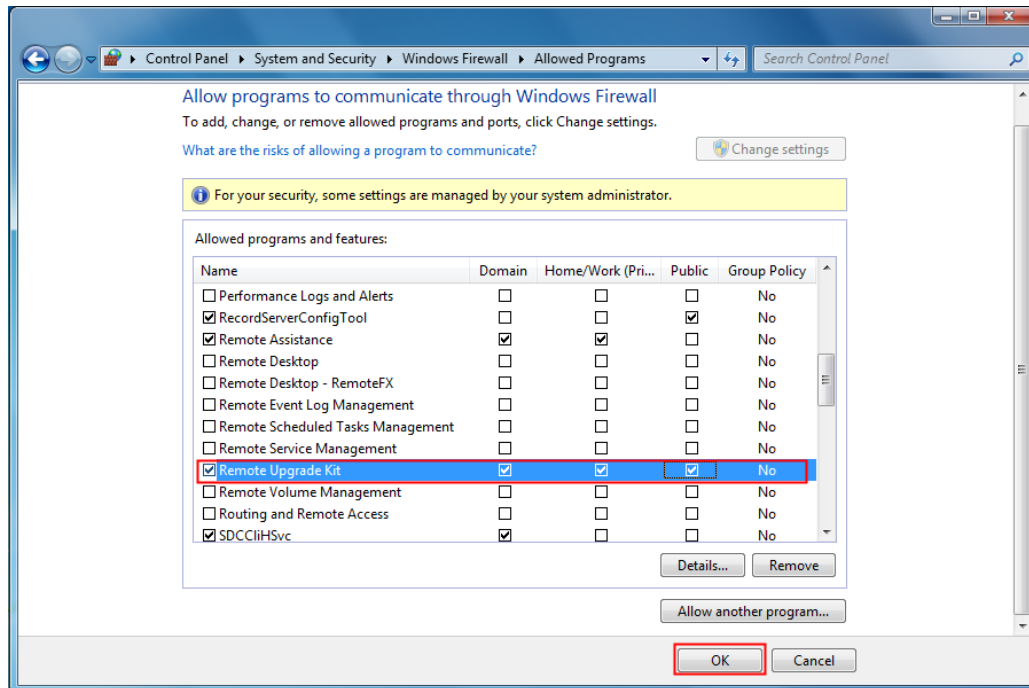
If the firewall of the computer is in use, the firewall must be configured accordingly for the remote upgrade kit to operate properly.

Here takes the firewall configuration of Win7 operating system as example to instruct the configuration of firewall.

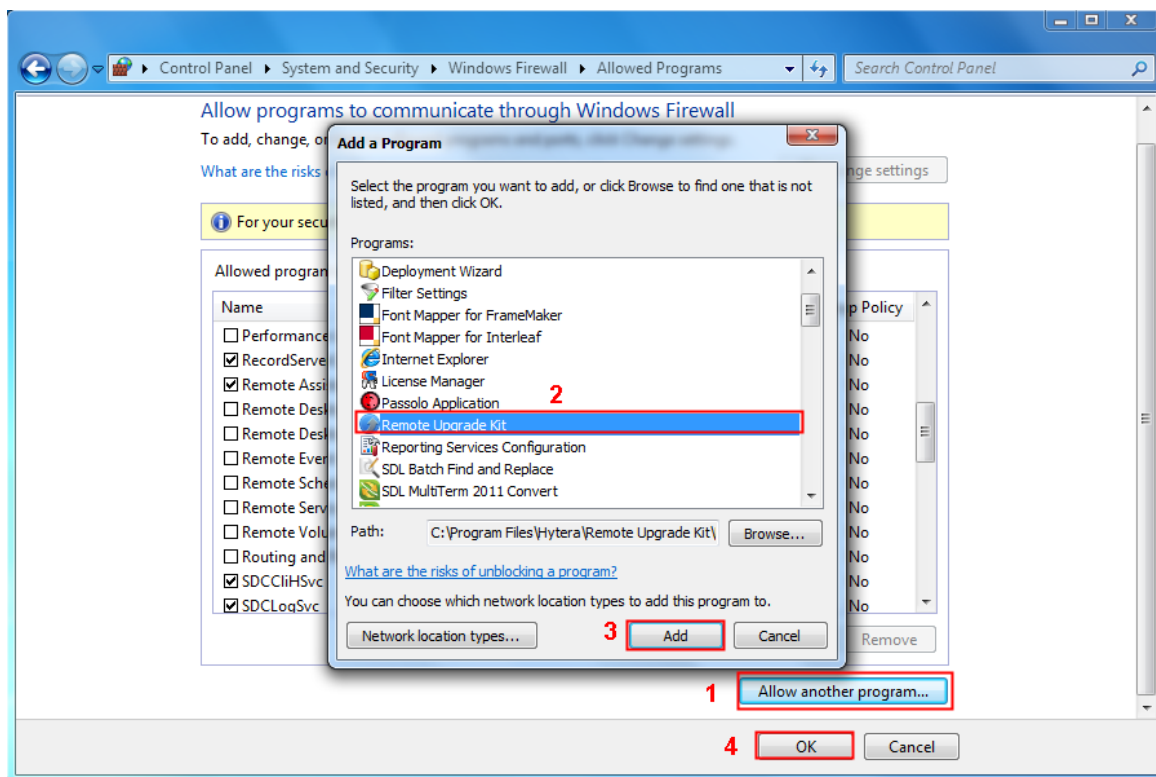
Step 1 Go to “Control Panel -> System and Security” and click “Allow a program through Windows Firewall”.



Step 2 Check “Remote Upgrade Kit”, “Domain”, “Home/Work(Private)” and “Public” as shown in the figure below. And then click “OK”.

**Note**

If you cannot find the item "Remote Upgrade Kit" in the above figure, please add it into the list following the steps shown in the figure below.



3. Upgrade Procedure

Caution

Upgrade the repeaters/transceivers when they are idle to avoid communication termination.

After remote upgrade, the repeater will restart automatically and the settings before upgrade will remain unchanged.

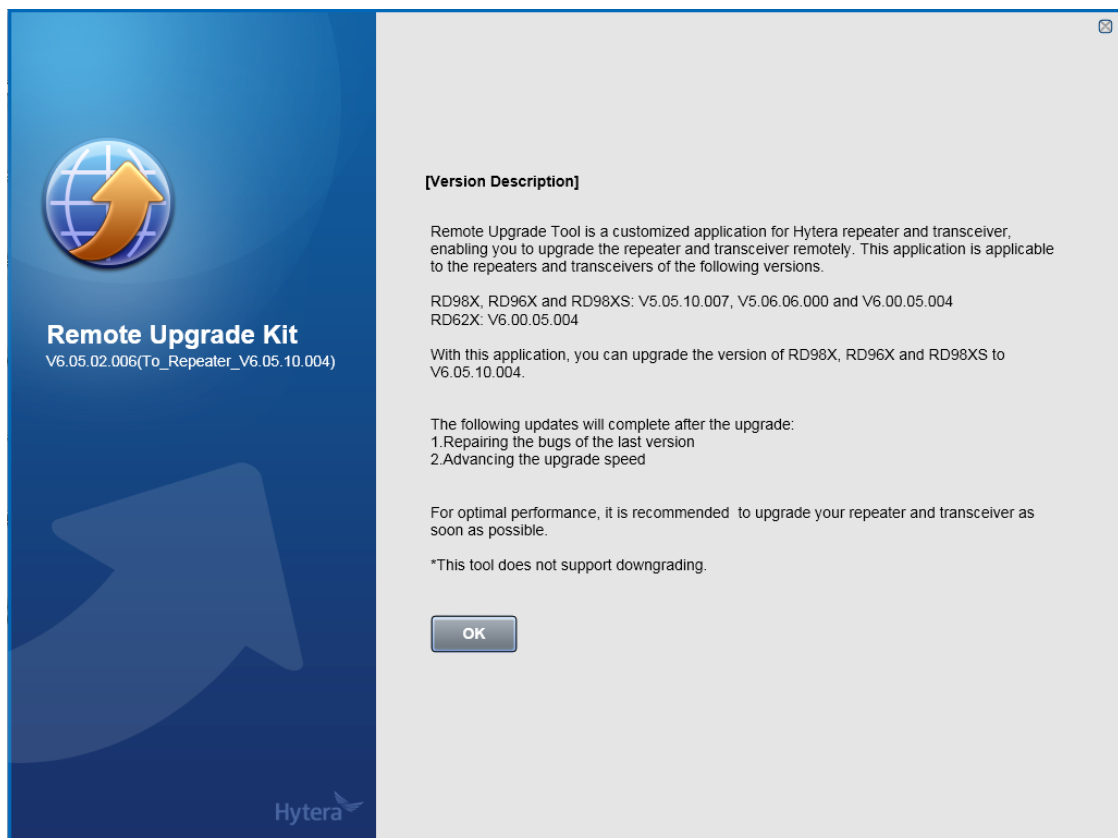
In this section, the repeater upgrade will be taken as example. The upgrade procedure below also applies to the transceiver upgrade.

The upgrade procedure is as follows:

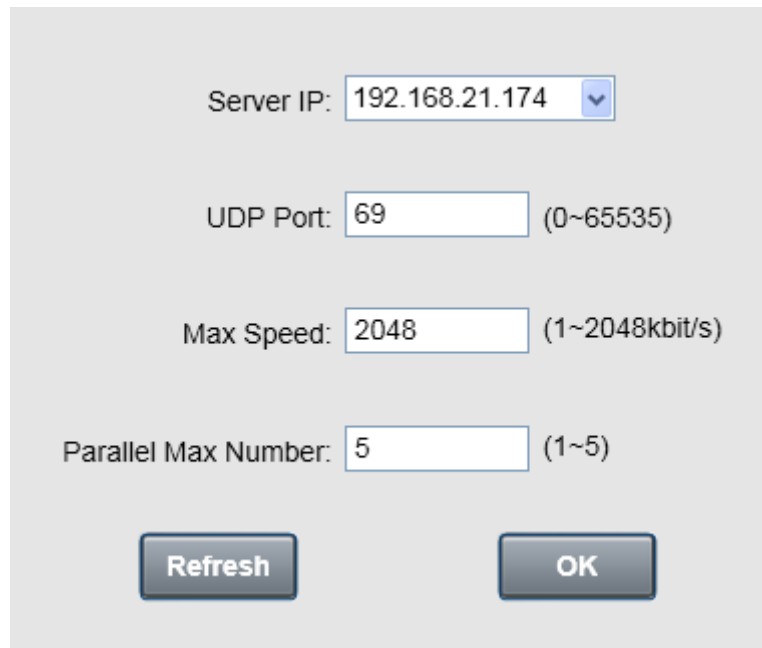
Step 1 Run the remote upgrade kit.

In the Win7 operating system, you must run the remote upgrade kit using the Administrator account.

Step 2 Click the “OK” button.



Step 3 Select the communication IP address for the server and the repeater and set the relevant parameters.



Server IP: 192.168.21.174

UDP Port: 69 (0~65535)

Max Speed: 2048 (1~2048kbit/s)

Parallel Max Number: 5 (1~5)

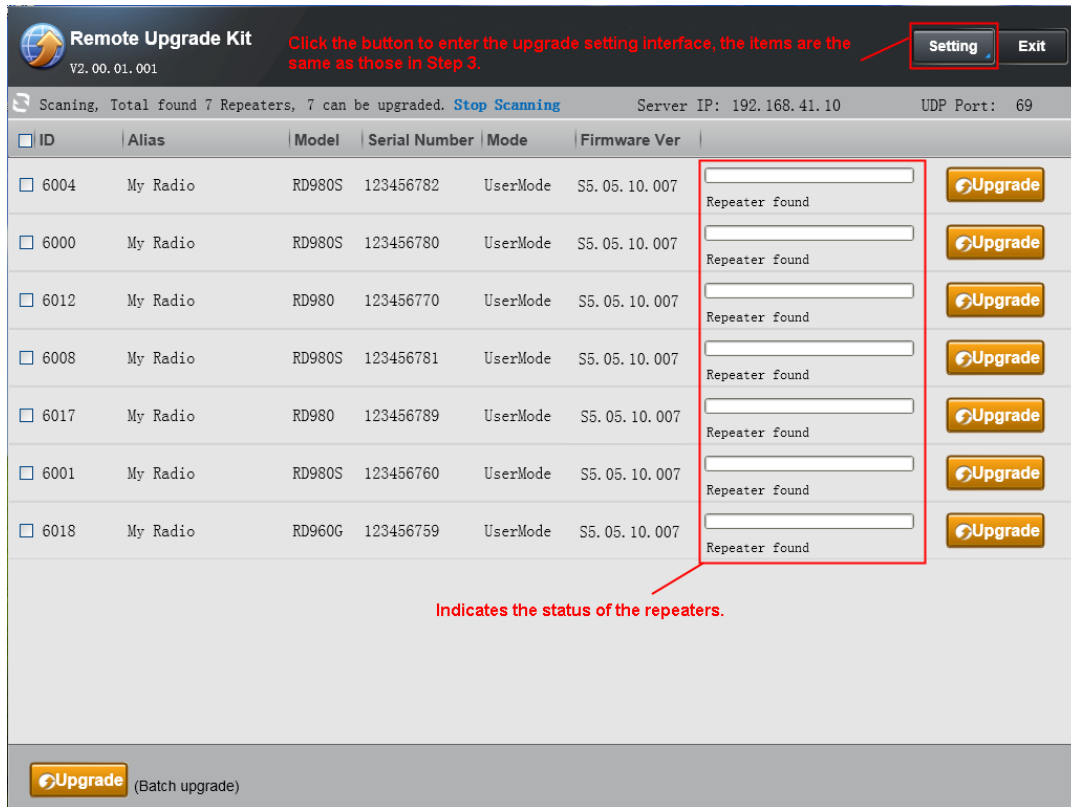
Refresh OK

Parameters	Description
Server IP	The IP address of the remote upgrade server, which must be consistent with “Remote Upgrade Service IP” set in “Configuring the Remote Upgrade Feature” . Both IP addresses must be consistent with that set in “Configuring the Server Network” .
UDP Port	The UDP Port of the remote upgrade server, which must be consistent with “Remote Upgrade Service UDP Port” set in “Configuring the Remote Upgrade Feature” .
Max speed	This parameter decides the maximum data transmission speed during repeater upgrade. Sets according to the network bandwidth.
Parallel Max Number	This parameter decides the maximum repeaters in parallel upgrade. It is different from the batch upgrade number. For Example, the Parallel Max Number is set to 3, and 9 repeaters are selected in the batch upgrade. In the upgrade procedure, only 3 repeaters will upgrade at the same time, and the rest repeater will be put in queue for upgrading.

Step 4 Select the repeaters to be upgraded and click the “Upgrade” button on the lower left for batch upgrade.

Click the “Upgrade” button on the right for individual upgrade. If the repeater does not support remote upgrade feature, this button will be grayed out and the checkbox will be unavailable.

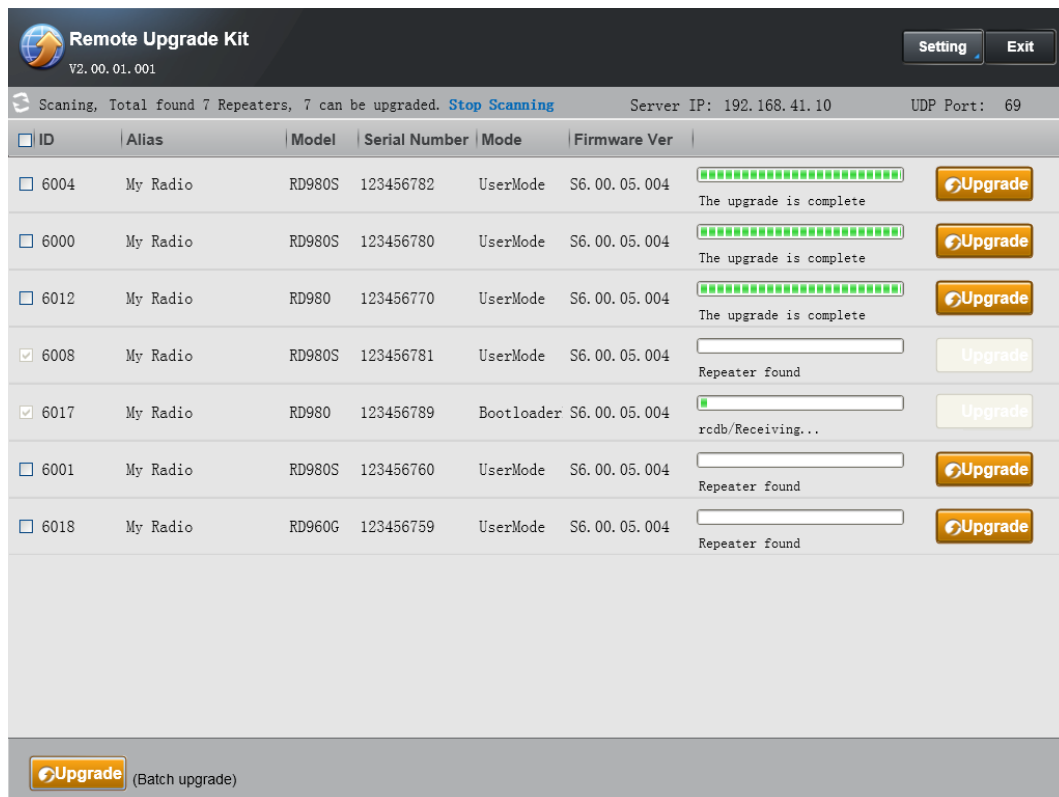
- It takes about 10 minutes to upgrade a repeater via the intranet. The upgrade time in extranet depends on the network status.
- Batch upgrade takes more time depending on the number of repeaters.



Parameter descriptions on the above figure:

Parameters	Description
Server IP	IP address of the remote upgrade server.
UDP Port	UDP Port of the remote upgrade Server.
Alias	Alias of the repeater.
Model	Model of the repeater.
Serial Number	The only identification of a repeater which is used to identify the target repeater.
Mode	During upgrade, the repeater is in Bootloader Mode. When it is idle, the repeater is in User Mode.
Firmware Ver	The firmware version of the repeater.

Step 5 When finished, the software will prompt “The upgrade is complete”, display the corresponding firmware version and change the “Mode” to “UserMode”.



Note

Please click the “ Upgrade” button again or restart the remote upgrade kit to retry in case of upgrade failure. If the repeater still cannot be upgraded, please contact the local dealer or the customer service of the Company for technical support.

4. Application Example

4.1 Description

To ensure the communication signal coverage, the patrol team installs a RD98XS repeater on the top of a hill. Now the patrol team employs Remote Upgrade feature for future upgrade. The patrol team can connect the repeater to the remote upgrade server via the network and upgrade the repeater via the server.

Network information is as follows:

Device	IP Address
Remote Upgrade Server	Static IP address: 192.168.1.100 Gateway IP: 192.168.1.1 Netmask: 255.255.255.0
Repeater	Ethernet IP: 192.168.1.34 Gateway IP: 192.168.1.1 Netmask: 255.255.255.0



Note

In this example, all ports keep the default value.

4.2 Requirement

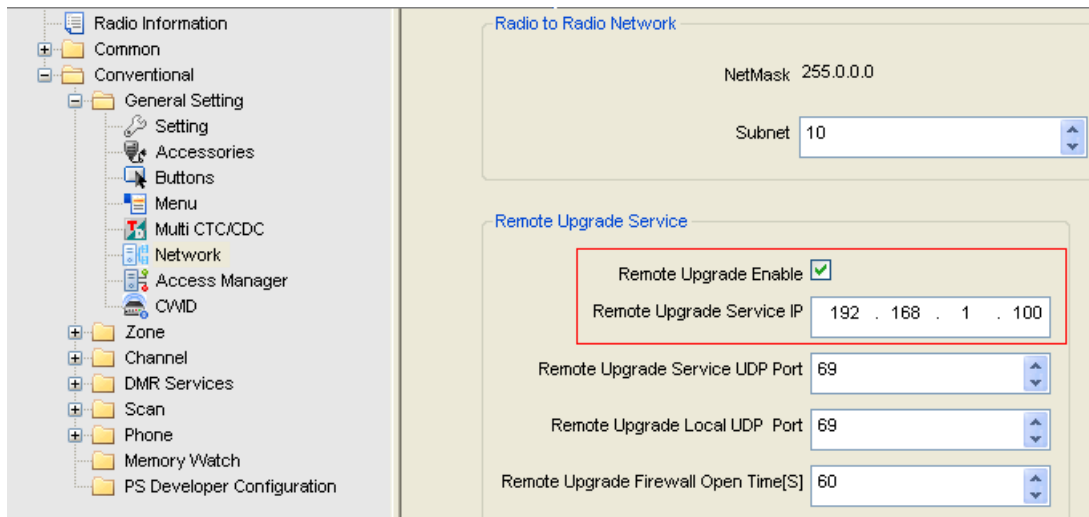
- Proper network connection.
- Proper repeater operation status

4.3 Configuration

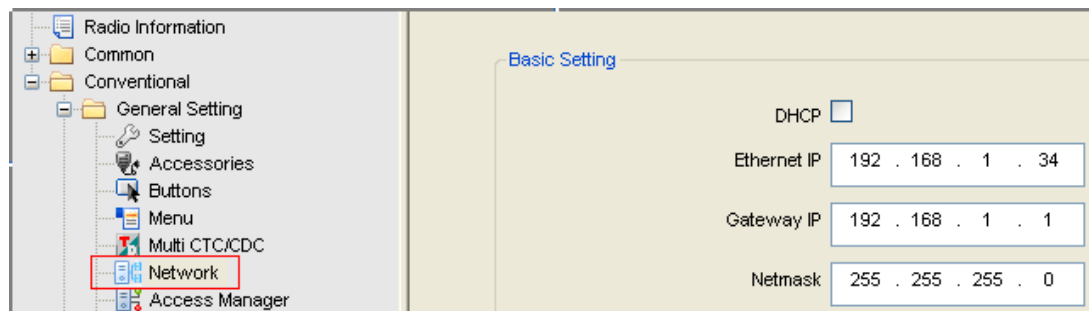
Configuring the Repeater

The repeater must be configured and connected to the remote upgrade server via CPS before the repeater is put into use.

Step 1 Check the Remote Upgrade Enable parameter and set the Remote Upgrade Service IP to 192.168.1.100.

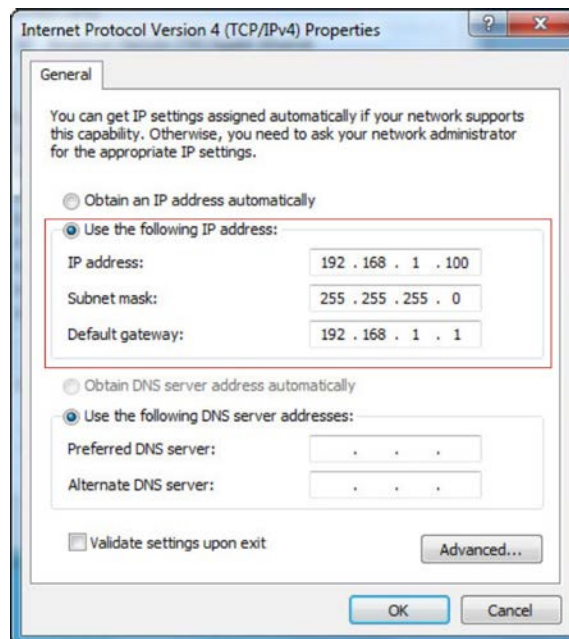


Step 2 Set the Ethernet IP of the repeater to 192.168.1.34.



Configuring the Server Network

Set the IP address of the remote upgrade server to 192.168.1.100, and Gateway IP to 192.168.1.1. The Netmask keeps the default value.



Installing the Remote Upgrade Kit

The operator installs the corresponding Remote Upgrade Kit on the remote upgrade server.

Configuring the Firewall

The operator configures the firewall of the upgrade server accordingly for the remote upgrade kit to operate properly. See [Configuring the Firewall](#) for details.

4.4 Upgrade Procedure

The remote upgrade procedure is as follows:

- Step 1** Run the remote upgrade kit and click the "OK" button.
- Step 2** Select 192.168.1.100 for the Server IP and keep the other parameters as default. And then click the "OK" button.

Server IP: 192.168.1.100

UDP Port: 69 (0~65535)

Max speed: 2048 (1~2048kbit/s)

Refresh OK

Step 3 The remote upgrade kit will start scanning and list the available repeaters.

Step 4 Click the “Upgrade” button on the right.
The upgrade will take about 10 minutes.

Remote Upgrade Kit V2.00.01.001

Setting Exit

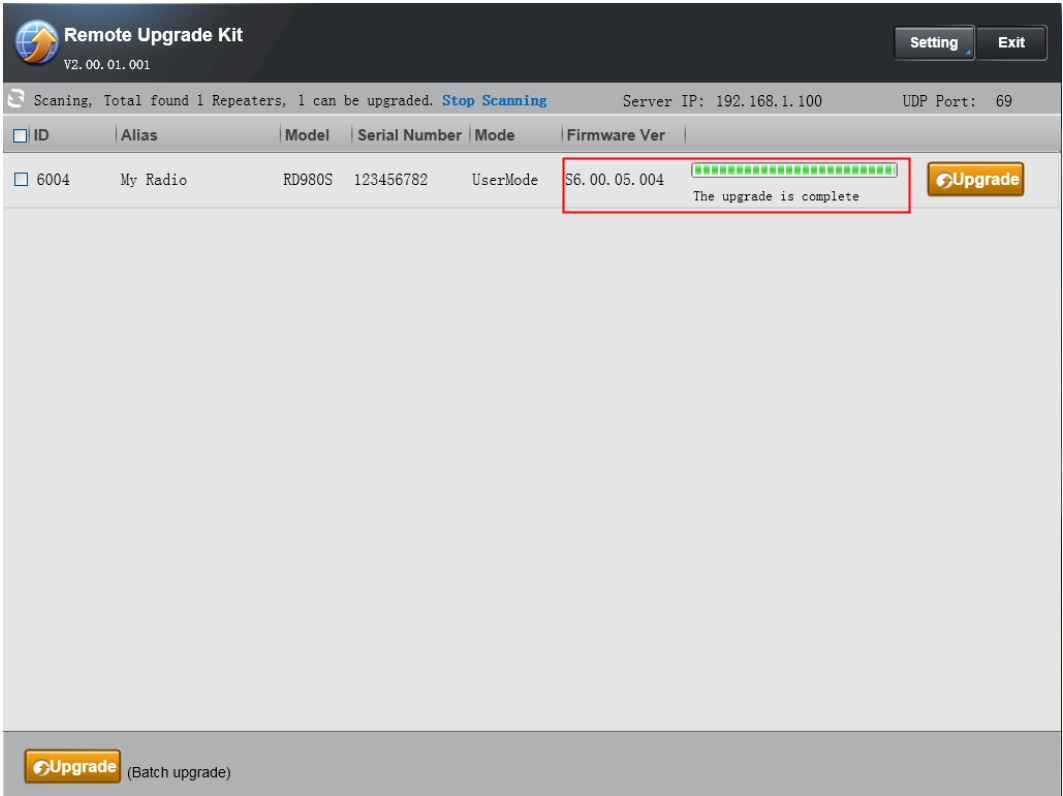
Scanning, Total found 1 Repeaters, 1 can be upgraded. [Stop Scanning](#) Server IP: 192.168.1.100 UDP Port: 69

ID	Alias	Model	Serial Number	Mode	Firmware Ver	
<input type="checkbox"/> 6004	My Radio	RD980S	123456782	UserMode	S5.05.10.007	<input type="button" value="Upgrade"/>

Repeater found

(Batch upgrade)

Step 5 When finished, the software will prompt “The upgrade is complete”, display the corresponding firmware version and change the “Mode” to “UserMode.”



5. FAQ

Q: If the remote upgrade fails due to power shut down or network disconnection, can the repeaters be upgraded again?

A: Generally, the repeaters/transceivers can be upgraded again, unless the Bootloader of the repeaters/transceivers is destroyed during upgrade.

Q: When a repeater/transceiver is being upgraded, can other repeaters/transceivers be upgraded at the same time?

A: Other repeaters/transceivers may not be upgraded immediately due to the restriction that only a certain number of repeater/transceivers can be upgraded at a time. They will be put into a queue and wait to be upgraded.

Q: After being remotely upgraded, will the tuning parameters, MAC address, network data and machine code of the repeater be changed?

A: No.

Q: When the repeater is upgraded from R5.5 to R6.0, do the corresponding radios work with the repeater need to be upgraded?

A: Yes, they do. Firmware R6.0 employs a different protocol from R5.5, the radios need to be upgraded for proper operation.

Q: Why the remote upgrade kit cannot scan the repeaters/transceivers to be upgraded?

A: Possible situations are as follows:

- Network disconnection between the repeaters/transceivers and the server.
- Improper network setting for the server.
- Firewall is not configured accordingly for the remote upgrade kit to operate properly.
- Improper network setting for the repeaters/transceivers.

Q: Will repeat upgrade cause damage?

A: No. You can still successfully upgrade the repeater of firmware version 6.0. But if the remote upgrade kit does not support same version upgrade, the repeater cannot be upgraded repeatedly.

Q: How to remotely upgrade the repeaters without Remote Upgrade feature but it is already put into use?

A: You need to upgrade the repeater to a version which supports the Remote Upgrade feature on site and make proper configuration. (See [Configuration](#))

Q: What to do when the remote upgrade kit pops up “Upgrade failed”, “Upload file failed” or “Failed to parse the data file”?

A: Please upgrade the repeater/transceivers again or restart the remote upgrade kit to retry in case of upgrade failure. If the repeater /transceivers still cannot be upgraded, please contact the local dealer or the customer service of the Company for technical support.