

How to update the firmware of YL9100 HPLC modules

Update date: May.28th, 2021

YL911X Pump, YL9131 Column compartment, and YL9120 UVD of YL9100 HPLC system have a same MPU board for loading the firmware file and the all module must be updated to corresponding firmware file. When you replace MPU board not updated by firmware file with new one or update the firmware version due to the revision, you must update the firmware by yourself. This document describes how to update the firmware file for YL9100 Plus pump and the other YL9100 modules. Update procedure of YL9100 Plus pump requires more steps (chapter I) due to LCD function.



Figure 1. YL911X Pump, YL9131 Column Compartment, YL9120 UVD of YL9100 HPLC System

Service Note



1. Linux image writing on YL9100 Plus pump with LCD

1. Open the 'tftpd32' program (see Figure 2) on the PC connected with pump.



Figure 2. 'tftpd32' program icon

2. Click on the 'Browse' button and select directory folder where the 'ramdisk.gz' and 'zImage' files are saved as shown in Figure 3 (refer to S-1 on page 13).
3. Then press the 'OK' button.

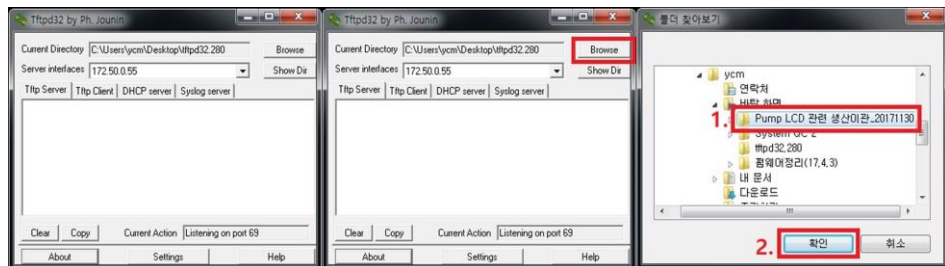


Figure 3. tftpd32 - Directory folder setting

4. Click on the 'Show Dir' button and check if 'ramdisk.gz', and 'zImage' files exists.
5. If exists, press 'OK' button (see Figure 4).

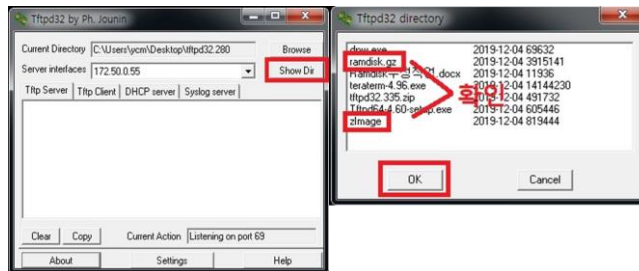


Figure 4. tftpd32 - Show directory

6. Next, open the 'Tera Term' program (See Figure 5).



Figure 5. 'Tera Term' program icon

7. When 'New connection' box appears, change to 'Serial' (not TCP/IP) and press 'OK' button as shown in Figure 6.

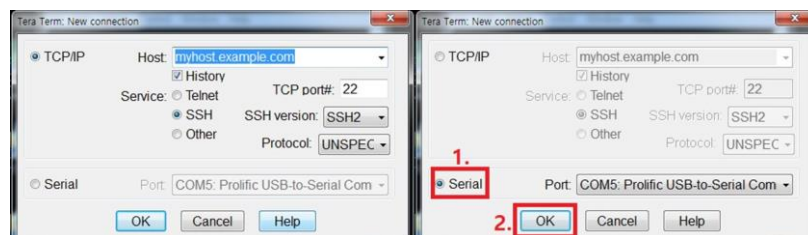


Figure 6. Tera Term - Serial setting

8. Go to 'Setup' on the top menu, and click on the 'Serial port...' (see Figure 7).

Service Note

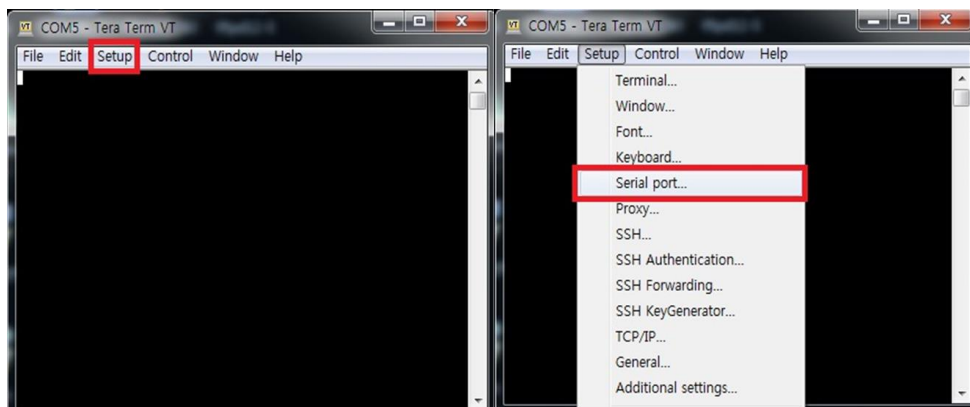


Figure 7. Tera Term - Setup menu

9. When the 'Serial port setup' box opens like in Figure 8, change the 'Baud rate' to 115200 and press 'OK' button.



Figure 8. Tera Term - Serial port setup

10. Find the 'ID SELECT' DIP switch' located back side of the YL9110 pump (refer to Figure 9).



Figure 9. Location of the 'ID SELECT DIP SWITCH' on the main board

11. Change all (1, 2, 3, 4) the 'ID SELECT' DIP switches' to OFF status as shown in right image of Figure 10.

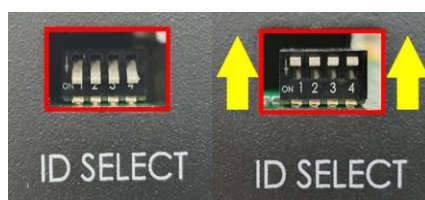


Figure 10. Change 'ID SELECT' DIP switch to off

Service Note



12. Turn on the pump then message will appears in 'Tera Term' window as shown in Figure 11.
13. When the 'Hit any key to stop autoboot: 3' message appears, press the 'Enter' key before the counter value reaches 3 to 0.

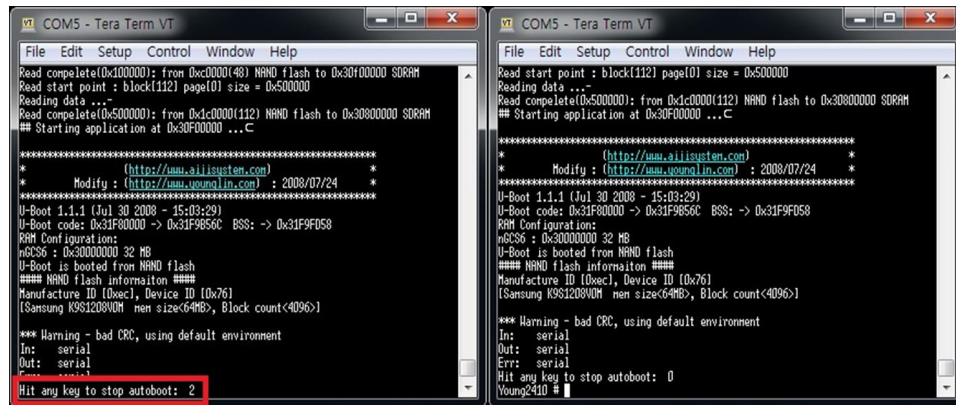


Figure 11. Tera Term - 'Hit any key to stop autoboot: 3' message

14. Enter the 'nandw kernel' and press 'Enter' key (see Figure 12).

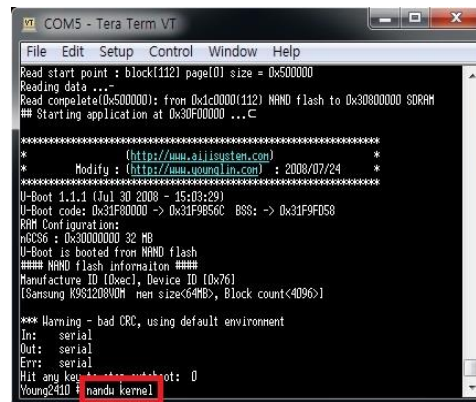


Figure 12. Tera Term - 'nandw kernel' command

15. Then, 'zimage' file starts to write on the 'tftpd32' program (see Figure 13).

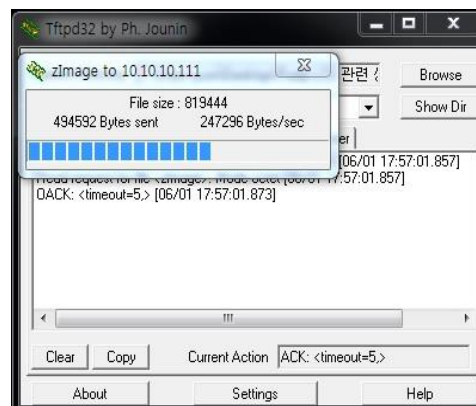


Figure 13. tftpd32 - 'zimage' writing

16. When the 'zImage' file writing is done, enter the 'nandw ramdisk' as shown in Figure 14 and press 'Enter' key.

Service Note

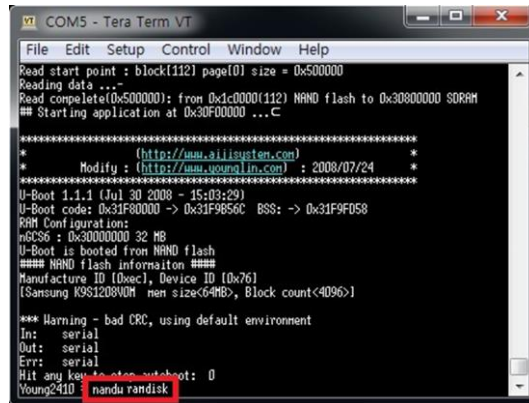


Figure 14. Tera Term - 'handw ramdisk' command

17. Then, 'ramdisk' file starts to write (see Figure 15).

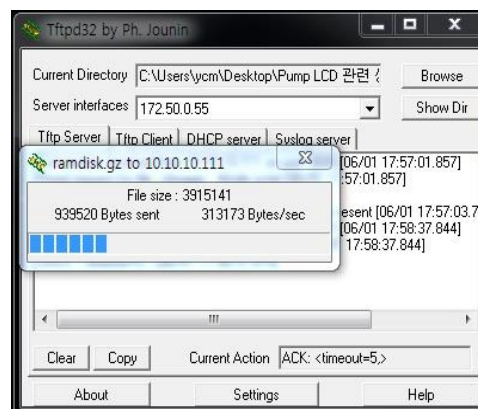


Figure 15. tftpd32 - 'ramdisk' writing

18. Both 'zlamge' and 'ramdisk' writing is finished, turn off the pump.

Service Note



II. Firmware writing for YL9100 Plus pump and the other modules

*** When updating firmware version due to the revision, please follow from step 13.**

**** Red words** in chapter II mean that different values must be entered depending on the IP address of module (Pump; 10.10.10.**10**, Column compartment; 10.10.10.**30**, UVD; 10.10.10.**20**).

1. Run the 'Command Prompt' (cmd.exe) as administrator.

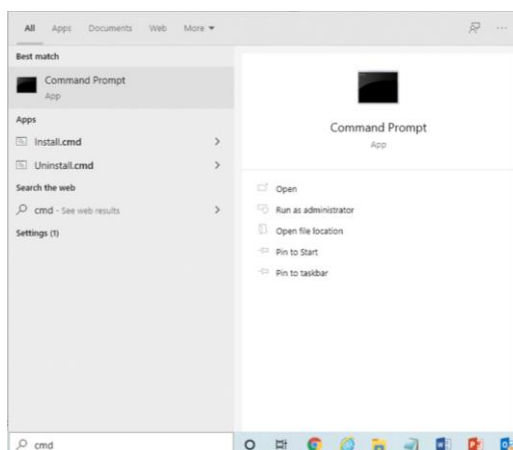


Figure 16. Run the 'Command Prompt'

2. Enter the 'ping 10.10.10.**10** -t' (see Figure 17).

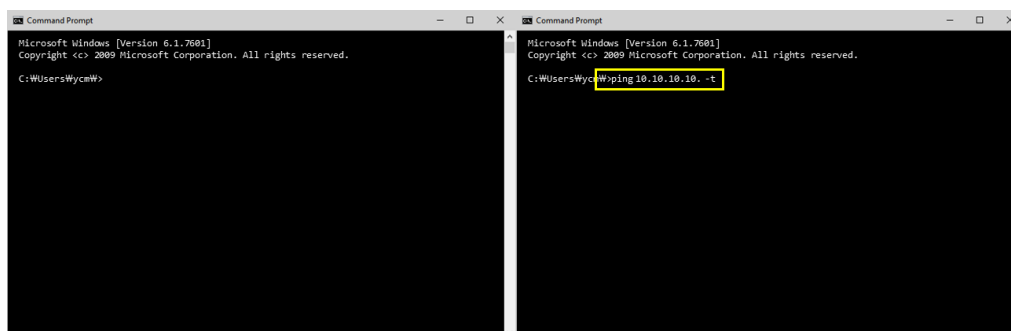


Figure 17. Enter command - 'ping 10.10.10.10 -t'

3. When 'Request timed out' message appears as shown in Figure 18, turn on the pump and check if the communication is connected.

* If communication is connected successfully, response of 10.10.10.**10** message appears like, 'byte=32 time<1ms TTL=255'.

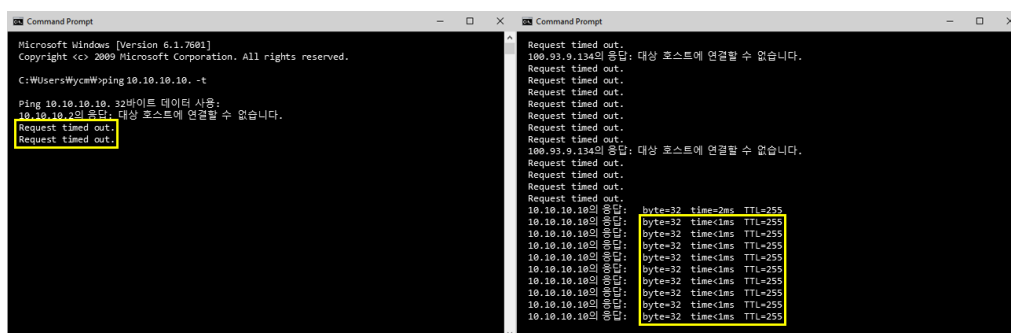


Figure 18. Communication is connected successfully

Service Note



4. After connection is successfully done, turn off the pump.
5. Change the 'ID SELECT DIP SWITCH' to ON status (see right image of Figure 19).

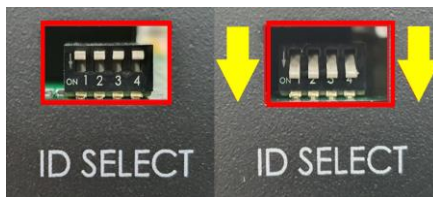


Figure 19. Change 'ID SELECT' DIP switch to on

6. Turn on the pump again and check if communication of ping 10.10.10.10 -t is connected on the 'cmd.exe' window.
 - * If communication is connected successfully, response of 10.10.10.10 message appears like, 'byte=32 time<1ms TTL=255' as same as step II-3.
7. Open one more the 'cmd.exe' window.
8. Enter the 'telnet 10.10.10.10' then press 'Enter' key (see Figure 20).
9. When entered to telnet, the 'Welcom to HPLC MPU Board' message appears as shown in right image of Figure 20.
 - * If 'telnet' command is not executed, see the 'Troubleshooting' (S-2 on page 12) on this service note.

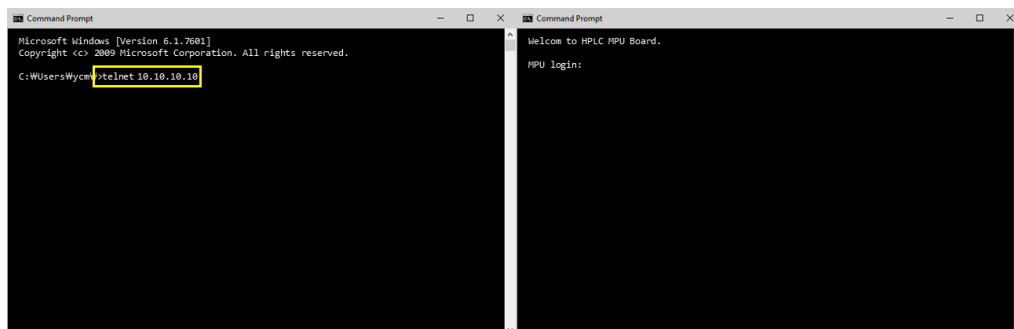


Figure 20. Connect to 'telnet'

10. Enter 'root' command and press 'Enter' key (see Figure 21).

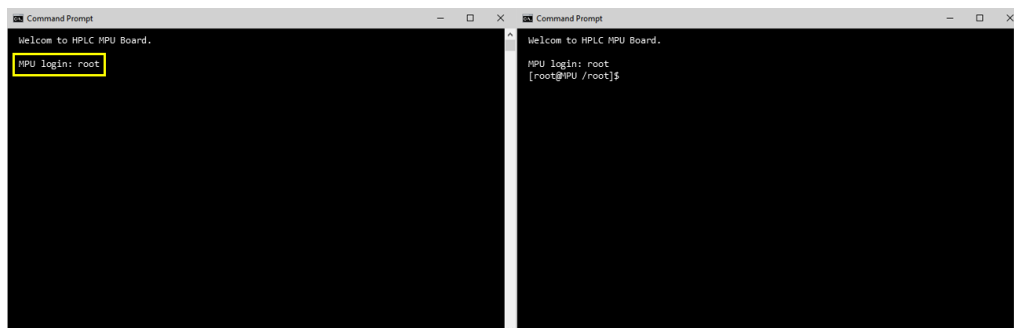


Figure 21. Enter 'root'

Service Note



11. Enter 'cd /home' and press 'Enter' key (see Figure 22).
12. Then you can see that [root@MPU /root]\$ is changed to [root@MPU /home]\$.

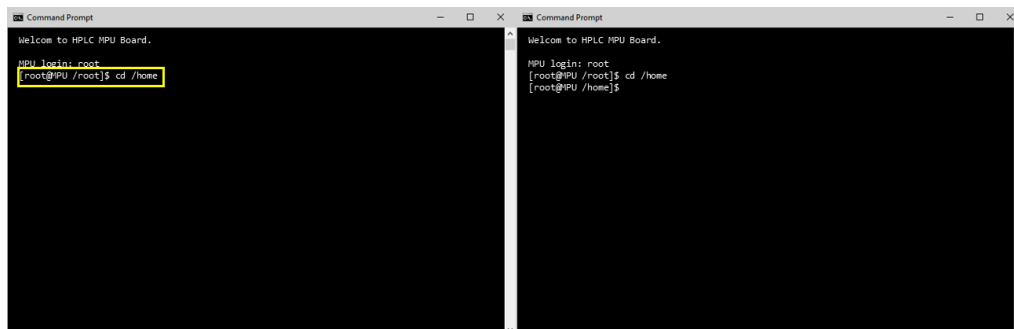


Figure 22. Enter 'cd /home'

13. Open the 'YLFirmwareUpdateInstall_6' program.
- * Don't close the II-12 'cmd' window for step II-19.

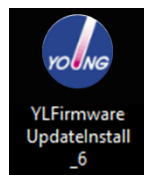


Figure 23. YL Firm-ware update program icon

14. Press the 'Connect' button on the pump menu (refer to Figure 24), then the version changes from 'Unknown' to '1.1.1' and the 'Connect' button changes to 'Update'.
15. Press the 'Update' button to start the Firmware writing.
16. When the writing process is finished, 'Please, reboot the Pump system!' message box appears.
17. Check the version changes to newest version and the status changes to 'Completed!'.

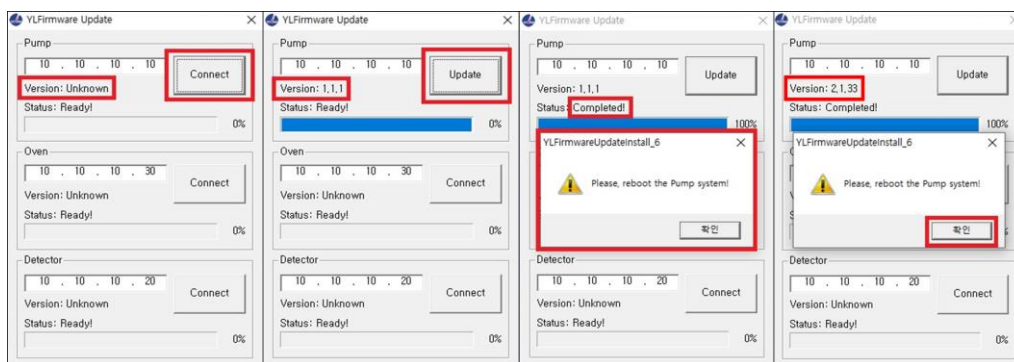
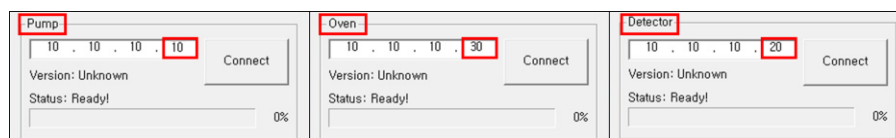


Figure 24. YLFirmware Update program

- * Press the 'Connect' and 'Update' buttons for each module you are updating.



18. Click on the 'OK' button, and close the 'YLFirmware Update' program.

Service Note



19. Open the II-13 cmd window again, enter the 'killall lmain' in [root@MPU /home]\$.

```

Welcome to HPLC MPU Board.
MPU login: root
[root@MPU /root]$ cd /home
[root@MPU /home]$ killall lmain
[root@MPU /home]$
  
```

Figure 25. Enter 'killall lmain'

20. Enter the './lc_exe' and press 'Enter' key (see Figure 26).

```

Welcome to HPLC MPU Board.
MPU login: root
[root@MPU /root]$ cd /home
[root@MPU /home]$ killall lmain
[root@MPU /home]$ ./lc_exe
Using bd_check_dev.o
Using hplc_gpio_dev.o
Using hplc_gpio_dev.o
Using bd_check_dev.o
file manager excute
[root@MPU /home]$ open /dev/ttyS
serial set complete...
  
```

Figure 26. Enter './lc_exe'

21. Enter the './rtctest s2r 021715152020:30' and press 'Enter' key (see Figure 27).

* This is a command that enters date and time.

./rtctest s2r 0217 (date), 1515 (hour/minute), 2020 (year), :30 (second).

```

Welcome to HPLC MPU Board.
MPU login: root
[root@MPU /root]$ cd /home
[root@MPU /home]$ killall lmain
[root@MPU /home]$ ./lc_exe
Using bd_check_dev.o
Using hplc_gpio_dev.o
Using hplc_gpio_dev.o
Using bd_check_dev.o
file manager excute
[root@MPU /home]$ open /dev/ttyS
serial set complete...
./rtctest s2r 021715152020:30
Writing into SX2410 RTC.
year : 2020
Rtc_time_data.tm_year : 0120
TIME 2020-02-17 15:15:30
io_ctrl : 0
[root@MPU /home]$
  
```

Figure 27. Enter the date & time command

22. Enter the 'touch *' and press 'Enter' key (see Figure 28).

```

Welcome to HPLC MPU Board.
MPU login: root
[root@MPU /root]$ cd /home
[root@MPU /home]$ killall lmain
[root@MPU /home]$ ./lc_exe
Using bd_check_dev.o
Using hplc_gpio_dev.o
Using hplc_gpio_dev.o
Using bd_check_dev.o
file manager excute
[root@MPU /home]$ open /dev/ttyS
serial set complete...
./rtctest s2r 021715152020:30
Writing into SX2410 RTC.
year : 2020
Rtc_time_data.tm_year : 0120
TIME 2020-02-17 15:15:30
io_ctrl : 0
[root@MPU /home]$ touch *
[root@MPU /home]$
  
```

Figure 28. Enter 'touch *'

Service Note



23. Enter the 'll' and make sure that the date & time are applied.

* This command is double alphabet L (small), don't be confused with I (i) or 1.

```

Welcome to HPLC MPU Board.
MPU login: root
[root@MPU /root]$ cd /home
[root@MPU /home]$ killall lcamin
[root@MPU /home]$ ./lc_exe
Using bd_check_dev.o
Using hplc_gpio_dev.o
Using hplc_gpio_dev.o
Using bd_check_dev.o
file manager excute
[root@MPU /home]$ open /dev/ttyS
serial set complete...
./rtcset s2r 021715152020:30
Writing into S3C2410 RTC.
year : 2020
Rtc time_data.tm_year : 0120
TIME 2020-02-17 15:15:30
io_ctrl : 0
[root@MPU /home]$ touch *
[root@MPU /home]$ ll
-rwxr-xr-x 1 root root 3204 Feb 17 15:24 bd_check_dev.o
-rw-r--r-- 1 root root 0 Feb 17 15:24 dataTemp.txt
-rwxr-xr-x 1 root root 17726 Feb 17 15:24 file_manager
-rwxr-xr-x 1 root root 16520 Feb 17 15:24 hplc_gpio_dev.o
-rwxr-xr-x 1 root root 152 Feb 17 15:24 lc_exe
-rwxr-xr-x 1 root root 117104 Feb 17 15:24 lcamin
-rwxr-xr-x 1 nobody nobody 73 Feb 17 15:24 mt
-rwxr-xr-x 1 root root 81 Feb 17 15:24 padset.cfg
-rw-r--r-- 1 root root 65 Feb 17 15:24 pconfig.cfg
-rwxr-xr-x 1 root root 60 Feb 17 15:24 pdevcfg.cfg
-rw-r--r-- 1 root root 0 Feb 17 15:24 pidXXX.txt
drwxr-xr-x 1 nobody nobody 0 Feb 17 15:24 qt
-rwxr-xr-x 1 nobody nobody 16133 Feb 17 15:24 rtcset
-rwxr-xr-x 1 root root 43 Feb 17 15:24 time.txt

```

Figure 29. Enter 'll'

24. Enter the 'cd /home3' and press 'Enter' key (see Figure 30).

25. Then you can see that [root@MPU /home]\$ is changed to [root@MPU /home3]\$.

```

./rtcset s2r 021715152020:30
Writing into S3C2410 RTC.
year : 2020
Rtc time_data.tm_year : 0120
TIME 2020-02-17 15:15:30
io_ctrl : 0
[root@MPU /home]$ touch *
[root@MPU /home]$ ll
-rwxr-xr-x 1 root root 3204 Feb 17 15:24 bd_check_dev.o
-rw-r--r-- 1 root root 0 Feb 17 15:24 dataTemp.txt
-rwxr-xr-x 1 root root 17726 Feb 17 15:24 file_manager
-rwxr-xr-x 1 root root 16520 Feb 17 15:24 hplc_gpio_dev.o
-rwxr-xr-x 1 root root 152 Feb 17 15:24 lc_exe
-rwxr-xr-x 1 root root 117104 Feb 17 15:24 lcamin
-rwxr-xr-x 1 nobody nobody 73 Feb 17 15:24 mt
-rwxr-xr-x 1 root root 81 Feb 17 15:24 padset.cfg
-rw-r--r-- 1 root root 65 Feb 17 15:24 pconfig.cfg
-rwxr-xr-x 1 root root 60 Feb 17 15:24 pdevcfg.cfg
-rw-r--r-- 1 root root 0 Feb 17 15:24 pidXXX.txt
drwxr-xr-x 1 nobody nobody 0 Feb 17 15:24 qt
-rwxr-xr-x 1 nobody nobody 16133 Feb 17 15:24 rtcset
-rwxr-xr-x 1 root root 43 Feb 17 15:24 time.txt
[root@MPU /home]$ cd /home3
[root@MPU /home3]$

```

Figure 30. Enter 'cd /home3'

26. Press the ▲ arrow key on your keyboard to re-execute previous command.



Figure 31. Press the Up-arrow button on the keyboard

27. Re-enter the './rtcset s2r 021715152020:30' and press 'Enter' key (see Figure 32).

```

./rtcset s2r 021715152020:30
Writing into S3C2410 RTC.
year : 2020
Rtc time_data.tm_year : 0120
TIME 2020-02-17 15:15:30
io_ctrl : 0
[root@MPU /home]$ touch *
[root@MPU /home]$ ll
-rwxr-xr-x 1 root root 3204 Feb 17 15:24 bd_check_dev.o
-rw-r--r-- 1 root root 0 Feb 17 15:24 dataTemp.txt
-rwxr-xr-x 1 root root 17726 Feb 17 15:24 file_manager
-rwxr-xr-x 1 root root 16520 Feb 17 15:24 hplc_gpio_dev.o
-rwxr-xr-x 1 root root 152 Feb 17 15:24 lc_exe
-rwxr-xr-x 1 root root 117104 Feb 17 15:24 lcamin
-rwxr-xr-x 1 nobody nobody 73 Feb 17 15:24 mt
-rwxr-xr-x 1 root root 81 Feb 17 15:24 padset.cfg
-rw-r--r-- 1 root root 65 Feb 17 15:24 pconfig.cfg
-rwxr-xr-x 1 root root 60 Feb 17 15:24 pdevcfg.cfg
-rw-r--r-- 1 root root 0 Feb 17 15:24 pidXXX.txt
drwxr-xr-x 1 nobody nobody 0 Feb 17 15:24 qt
-rwxr-xr-x 1 nobody nobody 16133 Feb 17 15:24 rtcset
-rwxr-xr-x 1 root root 43 Feb 17 15:24 time.txt
[root@MPU /home3]$ ./rtcset s2r 021715152020:30

```

Figure 32. Enter the './rtcset s2r 021715152020:30'

Service Note



28. Press the ▲ arrow key on the keyboard, and enter the 'touch *'.

```

[root@IPU /home]$ touch *
[root@IPU /home]$ ll
-rwxrwxrwx 1 root root 3284 Feb 17 15:24 bd_check_dev.o
-rw-r--r-- 1 root root 0 Feb 17 15:24 dataTemp.txt
-rwxrwxrwx 1 root root 17726 Feb 17 15:24 file_manager
-rwxrwxrwx 1 root root 16520 Feb 17 15:24 hplc_gpio_dev.o
-rwxrwxrwx 1 root root 152 Feb 17 15:24 lc_exe
-rwxrwxrwx 1 root root 117184 Feb 17 15:24 lcmain
-rwxrwxrwx 1 root root 73 Feb 17 15:24 mnt
-rwxrwxrwx 1 root root 81 Feb 17 15:24 padset.cfg
-rw-r--r-- 1 root root 65 Feb 17 15:24 pconfig.cfg
-rwxrwxrwx 1 root root 60 Feb 17 15:24 pdevcfg.cfg
-rw-r--r-- 1 root root 0 Feb 17 15:24 pidXXXX.txt
drwxr-xr-x 1 nobody nobody 0 Feb 17 15:24 qt
-rwxrwxrwx 1 nobody nobody 16133 Feb 17 15:24 rtcset
-rwxrwxrwx 1 root root 43 Feb 17 15:24 time.txt
[root@IPU /home]$ cd /home3
[root@IPU /home3]$ ./rtcset s2r 021715152020:30
Writing into 53C2410 RTC.
year : 2020
Rtc time_data.tm_year : 0120
TIME 2020-02-17 15:15:30
io_ctrl : 0
[root@IPU /home3]$ touch *
[root@IPU /home3]$
  
```

Figure 33. Enter 'touch *'

29. Enter the 'll' and check the date & time as shown in left image of Figure 34.

```

[root@IPU /home]$ ll
-rwxrwxrwx 1 root root 3284 Feb 17 15:24 bd_check_dev.o
-rw-r--r-- 1 root root 0 Feb 17 15:24 dataTemp.txt
-rwxrwxrwx 1 root root 17726 Feb 17 15:24 file_manager
-rwxrwxrwx 1 root root 16520 Feb 17 15:24 hplc_gpio_dev.o
-rwxrwxrwx 1 root root 152 Feb 17 15:24 lc_exe
-rwxrwxrwx 1 root root 117184 Feb 17 15:24 lcmain
-rwxrwxrwx 1 root root 73 Feb 17 15:24 mnt
-rwxrwxrwx 1 root root 81 Feb 17 15:24 padset.cfg
-rw-r--r-- 1 root root 65 Feb 17 15:24 pconfig.cfg
-rwxrwxrwx 1 root root 60 Feb 17 15:24 pdevcfg.cfg
-rw-r--r-- 1 root root 0 Feb 17 15:24 pidXXXX.txt
drwxr-xr-x 1 nobody nobody 0 Feb 17 15:24 qt
-rwxrwxrwx 1 nobody nobody 16133 Feb 17 15:24 rtcset
-rwxrwxrwx 1 root root 43 Feb 17 15:24 time.txt
[root@IPU /home]$ cd /home3
[root@IPU /home3]$ ./rtcset s2r 021715152020:30
Writing into 53C2410 RTC.
year : 2020
Rtc time_data.tm_year : 0120
TIME 2020-02-17 15:15:30
io_ctrl : 0
[root@IPU /home3]$ touch *
[root@IPU /home3]$ ll
-rwxrwxrwx 1 root root 121 Feb 17 15:17 mnt
-rwxrwxrwx 1 nobody nobody 207 Feb 17 15:17 mpd_set
-rw-r--r-- 1 nobody nobody 65 Feb 17 15:17 mtdinfo.txt
-rwxrwxrwx 1 nobody nobody 503 Feb 17 15:17 rc_lcmain
-rw-r--r-- 1 nobody nobody 16133 Feb 17 15:17 rtcset
  
```

Figure 34. Enter 'll'

30. Enter the 'quit' and press 'Enter' key to disconnect the communication with MPU board as shown in Figure 35.

```

-rwxrwxrwx 1 root root 117184 Feb 17 15:24 lcmain
-rwxrwxrwx 1 nobody nobody 73 Feb 17 15:24 mnt
-rwxrwxrwx 1 root root 81 Feb 17 15:24 padset.cfg
-rw-r--r-- 1 root root 65 Feb 17 15:24 pconfig.cfg
-rwxrwxrwx 1 root root 60 Feb 17 15:24 pdevcfg.cfg
-rw-r--r-- 1 root root 0 Feb 17 15:24 pidXXXX.txt
drwxr-xr-x 1 nobody nobody 0 Feb 17 15:24 qt
-rwxrwxrwx 1 nobody nobody 16133 Feb 17 15:24 rtcset
-rwxrwxrwx 1 root root 43 Feb 17 15:24 time.txt
[root@IPU /home]$ cd /home3
[root@IPU /home3]$ ./rtcset s2r 021715152020:30
Writing into 53C2410 RTC.
year : 2020
Rtc time_data.tm_year : 0120
TIME 2020-02-17 15:15:30
io_ctrl : 0
[root@IPU /home3]$ touch *
[root@IPU /home3]$ ll
-rwxrwxrwx 1 root root 121 Feb 17 15:17 mnt
-rwxrwxrwx 1 nobody nobody 207 Feb 17 15:17 mpd_set
-rw-r--r-- 1 nobody nobody 65 Feb 17 15:17 mtdinfo.txt
-rwxrwxrwx 1 nobody nobody 503 Feb 17 15:17 rc_lcmain
-rw-r--r-- 1 nobody nobody 16133 Feb 17 15:17 rtcset
[root@IPU /home3]$ quit
  
```

Figure 35. Quit the communication

Service Note



S-1. Troubleshooting

If 'telnet' command is not executed in step II-9, 'telnet is not recognized as an internal or external command, operable program or batch file.' message appears as shown in Figure 36.

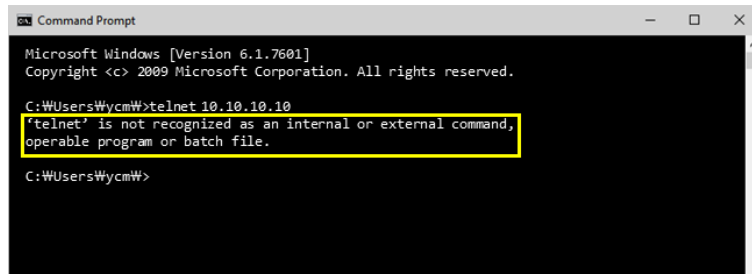


Figure 36. 'telnet' execution failure message

1. Go to [Window] – [Settings] – [Program and Features].
2. Click on the [Turn Windows features on or off].

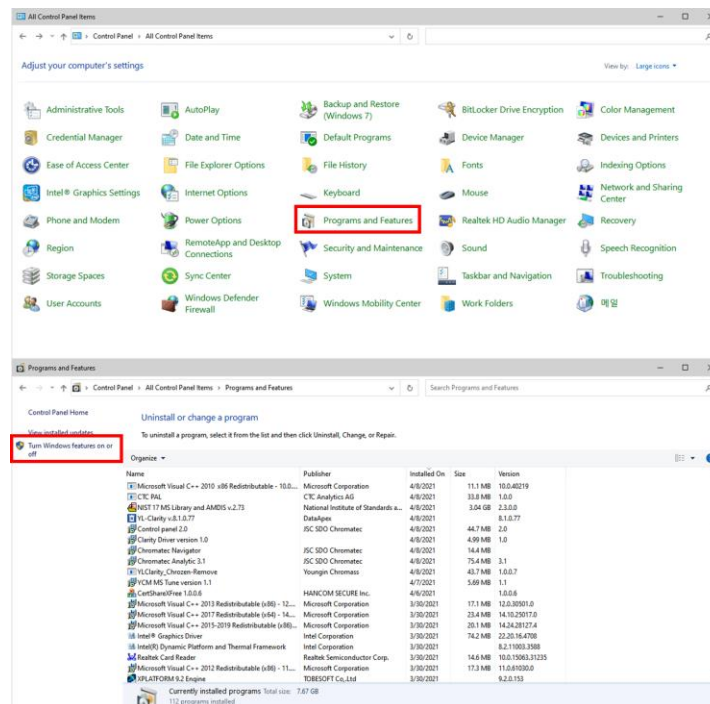


Figure 37. How to open 'Program and features' in Windows 10

3. Check on the [Telnet Client] box as shown in Figure 38 and press 'OK' button.

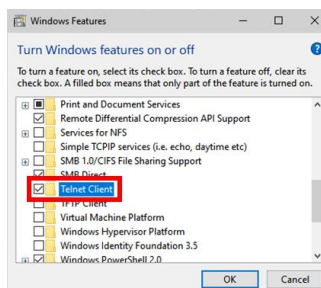


Figure 38. Check on the 'Telnet Client'

Service Note



S-2. How to install software related to firmware update

1. Download the installation file by clicking on the below 'DOWNLOAD' button.

* YL Firmware Updater will be provide with the firmware file.

DOWNLOAD



2. Unzip a compressed file.

3. Run the Application file.

- tftpd32 (64bit): Tftpd64-4.60-setup.exe

- tftpd32 (32bit): tftpd32.exe

- Tera Term: teraterm-4.96.exe

4. Make a new folder and move 'ramdisk.gz' and 'zImage' files into the new folder.

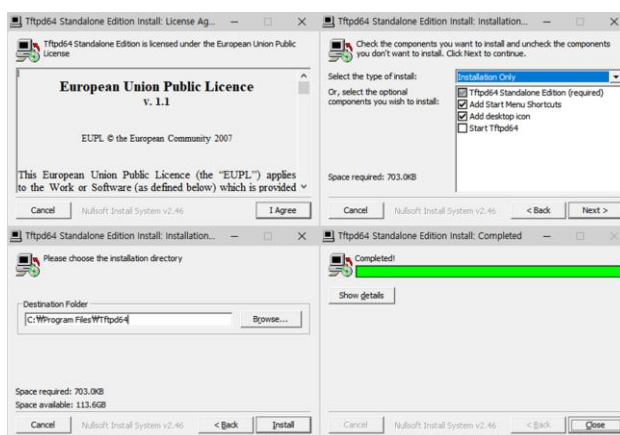


Figure 39. Tftpd32 installation

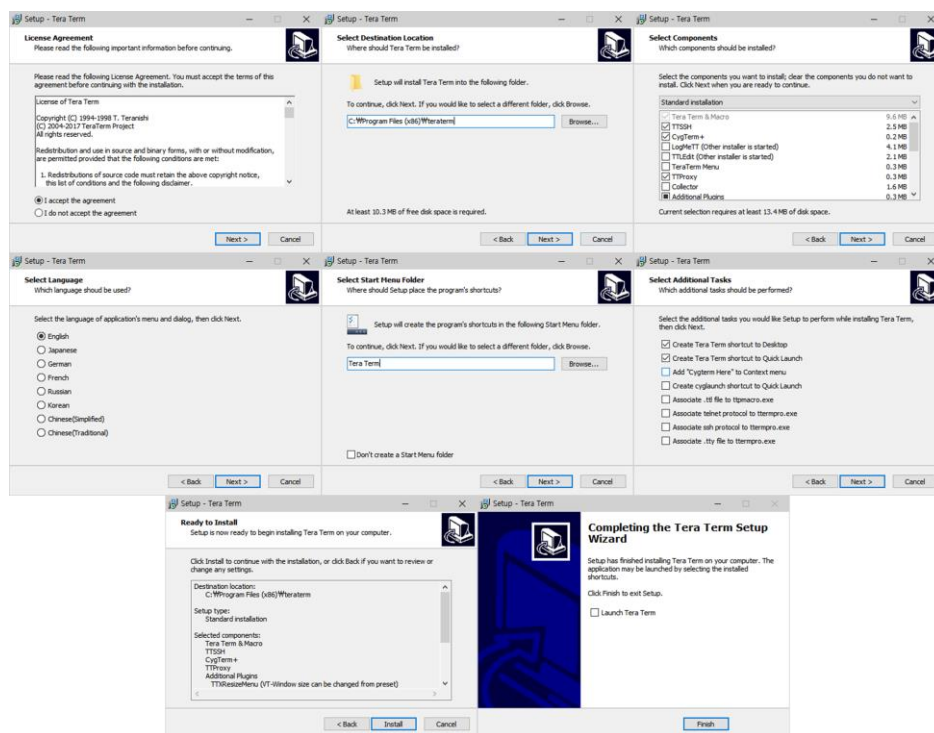


Figure 40. Tera Term installation

Service Note

**S-3. Commands**

If you are confused with the command spelling, use copy & paste.

```
ping 10.10.10.10 -t  
telnet 10.10.10.10  
root  
cd /home  
killall lmain  
./lc_exe  
./rtcset s2r 021715152020:30  
touch *  
ll  
cd /home3'  
quit
```