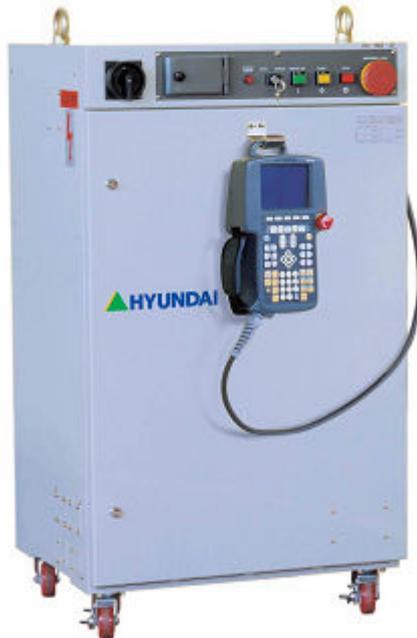


Hi4aHV051001FME1

HYUNDAI ROBOT
Function Manual
HRView



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1. Overview

1.1. HRView Overview

HRView is software for transmission and reception of files contained in HHI's Hi3, Hi3TB and Hi4 robot controllers via RS-232C cable or Ethernet to and from external PCs. Ethernet is available only for Hi3TB.

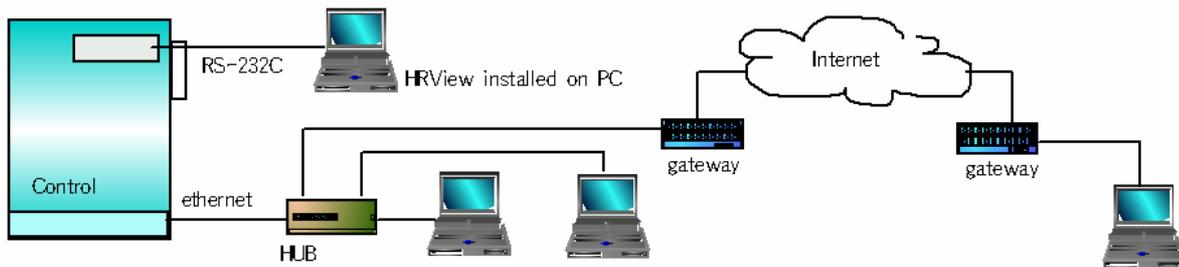


Fig 1.1 Use of HRView

1.2. Function

This program can perform the following jobs for Hi3, Hi3TB and Hi4 robot controllers.

- (1) Viewing file list(s) in the controller
- (2) Storing certain file(s) of the controller in PC (backup)
- (3) Retrieving certain files of PC to the controller (restore)
- (4) Deleting certain files of the controller or PC
- (5) Editing controller files stored in PC (calling Notepad, one of Windows utilities)
- (6) Changing file format (step number, version, etc.)

1.3. Ethernet Communication

Communication function through Ethernet can be used only when Ethernet interface board (BD473), one of the options of Hi3TB robot controller is attached. (For Ethernet file transmission and reception of Hi4 robot controller, use FTP function.)

1.4. Caution

More than two HRViews cannot be connected at the same time to the controller through Ethernet. As long as first connected HRView remains, other HRViews cannot be connected. Also, HRViews from two channels, RS-232C and Ethernet cannot simultaneously access to the controller.

2. HRView Installation Method

2.1. User Environment

Table 2-1 HRView user environment

H/W	Pentium or higher compatible PC, 16MB, VGA 640x480 256 colors and more recommended
O/S	Window 95/98/ME/NT/2000/XP
Robot controller	Hi3 controller system main S/W V07.02-01 and higher can be used. However, Ethernet is available only in Hi3TB.

2.2. Installation



Fig 2.1 HRView installation screen

Insert HRView disk and run setup.exe. Then, InstallShield Wizard starts.

Select language in the first dialog box. If Korean is selected, Korean HRView is installed. If English is selected, English HRView is installed.

Continue to set installation directory and program icon directory by clicking . Then appropriate files are copied to the directory, and installation is completed.

3. Controller Parameter Setup

Hi3 controller has two serial ports. One is for T/P, and the other serial port #1 is for HRView. Ethernet is not available.

Hi3TB and Hi4a robot controllers have four serial ports. Two of them can be used for HRView. Serial port #1 in condition setup is RS-232C port attached to controller cabinet front. In case of Hi3TB, serial port #2 is connected to RJ-45 port through Ethernet adopter. (Check the option applied to the robot controller to be used.)

Except the following setup, additional manipulation for communication is not necessary. Controller can be in the any mode or any manipulation status. While the motor is on and the robot performs a job, HRView can be used. This is called “Hot Save/Load” function.

Controller performs transmission and reception internally according to HRView request signal through Ethernet or RS-232C cable. These details are not indicated on the teach pendant screen.

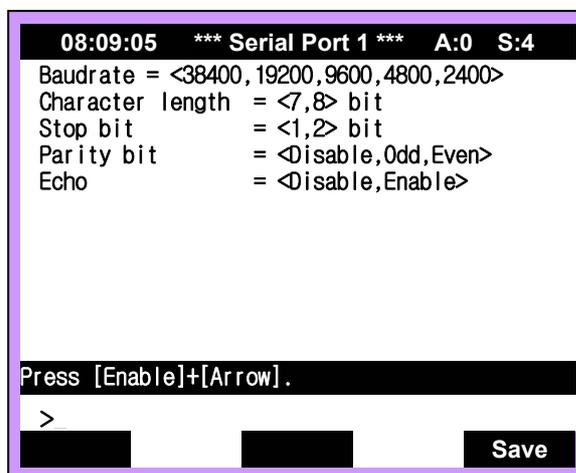
3.1. Hi3 Controller

(1) To use Ethernet: Ethernet is not available.

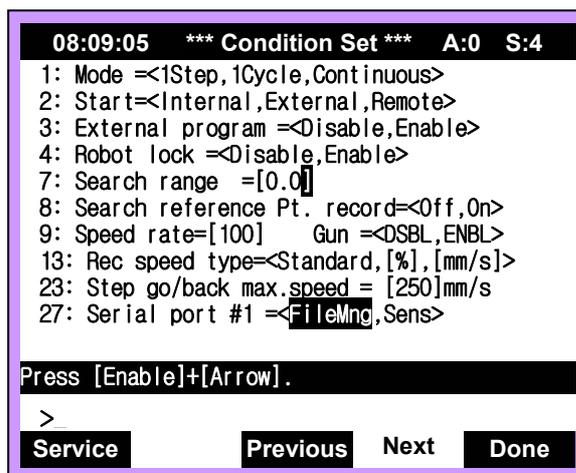
(2) For RS-232C use:

Condition setup and controller parameter should be the same as follows. The Baudrate of the Serial Port 1 should have the same setup as HRView setup. However, the rest of the communication options should be the same as follows.

- Constant Setup Group (1) → 『13: Serial Port』 → 『3: Serial Port 1』



- Condition Set → 『27: Serial Port 1』 : Set as FileMng

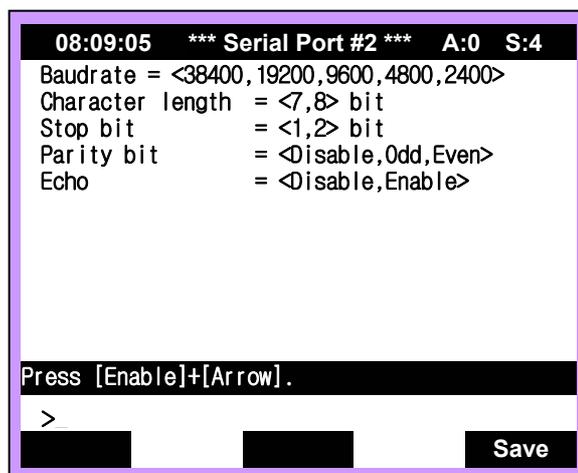


3.2. Hi3TB Controller

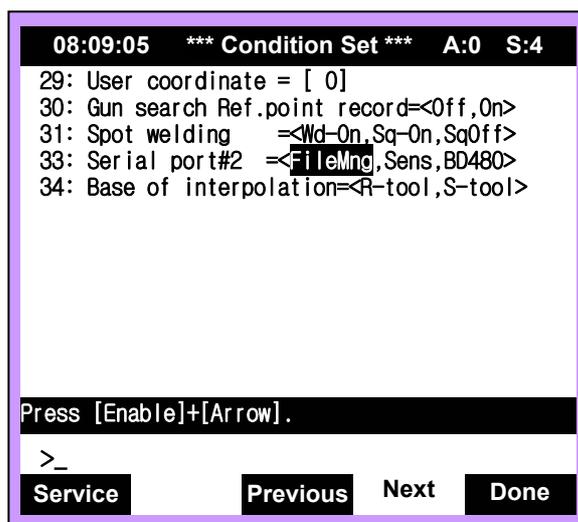
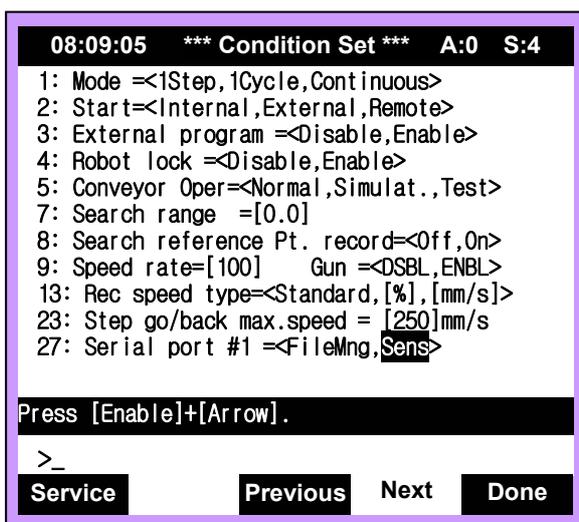
(1) For Ethernet use:

Condition setup and controller parameter should be the same as follows. The Baudrate of the Serial Port 2 should have the same setup as BD473 setup. However, the rest of the communication options should be the same as follows.

- Constant Setup Group (1) → 『13: Serial Port』 → 『4: Serial Port 2』



- Condition Set → 『27: Serial Port #1』 : Set as Sens
- Condition Set → 『33: Serial Port #2』 : Set as FileMng



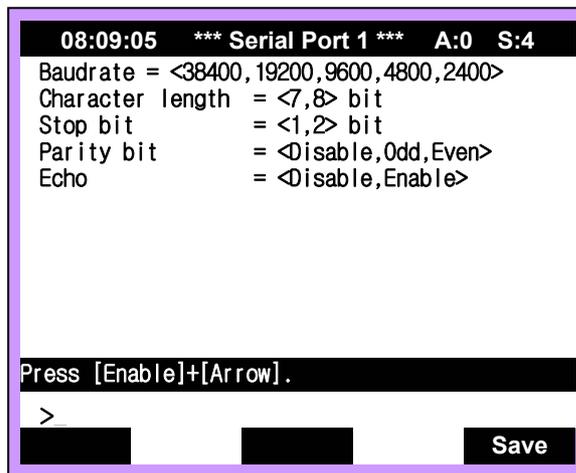
(2) To use RS-232C:

Condition setup and controller parameter should be the same as follows. The Baudrate of the Serial Port 2 should have the same setup as BD473 setup. However, the rest of the communication options should be the same as follows.

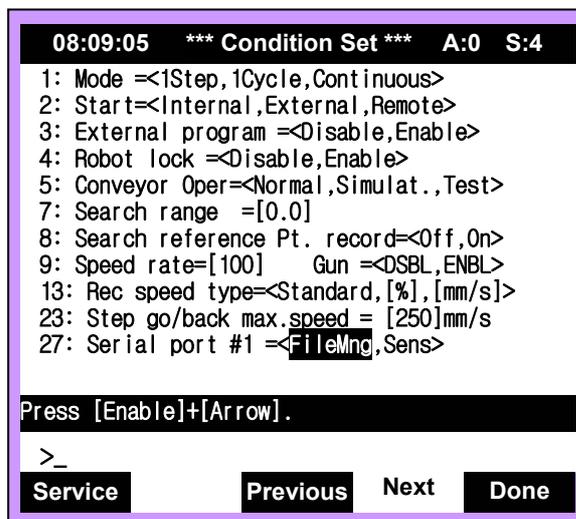
When both 『27: Serial Port 1』 and 『33: Serial Port 2』 are set as “FileMng,” Serial Port 1 has a priority, and HRView communication can be done only with Serial Port 1.

The Baudrate of the Serial Port 1 should have the same setup as HRView setup. However, the rest of the communication options should be the same as follows.

- Constant Setup Group (1) → 『13: Serial Port』 → 『3: Serial Port 1』



- Condition Set → 『27: Serial Prot #1』 : Set as FileMng



3.3. Hi4a Controller

Hi4 controller has the same function as Hi3TB. However, rapid Baudrate speeds are added and screen structure is different.

(1) For Ethernet use:

Use FTP function for Ethernet file transmission/reception.

(2) For RS-232C use:

Condition setup and constant setup should be the same as follows. When both 『Serial Port 1』 and 『Serial Port 2』 are set as “FileMng,” Serial Port 1 has a priority, and HRView communication can be done only with Serial Port 1.

The Baudrate of the Serial Port 1 should have the same setup as HRView setup. However, the rest of the options should be the same as follows.

- 『[PF2]: System』 → 『2: Controller Parameter』 → 『2: Serial ports』 → 『3: Serial port #1 (CNSIO)』

```

08:09:05 *** Serial port#1 *** A:0 S:4
Baudrate = <-,19200,38400,57600,115200>
Character length = <7,8> bit
Stop bit = <1,2> bit
Parity bit = <Disable,Odd,Even >
Echo = <Disable,Enable >
Serial port usage = <FileMng,Sens,LVS >

Press [SHIFT]+[<-][->] Key.
>
Complete

```

- 『[PF2]: System』 → 『2: Controller Parameter』 → 『2: Serial ports』 → 『4: Serial Port #2 (OPSIO)』

```

08:09:05 *** Serial port#2 *** A:0 S:4
Baudrate = <-,19200,38400,57600,115200>
Character length = <7,8> bit
Stop bit = <1,2> bit
Parity bit = <Disable,Odd,Even >
Echo = <Disable,Enable >
Serial port usage = <FileMng,Sens,LVS >

Press [SHIFT]+[<-][>-] Key.
>
Complete
    
```


4. Cabling Method

(1) RS-232C Cable

RS-232C cable connection is as follows.

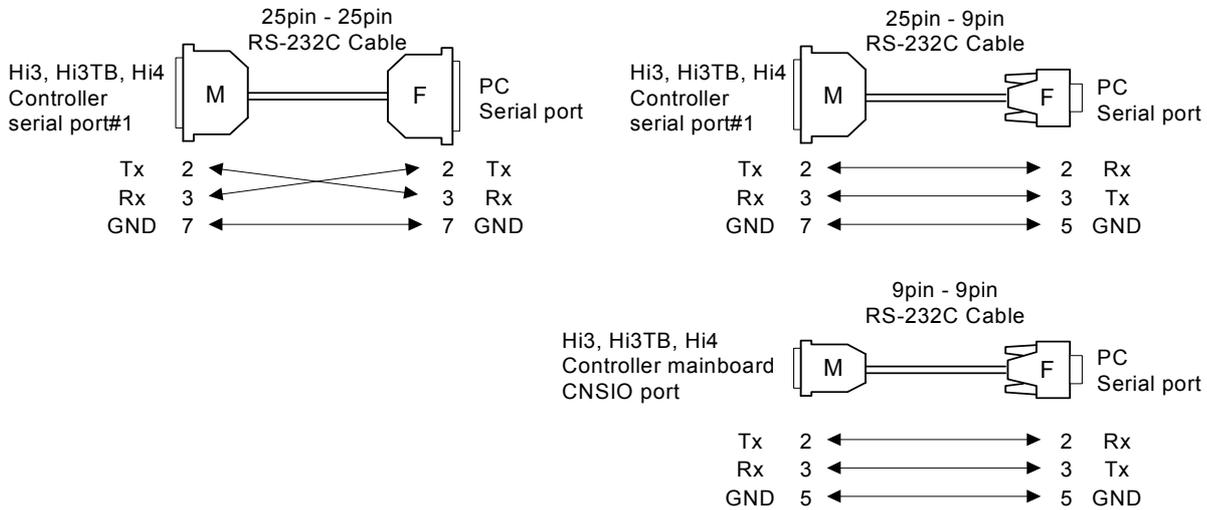


Fig 4.1 Cabling method

Connect connectors at the both ends of the cable to available PC serial port and to serial port #1 of controller cabinet, respectively.

(2) Ethernet TP (Twisted Pair) cable

If the controller should be connected to the hub, use the cable that TX-RX is not twisted. If the controller should be connected directly to a PC, use the cable that TX-RX is twisted.

5. HRView Operating Guide

5.1. Run and End

Double-click the HRView icon on the desktop or select HRView after clicking Start button. Then, the following window appears. Drag the corners with the mouse to adjust the window size.

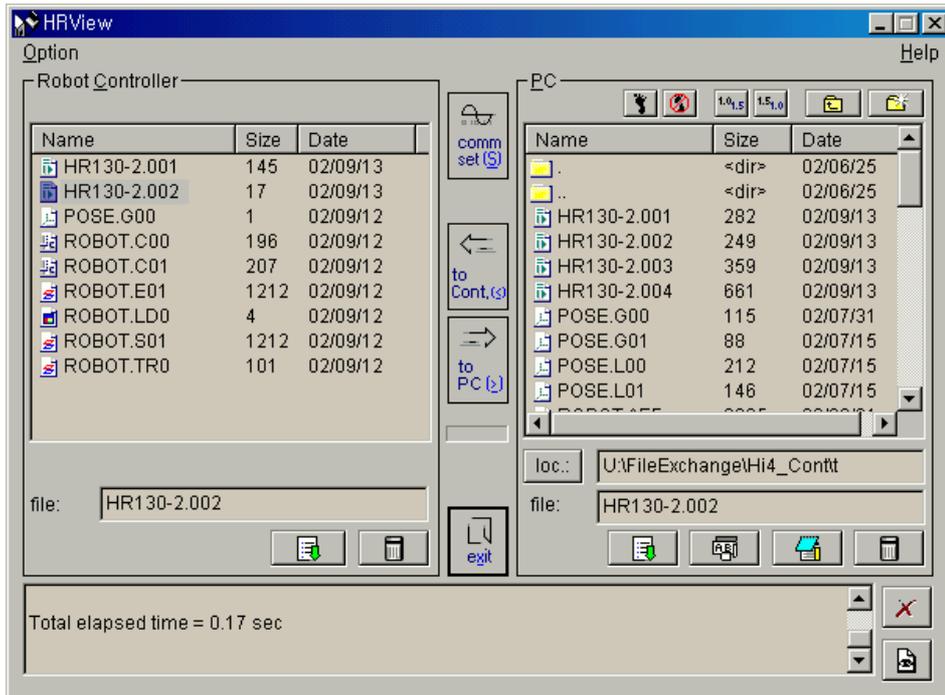


Fig 5.1 HRView main dialog box

Press  to end.

5.2. Password Input for Ethernet Access

If last communication setup was Ethernet, an ID and password input dialog box will appear.

This process is for authentication to access the controller of the IP address shown in the dialog box. To access the controller of the IP address, input ID and password, and click OK button. Then, the controller will be connected and HRView will start.

If the controller in the dialog box is not the right one, click Cancel button. Then, HRView will start, but the controller will not be connected.

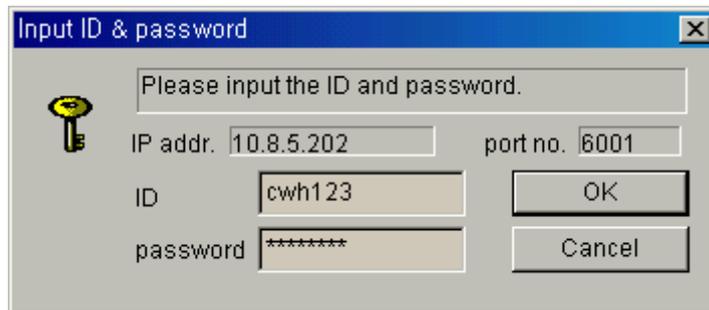


Fig 5.2 ID and password input dialog box

5.3. Communication Setup and Connection

Click , and communication setup dialog box will appear.

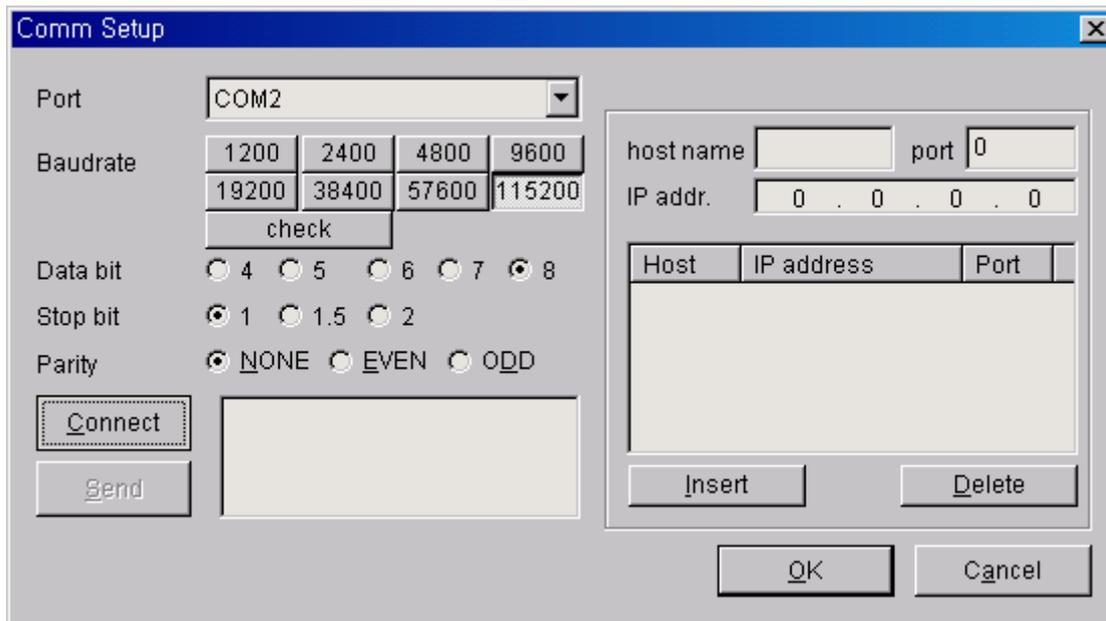
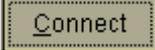
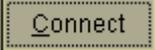
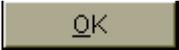
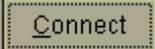


Fig 5.3 Communication setup dialog box

- ① Click  to control the connection status. If this button is pressed, this means connected status. If not, this means disconnected status.
- ② As to RS-232C, set each communication parameter (it should be the same as that of the controller) on the left in the disconnected status, click  button, and click  to end. Cable should be connected to the communication port.
- ③ As to Ethernet, enter IP address and port number in the disconnected status, click  button, and click  to end. IP addresses and port numbers of many controllers can be managed by using list box,  and .

5.4. List Indication, Transfer and Deletion of Files

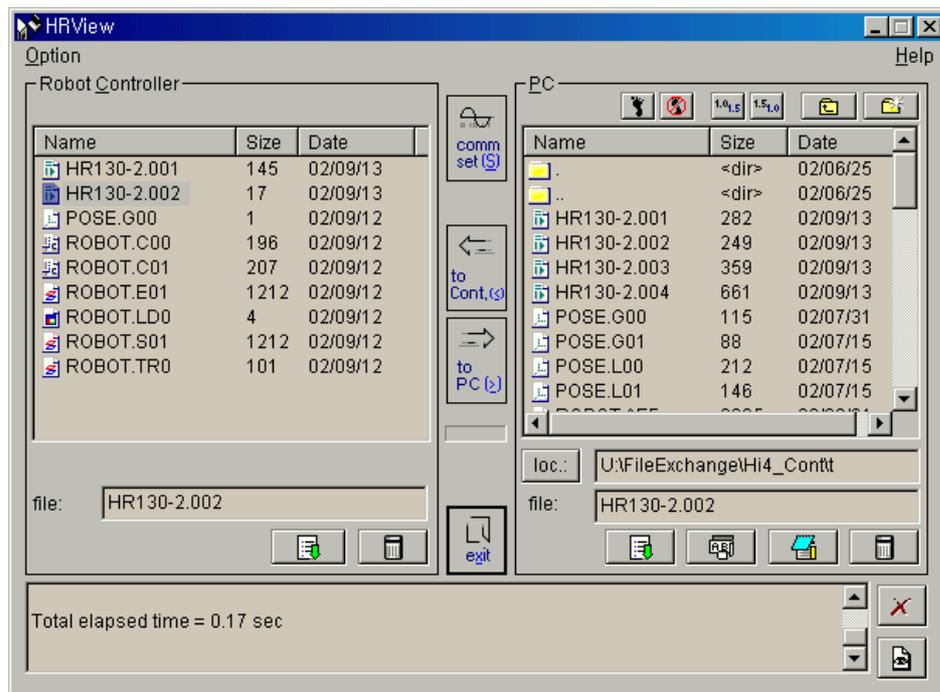


Fig 5.4 List indication, transfer and deletion of files

- ① Click  on the left. Then, a file list of the controller is transferred.
- ② To store one file in PC, click the file with the left button of mouse in the controller list box, and click . When transfer is completed, a message box appears. To select several files, click files with or .
- ③ To transfer one file to the controller, click the file in the PC list box, and click . When transfer is completed, a message box appears.
- ④ To delete files from the controller list box, select files and click  on the left. To delete files from the PC list box, select files and click  on the right.

5.5. Other Functions

- ① Select a file in the PC list box, and click  to edit the file in a Notepad format. (Text file only)
- ② Select a file in the PC list box, and click  to rename the file.
- ③ Select program files in the PC list box, and click  (Step On) to number all steps of the files. If the files are already numbered, the files are re-numbered. Click  (Step Off) to remove the numbers of all steps.

(Step number is useful for review/editing of files with Notepad. When steps are inserted in the files through typing or cut and paste, it is difficult to re-adjust step numbers one by one. In this case, click  and  in that order to re-number the steps conveniently.)

Also, some controller versions sometimes have syntax errors when a file is transferred to the controller due to step number. In this case, remove the step by clicking  button, and try again.)

- ④ Click , and then a folder search dialog box appears. You can select a folder in the PC list box. Also, you can drag the folder icon from the Windows Explorer to HRView window.
- ⑤ Click headers of the list box such as name, size and date to organize the file list in order of the selected header.
- ⑥ Double click a directory of the list box to move to the selected directory.
- ⑦ Click  to move to the parent directory in the PC list box. Or, double click  in the file list.

- ⑧ Click  to create a new directory in the PC list box.
- ⑨ Select program files in the PC list box, and click . Then, the files are changed from version 1.0 to version 1.5. Click , and then the files are changed from version 1.5 to version 1.0.

(Hi3 controller mv6.09-11 and less versions use program file version 1.0. Hi3 controller's higher version and Hi3-TB, Hi4a controllers use program file version 1.5 and version 1.0.

Only program file version 1.5 can be uploaded from HR OLP Package and Hi4a OLP Package.)

6. Etc. Setting

Select 『Setting → Etc』 menu, and then an other setup dialog box appears. Enter necessary setup, and click OK.

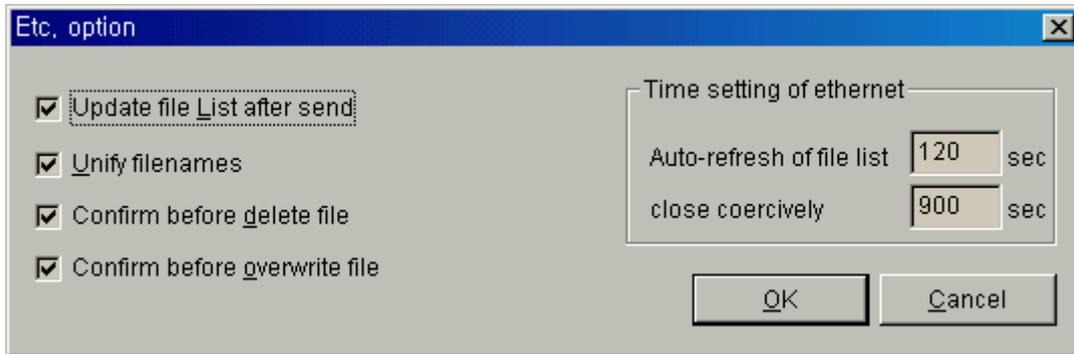


Fig 6.1 Etc. setting dialog box

① Update file List after send

This check box determines whether to renew a file list of the controller list box after transferring a file to the controller.

② Unify filenames

This check box determines whether to reflect the same file name on the other file name edit box when a file name of the controller or PC list box is clicked.

③ Confirm before delete file

This check box determines whether to allow a dialog box to ask yes or no when “Delete” button is clicked.

④ Confirm before overwrite file

This check box determines whether to allow a dialog box to ask yes or no regarding rewriting file name, if there is the same file name after file transfer.

⑤ Auto-refresh of file list

Ethernet interface board(BD473) automatically disconnects HRView, if no communication occurs for three minutes. To prevent this, HRView automatically request the controller’s file list again after a while. This option allows setting a

re-search time interval. Two minutes and thirty seconds (150 seconds) is appropriate.

⑥ Close coercively

HRView automatically disconnects Ethernet interface board (BD473) after some time.

This option allows setting disconnection time.

7. Transferable Files (in case of Hi4a Controller)

Table 7-1 Transferable file types (in case of Hi4a controller)

File Type	Filename Extension	Transferable Direction
5.0 program file	001~999	
6.0 program file	001~999	
Controller / Robot parameter file / Module Robot File (Hi4a only)	C00 / C01 / CM0	
Error / Stop history file	E01 / S01	
Operation history file IO Name file	TR0 IM0	
Global pose file Global shift file Local pose file Local shift file	POSE.G00 SHIFT.G00 POSE.L00 SHIFT.L00	
Arc welding condition files	ASF, AEF, AUX, WEV, WLD AS2, AE2, AX2 WV2, WL2	
Welding condition file (Hi4a only)	WSD	
Fieldbus setup file Palletize file (Hi4a only) Ladder diagram file (Hi4a only)	FBU, FB2 PAL LD0	

- Stored format by HRView is the same as stored format by PC-card. In other words, Files transferred to PC via HRView can be re-stored in the controller via PC-card.
- If moves that are not supported are performed, a message 『File name is not pertinent』 appears on HRView.
- As to old version controller, some file types cannot be transferred according to the version.

8. Troubleshooting

- (1) If connection is not done in the communication setup dialog box,
 - ① Check if setup such as port or speed is appropriate and if the setup is the same as controller setup.
 - ② Press Ctrl+Alt+Del to check the program manager dialog box to see if more than one HRView is running. If so, remove other HRViews.

- (2) If all type of communication such as receiving file list or transferring files,
 - ① Check communication setup of PC and controller respectively.
 - ② Check condition setup of controller.
 - ③ Turn off both controller and HRView program, and turn them on. Then, try again.
 - ④ Some PC has a COM port usage option in BIOS setup. Check it.
 - ⑤ Check if communication cable has a problem.
 - ⑥ If Ethernet is used, check IP address and port number.

- (3) If communication fails after control integer file (C00) is transferred to controller,

In case of some controller version, when controller parameter file (C00) load is completed, RS-232C communication setup of the controller parameter file is applied to controller immediately. If this setup value is different from the current communication setup, communication error occurs. Therefore, communication setup of controller or HRView should be reset according to the other.

9. Release note

1. version 1.0 (First release version) - 1999.06.

2. version 1.1 - 1999.07.
 - (1) Load completion protocol upgrade: Load error detection of a single packet
 - (2) File list directory item sort upgrade
 - (3) File list renewal option (after transfer) added
 - (4) Multiple files transfer function added
 - (5) Transfer result message upgrade
 - (6) Conveyor sync reflected on encoder value grammar check

3. version 1.11 - 1999.07.23
 - (1) After load fails due to incorrect external file format, correct file load also failed: The problem solved.
 - (2) Minimize button added in dialog box

4. version 1.15
 - (1) Multiple languages support system (Language selection in registry)
 - (2) English version function added

5. version 1.16 - 1999.08.26
 - (1) RS-232C connection manual error corrected (Replaced with figure illustration)
 - (2) When large font is set on the window, characters of some buttons are indicated in a new line: Replaced by icon buttons.
 - (3) Automatic scroll on the lower end monitor.
 - (4) Double click on .. on the list control does not allow moving to C:\ or D:\ : The problem solved.

6. version 1.17 - 2000.01.31
 - (1) Quick move function added. Move to the previous directory when a program is operated. (Directory name stored in registry)
 - (2) RENAME function implemented
 - (3) The term 'Recommended' in other options changed to 'Default'

7. version 1.18 - 2000.02.18
- (1) Program operated in the previous setup environment such as communication and other setup (stored in registry)
 - (2) When multiple files were transferred or deleted, an error occurred. Every time, users had to click OK on the message box. The error message is outputted on the lower end monitor and output form is reorganized.
 - (3) Message box appears only once after the entire file transfers. In the message box, each number of successful and failed transfers.
 - (4) When a cursor was moved in a file list box, file name edit box was not renewed accordingly: The problem solved.
8. version 1.24 - 2000.07.12
- (1) Communication speed improved more than six times by optimizing timeout parameter of RS-232C communication.
 - (2) Communication port 1 and 2 support extended to port 1, 2, 3 and 4.
 - (3) Step ON and OFF buttons added for step number addition/deletion.
9. version 1.28 - 2000.11.17
- (1) Program file grammar tested by Format Version 1.5 (Compatible with lower version: Version 1.0 is also available.)
 - (2) Some strings in the main dialog boxes were in English even after Korean installation: The problem solved.
 - (3) Korean font in the main dialog boxes are changed from Gulim 10 to Dodeum 10. (More sleek)
10. version 1.29 - 2000.11.21
- (1) Monitoring file open button added. Monitoring details files are "monitor.txt" files and viewed in Notepad.
 - (2) Monitoring sweeping button is an icon button.
11. version 1.40 - 2001.06.05
- (1) Ethernet function added
 - (2) Communication function separated into HRView.DLL
 - (3) "Confirm file deleting" added to other setup

- (4) "Grammar check before transfer" in other setup changed to an item recommended not to use.
- (5) When details are outputted in the controller file list box, the details are arranged after all the details are received.
- (6) In the "Store" function, error messages from the controller are not outputted: The problem solved.

12. version 1.41**- 2001.06.14**

- (1) Letters shown in file name edit box should be in uppercase unconditionally so that errors are avoided due to incorrectly recognized file names.

13. version 1.46**- 2001.09.13**

- (1) Communication speed 57600 and 115200 added (available only in Hi4a)
- (2) Six buttons including File list, Rename, Edit and Delete changed to an icon type. Tool tip for details added.
- (3) Progress bar for LOAD added

14. version 1.50**- 2001.10.09**

- (1) In old versions, not operated in NT series. This version distinguishes 95/98 platform from NT platform, and applies a different RS-232C communication method to each platform.
- (2) HRView grammar check in program files deleted. Grammar check performed in the controller during LOAD and then the result transferred to HRView.

15. version 1.51**- 2001.11.27**

- (1) In old versions, errors occurred due to incorrectly recognized file names when multiple files with lowercase filename extension were retrieved from PC file list. This version changes lowercase filename extension to uppercase when retrieving files.
- (2) In old versions, icons of files with lowercase filename extension were not correctly indicated in PC file list: The problem solved.

16. version 1.52**- 2002.01.14**

- (1) When saving a file in PC, rename the file after the file is successfully saved as a temporary file. Therefore, the original file in PC remains, even though an error

occurs while file transfer.

17. version 1.53 - 2002.03.13

- (1) LOAD changed to Download. SAVE changed to Upload.
- (2) During Upload (save), progress bar rises. However, the rising move repeats until transfer ends, because file size is not predictable.
- (3) During Upload, in case that the file already exists, if the file is read-only file, it is considered as an error. Otherwise, a dialog box asks whether to rewrite the file.

18. version 1.55 - 2002.03.19

- (1) During Download, in case that the file already exists, a dialog box asks whether to rewrite the file. (This function is activated only in Hi3-TB 7.05.01, Hi4a 10.00-16 and higher version.)
- (2) Communication failure message supplemented (Check list)
- (3) Caution: Not compatible with the existing HRView.DLL versions.

19. version 1.57 - 2002.05.30

- (1) When transfer fails, tries two more times.
- (2) Move button to a parent directory added
- (3) Directory creation button added
- (4) HRView.dll version check function added to HELP menu.
Current HRView.dll is v1.20 build 0001.
HRView.dll of the previous versions has no version.

20. version 1.60 - 2002.06.17

- (1) Button names changed: Download -> To Controller, Upload -> To PC
- (2) Direct editing in the directory edit box of PC. (Clip board-paste available)
(After editing, press [Search again] to reflect the changes.)
- (3) Dialog box size change and maximizing available. (Minimum size is limited to 560x360.)
- (4) Step number On/Off function is available for multiple files.
- (5) Program file conversion function added (from v1.5 to v1.0)

21. version 1.63 - 2002.06.25

- (1) When file transfer to PC failed, the beginning and end parts of next file were cut, and the message said "Success.": The problem solved.
- (2) When forced to end by end button during transfer, transfer was not canceled properly: The problem solved.
- (3) Folder was not created under drive route: The problem solved.
- (4) When several files are transferred to PC, the file names appear in the list box one by one after file transfer is completed.
- (5) Folders can be dragged from Windows Explorer and dropped to other folder.

22. version 1.64 - 2002.07.10

- (1) Program file conversion function from v1.5 to v1.0 added (For Dynalog)
- (2) English mode bug solved
- (3) Win95 OS recognition error solved
- (4) File icon design change. TBL file icon added.

23. version 1.64 build 0002 - 2002.08.21

- (1) HRView.DLL ver 1.25 build 0002
 - a) When a long string with more than 600 characters is transferred, this is considered as an error. (In old versions, more than 456 characters caused program error.)

24. version 1.64 build 0003 - 2002.09.13

- (1) Arc file icon is applied to newly added AS2, AE2, AX2, WV2 and WL2 files.
- (2) HRView.DLL ver 1.25 build 0003
 - a) After English installation, letters in the communication setup dialog box were Korean: The problem solved.
- (3) When C01 files were transferred to PC, unnecessary dialog box messages appeared: The problem solved.

25. version 1.64 build 0004 - 2002.12.30

- (1) monitor.txt is added to newly created WM_HRVIEW_OPEN_MON message handling.
(For Visual Basic)

26. HRView.DLL ver 1.27 build 0001 - 2003.01.17

- (1) When some files such as fbu are copied to PC, \r is added to the first character of some strings. The strings have problems, when copied to Notepad.

27. version 1.64 build 0005 - 2003.12.23

- (1) Korean characters in dialog boxes were broken: The problem solved.

28. HRView.DLL ver 1.31 build 0001 - 2003.12.23

- (1) In WinNT/2000/XP, serial communication occupied almost all CPU after serial communication is open: The problem solved.
- (2) COM4~COM8 added. COM selection U/I changed to a dropdown list box.

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