

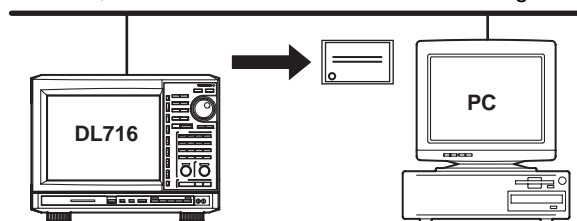
The Ethernet function has been added starting with Firmware version 3.05.

Please use the information below as a supplement to the instruction manual.

Overview

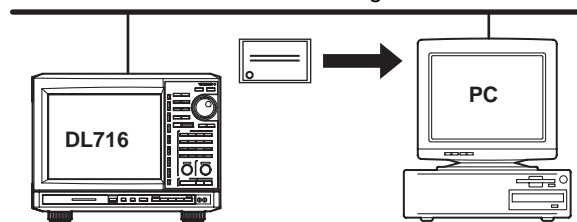
**Saving to a Network Drive (FTP Client)**

You can save, delete, and copy waveform data and setting information to a network PC or workstation's hard disk in the same way that you can on the internal floppy- or hard disk. You can also save screen data. Since the DL716 is acting as the client in this situation, the PC or workstation must be running the server.



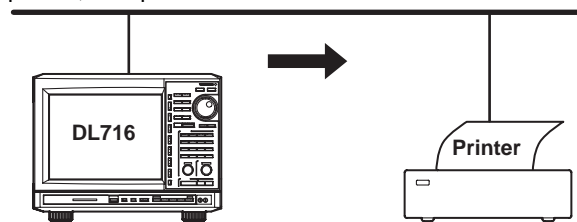
**Downloading Files to the DL716's Internal Floppy or Hard Disk (FTP Server)**

You can download a file from a network PC or workstation to the DL716's internal floppy disk or hard disk. Since the DL716 is acting as the server in this situation, the PC or workstation must be running the client.



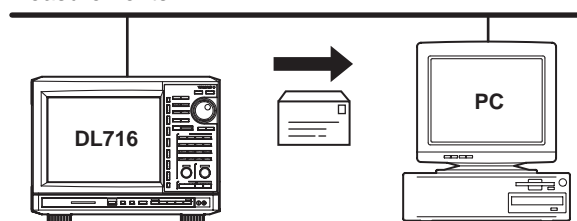
**Printing to a Network Printer (LPR Client Function)**

You can print screen images to a network printer just as you would to the internal printer, or a printer with a centronics interface.



**Sending Mail (SMTP Client Function)**

You can send mail at a designated time to a specified mail address. Using this function, you can periodically send data such as the GO/NOGO results or the number of measurements.



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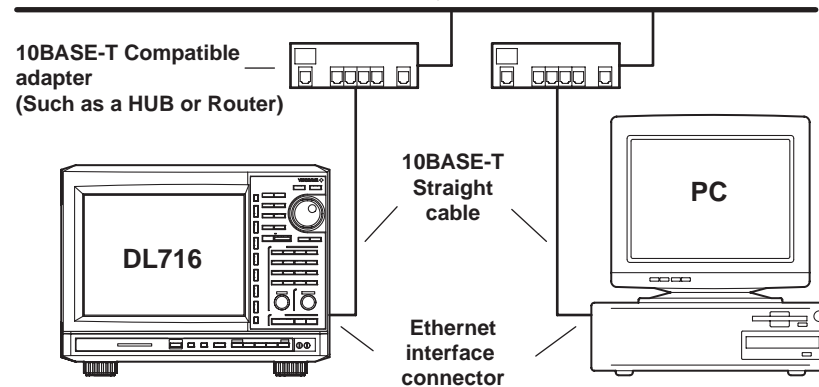
## Specifications

Number of Ports	1
Electrical / Mechanical Specifications	IEEE802.3 Compliant
Transmission System	Ethernet (10BASE-T)
Transmission Speed	10 Mbps
Communication Protocol	TCP/IP
Services	FTP Server FTP Client (Network Drive) LPR Client (Network Printer) SMTP Client (Sending Mail) DHCP DNS
Connector Type	RJ-45 Connector

## Connection Method

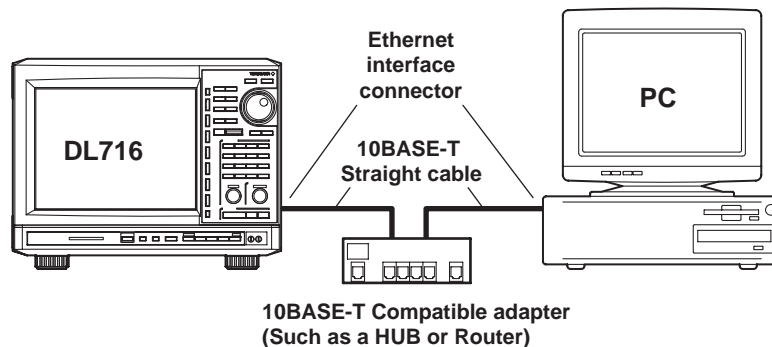
### Connection to a Network

The DL716 uses a 10BASE-T type Ethernet connector. Use an adapter such as a hub shown below to connect to the network. If you have a different connector type, use the appropriate adapter for that connector type.



### One-to-one Connection to a PC

Make the connection using a 10BASE-T cross cable and cross adapter as shown below.



### Note

- When making a one-to-one connection to a PC, the network card in the PC should be a 10BASE-T / 100BASE-T auto-switching card.
  - When connected to an Ethernet network, an overrun error in RS-232C communications can occur. If this happens, reduce the speed of the RS-232C communications.
  - Do not access the instrument through the network using a PC while the instrument is accessing a different PC or hard disk on the network.
  - You cannot use the FTP function for exchange between two DL716s. For example, one client DL716 cannot FTP another DL716 acting as the server.
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# Configuring the Ethernet Interface (TCP/IP)

## *Explanation*

The following configurations must be made in order to use the Ethernet functions of the DL716:

### **Setting the IP Address, Subnet Mask, Default Gateway, DHCP, and DNS**

Confirm these settings with the administrator of the system or network on which the DL716 will be used.

#### **DHCP (Dynamic Host Configuration Protocol)**

When using DHCP, you can automatically make the following settings:

IP address, subnet mask, default gateway, and DNS.

To use DHCP, you must have DHCP Server installed on the network.

Please ask your network administrator whether you can use DHCP.

When using DHCP, you are given a new IP address each time you turn the power ON so you'll need to be careful when using the FTP server on the DL716.

#### **IP Address (Internet Protocol Address)**

Assign an IP address to the DL716. The default setting is "0.0.0.0."

The IP address is used to distinguish between the various devices connected to the internet when communicating using the TCP/IP protocol. The address is a 32-bit value normally expressed with four values (0-255), each separated by a period as in 192.168.111.24. You must obtain a unique IP address from your network administrator. The settings can be automatically configured in environments that can use DHCP.

#### **Subnet Mask**

Specify the mask that is used to determine the network address from the IP address. The default setting is "255.255.255.0." Consult the network administrator for the setting value. In some cases, this setting may not be necessary. The settings can be automatically configured in environments that can use DHCP.

#### **Default Gateway**

Set the IP address of the gateway (default gateway) for communicating with machines on different segments (network group). The default setting is "0.0.0.0." Consult the network administrator for the setting value. In some cases, this setting may not be necessary. The settings can be automatically configured in environments that can use DHCP.

#### **DNS (Domain Name System)**

The DNS is a system that correlates the host name/domain name to the IP address. (Given AAA.BBBBB.co.jp, AAA is the hostname, and BBBB.co.jp is the domain name.) The host/domain name can be used instead of the IP address when accessing the network. In the case of the DL716, when using the network drive and printer functions, you can specify the host by name instead of by IP address. Set the domain name, the DNS server address (default is "0.0.0.0"), and the domain suffix. In DHCP environments, these settings can be configured automatically.

#### **DNS Server**

Up to two DNS servers can be specified (primary and secondary). If the primary server is down, the secondary server is used to search the host name/domain name and IP address.

### Domain Suffix

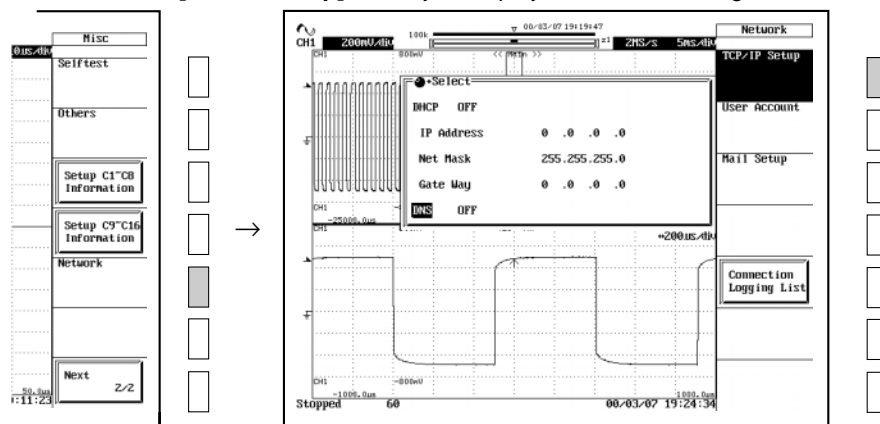
If the IP address corresponding to the “domain name” described in the previous paragraph is not found on the DNS server, then it may be that the system is configured to use another domain name. Set this other domain name as a domain suffix. Up to two domain suffixes can be specified (primary and secondary).

### Note

To change this menu setting, you must restart the DL716.

## Procedure

1. Press the  key.
2. Press the **[Next 1/2]** soft key to display **[Next 2/2]** menu.
3. Press the **[Network]** soft key to display the **[Network]** menu.
4. Press the **[TCP/IP Setup]** soft key to display the TCP/IP settings menu.



### • DHCP ON/OFF

5. Move the cursor to **[DHCP]** using the jog shuttle and press the  key to turn DHCP ON or OFF. If you select ON, then it is not necessary to set the IP address, subnet mask, and default gateway. If you wish to set up the DNS, please skip to step 12. If you do not wish to set up the DNS, check the network cable connection and restart the DL716. The IP address, subnet mask, and default gateway are automatically set.

### • Setting the IP Address

If you turned DHCP OFF in step 5, set the IP address.

6. Move the cursor to the **[IP Address]** field with the jog shuttle, and press the  key to display the settings menu.
7. Enter the IP address values from 0 to 255 using the jog shuttle.

### • Setting the Subnet Mask

Set the subnet mask if you turned DHCP OFF in step 5.

8. Move the cursor to the **[Net Mask]** field using the jog shuttle, and press the  key to display the settings menu.
9. Enter the subnet mask address values from 0 to 255 using the jog shuttle.

- **Setting the Default Gateway**

Set the default gateway if you turned DHCP OFF in step 5.

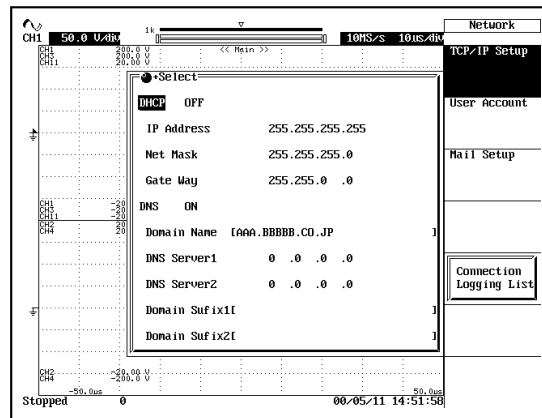
10. Move the cursor to the **[Gate Way]** field with the jog shuttle, and press the  key to display the settings menu.
11. Enter the default gateway address values from 0 to 255 using the jog shuttle.

- **Setting the DNS**

12. Move the cursor to **[DNS]** by turning the jog shuttle.
13. Press the  key to display the DNS setting menu.
14. Press the  key to set the DNS to ON, OFF, or AUTO. If DHCP is ON and DNS is set to AUTO, the domain name and DNS server name are automatically set by restarting the DL716. If DHCP is OFF, the settings will not be automatically configured even if DNS is set to AUTO.

If it's set to ON, the domain name, DNS server name, and domain suffix are displayed.

If it is set to OFF, check the network cable connection and restart the DL716.



15. Move the cursor to **[Domain Name]** by turning the jog shuttle.
16. Press the  key to display the keyboard.
17. Follow the procedure on page 4-1 of the User's Manual and input the domain name.
18. Move the cursor with the jog shuttle to the **[DNS Server 1]** field, and press the  key to display the setting menu.
19. Set the primary DNS server values from 0 to 255 using the jog shuttle.
20. In the same manner, set the secondary DNS server in the **[DNS Server 2]** field.
21. Move the cursor to **[Domain Suffix1]** by turning the jog shuttle.
22. Press the  key to display the keyboard.
23. Follow the procedure on page 4-1 of the User's Manual and input the primary domain suffix.
24. In the same manner, set the secondary domain suffix in the **[Domain Suffix 2]** field.

- **Turning the Power ON/OFF**

25. You must restart the DL716 for the settings to take affect. After all the settings are complete, turn the power to the DL716 OFF, then back ON again.

# Saving Waveform and Setting Data to a Network Drive

## Explanation

You can save data such as waveform and settings files to network drives via ethernet in the same manner as with floppy disks or internal hard disks (optional). However, you cannot load information from network drives.

### File Structure

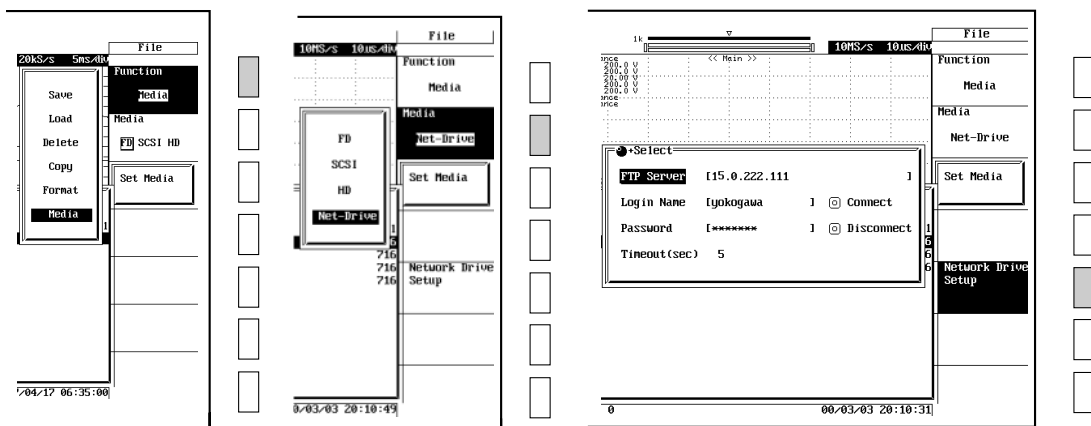
By pressing "Set Media," the following files and directories will be created in the home directory of the server:

```
home/DRIVE.INF
home/DIR1/DL_MISC/FILELIST.VOL
home/DIR1/DL_SETUP/FILELIST.VOL
home/DIR1/DL_WAVE/FILELIST.VOL
```

Please do not delete home/DRIVE.INF under any circumstances.

## Procedure

1. Press the **FILE** key.
2. Press the **[Function]** soft key repeatedly to select "Media."
3. Press the **[Media]** soft key repeatedly to select "Net Drive"
4. Press the **[Network Drive Setup]** soft key to display the Settings menu.
5. Move the cursor to "FTP Server" using the jog shuttle, and press the **SELECT** key to display the keyboard.
6. Follow the procedure on page 4-1 of the User's Manual, and enter the address of the FTP server. When using DNS, you can specify the address by name.
7. Move the cursor to "Login Name" using the jog shuttle, then press the **SELECT** key to display the keyboard.
8. Follow the procedure on page 4-1 of the User's Manual and enter the login name.
9. Move the cursor to "Password" using the jog shuttle, then press the **SELECT** key to display the keyboard.
10. Follow the procedure on page 4-1 of the User's Manual, and enter the password that corresponds to the login name. If the login name is "anonymous", it isn't necessary to enter the password.
11. Move the cursor to "Connect" using the jog shuttle, then press the **SELECT** key to open the connection. If the device is properly connected, the "Net-Drive" icon appears in the upper left part of the screen.
12. For further information, please refer to the file operations (save, load, delete, etc. in sections 11.6 to 11.11 of the User's Manual.



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**Note**

- You must run FTP server software on PCs and workstations that will be connected to the network. Also, please note the following regarding the server software:
    - Use UNIX format for list output (character strings returned by "dir").
    - Make the home directory and its subdirectories writable.
  - In the following cases, the time information in a file list will not be displayed accurately:
    - When WindowsNT uses an AM or PM timestamp.
    - When using a server that returns non-ASCII character strings in a list.
  - The following are not possible:
    - Loading and displaying saved waveform and setting files, and file information.
    - Turning file protect ON and OFF on saved files.
    - Formatting a network drive.
    - Copying between network drives.
  - Before saving data to a network drive, you must configure TCP/IP (see "Configuring Ethernet Interface").
  - When saving to a network drive, you can't access the DL716 from a PC or workstation via network.
  - You must restart the DL716 for the Timeout settings to take effect.
-

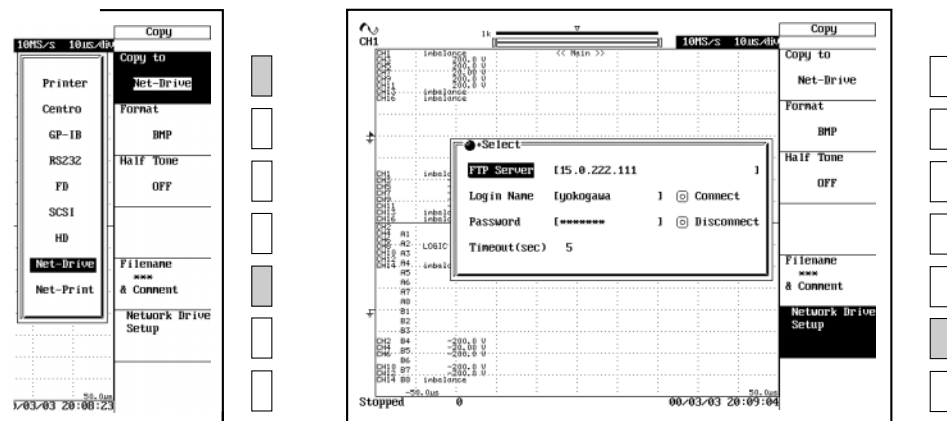
# Saving Screen Image Data to a Network Drive

## Explanation

You can save a screen image to a network drive via Ethernet just as you would save it to a floppy disk or the internal hard disk (optional).

## Procedure

1. Press " **SHIFT**" Shift to engage shift lock.  
The functions shown on the panel in purple letters are now active.
2. Press the  **COPY MENU** key.
3. Press the [**Copy to**] soft key to display the Output Medium Selection menu.
4. Press the same [**Copy to**] soft key repeatedly to select "**Net Drive.**"
5. Press the [**Network Drive Setup**] soft key to display the settings menu.
6. Move the cursor to "**FTP Server**" using the jog shuttle, then press the  **SELECT** key to display the keyboard.
7. Follow the procedure on page 4-1 of the User's Manual and enter the FTP server address. If you are using a DNS, please specify it by name.
8. Move the cursor to "**Login Name**" using the jog shuttle, then press the  **SELECT** key to display the keyboard.
9. Follow the procedure on page 4-1 of the User's Manual and enter the login name.
10. Move the cursor to "**Password**" using the jog shuttle, then press the  **SELECT** key to display the keyboard.
11. Follow the procedure on page 4-1 of the User's Manual and enter the password that corresponds to the login name. If the login name is "**anonymous**", it is not necessary to enter a password.
12. Follow the normal procedure for saving the screen data as explained in section 10.6 of the User's Manual.



## Note

- Before saving screen data to a network drive, refer to "Configuring the Ethernet Interface" and input the TCP/IP settings.
- When saving, you cannot access the DL716 from your PC or workstation.
- You must restart the DL716 for the Timeout settings to take effect.



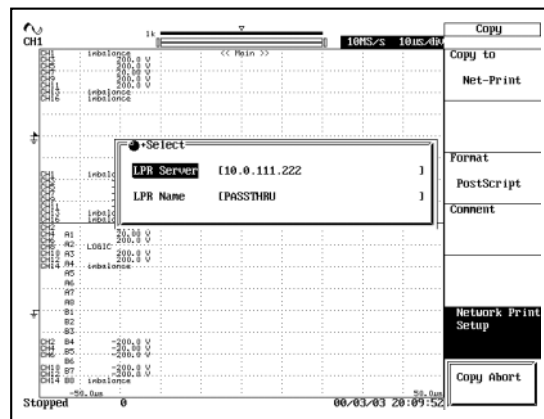
# Sending Screen Image Data to a Network Printer

## Explanation

You can send screen images to a network printer via Ethernet.

## Procedure

1. Press " **SHIFT**" Shift to engage shift lock.  
The functions shown on the panel in purple letters are now active.
2. Press the Copy Menu key.
3. Press the [**Copy to**] soft key to display the Output Medium Selection menu.
4. Press the same [**Copy to**] soft key repeatedly to select "**Net Print.**"
5. Press the [**Network Print Setup**] soft key to display the settings menu.



6. Move the cursor to "**LPR Server**" using the jog shuttle, then press the  **SELECT** key to display the keyboard.
7. Follow the procedure on page 4-1 of the User's Manual and enter the printer server address. If you are using a DNS, you can specify it by name.
8. Move the cursor to "**LPR Name**" using the jog shuttle, then press the  **SELECT** key to display the keyboard.
9. Follow the procedure on page 4-1 of the User's Manual and enter the printer name.
10. Follow the normal procedure for sending the data to the printer as explained in section 10.4 of the User's Manual.

## Note

- Before outputting screen image data, refer to "Configuring the Ethernet Interface" and enter the TCP/IP settings.
- You can output to any TCP/IP printer.

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# Using the Mail Function

## Explanation

You can transmit DL716 status information to a specified email address at periodic intervals via Ethernet.

- **Time of Transmission**

Set the time at which a transmission will be sent.

- **Transmission Interval**

Off / 1H / 2H / 3H / 4H / 6H / 8H / 12H / 24H

- **Information Transmitted from the DL716**

- Acquisition status.
- The measurement value of each channel (except for the logic module).
- Error information during a specified time (the error number, and one line of the English error message text, up to 16 messages).
- GO/NOGO Success/Fail Information

- **Sample Transmission:**

\*\*\* DL716 Periodical Report \*\*\*

[Comment]            abcdefghijklm

[ACQ Status]        Stopped            662

[GO/NOGO Status]   Success:            4            Fail: 0

CH1                496.0mV

CH2                0.25mV

VCH3               -1.93mV

VCH9               -0.3mV

VCH10              -3.20mV

ErrNo            4            Exit from Action On Trigger mode

ErrNo            12           Terminating...

ErrNo            836          Cannot change settings during Action On Trigger

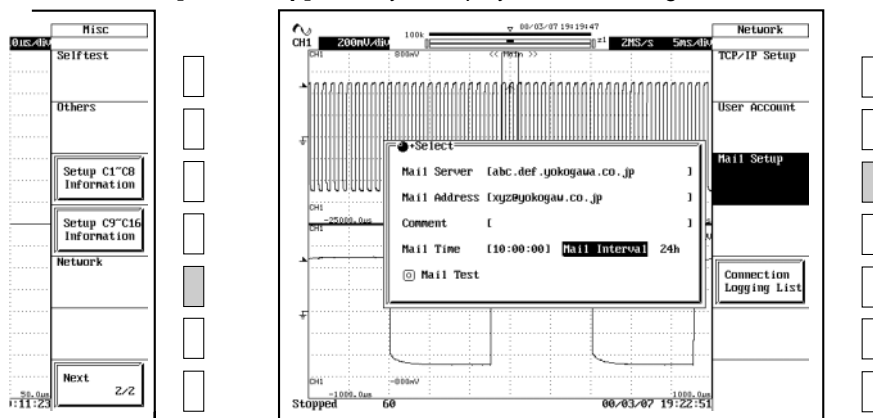
ErrNo            602          No SCSI device or no media inserted

ErrNo            680          Illegal printer head position

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## Procedure

1. Press the  key.
2. Press the [Next 1/2] soft key to display the "Next 2/2" menu.
3. Press the [Network] soft key to display the "Network" menu.
4. Press the [Mail Setup] soft key to display the mail settings menu.



5. Move the cursor to "Mail Server" using the jog shuttle, then press the  key to display the keyboard.
6. Follow the procedure on page 4-1 of the User's Manual and enter the mail server name. If you are using a DNS, please specify it by name.
7. Move the cursor to "Mail Address" using the jog shuttle, then press the  key to display the keyboard.
8. Follow the procedure on page 4-1 of the User's Manual and enter the mail address.
9. As necessary, move the cursor to "Comment" using the jog shuttle, then press the  key to display the keyboard.
10. Follow the procedure on page 4-1 of the User's Manual and enter a comment.
11. Move the cursor to "Mail Time" using the jog shuttle, then press the  key to display the keyboard.
12. Follow the procedure on page 4-1 of the User's Manual and enter the mail transmission time.
13. Move the cursor to "Mail Interval" using the jog shuttle, then press the  key to display the settings.
14. Move the cursor to "Mail Test" with the jog shuttle, then press the  key to send a mail test to the specified mail recipient.

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### Note

- The "to:" and "from:" addresses are the same.  
The most recent items of the error history appear at the top.
  - Before using this function, refer to "Configuring the Ethernet Interface" and enter the TCP/IP settings.
  - On the mail server, set the host name and the IP address of the SMTP Server used for mail transmission. If you set [Mail Interval] to OFF, mail is not transmitted.
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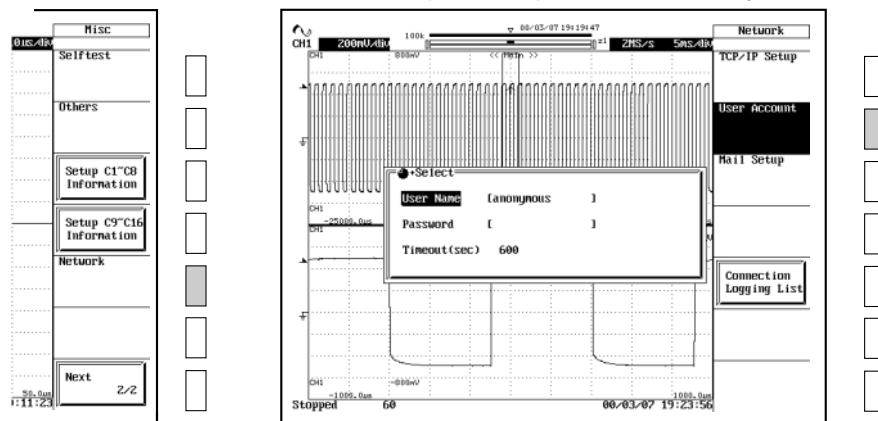
# Accessing DL716 Drives from a PC or Workstation

## Explanation

You can access the DL716's internal hard drive, floppy disk drive, or SCSI devices from a PC or workstation via Ethernet. In order to access these devices, you must be running FTP client software. Please see the "Approved Software" for a compatible FTP client.

## Procedure

1. Run the FTP client application on the PC or workstation.
2. Press the **MISC** key.
3. Press the **[Next 1/2]** soft key to display the "Next 2/2" menu.
4. Press the **[Network]** soft key to display the "Network" menu.
5. Press the **[User Account]** soft key to display the account settings menu.



6. Move the cursor to "User Name" using the jog shuttle, then press the **SELECT** key to display the keyboard.
7. Follow the procedure on page 4-1 of the User's Manual and enter the user name. If you do not wish to limit access, use the "anonymous" setting. If access is to be limited, enter a user name of 15 characters or less.
8. Move the cursor to "Password" using the jog shuttle, then press the **SELECT** key to display the keyboard.
9. Follow the procedure on page 4-1 of the User's Manual and enter the password. If the user name is set to "anonymous", it is not necessary to enter a password.
10. Move the cursor to "Timeout" using the jog shuttle, then press the **SELECT** key to display the Timeout Settings menu.
11. Enter the Timeout time using the jog shuttle. If the DL716 is not being accessed at the Timeout time, the connection to the network will be automatically closed.

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12. When you press the [Connection Logging List] soft key, the 24 most recent access times, user names, and IP addresses are displayed.

Date	Time	User	IP address	Result
00/03/31	15:47:07	anonymous	10. 0.236.117	Success
00/03/31	15:46:43	anonymous	10. 0.236.117	Fail
00/03/31	15:46:27	user1	10. 0.236.117	Success
00/03/31	15:45:41	yokogawa	10. 0.236.117	Success
00/03/31	15:44:41	yokogawa	10. 0.236.117	Fail
00/03/31	15:44:21	anonymous	10. 0.236.117	Success
00/03/31	15:31:57	anonymous	10. 0.236.117	Success

The screenshot shows a terminal window titled "Connection Logging List(FTP Server)". The main area contains a table with columns for Date, Time, User, IP address, and Result. To the right of the table is a sidebar with several menu options: Network, TCP/IP Setup, User account, Fail Setup, and Connection Logging List. The "Connection Logging List" option is highlighted with a grey bar. To the right of the sidebar are several vertical rectangular buttons, some of which are also highlighted.

**Note**

- The DL716 can only support one client. It is not possible to access the unit from multiple PCs or workstations at the same time.
  - When the DL716 is being accessed from a PC or workstation, "🖥️" is displayed in the upper left part of the screen.
  - The floppy disk and the internal HDD are displayed as "FD0" and "SC4-1" in the root directory. Other devices connected via SCSI are displayed as SCn (where "n" is the SCSI ID number).
  - The log is cleared when the power is turned OFF.
  - Before accessing a drive, refer to "Configuring the Ethernet Interface" and enter the TCP/IP settings.
  - You cannot use another network drive when accessing a DL716 drive.
  - You must restart the DL716 for the Timeout settings to take effect.
  - You cannot connect to the DL716 when it is performing realtime recording.
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# Viewing the MAC Address

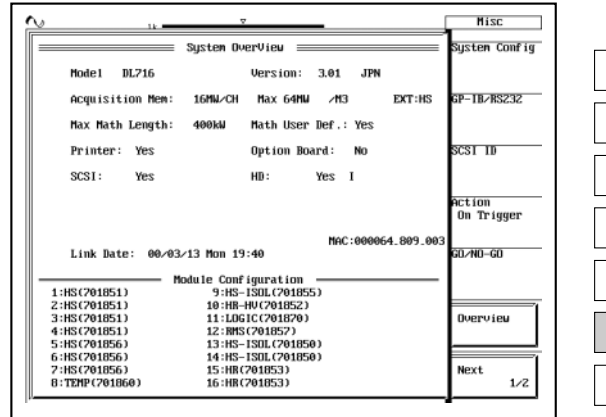
## Explanation

You can check the factory default MAC address of the DL716.

## Procedure

1. Press the  key.
2. Press the **[Overview]** soft key.

The MAC address is shown by the first set of digits after the word **"MAC"**. For example, the **"XXXXX"** digits in the address, **"MAC : XXXXX.aaa.bbb."**



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## Note

The MAC address is displayed only if the Ethernet option is installed.

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# Approved Software

The following software has been approved by Yokogawa for use with the DL716:

## **FTP Client Software (Recommended software)**

### **Windows 95/98**

\* Ws\_ftp Limited Edition 5.08

Where to find: [http://www.ipswitch.com/Products/WS\\_FTP/](http://www.ipswitch.com/Products/WS_FTP/)  
Netscape Navigator 4.5 FTP; only running put and get functions

ffftp 1.68a

Where to find: <http://www2.biglobe.ne.jp/~sota/>

FTP Explorer 1.00 010

Where to find: <http://www.ftpx.com/>

Option->Transfer->Background transfer item larger than

Make the background transfer item bigger than the file you are sending.

Waveform Viewer for DL series Ver1.32

SunOS 4.1.1-JLE1.1.1          ftp

SunOS 5.5.1                    ftp

Linux 2.0.35                  ftp

ncftp 2.4.3

Where to find: <http://www.ncftp.com/ncftp/>

HP-UX 9.05                    ftp

## **FTP Server Software**

### **Windows 95/98**

Tiny FTPDaemon 0.52a

Where to find: [http://hp.vector.co.jp/authors/VA002682/tftpd\\_frame.htm](http://hp.vector.co.jp/authors/VA002682/tftpd_frame.htm)

Serv-U 2.5a

Where to find: <http://www.cat-soft.com/>

Personal Web Server (Win95 Edition)

There is no FTP function on Win98.

### **Windows NT**

IIS 3.0

SunOS 4.1.1-JLE 1.1.1          ftpd

SunOS 5.5.1                    ftpd

Linux 2.0.35                  wu-ftpd 2.4.2

Where to find: <http://www.academ.com/academ/wu-ftpd/>

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# Error Messages

The following is a list of Ethernet error messages:

<b>Code</b>	<b>Message</b>
730	Mail could not be sent. Please check your network settings and connection.
750	Can't connect to server. Please check your network settings and connection.
751	Not connected to Server. Please check your network settings and connection.
752	This function is not supported.
753	FTP Error: Pwd Please check your network settings and connections.
754	FTP Error Cwd Please check your network settings and connection.
755	FTP Error: Rm Please check your network settings and connection.
756	FTP Error List Please check your network settings and connection.
757	FTP Error Mkdir Please check your network settings and connection.
758	FTP Error Rmdir Please check your network settings and connection.
759	FTP Error Get Please check your network settings and connection.
760	FTP Error Put Please check your network settings and connection.
761	FTP Error GetData Please check your network settings and connection.
762	FTP Error PutData Please check your network settings and the contents of any connected drives.
763	FTP Error : AppendData Please check your network settings and the contents of any connected drives.
764	FTP Error: Client Handle Please check your network settings and connection.
765	FTP Error: Others Please check your network settings and connection.