

# Chapter 6 Communication and Frame Editor

Three usable functions of Enet communication module are follows:

### 6.1 Communication Function

#### .. High Speed Link (HS\_Link)

High Speed Link is the communication method between **GLOFA PLC communication modules**, and is used to periodically switch data or information with partner stations. You can effectively use it for the running system by referring periodically to its own or the partner station's changing data, or you can also perform communications by simple setup of parameter. That is, you can do communications by designating the partner station's and your own area and data volume, speed, station number at the High Speed Link parameter of GMWIN. It is possible to communicate with data volume from minimum 1 word (16 bits) up to 12,800 words, it is possible as well to set up parameter according to communication contents at the communication period from minimum 20 ms up to 10 sec. You can do an effective job not only by easy communication with the partner station in setting up the simple parameter, but also by easy periodical handle of lots of data at a time because internal data processing is performed at high speed.

#### .. Function Block (FB)

It is a service used to communicate only with the appropriate partner station for the special event occurrence. In other words, if you use this Function Block, you can use command frame suitable to the other company when you want to communicate **with other company's PLC**. It is a difference from the High Speed Link as the periodical communication. You can especially use the Function Block when you should send the content to another station because an error occurs at the partner station, or when you want to communicate in the status of the specific contact input. For a use of this communication, you can take advantage of tcp/ip, udp/ip all, and 5 kinds of Function Blocks are offered for them. The data volume used for the High Speed Link is word (16 bits), but the Function Block has Bit, Byte, Word as its data volume. Therefore, you can perform communication with each partner stations according to the various data types

#### .. Dedicated Communication (GLOFA\_NET)

This service is **a built-in protocol at GLOFA Enet module**. You are able to read and write information and data in the PLC by using MMI as commercial program, or PC program written by user. It is also a service used to download, upload PLC program, and to control PLC (with it running, stopping, pausing).

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You can use this service by means of **TCP port 2004**. It is influenced by the basic parameter setup in the frame editor. (the number of dedicated connection, latency time for receive)

The services described above can be used separately or with mixture. You are namely free and easy to use High Speed Link, dedicated service and Function Block service at the same time.

The differences of high-speed and Function Block are described below.

The differences of the services used to periodically send and receive data to and with the partner station (High Speed Link) and to send the appropriate content when a special event occurs (for Function Block) are explained in short:

Content	High Speed Link	Function Block
Basic Unit for TX/RX Data	1 Word(16 bits)	Usable by data type Ex.) Bit, Byte, Word ...
Communication Period	200 ms ~ 10 sec	Performs whenever 'Function Block enable' (REQ) starts. (Timer)
Communicable Module	Used between GLOFA Enet communication modules	Used for the communication with GLOFA Enet communication module and other company's module and high order PC.
Station Numbering	Downloading by Enet module after setting up the high-speed station number using the parameter in frame editor.	No use of station number. Downloading by Enet module after setting up IP address using the parameter in frame editor.
Operation Method	Setting up High Speed Link parameter Downloading into PLC Permitting High Speed Link	Writing a program using GMWIN and frame editor-> compiling-> downloading into PLC running
Control by CPU mode key	Performance of run if CPU module permits High Speed Link to run with RUN, STOP, PAU-SE.	Performance of run according to the status of CPU module key.

[Table 6.1] Differences of performance between High Speed Link and Function Block.

### 6.2 Setup of Parameter

If you want to use GLOFA Ethernet Communication module, you should first set up system parameter, and then download the set parameter by Ethernet module. A frame that takes charge of such work is called frame editor.

#### 6.2.1 Frame Editor

A tool defining basic system parameter, which controls and manages network, and communication frame in Ethernet communication. The frame editor is composed of 2 kinds of setups; **basic parameter setup** and **frame list setup**. The basic setup determines communication system parameter on Ethernet network, and the frame setup defines communication frame when performing Function Block communication. The parameter and frame set by a user can be written (downloaded) in the Ethernet communication module, and they can also be read (uploaded) by the Ethernet module.

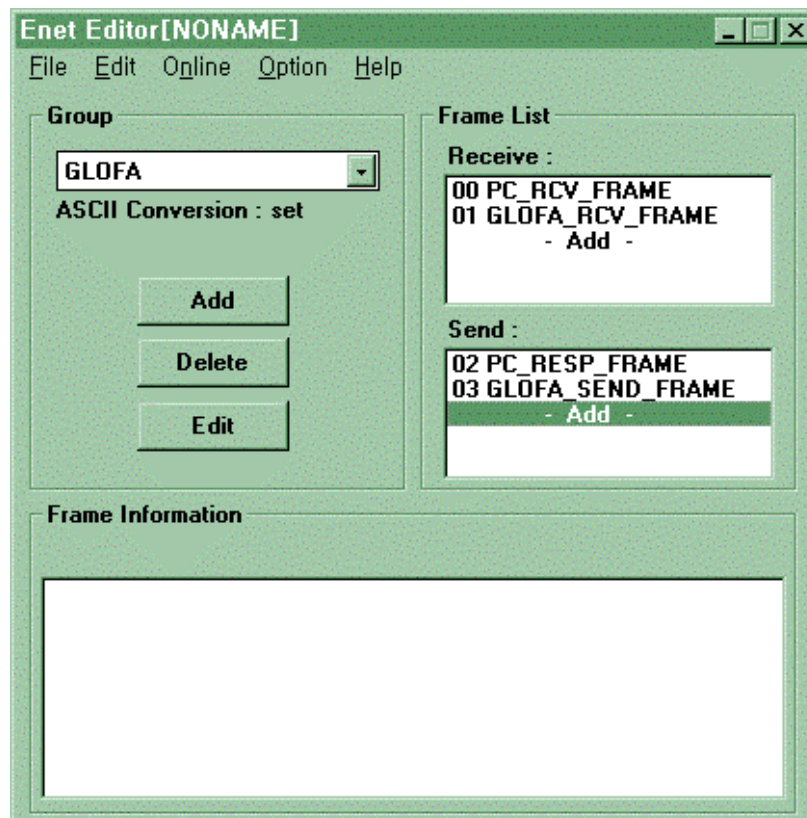
And now, we are explaining the setup of the essential basic parameters to perform Ethernet module. For the frame setup, please refer to 'Function Block'.

Figure 6.1 is initial screen of the frame editor when you select frame editor icon.

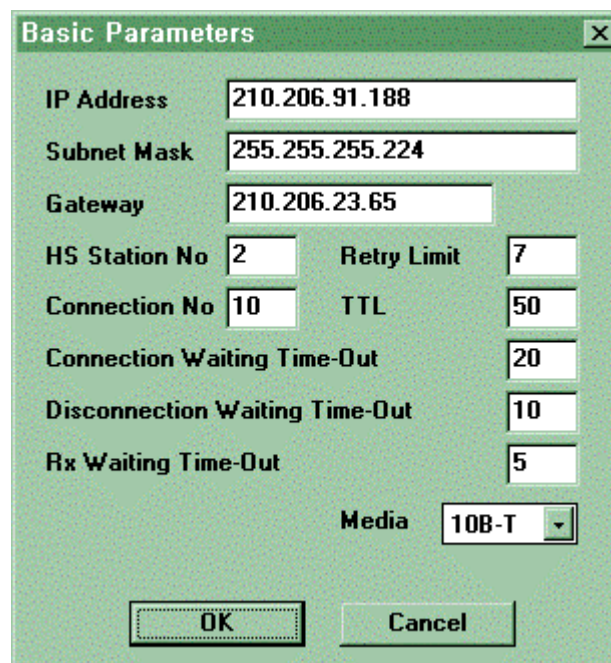
##### 1) Basic Parameter Setup

The basic parameter is used to set communication system parameter in order to control and manage Ethernet network. It determines IP address of Ethernet communication module, subnet mask, gateway address, High Speed Link station number, channel opening time, re-transmission frequency, dedicated connection numbers, RX latency time, TTL (time to live = time for live packet). Thus, to perform Ethernet communication, you have to setup the basic parameter on the basic setup screen within editing button, and then download it.

Figure 6.2.1(A) is showing the set basic parameter.



[Figure 6.2.1(A)] Frame Editor



[Figure 6.2.1(B)] Basic Setup (Initial Value)

The description about the screen on the figure 6.2.1(B) is as follows. **IP Address, High Speed Link station number, media** out of the items below are needed to be set again corresponding to use environment.

**IP Address:** Sets IP Address of Enet communication module.

**Subnet Mask:** A value used to distinguish whether partner station is in the same network with it.

**Gateway Address:** Gateway module address (router address) used to receive and send data through a station, which uses different network from its, or public network.

**High-speed Station Number:** Sets station number when communicating between GLOFA PLC Enet module with High Speed Link.

**Re-transmission Frequency:** Frequency of re-transmission if there is no reply from partner station.

**Connection Latency Time:** Time to wait to connect with partner station, if, in program, XXX\_TCPACT, XXX\_TCPPAS are set in E\_CONN Function Block. An error occurs when it is impossible to connect with it in the set time.

**Release Latency Time:** Time to wait for the reply of partner station when asking for release of connection. If there is no reply, it quits the connection after waiting for a fixed time.

**RX Latency Time** : During dedicated communication, if there is no any requirement from high order for the fixed time with high order PC or MMI connected, it quits the dedicated service connection without any relation of normal quit on the assumption that there is a problem in the system. In other words, this latency time is used in dedicated service to set a new channel again in case that a problem occurs in the partner station, or a cable is disconnected.

**TTL(Time To LIVE):** If partner station does not belong to the network with its own one, it searches the partner station via router within a range of the maximum set value of TTL.

**Dedicated Connection Numbers:** maximum number of dedicated TCP service to be connected at the same time. (1 up to 16)

**Media:** It selects a media it wants to use.(10BASE5/2 or 10BASE-T)

### 2) Frame Download/Upload

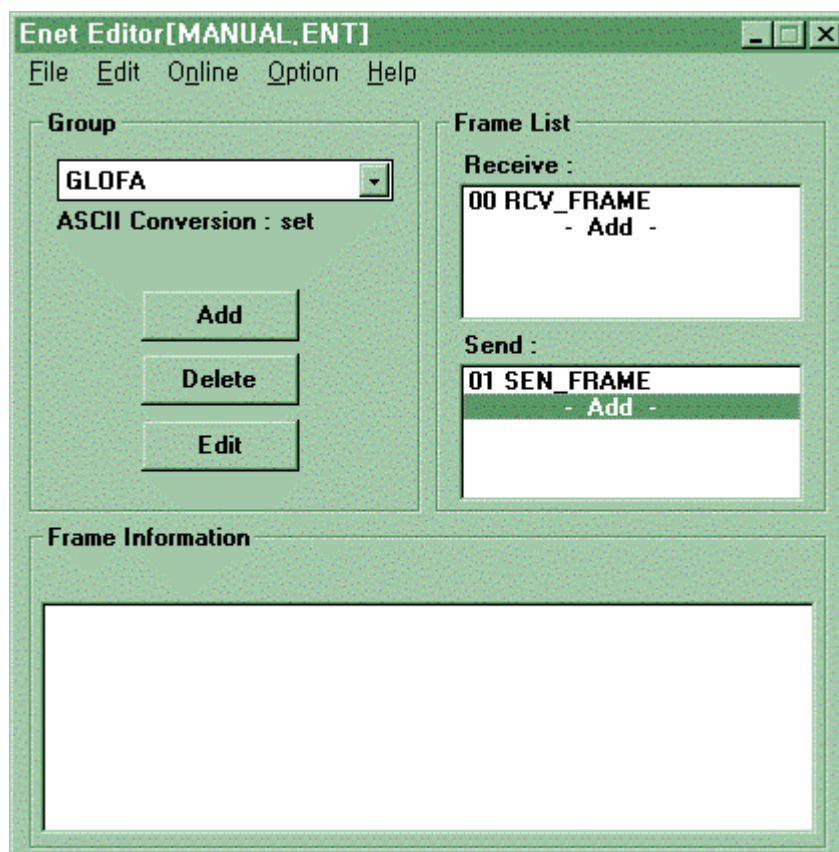
You can download (write) defined basic parameter and frame in the Ethernet communication module with frame editor, or can upload (read) the frame or the parameter from the Ethernet communication module.

#### A) Write (Download)

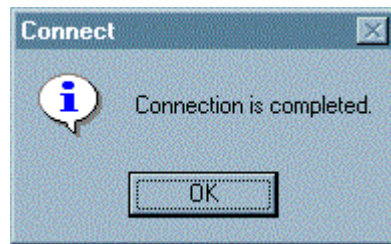
Please perform writing **after stopping CPU** while CPU is running. If you perform the writing during CPU run, it has a large influence on the communication.

- ① It connects by means of CPU on-line and primary base CPU, in which Ethernet communication module is equipped for using frame and parameter.

Figure 6.2.1(D) is showing that connection is finished. (If you use COM Port like GMWIN, you should connect **after cutting the connection of GMWIN**).

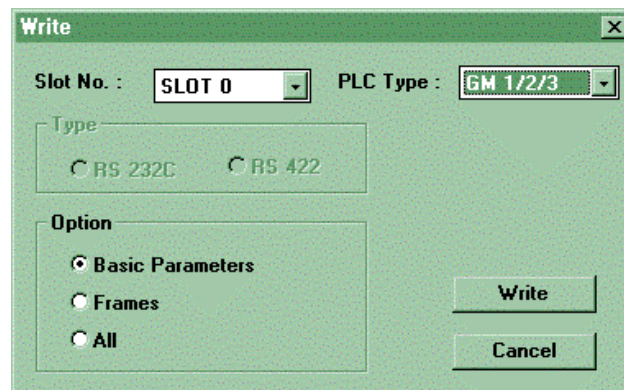


[Figure 6.2.1(C)] Connection Screen



[Figure 6.2.1(D)] 'Connection Completed' Screen

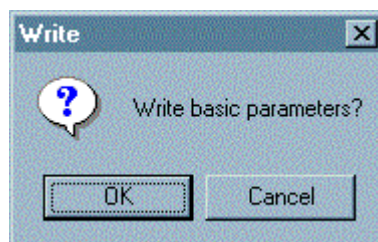
- ② When you select writing on line after the connection, a screen like figure 6.2.1(E) is shown. Then, you specify slot position, frame and parameter, in which Ethernet communication module is equipped to write (download).



Basic parameter is for setting of IP Address, High Speed Link station link, frame is the one defined by user.

[Figure 6.2.1(E)] Writing Screen

- ③ When you have selected writing in b, it confirms it again before writing data.



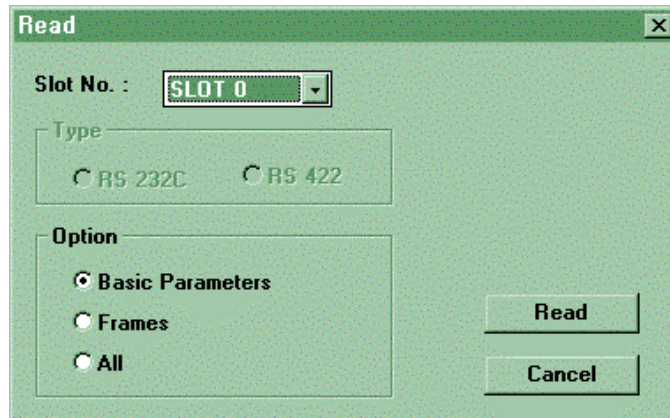
[Figure 6.2.1(F)] Writing Confirmation Screen

- ④ If all the steps are finished, the writing of frame file is normally finished. But, because the present parameter value, with which Ethernet communication module is running, is the previous downloaded parameter, you **must switch on again or reset**. If not, it performs further with the previous value.



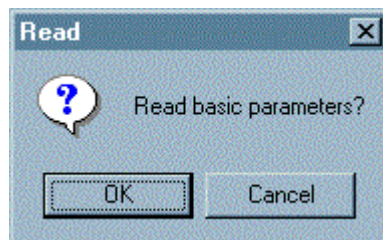
### B) Reading (Upload)

- ① It connects with primary base CPU, in which Ethernet communication module is equipped for reading.
- ② After connection, when you select reading on line, figure 6.2.1(G) is shown on the screen. Then, you select slot number and communication option, and then select OK button.



[Figure 6.2.1(G)] Reading Screen

- ③ When you have selected reading button in b, it confirms reading action again with a screen. If you select OK now, it begins to read.



[Figure 6.2.1(H)] Reading Confirmation Screen

If you check for edit/basic setup on frame editor screen after a screen of 'reading completed', you can see there that data read in Ethernet module is saved.



[Figure 6.2.1(I)] 'RX Completed' Confirmation Screen