Chapter 5 Frame Editor

5.1 Basic functions

Frame Editor is a WINDOWS application to set basic operation mode of Cnet I/F module and to operate Run/Stop frame download, etc. Frame Editor is also upgraded to Ver.2.0 to fit the functions of module Ver.2.0 and is developed to be in 100% compliance with former versions of Frame Editors along with additional functions to support supplemented features of Cnet Ver.2.0. Updated version of Frame Editor can be used through downloads in Internet Home Page of LG Industrial Systems(http://www.lgis.lg.co.kr/fa). This manual is based on Frame Editor Ver.2.0 for instruction of its functions. Basic functions of Frame Editor are as follows.

- ❑ Setting of basic parameters
- ❑ Frame edit for user mode
- ❑ Reading/Writing of frame and basic parameters
- ❑ Switching of module operation
- ❑ Monitoring of TX/RX frame
- ❑ Saving of frame and parameter files Ver. 2.0
- ❑ Change of online mode Ver. 2.0
- ❑ Management of flash memory Ver. 2.0

Frame Editor can be used with its execution program of FEDIT20.EXE as copied to desired folder and run without additional installation.

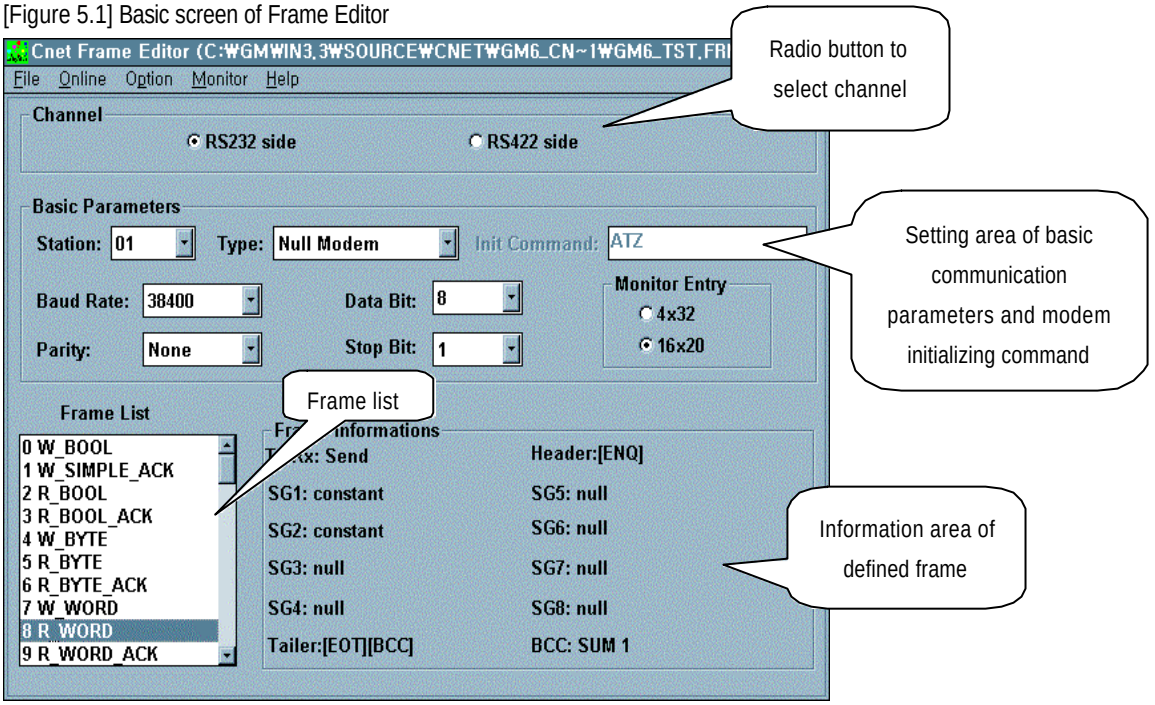
Remark

[Note1] GM7 series doesn't use Frame Editor. Parameter and protocol required for communication can be composed in communication parameters inside GMWIN.

5.2 Screen configuration and menu

[Figure 5.1] shows the initial screen when Frame Editor is run for setting of communication channel, basic parameters and frame.

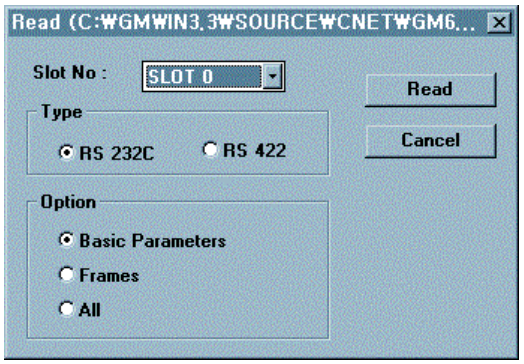
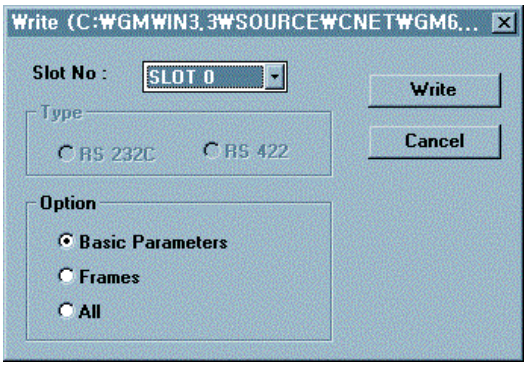
[Figure 5.1] Basic screen of Frame Editor

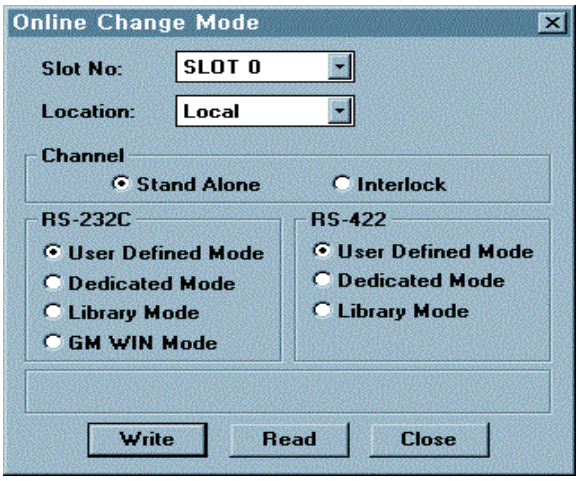
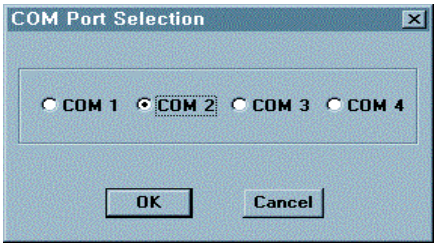
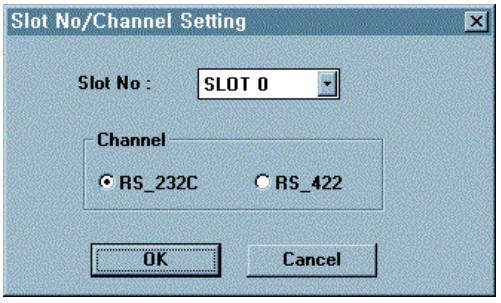


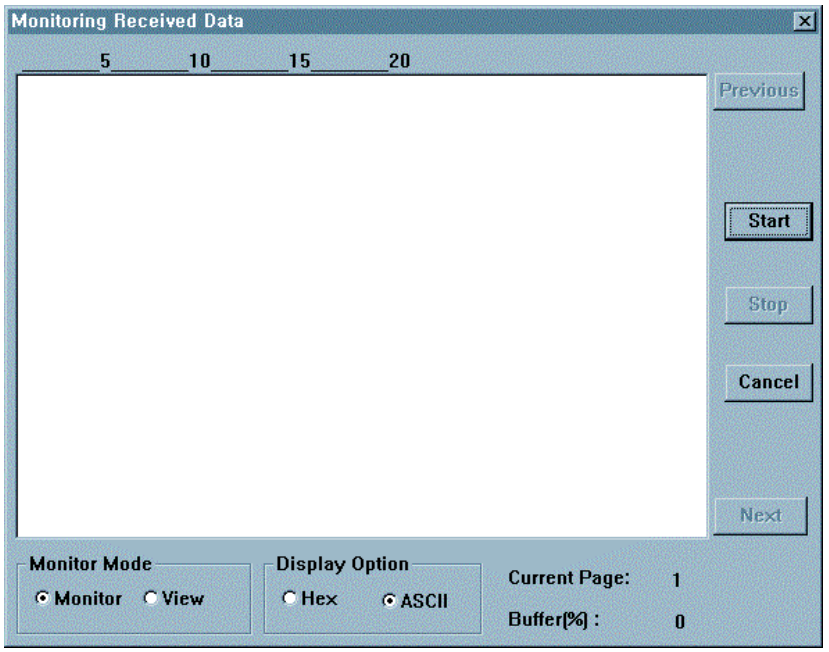
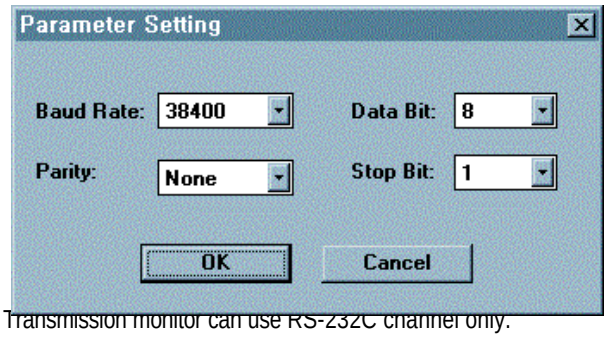
The upper menu bar of Frame Editor has functions described in [Table 5.1]

[Table5.1] Menus

Type	Menu	Function
File	New	Creat new frame file
	Open	Open existing frame file
	Save	Save edited frame current in file
	Save as	Save edited frame current in new file
	Open Lib	Open library file for other company's dedicated driver(Added to Ver.2.0)
	Exit	End Frame Editor
Online	Connect	Connect to PLC(Connected via GMWIN port of CPU module)

Type	Menu	Function
Online	Disconnect	Disconnect to PLC
	Read	Read parameters and frame in module 
	Write	Write parameters and frame in module. Communication channel to perform Write with depends on communication channel setting in the basic screen 
	Change Run/Stop	Run or Stop the operation of each channel 

<table>
<tr><th>Type</th><th>Menu</th><th>Function</th></tr>
<tr><td rowspan="2">Online</td><td>Online change mode</td><td>Change operation mode of module in online. Ver. 2.0
 
</td></tr>
<tr><td>Flash memory</td><td>Write/Read other company's dedicated driver saved in flash memory and check Cnet O/S version of flash memory. Ver. 2.0</td></tr>
<tr><td>Option</td><td>Port</td><td>Select communication port to use among COM1 ~ COM4.
 
</td></tr>
<tr><td>Monitor</td><td>Receive frame</td><td>Display receiving monitor screen indicating data received by module. It is activated after connected with PLC
① Dialog box for selecting port to monitor
 
</td></tr>
</table>

<table>
<tr><th>Type</th><th>Menu</th><th>Function</th></tr>
<tr><td rowspan="2">Monitor</td><td>Receive frame</td><td>② Receiving monitor screen
 
</td></tr>
<tr><td>Send frame</td><td>Display data transmitted via this module on the screen by reading through Frame Editor
 

Transmission monitor can use RS-232C channel only.</td></tr>
</table>

5.2.1 Basic parameter setting

Basic parameters are for setting communication specification of communication module to decide communication speed, parity, data bit, stop bit and modem service as required. If modem communication is applied, command for initializing modem shall be input. (Command for initializing modem may depend on makers, however, mostly set to 'ATZ'.) [Table 5.2] describes items of basic parameters which are to be set basically. Basic parameters are set respectively according to channels of RS-232C and RS-422 with setting values saved respectively per communication channel. [Figure 5.2] shows setting screen of each item in basic parameter screen.

[Table5.2] Setting items of basic parameters

Setting item	Contents	Remark
Station	Set module station No. used in dedicated mode and other company's dedicated mode	stations 0~31
Type	If communication channel is RS-232C, set to communication type of RS-232C channel	Null modem / Modem / Dedicated modem
	If communication channel is RS-422, set to communication type of RS-422 channel	RS-422/RS-485
Baud Rate	Set communication speed per channel	300~76800 bps[Note1]
Data bit	Number of data bits in asynchronous communication type	7~8 bits
Stop bit	Number of stop bits required for asynchronous communication type	1~2 bits
Parity	Number of parity bits for checking data error	None/Even/Odd
Init command	Initializing command of dial-up modem if modem used	Default value is ATZ
Monitor Entry	Number of monitors registerable in dedicated mode	4X32 or 16X20

Remark

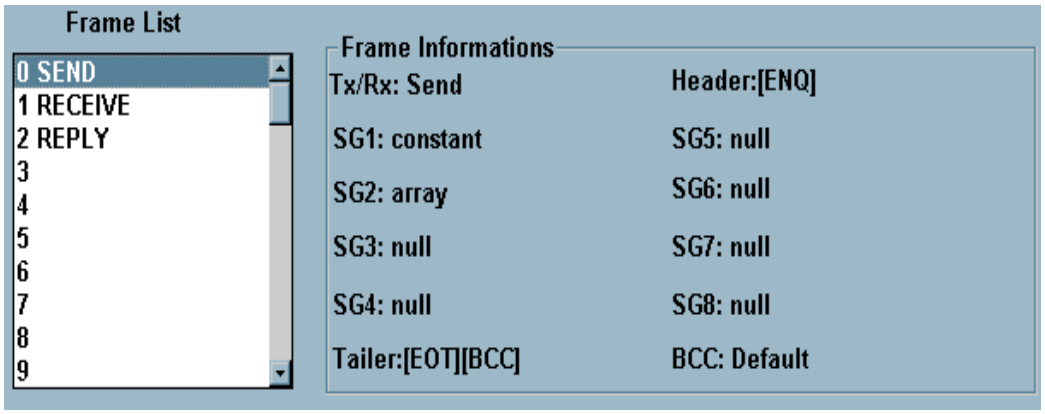
[Note1] Communication speeds can be set up to 38400bps for RS-232C channel and up to 76800bps for RS-422 channel

5.2.2 Frame setting

Frame setting is for definition of protocol to allow Cnet I/F module to communicate as agreed with protocol of the other's device if used in user defined mode. Frame is a basic setting item surely required for user defined communication and TX/RX program using this shall be composed in GMWIN. Frame edit can be set up to 64 respectively according to types of frames.

[Figure5.2] shows the main screen when 3 frames are registered. Frame edit screen is composed of two screens for frame list and frame information. Frame list displays registered frame names and registration No., and frame information displays summarized information for selected frames.

[Figure 5.2] Registration screen of frames



Frame type can be set for transmission and receiving. [Figure5.3] describes how to register frames with 3 examples of frame registration.

1) Transmitted frame setting (SEND)

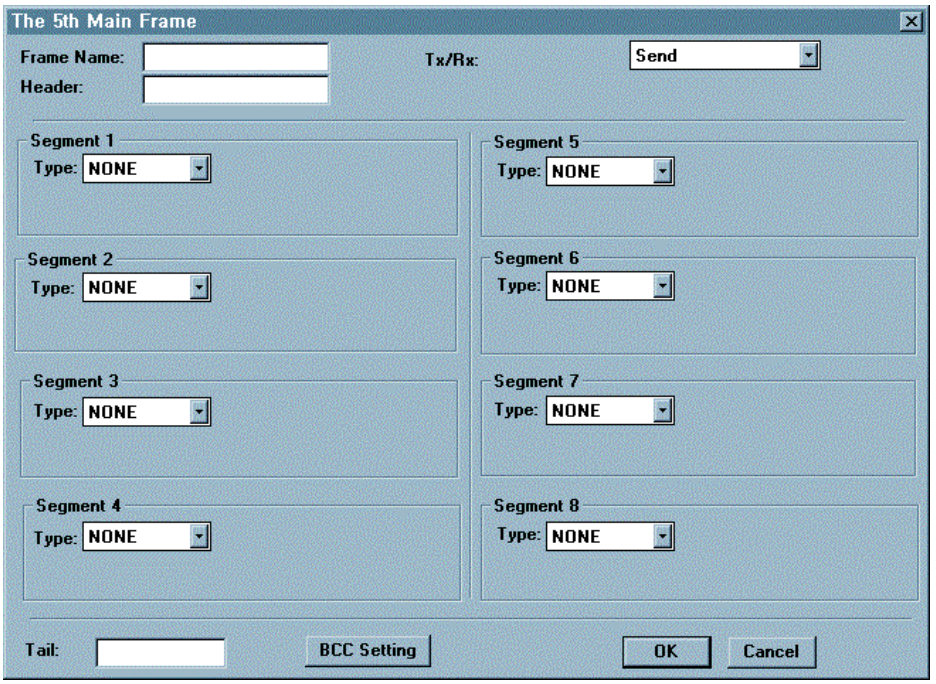
[Figure 5.2] describes how to register 'SEND' frame as of No.1 transmitted frame in frame list. No.1 frame is supposed to be transmitted frame in the structure as below.

Trans. sequence	Header <---------- Tail								
Frame type	Header	Frame body					Tail	BCC	
		Command (CONST)				Data (ARRAY)			
Trans. frame	ENQ	0	0	W	B	Variable data (4-byte)	EOT		
ASCII code	H05	H30	H30	H57	H42		H04		

- ❑ Transmission sequence means sequence of such data transmitted in serial communication as Header, Constant, Array, Tail and BCC in order.
- ❑ Frame type according to method when transmitted frame is registered in Frame Editor is divided usually into header, tail and frame body.
- ❑ Header and tail are used to tell the start from the end of frame mainly with special characters. Occasionally header and tail are not provided for some protocols, however, they are recommended to use for reliable communication along with special codes like STX, EOT and ETX.
- ❑ Frame body is divided into Array where Tx / Rx data is set and Constant area of station No. and command.
- ❑ Transmitted frame means transmitted data via communication channel.
- ❑ ASCII codes displayed in HEX of transmitted data with 'H' in front of each figure which is indicating HEX unit of HEXdecimal figures do not contain actually transmitted data.

Register the transmitted data above in Frame Editor as in sequence below.

A) Double-click on frame No. to edit in frame list of [Figure 5.2] with mouse to display frame edit screen as below. It is a blank space before initial registration.



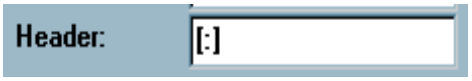
B) Frame name : Input frame name. Max. 16 characters of English letters and figures can be input as a frame name, and registered name shall be the same as used for PLC programming in GMWIN.[Note1]

Remark

[Note1] When inputting name, do not use '_UDATA_SEND' or '_UDATA_RCV', which performs special function. Refer to 7.1 User defined communication for more information. If identical frame name is used as repeated, normal communication is not available.

C) TX/RX : Input Send for transmission and Receive for receiving.

D) Header : As of an area indicating the start of data frame, such control characters as ENQ (Enquiry,ASCII code of H05), STX (Start of Text, ASCII code of H02) and ACK (Acknowledge, ASCII code of H06) can be applied, and in addition, signs of (:, ;, {, . . . } and figures can be selected at user's option. Max. 8 control characters are allowed for use as continued. Header shall be surely set bound up with '[' and ']' like '[ENQ]'. The following example is for header setting.



E) Frame body setting : Frame body is used for area setting to which actual data including commands are to be transmitted. For sorting out these, setting according to max. 8 segments is available in Frame Editor. To input per segment is to sort constantly transmitted data area (CONST) from variable data area (ARRAY).

Since CONST area and ARRAY area may be used as mixed, setting shall be performed as agreed with those respectively in several segments. Segments shall be applied from No. 1 as in transmission sequence of frames. Do not insert a segment unused in the middle.

❑ CONST : Set data which is constant with invariable features to Constant. Fixed area like command or station number of frame is applicable for this. CONST data shall be set as classified into HEX. or ASCII with max.30 byte available.

❑ ARRAY : Variable area which is changeable data whose contents are variable like TX/RX data is applicable for this. If set to ARRAY, TX/RX data is meant to be changeable based on frame, thus specified number of data can be transmitted and received by setting the number of data. The size set in ARRAY size area shall be the same as the actual number of data to be transmitted and received. The number of data on the basis of ASCII code's length can be set up to 240 byte with total length of frame limited to 256 byte.

[Table 5.3] describes setting items of frame body.

[Table 5.3] Setting of data type

Setting item	Data type	Contents	Remark
CONST	HEX	● Used if set figures are transmitted/received as they are ● HEX. figures only available. ● Setting of the even number of data only available[Note1] ● Data of '00' is unavailable.[Note2] ● Setting up to 30 byte available	Ver.2.0 Used for communication in HEX. figures
	ASCII	● Used if set figures or ASCII codes in characters are transmitted/received ● Character setting available. ● Setting up to 15 byte available	Used for communication in characters
ARRAY [Note3]	Convert	● SD area data of PLC program F/B is converted into ASCII code when transmitted. ● Data if received is sent to RD area of PLC program F/B as converted into HEX. ● HEX. figures only available. ● Setting up to 120 byte of data available.	Communication in figures only available. ASCII data out of HEX. range is regarded as an error.

Setting item	Data type	Contents	Remark
ARRAY [Note3]	None	● SD area data of PLC program F/B is not converted into ASCII code when transmitted. ● Data if received is sent to RD area of PLC program F/B as not converted into HEX. ● TX/RX of data in figures and characters are available. ● Setting up to 120 byte of data available.	Communication available In characters and figures

Remark

[Note1] It means that the number of data shall be set in unit of byte

Ex. HEX. input : 0123456789 → setting available (The number of data is 10)

HEX. input : 012345678 → setting unavailable (The number of data is 9)

[Note2] If data is '00', it shall be set to Array.

[Note3] Array setting up to 4 of 8 segments is available.

[Table 5.4] shows transmitted data flow when data type is set to Convert or None. It is supposed that 4 byte data of '12 34 56 78 ' is transmitted in PLC.

[Table5.4] Example of transmitted data conversion based on data type setting

Classification	If Convert selected	If None selected
Data of PLC side	'1 2 3 4 5 6 7 8'	'1 2 3 4 5 6 7 8'
Data conversion	ASCII conversion	No ASCII conversion
Correspondent device	'31 32 33 34 35 36 37 38'	'1 2 3 4 5 6 7 8'

As for [Table5.4], if not converted into ASCII, data of PLC transmission area is transmitted as it is causing data to be sent in HEX. to the other device.

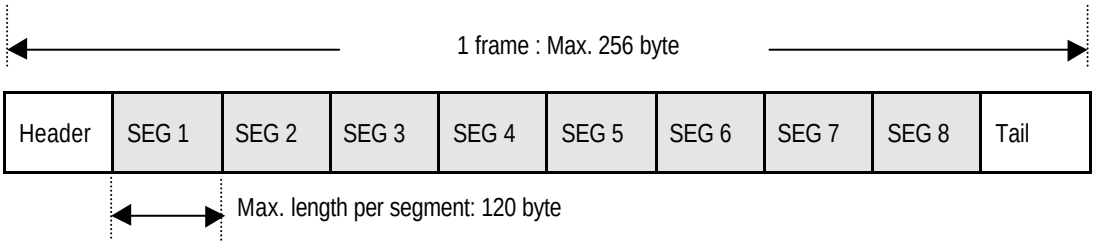
[Table 5.5] Example of received data conversion based on data type setting

Classification	If Convert selected	If None selected
Data of PLC side	'1 2 3 4 5 6 7 8'	'31 32 33 34 35 36 37 38'
Data conversion	ASCII conversion	No ASCII conversion
Correspondent device	'31 32 33 34 35 36 37 38'	'31 32 33 34 35 36 37 38'

[Table5.5] shows that desired HEX data can be received by setting the data type to Convert in Cnet when ASCII code is transmitted by the correspondent device. If None is selected, ASCII code is directly sent to PLC as received. In case of communication in character data, receiving of character data is available if the data type 'None' is selected.
Input the right data area as described below after setting CONST and ARRAY in segment type.

- ❑ If segment type is CONST, input fixed area of frame
- ❑ If segment type is ARRAY transmission, set one of SD1, SD2, SD3 and SD4.
- ❑ If segment type is ARRAY receiving, set one of RD1, RD2, RD3 and RD4.

Data size needs setting only for ARRAY up to 120 byte per segment. As max. length of one frame is limited to 256 byte, the total data length of 8 segments shall be set not more than 256 byte. The figure below describes for the details.



[Figure 5.4] shows the frame edit screen where ASCII data '00WB' of CONST type is input in segment 1 and CONVERT is set to ARRAY type in segment 2 in accordance with the setting method above.

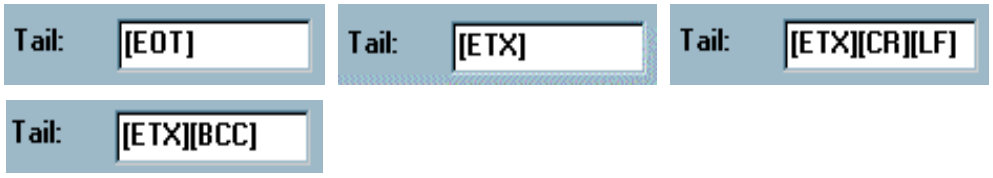
[Figure5.4] Transmitted frame setting

(a) CONST data input (00WB)

(b) ARRAY data input (4-byte)

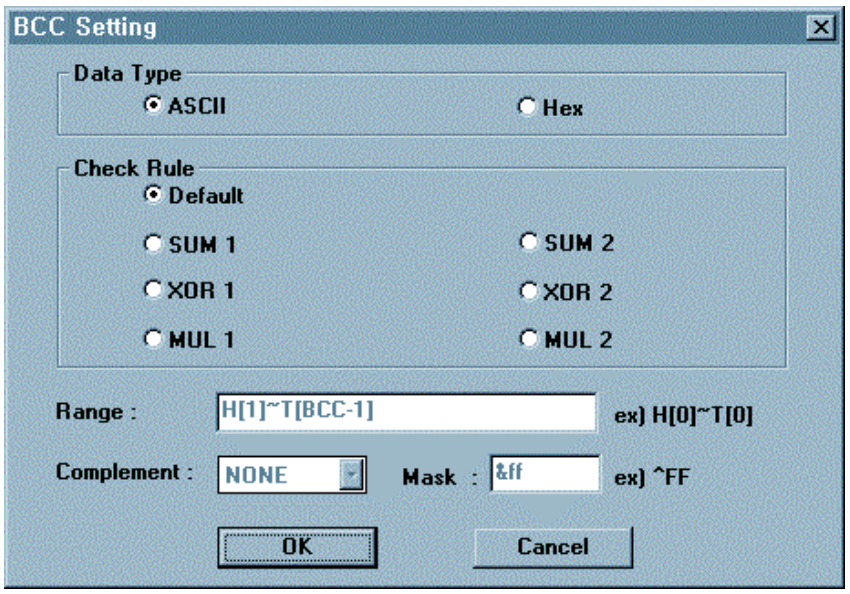
Since the structure of transmitted data is classified into fixed data area of '00WB' and variable data area of '12345678', '00WB' of ASCII type is input in CONST area and Convert is selected in ARRAY area for transmission of variable data area with 4 byte of transmission data designated as in [Figure5.4]. 2 segments are used for CONST and ARRAY data in the figure.

F) Set tail : Tail as of an area to sort out the end of frame can be set with control character, signal, figure, etc. as in header. If several characters are used with signals of '[' and ']' available to be set as in header, max.8 can be continued as applied. In addition, BCC is serviceable for detection of errors in tail. [BCC] shall be surely set for BCC service. For BCC service, press [BCC setting] button on the right to select calculation method and range of BCC.



G) BCC setting : BCC provides check information on frame error by setting [BCC] to tail for BCC check. If BCC check is selected, BCC data is transmitted along with for transmitted frame and only correct BCC value of received data is received for received frame according to setting method. The next figure is BCC setting screen when BCC setting button is pressed with BCC type and mode available to be set. Exercising of basic setting is shown as in [Figure 5.5].

[Figure 5.5] Example of BCC basic setting



① Data Type : Set selecting type of BCC calculation result to ASCII or HEX in frame.

- ❑ ASCII : Insert BCC calculation result as converted into ASCII data in BCC area with 2 byte of BCC value available to be transmitted and received.
- ❑ HEX. : Insert BCC calculation result as converted into HEX. data in BCC area with 1 byte of BCC value available to be transmitted and received.

② Check Rule : As of menu to set BCC calculation type, it can specify calculation types of Default, Sum, Multiplication or Exclusive OR, and range. Regardless of calculation types, calculation is performed based on ASCII code values if the frame is of ASCII, and based on frame HEX values if the frame is of HEX.

Example of BCC calculation according to BCC calculation type set is described below with ASCII communication frame.

Frame type	Header		Frame body								Tail	
Frame contents	STX	ENQ	0	0	R	S	B	2	0	0	EOT	BCC
ASCII code	H02	H05	H30	H30	H52	H53	H42	H32	H30	H30	H04	As
BCC calculation range	H[0]	H[1]	S[0]	S[1]	S[2]	S[3]	S[4]	S[5]	S[6]	S[7]	T[0]	set

DEFAULT

Insert lower 1 byte of the HEX decimal-summing results of data from 2nd to [BCC] except the 1st date into [BCC] area. Summing area is fixed. (H[1] ~ [BCC-1])

Calculation Ex.

In exercising frame, add ASCII codes in calculation range of H[1] ~ T[0] in HEX.

(05 + 30 + 30 + 52 + 53 + 42 + 32 + 30 + 30 + 04) = 1E2

Use only lower byte in result 1E2 for BCC

BCC value = (HEX.:E2 / ASCII:4532)

SUM 1

User can set summing area in BCC range area. The other sections are the same as Default.

(Ex. : Set H[0] ~ T[0] in the range if BCC range is to be from the 1st data of header to tail)

Calculation Ex.

In exercising frame, add ASCII codes in calculation range of H[0] ~ T[0] in HEX.

(02 + 05 + 30 + 30 + 52 + 53 + 42 + 32 + 30 + 30 + 04) = 1E4

Use only lower byte in result 1E4 for BCC

BCC value = (HEX.:E4 / ASCII:4534)

SUM 2

Function for data mask of BCC calculation results in SUM 1 is added. Masks are classified into &(AND), |(OR), and ^(Ex-OR). (Ex : In case the mask is set to [& F0] with the setting range of H[0] ~ T[0] by SUM 1 of BCC type)

Calculation Ex.

In exercising frame, add ASCII codes in calculation range of H[0] ~ T[0] in HEX.

(02 + 05 + 30 + 30 + 52 + 53 + 42 + 32 + 30 + 30 + 04) = 1E4

Use the result from AND calculation between lower byte ‘E4’ and ‘F0’ in result 1E4 for BCC.

BCC value = (HEX.:E0 / ASCII:4530)

XOR 1

Use the result from Exclusive-OR calculation of all data in setting area for BCC.

Range setting is same as in SUM 1. (Ex. : In case the range is set to H[0] ~ T[0] with BCC type of XOR 1)

Calculation Ex.

In exercising frame, perform XOR calculation of ASCII codes in calculation range of H[0] ~ T[0].

(02 ^ 05 ^ 30 ^ 30 ^ 52 ^ 53 ^ 42 ^ 32 ^ 30 ^ 30 ^ 04) = 72

BCC value = (HEX.:72 / ASCII: 3732)

XOR 2

Function for data mask of BCC calculation results in XOR 1 is added. Masks are classified into &(AND), |(OR), and ^(Ex-OR). (Ex : In case the mask is set to [& F0] with the setting range of H[0] ~ T[0] by XOR 2 of BCC type)

Calculation Ex.

In exercising frame, perform Ex-OR calculation of ASCII codes in calculation range of H[0] ~ T[0].

(02 ^ 05 ^ 30 ^ 30 ^ 52 ^ 53 ^ 42 ^ 32 ^ 30 ^ 30 ^ 04) = 72

Use the result from AND calculation between the result '72' and 'F0' for BCC.

BCC = (HEX.:70 / ASCII:3730)

MUL 1

Use the result from Multiplication calculation of all data in setting area for BCC.

Range setting is same as in SUM 1. (Ex. : In case the range is set to H[0] ~ T[0] with BCC type of MUL 1)

Calculation Ex.

In exercising frame, perform Multiplication calculation of ASCII codes in calculation range of H[0] ~ T[0].

(02 X 05 X 30 X 30 X 52 X 53 X 42 X 32 X 30 X 30 X 04) = 00

BCC value = (HEX.:00 / ASCII: 3030)

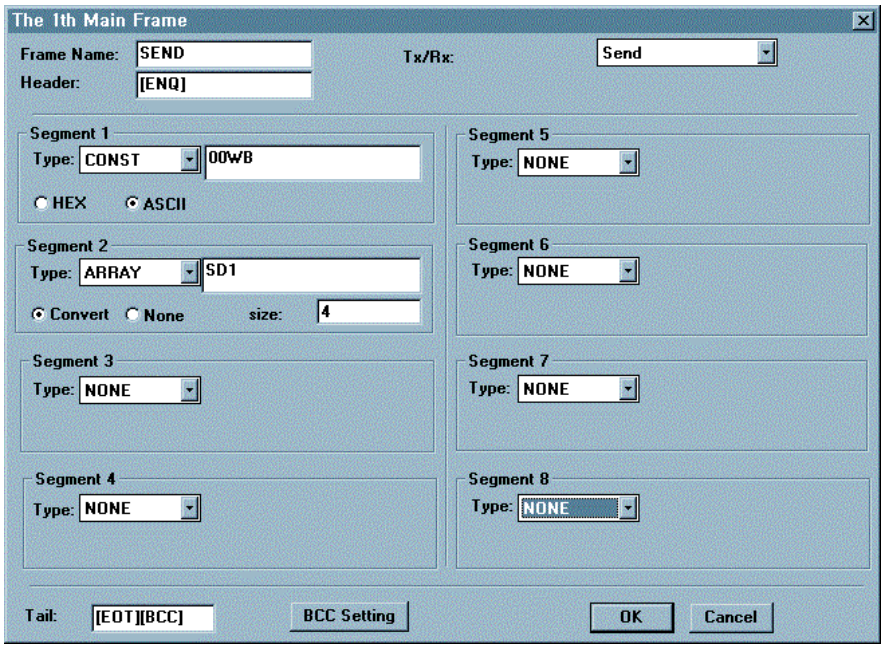
MUL 2
Function for data mask of BCC calculation results in MUL 1 is added. Masks are classified into &(AND), |(OR), and ^(Ex-OR). (Ex : In case the mask is set to [| F0] with the setting range of H[0] ~ T[0] by MUL 2 of BCC type)
Calculation Ex. In exercising frame, multiply ASCII codes in calculation range of H[0] ~ T[0]. (02 X 05 X 30 X 30 X 52 X 53 X 42 X 32 X 30 X 30 X 04) = 00 Use the result from OR calculation between the result '00' and 'F0' for BCC. BCC = (HEX.:F0 / ASCII:4630)

③ Mask : If BCC calculation is set to SUM2 / XOR2 / MUL2, masking option of calculation result to specified data is available with the 3 following methods.

- ❑ & : Use the result from AND calculation with data behind the signal for BCC.
- ❑ | : Use the result from OR calculation with data behind the signal for BCC.
- ❑ ^ : Use the result from Exclusive OR calculation with data behind the signal for BCC.

[Figure 5.6] shows the result of frame registration from frame name to BCC in sequence as above, and the frame name is registered via 'SEND'.

[Figure 5.6] Completed transmitted frame.



2) Received frame setting (RECEIVE)

It describes how to register 'RECEIVE' frame as of No.2 received frame in frame list in [Figure5.2]. No.2 frame is supposed to be received frame in the structure as below. Received data of 6 byte means variable data of 6 byte.

Trans. sequence	Header <---------- Tail								
Frame type	Header	Frame body					Tail	BCC	
		Command (CONST)				Data (ARRAY)			
Trans. frame	ACK	0	0	R	B	Variable data (6 byte)	ETX		
ASCII code	H06	H30	H30	H52	H42		H03		

User can define the frame in the sequence below in the [Figure 5.2] if communication frame Cnet I/F module is to receive is as above and if the figure of 6 byte behind '00RB' is the contact data (variable area) which is transmitted from the other station.

A) Double-click on frame No.2 to edit in [Figure 5.2] with mouse.

B) If frame setting screen as in [Figure 5.7] is displayed, input frame name to be received and TX/RX along with [ACK] in header, while the name and header setting are same as in transmission. In this case, input frame name as of 'RECEIVE'.

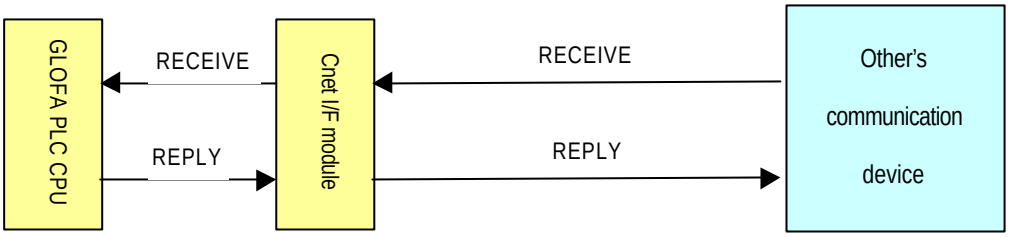
Remark

[Note1] When inputting name, do not use '_UDATA_SEND' or '_UDATA_RCV', which performs special function. Refer to 7.1 User defined communication for more information.

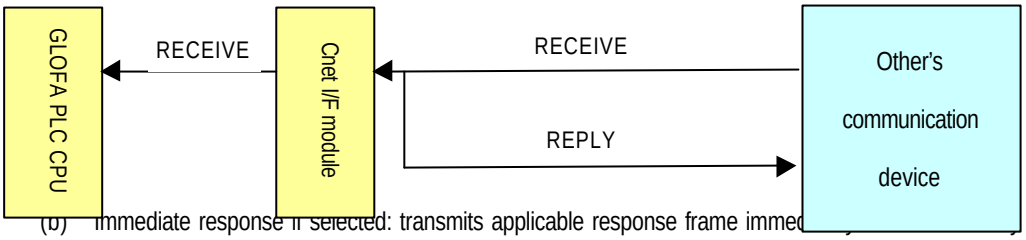
[Figure5.7] Setting of received frame type

C) If set to Receive, frame name of immediate response can be set by 'REPLY' input. Immediate response function is used in protocol which informs the other station that the frame if received is normally received. Once if the immediate response is selected and transmitted frame just like the response frame name is registered, the transmitted frame which is registered as immediate response frame is transmitted automatically even though SEND function block isn't used in PLC. [Figure 5.8] describes the immediate response function.

[Figure 5.8] How to use immediate response



(a) Immediate response if not selected: transmits response frame by PLC programming for transmission.

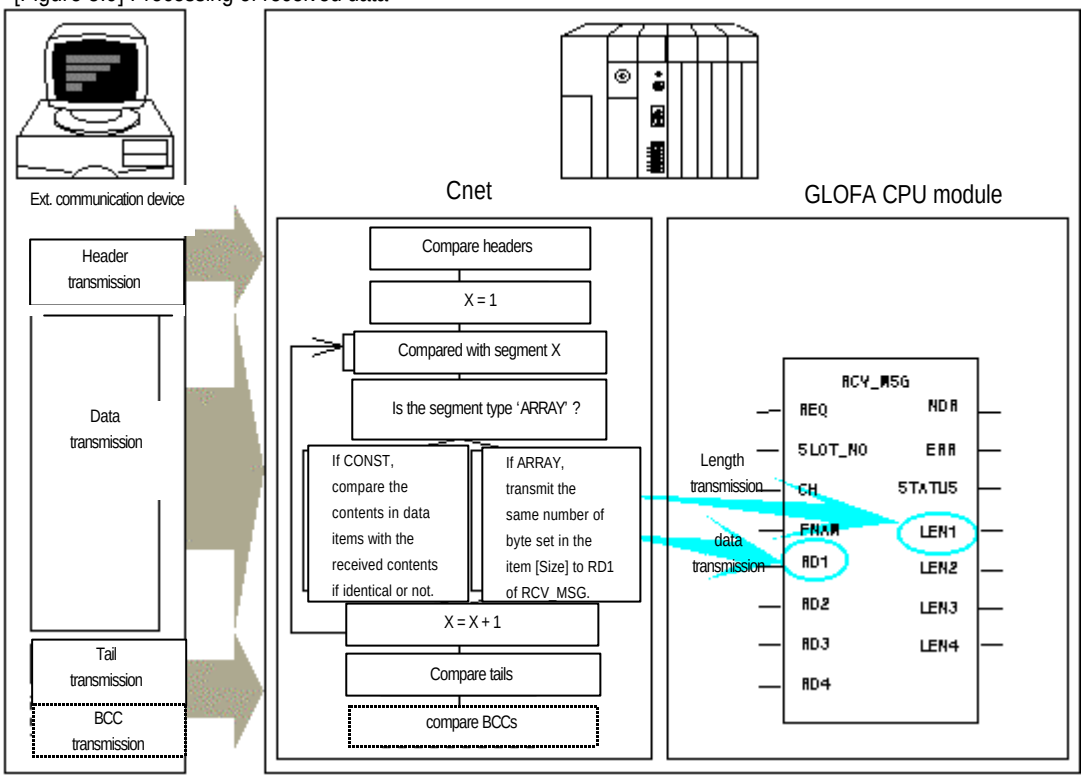


(b) Immediate response if selected: transmits applicable response frame immed
Cnet I/F module. (Programming in PLC is unnecessary)

If immediate response frame has been set, the same transmitted frame as the setting name shall be defined. ARRAY data cannot be transmitted in the transmitted frame of immediate response.

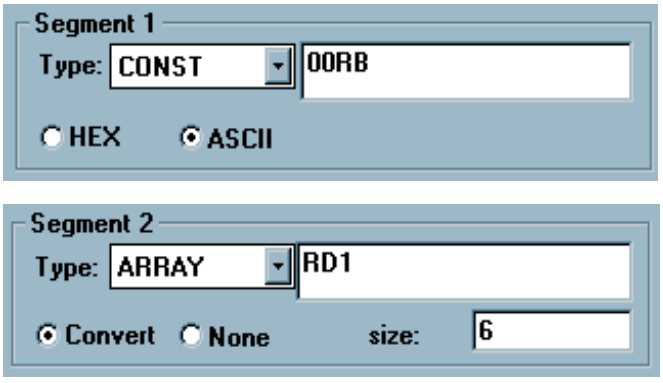
D) Set received frame per segment. Setting is same as in transmitted frame, however such ARRAY variable names in variable data area shall be surely used as RD1, RD2, RD3 and RD4. When PLC programming, data entering variable data area is received in RD1~RD4 while RCV_MSG function block is being input. It means that the data in setting area to RD1 array of Frame Editor among the received frames from the other station is let saved in ARRAY variable set to RD1 of RCV_MSG function block in user program. If CONVERT is selected in Frame Editor, ASCII data is saved as converted to figures, and as of characters as they are if NONE is selected.

[Figure 5.9] Processing of received data



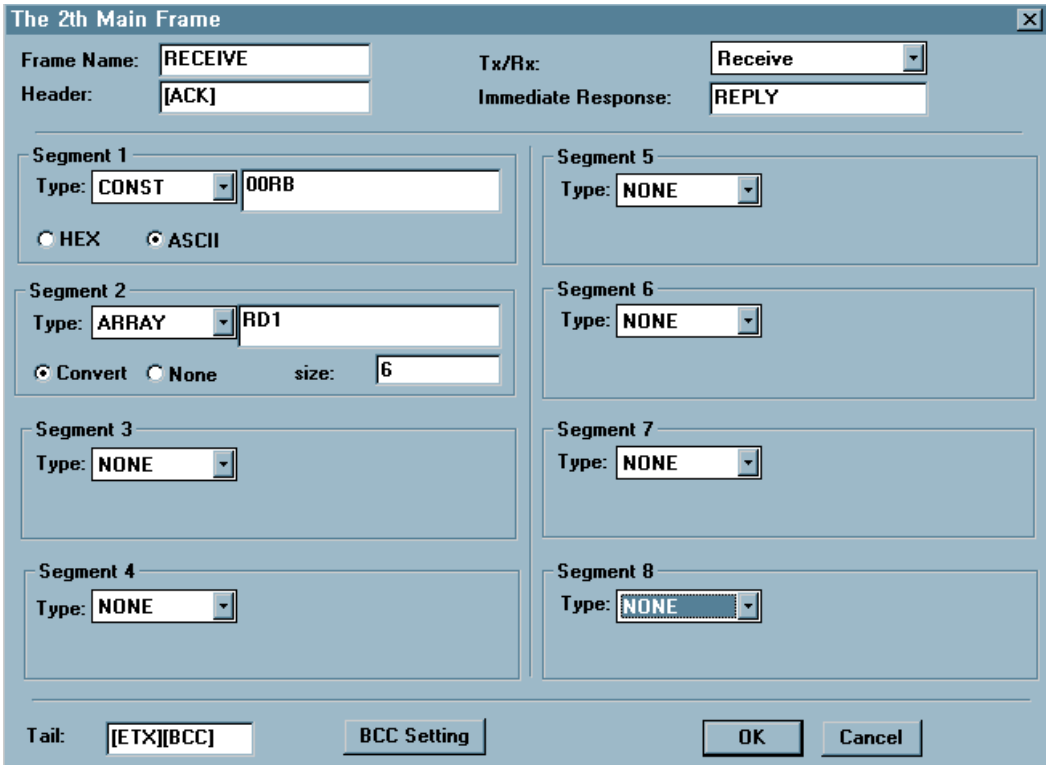
[Figure 5.10] shows the input result of CONST and ARRAY to frame segment in received frame for exercising.

[Figure 5.10] Input result for received frame



E) If segment input is completed, input [ETX] into tail and apply basic setting to [BCC] as below to complete received frame input.

F) The following screen is for Frame Editor when received frame is registered.



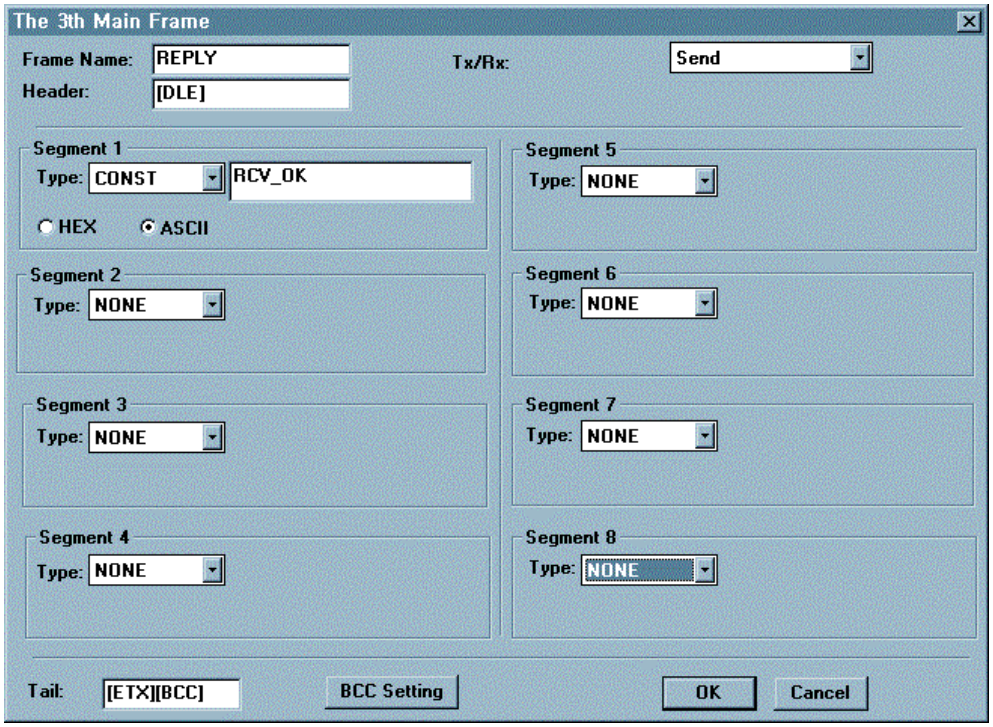
G) As the immediate response frame is set to 'REPLY' in received frame setting, the transmitted frame as of 'REPLY' shall be composed as below.

3) Setting of immediate response frame (REPLY)

If 'RECEIVE' frame is received, automatic transmission of response frame is available without PLC programming by setting of the next transmitted frame because 'REPLY' frame has been set to immediate response frame of RECEIVE frame.

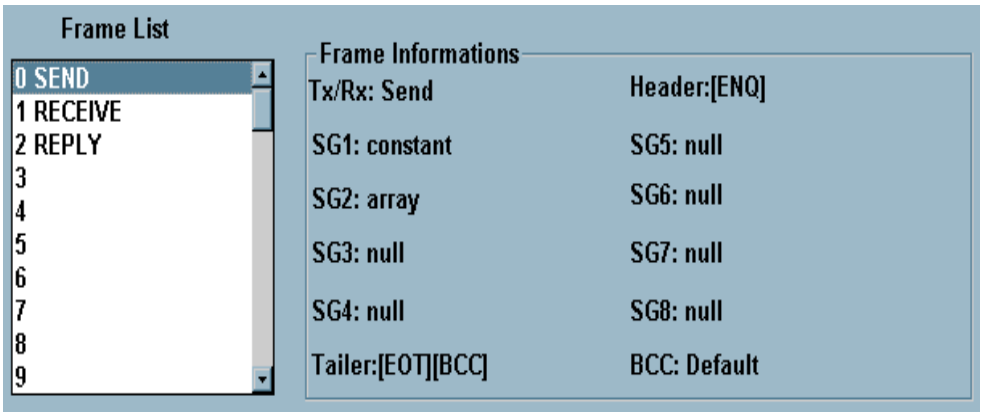
Trans. sequence	Header <---------- Tail									
Frame type	Header	Frame body						Tail	BCC	
		Command (CONST)								
Trans. frame	DLE	R	C	V	-	O	K	ETX	F	7
ASCII code	H10	H52	H43	H56	H5F	H4F	H4B	H03	H46	37

Double-click on frame No.3 area in frame list of [Figure 5.2] to register transmitted frame 'REPLY'. Registration procedure is same as in 'SEND' frame and Registration result is as below.



4) Frame information

If frame in frame list is once clicked after frame registration, frame information screen is displayed on the right introducing information briefly about the frame selected. Frame information provides TX/RX type, header/tail type, BCC setting and also the number of CONST and ARRAY per segment. Next figure shows 'SEND' frame information registered via transmitted frame.



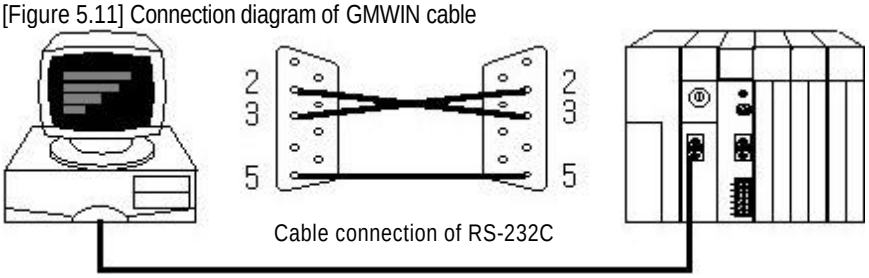
5.2.3 Frame writing/reading

Basic parameters and frame set by using Frame Editor can be written (downloaded) to Cnet I/F module or read (uploaded) from Cnet I/F module.

1) Writing (download)

A) First, connect GMWIN cable to COM terminal of PLC CPU module equipped on Cnet I/F module. PC and COM terminal of PLC shall be connected.

[Figure 5.11] Connection diagram of GMWIN cable



B) Select [Online]-[Connect] in Frame Editor and connect to CPU to display connection completed message. [Note1]

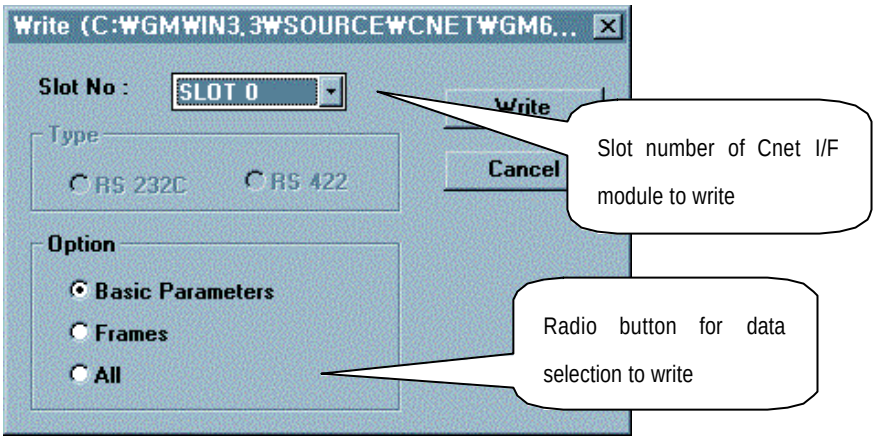
Remark

[Note1] Online connection via Frame Editor is unavailable if GMWIN program is connected. If GMWIN program is in service, try the connection after GMWIN is disconnected surely switch PLC CPU over to STOP before basic parameters or frame is downloaded. If downloaded in PLC run mode, writing error may occur.

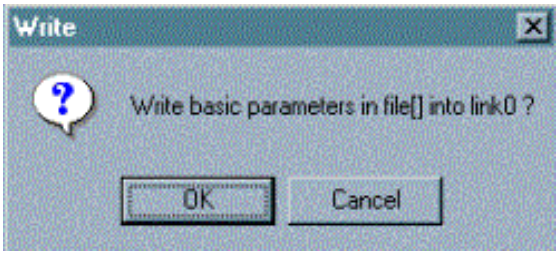
C) Select [Online]-[Write] in Frame Editor to display the dialog box as below.

D) Select communication channel to use among RS-232C/RS-422 in basic screen of Frame Editor.

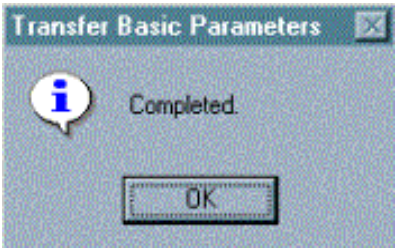
E) Select menu [Online] [Write] to display the Write dialog box as below and set slot number where Cnet is equipped. Communication option to download is for selecting option among basic parameters and frame. Select 'All' to download basic parameters and frame at a time.



F) Select communication option and [Write] button to display the dialog box of Write OK as below. Herein, select OK to start writing.



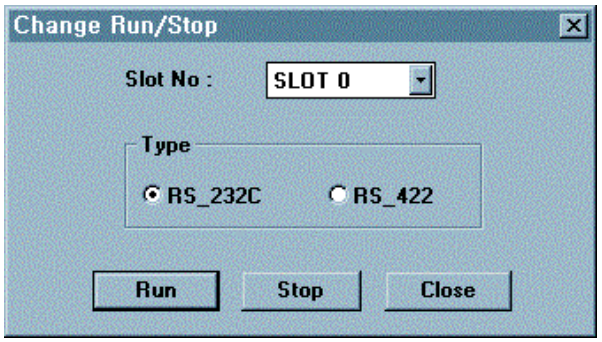
G) If download is completed, the following completion message is displayed to indicate download completed. [Note1]



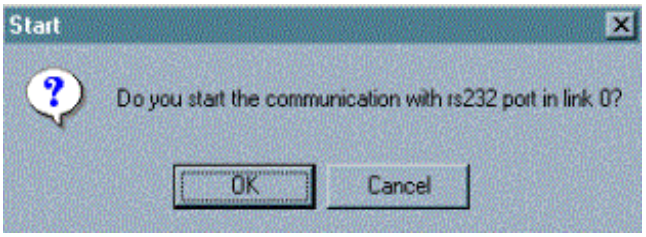
Remark

[Note1] If frame or basic parameters are downloaded, the communication of downloaded channel stops. In this case, switch the channel to Run mode via Change Run/Stop. It is caused by changed basic setting for communication to stop the operation of the channel.

H) Since downloaded channel is in communication stop status, select menu [Online][Change Run/Stop] and open the dialog box of Change Run/Stop to re-start communication.



I) The dialog box of Change Run/Stop is to stop or run the operation of the appropriate channel. Since the channel operation stopped due to downloading, select Cnet's slot number and appropriate channel, and press [Run] button to switch over to communication run status and re-start the operation in communication mode downloaded. If [Run] button is selected, the message below is displayed.



Remark

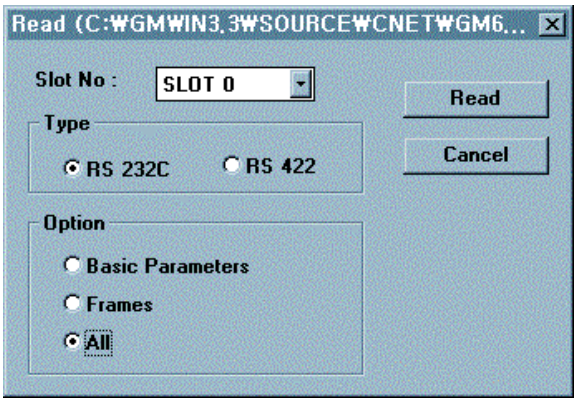
[Note1] The status of communication run or stop per channel can be checked through LED display in Cnet module. RUN-LED if turned on means communication run, and communication stop if off per channel. Even when PLC reset or powered back, communication is switched over to Run mode.

2) Reading (upload)

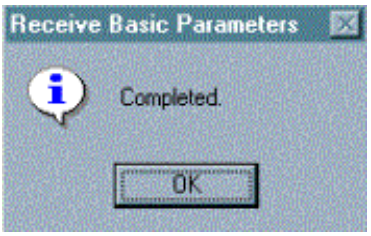
Basic parameters and frame data downloaded in Cnet I/F module are saved in flash memory as kept inside Cnet I/F module even if powered off. And these data can be also saved in file by reading via Frame Editor. The following describes the sequence of frame reading.

A) Select [Online]-[Connect] in Frame Editor and connect to PLC.

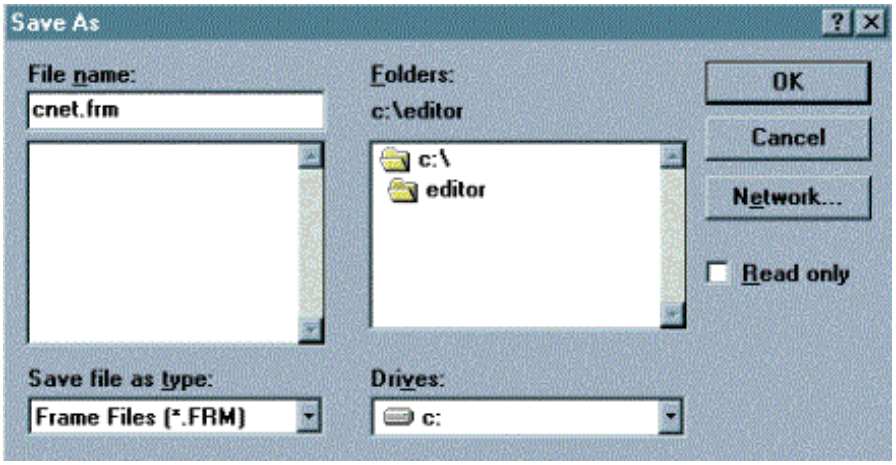
B) If connected, select [Online]-[Read] to display the Read dialog box as below and then select channel and Read type via slot No., communication type and communication option.



C) After required items are selected, select menu [Read] to display the status in which basic parameters and frame are read.



D) The data read can be saved in file via file saving menu.



5.2.4 Monitor function

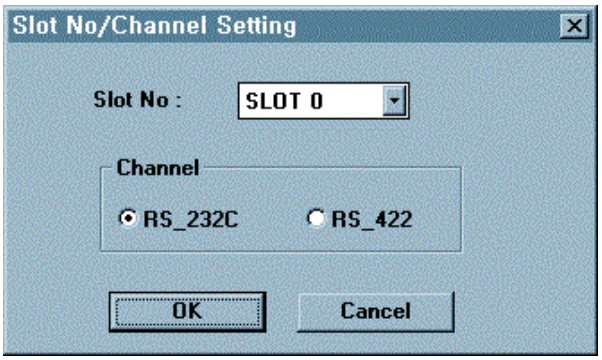
When data is transmitted or received via this communication module, it needs checking if actually transmitted well or what kind of data is received. Usually, protocol analyzer has been used for checking the data in spite of the troublesome procurement. However, to shoot the trouble, receiving monitor function is provided for Frame Editor to view the data received by the other station along with transmission monitor function to view the data transmitted from self-station.

1) Receiving monitor

Receiving monitor views the data transmitted from external devices via Cnet I/F module using Cnet module. If basic parameters of Cnet I/F module are set correctly as agreed with communication type, the receiving monitor can fill the role of monitoring regardless of different frame definition or station number setting to inspect communication status as required.

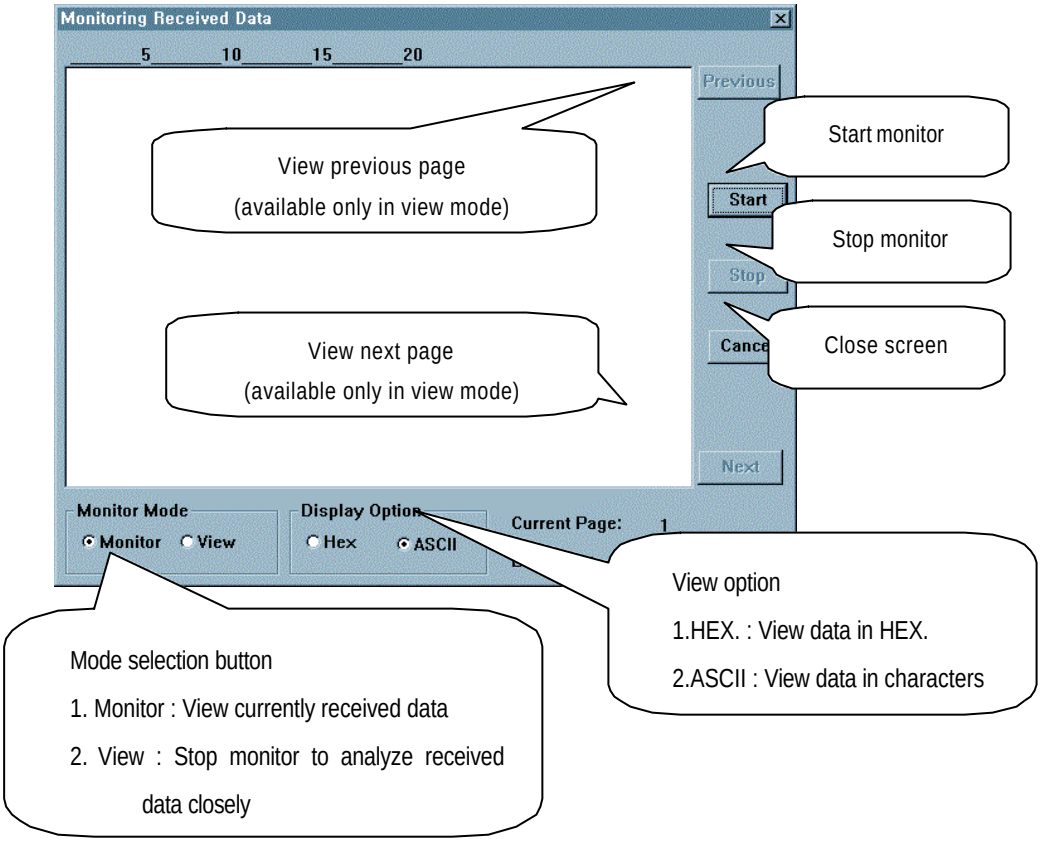
A) First, run Frame Editor and select [Online]-[Connect] to connect with CPU.

B) Select menu [Monitor]-[Receive Frame] to display dialog box for selecting channel to monitor as below.

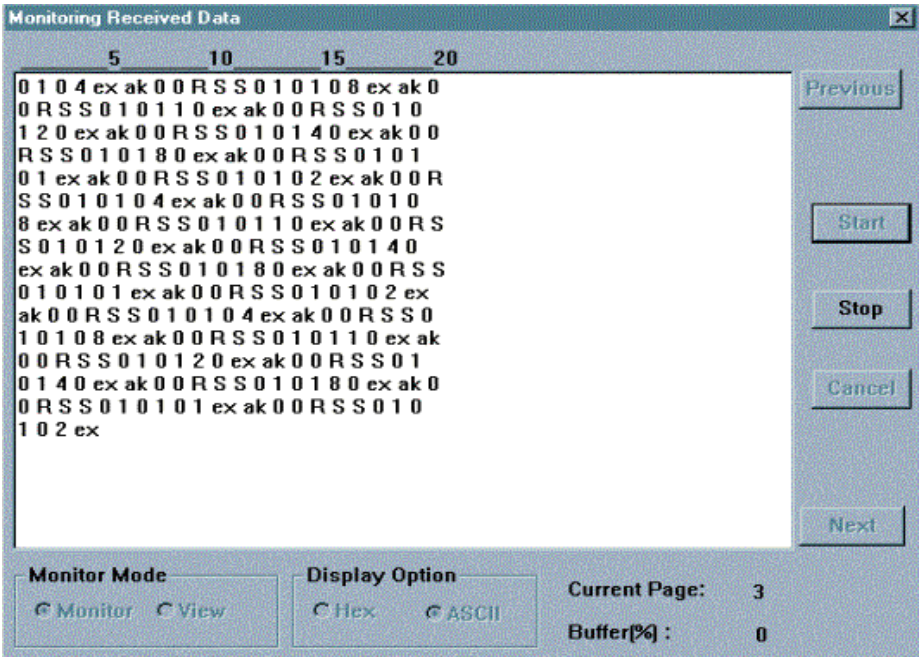


C) Select slot No. and Channel where module is inserted, and click on [OK] button.

D) If the receiving monitor screen as below is displayed, press [Start] button to start monitor.



E) If data is received by Cnet I/F module, the received data is monitored in the screen as below.

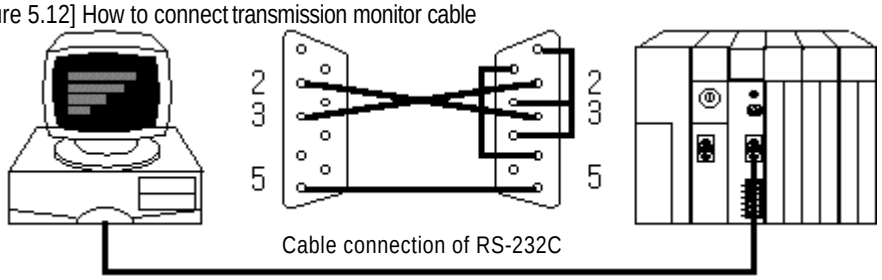


2) Transmission monitor

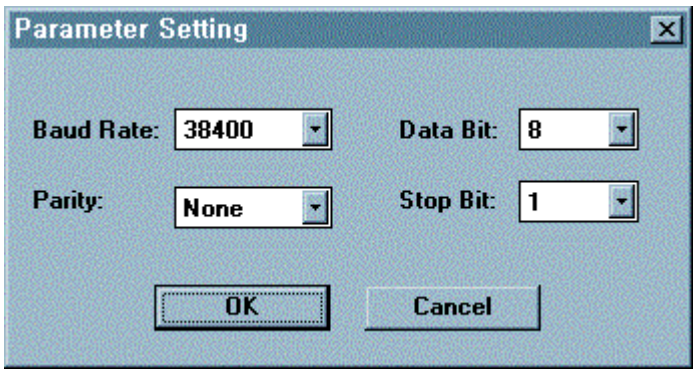
Transmission monitor is used to check and monitor data if actually transmitted from Cnet I/F module via null modem cable connecting PC with RS-232C communication channel of Cnet I/F module as in [Figure 5.12].

A) First, connect RS-232C cable to RS-232C port of Cnet I/F module to monitor..

[Figure 5.12] How to connect transmission monitor cable

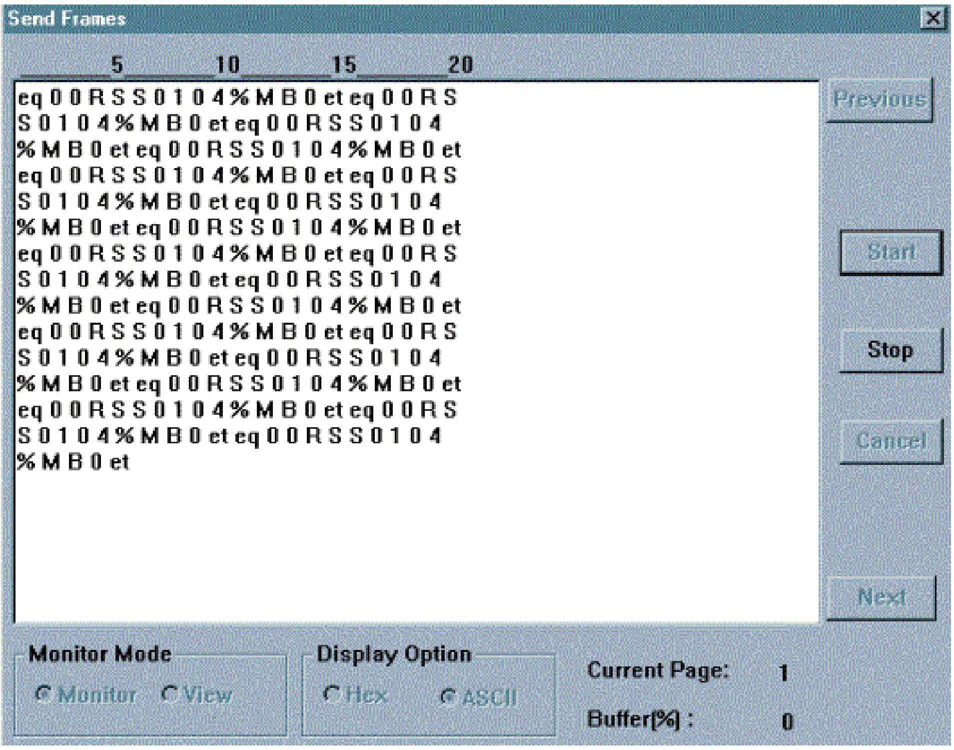


B) If [Monitor]-[Send Frame] is selected in Frame Editor, the following dialog box for parameter setting is shown, herein, input basic parameters of Cnet I/F module as communication speed, number of data bits, parity bits and stop bits, and then press [OK] button.



C) Set communication parameters as of RS-232C channel in Cnet I/F module.

D) Press [Start] button in transmission monitor screen as the figure below to display data which is in transmission.



E) To analyze transmitted data closely, press [Stop] button as in the receiving monitor and then switch monitor mode to 'View'. By changing of View option, data can be viewed in HEX or ASCII.

Remark

[Note1] Transmission monitor is available only for RS-232C channel. For receiving monitor of RS-422 channel, RS-232C to RS-422 converter shall be used.

5.3 Managing function of flash memory Ver.2.0

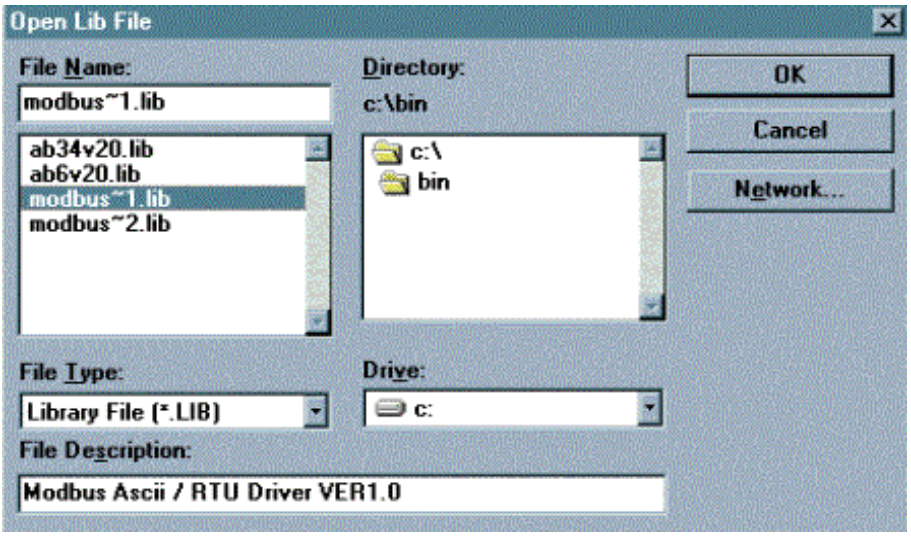
Cnet O/S can be upgraded and other company's driver also can be downloaded through flash memory of Cnet I/F used as an area for Cnet O/S and other company's dedicated driver. Via flash memory used as an O/S rom area, Version Up is available by user in person, however for Cnet Ver.2.0 or later only, along with additional function to manage flash memory for Frame Editor.

5.3.1 Write flash memory

Set Cnet mode switch to flash writing mode, supply power and open the required driver file via Frame Editor to download Write flash memory to Cnet I/F module as below.

1) Setting of Cnet operation mode: If PLC is powered on after Cnet mode switch is set to flash writing mode, No.'0' LED of Cnet I/F module flashes in a cycle of 1 second. Refer to Chapter 4 Operation mode setting for details of flash writing mode setting of Cnet I/F module.

2) Run Frame Editor and select [Open Lib] in [File] to display the dialog box for opening library file. Select the directory where driver is saved and then choose the applicable library file to confirm. File description shows the contents and the version of the library file where the version of the library can be checked.

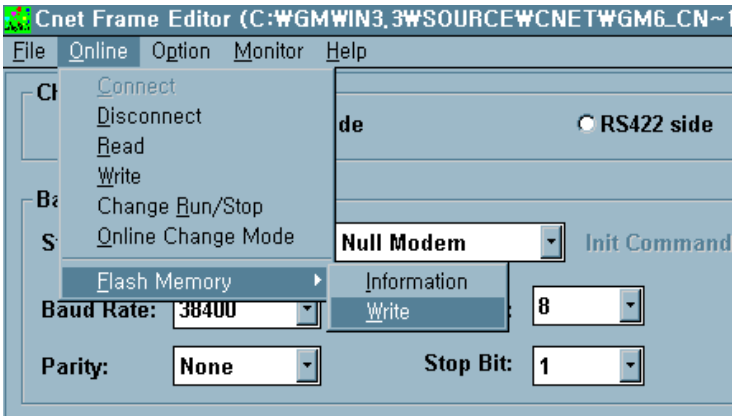


3) Library files of AB DF1 and MODBUS are provided via downloads per Cnet I/F module respectively. Library file names per Cnet I/F module are described in [Table 5.6].

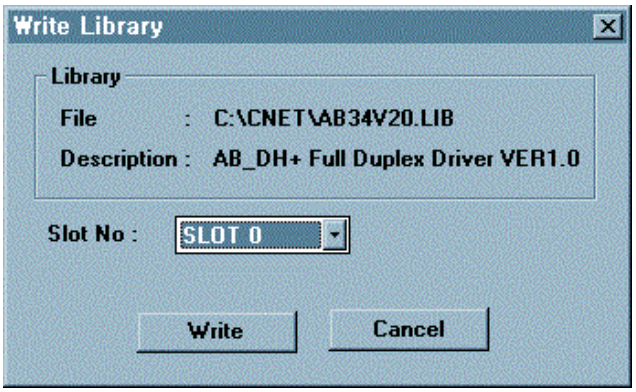
[Table 5.6] Other company's driver file description

File name	Description
AB34.LIB	AB DF1 Driver for G3L-CUEA/G4L-CUEA
AB6.LIB	AB DF1 Driver for G6L-CUEB/G6L-CUEC
MODBUS34.LIB	Modbus Driver for G3L-CUEA/G4L-CUEA
MODBUS6.LIB	Modbus Driver for G6L-CUEB/G6L-CUEC

4) After online connected, select [Write] via [Flash memory] in menu [Online] as below.



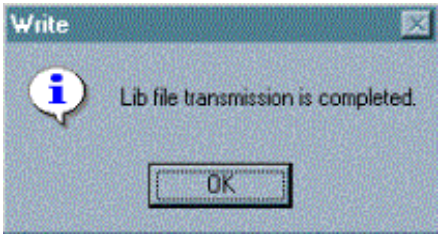
5) If Write flash memory is selected, the following dialog box for library writing is displayed. Select slot number therein and then choose Write button



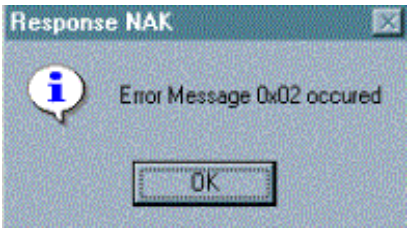
Remark

[Note1] Do not let program operation escaped from Frame Editor while downloading to flash memory or from Windows program, nor let PC or PLC powered off. If OS data of flash memory is ever damaged, normal operation of Cnet I/F module is unavailable. A/S shall be requested in this case.

6) If library writing is completed, the following message will be displayed.



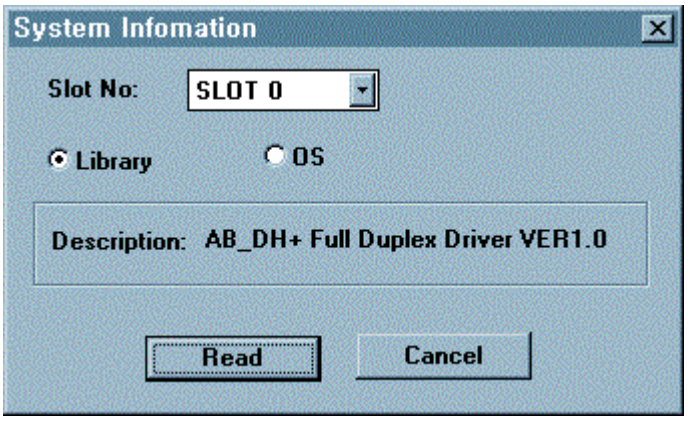
7) If the message below is displayed, check operation mode or slot number in Cnet I/F module.



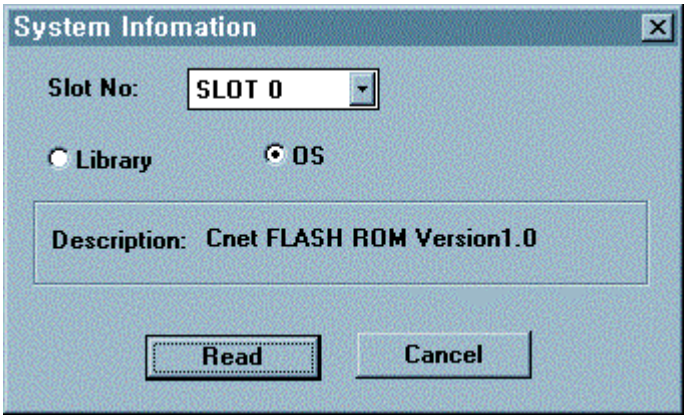
5.3.2 Reading of flash memory

Read flash memory is for checking the type and the version of O/S and other company's driver saved in flash memory of Cnet I/F module. Reading is allowed in all modes except Loop-Back mode with the following procedure as below.

1) Select Read flash memory of sub-menu in flash memory from online menu of menu bar to display the following screen where to read flash memory information. Herein, select applicable slot and library and then press Read to check the type and the version of driver downloaded in Cnet I/F module.



2) Select OS in system information and run Read to read the version of Cnet Flash ROM.



5.4 Changing of online mode Ver.2.0

In Cnet Ver.2.0, the operation mode can be changed during operation by setting via Frame Editor besides via mode switch. With online mode changeable all for local/remote Cnet I/F modules, the operation mode of Cnet module placed distantly can be also changed. No.9 online mode is added to mode switch for this function, however, mode change is available using Frame Editor only in online mode with features as below.

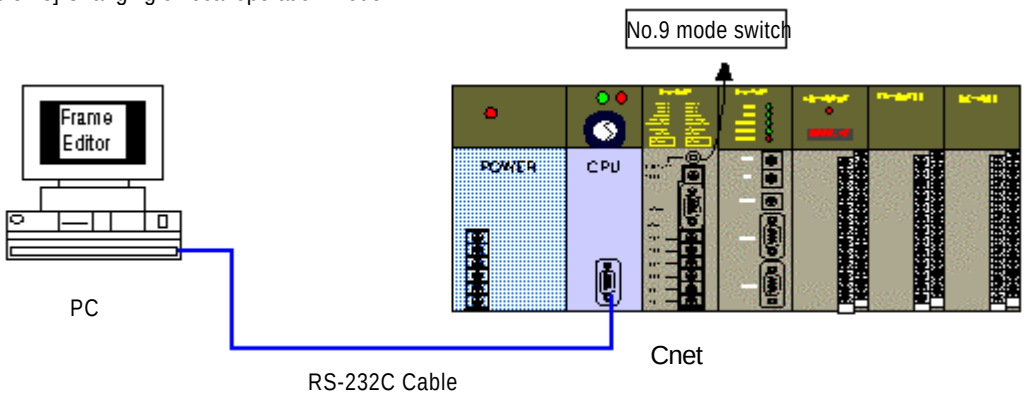
- ❑ Online mode is changeable by adding No.9 online mode to mode switch.
- ❑ Setting of each operation mode is available for channels RS-232C/RS422 respectively.
- ❑ Mode changeable for local/remote stations.
- ❑ Mode change for remote station is available only via RS-232C channel.
- ❑ Set operation mode is saved in flash memory as kept even if powered off.
- ❑ Reading mode available via Frame Editor.
- ❑ Other company's dedicated mode can be set only in online mode.

5.4.1 Changing of local operating mode

The operation mode of Cnet I/F module mounted on PLC which is local-connected to Frame Editor is changeable by virtue of this function. If mode switch is set to No.9 online mode, its setting is allowed via the changing menu of online mode of Frame Editor. As for changing local mode, all operation modes supported in Cnet can be set per channel also to stand-alone or interlocking channel.

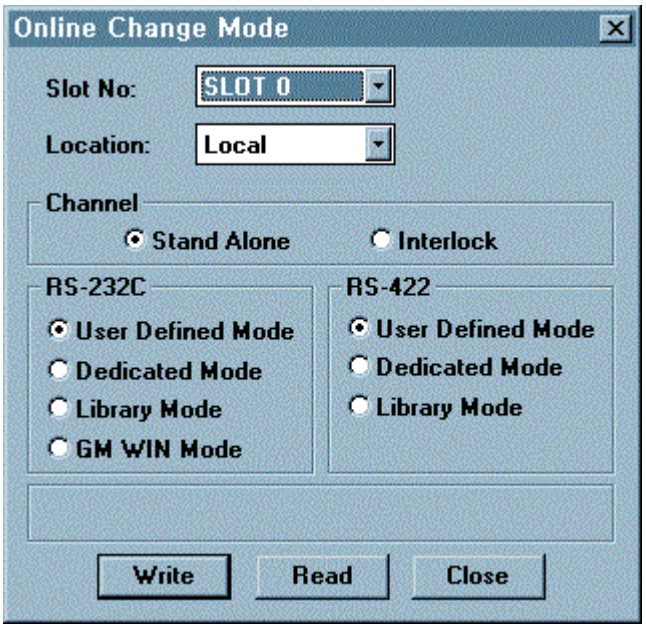
[Figure 5.13] shows structure of Cnet I/F module in local connection. Operation mode switch of Cnet I/F module mounted on No.'0' slot is set to No.9 and Frame Editor is connected with PLC CPU.

[Figure 5.13] Changing of local operation mode



The following is how to change online mode of Cnet I/F module in the structure of [Figure5.13].

1) Select No.9 mode switch of Cnet I/F module continuously with power on and perform online connection via Frame Editor.
2) Select change items of online mode in online menu to enter mode change menu.



3) Set slot No.0 where Cnet I/F module is mounted and connection stage to local in online mode change box.
4) Select desired type of channel operation from channels of interlocking and stand-alone. [Note]

Remark

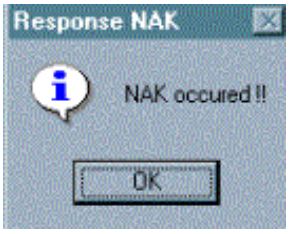
[Note1] Setting values are valid only in RS-232C channel for G6L-CUEB and only in RS-422 channel for G6L-CUEC. In case of two types of modules, the operation isn't available in interlocking mode. Basic value if not set is user mode all for RS-232C/RS-422 in stand-alone channel.

5) If mode is set as required, select Write button to change modes. If modes are changed, the following message will be displayed to indicate operation mode completed.

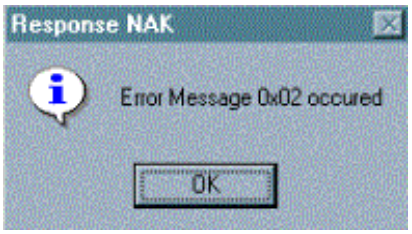
Remark

Note1] If mode change is written, communication of RS-232C/RS-422 channel is disconnected for approx. 1 second to convert operation into newly changed mode and then is automatically operated in changed mode after mode change is completed.

6) If the message below is shown, the mode switch of Cnet I/F module is not No.9 online mode. Change mode switch of Cnet I/F module to No.9 online mode, reset PLC and execute again from No. (1).



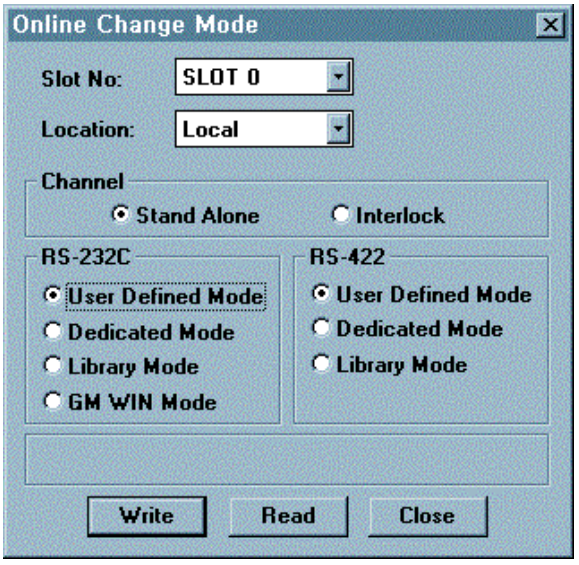
7) If the message below is shown, version of Cnet I/F module is below Ver.2.0 and online mode change is unavailable.



8) The changed mode is saved in flash memory of Cnet I/F module as kept even if powered off.

9) Operation mode in online mode set is valid only in online mode. If mode switch is selected in off-line mode from 0 to 7, the operation mode is decided according to each mode switch.

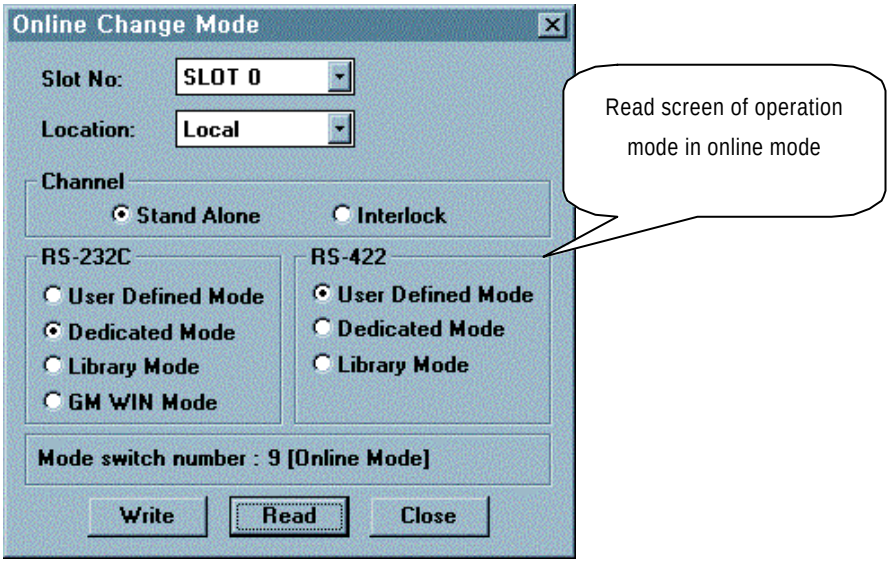
10) Operation mode of Cnet module can be also read via Frame Editor even though Cnet module is not in online mode. Select Read button with slot number and connection stage set to local in online mode change menu as below.[Note1]

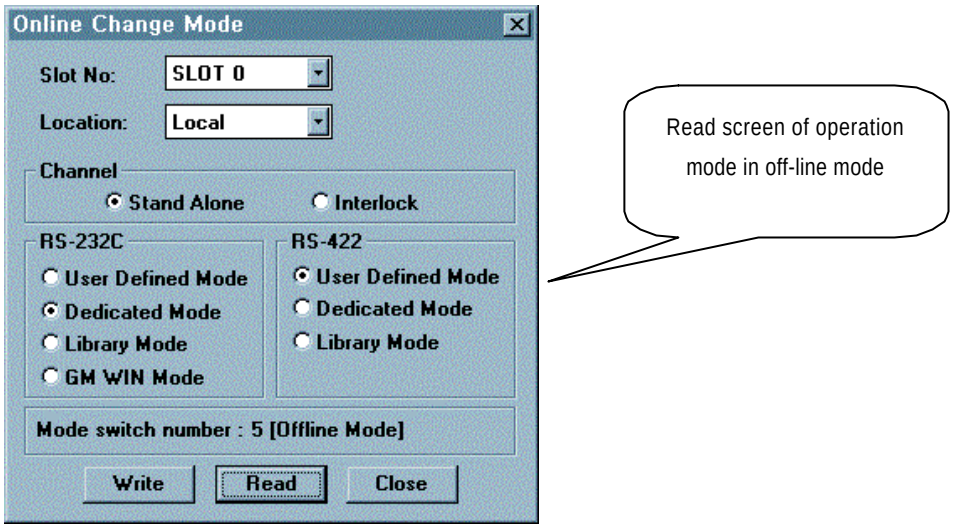


Remark

[Note1] Operation mode can be read in the other modes than LOOP-BACK mode and flash writing mode.

11) The figure above shows the screen for operation mode which has been read with online/off-line information and operation mode displayed.





12) The figure above shows the screen for operation mode which has been read with online/off-line information and operation mode displayed.
13) Changing and reading the operation mode are unavailable for below Cnet Ver.2.0.
14) If operation mode is changed during normal operation, RS-232C/RS-422 channel stops operation for approx. 1 second and communication with the outside is disconnected, however, automatically it starts operation again after operation change is completed.

5.4.2 Changing of remote operating mode

Setting of remote operation mode is for changing the operation mode of Cnet I/F module which is remote-connected via RS-232C channel of local PLC Cnet I/F module. It is convenient for such remote communication via Cnet I/F module and dedicated modem mainly between two PLCs as continued converted to desired operation mode again with program modification by GMWIN remote connection to remote PLC after changing Cnet operation mode to GMWIN mode.

Main features of changing remote operation mode are as follows.

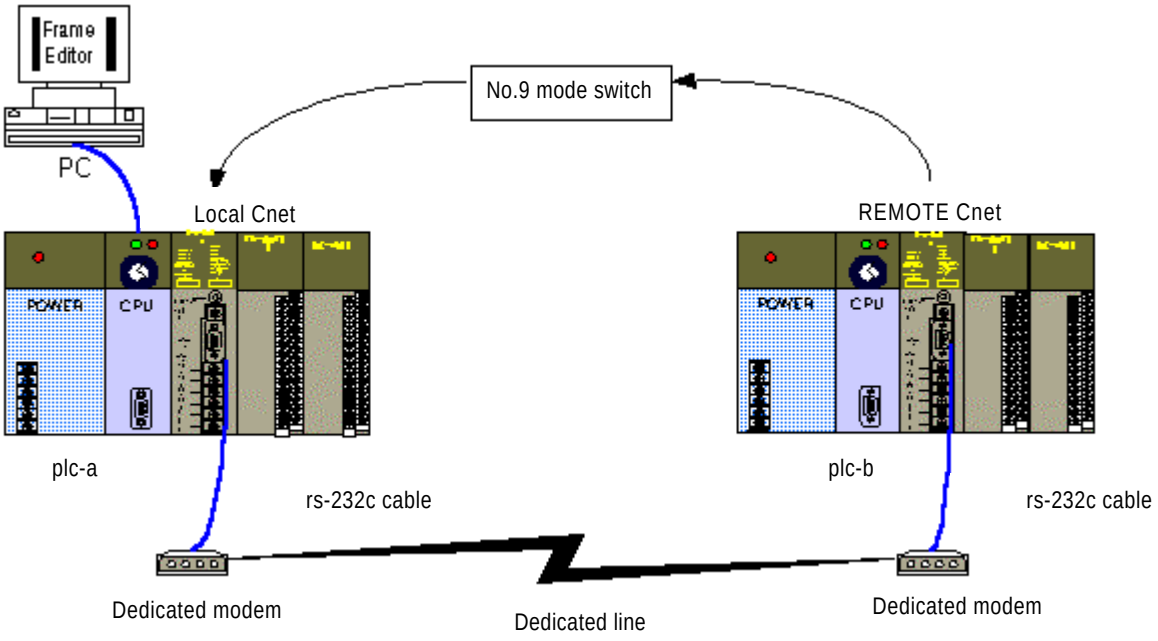
❑ Setting of operation mode for Cnet I/F module of remote PLC is available.
❑ Both local / remote Cnet I/F modules are available only in online mode.
❑ Remote operation setting via RS-422 channel is unavailable.
❑ Communication of Cnet I/F module if its operation mode is being changed is disconnected for approx.1 second and then is run as started again in the changed mode after the operation change.
❑ All local / remote Cnet I/F modules shall be of Ver. 2.0 or later to allow operation change.
❑ Communication mode in RS-232C channel of two Cnet I/F modules shall be set identical.

❑ As for remote operation change, setting channel operation to interlocking channel is unavailable.

❑ Operation mode of remote Cnet I/F module can be read.

❑ In case of G6L-CUEC module equipped with RS-422 channel only, changing of the remote operation mode is not allowed.

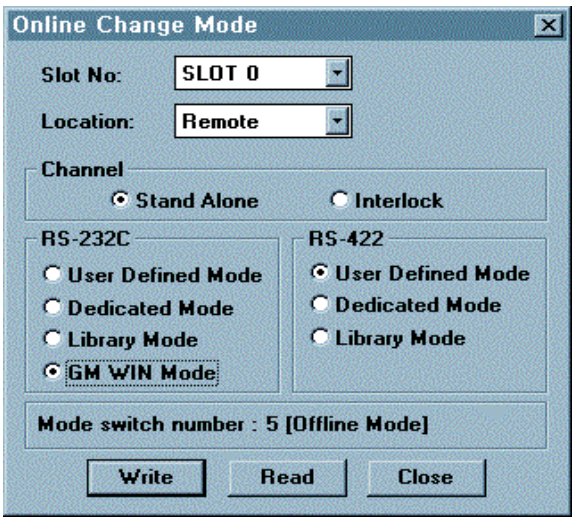
[Figure 5.14] shows an example of system structure where operation mode of remote Cnet I/F module is changed.



[Figure5.14] System structure where remote operation mode is changeable

The following describes how to change PLC-B mode, and how to change and download program via Cnet in the system as shown in [Figure 5.14] below.

1) Set local/remote Cnet to No.9 online mode and supply power.
2) Change local PLC-A to STOP mode.
3) Check if communication of RS-232C channel between PLC-A/B is normal and then connect Frame Editor to local PLC-A. Successively, select change menu of operation mode to display setting screen of operation mode as in the figure.



4) Set slot No.'0' where Cnet I/F module is mounted and connection stage to remote in online mode change.

5) Select desired type of channel operation from channels of interlocking and stand-alone. [Note]

Remark

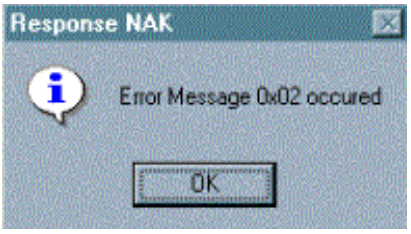
[Note1] Setting values are valid only in RS-232C channel for G6L-CUEB and only in RS-422 channel for G6L-CUEC. In case of two types of modules, the operation isn't available in interlocking mode. Basic value if not set is user mode all for RS-232C/RS-422 in stand-alone channel.

6) If mode is set as required, select Write button to change modes. If modes are changed, the following message will be displayed to indicate operation mode completed. [Note1]

Remark

[Note1] If mode change is written, communication of RS-232C/RS-422 channel is disconnected for approx. 1 second to convert operation into newly changed mode and then is automatically operated again in changed mode after mode change is completed.

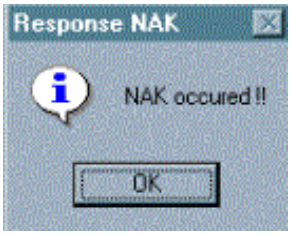
7) If the message below is shown, the mode switch of one Cnet I/F module is not No.9 online mode. Change mode switch of Cnet I/F module to No.9 online mode, reset PLC and execute again from No. (1)[Note]



Remark

[Note1] Both Cnet I/F modules of PLC-A/PLC-B shall be set to No.9 online mode.

8) If the message below is shown, version of Cnet I/F module is below Ver.2.0. Online mode change is unavailable.



Remark

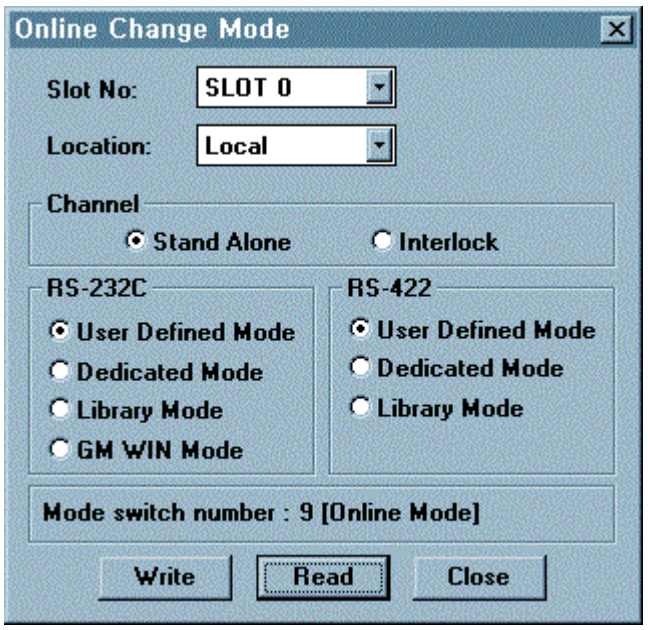
[Note1] Both Cnet modules of PLC-A/PLC-B shall be of Ver.2.0.

[Note2] Error above may occur where communication error is expected in status of modem communi-cation.

[Note3] If communication in a cycle of within 20msec is overloaded, set CPU mode of PLC to Stop and then change the operation mode. Where communication is overloaded, error in mode change may occur.

9) The changed mode is saved in flash memory of module as kept even if powered off.

10) Operation mode of remote Cnet I/F module can be read via Frame Editor even though Cnet I/F module is not in online mode. Select Read button with slot number and connection stage set to remote in online mode change menu to display operation mode of remote Cnet I/F module as below.



11) The figure above shows that RS-232C is in GMWIN mode and RS-422 is set to user mode with Cnet I/F module of PLC-B in No.9 online mode.