

Chapter 7 Rnet Communication

Chapter 7 Rnet Communication

7.1 Overview

The major characteristics of Rnet network are the cost saving of installation/maintenance, diversification of system configuration, easy maintenance and repair, easy system change. This network supports the electrical network (twisted pair cable) that is cost effective and easy to install for the diversification of configuration.

Rnet module can be used in common for GLOFA series and MASTER-K series and applied diversely according to the system application.

In Rnet version V1.0, GLOFA Rnet and MASTER-K Rnet module can be in common.

Type	Rnet V1.0	Remarks
Master (RMM)	G3L-RUEA	GM3/K1000S Rnet (electric)
	G4L-RUEA	GM4/K300S Rnet (electric)
	G6L-RUEA	GM6/K200S Rnet (electric)
	G7L-RUEA	GM7/K80S Rnet (electric)

7.2 Communication Specification

Remote I/O module transmission specification (master standard)

Items		Specification
Transmission speed		1Mbps(Rnet module common)
Encoding method		Manchester Biphase-L
Electric	Transmission distance (per segment)	Max. 750m
	Transmission distance (when using the repeater)	Max. 750m * (6 repeaters + 1) = 5.25km
	Transmission wire	Twisted pair shield cable
Max. no of station number		Master + slave = 64 stations (at least one master should be connected.)
Max. protocol size		256 bytes
Access type of Communication		Circulated Token Passing
Communication method		Connection Oriented service Connectionless service
Frame error check		$CRC\ 16 = X^{15} + X^{14} + X^{13} + \dots + X^2 + X + 1$

7.3 Communication Parameter Setting

7.3.1 Overview

The method to program in RNET communication module is supposed to enable to communicate with Smart I/O module through *High Speed Link* service as mentioned on Chapter 4 'Communication Programming'.

High Speed Link

The *High Speed Link* service through Rnet communication module is available to use all the existing function and carry out the communication by simple parameter setting. The parameter shall be set in GMWIN for GLOFA series and in KGLWIN for MASTER-K and from RNET version V1.0, min. communication period can be set every scan.

- 1) Setting available range of Rnet communication module

max. High Speed Link point per communication model(Rnet master standard)

Classification		Max. communication point	Max. sending point	Max. block no.	Max. point per block
RNET Communi cation module	G3L-RUEA	3,840 words	1,920 words	64 (0-63)	60 words
	G4L-RUEA	3,840 words	1,920 words	64 (0-63)	60 words
	G6L-RUEA	3,840 words	1,920 words	64 (0-63)	60 words
	G7L-RUEA	3,840 words	1,920 words	64 (0-63)	60 words

Communication setting when communicating with Smart I/O module

HS link block setting		Sending/ Receiving period	Address area		HS link information
Sending	Receiving		GLOFA-GM	MASTER-K	
32	32	20ms ~ 10s	%QW, %IW	P area	Ref.7.3.2

Remark

- 1) In case of Smart I/O, if 32 points are installed for one module, max. link point is available to use up to 2,016 words for 63 stations.
- 2) For further information, please refer to 'Chapter 4. Communication Programming'.

7.3.2 High Speed Link Communication Status Flag

1) High Speed Link information function

It is available to confirm the reliability of data sent/received to/from other station (remote station) through *High Speed Link* and the user can utilize the above information by combining with *High Speed Link* sending/receiving data as keyword type when writing the program in case of emergency or maintenance.

High Speed Link Information

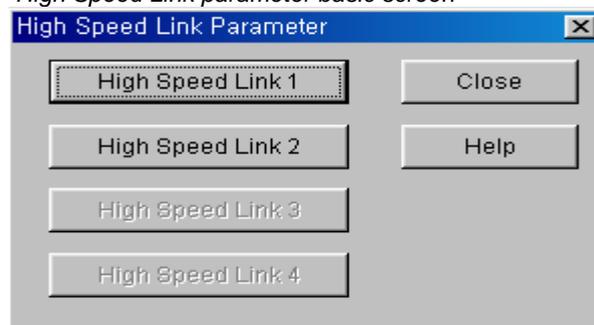
Classification	Run-link	Link-trouble LINK_ TROUBLE	Sending/ receiving status TRX_MODE	Action mode DEV_MODE	Error DEV_ERROR	<i>High Speed Link</i> status HS_STATE
Information type	Overall information	Overall information	Individual information	Individual information	Individual information	Individual information
Keyword name (□=HS link no. 1,2,3,4)	_HS□RLINK	_HS□LTRBL	_HS□TRX[n] (n=individual parameter no.0~63)	_HS□MOD[n] (n=individual parameter no. 0~63)	_HS□ERR[n] (n=individual parameter no. 0~63)	_HS□STATE[n] (n=individual parameter no. 0~63)
Data type	BIT	BIT	BIT-ARRAY	BIT-ARRAY	BIT-ARRAY	BIT-ARRAY
Monitoring	Available	Available	Available	Available	Available	Available
Program	Available	Available	Available	Available	Available	Available

7.3.3 GMWIN High Speed Link Setting

1) GMWIN project and Link parameter

If you select the *High Speed Link* parameter from GMWIN project basic screen, the *High Speed Link* parameter basic screen will appear and you can select the corresponding item.

High Speed Link parameter basic screen



If selecting 'parameter'-'*High Speed Link* parameter' from project screen, the above menu will appear.

Chapter 7 Rnet Communication

High Speed Link parameter basic screen through GM7 master

In case of GM7 RNET, select [parameter]-[High Speed Link parameter] from project screen.

2) Setting function

The *High Speed Link* items 1~4 means max. installation number of communication module according to PLC CPU type. It is available to install max. 4 communication module for GLOFA GM1/GM2/GM3 CPU/GM4-CPUB, max. 2 for GLOFA GM4-CPUA/GM6 and max. 1 for GM7.

Communication module installation relation per CPU model

Classification	Available communication module	Max. installation number (note 1)
GLOFA-GM3	G3L-RUEA	4 EA
GLOFA-GM4-CPUA	G4L-RUEA	2 EA
GLOFA-GM4-CPUB	G4L-RUEA	4 EA
GLOFA-GM6	G6L-RUEA	2 EA
GLOFA-GM7	G7L-RUEA	1 EA

3) Link parameter setting

If you select the corresponding parameter from parameter setting basic screen, the *High Speed Link* parameter setting first screen will appear as shown in the following figure. If setting the parameter at first, the initial value will be indicated as shown on the figure below.

Parameter setting screen

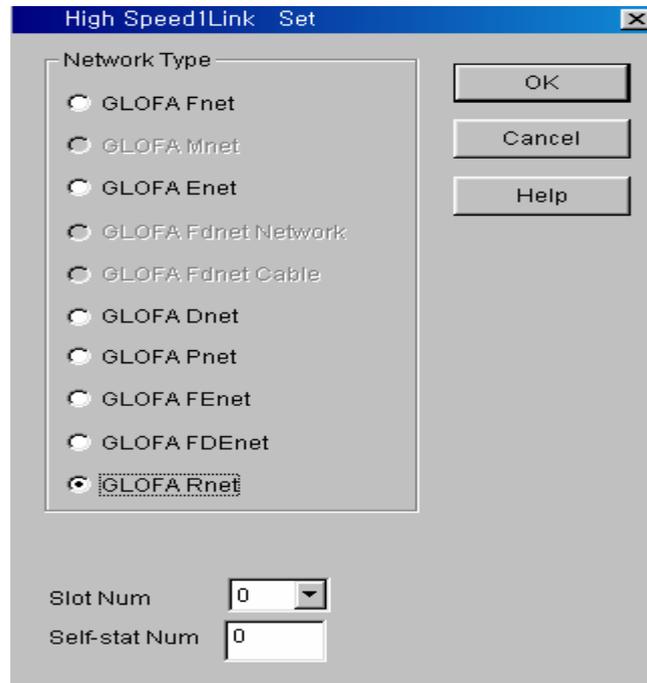
Num	Type	Class	From Area	To Area	Size
0					
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					

Parameter setting initial screen is composed of two items such as 'link setting' and 'Entry list' and the setting method per each item and its function is as follows.

(1) Link setting

Link setting is the item to set the basic items of communication module to perform the *High Speed Link*.

High Speed Link set screen

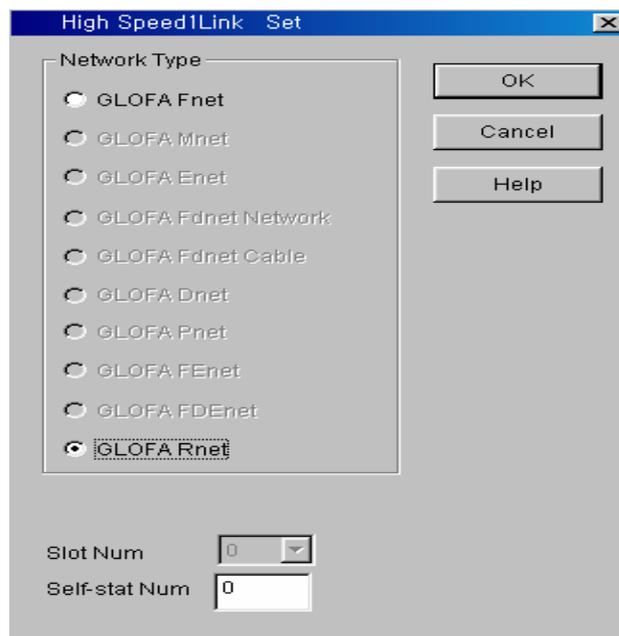


Network type : It sets the installed communication module type and Rnet shall be set.

Slot no. : It sets the position that the communication module to set is installed. (0 ~ 7 slot).

Station no. : Enters the setting self station no. into the station address switch of communication module front side. The self station no. of Rnet shall be set as '0' to use.

(2) G7L-RUEA link setting



Chapter 7 Rnet Communication

Network type : It sets GLOFA Rnet.

Slot no. : Not-active

Self station no. : The self station no. shall be set as '0' and used.

(3) Entry list setting

Entry list is the area to register the actual data sending/receiving information. For further information, please refer to Chapter 4. 'Communication Programming'.

Remark

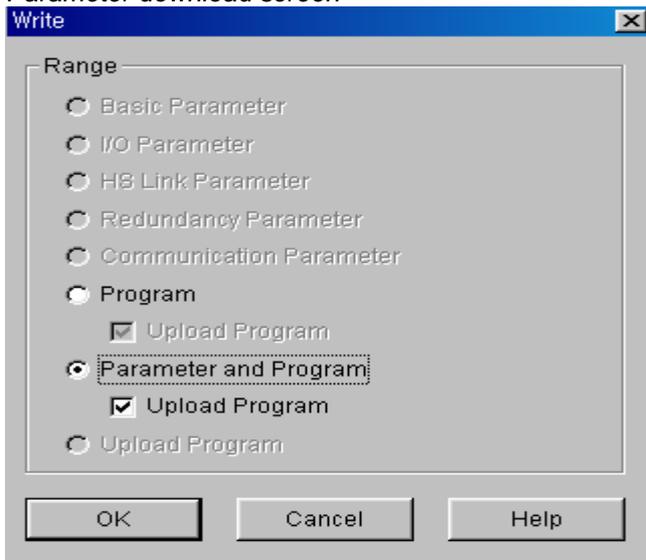
GRL-DT4A among Smart I/O module has 'input' and 'output'. Thus, in case of using the Entry list, please be sure that two lists are required for one module. In this case, when sending/receiving, the station no. shall be set same but the block no. differently.

4) High Speed Link operation

After setting the *High Speed Link* parameter and executing 'make' from GMWIN compile menu, if you select 'parameter write' and start the *High Speed Link* service, the *High Speed Link* service by the parameter setting begins to run. The *High Speed Link* start order is as follows.

(1) Parameter write

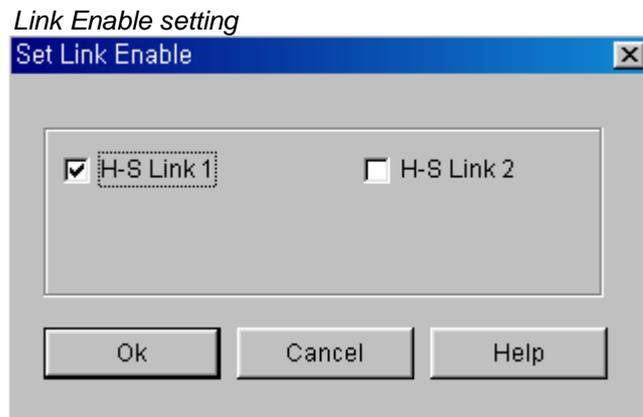
Parameter download screen



Chapter 7 Rnet Communication

After saving the *High Speed Link* parameter written by the user in the GMWIN project file and connecting with PLC through 'online connect' from GMWIN basic menu, select 'write' and download the *High Speed Link* parameter or 'parameter and program'.

(2) *High Speed Link* start



(3) G7L-RUEA *High Speed Link* start



After parameter write, *High Speed Link* is executed after setting the 'Link enable'. Link enable setting is available only in the stop mode of PLC. And if the *High Speed Link* enable setting starts, it carries out the *High Speed Link* regardless of PLC action mode and 'parameter' and 'Link enable information' shall be battery backup in the PLC CPU and preserved if the power is cut off.

(4) *High Speed Link* information monitor

It is available to monitor the current *High Speed Link* status by using 'monitor' function after the GMWIN online connection. There are two kinds of methods to monitor : by selecting 'variable monitor' from monitor menu and by high speed parameter monitor.

- Variable monitor

'Variable monitor' is the function to monitor the necessary items by using the GMWIN flag monitor function and the order to monitor is as follows.

Chapter 7 Rnet Communication

- ① Select **Variable monitor** from online monitor items.
- ② Select **flag** from 'register variable ' screen as shown on the figure.
- ③ Select the *High Speed Link* information flag you want to monitor directly one by one from **Variable, Flag list** screen and register. (As `_HSxSTATE[n]`, `_HSxERR[n]`, `_HSxMOD[n]`, `_HSxTRX[n]` is ARRAY flag, the user enters the registration no. of parameter that he wants to monitor directly).

Remark

'x' shows the *High Speed Link* no. and it has the range 1~4 for GM1/GM2/GM3/GM4-CPUB PLC, 1~2 for GM4-CPUA,GM6 PLC and only 1 is effective for GM7. [n] is the individual parameter no.(0~63).

If you register the variable from the menu and select 'close', the corresponding monitor screen will appear and the monitoring begins.

High Speed Link information variable register screen

The screenshot shows the 'Register Variable' dialog box. The 'Kind' section has the following options:

- Configuration Global Variable
- Resource Global Variable
- Instance Variable
- System Flag
- Direct Variable

Below the 'Direct Variable' option is an input field and the example text: "Ex) %IX0.0.0 or %QX0.1.0-%QX0.1.8".

The 'Resource' dropdown is set to 'Resource0' and the 'Instance' dropdown is set to 'INST0'.

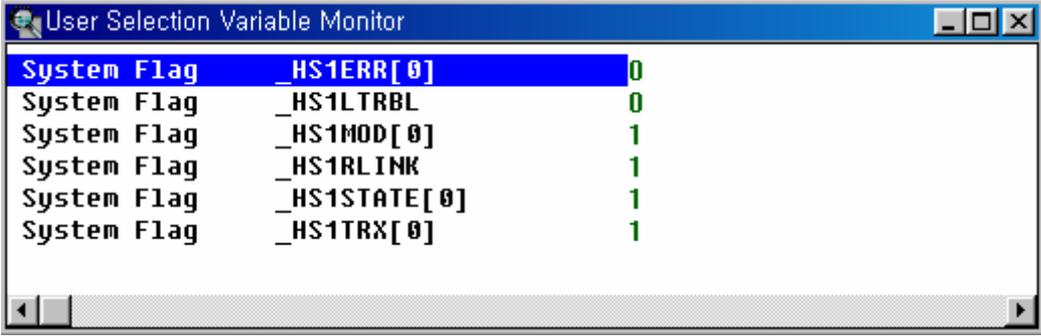
The 'Variables, System Flags' list contains the following items:

_H_BCK_ER	Hot restart unable error
_HS1ERR	Station status informati
_HS1LTRBL	Abnormal information o
_HS1MOD	Station mode informati
_HS1RLINK	HS RUN_LINK informat
_HS1STATE	General communicatio
_HS1TRX	Communication status
_HS2ERR	Station status informati

The 'Registered-Variables' list is currently empty.

Chapter 7 Rnet Communication

High Speed Link information monitor screen (variable registration)



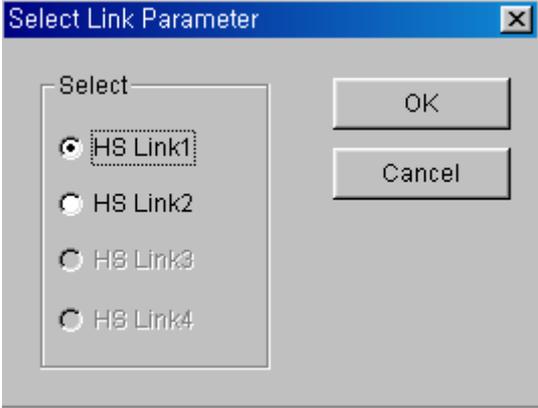
System Flag	Value
_HS1ERR[0]	0
_HS1LTRBL	0
_HS1MOD[0]	1
_HS1RLINK	1
_HS1STATE[0]	1
_HS1TRX[0]	1

The detailed contents for the corresponding flag is described in 'Communication module flag application' and it is available to carry out the RNET network status diagnosis by the corresponding flag monitor properly.

- High speed parameter monitor

This is the function to monitor the *High Speed Link* communication status from the menu as below. Select 'link parameter' item from monitor menu of GMWIN online connection.

Link parameter selection screen



Select Link Parameter

Select

HS Link1

HS Link2

HS Link3

HS Link4

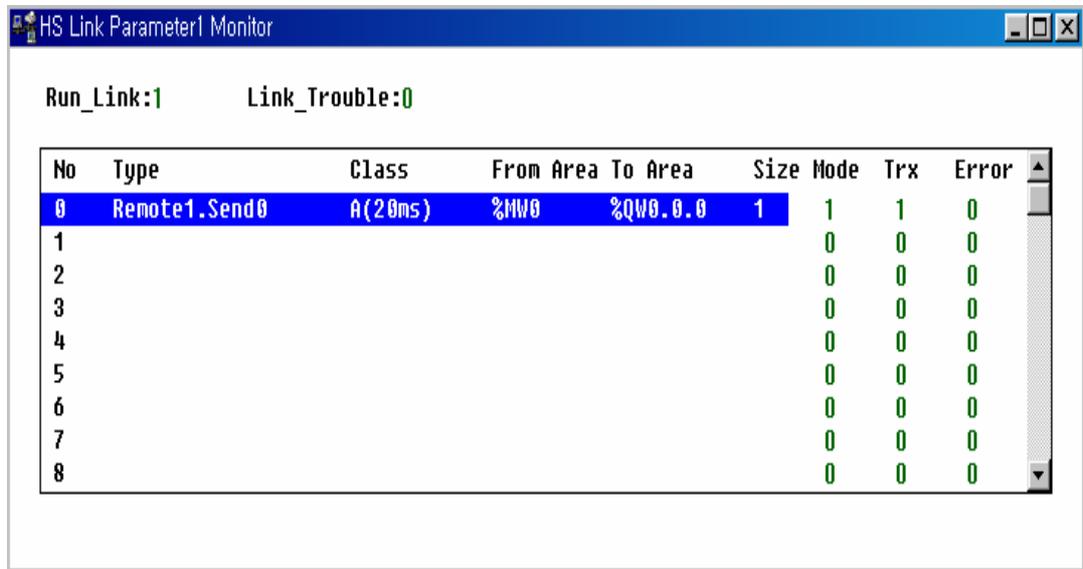
OK

Cancel

Link parameter monitor shows the general information for RUN-LINK, LINK-TROUBLE on the top screen as below and the individual information such as mode (action mode), communication (sending/receiving status), error on the setting parameter items.

Chapter 7 Rnet Communication

High Speed Link parameter monitor screen (Example)



The screenshot shows a window titled "HS Link Parameter1 Monitor". At the top, it displays "Run_Link:1" and "Link_Trouble:0". Below this is a table with the following columns: No, Type, Class, From Area, To Area, Size, Mode, Trx, and Error. The table contains 9 rows of data, with the first row highlighted in blue.

No	Type	Class	From Area	To Area	Size	Mode	Trx	Error
0	Remote1.Send0	A(20ms)	%MW0	%QW0.0.0	1	1	1	0
1						0	0	0
2						0	0	0
3						0	0	0
4						0	0	0
5						0	0	0
6						0	0	0
7						0	0	0
8						0	0	0

For the meaning of the value monitored on the above figure, please refer to 'Chapter 4. Communication Programming'.

Remark

- 1) RUN-LINK monitoring
In case that GRL-TR4A among Smart I/O is set in the parameter, RUN-LINK shall be indicated as '0'.

7.3.4 KGLWIN Link Setting

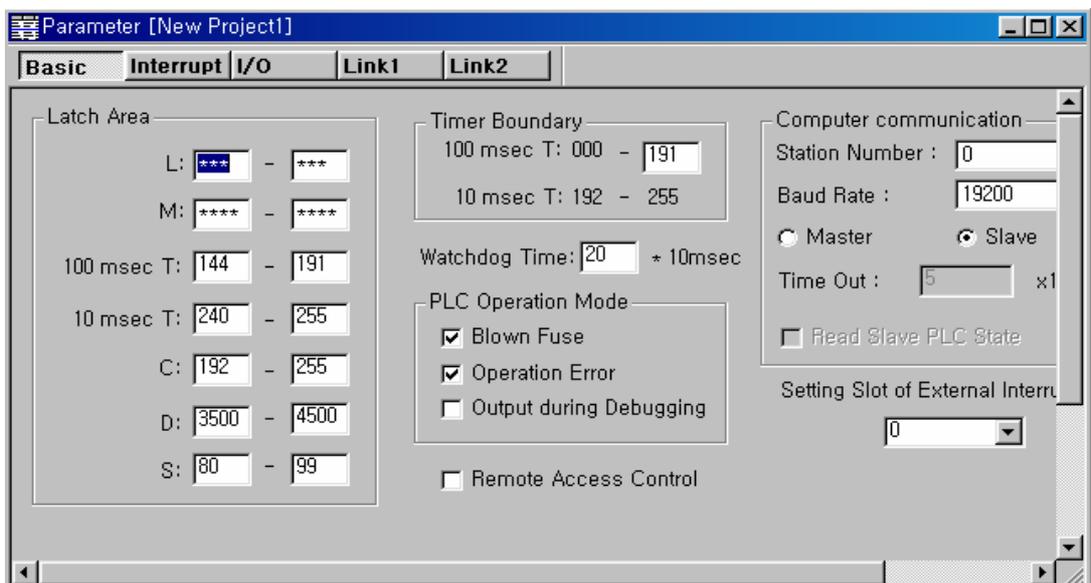
1) KGLWIN project and Link parameter

High Speed Link parameter selects link parameter from KGLWIN project screen and sets the corresponding item. The setting order and the function per item are as follows.

(1) KGLWIN project setting

The following shows parameter basic screen appeared when selecting 'parameter' window.

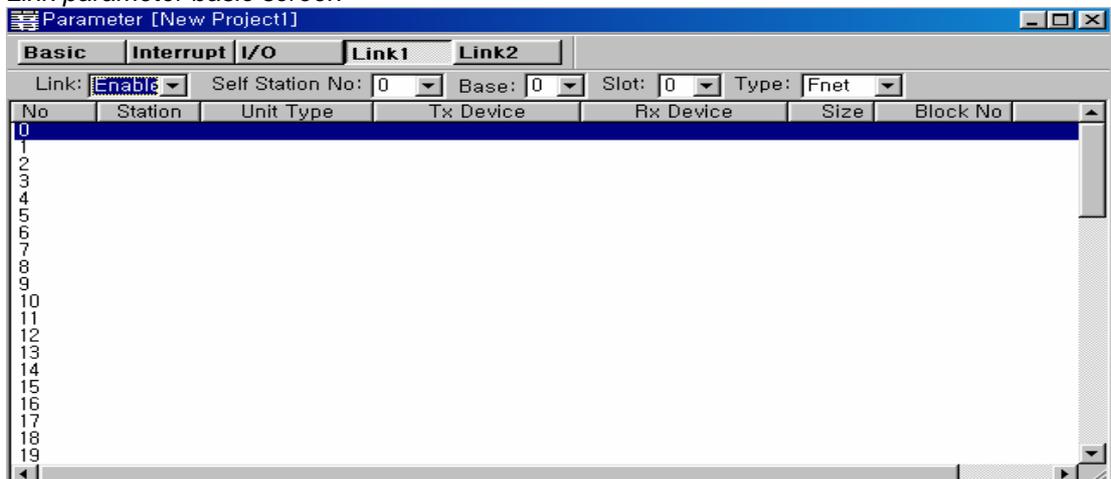
KGLWIN parameter basic screen (in case of K200S)



(2) Link parameter basic setting

If you select 'Link 1' from KGLWIN parameter basic screen, the *High Speed Link 1* parameter basic screen as shown below will appear.

Link parameter basic screen

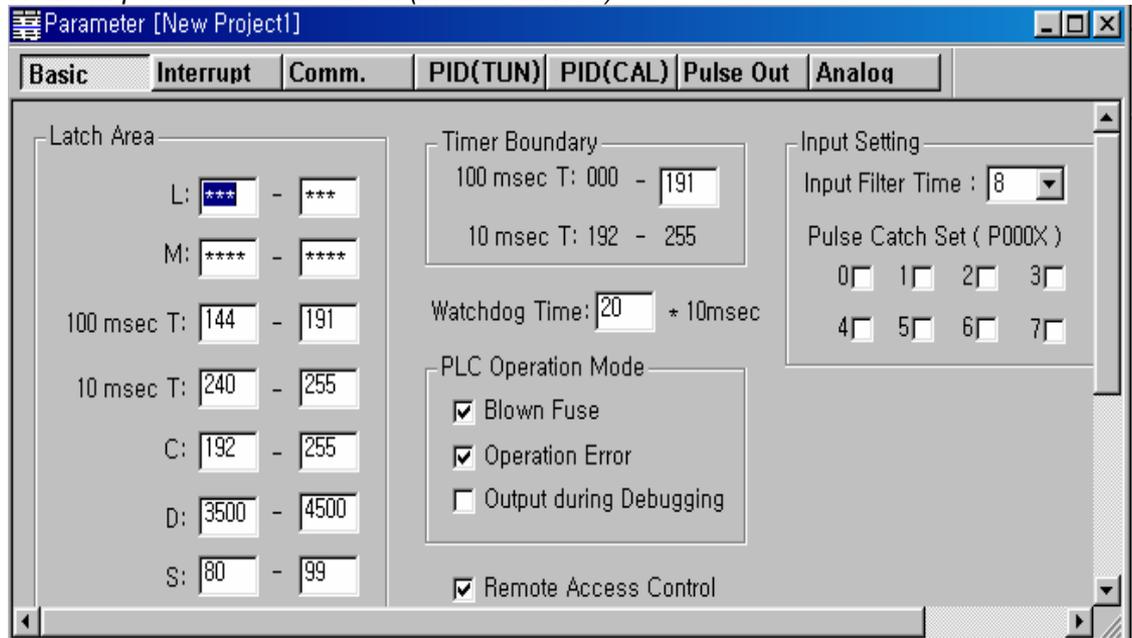


Chapter 7 Rnet Communication

(3) K80S project and Link parameter basic setting

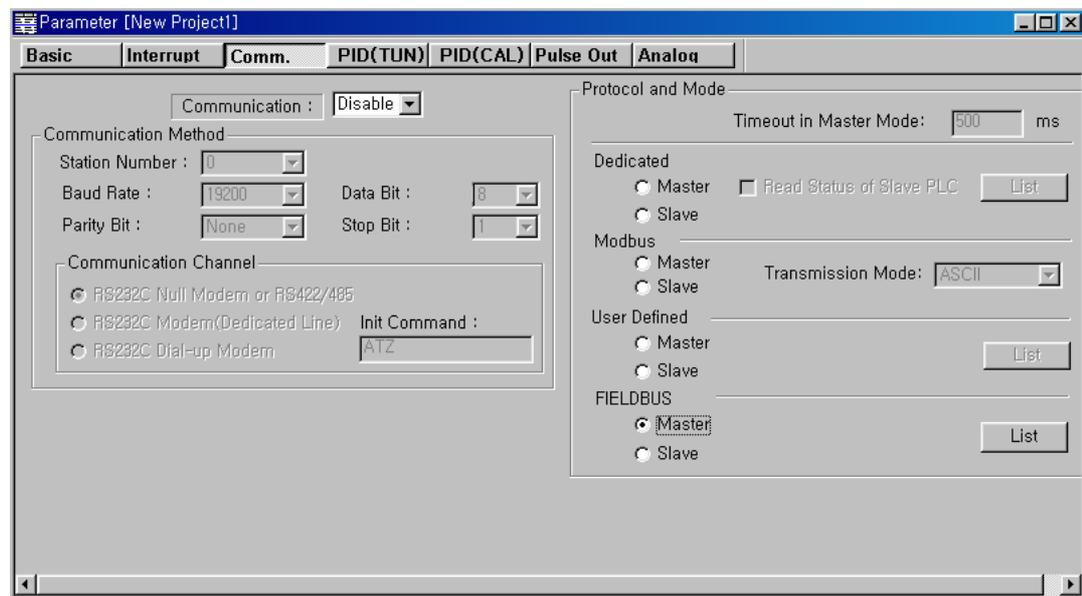
This is parameter basic screen to be appeared when selecting K80S parameter window.

KGLWIN parameter basic screen (in case of K80S)



If selecting 'communication' from KGLWIN parameter basic screen as shown on the above figure, the communication parameter setting screen will appear as below and if you select 'master' from the FIELDBUS menu on the right bottom side and press 'register list', the *High Speed Link* parameter basic screen will appear.

Communication parameter setting screen



Link parameter basic screen

The screenshot shows a software window titled 'FIELDBUS'. At the top, there are two dropdown menus: 'Kind' set to 'Rnet' and 'Self-Station No' set to '0'. Below this is an 'Entry List' table with the following columns: 'No', 'Station Type', 'From Area', 'To Area', 'Size', 'Block No', and 'Period'. The 'No' column contains numbers from 0 to 20. The rest of the table is empty. At the bottom of the window, there are buttons for 'Delete...', 'Copy...', 'Edit...', 'OK', 'Cancel', and 'Help'.

- ⊙ **Link1** : This is one of *High Speed Link* type and max.4 communication modules can be installed for K1000S CPU, max. 2 for K300S/K200S and max.1 for K80S. The *High Speed Link* no. is not related to the installed slot no. and only one *High Speed Link* parameter is available to set for one communication module. The table below shows the installation available communication module per CPU model and max. installation amount.

Relation of communication module installation per CPU model

Classification	Communication module	Max. installation amount	Remarks
K1000S	G3L-RUEA	4 EA	Each communication module can be installed by combining each other.
K300S (below v2.2)	G4L-RUEA	2 EA	
K300S (more than v2.2)	G4L-RUEA	4 EA	
K200S	G6L-RUEA	2 EA	
K80S	G7L-RUEA	1 EA	

- ⊙ **Link** : It sets whether or not to execute the link of communication module. (Enable, Prohibit)
- ⊙ **Self station no.** : Self station no. should be set as '0' and used.
- ⊙ **Slot** : This is the communication module installed slot no. and it is set by selecting one from '0'~'7'.

Chapter 7 Rnet Communication

- ◎ **Registration no.** : This is the serial no. to indicate the registered order of the individual parameter and it is set by '0' ~'63'. It is available to register up to total 63 and not related to the sending/ receiving order. But it is available to register max. 32 for sending and 32 for receiving respectively.

(4) Link parameter detail setting

If you doubleclick in the status that the *High Speed Link* registration no.1 is selected, the link parameter setting screen will appear as shown on the figure below.

Link parameter modification screen (in case of the HS link registration no.0)

- ◎ **Station no.** : If sending/receiving the data of the setting item, it is required to set other station no. The following table shows the method to set the station no.

Station no. setting method

Communication type	Station no.	Range of station no.
Remote sending	Station no. of other station (remote)	1~63
Remote receiving		

- ◎ **Block No.** : This is the parameter to send/receive lots of data of various areas from one station and distinguish the data of various blocks each other. If setting 32 stations for Smart I/O output module, the input should be set as 31 stations and if setting 32 stations for input. The output should be set as 31 stations because this supports up to 64 stations including master station. In this case, if setting more than 2 same block no. for the same station no., the network will be down. Thus it is not available to set more than 2 block for the same station. The max. number of connection station is 64 stations including the master station but if the sending/receiving is set for the one station at the same time, it is not available to set max. station setting.

Chapter 7 Rnet Communication

- ⊙ **Communication type** : It is set by remote sending and remote receiving.
 Remote sending : when sending the data of self station to remote station.
 Remote receiving : when receiving the data of remote station to self station.
- ⊙ **Sending/Receiving device** : This means the area of sending/receiving. In case of remote sending that means the sending to remote station, set the sending area of self station for the sending device and the receiving area (P area) of remote station for the receiving device. As the remote receiving means the receiving from remote station, set the sending area (P area) of remote station for the sending device and the receiving area of self station for the receiving device.

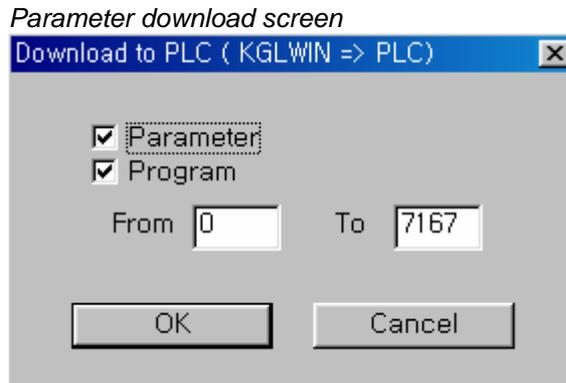
Sending/Receiving device setting area per communication type

Communication type	Device	Setting available area	Remarks
Remote sending	Sending	P,M,L,K,F,D,T,C all area	Sending area of self station
	Receiving	P area	Receiving area of remote station
Remote receiving	Sending	P area	Sending area of remote station
	Receiving	P,M,L,K,D,T,C area	Receiving area of self station

- ⊙ **Size** : This means the size of sending/receiving data and the unit is 1 word (16 points). It is available to set max. 60words but for Rnet, it is set as 2 words at the present time because max. points of the current Smart I/O is 2words (32 points).
 - ⊙ **Communication period** : *High Speed Link* is the service to carry out the sending/receiving by the parameter set by the user at the point that PLC program ends. Thus, when PLC program scan time is short within several ms, communication module begins to transmit the data according to every program scan which results in increasing the communication amount and reducing the effectiveness of overall communication system. Thus, to prevent this, the user can set the sending/receiving period from min.20ms (RNET version V1.0 : from every scan) to max. 10sec. The sending/receiving period means the sending period if the corresponding block is set as 'sending' and the period to check the data receiving of the corresponding block if it is set as 'receiving'.
- (5) *High Speed Link* operation
 After completing the *High Speed Link* parameter setting, if you click the 'verify' button from download menu and execute the parameter download, the *High Speed Link* service begins. In this case, the corresponding link of the link parameter basic

Chapter 7 Rnet Communication

screen should be Enable status.



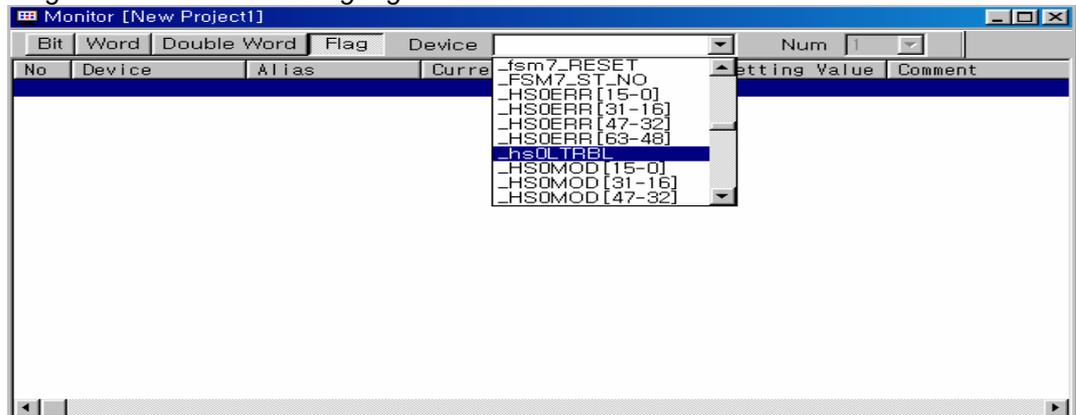
2) High Speed Link information monitor

After KGLWIN online connection, it is available to monitor *High Speed Link* information by using monitoring window and 'information read' window. There are two kinds of method to monitor : one is by selecting the flag to monitor from flag monitor menu of monitoring window to monitor the individual information and overall information and another one is by selecting the *High Speed Link* parameter from online-information read menu to monitor overall information.

- Flag monitor

Flag monitor is the function to monitor by selecting the necessary flag from KGLWIN [project]→[monitoring] using the flag monitor menu. First, if you select flag monitor button from monitoring window, the flag monitor screen as shown on the figure below will appear and if you press the registration button (▼), the flag registration screen will appear. Select the *High Speed Link* information flag to monitor from the flag registration screen one by one and register it. If flag registration is completed, it begins to monitor in 'monitor' screen. If the monitoring does not work, please check the monitor start mode once again.

Flag monitor screen and Flag registration screen



Flag monitor screen (the flag is registered.)

No	Device	Alias	Current Value	Setting Value	Comr
0	_hsORLINK	D4600.0	1		
1	_hsOLTRBL	D4600.1	0		
2	_HSQERR[15-0]	D4613	00000/h0000/.....		
3	_HS1MOD[15-0]	D4625	00000/h0000/.....		

- Reading information in *High Speed Link* parameter monitor

If you select the *High Speed Link* parameter from the menu 'online-information read', you can see the detailed information for the *High Speed Link* parameter as shown on the above figure.

High Speed Link parameter monitor

No	Type	Period	TxArea	RxArea	Length	Mode	Trx	Erro
0	R02.S00	20ms	M000	P000	1	0	:	:
1	R03.S01	20ms	M000	P000	1	0	:	:

OSlot/Rnet/Station No:00

OK

R02.R03 from the type item means Remote station (Smart I/O) 2 and 3 and SOO,S01 means the block no., and this is the parameter to transmit the data of self station (M000) to Remote (Smart I/O) station 2 (P000) through block no.'0'. R03 is also the parameter to transmit the data of self station (M000) to Remote (Smart I/O) station 3 (P000) through

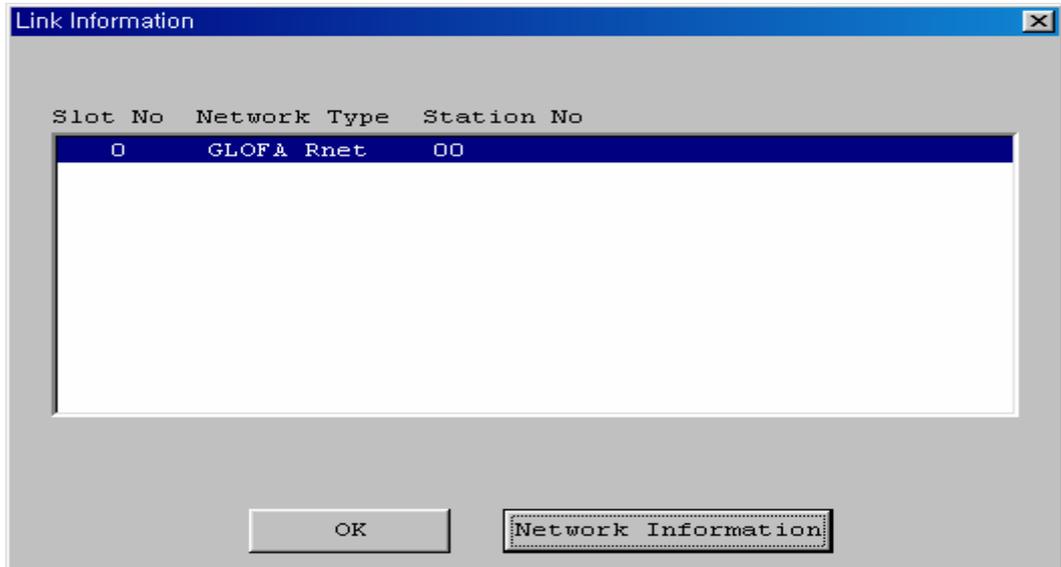
Chapter 7 Rnet Communication

block no.1.

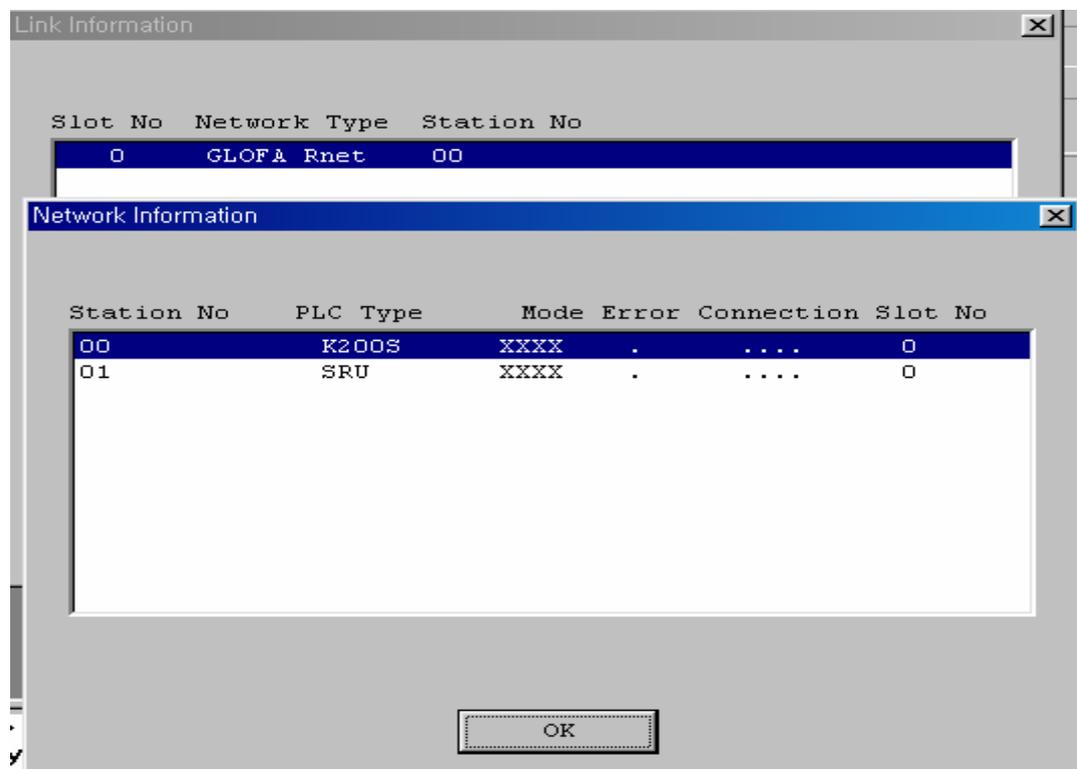
Chapter 7 Rnet Communication

- Link information monitor from information Read

If you select the menu 'online'-'information read'-'link information', it is available to monitor the link status of the communication module installed per slot easily.



If you select the module to monitor and click the verify button, you can see the connection status of all RNET network connected to the corresponding module. **(except K80S)**



Chapter 7 Rnet Communication

3) Flag

L area list when using the data link module (in case that installed in Slot no.0)

x : slot no., *n* : station no. of other station

Keyword	Address no.		Description
_NETx_LI V[n]	L0001~L003F	L0001 ~ L000F (1~15 stations)	This is the flag to inform that the power of other station is normal and the data is sending/receiving normally with other station through communication cable as the Alive information of other station. (Reading only)
		L0010 ~ L001F (16~31 stations)	
		L0020 ~ L002F (32~47 stations)	
		L0030 ~ L003F (48~63 stations)	
		L0050 ~ L005F (16~31 stations)	
		L0060 ~ L006F (32~47 stations)	
		L0070 ~ L007F (48~63 stations)	

High Speed Link detail flag

x : K1000S=9, K300S/K200S=4 *m* : HS link no.

Keyword	Type	Bit position	Items	Description
_HSmRLINK	Bit	Dx600.0	High Speed Link RUN_LINK information	This indicates that all station are acting normally according to the parameter set in the high speed line and will be 'ON' under the following conditions. 1. When all station set in the parameter is RUN mode and there is no error, 2. When all data block set in the parameter is communicating normally, 3. When the parameter set in the parameter of each station itself is communicating normally, Once 'ON', RUN-LINK maintains the 'ON' unless stopped by Disable.
_HSmLTRBL	Bit	Dx600.1	Abnormal information of High Speed Link (LINK_TROUBLE)	In the status that _HSmRLINK is ON, if the communication status of the station set in the parameter and the data block is as follows, this flag shall be ON. 1. When the station set in the parameter is not RUN mode, 2. When there is an error in the station set in the parameter, 3. When the communication status of data block set in the parameter is not smooth, LINK-TROUBLE shall be ON if the above 1,2,3 condition occurs, and if the condition returned to the normal condition, it shall be OFF.
_HSmSTATE[k] (k=0~63)	Bit Array	Dx601.0 ~ Dx604.15	General communication status information of k data block set in the High Speed Link parameter	This indicates the general status of communication information for each data block of the setting parameter. _HSmSTATE[k] = _HSmMOD[k] & _HSmTRX[k] & _HSmERR[k]

Chapter 7 Rnet Communication

Keyword	Type	Bit position	Items	Description
_HSmMOD[k] (k=0~63)	Bit Array	Dx605.0 ~ Dx608.15	Mode information (RUN = 1, others = 0)	Indicates the action mode of the station set in k data block of parameter.
_HSmTRX[k] (k=0~63)	Bit Array	Dx609.0 ~ Dx612.15	Status information (normal=1, abnormal=0)	Indicates whether the communication status of k data block of the parameter is communicating smoothly as set in the parameter.
_HSmERR[k] (k=0~63)	Bit Array	Dx613.0 ~ Dx616.15	The status information of the station set in k data block from the <i>High Speed Link</i> parameter. (normal=1, abnormal=0)	Indicates if the error occurs in the station set in k data block of the parameter.

High Speed Link detail flag when m=1~3

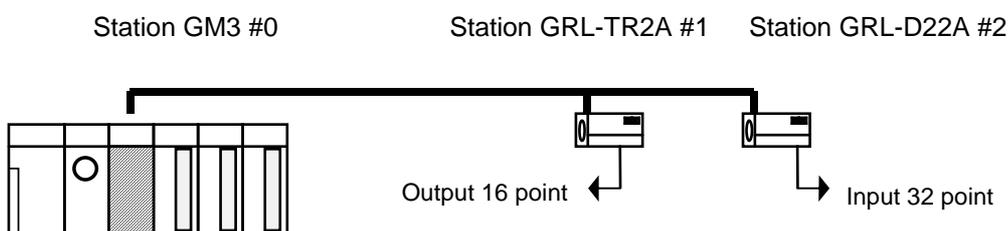
HS link type	D area address no.	Remarks
<i>High Speed Link2</i> (m=1)	Dx620 ~ Dx633	Comparing with m=0, D area address no. is as follows when m=3. Calculation formula : when m=1~3, D area address no. address no. + 20 × m
<i>High Speed Link3</i> (m=2)	Dx640 ~ Dx653	
<i>High Speed Link4</i> (m=3)	Dx660 ~ Dx673	

7.4 Program Example

7.4.1 GLOFA-GM Series

Program Example 1 :

In GM3 base, the communication module (G3L-RUEA) is installed for slot 0, output 32 points for slot 1, and input 32 points for slot 2, respectively. This is the example to send GM3 %IW0.2.0 data to station 1 and output the data of station 2 to GM3 %QW0.1.0.



To perform the program example, first make the I/O configuration table as shown on the table below and write the *High Speed Link* parameter in the corresponding CPU module, respectively.

I/O configuration and Sending/receiving flow

Sending/receiving structure	Area to read	Storage area	Block no.	Size
Sending from GM3→station 1	%IW0.2.0	%QW0.0.0	0	1
Receiving from GM3←station 2	%IW0.0.0	%QW0.1.0	1	1

Working order

- 1) Station number allocation and communication cable connection
- 2) The user program writing (per each station)
- 3) Make the data sending/receiving map same type of the above table
- 4) Parameter setting in GMWIN *High Speed Link* parameter setting item
- 5) Execute 'compile' and 'make' from compile menu
- 6) Execute program and parameter write from online menu.
- 7) Select 'Link Enable set' from online menu and set the *High Speed Link* Enable that corresponds to the setting no.
- 8) Change the mode to RUN from online menu.
- 9) Start 'monitor' from online menu and check if RUN-LINK is ON without error in the *High Speed Link* monitor.
- 10) If the error occurs, repeat the above from 1).

Chapter 7 Rnet Communication

Sending parameter setting from GM3 station 0 to station 1

The screenshot shows the 'High Speed1Link Item Edit' dialog box. The 'Station Type' is set to 'Remote' and 'Station No' is '1'. The 'Mode' is set to 'Send'. 'Block No' is '0'. The 'Area' section has 'From' set to '%IW' with a value of '0.2.0' and 'To' set to '%QW' with a value of '0.0.0'. 'Send Period' is 'A(20ms)' and 'Size' is '1'. Buttons for 'OK', 'Cancel', and 'Help' are at the bottom.

Receiving parameter setting by GM3 station 0 from station 2

The screenshot shows the 'High Speed1Link Item Edit' dialog box. The 'Station Type' is set to 'Remote' and 'Station No' is '2'. The 'Mode' is set to 'Receive'. 'Block No' is '2'. The 'Area' section has 'From' set to '%IW' with a value of '0.0.0' and 'To' set to '%QW' with a value of '0.1.0'. 'Send Period' is 'A(20ms)' and 'Size' is '1'. Buttons for 'OK', 'Cancel', and 'Help' are at the bottom.

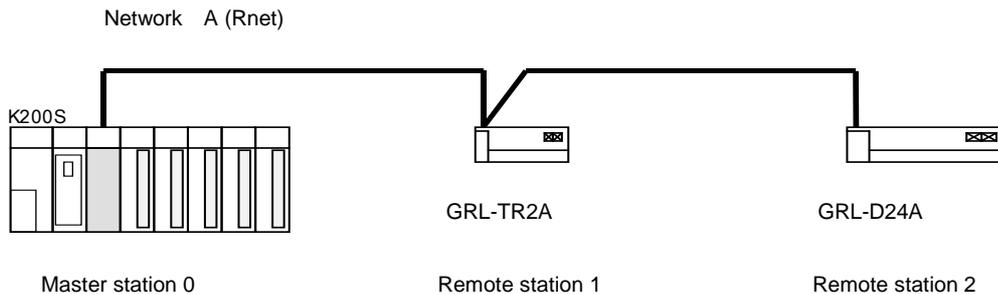
Remark

- 1) Do not register the same station no. more than 2 or the same block no. more than 2.

7.4.2 MASTER-K Series

Program Example 1

Here describes the *High Speed Link* parameter setting method to perform the data communication in RNET master system below with the I/O structure same as shown on the table below.



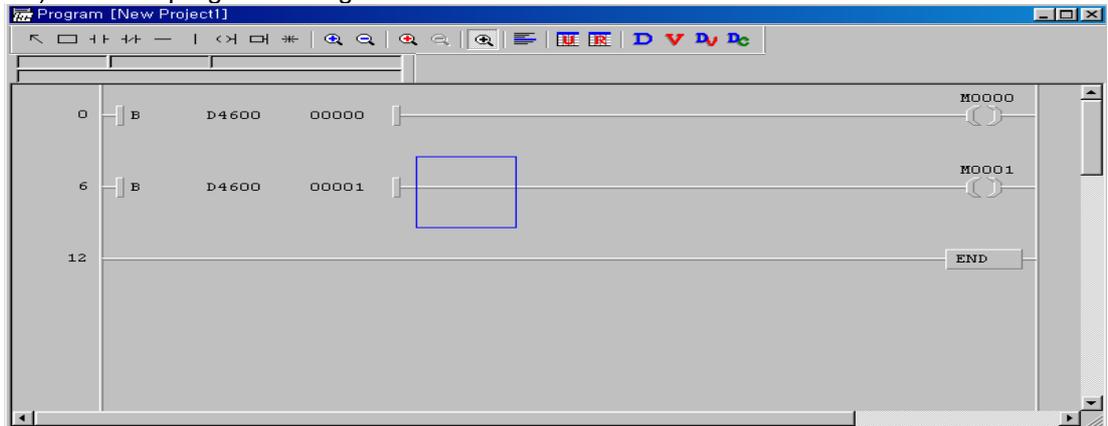
I/O configuration and Sending/receiving flow

Sending/receiving structure		Sending area	Receiving area
K200S (station 0)	Sending :--> GRL-TR2A(station 1)	P0003	-
		-	P000
	Receiving :<-- GRL-D24A(station 2)	P0000	-
		-	P0004

From the example, K200S CPU sends the input value of input module (P3) installed in self station slot 2 by 1 word and outputs the data received from other station to P4 output module. The *High Speed Link* parameter configuration and program for data exchange on the above is described in the figure below. The program can be used in common and sets only link parameter respectively. (it is available to use the same program and parameter in the K1000S/K300S RNET communication.)

Chapter 7 Rnet Communication

1) The user program writing



The above figure is the program to set M0000 area when RUN-LINK is ON and M0001 area when LINK-TROUBLE flag is ON.

(B) High Speed Link parameter setting

To make Station 0,1,2 to change the data as specified on the table in the master configuration system, the user should write the user program first and then prepare the data sending/receiving map as shown on the table. And to send/receive the data as shown on the table, it is required to write the *High Speed Link* parameter and download it in PLC and the *High Speed Link* start shall be carried out according to the following order.

- 1) Station number allocation and communication cable connection
- 2) The user program writing (per each station)
- 3) Make the data sending/receiving map
- 4) Parameter setting in KGLWIN *High Speed Link* parameter setting item
- 5) Execute program and parameter download from the online menu
- 6) Change the mode to RUN from the online menu.
- 7) Check the *High Speed Link* status through flag monitor
- 8) If the error occurs, repeat the above from 1).

The *High Speed Link* parameter for the system of program example is set as follows.

K200S (station 0) High Speed Link parameter

Parameter [New Project1]							
Basic							
Link1							
Link:	Enable	Self Station No:	0	Base:	0	Slot:	0
				Type:	Rnet		
No	Station	Unit Type	Tx Device	Rx Device	Size	Block No	
0	1	Remote Out	P003	P000	1	0	
1	2	Remote In	P000	P004	2	1	
2							
3							
4							
5							
6							
7							
8							

Chapter 7 Rnet Communication

(C) *High Speed Link* speed fixing method.

The system of Example 1) is a simple system that the communication module of station 3 sends/receives the data of 1word per each station. And the calculation method for communication speed is as follows.

Formula $St = P_scanA + C_scan$

$St =$ *High Speed Link* max. transmission time

$P_scanA =$ PLC A max. program scan time

$C_scan =$ max. communication scan time

As P_scanA is PLC scan time on the above, if assuming that it is 3ms each for the above program, (available to verify through online-information read-PLC information)

$$C_scan = n1 \times 180us + n2 \times 828us + 1,000us \text{ -----[formula 7-1]}$$

$n1 :$ output station number

$n2 :$ input station number

$$C_scan = 1 \times 180 + 1 \times 828 + 1,000 = 2,008us$$

$$St = P_scanA(=3ms) + Cscan(2ms) = 5ms$$

Therefore, the sending/receiving period should be set as min. more than 5ms.