

## Chapter 14 The RS422/485 communication of GM6-CPUB

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## **14 The RS422/485 communication of GM6-CPUB**

### **14.1 Introductions**

- 1) The GM6-CPUB module can be used as the master station of RS422/485 network and applicable for the 1:N network of GSeries PLCs and/or PC.
- 2) To operate the GM6-CPUB as the master station, basic parameters and high speed link parameters should be set properly.
- 3) The dedicated Gseries Cnet protocol is used for transmission control.
- 4) The GM6-CPUA and GM6-CPUC does not support the master station function.

### **14.2 Features**

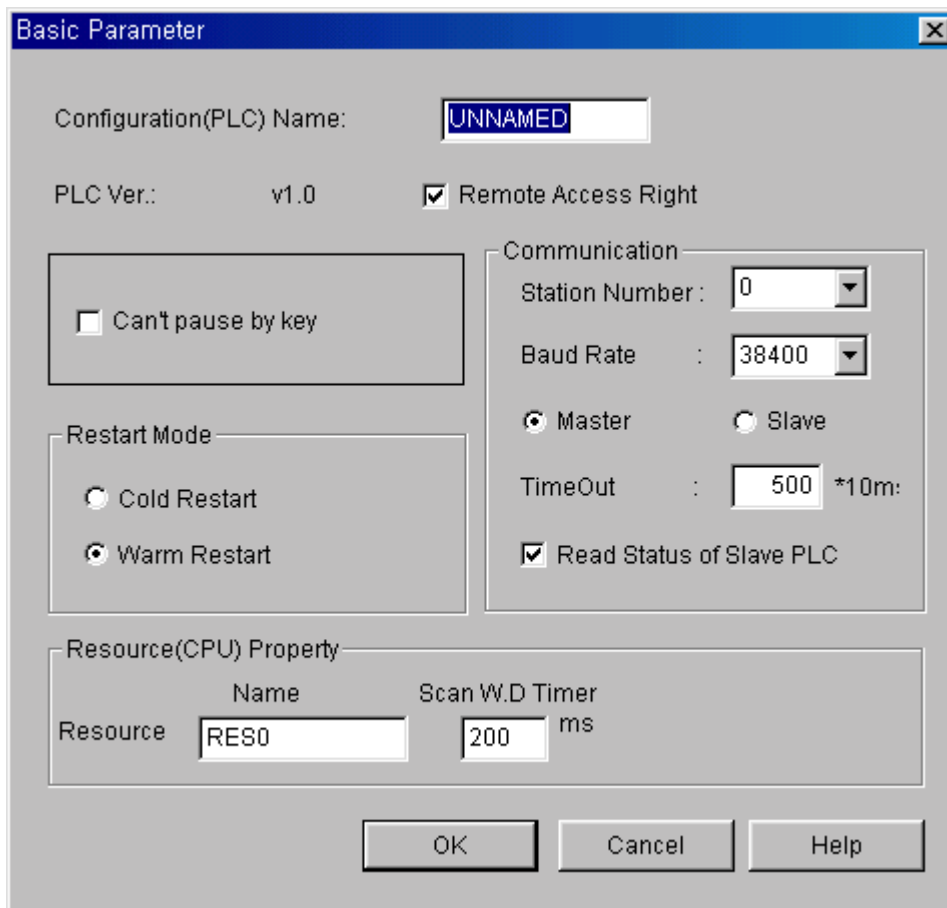
- 1) Max. 64 high speed link items can be assigned.
- 2) Max. 32 stations can be linked.
- 3) According to the parameter setting, the operation mode and error code of slave stations is stored at the relevant flag.
- 4) The communication status can be monitored with the monitoring function of GMWIN software.

**14.3 Parameter setup**

To start RS422/485 communication,

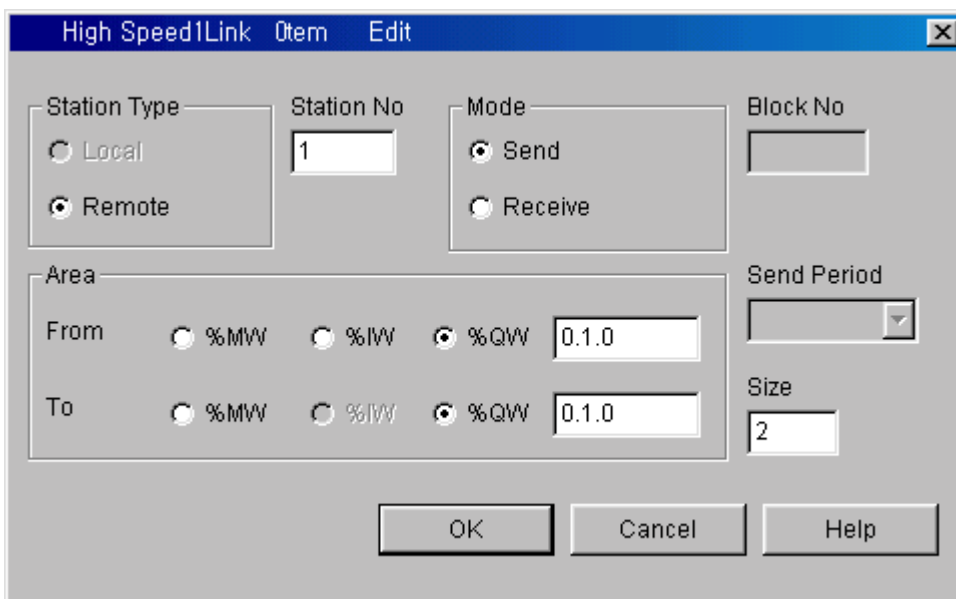
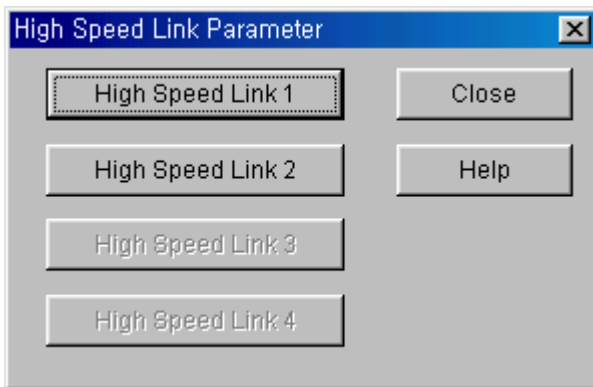
- The CPU module type should be a B-type CPU. (GM6-CPUB)
- Set the communication parameters of the 'Basic Parameters' of GMWIN software.
- Set the 'High speed link 1' of the 'High Speed Link Parameters'
- Enable the high speed link 1 with 'Link Enable...' menu.

1) Basic parameter setup



- a) Station number : Assign the station number of master station in the range of 0 ~ 31
- b) Baud rate : Select the communication as 9600, 19200 or 38400 bps.
- c) Master/Slave : Only GM6-CPUB can be set as master station. If the CPU is selected as master station, the network type of high speed link 1 is automatically set as GSeries 422/485.
- d) Timeout : Set the period that the interval until a timeout error occurs. The default value is 500msec and minimum value is 10msec (1×10msec).
- e) Read status of slave PLC : If check this item, the master station reads the status of slave PLCs and store the status at the corresponding flags.

2) High speed link parameter setup



- a) Only the 'High speed link 1' can be set as GLOFA 422/485 network type.
- b) The setup is similar as the high speed link parameter setup with other communication modules such as Fnet module.
  - Max. 64 items can be assigned.
  - The size of data block is assigned by the unit of word, and the Max. size is 60 words.
  - Area setup
 

Send	From : I / Q / M	To : Q / M
Receive	From : I / Q / M	To : Q / M

## 14.4 The status flag

- 1) Communication error counter flag
  - Flag name : `_M422_ERR_CNT[n]` (Array\_Byte Type, n = 0 ~ 31)
  - Description  
Each byte of the '`_M422_ERR_CNT[n]`' array indicates how many times communication errors occurred at the relevant station. For example, the `_M422_ERR_CNT[5]` is the error counter of station 5.
- 2) The error code
  - Flag name : `_M422_ERR[n]` (Array\_Byte Type, n = 0 ~ 31)
  - Description  
0 : No error                    1 : Timeout error        2 : NAK
- 3) Operation mode and error of slave station
  - Flag name : `_S422_STATE[n]` (Array\_Byte Type, n = 0 ~ 31)
  - Description  
Bit 0 : Indicates an error of slave PLC. (0 : No error, 1 : Error occurred)  
Bit 1 ~ Bit 3 : Reserved  
Bit 4 ~ Bit 7 : Indicates the operation mode of slave PLC  
Bit 4 : STOP                    Bit 5 : RUN  
Bit 6 : PAUSE                  Bit 7 : DEBUG
- 4) The status flag of master station
  - Flag name : `_M422_STATE` (Byte Type, n = 0 ~ 31)
  - Description  
Bit 0 : Turn on when the CPU module is assigned as master station but it is not B type (GM6-CPUB)  
Bit 1 : Turn on when the master station number of basic parameter setting is duplicated with one of the slave station numbers of high speed link parameters setting.  
Bit 2 : Turn on when the M area of high speed link parameter setting is out of the range.
- 5) The scan time of RS422/485 communication
  - Description        `_M422_SCAN_MAX` (Time Type) : The maximum scan time  
                         `_M422_SCAN_MIN` (Time Type) : The minimum scan time  
                         `_M422_SCAN_CUR` (Time Type) : The current scan time

### Remark

: A total time of the processing time of the all parameter settings. (From the execution of the first parameter setting to the next execution)

## 14.5 Monitoring

Users can monitor the communication status of RS422/485 network with the monitor function of the GMWIN software. The high speed link parameter 1 monitoring screen is used for monitoring the RS422/485 network status.

- The CPU module should be a B-type, and assigned as master station in the basic parameter setting. Otherwise, the monitor screen will show the status of high speed link service.
- In the monitoring screen, the following flags are shown;
 

Master PLC parameter	<code>_M422_STATE</code> (On / Off)
The scan time of communication	<code>_M422_SCAN_MAX</code> (Maximum scan time) <code>_M422_SCAN_MIN</code> (Minimum scan time) <code>_M422_SCAN_CUR</code> (Current scan time)
No., Type, From, To, Size	The contents of high speed link 1 parameters
Error counter and code	<code>_M422_ERR_CNT</code> , <code>_M422_ERR</code>
Slave PLC	<code>_S422_STATE</code>



**14.6 Communication method and termination resistor**

1) Data type

- Data bit : 8 bits
- Stop bit : 1 bit
- Parity : None

2) Communication speed (Baud rate) : Selectable one of 9600, 19200, 38400 bps

3) Termination resistor

When use a long cable for connecting two or more PLCs, a termination resistor should be connected at the both ends of network. Otherwise, the communication can be disturbed by the reflected wave of cable. The termination resistor should be 1/2W grade and have the equivalent resistance with the characteristic impedance of cable. (When use the RS-422 protocol, connect two termination resistors between SDA and SDB, RDA and RDB. With the RS-485 protocol, connect a termination resistor between RDA and RDB, or SDA and SDB.)

**14.7 RS-422/485 pin assignment**

1) The RS-422 network is connected with 5-pin connector. The following table shows the name, and description of each pins and direction of signal.

Pin No.	MASTER	Signal direction	SLAVE
1	RDA	←	SDA
2	RDB	←	SDB
3	SDA	→	RDA
4	SDB	→	RDB
5	SG	↔	SG

2) When using RS-485 interface, connect cable as RS-422 interface, then interconnect RDA and SDA, RDB and SDB. With the RS-485 interface, the send / receive signals share one line and communication is performed as half-duplex method.