

Chapter 1 Introduction

This User's Manual describes Cnet(Computer network) system of GLOFA PLC. Cnet is GLOFA PLC network system using computer link module. Cnet has the connection function with different model to communicate with communication devices of various different type protocols such as other company's PLC and computer, etc., and the function of modem communication to control remote PLC, and it has the following characteristics :

- ¡ Because communication speed and communication mode(protocol, etc.) are directly controlled by user using program operative in Frame editor of the window environment, connection with other company's products is easy.
- ¡ Separate operations by channel are possible through controlling each of other company's protocols for channel RS-232C and RS-422(RS-485), and saving and using the protocol data controlled by user in internal flash memory(128 Kbyte) are possible.
- ¡ Variable reading/writing and program reading/writing are possible by using dedicated protocol.
- ¡ Dedicated communication function suitable to multi-drop configuration connectable up to 32 units is provided.
- ¡ With modem communication function built-in, remote PLC can be controlled by GMWIN connection, dedicated communication, and user defined communication.
- ¡ Communication port RS-232C/RS-422(RS-485) communication port can be used by setting it to standalone channel or interlocking channel.
- ¡ Various communication speeds can be set from 300bps to 76,800bps.
- ¡ 1:1/1:N/N:M communication(on using channel RS-422) is possible.
- ¡ Communication method full-duplex(RS-422) and half-duplex(RS-485) are supported.
- ¡ Channel RS-422 can be used as multi-drop communication channel, RS-485 by basic parameter setting.
- ¡ Cnet can be mounted up to 8 units for GM1, GM2, and GM3 CPU, 4 units for GM4, and 2 unit for GM6 (able to be mounted on the main base only).
- ¡ It has satisfactory self diagnosis function and loop-back diagnosis function, so failure diagnosis is easy.

* GLOFA PLC communication module by network is described in Table 1.1. Refer to this on system configuration.

1. Introduction

Table 1.1 List of GLOFA PLC communication module by network

Network	Communication	Connection cable type	Name of communication module	Mounting base
GLOFA Mnet ¹⁾	MCM	Coaxial	G0L-MUEA	IBM PC
			G3L-MUEA	GM1/2/3
GLOFA Fnet ¹⁾	Master(FMM)	Twisted pair(Electric)	G0L-FUEA	IBM PC
			G3L-FUEA	GM1/2/3
			G4L-FUEA	GM4
			G6L-FUEA	GM6
			Optical	G3L-FUOA
	Slave(FSM)	Twisted pair(Electric)	G3L-RBEA	GM3
			G4L-RBEA	GM4
			G0L-SMQA	Single
			Optical	G3L-RBOA
	Option(FOU)	Twisted pair	G0L-FREA	Single
Optical/Twisted pair		G0L-FOEA	Single	
GLOFA Cnet ^{2),3)}	Master/Slave ⁴⁾ able to be set	Twisted pair/ Cable RS-232C used by Channel	G3L-CUEA	GM1/2/3
			G4L-CUEA	GM4
			G6L-CUEB	GM6
			G6L-CUEC	

Remark

- 1) Mounting units are allowable up to 4 units in combining Fnet/Mnet.
- 2) Cnet module is possible to be mounted on not extended base but main base only.
- 3) The number of maximum units able to be mounted is limited within 8 units for GM1/2/3 CPU, 4 units for GM4 CPU, and 2 unit for GM6 CPU.
- 4) Master/Slave can be set through user program by user.

Chapter 2 Definition of terms

This chapter describes the terms used in this User's Manual.

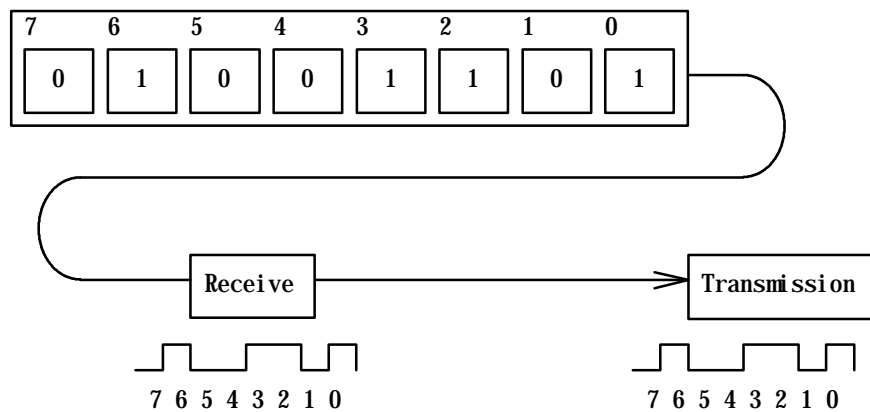
1) Communication type

- (1) Simplex
This is the communication type that data is transferred in constant direction. Information can not be transferred in the reverse direction.
- (2) Half-duplex
Data is transferred in two-way with one cable, but requiring time interval.
- (3) Full-duplex
Data is simultaneously transferred in two-way with two cables.

2) Transmission type

This is divided into the followings in consideration of the speed, safety, and economy on transmission in binary(bit composed of 0 and 1) :

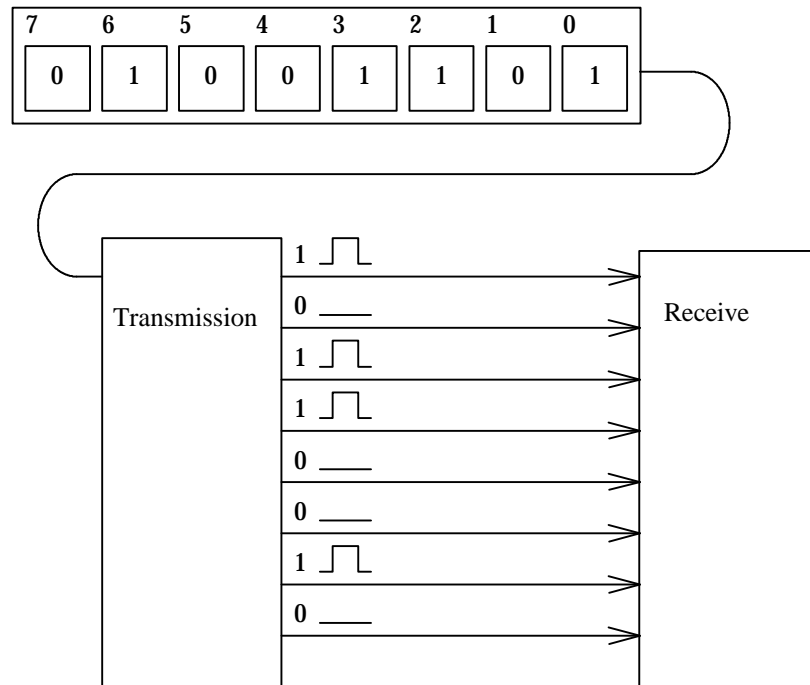
- (1) Serial transmission
This type transmits 1bit by one and one via one cable. The speed of transmission is slow, but the cost of installation is cheap, and the software is simplified.
RS-232C, RS-422, and RS-485 are the examples.



2. Definition of terms

(2) Parallel transmission

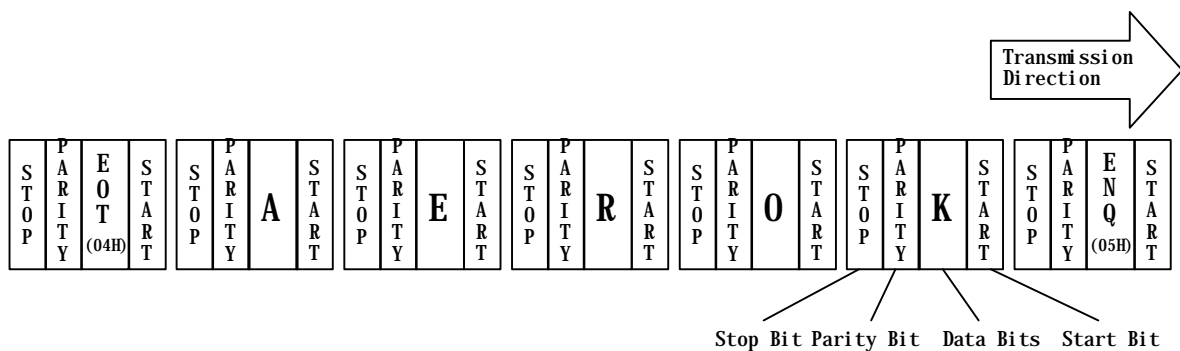
This is the type used in printer, etc., which transmit data in unit of 1Byte(8Bit), so the speed is high and the accuracy of data is good, but it has a demerit that the cost of installation becomes high, as transmission distance becomes long.



3) Start-stop synchronism type(Asynchronous type)

This is a type of synchronously transmitting 1 character by one and one on serial transmission. At this time, synchronous signal(Clock, etc.) is not transmitted. Character code is transmitted with a start bit attached to the head of 1 character, and it is finished with a stop bit attached to the tail.

i For transmitting 'KOREA'



4) Protocol

This is communication rule established in relation between the transmission side and the receive side of information in order to send and accept information between two computers/terminals or more without error, effectively, and reliably. In a general way, this specifies call establishment, connection, the structure of message exchange form, retransmission of error message, the procedure of line inversion, and the character synchronization between terminals, etc.

5) BPS(Bits per second) and CPS(Character per second)

BPS is a unit of transfer rate that represents how many bits is transferred per second. CPS is the number of the characters transferring for a second. Generally speaking, one characters is 1 Byte(8bits), so CPS is the number of byte which can be transferred per second.

6) Node

Node is a term that means the connected nodes of the data in the network tree structure, generally network is composed of a great number of nodes, and is also expressed as the station number.

7) Packet

Packet is the compound word of package and bucket, separates the transfer data into the defined length, and adds a header that presents the opposite addresses into it.

8) Port

Port is meant to be the part of the data process devices which sends or receives the data from a remote control terminal in data communications, but in Cnet serial communication is meant to be the RS-232C or RS-422 port.

9) RS-232C

RS-232C is the interface to link a modem with a terminal and to link a modem with a computer, and is also the serial communications specification established by EIA according to the recommendations of the CCITT. This is also used to link the null modem directly as well as the modem linkage. The disadvantage is that the transfer length is short and only single(1:1), and the specifications which recovers these disadvantages are RS422 and RS-485.

10) RS-422/RS-485

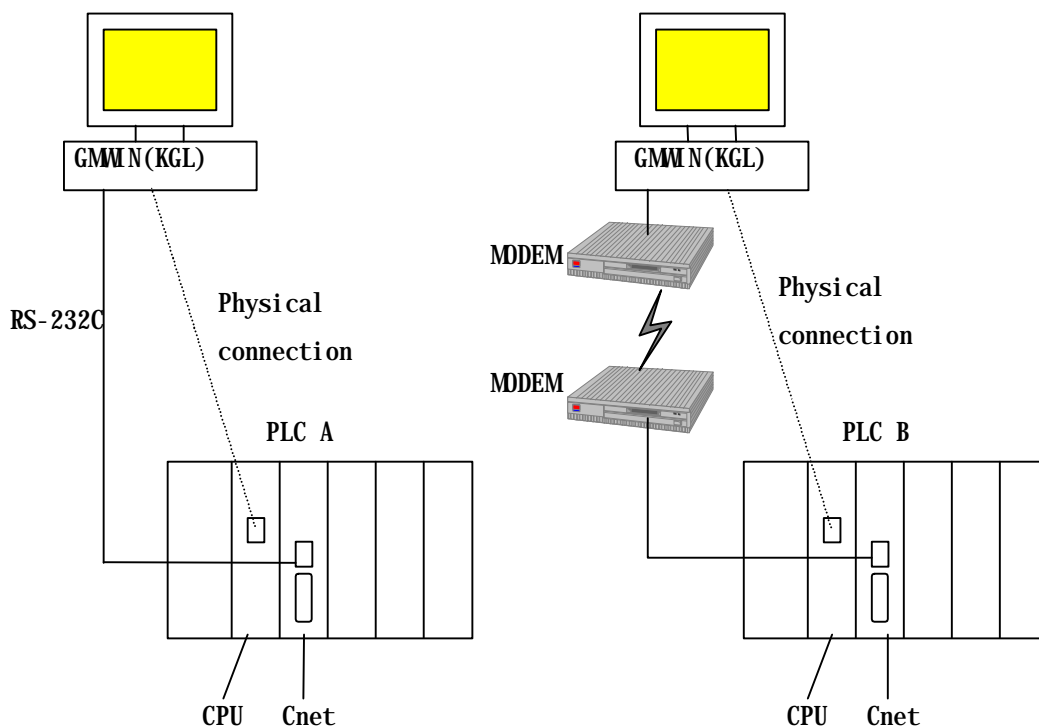
These are one of the serial transmission specifications which the transfer length is long and multi(1:N) connections are possible comparing with RS-232C. The difference of these two specifications is that RS-422 uses 4 signals [TX(+), TX(-), RX(+), RX(-)], while RS-485 has 2 signals [(+),(-)] which sending and receiving the data is executed through the same signal lines. Accordingly RS-422 executes the full-duplex type communications and RS-485 executes the half-duplex type communications.

11) BCC(Block Check Character)

Serial transmission may have signals distorted due to noise in transmission line, so BCC is a data for determination by receive side whether it is normal signal or distorted signal. And receive side calculates the BCC by using the data entered to the front end of BCC by itself, and then determines the normality or not of signals by comparing it with the received BCC.

12) GMWIN function

This is the function to remotely perform programming, reading/writing user's program, debugging, and monitoring, etc. without moving the physical connection of GMWIN in the network that PLC is connected to Cnet. Especially, this is a convenient function to control a remote PLC through modem.

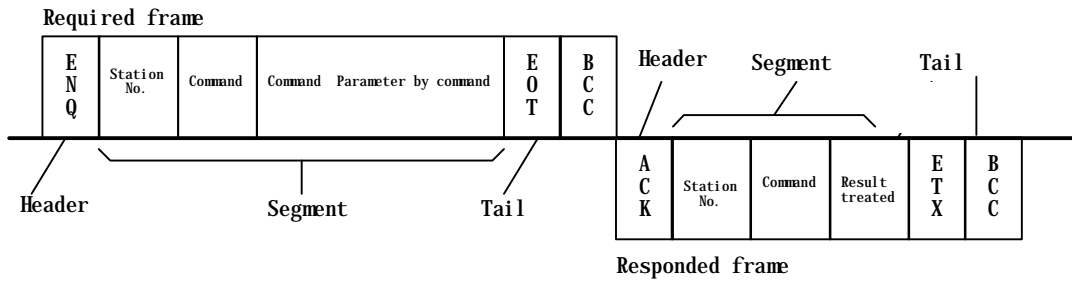


* GMWIN : Programming & debugging tool of GLOFA-GM PLC

13) Frame

This is the one of which Tx/Rx data is formatted in a given structure in data communication, and includes additional information such as segment(station number, commands, parameter by command), control character(ENQ, ACK, EOT, ETX) for synchronization, parity for error detecting, and BCC. The form of frame being used for serial communication of Cnet is as follows :

[structure of a general Tx/Rx frame]



- (1) Header
ASCII value indicating frame start.
- (2) Tail
ASCII value indicating frame end.
- (3) BCC(Block Check Character)
Parity is to check for Tx/Rx of byte unit.
BCC is to check for Tx/Rx frame.