

Chapter 2 Definition of terms

This chapter describes the communication terms used in this user' s manual.

1) Communication type

A) Simplex

This is the communication type that data is transferred in constant direction. Information can not be transferred in the reverse direction.

B) Half-Duplex

Data is transferred in two-way with one cable if time interval provided, though it can' t be transferred simultaneously.

C) Full-Duplex

Data is simultaneously transferred and received in two-way with two cables.

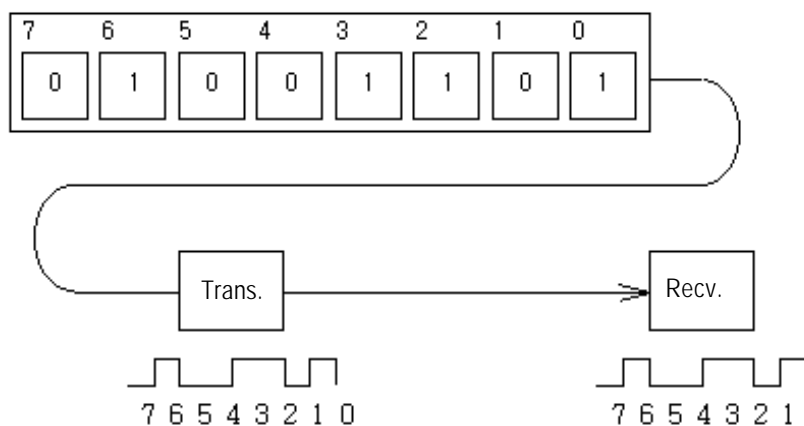
2) Transmission type

This is divided into the following 2 types in consideration of the speed, safety and economy on transmission in binary (bit composed of 0 and 1).

A) Serial transmission

This type transmits bit by bit via 1 cable. The speed of transmission is slow, but the cost of installation is low and the software is simplified.

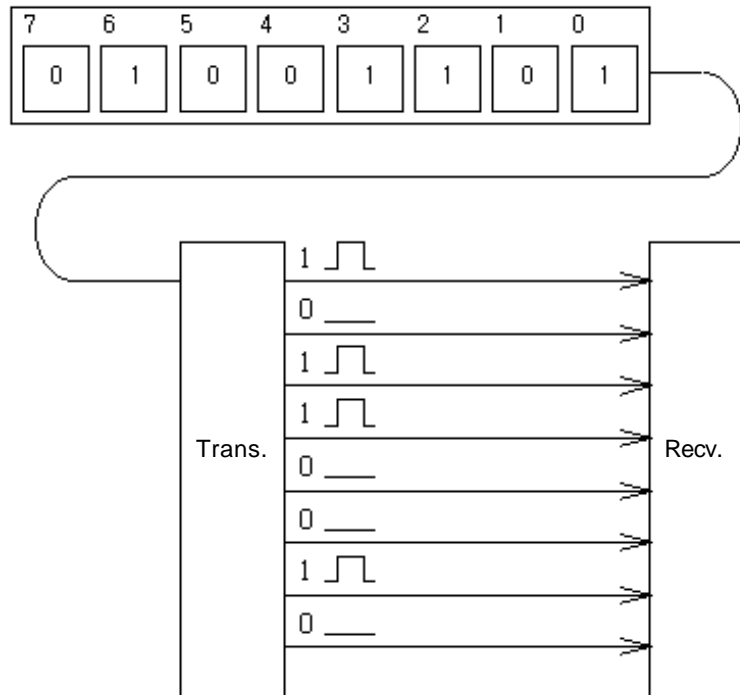
RS-232C, RS-422 and RS-485 are the examples.



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B) Parallel transmission

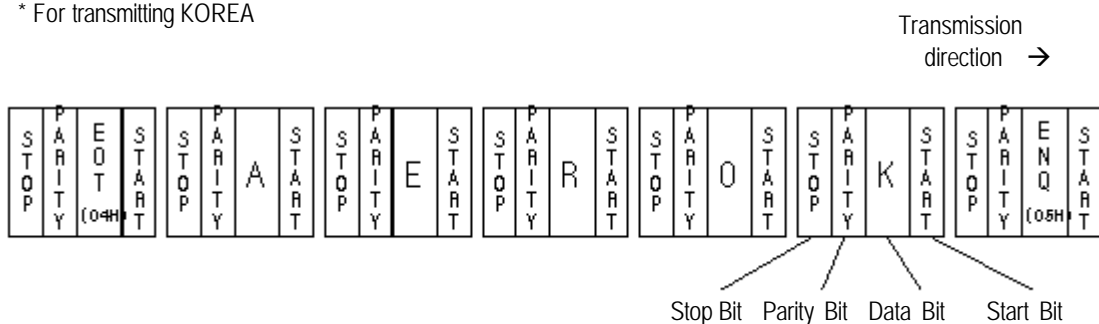
This type is used in printer, etc., which transmits data in unit of 1 byte, so the speed is high and the accuracy of data is reliable. However, the longer the transmission distance is, the higher the cost of installation is geometrically.



3) Asynchronous communication

This communication type transmits characters one by one synchronously in 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.

* For transmitting KOREA



4) Protocol

This is communication rule established in relation between the transmission side and the receiving side of information in order to send and accept information between two computers/terminals or more without error, effectively, and reliably. In general, this specifies call establishment, connection, structure of message exchange form, re-transmission of error message, procedure of line inversion, and 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 are transferred per second. CPS is the number of the characters transferring for a second. Generally, one character is 1Byte (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, a compound term of package and bucket used for packet exchange type to send information as divided in a unit of packet, separates transfer data into the defined length and adds a header that presents the opposite addresses (station No., etc.) 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

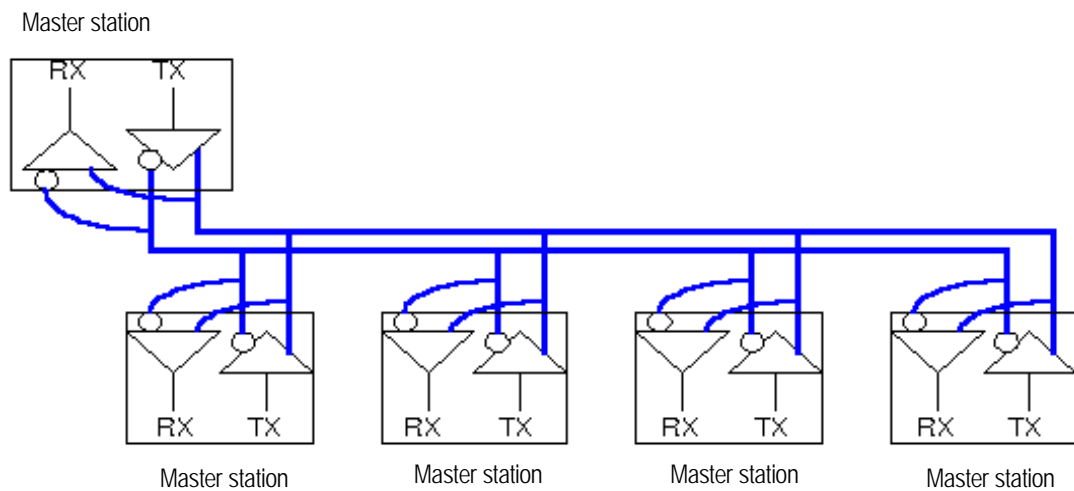
RS-232C is the interface to link a modem with a terminal and to link a modem with a computer, and is also the serial communications specification established by EIA according to the recommendations of the CCITT. This is also used to link the null modem directly as well as the modem linkage. The disadvantage is that the transfer length is short and only 1 : 1 communication is available, and the specifications which recover this disadvantage are RS-422 and RS-485.

10) RS-422/RS-485

As one of the serial transmission specifications, its transfer length is long and multi (1 : N) connections are available compared to RS-232C. The difference of these two specifications is that RS-422 uses 4 signals of TX(+), TX(-), RX(+) and RX(-), while RS-485 has 2 signals of (+) & (-), where data is sent and received through the same signal line. Accordingly, RS-422 executes the full-duplex type of communication and RS-485 executes the half-duplex type of communication.

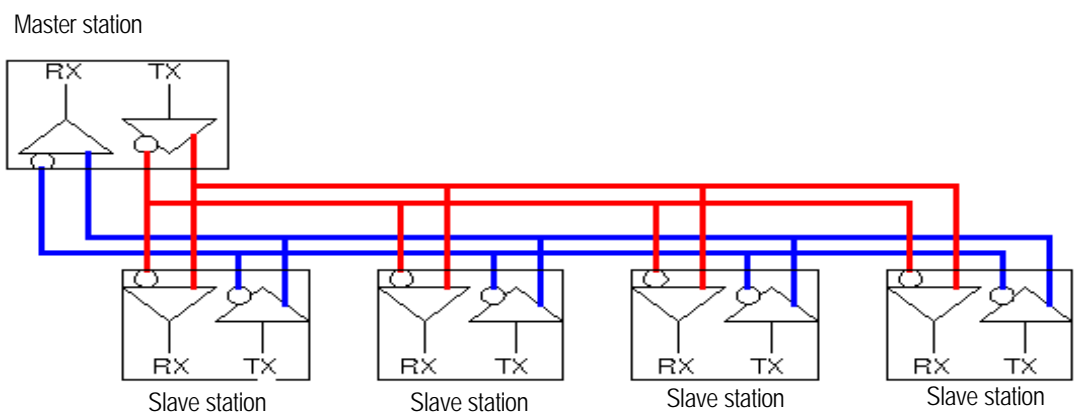
11) Half Duplex Communication

Two-way communication is available, however simultaneous communication of transmission & receiving isn't available. This communication type is applied to RS-485 for instance. It is used a lot for multi-drop communication type which communicates via one signal line by several stations. Half Duplex Communication results from the transmission characteristic performed by stations one by one not allowing simultaneous transmission by multi stations due to the data damage of data impact caused by the simultaneous multi-transmission of the stations. The figure below shows an example of structure based on Half Duplex Communication. Each station in communication with the terminal as linked with each other can send or receive data via one line so to execute communication with all stations, where multi-master is advantageously available.



12) Full Duplex Communication

Two way-communication of simultaneous transmission & receiving is available. This communication type is applied to RS-232C & RS-422.



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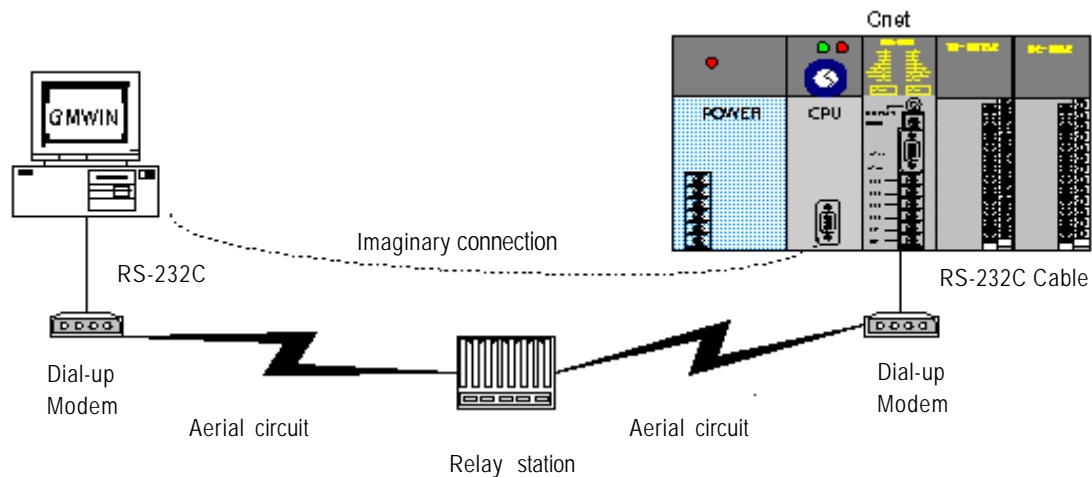
Since the transmission line is separated from the receiving line, simultaneous transmission & receiving is available without data impact, so called as Full Duplex Communication. The figure shows an example of structure based on RS-422 of Full Duplex Communication. Since transmission terminal of the master station and receiving terminals of the slave stations are connected to one line, and transmission terminals of the slave stations are linked with receiving terminal of the master station, the communication between slave stations is unavailable with the restricted function of multi-master.

13) BCC(Block Check Character)

As serial transmission may have signals distorted due to noise in transmission line, BCC is used as data to help receiving side to check the signals if normal or distorted and to detect errors in signals as compared with the received BCC after calculating BCC by receiving side itself using the data input to the front terminal of BCC.

14) 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 system where PLC is connected to Cnet I/F module. Especially, it is convenient to control a remote PLC via modem.



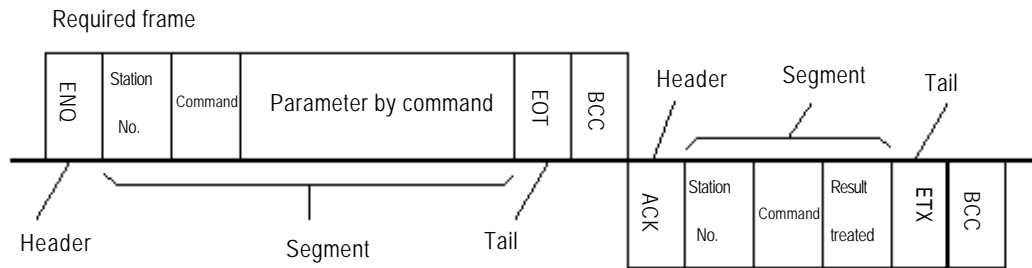
* GMWIN : Programming software of GLOFA PLC for Windows.

15) Frame

Frame is composed of transmitted and received data as in a specified form in data communication including additional information of segment [station No., commands, parameter by command], control characters [ENQ, ACK, EOT, ETX] for synchronization, parity for detecting error, and BCC. The structure of frame used for serial communication of Cnet is as follows.

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[Structure of general TX / RX frame]



- (1) Header : ASCII value indicating frame start.
- (2) Tail : ASCII value indicating frame end.
- (3) BCC (Block Check Character) : BCC as of check data for TX / RX frame is to inspect reliability of data with such various methods as ADD, OR, EXR and MULTIPLY.