PLC SERIES

USER MANUEL

CPU MODULES

GMT Industrial Electronics Industry and Trade Inc.

PLC CPU Modules
Safety Information

This manuel contains the usage and safety information of the GMTCNT brand PLC CPU modules.

Please read the user manuel carefully before using the appliance! The user shall be liable for any damage, harm or accidents incurred by non-compliance with the instructions in the operating instructions. In this case of malfunctions the device is out of warranty.

Important Safety Information:

Priority Considerations;

- The power must be disconnected before wiring the device.
- Wiring must be carried out in accordance with connection diagrams. Otherwise the PLC modules will be damaged or unable to function.
- Do not touch the module terminals when the terminals have power.
- Leads to damage connecting and disconnecting the expansion modules to the PLC when there is power.
- The device is CE marked according to EN standards.

Mounting Rules

- The following instructions must be observed when mounting the module. Otherwise the operation of the device may be affected or permanent damage.
- The device must be at least 50 mm in distance to the panel surface where it is installed and adequate ventilation conditions must be met.
- Ambient conditions should not exceed the temperature and humidity limits specified in the technical specifications.

PLC CPU Modules
General Specifications

PLC CPU Modules 2 main groups are divided into 4 series. These are as follows with the most general features.

GLC-196R	9 Digital(PNP/NPN) input(3 channel 20kHz counters), 6 relay output, RS232, RS485, USB ports
GLC-196T	9 Digital(PNP/NPN) input(3 channel 20kHz counters), 6 transistor output(3 channel 20kHz high-speed pulse out), RS232, RS485, USB ports
GLC-296R	9 Digital(PNP/NPN) input(3 channel 50kHz counters), 6 relay output, Analog input, Analog output, RS232, RS485, USB ports
GLC-296T	9 Digital(PNP/NPN) input(3 channel 50kHz counters), 6 transistor output(3 channel 100kHz high-speed pulse out), Analog input, Analog output, RS232, RS485, USB ports
GLC-396R	9 Digital(PNP/NPN) input(3 channel 50kHz counters), 6 relay outputs, analog input, analog output, RS232, RS485, USB Ports, WMI, RTC, ModBus, TCP, e-mail
GLC-396T	9 Digital(PNP/NPN) input(3 channel 50kHz counters), 6 transistor output(3 kanal 100 kHz high-speed pulse out), analog input, analog output, RS232, RS485, USB Ports, WMI, RTC, ModBus, TCP, e-mail
GLC-496R	9 Digital(PNP) input(3 channel 200kHz counters), 6 relay output, analog input, analog output, RS232, RS485, USB Ports, WMI, RTC, ModBus, TCP, e-mail, datalog
GLC-496T	9 Digital(PNP) input(3 channel 200kHz counters), 6 transistor output(3 channel 400 kHz high-speed pulse out), analog input, analog output, RS232, RS485, USB Ports, WMI, RTC, ModBus, TCP, e-mail, datalog

Relay Load Life (ambient temperature: 23°C);
Mechanical: 5,000,000 operations min.
Electrical (resistive load): 100,000 operations at 250 VAC, 5 A
200,000 operations at 30 VDC, 3 A
(with a rated load at 1,800 operations / hour).

Note: For GLC-196R, GLC-296R, GLC-396R and GLC-496R only.

PLC CPU Modules
Technical Specifications

Device Description: CPU modules in the PLC series are the main units that run the loaded program, receive information from the connected expansion modules, and control them. They can operate independently without requiring any additional units.
Input/Output Capacity: Depending on the model, they have 15 or 17 input/output points. This capacity can be increased up to 273 by connecting expansion modules. A maximum of 16 expansion modules can be connected to the CPU module.
Communication Ports: All CPU models include an Ethernet port, USB port, RS232, and RS485 serial ports.

*** Ethernet port:** Used as a programming port and can also be used for internet or intranet network connections. This port also supports the MODBUS TCP Master/Slave protocol*[1]. By using our WMI technology, it is possible to modify or monitor the PLC program over the internet *[1].

*** RS232 port:** Can be used as a serial port for data exchange with smart devices. Supports MODBUS RTU protocol or standard ASCII communication.

*** RS485 port:** Supports MODBUS RTU protocol or standard ASCII communication. Networking multiple CPUs through this port is possible.

*** USB port:** Provides PC connection via the USB port.

*** USB Data Log:** GLC-496 devices support external disk connection and automatically create files by recording data.

Real-time Clock (RTC)*[1]: Allows operations to be performed based on date and time within the PLC program. The CPU retains the configured current date and time information during power outages.
Usage: The PLC CPU can operate independently without requiring any other equipment. Scan time and program capacity are the same across all series. It becomes ready for use with a 24 VDC power supply. Mounting is done on a DIN rail, and its terminal-based structure allows easy cable connections.
Programming: It can be programmed with the GMT Soft/GMT Suite ladder editor software. GMT Soft/GMT Suite editor can be downloaded free of charge from our website. Communication between the GMT Soft/GMT Suite program and the PLC is achieved through the following methods:

* The connection is made using a standard CAT5 Ethernet cable. A direct cable connection between the PLC Ethernet port and the PC Ethernet port can be used.
* The PLC Ethernet cable can be connected to switches or hubs in the network where the PC is located. If there are multiple PLCs in the network, the device to connect to is selected from the MAC address list. This address is also found on the PLC label.
* A USB Mini-B type cable is used as the USB cable.

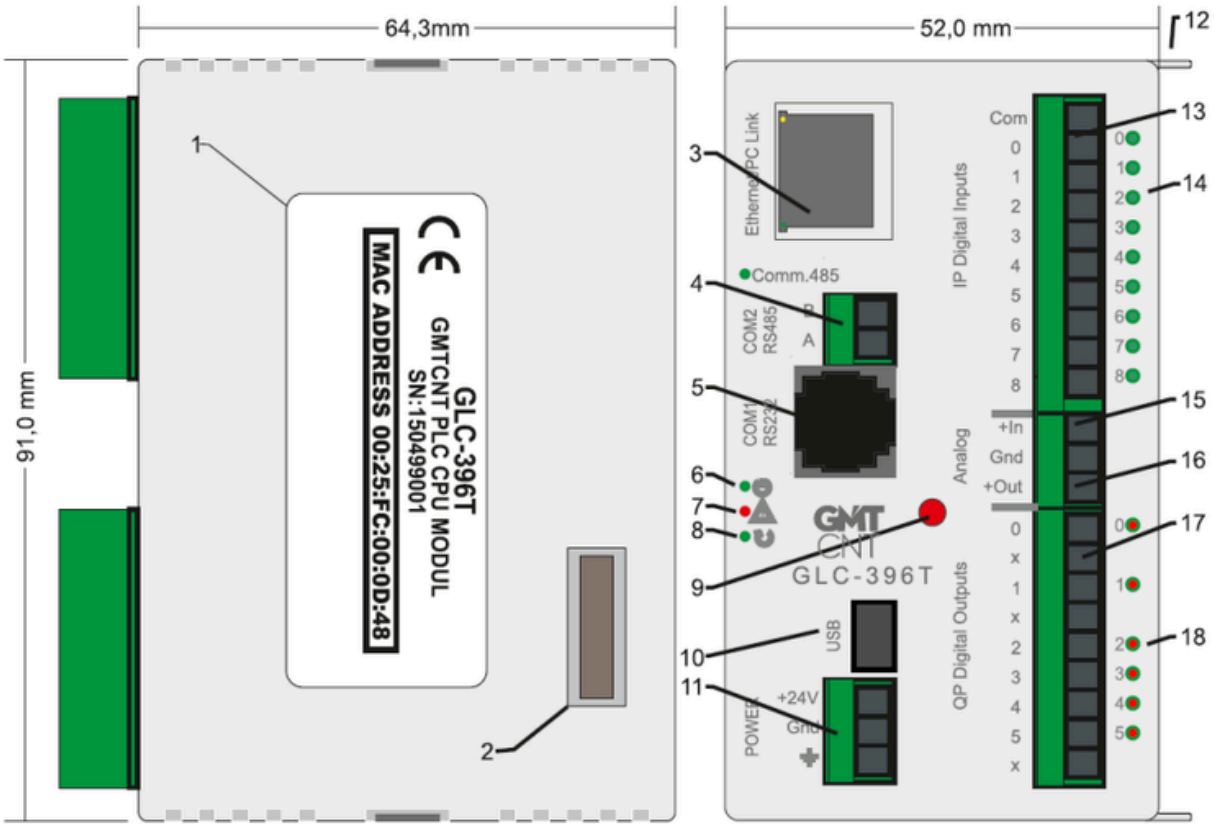
*[1]: Only for GLC-396 series and above.

PLC CPU Modules
Table of General Specifications

Feature	Section	Description
General	Supply Voltage	24 VDC, +/-%15 tolerans
	Power	Max 3W@24VDC
	CPU Process Speed	220 MIPS Arm CortexM4F
	Program Language	GMT Soft/GMT Suite editor software with ladder method.
	RTC (Real Time Clock)	Possibility to program the according to time and date.
	Operations	Ability to perform operations with logic, mathematical, commucication, high speed counter, high speed pulse output, timers&special function blocks.
Comm. Ports	Enternet Port	Programming via 100MB ethernet port, setting up link, MODBUS TPC Master/Slave support, access to the device via WMI technology.
	USB Port	Programming and setting up link with a PC connection via USB port. An automatic file recording creation with external disk connection support.
	RS232	ASCII or MODBUS RTU protocol with 4800 ... 115200bps speed support.
	RS485	ASCII or MODBUS RTU protocol with 4800 ... 115200bps speed support.
Memory Area (GMT Soft)	Integer Variables	1024 addresses 32 bit signed, 512 addresses 16 bit unsigned.
	Decimal Variables	1024 addresses 32 bit variables.
	Counters	256 addresses, 32 bit increasing / decreasing counter blocks.
	Timers	128 addresses, 4 type timers with 1ms and 32 bit resolution.
	System Variables	128 variables with 32 bit signed.
	Virtual Bits	1024 bits.
	System Bits	256 bits.
Memory Area (GMT Suite)	Program Size	196 KByte
	Operand Usage	10 KByte
Environment Conditions	Temperature	0 .. +50°C working gap(without icing)
	Humidity	5 .. 95%rH moisture working gap.
	Environment	Environments without flammable or corrosive gases.

PLC CPU Modules
Mechanical Specifications

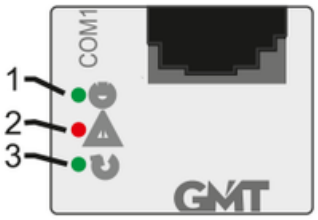
Mechanical specifications: The device is DIN rail mounted. If there are any extension modules on the configuration, the device should be montaged to the rail after the devices are mounted to each other. The module is fixed to the rail with the snap-in clip. The structure is as follows;



1	PLC Label(MAC Address is read from here)	10	USB port
2	Expansion Module BUS Conn. Port	11	+24V Supply Terminal
3	100 Mb ethernet port	12	Expansion Module mounting Nail
4	RS485 port	13	Digital Input Terminal Block
5	RS232 port	14	Digital Input Status LEDs
6	PLC Power LED	15	Analog Input Terminals
7	PLC Fault LED	16	Analog Output Terminals
8	Program Run LED	17	Digital Output Terminal Block
9	Reset Button	18	Digital Output Status LEDs

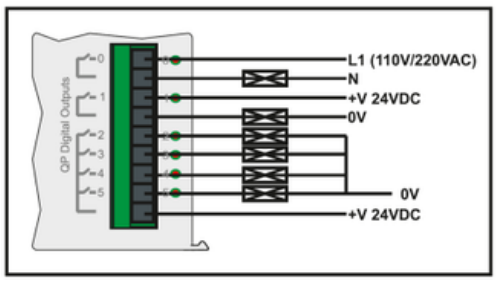
PLC CPU Modules
Digital (On /Off) Output Connections

Status LEDs:
1) Power LED: Led is on when 24V DC supply.
2) Fault LED: This led is not on in normally. When first power is applied, it will flash for 0.5 seconds. If the extension module configuration is incorect (a matching error), it flashes 3 times in succession. If at least one of the transistor outputs is short-circuited, the fault LED will be on continuously.
3) PLC Run LED: if the program is not running PLC Run LED will be 1 sec on & 1 sec off. If the program is running PLC Run LED will be 0,25 sec on & 0,25 sec off.

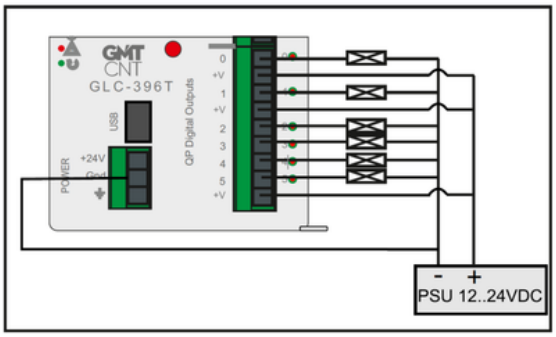


Digital Output Connections:
On / Off outputs on the CPU. According to the CPU model, there are two types as relay type or transistor type. They are commanded by the QP operand in the program.

GLC-X96R (Relay) Series Output Connection:
Outputs are 230VAC@5A intemal relays. Relay outputs are collected in three groups. Each of QP[0] and QP[1] has a single group structure, and also QP[2], QP[3], QP[4] ve QP[5] has a common group structure.The relays are suitable for AC or DC connections as long as they do not exceed the current limit since they operate as dry contacts.
* Switching frequency must be at 100Hz max.
* Max. Voltage value is 270VAC/125VDC.
* There is a status LED for each output.

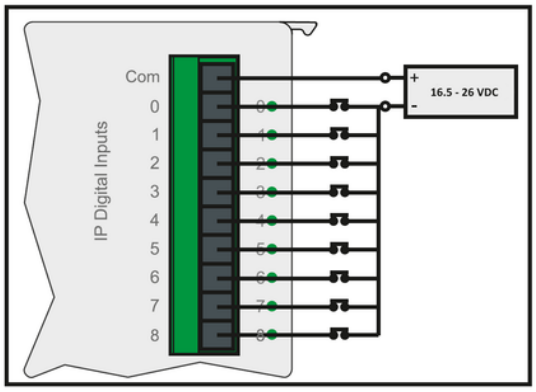


GLC-X96T (Transistor) Series Output Connection:
Outputs are PNP transistors. They can be wired directly to the relay, contactor and solenoid valve coils.
* Maximum switching frequency is 20/100 /400 kHz depend on model.
* 24 VDC@ (max) 450 mA output.
* Short circuit protection is available and the PLC will signal at the time of over current.
* The transistor voltage is supplied as extemal. It should be between 12...24V DC.
* Minimum 50 mA current is drawn from hiah speed outputs.

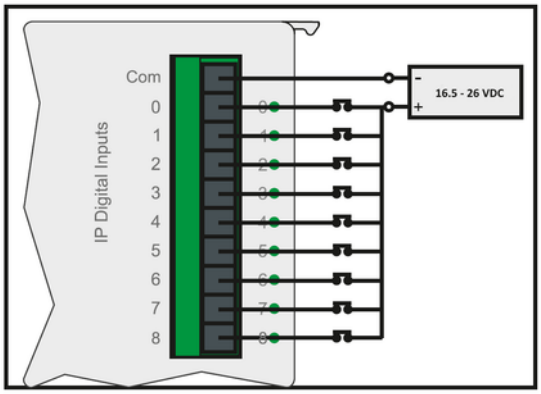


PLC CPU Modules
Digital (On /Off) Input Connections

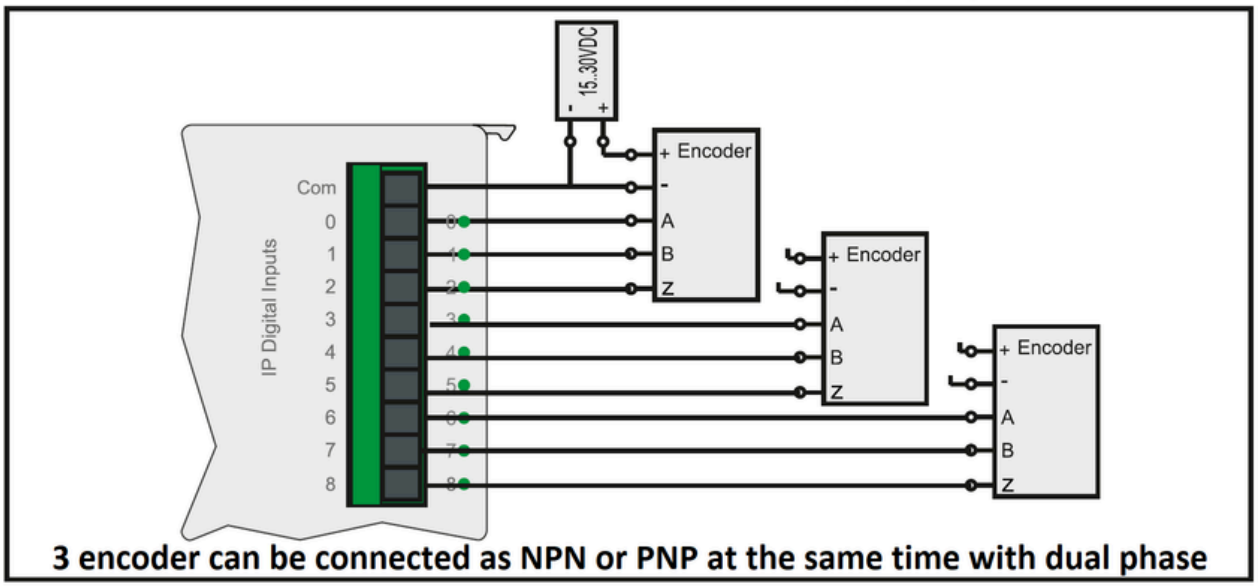
Digital Input Connections:
On / Off inputs on the CPU. Input type can be "PNP" or "NPN". Only in the 496R/T's input type is "PNP". According to the model, the counting speed is maximum20 kHz, 100 kHz or 500 kHz. It is sensitive to short pulse inputs (0.15 ms amplitude). The degree of sensitivity can be adjusted from the filters section inthe GMT Soft/GMT Suite editor. The common terminal end (GND), which isseparate from the CPU chassis was isolated by optocouplers.



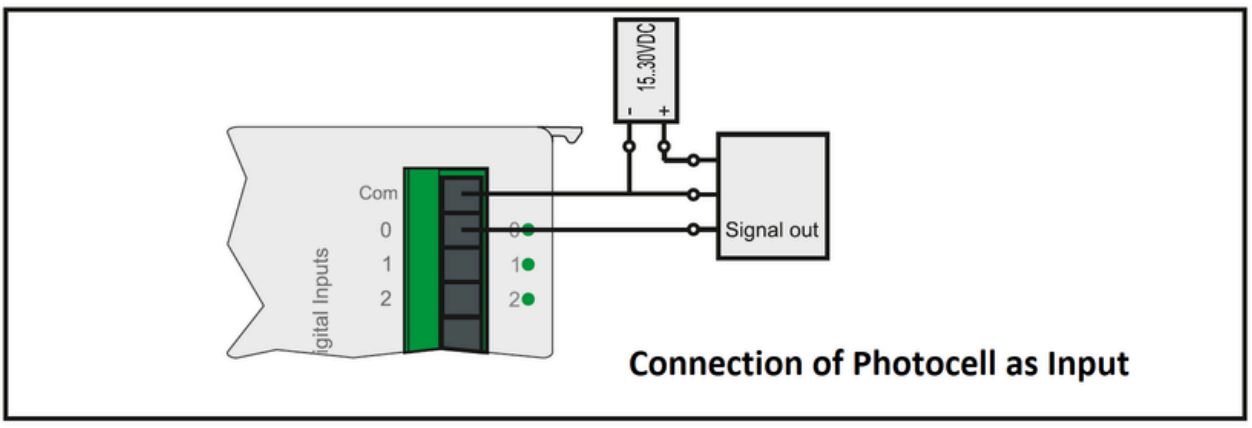
NPN Type Input Connection



PNP Type Input Connection



3 encoder can be connected as NPN or PNP at the same time with dual phase



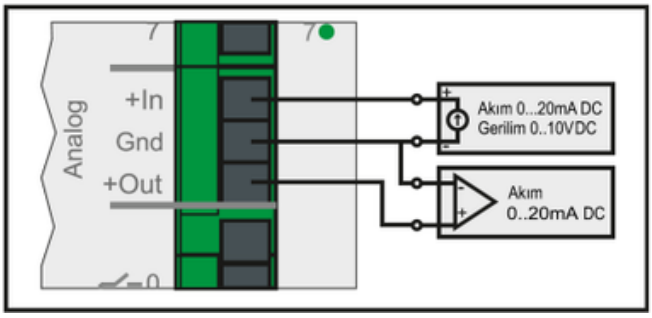
Connection of Photocell as Input

PLC CPU Modules
Analog Input / Output Connections

Analog input /output connections*[1]

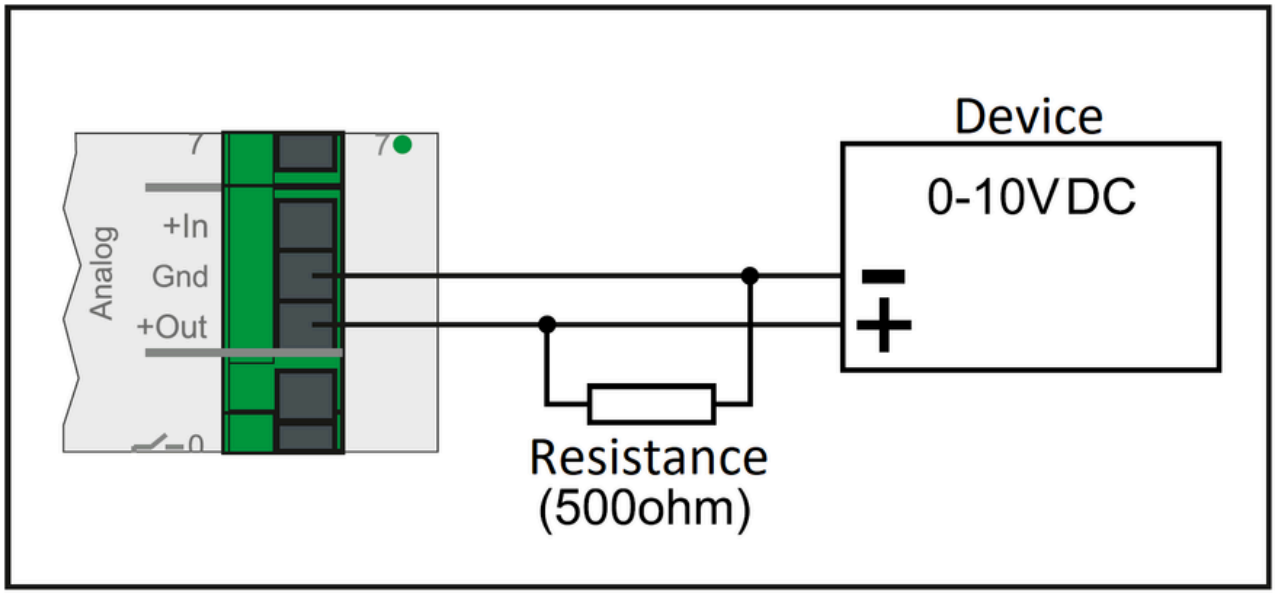
Analog input /output on the PLC CPU. Inputs type are 0-10V DC, 0-20 mA DC and 4..20 mA DC. Output type is 0-20mA DC. If required, it can be converted to 0-10V DC using a 500 Ohm resistor.

The analog input value is read from 0 .. 4095 linearly from the SI[1] in the PLC. The repeat rate is the same as the PLC ladder scan speed. The type SB [12] registers is selected by writing 0 or 1 to the opening value.



The analog output value is written in the PLC to SI [0] address. It generates the signal corresponding to 0 ..16383 values linearly. The repeat rate is the same as the PLC ladder scan speed.

Switching 0-20 mA analog output signal to 0-10 VDC



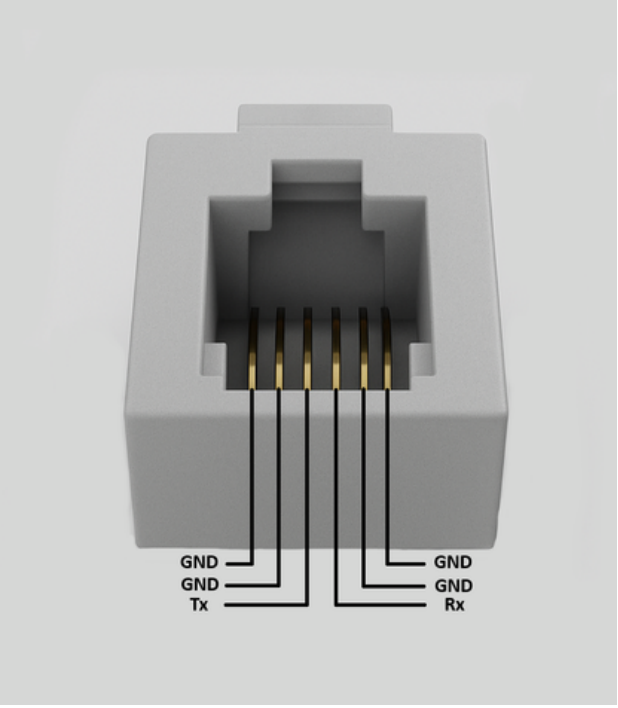
*[1] For GLC-296 and upper series only.

PLC CPU Module
Communication Ports

Ethernet Port Connection:

Purposes of ethernet port on the CPU are;
• Programming: This is used as a link building port where the prepared program is loaded, values are monitored and values are changed, from GMTSoft/GMTSuite editor program;
• CPU can be connected to SCADA or smart devices in MODBUS TCP Slave mode*².
• With WMI technology, programs can be loaded and monitored in PLC via Internet*². • In the system where PLC is used, besides the automation, it can send an e-mail at desired times such as number of production, alarm and so on*². The Ethernet port connects the PLC directly to the PC or network via standard CAT5 cable.

COM1 / RS232 connection:
An RJ11 jack is used for this type of connection. It can be used with any ASCII protocol or MODBUS RTU protocol which can be defined by the user by providing serial port connection through this jack. The following figure shows the pin connections of the RJ11-6p connector jack. It is the bottom view of the display jack in the figure. Galvanic insulation can be used as an optional.



COM2 / RS485 connection:
With this type of connector, it is possible to establish RS485 Network connection. It can communicate with MODBUS RTU protocol up to 255 units from other PLC or 3rd party devices with RS485 connection pin. Galvanic insulation can be used as an optional.

*² For GLC-396 and upper series only.

PLC CPU Modules
High Speed Puls Outputs

PLC GLC-196T, GLC-296T and GLC-396T series must be connected directly as shown below. In the GLC-496T series, the resistors connected to the high speed pulse outputs must be 390 ohms and minimum of 3W. No resistor connection is required for direction outputs. If servo drives from different manufacturers are used, the resistance values and connections must be done in accordance with the instructions of the relevant manufacturers.