GMTCNT

PLC SERIES
USER MANUAL

CPU MODULES

PLC CPU Modules
Safety information

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

Please read the user manual 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.

CE RoHS Compliant

http://www.gmtcontrol.com

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 20 kHz counters), 6 relay output, RS232, RS485, USB ports
GLC-196T	9 Digital (PNP/NPN) input (3 channel 20 kHz counters), 6 transistor output (3 channel 20 kHz high-speed pulse out), RS232, RS485, USB ports
GLC-296R	9 Digital (PNP/NPN) input (3 channel 50 kHz counters), 6 relay output, analog input, analog output, RS232, RS485, USB ports
GLC-296T	9 Digital (PNP/NPN) input (3 channel 50 kHz counters), 6 transistor output (3 channel 100 kHz high-speed pulse out), analog input, analog output, RS232, RS485, USB ports
GLC-396R	9 Digital (PNP/NPN) input (3 channel 50 kHz counters), 6 relay output, analog input, analog output, RS232, RS485, USB ports, WMI, RTC, ModBus TCP, e-mail
GLC-396T	9 Digital (PNP/NPN) input (3 channel 50 kHz counters), 6 transistor output (3 channel 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 200 kHz 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 200 kHz 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 are the main unit that receives data from its own terminals or extension modules connected to it and controls its outputs according to the loaded program. They can work alone without the need for any additional units.

Input / Output capacity: They have an input/output capacity of 15 (for 196X Models) or 17 (for models of 296X and upper) depending on their models. It is possible to increase this capacity to 274 by connecting expansion module devices. Up to 16 expansion modules can be connected to the CPU module.

Communication ports: All CPU models have Ethernet ports, USB ports, RS232 and RS485 serial ports.

- **Ethernet port:** It can be used as a programming port and also for internet or intranet network connection. This port also supports the MODBUS TCP Master/Slave protocol (1). it is possible to change or monitor the program of the PLC device over the Internet by using WMI technology (1).
- **RS232 port:** Can be used as a serial port for data send/receive with smart devices. Supports MODBUS RTU protocol or standard ASCII communication.
- **RS485 port:** Supports MODBUS RTU protocol or standard ASCII communication. It is possible to network the CPU via this port.
- **USB port:** Provides connection to PC via USB port.
  It has the feature of creating files by automatically recording with external disk connection support (for GLC-496 series only).

Real Time Clock (RTC) (1): It allows to perform transactions according to time and date in PLC program. The CPU does not lose the current time and date information set in power outages.

Device Usage: The PLC CPU can operate on its own without the need for other equipment. Cycle speed and program capacity are the same in all series. It is ready to use with 24 VDC supply. The mounting is on the DIN rail. Cable connections can be made easily with the terminal structure.

Programming: PLC can be programmed with GMTSoft/GMTSuite ladder editor software. You can download GMTSoft/GMTSuite editor program free of charge from our website http://gmtcontrol.com./en/yuklemeler/yazilimlar.html. GMTSoft/GMTSuite program-PLC communication for software installation and testing is carried out by the following methods.

- The connection is made using a standard CAT5 ethernet cable. The standard CAT5 ethernet cable can be used directly between PLC ethernet port and PC ethernet port.
- PLC ethernet cable can be connected to switches or HUBs in network where PC is located. If there is more than one PLC in the network, the device to be connected is selected from the MAC address list. This address is also found on the PLC product label.
- USB Mini-B type cable is used as an USB cable.

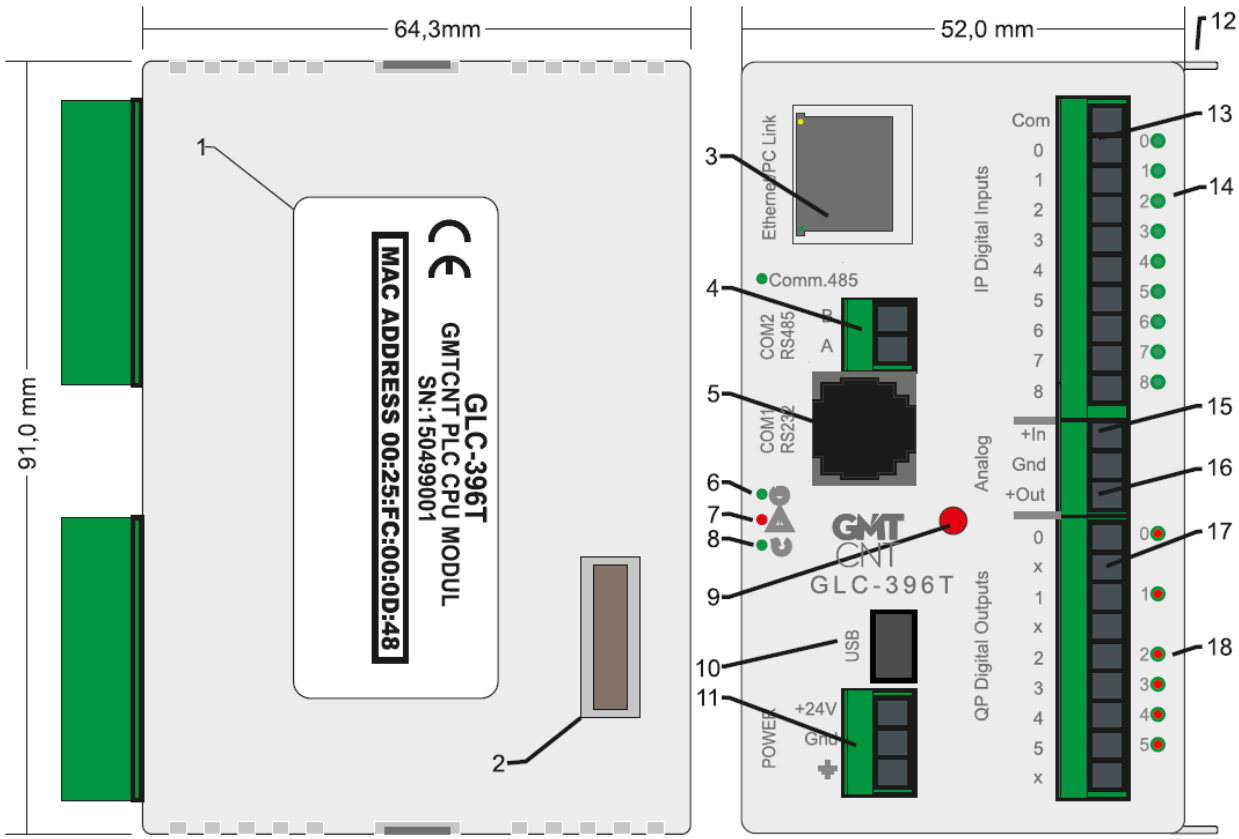
Note: (1) For GLC - 396 and upper series only.

PLC CPU Modules
Table of general specifications

Feature	Section	Description
General	Supply voltage	24 VDC, ±%15 tolerans.
	Power	Max 3W @ 24 VDC.
	CPU process speed	220 MIPS Arm CortexM4F.
	Program language	GMT Soft/GMT Suite editor software with ladder method.
	Program capacity	64 kB / 512 kB Ladder compiled.
	RTC (Real time clock)	Possibility to program the according to time and date.
	Operations	Ability to perform operations with logic, mathematical, communication, high speed counter, high speed pulse outputs, timers & special function blocks.
Comm. Ports	Ethernet port	Programming via 100MB ethernet port, setting up link, MODBUS TCP 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 ... 115200 bps speed support.
	RS485	ASCII or MODBUS RTU protocol with 4800 ... 115200 bps 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.
	Operant 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;

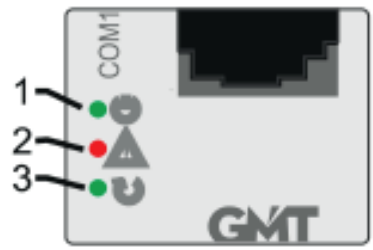


1	PLC Label (MAC address is read from here)	10	USB port
2	Expansion module BUS conn. port	11	+24V Supply terminal
3	100 Mb ethernet port	12	Expansion module mounting nail
4	RS485 port	13	Digital Input terminal block
5	RS232 port	14	Digital Input status LEDs
6	PLC Power LED	15	Analog input terminals
7	PLC Fault LED	16	Analog output terminals
8	PLC Run LED	17	Digital output terminal block
9	Reset Button	18	Digital output status LEDs

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 incorrect (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.



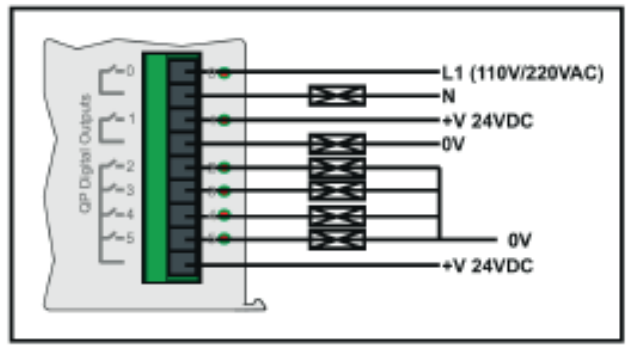
3) PLC Run LED: If the program is not running **PLC Run LED** will be 1 sec on & 1 sec off. If the program is running **PLC Run LED** will be 0,25 sec on & 0,25 sec off.

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:

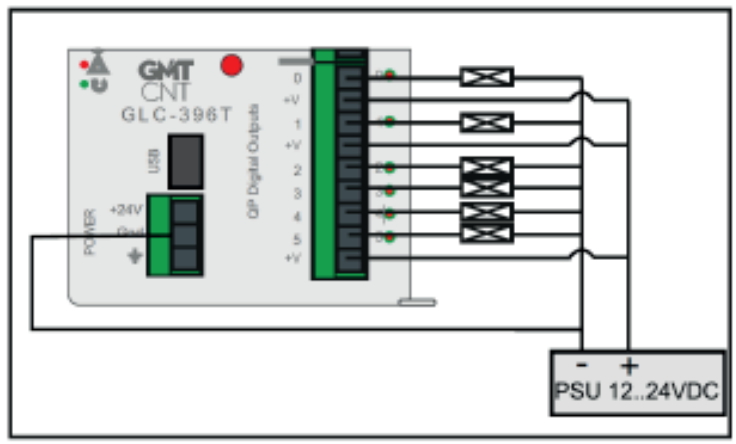
Outputs are 230VAC@5A internal relays. Relay outputs are collected in three groups. Each of QP[0] and QP[1] has a single group structure, and also QP[2], QP[3], QP[4] ve QP[5] has a common group structure.The relays are suitable for AC or DC connections as long as they do not exceed the current limit 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.

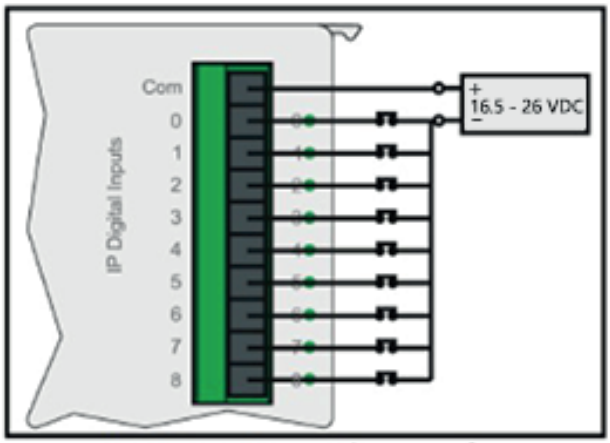


* Maximum switching frequency is 20 /100 /400 kHz depend on model.
* 24 VDC@ (max) 450 mA output.
* Short circuit protection is available and the PLC will signal at the time of over current.
* The transistor voltage is supplied as external. It should be between 12...24V DC.
* Minimum 50 mA current is drawn from high speed outputs.

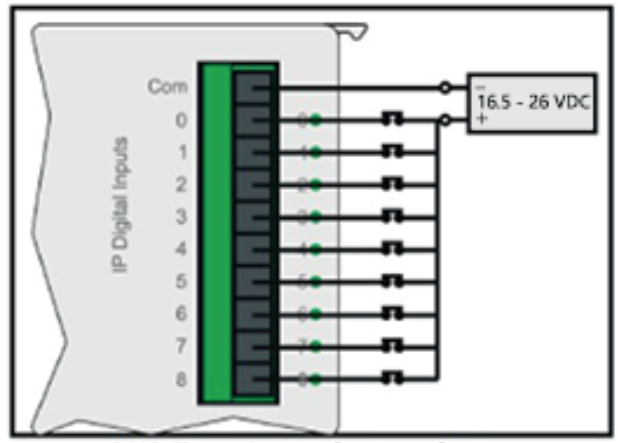
PLC CPU Modules
Digital (On / Off) input connections

Digital Input Connections:

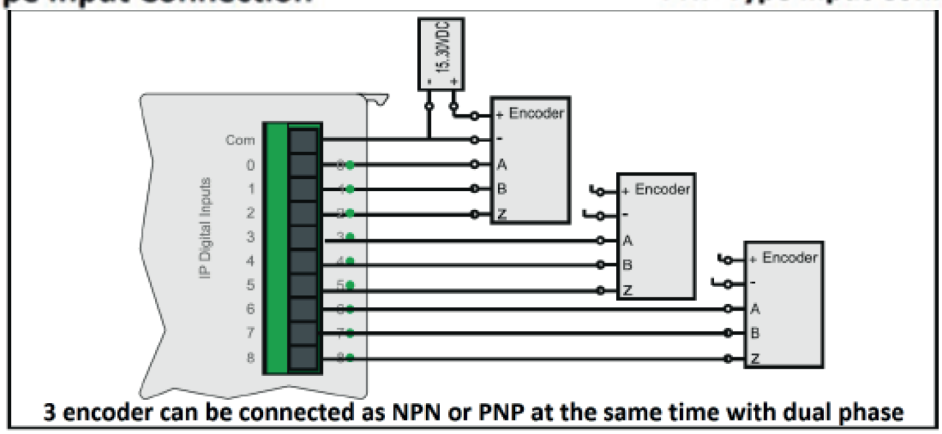
On / Off inputs on the CPU. Input type can be "PNP" or "NPN". Only in the 496R/ T's input type is "PNP". According to the model, the counting speed is maximum 20 kHz, 100 kHz or 500 kHz. It is sensitive to short pulse inputs (0.15 ms amplitude). The degree of sensitivity can be adjusted from the filters section in the GMT Soft/GMT Suite editor. The common terminal end (GND), which is separate from the CPU chassis was isolated by optocouplers.



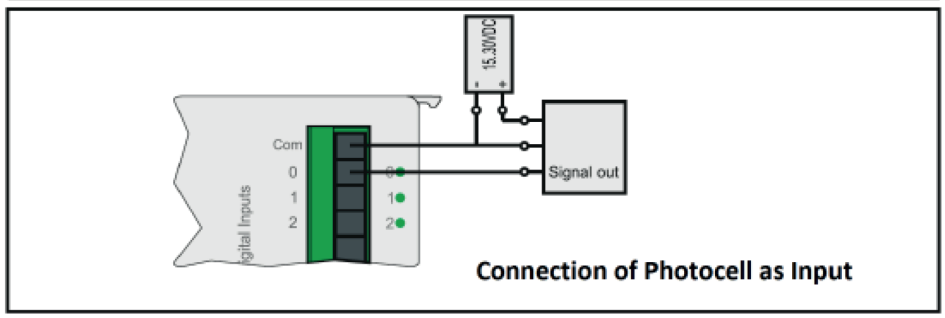
NPN Type Input Connection



PNP Type Input Connection



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

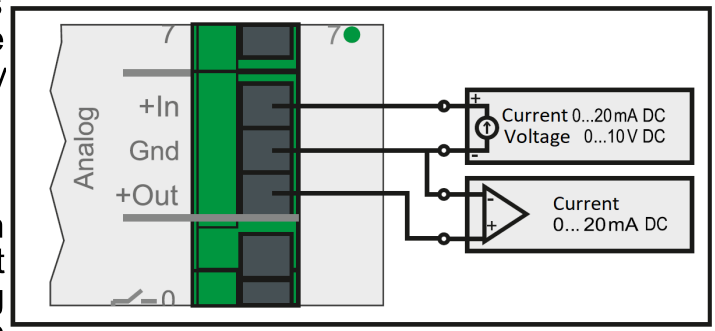


Connection of Photocell as Input

Analog input /output connections (1)

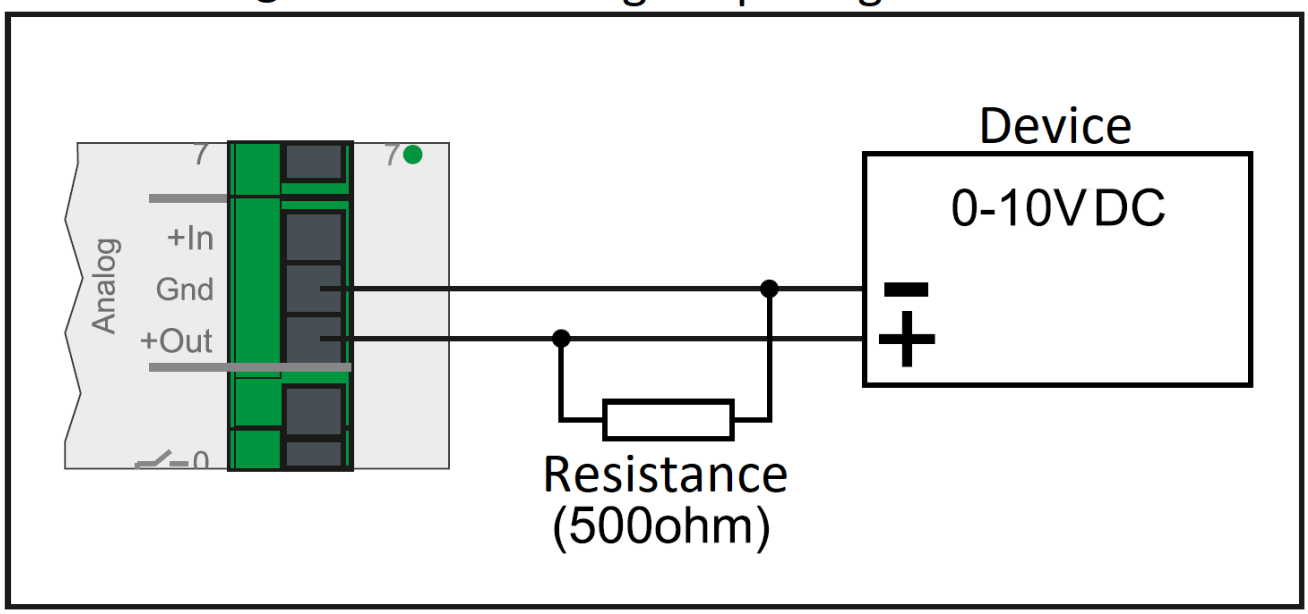
The proportional inputs and outputs on the PLC CPU. Inputs type are 0-10V DC, 0-20 mA DC and 4..20 mA DC. Output type is 0-20mA DC. If required, it can be converted to 0-10V DC using a 500 Ohm resistor.

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



Note: (1) For GLC - 296 and upper series only.

PLC CPU Modules
Communication ports

Ethernet port connection:

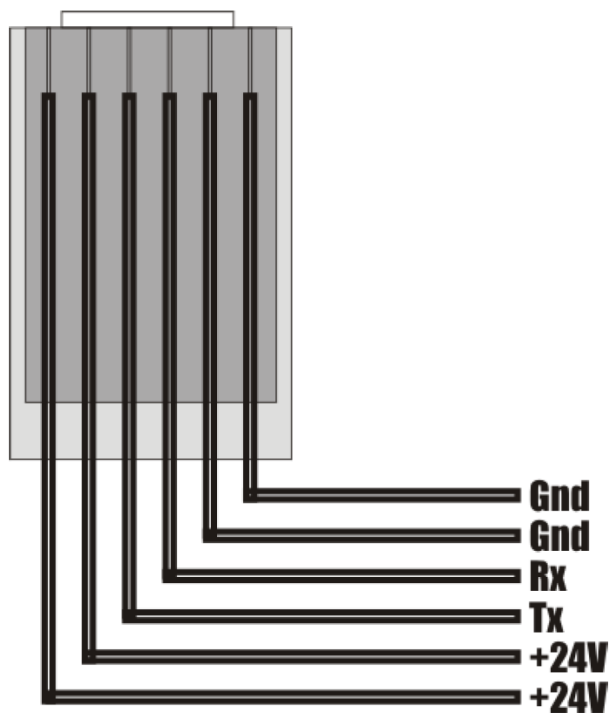
Purposes of ethernet port on the CPU are;

- Programming: This is used as a link building port where the prepared program is loaded, values are monitored and values are changed, from GMT Soft/GMT Suite 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.



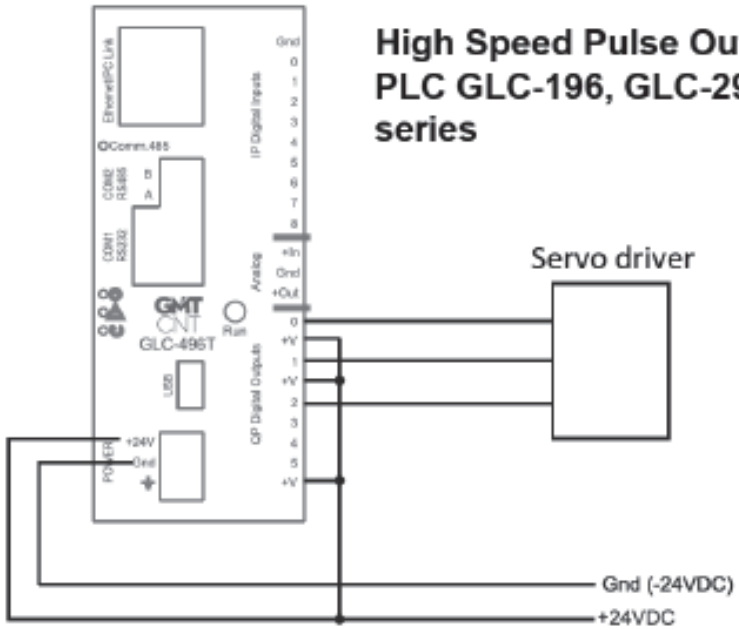
COM2 / RS485 connection:

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.

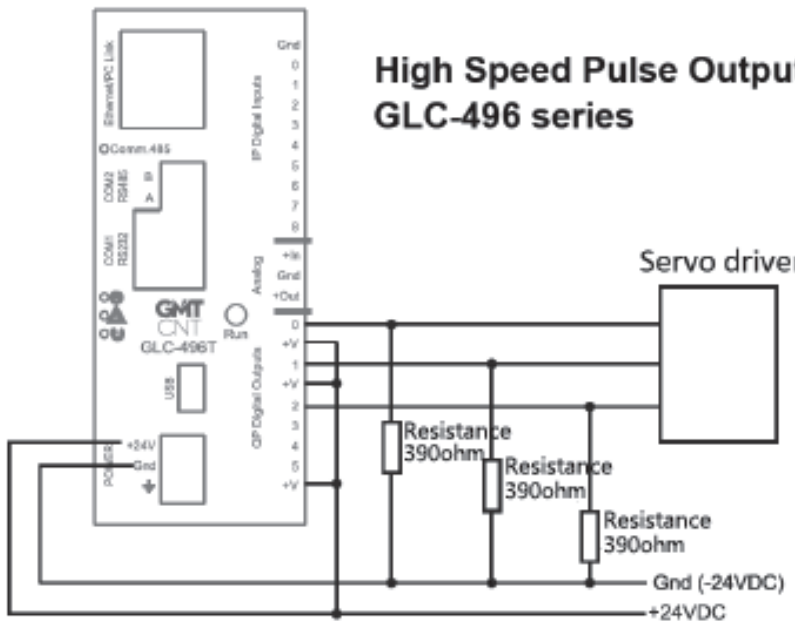
Note: (2) For GLC - 396 and upper series onlv.

PLC GLC-196, GLC-296 and GLC-396 series must be connected directly as shown below. In the GLC - 496 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.

High Speed Pulse Output Wiring for PLC GLC-196, GLC-296 and GLC-396 series



High Speed Pulse Output Wiring for GLC-496 series



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