



CtLG Driver
Manual

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1. Driver of Dedicated Protocol of LG Master-K and Glofa GM Controllers

1.1. Driver Use

CtLG driver is designed to exchange data between **asix** system and LG Industrial Systems Master – K and Glofa GM controllers with use of RS232 port. The driver enables access to data of LG controllers addressed directly by providing the address of variable within the device. The driver allows simultaneous handling of many LG controllers.

1.2. Declaration of Transmission Channel

The syntax of declaration of transmission channel using the driver is as follows:

```
Channel=UNIDRIVER, CtLG, Port=port_number; Speed=transmission_speed;
StopBits=number_of_stop_bits;ParityBit=control_of_frame_parity;
DataBits=number_of_data_bits; NumberOfBlocks=number_of_blocks;
TimeSynchr=address[:period];
```

where:

UNIDRIVER	- name of universal UNIDRIVER;
CtLG	- name of driver used for communication with LG controller;
Port	- number of COM serial port;
Speed	- speed of transmission between computer and device; the following speeds are acceptable: 1200, 2400, 4800, 9600, 19200, 38400, 56000, 57600, 115200, 128000; every speed is given in bits per second, i.e. bauds; default value is 1200 Bd;
StopBits	- number of stop bits: 1 or 2; for GlofaGM6 controller this parameter is built into controller on a permanent basis and amounts to 1; default value of the parameter is 1;
ParityBit	- defines the method of frame parity control; available options: <i>no</i> , <i>parity_control</i> , <i>odd_parity_contol</i> ; as substitutes for these options you may use, respectively: 0, 1, 2; for GlofaGM6 controller this parameter is built into controller on a permanent basis and amounts to 0, i.e. no; default value of the parameter is <i>parity_control</i> ;
DataBits	- number of data bits per frame: 7 or 8; for GlofaGM6 controller this parameter is built into controller on a permanent basis and amounts to 8; default value of the parameter is 8;
NumberOfBlocks	- max number of blocks specifying variables in a single read operation; maximum value of the parameter is 16; the parameter has been introduced because GLOFA controller properly executes queries for max 4 blocks (inconsistently with specification); default value of the parameter is 16;
TimeSynchr	- for Glofa controllers it is direct address of the table of 9 bytes, in controller that PC's system time is to be entered into. The table will be filled in with BCD-code numbers as follows: time[0] = two younger digits of year time[1] = month time[2] = day of month time[3] = hour time[4] = minutes

time[5] = seconds
 time[6] = day of week (Monday - 0, Tuesday - 1,... Sunday - 6)
 time[7] = two older digits of year
 time[8] = 1

e.g. 2001 - 03 - 15 18:30:45 Tuesday: time[0] = 01, time[1] = 03, time[2] = 15, time[3] = 18, time[4] = 30, time[5] = 45, time[6] = 03, time[7] = 20,

On Glofa controller's side, you should execute the command *RTC_SET argument*. The argument is symbolic address of the table of 8 bytes. When declaring this variable, in *Memory allocation* field select *Assign(AT)* option and pass direct address of the variable in the transmission channel declaration. Upon the system time is rewritten from PC to controller, value 1 is assigned to the ninth element of the table.

In case of MASTER-K controller, TimeSynchr is address of the table of word type consisting of five elements, which is available in controller N. The table is filled in with BCD-code numbers as follows:

time[0] = older byte = 2 younger digits of year, younger byte = month (1..12)
 time[1] = older byte = day of month (1..31), younger byte = hour
 time[2] = older byte = minutes, younger byte = seconds
 time[3] = older byte = 2 older digits of year, younger byte = day of week (Sunday - 0, Monday - 1...Saturday - 6)
 time[4] = 1

With exception of time[4], rewrite these words into special area of memory and set the appropriate bit.

period - default parameter to define the interval in seconds at which time will be rewritten from PC to the controller. By default, synchronisation time is 60 seconds.

EXAMPLE

An example of declaration of channel in which time will be synchronised for controller number 6 (GLOFA type) by the write into the area starting with MB10 (every 25 seconds):

PLC1 = UNIDRIVER, CtLG, Port=2;Speed=9600; StopBits=1;
 ParityBit=odd_parity_control; DataBits=8; TimeSynchr=6.MB10:25

1.3. Addressing the Process Variables

Addressing variables in Master - K family

The following direct address is only acceptable:

ControllerNo.TypeOfDevice.Address

where:

Controller no - number between 0 and 31.

Type of device:

Type of device	Range of device	Read/Write	Bit/Word
P (Input/Output relay)	P0 ~ P0031 (32 words) P0.0 ~ P31.15 (32 × 16 bits)	Read/Write	Both
M (auxiliary relay)	M0 ~ M191 (192 words)	Read/Write	Both

	M0.0 ~ M191.15 (192 × 16 bits)		
K (keep relay)	K0 ~ K31 (32 words) K0.0 ~ K31.15 (32 × 16 bits)	Read/Write	Both
L (link relay)	L0 ~ L63 (64 words) L0.0 ~ L63.15 (64 × 16 bits)	Read/Write	Both
F (special relay)	F0 ~ F63 (64 words) F0.0 ~ F63.15 (64 × 16 bits)	Read	Both
T (timer contact relay)	T0.0 ~ T0.255 (256 bits)	Read/Write	Both
T (timer elapsed value)	T0 ~ T255 (256 words)	Read/Write	Both
C (counter contact relay)	C0.0 ~ C0.255 (256 bits)	Read/Write	Both
C (counter elapsed value)	C0 ~ C255 (256 words)	Read/Write	Both
S (step controller)	S0 ~ S99 (100 sets)	Read/Write	Word only
D (data register)	D0 ~ D4999 (5000 words)	Read/Write	Word only

NOTE:

T and C devices should not be used for bit addressing because it does not work due to error in the controller's operating system.

There are two types of variables:

- bit,
- word.

The variable address may contain up to 8 characters (without device type character and ‘.’ character, if any). The address is given in decimal format. When bit is addressed within a word, the bit number (from 0 to 15) is given after dot. An exception to this rule is Timer and Counter types. As you can see in the above table, bits for these types are addressed from 0 to 255.

For example, 0. M5 – word with address 5

0. M5.10 – eleventh bit in word with address 5

EXAMPLE

Examples of variable declarations:

JJ_00, variable of WORD type with address M1, 0.M1, PLC1, 1, 1, NIC

JJ_01, variable of BIT type with address M5.10, 0.M5.10, PLC1, 1, 1, NIC

Addressing variables in Glofa – GM family

Direct address has the following format:

ControllerNo.TypeOfDevice.TypeOfVariable.Address

where:

ControllerNo - defines the controller no and is a number between 0 and 31;

TypeOfDevice - defines the type of device; the following types are available:

- M (internal memory),
- Q (output),
- I (Input).

The range of addressing for these devices is configurable and depends on type of device.

All of these devices can be both written to and read from:

TypeOfVariable - defines the type of variable. The following types are available:

- X – bit,
- B – byte
- W – word,
- D – double word.

For M device the address is given in decimal format and may contain maximum 13 characters, without the character of device type and variable type, e.g.:

3.MW1 - word with address 1 from dictionary no 3

If you want to address a bit in M device within a byte, word or double word, the bit number (counted from 0) in decimal format should be given after dot, for example:

4.MW1.14 - fourteenth bit in word 1 from dictionary 4

5.MD2.30 - thirteenth bit in double word 2 from dictionary 5

Bit can also be addressed directly using the X character, e.g.:

0.MX10 - tenth bit.

In case of addressing Q and I devices, the address is given in decimal format. These are three numbers (*base, slot, number*) separated with the '.' character, e.g.:

2.QX3.1.4 - controller no 2, 3 base, 1 slot, 4th bit,

3.IW2.4.1 - controller no 3, 2 base, 4 slot, 1st word.

EXAMPLE

Examples of variable declarations:

JJ_00, VARIABLE OF WORD TYPE WITH ADDRESS MW1, 0.MW1, PLC1, 1, 1, NIC

JJ_01, variable of BIT type with address QX3.1.4, 0.QX3.1.4, PLC1, 1, 1, NIC

1.4. Time marker

Values of variables read from LG are assigned PC's time stamp.

1.5. Driver Parameterisation

Driver parameterisation takes place with use of separate section named [CTLG], which is placed in initialisation file of application. Using this section, you may declare:

- log file,
- log file size,
- telegram log.

[***LOG_FILE = log_file_name***
 Meaning - for diagnostic purposes the text-type log file, into which messages about driver operation status are written, is used.
 Default value - by default, the log file is not created.

[***LOG_FILE_SIZE=number***
 Meaning - this item is used to define the size of log file, defined with use of LOG_FILE item.

Default value - by default, the log file size is 1 MB.

Parameter:

number - log file size in MB

[***LOG_OF_TELEGRAMS =Yes / No***
Meaning - this item allows contents of telegrams transferred between driver and controllers to be written into log file (declared with use of LOG_FILE item). The referred item should only be used in the **asix** system activation phase.

Default value - by default, value of this item is set to NO.

1.6. EXAMPLE of the Driver Parameterisation

An example of the driver section:

```
[CTLG]
```

```
LOG_FILE=d:\tmp\ctLG\LG.log
```

```
LOG_FILE_SIZE=3
```

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