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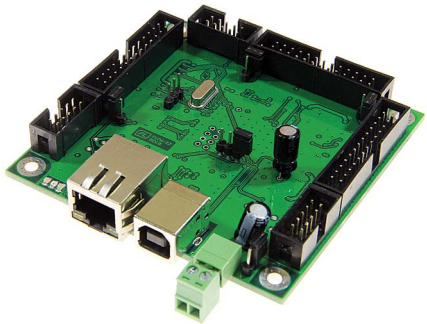
Installation guide



PLCM-E3

CNC Ethernet controller

CONTENTS:

Check wiki.purelogic.ru for more detailed information
You will find general information about PLCM series controller

1. GENERAL INFORMATION

This device is PLCM series controller (see “User manual”). It has 3 input-output ports and USB interface for connection with PC.

2. DELIVERY SET

- PLCM-E3 controller – 1 pcs.
- User manual for PLCM series controllers – 1 pcs.
- Installation guide for PLCM-E3 – 1 pcs.
- Disk with the software – 1 pcs.
- Ethernet cable – 1 pcs.
- USB cable, “B” type – 1 pcs.
- IDC26-DB25 (LPT) – 1 pcs.

3. TECHNICAL SPECIFICATIONS

Supply voltage	5V DC via XP9, 5V from USB port, 48V via Ethernet (PoE)
Maximum consumption current	250 mA
Control interface	Ethernet, USB, “B” type, STEP/DIR/ ENABLE signals translation, input signals translation, compatibility with MACH3
STEP signals maximum frequency	100 kHz
Quantity of inputs	15 pcs, buffered, 5V CMOS, Logical levels: “0”<1.8V, “1”>2.5V.
Quantity of outputs	Maximum input voltage: 5V
Maximum quantity of CNC machine axes	36 pcs, buffered, 5V CMOS, 10 mA MAX
Isolation resistance	6
Operating temperature	500 MOhm
Net weight	0 ... 40 °C
Overall dimensions (Width x Height x Depth)	0,3 kg

TURN OFF POWER DEVICE BEFORE MAKING ANY CONNECTIONS

POWER SUPPLY NEGATIVE WIRE CONNECTION WITH GROUND (GND), HOUSING AND ETC. IS FORBIDDEN

HIGH-QUALITY SHIELDED CONNECTION CABLES IS RECOMMENDED TO USE

CONTROLLER WORKS WITH R3.043.xxx MACH3 VERSIONS AND ABOVE, NECESSARILY UPDATE MACH3

4. BASIC SOCKETS AND INDICATORS

• XP7 socket (Fig. 2) is intended for connection PLCM-E2 to Ethernet local network. The connection is recommended to make by a cable which has category 5 or above. Patch cords application with direct and cross type of pressing is accepted. Possibly direct connection to PC without switchboard use.

• The XP8 socket is intended for connection of PLCM-E3 to PC USB port. The connection is recommended to make by a short shielded cable with ferrite rings.

• Controller has 3 ports (XP1, XP2, XP3), which are similar to PC LPT-port according to destination and pins numbering (Fig. 1). Adapter scheme (according to Fig. 1) allows to receive full LPT port analog from any PLCM-E3 port. One such adapter is included in the delivery set.

It is necessary to specify DB25 socket numbering of adapter in the Ports & Pins MACH3 dialog box.

Similarly to LPT port, 1, 2, 3, 4, 5, 6, 7, 8, 9, 14, 16, 17 pins are outputs, 10, 11, 12, 13, 15 are inputs.

• Near each port there is a jumper (JP1, JP2, JP3 for P1, P2, P3 ports accordingly), making closed which it is possible to apply supply voltage (+5V) on pin No. 26 of the corresponding socket controller . This opportunity can be used for an external equipment power supply connected to a controller port.

• XP6 (fig.2) allows to connect duplicate LEDs for controller state indication, for example, in the case of placement it in something housing. Reset output can be used for controller hardware reset. For this it is necessary to close 1 and 2 outputs of these socket.

• JP5 jumper connects a round pin platform (which is used for screw) to power supply negative wire and can be used for negative wire connection with housing in the case of ground certain type designing.

• JP4 jumper is for current value reset of controller IP-address to default value (192.168.10.10). For this it is necessary to close a jumper at SWITCHED OFF controller and to turn on power supply. Then pins are disconnected after 1-2 seconds.

DB25 PIN	IDC PIN
1	1
14	2
2	3
15	4
3	5
16	6
4	7
17	8
5	9
18	10
6	11
19	12
7	13
20	14
8	15
21	16
9	17
22	18
10	19
23	20
11	21
24	22
12	23
25	24
13	25
NC	**26**

Fig.1. Cable-adapter IDC26-DB25

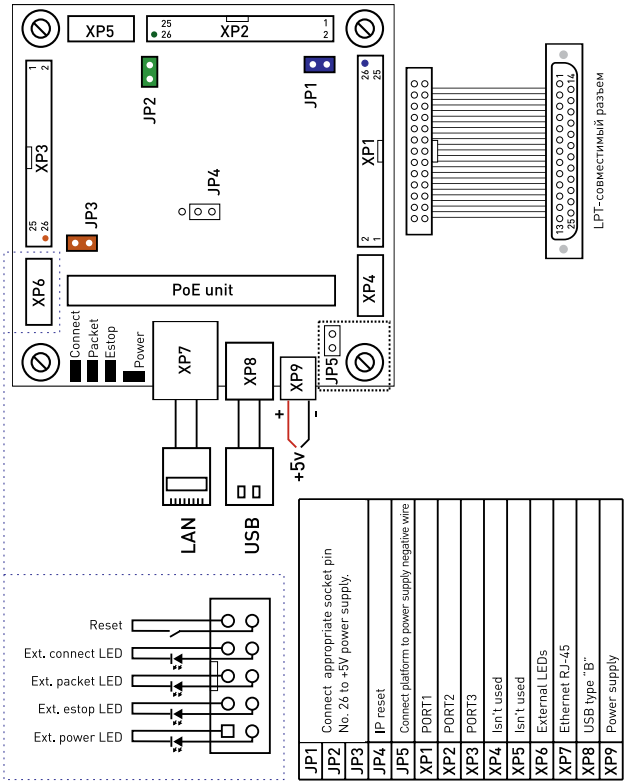


Fig. 2. Connection diagram

IDC26	PINS PURPOSE IN MACH3	input/Output
1	1	Output
2	14	Output
3	2	Output
4	15	input
5	3	Output
6	16	Output
7	4	Output
8	17	Output
9	5	Output
10	GND	-
11	6	Output
12	GND	-
13	7	Output
14	GND	-
15	8	Output
16	GND	-
17	9	Output
18	GND	-
19	10	input
20	GND	-
21	11	input
22	GND	-
23	12	input
24	GND	-
25	13	input
26	+5V (disconnectable)	-

Fig. 3. Outputs purpose of XP1, XP2, XP3 sockets

DB25	PINS PURPOSE IN MACH3	input/Output
1	1	Output
2	2	Output
3	3	Output
4	4	Output
5	5	Output
6	6	Output
7	7	Output
8	8	Output
9	9	Output
10	10	input
11	11	input
12	12	input
13	13	input
14	14	Output
15	15	input
16	16	Output
17	17	Output
18	GND	-
19	GND	-
20	GND	-
21	GND	-
22	GND	-
23	GND	-
24	GND	-
25	GND	-

Fig. 4. Adapter outputs purpose for XP1, XP2, XP3 ports

5. SOFTWARE INSTALLATION AND SETTING

1. Turn on the controller and connect it to the Ethernet or USB busbar (simultaneous connection through both interfaces is enabled).

Link LED should to light up in the process of Ethernet connection. If LED doesn't light up or blinks and network connection icon appears/ disappears in Windows, cable type automatic detection is incorrect (it is caused by feature of some network interface cards). In this case, it is required to adjust parameters manually. For this purpose go to "Start – Control panel – Network and Sharing Center – Local Area Connection – Properties". Further press «Configure» (Fig. 5). Select "Speed/duplex settings" property in "Advanced" window and set "10 Mbit/s full duplex" value (Fig. 6). (Parameters and names in various network interface cards can differ slightly from each other).

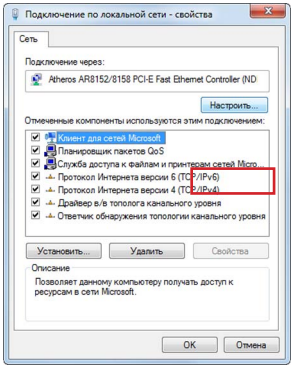


Fig. 5. Cable type setting

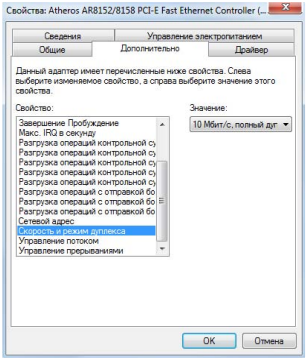


Fig. 6. Speed setting and Duplex Operating Mode setting.

2. It is necessary to install PlugIn for device operation with MACH3.

Download archive with PLCM series controllers software to the address www.purelogic.ru/files/downloads/SOFT/PLCM.zip and launch "setup.exe". Controller Setup Wizard will open (Fig. 7).

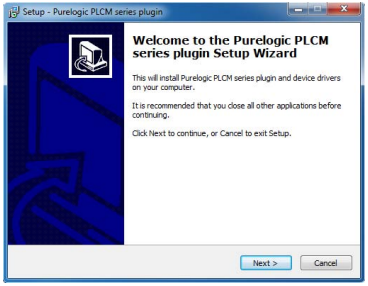


Fig. 7. Setup Wizard

Press "Next". If you install software for the first time and you want that Setup Wizard install of necessary drivers, select devices which it is planned to apply on this PC (Fig. 8). If any of devices isn't chosen, Setup Wizard will make only PlugIn updating for MACH3.

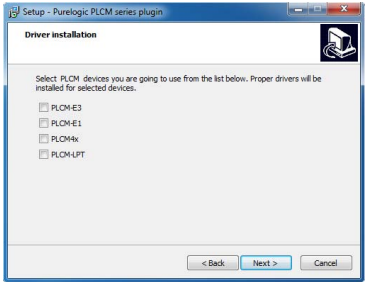


Fig. 8. Driver installation

Setup Wizard will suggest to perform automatic setting of PC network adapter for correct connection with PLCM-E3 after "Next" button pressing in the process of PLCM-E3 point choice (Fig. 9). Automatic search procedure of the controller can break a work of local network. Therefore use this function only if you don't use local network resources on this personal computer and you don't use the Internet. In search process controller should be connected to the local network.

Controller should be connected to PC using the USB interface in Wizard operating process. It is required for the correct driver USB installation.

Press "Next", "Install". Setup Wizard will copy necessary files and will finish the work.

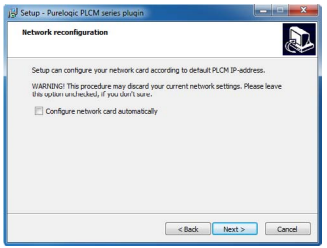


Fig. 9.
Network automatic installation

3. Select the corresponding PlugIn in a window presented at fig. 4. when MACH3 runs after PlugIn installation

As a rule, in the list there are two PlugIn versions for PLCM controllers: test and stable. Select that with which you want to work at present. So that MACH3 doesn't suggest to select PlugIn in each launching it is necessary to place the tick «Don't ask me again». If there is a need to change the output device, select MACH3 menu item – Function Cfg's – Reset device sel.

If you decided to pass to another version, for example, last time you were working with stable version, and now you want to try test version, after launching you NEED to follow in PlugIn settings (see below) and to update the controller internal software.

Fig. 10.
PlugIn choice.

4. After successful PlugIn launching in MACH3 PlugIn Control menu there will be a PLCM control item.

If image was appeared as in Fig.11 and you cann't select the device connected to Ethernet. It means that Windows Firewall blocks access to PLCM-E3. It is necessary to add MACH3 in Firewall exceptions or to disconnect a Firewall.

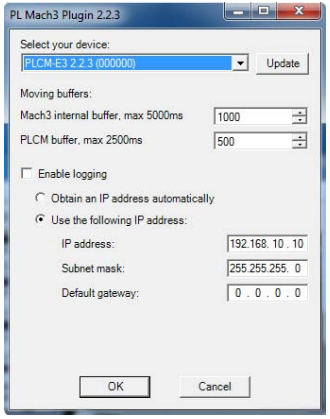


Fig. 11.
PlugIn setting in MACH3

5. Execute PlugIn setting.

It is necessary to select one of controllers connected to system from the drop-down list. There will be controller additional settings (Fig.12) after a choice. If PlugIn detects that the firmware became outdated, it will be offered to update a firmware in the controller. It is enough to make controller choice procedure once at the first device installation.

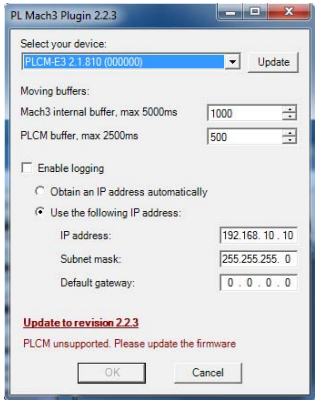


Fig.12.
PlugIn setting in MACH3

Settings description:

Time of MACH3 look-ahead trajectory calculation - specifies the data volume about a motion trajectory which the program needs to prepare in advance, to count forward, it is a buffer. The more this amount CNC operation is stabler. For example, MACH3 ceases to count new trajectory data during rotation of ToolPath images. Therefore the more those are counted in advance, motion «failure» probability is less during the image rotation or another load of MACH3.

Time of PLMACH look-ahead trajectory calculation - the similar buffer in PLCM board without MACH3 participating. The buffer stabilizes work during short-term failures of PLCM<>MACH3 connection and decelerations of MACH calculation.

Remark: On the one hand the more value of these parameters, the better (it is more buffer, operation is stabler). But with buffer increase FeedHold will be delayed to the sum of these two parameters, i.e. if MACH3 = 1 second buffer and PLMach = 0.5 second buffer, CNC system reaction time will be as the sum of FeedHold =1.5 second pressing and step motor braking time according to the pre-set profile of acceleration.

The logging

In the logging process the log-file of PLCM< > MACH3 interchange is saved in file «C:\MACH3\PLCM.log». If the device operation is incorrect this file needs to be sent to Purelogic RND technical support service with the detailed problem description.

Receive IP address automatically

We recommend to leave this point active if there is a DHCP server in your local network (the device which can dynamically set IP addresses; the usual house networking gateway for Internet connection can be it).

Use the following IP address

It is necessary to use this variant if there is no the DHCP in your network server fixing IP addresses.

Press the OK button for setting process completion.

Pay attention that documentation can be changed due
to constant technical upgrading of production.
You can download last versions from **www.purelogic.ru**

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