Platinum by Elmo

Go Safer, Smarter, Smaller, Simpler.
Go Platinum.

Platinum Maestro
Network Motion Controller
Installation Guide



May 2021 (Ver. 2.000)

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Catalog Number

P-MAS 0 N

Platinum Line

Hardware Option:

0 = Platinum Maestro only
1 = Platinum Maestro with extended IO w/ Diff IO
2 = Platinum Maestro with extended IO w/ TTL IO

IEC Application Licensed:

N = No IEC license
I = IEC licensed
V = IEC licensed + Visualization option

Revision History

Version	Date	Version	Date
Ver. 1.000	Jan 2016	Ver. 1.009	Nov 2019
Ver. 1.001	Mar 2016	Ver. 1.010	Jan 2020
Ver. 1.001	Mar 2016	Ver. 1.011	Aug 2020
Ver. 1.002	May 2016	Ver. 1.012	Aug 2017 For future use
Ver. 1.003	Dec 2016	Ver. 2.000	May 2021
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Chapter 1: Safety Information

In order to achieve the optimum, safe operation of the Platinum Maestro Multi-Axis Controller, it is imperative that you implement the safety procedures included in this installation guide. This information is provided to protect you and to keep your work area safe when operating the Platinum Maestro and accompanying equipment.

Please read this chapter carefully before you begin the installation process.

Before you start, ensure that all system components are connected to earth ground. Electrical safety is provided through a low-resistance earth connection.

The following safety symbols are used in this and all Elmo Motion Control manuals:



Warning:
This information is needed to avoid a safety hazard, which might cause bodily injury or death as a result of incorrect operation.



Caution:
This information is necessary to prevent bodily injury, damage to the product or to other equipment.



Important:
Identifies information that is critical for successful application and understanding of the product.

The following symbols are used in this document:



Note:
Information critical to the understanding and\or operating the feature.



Tip:
Information that helps understanding a feature, is good practice or a possible different way of action.

1.1 Cautions

- The Platinum Maestro must be connected to an approved 24 VDC power supply through a line that is separated from hazardous line voltages using reinforced or double insulation in accordance with approved safety standards.
- Before switching on the Platinum Maestro, verify that all safety precautions have been observed and that the installation procedures in this manual have been followed.

1.2 Directives and Standards

The Platinum Maestro conforms to the following industry standards:

Standard	Item
In compliance with **EN 60204-1**	Low Voltage Directive 73/23/EEC
In compliance with **CE 2006/95/EC**	Low-Voltage Directive 2006/95/EC

The Platinum Maestro has been developed, produced, tested and documented in accordance with the relevant standards. Elmo Motion Control is not responsible for any deviation from the configuration and installation described in this documentation. Furthermore, Elmo is not responsible for the performance of new measurements or ensuring that regulatory requirements are met.

1.3 Warranty Information

The products covered in this manual are warranted to be free of defects in material and workmanship and conform to the specifications stated either within this document or in the product catalog description. The Platinum Maestro is warranted for a period of 12 months from the date of shipment. No other warranties, expressed or implied – and including a warranty of merchantability and fitness for a particular purpose – extend beyond this warranty.

Chapter 2: Product Description

This installation guide describes the Platinum Maestro Network Motion Controller and the steps for its wiring, installation and power up. Following these guidelines ensures maximum functionality of the system to which it is connected.

2.1 Description

The Platinum Maestro is Elmo's premium network motion controller. It works in a network based system in conjunction with Elmo's intelligent servo drives to provide a total multi-axis motion control system solution.

The Platinum Maestro Motion Controller incorporates an integral high-level computational dual-core system (2 x 1.5 GHz) with limitless memory (RAM, ROM, and SD-Card), and onboard additional hardware peripherals.

The Platinum Maestro shares the motion processing workload with Elmo's SimplIQ, Gold, and Platinum Line drives, forming a distributed motion control system. The best servo and system performance is achieved by combining the specific Family Line drives, and the new real-time motion control capabilities of the Platinum Maestro controller.

The Platinum Maestro provides:

- Self-sufficient machine motion control – No reliance on connection with PC server
- Time deterministic control over motion, I/Os and processes in the system
- Complete compatibility with recognized networking and communications protocols
- Full, real-time, multi-axis motion synchronization
- Advanced user programming capabilities based on the leading standards
- Unified development platform that streamlines motion control solutions for novice and expert programmers alike

The Platinum Maestro offers real-time motion control support for full multi-axis system synchronization, using the well-known industry interface PLCopen for Motion Control standard.

Various programming capabilities, such as the IEC-61131-3 standard languages, as well as native C and C++ programming support, dramatically accelerate user-level program execution. Standard solutions are selected for ease of use.

Low-level communication with drives and I/O devices over the device network uses the CAN industry standard (DS 301, DS 401 for I/O devices, and DS 402 for drives and motion device profiles). These are used over standard CAN networks, as well as with the new EtherCAT CoE (CAN over EtherCAT) protocols.

Host interfaces are implemented using industry standard communications protocols, such as Ethernet TCP/IP and higher level protocols such as Ethernet/IP and Modbus.

Standardization in protocols, definitions, and APIs allows users rapid system level integration and opens the system to third party devices on the device network.

Chapter 3: Technical Specifications

3.1 Processor System

Feature	Details
Processor	Computational core system based on Dual Core (2×1.5 GHz)
On Board Flash	4 GByte
RAM	DDR-3, 4 GByte, 64 bit bus width, (Operational at Full Core Rate)
SD Card	MicroSD™ Memory Card (Push-push Type) SCHA

3.2 Communications

Specification	Details
Ethernet for Host	1 Ethernet port 1000 base-T Automatically detected 10/100/1000Mbps CAT5e/6 Cable UDP, Telnet, TCP
EtherCAT Master Field bus	2 Ethernet port 100 base-T for EtherCAT Master. Baud Rate: 100 Mbit/sec CAT5e Cable CoE, EoE, FoE EtherCAT Master with Full redundancy support
CAN for device network	1 Port 1Mbps, with Isolation CANopen master port Maximum Baud Rate of 1 Mbits/sec. **CAN Profile:** DS 301 **Device Profile** (drive and motion control)**:** CAN device profiles, e.g., DS301, DS505, DS402, DS401 (for I/O)
USB - Type A	Device USB: High-Speed (HS 480Mbps) USB 2.0
USB - Type B Device	Device USB: High-Speed (HS 480Mbps) USB 2.0

3.3 Power Supply

Feature	Details
Supply input voltage	Single power supply, 12V to 31V
Supply input power	Typical 7.5 W (Without video support)

3.4 Physical Specifications

Feature	Details
Weight	410 g (14.5 oz)
Dimensions	150 mm x 105 mm x 28 mm (5.91" x 4.13" x 1.10")
Mounting Method (with adapter)	Wall Mount (“Bookshelf”)

3.5 General

Feature	Details
RTC	Real Time Clock Option with 3V battery
Internal System BIT	The Platinum Maestro supports internal hardware BIT (Built-in-tests) procedures to check the system integrity level on each power up
Diagnostic LEDs	EtherCAT and Ethernet activity

3.6 Environmental Conditions

Feature	Details
Ambient operating temperature	0 °C to 40 °C (32 °F to 104 °F)
Storage temperature	-20 °C to +85 °C (-4 °F to +185 °F)
Maximum non-condensing humidity	90%

Chapter 4: Platinum Maestro Software Specifications

4.1 Operating System

Feature	Details	
Linux Operating System	With Elmo's RT extension for real-time motion control support	
Motion Programming and Debugging	Native C Programming, running on the target CPU. Compiling and debugging via the Eclipse IDE using GCC under Cygwin.	
	IEC 61131-3 with PLCopen Motion Library extension, using Elmo IDE. The following languages are supported:	
		Structured text (ST), textual Function block diagram (FBD), graphical Ladder diagram (LD), graphical Sequential function chart (SFC), has elements to organize programs for sequential and parallel control processing.

4.2 Axes

Feature	Details
Axes	Up to 96 axes, allowing mixed single axis, multiple axis and coordinated axes motions
Axis Types	Intelligent Servo Drives (Elmo), supporting the SimplIQ, Gold, and Platinum lines Operation in Numeric Control – NC - (real-time master synchronization) as well as non-NC modes DS 402 CoE for EtherCAT and standard DS 402 drives for CANopen
Control System Update Rate	**EtherCAT:** Cycle Simultaneous Update Rates: ≥ 250 µs for up to 16 axes 500 µs for 32 axes 1 mSec. for 64 axes Cycle Jitter: < 1 µs, based on Master DC (Distributed Clock) support, for the full network **CAN:** Cycle Update Rate ≥ 1 mSec. (CAN physical network limitations only) Cycle Jitter: < 100 µs for CAN Sync message initiation (actual jitter dependent on the CAN network's physical limitations)

4.3 Motion Modes and Interfaces

Feature	Details
The Platinum Maestro motion interfaces use PLCopen Standard	64 bit, real-time, double precision profile calculations, allowing full on-the-fly control over speed, acceleration, deceleration and jerk Complex motion schemes, including look-ahead optimizing of trajectory speed calculations, for complex vector motions Cyclic buffer for 1,000 function blocks (a buffer for 1,000 motion segments). The cyclical buffer removes any practical limit on the number of function blocks
Communication Protocols	**Host:** Ethernet TCP-IP/UDP for operational modes Telnet communication for setup and configuration USB: Using binary protocol (maintenance) Application level: Ethernet-IP/Modbus **Device Network:** EtherCAT: CoE/EoE/FoE, supports distributed clock master CAN: CANopen device profiles, e.g., DS 301, DS 305, DS 402, DS 401 (I/O device profile)
Host and Internal Software Interface	TCP/IP interface from Host Computer. Software Library is provided for easy TCP/IP communication interface. This version will also support Ethernet-IP and Modbus over the TCP-IP. Internal Software libraries, for "C" user programs are provided, to write user code running on the Platinum Maestro target processor (native mode).
Data Recording	8 MB data recording Up to 64 vectors can be recorded simultaneously. Supports more than 10 advanced triggering options and real-time scope capabilities Very fast data upload using Ethernet
Upload/Download Support	Firmware update support (Platinum Maestro and drives) System resource files Axis parameter files

4.4 Drive Communication Bridge Support

Feature	Details
Communication	The Platinum Maestro supports full communication with any specific drive (EtherCAT and CAN) for the purpose of simple tuning or configuration at the drive level, i.e. there is no need for direct communication with the drive.

Feature	Details
Spatial Position-Based Pulse Generation	The Platinum Maestro supports spatial (along the path) position-based pulse generation. This is a unique feature, required for the generation of position-based events in 3D scanning systems. The Platinum Maestro system, with Elmo's intelligent SimplIQ, Gold, and Platinum servo drives, can support single axis and spatial enhanced position-based compare functions, resulting in trigger output signals accurate to 1 encoder count along the trajectory path.

4.5 General

Feature	Details
Network Encoders	Supports master based motion on network encoders
Position Error Mapping	Supports 1-D, 2-D, and 3-D position-based error mapping compensation

4.6 Communication Options

The Platinum Maestro can communicate with a host PC either via a standard Ethernet port or through USB using a binary protocol for maintenance.

The Platinum Maestro communicates with its network devices using either EtherCAT or CAN networks.

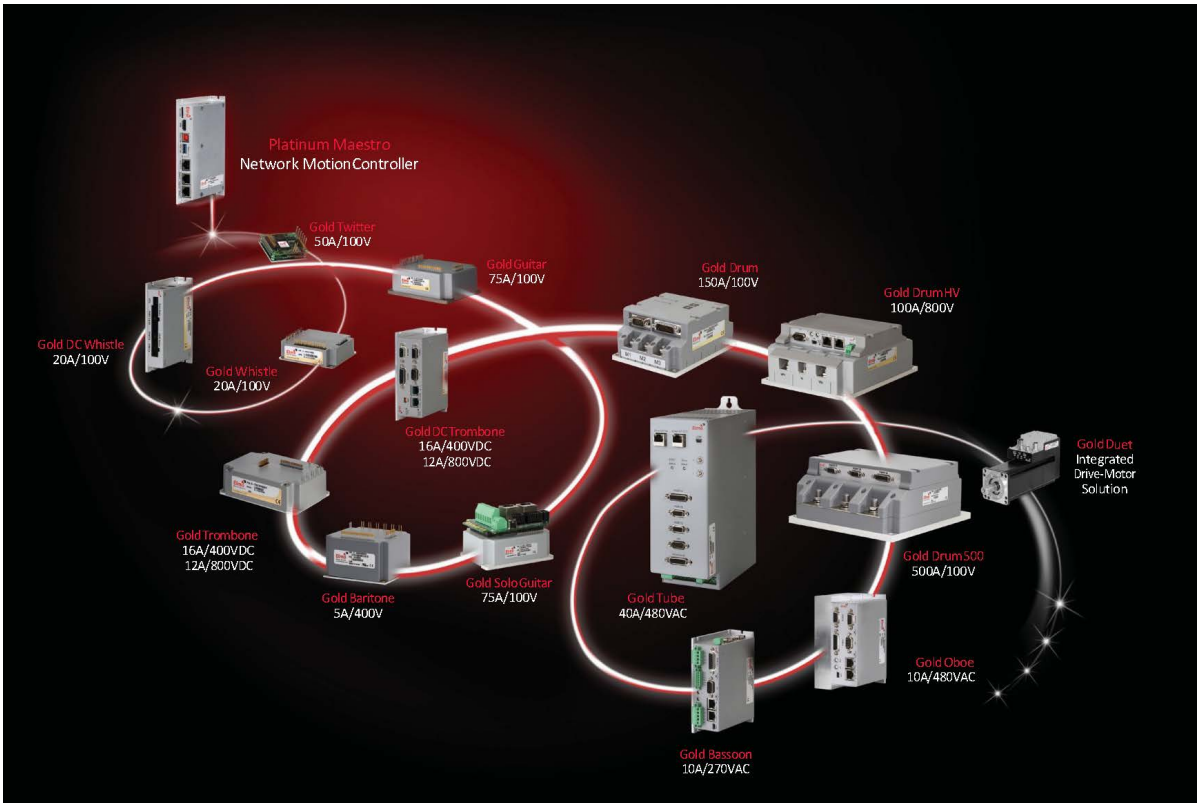


Figure 1: The Platinum Maestro Network Connections

Chapter 5: How to Use this Guide

This manual is part of a documentation set that can be used to set up and program the motion of any machine whose motors are controlled by Elmo's SimplIQ, Gold, and Platinum Line servo drives. When used in conjunction with the Maestro Software Manual it describes everything needed to get the Platinum Maestro up and running. Please read the safety instructions in the first chapter before starting.

After you have successfully mounted and installed the Platinum Maestro we suggest that you read the Platinum Maestro Software Manual. If you have not already done so, follow the instructions in the Installation Guide that arrived with your servo drive, and install a drive. At least one drive needs to be connected to the Platinum Maestro in order for it to function as a motion controller.

Chapter 6: Installation

6.1 Environmental Conditions

You can guarantee the safe operation of the Platinum Maestro by ensuring that it is installed in an appropriate environment.

For safe operation of the Platinum Maestro make sure it is installed in an appropriate environment.

Feature	Value
Ambient operating temperature	0 °C to 40 °C (32 °F to 104 °F)
Storage temperature	-20 °C to +85 °C (-4 °F to +185 °F)
Maximum non-condensing humidity	90%
Operating area atmosphere	No flammable gases or vapors permitted in area

6.2 Unpacking the Components

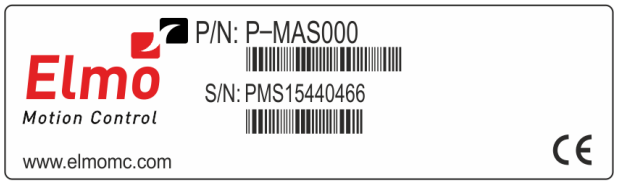
Before you begin working with the Platinum Maestro system, verify that you have all of its components, as follows:

- The Platinum Maestro multi-axis motion controller
- Platinum Maestro software which may be downloaded from www.elmomc.com

The Platinum Maestro is shipped in a cardboard box with Styrofoam protection.

To unpack the Platinum Maestro:

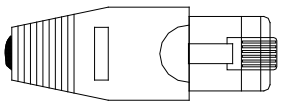
1. Carefully remove the Platinum Maestro from the box.
2. Check the Platinum Maestro to ensure that there is no visible damage to the instrument. If any damage has occurred, report it immediately to the carrier that delivered your controller.
3. To ensure that the Platinum Maestro you have unpacked is the appropriate type for your requirements, locate the part number sticker on the side of the Platinum Maestro as shown below.



PMAS005B

The part number at the top gives the type designation.

4. Verify that the Platinum Maestro type is the one that you ordered.
5. Refer to the appropriate part number in the section Catalog Number at the beginning of the installation guide.
6. If you are using CAN networking, verify that you have CAN termination resistors (dongles), illustrated at side.





6.3 Mounting the Platinum Maestro

The Platinum Maestro has three mounting options:

- Wall mount
- Surface mount

6.3.1 Wall Mount

Two M4 round head screws, one through each opening in the heat sink, are used to mount the Platinum Maestro (see the diagram below) on a wall.



Figure 2: Wall Mounting the Platinum Maestro

6.3.2 Surface Mount

Use four M4 round head screws, one through each opening in the heat sink to connect the Platinum Maestro to a surface.

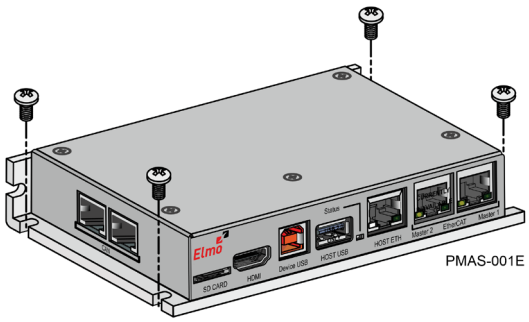


Figure 3: Surface Mounting the Platinum Maestro

Chapter 7: Wiring

7.1 Wiring the Platinum Maestro

Once the Platinum Maestro is mounted, you are ready to wire the device. Proper wiring, grounding and shielding are essential for ensuring safe, immune and optimal performance of the Platinum Maestro.

- Use shielded CAT5e/6 cables for Ethernet and EtherCAT communication.
- After completing the wiring, carefully inspect all wires to ensure tightness, good solder joints and general safety.

7.2 Connector Types

The Platinum Maestro has the following connectors:

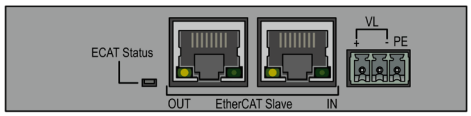
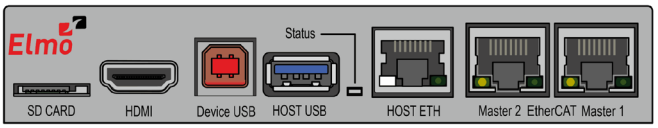
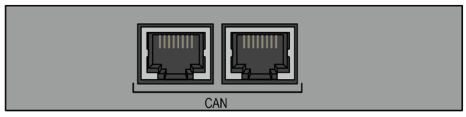
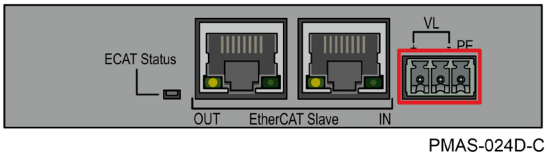
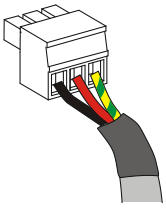
Pins	Type	Function
Top Connector		
	 PMAS-024D	
3	Phoenix 3.81 mm Pitch Header	Power and ground
Front Connectors		
	 PMAS026D	
	MMC1 Micro SD Card	SD Card
13	HDMI	HDMI (dependent on the firmware version)
	Type B - Device	Device USB
	Type A	USB
8	RJ-45	Host EtherCAT
8	RJ-45	EtherCAT Master 1
Bottom Connectors		
	 PMAS-025B	
8	RJ-45	CAN
8	RJ-45	CAN

Table 1: Connector Types

7.2.1 Power Connector

Pin	Signal	Function
PE	PE	Protective Earth
[-]	VL-	Power Supply Input Return
[+]	VL+	Power Supply Input Positive

Connector Location	Cable Connector
 PMAS-024D-C **3-Pin 3.81 mm Pitch Phoenix Header (MC 1.5/3-G-3.81)**	 **3-Pin Phoenix Plug (MC 1.5/3-ST-3.81)**

Type	Manufacturer & Part No.	Mating Connector
3.81 mm pitch Header and Plug	Phoenix Header MC 1.5/3-G-3.81	Phoenix Plug (supplied) MC 1.5/3-ST-3.81

Table 2: Platinum Maestro Power and Ground Connectors

7.3 Connecting the DC Power Supply

The Platinum Maestro requires 7.5 W when turned on. Any isolated power supply that can supply that power is acceptable. The supplied power must be within the rated voltage
range of 12 V to 32 V.

Connect the DC output from the power supply to the power input port on the Platinum Maestro using the 3-pin power plug provided.

To connect the power supply:

- Use a 24 AWG twisted pair shielded cable. The shield should have copper braid.
- Before applying power, first verify the polarity of the connection (protected).

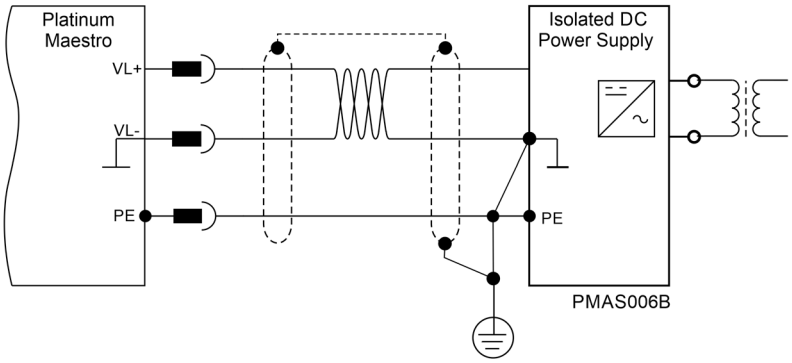


Figure 4: Power Supply Connection Diagram

7.4 Status Indicator

Figure 5 shows the position of the red/green dual LED, which is used for immediate indication of the Initiation and Working states.

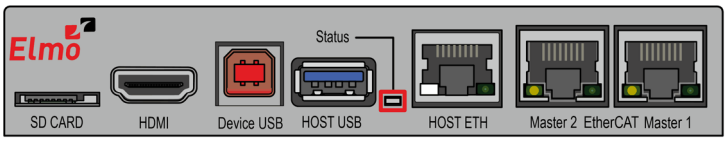


Figure 5: Platinum Maestro Status Indicator

The red/green dual LED is used for immediate indication of the following states:

- **Initiation state:** In this state the LED indicates whether the Maestro is in the boot state (blinking red) or in the operational state (steady green).
- **Error state:** In this state the LED indicates whether the motion controller is in error state (blinking green).

7.5 EtherCAT Status Indicator

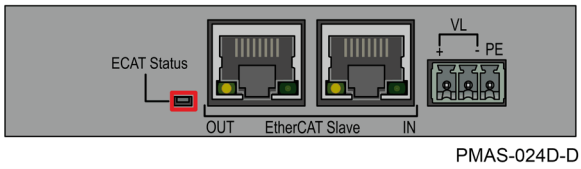


Figure 6: EtherCAT Status LEDs

The EtherCAT status indicator is a single red/green dual bi-colored LED that combines the green RUN indicator and the red ERROR indicator of the EtherCAT state machine. For further details, see the EtherCAT Application Manual.

7.6 EtherCAT Master Connectors

7.6.1 EtherCAT Master Port 1 Connector

Pin	Signal	Function
1	Ethernet_TX+	Ethernet transmit +
2	Ethernet_TX-	Ethernet transmit -
3	Ethernet_RX+	Ethernet receive +
4,5	N/A	
6	Ethernet_RX-	Ethernet receive -
7, 8	N/A	

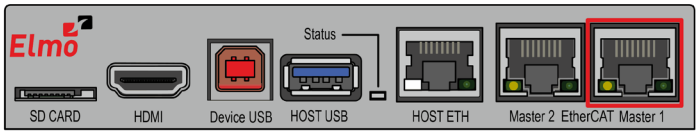
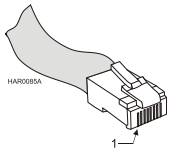
Connector Location	Cable Connector
 PMAS026D-J **8-Pin RJ-45 Connector**	 **8 pin RJ-45 plug**

Table 3: EtherCAT Master Port 1 Pin Assignments

7.6.2 EtherCAT Master Activity Indicators

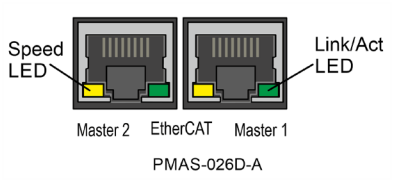


Figure 7: EtherCAT Slave Status LEDs

The green LED is the link/activity indicator (Figure 7). It shows the state of the applicable physical link and the activity on that link.

The amber LED is the speed indicator (Figure 7). It shows the speed of the connection on the Ethernet line. The possible states of these LEDs are summarized in Table 4.

LED	State	Meaning
Link /Activity	Off	No link is established
	On	A link is established
	Blinking	There is data transmission activity
Speed	On	The connection speed is 100 Mbps The speed of the EtherCAT line must be 100 Mbps. Otherwise, there is no EtherCAT data transmission
	Off	The connection speed is 10 Mbps

Table 4: LED States

7.6.3 EtherCAT Network

The Platinum Maestro is the master of the EtherCAT network and must always be the first device in the line.

The Ethernet Master 1 port of the Platinum Maestro should be connected to the EtherCAT In port of the next device down the line. The EtherCAT Out port of the last device in line can be left open. If redundancy is required, the Out port of the last device should be connected to the In port of the Platinum Maestro.

Note:
When connecting the EtherCAT communication cable it is recommended to use shielded CAT5e cable

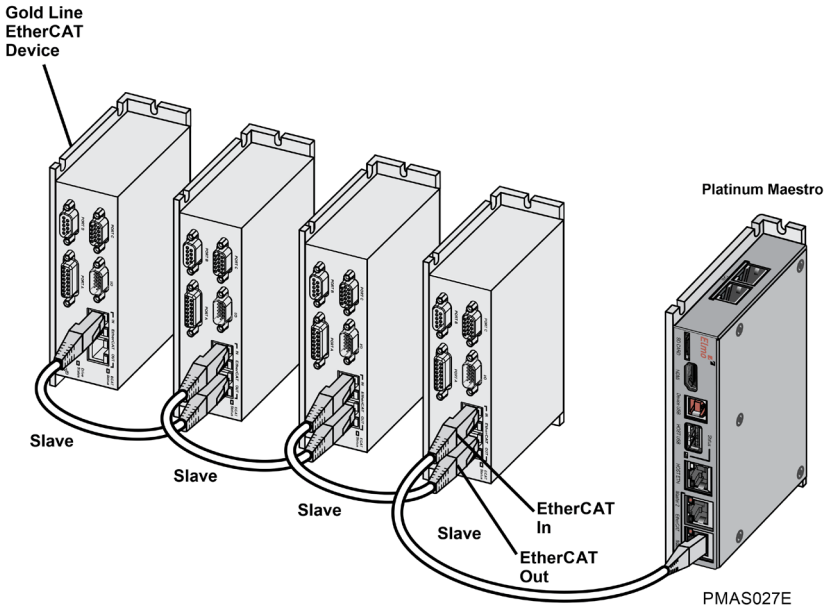


Figure 8: EtherCAT Gold Drives Network with no Redundancy

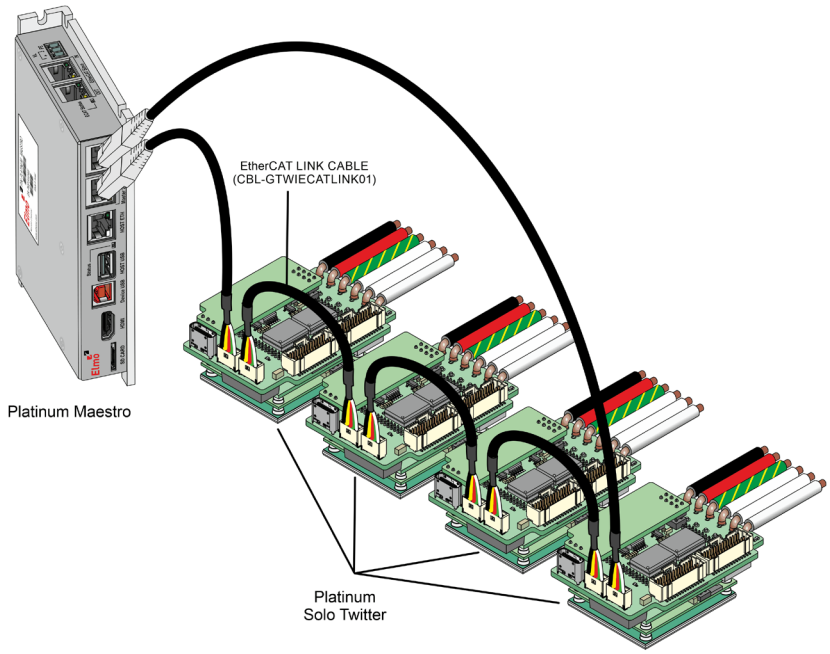


Figure 9: EtherCAT Platinum Drives Network with Redundancy

7.6.4 Ethernet Host Connectors

Pin	100Base-T		1000Base-T	
	Signal	**Description**	**Signal**	**Description**
1	TX+	Transmit Data+	BI_DA+	BiDirectional Data A+
2	TX-	Transmit Data-	BI_DA-	BiDirectional Data A-
3	RX+	Receive Data+	BI_DB+	BiDirectional Data B+
4	n/c	Not connected	BI_DC+	BiDirectional Data C+
5	n/c	Not connected	BI_DC-	BiDirectional Data C-
6	RX-	Receive Data-	BI_DB-	BiDirectional Data B+
7	n/c	Not connected	BI_DD+	BiDirectional Data D+
8	n/c	Not connected	BI_DD-	BiDirectional Data D-

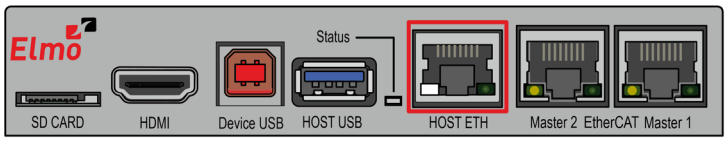
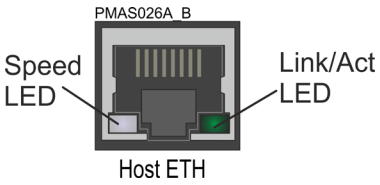
Connector Location	**Cable Connector**
 **8-Pin RJ-45 Connector**	 **8 pin RJ-45 plug**

Table 5: EtherCAT Host Pin Assignments

7.6.4.1 Ethernet Host Activity Indicators

The green LED is the link/activity indicator. It shows the state of the applicable physical link and the activity on that link.

The white LED is the speed indicator. It shows the speed of the connection on the Ethernet line. The possible states of these LEDs are summarized in Table 6.



LED	State	Meaning
Link /Activity	Off	No link is established
	On	A link is established
	Blinking	There is data transmission activity
Speed	Green	The connection speed is 1000 Mbps
	White	The connection speed is 100 Mbps
	Off	The connection speed is 10 Mbps

Table 6: LED States

7.6.5 Ethernet Communication

Note:
When connecting the Ethernet communication cable use a shielded CAT5e/6 Ethernet cable.

The Platinum Maestro connects to a PC either directly or through a hub, switch or router. Use a standard shielded CAT5e/6 Ethernet cable.

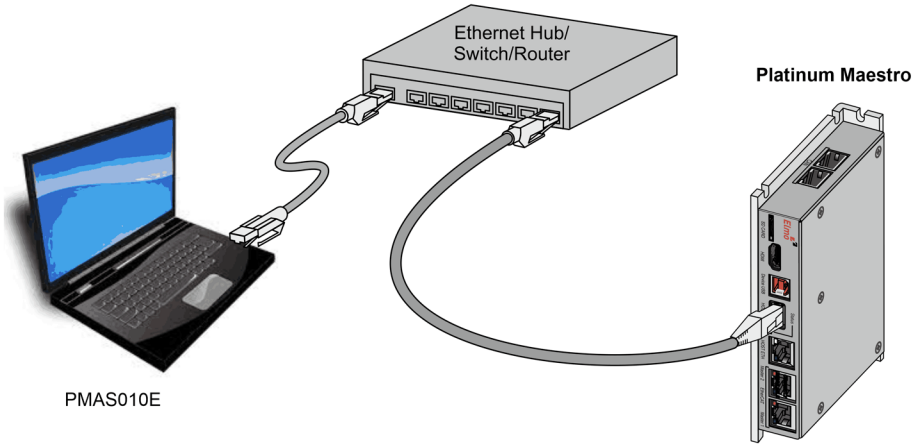


Figure 10: Platinum Maestro Connected to a Network

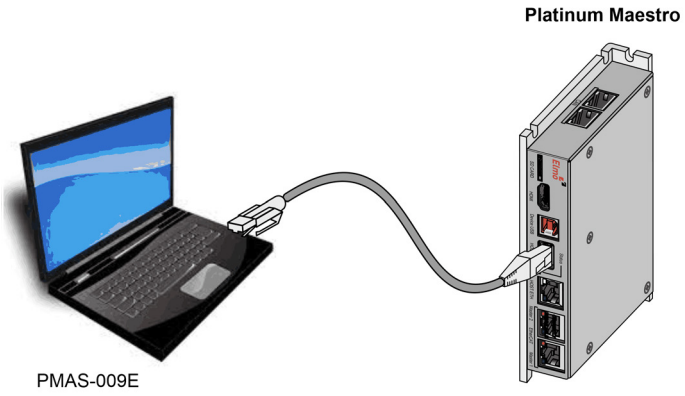


Figure 11: Platinum Maestro Connected Peer-to-Peer to a PC

7.7 CAN Connectors

Pin	Signal	Function
1	CAN_H	CAN_H bus line (dominant high)
2	CAN_L	CAN_L bus line (dominant low)
3	CAN_COMRET	CAN Communication Return
4, 5	N/A	—
6	CAN_SHLD	Shield, connected to the RJ plug cover
7	CAN_COMRET	CAN Communication Return
8	N/A	—

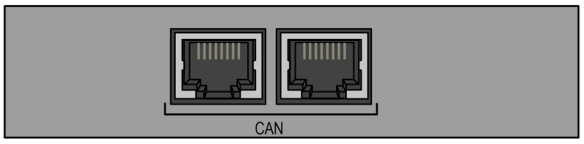
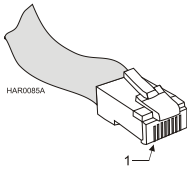
Connector Location	Cable Connector
 8-Pin RJ-45 Connector	 8 pin RJ-45 plug

Table 7: CAN Cable Pin Assignments

To connect the CAN communication cable:

- Use 26 or 28 AWG twisted pair shielded cables. For best results, the shield should have aluminum foil and be covered by copper braid with a drain wire (CAT5e FTP applicable).
- Connect the shield to the ground of the host (PC). Usually, this connection is soldered internally inside the connector at the PC end. You can use the drain wire to facilitate connection.
- The male RJ plug must have a shield cover.
- Ensure that the shield of the cable is connected to the shield of the RJ plug. The drain wire can be used to facilitate the connection.
- Connect a 120 Ω termination resistor to each end of the network cable.
  (The Platinum Maestro does not have an internal terminal.)
- A termination resistor is not required to be installed at the unused CAN port on the Platinum Maestro. It is optional.

- Use the CAN termination dongle supplied as a second “device end”. Simply insert the termination resistor into the CAN connector of the second end device on the bus. This is only possible if there are two CAN connectors.

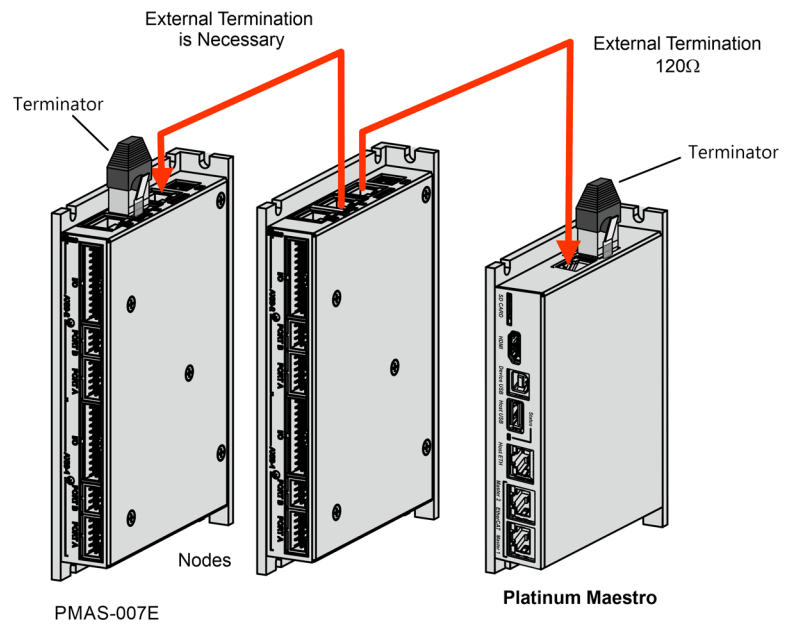
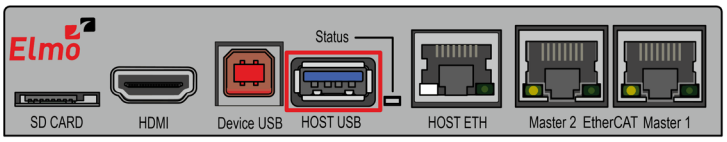
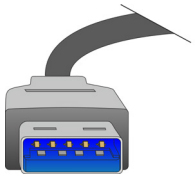


Figure 12: Connecting a 120 Ω Termination Resistor to Each End of the Network Cable

7.8 USB 2.0 Type A

The Platinum Maestro supports USB 2.0.

Pin	Signal	Function
1	USB VBUS	USB VBUS 5 V
2	USBD-	USB _N line
3	USBD+	USB _P line
4	USB COMRET	USB communication return
5	StdA_SSRX-	Super-Speed transmitter differential pair
6	StdA_SSRX+	
7	GND_DRAIN	Ground for signal return
8	StdA_SSTX–	SuperSpeed receiver differential pair
9	StdA_SSTX+	

Connector Location	Cable Connector
 PMAS026D-E **9-Pin Connector**	 **USB 3.0 Connector**

7.9 Device USB 2.0 Type B

The Platinum Maestro supports USB 2.0 (Host mode) in communication speed of Low-Speed (1.5Mbs), Full-Speed (12Mbs), and High-Speed (480Mbps).

Pin	Signal	Function
1	USB VBUS	USB VBUS from host
2	USBD-	USB _N line
3	USBD+	USB _P line
4	USB COMRET	USB communication return

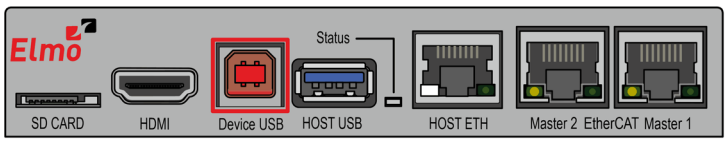
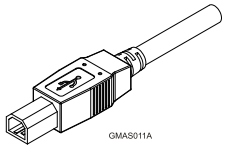
Connector Location	Cable Connector
 PMAS026D-F **USB 2.0 Connector**	 **USB Device Type B Plug**

Table 8: USB Pin Assignments

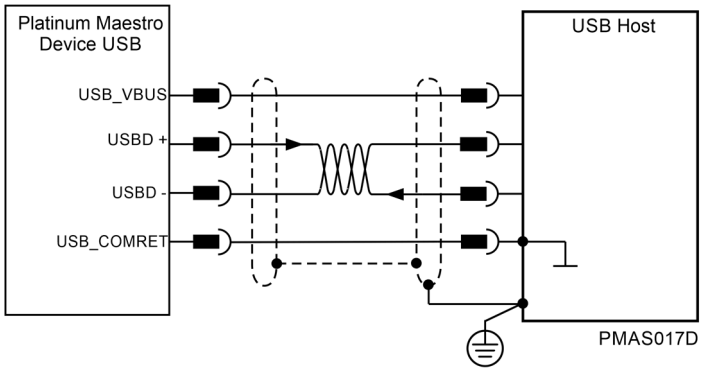
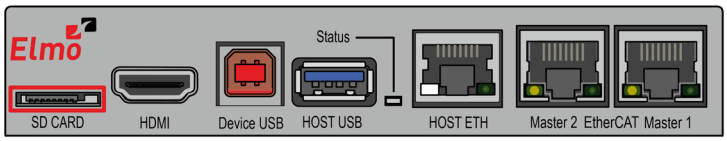


Figure 13: USB Network Diagram

To connect the USB communication cable:

- Connect the shield to the ground of the host (PC). Usually, this connection is soldered internally inside the connector at the PC end. You can use the drain wire to facilitate connection.
- Ensure that the shield of the cable is connected to the shield of the connector used for communications. The drain wire can be used to facilitate the connection.

7.10 microSD™ Memory Card (Push-push Type) SCHA

Connector Location	Cable Connector
 PMAS026D-I 	 **MicroSD Memory Card**

7.11 Powering Up

After the Platinum Maestro has been mounted, check that the cables are intact. The Platinum Maestro is then ready to be powered up.

7.12 Initializing the System

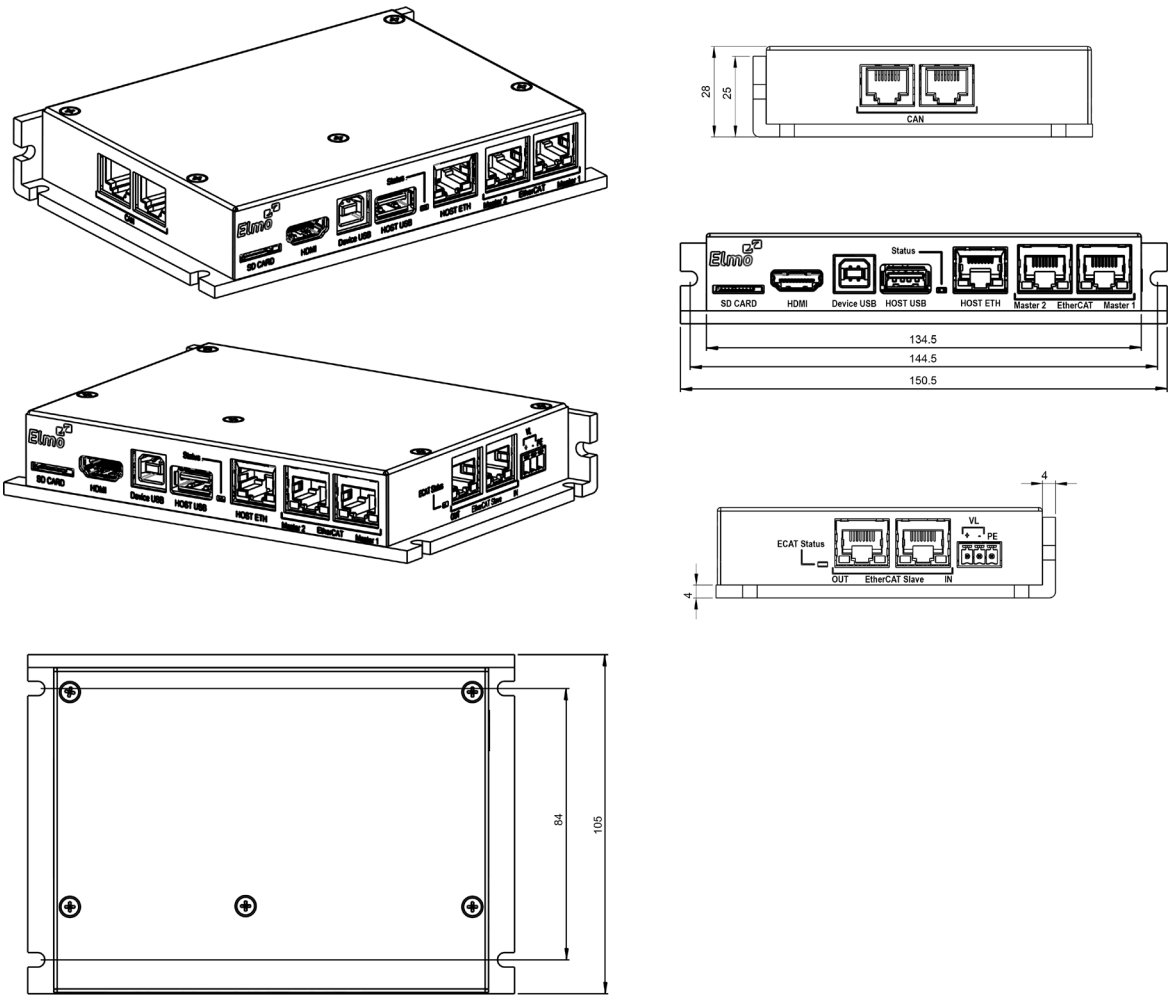
After the Platinum Maestro has been connected and mounted, the system must be set up and initialized. The minimum system requirements for a setup are:

- Platinum Maestro (and power supply)
- PC with the required Elmo software
- At least one servo drive and motor
- EtherCAT cables or a terminated CAN network
- A servo drive connected through an EtherCAT cable or a CAN cable (the terminated CAN network)

Users of SimplIQ servo drives:
Setting up the drives and motors is described in the Installation Guide for each servo drive and in the Elmo Application Studio User Guide. Advanced features are described in the SimplIQ Software Manual, Interlude API User Guide, and SimplIQ Command Reference and CAN Implementation Guide.

Users of Gold or Platinum Line servo drives:
Setting up the drives and motors is described in the Gold or Platinum Line Servo Drive Installation Guide and Elmo Application Studio Users Guide. Advanced features are described in the Gold or Platinum Line Software Manual, Gold or Platinum Line Command Reference and CAN Implementation Guide.

Chapter 8: Platinum Maestro Dimensions



PMAS021D

Chapter 9: Compliance with Standards

The Platinum Maestro network motion controller has been developed, produced, tested and documented in accordance with the relevant standards. Elmo Motion Control is not responsible for any deviation from the configuration and installation described in this documentation. Furthermore, Elmo is not responsible for the performance of new measurements or ensuring that regulatory requirements are met.

9.1 Low Voltage Directive

Specification	Details
The related standards below apply to the performance of the motion controller as stated in the environmental conditions paragraph 6.1 Environmental Conditions. The Platinum Maestro does not require UL compliance, as its maximum voltage is 32 VDC.	
In compliance with **EN 60204-1**	Low Voltage Directive 73/23/EEC
In compliance with **CE 2014/35/EU**	Low-voltage directive 2014/35/EU

9.2 Other Compliant Standards

Quality Assurance	
ISO 9001:2008	Quality Management
Design	
• IPC-D-275 • IPC-SM-782 • IPC-CM-770	Printed wiring for electronic equipment (clearance, creepage, spacing, conductors sizing, etc.)
Reliability	
MIL-HDBK- 217F	Reliability prediction of electronic equipment (rating, de-rating, stress, etc.)
Workmanship	
In compliance with **IPC-A-610**, level 3	Acceptability of electronic assemblies
PCB	
In compliance with **IPC-A-600**, level 3	Acceptability of printed circuit boards
Packing	
In compliance with **EN 100015**	Protection of electrostatic sensitive devices
Environmental	
In compliance with **2002/96/EC**	Waste Electrical and Electronic Equipment regulations (WEEE) **Note:** Out-of-service Elmo drives should be sent to the nearest Elmo sales office.
In compliance with **2002/95/EC** (effective July 2006)	Restrictions on Application of Hazardous Substances in Electric and Electronic Equipment (RoHS)

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