

Hardware Description
P2174HW-EN
2017-01

Cleco®

DGD

mPro400GC

Global Controller



About this Hardware Description

This Hardware Description is the -- original Hardware Description -- and is intended for all persons who are connecting and installing the mPro400GC controller.

The Hardware Description does the following:

- describes all connections and its set-up.

The following documents provide additional information for the operation and service of the mPro400GC controller.

- Recovery Installation
- Parts manual, no. PL12-1000EN
- System description, Fastening technology, no. P1730E

Symbols in the text:

<i>italics</i>	Identifies menu items such as <i>Diagnosis</i>
>	Identifies the selection of a menu item from the menu such as <i>File > Print</i>
<...>	Identifies elements such as buttons, push button or external keyboard input, e.g. <F5>
Courier	Identifies elements such as input fields, checkboxes, radio buttons or drop-down menus. Indicates the name of paths and files, e.g. setup.exe
/	Separates the subdirectories of file paths, e.g. file/print (OS9 operating system)
•	Identifies lists
→	Identifies instructions to be followed

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Workplace safety symbols

Warning notes are identified by a signal word and a pictogram:

- The signal word describes the severity and the probability of the impending danger.
- The pictogram describes the type of danger.

Observe these notes and proceed with special care in the situations described. Pass all safety instructions on to other operators. In addition to the safety instructions in these programming instructions, all local safety and accident prevention rules must be observed .

WARNING!

Potentially hazardous situation for health and safety.

If this warning is not observed, death or serious injury may occur.

CAUTION!

Potentially hazardous situation to health and safety, or risk of material and environmental damage. If this warning is not observed, injuries or damage to materials or the environment could occur.

**General notes**

include application tips and particularly useful information but no hazard warnings.



This pictogram identifies all references to potential electrical shock, alerting of hazards to life and health of personnel.

ATTENTION!

This sign warns of a possibly damaging situation.

If the note is not adhered to, the product or parts of it may be damaged.

1 Set-Up Guide

1.1 Controller description

The mPro400GC product line consists of three controllers; Master, Primary and Secondary.

- **Primary** - Controls up to sixteen (16) tools. This unit includes a servo. One (1) standard corded handheld or fixtured tool could directly connect. For further corded tools / fixtured spindles are Secondary controllers required.
- **Master** - Controls up to sixteen (16) tools. This controller does not include a servo. For corded tools / fixtured spindles are Secondary controllers required.
- **Secondary** - Controls one (1) corded handheld or fixtured tool. Must be used with a Master or Primary controller.

Controller	Order no.	Controls up to (...) tools	Servo included	Tool compatibility
Primary	mPro400GC-P	16	1	18–48 AirLB ¹⁾ Cordless EC tool DGD-Intelligent-Spindles (BTS Series) ²⁾
Master	mPro400GC-M	16	–	Cordless EC tool DGD-Intelligent-Spindles (BTS Series) ³⁾
Secondary	mPro400GC-S	1	1	18–48 AirLB ¹⁾

1) Limited to 1 tool

2) Additional Hardware necessary. For programming mark *Advanced* > *Controller Settings* > *Display Mpro Button*.



Abb. 1-1: Controller Description

1.2 General Information

It is mandatory that national, state and local safety and wiring standards be followed during installation. These standards take precedence over any information presented in this section.

CAUTION!

To avoid the hazard of electrical shock or burn, the following instructions must be adhered to. Failure to follow these instructions may also cause damage to your unit and void existing warranties.

- Do not energize the unit until all connections have been properly made.
- Equipment must be properly grounded before applying power. Units energized by cord and plug must be connected to an approved and properly grounded receptacle.
- All units must be energized by an isolated line.
- The unit must always be closed and secured prior to energizing the unit.
- Ensure the power switch is in the „off“ position prior to connecting the power cord.

Though it is not mandatory, the following instructions are highly recommended for the protected operation of your unit.

- Use oversized feeder lines to reduce electrical noise and voltage drop.

1.3 Checking your unit

Take time to ensure you have the required peripheral equipment and cables necessary to set-up and run your unit. If you do not have all the necessary items, contact your distributor. Refer to Abb. 1-2: for an illustration of your unit.

1.4 Software

Your unit has been preloaded with software and requires no additional software to begin your fastening process. If you are interfacing your unit with an external computer, mPro-Remote interfacing software is required.

1.5 Installing the Unit

1.5.1 Assembly

Each unit is used primarily as a single or multiple tool process/controller/monitor installed in a work station or work area. It may be wall mounted, beam mounted, suspended overhead or pedestal mounted. Always choose a stable location to avoid the possibility of unit damage and/or operator injury through hitting, falling, vibration or inconvenient mounting. All cables attached to the unit should be located and secured so that they cannot cause injury to the operator or to passersby. Like all electrical devices, the control system emit some heat. It should therefore be positioned where air can circulate freely around the housing.

Refer to Abb. 1-3: for mounting hole dimensions.

1.5.2 Location considerations

Your unit should be located to allow access to the front panel and connectors. The unit should be installed for unrestricted and comfortable viewing of the LCD screen by the operator. The LCD menu screen, key pad and connectors must be readily accessible for the set-up. Dependent on the peripheral equipment purchased, the unit may be located in a remote position but should still be accessible.

Attachment of accessories and tools should also be considered with the installation locations. Items to be considered are:

- Location of printer
- Attachment of a data collection unit, if desired.
- Attachment of remote annunciators, socket nest, or remote parameter select.
- Attachment of the unit in a network to a computer.
- Operation convenience/safety – keep cables off the floor or dangling in operator areas.

1.5.3 Power source

The controller requires a power supply connection of:

- 104–126 VAC or 207– 253 VAC / 50–60 Hz single phase / 1A Input current (rated), 16A (peak)

1.5.4 Intended use

The mPro400GC may be used only under the following conditions:

- Industrial EMC limit value class A
- Only cables of type authorized by Apex Tool Group may be used.
- Only accessory parts authorized by Apex Tool Group may be used.
- Unauthorized alterations, repairs and modifications are prohibited for reasons of safety and product liability.

1.5.5 EMC measures

- The filters required to satisfy the EMC regulations are built into the unit.
- The sealed control cabinet and shielded cable provide very good protection against irradiated and radiated interference.
- The tool complies with the following applicable EMC standards:
 - EN 61000-6-2:2005
 - EN 55011:2007
 - EN 61000-4-2:1995 + A1: 1998 + A2: 2001
 - EN 61000-4-3:2006 + A1:2008
 - EN 61000-4-4:2004
 - EN 61000-4-5:2006
 - EN 61000-4-6:2009
 - EN 61000-4-8:1993 + A1: 2001
 - EN 61000-4-11:2004

ATTENTION!

This is a Class A device. The device may cause signal interference; in this case, the operator may be required to implement suitable EMC measures.

- It is prohibited to operate the unit unless the control cabinet is closed. The properties of the shielding would change and the noise emission would increase.

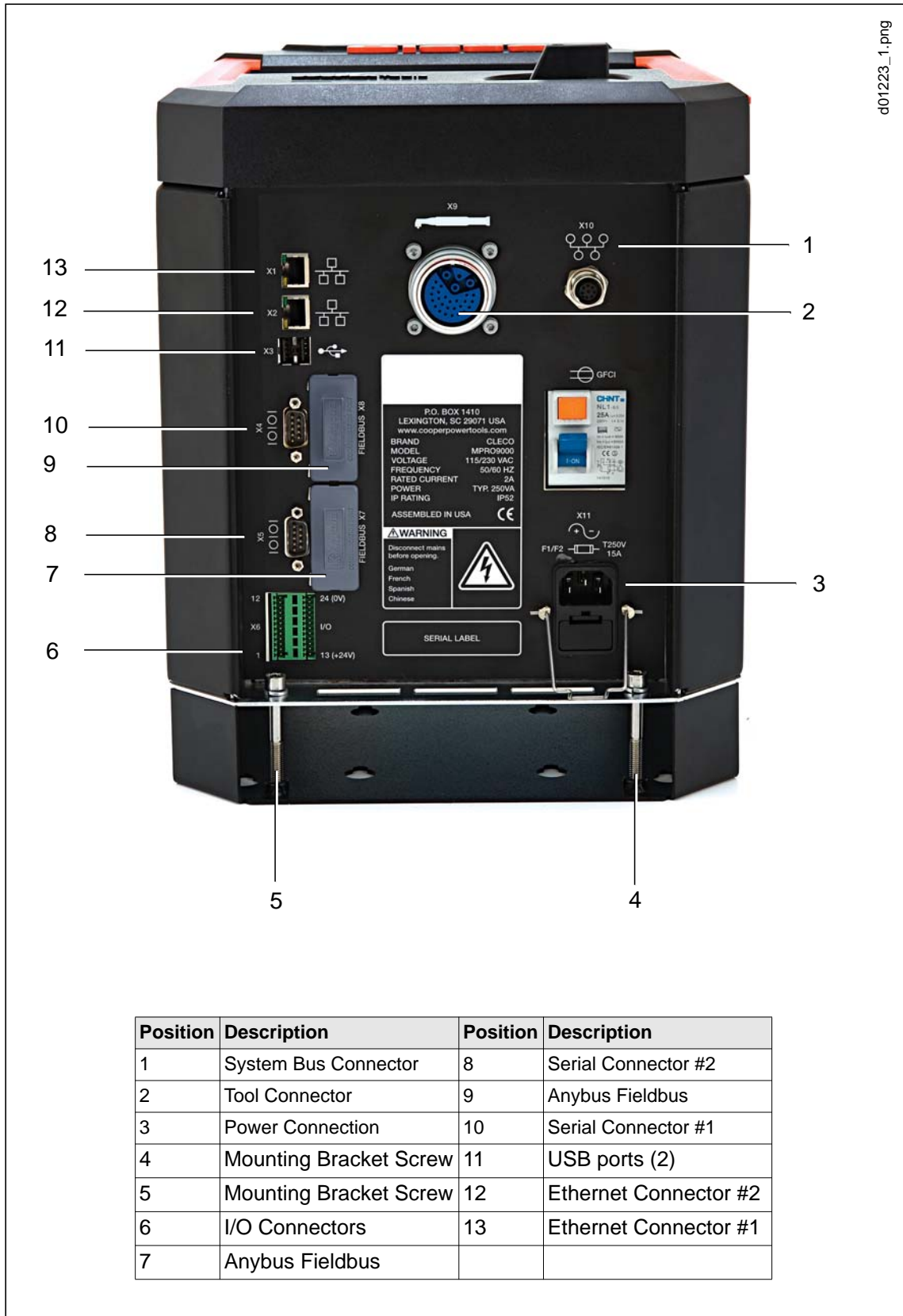
1.6 Mounting the Controller

1. Loosen the two long mounting screws at the bottom of the controller so the mounting plate can be separated from the controller. See Abb. 1-2:.

2. Abb. 1-3: illustrates the bolt pattern for hanging the mounting plate on a wall. Note the hole size dimensions so the correct size bolts are chosen. Size ¼" or M6 bolts (4) should fit the mounting plate holes and support the controller.
3. Once the mounting plate is installed in its location the controller can be hung on the bracket utilizing the four studs protruding from the back of the controller. Once in place, the controller can be secured at the bottom using the two long screws removed in Step 1.

1.7 Making Connections to the Controller

1. Connect the cable to the tool.
2. Connect the other end of the cable to the controller. The connector at the controller is an Air-LB connector and utilizes a push-pull style connector. Before attempting to attach the cable verify that the collar on the controller connector is pushed towards the controller. If the collar is pulled away from the controller the cable will not connect to the controller. Insert the cable connector and pull the collar away from the controller (towards the cable) to lock the cable in place.
3. Insert the power cord into the controller and into a 115 or 230 VAC power source.
4. Using the ON/OFF power switch at the front of the controller power the controller ON.



Position	Description	Position	Description
1	System Bus Connector	8	Serial Connector #2
2	Tool Connector	9	Anybus Fieldbus
3	Power Connection	10	Serial Connector #1
4	Mounting Bracket Screw	11	USB ports (2)
5	Mounting Bracket Screw	12	Ethernet Connector #2
6	I/O Connectors	13	Ethernet Connector #1
7	Anybus Fieldbus		

Abb. 1-2: Connector Locations

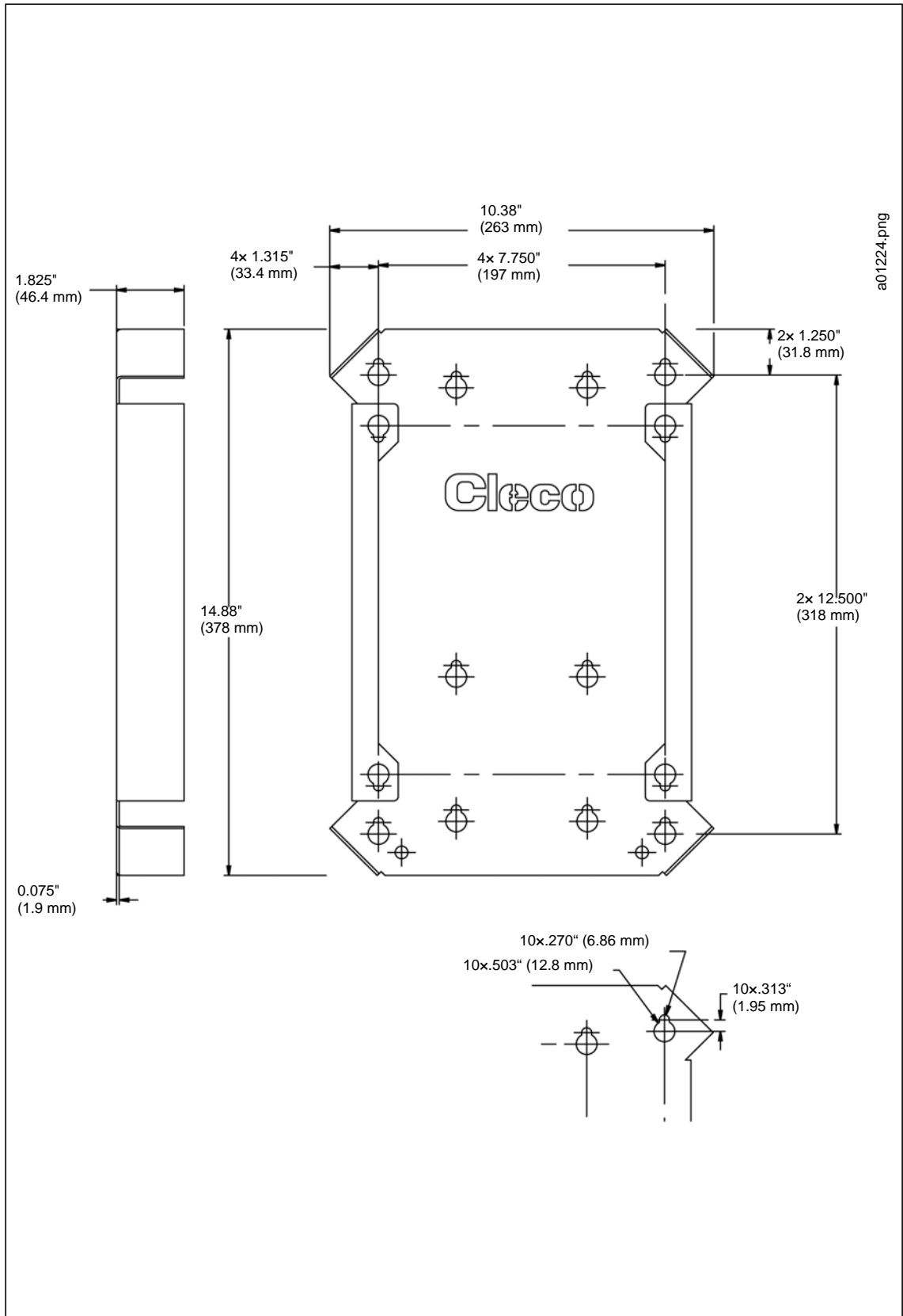


Abb. 1-3: Mounting Information

1.8 Technical Data

1.8.1 Housing

The Global Controller is factory sealed with external access to all connectors. The front of the unit has a USB and power switch.

On the back of the enclosure is a cover plate that can be removed to access the Compact Flash card which contains all program data. This secondary level of access requires removing the controller from the mounting plate.

All other connectors are located on the bottom of the enclosure. The mounting bracket has been designed to also assist with cable management.

Model	Weight*		Width		Height		Depth	
	lb	kg	in	mm	in	mm	in	mm
mPro400GC	31.5	14.5	10.5	267	15	381	11.4	290

1.8.2 Primary/Master Configuration

Note: Pins are numbered exactly as they are on the controller, Pins 1 and 13 at the bottom, Pins 12 and 24 at the top.

Display

- 10.4" TFT Liquid Crystal Display
- Touchscreen
- 800 x 600 resolution

Keyboard

No separate keypad is required. The touchscreen will provide a keyboard image on the screen that can be used for alphanumeric entry. A USB keyboard can also be connected to the unit and used for typing.

Ports

- Compact Flash – accessed through the back of the enclosure
- Any bus CC
- 2 x RS232 Serial Ports
- 3 x USB 2.0 Ports
- 2 x 10/100MBit RJ45 Ethernet Ports

Discrete I/O

- 8 inputs / 8 Outputs / 2 +24Vdc / 2 GND
- Output Current: 500 mA per output, 2000 mA total

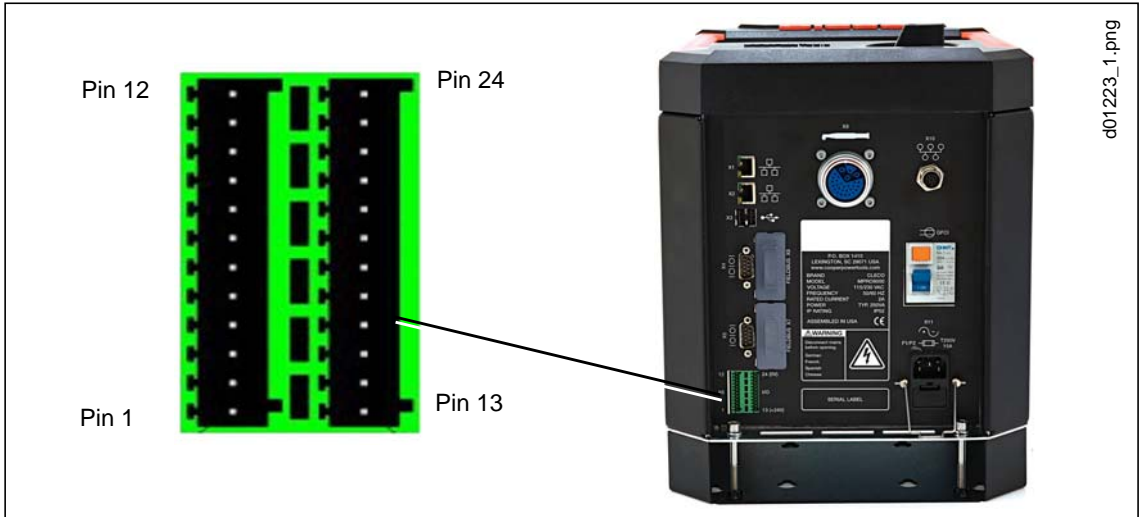


Abb. 1-4: Primary / Master Pin Configuration

Pin #	I/O	Description
12	Out	GND2
11	In	Common GND
10	Output	O 03
9	Output	O 02
8	Output	O 01
7	Output	O 00
6	Input	I 03
5	Input	I 02
4	Input	I 01
3	Input	I 00
2	In	Output Common O0-O3
1	Out	+24 V2

Pin #	I/O	Description
24	Out	GND2
23	In	Common GND
22	Output	O 07
21	Output	O 06
20	Output	O 05
19	Output	O 04
18	Input	I 07
17	Input	I 06
16	Input	I 05
15	Input	I 04
14	In	Output Common O4-O7
13	Out	+24 V2

The two I/O connectors are populated with both Inputs and Outputs to help reduce cabling when utilizing four or less Inputs and Outputs. The I/O can be used with the internal 24-volt supply in the controller or an external 24-volt supply such as a PLC. The following examples 1.8.4 / 1.8.5 utilize Tool Start as an Input and Cycle OK as an Output.

System Bus Connection

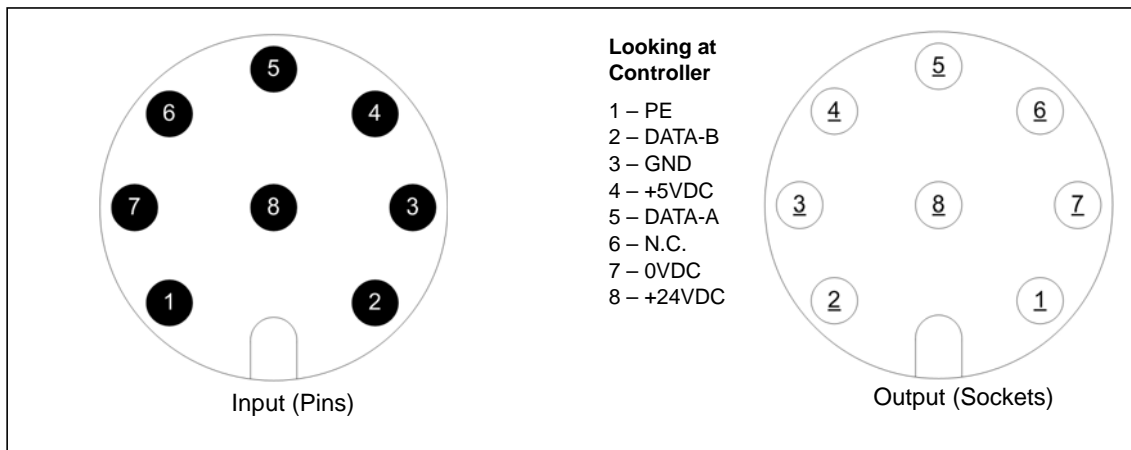


Abb. 1-5: System Bus Connection

Note: The Primary configuration has an output connector only. The Secondary and Master configurations have both an input and output connector.

AC power supply

- 104–126 VAC or 207–253 VAC
- 50–60 Hz single phase
- 1 A Input current (rated), 16 A (peak)

1.8.3 Secondary Configuration

Note: Pins are numbered exactly as they are on the controller, Pins 1 and 13 at the bottom, Pins 12 and 24 at the top. Some Inputs and Outputs are fixed, not programmable.

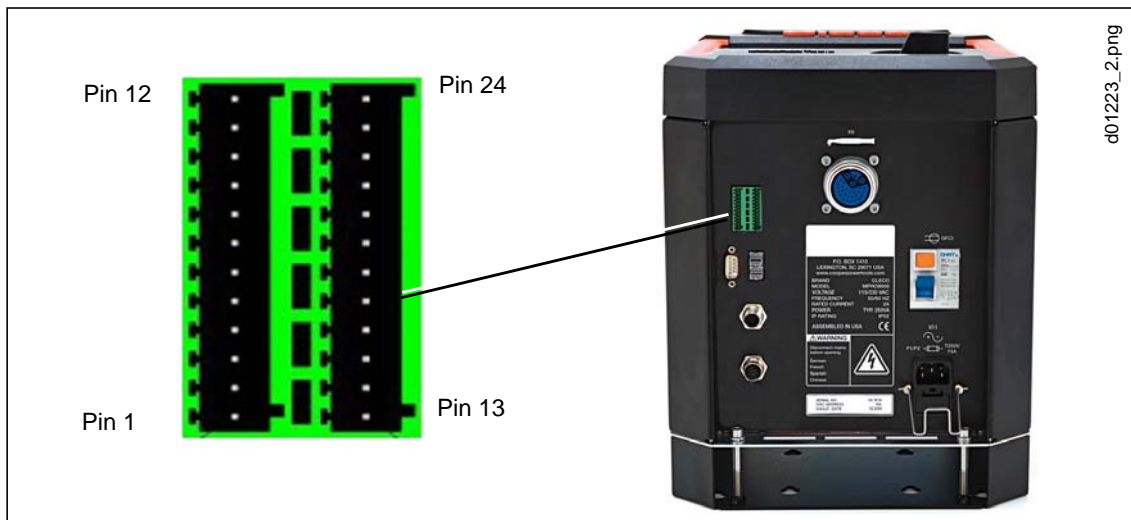


Abb. 1-6: Secondary Pin Configuration

Pin #	I/O	Description
12	Out	Common GND2
11	In	Common GND
10	Output	O 03
9	Output	O 02 (Yellow LED)
8	Output	O 01 (Green LED – OK)
7	Output	O 00 (Red LED – NOK)
6	Input	I 03
5	Input	I 02
4	Input	I 01 (Reverse)
3	Input	I 00 (Start)
2		N. C.
1	Out	+24 VDC

Pin #	I/O	Description
24	Out	Common GND
23	In	Common GND
22	Output	O 07
21	Output	O 06
20	Output	O 05
19	Output	O 04
18	Input	I 07
17	Input	I 06
16	Input	I 05
15	Input	I 04
14		N. C.
13	Out	+24 VDC

Serial Port

- RS232
- System Bus Connectors
 - 1 Male
 - 1 Female

System Bus Address

Two rotary dials are used to manually set the address for System Bus Devices. Turn the dial until the desired number appears in the slot. The dial closer to the front of the unit is the most significant digit. The dial closer to the system bus connectors is the least significant digit. No two system bus devices can have the same address. After address change is a reboot required.

AC power supply

- 104–126 VAC or 207–253 VAC
- 50–60 Hz single phase
- 1 A Input current (rated), 16 A (peak)

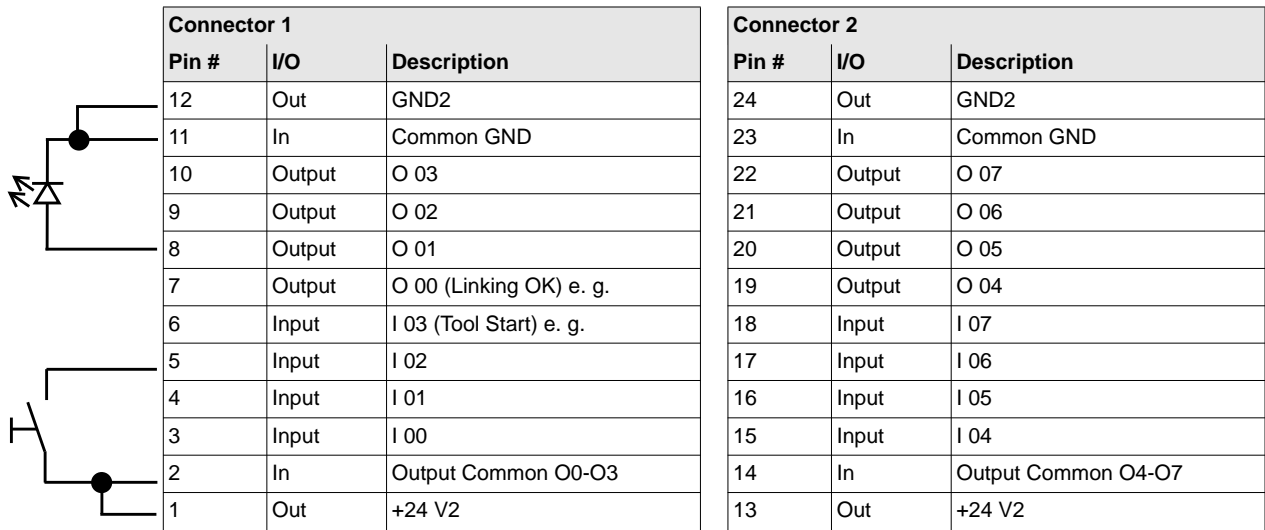
1.8.4 Connections Utilizing the Internal 24-volt Supply (Primary, Secondary, Master)

INPUTS: Pins 11 and 23 (Common GND) are the Input “returns”

- Controller Internal 24-volt Supply
 - Pins 11 and 23 must be jumpered to Pins 12 and 24 respectively.

OUTPUTS: Pins 2 and 14 (Output Common) are the voltage source for the Outputs

- Controller Internal 24-volt Supply
Pins 2 and 14 must be connected to Pins 1 and 13 respectively.



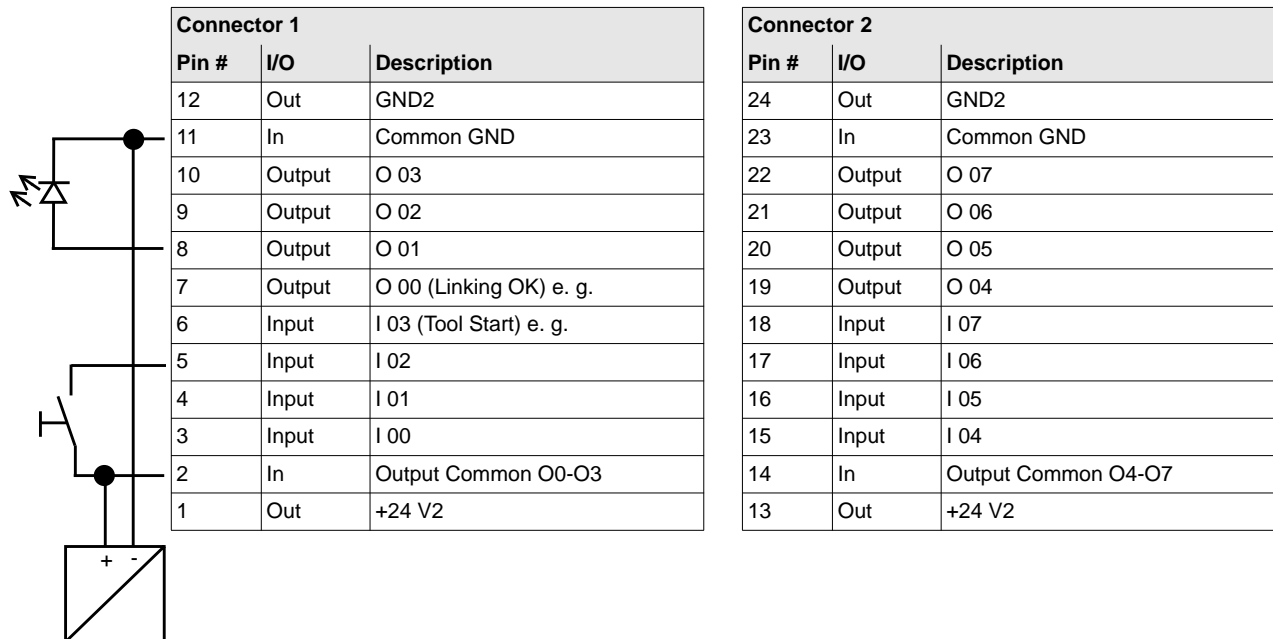
1.8.5 Connections Utilizing the External 24-volt Supply (Primary and Master only)

INPUTS: Pins 11 and 23 (Common GND) are the Input “returns”.

- Controller External 24-volt Supply
Pins 11 and 23 will have to return to the GND of the external 24-volt supply.

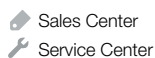
OUTPUTS: Pins 2 and 14 (Output Common) are the voltage source for the Outputs.

- Controller Internal 24-volt Supply
Pins 2 and 14 must be connected to the external 24-volt supply.



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NORTH AMERICA | SOUTH AMERICA

Detroit, Michigan

Apex Tool Group
2630 Superior Court
Auburn Hills, MI 48236
Phone: +1 (248) 393-5640
Fax: +1 (248) 391-6295

Lexington, South Carolina

Apex Tool Group
670 Industrial Drive
Lexington, SC 29072
Phone: +1 (800) 845-5629
Phone: +1 (919) 387-0099
Fax: +1 (803) 358-7681

Louisville, Kentucky

Apex Tool Group
1000 Glengarry Drive
Suite 150
Fairdale, KY 40118
Phone: +1 (502) 708-3400
apexpowertools.com/service

Canada

Apex Tool Canada, Ltd.
7631 Bath Road
Mississauga, Ontario L4T 3T1
Canada
Phone: (866) 691-6212
Fax: (905) 673-4400

Mexico

Apex Tool Group
Manufacturing México
S. de R.L. de C.V.
Vialidad El Pueblito #103
Parque Industrial Querétaro
Querétaro, QRO 76220
Mexico
Phone: +52 (442) 211 3800
Fax: +52 (800) 685 5560

Brazil

Apex Tool Group
Ind. Com. Ferram, Ltda.
Av. Liberdade, 4055
Zona Industrial Iporanga
Sorocaba, São Paulo
CEP# 18087-170
Brazil
Phone: +55 15 3238 3820
Fax: +55 15 3238 3938

EUROPE | MIDDLE EAST | AFRICA

England

Apex Tool Group GmbH
C/O Spline Gauges
Piccadilly, Tamworth
Staffordshire B78 2ER
United Kingdom
Phone: +44 1827 8727 71
Fax: +44 1827 8741 28

France

Apex Tool Group S.A.S.
25 rue Maurice Chevalier
B.P. 28
77831 Ozoir-La-Ferrière
Cedex, France
Phone: +33 1 64 43 22 00
Fax: +33 1 64 43 17 17

Germany

Apex Tool Group GmbH
Industriestraße 1
73463 Westhausen
Germany
Phone: +49 (0) 73 63 81 0
Fax: +49 (0) 73 63 81 222

Hungary

Apex Tool Group
Hungária Kft.
Platánfa u. 2
9027 Győr
Hungary
Phone: +36 96 66 1383
Fax: +36 96 66 1135

ASIA PACIFIC

Australia

Apex Tool Group
519 Nurigong Street, Albury
NSW 2640
Australia
Phone: +61 2 6058 0300

China

Apex Power Tool Trading
(Shanghai) Co., Ltd
2nd Floor, Area C
177 Bi Bo Road
Pu Dong New Area, Shanghai
China 201203 P.R.C.
Phone: +86 21 60880320
Fax: +86 21 60880298

India

Apex Power Tools India
Private Limited
Gala No. 1, Plot No. 5
S. No. 234, 235 & 245
Indialand Global
Industrial Park
Taluka-Mulsi, Phase I
Hinjawadi, Pune 411057
Maharashtra, India
Phone: +91 020 66761111

Japan

Apex Tool Group Japan
Korin-Kaikan 5F,
3-6-23 Shibakoen, Minato-Ku,
Tokyo 105-0011, JAPAN
Phone: +81-3-6450-1840
Fax: +81-3-6450-1841

Korea

Apex Tool Group Korea
#1503, Hibrand Living Bldg.,
215 Yangjae-dong,
Seocho-gu, Seoul 137-924,
Korea
Phone: +82-2-2155-0250
Fax: +82-2-2155-0252

Apex Tool Group, LLC

1000 Lufkin Road
Apex, NC 27539
Phone: +1 (919) 387-0099
Fax: +1 (919) 387-2614
www.apexpowertools.com

