WARNING: To minimize the risk of potential safety problems, you should follow all applicable local and national codes that regulate the installation and operation of your equipment. These codes vary from area to area and it is your responsibility to determine which codes should be followed, and to verify that the equipment, installation, and operation are in compliance with the latest revision of these codes.

Equipment damage or serious injury to personnel can result from the failure to follow all applicable codes and standards. We do not guarantee the products described in this publication are suitable for your particular application, nor do we assume any responsibility for your product design, installation, or operation.
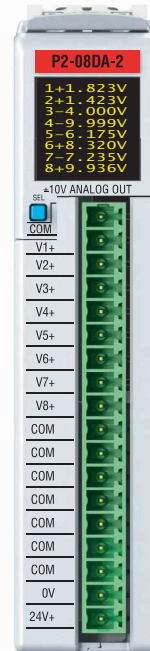
If you have any questions concerning the installation or operation of this equipment, or if you need additional information, please call Technical Support at 770-844-4200.

This publication is based on information that was available at the time it was printed. At AutomationDirect.com® we constantly strive to improve our products and services, so we reserve the right to make changes to the products and/or publications at any time without notice and without any obligation. This publication may also discuss features that may not be available in certain revisions of the product.

P2-08DA-2 Analog Output

The P2-08DA-2 Voltage Analog Output Module provides eight channels of ±10VDC outputs for use with the Productivity2000 System.

Removable Terminal Block Specifications

Part Number	P2-RTB	P2-RTB-1
Number of positions	18 Screw Terminals	18 Spring Clamp Terminals
Wire Range	30–16 AWG (0.051–1.31 mm²) Solid / Stranded Conductor 3/64 in. (1.2 mm) Insulation Maximum 1/4 in (6–7 mm) Strip Length	28–16 AWG (0.081–1.31 mm²) Solid / Stranded Conductor 3/64 in (1.2 mm) Insulation Maximum 19/64 in (7–8 mm) Strip Length
Conductors	"USE COPPER CONDUCTORS, 75ºC" or equivalent.	
Screw Driver Width	0.1 in (2.5 mm) Maximum*	
Screw Size	M2	N/A
Screw Torque	2.5 lb·in (0.28 N·m)	N/A

*Recommended Screwdriver TW-SD-MSL-1

Terminal Block sold separately, (see wiring options on page 5).
Warranty: Thirty-day money-back guarantee. Two-year limited replacement. (See www.productivity2000.com for details).
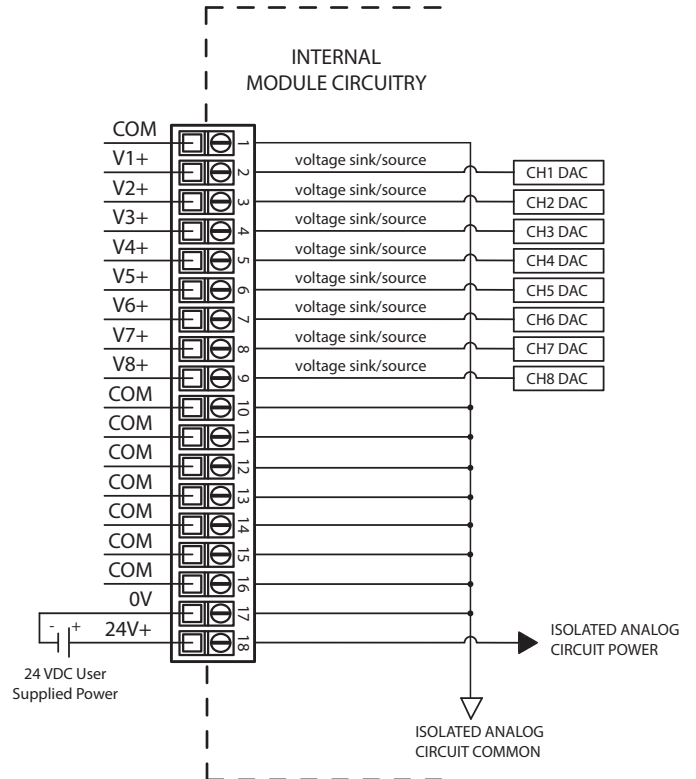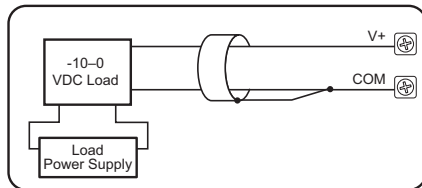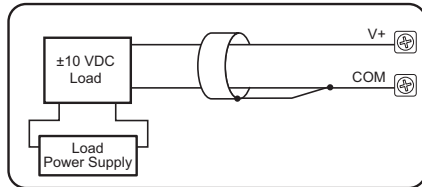
General Specifications

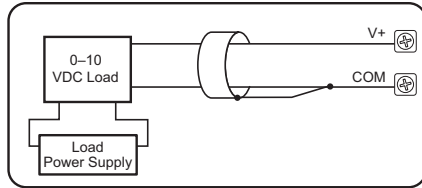|	
Operating Temperature	0º to 60ºC (32º to 140ºF)
Storage Temperature	-20º to 70ºC (-4º to 158ºF)
Humidity	5 to 95% (non-condensing)
Environmental Air	No corrosive gases permitted
Vibration	IEC60068-2-6 (Test Fc)
Shock	IEC60068-2-27 (Test Ea)
Field to Logic Side Isolation	1800VAC applied for 1 second
Insulation Resistance	> 10MΩ @ 500VDC
Heat Dissipation	150mW
Enclosure Type	Open Equipment
Module Keying to Backplane	Electronic
Module Location	Any I/O slot in a Productivity2000 System
Field Wiring	Use *ZIP*Link Wiring System or removable terminal block (not included). See "Wiring Options" on page 5.
EU Directive	See the "EU Directive" topic in the Productivity Suite Help File. Information can also be obtained at: www.productivity2000.com
Connector Type (not included)	18-position removable terminal block
Weight	90g (3.2 oz)
Agency Approvals	UL 61010-1 and UL 61010-2-201 File E139594, Canada and USA
	CE (EN 61131-2 EMC, EN 61010-1 and EN 61010-2-201 Safety)*

*Meets EMC and Safety requirements. See the D.O.C. for details.

Output Specifications

Output Channels	8
Output Ranges	±10VDC
Signal Resolution	16-bit
Resolution Value of LSB (least significant bit)	±10V = 305µV/count 1 LSB = 1 count
Data Range	-32768 to +32767 counts
Output Type	Voltage: 10mA max
Output Value in Fault Mode	0V
Load Impedance	≥1000Ω
Maximum Capacitive Load (voltage output)	0.01 µF
Maximum Inductive Load (Current Output)	1mH
Allowed Load Type	Grounded
Maximum Inaccuracy	0.1% of range (including temperature drift)
Maximum Full Scale Calibration Error	±0.025% of range maximum
Maximum Offset Calibration Error	±0.025% of range maximum
Accuracy vs. Temperature	±25ppm/°C max full scale calibration change (±0.0025% of range/°C)
Maximum Crosstalk at DC, 50Hz and 60Hz	-96dB, 1 LSB
Linearity Error	±16 LSB maximum (±0.025% of full scale) Monotonic with no missing codes
Output Stability and Repeatability	±10 LSB after 10 minute warm-up (typical)
Output Ripple	0.05% of full scale
Output Setting Time	300µs max, 5µs min (full scale change)
All Channel Update Rate	1ms
Maximum Continuous Overload	Outputs current limited to 40mA typical Continuous overloads on multiple outputs can damage the module.
Type of Output Protection	0.1 µF Transient Suppressor
Output Signal (power-up,-down) or at Power Up and Power Down	0V
External Power Supply Required	24VDC (-20% / +25%), 150mA

Voltage Output Circuits

INTERNAL MODULE CIRCUITRY

| Terminal		Description
COM	1	
V1+	2	voltage sink/source → CH1 DAC
V2+	3	voltage sink/source → CH2 DAC
V3+	4	voltage sink/source → CH3 DAC
V4+	5	voltage sink/source → CH4 DAC
V5+	6	voltage sink/source → CH5 DAC
V6+	7	voltage sink/source → CH6 DAC
V7+	8	voltage sink/source → CH7 DAC
V8+	9	voltage sink/source → CH8 DAC
COM	10	
COM	11	
COM	12	
COM	13	
COM	14	
COM	15	
COM	16	
0V	17	
24V+	18	ISOLATED ANALOG CIRCUIT POWER

24 VDC User Supplied Power

ISOLATED ANALOG CIRCUIT COMMON

Module Installation

WARNING: Do not apply field power until the following steps are completed. See hot-swapping procedure for exceptions.

Step One: Align module catch with base slot and rotate module into connector.

2 rotate to seated position

1 Align with slot
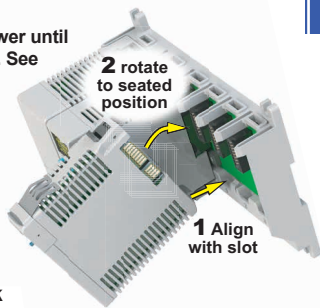
Step Two: Pull top locking tab toward module face. Click indicates lock is engaged.

Locked   Unlocked
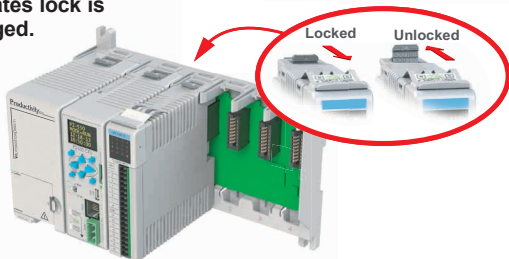
Step Three: Attach field wiring using the removable terminal block or *ZIP*Link wiring system.

WIRE STRIP LENGTH
MAX
MIN

QR Code

Use any QR Code reader application to display the module's product insert.

Caution: *If possible, remove field power prior to proceeding. If not, then **EXTREME** care **MUST** be taken to prevent damage to the module, or even personal injury due to a short circuit from the live terminal block.*

Important Hot-Swap Information

The Productivity2000 System supports hot-swap! Individual modules can be taken offline, removed, and replaced while the rest of the system continues controlling your process. Before attempting to use the hot-swap feature, be sure to read the hot-swap topic in the programming software's help file or our online documentation at AutomationDirect.com for details on how to plan your installation for use of this powerful feature.

Wiring Options

1 *ZIP*Link Feed Through *Modules and Cables*[1]

ZIPLINK
▼AUTOMATIONDIRECT®
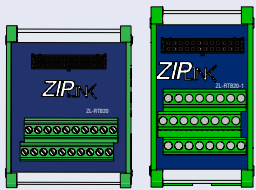
ZL-RTB20
ZL-RTB20-1

0.5 m (1.6 ft) cable
1.0 m (3.3 ft) cable
2.0 m (6.6 ft) cable

ZL-P2-CBL18
ZL-P2-CBL18-1
ZL-P2-CBL18-2

2 Terminal Block with pigtail cable

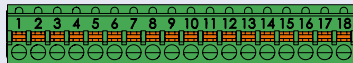**1.0 m (3.3 ft) cable**
2.0 m (6.6 ft) cable

ZL-P2-CBL18-1P
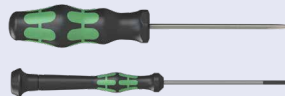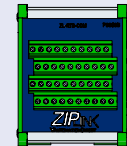ZL-P2-CBL18-2P

3 Screw Terminal Block only

P2-RTB
(Quantity 1)

4 Spring Clamp Terminal Block only

P2-RTB-1
(Quantity 1)

5 Accessories[2]

ZL-RTB-COM

TW-SD-SL-1

TW-SD-MSL-1

1. Cable + *ZIP*Link Module = Complete System
2. ZL-RTB-COM provides a common connection point for power or ground

Module Configuration

Using the Hardware Configuration tool in the Productivity Suite programming software, drag and drop the P2-08DA-2 module into the base configuration.

Select *Automatic Module Verification* or *No Verification and Enable Hot Swap* and *Stop Mode Values*. If desired, assign a *User Tagname* to each output point (channel) selected and to each *Status Bit Item*.

P2-08DA-2

8CH, 16-BIT, VOLTAGE, ANALOG OUTPUT

◉ Automatic Module Verification
○ No Verification and Enable Hot Swap

Add Default Tags   Remove Default Tags

Point	User Tagname	Stop Mode Value
1	AOS32-0.1.1.1	0
2	AOS32-0.1.1.2	0
3	AOS32-0.1.1.3	0
4	AOS32-0.1.1.4	0
5	AOS32-0.1.1.5	0
6	AOS32-0.1.1.6	0
7	AOS32-0.1.1.7	0
8	AOS32-0.1.1.8	0

Status Bit	User Tagname
Module Failed	MST-0.1.1.25
Missing 24V	MST-0.1.1.26

Module Info   Monitor   OK   Cancel   Help

Linear Scaling

Non-Linear Scaling

The Scale (Linear) function can be used to:

• **Convert an application specific range to a range which is native to the analog output module.**

• **Make other linear conversions in ranges appropriate to the application.**

The Scale (Non-Linear) function can be used for Non-Linear applications.

Select the Input and Output tags appropriate for the application. Convert raw input signals to engineering units for use in the program, or convert engineering units to output signals for control purposes

Select the minimum and maximum values of the raw input signal. These values will relate to the minimum and maximum scaled values.

Power On

```
PASSED
SELF
TEST
```

Appears initially

Hold **SEL** button down to cycle through primary screens. Release button to select screen.

```
DISPLAY
SETUP
INFO
```

```
DISPLAY
STATUS
INFO
```

```
DISPLAY
UNITS
DECIMAL
COUNTS
```

```
DISPLAY
UNITS
HEX
COUNTS
```

```
DISPLAY
UNITS
VOLTAGE
+/-9.99V
```

These screens will then auto cycle

```
P2-08DA2

Fw. Rev.
 1.00
```

```
16-BIT
+/-10V
```

This screen will auto cycle with status information

```
End of
Status
Menu
List
```

Error Messages – An existing error will be inserted into the cycling Status Info screen.

```
MISSING
EXTERNAL
24VDC
```

```
SELFTEST
FAIL
REPLACE
MODULE
```

```
End of
Status
Menu
List
```

```
MISSING
CONFIG
DATA
```

Momentarily Press **SEL** button to toggle through secondary displays

```
1        0
2        0
3        0
4        0
```

```
1   0000H
2   0000H
3   0000H
4   0000H
```

```
1   0.00V
2   0.00V
3   0.00V
4   0.00V
```

```
5        0
6        0
7        0
8        0
```

```
5   0000H
6   0000H
7   0000H
8   0000H
```

```
5   0.00V
6   0.00V
7   0.00V
8   0.00V
```

```
1        0
2        0
3        0
4        0
5        0
6        0
7        0
8        0
```

```
1   0000H
2   0000H
3   0000H
4   0000H
5   0000H
6   0000H
7   0000H
8   0000H
```

```
1   0.00V
2   0.00V
3   0.00V
4   0.00V
5   0.00V
6   0.00V
7   0.00V
8   0.00V
```

Document Name	Edition/Revision	Date
P2-08DA-2-DS	2nd Ed.	9/4/2019