**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.*
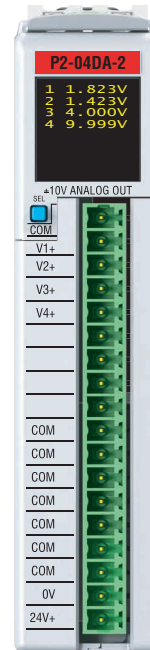
If you have any questions concerning the installation or operation of this equipment, or if you need additional information, please call Technical Support at 770-844-4200.

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# AUTOMATIONDIRECT.com
# Productivity2000

# P2-04DA-2 Analog Output

**The P2-04DA-2 Voltage Analog Output Module provides four 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).
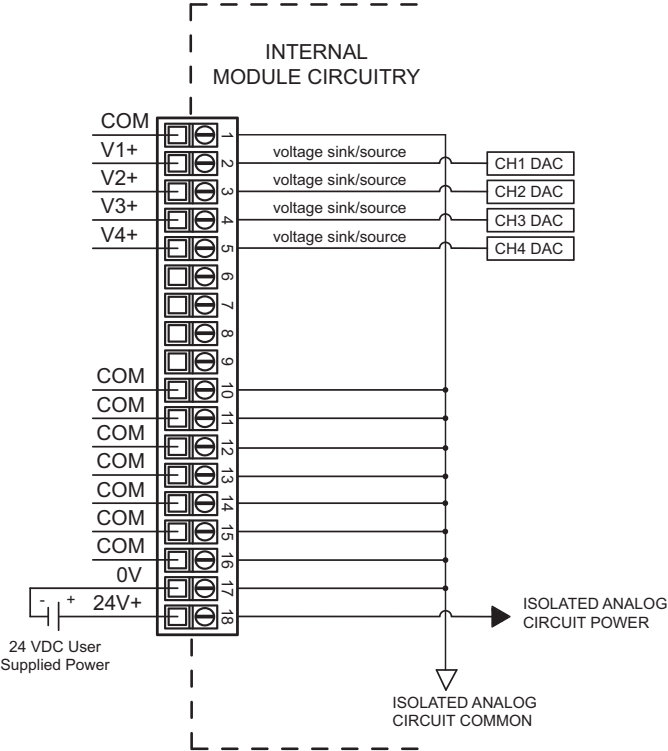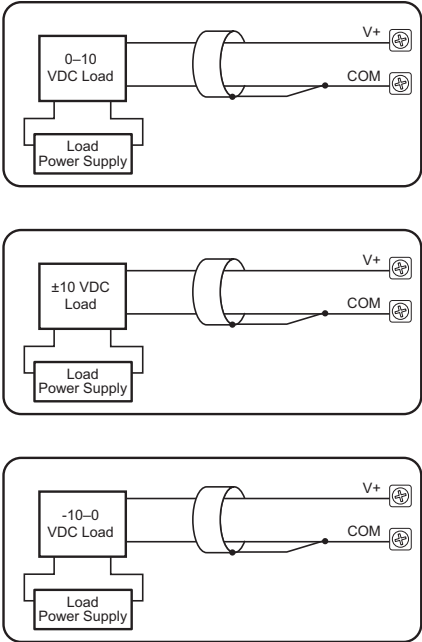
# General Specifications

| | |
|---|---|
| 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 | 2200mW |
| 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. |
| 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 | 4 |
| Output Ranges | ±10VDC |
| Signal Resolution | 16-bit |
| Resolution Value of LSB (least significant bit) | ±10V = 305μV/count<br>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%), 75mA |

## Voltage Output Circuits



INTERNAL
MODULE CIRCUITRY

| Terminal | Label | Signal | Channel |
|---|---|---|---|
| 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 |
| | 6 | | |
| | 7 | | |
| | 8 | | |
| COM | 9 | | |
| COM | 10 | | |
| COM | 11 | | |
| COM | 12 | | |
| COM | 13 | | |
| COM | 14 | | |
| COM | 15 | | |
| 0V | 16 | | |
| 24V+ | 17 | | |
| | 18 | | |

24 VDC User
Supplied Power

ISOLATED ANALOG
CIRCUIT 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
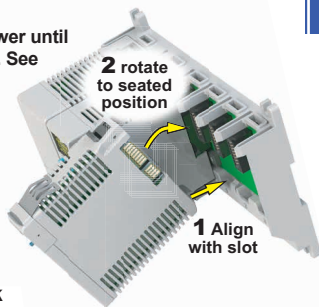
**Step Two:** Pull top locking tab toward module face. Click indicates lock is engaged.

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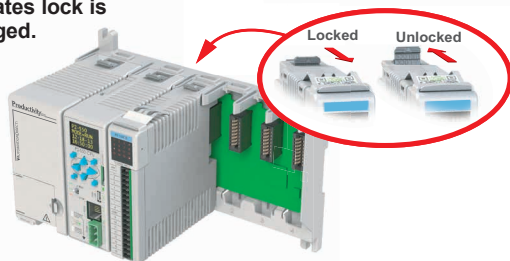
**Step Three:** Attach field wiring using the removable terminal block or *ZIP*Link wiring system.

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 ZIPLink Feed Through *Modules and Cables*[1]
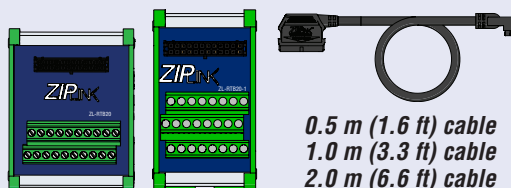
**ZIP**LINK
▼AUTOMATIONDIRECT

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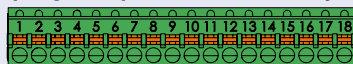
**1.0 m (3.3 ft) cable**
**2.0 m (6.6 ft) cable**

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 P2-04DA-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*.

P2-04DA-2
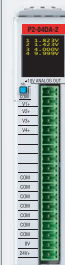
4CH, 16-BIT, VOLTAGE, ANALOG OUTPUT

◉ 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 |

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

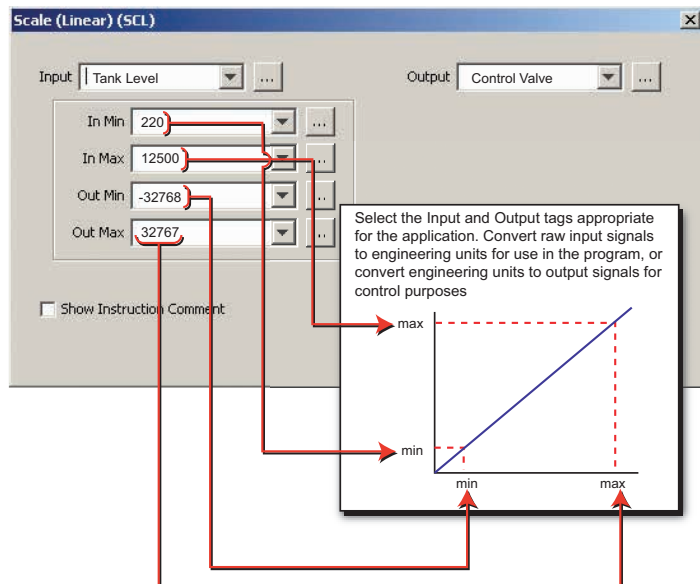| Module Info | Monitor | OK | Cancel | Help |
|---|---|---|---|---|

# 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.

# OLED Panel Display

## Power On

| PASSED SELF TEST | Appears initially |

These screens will then auto cycle

P2-04DA-2

Fw. Rev. 1.00

16-BIT, +/-10V

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 +/-10V

This screen will auto cycle with status information

End of Status Menu List

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

| 1 00000 | 1 0000H | 1 0.000V |
| 2 00000 | 2 0000H | 2 +0.00V |
| 3 SPARE | 3 SPARE | 3 SPARE |
| 4 00000 | 4 0000H | 4 0.00V |

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

MISSING EXTERNAL 24VDC → SELFTEST FAIL REPLACE MODULE → MISSING CONFIG DATA → End of Status Menu List

**www.productivity2000.com**

**Tech Support 770-844-4200**