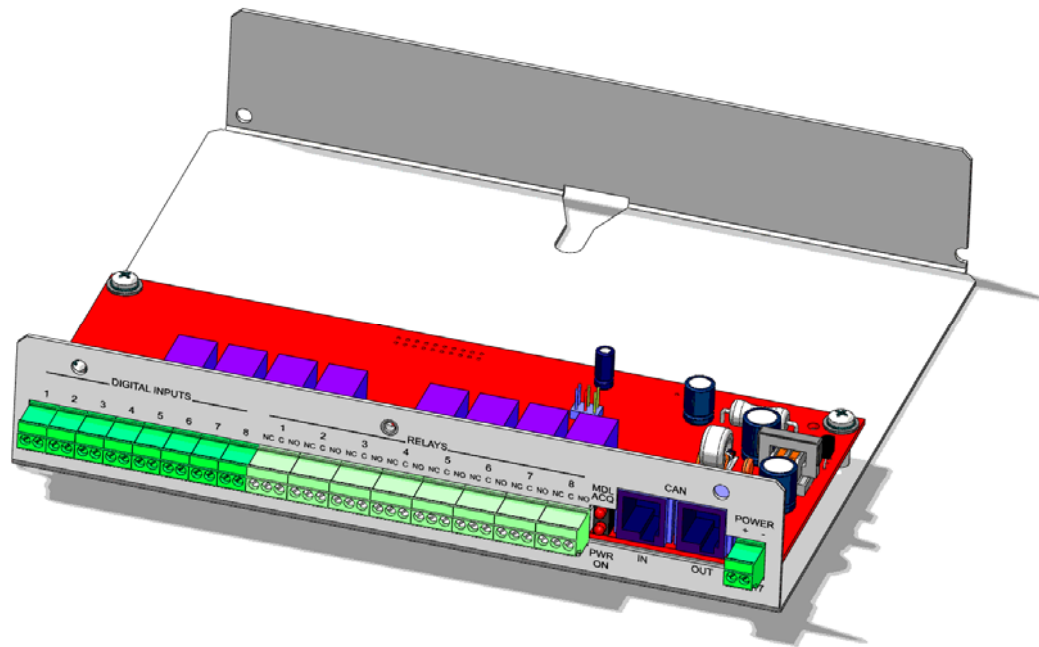


8 Output Relays and 8 Digital Inputs Installation & Operation Manual



Cordex Smart Peripheral 8DIO 8R/8D 8 Output Relays and 8 Digital Inputs

0180002-J0

The following documents and drawings are included in this manual:

- Specifications: 0180002-B1
- Customer connection drawing: 0180002-08
- Outline Drawing: 0180002-06
- Outline, Shelf CXC Peripherals 030-734-06

IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS

1. Please read this manual prior to use to become familiar with the product's numerous features and operating procedures. To obtain a maximum degree of safety, follow the sequences as outlined.
2. This manual provides warnings and special notes for the user:
 - a. Points that are vital to the proper operation of the product or the safety of the operator are indicated by the heading: **WARNING**.
 - b. CAUTION Safety information intended to PREVENT DAMAGE to material or equipment indicated by the heading: **CAUTION**.
 - c. A notation that is in ***Bold Italic*** typeface covers points that are important to the performance or ease of use of the product.
3. Before using the product, read all instructions and cautionary markings on the product and any equipment connected to the product.
4. Do not expose the product to rain or snow; install only in a clean, dry environment.

CAUTION – Unless otherwise noted, use of an attachment not recommended or sold by the product manufacturer may result in a risk of fire, electric shock, or injury to persons.

CAUTION – Do not operate the product if it has received a sharp blow, it has been dropped, or otherwise damaged in any way – return it to a qualified service center for repair.

CAUTION – Do not disassemble the product – call our qualified service centers for servicing. Incorrect reassembling may result in a risk of electrical shock or fire.

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1 Introduction

1.1 Scope of the Manual

This instruction manual explains the installation, interconnection, and operation of Alpha Technologies Cordex smart peripheral with eight output relays and eight digital inputs (8R/8D).

NOTE: *To aid the user with installation, reference drawings are included at the rear of the manual.*

1.2 Product Overview

The Alpha Technologies Cordex Smart Peripherals are designed for remote control and monitoring on telecommunications power systems that utilize a standard CAN communications bus. The data is gathered by an advanced system-monitoring unit such as the Alpha Cordex Series system controller (CXC); for example, each channel of the 8R/8D smart peripheral can be stored and viewed on the CXC. The data logging capability of the CXC (version 1.9 software and greater) can also provide the user with monitoring information in an easy-to-read table format.

The 8R/8D peripheral module is designed to expand the CXC I/O and has eight output relays and eight digital inputs.

The CXC supports a total of 16 peripheral modules per system; which can include the Shunt MUX or BCM modules in any combination. The maximum number of relays per system is also 16 including the CXC onboard relays; however, if you were to configure a system of all 8R/8D modules, the digital inputs would increase to a maximum of 128 plus the CXC digital inputs.

The CAN communications bus supports a maximum of 125 nodes. Each CXC, or Cordex Smart Peripheral or Cordex rectifier would count as one node.

The standard shelf option provides for up to two modules mounted in a standard 1RU, 19" or 23" rack. A stand-alone PCB and a single module wall mount shelf are also available.

The 8DIO software is factory loaded and configured (part number 0350035, version 2.00).

2 Inspection

2.1 Packing Materials

All Alpha products are shipped in rugged, double walled boxes and suspended via solid inserts to minimize shock that may occur during transportation. Packaging assemblies and methods are tested to International Safe Transit Association standards.

Products are also packaged with Cortex. This plastic wrap contains a corrosive-inhibitor that protects the product from corrosion for up to two years.

2.1.1 Returns for Service

Save the original shipping container. If the product needs to be returned for service, it should be packaged in its original shipping container. If the original container is unavailable, make sure the product is packed with at least three inches of shock-absorbing material to prevent shipping damage.

NOTE: *Alpha Technologies is not responsible for damage caused by the improper packaging of returned products.*

2.2 Check for Damage

Prior to unpacking the product, note any damage to the shipping container. Unpack the product and inspect the exterior for damage. If any damage is observed contact the carrier immediately.

Continue the inspection for any internal damage. In the unlikely event of internal damage, please inform the carrier and contact Alpha Technologies for advice on the impact of any damage.



Verify that you have all the necessary parts per your order for proper assembly.

3 Assembly and Installation

The following illustration shows the components that make up a typical assembly:

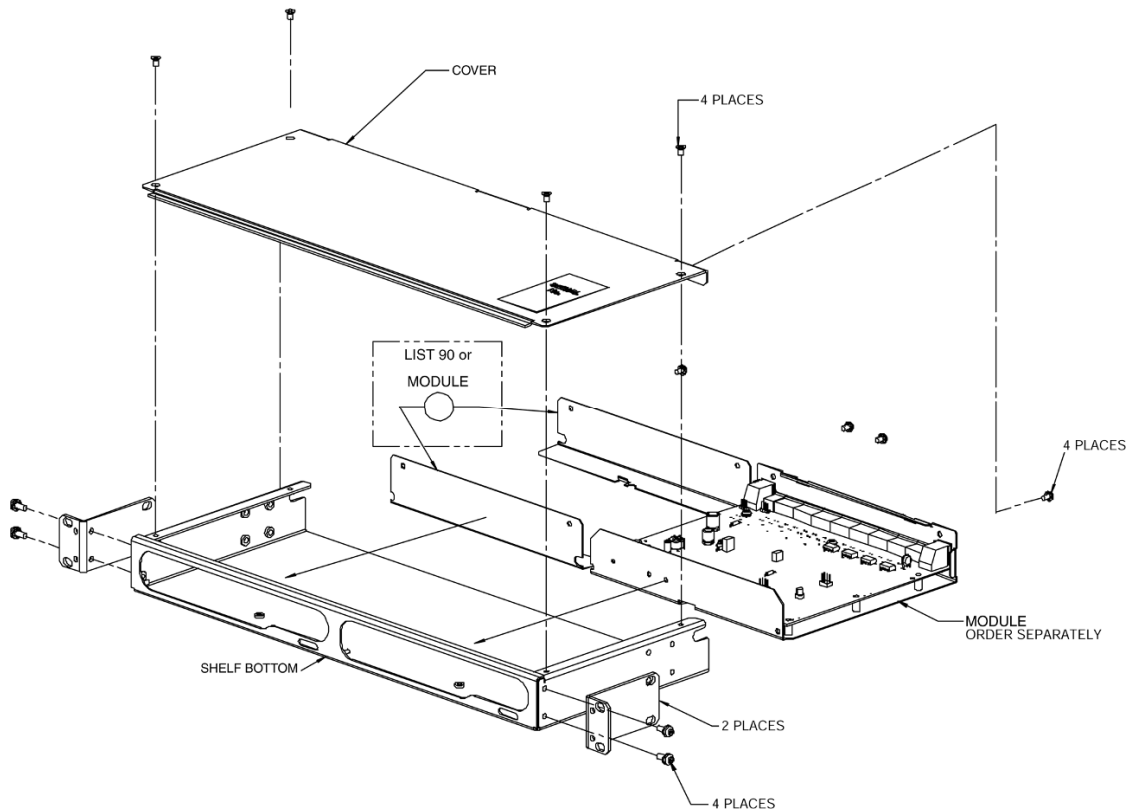


Figure 1—Illustration of typical assembly

The standard shelf consists of a one-piece bottom, sides, and front panel with cutouts. Mounting brackets and a top cover with screws are also provided. The Cordex Smart Peripheral modules and blanking plates are separate.

3.1 Module Mounting

The Cordex Smart Peripheral modules (two per shelf maximum) slide from the rear of the shelf. Use the screws provided with the top cover of the shelf to secure the assembly.

An optional blanking plate can be used to cover unused module cutouts (front and rear of shelf); for example, when only one module is used in a (two-module) shelf.

3.2 Shelf Preparation/Mounting

The standard shelf is supplied with universal-rack mounting brackets and may be mounted in a standard 19" or 23" relay rack. See drawing 030-734-06. Install brackets as required.

NOTE: *The shelf shall be mounted in a clean and dry environment.*

Secure the shelf to the rack using two #12 – 24 x 1/2" screws in each bracket. Philips-type screws and screwdriver should be used to eliminate the possibility of slippage and scratching of the unit's exterior. Washers (such as internal tooth) or special screws that are designed to cut through the painted surface should be used to ensure a good chassis ground.

4 Wiring and Connections

4.1 Safety Precautions



WARNING

Hazardous voltages are present at the input of power systems. The DC output from the rectifiers and battery system, though not dangerous in voltage, has a high short circuit current capacity that may cause severe burns and electrical arcing.

Before working with any live battery or power system/distribution center, follow these precautions:

- Remove all metallic jewelry; e.g., watches, rings, metal rimmed glasses, necklaces.
- Wear safety glasses with side shields (and prescription lenses if necessary) at all times during installation.

Metallic tools must be insulated.

The installer should follow all applicable local rules and regulations for electrical and battery installations; e.g., CSA, UL, CEC, NEC, OSHA, and local fire codes.

4.2 Tools Required

Various tools are essential for product installation. Use this list as a guide:

- Philips head screwdriver, #3 (tip size 1/4")
- Slot head screwdriver (blade size 1/8")
- Digital voltmeter equipped with test leads
- Cutters and wire strippers (#12 to #22AWG) (4 to 0.34mm²).

4.3 Connections

All wiring connections are accessible at the rear of the module. All cables should be routed together, bundled with clips (user supplied) and clamped directly into applicable terminal blocks.

NOTE: *Unused inputs must be shorted together.*

Twist positive and negative wire pairs together to minimize electrical noise pickup.

CAUTION –When wiring the terminal blocks, take care to bundle and route the wires so they do not interfere with the circuit breakers. Loose wires may cause the breakers to trip.

4.3.1 Grounding

A standoff is provided on the PCB (next to the CAN OUT connector) for earth ground.

4.3.2 Module Input Power

The input power to the module is supplied via the system DC voltage:

- Connect system (+) power bus lead to (+) module supply terminal.
- Connect system (-) power bus lead to (-) module supply terminal.

4.3.3 CAN Serial Ports

Two CAN Serial ports (modular jack with offset latch) for communications with Alpha Cordex System Controller and other CAN-enabled equipment (nodes) on the same system, are located at the rear of each module.

Daisy-chain from node to node (CAN OUT of one module to CAN IN of another) as necessary and ensure that only the last node is terminated as follows:

4.3.3.1 CAN Termination

A jumper allows the CAN bus to be open (to the next module in the system) or terminated. Termination must be set to "IN" (enabled) only on the final node on the CAN bus; otherwise, set termination to "OUT."

5 Operation

Cordex Smart Peripheral module operation is controlled via the web browser interface built into the Alpha Cordex Series system controller (CXC). Refer to the CXC Software manual (current version).

5.1 Display

The POWER ON LED lights when valid DC power is connected to the module.

The MODULE ACQUIRED LED lights when the CXC has assumed control of the module. This LED flashes to signal which module specifically is being monitored/pollled; e.g., when a user is querying signals via the CXC. This allows the user to identify the physical location of the module.

5.2 Can Bus Communications

The CAN bus is used for communication between the Cordex Smart Peripheral module and the CXC; which consists of commands and data transfer that are used during the operation of the power system to monitor the status of the module and the equipment connected to the system via the module.

5.3 CXC Data Logging

Data collected from the Cordex Smart Peripherals by the CXC may be exported into a standard spreadsheet format for analysis. Graphs may then be generated to depict status (e.g. deterioration of a battery) over time. Records can be taken over a preset interval or when certain conditions are met; such as, charge and discharge cycles.

NOTE: See *CXC Software manual for detailed instruction on programming.*

6 Maintenance

Although very little maintenance is required with Alpha systems, routine checks and adjustments are recommended to ensure optimum system performance. Qualified service personnel should do repairs.

The following table lists a few maintenance procedures for this system. These procedures should be performed at least once a year.



WARNING: HIGH VOLTAGE AND SHOCK HAZARD.

Use extreme care when working inside the shelf while the system is energized. Do not make contact with live components or parts.

Circuit cards, including RAM chips, can be damaged by static electricity. Always wear a grounded wrist strap when handling or installing circuit cards.

| Procedure | Date Completed |
|---|----------------|
| Inspect all system connections (re-torque as necessary) | |
| Verify alarm/control settings | |
| | |

Table A—Sample maintenance log

NOTE: *There are no field replaceable parts.*

7 Warranty

Alpha Technologies Ltd. warrants all equipment manufactured by it to be free from defects in parts and labor, for a period of two years from the date of shipment from the factory. The warranty provides for repairing, replacing or issuing credit (at Alpha's discretion) for any equipment manufactured by it and returned by the customer to the factory or other authorized location during the warranty period. There are limitations to this warranty coverage. The warranty does not provide to the customer or other parties any remedies other than the above. It does not provide coverage for any loss of profits, loss of use, costs for removal or installation of defective equipment, damages or consequential damages based upon equipment failure during or after the warranty period. No other obligations are expressed or implied. Warranty also does not cover damage or equipment failure due to cause(s) external to the unit including, but not limited to, environmental conditions, water damage, power surges or any other external influence.

The customer is responsible for all shipping and handling charges. Where products are covered under warranty Alpha will pay the cost of shipping the repaired or replacement unit back to the customer.

SPECIFICATIONS FOR ALPHA CORDEX SMART PERIPHERAL 8 O/P RELAYS, 8 DIGITAL I/P

Basic Unit

| | |
|----------------------------|--|
| Maximum Power Consumption: | 5 Watts |
| Input Voltage: | ± 9 to 60VDC (supply) |
| Relay Outputs: | 8 Form C per module, 60VDC, 1A maximum |
| Digital Inputs: | 8 per module, max voltage 60VDC, triggered at 5VDC |
| Software: | Compatible with Cordex Controller Software version 1.9 (minimum requirement) |
| Communications Bus Length: | Maximum 100m (328 ft) from CAN bus controller to the end CAN Termination [Maximum 16 peripheral modules on CAN bus] |

Interface

| | |
|-------------|---|
| Rear Panel: | LEDs for Power ON and Module Acquired |
| Internal: | RJ-12 offset connectors (CAN in and CAN out) to daisy-chain modules for Cordex Series communications; Jumper for CAN Termination selection |

Mechanical

| | |
|--------------|---|
| Mounting: | 19"/23" relay rack (flush/offset), stand-alone |
| Module Size: | 40.6mm H x 211.5mm W x 197.3mm D (1.6" H x 8.33" W x 7.77" D) |
| Shelf Size: | 44mm H x 432mm W x 178mm D (1.75" H x 17" W x 7" D) [all dimensions do not include mounting brackets] |

Environmental

| | |
|--------------|--|
| Temperature: | -40 to 75°C operating (-40 to 167°F) -40 to 85°C storage (-40 to 185°F) |
| Humidity: | 0 to 95% non-condensing |

Recommended Connection Wire Sizes (as per UL/CSA)

| | |
|--------------------|--|
| Temperature Range: | 0 to 50°C (32 to 122°F) |
| Wire Size: | 2.08 to 0.325mm ² (#14 to #22 AWG) |

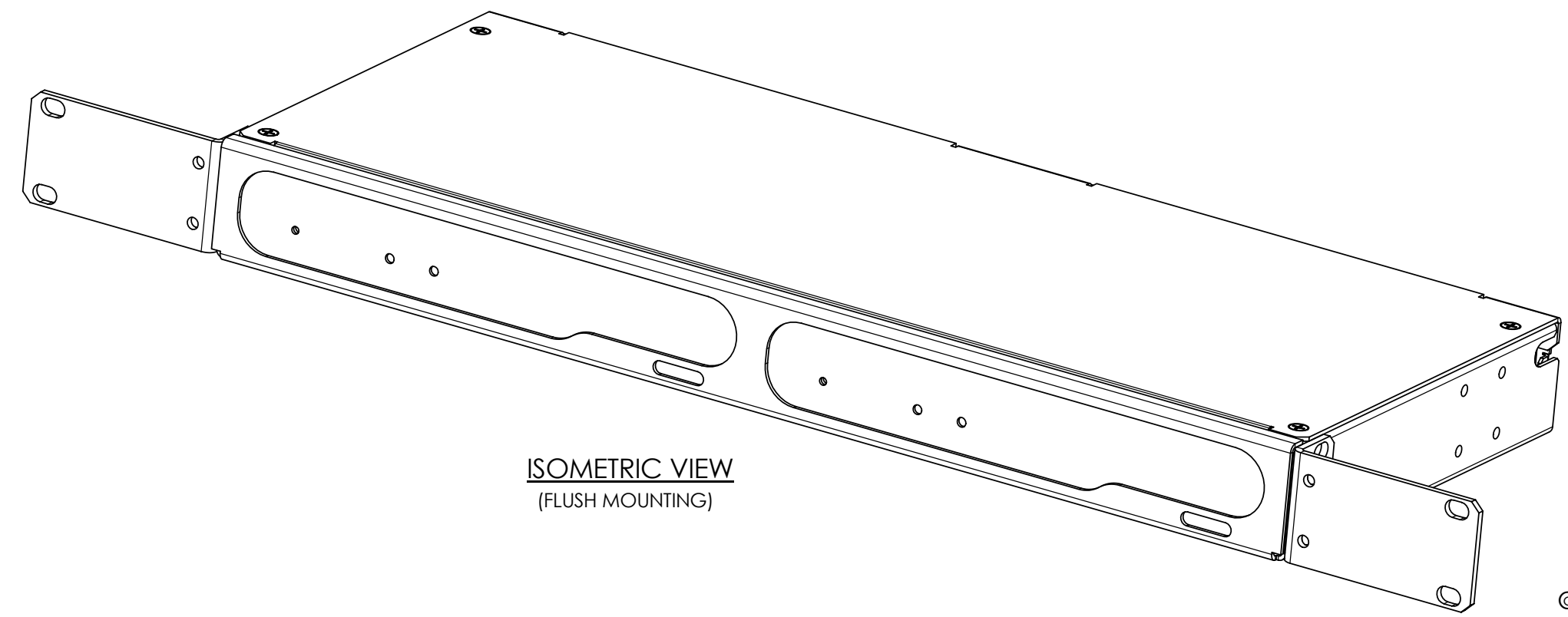
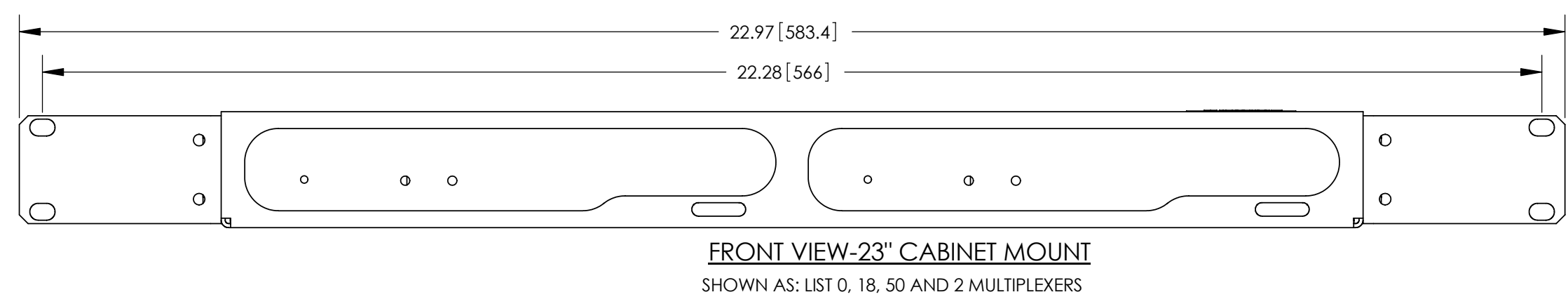
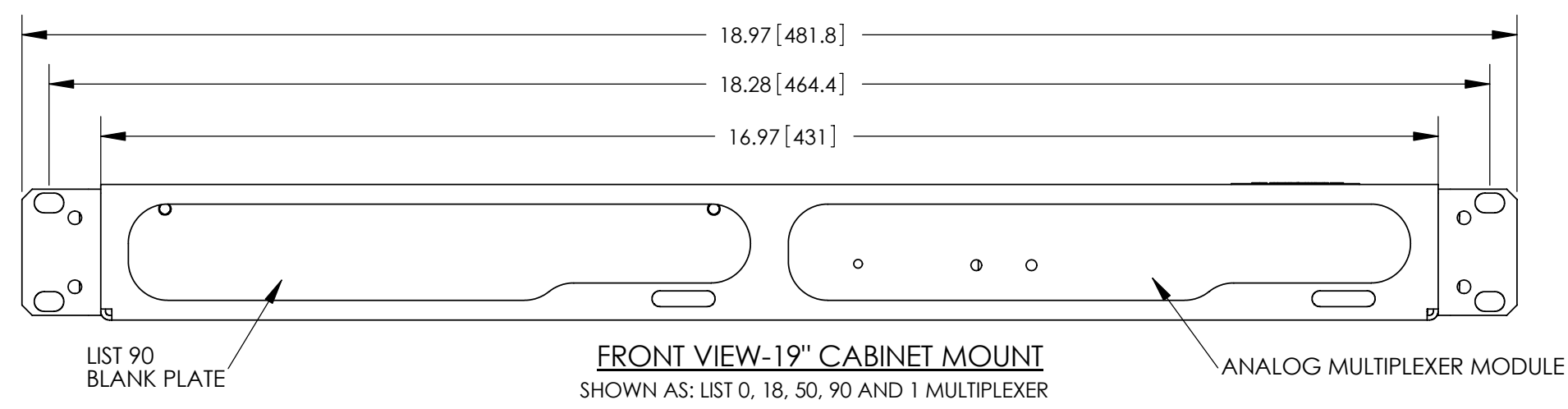
Part Numbers and List Options

Product is available to order under the following part numbers and list options:

| <u>Description</u> | <u>Part Number</u> |
|--|---------------------|
| Cordex Smart Peripheral 8 O/P Relays, 8 Digital I/P..... | (RoHS) 0180002- xxx |
| Gray finish with blue silkscreen..... | 0180002-002 |
| Charcoal finish with white (contrasting) silkscreen | 0180002-003 |
| Shelf, Cordex Smart Peripheral (fits 2 modules)..... | 030-734-20-xxx |
| <u>Options:</u> | |
| Basic shelf..... | |
| Universal mounting brackets, SEE OUTLINE DRAWING FOR MOUNTING OPTIONS..... | |
| Gray finish with blue silkscreen..... | |
| Charcoal finish with white (contrasting) silkscreen | |
| Module blank..... | |
| Stand alone PCB, right angle terminal block, top screw plugin, vertical LED..... | 7050046-002 |
| Stand alone PCB, right angle terminal block, front screw plugin, right angle LED | 7050046-003 |

*The above information is valid at the time of publication. Consult factory for up-to-date ordering information.
Specifications are subject to change without notice.*

| REVISIONS | | | | |
|-----------|-------------|--------|-------|------|
| LTR | DESCRIPTION | REV BY | DATE | APPD |
| B | NOTE ADDED | JLM | 07/08 | |



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DIMENSIONS ARE IN INCHES WITH METRIC [mm] IN BRACKETS: INCHES [mm]

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| | | | |
|----------|----------|---------|----------|
| DESIGN | JU/FL/RD | 2004/08 | MATERIAL |
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| CHECKED | RD | 2004/08 | |
| APPROVED | RD | 2004/08 | FINISH |

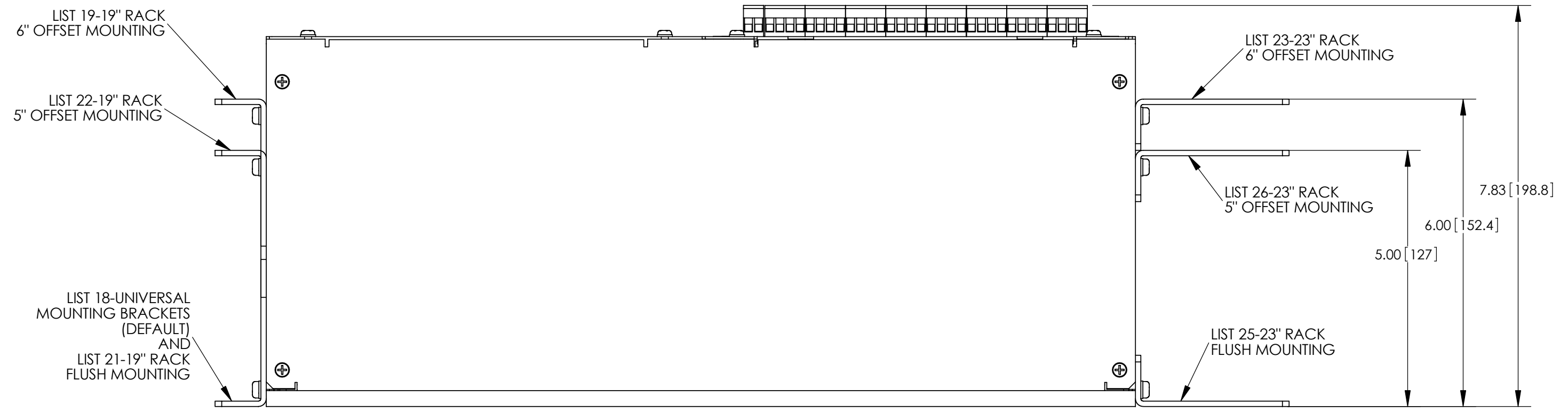
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X.X +0.04" [X] ±1mm
X.XX ±0.02" [X.X] ±0.5mm
X.XXX ±0.01" [X.XX] ±0.25mm

PER P.O. and Doc. 070-024-83
SCALE 1:2

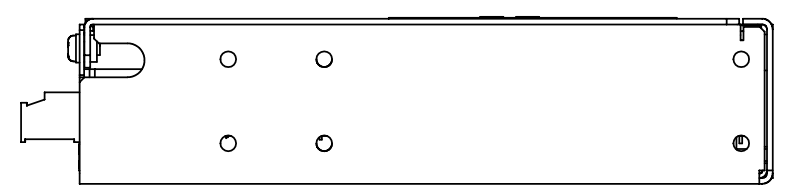
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**OUTLINE, SHELF
CXC PERIPHERALS**

ISSUE DATE SHEET 1 OF 2
SIZE TYPE DWG NO. REV
B D2 030-734-06 B

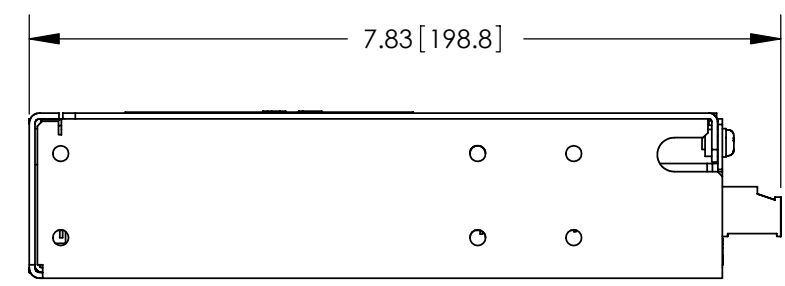
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| LTR | DESCRIPTION | REV BY | DATE | APPD |
| | | | | |



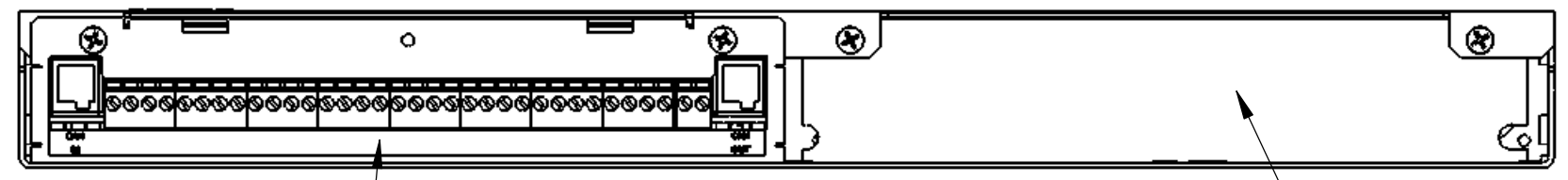
TOP VIEW-MOUNTING OPTIONS



LEFT SIDE VIEW



RIGHT SIDE VIEW



REAR VIEW

MODULE TERMINAL BLOCKS FOR MULTIPLEXER INPUTS, AND POWER CONNECTIONS SHOWN AS AN EXAMPLE. SHELF WILL ACCOMMODATE OTHER MODULES.

BLANK PLATE

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DIMENSIONS ARE IN INCHES WITH METRIC [mm] IN BRACKETS: INCHES [mm]

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| | | | |
|----------|----------|---------|----------|
| DESIGN | JU/FL/RD | 2004/08 | MATERIAL |
| DRAWN | EOF | 2004/08 | |
| CHECKED | RD | 2004/08 | |
| APPROVED | RD | 2004/08 | FINISH |

TOLERANCES

| | | | |
|-------|--------|--------|---------|
| X.X | +0.04" | [X] | ±1mm |
| X.XX | +0.02" | [X.X] | ±0.5mm |
| X.XXX | +0.01" | [X.XX] | ±0.25mm |

PER P.O. and Doc. 070-024-83

SCALE 1:2

TITLE

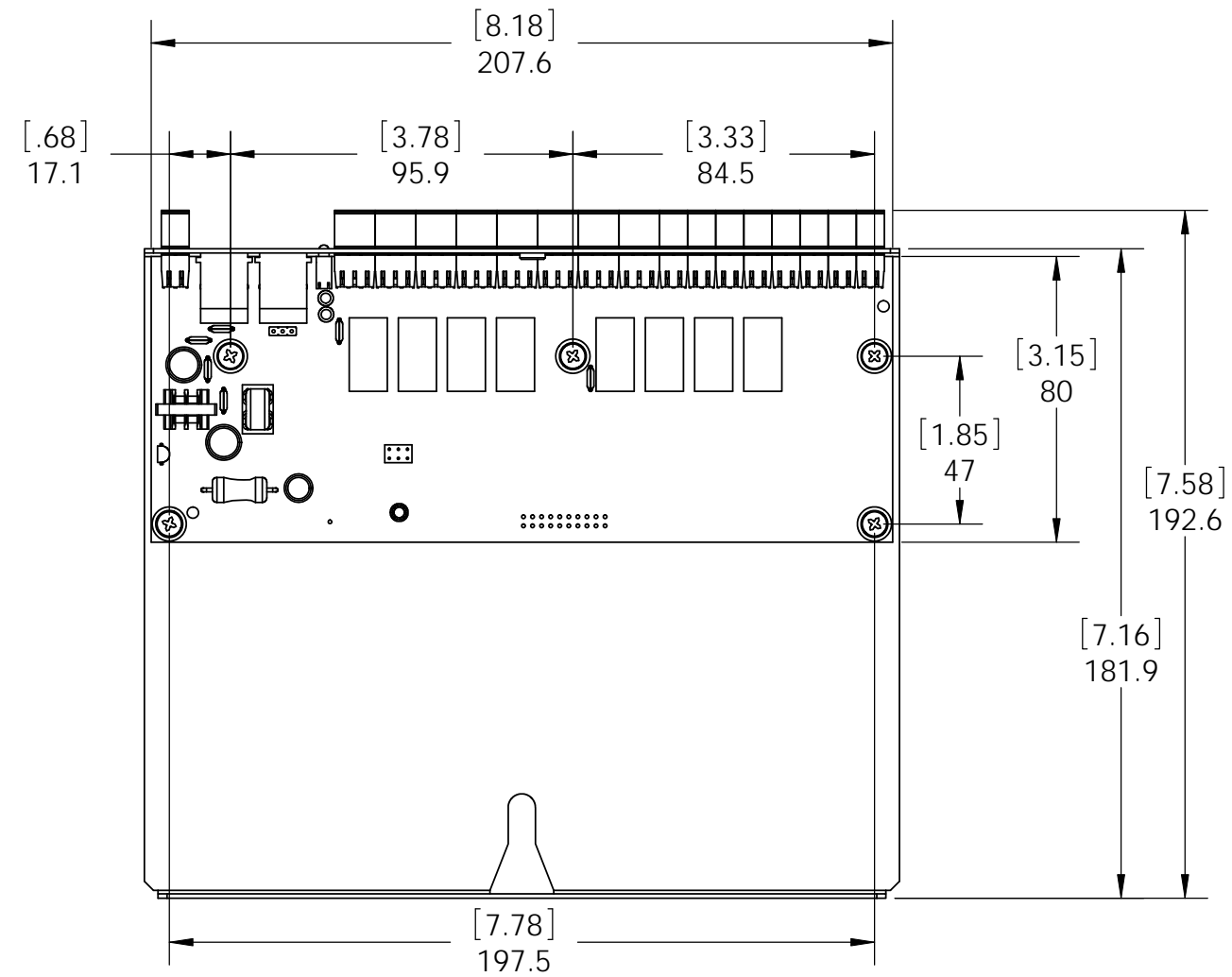
OUTLINE, SHELF CXC PERIPHERALS

ISSUE DATE SHEET 2 OF 2

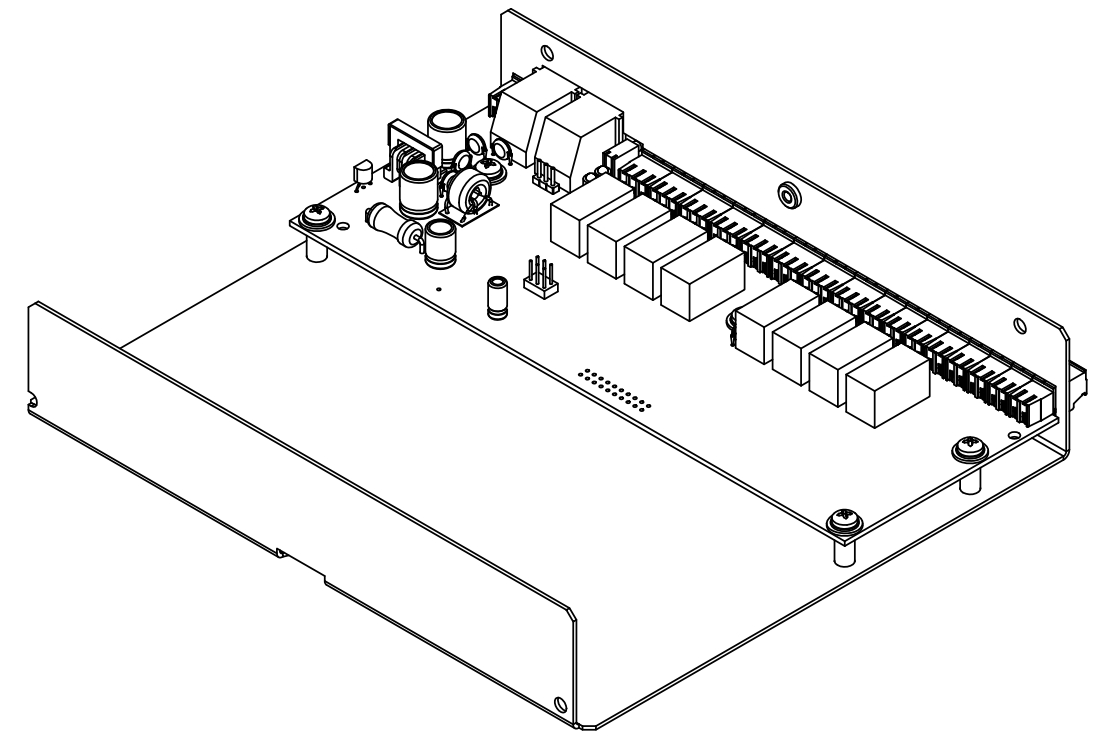
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B D2 030-734-06 B

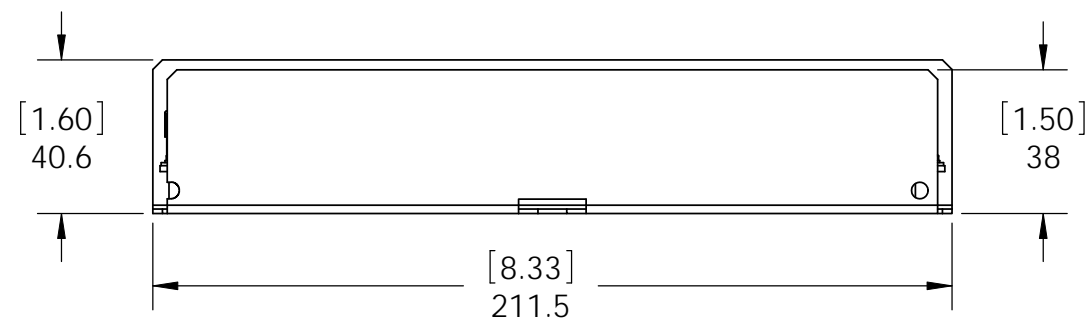
| REVISIONS | | | | | |
|-----------|-------------|-----|-------|------|------|
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| B | ECO 10552 | JLM | 01/11 | KL | SAM |



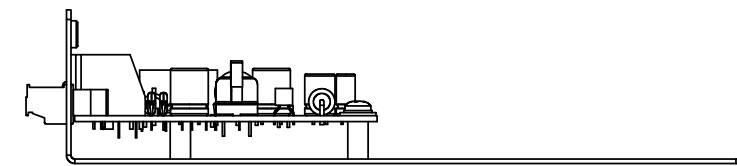
TOP VIEW
(SOME COMPONENTS ARE NOT SHOWN)



ISOMETRIC VIEW
(SOME COMPONENTS ARE NOT SHOWN)



FRONT VIEW



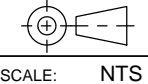
SIDE VIEW

ITEM
QTY



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| | |
|----------------|----------------|
| UNITS: mm [in] | |
| X [X.X] | ±1 [±0.040] |
| X.X [X.XX] | ±0.5 [±0.020] |
| X.XX [X.XXX] | ±0.05 [±0.002] |
| ANGULAR: | ±0.5° |

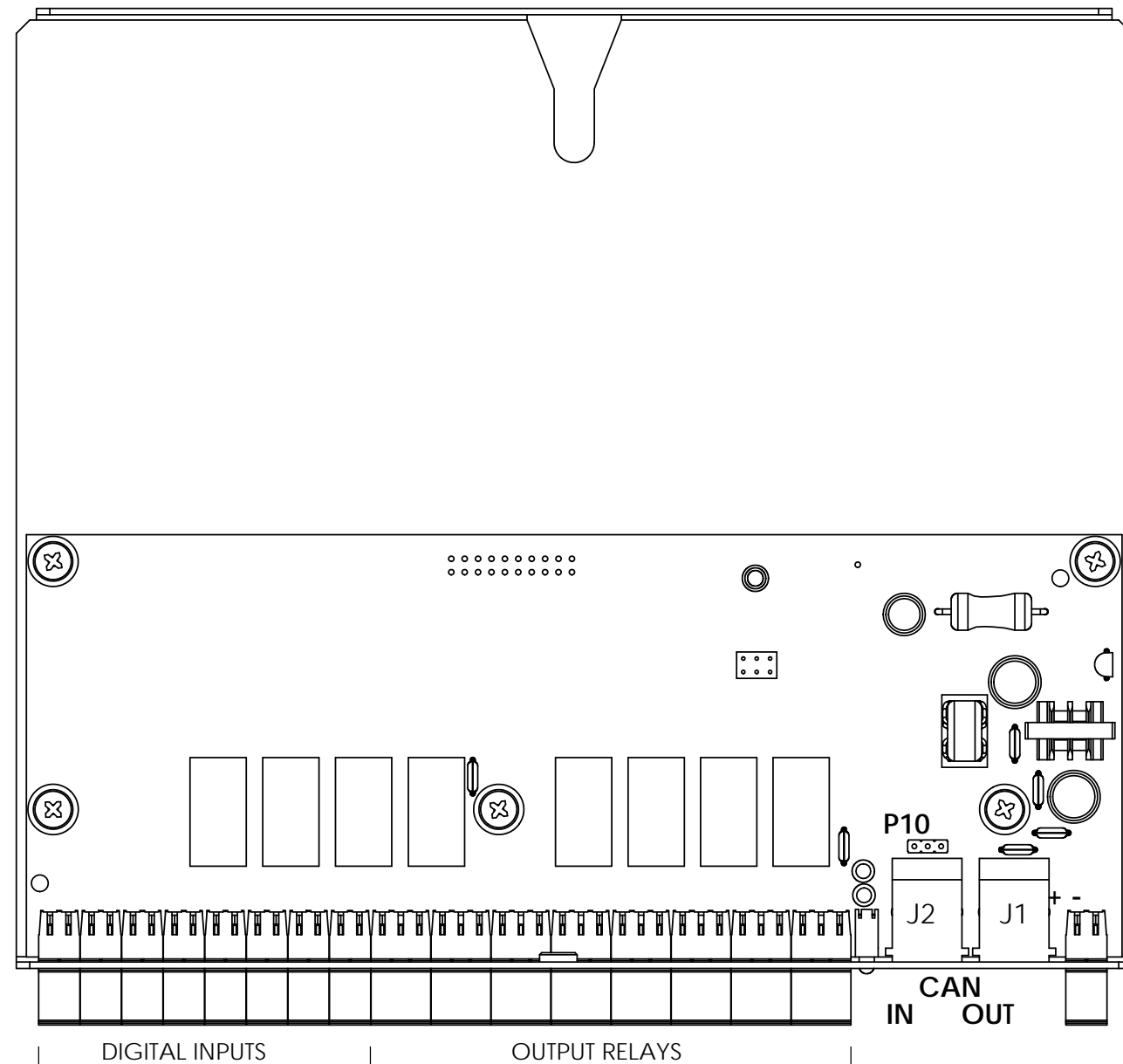


TITLE: OUTLINE DWG, 8DIO, 8 O/P RELAYS, 8 DIGITAL I/P

| | NAME | DATE |
|----------|------|---------|
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| DRAWN | JLM | 2010/11 |
| CHECKED | KL | 2010/11 |
| APPROVED | SAM | 2010/11 |

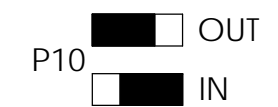
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|---------------------------|--------------|
| ISSUE DATE | SHEET 1 OF 1 |
| SIZE TYPE DWG NO. | REV B |
| B D2 | 0180002-06 |
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| REVISIONS | | | | | | |
|-----------|-------------|-----|-------|------|------|--|
| LTR | DESCRIPTION | DWN | DATE | CHKD | APPD | |
| B | ECO 10552 | JLM | 11/01 | KL | SAM | |



TOP VIEW
(SOME COMPONENTS NOT SHOWN)

JUMPER SETTING FOR CAN TERMINATION

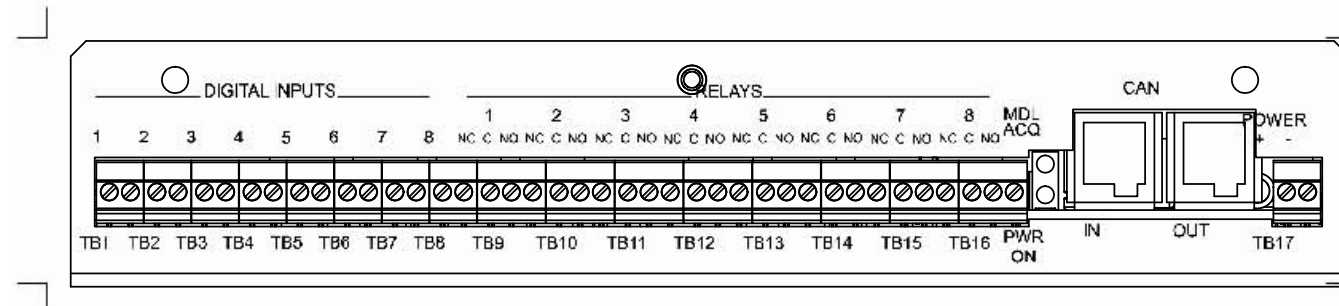


CAN OUT RJ12 OFFSET PIN OUT (J1)

1. GND
2. CAN H
3. NOT CONNECTED
4. CAN L
5. NOT CONNECTED
6. NOT CONNECTED

CAN IN RJ12 OFFSET PIN OUT (J2)

1. GND
2. CAN H
3. NOT CONNECTED
4. CAN L
5. NOT CONNECTED
6. NOT CONNECTED



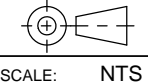
REAR VIEW

ITEM
QTY



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| | |
|----------------|----------------|
| UNITS: mm [in] | |
| X [X.X] | ±1 [±0.040] |
| X.X [X.XX] | ±0.5 [±0.020] |
| X.XX [X.XXX] | ±0.05 [±0.002] |
| ANGULAR: | ±0.5° |



TITLE: CUSTOMER CONNECTION, 8DIO, 8 O/P RELAYS, 8 DIGITAL I/P

| | NAME | DATE |
|----------|------|---------|
| DESIGN | SAM | 2010/11 |
| DRAWN | JLM | 2010/11 |
| CHECKED | KL | 2010/11 |
| APPROVED | SAM | 2010/11 |

| | | |
|---------------------------|---------------|--------------|
| ISSUE DATE | | SHEET 1 OF 1 |
| SIZE | TYPE DWG NO. | REV |
| B | D2 0180002-08 | B |
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Power