

**HARDWARE DESCRIPTION DOCUMENT (HDD)**

**For the**

**Vetronix Research Corporation**

**Low Power  
Power Management Distribution Unit  
(LP-PMDU)**

**Item Part Numbers:**

**LP-PMDU-1628**

**LP-PMDU-2428**



### **3.0 CHARACTERISTICS**

#### **3.1 Component Description**

The PMDU is a rugged assembly used to provide the interface between a vehicle's control and acquisition serial data bus and numerous remotely located loads, sensors, and actuators. The PMDU operates in 24VDC/28VDC powered systems, per MIL-STD-1275D, and provides load switching, load protection, and discrete digital input/output and analog input control and acquisition functions. The PMDU communicates to the vehicle's control and acquisition application software via a redundant serial Controller Area Network (CAN) or MIC communication bus. The physical interface of the CAN Bus is governed by SAE J1939 and MIC Bus is governed by Electronic Industries Association (EIA) RS-485A.

Detailed communications protocol is defined in Interface Control Documents (ICDs), ICD110412-828 for the CAN Bus interface and ICD110413-828 for the MIC Bus interface. The MIC Bus, also referred to as the Utility Bus, is commonly used in critical military and industrial applications. The CAN Bus has been widely accepted for use in many applications. The PMDU's standard CAN Bus ICD can be configured with application-specific or customer defined CAN Bus operational protocols as required.

A vehicle's control and acquisition system may consist of multiple PMDUs, as well as other CAN Bus or MIC Bus compatible hardware. PMDUs are used primarily in 28VDC vehicle applications to provide secondary power management and distribution as well as data acquisition and control.

##### **3.1.1 General Capabilities**

The electrical functionality of the PMDU is implemented using the Vetronix Programmable Load Control Module known as the PLCM-828. The PLCM-828 is an existing off-the-shelf component that contains power and data acquisition circuits that have been proven over several years in military and industrial applications.

The PLCM-828 contains:

- 8 Programmable Load Outputs (1A to 25A in 1A increments)
- 8 Digital Input/Output (DIO) Channels
- 4 Single ended Analog Inputs or 2 Differential Analog Input
- 2 Sensor Power Outputs
- Dual, Electrically Isolated CAN Bus and MIC Bus Interface
- Internal Logic Power Supply

Two PLCM-828 modules are housed in the PMDU-1628 assembly to provide a 16-load capability and three of the PLCM-828 modules are housed in the identical enclosure to provide a 24-load capability in the PMDU-2428 assembly. Each PLCM-828 is directly addressable by the CAN or MIC bus regardless of how many modules are packaged in an assembly or entire applications. This allows a power management and data acquisition system to be developed with an architecture that will accommodate future growth and the maximum amount of software reuse. For example, a PMDU-1624 can be upgraded to a PMDU-2428 without causing any assembly size or mounting change, or require any modification to assembly's existing I/O or firmware interface.

The **PMDU-1628** provides:

- 16 Programmable Load Outputs (1A to 25A in 1A increments, 200A maximum)
  - 6 Loads on #20 contacts (1A to 7A)
  - 6 Loads on #16 contacts (1A to 15A)
  - 4 Loads on #12 contacts (1A to 25A)
- Load Paralleling
- Load Status, Current, and Voltage Reporting
- Input Voltage and LRU Temperature Reporting
- 16 Digital Input/Output Channels
- 8 Single Ended Analog Inputs or 4 Differential Analog Input
- 4 Sensor Power Outputs
- Dual, Electrically Isolated CAN Bus and MIC Bus Interface
- Internal Logic Power Supply

The **PMDU-2428** provides:

- 24 Programmable Load Outputs (1A to 25A in 1A increments, 200A maximum)
  - 12 Loads on #20 contacts (1A to 7A)
  - 6 Loads on #16 contacts (1A to 15A)
  - 6 Loads on #12 contacts (1A to 25A)
- Load Paralleling
- Load Status, Current, and Voltage Reporting
- Input Voltage and LRU Temperature Reporting
- 24 Digital Input/Output Channels
- 12 Single Ended Analog Inputs or 6 Differential Analog Input
- 6 Sensor Power Outputs
- Dual, Electrically Isolated CAN Bus and MIC Bus Interface
- Internal Logic Power Supply

3.1.2 Functional Diagram

The functional interface diagram for the PMDU-1628 is shown Figure 1 and the PMDU-2428 is shown in Figure 2.

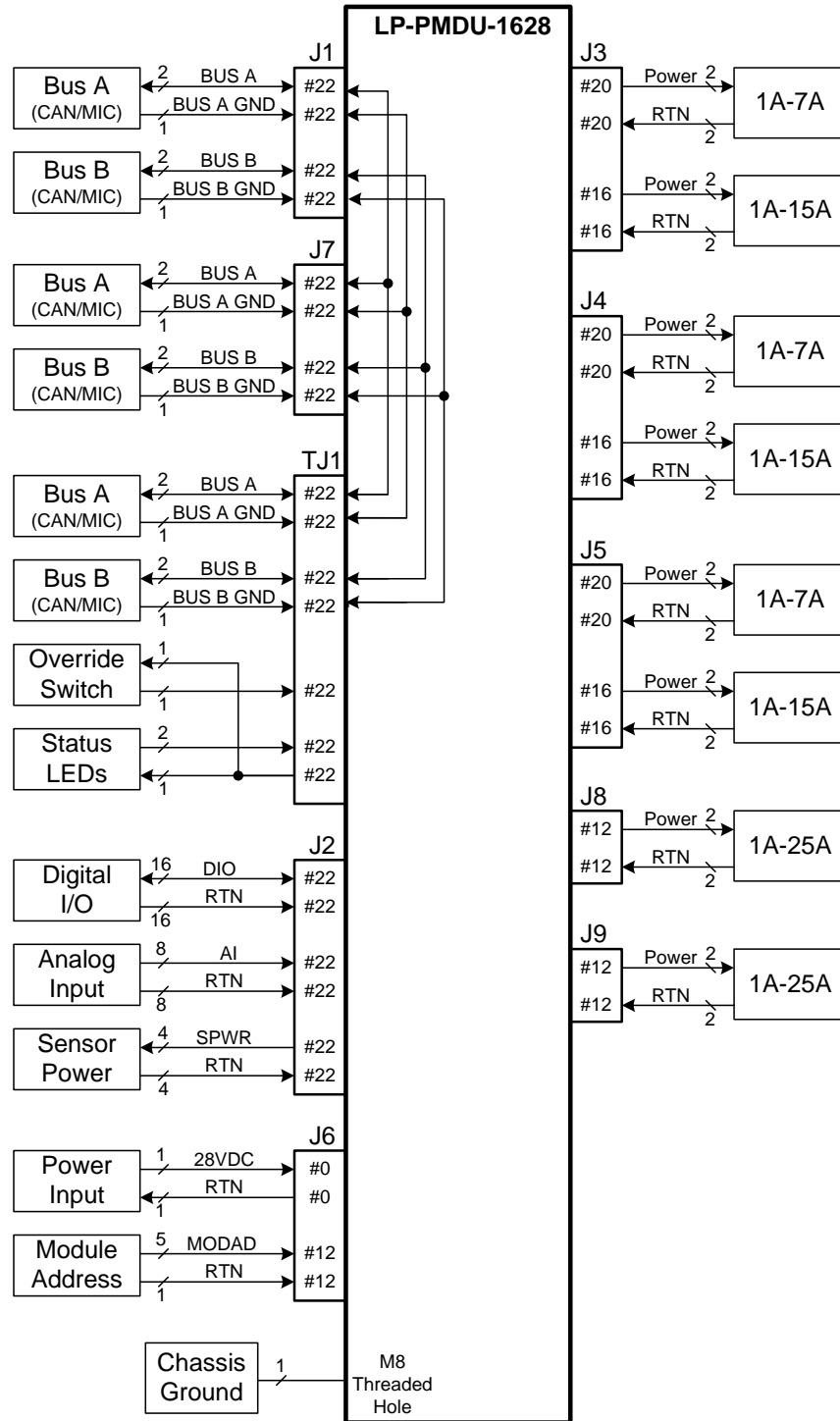


Figure 1. PMDU-1628 Functional Interface Diagram

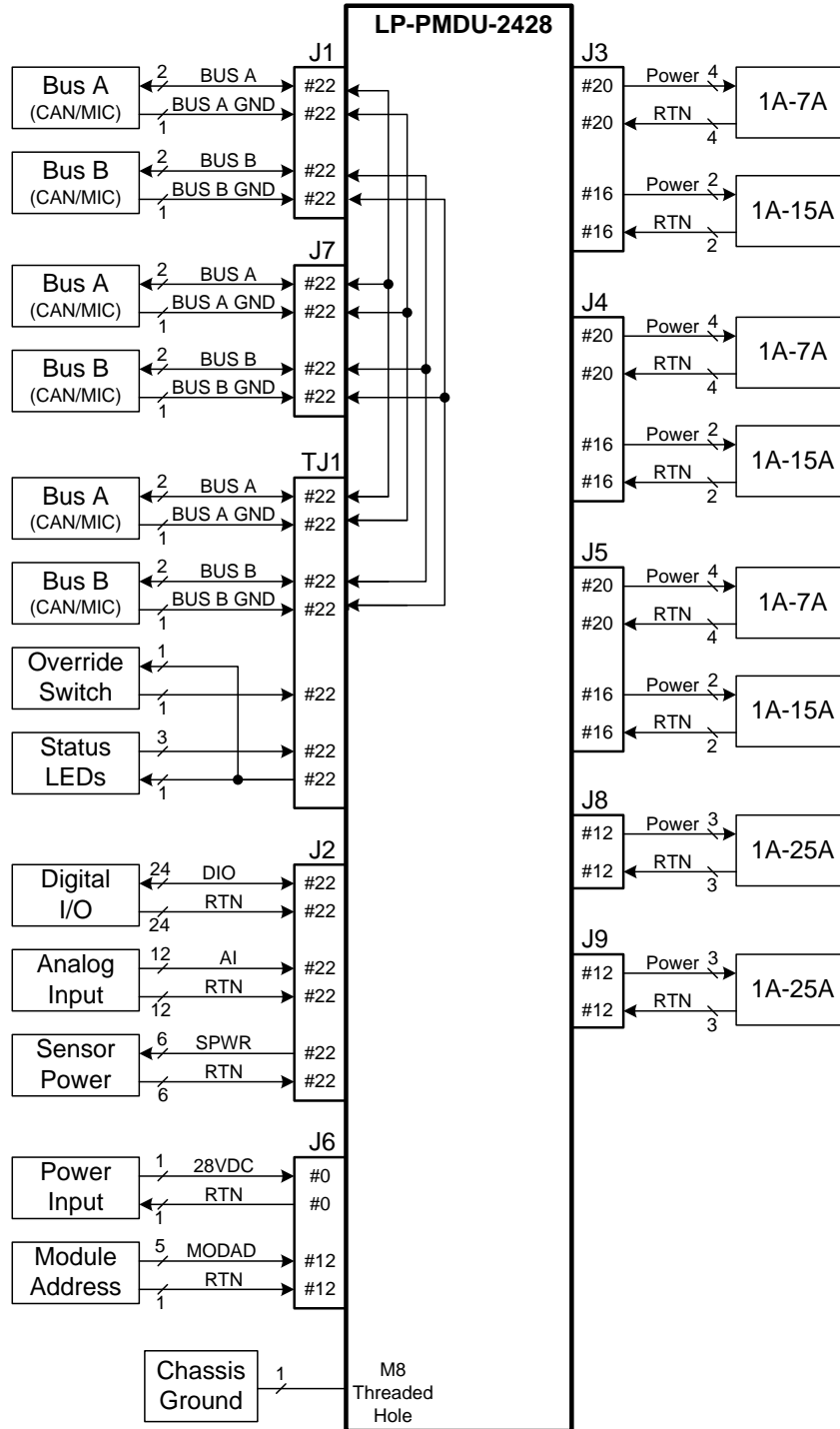


Figure 2. PMDU-2428 Functional Interface Diagram

**3.2.1.1 Dimensions**

Both the PMDU-1628 and PMDU-2428 are housed in identical enclosures. Figure 3 shows the general dimensions and connector orientation for both PMDU assemblies. Dimension detail is contained on item drawings LP-PMDU-1624 and LP-PMDU-2428.

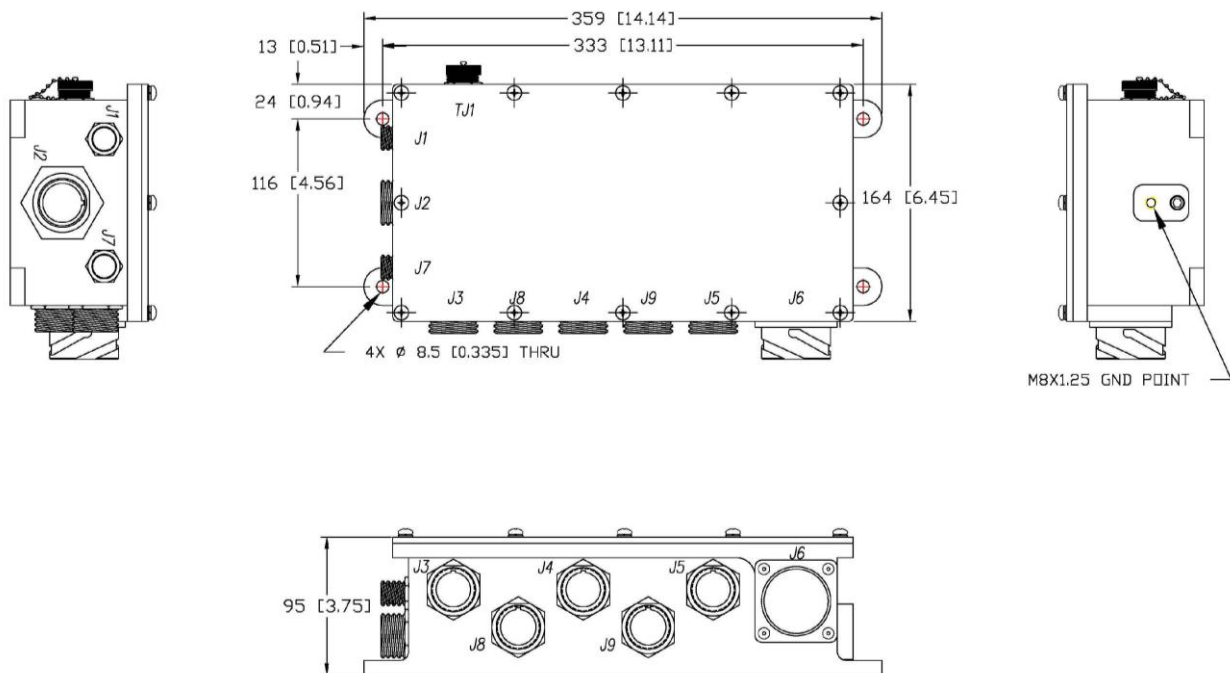


Figure 3. PMDU Assembly

**3.2.1.2 Weight**

The PMDU-1628 weighs less than 12 pounds and the PMDU-2428 weighs less than 13 pounds.