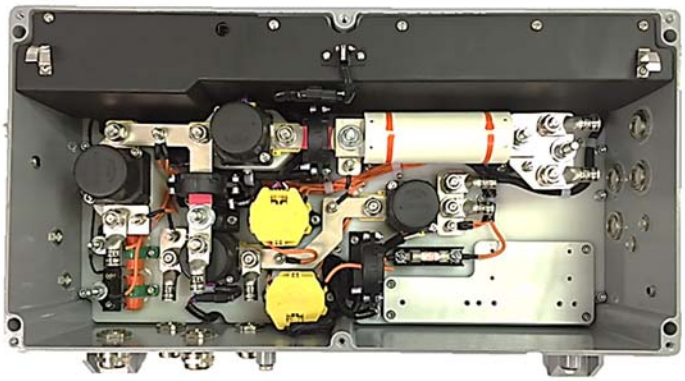
Smart Power Distribution Modules

SPDM- 60/100/250/400



SPDM-100 pictured

The HDS Smart Power Distribution Module (SPDM) product line offers a single integrated solution to DC bus management. Available in 60kW, 100kW, 250kW, and 400kW configurations, the SPDM provides a solution for connecting both single and distributed energy storage systems to chargers and auxiliary loads. The SPDM can act as the main power distribution and battery disconnect unit, or as a redundant safety system independent of the BMS and system controller.

Key Advantages: Safe, Reliable, and Rugged Power Distribution with Flexible Configurations and Simple Integration.

Key Applications: Production Electric and Hybrid Vehicles, Test Vehicles, Bench Test Systems, Stationary Power Systems, Battery Test Systems, etc.

SPDM Features:

- **Advanced Controls:** Integrated controller with bus voltage and current monitors for contactor control.
- **High Voltage Safe:** HVIL and available Isolation Monitoring allow safe operation up to 800V DC.
- **High Efficiency:** Very low 12 or 24V DC power consumption, ideal for battery powered systems.
- **Flexible Communication:** Customizable CAN 2.0 speed, frequency and messages.
- **EMI/EMC Compatible:** Shielding and grounding provisions for all HV inputs.
- **Robust Design:** Can be mounted in any orientation for ease of installation.
- **Additional functions:** pre-charge, welded contactor detection, isolation break detection, over/under-voltage, and over-current protection, manual service disconnect, auxiliary outputs, and filtering.

Hybrid Design Services, Inc.
2479 Elliott Dr.
Troy, MI 48083

Phone: +1-248-298-3400
Fax: +1-248-298-3402
sales@hybriddesignservices.com
www.hybriddesignervices.com.

SPDM Product Features

LV input: 12/24 V DC, with reverse polarity-protection.

HV Inputs: Application dependent up to 800 volts and up to 500 ampere *(400 kW; higher voltages and power capability may be available; application information is required)*

HV Outputs: Application dependent up to 800 volts and up to 500 ampere *(400 kW; higher voltages and power capability may be available; application information is required)*

Data Link: J1939 Compatible data link with J1939-11 physical layer (Twisted Pair, Shielded)

Fusing / Circuit Breakers:
- 5A to 500A fusing available up to 800 volts
- Voltages greater than 800 require additional application information

Contactors:
- Automotive grade positive and negative switched HV I/O, 800V, 500A maximum continuous carry.
- Contactor state feedback and fault status checks.
- OPTION: Contactors for switching additional HV outputs.

Current Monitoring:
- Three (3) I/O currents up-to +/- 350A using high accuracy fluxgate automotive grade current sensors. (currents greater than 350A require additional application information)
- OPTION: Additional current sensors (up to 2)

HV Monitoring:
- Four (4) I/O voltages up-to 1000V DC using HDS-developed isolated high voltage sense boards with scaled output.

HV Interlock:
- One (1) high-voltage inter-lock on the enclosure lid.
- OPTION: Additional HV connectors can be monitored by the HVIL

Data Link Interface
- J1939 compatible CAN bus with customizable messages (250kbps, 500kbps or 1000kbps)
- Safe and secure on / off control of the contactors
- System Status and Fault Messages up to 200Hz

Controller
- Freescale automotive grade controller.
- Interfaces with vehicle or system controller.

SPDM Product Options

Pre-charge control (OPTION):
- Additional contactor and pre-charge resistor can be used to safely charge the DC Bus.
- Bus voltage rise is monitored by the controller.

HV Isolation Monitoring (OPTION):
- Additional HV Isolation Monitoring can be used to continuously monitor isolation between HV and the chassis.

HV Connectors (OPTION):
- Optional high power connectors can be provided instead of standard cable lugs.

Manual Service Disconnect (OPTION):
- Optional MSD available to ensure safe servicing.

Data Logging (OPTION):
- Optional data logging functionality available with on-board flash storage.
- Additional Vehicle/System parameters can be recorded.

Remote Access (OPTION):
- Remote control and data acquisition capable.
- Remote software updates capable.

Customizable CAN Messages:
- Operating Status:
  - Contactor States
  - DC Bus Voltages
  - DC Bus Currents
  - System Status
- Fault Status:
  - Over voltage warning limits
  - Under voltage warning limit
  - Over current warning limit
  - Contactor Error
  - Pre-charge Error
  - Pre-charge time-out Error
  - HV Isolation Error
  - HVIL Error
- Custom messages available.

Typical SPDM -100 Product Specifications

Electrical Specifications	
LV Input	12V/24VDC
LV Current	< 5A cont.
Energy Storage Voltage	< 800 VDC
HV Input (ESS)	125 kW
HV Charge	125 kW
HV Output	100 kW
Aux HV Output	25 kW

Mechanical Specifications	
Dimensions	660 x 425 x 250 mm (26 x 17 x 10 in.)
Weight	34 kg (75 lb.)
Operating Temperature	- 40 °C to + 85 °C
Storage Temperature	- 55 °C to + 105 °C
Ingress Protection	IP6k9k *
Environmental Protection	SAE J1455

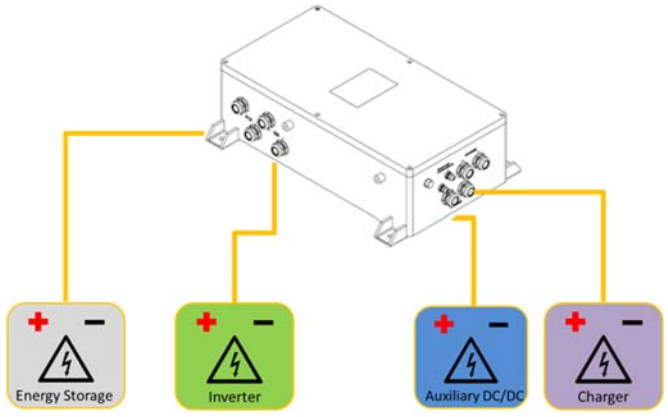
** application- and configuration- dependent*

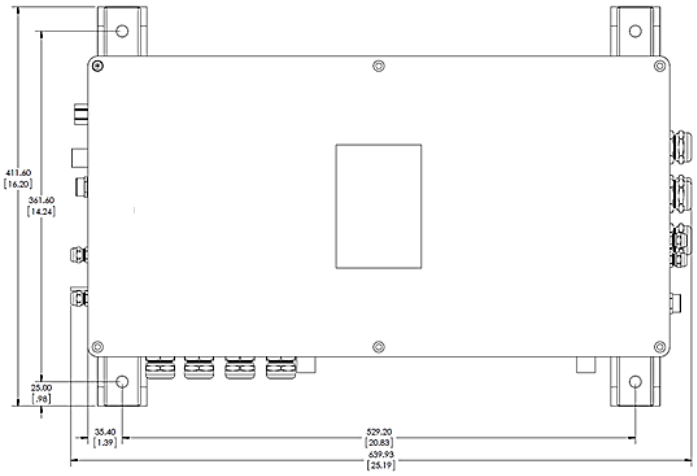
SPDM Application Notes

The SPDM can be configured to run in autonomous or slave mode.

- Autonomous Mode: The SPDM can be configured to open the contactors when certain operation limits are reached.
- Slave Mode: The SPDM receives contactor state commands from a vehicle/system controller. The SPDM reports the voltage and current data.

The figure below depicts the SPDM in an xEV Application.





Note: HV and LV Connections, Packaging Size, and Mounting Features are customizable.

Hybrid Design Services, Inc. (HDS™) offers a full range of consulting, engineering, design, prototyping, manufacturing and testing services, focusing on the advanced transportation and energy technology sectors.

Contact HDS to learn more about the HDS Smart Power Distribution Modules and other products.

Hybrid Design Services, Inc.
2479 Elliott Dr., Troy MI 48083
+1.248.298.3400 (phone)
+1.248.298.3402 (fax)
sales@hybriddesignservices.com
www.HybridDesignServices.com