GENERAL SPECIFICATIONS

Input Power
0 to 50 VDC

Current Rating
Up to 300 amps per channel on PDUs and 25 amps per channel on multi-channel cards. Channels may be paralleled for increased current ratings.

Programming Current Range
10% to 100% of channel maximum current rating

Interface Options
Standard interfaces: CANbus, RS-485, RS-422 or Discrete
Factory options: Ethernet, MIL-STD-1553B

Instant Trip Level
Up to 1400% of programmed current rating

Control Power Input
28 VDC Line or 5 VDC External

Isolation
Opto-isolated control circuitry

Power Out to Control Isolation
500 Volts

Load Monitoring/Reporting Accuracy
5% voltage, current, temperature measurements.

Thermal Interface Temperature Range
-40°C to 105°C

Temperature and Altitude
MIL-STD-810F
Methods 501, 502, and 520:
• -40°C (ambient) and altitude of 15,000 feet, minimum soak of 8 hours
• 71°C (ambient) and altitude of 15,000 feet, minimum soak of 8 hours

Operational Vibration
MIL-STD-810F, Method 514.5:
Category 24 - Minimal Integrity Test, Figure 514.5C-17 for a duration of 60 minutes in each of the three orthogonal axes.

Operational Shock
MIL-STD-810F: functional shock response spectrum (SRS) per the “Functional Test for Ground Equipment” of Table 516.5-1 and Figure 516.5-8 in each of the three orthogonal axes.

Humidity
In accordance with MIL-STD-810F Method 507.4: 5 humidity cycles (240 hours)

EMI
In accordance with MIL-STD-461, including CE102, CS101, CS114, CS115, CS116, RE102, and RE103.

Radiation
Tactical Nuclear Radiation Tolerant

Note: Certain specifications are model dependant. Contact factory for details.

Standard modules and multi-channel boards are ready to order. Contact DDC for model specifications.

In addition to the standard 28 VDC products described, DDC capabilities include 270 VDC and AC SSPCs, as well as custom packaging and connectivity.

INDUSTRY STANDARDS

MIL-STD-704F Electric Power Aircraft
MIL-STD-810F Environmental Standards
MIL-STD-1275D Vehicle Power, 28V/DC
MIL-STD-1686C ESD Program
MIL-STD-461 Electro-magnetic Interference
DDC’s Solid State Power Controllers (SSPC) cards, power distribution units, and modules provide state of the art switching and circuit protection for secondary and primary power distribution. SSPCs provide functional and performance advantages compared to relays and circuit breakers, including much higher reliability, accurate measurements, very low power dissipation, controlled rise and fall times for reduced EMI emissions, “soft starting” of loads, and controlled shutdown. Protective features include rapid short circuit protection for secondary and primary power distribution.

**Features**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Logic</td>
<td>Microprocessor-based, allows for flexible control and diagnostics</td>
</tr>
<tr>
<td>Control including I2t and Instant Trip Protection</td>
<td>Protects loads and wiring harnesses like a thermal mechanical circuit breaker, but with solid-state reliability. I2t protection eliminates nuisance trips when switching into motor, capacitive, or lamp loads.</td>
</tr>
<tr>
<td>Ruggedized and Military Qualified</td>
<td>MIL-STD-810 and DEF STAN 61-5 Compliant</td>
</tr>
<tr>
<td>Rack-Mountable or Small Module</td>
<td>Smart Point-of-Load Modules with I2T Protection</td>
</tr>
<tr>
<td>Water Proof and Dust Resistant</td>
<td>Operating Temperature: Ambient Air Cooled: -40°C to 71°C, Conduction Cooled: -40°C to 105°C</td>
</tr>
</tbody>
</table>

**Power Distribution Units**

- Up to 32 Independent Load Channels, Rated From 5A to 600A
- Total Current Capability of 600A
- Remote Control of Channels and Channel Groups
- Channel Paralleling for Higher Current Loads
- Programmable Channel Trip Point with PT Protection

**SSPC Cards**

- Up to 20 Independent Load Channels, Rated From 5A to 300A
- Total Current Capability of 300A
- Remote Control of Channels and Channel Groups
- Channel Paralleling for Higher Current Loads
- Programmable Channel Trip Point with PT Protection

**Smart Point-of-Load Modules**

- 3.5 to 35A Programmable Trip Point with PT Protection
- Remote Control via SAE J1939 CAN BUS Interface or Discrete Signal Interface
- Nominal 28 VDC Operation
- MIL-STD-1275B Compliant
- Conduction Cooled: -40°C to +85°C Operating Temperature

**Features**

- **PI and Instant Trip Protection**
  - Protects loads and wiring harnesses like a thermal mechanical circuit breaker, but with solid-state reliability. I2t protection eliminates nuisance trips when switching into motor, capacitive, or lamp loads.
- **Fast Clearing of Short Circuits**
  - Provides 1 ms or less deactivation time following short circuit.
- **Remote Control of Channels and Channel Groups**
  - Enables remote control of individual channels.
- **Total Current Capability of 600A**
  - Supports high current loads.
- **Remote Control via SAE J1939 CAN BUS**
  - Allows for remote control and diagnostics.

**Applications**

- Ground Vehicles
- Aircraft
- Unmanned Vehicles
- Weapon Launchers
- Watercraft
- Turrets
- Aircraft
- Ground Vehicles
- Unmanned Vehicles
- Weapon Launchers
- Weapon Launchers

**Deployment**

- Over Two Decades of Military Deployment
  - DDC leads the industry in experience, reliability and product deployment
  - More than 500,000 DDC SSPC nodes installed on Military Vehicles since 1996
DDC’s Solid-State Power Controller (SSPC) cards, power distribution units, and modules provide state-of-the-art switching and circuit protection for secondary and primary power distribution. SSPCs provide functional and performance advantages compared to relays and circuit breakers, including much higher reliability, accurate measurements, very low power dissipation, controlled rise and fall times for reduced EM emissions, “soft starting” of loads, and controlled shutdown. Protective features include rapid short circuit protection, enabling circuit deactivation times on the order of 1 ms, along with IP over load protection. Protection includes ground-fault and over load protection, and the SSPCs themselves are shock tolerant, reliably avoiding “nuisance trips” when switching into motors, capacitive, or incandescent lamp loads.

DDC’s SSPC boards and modules are processor-based, providing advantages in the areas of flexibility, measurement and computational accuracy, and connectivity to an external power management computer by means of a data bus or network interface, such as CAN Bus, or RS-485. SSPC channels can be programmed for different rated currents to accommodate varying loads, and multiple SSPC channels can be paralleled, enabling higher current capacities.

A power management computer can poll the values of various SSPC parameters over the board’s bus or network interface, including basic on/off and built-in test status, input voltage, output voltage and current, board rail and/or load temperatures. This data can then be used to support system-level diagnostics and prognostics, enabling predictive, condition-based maintenance to protect generators, batteries, wiring, connectors, loads and the SSPCs from failures and potential damage.

**FEATURES**
- PI and Instant Trip Protection
- Rapid deactivation following short circuit detection (~ 1 mS)
- Programmable Current Rating
- Channel Paralleling
- Solid State Switching
- Network Control
- Controlled Turn-On/Turn-Off Time & High Inrush Capability
- Low Power Dissipation
- Programmable Channel Defaults and Mission Override
- Multiple Board and Module Configurations
- Over Two Decades of Military Deployment

**BENEFITS**
- Protects loads and wiring harnesses like a thermal mechanical circuit breaker, but with solid-state reliability. PI protection eliminates nuisance trips when switching into motor, capacitive, or lamp loads.
- Fast clearing of short circuits prevents damage to wiring, equipment, and vehicles.
- Selection of channel current rating from 10% to 100% of maximum rating provides precise load protection and power distribution system flexibility.
- Provides system expandability with fewer SSPC components.
- Allows the system processor to control on/off status of SSPC channels, check conditions, and monitor power quality. Provide inputs to system computers for prognostics, diagnostics, and improved system maintenance.
- Highly efficient MOSFETs reduce losses and heat generation.
- Enables the power distribution system to respond to power loss and emergency conditions.
- Supports varying power distribution architectures, channel densities and space limitations.

**Power Distribution Units**
- Up to 32 Independent Load Channels, Rated From 5A to 600A
- Total Current Capability of 600A
- Remote Control of Channels and Channel Groups
- Channel Paralleling for Higher Current Loads
- Programmable Channel Trip Point with PT Protection
- SAE J1939 CAN BUS Compatible Interface and RS-485 Interface Options

**SSPC Cards**
- Programmable Channel Trip Point with PT Protection
- SAE J1939 CAN BUS Compatible Interface and RS-485 Interface Options
- Low Power Dissipation, <26 Watts at Maximum Load Current
- Conduction Cooled -40°C to 85°C or Ambient Air Cooled -40°C to 71°C Operating Temperature
- Nominal 28 VDC Operation, MIL-STD-1275D, MIL-STD-704, and DEF STAN 61-6A Compliant
- MIL-STD-410 and MIL-STD-461 Compliant

**Smart Point-of-Load Modules**
- 3.5 to 35A Programmable Trip Point with PT Protection
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**INDUSTRY STANDARDS**

- **MIL-STD-704F**: Electric Power, Aircraft
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- **MIL-STD-1275D**: Vehicle Power, 28V/DC
- **MIL-STD-1686C**: ESD Program
- **MIL-STD-461E**: Electro-magnetic Interference

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