PRODUCT SPECIFICATION

Digital Power
Flexible Power Solutions

DCP1224-VD | 12V/24V Control Panel

Driver Control Panel for Tactical Reconnaissance Vehicle

MODEL: DCP1224-VD | CATEGORY: PDU | FORM: Vehicle Integration

PRODUCT OVERVIEW

Key Product Features

- Integrated driver interface combining control, monitoring, and protection
- Dual-voltage operation (12V / 24V vehicle systems)
- Multi-parameter instrumentation (speed, RPM, voltage, fuel, temperature)
- Centralized control of lighting, IR systems, and drivetrain functions
- Relay-controlled outputs for high-current load management
- LED-based status indication and fault diagnostics
- Integrated Low Voltage Load Disconnect (LVLD) for battery protection
- Rugged, sealed construction for harsh environments
- Modular wiring harness with serviceable connectors
- Automotive-grade wiring and distributed electrical architecture

PRODUCT DESCRIPTION

The DCP1224-VD Driver Control Panel is a rugged, integrated human-machine interface (HMI) engineered for tactical and mission-critical vehicle platforms. It consolidates instrumentation, electrical control, monitoring, and protection into a compact, panel-mounted system.

Designed for dual-voltage (12V/24V) vehicle architectures, the unit provides real-time visibility of vehicle performance while enabling centralized control of key subsystems including lighting, drivetrain, infrared systems, and auxiliary loads. Integrated Low Voltage Load Disconnect (LVLD) functionality ensures battery protection and operational readiness in demanding environments.

Applications

- Tactical reconnaissance vehicles
- Military ground and armored platforms
- Special operations vehicles
- Off-road and industrial vehicles
- Custom defense vehicle integrations
- Law enforcement and emergency response vehicles

PRODUCT OVERVIEW

Key Differentiators

- Integrated HMI + power control in one unit
- Built-in LVLD battery protection (not external module)
- Dual-voltage platform compatibility
- Distributed architecture with centralized control layers
- LVLD thresholds + staged disconnect/recovery
- Ruggedized for vibration, temperature, and contaminants

Customization & OEM Support

- Custom panel layouts and harness integration
- LVLD tuning and system configuration
- Multi-voltage platform support (12V / 24V)
- Connector and interface customization
- Engineering support from concept to production
- Branding / panel layout options

Environmental & Reliability

- Designed for high vibration environments
- Sealed connectors and switches
- Resistant to dust, moisture, and contaminants
- Automotive-grade wiring and insulation
- Field-serviceable design

Safety & Compliance

- Designed to meet MIL-STD-1275 (vehicle power systems)
- Designed to meet MIL-STD-461 (EMI / EMC compliance)
- Designed to meet MIL-STD-810 (shock, vibration, environmental)
- Compliant with MIL-DTL-5015 / Deutsch connector standards
- Wiring compliant with UL1015 / VW-1 flame standards
- Integrated protection: fuses, relays, and LVLD battery safeguard system

For quotes and customization requests, contact Digital Power sales at (877) 634-0982 or sales@digipwr.com.

SYSTEM ARCHITECTURE

Overview

The DCP1224-VD utilizes a distributed electrical architecture with centralized control and monitoring, enabling efficient management of vehicle subsystems.

Power Distribution

- Terminal 30: Permanent battery supply
- Terminal 15: Ignition-switched supply
- Terminal 31: Ground return
- Integrated 24V bus for high-power subsystems

Subsystem Layers

- Instrumentation layer (gauges and sensors)
- Control layer (switches and operator interface)
- Output layer (relay-driven loads)
- Protection layer (fuses and LVLD system)
- Interface layer (vehicle harness connections)

Harness Interface

- Main harness: P1 (HDP26-24-31PT)
- Secondary harness: P2 (HDP26-24-23PE)
- Auxiliary interface: P3 (DT06-12SA)

Instrumentation

Gauges

- Speedometer
- Tachometer
- Fuel level (dual tank configuration)
- Engine temperature
- Voltage monitoring (12V and 24V systems)

Sensor Inputs

- Engine RPM signal
- Vehicle speed signal
- Fuel level sensors (left/right tanks)
- Engine temperature sensor
- Oil pressure switch
- Brake fluid switch

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SYSTEM ARCHITECTURE

Control Functions

Ignition Control

- OFF / ACC / IGN / START

Lighting System

- High beam / low beam
- Fog lights
- Parking lights
- Turn signals (left/right)
- Hazard warning system
- Blackout lighting (ground-controlled)

Infrared System

- Front IR lighting
- Rear IR / signaling

Drivetrain Control

- Front differential lock
- Rear differential lock
- 4×4 engagement indication

Auxiliary Controls

- Horn
- ARB relay activation
- Panel illumination

Indicators & Warning Systems

LED Indicators

- 4×4 active status
- Parking brake status
- Oil system fault
- Brake malfunction
- System activation
- Check engine

Warning Inputs

- Low oil pressure
- Brake fluid fault
- Engine malfunction
- LVLD warning signal

ELECTRICAL SPECIFICATIONS

Parameter	Specification
Operating Voltage	12V / 24V DC
Input Supply	Terminal 30, Terminal 15
Ground	Terminal 31
Wiring	Automotive-grade
Protection	Fuses, relays, LVLD
Signal Type	Analog sensor inputs
Output Type	Switch and relay controlled

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ELECTRICAL SPECIFICATIONS

Connectors & Interfaces

Connector	Type	Description
P1	HDP26-24-31PT	Main harness interface
P2	HDP26-24-23PE	Secondary harness
P3	DT06-12SA	Auxiliary connector

Signal Types

- Power: +12V (15), +12V (30), +24V
- Ground: Terminal 31
- Inputs: Sensor signals
- Outputs: Switched / relay-controlled loads

Wiring & Distribution

- Red wiring: power distribution (+12V / +24V)
- Black wiring: ground return
- Splice points (SP) used for distribution nodes
- Separate circuits for:
  - Lighting systems
  - IR systems
  - Fuel pumps
  - Indicators
- Flasher system integrated with ignition supply (+15)

Mechanical Specifications

Parameter	Value
Panel Type	CNC-machined metal dashboard
Mounting	Panel mount
Construction	Rugged, sealed
Harness	Rear integrated
Temperature Range	-40°C to +105°C

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LOW VOLTAGE LOAD DISCONNECT (LVLD)

Overview

The LVLD system monitors system voltage and automatically disconnects non-essential loads when voltage drops below predefined thresholds, preventing deep discharge and preserving engine start capability.

The system provides:

- Deep discharge prevention through controlled load shedding
- Guaranteed reserve capacity for engine starting
- Optimized battery lifecycle performance
- Safeguarding of mission-critical electrical systems

12V System

Parameter	Specification
Warning Lamp + Buzzer	11.5V
Disconnect Relay	11.4V
Reconnect Voltage	13.2V

24V System

Parameter	Specification
Warning Lamp + Buzzer	22.3V
Disconnect Relay	22.2V
Reconnect Voltage	25.3V

Functional Operation

Normal Operation

- All systems active within normal voltage range

Warning Stage

- Warning lamp and buzzer activated

Disconnect Stage

- Non-essential loads disconnected via relay

Recovery Stage

- Loads automatically restored when voltage recovers

System Integration

- 12V LVLD alarm → panel signal line
- 24V LVLD alarm → panel signal line
- Outputs connected to LED indicators and Relay control circuits

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