

## Intelligent SPD Status Monitoring terminal



### 1. Description

Advanced electronic systems are vulnerable to electromagnetic interference—especially from lightning—which can cause overvoltage, equipment damage, and operational failure.

Surge Protective Devices (SPDs) absorb damage to protect systems, but they eventually fail. Unreplaced SPDs leave critical infrastructure—like railways, power grids, and aviation systems—exposed to lightning strikes. Manual inspections often miss timely detection, creating prolonged safety risks.

The SmartSPD Guardian provides real-time SPD monitoring. It tracks leakage current, switch status, lightning strikes, PE connection, temperature, and humidity while logging all events and alarms.

Integrated with management software and monitoring hardware (e.g., RTUs), it enables remote, centralized supervision and enhances system safety through instant failure alerts.

### 2. Features

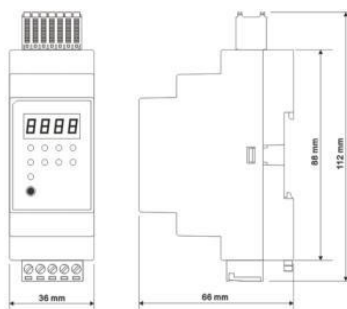
- ◆ **Compact Size:** Designed as a DIN-rail mounted instrument, it can be easily integrated into lightning protection boxes, distribution cabinets, power panels, or network racks without modifying the original layout or dimensions.
- ◆ **Easy Installation:** Features plug-and-play terminal blocks for quick setup and maintenance.
- ◆ **Diverse Interfaces:** Supports dry contact input, NTC temperature, ambient temperature & humidity, SPD leakage current, lightning strike counting, and PE wire status monitoring.
- ◆ **Flexible Communication:** Equipped with a standard RS485 interface for data upload and cascading expansion. Optional extensions enable Ethernet, LoRa, 4G, and other communication modes.
- ◆ **Strong Anti-interference:** Includes surge protection on serial ports, opto-isolation on acquisition channels, and enhanced shielding for the MCU and peripheral circuits to ensure reliable operation under surge and EMI conditions.

### 3. Technical Specification



Item		Descriptoin
Model		TDZ-SZJ
Power supply		12VDC input, reverse polarity protection
Power consumption		1W
Communication	RS485	Standard S MODBUS RTU protocol
		Baud rate: Adjustable (Default: 9600), Data bits: 8, Parity: None, Stop bits: 1
		Device Address: Adjustable from 1 to 128, default is 1.
1-Channel NTC Temp. Acquisition	Plug-in spring terminal, NTC sensor	<ul style="list-style-type: none"> <li>- Connection: Plug-in spring terminal</li> <li>- Sensor: NTC sensor for SPD surface temperature</li> <li>- Range: -30 °C to 160 °C</li> <li>- Alarm: High/Low limit alarm with LED indicator</li> <li>- Logging: Stores date/time of last 10 alarms</li> </ul>
2-Channel Dry Contact Input	Plug-in spring terminal, Opto-isolated, Passive dry contact	Monitors SPD remote signal or SCB/SSD'S status (NO contact, closed=alarm) <ul style="list-style-type: none"> <li>- Indication: LED lights in alarm state</li> </ul>
3-Channel Leakage Current	Plug-in spring terminal	Measurement: Leakage current of L1/L2/L3-N(PE) modules (50/60 Hz) <ul style="list-style-type: none"> <li>- Range: 100 <math>\mu</math>A to 150 mA</li> <li>- Accuracy: <math>\pm</math>10%</li> </ul>
3-Channel SPD Remaining Life	<ul style="list-style-type: none"> <li>- Method: Real-time calculation based on leakage current variation, fluctuation, and trend</li> <li>- Output: Life percentage data</li> <li>- Indication: Local (Green/Orange/Red = Normal/Warning/Alarm) and remote readout</li> </ul>	
Built-in Temp. & Humidity	Temperature	-20~60°C
	Humidity	0~100% RH
1-Channel Surge Event	Count	Records last 9999 surge events with date/time
	Trigger Current	0.5kA~100kA
	Surge Type	T1/T2/T3
	Sensor	Induction coil (requires clamping on PE line)
1-Channel PE Connection Check	Detects open ground or false ground status <ul style="list-style-type: none"> <li>- Indication: Local status indicator</li> </ul>	
Power-Off Data Retention	<ul style="list-style-type: none"> <li>- Alarm Data: Permanently saved</li> <li>- Clock Data: Maintained for over 6 months</li> </ul>	
Firmware Upgrade	Via serial port; supports remote upgrade over Ethernet, LoRa, or 4G modules in transparent transmission mode	
Enclosure material	PC+ABS, Grey (custom color available for 500+ units), Flame Retardant V0	
Mounting	Standard 35mm DIN rail	
Operating Environment	-25~70°C, 0~95% RH	

## 4. Dimension:



## 5. Installation wiring Diagram

