

Industrial 10BASE-T1L SPE to 10/100BASE-TX Media Converter



Bridging Single Pair Ethernet to Standard Industrial Networks

PLANET SPE-1SP1T / SPE-1SP1T-TB is a 1-Port 10BASE-T1L to 1-Port 10/100BASE-TX Single Pair Ethernet Media Converter, designed to bridge industrial 10BASE-T1L (IEEE 802.3cg) networks with standard Ethernet infrastructure. As Industry 4.0 drives the need for extending Ethernet connectivity to the edge of the factory floor — down to individual sensors and actuators — Single Pair Ethernet (SPE) has emerged as the ideal solution, using just one twisted pair to carry Ethernet signals over distances up to 1,000 meters, far exceeding the reach of conventional Ethernet cabling (100 meters).

Model	SPE-1SP1T	SPE-1SP1T-TB
10BASE-T1L Connector	IP20 IEC 63171-2	3-Pin Terminal Block
Maximum Distance	1km	1km
10/100BASE-TX RJ45 Port	1	1
Power Requirement	DC 9-48V, 0.5A	
Enclosure	Compact IP30 Metal Case	
Operating Temperature	-40~75 degrees C	

Sharing the same compact form factor, the SPE-1SP1T and SPE-1SP1T-TB differ only in their 10BASE-T1L connector type: the SPE-1SP1T features an IP20 IEC 63171-2 industrial SPE connector, while the SPE-1SP1T-TB is equipped with a 3-Pin terminal block interface for direct wiring, making it ideal for industrial control panels and cabinets. The SPE-1SP1T and SPE-1SP1T-TB allow existing switches, PLCs, and industrial computers to connect to SPE-based field devices without any network architecture changes, significantly reducing cabling costs and complexity while accelerating IIoT deployment.

SPE Connector Options IEC 63171-2 vs Terminal Block

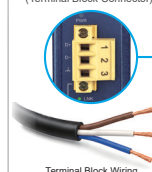
OPTION A SPE-1SP1T (IEC 63171-2 Connector)



IEC 63171-2

- ✓ Pre-terminated SPE connector
- ✓ Quick installation
- ✓ Tool-free termination
- ✓ Best for standardized industrial SPE cabling

OPTION B SPE-1SP1T-TB (Terminal Block Connector)



3-Pin Terminal Block

- ✓ Direct wire connection
- ✓ Flexible field wiring
- ✓ Ideal for control panels and cabinets
- ✓ Convenient when bare wire installation is preferred

Single Pair Ethernet (SPE) Interface

- Comply with IEEE 802.3cg 10BASE-T1L standard
- Supports transmission distance up to 1,000 meters over a single twisted pair
- **SPE-1SP1T**: IP20 IEC 63171-2 industrial SPE connector
- **SPE-1SP1T-TB**: 3-Pin Terminal block connector for direct wiring

Physical Port

- 1 10/100BASE-TX RJ45 copper port
- Auto-negotiation and Auto MDI/MDI-X support

Layer 2 Features

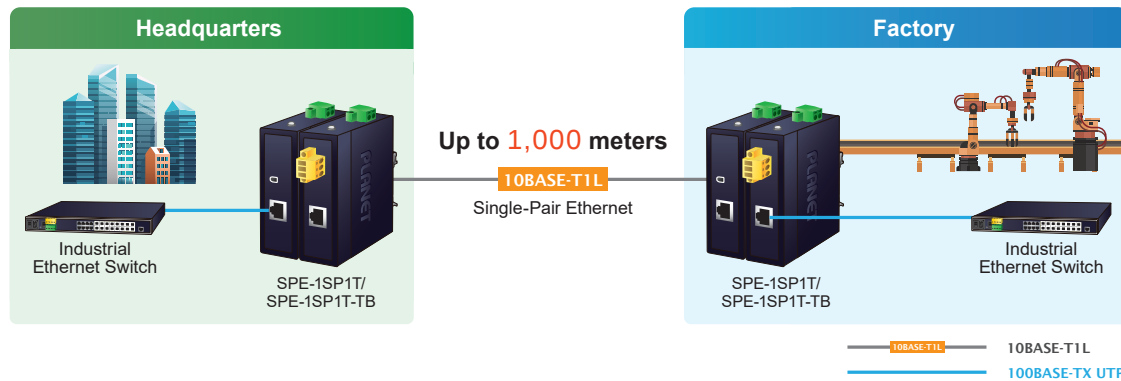
- Complies with IEEE 802.3, 10BASE-T and IEEE 802.3u, 100BASE-TX Ethernet standards
- High-performance Store and Forward architecture, broadcast storm control and runt/CRC filtering eliminate erroneous packets to optimize the network bandwidth
- Integrated address look-up engine, supporting 4K absolute MAC addresses
- 4K bytes packet size
- Automatic address learning and address aging
- IEEE 802.1Q VLAN transparency

Industrial Case and Installation

- IP30 metal case
- DIN-rail, wall-mount or side wall-mount design for DC input power design
 - 9 to 48V DC input range with polarity reverse protection
- Supports 6000 VDC Ethernet ESD protection
- -40 to 75 degrees C operating temperature
- Advantage of minimum installation time (Simply by Plug-and-Play)
- Supports extensive LED indicators for network diagnosis
- Free fall, shock-proof and vibration-proof for industries

Long-Distance SPE Transmission

The SPE-1SP1T and SPE-1SP1T-TB supports 10BASE-T1L (IEEE 802.3cg), enabling Ethernet transmission over a single twisted pair for distances up to 1,000 meters — 10 times farther than conventional Ethernet cabling. This extended reach eliminates the need for repeaters in large industrial facilities, allowing Ethernet connectivity to reach remote sensors, actuators, and field devices that were previously out of range for standard networking, while significantly simplifying cable planning in expansive plant layouts.



Flexible Connector Options for Every Installation

To accommodate different wiring preferences, PLANET offers two connector variants under the SPE-1SP1T series. The SPE-1SP1T features an IP20 IEC 63171-2 industrial SPE connector for quick, tool-free termination, while the SPE-1SP1T-TB is equipped with a 3-Pin terminal block interface for direct wire connection — ideal for control panels and cabinets where field wiring is preferred. Both models share the same compact form factor and a standard RJ45 port on the Ethernet side, ensuring seamless integration with existing switches, PLCs, and industrial computers.

Wide-Range DC Power Input

The SPE-1SP1T series accepts a wide DC input range of 9-48V at up to 0.5A via a dedicated terminal block, offering compatibility with a broad range of industrial power supplies and battery-backed systems. This flexibility simplifies power infrastructure planning, particularly in facilities with mixed voltage standards or where centralized DC power distribution is already in place.

Rugged Metal Housing Built for Harsh Environments

Housed in an IP30-rated metal enclosure, the SPE-1SP1T series is engineered to withstand the mechanical stress, dust, and electromagnetic interference common in industrial settings. The all-metal casing provides superior durability compared to plastic enclosures, extending product lifespan in demanding factory floor, control cabinet and outdoor-adjacent installations where equipment reliability is critical to continuous operations.

Versatile Mounting for Space-Constrained Environments

The SPE-1SP1T series supports both DIN-rail and wall-mount installation, giving system integrators the flexibility to fit the converter into standard industrial control cabinets or mount it directly onto walls and equipment panels where cabinet space is limited. This dual-mounting capability simplifies deployment across diverse industrial environments, from centralized control rooms to distributed field enclosures, without requiring additional mounting accessories.

Wide Operating Temperature for Extreme Conditions

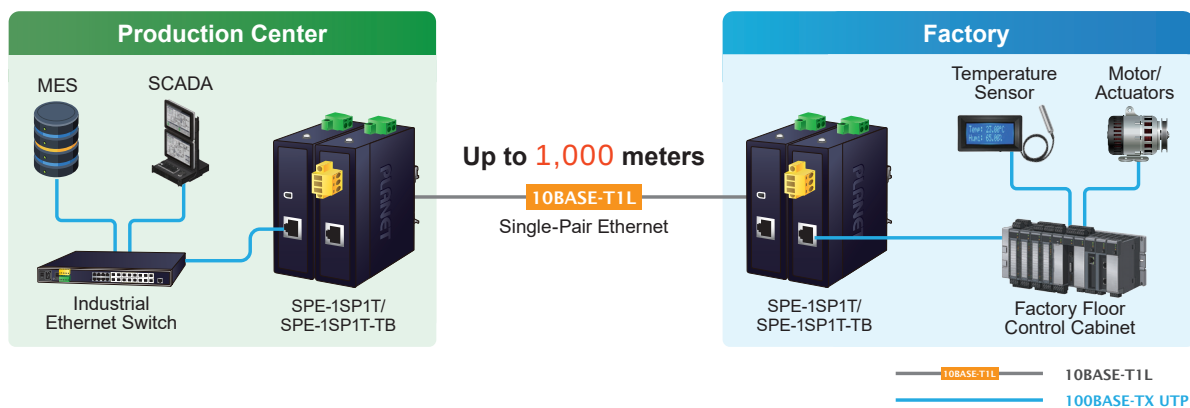
With an operating temperature range of -40°C to 75°C and a storage range of -40°C to 85°C, the SPE-1SP1T series is built to perform reliably in extreme environments — from sub-zero cold chains and outdoor cabinets to high-heat manufacturing floors — without compromising signal integrity or long-term stability.

Applications

Industrial Automation & Process Control

In modern smart factories, the SPE-1SP1T / SPE-1SP1T-TB serves as a critical bridge between legacy Ethernet infrastructure and next-generation 10BASE-T1L field devices. As Industry 4.0 initiatives push for real-time data collection directly from sensors, actuators, and PLCs on the production line, traditional fieldbus and 4-20mA analog connections often struggle to keep pace with the bandwidth and integration demands of modern manufacturing execution systems (MES) and SCADA platforms.

By converting 10BASE-T1L signals to standard 10/100BASE-TX, the SPE-1SP1T series allows existing industrial switches and computers to directly access edge devices over a single twisted pair, extending reliable connectivity up to 1,000 meters without additional repeaters. Its IP30 metal housing, wide operating temperature range (-40°C to 75°C), and flexible DIN-rail or wall-mount installation make it well-suited for harsh factory floor environments, control cabinets, and machine-level deployments where space and environmental resilience are equally critical. This enables manufacturers to modernize their connectivity architecture incrementally, without the cost and disruption of a full network overhaul.

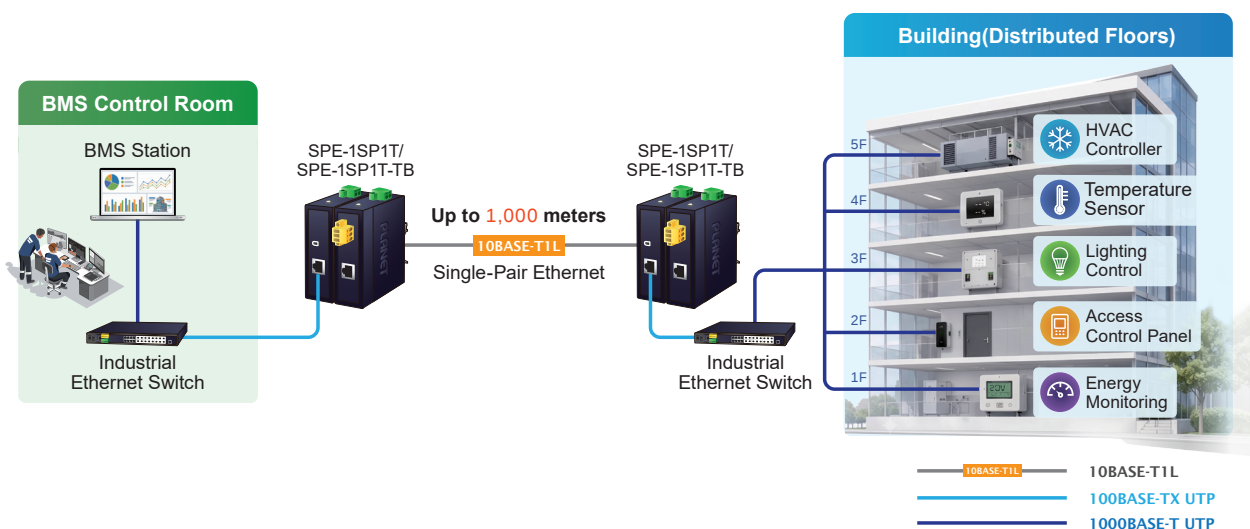


Building Automation & Facility Management

Beyond the factory floor, the SPE-1SP1T / SPE-1SP1T-TB also addresses the growing connectivity needs of smart building infrastructure, where HVAC systems, lighting controls, access control panels, and energy monitoring sensors are increasingly distributed across large facilities. In many commercial buildings, RS-485 (paired with BACnet MS/TP or Modbus RTU) has long served as the standard for connecting room sensors and controllers — reliable and low-cost but limited in bandwidth and IT integration.

The SPE-1SP1T / SPE-1SP1T-TB's single twisted-pair transmission over distances up to 1,000 meters can directly reuse the same 2-conductor cabling already installed for RS-485 or LON, avoiding the cost and disruption of rewiring in retrofit projects. Combined with its wide DC input range (9-48V) and compact form factor, the converter can be flexibly deployed within ceiling spaces, utility closets, or equipment racks — helping facility managers reduce installation costs while enabling the kind of granular, real-time monitoring that modern energy management and building automation systems require.

Extend Building Management System to Distributed Floors



Specifications

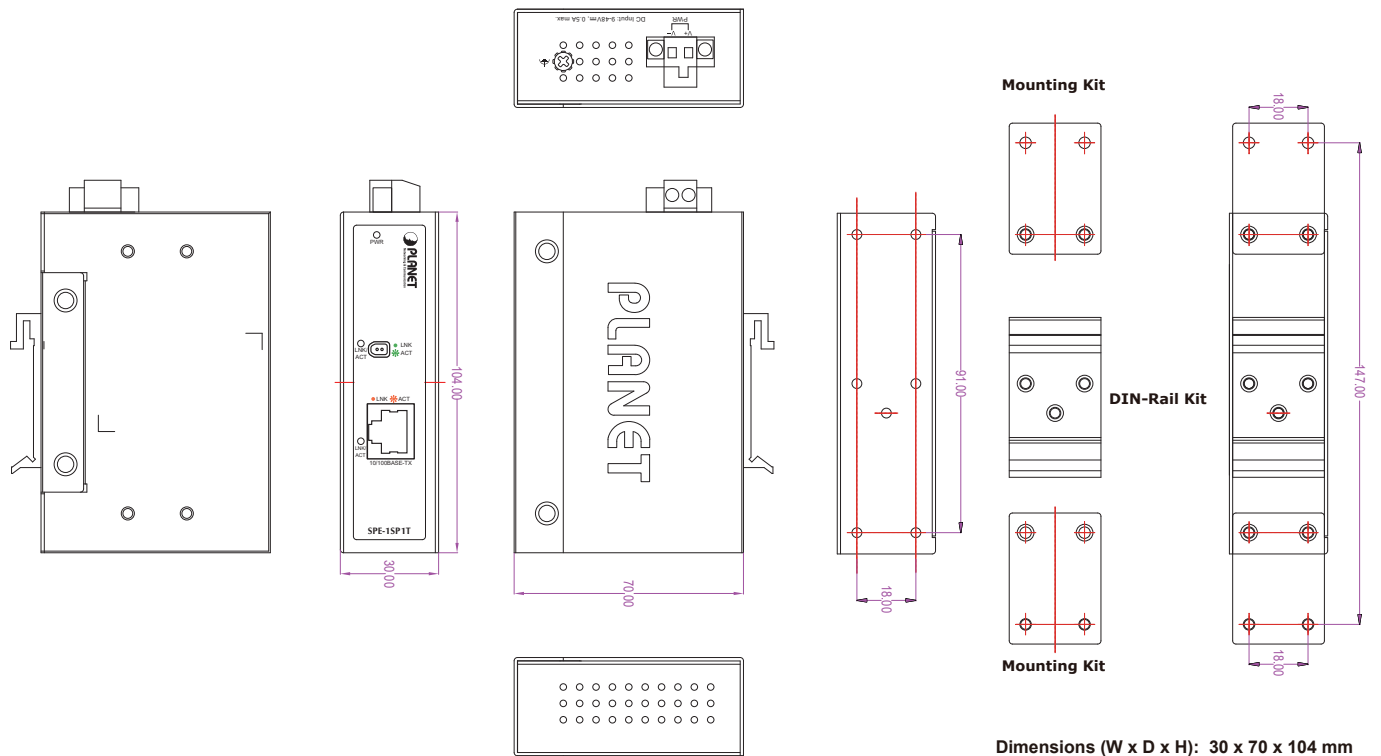
Product		SPE-1SP1T	SPE-1SP1T-TB
Hardware Specifications			
Single Pair Ethernet (SPE) Interface	IP20 IEC 63171-2 industrial SPE connector, 10Mbps full duplex mode		3-Pin Terminal block connector for direct wiring, 10Mbps full duplex mode
Ethernet Interface	1 x 10/100BASE-TX Copport port		
SRAM (Chipset built-in)	64KB		
Flash Memory	32Mbit		
ESD Protection	±6KV air gap discharge ±6KV contact discharge		
Surge Immunity	6KV DC		
Enclosure	IP30 metal case		
Dimensions (W x D x H)	30 x 70 x 104mm		
Weight	205g		
Power Requirements - DC	DC 9~48V, 0.5A max.		
Power Consumption	DC 9V: Max. 0.36 watts/1.22BTU (Power on without any connection) Max. 0.45 watts/1.53BTU (Full loading) DC 48V: Max. 0.4 watts/1.36BTU (Power on without any connection) Max. 0.5 watts/1.70BTU (Full loading)		
LED Indicator	1 x LED for System: ● Green: DC Power 1x LED for 10BASE-T1L SPE Port (Port-1): ● Green: LNK/ACT 1 x LED for 10/100BASE-TX RJ45 Port (Port-2) ● Amber: 10/100 LNK/ACT		
Switching			
Switch Architecture	Store-and-forward		
Address Table	4K		
Jumbo Frame	4K bytes		
Flow Control	Back pressure for half duplex IEEE 802.3x pause frame for full duplex		
Standard Conformance			
Standards Compliance	IEEE 802.3 Ethernet IEEE 802.3u Fast Ethernet IEEE 802.3cg 10BASE-T1L IEEE 802.3x Flow Control and Back Pressure		
Regulatory Compliance	FCC Part 15 Class A, CE		
Stability Testing	IEC60068-2-32 (free fall) IEC60068-2-27(shock) IEC60068-2-6 (vibration)		
Environments			
Operating	Temperature: -40 ~75 degrees C Relative Humidity: 5 ~ 95% (non-condensing)		
Storage	Temperature: -40 ~ 85 degrees C Relative Humidity: 5 ~ 95% (non-condensing)		

Ordering Information

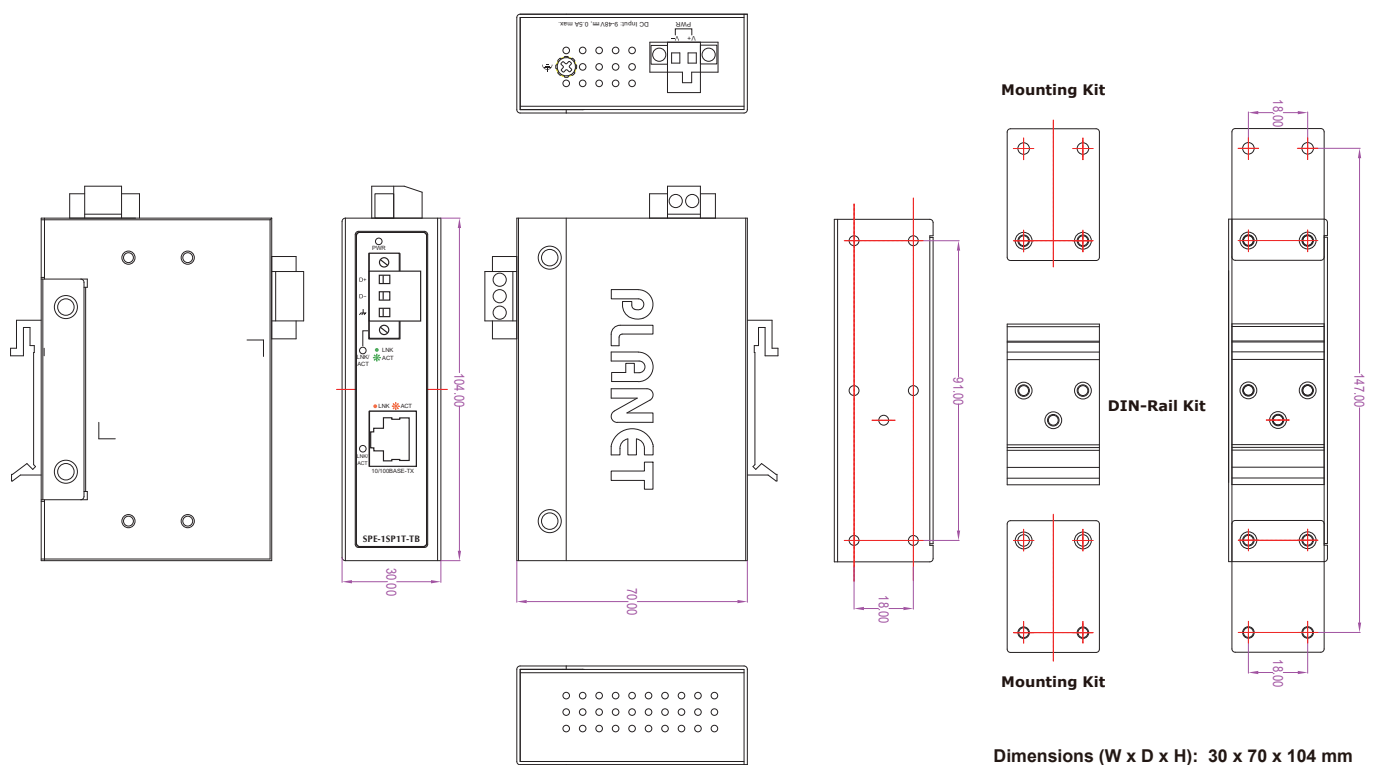
SPE-1SP1T	Industrial 1-Port 10BASE-T1L + 1-Port 10/100BASE-TX Unmanaged Single-Pair Ethernet Media Converter
SPE-1SP1T-TB	Industrial 10BASE-T1L Terminal Block SPE to 10/100BASE-TX Media Converter

Dimensions

■ SPE-1SP1T



■ SPE-1SP1T-TB



Related Products

PWR-40-24 (MEAN WELL -- MDR-40-24)	40W 24V DC Single Output Industrial DIN-rail Power Supply (-20 ~ 70 degrees C)
PWR-60-24 (MEAN WELL -- MDR-60-24)	60W 24V DC Single Output Industrial DIN-rail Power Supply (-20 ~ 70 degrees C)
PWR-75-24 (MEAN WELL -- XDR-75E-24)	75W 24V DC Single Output Industrial DIN-rail Power Supply (-40 ~ 70 degrees C)

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SPE-1SP1T/SPE-1SP1T-TB_v1.1