

TERA® SPE Deployment

Solutions for Retrofit, Future-Proof New, and Day 1 SPE Installations

Simon's TERA cabling robustly supports 4-pair information technology (IT) applications over distances of up to 100 m (328 ft) and 1-pair operational technology (OT) applications over distances of up to 400 m (1,300 ft). The high performance and unique cable-sharing ability of TERA components mean that existing installed TERA permanent links can easily be retrofitted to support 10BASE-T1L single-pair Ethernet (SPE) applications. In addition, it's easy to specify new generic TERA permanent links capable of supporting both future IT and OT device connections, as well as new TERA permanent links dedicated to SPE networks and devices. TERA SPE cabling is compatible with 1-pair screw terminal and 1-pair pluggable equipment connections.

TERA 4-pair IT cabling supports 100 m channels, consisting of up to 90 m of solid cable, 10 m of stranded cord cable, and 4 connectors. TERA SPE cabling supports 400 m channels, consisting of up to 375 m of solid cable, 25 m of stranded cord cable, and 5 connectors, making it ideal for support of both backbone and horizontal OT cabling implementations.

Retrofit Design: Up to 285 m of solid cable can be added to existing installed 90 m 4-pair TERA permanent links to create 375 m SPE-ready permanent links. In this configuration, the 90 m installed permanent link typically consists of a patch panel in the telecommunications room (TR) connected to an equipment outlet (EO) or a service concentration point (SCP) outlet housed in a zone enclosure. As shown in the design example, SPE devices may be connected to an existing EO or SCP outlet with a 1-pair TERA plug or the installed TERA permanent link may be extended from the SCP as follows:

- An EO can be added after the SCP outlet or existing EO
- A second SCP outlet housed in a zone enclosure can be added after the first SCP outlet
- A second SCP outlet housed in a zone enclosure and an EO can be added after the first SCP outlet

While SCP outlets in an existing enclosure can support many device connections in a given zone coverage area, a second SCP outlet offers the ability to create new zone coverage areas over distances significantly greater than 100 m. EOs used in conjunction with SCP outlets housed in zone enclosures are recommended to simplify labeling and administration.

Future-Proof New Design: 90 m 4-pair TERA permanent links, consisting of patch panels in the TR connected to SCP outlets housed in zone enclosures, are installed. The zone enclosures contain 24, 48, or 96 SCP outlets and are logically positioned throughout the ceiling space to offer centralized connection points for future devices. The addition of optional EOs can simplify identifying locations and labeling ports for future device deployments. Alternately, 90 m permanent links consisting of patch panels in the TR connected to EOs may be deployed. These flexible and generic topologies support future IT device connections as well as solid cable and connector additions to support OT networks using the retrofit design approach.

Day 1 Design: 400 m TERA channels, consisting of up to 375 m of 4-pair solid cable and 25 m of 1-pair stranded cord cable, are deployed to specifically support 10BASE-T1L SPE networks. A 4-connector "expanded star" topology, consisting of patch panels in the TR connected to SCP outlets housed in zone enclosures with cables extending to a second zone coverage area served by SCP outlets extending to equipment outlets, is recommended for channels 250 m and longer. The Simon SPE TERA channel can support up to 5 connectors if additional flexibility and administration is needed.

Design Example

The following example depicts deployment of a converged access control network consisting of traditional IT security cameras and SPE devices. The SPE access control devices include keypads, exit buttons, wall readers, and electric doors strikes. The facility was pre-cabled with 90 m 4-pair TERA permanent links when the network cabling was originally installed, but new TERA SPE cabling needs to be deployed to support a recent warehouse expansion.

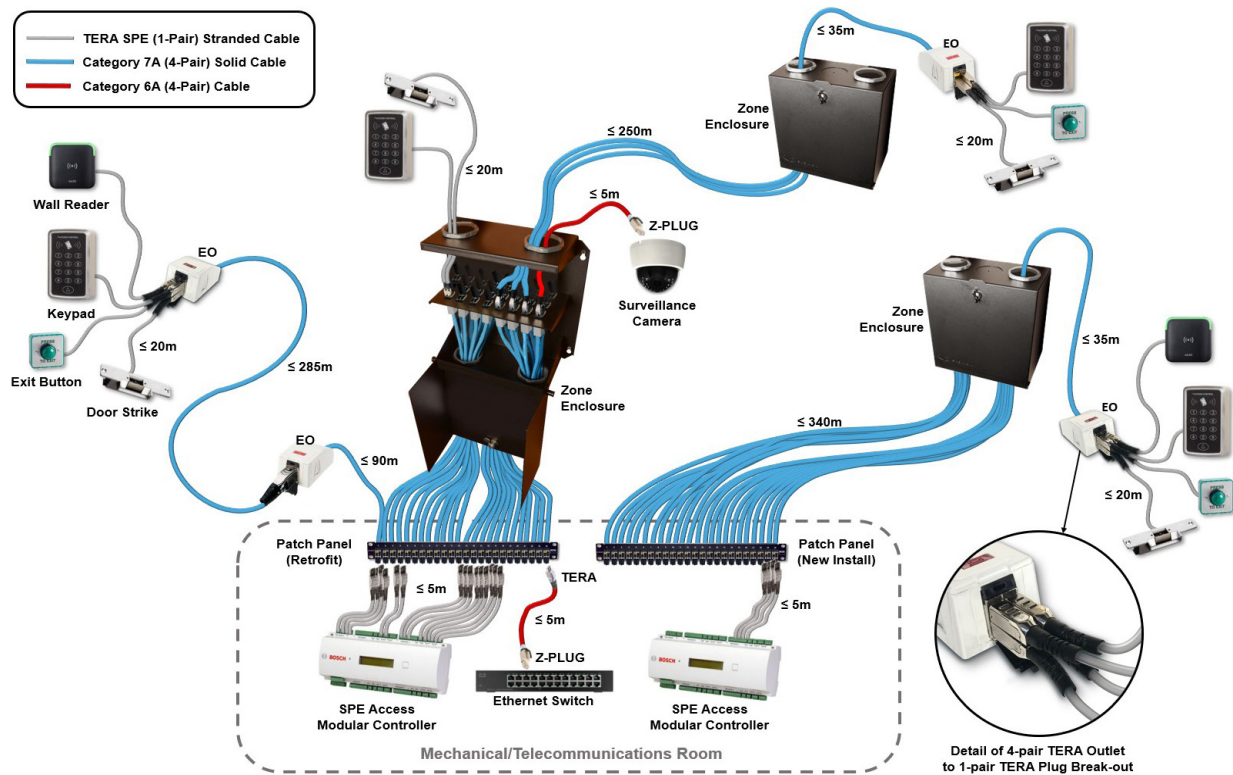
TERA Access Control Retrofit and New Deployment Example

Retrofit SPE connections are deployed as follows (see examples extending from the Retrofit Patch Panel):

- Surveillance cameras are connected to existing TERA permanent links with category 6A cable and field-terminated Z-PLUG® and 4-pair TERA plugs
- SPE access control devices are connected to existing EOs and SCP outlets with 1-pair stranded TERA patch cords
- Up to 285 m of solid 4-pair cable and EOs are used to extend the reach of existing equipment and SCP outlets to make SPE device connections
- A second zone enclosure housing SCP outlets is logically positioned to support a new zone coverage area up to 250 m away from the first zone enclosure (i.e., an “expanded star” topology) and EOs, each supporting up to 4 SPE devices, are logically positioned in a 35 m radius around the second zone enclosure

New “Day 1” SPE infrastructure is deployed as follows (see examples extending from the New Install Patch Panel):

- 375 m 4-pair permanent links consisting of a patch panel in the TR, SCP outlets housed in a zone enclosure, and EOs logically positioned in a 35 m radius around the zone enclosure support dedicated SPE equipment connections with up to 20 m of 1-pair stranded TERA patch cords



Notes

1. Solid and stranded cable segment lengths may vary from shown provided the maximum channel lengths allowed by 100 m TERA 4-pair and 400 m TERA SPE cabling systems are not exceeded
2. The topologies shown are provided for example; up to 4 connectors are permitted in 100 m TERA 4-pair channels and up to 5 connectors are permitted in 400 m TERA SPE channels
3. An equipment outlet is optional if an SCP outlet housed in a zone enclosure is present
4. 2-, 4-, and 6-port Surface Mount boxes or other comparable products may be used as alternatives to the second zone enclosure in retrofit configurations supporting lower density SPE device connections
5. For ease of administration and management, 1-pair equipment cord lengths should not exceed 20 m
6. TERA SPE cabling systems support 1-pair screw terminal and 1-pair pluggable equipment connections

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