4 **3** **2** **1**

10BASE-T1L: Building Automation over IP

Building Automation switch

BAS Controller

T1L Unitary Controller

T1L Switch

T1L

D

5 [B] Ethernet Link

1,4 [A] Single Pair Ethernet (SPE)

HVAC, Smart Building, Energy Metering, Lighting Control

10BASE-T1L: Remote IP Device Connections

T1L Remote Adapter(s)

T1L SPoE Switch

C

Managed switch (PoE enabled)

6,7 [B] Ethernet Link

2

1,4 [A] Single Pair Ethernet (SPE)

Remote IP devices

Ethernet-APL: Process Automation

Controller

APL Field Switch

B

APL Power Switch

1,4 Ethernet-APL over SPE cable   *Trunk: 1000m max*

Spur: 200m max

3

Devices in Zone 1/Div 2

Ethernet (2 or 4 pair)

Single Pair Ethernet (SPE)

7

6

9,10

B - Length	Cable Type	Connector Types
≤ 100m	Ethernet Standard Twisted Pair (2 or 4 pair)	RJ-45, M12 d or x-code

PoE (802.3af): 15.4W max; 13W at device
PoE+ (IEEE 802.3at): 30W max; 25.5W at device
PoE++, Type 3 (IEEE 802.3bt): 60W max; 51W at device
PoE++, Type 4 (IEEE 802.3bt): 99W max; 71.3W at device

1,4

2

3

A - Length	Cable Type	Connector Types
≤ 400m	23 AWG SPE (S/FTP)	-1 connector (IP20), M8 (IP67)
≤ 1000m	18 AWG SPE (S/FTP)	

SPoE / PoDL (IEEE 802.3cg-2019™): 52W max; PD: up to 8.4w at 24VDC; up to 52W at 55VDC

A

RJ45 field plug

M12 connector

IP-20 connector

M8 connector

Color Coding Legend	ModBus	4-pr Ethernet	# ← BOM reference (Ref.) number on back page	PCD019-APR24-ENG	**PANDUIT™**	Single Pair Ethernet Applications
	SPE	Intrinsically Safe				

4 **3** **2** **1**

Bill of Materials

Ref.	Part Number	Description
		Single Pair Ethernet 18 AWG Components
1	SP-SFCS1IG-CEG	Single Pair Ethernet shielded copper cable, 18/7 AWG stranded, S/FTP, CM/CMR, 1000 ft./305m reel in a box (Global)
2	SP-1LSA22BL	Single Pair Ethernet shielded plug connector, terminates 18 AWG 1-Pair shielded copper cable; Ingress protection rating of IP20
3	SP-18SA42BL	IndustrialNet™, M8 male, 4-Pin, A-Code, field terminable Single Pair Ethernet connector: Ingress protection rating of IP65/IP67
		Single Pair Ethernet 23 AWG Components
4	SP-SFPS2IG-CEG	Copper cable, SPE, SP1-400, 1-Pair, 23/1 AWG, S/FTP, CMP, international gray, 1000ft/305m reel (North America)
	SP-SFLS2IG-CEG	Copper cable, SPE, SP1-400, 1-Pair, 23/1 AWG, S/FTP, LSZH (IEC 60332-1), EuroClass Dca - s1a, d1, a1, international gray, 1000ft/305m reel (LATAM, EMEA, AP regions)
	SP-SFYS2IG-CEG	Copper cable, SPE, SP1-400, 1-Pair, 23/1 AWG, S/FTP, LSZH (IEC 60332-1), EuroClass Cca - s1a, d1, a1, international gray, 1000ft/305m reel (Europe)
		Related Ethernet Components (for building channel)
5	ISTPHCH*MTL	IndustrialNet™ Category 5e Shielded Patch Cord, constructed of industrial grade, 24 AWG, SF/UTP, twisted pair, stranded, CM cable; 600 V rated; RJ45 to RJ45
	ISTPH6X*MTL	IndustrialNet™ Category 6A Shielded Patch Cord, constructed of industrial grade, 26 AWG, SF/UTP, twisted pair, stranded, CMR cable, twisted pair, stranded, CMR cable; 600 V rated; RJ45 to RJ45
6	FPS6X88MTG	TX6A™ Category 6A Shielded Field Terminable RJ45 Plug terminates 4-pair, 22-26 AWG shielded twisted pair cable
7	ISFCH6X04ATL-UG	Category 6A industrial copper cable, 4-pair, 24/7 AWG stranded, SF/UTP, CMR, rated for 600V panel or on-machine applications when the space is shared with high voltage power cables, oil and UV resistant
8	ISFCH5C02ATL-XG	Category 5e industrial copper cable, (CM/CMX outdoor), 2-pair, SF/UTP copper cable; stranded copper conductors are 24/7 AWG with HDPE insulation, covered with a TPE jacket; rated for 600 V panel or on-machine applications when the space is shared with high voltage power cables
9	ISPS5E44MFA	Category 5e 4-position, IndustrialNet™ M12 D-Code Plug, for use with stranded 26/7 – 22/7 AWG, UTP copper cable
10	ISPS6A88MFA	Category 6A, IndustrialNet™ M12 X-Code Plug, field terminable for use with industrial grade, 26/7 - 22/7 AWG stranded, Category 6A, UTP or shielded copper cable
		*Patch cord lengths available in meters: 0.3, 0.6, 1, 2, 3, 5, 10, 15, 20.

About this Configuration

Panduit offers a reliable end-to-end network physical layer infrastructure, for building automation systems and intelligent building Internet of Things (IoT) applications, and industrial network applications, which simplifies network deployments and provides future-ready designs. The parts listing provides components necessary to build a channel or link using single-pair Ethernet.

Migrating to Ethernet

Building automation systems are moving into standards-based Ethernet networks and away from proprietary and serial networks. Having an engineered design for the network physical infrastructure allows for optimal performance and expansion. With the proliferation of sensors and IoT, building automation systems are becoming more network centric and require reliable and expandable physical infrastructure.

Structured Cabling

Structured cabling is a planned cabling system that systematically lays out the cable management necessary for communications. Structured cabling provides testable links, wired spare ports, and the use of solid cable for the system backbone. While building automation will still consist of some point-to-point connections, developing a structured cabling system for the majority of connections is beneficial.

Single Pair Ethernet Cabling

Future proof the network by installing Single Pair Ethernet cable. This cable can be used for many types of traditional fieldbus networks and will accommodate Single Pair Ethernet solutions as they become available.

For more information contact your local distributor or Panduit Sales Representative.

PANDUIT™