

Rail & Transit Connectivity Quick Reference Guide

Switches, Media Converters, Ethernet Extenders

Quick Help Contact: info@etherwan.com.tw

<http://www.etherwan.com>

As much electromagnetic interference is generated in railway systems, proper standards are required for railway applications. For example, devices installed in rolling stock should comply with EN50155 standard, and wayside devices should comply with EN50121-4 standard. This Quick Reference Guide lists EtherWAN's best-selling network connectivity products for railway applications. Through few simple steps, you'll be able to select the right EtherWAN product according to your requirements. If you need further assistance, please don't hesitate to contact our sales department.

Information Needed to Select the Proper PoE or Non PoE Switch:

1. Distinguish Rolling stock or Wayside.
 - a. Rolling stock should comply with EN50155 standard.
 - b. Wayside devices should comply with EN50121-4 standard.
2. How many devices are you connecting?
3. Are the devices 10/100 Fast Ethernet (FE) or 10/100/1000 Gigabit Ethernet?
4. Will you need room for additional devices (expansion) in the future?
 - a. It's always a good practice to have some extra ports available for adding additional device connectivity.
5. Do you require Fiber Optic connectivity?
 - a. If so, what type of fiber optics will be used Single Mode (SM) Multi Mode (MM) or WDM?
 - b. What speed (FE/GE) and distance? What type of connectors; SC, ST, LX, LC, SFP, etc..?
 - i. 100M Fiber
 - SFP mode flexible for variable distance
 - 2KM Multi mode(MM)
 - 10KM Single mode(SM)
 - 20KM.Single mode(SM)
 - ii. 1000M fiber
 - SFP mode flexible for variable distance
 - 550M Multi mode(SX)
 - 10KM Single mode(LX)
 - 20KM.Single mode(LX)
6. Are you connecting network uplink to central office and downlink to next switch?
 - a. If yes, you need two extra ports for network uplink & downlink. Total Bandwidth Calculation for all devices to choose uplink & downlink ports bandwidth.
7. Does your network application require redundancy?



- a. If, yes. Please choose managed switch with EtherWAN Alpha-Ring or RSTP or STP feature.
8. Are you connecting devices that require active PoE (802.3af or 802.3at) such as Wireless AP (WAP), IP Cameras, Digital Display or VoIP Phones?
 - a. If yes, what is the maximum power draw (wattage) of each PoE Device? This can be found on the datasheet for the device or the web site of the device manufacturer.
 - b. If the wattage of your PD requires below 15.4W, then choose to purchase a IEEE802.3af PoE switch.
 - c. If the wattage of your PD requires more than 15.4W, then choose to purchase a IEEE802.3at PoE switch.
 - d. If the wattage of your PD requires more than 30W, then consider to purchase a ultra-PoE switch.
 - e. Add up total wattage from all devices.
9. Make sure the switch you are selecting has enough PoE Power Budget to cover the total power draw calculated in #7 above; it is a good practice to allow for 20% overage on power budget.
 - a. Example: Camera draw @ 12W each x 8 cameras = 96W + 20% overage 19.2W = 115.2W total minimum PoE budget recommended.
10. Managed vs. Unmanaged? We always recommend Managed for PoE applications as, this allows for troubleshooting if there are any issues and also allows for remote power cycling of any individual devices. Managed is also required if VLAN, QoS, Redundancy or Security is required.
11. Installation Location:
 - a. Outdoor Deployment : Operating Temperature (-40 ~ 75°C)
 - b. Indoor Deployment with air conditioner: Operating Temperature (0~ 45°C)
 - c. Indoor Deployment without air conditioner: Operating Temperature (-10~60°C)
12. Suggest purchasing a surge protector if you run your Ethernet cables outside of a building.
13. In addition, you can use this web site to easy search. <http://global.etherwan.com/product-selector/ethernet-switches>

Hardened EN50155 M12 Switches (-40~75 °C)

Part #	Ports	Description
ER59402-201T0	16 TX M12 + 2 GT	Managed 16 10/100TX M12 + 2 GT , 12 – 48VDC Power Input, with IP67
ER59402-201GT	16 TX M12 (8 x PoE+), + 2 GT	Managed 16 10/100TX M12 (8x PoE+ 30W), +2 GT , 240W Power Budget , 52 – 57VDC Power Input, with IP67
ER58802-201HT	8 TX M12 PoE+, + 2 GT M12	Managed 8 10/100TX M12 PoE+(30W), 2 GT M12, 120W Power Budget , 24 – 48VDC Power Input
ER52082-I	8 TX M12 PoE+, + 2 GT M12	Managed 8 10/100TX M12 PoE+ (30W) + 2 GT M12, 120W Power Budget, 110VDC Power Input

Hardened Din-Rail PoE and Non-PoE Switches (-40~75 °C) *Note: Power Supplies Sold Separately for Din-Rail Switches*

Part #	Ports	Description
EX78931-0VB	12 GT(8 x PoE++), + 4 GE SFP	Managed 12 GT (8 PoE++ 60W), + 4 GE SFP, 240W Power Budget , 52 – 57VDC Power Input



EX78802-01B	8 TX PoE+, + 2 GT	Managed 8 10/100TX PoE+(30W), +2 GT, 180W Power Budget , 47 – 57VDC Power Input
EX78802-0VB	8 TX PoE+, + 2 GE SFP	Managed 8 10/100TX PoE+(30W), 2 GE SFP, 180W Power Budget , 47 – 57VDC Power Input
EX78602-01B	6 TX PoE++, + 2 GT	Managed 6 10/100TX PoE++ (4x 30W+2x 60W) + 2 GT, 180W Power Budget, 52 – 57VDC Power Input
EX73931-0VB	12 GT + 4 GE SFP	Managed Lite Layer 3 (LL3) Switch; 12 GT + 4 GE SFP, 12 – 48VDC Power Input
EX71802-0VB	8 TX + 2 GE SFP	Managed 8 10/100TX + 2 GE SFP, 12 – 48VDC Power Input
EX71802-0AB	8 TX + 2 GE Fiber LX 10Km SC	Managed 8 10/100TX + 2 GE Fiber Single-Mode 10Km SC, 12 – 48VDC Power Input
EX71620-10B	6 TX + 2 Fiber MM 2Km SC	Managed 6 10/100TX + 2 100FX Fiber Multi-Mode 2Km SC, 12 – 48VDC Power Input
EX71620-A0B	6 TX + 2 Fiber SM 20Km SC	Managed 6 10/100TX + 2 100FX Fiber Single-Mode 20Km SC, 12 – 48VDC Power Input
EX71440-10B	4 TX + 4 Fiber MM 2Km SC	Managed 6 10/100TX + 4 100FX Fiber Multi-Mode 2Km SC, 12 – 48VDC Power Input
EX71440-A0B	4 TX + 4 Fiber SM 20Km SC	Managed 6 10/100TX + 4 100FX Fiber Single-Mode 20Km SC, 12 – 48VDC Power Input
EX73402-01B	16 TX + 2 GT	Managed 16 10/100TX + 2 GT, 12 – 48VDC Power Input
EX73402-0AB	16 TX + 2 GE Fiber LX 10Km SC	Managed 16 10/100 TX + 2 GE Fiber Single-Mode 10Km SC, 12 – 48VDC Power Input
EX73322-1AB	12 TX + 2 Fiber MM 2Km SC + 2 GE Fiber LX 10Km SC	Managed 12 10/100 TX + 2 100FX Fiber Multi-Mode 2Km SC + 2 GE Fiber Single-Mode 10Km SC, 12 – 48VDC Power Input
EX73242-1AB	12 TX + 4 Fiber MM 2Km SC + 2 GE Fiber LX 10Km SC	Managed 12 10/100 TX + 4 100FX Fiber Multi-Mode 2Km SC + 2 GE Fiber Single-Mode 10Km SC, 12 – 48VDC Power Input
EX46908A-0-J	8 GT PoE+	Unmanaged 8 GT PoE+(30W) 120W PoE Power Budget, 18 - 57VDC Power Input
EX46928A-V-J	8 GT PoE+ , + 2 GE SFP	Unmanaged 8 GT PoE+(30W) + 2 GE SFP, 120W PoE Power Budget, 18 - 57VDC Power Input
EX46928A-A-J	8 GT PoE+ , + 2 GE Fiber LX 10Km SC	Unmanaged 8 GT PoE+(30W) + 2 GE Fiber Single-Mode 10Km SC, 120W PoE Power Budget, 18 - 57VDC Power Input
EX45905	5GT (4 x PoE+)	Unmanaged 5 GT (4 ports PoE+ 30W) , 120W PoE Power Budget, 24/48VDC Power Input
EX45915-V	5GT (4 x PoE+) + 1 GE SFP	Unmanaged 5 GT (4 ports PoE+ 30W) + 1 GE SFP, 120W PoE Power Budget, 24/48VDC Power Input
EX45915-A	5GT (4 x PoE+) + 1 GE Fiber LX 10Km SC	Unmanaged 5 GT (4 ports PoE+ 30W) + 1 GE Fiber Single-Mode 10Km SC, 120W PoE Power Budget, 24/48VDC Power Input
EX42305	5TX (4 x PoE+)	Unmanaged 5 10/100TX (4 ports PoE+ 30W), Din-Rail, 120W Power Budget, 24/48VDC Power Input
EX42315-V	5TX (4 x PoE+) + 1GE SFP	Unmanaged 5 10/100TX (4 ports PoE+ 30W) +1 GE SFP, 120W Power Budget, 24/48VDC

Part #	Ports	Description
EX42315-A	5TX (4 x PoE+) + 1GE Fiber LX 10Km SC	Unmanaged 5 10/100TX (4 ports PoE+ 30W) +1 GE Fiber Single-Mode 10Km SC, 120W Power Budget, 24/48VDC Power Input

Hardened Rack Mount PoE and Non-PoE Switches (-40~75 °C) Note: Power Supplies Sold Separately for Din-Rail Switches

Part #	Ports	Description
EX76402-01TT	16 TX PoE+, + 2 GT	Managed 16 10/100TX PoE+(30W) + 2 GT, 246.4W PoE Budget, 48-57VDC Power Input
EX76402-0ATT	16 TX PoE+, + 2 GE Fiber LX 10Km SC	Managed 16 10/100TX PoE+(30W) + 2 GE Fiber Single-Mode 10Km SC, 246.4W PoE Budget, 48-57VDC Power Input
EX75604-04VGT	24 TX PoE+, + 4 GE SFP	Managed 24 10/100TX PoE+(30W) + 4 GE SFP, 420W PoE Budget, 48-57VDC Power Input
EX77604-00VC	24 TX + 4 GE SFP Combo	Managed 24 10/100TX + 4 GE SFP Combo, 90-264VAC Power Input
EX89000-00C	Up to 24 FE + 4 GE	Managed Modular 1U Chassis Switch, Modules Ordered Separately, 90 - 264VAC Power Input

Media Converters Note: Power Supplies Sold Separately for Din-Rail Switches

Part #	Ports	Description
EL100C	1 TX, 1 Fiber MM 2Km SC	Commercial Unmanaged 10/100TX to 100FX Multi-Mode 2Km SC, Power Adapter Included
EL100C-20	1 TX, 1 Fiber SM 20Km SC	Commercial Unmanaged 10/100TX to 100FX Single-Mode 20Km SC, Power Adapter Included
EX42011-1A-1-A	1 TX, 1 Fiber MM 2Km SC	Industrial Unmanaged 10/100TX to 100FX Multi-Mode 2Km SC, Power Adapter Included
EX42011-2A-1-A	1 TX, 1 Fiber SM 20Km SC	Industrial Unmanaged 10/100TX to 100FX Single-Mode 20Km SC, Power Adapter Included
EL900-A-B-1-A	1 TX, 1 Fiber MM 2Km SC	Hardened Din-Rail Unmanaged 10/100TX to 100FX Multi-Mode 2Km SC, 10-48VDC Power Input
EL900-A-N-1-A	1 TX, 1 Fiber SM 20Km SC	Hardened Din-Rail Unmanaged 10/100TX to 100FX Single-Mode 20Km SC, 10-48VDC Power Input
EM1100TLC-10	1 GT, 1 GE Fiber LX 10Km SC	Commercial Unmanaged 10/100/1000TX to GE Fiber Single-Mode 10Km SC, Power Adapter Included
EL2315	1 GT, 1 GE SFP	Commercial Unmanaged 10/100/1000TX to GE SFP, Power Adapter Included
EL9100-A1B	1 GX, 1 Fiber LX 10Km SC	Hardened Din-Rail Unmanaged 10/100/1000TX to GE Fiber Single-Mode 10Km SC, 12-48VDC Power Input
EMC400-EPWS	4-Bay	Commercial 4-slot Din-Rail Media Converter Chassis with two DR-30-12 Power Supplies in the Package
EMC1600	16-Bay	Commercial Media Converter Chassis. 19" Rack Mount Redundant Power Supplies,

100VAC - 260VAC

Ethernet Extenders *Note: Power Supplies Sold Separately for Din-Rail Switches*

Part #	Ports	Description
ED3501-U	1 TX, 1 Copper pair	Unmanaged 1 10/100TX Port to 1 Copper Pair, Power Adapter Included
ED3541-00B	1 TX, 1 Copper pair	Hardened Din-Rail Unmanaged 10/100TX Port to 1 Copper Pair, PSU Sold Separately
ED3575-622	6 FE, 2 GE, 2 Copper	Hardened Din-Rail Managed 6 10/100TX + 2 GE SFP Combo + 2 Copper Pair, PSU Sold Separately
ED3238-TRU	1 TX PoE, 1 Coaxial	Unmanaged 10/100TX PoE (15.4W) Ethernet Extender over RG6, RG11, or RG59 Coaxial Cable, included one ED3238T, one ED3238R and Power Adaptor, USA Type
ED3638	1 TX PoE+, 1 Coaxial	Hardened Din-Rail Unmanaged 10/100TX PoE+ (30W) Ethernet Extender over RG6, RG11, or RG59 Coaxial Cable, included one ED3638T, one ED3638R , PSU Sold Separately
ED3538	1 TX PoE+, 1 Copper	Hardened Din-Rail Unmanaged 10/100TX PoE+ (30W) Ethernet Extender over Copper pair , included one ED3538T, one ED3538R, PSU Sold Separately

SFP Modules

Part #	Ports	Description
EX-1250TSP-MB2L-AS	1 GE SFP	SFP Module, Hardened (-40°C - 85°C) Gigabit, Duplex LC, 1310nm, 2Km
EX-1250TSP-MB4L-AS	1 GE SFP	SFP Module, Hardened (-40°C - 85°C) Gigabit, Duplex LC, 1310nm, 10Km
EX-1250TSP-MB5L-AS	1 GE SFP	SFP Module, Hardened (-40°C - 85°C) Gigabit, Duplex LC, 1310nm, 20Km
EX-LS38-C3L-TI-N-CE	1 GE SFP	SFP Module, Hardened (-40°C - 85°C) GE, DDM, Single LC, TX:1310nm, RX:1550nm 40Km
EX-LS48-C3L-TI-N-CE	1 GE SFP	SFP Module, Hardened (-40°C - 85°C) GE, DDM, Single LC, TX:1550nm, RX:1310nm 40Km
EX-LS48-C3U-TI-N-EB	1 GE SFP	SFP Module, Hardened (-40°C - 85°C) GE, DDM, Duplex LC, 1550nm, 70Km

Power Supplies

Part #	Volts/Watts	Description
SDR-240-48	48-55VDC/240W	Hardened Din-Rail PSU 88-264VAC(47-63Hz) or 124-370VDC Input, 48-55VDC Output
SDR-480-48	48-55VDC/480W	Hardened Din-Rail PSU 90-264VAC(47-63Hz) or 124-370VDC Input, 48-55VDC Output

Surge Protector

Part #	Description
PD1041	Hardened RJ45 Surge Protection Device
PD3041	Hardened Copper Wire RJ11 Surge Protection Device

Why choose EtherWAN?

1. Products undergo a strict quality assurance testing process to minimize failures in the field.
2. Full PoE power budgets to ensure enough PoE power for a reliable IP Surveillance system.
3. Our high quality and high reliability switches minimize the need to...
 - a. ...repeatedly return to customer site for troubleshooting
 - b. ...replace inadequate or failing lower quality products
 - c. ...try and retain unhappy customers or losing future business from lack of customer referrals

EtherWAN — When Connectivity is Crucial

Rolling Stock Connectivity for End Device Connectivity

Number of Devices	Recommend
Up to 8 M12 end devices + 2G Uplinks	ER52082-I unmanaged 8 10/100/1000TX M12 PoE+ (30W) + 2 GT M12 (-40~75°C)
Up to 8 M12 end devices + 2G Uplinks, Redundant Path requirement	ER58802-201HT Managed 8 10/100TX M12 PoE+ (30W) + 2 GT M12 (-40~75°C)
Up to 16 M12 end devices + 2G Uplinks, Redundant Path and IP67 requirement	ER59402-201GT Managed 16 10/100TX M12 (8x PoE+ 30W) + 2GT (-40~75°C), IP67

Wayside Connectivity for End Device Connectivity

Number of Devices	Recommend
Up to 8 end devices	EX71800-00B Managed 8 10/100TX (-40~75°C)
Up to 8 end devices + 2G Uplinks	EX71802-0VB Managed 8 10/100TX + 2 GE SFP (-40~75°C)
Up to 12 GE end devices, 4G Fiber Uplink Ports	EX73931-0VB Managed 12 10/100/1000TX + 4 GE SFP Lite L3 Switch (-40~75°C)
Case I. 4 PTZ Cameras, 2-4 Non PTZ Cameras, 4 Uplinks Case II. 4 APs with heater, 4 Uplinks (Choose 60W PoE Switch for over 30W PoE PD camera or AP)	EX78931-0VB Managed 12 10/100/1000TX PoE++ (8x60W) + 4 GE SFP uplinks, 240W Power Budget (-40~75°C)
Case I. 2 PTZ Cameras + 2-4 Non PTZ Cameras, 2 Uplinks Case II. 2 APs with heater+ 2-4 Non PTZ Cameras, 2 Uplinks (Choose 60W PoE Switch for over 30W PoE PD camera or AP)	EX78602-0VB Managed 6 10/100TX PoE++ (4x 30W+2x60W) + 2 GE SFP uplinks, 180W PoE Power Budget (-40~75°C)
Up to 8 Cameras or Wireless APs with PoE , 2 Uplinks	EX78802-0VB-T Managed 8 10/100TX PoE+(30W) + 2 GE SFP, 180W PoE Power Budget (-40~75°C)
Up to 4 Cameras or Wireless APs With PoE , 1 Uplink	EX45915-V Unmanaged 5 10/100/1000TX (4 x PoE+ 30W) + 1 GE SFP, 180W PoE Power Budget (-40~75°C)



8F., No.2, Alley 6, Lane 235, Baoqiao Rd., Xindian District, New Taipei City 231, Taiwan
Tel : +886-2-6629-8986 | Fax : +886-2-6629-7758 | www.etherwan.com