SFP-ER

Miniature Ethernet Copper Range-Extension Device

- Point-to-point Ethernet connectivity with rates up to 100 Mbps

- Eliminates the need for new fiber installation

- Extends the 100 m (328 ft) distance limit for Ethernet connectivity over single or double copper pairs up to 550m (1804 ft)

- Small-Form-Factor that can be plugged into any Ethernet switch with SFP ports

SFP-ER is a Small-Form-Factor, Ethernet extender that improves bandwidth and distance of existing copper lines. It helps avoid installation of new fiber lines at customer sites.

Housed in a Small Form-Factor Pluggable (SFP) enclosure, it is designed for quick and simple insertion into any 100BaseFx Ethernet port with an MSA-compatible socket.

MARKET SEGMENTS AND APPLICATIONS

SFP-ER is intended for indoor applications and is used for point-to-point Ethernet connectivity.

SFP-ER is based on the proprietary RAD patent that allows full 100 Mbps Ethernet bandwidth to be extended over 2-wire, 4-wire or 8-wire copper lines (full duplex on each pair).

OPERATION AND MAINTENANCE

Installation
SFP-ER is a book-end solution that can work only with an additional SFP-ER.

Follow the instructions below to install and connect SFP-ER:

- Plug SFP-ER into a device/switch with a 100 Mbps Serdes interface. Repeat the this step for the additional SFP-ER device

Connection
- Connect SFP-ER devices using a straight cable:

   2-wire cable: use pins 1 and 2
   4-wire cable: use pins 1, 2, 3 and 6
   8-wire cable: use pins 1–8.

- Always connect SFP-ER to another SFP-ER device. If an SFP-ER was connected to a regular port of any Ethernet device, such as a switch, reset SFP-ER by unplugging and re-inserting the unit.

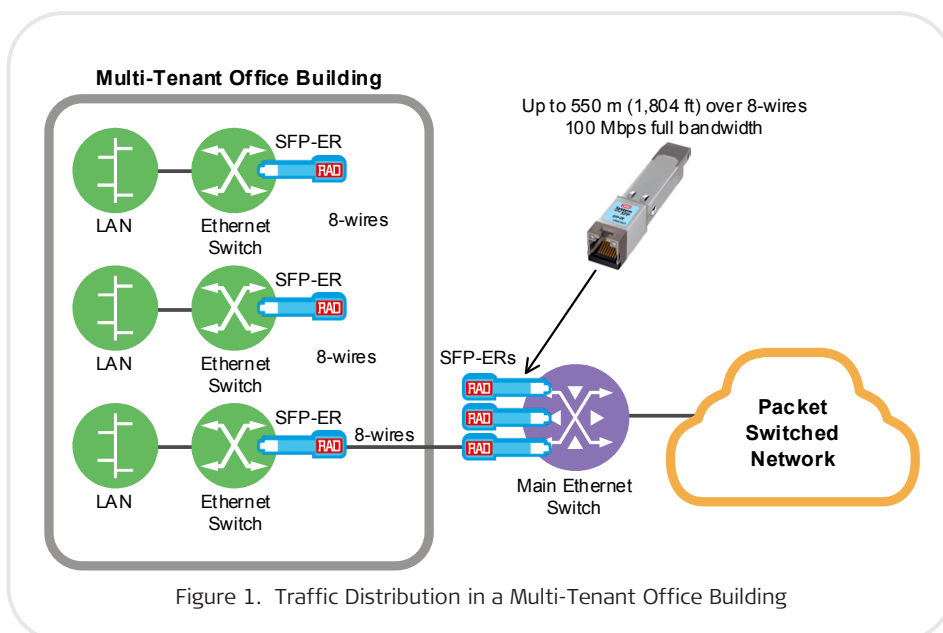- Link synchronization may take around one minute

Figure 1. Traffic Distribution in a Multi-Tenant Office Building

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Miniature Ethernet Copper Range-Extension Device

Specifications

HOST INTERFACE

Type
100 Mbps TX Serdes

Host Edge Connector
SFP-based, MSA-compliant

Range
See *Table 1* for a list of ranges

Connector
RJ-45

Data Rate
100 Mbps

GENERAL

The SFP-ER components are lead-free

Indicators
LINK/ACT (green) –
    On: Ethernet link is OK
    Blinking: Data is being transmitted or
    received

SPD (yellow) –
    On: Extended range is linked at
    100 Mbps

Physical
Height: 12.4 mm (0.48 in)
Width: 14.0 mm (0.55 in)
Depth: 74.1 mm (2.91 in)
Weight: 30.0g (1.06 oz)

Power
3.3V

Power Consumption
1.0W

Environment
Temperature:
    Operating: 0 to 50°C (32 to 122°F)
    Storage: -40 to 85°C (-40 to 185°F)

Humidity: Up to 90%, non-condensing

Ordering

SFP-ER

Note: Regardless of the cable length, the cable should be crimped exactly according to the standards. For reference, see Table 2.

Table 1. Operation Range over CAT5e Cable

Rate [Mbps]	Pairs	Error-Free		BER<10^{-10}	
		[m]	[ft]	[m]	[ft]
100	4	550	1804	575	1886
	2	250	820	300	984
	1	300	984	300	984

Table 2. Cable Color Coding

Pin	Pair	Wire		
1	3	1		white/green
2	3	2		green
3	2	1		white/orange
4	1	2		blue
5	1	1		white/blue
6	2	2		orange
7	4	1		white/brown
8	4	2		brown

RAD
Your Network's Edge