

# S-RPT/EFM

## 2/4-Wire SHDSL/SHDSL.bis Repeater



- SHDSL/SHDSL.bis extension based on TC-PAM 16/32 coding
- Duplex data transmission over one or two symmetrical pairs at up to 11.4 Mbps over 4-wire line
- Ethernet in the First Mile (EFM) bonding support
- TDM services transmission with HDLC encapsulation
- Weatherproof metal enclosure for outdoor installation
- Remote power feeding capabilities for different topologies

S-RPT/EFM is a compact 2/4-wire SHDSL/SHDSL.bis repeater, extending the range of data transmission over SHDSL/SHDSL.bis infrastructure. S-RPT/EFM can be chained to increase the transmission range.

Based on the latest DSL technology, S-RPT/EFM provides superior distance and speed using TC-PAM 16/32 encoding, which offers a narrower power spectrum than 2B1Q and other technologies.

The xDSL ports comply with ITU-T G.991.2 and ETSI TS 101524 standards, and operate at bit rates from 192 to 11392 kbps, depending on the repeater and modem configuration (2- or 4-wire).

S-RPT/EFM is available in two different compact versions:

- Tabletop plastic enclosure for indoor use
- Weatherproof metal enclosure for outdoor installation.

S-RPT/EFM extends DSL connection between the Central Office (CO) unit (Megaplex-4 equipped with ASMi-54C modules) and the Customer Premises Equipment (CPE) units (ASMi-53, ASMi-54L, or LA-210) providing:

- Ethernet services connectivity with end-to-end EFM solution from CO to CPE
- Remote power feeding (with the external MPF unit).

S-RPT/EFM performs a digital loopback test towards the CO SHDSL unit.

# S-RPT/EFM

## 2/4-Wire SHDSL/SHDSL.bis Repeater

The S-RPT/EFM unit is managed in two ways:

- Locally, from an ASCII terminal via a serial control interface (indoor unit only)
- Remotely, from the CO unit via the standard Embedded Operations Channel (EOC) commands.

Performance and alarm monitoring is available remotely via the CO equipment or locally via the terminal.

RADview management station, connected to the CO unit, can manage the S-RPT/EFM units throughout the entire SHDSL link providing access to statistics, status, and diagnostics tools.

Using standard EOC messages, the CO SHDSL equipment can display the number of repeaters installed on the line and reported alarms. It can also remotely initiate a loopback test toward the CO.

S-RPT/EFM can be powered locally, using a 48 VDC power supply, or remotely, over the SHDSL line from a power feeding hub, such as RAD's MPF (for the Megaplex-4100 SHDSL modules).

**Note:** In 2-wire SHDSL only one repeater can be fed remotely.

**Note:** Rate examples shown in Table 1 were obtained in the laboratory without real line interference.

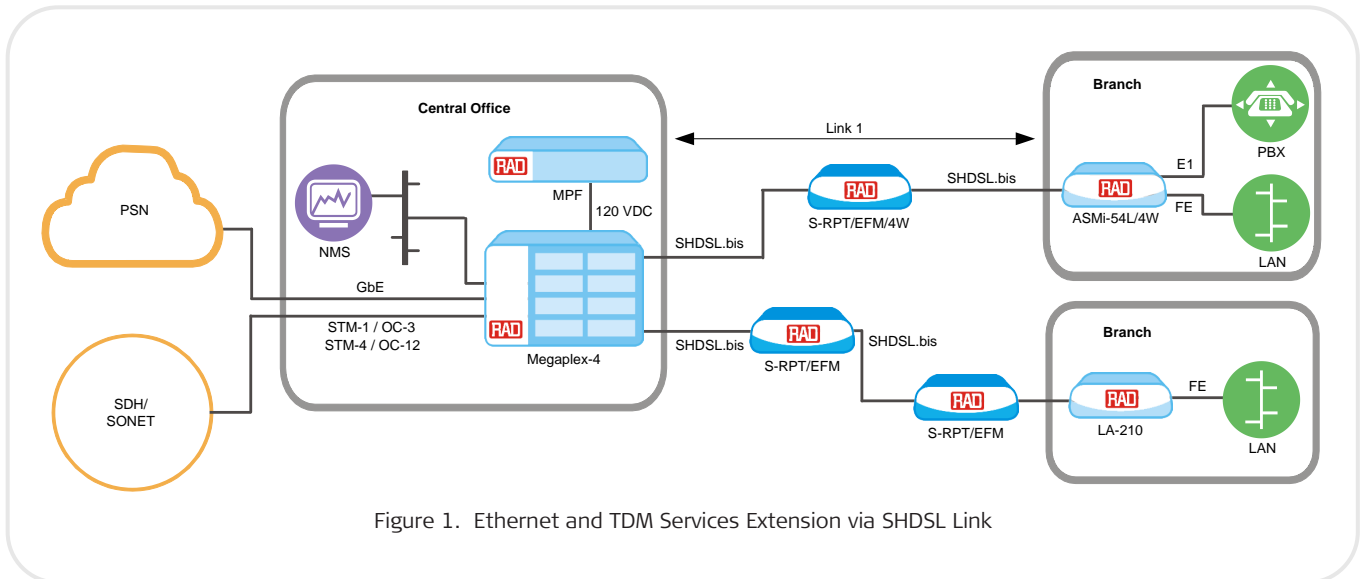


Figure 1. Ethernet and TDM Services Extension via SHDSL Link

Table 1. 26 AWG, 4-Wire Line Range Example

SHDSL Rate [Mbps]	Link 1 Range (Figure 1) S-RPT/EFM/4W Powered Remotely ASMi-54L/4W Powered Locally		Link 1 Range (Figure 1) S-RPT/EFM/4W Powered Remotely ASMi-54L/4W Powered Remotely	
	[km]	[miles]	[km]	[miles]
11.4	4.5	2.8	4.5	2.8
4.096	7.5	4.7	6	3.7

## Specifications

### LINE INTERFACE

#### Line Type

Symmetrical PSD  
2/4-wires unconditioned dedicated line  
(twisted pair)

#### Compliance

ITU-T G.991.2, ETSI TS 101524

#### Line Coding

16/32 TC-PAM

#### Line Rate

4-wire: 384 to 11392 kbps  
2-wire: 192 to 5696 kbps

#### Impedance

135Ω

#### xDSL Connectors

Plastic enclosure: 2 x RJ-45  
Metal enclosure: 8-pin sealed circular  
connector

### CONTROL PORT (PLASTIC ENCLOSURE)

#### Interface

V.24/RS-232

#### Type

DCE

#### Format

8 bit, no parity, 1 stop bit, no linefeed  
with carriage return  
XON/XOFF enabled

#### Data Rate

115.2 kbps

#### Connector

9-pin, D-type, female (EIA/TIA 574)

### INDICATORS

**Front Panel** (indoor unit)/**Cover** (outdoor  
unit)

SHDSL SYNC 1, SHDSL SYNC 2 - tricolor  
LED indicators (red/yellow/green), see  
specification in *Table 1*

**Rear Panel** (indoor unit only)

RPF (green) -

On: remote power feeding is received  
Off: no remote power feeding.

### MANAGEMENT

#### Local Management (Indoor Unit Only)

Direct connection of ASCII local terminal  
or terminal emulation

#### Remote Management

EOC messages from the CO

### POWER

#### Local

Plastic enclosure: 48 VDC (36 to 72 VDC)

#### Remote

60 to 140 VDC over xDSL line

#### Power Consumption

3.6 W (2-wire)

4.0 W (4-wire)

### GENERAL

#### Physical

Plastic enclosure:  
Height: 43.7 mm (1.7 in)  
Width: 220 mm (8.6 in)  
Depth: 170 mm (6.7 in)  
Weight: 0.6 kg (1.3 lb)

Metal enclosure:

Height: 40 mm (2.6 in)  
Width: 214 mm (12.2 in)  
Depth: 188 mm (6.5 in)  
Weight: 1.3 kg (2.9 lb)

#### Environment

Temperature: -5° to 45°C (23° to 113°F)  
for plastic enclosure

Temperature: -20° to 65°C (-4° to 149°F)  
for metal enclosure

Humidity: 5% to 85%, non-condensing

**S-RPT/EFM****2/4-Wire SHDSL/SHDSL.bis Repeater****Ordering****RECOMMENDED CONFIGURATIONS****S-RPT/4W/EFM**

4-wire SHDSL/SHDSL.bis repeater, plastic enclosure

**S-RPT/4W/IP67/EFM**

4-wire SHDSL/SHDSL.bis repeater, metal enclosure

**SUPPLIED ACCESSORIES****Cable Connector**

Mating circular plug to the outdoor unit input/output port

**WM-37**

Wall-mounting kit for outdoor unit installation

**OPTIONAL ACCESSORIES****S-PRT-PS**

100/240 VAC to 48VDC power adapter

**RM-33-2**

Hardware kit for mounting one or two S-RPT/EFM indoor units in a 19-inch rack

Pulse Supply  
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