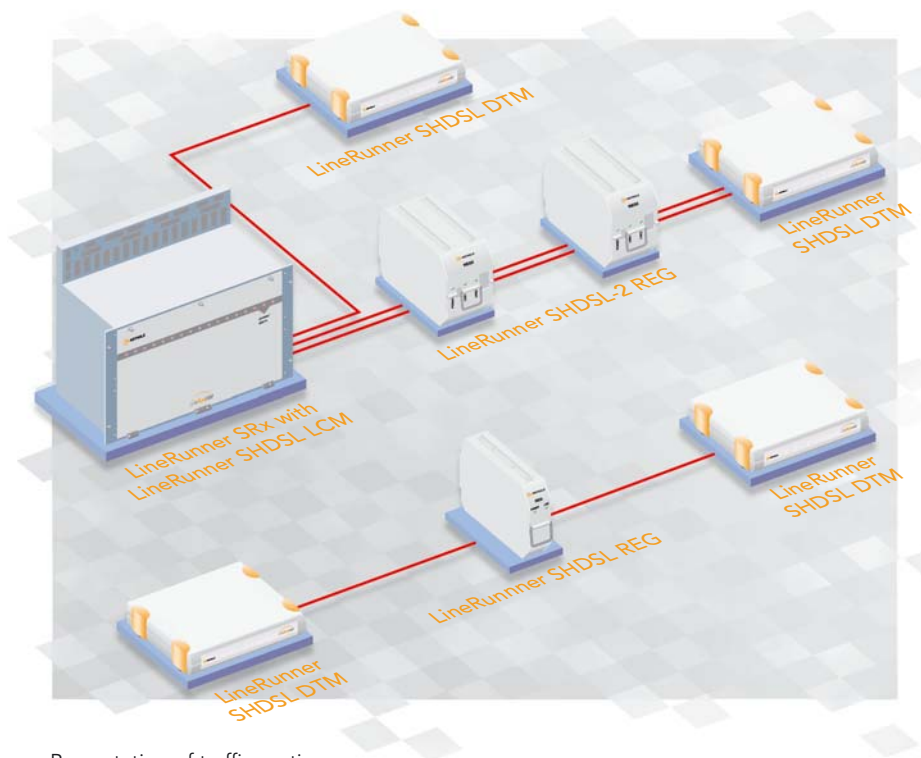


LineRunner SHDSL LCM/DTM

The modular SHDSL transmission system for effective provisioning of TDM data services



Presentation of traffic routing

- Wide range of interfaces
 - G.703/G.704
 - X.21/V.11
 - V.35
 - V.36
 - V.24/V.28
 - 10/100BaseT
- Subrates are supported
- Optional 1- and 2-pair-transmission system
- Regenerators for increased reach
- Remote power feeding
- Management via ASMOS

LineRunner SHDSL LCM/DTM offers a professional solution for the delivery of business data services, with bandwidths of up to 2 Mbps. With a modular design and a wide range of interfaces it is a cost effective and flexible solution that can be used to meet specific customer requirements.

■ Introduction

The main application of LineRunner SHDSL LCM/DTM is the delivery of symmetrical data services over copper lines. SHDSL (Single-Pair

High-Speed Digital Subscriber Line) transmission technology according to ITU-T G.991.2 is used.

The following components make up the SHDSL solution:

- SHDSL LCM: Line cards
- SHDSL DTM: Desktops
- SHDSL REG: Regenerators

LineRunner SHDSL LCM/DTM offers a variety of interfaces and transmission capacities from subrates <64 kbps to n x 64 kbps with rates up to 2,048 kbps.

It therefore allows simple and fast provisioning of any kind of data service for business customers and network operators, e.g.:

- Symmetrical broadband Internet access
- VPN and LAN-LAN services
- ISDN PRA
- Transparent 2 Mbps leased lines
- Connection of GSM/UMTS base stations

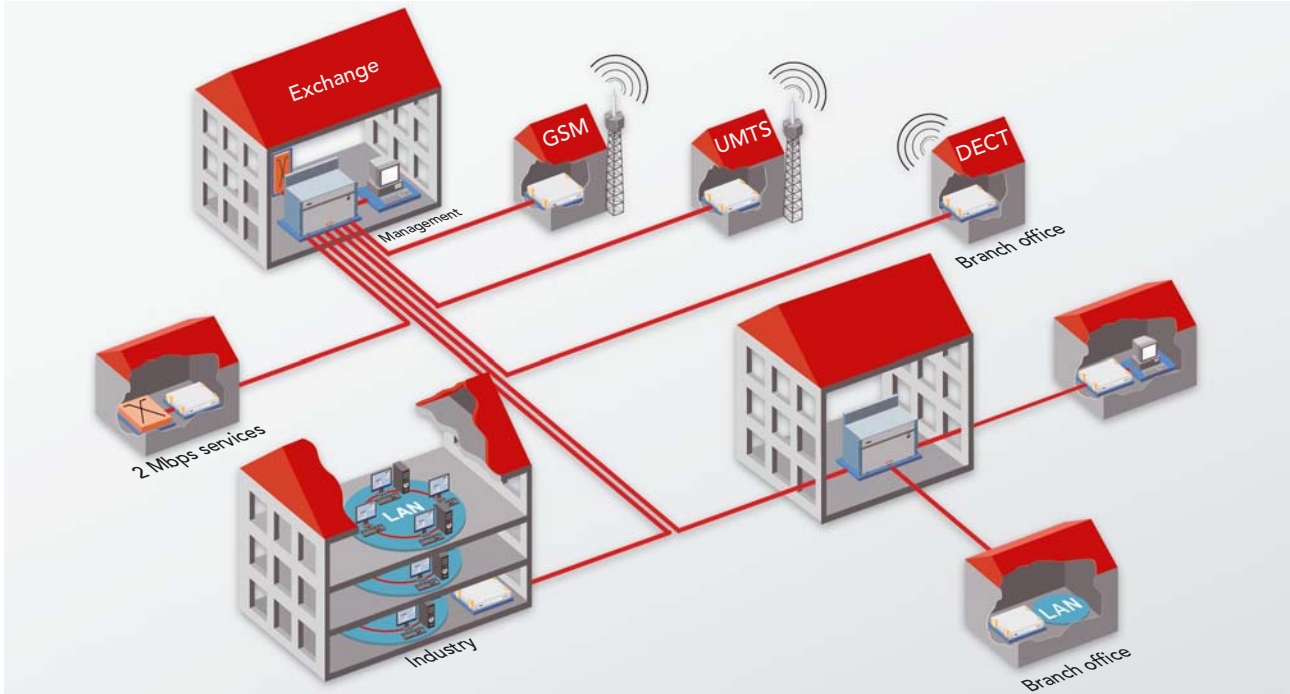


Figure 2: Applications

With the availability of regenerators, remote power feeding and the option of 1-pair or 2-pair transmission it is possible to deliver services in environments with difficult connection conditions and over an extended range.

■ **Line card SHDSL LCM**

LineRunner SHDSL LCM is the transmission unit for LineRunner SRx subracks. The following subracks are supported:

- LineRunner SRS2: Application interfaces G.703/120 ohms and X.21/V.11
- LineRunner SRA2: Application interface G.703/75 ohms
- LineRunner SRV: Application interface V.36

Mixed equipment with already installed LineRunner DSL modules in a subrack is possible. Integrated

remote power feeding allows the remote supply of LineRunner SHDSL DTM desktop units or regenerators via the transmission line.

■ **Desktop SHDSL DTM**

LineRunner SHDSL DTM desktops can be deployed as network termination (NT) units in customer premises. The LineRunner SHDSL DTM configuration can be changed from NT to LT using a switch. This allows the LineRunner SHDSL DTM to act as an LT module for individual desktop-desktop routes. LineRunner SHDSL DTM provides a G.703/G.704 application interface (120 ohms). Using optional plug-in modules the unit can easily be equipped with any other application interface.

As an option, LineRunner SHDSL DTM can be equipped with a remote power feeding module that

supplies a NT or regenerator via the transmission line.

■ **Rate adaptive**

Capacity and transmission rates between the LT and NT can be adjusted via the management software. The SHDSL transmission rate can be configured as $n \times 64$ kbps where $n = 3$ to 32. Transmit power is reduced (power backoff) for operation over short distances between the central office and the customer premises – this guarantees maximum spectral compatibility.

■ **1-pair/2-pair operation**

LineRunner LCM/DTMs are available as 1-pair or 2-pair versions. 2-pair systems have a larger transmission range in comparison to 1-pair systems. All 2-pair systems can be switched to

1-pair mode via the network management.

■ Remote power feeding

LineRunner LCM features an integrated remote supply module – as an option LineRunner DTM can be equipped with it in the factory. Each remote supply module can remotely power one unit (REG or NT). Moreover the remote supply module is able to generate a wetting current. A wetting current is a constant low current that protects the contacts on a transmission route from corrosion (see figure 4). This reduces service costs und augments reliability.

■ Application interfaces

LineRunner SHDSL desktops offer a variety of application interfaces. These are:

- Ethernet 10/100BaseT
- G.703, 120 or 75 ohms
- X.21
- V.35
- V.36

Moreover application interfaces are available that support besides standard data rates ($n \times 64$ kbps) so-called subrates (<64 kbps) additionally. They allow to simply realise applications that demand for a mandatory subrate with LineRunner SHDSL.

You can easily interconnect networks via the Ethernet interface. The Ethernet interface is an optional application interface

where you can insert the DTM or attach it to the SHDSL LCM. This



Figure 3: Units of the SHDSL transmission system: DTM, LCM and subracks

way you can offer Ethernet in all installed LineRunner

DTM desktops or subracks without exchanging any hardware.

■ Regenerators

Regenerators are available to increase the normal range of SHDSL systems. Up to two regenerators can be deployed per transmission line.

Regenerators can be remotely supplied by the LineRunner SHDSL LCM or the SHDSL DTM. A number of housings for indoor, pole, wall and underground installation are available.

■ Performance monitoring

LineRunner SHDSL LCM/DTM provides extensive control of

transmission quality based on performance data according to ITU-T G.826. Performance data is collected at the LT, NT and even at the regenerators.

■ LineRunner DTM and UMUX

LineRunner DTM is fully compatible to the multi-service access system UMUX. It is employed as network termination together with the STIC1/STIC2 module.

■ Management

All modules can be managed via LineRunner ASMOS. NTs connected to a STIC are managed via UNEM/UCST

Don't hesitate to contact us for further information on the LineRunner SHDSL system



Figure 4: Remote powering and wetting current in a SHDSL transmission system

Technical data

General		
Line code	16 TC-PAM according to ITU-T G.991.2 Annex B	
Transmission rate on the SHDSL route	n x 64 kbps duplex on 1 or 2 copper pairs, n = 3 ... 32	
Configurable payload data rate at the application interface	n x 64 kbps duplex on 1 or 2 copper pairs, n = 1 ... 32	
Supported regenerators	1-pair- or 2-pair regenerators (up to 2 per route)	
Remote supply (optional for LineRunner SHDSL DTM)	<115 V DC (according to EN 60950), 75 mA	
Wetting current	typ. 2 mA, max 10 mA (according to ITU 991.2)	
Storage of performance data	96 x 15 minutes and 7 x 24 hours	
LineRunner SHDSL LCM (Line card)		
Transmission interface	SHDSL, 1-pair or 2-pair mode (2-pair can be switched to in 1-pair operation)	
Remote supply of NT or REG	via 1 or 2 copper pairs	
Supported subracks	LineRunner SRA2, LineRunner SRS2, LineRunner SRV	
Application interfaces (connector type)	Ethernet (RJ45)G.703/G.704-120 ohms (DSub-15) or G.703/G.704-75 ohms (BNC), X.21/V.11 (DSub-15), V.36 (DSub-37)	
Power consumption	<5.0 W (<15 W with remote power feeding)	
LineRunner SHDSL DTM (Desktop)		
Fixed application interfaces (connector type)	G.703/704-120 ohms (RJ 45)	
Optional application interfaces (connector type)	G.703/704-75 ohms (BNC), X.21/V.11 (DSub-15), V.35 (MF-34), V.36 (DSub-37), V.24/V.28 (DSub-25), Ethernet (RJ 45)	
Payload data rate	n x 64 kbps, n = 1 ... 32	
Payload data rate (subrates, according to ITU-T V.110)	600/1,200/2,400/4,800/9,600/19,200/38,400/48,000/56,000 bps	
Power supply	88 ... 264 V AC (47 ... 63 Hz) 38 ... 60 V DC remotely supplied	
Power consumption	2.7 W to 10.5 W (according to configuration and application interface)	
Dimensions (H x W x D) and weight	50 x 290 x 225 mm, 820 g ... 1050 g	
Ethernet-Spezifikationen		
Modes	10FX, 10 HX, 100FX, 100HX	
Konfiguration	Manuell or Auto-negotiation	
Transmission ranges (1-pair/2-pair without noise)		
	Ø 0.4 mm	Ø 0.8 mm
n=3	7.5 km/-	19.8 km /-
n=6	5.8 km/7.5 km	16.5 km /19.8 km
n=16	4.9 km/5.7 km	12.0 km /15.4 km
n=32	4.1 km/4.9 km	9.4 km /12.0 km
Remote supply range		
	Ø 0.4 mm	Ø 0.8 mm
LineRunner DTM without MOD/with MOD G.703A NT	5.5 km	22.1 km
LineRunner DTM with MOD X.21	4.5 km	17.9 km
LineRunner DTM with MOD V.35	4.1 km	16.3 km
Environmental conditions		
Temperature range operation	-25° C to +55° C, according to ETS 300019-1-3, Class 3.3	
Rel. humidity operation (non condensing)	5 % to 95 %, according to ETS 300019-1-3, Class 3.3	
Temperature range storage	-25° C to +55° C, according to ETS 300019-1-3, Class 1.2	
Rel. humidity storage (non condensing)	10 % to 100 %, according to ETS 300019-1-3, Class 1.2	



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