R&S®SITLine ETH-S ETHERNET ENCRYPTION DEVICE

Specifications

R&S®SITLine ETH-S is an Ethernet encryption device that secures the confidentiality and integrity of data that is exchanged over Ethernet services. Depending on the product model, the high-quality, cutting-edge encryption uses the entire line bandwidth of a 10 Mbit/s, 100 Mbit/s, 1 Gbit/s or 10 Gbit/s line in full-duplex mode, regardless of the package size being transferred. In combination with the low latency, the device is integrated into the data network without any significant compromise to the network functionalities and performance.

Models

R&S®SITLine ETH-S, 10M	port line speed	10 Mbit/s
	number of lines	1
	number of data ports	2
R&S®SITLine ETH-S, 100M	port line speed	100 Mbit/s
	number of lines	1
	number of data ports	2
R&S®SITLine ETH-S, 1G	port line speed	1 Gbit/s
	number of lines	1
	number of data ports	2
R&S®SITLine ETH-S, 10G	port line speed	10 Gbit/s
	number of lines	1
	number of data ports	2

Network

Data ports		
Ports	data lines, 2 ports per line	1 port pair
Data rates	line rate	SFP/SFP+
Frame type	Ethernet (IEEE frame, DIX Ethernet II)	10 Mbit/s to 10 Gbit/s, full duplex per SFP+ port pair
Ethernet MTU	IEEE frame	IEEE 802.3, Ethernet II
Number of data ports	DIX Ethernet II	1518 byte/1522 byte
	data lines, 2 ports per line	16 383 byte
Media types, fiber (multimode/single-mode), electric	transceiver SFP+	• 10GBASE-SR • 10GBASE-LR
	transceiver SFP	• 1000BASE-SX • 1000BASE-LX • 10/100/1000BASE-T
VLAN support	VLAN, Q in Q	• IEEE 802.1Q • IEEE 802.1ad • IEEE 802.1ah
WAN services		
Port based	in line with Metro Ethernet Forum (MEF)	EPL, EP-LAN, dark fiber
VLAN based	in line with MEF	EVPL, EVP-LAN, dark fiber

Frame processing		
Architecture		FPGA based cut-through
MTU	standard size, in line with IEEE 802.3	≤ 1518 byte, ≤ 1522 byte (with 1 VLAN tag)
	jumbo frames	9216 byte
Latency	frame size	
	64 byte	
	R&S® SITLine ETH-S, 10G	max. 4 µs
	R&S® SITLine ETH-S, 1G	max. 4.4 µs
	1518 byte	
	R&S® SITLine ETH-S, 10G	max. 9.5 µs
	R&S® SITLine ETH-S, 1G	max. 17
	9198 byte	
	R&S® SITLine ETH-S, 10G	max. 36 µs
	R&S® SITLine ETH-S, 1G	max. 86 µs
Frame filter	configurable controlled bypass	• IEEE layer 2 control protocols • Cisco layer 2 control protocols • precision time protocol

Cryptography and security

Operational mode		
Standard	full Ethernet payload including ether type (ET) data field, encrypted	for all network services: • point-to-point (P2P)/EPL/EVPL • point-to-multipoint (P2MP) • multipoint-to-multipoint (MP2MP)/ LAN/ EPLAN/EVPLAN
Ethernet tunnel	new Ethernet frame, full original frame, encrypted	only for P2P services: • P2P/EPL/EVPL • P2MP
Secured connections		
Number of secure connections		up to 1000 session keys at the same time
Connection establishment		automatic
Key assignment	configurable	port or first VLAN tag
Encryption offset	configurable	up to 3 VLAN tags
Symmetric cryptography		
Algorithm		AES
Key length		256 bit
Mode		GCM
Integrity protection	configurable	0 byte (off), 8 byte, 12 byte, 16 byte
Replay protection	configurable	• replay protection per port/VLAN and per service class (PCP value) • replay window of size 8
Key agreement		
Protocol		authenticated Diffie-Hellman ECKAS-DH
Authentication		ECGDSA
Key lifetime		
Main key	automatic key renewal without interrupting the connection	10 s to 65 535 s, standard: 36 000 s
Session key	automatic key renewal without interrupting the connection	1 s to 32 767 s, standard: 180 s

Authentication/signatures		
Device certificate		X.509
	certificate storage	secure on smart card
	certificate change	• online, without interruption • offline/manually, with interruption
Asymmetric cryptography	ANSI X9.62, ECDSA/ECGDSA	ECC
	key length	• 384 bit ECC, for authenticating security connections to partner devices • 512 bit ECC (brainpool), for authenticating TLS connections to the management server
	hash algorithm	• SHA-384, for authenticating security connections to partner devices • SHA-512, for authenticating TLS connections to the management server

Device management

Management port		
Port		1 × SFP port MGMT, for out-of-band management
Media types		10/100/1000BASE-T
Remote/online management		
VLAN support		IEEE 802.1Q
Supported IP versions		• IPv4, IPv6 • static IP addresses, domain/host names
Access	out-of-band	local management port: MGMT
	in-band	red data ports: A
	remote management via primary device	black data ports: X
Local management		
Port		1 × RJ-45 port CONSOLE for: • SSH • HTTP, for log export and local firmware update
Media types		10/100/1000BASE-T
Card reader		
Format	contact smart card	ID-1: ISO 7816-2
Display		
Display		OLED display, for information output
Display button		to navigate the information output
LEDs	front	for data port throughput
Security management		
Managing and monitoring all security functions		
Protocol		proprietary
Management station		R&S®Trusted Objects Manager NE
Security anchor		smart card
Network management		
Managing and monitoring network parameters		
Protocol	SNMP	v2c, v3
Supported management information base (MIB)	standard	• SNMP MIB (RFC 3418) • interfaces group MIB (RFC 2863) • Ethernet-like interfaces MIB (RFC 3635) • MAU MIB (RFC 4836)
	company-specific	R&S®SITLine-II MIB
Connections to the security management		
Management connection	protocol	TLS 1.2
Remote management connection	protocol	TLS 1.2 and management transport channel, secured connection between primary and secondary device

Additional functions		
Device security	secure boot	only firmware signed by the manufacturer
	protection against manipulation, tamper resistance	tamper security module
	clear button	button on the front of the device, resets it to the delivery state
Device monitoring	hardware monitoring	built-in test during booting and operation, temperature

Approvals and certificates

Electronic security	LVD 2014/35/EU	in line with: EN 62368-1: 2014+AC: 2015
EMC	EMCD 2014/30/EU	in line with: • EN 55032: 2015+A11: 2020 (class A) • EN 55035: 2017+A11: 2020 • EN 61000-3-2: 2014 • EN 61000-3-3: 2013
Security approvals	national, German security classification	Verschlusssache – nur für den Dienstgebrauch (VS-NfD)
	NATO	NATO RESTRICTED (NR)
	EU	RESTREINT UE/EU RESTRICTED
EU legislation	EU: in line with Data Act – Regulation (EU) 2023/2854	for details, see user documentation

General data

Power supply		
AC power supply units		2 modules, hot-swappable
Input voltage	AC	110 V to 240 V, 50 Hz/60 Hz
Power consumption	on the AC power socket	max. 20 W
Battery	type	CR ½ AA, integrated
	voltage	3 V
	durability	10 years
Climatic and environmental conditions		
Ambient temperature	storage temperature	–20 °C to +70 °C
	operating temperature	+5 °C to +40 °C
Humidity	without condensation	up to 90 %, relative
Air pressure	transport	min. 566 hPa, corresponds to approx. 4500 m above sea level
	operation	min. 795 hPa, corresponds to approx. 2000 m above sea level
Heat loss	maximum	max. 68 British thermal units (BTU)/h
Ventilation	air flow	fanless, external air flow
	fans	fanless
Reliability		
MTBF, device without additional components	in line with SN 29500 at +25 °C	min. 154 000 h
Installation		
Dimensions	rack	4.5", ⅓ RU (1 RU rack mount kit available)
	W × H × D	115 mm × 37 mm × 1995 mm (4.53 in × 1.46 in × 78.54 in)
Mounting	rack mount	19" mounting plate as optional accessory
Weight		1 kg (2.20 lb)

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R&S®SITLine ETH-S Ethernet encryption device
Data without tolerance limits is not binding | Subject to change