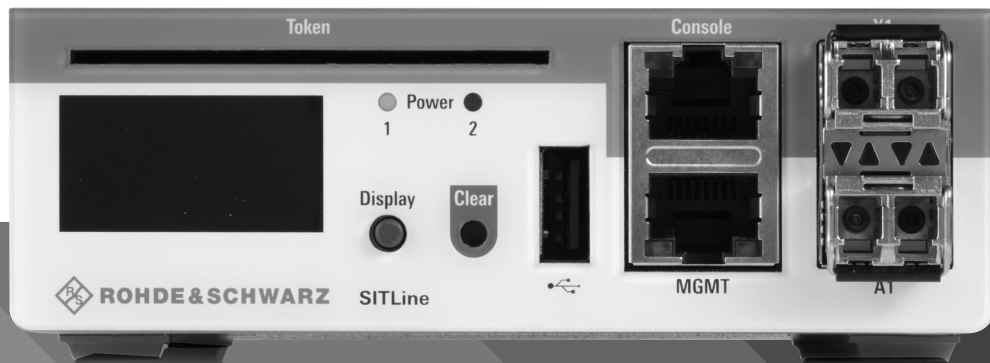# R&S®SITLine ETH-S ETHERNET ENCRYPTOR

Specifications

Data Sheet
Version 03.00

ROHDE&SCHWARZ

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CONTENT

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 variant, the high-quality, cutting-edge encryption uses the entire line bandwidth of a 1 Gbit/s line or 10 GB/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.

Specifications

Network

Data ports		
Number of ports		1 × line (2 SFP/SFP+ ports) • "A1" private/unencrypted • "X1" public/encrypted
Data rates	line rate	10 Gbit/s or from 10 Mbit/s to 1 Gbit/s
Frame type	ethernet	IEEE 802.3, DIX Ethernet II
Ethernet MTU	IEEE802.3	1518/1522 bytes
	DIX Ethernet II	9216 bytes (jumbo frames)
Media type	10 Gbit/s	• 10GBASE-SR • 10GBASE-LR
	1 Gbit/s	• 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	MEF services EPL and EP-LAN, dark fiber
	VLAN-based	MEF services EVPL, EVP-LAN
Frame processing		
Transfer mode		store & forward
Maximum throughput on the "X" port for 64-bytes frames	unencrypted	
	for 1 Gbit/s	1 488 095 frame/s
	for 10 Gbit/s	14 880 952 frame/s
	encrypted with security header	
	for 1 Gbit/s	1 329 787 frame/s
	for 10 Gbit/s	13 297 872 frame/s
	encrypted with security header and integrity check sum of 8 bytes	
	for 1 Gbit/s	1 225 490 frame/s
	for 10 Gbit/s	12 254 901 frame/s
Latency	frame size	
	64 bytes	
	for 1 Gbit/s	4 µs
	for 10 Gbit/s	4.4 µs
	256 bytes	
	for 1 Gbit/s	5.7 µs
	for 10 Gbit/s	5.1 µs
	512 bytes	
	for 1 Gbit/s	8 µs
	for 10 Gbit/s	6 µs
	1518 bytes	
	for 1 Gbit/s	17 µs
	for 10 Gbit/s	9.5 µs
	9198 bytes	
	for 1 Gbit/s	86 µs
	for 10 Gbit/s	36 µs
Frame filter		configurable network control bypass for unencrypted transfer of: • IEEE layer 2 control protocols • Cisco layer 2 control protocols • precision time protocol

Device management

Management ports		
Number of ports		1 × RJ-45 port "MGMT" for out-of-band management
		1 × RJ-45 port "Console" for local management
Media type		10/100/1000BASE-T
Card reader		
Format	contact smart card	ID-1 (ISO 7816-2), secure configuration memory, trust anchor
Local management		
Access		"Console" port
Protocol		• ssh for R&S®SITLine Console • http for log export and firmware update
Security management		
Management system		R&S®Trusted Objects Manager
Access	out-of-band	"MGMT" (management port)
	in-band	"A1" (private data port)
	remote via locally managed device (proxy)	"X1" (public data port)
VLAN support		IEEE 802.1Q
Supported IP versions		IPv4, IPv6
Protocol		trusted channel (proprietary, TLS-1.2 based
Network management		
Management system		SNMP capable, freely selectable
Access	out-of-band	"MGMT" (management port)
	in-band	"A1" (private data port)
VLAN support		IEEE 802.1Q
Supported IP versions		IPv4, IPv6
Protocol		SNMP v2c, v3
Supported MIBs	standard	• SNMP MIB (RFC 3418) • interfaces group MIB (RFC 2863) • Ethernet-like interface MIB (RFC 3635) • MAU MIB (RFC 4836)
	company-specific	R&S®SITLine-II MIB

Cryptography and security

Secured connections		
Number		up to 1000
Connection establishment		automatic
Key assignment		per port or per port/VLAN
Encryption offset		up to 3 VLAN tags
Encryption mode		
Any-to-any (multipoint)		for all network services (EPL, EVPL, EP-LAN, EVP-LAN), up to 1000 partner devices in a multipoint network (port based/ VLAN-based)
Peer-to-peer (tunnel mode)		only for point-to-point services (EPL, EVPL) up to 1000 tunnels via different VLANs
Symmetric cryptography		
Algorithm		AES with 256 bits
Integrity check sum	configurable (on/off/length of integrity check sum)	0 bytes (off), 8 bytes, 12 bytes, 16 bytes
Replay protection	configurable (on/off)	• 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		
Master 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		ECC (ANSI X9.62, ECDSA/ECGDSA)
	key length	• 384 bits ECC for authenticating security connections to partner devices • 512 bits ECC (brainpool) for authenticating TLS connections to the SMS
	hash algorithm	• SHA-384 for authenticating security connections to partner devices • SHA-512 for authenticating TLS connections to the SMS
Random generation of numbers		
Random generator		RNG class PTG.3
Device security		
Secure boot		only firmware signed by the manufacturer
Protection against manipulation		opening of the device leads to "tampered" state; device must be reinstalled and reinitialized
"Clear" button		deletes the security configuration from the device

General data

Power supply		
Power supply units		1 or 2 external power supply units, 110 – 240 V AC, 50/60 Hz replaceable during operation
Voltage supply		two inputs, 24 V to 48 V DC, redundant
Power consumption		max. 20 W
Battery	type	CR 1/2 AA, built-in
	voltage	3 V
	durability	10 years
Climatic and environmental conditions		
Ambient temperature	storage	–20 °C to +70 °C
	operating temperature	+5 °C to +50 °C
Humidity		up to 90 % relative, non-condensing
Air pressure	transport	min. 566 hPa (equates to approx. 4500 m above sea level)
	operation	min. 795 hPa (equates to approx. 2000 m above sea level)
Heat loss		max. 68 BTU/h
Ventilation		fanless, external air flow
Reliability		
MTBF	device without display and additional components, according to SN 29500	
	at +25 °C	660 939 h
	at +45 °C	345 662 h
	at +50 °C	289 687 h
Installation		
Form factor	rackmount device	4.5", 1 RU
	W × H × D	115 mm × 37 mm × 195 mm (4.53" × 1.46" × 7.68")
Mounting		optional additional components: support base for 19" rack
Weight		1.0 kg (2.2 lb)

Device variants

R&S®SITLine ETH-S 10M	port line speed	10 Mbit/s
	number of lines per device	1
R&S®SITLine ETH-S 100M	port line speed	100 Mbit/s
	number of lines per device	1
R&S®SITLine ETH-S 1G	port line speed	1 Gbit/s
	number of lines per device	1
R&S®SITLine ETH-S 10G	port line speed	10 Gbit/s
	number of lines per device	1

Approvals and certificates

Electrical security		according to LVD 2014/35/EU: EN 62368-1:2014+AC:2015
EMC (electromagnetic compatibility)		according to EMCD 2014/30/EU: EN 55032:2015+A11:2020 (Class A), EN 55035:2017+A11:2020, EN61000-3-2:2014 (Class A), EN61000-3-3:2013
Security approvals	national	VS-NUR FÜR DEN DIENSTGEBRAUCH (RESTRICTED)
	NATO	NATO RESTRICTED (NR)
	EU	RESTREINT UE/EU RESTRICTED (in approval)

Ordering details

Name	Type	Order number
Ethernet encryption device, 10 Mbit/s	R&S®SITLine ETH-S 10M	5414.6260.09
Ethernet encryption device, 100 Mbit/s	R&S®SITLine ETH-S 100M	5414.6260.08
Ethernet encryption device, 1 Gbit/s	R&S®SITLine ETH-S 1G	5414.6260.02
Ethernet encryption device, 10 Gbit/s	R&S®SITLine ETH-S 10G	5414.6260.03

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Rohde & Schwarz Cybersecurity GmbH

Mühldorfstraße 15 | 81671 Munich, Germany
Info: +49 30 65884-222
E-Mail: cybersecurity@rohde-schwarz.com
www.rohde-schwarz.com/cybersecurity

Rohde & Schwarz GmbH & Co. KG

www.rohde-schwarz.com

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