# R&S®SITLINE ETH50
ETHERNET ENCRYPTOR

Specifications

Network and management interfaces

Each R&S®SITLine ETH has two identical interfaces (to the private network A and to the public network X). The device functions quasi-transparently. The interface to the private network is internally connected and adjusted to the interface to the public network to establish a protected line.

Network interfaces		
R&S®SITLine ETH50 1 x 100-Mbit/s line, electrical	Port A1/X1, copper	RJ-45 built-in plug (patch cable is not included in the scope of delivery)
	Cable type	STP Cat5
	Distance	Maximum 100 m
Management interfaces		
"Token" slot	For initializing the device and for updating the firmware on-site	USB 2.0 type A for device token (USB smart card) and for update token (optional)
"Local" port	For initializing the device and for updating the firmware and for configuring the device on-site	USB 2.0 type B (local) for connecting a PC over the USB cable
"Clear" button	For deleting all security parameters	For emergency clearing, press both buttons at the same time
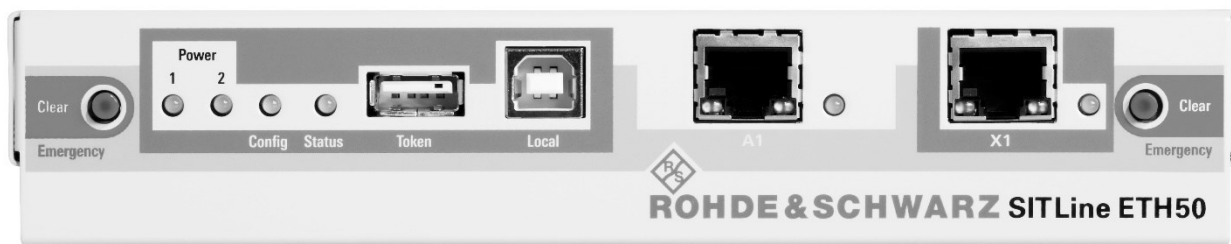
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Security functions and cryptographic parameters

Authentication and key agreement		
Device certificates	Are created and signed by the R&S®SITScope security management system	X.509 certificates, based on smart card technology
	Deployment	First deployment is offline over smart card token; renewal is online over the network
Authentication algorithm		Elliptic curves (ANSI X9.62) with a key length of 257 bits (similar to RSA with around 3,200 bits), SHA-256
Key agreement for symmetrical encryption		Diffie Hellman with elliptic curves (ECKAS DH) with a key length of 257 bits
Data encryption		
Algorithm and key length	Standard	AES with 256 bits
	Configurable	Other symmetrical algorithms possible
Encryption mode		
Transfer mode transport	Payload encryption, Ethernet address information unchanged	GCM (Galois/Counter Mode): • Cryptographically independent frames
Transfer mode tunnel	Encryption of payload including Ethernet address information	• Encryption of identical frames with different results • Including defense measures against replay attacks
Integrity protection	Integrity check	Activation is optional, length adjustable from 8 bytes to 16 bytes
	Integrity range	Always comprises payload, VLAN tag and MAC address field are optional
Lifespan of the master key		Configurable (min. 6 hours, max. 7 days), key exchange without any effects on existing communication connections
Lifespan of the session key	Also applies for derived keys for data encryption and protection of data integrity	Min. 1 minute, max. 7 days, key exchange without any effects on existing communication connections
Network operating modes		
Ethernet Line (E-Line) Ethernet LAN (E-LAN) Ethernet Tree (E-Tree)	Port-based encryption (all VLANs)	Multipoint operating mode PORT-EPLAN
		VLAN-independent encryption
		Offset configurable for 0 to 3 unencrypted VLAN tags (Q in Q)
	VLAN-based encryption	Multipoint operating mode VID-EVPLAN
		VLAN-specific encryption
		Offset configurable for 1 to 3 unencrypted VLAN tags (Q in Q)
Secure connections	For each device	Up to 250

General data

Performance and reliability		
Throughput	GCM, full-duplex	Max. 98 Mbit/s
Latency	Store and forward	≤ 0.018 ms
Mean time between failures (MTBF)	According to MIL-HDBK-217 FN2 Method I Case 3, operating temperature +25 °C (ambient air)	> 350,000 h
Installation		
Design	Half-rack format	7.5", 1 RU
Dimensions	W x H x D	190 mm × 36 mm × 190 mm
Rack mounting	Top-hat rail (according to DIN)	Specific mounting material (racks, rails) for each rack variant
Distance required for bending the cable for rack mounting	Front side (of the front edge)	45 mm
	Back side (of the back edge)	45 mm
Weight	Device incl. DIN rail clip and one AC power supply unit	Max. 1.5 kg
Dispatch		
Dispatch weight	Including packaging, accessories, manuals	Max. 3 kg
Dimensions of packaging	W x H x D	350 mm × 160 mm × 310 mm
Power supply and ventilation		
AC/DC supply	External power supply unit	100 V to 240 V (50 Hz to 60 Hz)
DC/DC supply	Connection for dual power supply unit conventional 4 wire ATX plug-in connector	24 V to 60 V, redundant, hot-swap, redundant, hot-swap
Power consumption	AC 230 V	0.05 A
	DC power socket	0.2 A
Performance consumption	DC power socket	Max. 10 W
Heat loss	Calculated value	34 BTU/h
Battery		2 x lithium round cell battery 3.0 V
Air flow	Passive	From left to right
Fans		Fanless operation
Mounting conditions	Ambient temperature -20 °C to +55 °C	Mounting position as you like
	Ambient temperature +55 °C to +70 °C	Vertical mounting position for optimal convection air flow
Climatic conditions and mechanical load-bearing capacity		
Temperature	Temperature range for operation	-20 °C to +70 °C
	Temperature range for usage	-20 °C to +70 °C
	Temperature range for storing	-40 °C to +70 °C
Humidity		Max. 90 % rel. humidity, without dew
Air pressure	Transport	566 hPa (corresponds to 4,500 m)
	Operation	795 hPa (corresponds to 2,000 m)
Vibration	Sinus-shaped	5 Hz to 150 Hz

Ordering details

R&S®SITLine ETH and R&S®SITScope security management system

Name	Type	Order number
R&S®SITLine ETH50 for Fast Ethernet, for Ethernet LAN with and without VLAN (EP-LAN, EVP-LAN), Group encryption for several Ethernet lines with or without VLAN (EPL, EVPL) as well as Ethernet Trees (E-Tree), incl. 1 device token, 1 external AC/DC power supply unit and 1 USB cable (type A to B)		
Ethernet encryptor, 1 line, multipoint, 10 Mbit/s	R&S®SITLine ETH50 MP 10	5414.6053.12
Ethernet encryptor, 1 line, multipoint, 25 Mbit/s	R&S®SITLine ETH50 MP 25	5414.6053.13
Ethernet encryptor, 1 line, multipoint, 50 Mbit/s	R&S®SITLine ETH50 MP 50	5414.6053.14
Ethernet encryptor, 1 line, multipoint, 100 Mbit/s	R&S®SITLine ETH50 MP 100	5414.6053.15
Accessories/spare parts for R&S®SITLine ETH50		
1 USB cable (type A to B) for on-site initialization		1502.0567.00
External power supply unit, 110 V to 240 V, 50 Hz/60 Hz		5401.8898.00
Device token, USB dongle with integrated smart card (SIM card)		5410.0650.04
Management Information Base (MIB) for SNMP browser	R&S®SITLine ETH SNMP MIB	5401.8930.30
R&S®SITScope security management system		
Set consisting of software and tools (server and client software), 3 root tokens, 4 user tokens, 1 USB smart card reader, 1 USB dongle smart card reader, 1 USB cable (type A to B)	R&S®SITScope Set	5410.8400.53
R&S®SITScope Set, preinstalled on server hardware "Large" (recommended for installations exceeding 50 R&S®SITLine ETH Ethernet encryptors, depending also on the scope of log data of the entire system)	R&S®SITScope Appliance "Large"	5410.8400.14
Accessories for R&S®SITScope		
Root token, ID1 smart card with a pop-out SIM card		5410.0650.06
User token, ID1 smart card with a pop-out SIM card		5410.0650.07
USB smart card reader (benchtop model)		6131.2191.00
USB smart card reader (benchtop model)		3629.2864.00

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