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Connection Master

Datasheet

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Connection Master: Your safe way to future-proof utility communications

The pace of innovation in telecommunications is increasing at breathtaking speed. What is necessary to keep your utility at the leading edge in this area? How can you benefit from new, IP-based services – while protecting your existing SDH and PDH interfaces in running systems?

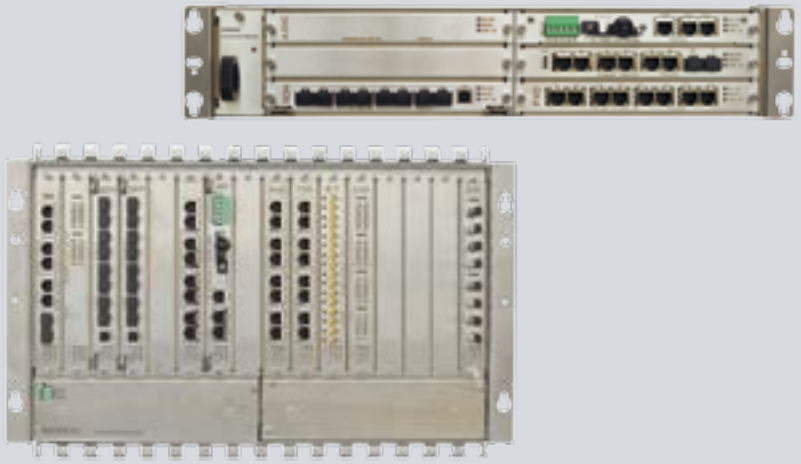
Our solution: One platform – three proven technologies

Connection Master is Siemens' new multiservice access communication platform for utilities and industrial applications. Complying with SDH, PDH (TDM), and Ethernet (over SDH), it supports voice and data legacy interfaces transported via Next Generation SDH.

With its performance capabilities, Connection Master can handle any type of application, including POTS (Plain Old Telephone Service) and SCADA (Supervisory Control and Data Acquisition). Very low latency enables reliable support of time-critical applications such as teleprotection.

Easy migration of existing access equipment

To protect your investment, Connection Master is designed to be backward compatible with your existing network – for example, with FMX2 product families. The new platform is available along with Network Management Systems (NMS) that support legacy equipment, too. This allows for a flexible migration to the Connection Master.



"The Connection Master is your comprehensive platform for SDH, PDH, and future-proof Ethernet-based services for strictly time-critical, low-latency utility communication applications."

Equipping options

	6-Slot Subrack			16-Slot Subrack	
Tributaries	**CM 2...4**			**CM 12...14**	
Subrack slot	Equipping			Equipping	
1	A-DXC	Redundant power	Tributary	Tributary	
2	Redundant trunk [3]		Tributary	Tributary	
3	Trunk (control unit)			Trunk (control unit)	
4	Primary power [1]			Redundant trunk [3]	Tributary
5	Redundant power [4]		Tributary	A-DXC	Tributary
6	Redundant A-DXC		Tributary	Redundant A-DXC	Tributary
7				Primary power [1] [2]	
8				Redundant power [2] [4]	Tributary
9 ... 16				8 x Tributary	
Fan	1 standard			2; fanless option, see note [5]	

[1] Power adapter unit in the primary power slot is mandatory because the local Ethernet management and external synchronization are connected to it.
[2] Must be ST32008.11 Power Adapter DC 48V Bus Extension.
[3] When two trunk units are used, they can either work in a hot-standby mode or as individual control units each with their own dedicated tributary units.
[4] On redundant power units, the Ethernet management interfaces cannot be used for node management. Also, the external synchronization interfaces are not supported.
[5] If ST32001.11 CU SDH trunk for Extended Temperature is used, a fan unit is not necessarily needed (up to +45 °C)

Power adapter options	6-Slot Subrack	16-Slot Subrack CM
Power Adapter DC 48V CM	X	–
Power Adapter DC 24-60V/48V CM	X	–
Power Adapter DC 48V Bus Ext. CM	–	X

Technical data

interfaces	
CU SDH / CU SDH Extended Temperature	**ST32001.01**
Low Order cross-connect capacity	5040 x 5040 VC-12s Note: Capacity with 4 x STM-16 and 4 x STM-4 interfaces
High Order cross-connect capacity	80 x 80 VC-4s
LO/HI order VCAT	32 groups
Ethernet encapsulation	GFP, LAPS, PPP/HDLC: 32 channels
SDH protection	MSP 1+1 unidirectional MSP 1+1 bidirectional SNCP/UPSR ring
SFP interfaces	4 x STM-4/16, 4 x STM-1/4 or 4 x STM-4/16, 2 x STM-1/4, 2 x GbE
Cooling	ST32001.01: Forced cooling; fan is mandatory
Ethernet Unit 1000BT, 8 Ports	**ST32002.01**
RJ-45 interface	6 x 10/100/1000BASE-T Full duplex or half duplex Auto negotiation 4 x PoE
SFP interface	1 x 10/100/1000BASE 1 x 1000BASE
Maximum frame size	1632 bytes
L2 switching	VLAN IEEE802.1Q QoS IEEE802.1p Rate limiter
PoE PSE	IEEE802.3af
PoE PSE maximum power	13 W
E1/T1 Unit, 8 ports, 75 ohm / 120 ohm	**ST32003.01 / ST32003.11**
G.703 interface	8 x SMB (ST32003.01) 8 x RJ-45 (ST32003.11)
Impedance	75 ohm (ST32003.01) 120 ohm (ST32003.11)
Framing	G.704 or unframed
E1 interface	Short haul, maximum attenuation 6 dB

interfaces	
Data Unit V and X, 4 ports	**ST32004.01**
4-port SSC interface	V.28, V.11, V.35, X.21, RS-530, RS-530A
Interface type	DCE or DTE
Transmission mode	Asynchronous / synchronous: V.28, V.11, V.35, X.21, RS-530, RS-530A Asynchronous: By using async / sync conversion (ITU-T Rec. V.14 or oversampled) Transition coded (ITU-T Rec. R.111) / sampling / sampling & filtering
Transmission rate	48 kbit/s, 56 kbit/s, nx64 kbit/s up to 1984 kbit/s Subrates by using V.110 rate adaptation: 0.6...56 kbit/s Subrates by using transition coded, sampling or sampling & filtering: 0.6...19200 bit/s
Data Unit G.703/64k, 8 ports	**ST32004.02**
RJ-45 interface	8 x G.703 / 64 kbit/s
Impedance	120 ohm
Signaling	codirectional / contradirectional
Optical Teleprotection Unit, 4 ports	**ST32004.11**
Optical interfaces	8 x ST connector, 4 ports nx64 kbit/s payload (n = 1...12); multimode fiber; transmission capacity per port: 64...768 kbit/s
Protocol	IEEE C37.94
Fiber type	50/125 µm or 62.5/125 µm multimode optical fiber
Distance	Max. 1.5...2 km; depends on used fiber and the selected OTP transmitter level
Optical receiver sensitivity	-32 dBm (+2 dB)...-11 dBm (+2 dB)
Optical transmitter wavelength	830 nm + 40 nm
Optical transmitter level	50 µm fiber: > -23.0 dBm (+2 dB) and < −11.0 dBm (+2 dB) 62.5 µm fiber: > -20.5 dBm (+2 dB) and < −14.3 dBm (+2 dB) OTP transmitter level is SW settable
Bit rate	2048 kbit/s + 100 ppm
VF/E&M Unit, 8 ports	**ST32005.01**
8-port SSC interface	8 x 2-wire / 4-wire
Impedance 4-wire	600 ohm
Impedance 2-wire	600 ohm 900 ohm 600 ohm + 2.16µF 900 ohm + 2.16µF 270 ohm + 750 ohm || 150 nF 220 ohm + 820 ohm || 120 nF 220 ohm + 820 ohm || 115 nF 370 ohm + 620 ohm || 310 nF
Signaling	3 x E and 3 x M per port

Technical data

interfaces	
FXS Unit, 16 ports	**ST32005.11**
RJ-45 interface	8 connectors, 2 ports/connector
Integrated ring generator	25 Hz / 50 Hz
Impedance	600 ohm 900 ohm 600 ohm + 2.16µF 900 ohm + 2.16µF 270 ohm + 750 ohm || 150 nF 220 ohm + 820 ohm || 120 nF 220 ohm + 820 ohm || 115 nF 370 ohm + 620 ohm || 310 nF
Signaling	R2 / Hot Line
FXO Unit, 16 ports	**ST32005.21**
RJ-45 interface	8 connectors, 2 ports/connector
Advanced DXC Unit	**ST32010.01**
Cross-connect capacity	Based on license Maximum cross-connect capacity: 196 x E1 / VC-12 links (equivalent to 63 E1 Y loops) Granularity: 8 kbit/s...nx64 kbit/s, non-blocking
Connection types	B, point-to-point connection with support for max. 2 condition bits Y, loop protection with support for pilot bit C, digital summing with support for max. 2 condition bits S, VF summing with support for max. 2 condition bits M, bit masking with support for max. 2 condition bits D, fixed data pattern with support for max. 2 condition bits
Framing	G.704 framed; PCM30, PCM30CRC4, PCM31, PCM31CRC4
Alarm Unit	**ST32011.01**
Line interface	1 x RJ-45; 1...4 pairs; SHDSL/SHDSL.bis Line rate: Up to 5.7 Mbit/s over a single copper pair. With bonded SHDSL.bis, it is possible to deliver 22.8 Mbit/s.
Digital interfaces	2 x E1; 2 x Fast Ethernet; 2 x V.11/V.24/V.35
Operating modes	Ethernet over TDM; TDM over copper, legacy mode; TDM and Ethernet over copper; Ethernet over copper
Management	**Windows based Multiservice Manager Management also supported via SNMP interface (v2c compatible) Management Information Bases (MIBs): Connection Master Private MIB, RFC 1213 and SONET MIB**

mechanics	
Subrack 6-Slot	**ST32009.01**
Installation capacity	2...4 tributary units
Subrack 16-Slot	**ST32009.04**
Installation capacity	6 x 10/100/1000BASE-T Full duplex or half duplex Auto negotiation 4 x PoE
NOTE!	All the above subrack models support CU SDH trunk unit redundancy and also tributary units to be introduced in the later releases of Connection Master. Also, all subrack models can house 1 or 2 power adapter units.
Fan Unit for 6-Slot Subrack	**ST32007.01**
Maximum rotation	6900 rpm
Lifetime of fans	8 years (at +20 °C ambient temperature)
Air flow	75 m3/h (6900 rpm)
Fan Unit for 16-Slot Subrack	**ST32007.02 / ST32007.12**
Maximum rotation	6000 rpm
Lifetime of fans	8 years (at +20 °C ambient temperature)
Air flow	130 m3/h (6000 rpm)
Alarm interface (only in ST32007.12)	3-position Phoenix MC1.5/3-G-3.81 (unit connector) 3-position Phoenix MC1.5/3-ST-3.81 (cable connector) Characteristics of relay contact: U = 57 V , I max = 500 mA

Technical data

power	
Power Supply AC/DC 2x1kW	**ST32006.02**
Maximum output power / module	1000 W (20.9 A @ -48 VDC, +40 °C) 600 W (12.6 A @ -48 VDC, +65 °C)
Efficiency	Minimum 92%
Input frequency range	45...65 Hz
Temperature operating range	-40...+75 °C (derating)
Power Adapter DC 48V	**ST32008.01**
Input voltage range and output power	Min. input voltage -40.5 V Max. input voltage -57.0 V Max. output power 400 W Breaker size 10 A
Power Adapter DC 24-60/48V	**ST32008.02**
Input voltage range and output power	Min. input voltage -20.0 V Max. input voltage -72.0 V Max. output power 80 W at 24V; 120 W at 48V Breaker size 10 A
Power Adapter DC 48V Bus Extension	**ST32008.11**
Input voltage range and output power	Min. input voltage -40.5 V Max. input voltage -57.0 V Max. output power 400 W Breaker size 10 A

power consumption and weight

Product	Power consumption (max. W)	Weight (g) (includes package)
ST32001.01 CU SDH	50	740
ST32002.01 Ethernet Unit 1000BT, 8 Ports	12 [1)]	540
ST32003.01 E1/T1 Unit, 8 ports, 75 ohm	8	360
ST32003.11 E1/T1 Unit, 8 ports, 120 ohm	8	350
ST32004.01 Data Unit V and X, 4 ports	9	320
ST32004.02 Data Unit G.703/64k, 8 ports	5	410
ST32004.11 Optical Teleprotection Unit, 4 ports	5	490
ST32005.01 VF/E&M Unit, 8 ports	10	500
ST32005.11 FXS Unit, 16 ports	20	450
ST32005.21 FXO Unit, 16 ports	20	450
ST32006.02 Power Supply AC/DC 2x1kW	n/a	8000
ST32007.01 Fan Unit for 6-Slot Subrack	9	275
ST32007.02/ST32007.12 Fan Unit for 8+8-Slot/16-Slot Subrack	29	1400
ST32008.01 Power Adapter DC 48V	6	460
ST32008.02 Power Adapter DC 24-60/48V	15	520
ST32008.11 Power Adapter DC 48V Bus Extension	15	540
ST32009.01 Subrack 6-Slot	n/a	3600
ST32009.04 Subrack 16-Slot	n/a	10700
ST32010.01 Advanced DXC Unit	8	350
ST32011.01 Alarm Unit	5	430
ST32012.01 MultiLine Terminal	9	490

[1)] PoE (Power over Ethernet) adds max. 15 W per port load on power adapter unit

Technical data

Mean Time Between Failures (MTBF)	
Product	**MTBF (years)**
ST32001.01 CU SDH	26
ST32002.01 Ethernet Unit 1000BT, 8 Ports	60
ST32003.01 E1/T1 Unit, 8 ports, 75 ohm	104
ST32003.11 E1/T1 Unit, 8 ports, 120 ohm	114
ST32004.01 Data Unit V and X, 4 ports	69
ST32004.02 Data Unit G.703/64k, 8 ports	62
ST32004.11 Optical Teleprotection Unit, 4 ports	43
ST32005.01 VF/E&M Unit, 8 ports	26
ST32005.11 FXS Unit, 16 ports	54
ST32005.21 FXO Unit, 16 ports	45
ST32006.02 Power Supply AC/DC 2x1kW	16
ST32007.01 Fan Unit for 6-Slot Subrack	190
ST32007.02 Fan Unit for 8+8-Slot/16-Slot Subrack	208
ST32007.12 Fan Unit for 16-Slot Subrack with alarm output	tbd
ST32008.01 Power Adapter DC 48V	120
ST32008.02 Power Adapter DC 24-60/48V	82
ST32008.11 Power Adapter DC 48V Bus Extension	57
ST32009.01 Subrack 6-Slot (with fan)	143
ST32009.04 Subrack 16-Slot (without fan)	326
ST32010.01 Advanced DXC Unit	122
ST32011.01 Alarm Unit	tbd
ST32012.01 MultiLine Terminal	tbd

environmental and safety	
Climatic: 6-Slot Subrack with fan	Operation: EN 300 019-1-3, Class 3.1 (-5 to +50 °C) Storage: EN 300 019-1-1 Class 1.2 (-25 to +55 °C) Transport: EN 300 019-1-2 Class 2.3 (-40 to +70 °C)
Climatic: 16-Slot Subrack with fans	Operation: EN 300 019-1-3, Class 3.2 (-5 to +55 °C) Storage: EN 300 019-1-1 Class 1.2 (-25 to +55 °C) Transport: EN 300 019-1-2 Class 2.3 (-40 to +70 °C)
EMC	EN 300 386 V1.4.1...1.6.1, class B EN 55022, class B
Safety	EN 60950-1

compliance with standards – details			
Standard	**Test**	**Test object**	**Level**
CISPR 22 ed. 6 (2008)	Radio disturbance characteristics, emissions	Enclosure port, 30 MHz...6 GHz	Class B
EN 55022 (2010)	Radiated emissions	Enclosure port, 30 MHz...6 GHz	Class B
EN 55022 (2010)	Conducted emissions	DC power port	Class B
		Signal port	Class B
IEC 61000-4-2 (2008) EN 61000-4-2 (2009)	Electrostatic discharge immunity	Electrostatic discharge immunity	±10 kV
		Indirect contact discharge	±8 kV
		Air discharge	±15 kV
IEC 61000-4-3 (2006); +A1 (2008); +A1 (2010)	Radiated RF immunity	Enclosure ports, 80...2700 MHz	10 V/m
IEC 61000-4-4 (2004) EN 61000-4-4 (2004); +A1 (2010)	Electrical fast transient/burst immunity	DC power port	±4 kV
		Signal ports	±4 kV
IEC 61000-4-5 (2005) EN 61000-4-5 (2006)	Surge immunity	DC power port line to line	±2 kV
		DC power port line to GND	±2 kV
		Signal ports	±4 kV
IEC 61000-4-8 (1993)	Power frequency magnetic field immunity	Not applicable; no devices susceptible to magnetic fields.	
IEC 61000-4-12 (1995)	Oscillatory waves immunity	DC power port	2.5 kV
		Signal ports	2.5 kV
IEC 61000-4-17	DC power, ripple immunity	DC power port	10%
ITU-T K.45	Surge immunity	Signal ports outdoor	±1500 V

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