SIGNAMAX™
CONNECTIVITY SYSTEMS

Signamax LLC, a US based company, is uniquely focused on providing high-performance network and complex distribution solutions for customers worldwide. We offer products for copper and fiber based network connections designed for increased performance, reliability, and easy installation. Signamax components are also popular for their valued performance & price ratio.

Signamax worldwide support

Our knowledgeable sales, technical support, and engineering staff are dedicated to understand the requirements of our customers. With company headquarters in Washington DC, contracted distributors in 14 European countries, and production in US, Europe, and Asia, Signamax Connectivity Systems is uniquely positioned to deliver complete network solutions to our customers all over the world. Moreover, with our central warehouse and sales center for Europe in Czech Republic, we can provide better service and support to all European customers.

Product solutions

With **Signamax Connectivity Systems** you can get the right solution for complete infrastructure.

Signamax Network Connectivity Systems line represents one of the industry's best products for high performance Ethernet, Fast Ethernet, and Gigabit Ethernet components including interface cards, switches, and media converters supporting both copper and fiber optic based networks. Signamax Media Converters allow mixed media and speeds in networks for optimum performance. Signamax managed and unmanaged Switches range from 5 to 24 ports with support for 10/100Base to 1000Base speeds with both copper and fiber terminations. Signamax optical modules portfolio is carefully selected to meet all needs of fast growing FTTx networks. From simple multimode 100M modules to the most advanced 10G modules of various kinds, with different compatibilities, these all are in Signamax portfolio.

Our Signamax Premise Connectivity products include data cables, patch panels, outlets, patch cables, and other network components for all currently existing categories ranging from Category 5E up to Category 7A as well as fiber optic systems, all designed to exceed the latest ANSI/TIA/EIA, ISO/IEC, and CENELEC specifications. We also manufacture different types of data racks, distribution frames, and cable management systems. All certified Signamax system installations are covered by 20 Years Registered System Warranty encompassing all system elements.

Standards and Quality

You will find that our products have better design, easier installation and bring unique level of performance as well as reliability to your network than most suppliers can offer. The products are designed for the most demanding applications engineered to meet stringent international standards and specifications. Moreover, Signamax network solutions are certified by independent laboratories and backed up by long-term performance warranties that keep peace in your mind.

RoHS

We, here at Signamax, care about the environment we live in. Therefore our products comply with the RoHS directive (2002/95/EC) valid from July 1st, 2006.

Visit the www.signamax.eu web page to find your local Signamax representative.

WITH SIGNAMAX YOU CAN KEEP YOUR WORLD CONNECTED

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Keeping Your

In today's technology driven environment, the backbone of your organization is your network—keeping you connected to staff, customers, suppliers, and the world at large. To run a successful enterprise, you need a network that is reliable, fast, and ready to accommodate the inevitable growth you will experience. We are the company that can deliver network solutions that are up to all those challenges. We are Signamax Connectivity Systems.

Our mission is to provide end-to-end network connectivity for all your needs. As your single source for your full range of both Network & Premise Connectivity Systems, Signamax delivers wide range of high-performance and cost effective products for Ethernet, Fast Ethernet, Gigabit Ethernet, and 10G Ethernet applications.

The Signamax media converters enable mixed media and also mixed speeds on a network for optimum performance. Our portfolio includes managed and unmanaged switches that are offered in configurations from 5 to 48 ports with support of 10/100Base to 1000Base speeds with both copper and fiber terminations. Signamax optical modules range consists of various types and speeds, from simple 100M multimode SFP's to advanced 10G XFP and SFP+ modules.

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World Connected

The Signamax Premise Connectivity System will enable you to build a network infrastructure that can accommodate all your network applications. This system is comprised of wiring solutions for your equipment room, distribution cabling as well as cross-connects offering a wide-range of high-performance copper & fiber-optic components, all designed to work together as a system. Whenever you need products from category 5E, category 6, category 6A, category 7, or even category 7A, we are able to provide suitable solution upon your needs. From the smallest desktop installation projects to the largest enterprise fiber-optic installations, Signamax has the widest range of network solutions that you need to support your business.

You will find that our products are designed better, install with greater ease and bring an unparalleled level of performance to your network. Our premise systems are designed for the most demanding applications, engineered to meet stringent standards and specifications. Each product is manufactured to the highest quality standards and properly tested to ensure that it exceeds the application standards, such as ANSI/TIA/EIA, ISO/IEC and CENELEC. The strength and integrity of our Premise Connectivity Systems are backed by the skills and experience of our technical staff.

At Signamax, we are dedicated to help your business run more efficiently. With our long-term performance warranties you can have peace in your mind when selecting Network & Premise Connectivity Systems to support your network. If you would like to keep your world connected, choose the supplier that can make it happen, choose Signamax Connectivity Systems.

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NETWORK CONNECTIVITY SYSTEMS

Active

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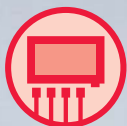
Switching—Introduction

In modern network, switch is a cornerstone. Where its predecessor, network hub, overloaded whole network with multicast, recent switch is quite smart device. Even the simplest one maintains the list of connected clients and sends information specifically where it's expected. Used in all levels for variety of purposes, from simply adding ports to local site to network core management and server connection, switch become natural part of LAN.

For over ten years, Signamax Network Connectivity Systems, division of Signamax Connectivity systems (SCS), strives to provide latest technologies to the market. As a result, Signamax introduces new portfolio of switches. Products are carefully selected and manufactured to cover all networking needs in given segment while maintaining Signamax's biggest advantage—unrivalled price / performance ratio.

In Signamax portfolio, there are three device levels recognized, varied by management type.

Unmanaged Switches—Simple, yet powerful devices, plug-and-forget type.

Web-Managed Switches—Manageable over web interface, these switches allows user to control basic and some of advanced functions remotely.

Managed Switches—fully controllable, these devices gives user access to any and all features, included in switch. Advanced management protocols determines such device to be included in complex, centrally managed networks.

Unmanaged Switch
100-7008FE

Web-Managed Switch
300-7624FE2GC

Managed switch
500-7616GS8GC

Managed Switches

It is all about control. With Signamax Managed switches, you have it under control 24/7, remotely or locally. SNMP, Web, Console, you name it.
Packed with newest functions, including IGMP snooping, Bandwidth Control, QoS, Q-in-Q and much more, these switches are ideal for demanding multimedia application.
Selected models are Metro Ethernet Forum standards compliant, small form factor and with dual-rate SFP slots.

500-7608FE1GC

500-7624FES2GC

500-7622GE2GC

Optical Switches

PART NO.	100M SFP	1G SFP	ADDITIONAL PORTS	MANAGEMENT	RACKMOUNT	REMARK
500-7616GS8GC		16	8x 1G Combo	SNMP	✓	065-7851
500-7624FS4GC	24		4x 1G Combo	SNMP	✓	

Metallic Switches

PART NO.	10/100 RJ45	10/100/1000 RJ45	ADDITIONAL PORTS	MANAGEMENT	RACKMOUNT	REMARK
500-7622GE2GC		22	2x 1G Combo	SNMP	✓	dual rate sfp
500-7612GE2GS		12	2x SFP	SNMP	✓	
500-7624FE2GC	24		2x 1G Combo	SNMP	✓	
500-7608FE1GC	8		1x 1G Combo	SNMP	✓	dual rate sfp

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Managed Switches Technicals

		500-7616GS8GC	500-7622GE2GC	500-7612GE2GS	500-7624FS4GC 500-7624FE4GC	500-7624FE2GC	500-7608FE1GC
Physical characteristics	100M Ports	✘	✘	✘	24	24	8
	1G Ports	✘	22	12	✘	✘	✘
	Combo ports	8	2		4 / 4	2	1
	SFP ports	16 x 1G	✘	2 x 1G	24 x 100M / -	✘	✘
	Rackmount	✓	✓	✓	✓	✓	optional
	Console Port	✓	✓	✓	✓	✓	✓
Performance	Switching fabric capacity	48 Gpbs non-blocking	48 Gbps non-blocking	28 Gbps non-blocking	12.8 Gpbs non-blocking	8.8 Gbps non-blocking	3.6 Gbps non-blocking
	MAC address table	8 K	8 K	8 K	16 K	16 K	8 K
	Memory Buffer		1,381 kBytes	340 kBytes	437.5 kBytes	437.5 kBytes	128 kBytes
	Packet Length	9 kBytes	9 kBytes	9 kBytes	9 kBytes	9 kBytes	1,632 kBytes
Standards	802.3 10BaseT	✓	✓	✓	✓	✓	✓
	802.3u 100BaseTx/Fx	✓	✓	✓	✓	✓	✓
	802.3ab 1000Base T	✓	✓	✓	✓	✓	✓
	802.3z 1000Base X	✓	✓	✓	✓	✓	✓
	802.3x Flow Control	✓	✓	✓	✓	✓	✓
	802.1d STP	✓	✓	✓	✓	✓	✓
	802.1w RSTP	✓	✓	✓	✓	✓	✘
	802.1s MSTP	✓	✘	✘	✘	✓	✘
	802.1p QoS	✓	✓	✓	✓	✓	✓
	802.1q Tag VLAN	✓	✓	✓	✓	✓	✓
	802.3ad LACP	✓	✓	✓	✓	✓	✘
	802.3ag CFM		Upgradable	✘	✘	✘	✘
	802.1x Port Based Authentication	✓	✓	✓	✓	✓	
	802.1ad VLAN Stacking		✓	✓	✓	✓	✓
Traffic management & QoS	Bandwidth Control	✓	✓	✓	✓	✓	✓
	Broadcast Storm Suppression	✓	✓	✓	✓	✓	✓
	IGMP Snooping	Y1,Y2	Y1,Y2	Y1,Y2	Y1,Y2	Y1,Y2	Y1,Y2
	IGMP Filtering	✓	✓	✘	✓	✓	✘
	IGMP Fast Leave	✓	✓	✘	✓	✓	✘
	MVR		✓	✘	✓	✓	✘
	QoS Priority Queues (Traffic Class)	✓	4	4	8	8	4
	Port Based QoS	✓	✓	✓	✓	✓	✓
	802.1p CoS	✓	✓	✓	✓	✓	✓
	IP ToS/DSCP	✓	✓	✓	✓	✓	✓
	Application QoS	✓	✓	✓	✓	✓	✓

Managed Switches Technicals

		500-7616GS8GC	500-7622GE2GC	500-7612GE2GS	500-7624FS4GC 500-7624FE4GC	500-7624FE2GC	500-7608FE1GC
Security & Authentication	Port Based VLAN	✓	✓	✓	✓	✓	✓
	802.1Q Tag Based VLAN		✓	✓	✓	✓	✓
	Protocol VLAN	✓	✗	✗	✓	✓	✗
	Q-in-Q	✓	✓	✓	✓	✓	✓
	Q-in-Q TPID Selectable	✓	✗	✗	✓	✓	✓
	VLAN ID	4094	4094	4094	4094	4094	4094
	VLAN Groups	256	128	128	256	256	64
	802.1X Port Based Network Access Control	✓	✓	✓	✓	✓	✗
	RADIUS Authentication		✓	✓	✓	✓	✓
	ACL (Access Control List)	✓	✓	✗	✓	✓	✗
	DHCP Option 82		✓	✗	✓	✓	✗
Network Management & Maintenancel	Web Management	✓	✓	✓	✓	✓	✓
	SNMP Management	✓	✓	✓	✓	✓	✓
	Telnet	✓	✓	✓	✓	✓	✓
	CLI	✓	✓	✗	✓	✓	✗
	Out Band Console		✓	✓	✓	✓	✓
	Port Mirroring	✓	✓	✓	✓	✓	✗
	Support Power Down Trap Management	✓	✓	✓	✓	✓	✓
	Dual Image	✗	✗	✗	✗	✓	✗
	Dual Configuration	✗	✗	✗	✗	✓	✗
	NVRAM to Store the Event Log	✗	✗	✗	✗	✓	✗
	Support Private, RFC-1213, RMON (Group 1,2,3,9) IBs		✓	✓	✓	✓	✓
	Support DHCP Client		✓	✓	✓	✓	✓
	Support DHCP Auto Provisioning		✓	✓	✓	✓	✓
	Support SNTP Time Server	✓	✓	✓	✓	✓	✓
	Fiber Redundancy	✗	✗	✗	✗	✓	✗
	Support FTP, TFTP Server and Client Firmware Upgrade		✓	✓	✓	✓	✓
	SFP-8472 Diagnostic Monitoring Interface	✗	✓	✗	✓	✓	✓
Others	Dimension (HxDxW) (mm)	440 × 205 × 44	240 × 200 × 44	240 × 155 × 34	440 × 205 × 44	240 × 200 × 44	245 × 160 × 34
	Weight	3.1 kg	1.9 kg	1.1 kg	3.1 kg / 2.9 kg	1.9 kg	0.57 kg
	Power Consumption	24 W	35 W	15 W	24 W / 19 W	15 W	6.12 W
	Operating Temperature (°C)	0 – 50	0 – 50	0 – 50	0 – 50	0 – 50	0 – 50
	Storage Temperature (°C)	-20 – 60	-20 – 60	-20 – 60	-20 – 60	-20 – 60	-20 – 60
	Humidity	5-90%	5-90%	5-90%	5-90%	5-90%	5-90%

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Web-Managed Switches

Powerful devices with great price, this is characteristic for Signamax Web-Managed switches portfolio. Innovated range, covering most common port and speed configurations, innovated management with added features and improved quality, is ideal for one who seeks control with expenses on mind.

300-7306GE2GC

300-7624FE2GC

PART NO.	10/100 RJ45	10/100/1000 RJ45	ADDITIONAL PORTS	MANAGEMENT	RACKMOUNT	REMARK
300-7620GE4GC		20	4x 1G Combo	Web	✓	
300-7306GE2GC		6	2x 1G Combo	Web	✓	
300-7624FE2GC	24		2x 1G Combo	Web	✓	
300-7624FE	24			Web	✓	065-7542
300-7616FE	16			Web	✓	065-7532
300-7008FE	8			Web	desktop	065-7508

Web-Managed Switches Technicals

		300-7620GE4GC EW-7244VW	300-7306GE2GC EW-4082VW	300-7624FE2GC EW-7242VW	300-7624FE 065-7542	300-7616FE 065-7532	300-7008FE 065-7508
Physical characteristics	100M Ports	✘	✘	24	24	16	8
	1G Ports	20	6	✘	✘	✘	✘
	Combo ports	4	2	2	✘	✘	✘
	Rackmount	✓	✓	✓	✓	✓	✘
	Flash Memory	1 MB	2 MB	512 kB	512 kB	512 kB	512 kB
	SDRAM	128 K SRAM	128 K SRAM	SRAM 32 kB Integrated	SRAM 32 kB Integrated	SRAM 32 kB Integrated	SRAM 32 kB Integrated
	Packet Buffer	500 kB	176 kB	2.75 MB	1.625 MB	1.625 MB	1.75 MB
	Safety	✓	✓	✓	✓	✓	✓
	Emissions	✓	✓	✓	✓	✓	✓
Performance	Switching fabric capacity	48 Gbps	16 Gbps	8.8 Gbps	4.8 Gbps	3.2 Gbps	1.6 Gbps
	MAC address table	8 K	8 K	4 K	8 K	4 K	4 K
	Forwarding Rate	35.7 Mpps	11.9 Mpps	6.5 Mpps	3.6 Mpps	2.4 Mpps	1.2 Mpps
L2 Features	Autonegotiation	✘	✓	✓	✘	✘	✘
	Auto MDI/MDIX	✘	✓	✓	✘	✘	✘
	802.3x (Full-duplex)	✓	✓	✓	✘	✘	✘
	Back-Pressure (Half-duplex)	✓	✓	✓	✘	✘	✘
	IEEE 802.1D (STP)	✓	✓	✘	✘	✘	✘
	IEEE 802.1w (RSTP)	✓	✓	✘	✘	✘	✘
	IEEE 802.1Q Tagged Based	✓	✓	✘	✘	✘	✘
	VLAN Group	4K (UI limit to 128)	4K (UI limit to 16)	4K (UI limit to 16)	32	16	16
	Port-based VLAN	✓	✓	✓	✓	✓	✓
	Q in Q Multiple VLAN	✓	✓	✘	✘	✘	✘
	IEEE 802.3ad with LACP	✓	✓	✓	✓	✓	✓
	Static Trunk	✓	✓	✓	✓	✓	✓
	Max. Group	8	4	3	2	2	2
	Max. Ports/Group	24	8	4 (FE) / 2 (GE)	4	4	4
	Traffic Load Balancing	✓	✓	✓	✓	✓	✓
	IGMP Snooping v1/v2	✓	✓	✓	✓	✓	✓
	Immediate Leave	✓	✓	✘	✘	✘	✘
	Broadcast	✓	✓	✓	✓	✓	✓
	Multi-cast	✓	✓	✘	✘	✘	✘
	Un-known Unicast	✓	✓	✘	✘	✘	✘
	Jumbo Frame Support	9 K	9 K	✘	✘	✘	✘

Web-Managed Switches Technicals

		300-7620GE4GC EW-7244VW	300-7306GE2GC EW-4082VW	300-7624FE2GC EW-7242VW	300-7624FE 065-7542	300-7616FE 065-7532	300-7008FE 065-7508
QoS Features	Number of priporic queue	8 queues/port	8 queues/port	4 queues/port	4 queues/port	4 queues/port	4 queues/port
	Rate Limiting	128 K granularity	✘	32 K granularity	32 K granularity	32 K granularity	32 K granularity
	DiffServ (RFC2474)	✔	✔	✔	✔	✔	✔
	WRR	✘	✔	✔	✔	✔	✔
	Strict Priporic scheduling	✘	✔	✔	✔	✔	✔
	Hybrid	✘	✔	✔	✔	✔	✔
	802.1p	✔	✔	✔	✔	✔	✔
	IP Precedence	✘	✘	✘	✔	✔	✔
	IP TOS Precedence	✘	✘	✘	✔	✔	✔
	IP DSCP	✔	✔	✔	✔	✔	✔
	TCP / UDP	✘	✘	✘	✔	✔	✔
	Port based Prioirty	✔	✔	✔	✔	✔	✔
Security	IEEE 802.1x Port-based	✘	✘	✘	✘	✘	✘
	Local Authenticatoin	✘	✘	✘	✘	✘	✘
	Remote Authentication	✘	✘	✘	✘	✘	✘
	MAC Filter		✘	✘	✘	✘	✘
	IP Filter		✔	✘	✘	✘	✘
Management	Web Based Management	✔	✔	✔	✔	✔	✔
	Software Download/Upgrade	✔	✔	✔	✔	✔	✔
	Dual F/W Images	✔	✔	✘	✘	✘	✘
	Configuration Download / Upload	✔	✔	✔	✔	✔	✔
	SNMP	✔	✔	✔	✔	✔	✔
	DHCP Client	✔	✔	✔	✔	✔	✔
	Port Mirroring	✔	✔	✔	✔	✔	✔
	BootP Client	✘	✘	✘	✔	✔	✔
	Remote Ping	✔	✘	✘	✘	✘	✘
	LLDP	✘	Option (802.1x)	✘	✘	✘	✘
	Cable Diagnostics / VeriPHY	✔	✔	✘	✘	✘	✘
Others	Weight	3.7 kg	1.32 kg	3.6 kg	2.1 kg	1.8 kg	0.46 kg
	Operating Temperature (C°)	0 – 40	0 – 40	0 – 40	0 – 55	0 – 55	0 – 55
	Storage Temperature (C°)	-40 – 70	-40 – 70	-40 – 70	-20 – 90	-20 – 90	-20 – 90
	Humidity	15-95% non condenisng	15-95% non condenisng	15-95% non condenisng	10-90% non condenisng	10-90% non condenisng	10-90% non condenisng
	Altitude	up to 3 km	up to 3 km	up to 3 km	up to 3 km	up to 3 km	up to 3 km
	Voltage	100-240 VAC	100-240 VAC	100-240 VAC	100-240 VAC	100-240 VAC	5 V / 2A (adaptor)
	POWER, SPEED, Link/Act	✔	✔	✔	✔	✔	✔
	Reset button	✔	✔	✔	✔	✔	✔
	Dimension (H×W×D) (mm)	910 × 500 × 306	294 × 239 × 65	91 × 500 × 306	294 × 239 × 65	294 × 239 × 65	91 × 191 × 117

Unmanaged Switches

Great for small to medium networks or where one needs to add ports easily, wide variety of Signamax unmanaged switches covers all needs.

100-7616FE

100-7624FE2GC

100-7008GE

PART NO.	10/100 RJ45	10/100/1000 RJ45	ADDITIONAL PORTS	MANAGEMENT	RACKMOUNT	REMARK
100-7620GE4GC		20	4x 1G Combo	✖	✓	
100-7008GE		8		✖	✖	065-7907
100-7005GE		5		✖	✖	065-7906
100-7624FE2GC	24		2x 1G Combo	✖	✓	
100-7616FE	16			✖	✓	065-7031A
100-7316FE	16			✖	✖	065-7032A
100-7308FE	8			✖	✖	065-7014
100-7008FE	8			✖	✖	065-7028B
100-7005FE	8			✖	✖	065-7025B

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Media Converters

Signamax Media Converters provides an intelligent solution for long distance connections between networks, both metallic and optical. These converters are designed to handle a wide variety of fiber optic network applications.

Built-in 10/100 or 10/100/1000 switch enables the fiber cable connection to operate at any compatible IP network, while remaining completely 100BaseFX or 1000BaseSX standard-compliant. Fiber connection can also operate in full duplex mode whether the RJ45 port is connected to a full duplex switch. Each Media Converter provides a 10/100BaseT/TX or 10/100/1000T/Tx auto-negotiating RJ45 twisted-pair connector port featuring store-and-forward switching architecture. Built-in switch does the network segmentation to provide maximum fiber distance. Each Media Converter is equipped with LFS (Link Fault Signaling) feature.

Newly developed modular converters offers SFP slot instead of fixed optical port. This feature gives user possibility to choose or change optical interface without need of changing main device.

100-1600SDR

TECHNICALS

APPLICABLE STANDARDS
IEEE 802.3ab 1000BaseT
IEEE 802.3z 1000BaseLX
IEEE 802.3z 1000BaseSX

FIXED PORTS
One twisted-pair port meeting IEEE 802.3ab standard specification;
Category 5E or better cable, 100 meters maximum distance
and/or One fiber optic port meeting IEEE 802.3z standard;
62.5/125 micron Multi Mode fiber optic cable, 220 meters maximum distance
or 50/125 micron Multi Mode fiber optic cable, 550 meters maximum distance
or 1 fiber optic port meeting IEEE 802.3z 1000BaseLX standard specification;
9/125 micron Single Mode fiber optic cable, spanning 20 kilometers maximum distance (model 100-1220)
or 1 SFP slot for gigabit or switching (as specified) SFP module

PERFORMANCE
1,488,000 packets per second at 1,000 Mbps

LEDS
Power; TX; RX; FDX/COL; LNKF; LNKC

PHYSICAL CHARACTERISTICS
Dimensions (LxWxH): 110 x 81 x 23 mm
Weight: 150 g

SAFETY
UL Listed

Switching Fiber Converters

PART NO.	INTERFACE 1	INTERFACE 2	POWER	LFS	CHASSIS COMATIBILITY	REMARK
100-1100	10/100Tx RJ45	100M multimode, ST	12V ext	✓	✓	065-1100
100-1110	10/100Tx RJ45	100M multimode, SC	12V ext	✓	✓	065-1110
100-1120	10/100Tx RJ45	100M singlemode, SC, 20Km	12V ext	✓	✓	065-1120

Gigabit Media Converters

PART NO.	INTERFACE 1	INTERFACE 2	POWER	LFS	CHASSIS COMATIBILITY	REMARK
100-1210S	10/100/1000T/Tx	1000M multimode, SC	12V ext	✓	✓	065-1196
100-1220S	10/100/1000T/Tx	1000M singlemode, SC, 20Km	12V ext	✓	✓	065-1197A

SFP Fiber Converters

PART NO.	INTERFACE 1	INTERFACE 2	POWER	LFS	CHASSIS COMATIBILITY	REMARK
100-1600	1000T	1000M SFP	12V ext	✓	✓	
100-1600SDR	10/100/1000T/Tx	100/1000M SFP	12V ext	✓	✓	dual rate SFP

16-Bay Media Converter Rack Mount Chassis

The Signamax 100-1916AC 16-Bay Media Converter Rack Mount Chassis provides higher rack mount media converter density for large installations that can accommodate rear access to the chassis for power supply maintenance. The 100-1916AC provides 16 bays of space for all 100 series Signamax media converters in a standard two rack unit high enclosure. High port density allows a variety of media converter solutions to be utilized in a minimum amount of rack space for enterprise-level businesses and carriers. Redundant, fan-cooled load-sharing power supplies can be hot-swapped to ensure maximum system uptime.
The 100-1916 has a choice of power supply configurations, supporting AC power for 110 volt or 220 volt power systems or -48 volt DC power for carrier operations.

100-1916

TECHNICALS

CAPACITY
Sixteen bays, for up to sixteen 100 series media converters

POWER SUPPLIES
Load-sharing and hot-swappable, 2 supplied as standard equipment AC and -48V DC units available
Power status LED on each power supply, as well as remote status LEDs on front panel

LEDS
Power 1/Power 2: Power supply on-line

PHYSICAL CHARACTERISTICS
Dimensions (LxWxH): 440 x 276 x 90 mm, 2 standard rack units
Weight: Approximately 8.5 kg, fully loaded

SAFETY
UL 1950 listed
Cooling Fans: UL/cUL/TUV Listed/Approved

16-Bay Media Converter Rack Mount Chassis

PART NO.	INTERFACE 1	POWER
100-1905	5 slot chassis	n/a
100-1916AC	16 slot chassis	2x 100-240VAC
100-11DINMNT	DIN bracket for converter	

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SIGNAMAX™
CONNECTIVITY SYSTEMS

Optical modules

SFP (Small Form Pluggable) modules are answer to call for modularity and unification of modern active products. These two, mostly opposite, request comes from two basic needs: to unify the product, in terms of model variations on one side and to offer different port setup for different customer on other side.

In the past, answer for these needs was interchangeable modules, which allowed user to modify product to their needs. That time, modules were proprietary for given product, so modularity was limited to named device. As an evolution, modules were standardized for purpose of brand/ product independency. GBIC standard gave users freedom in terms of interoperability and cross-device usage. Despite all advantages, GBIC still had one disadvantage, its dimensions.

For important request of port density and true RJ45 replacement, SFP standard is issued. Keeping all advantages of previous formats, interoperability and modularity thus cost-effectiveness, it adds one very important feature—size. SFP slot consumes same space as standard RJ45 port, which leads to true modularity and gives product manufacturers limitless options.

For purposes of 10G ethernet, there are new formats developed. These are SFP+, XFP, X2 and Xenpak.

SFP module (including all derived formats for 10G) is standardized interchangeable interface, which provides modularity for correspondingly equipped devices. In Signamax, we recognize following options and features:

FEATURES

- **Interface—**most used interface is optical, with duplex LC connector. There are also RJ45 equipped modules and simplex LC connectors in case of WDM module
- **Media type—**there are two media used in Signamax modules. Optical with both single mode and multimode cable and metallic, with RJ45 connector.
- **Speed—**we provide full speed range, from 100M (10/100M in case of RJ45) to 10G. Specialty is switching metallic SFP modules with RJ45 connector.
- **Distance—**for multimode, standard is 550m. For single mode, distance varies and is clearly stated in module's name and PN. For RJ45, industry standard is applied and distance is 100 m for channel.
- **DDMI—**selected modules are equipped with controlling functionality—DDMI. Via this functionality and when active product supports this, module characteristics can be read remotely.
- **Compatibility—**general compatibility of Signamax modules is Cisco. It's supported by most manufacturers. In some cases, major vendors lock their devices to be able to cooperate with certain modules only (HP, Nortel, Juniper…). Signamax offers other compatibilities on request.

100-32WDMx-LR20

100-32SM-LR20

100-32SM-LR80
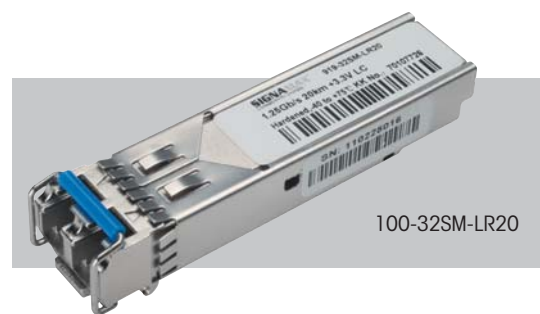
100-31MM

Optical modules

100-32SRJ

MODEL	SPEED		FORMATE	DISTANCE	WAVELENGTH	DDMI
100-31MM	100M	LC Duplex	SFP	550 m	Tx/Rx: 1,310 nm	
100-31MM-DDMI	100M	LC Duplex	SFP	550 m	Tx/Rx: 1,310 nm	
100-31SM-LR20	100M	LC Duplex	SFP	20 km	Tx/Rx: 1,310 nm	
100-31SM-LR20-DDMI	100M	LC Duplex	SFP	20 km	Tx/Rx: 1,310 nm	✓
100-31WDMA-LR20	100M	LC Simplex	SFP	20 km	Tx: 1,310 nm/Rx: 1,550 nm	
100-31WDMB-LR20	100M	LC Simplex	SFP	20 km	Tx: 1,550 nm/Rx: 1,310 nm	
100-32MM	1G	LC Duplex	SFP	550 m	Tx/Rx: 850 nm	
100-32MM-DDMI	1G	LC Duplex	SFP	550 m	Tx/Rx: 850 nm	
100-32SM-LR20	1G	LC Duplex	SFP	20 km	Tx/Rx: 1,310 nm	
100-32SM-LR20-DDMI	1G	LC Duplex	SFP	20 km	Tx/Rx: 1,310 nm	✓
100-32SM-LR40	1G	LC Duplex	SFP	40 km	Tx/Rx: 1,310 nm	
100-32SM-LR40-DDMI	1G	LC Duplex	SFP	40 km	Tx/Rx: 1,310 nm	✓
100-32SM-LR80	1G	LC Duplex	SFP	80 km	Tx/Rx: 1,550 nm	
100-32SM-LR80-DDMI	1G	LC Duplex	SFP	80 km	Tx/Rx: 1,550 nm	✓
100-32RJ	1G	RJ45	SFP	100 m	n/a	
100-32SRJ	10/100/1000M	RJ45	SFP	100 m	n/a	
100-32WDMA-LR20	1G	LC Simplex	SFP	20 km	Tx: 1,310 nm/Rx: 1,550 nm	
100-32WDMA-LR20-DDMI	1G	LC Simplex	SFP	20 km	Tx: 1,310 nm/Rx: 1,550 nm	✓
100-32WDMB-LR20	1G	LC Simplex	SFP	20 km	Tx: 1,550 nm/Rx: 1,310 nm	
100-32WDMB-LR20-DDMI	1G	LC Simplex	SFP	20 km	Tx: 1,550 nm/Rx: 1,310 nm	✓
100-35MM	10G	LC Duplex	SFP+	300 m	Tx/Rx: 850 nm	✓
100-35SM	10G	LC Duplex	SFP+	10 km	Tx/Rx: 1,310 nm	✓
100-35SM-LRxx	10G	LC Duplex	SFP+	40+ km	Tx/Rx: 1,550 nm	✓
100-36MM	10G	LC Duplex	XFP	300 m	Tx/Rx: 850 nm	✓
100-36SM	10G	LC Duplex	XFP	10 km	Tx/Rx: 1,310 nm	✓
100-36SM-LRxx	10G	LC Duplex	XFP	40+ km	Tx/Rx: 1,550 nm	✓

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CONNECTIVITY SYSTEMS

POE

Power over Ethernet (PoE) is a method of powering networking and electronic devices by use of standard structured cabling instead of legacy power wires. Summarized under 802.3af (original) and 802.3at/ath (high power PoE) standards, it assures interoperability and seamless cross-brand-platform implementation.

There are two types of PoE devices—PoE PSE device and PoE PD device.

PoE PSE (or Power Source Equipment) is basically source of power. It combines 48VDC power with data into single data cable. For example, PoE PSE switch provides data and power at single RJ45 port.

PoE PD (Powered Device), on the other hand, is device which extracts power from its RJ45 port and uses it for powering itself. Typical example of such device is IP telephone or IP camera.

Advantages of PoE implementation are simple, yet powerful. With proper deployment, one saves power outlets, utilizes 100M span of metallic network and concentrates powering into one point.

Signamax range of PoE products suits all needs of both standard and specialized LAN. Starting from simple one-line injector/splitter, with switches of different port configuration to PD devices and special high-power switches, one can find the right solution here.

300-7308FPOE

100-7624FPOE2GC

POE

Standard PoE

Standardized by 802.3af international standard, PoE devices are here to easily implement power into common Local Area Network infrastructure. From simple IP telephony to demanding camera solutions, deployment of PoE not only saves investments, it also expands possibilities to environments not reachable before. Standard is 15,4 W @ 90 m.

High Power PoE

Newly designed to meet growing demands of several applications, 802.3at standard provides up to 30W at single line. Designed for Power-hungry wireless devices, heated camera domes and similar solutions, it allows long reach and saves costs at distant applications.

300-7616FPOE

100-7POES-T

Standard PoE Devices

PART NO.	DEVICE TYPE	PORT CONFIGURATION		MANAGEMENT	REMARK
100-7308FPOE	PoE Switch	8x 10/100M PoE		n/a	
100-7624FPOE2GC	PoE Switch	24x 10/100M PoE	2x 1G Combo	n/a	
300-7308FPOE	PoE Switch	8x 10/100M PoE		Web-Smart	065-7508PoE
300-7616FPOE	PoE Switch	16x 10/100M PoE		Web-Smart	(065-7532PoE)
300-7624FPOE2GC	PoE Switch	24x 10/100M PoE	2x 1G Combo	Web-Smart	
100-POEI	PoE Injector	1x 10/100M		n/a	065-7PoEI
100-POES	PoE Splitter	1x 10/100M		n/a	065-7PoES

High Power PoE Devices

PART NO.	DEVICE TYPE	PORT CONFIGURATION		MANAGEMENT	REMARK
100-7305FPOE-T	High Power PoE Switch	5x 10/100M PoE		n/a	2x High power PoE port
100-7PoEI-T	High power PoE Injector	1x 1G PoE		n/a	
100-7PoES-T	High Power PoE Splitter	1x 1G PoE		n/a	
300-7624FPOE2GC-T	High Power PoE Switch	24x 10/100M PoE	2x 1G Combo	Web-smart	12 x High Power PoE port

SIGNAMAX™
CONNECTIVITY SYSTEMS

Industrial Ethernet

Industry, one of integral parts of our civilization, achieved many milestones in past decades. Since Henry Ford invented belt production, there are demands for automation and control of production, followed by need of computerized processing and control. Nowadays, trend is to integrate production centers into standard network by implementation of Industrial Ethernet.

Major positive effects of this implementation:
First, by being integral part of larger network, industrial appliances can be planned and controlled with unparallel effectiveness, cost and labor saving.
Second, implementation of Ethernet standards and products guarantees cross brand interoperability, standardization of features, thus another cost optimization.
Singamax is well aware of this market need and brings brand new products to its portfolio. Based on customers' feedback, portfolio is carefully selected to cover most common needs of all industries. In compliance with industrial standards and backed with 60 months warranty, Signamax Industrial (SI) portfolio is here to suit your needs.

Switches and Media Converters
Most advanced products in portfolio. Starting from very simple non-managed 4 port switches to L2+ managed, IP67 specialized switches. All switches are in compliance with strict international standards and are tested to work in harsh environments. Extreme temperatures, EMC/EMI bursts, vibrations, dust, it's where SI work with unaltered performance. In addition, some products are certified to comply with specific standards, which are:
• UL-60950 Standards for deployment in hazardous, flammable
  or explosive environments
• EN-50121-4 Set of standards for deployment in railway environment
• IEC 61850 Standard for implementation in power transition
  networks—Power plants
• ITS Set of regulations for deployment in traffic control environment

In addition, selected switches are equipped with redundant ring capability. It is possible to interconnect these into redundant ring topology, providing failure recovery time under 20 ms.

All products are wide-temperature certified up to -40° to +70°C and connected to power by Terminal Block, providing these with wide range of input power current and availability to direct connection to UPS.

Industrial serial server

IP67 Managed industrial switch

Industrial Ethernet

Optical modules

Similar to standard optical modules, Signamax offers industrial modules in wide variety of speeds and connector types. In addition, modules are tested and comply with strict Industrial standards, such as temperature, EMI/ECM bursts, vibrations etc.

Accessories

When designing industrial networks, there are certain rules to obey. You can use special, very rugged products, but when you choose to power these with standard plastic adapter and it dies, its waste of resources. Signamax Industrial Ethernet accessories are designed to provide all products necessary for successful IE deployment. Power supplies, DIN mount kits, DIN rail keystone holders and special cables, it's what Signamax offers.

PREMISE CONNECTIVITY SYSTEMS

Passive

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CONNECTIVITY SYSTEMS

Introduction to Structured Cabling

History

Until the beginning of 1980's, the majority of computer networks worked in a host/terminal mode. Applications as well as data were stored centrally on a host computer and user stations called terminals handled them in this centralized way. Considering the text character of this type of communication, it was not necessary to build special high capacity transmission paths for terminal networks. However, their prevalence ended in 1981 when IBM launched their first personal computer onto the market. This new type of workstation was equipped with a local memory and outputs for connecting various peripherals. This resulted in a different—decentralized—mode of operation. This greater independence brought two important issues: (1.) difficult administration and (2.) mutual user co-operation.

Therefore, it was necessary to find a way that would enable to connect new PCs` into a computer network through which it would be possible to share files, applications, and costly peripherals in the same manner as previously in terminal networks.

In the beginning, several solutions arose from different producers. However, differences in technologies and diversity in components of these new systems led to their mutual incompatibility. A solution to this situation was to design a universal system that would set recommended standards determining electrical and physical characteristics of cables as well as connecting hardware. At the beginning of 1990's, American National Standards Institute (ANSI) asked Telecommunications Industry Association (TIA) and Electronic Industries Alliance (EIA) to propose a universal standard for metallic cabling systems. One of the most suitable ways for the new cabling system design was to use the already existing solution introduced by AT&T. These networks used telephone distribution systems that were installed in most office buildings at that time. They had a star topology and used a twisted pair cable as the main transmission medium. The outcome of the commission work was the first specification for structured cabling published in July 1991. It was referred to as ANSI/TIA/EIA 568. Together with the technical bulletins TSB-36 and TSB-40 issued a little later, the new documents defined basic transmission requirements for Category 3, 4, and 5.

In 1995, the first update of the above mentioned standard and also the first version of the international ISO/IEC 11801 standard were issued. In 1996, CENELEC published the first European specification for structured cabling cables and components named EN 50173. As the result of a new high-speed protocol development (i.e. Gigabit Ethernet), all these standards were updated in 2000 and 2002. The updates defined new parameters that must be met by structured cabling components in order to comply with the new protocol requirements. The documents were supplemented with further measured or numerated parameters, such as PSNEXT, PSACR, PSELFEXT, Delay Skew etc. In these specification updates, the new Category 5 (today known as Category 5E), Category 6, and Category 7 were introduced.

Introduction to Structured Cabling

Currently Existing Categories

Category 3—this is the first and therefore oldest category in structured cabling. In the beginning, Category 3 components were used for both voice and data transmissions. The bandwidth was defined up to 16 MHz with data rates of 10 Mbps. Today, Category 3 is predominantly used for telephone distribution systems (e.g. connection from ISDN patch panels to telephone PBX board, telephone equipment cords etc).

Category 5E—at present, Category 5E (or Enhanced Category 5) is still one of the most frequently used categories in structured cabling. The first standard for Category 5E was published in 2000 and was referred to as ANSI/TIA/EIA 568B.1 for the American standards, CENELEC EN 50173-1:2000 for the European standards, and ISO/IEC 11801:2000 for the international standards. In CENELEC as well as ISO/IEC specifications, it is still referred to as Category 5 (i.e. not Category 5E). The term "Category 5E" is used only in the ANSI/TIA/EIA standard. It was originally introduced by manufactures in order to distinguish between the already existing Category 5 components and the "new" improved Category 5E. As mentioned previously, Category 5E cabling components are suitable for the Gigabit Ethernet protocol (i.e. 1000BaseT), which should fit requirements of most company networks with regular data traffic. However, the 1 Gbps transmission rate is the limit for all Category 5E products and no further improvements are possible.

Category 6—the final specification for Category 6 was published in 2002. The document update is known as ANSI/TIA/EIA 568B.2-1 for the American standards, CENELEC EN 50173-1:2002 for the European standards, and ISO/IEC 11801:2002 for the international standards. Category 6 is specified up to 250 MHz. The double available bandwidth in comparison with Category 5E requires higher component quality. On the other hand, if these quality requirements are met, Category 6 components offer improved performance and transmission reliability, especially in connection with the 1000BaseT and 1000BaseTX protocols.

Category 6A—this is a new category that was finalized in April 2008 in the American ANSI/TIA/EIA 568B.2-10 standard and at the end of 2009 in the international ISO/IEC 11801 Amendment 2 standard. This "new" category is referred to as "Augmented Category 6" or "Category 6A". It was developed specifically for the new 10GBaseT Ethernet protocol in mind. Category 6A offers 500 MHz bandwidth and thus is suitable for the most data-intensive applications used on metallic computer networks. You can learn more about the 10GBaseT protocol as well as Category 6A further on in this catalogue.

Category 7—this category was first mentioned in 1997, however, its specification was not finished before 2002. Category 7 was specified in the CENELEC EN 50173:2002 and ISO/IEC 11801:2002 standards but for installation cables only. In the ANSI/TIA/EIA standards Category 7 is not mentioned. The bandwidth that is defined for Category 7 is 600 MHz.

Category 7A—a new category that has just come into reality specifying installation cables up to 1000 MHz. The primary purpose for introducing Category 7A was to keep sufficient bandwidth distance from Augmented Category 6.

The table bellow shows supported protocols, bandwidth, maximum transmission rates, and recommended use for all categories.

	CAT 3	CAT 4	CAT 5	CAT 5E	CAT 6	CAT 6A	CAT 7	CAT 7A
Supported Protocols	Analog. Voice, ISDN, 10BaseT	IBM Token Ring	100BaseT and lower	1000BaseT and lower	1000BaseTX and lower	10GBaseT and lower	10GBaseT and lower	10GBaseT and lower
Bandwidth	16 MHz	20 MHz	100 MHz	100 MHz	250 MHz	500 MHz	600 MHz	1,000 MHz
Maximum Transmission Rate	10 Mbps	16 Mbps	100 Mbps (Fast Ethernet)	1,000 Mbps (Gigabit Ethernet)	1,000 Mbps (Gigabit Ethernet)	10 Gbps	10 Gbps	10 Gbps
Usability	Predominantly telephone distribution systems	No longer installed	No longer installed	Regular data and voice traffic	Higher data traffic (multimedia, streaming)	High data traffic, backbone distribution sytems, SAN	High data traffic, backbone distribution sytems, SAN	High data traffic, backbone distribution sytems, SAN

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Introduction to Structured Cabling

In the ISO/IEC 11801 and CENELEC EN 50173 generic cabling documents, further copper cabling distinctions referred to as "Classes" were introduced. Classes are used for classifying the permanent link or channel performance rather than for rating individual cabling components. The brief description of all classes as specified in the ISO/IEC and CENELEC standards is the following:

Class A—specifies analogue voice telephony with the bandwidth of up to 10 KHz.

Class B—defines frequencies up to 1 MHz for voice and slow data links (i.e. IBM 3270 terminals etc.)

Class C—this class corresponds to permanent link and channel performances using Category 3 components. Similarly to Category 3, it covers the bandwidth of up to 16 MHz. Its primary application today is to classify telephone distribution systems.

Class D—the class was first ratified in 1995 and updated in 2000. Today Class D covers permanent link and channel topologies built with Category 5E cables and connecting hardware with the bandwidth of up to 100 MHz.

Class E—this class was specified in 2002 and corresponds to data links with Category 6 components with the bandwidth of up to 250 MHz.

Class E$_A$—this is a new class that was defined at the end of 2009 in ISO/IEC 11801 Amendment 2. Class E$_A$ specifies permanent link and channel systems up to 500 MHz. Similarly to Category 6A, Class E$_A$ links are aimed to be used with the 10GBaseT protocol.

Class F—this class covers the standard bandwidth of up to 600 MHz and corresponds to Category 7 links.

Class F$_A$—with reference to Class E$_A$ and its 500 MHz frequency, it was necessary to re-define the original Class F with a new class with 1,000 MHz bandwidth named Class F$_A$. As with Category 7/Class F, the Category 7A/ Class F$_A$ document specifies double shielded installation cables only.
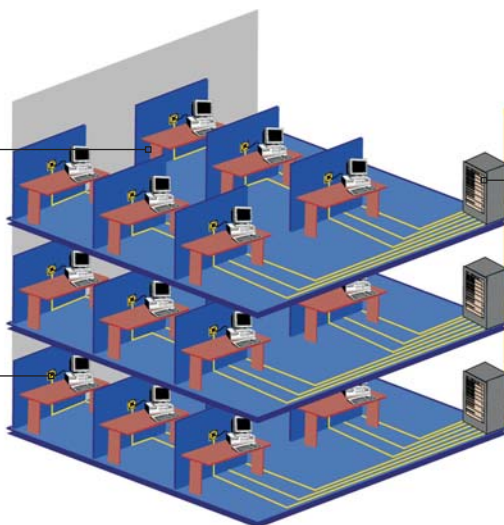
What is Structured Cabling?

Structured cabling is a universal system,

- that supports digital as well as analog signal transmissions,
- in which telecommunication outlets are installed even in locations where they are not needed at the time of installation,
- that use data cables with four twisted pairs and fiber optic cables,
- in which long technical and also moral service life is expected,
- whose correct functionality is as important for a company as the functioning of the electrical distribution system or any other system in company's infrastructure.
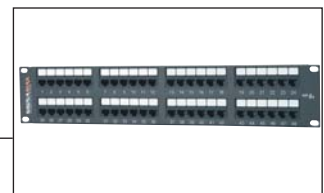
Installation Cables
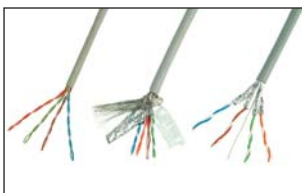
Patch Panels

Work Area Outlet System

Fiber Optic System

Structured Cabling Testing

Testing has a major significance for correct functionality of structured cabling. Testing devices are able to measure installed components and determine whether all requirements defined in international standards necessary for reliable operation have been met. The following main parameters are usually tested:

Wire Map

This parameter checks correct termination of cable wires in telecommunication outlets and patch panels. At the same time, it checks the signal throughput on the whole cable length—i.e. it is able to detect any open-circuit or short circuit faults. The Wire Map parameter is very important but alone it cannot ensure correct functionality of an installed computer network.

What to do if the Wire Map parameter fails?

First, it is necessary to check whether the individual wires have been installed correctly in the termination block. If so (i.e. the wire map corresponds to the standardized T568A or T568B schemes) and the Wire Map parameter still fails, there could be several causes for this: an incorrectly terminated wire in the termination block, a wire interruption inside the cable, or a short-circuit. Advanced testing devices are able to determine fault locations with relatively high accuracy and by doing so make fixing wire-map problems easier.

T568A and T568B wire map schemes:

T568A	T568B
1. white-green	1. white-orange
2. green	2. orange
3. white-orange	3. white-green
4. blue	4. blue
5. white-blue	5. white-blue
6. orange	6. green
7. white-brown	7. white-brown
8. brown	8. brown
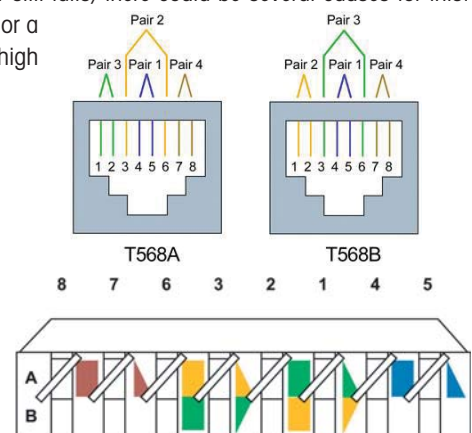
NEXT (Near End Cross Talk)

NEXT is a value that expresses how much signal can get from one pair to another pair within one cable. The measurement of cross-talk at the near end takes place at the same end of the cable as the location of the signal source. For this parameter, all combinations of pairs are measured within one cable—i.e. 12-36, 12-45, 12-78, 36-45, 36-78, 45-78. This measuring is done for both ends.

What to do if the NEXT parameter fails?

First, it is essential to find out at which end of the cable NEXT is showing the error (this function is supported by all advanced testing devices). Then it is necessary to check the maximum permitted unlaid of wires in one pair on the termination block—that should not be more than 13 mm. Typically for Category 6 or higher categories, 13 mm does not necessarily ensure that the NEXT parameter will pass so it is essential to keep the pair unlaid as short as possible. It is also important that the original twisting of each pair is preserved during installation and that there is no air core between the twisted wires in a pair. A frequent source of cross-talk problems can also be when using cable couplings. Hence, if a cable is not long enough, it is better to replace it with a cable of a corresponding length rather than use couplings.

Attenuation

Attenuation shows the difference between the strength of the initial signal and the strength of the signal after it gets to the other end of the wire. It is caused mainly by the wire resistance and it is usually larger for higher frequencies. Attenuation also increases as the diameter of the cable decreases—this means that a cable with the size of AWG 24 has a slightly higher attenuation than an AWG 23 cable.

What to do if the Attenuation parameter fails?

The length of the horizontal cable must be checked—i.e. whether the electrical length of the link (i.e. the actual length of the twisted pairs inside the cable) corresponds to the maximum permitted permanent link of 90 m. A frequent cause of higher attenuation is also an incorrectly terminated wire in patch panels, outlets, or keystones.

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Structured Cabling Testing

ACR-N (Attenuation to Crosstalk Ratio – Near End)

ACR-N (originally called just ACR) is a theoretical parameter (i.e. it is not measured but is deduced from two previously measured values) which shows the margin between NEXT and attenuation values: ACR-N [dB] = NEXT [dB] - A [dB]. If the level of attenuation meets or approaches the level of near end cross-talk, the transmitted signal will be lost. The gap between NEXT and attenuation must be at least 10 dB.

What to do if the ACR-N parameter fails?

As the ACR-N parameter is dependent on NEXT as well as attenuation values, an improvement of these two parameters will influence the resulting ACR-N values.
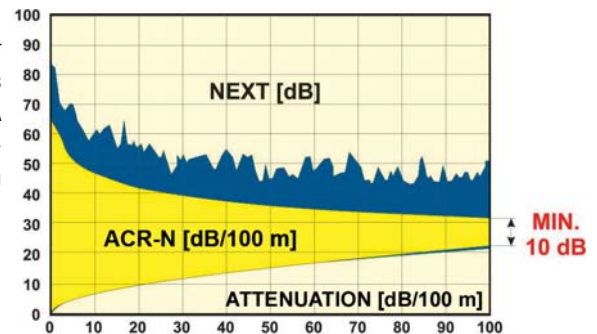
FEXT (Far End Cross Talk)

FEXT expresses the cross-talk of the signal from one pair to another pair within one cable measured at the far end. This is the same parameter as NEXT, only with FEXT the measurement is done at a different cable end. Again, all combinations of pairs are measured within one cable—i.e. 12-36, 12-45, 12-78, 36-45, 36-78, and 45-78. FEXT servers as an important basis for the following ACR-F parameter.

ACR-F (Attenuation to Crosstalk Ratio–Far End)

ACR-F (originally called ELFEXT, Equal Level Far End Cross Talk) corresponds much better to the actual situation during data transfer than FEXT. It is because the cross-talk inside the cable decreases as the attenuation increases. ACR-F is a theoretical parameter (i.e. it is not measured but is calculated from other previously measured values): ACR-F [dB] = FEXT [dB] - A [dB]. Thus ACR-F is the cross-talk at the far end decreased by attenuation.

PSNEXT (Power Sum NEXT)

PSNEXT is a theoretical value calculated from the previously measured NEXT. The PSNEXT parameter is primarily important for protocols that use all four pairs for signal transfer (e.g. Gigabit Ethernet). The output sum of cross-talk at the near end shows how much signal gets from three pairs to the remaining fourth pair. The source of the signal and measurement of cross-talk takes place at the same end of the cable.

What to do if the PSNEXT parameter fails?

Just as with other parameters, PSNEXT is also influenced by the measured values of NEXT. Thus, an improvement in the near end cross-talk value will affect the resulting value of PSNEXT.

PSACR-F (Power Sum ACR-F)

PSACR-F is calculated from the ACR-F value. Just like PSNEXT, this parameter is important for protocols that use all four pairs for signal transfer. PSACR-F expresses how much signal in the same cable gets from three pairs to the remaining fourth pair. The source of the signal and measurement of cross-talk takes place at opposite ends of the cable.

Propagation Delay

This value expresses a delay of the signal travelling from one end of the cable to the other. The typical delay of the signal in a Category 5E cable is around 5 ns per 1 m; the permitted limit is 5.7 ns per 1 m, which is 570 ns per 100 m. Propagation Delay also serves as a basis for testing the Delay Skew value.

Structured Cabling Testing

Delay Skew

Delay Skew shows the difference in signal delay between the fastest and the slowest pair. The Delay Skew parameter is affected by (1.) different length of pairs; (2.) difference in material (resistance, impedance etc.); (3.) the effect of surrounding interference. If the difference is too great, there can be an incorrect interpretation of data by the active device (usually a switch, network card, etc.). Just as for PSNEXT and PSACR-F, the Delay Skew parameter is critical for protocols that use all four pairs, such as Gigabit Ethernet.

Length

There is a direct proportionality between length and attenuation (i.e. the longer the length of the cable, the higher the attenuation). Testing devices use the so-called TDR (Time Domain Reflectometery) for measuring lengths.


This means that a pulse is sent down the cable, then it is reflected back onto the remote unit, and subsequently the time during which the pulse travels the whole track is recorded. Based on NVP (i.e. Nominal Velocity of Propagation, which expresses the signal speed in the cable as compared to the speed of light in a vacuum), the length of the measured segment is calculated. This concerns the length of twisted pairs inside the cable (the so-called electrical length), not "untangled" cable (the so-called physical length). At 85 m, the variation between the electrical and physical lengths can be up to 5 m depending on the twisting of each pair.

Return Loss

Return Loss shows the reflection of the signal because of varying impedance at different cable parts. Due to these impedance imbalances, part of the energy can return to the transmitter, which can cause the signal interference.

When testing structured cabling, two basic topologies are used:

Permanent Link—the connection from a patch panel to a work-area telecommunication outlet (i.e. also called horizontal cabling). This is the most permanent fixture in structured cabling and cannot be easily taken apart. The maximum permitted length is 90 m.
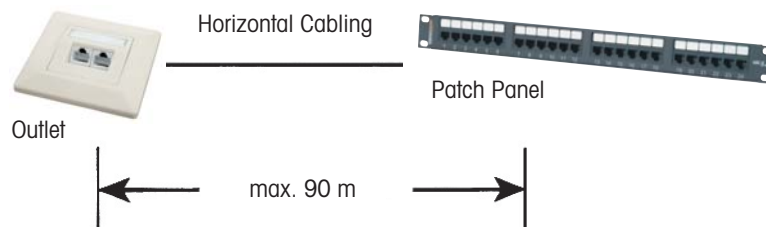
Channel—the connection from an active device (e.g. a switch) in a data rack to a network card, patch cords included. The recommended maximum length of equipment cords in data racks is 5 m; the maximum recommended length for work area cords is 20 m. The length of the channel (i.e. the horizontal cabling plus an equipment cord as well as a work-area cord) should not exceed 100 m.
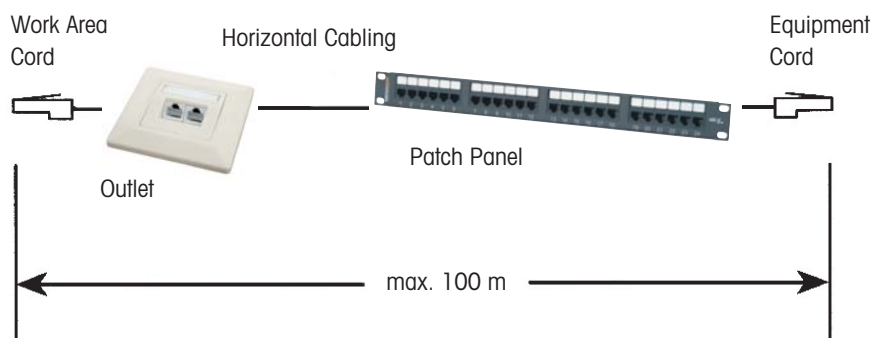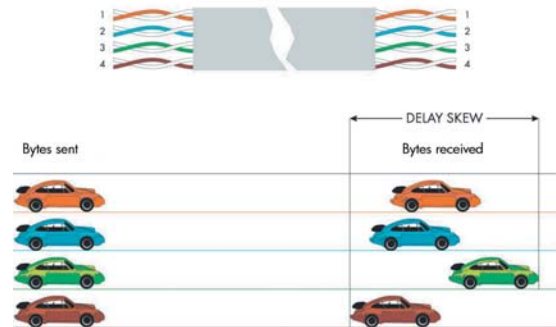
10GBaseT and Structured Cabling

Until recently, Gigabit Ethernet was considered to be the limit that would be very difficult to overcome on metallic structured cabling. Now it is obvious that 1 Gbps is not the maximum transmission rate that can be achieved on copper twisted pair cables. The new 10GBaseT Ethernet standard that was published in June 2006 by the IEEE 802.3an group proves this. In the first stage, this new protocol with transmission speeds of up to 10 Gbps was primarily employed in backbone distribution systems, SAN`s (Storage Area Networks), and data centers. But now, it is quite common to use the 10GBaseT protocol also on horizontal cabling in various network environments (e.g. commercial and governmental offices, universities, industry premises etc).

1. Running 10GBaseT on Currently Existing Cabling

The documents ANSI/TIA/EIA TSB 155 and ISO/IEC 24750 deal with operating the 10GBaseT protocol over currently existing Category 5E and Category 6 cabling systems. The test results performed in connection with these bulletins showed that it is not possible to run 10 Gbps data transfers on Category 5E networks and that on current unshielded Category 6 cabling the 10GBaseT protocol can operate only for a distance of up to 55 m. This length limitation should be improved on shielded Category 6 systems but it is highly recommended to use Category 6A components for all new 10G installations. It is the new Category 6A that was primarily designed to provide full compatibility with no length limitations for 10GBaseT. The factor that plays an important role in the above mentioned length restriction is the so-called Alien Crosstalk. It is influenced by the amount of cross-talk signal from external sources, such as other cables in a cable bundle, electronic devices operated nearby, telephones, etc.

2. New Requirements for Future Cabling Systems for 10GBaseT

As it was already mentioned, a new category with the bandwidth of up to 500 MHz (i.e. double of what is available for the current Category 6) was defined to ensure full compatibility of cabling systems with the 10GBaseT protocol. This new category is referred to as "Augmented Category 6" or "Category 6A" and was published in ANSI/TIA/EIA 568B.2-10 in April 2008 and recently revised in ANSI/TIA/EIA 568C.2. The Category 6A specifies both permanent link and channel systems as well as individual component requirements.

In terms of classes for the 10GBaseT protocol, the Class E_A is also defined in ISO/IEC 11801 Amendment 2 for both permanent link and channel topologies. However, unlike in the ANSI/TIA/EIA specification, the Class E_A in the ISO/IEC standards is defined for both screened and unscreened cabling systems.

10GBaseT and Structured Cabling

Signamax Category 6A shielded cable parameters (at temperature of 20°C). The cable supports 10GBaseT.

f (MHz)	Attenuation (dB/100 m)	NEXT (dB)	PSNEXT (dB)	ACR-N (dB/100 m)	PSACR-N (dB/100	ACR-F (dB/100	PSACR-F (dB/100 m)	Return loss (dB)
1	1.8	100	97	98	95	105	105	-
4	3.4	100	97	97	94	105	102	27
10	5.4	100	97	95	92	97	94	30
16	6.8	100	97	93	90	93	90	30
20	7.7	100	97	92	89	91	88	30
31.2	9.6	100	97	90	87	87	84	30
62.5	13.7	100	97	86	83	81	78	30
100	17.4	100	97	83	80	77	74	30
125	19.5	95	92	75	72	75	72	26
155.5	21.9	94	91	72	69	73	70	26
175	23.3	93	90	70	67	72	69	25
200	25.0	92	89	67	64	71	68	25
250	28.1	90	87	62	59	69	66	24
300	30.9	89	86	58	55	67	64	24
400	38.3	87	84	48	45	64	61	23
500	44.8	85	82	40	37	61	58	22

Signamax Category 7 shielded cable parameters (at temperature of 20°C). The cable supports 10GBaseT.

| f (MHz)	Attenuation (dB/100 m)	NEXT (dB)	PSNEXT (dB)	ACR-N (dB/100 m)	PSACR-N (dB/100	ACR-F (dB/100	PSACR-F (dB/100 m)	Return loss (dB)
1	1.8	100	97	98	95	105	105	-
4	3.4	100	97	97	94	105	102	27
10	5.4	100	97	95	92	97	94	30
16	6.8	100	97	93	90	93	90	30
20	7.7	100	97	92	89	91	88	30
31.2	9.6	100	97	90	87	87	84	30
62.5	13.7	100	97	86	83	81	78	30
100	17.4	100	97	83	80	77	74	30
125	19.5	95	92	75	72	75	72	26
155.5	21.9	94	91	72	69	73	70	26
175	23.3	93	90	70	67	72	69	25
200	25.0	92	89	67	64	71	68	25
250	28.1	90	87	62	59	69	66	24
300	30.9	89	86	58	55	67	64	24
450	38.3	87	84	48	45	64	61	23
600	44.8	85	82	40	37	61	58	22
750	52.0	83	80	31	28	59	56	21
900	59.4	82	79	23	20	58	55	20

Category 6 Wall Outlets

Signamax Category 6 outlets are designed for a comfortable installation. This is ensured by strain relief providing an easy cable positioning and cable fixture to the outlet housing. The outlets have a slim design and excellent performance. The modular construction of Signamax Category 6 outlets allows flush mounting or wall mounting installation using a universal back box. All these outlet products exceed electrical parameters specified in the ANSI/TIA/EIA 568C.2, ISO/IEC 11801, and EN 50173 standards. Both T568A and T568B wiring configurations are supported on the Krone termination block. Space for port numbering stickers or direct marking above each port allows an easy administration.
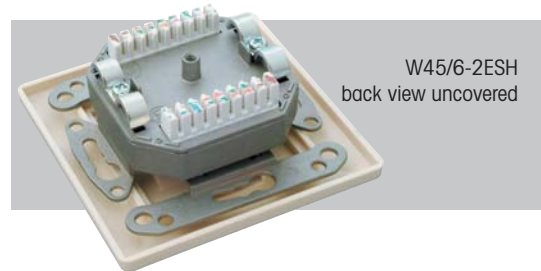
W45/6-2ESH
back view uncovered
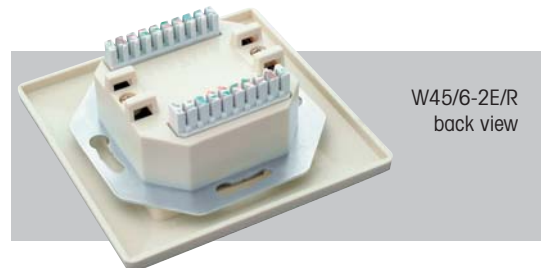
W45/6-2E/R
back view

W45-AP80-32/R

W45/6-2ESH/R

SPECIFICATIONS

Number of Ports: 2 x RJ45
Life Cycle: 1,000 plug insertions
Contact Material: 50μ gold and 100μ nickel
IDC Block: Krone 8p8c
IDC Block Life Cycle: 200 terminations
Wire: AWG 26-22
Other Material: FR according to UL94V-0
Storage Temperature: -40° – 70°C
Operation Temperature: -10° – 60°C
Max. Humidity Operation: 93%

Category 6 Wall Outlets

PART NO.	DESCRIPTION
W45/6-2ESH/R	Shielded Wall Outlet Category 6, 80x80 mm, White
W45/6-2ESH	Shielded Wall Outlet Category 6, 80x80 mm, Ivory
W45/6-2E/R	Unshielded Wall Outlet Category 6, 80x80 mm, White
W45/6-2E	Unshielded Wall Outlet Category 6, 80x80 mm, Ivory
W45-AP80-32/R	Wall Mounted Back Box, 80x80x32 mm, White
W45-AP80-32	Wall Mounted Back Box, 80x80x32 mm, Ivory

Category 5E Wall Outlets

For Signamax Category 5E outlets their high transmission parameters is the key attribute. Two angled RJ45 ports are covered by a plastic frame that fits various trunking systems using 80 x 80 mm modules. The outlets have an excellent performance and they are developed for all demanding markets. Modular construction of these Signamax outlets allows flush mount or wall mount installation using a universal back box. Space for port numbering stickers or direct marking above each port allows an easy administration. All Signamax Category 5E outlets exceed electrical parameters specified in the ANSI/TIA/EIA 568C.2, ISO/IEC 11801, and EN 50173 standards. Both T568A and T568B wiring configurations are supported on the Krone termination block.

W45/5-2ESH
back view

W45/5-2E/R
back view

W45-AP80-32/R

W45/5-2E/R

SPECIFICATIONS

Number of Ports: 2 x RJ45
Life Cycle: 1,000 plug insertions
Contact Material: 50μ gold and 100μ nickel
IDC Block: Krone 8p8c
IDC Block Life Cycle: 200 terminations
Wire: AWG 26-22
Other Material: FR according to UL94V-0
Storage Temperature: -40° – 70°C
Operation Temperature: -10° – 60°C
Max. Humidity Operation: 93%

Category 5E Wall Outlets

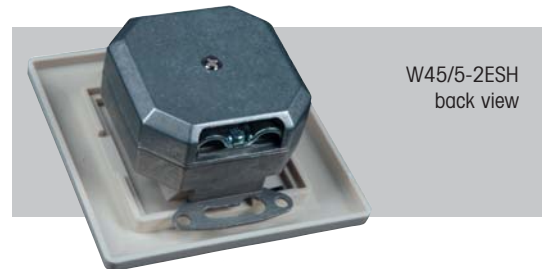| PART NO.	DESCRIPTION
W45/5-2ESH/R	Shielded Wall Outlet Category 5E, 80x80 mm, White
W45/5-2ESH	Shielded Wall Outlet Category 5E, 80x80 mm, Ivory
W45/5-2E/R	Unshielded Wall Outlet Category 5E, 80x80 mm, White
W45/5-2E	Unshielded Wall Outlet Category 5E, 80x80 mm, Ivory
W45-AP80-32/R	Wall Mounted Back Box, 80x80x32 mm, White
W45-AP80-32	Wall Mounted Back Box, 80x80x32 mm, Ivory

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Category 6A Keystone Jacks

Signamax Category 6A shielded keystone jacks have been specifically designed to meet the needs for high-bandwidth applications, such as 10GBaseT. These Signamax components have a very slim profile and thus can easily fit in most high density applications. The 10G keystones are engineered to exceed the Category 6A permanent link as well as channel requirements and are fully tested up to 500 MHz. The compliancy of these Signamax keystones with the latest Category 6A and Class E_A standards has been authorized by an independent testing laboratory GHMT.

Signamax Category 6A keystone jacks support T568A and T568B wiring for maximum flexibility using an easy to read colour-code wiring label. The keystones can be terminated by standard 110 as well as Krone termination tools or they can be purchased as tool free. Their new contact design provides enhanced plug to jack connection integrity and protects against damage caused by insertion of 4 or 6 position plugs. The contacts are rated for 1,000 plug insertions.

KJS458-10G-BK-TF
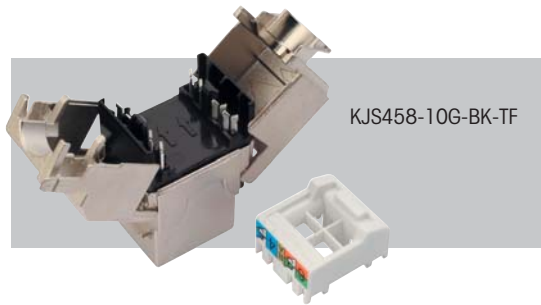
KJS458-10G-BK-TF

KJS458-10G
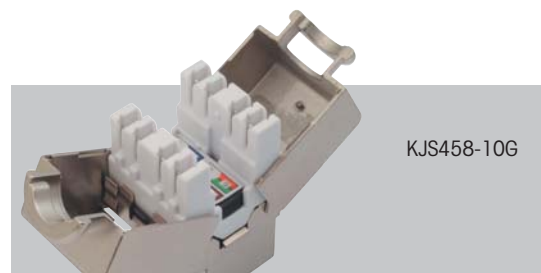
KJS458-10G

KJS458-10G

SPECIFICATIONS

Number of Ports: 1 x RJ45
Life Cycle: 1,000 plug insertions
Contact Material: 50μ gold and 100μ nickel
Termination Block: tool free or dual 110/Krone 8p8c
Termination Block Life Cycle: 200 terminations
Wire: AWG 26-22
Other Material: FR according to UL94V-0
Storage Temperature: -40° – 70°C
Operation Temperature: -10° – 60°C
Max. Humidity Operation: 93%

Category 6A Shielded Keystone Jack

PART NO.	DESCRIPTION
KJS458-10G	Shielded Keystone Jack, Category 6A, Universal Wiring T568A/B
KJS458-10G-BK-TF	Shielded Keystone Jack, Category 6A, Tool Free

Category 6 Keystone Jacks

Signamax Category 6 keystone jacks are easy-to-install structured cabling components available with IDC as well as tool free termination blocks, both in UTP and STP types. All these Category 6 keystones fully complies with the latest ANSI/TIA/EIA 568C.2, ISO/IEC 11801, and EN 50173 standards and therefore provide an excellent performance for most today's high-bandwidth applications. The keystones are designed to be solid, reliable, and are rated for 1,000 plug insertions. They support both T568A and T568B colour-code wiring for maximum installation flexibility and due to their small form factor can fit the majority of modular faceplates. Signamax Category 6 keystones are available in different colours.

KJ458-C6-BK

KJ458-C6-WH

KJ458-C6-YE

KJS458-C6-BK-TF

Category 6 Unshielded/Shielded Keystone Jacks

PART NO.	DESCRIPTION
KJ458-C6-WH	Unshielded Keystone Jack, Category 6, Universal Wiring T568A/B, White
KJ458-C6-BK	Unshielded Keystone Jack, Category 6, Universal Wiring T568A/B, Black
KJ458-C6-BU	Unshielded Keystone Jack, Category 6, Universal Wiring T568A/B, Blue
KJ458-C6-GN	Unshielded Keystone Jack, Category 6, Universal Wiring T568A/B, Green
KJ458-C6-RD	Unshielded Keystone Jack, Category 6, Universal Wiring T568A/B, Red
KJ458-C6-YE	Unshielded Keystone Jack, Category 6, Universal Wiring T568A/B, Yellow
KJ458-C6-IV	Unshielded Keystone Jack, Category 6, Universal Wiring T568A/B, Ivory
KJ458-C6-BK-TF	Unshielded Keystone Jack, Category 6, Tool Free, Black/White
KJS458-C6	Shielded Keystone Jack, Category 6, Universal Wiring T568A/B
KJS458-C6-BK-TF	Shielded Keystone Jack, Category 6, Tool Free

KJS458-C6

SPECIFICATIONS

Number of Ports: 1 x RJ45
Life Cycle: 1,000 plug insertions
Contact Material: 50µ gold and 100µ nickel
Termination Block: tool free or dual 110/Krone 8p8c
Termination Block Life Cycle: 200 terminations
Wire: AWG 26-22
Other Material: FR according to UL94V-0
Storage Temperature: -40° – 70°C
Operation Temperature: -10° – 60°C
Max. Humidity Operation: 93%

Category 5E Keystone Jacks

Signamax Category 5E keystone jacks exceed the permanent link and channel requirements defined in the ANSI/TIA/EIA 568C.2, ISO/IEC 11801, and EN 50173 standards. The keystones are tested up to 150 MHz and provide a sound platform for supporting all today's network operating systems including Gigabit Ethernet. These Category 5E keystone jacks can be terminated with 110 as well as Krone termination tools or they can be purchased as tool free. All Signamax Category 5E keystones feature colour-coding for both T568A and T568B wiring and are very easy to install. Similarly to other Signamax products, the new contact design provide enhanced plug to jack connection integrity and protects against damage caused by insertion of 4 or 6 position plugs. The contacts are rated for 1,000 plug insertions.

KJ458-C5E-BK

KJS458-C5E

KJS458-C5E-BK-TF

KJ458-C5E-BK-TF

SPECIFICATIONS

Number of Ports: 1 x RJ45
Life Cycle: 1,000 plug insertions
Contact Material: 50µ gold and 100µ nickel
Termination Block: tool free or dual 110/Krone 8p8c
Termination Block Life Cycle: 200 terminations
Wire: AWG 26-22
Other Material: FR according to UL94V-0
Storage Temperature: -40° – 70°C
Operation Temperature: -10° – 60°C
Max. Humidity Operation: 93%

Category 5E Unshielded/Shielded Keystone Jacks

PART NO.	DESCRIPTION
KJ458-C5E-WH	Unshielded Keystone Jack, Category 5E, Universal Wiring T568A/B, White
KJ458-C5E-BK	Unshielded Keystone Jack, Category 5E, Universal Wiring T568A/B, Black
KJ458-C5E-BU	Unshielded Keystone Jack, Category 5E, Universal Wiring T568A/B, Blue
KJ458-C5E-GN	Unshielded Keystone Jack, Category 5E, Universal Wiring T568A/B, Green
KJ458-C5E-RD	Unshielded Keystone Jack, Category 5E, Universal Wiring T568A/B, Red
KJ458-C5E-YE	Unshielded Keystone Jack, Category 5E, Universal Wiring T568A/B, Yellow
KJ458-C5E-IV	Unshielded Keystone Jack, Category 5E, Universal Wiring T568A/B, Ivory
KJ458-C5E-BK-TF	Unshielded Keystone Jack, Category 5E, Tool Free, Black/White
KJS458-C5E	Shielded Keystone Jack, Category 5E, Universal Wiring T568A/B
KJS458-C5E-BK-TF	Shielded Keystone Jack, Category 5E, Tool Free

Keystone Jack Modular Outlets

Signamax modular outlets are designed to be user-friendly solution for customers who need high modularity in a reasonable quality. This contains wide range of modular outlets and frames, each usable with the keystone jacks from Signamax portfolio.

KJGM-1-WH

KJGM-2-WH

SCM-1A-FR

SCM-2A-FR

Keystone Jack Modular Outlets

PART NO.	DESCRIPTION
KJGM-2-WH	Modular Outlet for Two Keystones, 80x80 mm, White
KJGM-1-WH	Modular Outlet for One Keystone, 80x80 mm, White
KJFRF80-1WH	Modular Outlet Frame, 80x80 mm, French Style, Inner Size 45x45mm, White
SCM-1-FR	Modular Outlet 90° Module, 45x45 mm, for 1 Keystone, French Style, White
SCM-11-FR	Modular Outlet 90° Module, 22.5x45 mm, for 1 Keystone, French style, White
SCM-BL-FR	Modular Outlet 90° Blank Module, 22.5x45 mm, French Style, White
SCM-1A-FR	Modular Outlet 45° Module, 45x45 mm, for 1 Keystone, French Style, White
SCM-2A-FR	Modular Outlet 45° Module, 45x45 mm, for 2 Keystones, French Style, White

Keystone Multimedia Modules

Signamax Premise Connectivity System offers a wide range of keystone connector modules designed to create a customized multimedia solution in any single or double gang faceplate or surface mount box. Applications include wide variety of small form factor fiber optic couplers.

CMK-ST

Keystone Multimedia Modules

PART NO.	DESCRIPTION
CMK-BL	Blank Keystone Module
CMK-ST	ST MM Fiber Connector Module
CMK-SC	SC MM Fiber Connector Module
CMK-LC	LC MM Fiber Connector Module

CMK-SC

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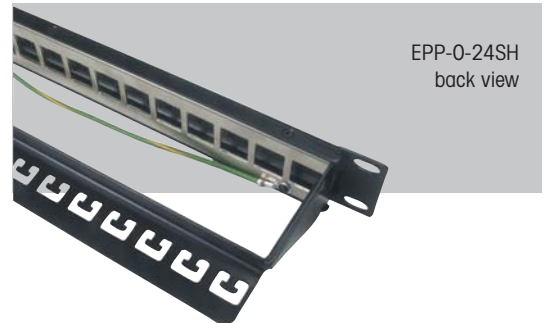
Unloaded Patch Panel for 10G Keystones

Signamax shielded unloaded patch panel is designed to be used with Signamax Category 6A keystones KJS458-10G and KJS458-10G-BK-TF. Therefore, the panel is an important part of the Signamax 10G high-performance solution and helps to provide for a reliable transmission of the 10GBaseT signal. This Signamax panel can be loaded with 24 keystones and is equipped with a cable management bar to ensure proper and stable connection. The colour of the Signamax shielded unloaded patch panel is black and its height is 1U.

EPP-0-24SH

EPP-0-24SH
back view

SPECIFICATIONS

Number of Ports: 24
Colour: Black
Units: 1U
Height: 44 mm
Width: 484 mm
Depth: 114 mm
Storage Temperature: -40° – 70°C
Operation Temperature: -10° – 60°C
Max. Humidity Operation: 93%

Unloaded Patch Panel for 10G Keystones

PART NO.	DESCRIPTION	RACK SPACE
EPP-0-24SH	24-Port Unloaded Shielded Patch Panel for Category 6A Keystones	1U

Category 6 Shielded Patch Panel

Signamax shielded Category 6 patch panel is designed to be used with other Signamax Category 6 components as a part of the premise connectivity solution. The panel meets all electrical parameters specified in the ANSI/TIA/EIA 568C.2, ISO/IEC 11801, and EN 50173 standards. It supports both T568A and T568B wiring configurations using an easy to read colour-coded wiring label. Each port of this Signamax Category 6 panel is sequentially numbered for easy administration. The panel is equipped with finger-screw strain reliefs to secure the cables and to ensure proper connection between the shielding of cables and the panel. The Signamax shielded Category 6 patch panel is equipped with Krone termination block and is supplied in grey colour (RAL 7035).
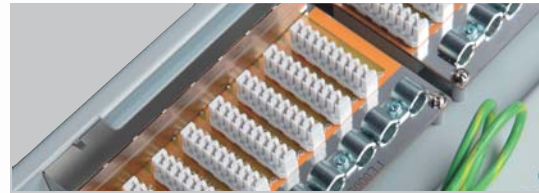
EPP-8KS6-24SHE
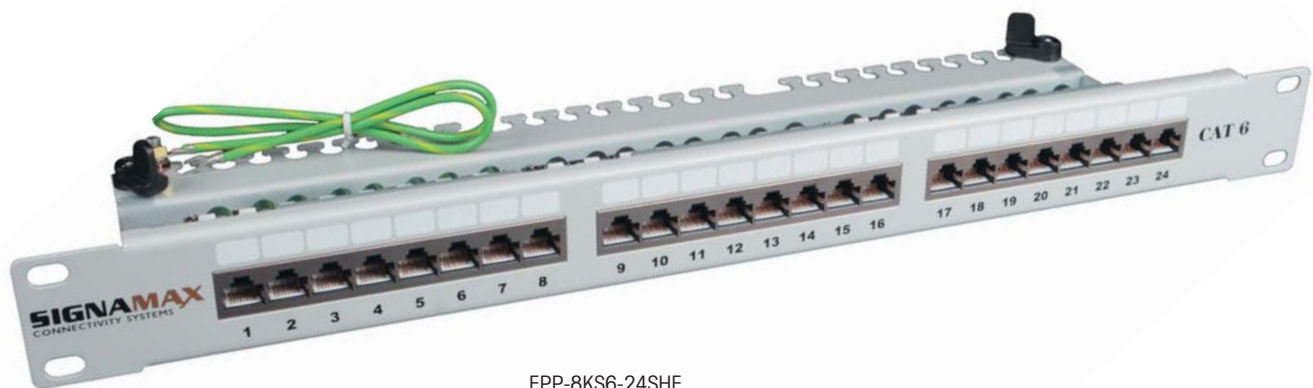
EPP-8KS6-24SHE

SPECIFICATIONS

Number of Ports: 24 x RJ45
Life Cycle: 1,000 plug insertions
Contact Material: 50µ gold and 100µ nickel
IDC Block: dual 110/Krone 8p8c
IDC Block Life Cycle: 200 terminations
Wire: AWG 26-22
Other Material: FR according to UL94V-0
Colour: Grey
Units: 1U
Height: 44 mm
Width: 484 mm
Depth: 137 mm
Storage Temperature: -40° – 70°C
Operation Temperature: -10° – 60°C
Max. Humidity Operation: 93%

Category 6 Shielded Patch Panel

PART NO.	DESCRIPTION	RACK SPACE
EPP-8KS6-24SHE	24-Port Category 6 Shielded Patch Panel, Universal Wiring T568A/B	1U

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Category 6 Unshielded Patch Panels

Signamax Category 6 unshielded patch panels are designed to exceed the ANSI/TIA/EIA 568C.2, ISO/IEC 11801, and EN 50173 performance specifications providing usable bandwidth up to 350 MHz. These high-density panels are available in 12- through 48-port versions and feature enhanced front and rear labeling for easy circuit identification. Signamax Category 6 unshielded panels support both T568A and T568B wiring configurations using an easy to read colour-coded wiring labels. These panels are constructed for maximum durability and feature a fully enclosed, 6-port module design, which provides flexibility and protection of printed circuitry during termination. A newly designed RJ45 contact configuration provides enhanced plug to jack connection integrity for superior reliability. Rear termination is made quick and easy using a 4-pair inline 110 type connector compatible with industry standard 110 termination tool. These Signamax panels are supplied in black colour.

24458MD-C6C

48458MD-C6C

SPECIFICATIONS

Number of Ports: 12, 24, and 48 x RJ45
Life Cycle: 1,000 plug insertions
Contact Material: 50μ gold and 100μ nickel
IDC Block: dual 110/Krone 8p8c
IDC Block Life Cycle: 200 terminations
Wire: AWG 26-22
Other material: FR according to UL94V-0
Colour: Black
Units: 1U and 2U
Height: 44 mm
Width: 484 mm
Storage Temperature: -40° – 70°C
Operation Temperature: -10° – 60°C
Max. Humidity Operation: 93%

SMB-350

Category 6 Unshielded Patch Panels

PART NO.	DESCRIPTION	RACK SPACE
12458MD-C6C	12-Port Category 6 Unshielded Patch Panel, Universal Wiring, T568A/B	1U
24458MD-C6C	24-Port Category 6 Unshielded Patch Panel, Universal Wiring, T568A/B	1U
48458MD-C6C	48-Port Category 6 Unshielded Patch Panel, Universal Wiring, T568A/B	2U
SMB-350	Cable Management Bar for Signamax Unshielded Patch Panels	

Category 5E Shielded Patch Panel

Signamax Category 5E shielded patch panel is designed to exceed the ANSI/TIA/EIA 568C.2, ISO/IEC 11801, and EN 50173 performance specifications providing usable bandwidth beyond 155 MHz. This panel is available in 24-port version and features enhanced front and rear labeling for easy circuit identification. The panel supports both T568A and T568B wiring configurations using an easy to read colour-coded wiring label. It is constructed for maximum durability and features a fully enclosed, 8-port module design, which provides flexibility and protection of printed circuitry during termination. The Signamax shielded Category 5E panel includes an integrated cable management feature for cable routing and strain relief requirements. The Signamax shielded Category 5E patch panel is equipped with Krone termination block and is supplied in grey colour (RAL 7035).

EPP-8KS5-24SHE

EPP-8KS5-24SHE

SPECIFICATIONS

Number of Ports: 24 x RJ45
Life Cycle: 1,000 plug insertions
Contact Material: 50μ gold and 100μ nickel
IDC Block: dual 110/Krone 8p8c
IDC Block Life Cycle: 200 terminations
Wire: AWG 26-22
Other Material: FR according to UL94V-0
Colour: Grey
Units: 1U
Height: 44 mm
Width: 484 mm
Depth: 137 mm
Storage Temperature: -40° – 70°C
Operation Temperature: -10° – 60°C
Max. Humidity Operation: 93%

Category 5E Shielded Patch Panel

PART NO.	DESCRIPTION	RACK SPACE
EPP-8KS5-24SHE	24-Port Category 5E Shielded Patch Panel, Universal Wiring, T568A/B	1U

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Category 5E Unshielded Patch Panels

Signamax Category 5E unshielded patch panels have been engineered for high-performance, high-density, and easy installation. These panels exceed both component and channel performance as specified in the ANSI/TIA/EIA 568C.2, ISO/IEC 11801, and EN 50173 standards, and include new features for port labeling, colour-coding, and cable management. These Signamax Category 5E panels are designed for maximum strength, which allows for termination with a standard multi-pair 110 impact tool to reduce installation time. The panels feature a fully enclosed design for protection of printed circuitry during termination. The Signamax Category 5E unshielded patch panels are supplied in black colour.

12458MD-C5E
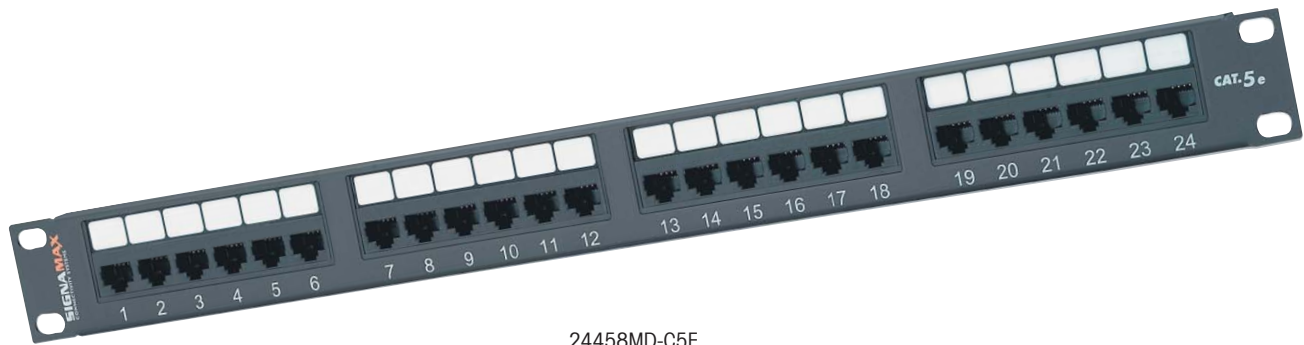
24458MD-C5E

SPECIFICATIONS

Number of Ports: 12, 24, and 48 x RJ45
Life Cycle: 1,000 plug insertions
Contact Material: 50μ gold and 100μ nickel
IDC Block: dual 110/Krone 8p8c
IDC Block Life Cycle: 200 terminations
Wire: AWG 26-22
Other Material: FR according to UL94V-0
Colour: Black
Units: 1U and 2U
Height: 44 mm
Width: 484 mm
Storage Temperature: -40° – 70°C
Operation Temperature: -10° – 60°C
Max. Humidity Operation: 93%
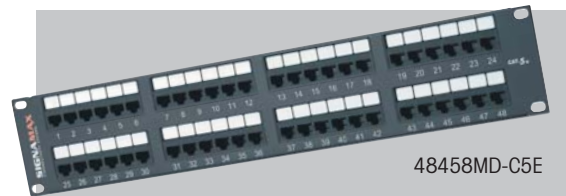
48458MD-C5E

SMB-350

Category 5E Unshielded Patch Panels

PART NO.	DESCRIPTION	RACK SPACE
12458MD-C5E	12-Port Category 5E Unshielded Patch Panel, Universal Wiring, T568A/B	1U
24458MD-C5E	24-Port Category 5E Unshielded Patch Panel, Universal Wiring, T568A/B	1U
48458MD-C5E	48-Port Category 5E Unshielded Patch Panel, Universal Wiring, T568A/B	2U
SMB-350	Cable Management Bar for Signamax Unshielded Patch Panels	

ISDN Patch Panels

Signamax ISDN Category 3 patch panels are high-density panels with 25 and 50 ports. The panels meet all electrical parameters for Category 3 and are designed for termination of two pair telecommunication cables in Krone termination blocks. Their printed circuit board design together with solid quality components ensures the Category 3 performance. Integrated back cable management for separate cables provides organized and secure installation. All ports are numbered. Signamax ISDN patch panels are available in 1U height and grey colour (RAL 7035).

ISDN25

ISDN50

SPECIFICATIONS

Number of Ports: 25 and 50 x RJ45
Life Cycle: 750 plug insertions
Contact Material: 15µ gold and 100µ nickel
IDC Block: Krone 4p4c and 8p8c
IDC Block Life Cycle: 200 terminations
Wire: AWG 26-22
Other Material: FR according to UL94V-0
Colour: Grey
Units: 1U
Height: 44 mm
Width: 484 mm
Depth: 129 mm
Storage Temperature: -40° – 70°C
Operation Temperature: -10° – 60°C
Max. Humidity Operation: 93%

Category 3 Shielded Patch Panels

PART NO.	DESCRIPTION	RACK SPACE
ISDN25	25-Port Category 3 ISDN Patch Panel	1U
ISDN50	50-Port Category 3 ISDN Patch Panel	1U

SIGNAMAX™
CONNECTIVITY SYSTEMS

S-FTP Category 6A Patch Cords

Signamax shielded Category 6A patch cords with high-quality RJ45 connectors are assembled by using an individually shielded pairs patch cable. The high quality plugs are plated by gold over nickel on polished bronze for up to 2,500 plug cycles. The Category 6A halogen-free patch cables are available in 0.5 m, 1 m, 2 m, 3 m, 5 m, 7 m, and 10 m lengths and in grey colour. Protection provided by rubber boots prevents pair-to-pair disturbance inside the body of the connector and increases performance of the patch cable.

C6A-315GY

S-FTP Category 6A Patch Cords

LENGTH	GREY
0.5 m	C6A-315GY-0.5MB
1 m	C6A-315GY-1MB
2 m	C6A-315GY-2MB
3 m	C6A-315GY-3MB
5 m	C6A-315GY-5MB
7 m	C6A-315GY-7MB
10 m	C6A-315GY-10MB

Other lengths or colours are available on request.

S-FTP Category 6 Patch Cords

Signamax shielded Category 6 patch cords with durable Category 6 plugs are assembled using an AWG 26 individually shielded four-pair patch cable. The high-quality Category 6 connectors are plated by gold over nickel on polished bronze for up to 2,500 plug cycles. These patch cords easily exceed the ANSI/TIA/EIA 568C.2, ISO/IEC 11801, and EN 50173 standards. They are available in various lengths and colours with PVC jacket.
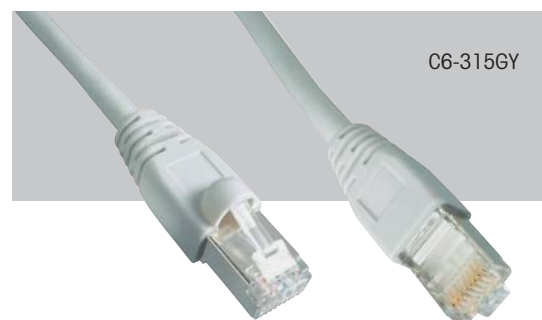
C6-315GY

S-FTP Category 6 Patch Cords

LENGTH	GREY	GREEN	BLUE	RED	YELLOW
0.5 m	C6-315GY-0.5MB	C6-315GR-0.5MB	C6-315BU-0.5MB	C6-315RD-0.5MB	C6-315YE-0.5MB
1 m	C6-315GY-1MB	C6-315GR-1MB	C6-315BU-1MB	C6-315RD-1MB	C6-315YE-1MB
2 m	C6-315GY-2MB	C6-315GR-2MB	C6-315BU-2MB	C6-315RD-2MB	C6-315YE-2MB
3 m	C6-315GY-3MB	C6-315GR-3MB	C6-315BU-3MB	C6-315RD-3MB	C6-315YE-3MB
5 m	C6-315GY-5MB	C6-315GR-5MB	C6-315BU-5MB	C6-315RD-5MB	C6-315YE-5MB
7 m	C6-315GY-7MB	C6-315GR-7MB	C6-315BU-7MB	C6-315RD-7MB	C6-315YE-7MB
10 m	C6-315GY-10MB	C6-315GR-10MB	C6-315BU-10MB	C6-315RD-10MB	C6-315YE-10MB

Other lengths, colours or halogen free patch cables are available on request.

S-FTP Category 5E Patch Cords

Signamax shielded Category 5E patch cords are very flexible and reliable products that are produced using an AWG 26 double shielded patch cable. They easily comply with the ANSI/TIA/EIA 568C.2, ISO/IEC 11801, and EN 50173 performance specifications. Protection provided by molded boots prevents pair-to-pair disturbance inside the body of the connector and increases performance of the patch cable. Similarly to other Signamax patch cords, the shielded Category 5E patch cables are available in various lengths and colours with PVC jacket.
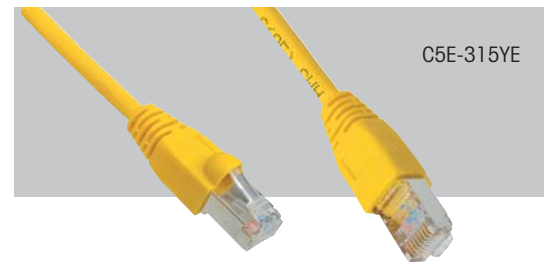
C5E-315YE

S-FTP Category 5E Patch Cords

LENGTH	GREY	GREEN	BLUE	RED	YELLOW
0.5 m	C5E-315GY-0.5MB	C5E-315GR-0.5MB	C5E-315BU-0.5MB	C5E-315RD-0.5MB	C5E-315YE-0.5MB
1 m	C5E-315GY-1MB	C5E-315GR-1MB	C5E-315BU-1MB	C5E-315RD-1MB	C5E-315YE-1MB
2 m	C5E-315GY-2MB	C5E-315GR-2MB	C5E-315BU-2MB	C5E-315RD-2MB	C5E-315YE-2MB
3 m	C5E-315GY-3MB	C5E-315GR-3MB	C5E-315BU-3MB	C5E-315RD-3MB	C5E-315YE-3MB
5 m	C5E-315GY-5MB	C5E-315GR-5MB	C5E-315BU-5MB	C5E-315RD-5MB	C5E-315YE-5MB
7 m	C5E-315GY-7MB	C5E-315GR-7MB	C5E-315BU-7MB	C5E-315RD-7MB	C5E-315YE-7MB
10 m	C5E-315GY-10MB	C5E-315GR-10MB	C5E-315BU-10MB	C5E-315RD-10MB	C5E-315YE-10MB
15 m	C5E-315GY-15MB	C5E-315GR-15MB	C5E-315BU-15MB	C5E-315RD-15MB	C5E-315YE-15MB
20 m	C5E-315GY-20MB	C5E-315GR-20MB	C5E-315BU-20MB	C5E-315RD-20MB	C5E-315YE-20MB

Other lengths, colours or halogen free patch cables are available on request.

UTP Category 6 Patch Cords

Signamax continues to set the standard for high performance patch cords. These Category 6 patch cables are manufactured to the strictest performance requirements as specified in the ANSI/TIA/EIA 568C.2, ISO/IEC 11801, and EN 50173 using the highest-level connector design and cable construction. Signamax category 6 PVC patch cords incorporate slim-profile boots which protect the plug latch and a flexible cable strain relief.

C6-114GY

UTP Category 6 Patch Cords

LENGTH	GREY	GREEN	BLUE	RED	YELLOW
0.5 m	C6-114GY-0.5MB	C6-114GR-0.5MB	C6-114BU-0.5MB	C6-114RD-0.5MB	C6-114YE-0.5MB
1 m	C6-114GY-1MB	C6-114GR-1MB	C6-114BU-1MB	C6-114RD-1MB	C6-114YE-1MB
2 m	C6-114GY-2MB	C6-114GR-2MB	C6-114BU-2MB	C6-114RD-2MB	C6-114YE-2MB
3 m	C6-114GY-3MB	C6-114GR-3MB	C6-114BU-3MB	C6-114RD-3MB	C6-114YE-3MB
5 m	C6-114GY-5MB	C6-114GR-5MB	C6-114BU-5MB	C6-114RD-5MB	C6-114YE-5MB
7 m	C6-114GY-7MB	C6-114GR-7MB	C6-114BU-7MB	C6-114RD-7MB	C6-114YE-7MB
10 m	C6-114GY-10MB	C6-114GR-10MB	C6-114BU-10MB	C6-114RD-10MB	C6-114YE-10MB

Other lengths, colours or halogen free patch cables are available on request.

SIGNAMAX™
CONNECTIVITY SYSTEMS

UTP Category 5E Patch Cords

Signamax unshielded Category 5E patch cables with high-quality connectors are assembled using an AWG 26 patch cable. Their reliable RJ45 plugs are plated by gold over nickel on polished bronze for up to 2,500 plug cycles. All patch cords use a special new connector design that assures maximum pair twist for unparalleled transmission performance and signal integrity. The Signamax unshielded Category 5E patch cables are available in various lengths and colours with PVC jacket.


C5E-114RD

UTP Category 5E Patch Cords

LENGTH	GREY	GREEN	BLUE	RED	YELLOW
0.5 m	C5E-114GY-0.5MB	C5E-114GR-0.5MB	C5E-114BU-0.5MB	C5E-114RD-0.5MB	C5E-114YE-0.5MB
1 m	C5E-114GY-1MB	C5E-114GR-1MB	C5E-114BU-1MB	C5E-114RD-1MB	C5E-114YE-1MB
2 m	C5E-114GY-2MB	C5E-114GR-2MB	C5E-114BU-2MB	C5E-114RD-2MB	C5E-114YE-2MB
3 m	C5E114GY-3MB	C5E-114GR-3MB	C5E-114BU-3MB	C5E-114RD-3MB	C5E-114YE-3MB
5 m	C5E-114GY-5MB	C5E-114GR-5MB	C5E-114BU-5MB	C5E-114RD-5MB	C5E-114YE-5MB
7 m	C5E-114GY-7MB	C5E-114GR-7MB	C5E-114BU-7MB	C5E-114RD-7MB	C5E-114YE-7MB
10 m	C5E-114GY-10MB	C5E-114GR-10MB	C5E-114BU-10MB	C5E-114RD-10MB	C5E-114YE-10MB
15 m	C5E-114GY-15MB	C5E-114GR-15MB	C5E-114BU-15MB	C5E-114RD-15MB	C5E-114YE-15MB
20 m	C5E-114GY-20MB	C5E-114GR-20MB	C5E-114BU-20MB	C5E-114RD-20MB	C5E-114YE-20MB

Other lengths, colours or halogen free patch cables are available on request.

UTP Category 5E and 6 Flat Patch Cords

Signamax Category 5E and Category 6 flat patch cords are high-quality products where emphasis was put on their slim and flat design. These patch cords are manufactured to provide maximum space efficiency and highest patch cable management comfort in data racks. As all other Signamax patch cords, they also easily comply with the ANSI/TIA/EIA 568C.2, ISO/IEC 11801, and EN 50173 standards. The flat patch cords are available with LSOH jacket and in grey colour (RAL 7035).
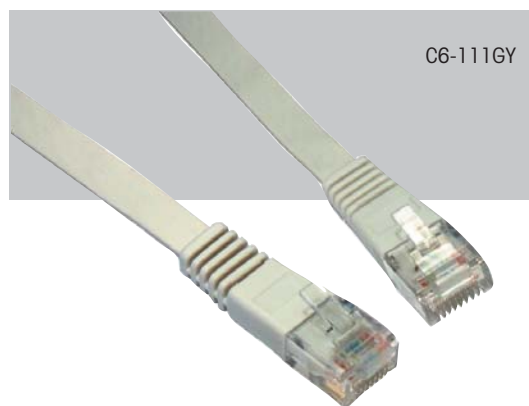
C6-111GY

UTP Category 6 and Category 5E Flat Patch Cords

LENGTH	CAT 6 GREY	CAT 5E GREY
0.5 m	C6-111GY-0.5MB	C5E-111GY-0.5MB
1 m	C6-111GY-1MB	C5E-111GY-1MB
2 m	C6-111GY-2MB	C5E-111GY-2MB
3 m	C6-111GY-3MB	C5E-111GY-3MB
5 m	C6-111GY-5MB	C5E-111GY-5MB
7 m	C6-111GY-7MB	C5E-111GY-7MB
10 m	C6-111GY-10MB	C5E-111GY-10MB

Other lengths or colours are available on request.

T-Adapters and Testers

When installing a cabling system, checking for open or short circuits is always an important requirement. Signamax remote cable testers answer the need for testing the T568A/T568B wire schemes as well as help to identify open or short circuits faults for all types of cabling, both UTP and STP.

E079X

Remote Cable Tester with USB Port and T-Adapters

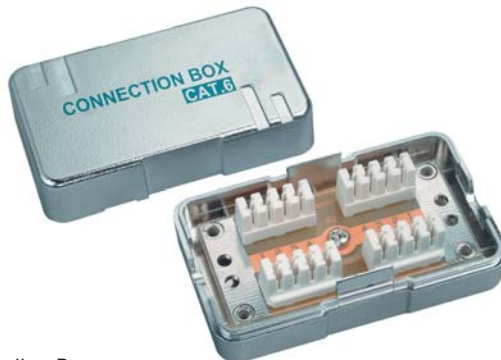| PART NO	DESCRIPTION
E097X	Remote Cable Tester with USB Port
TA-V1	T-Adapter for Splitting 4-Pair Port to 10BaseT and Telephone Ports
TA-V2	T-Adapter for Splitting 4-Pair Port to Two 10BaseT Ports
TA-V3	T-Adapter for Splitting 4-Pair Port to Two Telephone Ports

T-Adapters must be used in pairs.

TA-V1

Couplers and Connection Boxes

Signamax couplers and connection boxes allow a simple operation with installation cables, which can be easily extended. Broken cables can be coupled with no need to install new complete cable segment. Connection boxes can be used for all standard 4- to 8-wire installation cables of AWG 26-22 up to 10 mm outer diameter.

KRJ45-VEB6

KRJS45-VEB6

KRJ45/5S-SH

Couplers and Connection Boxes

PART NO	DESCRIPTION
KRJ45-S	Coupler RJ45 8p8c, Category 5E, Unshielded
KRJ45-VEBB	Coupler RJ45 8p8c, Category 5E, Shielded
KRJ45/5S	Panel Mount Feed-Thru Coupler RJ45 8p8c, Category 5E, Unshielded
KRJ45/5S-SH	Panel Mount Feed-Thru Coupler RJ45 8p8c, Category 5E, Shielded
KRJ45-VEB5	Connection Box LSA+, Category 5E, Unshielded
KRJS45-VEB5	Connection Box LSA+, Category 5E, Shielded
KRJ45-VEB6	Connection Box LSA+, Category 6, Unshielded
KRJS45-VEB6	Connection Box LSA+, Category 6, Shielded

S-STP Category 7 and 7A Installation Cables

Signamax double shielded installation cables comply with the most stringent Category 7/Class F and Category 7A/Class F_A specifications. Selected design goes hand-in-hand with the best quality which, with strictly controlled production, guarantees the highest performance. These shielded Category 7 and Category 7A installation cables are produced in S-STP configuration and are tested up to 900 MHz, 1,200 MHz, and 1,500 MHz. Their excellent performance ensures full compatibility with all new high-speed data protocols, such as 10GBaseT. Foamed PE insulated conductors in these Signamax cables have the pairs shielded by aluminum foil and copper braid. Sheath material is supported by fire retardant, low smoke, halogen free, and CPD rated compounds (i.e. LSOH, LSOHFR, CPD b2ca s1 d0). Signamax Category 7 and Category 7A shielded installation cables complies with the latest standards as specified in the EN 50173 and ISO/IEC 11801 documents.
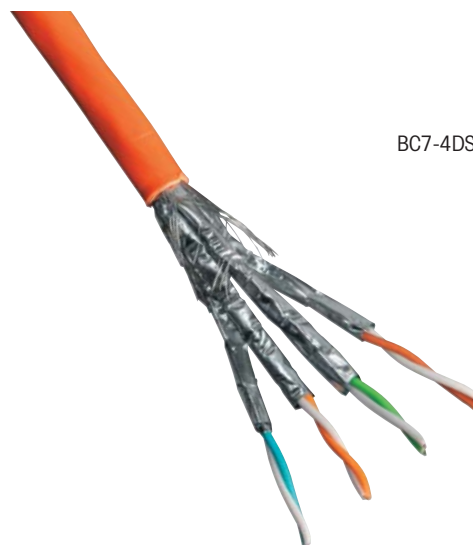
BC7-4DS-HF

Transmission Characteristics acc. to Category 7 (at 20°C)

Frequency (MHz) nom.	Attenuation (dB/100 m)	NEXT (dB)	ACR-N (dB)
10.00	5.8	105	99
16.00	7.1	100	93
20.00	8.0	99	91
31.25	10.0	98	88
62.50	14.7	94	79
100.00	18.5	90	71
300.00	29.0	83	54
600.00	48.7	77	28
750.00	54.0	75	21
900.00	57.0	74	17

SPECIFICATIONS

ELECTRICAL PROPERTIES AT 20°C ±5°C
Loop Resistance: ≤ 165 Ω/km
Resistance Unbalance: ≤ 2%
Insulation Resistance (500 V): ≥ 2,000 MΩ *km
Mutual Capacitance at 800 Hz: 43 nF/km
Capacitance Unbalance (pair/ground): ≤ 1,500 pF/km
Nominal Velocity of Propagation: 79%
Propagation Delay: < 427 ns/100 m
Delay Skew: < 12 ns/100 m

MECHANICAL PROPERTIES
Bending Radius Installation: 8 x outer diameter
Bending Radius Installed: 4 x outer diameter

TEMPERATURE RANGE
During Operation: -20° to +60°C
During Installation: 0° to +50°C

CONSTRUCTION
Conductor 900 MHz: bare copper wire, Ø 0.565 mm
Conductor 1,200 MHz: bare copper wire, Ø 0.58 mm
Conductor 1,500 MHz: bare copper wire, Ø 0.62 mm

FIRE CLASSIFICATION
LSOH: IEC 61034-2, IEC 60754-2, IEC 60332-1-2
LSOHFR: IEC 61034-2, IEC 60754-2,
        IEC 60332-3-24 available on request
CPD: CPD rating b2ca s1 d0 available on request

S-STP Category 7 and Category 7A Installation Cables

PART NO.	DESCRIPTION
BC7-4DS-HF	Category 7 S-STP Installation Cable, 900 MHz, 500 m reel, LSOH
BC7-4DS-HF-CPD	Category 7 S-STP Installation Cable, 900 MHz, 500 m reel, b2ca s1 d0
BC7A-4DS-HF-1200	Category 7A S-STP Installation Cable, 1200 MHz, 500 m reel, LSOH
BC7A-4DS-HF-1500	Category 7A S-STP Installation Cable, 1500 MHz, 500 m reel, LSOH

LSOHFR cables are available on request.

Certificates 10GBaseT CAT7 Cable

Certificate

Customer: **INTELEK spol. s .r.o.**
Vlarska 22
CZ-658 14 Brno, Czech Republic

Description: Modular Jack **Signamax**
10G Shielded Keystone Jack,
Universal Wiring, T568A/B
Part-No.: KJS458-10G

Data Cable **Signamax**
90m Category 7 S-STP Installation Cable, LSOH
Part-No.: BC7-4DS-HF

Applied standards: TIA/EIA-568-B.2-10 (2008-04)
Transmission Performance Specifications for 4-Pair 100 Ω
Augmented Category 6 Cabling (Category 6A)

Results: Up to a bandwidth of **500MHz** the sample, a **2-Connector permanent Link**, meet the limits of the specified standards and regulations.

The test results which were determined in the course of the measurement refer to the submitted specimen. Any future technical modifications of the data cables or connectors are subject to the responsibility of the manufacturer.

This Certificate refers to the comprehensive test report, **no. P1750c-07-E, from June 11th 2008** and shall only be applicable in conjunction with the test report.

Bexbach, June 11th 2008

Dirk Wilhelm, engineer
(Chairman of the Managing Board)

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E-Mail: info@ghmt.de
http://www.ghmt.de

GHMT Aktiengesellschaft

Certificate

Customer: **INTELEK spol. s .r.o.**
Vlarska 22
CZ-658 14 Brno, Czech Republic

Description: Modular Jack **Signamax**
10G Shielded Keystone Jack,
Universal Wiring, T568A/B
Part-No.: KJS458-10G

Patch Cord **Signamax**
2x5m 10G Category 6A S-STP patch cable, grey, 5m
Part-No.: C6A-315GY-5MB

Data Cable **Signamax**
90m Category 7 S-STP Installation Cable, LSOH
Part-No.: BC7-4DS-HF

Applied standards: TIA/EIA-568-B.2-10 (2008-04)
Transmission Performance Specifications for 4-Pair 100 Ω
Augmented Category 6 Cabling (Category 6A)

ISO/IEC 11801 AMD 1 Ed. 2.0 (2008-04)
Information technology – Generic cabling for customer premises

Results: Up to a bandwidth of **500MHz** the sample, a **2-Connector Channel**, meet the limits of the specified standards and regulations.

PS ANEXT and PS AACR-F met by design for Class E_A, because the result of the Coupling Attenuation is better than 50 dB at 30 MHz < f < 100 MHz and 90 -20*log(f) dB at 100 MHz < f < 1.000 MHz. The test results which were determined in the course of the measurement refer to the submitted specimen. Any future technical modifications of the data cables or connectors are subject to the responsibility of the manufacturer.

This Certificate refers to the comprehensive test report, **no. P1754e-07-E, from August 26th 2008** and shall only be applicable in conjunction with the test report.

Bexbach, August 26th 2008

Dirk Wilhelm, engineer
(Chairman of the Managing Board)

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http://www.ghmt.de

GHMT Aktiengesellschaft

Signamax Permanent Link Certificate with BC7-4DS-HF cable

Signamax Channel Certificate with BC7-4DS-HF cable

STP Category 6A Installation Cable

This Signamax cable for Category 6A and Class E_A systems is manufactured to the highest quality standards. It easily exceeds the performance specifications for Category 6A defined in the ANSI/TIA/EIA 568C.2 standard and also for Class E_A defined in the ISO/IEC 11801 Amendment 2.0. The Signamax Category 6A installation cable is designed using high performance materials and special aluminum foil shielding to guarantee maximum reliability. The cable is tested up to 500 MHz and ensures excellent Alien Cross Talk elimination. This Category 6A cable is especially suitable for all new high-speed and high-bandwidth data protocols, such as 10GBaseT. Sheath material is supported by fire retardant, low smoke, and halogen free compounds, both LSOH and LSOHFR. The color of the Signamax Category 6A cable is grey (RAL 7035).

BC6A-4S-HF

Transmission Characteristics acc. to Category 6A (at 20°C)

f (MHz)	Attenuation (dB/100 m)	NEXT (dB)	ACR-N (dB/100 m)	Return loss (dB)
1	1.8	100	98	-
4	3.4	100	97	27
10	5.4	100	95	30
16	6.8	100	93	30
20	7.7	100	92	30
31.2	9.6	100	90	30
62.5	13.7	100	86	30
100	17.4	100	83	30
125	19.5	95	75	26
155	21.9	94	72	26
175	23.3	93	70	25
200	25.0	92	67	25
250	28.1	90	62	24
300	30.9	89	58	25
400	38.3	87	48	23
500	43.0	86	43	23

SPECIFICATIONS

ELECTRICAL PROPERTIES AT 20°C ±5°C
Loop Resistance: ≤ 145 Ω/km
Resistance Unbalance: ≤ 2%
Insulation Resistance (500 V): ≥ 2,000 MΩ *km
Mutual Capacitance at 800 Hz: 45 nF/km
Capacitance Unbalance (pair/ground): ≤ 800 pF/km
Nominal Velocity of Propagation: 75%
Propagation Delay: < 500 ns/100 m
Delay Skew: < 20 ns/100 m

MECHANICAL PROPERTIES
Bending Radius Installation: 8 x outer diameter
Bending Radius Installed: 4 x outer diameter

TEMPERATURE RANGE
During Operation: -20° to +60°C
During Installation: 0° to +50°C

CONSTRUCTION
Conductor: bare copper wire, Ø 0.565 mm (AWG 23)
Insulation: PE, Ø 1.4 mm

FIRE CLASSIFICATION
LSOH: IEC 61034-2, IEC 60754-2, IEC 60332-1-2
LSOHFR: IEC 61034-2, IEC 60754-2,
              IEC 60332-3-24 available on request

STP Category 6A Installation Cable

PART NO.	DESCRIPTION
BC6A-4S-HF	Category 6A STP Installation Cable, 500 m reel, LSOH

LSOHFR cable is available on request.

Certificates 10GBaseT CAT6A Cable

Certificate

Customer: INTELEK spol. s .r.o.
Vlarska 22
CZ-658 14 Brno

Description: Data Cable: 90m

Signamax
Category 6A STP Installation Cable, LSOH
Part-no.: BC6A-4S-HF

Module:

Signamax
Category 6A Shielded Keystone Jack,
Universal Wiring, T568A/B
Part-no.: KJS458-10G

Applied standards: 1st FPDAM 2 to ISO/IEC 11801
Amendment 2 (2008-11):
Information technology – Generic cabling for customer premises

TIA/EIA-568-B.2-10 (2008-04)
Transmission performance specifications for 4-pair 100 Ω
augmented category 6 cabling (Category 6A)

Results: Up to a bandwidth of **500MHz** the sample, a **Permanent Link with the length of 90m**, meet the **Class E$_A$** limits of the specified standards and regulations.

PS ANEXT and PS AACR-F met by design for Class E$_A$, because the result of the Coupling Attenuation is better than 50 dB at 30 MHz < f < 100 MHz and 90 -20*log(f) dB at 100 MHz < f < 1.000 MHz. The test results which were determined in the course of the measurement refer to the submitted specimen. Any future technical modifications of the data cables or connectors are subject to the responsibility of the manufacturer.

This Certificate refers to the comprehensive test report, no. P2072a-09-E, from June 19th 2009 and shall only be applicable in conjunction with the test report.

Bexbach, June 19th 2009

Dirk Wilhelm, engineer
(Chairman of the Managing Board)

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E-Mail: info@ghmt.de
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GHMT Aktiengesellschaft

Signamax Permanent Link Certificate with BC6A-4S-HF cable

Certificate

Customer: INTELEK spol. s .r.o.
Vlarska 22
CZ-658 14 Brno

Description: Module:

Signamax
Category 6A Shielded Keystone Jack,
Universal Wiring, T568A/B
Part-no.: KJS458-10G

Data Cable: 90m

Signamax
Category 6A STP Installation Cable, LSOH
Part-no.: BC6A-4S-HF

Patchcord: 2x5m

Signamax
Category 6A S-STP Patch Cable, Grey
Part-no.: C6A-315GY-5MB

Applied standards: ISO/IEC 11801 Amendment 1 (2008-04)
Information technology – Generic cabling for customer premises

ISO/IEC TR-24750 (2007-07) Assessment and mitigation of installed balanced cabling channels in order to support 10GBASE-T

ANSI/TIA-568-B.2-10 (2008-03)
Transmission performance specifications for 4-pair 100 Ω Augmented category 6 cabling

ANSI/TIA-TSB-155 (2007-03)
Additional guidelines for 4-pair 100 Ω category 6 cabling for 10GBase-T

IEEE 802.3an TM-2006
Local and Metropolitan Area Networks (10 GBASE-T)

Results: Up to a bandwidth of **500MHz** the sample, a **Channel**, meet the **Class E$_A$** limits of the specified standards and regulations.

PS ANEXT and PS AACR-F met by design for Class E$_A$, because the result of the Coupling Attenuation is better than 50 dB at 30 MHz < f < 100 MHz and 90 -20*log(f) dB at 100 MHz < f < 1.000 MHz. The test results which were determined in the course of the measurement refer to the submitted specimen. Any future technical modifications of the data cables or connectors are subject to the responsibility of the manufacturer.

This Certificate refers to the comprehensive test report, **no. P2073a-09-E, from June 19th 2009** and shall only be applicable in conjunction with the test report.

Bexbach, June 19th 2009

Dirk Wilhelm, engineer
(Chairman of the Managing Board)

GHMT AG
In der Kolling 13
D-66450 Bexbach
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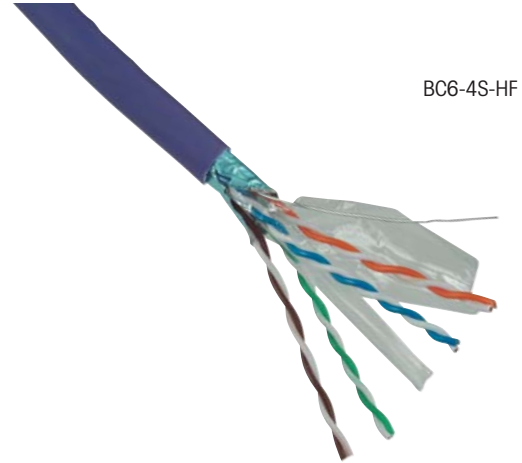http://www.ghmt.de

GHMT Aktiengesellschaft

Signamax Channel Certificate with BC6A-4S-HF cable

FTP Category 6 Installation Cables

Signamax Category 6 shielded installation cables are high-performace data cables that are designed to meet the demands of today's most advanced voice and data networks. Category 6 cables support 1000BaseT/TX protocols for data rates up to 1 Gb/s and exceed the requirements of the ANSI/TIA/EIA 568C.2, ISO/IEC 11801, and EN 50173 standards. The Signamax Category 6 cable conductor is AWG 23 bare copper wire with high density polyethylene insulation. The non-metallic cross separator inside the cable ensures the best crosstalk elimination between individual pairs. Sheath material is supported by both PVC and LSOH compounds. The colour of PVC jacket is grey (RAL 7035), LSOH jacket is purple (RAL 4005).

BC6-4S-HF

Transmission Characteristics acc. to Category 6 (at 20°C)

Frequency (MHz)	Attenuation nom. (dB/100 m)		NEXT (dB)		ACR-N (dB/100 m)		Return loss (dB)
	max.	nom.	min.	nom.	min.	nom.	min.
1	2	2	74	90	71.8	88	23
4	3.8	3.8	65	89	61.2	85.2	23
10	6	6	59	89	53	82.8	23
16	7.6	7.6	56	86	48.4	78.1	23
20	8.5	8.5	55	84	46.5	75.8	23
31.2	10.7	10.7	52	81	41.3	70.7	23
62.5	15.5	15.1	47	77	31.5	61.8	23
100	19.9	19.1	44	74	24.1	54.7	23
125	22.5	21.3	43	72	20.5	51	21
155.5	25.4	23.8	42	71	16.6	47.1	21
175	27.1	25.3	41	70	13.9	44.9	21
200	29.2	27	40	69	10.8	42.3	21
250	33	32.6	38	68	5	35.2	19

FTP Category 6 Installation Cables

PART NO.	DESCRIPTION
BC6-4S	Category 6 FTP Installation Cable, 500 m reel, PVC
BC6-4S-HF	Category 6 FTP Installation Cable, 500 m reel, LSOH

SPECIFICATIONS

ELECTRICAL PROPERTIES AT 20°C ±5°C
Loop Resistance: ≤ 145 Ω/km
Resistance Unbalance: ≤ 2%
Insulation Resistance (500 V): ≥ 2,000 MΩ *km
Mutual Capacitance at 800 Hz: 45 nF/km
Capacitance Unbalance (pair/ground): ≤ 800 pF/km
Nominal Velocity of Propagation: 69%
Propagation Delay: < 535 ns/100 m
Delay Skew: < 20 ns/100 m

MECHANICAL PROPERTIES
Bending Radius Installation: 8 x outer diameter
Bending Radius Installed: 4 x outer diameter

TEMPERATURE RANGE
During Operation: -20° to +60°C
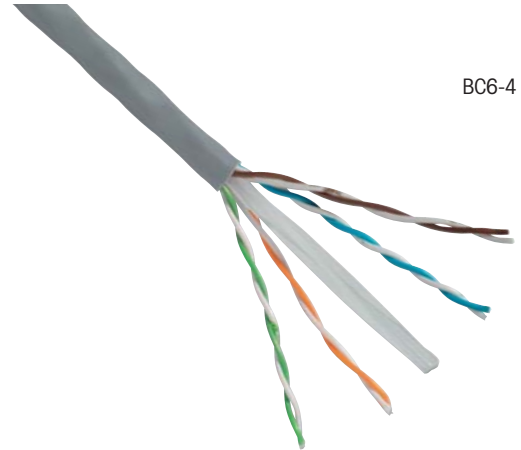During Installation: 0° to +50°C

CONSTRUCTION
Conductor: bare copper wire, Ø 0.565 mm (AWG 23)
Insulation: PE, Ø 1.09 mm

FIRE CLASSIFICATION
LSOH: IEC 61034-2, IEC 60754-2, IEC 60332-1-2

UTP Category 6 Installation Cables

Both Signamax Category 6 unshielded installation cables are carefully manufactured to provide the highest level of transmission performance to meet the needs of today`s most advanced networks. Category 6 cables support 10BaseT through 1000BaseT/TX protocols for data rates up to 1 Gb/s and exceed the requirements of the ANSI/TIA/EIA 568C.2, ISO/IEC 11801, and EN 50173 standards. The cable conductor is AWG 23 bare copper wire with high density polyethylene insulation. The non-metallic cross separator inside the Signamax unshielded Category 6 cables ensures the best crosstalk elimination between individual pairs. Sheath material is supported by both PVC and LSOH compounds. The colour of PVC jacket is grey (RAL 7035), LSOH jacket is purple (RAL 4005).

BC6-4

Transmission Characteristics acc. to Category 6 (at 20°C)

Frequency (MHz)	Attenuation nom. (dB/100 m)		NEXT (dB)		ACR-N (dB/100 m)		Return loss (dB)
	max.	nom.	min.	nom.	min.	nom.	min.
1	2	2	74	90	71.8	88	23
4	3.8	3.8	65	89	61.2	85.2	23
10	6	6	59	89	53	82.8	23
16	7.6	7.6	56	86	48.4	78.1	23
20	8.5	8.5	55	84	46.5	75.8	23
31.2	10.7	10.7	52	81	41.3	70.7	23
62.5	15.5	15.1	47	77	31.5	61.8	23
100	19.9	19.1	44	74	24.1	54.7	23
125	22.5	21.3	43	72	20.5	51	21
155.5	25.4	23.8	42	71	16.6	47.1	21
175	27.1	25.3	41	70	13.9	44.9	21
200	29.2	27	40	69	10.8	42.3	21
250	33	32.6	38	68	5	35.2	19

SPECIFICATIONS

ELECTRICAL PROPERTIES AT 20°C ±5°C
Loop Resistance: ≤ 145 Ω/km
Resistance Unbalance: ≤ 2%
Insulation Resistance (500 V): ≥ 2,000 MΩ *km
Mutual Capacitance at 800 Hz: 45 nF/km
Capacitance Unbalance (pair/ground): ≤ 800 pF/km
Nominal Velocity of Propagation: 69%
Propagation Delay: < 535 ns/100 m
Delay Skew: < 20 ns/100 m

MECHANICAL PROPERTIES
Bending Radius Installation: 8 x outer diameter
Bending Radius Installed: 4 x outer diameter

TEMPERATURE RANGE
During Operation: -20° to +60°C
During Installation: 0° to +50°C

CONSTRUCTION
Conductor: bare copper wire, Ø 0.565 mm (AWG 23)
Insulation: PE, Ø 1.02 mm

FIRE CLASSIFICATION
LSOH: IEC 61034-2, IEC 60754-2, IEC 60332-1-2

UTP Category 6 Installation Cables

PART NO.	DESCRIPTION
BC6-4	Category 6 UTP Installation Cable, 500 m reel, PVC
BC6-4HF	Category 6 UTP Installation Cable, 500 m reel, LSOH

FTP Category 5E Installation Cables

Signamax Category 5E shielded installation cables are reliable data cables for transmission situations where electromagnetic disturbance could cause a problem. These shielded Signamax cables represent one of the key elements for safety and economical data transfers. Their sophisticated design ensures very low electromagnetic emitency and low crosstalk. All parameters exceed requirements specified by the ANSI/TIA/EIA 568C.2, ISO/IEC 11801, and EN 50173 performance standards. Signamax Category 5E cables are suitable for the high-speed 1000BaseT Ethernet protocol. The cable conductor is AWG24 bare copper wire with high density polyethylene insulation. Sheath material is supported by both PVC and LSOH compounds. The colour of PVC jacket is grey (RAL 7035), LSOH jacket is purple (RAL 4005).
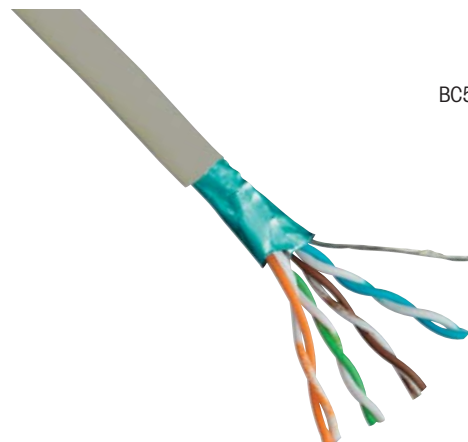
BC5E-4S

Transmission Characteristics acc. to Category 5E (at 20°C)

Frequency (MHz)	Attenuation nom. (dB/100 m)		NEXT (dB)		ACR-N (dB/100 m)		Return loss (dB)
	max.	nom.	min.	nom.	min.	nom.	min.
1	2	2	74	90	71.8	88	23
4	3.8	3.8	65	89	61.2	85.2	23
10	6	6	59	89	53	82.8	23
16	7.6	7.6	56	86	48.4	78.1	23
20	8.5	8.5	55	84	46.5	75.8	23
31.2	10.7	10.7	52	81	41.3	70.7	23
62.5	15.5	15.1	47	77	31.5	61.8	23
100	19.9	19.1	44	74	24.1	54.7	23

FTP Category 5E Installation Cables

PART NO.	DESCRIPTION
BC5E-4S	Category 5E FTP Installation Cable, 305 m box, PVC
BC5E-4S-HF	Category 5E FTP Installation Cable, 305 m box, LSOH

SPECIFICATIONS

ELECTRICAL PROPERTIES AT 20°C ±5°C
Loop Resistance: $\leq$ 190 Ω/km
Resistance Unbalance: $\leq$ 2%
Insulation Resistance (500 V): $\geq$ 2,000 MΩ *km
Mutual Capacitance at 800 Hz: 48 nF/km
Capacitance Unbalance (pair/ground): $\leq$ 800 pF/km
Nominal Velocity of Propagation: 67%
Propagation Delay: < 535 ns/100 m
Delay Skew: < 20 ns/100 m

MECHANICAL PROPERTIES
Bending Radius Installation: 8 x outer diameter
Bending Radius Installed: 4 x outer diameter

TEMPERATURE RANGE
During Operation: -20° to +60°C
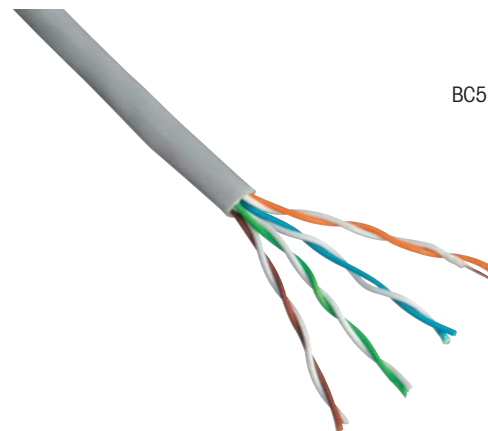During Installation: 0° to +50°C

CONSTRUCTION
Conductor: bare copper wire, Ø 0.50 mm (AWG 24)
Insulation: PE, Ø 1.0 mm

FIRE CLASSIFICATION
LSOH: IEC 61034-2, IEC 60754-2, IEC 60332-1-2

UTP Category 5E Installation Cables

Signamax Category 5E unshielded installation cables are suitable for data transmissions of the 10BaseT, 100BaseT, and 1000BaseT protocols. Supplied as a part of complete Signamax Category 5E solution, these cables represent one of the key elements for safety and economical data transfers. All parameters exceed requirements specified by ANSI/TIA/EIA 568C.2, ISO/IEC 11801, and EN 50173 performance standards. The cable conductor is AWG24 bare copper wire with high density polyethylene insulation. Sheath material is supported by both PVC and LSOH compounds. The colour of PVC jacket is grey (RAL 7035), LSOH jacket is purple (RAL 4005).

BC5E-4

Transmission Characteristics acc. to Category 5E (at 20°C).

Frequency (MHz)	Attenuation nom. (dB/100 m)		NEXT (dB)		ACR-N (dB/100 m)		Return loss (dB)
	max.	nom.	min.	nom.	min.	nom.	min.
1	2	2	74	90	71.8	88	23
4	3.8	3.8	65	89	61.2	85.2	23
10	6	6	59	89	53	82.8	23
16	7.6	7.6	56	86	48.4	78.1	23
20	8.5	8.5	55	84	46.5	75.8	23
31.2	10.7	10.7	52	81	41.3	70.7	23
62.5	15.5	15.1	47	77	31.5	61.8	23
100	19.9	19.1	44	74	24.1	54.7	23

UTP Category 5E Installation Cables

PART NO.	DESCRIPTION
BC5E-4	Category 5E UTP Installation Cable, 305 m box, PVC
BC5E-4HF	Category 5E UTP Installation Cable, 305 m box, LSOH

SPECIFICATIONS

ELECTRICAL PROPERTIES AT 20°C ±5°C
Loop Resistance: ≤ 190 Ω/km
Resistance Unbalance: ≤ 2%
Insulation Resistance (500 V): ≥ 2,000 MΩ *km
Mutual Capacitance at 800 Hz: 48 nF/km
Capacitance Unbalance (pair/ground): ≤ 800 pF/km
Nominal Velocity of Propagation: 67%
Propagation Delay: < 535 ns/100 m
Delay Skew: < 20 ns/100 m

MECHANICAL PROPERTIES
Bending Radius Installation: 8 x outer diameter
Bending Radius Installed: 4 x outer diameter

TEMPERATURE RANGE
During Operation: -20° to +60°C
During Installation: 0° to +50°C

CONSTRUCTION
Conductor: bare copper wire, Ø 0.50 mm (AWG 24)
Insulation: PE, Ø 0.88 mm

FIRE CLASSIFICATION
LSOH: IEC 61034-2, IEC 60754-2, IEC 60332-1-2

SIGNAMAX™
CONNECTIVITY SYSTEMS

PREMISE CONNECTIVITY SYSTEMS

Fiber Optics

SIGNAMAX™
CONNECTIVITY SYSTEMS

Optical Fiber Performance

Loose Buffer Tube

Fiber Type	Multimode Fibers								
	Optical Performance						Dimensions		
	Attenaution (typ. / max.) (dB/km)		Bandwidth (MHz/km)		1 GbE Lenght (m)		"Core Diameter" (µm)	"Cladding Diameter" (µm)	"Coating Diameter" (µm)
	850 nm	1,300 nm	850 nm	1,300 nm	850 nm	1,300 nm			
MM 62,5 / 125 OM1	2.7 / 3.2	0.6 / 1.1	220	600	300	550	62.5 ±2.5	125 ±1.0	245 ±10
MM 50 / 125 OM2	2.3 / 2.8	0.6 / 0.9	600	1,200	600	600	50 ±2.5	125 ±1.0	245 ±10
MM 50 / 125 OM3	- / 3.0	- / 1.0	1,500	500	300*	-	50 ±2.5	125 ±1.0	245 ±10
MM 50 / 125 OM4	- / 3.0	- / 1.0	3,500	500	550*	-	50 ±2.5	125 ±1.0	245 ±10

* 10 Gbps Ethernet

Fiber Type	Singlemode Fibers							
	Optical Performance				Dimensions			
	Attenaution (typ. / max.) (dB/km)		Chromatic Dispersion ps (nm/km)		Mode Field Diameter (µm)		"Cladding Diameter" (µm)	"Coating Diameter" (µm)
	1, 310 nm	1,550 nm	1,310 nm	1,550 nm	1,310 nm	1,550 nm		
SM 9 / 125 G.652D	0.35	0.24	3.5	18.0	9.2 ±0.4	10.4 ±0.4	125 ±0.7	245 ±10
SM 9 / 125 G.657A	0.35	0.24	3.5	18.0	8.9 ±0.4	10.0 ±0.5	125 ±0.7	245 ±10

Tight Buffer

Fiber Type	Multimode Fibers								
	Optical Performance						Dimensions		
	Attenaution (typ. / max.) (dB/km)		Bandwidth (MHz/km)		1 GbE Lenght (m)		"Core Diameter" (µm)	"Cladding Diameter" (µm)	"Coating Diameter" (µm)
	850 nm	1,300 nm	850 nm	1,300 nm	850 nm	1,300 nm			
MM 62,5 / 125 OM1	2.8 / 3.3	0.7 / 1.2	220	600	300	550	62.5 ±2.5	125 ±1.0	245 ±10
MM 50 / 125 OM2	2.3 / 2.8	0.6 / 0.9	600	1,200	600	600	50 ±2.5	125 ±1.0	245 ±10
MM 50 / 125 OM3	- / 3.2	- / 1.1	1,500	500	300*	-	50 ±2.5	125 ±1.0	245 ±10
MM 50 / 125 OM4	- / 3.2	- / 1.1	3,500	500	550*	-	50 ±2.5	125 ±1.0	245 ±10

* 10 Gbps Ethernet

Fiber Type	Singlemode Fibers							
	Optical Performance				Dimensions			
	Attenaution (typ. / max.) (dB/km)		Chromatic Dispersion ps (nm/km)		Mode Field Diameter (µm)		"Cladding Diameter" (µm)	"Coating Diameter" (µm)
	1, 310 nm	1,550 nm	1,310 nm	1,550 nm	1,310 nm	1,550 nm		
SM 9 / 125 G.652D	0.33 / 0.5	0.25 / 0.4	3.5	18.0	9.2 ±0.4	10.4 ±0.4	125 ±0.7	245 ±10
SM 9 / 125 G.657A	0.32 / 0.5	0.25 / 0.4	3.5	18.0	8.9 ±0.4	10.0 ±0.5	125 ±0.7	245 ±10

FO Cables—Uni Distribution

Signamax Tight Buffered internal/external fiber optic cables are suitable for fiber backbones in riser & horizontal configurations or for direct terminations made on-site. From 4 to 24-core cables feature a single unit of colour coded 900 μm buffered fibers.

BENEFITS
- Choice of fiber types
- Colour coded fibers
- High strength E-Glass rodent resistant yarn strength members for ease of handling
- LSZH jacket
- Easy to strip

APPLICATIONS
- Internal cable for installation in trunking, under floor or ceiling spaces
- Fiber backbones in riser and horizontal configurations

LSZH Jacket

E-Glass Strength Member

Multi Coloured Tight Buffer Fibre

Technical Specifications

DESCRIPTION	4-CORE LSZH	8-CORE LSZH	12-CORE LSZH	24-CORE LSZH
Outer Diameter (mm)	4.8 ±0.3	5.8 ±0.3	6.5 ±0.3	7.5 ±0.3
Weight (kg/km)	26	34	40	61
Max. Load (installation) (N)	600	750	750	900
Max. Load (installed) (N)	300	375	375	450
Min. Bend Radius (installation) (mm)	96	116	130	150
Min. Bend Radius (installed) (mm)	48	58	65	75
Fire Performance	IEC 60332-1			
Operating Temp. (°C)	-20 to +60	-20 to +60	-20 to +60	-20 to +60
Storage Temp. (°C)	-20 to +60	-20 to +60	-20 to +60	-20 to +60
Installation Temp.	-5 to +40	-5 to +40	-5 to +40	-5 to +40
Crush Resistance (N/10 cm)	1,000	1,000	1,000	1,000

FEATURES	
OS1	✓
OM1	✓
OM2	✓
OM3	✓
OM4	✓
Internal Use	✓
External Use	✓
Fire Retardant	✓
Water Resistant	✗
Rodent Resistant	✓
Armored	✗

Uni Distribution Cables Parameters

| FIBRE GRADE		CONSTRUCTION	JACKET	FIBER COUNT
OM1	62.5/125, MM	TB = Tight Buffered	LSZH	4 core
OM2	50/125, MM			8 core
OM3	50/125, MM enh			12 core
OM4	50/125, MM 10G+			24 core
OS1	09/125, SM			

FO Cables—Central Loose Tube

Signamax Central Loose Tube cables are suitable for internal and external duct (or lashed aerial with catenary) use, ideal for campus links without the need for transition cable splicing and on-site fiber splicing. The cables consist of 2 to 24, 250μm optical fibers in central gel filled loose tube with e-glass non metallic strength members and black PE or LSZH jacket with ripcord.

BENEFITS
- Choice of fiber types
- Colour coded fibers
- E-glass strength members for rodent resistance
- Flame retardant LSZH jacket option for enhanced fire performance
- Compact 250 μm loose tube construction

APPLICATIONS
- Suitable for internal / external duct applications
- Ideal for intra building links in campus environments

Optical Fibres
Water Repellent Thixotropic Gel
PBT Loose Tube
e-glass Strength Member
PE/LSZH Jacket
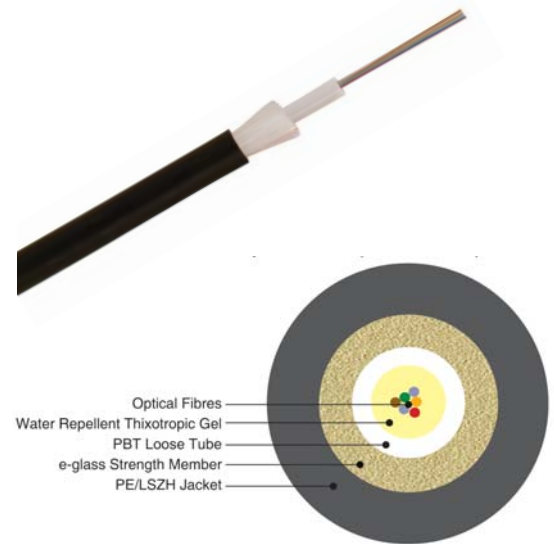
Technical Specifications

DESCRIPTION (UNIT)	4-CORE LSZH/PE	8-CORE LSZH/PE	12-CORE LSZH/PE	24-CORE LSZH/PE
Outer Diameter (mm)	6.5 ±0.3	6.5 ±0.3	6.5 ±0.3	6.7 ±0.3
Weight (kg/km)	40	40	40	47
Max. Load (installation) (N)	1,000	1,000	1,000	1,000
Max. Load (installed) (N)	500	500	500	500
Min. Bend Radius (installation) (mm)	20	20	20	20
Min. Bend Radius (installed) (mm)	10	10	10	10
Fire Performance	IEC 60332-1			
Operating Temp. (°C)	-20 to +60	-20 to +60	-20 to +60	-20 to +60
Storage Temp. (°C)	-30 to +60	-30 to +60	-30 to +60	-30 to +60
Installation Temp. (°C)	-5 to +40	-5 to +40	-5 to +40	-5 to +40
Crush Resistance (N/10 cm)	1,000	1,000	1,000	1,000

FEATURES	
OS1	✓
OM1	✓
OM2	✓
OM3	✓
OM4	✓
Internal Use	✓
External Use	✓
Fire Retardant	✓
Water Resistant	✓
Rodent Resistant	✓
Armored	✗

Central Loose Tube Cables Parameters

FIBRE GRADE		CONSTRUCTION	JACKET	FIBER COUNT
OM1	62.5/125, MM	CLT = Central Loose Tube	LSZH	4 core
OM2	50/125, MM		PE	8 core
OM3	50/125, MM enh			12 core
OM4	50/125, MM 10G+			24 core
OS1	09/125, SM			

FO Cables—Multi Loose Tube Cable

Signamax Multi Loose Tube cables are suitable for internal and external duct use, ideal for campus links without the need for transition cable splicing, on-site fiber splicing. Cable construction consists of up to 144, 250 µm coated fibers are contained within colour-coded tubes of 12 fibers each with gel and the requisite number of fller tubes is stranded around a central strength member. These are bound by water-blocking tape and E-Glass non metallic strength members with ripcord and black high density polyethylene (HDPE) or Low Smoke Zero Halogen (LSZH) jacket.

BENEFITS
- Choice of fiber types
- Colour coded fibers
- Compact 250 µm loose tube construction
- PE jacket for environmental protection and water permeation resistance
- Flame retardant LSZH jacket option for enhanced fire performance

APPLICATIONS
- Suitable for external duct applications
- Suitable for applications where environmental resistance is required

FRP Central Strength Member
Fibre Optic Loose Tube Cable
Water Repellent Thixotropic Gel
Optical Fibre
e-glass Strength Member
Water Blocking Tape
PE or LSZH Jacket

Technical Specifications

DESCRIPTION	48-CORE LSZH/PE	72-CORE LSZH/PE	96-CORE LSZH/PE	144-CORE LSZH/PE	FEATURES	
Outer Diameter (mm)	10.5 ±0.3	11.1 ±0.3	12.6 ±0.3	15.6 ±0.3	OS1	✓
Weight (kg/km	90	97	121	178	OM1	✓
Max. Load (installation) (N)	1,500	1,500	1,500	1,500	OM2	✓
Max. Load (installed) (N)	600	600	600	600	OM3	✓
Min. Bend Radius (installation) mm)	210	220	250	310	OM4	✓
Min. Bend Radius (installed) (mm)	105	110	125	155	Internal Use	✓
Fire Performance	IEC 60332-1				External Use	✓
Operating Temp. (°C)	-30 to +70	-30 to +70	-30 to +70	-30 to +70	Fire Retardant	✓
Storage Temp. (°C)	-40 to +60	-40 to +60	-40 to +60	-40 to +60	Water Resistant	✓
Installation Temp. (°C)	-5 to +40	-5 to +40	-5 to +40	-5 to +40	Rodent Resistant	✓
Crush Resistance	2,000	2,000	2,000	2,000	Armored	✗

Multi Loose Tube Cables Parameters

FIBRE GRADE		CONSTRUCTION	JACKET	FIBER COUNT
OM1	62.5/125, MM	MLT = Multi Loose Tube	LSZH	48 core
OM2	50/125, MM		PE	72 core
OM3	50/125, MM enh			96 core
OM4	50/125, MM 10G+			144 core
OS1	09/125, SM			

SIGNAMAX™
CONNECTIVITY SYSTEMS

FO Cables—Tight Buffered FTTx DROP Cable

This universal self-supporting singlemode cable is suitable for indoor and outdoor use—perfect for FTTx DROP aplications. Low bend fibers are made due to ITU-T G.657A and they are compatible with common low-waterpeak fibers ITU-T G.652D. Minimal bend radius is 10 mm. Cable is supplied on plywood drum. Cable outer diameters are from 3 to 3.7 mm (depends on number of fibers).

BENEFITS
- Choice of fiber type
- Colour coded fibers
- High water resistant
- UV stable LSZH jacket (Black/Ivory)

APPLICATIONS
- Outdoor/Indoor installation
- Aerial Self-supporting Installation

LSZH Jacket

E-Glass Strength Member

Multi Coloured Tight Buffer Fibre
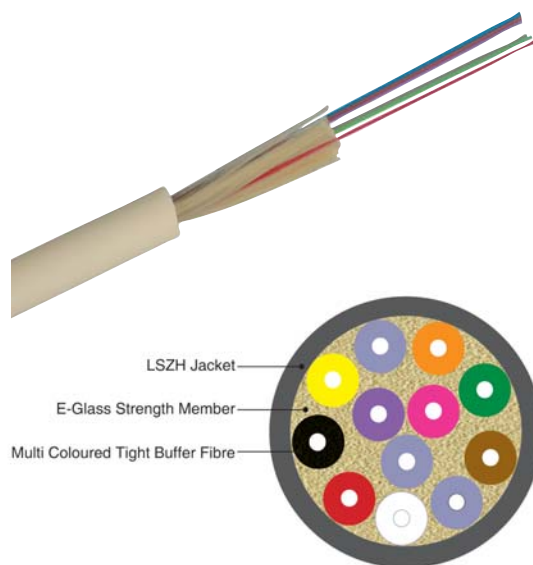
Technical Specifications

DESCRIPTION (UNIT)	2-CORE LSZH	4-CORE LSZH	8-CORE LSZH	12-CORE LSZH	16-CORE LSZH
Jacket Colour	Black / Ivory				
Outer Diameter (mm)	3.0 ±0.3	3.0 ±0.3	3.4 ±0.3	3.4 ±0.3	3.7 ±0.3
Weight (kg/km)	10	10	12	12	14
Max. Tensile Load (N)	500	500	500	500	500
Min. Bend Radius (Long Term) (mm)	23	23	23	23	30
Min. Bend Radius (Short Term) (mm)	12	12	12	12	15
Primary Buffer Diameter (µm)	250	250	250	250	250
Fire Performance	IEC 60332-1				
Operating Temp. (°C)	-20 to +60	-20 to +60	-20 to +60	-20 to +60	-20 to +60
Storage Temp. (°C)	-25 to +60	-25 to +60	-25 to +60	-25 to +60	-25 to +60
Installation Temp. (°C)	-5 to +40	-5 to +40	-5 to +40	-5 to +40	-5 to +40
Crush Resistance (N/10 cm)	500	500	500	500	400

FEATURES	
OS1	✓
OM1	✗
OM2	✗
OM3	✗
OM4	✗
Internal Use	✓
External Use	✓
Fire Retardant	✓
Water Resistant	✓
Rodent Resistant	✗
Armored	✗

Tight Buffered FTTX Drop Cables Parameters

FIBRE GRADE		CONSTRUCTION	JACKET	FIBER COUNT	COLOUR
OS1	09/125, SM	DP = FTTx DROP	LSZH	2 core	Black = BK
			PU	4 core	Ivory = IVR
				8 core	
				12 core	
				16 core	

# FO Cables—Multitube Distribution Micro Cable

Signamax optical micro cables are suited primarilly for outdoor backbone installation. Constructed with extra rugged jacket and with high fibre density, these are ideal candidate for installation by blowing. Cable is jelly-filled MLT construction with OS-1 fibre, count up to 144.

Black Outer PE Jacket
Gel Filled LooseTube With Optical Fibres
Central Strength Member
Aramid Yarn

BENEFITS
- Color-coded fibers
- PU jacket for outdoor installation
- Extra rugged jacket for blowing

APPLICATIONS
- Outdoor direct installation
- fiber backbones and long distance connections
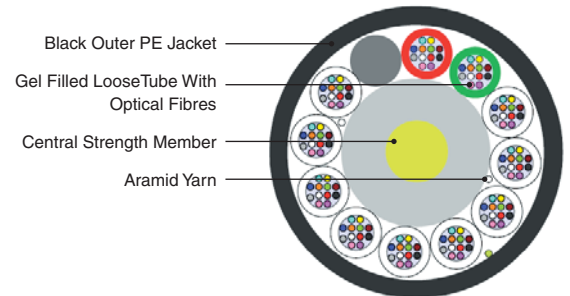
Technical Specifications

DESCRIPTION	6 TUBES 24, 48-CORE	8 TUBES 72, 96-CORE	12 TUBES 96, 144-CORE
Outer Diameter (mm)	5.7	6.6	8.6
Weight (kg/km)	27	40	62
Max. Load (installation) (N)	900	1,000	900
Min. Bend Radius (installation) (mm)	60	60	60
Min. Bend Radius (installed) (mm)	70	70	70
Operating Temp. (°C)	-25 to +70	-25 to +70	-25 to +70
Storage Temp. (°C)	-25 to +70	-25 to +70	-25 to +70
Installation Temp. (°C)	-5 to +50	-5 to +50	-5 to +50
Crush Resistance (N/10 cm)	1,500	1,500	1,500

Micro Cables Parameters

FIBRE GRADE		CONSTRUCTION	JACKET	FIBER COUNT
OS1	09/125, SM	MLT Micro outdoor	PE	12 core
				to
				144 core

FO Cables—Accessories

When installing optical cable, quality accessories are needed. Signamax offers complete portfolio of fiber cassetes, ground couplings, cable anchors and more. Wide produkt portfolio and good price/performance ratio is provided, as usual in Signamax.

Product groups:

- Ground couplers—ideal for field termination, 12-144 fibers.
  Pole or wall mount, IP65 or IP67.
- Cable anchors—for flat or round cable with different diameters.
  For DROP cable.
- Cable splices—for pigtails, komplete with protections and enclosure.
- FTTH optical outlet—with various port configurations.

FLES cable support

Splicer box

Ground splice enclosure

Fiber Optic Pigtails

Signamax fiber optic pigtails are essential when terminating cables within splice enclosures. Purchasing pre-polished assemblies eliminates the risk of poor connector termination away from the installation. The Signamax range of fiber optic pigtails has grown through the years, from every day standard versions to special products to meet your exacting needs. The industry standard OM1, OM2 & OS1 pigtails through to the latest OM3 or OM4 cable assemblies.

ST connector

SC/APC

LC connector
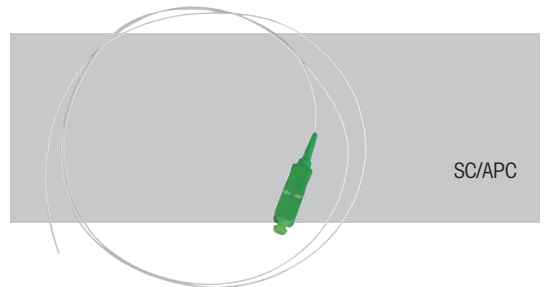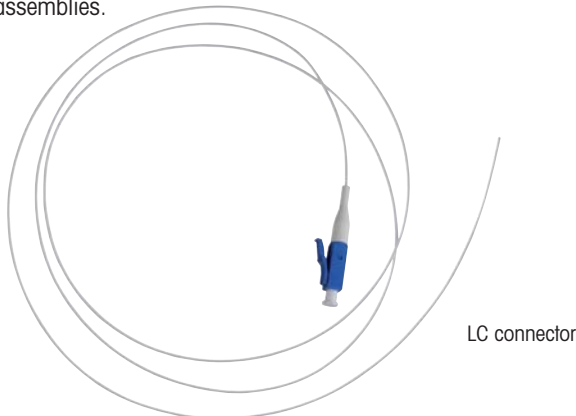
SC connector

BENEFITS

- Choice of connectors type
- Low smoke zero halogen (LSZH) buffer
- 900 μm tight buffer or easy strip
- IEC, EIA TIA and Telecordia standards

APPLICATIONS

- Data Centre
- Telecommunication Networks
- CATV
- LAN and WAN
- FTTX
- Broadband Network

Connector Specification

OPTICAL PERFORMANCE	SINGLEMODE	MULTIMODE	CONFORMANCE
Insertion loss (Typ)	0.30 dB	0.25 dB	IEC 61300-3-34
Ave/Master*	0.18 dB	0.15 dB	IEC 61300-3-4
Ave/Random*	0.18 dB	0.20 dB	IEC 61300-3-34

* The change in attenuation for all the above listed criteria shall be a maximum of 0.20 dB

Buffer Specifcation

CHARACTERISTIC	SIMPLEX
Crush (N/10 cm)	500
Operating Temperature (˚C)	-20 to +60
Nominal buffer Diameter (μm)	900 ±50
Max Tensile Load (N)	6

Pigtails

FIBRE GRADE		CONNECTOR TYPE	LENGTH
OM1	62.5/125, MM	ST	1m = 1
OM2	50/125, MM	SC	2m = 2
OM3	50/125, MM enh	SCA	
OM4	50/125, MM 10G+	LC	
OS1	09/125, SM	LCA	
		E2	
		E2A	
		MTF = MTRJ (F)	
		MTM = MTRJ (M)	

FEATURES	
OS1	✓
OM1	✓
OM2	✓
OM3	✓
OM4	✓
Internal Use	✓
External Use	✗
Fire Retardant	✓
Water Resistant	✗
Rodent Resistant	✗
Armored	✗

Fiber Optic Patchcords

Signamax patchcords utilise the best quality connectors and cables available, backed by over 14 years manufacturing experience in producing fiber optic cable assemblies.

Each assembly is packaged individually and individually identifed for traceability.

- Every Signamax Patch cord is 100% tested and supplied with its own test certifcation.
- Stock available in yellow, orange, grey, aqua.
- Listed are our most popular multimode duplex patchcords—we can supply patchcords in all connector types, cable lengths and colours.

BENEFITS
- Conform to IEC, EIA-TIA, and Telecordia performance requirements
- End face geometry result data included
- RoHS, REACH & SvHC compliant

APPLICATIONS
- Data Centre
- Telecommunication Networks
- CATV
- LAN and WAN
- FTTX
- Broadband Network
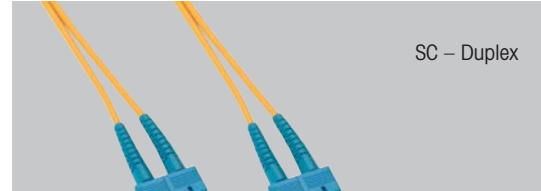
SC – Duplex

ST – Duplex

MTRJ F/M

MTRJ F/M

LC – Duplex

Fiber Optic Patchcords

Cable Specifcation

CHARACTERISTIC	SIMPLEX	DUPLEX
Cable Material	LSZH or PVC	LSZH or PVC
Strength Member	Aramid	Aramid
Crush (N)	1,000	1,000
Operating Temperature (°C)	-20 to +60	-20 to +60
Secondary Buffer Diameter (μm) (2.0/2.4/3.0 mm)	900 ±50	900 ±50
Secondary Buffer Diameter (μm) (1.6 mm and 1.8 mm)	600 ±50	600 ±50
Minimum Bending Radius (mm)	10D (installed) 20D (loaded)	10D (installed) 20D (loaded)
Fire Specifcation	IEC 60332-1 / IEC 60332-3	

FEATURES	
OS1	✓
OM1	✓
OM2	✓
OM3	✓
OM4	✓
Internal Use	✓
External Use	✗
Fire Retardant	✓
Water Resistant	✗
Rodent Resistant	✗
Armored	✗

The patchcords are available in standard length of 1, 2, 3, 5 m.
For other lengths please contact us for the actual P/N lead times.

Connector Specifcation

OPTICAL PERFORMANCE	SINGLEMODE	MULTIMODE	CONFORMANCE
Outer Diameter	OS1	OM1/OM2/OM3/OM4	
MAX IL/Master (Acceptance)	0.15 dB	0.15 dB	IEC 61300-3-4
MAX IL/Random	0.30 dB	0.25 dB	IEC 61300-3-34
Ave/Master*	0.18 dB	0.15 dB	IEC 61300-3-4
Ave/Random*	0.18 dB	0.20 dB	IEC 61300-3-34
Return Loss	55/65 dB	-	IEC 61300-3-6

MECHANICAL PROPERTIES	CRITERIA	CONFORMANCE
Mechanical endurance	500 matings	IEC 61300-2-2
Vibration	10-55 Hz, 0.75 amplitude	IEC 61300-2-1
Drop	Drop height 1 m, 5 drops	IEC 61300-2-12
Cable retention	Magnitude 90 N	IEC 61300-2-4
Cable torsion	1.5-2.5 kg for 2-3 mm	IEC 61300-2-5

* The change in attenuation for all the above listed criteria shall be a maximum of 0.20 dB.

Patchcords

FIBRE GRADE		CONNECTOR 1	CONNECTOR 2	CONSTRUCTION	LENGTH
OM1	62.5/125, MM	STpc	STpc	Simplex	1m = 1
OM2	50/125, MM	SCpc	SCpc	Duplex	2m = 2
OM3	50/125, MM enh	SCapc	SCapc		3m = 3
OM4	50/125, MM 10G+	LCpc	LCpc		5m = 5
OS1	09/125, SM	Lcapc	Lcapc		xm = x
		xx	xx		

SIGNAMAX™
CONNECTIVITY SYSTEMS

Connectors and Adapters

SIGNAMAX Premise Connectivity System Fiber optic connectors are offered in wide range of types. All standard shapes are offered in both multimode and singlemode construction.

Signamax offers a wide variety of fiber optic adapters including ST, SC, LC and MTRJ. Our ST and SC adapters are available with a phosphor bronze sleeve for universal applications (MM/SM). All SC, LC and MTRJ adapters are provided with retaining clips for easy, snap-in mounting.

ST Fiber Connectors and Adapters

ST adaptors have high precision alignment sleeves for reliability and better reconnectability. ST adaptors come with a ceramic sleeve for the singlemode and phosphor bronze sleeve for the multimode. The housing is available in single D or double D types.

ST connector has a quick release bayonet style body and spring loaded ferrule. ST connectors are available in singlemode PC and multimode PC. The connectors come with standard boots suitable for 900 µm, 2 mm and 3 mm cable diameters.

FA-ST-MM

ST Fiber Connectors

| PART NO.	DESCRIPTION
FC-ST-MM	ST MM Connector, Zirconia sleeve, crimping, 3.0 mm
FC-ST-SM	ST SM Connector, Zirconia sleeve, crimping, 3.0 mm

Singlemode Adapter available on request.

FC-ST

SC Fiber Connectors and Adapters

Signamax SC fiber optic connectors are comprised of a polymer body and ceramic ferrule/spring/crimp barrel with a crimp-over-sleeve and rubber boot. Suitable for 900 µm and 3 mm cables, connectors are manufactured to exacting specifcations and tolerances. The ceramic ferrule together with the precision-engineered polymer housing ensures consistent long-term mechanical and optical performance. Two single Signamax SC connectors can be coupled together to form a duplex version, quickly and easily, allowing the user to choose between cross-over or straight-through. The SC connector is the most popular optical fiber connector in use today, seen in every area of the communications environment, from a telecoms distribution room to a local area network closet.

FA-SC

FC-SC

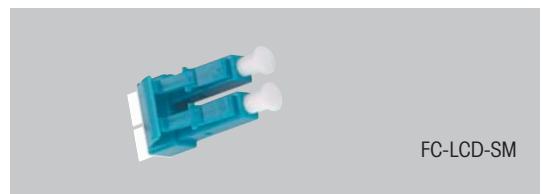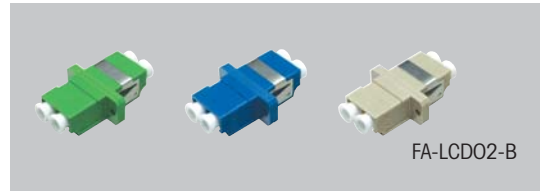SC Adapters and Connectors, Hybrid Adapters

PART NO.	DESCRIPTION	PART NO.	DESCRIPTION
FA-SCS-SM	SC Adaptor, Simplex SM, Zr, Blue	FC-SC-SM	SC Connector, SM(PC), Blue
FA-SCS-MM	SC Adaptor, Simplex MM, Pb, Biege	FC-SC-MM	SC Connector, MM(PC), Biege
FA-SCD03-BU	SC Adaptor, Duplex SM, Zr, Blue	FC-SCA-SM	SC Connector, SM(APC), Green
FA-SCD02-B	SC Adaptor, Duplex MM, Pb, Biege	FC-SCD-SM	SC Duplex Connector, SM(PC), Blue
FA-SCAS-SM	SC/APC Adaptor simplex SM Green	FC-SCD-MM	SC Duplex Connector, MM(PC), Biege
FA-SCAD-SM	SC/APC Adaptor duplex SM Green	FC-SCDA-SM	SC Duplex Connector, SM(APC), Blue
FA-SCSTD-MM	SC/ST hydrid duplex MM Beige	FA-SCSTD-SM	SC/ST hydrid duplex SM Blue
FA-SCFCS	SC/FC hybrid ceramic simplex metal housing	FA-SCSTD-SM	SC/ST hydrid duplex SM Blue
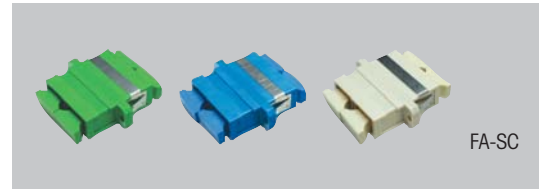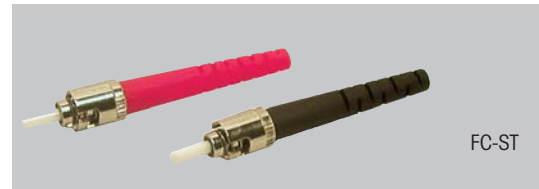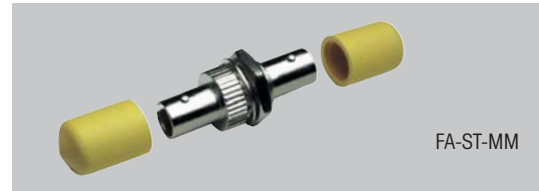
Connectors and Adapters

LC Fiber Connectors and Adapters

Occupying half the space of connectors such as the SC, the LC connector was the frst small form factor (SFF) connector launched to the market. Used extensively in the local area network closet as standard ft to many market leading hubs and switches, the LC connector sets the standard for small fbre optic connectors. Signamax LC fbre optic connectors use a polymer body and ceramic ferrule/spring/crimp barrel assembly together with a crimp-over-sleeve and rubber boot. Suitable for 900 µm and 2 mm cables, the connector is manufactured to stringent specifcations with the combination of ceramic ferrule and plastic body ensuring reliable long-term erformance.


FA-LCD02-B

FC-LCD-SM

LC Adapters and Connectors, Hybrid Adapters

PART NO.	DESCRIPTION	PART NO.	DESCRIPTION
FA-LCD02-B	LC Duplex Adaptor Beige MM	FC-LC-SM	LC Connector, One-Piece, Simplex, SM
FA-LCD03-B	LC Duplex Adaptor Blue SM	FC-LC-MM	LC Connector, One-Piece, Simplex, MM
FA-LCDA-G	LC/APC duplex SM Green	FC-LCD-SM	LC Connector, One-Piece, Duplex, SM
FA-LCS-MM	LC Simplex Adaptor MM Beige	FC-LCD-MM	LC Connector, One-Piece, Duplex, MM
FA-LCS-SM	LC Simplex Adaptor SM Blue		
FA-LCSCS	LC/SC hybrid simplex Ceramic blue		
FA-LCST	LC/ST hybrid ceramic blue		

MTRJ Fiber Connectors and Adapters

The MT-RJ connector is a development of the now legendary MT Ferrule. This amazing technology is at the heart of many state of the art connectors. The MT ferrule in it's various designs has the ability to connect anything from 2 fbers in the MT-RJ up to 72 fiber in the latest versions of the MPO connector. The Signamax MTRJ fiber optic is capable of terminating any 125 µm fiber. The fexibility of the connector allows it to be used in short run local area networks, as as longer haul cabling using singlemode fiber.
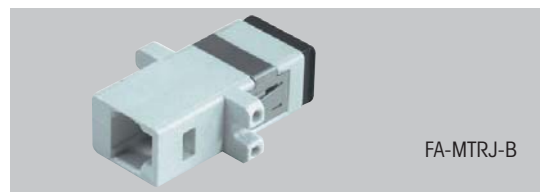

FA-MTRJ-B

MT-RJ Adapters and Connectors

PART NO.	DESCRIPTION
FA-MTRJ-B	MTRJ MM/SM Adapter
FC-MTM-SM	MT-RJ Connector, Multipiece type, SM Male
FC-MTF-SM	MT-RJ Connector, Multipiece type, SM Female
FC-MTM-MM	MT-RJ Connector, Multipiece type, MM, Male
FC-MTF-MM	MT-RJ Connector, Multipiece type, MM Female

SIGNAMAX™
CONNECTIVITY SYSTEMS

Fiber Optic Patch Panels

Signamax 19" fiber optic patch panels are designed for direct fiber termination. These patch panels are modular and contains two parts—a body and a faceplate for different fiber adapter types. Their standard size is 1U and the panels have fully metal construction for usage in critical environments. The Signamax fiber optics patch panels can be easily pulled out with no need to be dismantled from the rack. Their rear section accommodates cable entry and cable holder that protects fiber optic cables against damage.
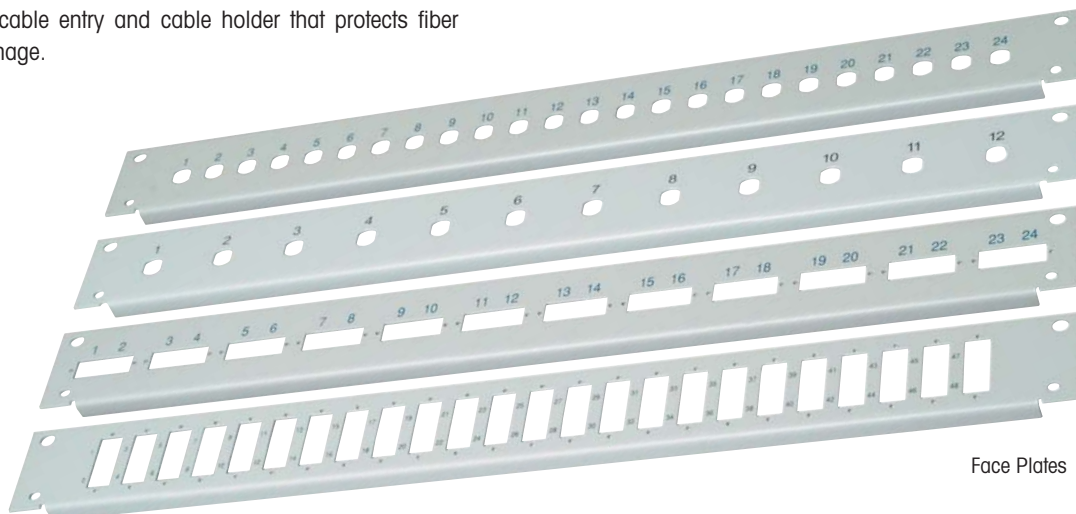
Face Plates

Fiber Optic Patch Panels RAL 7035

PART NO.	DESCRIPTION
FP-1U-B	Fiber Optic Patch Panel without Face Plate 1U
FP-2U-B	Fiber Optic Patch Panel without Face Plate 2U
FP-12ST-1U-B	1U Face Plate for Fiber Optic Patch Panel 12ST
FP-16ST-1U-B	1U Face Plate for Fiber Optic Patch Panel 16ST
FP-24ST-1U-B	1U Face Plate for Fiber Optic Patch Panel 24ST
FP-2U-24ST-B	2U Face Plate for Fiber Optic Patch Panel 24ST
FP-2U-32ST-B	2U Face Plate for Fiber Optic Patch Panel 32ST
FP-12SCD-1U-B	1U Face Plate for Fiber Optic Patch Panel 12SC Duplex
FP-16SCD-1U-B	1U Face Plate for Fiber Optic Patch Panel 16SC Duplex
FP-24SCD-1U-B	1U Face Plate for Fiber Optic Patch Panel 24SC Duplex
FP-24SCD-2U-B	2U Face Plate for Fiber Optic Patch Panel 24SC Duplex
FP-32SCD-2U-B	1U Face Plate for Fiber Optic Patch Panel 32SC Duplex
FP-12SCS-1U-B	1U Face Plate for Fiber Optic Patch Panel 12SC Simplex
FP-24SCS-1U-B	1U Face Plate for Fiber Optic Patch Panel 24SC Simplex
FP-24SCS-2U-B	2U Face Plate for Fiber Optic Patch Panel 24SC Simplex
FP-32SCS-2U-B	2U Face Plate for Fiber Optic Patch Panel 32SC Simplex

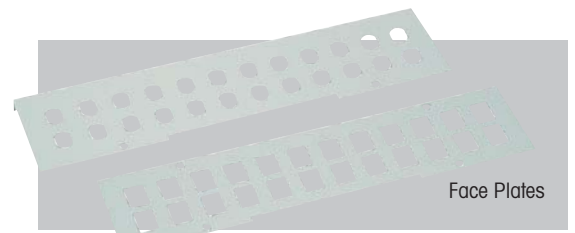Standard colour is grey (RAL 7035), black (RAL 9005) is available on request.

WallBoxes

Signamax wall mount fiber optic box is used for direct termination of fibers. The rear section accommodates cable entry and protects against taking out the cables. The wall mount box includes two separate sections for fusion splice trays and for routing optical patch cords to the equipment. It is fitted with two locks and their keys as standard delivery. Its surface is treated with pulverized colour for internal environment according to the RAL scale. Standard colour is grey (RAL 7035), black (RAL 9005) is available on request.

RA2-FO-A05-B

Wall Mount Fiber Optic Box RAL 7035

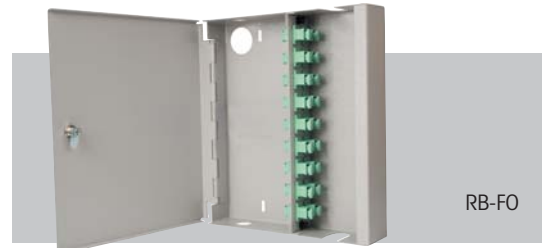| PART NO.	DESCRIPTION
RA2-FO-A05-B	Wall Mounted Fiber Optic Box without Accessories
RA-FO-24ST-B	Panel for RA2-FO-A05 and for 24 ST Adapters
RA-FO-24SC-B	Panel for RA2-FO-A05 and for 24 SC Adapters
RA-FO-12ST-B	Panel for RA2-FO-A05 and for 12 ST Adapters
RA-FO-12SC-B	Panel for RA2-FO-A05 and for 12 SC Adapters

Standard colour is grey (RAL 7035), black (RAL 9005) is available on request.

Face Plates

Wall Mount Fiber Optic Box—Equiped
Loaded boxes come complete with Fiber Management Kit. Available for Multimode, Singlemode and Angled. Connector options include: Simplex and Duplex SC, Duplex and Quad LC, E2000, ST, and MTRJ. Standard colour is gray (RAL 7035).
Dimensions (WxHxD): 225 x 365 x 90 mm.
Cable Entry: 4 x 20 mm Gland Holes.

RB-FO

MM ST Adapters

PART NO.	DESCRIPTION
RB-FO-12STM-B	Signamax 12Way ST Wall Mount Lockable Box Double Door 12 M/M ST Adapters
RB-FO-24STM-B	Signamax 24Way ST Wall Mount Lockable Box Double Door 24 M/M ST Adapters
RB-FO-48STM-B	Signamax 48Way ST Wall Mount Lockable Box Double Door 48 M/M ST Adapters

SM ST Adapters

PART NO.	DESCRIPTION
RB-FO-8STS-B	Signamax 8Way ST Wall Mount Lockable Box Double Door 8 S/M ST Adapters
RB-FO-12STS-B	Signamax 12Way ST Wall Mount Lockable Box Double Door 12 S/M ST Adapters
RB-FO-24STS-B	Signamax 24Way ST Wall Mount Lockable Box Double Door 24 S/M ST Adapters

MM Duplex SC Adapters

PART NO.	DESCRIPTION
RB-FO-24SCM-B	Signamax 24Way SC Wall Mount Lockable Box Double Door 12 M/M DSC Adapters
RB-FO-48SCM-B	Signamax 48Way SC Wall Mount Lockable Box Double Door 24 M/M DSC Adapters

SIGNAMAX™
CONNECTIVITY SYSTEMS

PREMISE CONNECTIVITY SYSTEMS

RACKS

SIGNAMAX™
CONNECTIVITY SYSTEMS

19" Free Standing Data Racks

Attractive design and high quality are typical features of these Signamax free standing data racks from the REC product range. Their skeleton is welded metal plate that is multiple-bent for enforced strength and rigidity necessary for heavier equipment. All profile moldings are flexible and adjustable. Ventilation slots in the upper and lower cabinetry allow airflow for efficient cooling. The door is made of safety glass and can be mounted for either left or right-hand opening on either the front or rear side of the data rack. The side covers, back cover, and front door are provided with ground straps. These free standing data racks can also be interconnected into sets for larger server room installations.

Bottom part

Rear cover hinge

REC-6426B
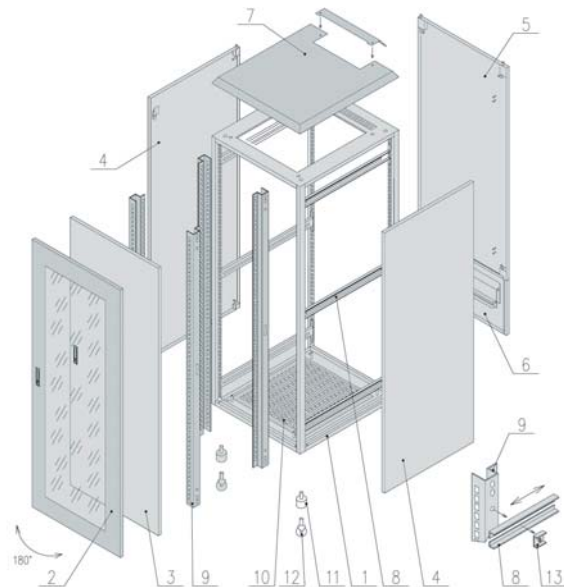
1. Skeleton
2. Glass front door
3. Full door
   (upon request only)
4. Side cover
5. Rear cover
6. Cable opening
7. Ceiling cover

8. Cross bar
9. 19" frame
10. Filter (both in the bottom
    and the ceiling)
11. Adjustable feet
12. Travel wheels
    (upon request only)
13. Frame mounting

19" Free Standing Data Racks

REC 19" Free Standing Data Racks RAL 7035

PART NO.	DESCRIPTION
REC-6156B	19" Free Standing Rack, height 15U, width and depth 600 mm
REC-6186B	19" Free Standing Rack, height 18U, width and depth 600 mm
REC-6246B	19" Free Standing Rack, height 24U, width and depth 600 mm
REC-6286B	19" Free Standing Rack, height 28U, width and depth 600 mm
REC-6326B	19" Free Standing Rack, height 32U, width and depth 600 mm
REC-6386B	19" Free Standing Rack, height 38U, width and depth 600 mm
REC-6426B	19" Free Standing Rack, height 42U, width and depth 600 mm
REC-6456B	19" Free Standing Rack, height 45U, width and depth 600 mm

PART NO.	DESCRIPTION
REC-6248B	19" Free Standing Rack, height 24U, width 600 mm, depth 800 mm
REC-6288B	19" Free Standing Rack, height 28U, width 600 mm, depth 800 mm
REC-6328B	19" Free Standing Rack, height 32U, width 600 mm, depth 800 mm
REC-6388B	19" Free Standing Rack, height 38U, width 600 mm, depth 800 mm
REC-6428B	19" Free Standing Rack, height 42U, width 600 mm, depth 800 mm
REC-6458B	19" Free Standing Rack, height 45U, width 600 mm, depth 800 mm

PART NO.	DESCRIPTION
REC-8248B	19" Free Standing Rack, height 24U, width and depth 800 mm
REC-8288B	19" Free Standing Rack, height 28U, width and depth 800 mm
REC-8328B	19" Free Standing Rack, height 32U, width and depth 800 mm
REC-8388B	19" Free Standing Rack, height 38U, width and depth 800 mm
REC-8428B	19" Free Standing Rack, height 42U, width and depth 800 mm
REC-8458B	19" Free Standing Rack, height 45U, width and depth 800 mm

PART NO.	DESCRIPTION
REC-8286B	19" Free Standing Rack, height 28U, width 800 mm, depth 600 mm
REC-8326B	19" Free Standing Rack, height 32U, width 800 mm, depth 600 mm
REC-8386B	19" Free Standing Rack, height 38U, width 800 mm, depth 600 mm
REC-8426B	19" Free Standing Rack, height 42U, width 800 mm, depth 600 mm
REC-8456B	19" Free Standing Rack, height 45U, width 800 mm, depth 600 mm

PART NO.	DESCRIPTION
REC-6421B	19" Free Standing Rack, height 42U, width 600 mm, depth 1,000 mm
REC-8421B	19" Free Standing Rack, height 42U, width 800 mm, depth 1,000 mm
REC-6451B	19" Free Standing Rack, height 45U, width 600 mm, depth 1,000 mm
REC-8451B	19" Free Standing Rack, height 45U, width 800 mm, depth 1,000 mm

Fan Units
Fan units can be mounted in the lower or the upper part of the rack without affecting available rack space. Dust filters are included.

Wheels
Four wheels (P/N REC-CB4) are available on request.

Colour and Surface Finish
Surface is treated with pulverized colour for internal environment according to the RAL scale. Standard colour is grey (RAL 7035), black (RAL 9005) is available on request.

Adjustable Feet
Delivery includes 4 adjustable feet. They can be adjusted up to 20 mm to compensate for uneven floors and assure high stability.

Door Lock
There is an adjustable 3-point lock on the front door.

Front and Side Access
The front door and the side covers can be easily opened or removed.

Cable Entry
Cables can be installed via the slot in the lower part of the rear cover, or through the top and the bottom parts of the rack.

Guaranteed Load Capacity
Maximum load capacity on adjustable feet is 200 kg. On a frame stand it is 400 kg. On the REC-CB4 wheels it is also 400 kg. These values are guaranteed for evenly distributed static load.

Alternative Components Available on Request
Full door or perforated door
Perforated side covers
Perforated rear cover

SIGNAMAX™
CONNECTIVITY SYSTEMS

19" Free Standing Server Racks

Signamax 19" server racks are especially suitable for large server installations, but all other 19" components and accessories can be installed into these racks as well. The rear cover of these free standing server racks from the REC-S product range is perforated and therefore allows for higher air flow. The front door is made of safety glass and can be mounted for either left or right-hand opening. The height of the Signamax server racks ranges from 42-48U with 600 to 800 mm width. The depth of the server racks can be produced from 800 to 1,200 mm. Other dimensions are available on request.

REC-S-6421B

Fan Units
Fan units can be mounted in the lower or the upper part of the rack without affecting available rack space. Dust filters are included.

Wheels
Four wheels (P/N REC-CB4) are available on request.

Colour and Surface Finish
Surface is treated with pulverized colour for internal environment according to the RAL scale. Standard colour is grey (RAL 7035), black (RAL 9005) is available on request.

Adjustable Feet
Delivery includes 4 adjustable feet. They can be adjusted up to 20 mm to compensate for uneven floors and assure high stability.

Door Lock
There is an adjustable 3-point lock on the front door.

Front and Side Access
The front door and the side covers can be easily opened or removed.

Cable Entry
Cables can be installed via the slot in the lower part of the rear cover, or through the top and the bottom parts of the rack.

Guaranteed Load Capacity
Maximum load capacity on adjustable feet is 200 kg. On a frame stand it is 400 kg. On the REC-CB4 wheels it is also 400 kg. These values are guaranteed for evenly distributed static load.

Alternative Components Available on Request
Full door or perforated door
Perforated side covers

REC-S 19" Free Standing Server Racks RAL 7035

PART NO.	DESCRIPTION
REC-S-6421B	19" Server Rack, Height 42U, Width 600 mm, Depth 1,000 mm
REC-S-8421B	19" Server Rack, Height 42U, Width 800 mm, Depth 1,000 mm
REC-S-6451B	19" Server Rack, Height 45U, Width 600 mm, Depth 1,000 mm
REC-S-8451B	19" Server Rack, Height 45U, Width 800 mm, Depth 1,000 mm
REC-S-6481B	19" Server Rack, Height 48U, Width 600 mm, Depth 1,000 mm
REC-S-8481B	19" Server Rack, Height 48U, Width 800 mm, Depth 1,000 mm

19" Wall Mounted Racks

Signamax wall mounted racks, both ventilated and unventilated, are data cabinets suitable for installing small-sized structured cabling systems. Their front door is mounted using two hinges and secured by 1-point lock. Safety glass used in the door assembly provides very high safety. These Signamax racks can be mounted upside-down, enabling the door to be opened from the left or right. There are openings in the back of the rack which enable mounting the cabinet onto the wall. The ceiling and the bottom of these Signamax racks are equipped with cable entries. The center section of the 500 mm racks can be unlocked separately. The maximum load is 35 kg.

RECW-125B

RECW and RECW-UV 19" Wall Mounted Racks RAL 7035

PART NO.	DESCRIPTION
RECW-044B	19" Wall Mounted Rack, Ventilated, Not Divided, Height 4U, Depth 400 mm
RECW-064B	19" Wall Mounted Rack, Ventilated, Not Divided, Height 6U, Depth 400 mm
RECW-094B	19" Wall Mounted Rack, Ventilated, Not Divided, Height 9U, Depth 400 mm
RECW-124B	19" Wall Mounted Rack, Ventilated, Not Divided, Height 12U, Depth 400 mm
RECW-154B	19" Wall Mounted Rack, Ventilated, Not Divided, Height 15U, Depth 400 mm
RECW-184B	19" Wall Mounted Rack, Ventilated, Not Divided, Height 18U, Depth 400 mm
RECW-214B	19" Wall Mounted Rack, Ventilated, Not Divided, Height 21U, Depth 400 mm

PART NO.	DESCRIPTION
RECW-065B	19" Wall Mounted Rack, Ventilated, Divided, Height 6U, Depth 500 mm
RECW-095B	19" Wall Mounted Rack, Ventilated, Divided, Height 9U, Depth 500 mm
RECW-125B	19" Wall Mounted Rack, Ventilated, Divided, Height 12U, Depth 500 mm
RECW-155B	19" Wall Mounted Rack, Ventilated, Divided, Height 15U, Depth 500 mm
RECW-185B	19" Wall Mounted Rack, Ventilated, Divided, Height 18U, Depth 500 mm
RECW-215B	19" Wall Mounted Rack, Ventilated, Divided, Height 21U, Depth 500 mm

PART NO.	DESCRIPTION
RECW-UV-044B	19" Wall Mounted Rack, Unventilated, Not Divided, Height 4U, Depth 400 mm
RECW-UV-064B	19" Wall Mounted Rack, Unventilated, Not Divided, Height 6U, Depth 400 mm
RECW-UV-094B	19" Wall Mounted Rack, Unventilated, Not Divided, Height 9U, Depth 400 mm
RECW-UV-124B	19" Wall Mounted Rack, Unventilated, Not Divided, Height 12U, Depth 400 mm
RECW-UV-154B	19" Wall Mounted Rack, Unventilated, Not Divided, Height 15U, Depth 400 mm
RECW-UV-184B	19" Wall Mounted Rack, Unventilated, Not Divided, Height 18U, Depth 400 mm
RECW-UV-214B	19" Wall Mounted Rack, Unventilated, Not Divided, Height 21U, Depth 400 mm

PART NO.	DESCRIPTION
RECW-UV-065B	19" Wall Mounted Rack, Unventilated, Divided, Height 6U, Depth 500 mm
RECW-UV-095B	19" Wall Mounted Rack, Unventilated, Divided, Height 9U, Depth 500 mm
RECW-UV-125B	19" Wall Mounted Rack, Unventilated, Divided, Height 12U, Depth 500 mm
RECW-UV-155B	19" Wall Mounted Rack, Unventilated, Divided, Height 15U, Depth 500 mm
RECW-UV-185B	19" Wall Mounted Rack, Unventilated, Divided, Height 18U, Depth 500 mm
RECW-UV-215B	19" Wall Mounted Rack, Unventilated, Divided, Height 21U, Depth 500 mm

Colour and Surface Finish
Surface is treated with pulverized colour for internal environment according to the RAL scale. Standard colour is grey (RAL 7035) and black (RAL 9005) is available on request.

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CONNECTIVITY SYSTEMS

19" Free Standing Assembled Data Racks

Signamax free standing assembled racks are suitable for installation of structured cabling components or any other network equipment. The assembled design of these racks is specifically accommodated to computing and data centers where rack size could cause a transport problem. The front door is mounted using three hinges and is secured by 1-point lock. Safety glass used in the door assembly provides high safety. The removable rear and side covers are locked and can be opened with a key that is provided with each rack. In the bottom and top parts of the rack, slots for optional fan installation are provided. These Signamax free standing assembled racks can be attached together to form groups. Their surface is treated with pulverized colour for internal environment according to the RAL scale. Standard colour is grey (RAL 7035), black (RAL 9005) is available on request.

Skeleton detail—
inside assembly

Side cover lock

Skeleton detail—
outside assembly

REC-A-6426B

19" Free Standing Assembled Data Racks

REC-A 19" Free Standing Assembled Racks RAL 7035

PART NO.	DESCRIPTION
REC-A-6156B	19" Assembled Free Standing Rack, Height 15U, Width and Depth 600 mm
REC-A-6186B	19" Assembled Free Standing Rack, Height 18U, Width and Depth 600 mm
REC-A-6246B	19" Assembled Free Standing Rack, Height 24U, Width and Depth 600 mm
REC-A-6286B	19" Assembled Free Standing Rack, Height 28U, Width and Depth 600 mm
REC-A-6326B	19" Assembled Free Standing Rack, Height 32U, Width and Depth 600 mm
REC-A-6386B	19" Assembled Free Standing Rack, Height 38U, Width and Depth 600 mm
REC-A-6426B	19" Assembled Free Standing Rack, Height 42U, Width and Depth 600 mm
REC-A-6456B	19" Assembled Free Standing Rack, Height 45U, Width and Depth 600 mm

PART NO.	DESCRIPTION
REC-A-6248B	19" Assembled Free Standing Rack, Height 24U, Width 600 mm, Depth 800 mm
REC-A-6288B	19" Assembled Free Standing Rack, Height 28U, Width 600 mm, Depth 800 mm
REC-A-6328B	19" Assembled Free Standing Rack, Height 32U, Width 600 mm, Depth 800 mm
REC-A-6388B	19" Assembled Free Standing Rack, Height 38U, Width 600 mm, Depth 800 mm
REC-A-6428B	19" Assembled Free Standing Rack, Height 42U, Width 600 mm, Depth 800 mm
REC-A-6458B	19" Assembled Free Standing Rack, Height 45U, Width 600 mm, Depth 800 mm

PART NO.	DESCRIPTION
REC-A-8248B	19" Assembled Free Standing Rack, Height 24U, Width and Depth 800 mm
REC-A-8288B	19" Assembled Free Standing Rack, Height 28U, Width and Depth 800 mm
REC-A-8328B	19" Assembled Free Standing Rack, Height 32U, Width and Depth 800 mm
REC-A-8388B	19" Assembled Free Standing Rack, Height 38U, Width and Depth 800 mm
REC-A-8428B	19" Assembled Free Standing Rack, Height 42U, Width and Depth 800 mm
REC-A-8458B	19" Assembled Free Standing Rack, Height 45U, Width and Depth 800 mm

PART NO.	DESCRIPTION
REC-A-8246B	19" Assembled Free Standing Rack, Height 24U, Width 800 mm, Depth 600 mm
REC-A-8286B	19" Assembled Free Standing Rack, Height 28U, Width 800 mm, Depth 600 mm
REC-A-8326B	19" Assembled Free Standing Rack, Height 32U, Width 800 mm, Depth 600 mm
REC-A-8386B	19" Assembled Free Standing Rack, Height 38U, Width 800 mm, Depth 600 mm
REC-A-8426B	19" Assembled Free Standing Rack, Height 42U, Width 800 mm, Depth 600 mm
REC-A-8456B	19" Assembled Free Standing Rack, Height 45U, Width 800 mm, Depth 600 mm

PART NO.	DESCRIPTION
REC-A-6421B	19" Assembled Free Standing Rack, Height 42U, Width 600 mm, Depth 1,000 mm
REC-A-8421B	19" Assembled Free Standing Rack, Height 42U, Width 800 mm, Depth 1,000 mm
REC-A-6451B	19" Assembled Free Standing Rack, Height 45U, Width 600 mm, Depth 1,000 mm
REC-A-8451B	19" Assembled Free Standing Rack, Height 45U, Width 800 mm, Depth 1,000 mm

Fan Units
Fan units can be mounted in the lower or the upper part of the rack without affecting available rack space. Dust filters are included.

Wheels
Four wheels (P/N REC-CB4) are available on request.

Colour and Surface Finish
Surface is treated with pulverized colour for internal environment according to the RAL scale. Standard colour is grey (RAL 7035), black (RAL 9005) is available on request.

Adjustable Feet
Delivery includes 4 adjustable feet. They can be adjusted up to 20 mm to compensate for uneven floors and assure high stability.

Door Lock
There is 1-point lock on the front door.

Front and Side Access
The front door and the side covers can be easily opened or removed.

Cable Entry
Cables can be installed via the slot in the lower part of the rear cover, or through the top and the bottom parts of the rack.

Alternative Components Available on Request
Full door or perforated door
Perforated side covers
Perforated rear cover

SIGNAMAX™
CONNECTIVITY SYSTEMS

19" Free Standing Riveted Data Racks

These Signamax riveted racks are modern free standing data cabinets that are designed for installation of structured cabling components or any other network equipment. The skeleton of these Signamax REC-R racks is riveted and therefore welding is replaced by rivets. All Signamax riveted racks are produced as an economical solution with very good quality industrial design. Solid firmness of these racks is the result of employing solid steel-sheet structure assembled by steel rivets. The front door is mounted using three hinges and secured by 1-point lock. The door can be opened up to 180°. The safety glass used in the door assembly provides very high safety. The removable rear and side covers are locked and can be opened with a key that is provided with each rack. In the bottom and top parts of the rack, slots for optional fan installation are provided. These Signamax riveted racks can be attached together to form groups.

Bottom part of the rack

Bottom part of the rack—detail

Fan Units
Fan units can be mounted in the lower or the upper part of the rack without affecting available rack space. Dust filters are included.

Wheels
Four wheels (P/N REC-CB4) are available on request.

Colour and Surface Finish
Surface is treated with pulverized colour for internal environment according to the RAL scale. Standard colour is grey (RAL 7035), black (RAL 9005) is available on request.

Adjustable Feet
Delivery includes 4 adjustable feet. They can be adjusted up to 20 mm to compensate for uneven floors and assure high stability.

Door Lock
There is 1-point lock on the front door.

Front and Side Access
The front door and the side covers can be easily opened or removed.

Cable Entry
Cables can be installed via the slot in the lower part of the rear cover, or through the top and the bottom parts of the rack.

Guaranteed Load Capacity
Maximum load capacity is 400 kg.

Alternative Components Available on Request
Full door or perforated door
Perforated side covers
Perforated rear cover

REC-R-6426B

19" Free Standing Riveted Data Racks

REC-R 19" Free Standing Riveted Data Racks RAL 7035

PART NO.	DESCRIPTION
REC-R-6156B	19" Free Standing Rack, Riveted, Height 15U, Width and Depth 600 mm
REC-R-6186B	19" Free Standing Rack, Riveted, Height 18U, Width and Depth 600 mm
REC-R-6246B	19" Free Standing Rack, Riveted, Height 24U, Width and Depth 600 mm
REC-R-6286B	19" Free Standing Rack, Riveted, Height 28U, Width and Depth 600 mm
REC-R-6326B	19" Free Standing Rack, Riveted, Height 32U, Width and Depth 600 mm
REC-R-6386B	19" Free Standing Rack, Riveted, Height 38U, Width and Depth 600 mm
REC-R-6426B	19" Free Standing Rack, Riveted, Height 42U, Width and Depth 600 mm
REC-R-6456B	19" Free Standing Rack, Riveted, Height 45U, Width and Depth 600 mm

PART NO.	DESCRIPTION
REC-R-6288B	19" Free Standing Rack, Riveted, Height 28U, Width 600 mm, Depth 800 mm
REC-R-6328B	19" Free Standing Rack, Riveted, Height 32U, Width 600 mm, Depth 800 mm
REC-R-6388B	19" Free Standing Rack, Riveted, Height 38U, Width 600 mm, Depth 800 mm
REC-R-6428B	19" Free Standing Rack, Riveted, Height 42U, Width 600 mm, Depth 800 mm
REC-R-6458B	19" Free Standing Rack, Riveted, Height 45U, Width 600 mm, Depth 800 mm

PART NO.	DESCRIPTION
REC-R-8158B	19" Free Standing Rack, Riveted, Height 15U, Width and Depth 800 mm
REC-R-8188B	19" Free Standing Rack, Riveted, Height 18U, Width and Depth 800 mm
REC-R-8248B	19" Free Standing Rack, Riveted, Height 24U, Width and Depth 800 mm
REC-R-8288B	19" Free Standing Rack, Riveted, Height 28U, Width and Depth 800 mm
REC-R-8328B	19" Free Standing Rack, Riveted, Height 32U, Width and Depth 800 mm
REC-R-8388B	19" Free Standing Rack, Riveted, Height 38U, Width and Depth 800 mm
REC-R-8428B	19" Free Standing Rack, Riveted, Height 42U, Width and Depth 800 mm
REC-R-8458B	19" Free Standing Rack, Riveted, Height 45U, Width and Depth 800 mm

PART NO.	DESCRIPTION
REC-R-8286B	19" Free Standing Rack, Riveted, Height 28U, Width 800 mm, Depth 600 mm
REC-R-8326B	19" Free Standing Rack, Riveted, Height 32U, Width 800 mm, Depth 600 mm
REC-R-8386B	19" Free Standing Rack, Riveted, Height 38U, Width 800 mm, Depth 600 mm
REC-R-8426B	19" Free Standing Rack, Riveted, Height 42U, Width 800 mm, Depth 600 mm
REC-R-8456B	19" Free Standing Rack, Riveted, Height 45U, Width 800 mm, Depth 600 mm

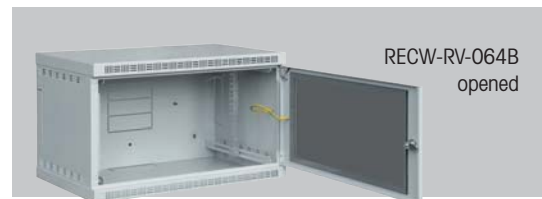| PART NO.	DESCRIPTION
REC-R-8421B	19" Free Standing Rack, Riveted, Height 42U, Width 800 mm, Depth 1,000 mm
REC-R-8451B	19" Free Standing Rack, Riveted, Height 45U, Width 800 mm, Depth 1,000 mm
REC-R-6421B	19" Free Standing Rack, Riveted, Height 42U, Width 600 mm, Depth 1,000 mm
REC-R-6451B	19" Free Standing Rack, Riveted, Height 45U, Width 600 mm, Depth 1,000 mm

SIGNAMAX™
CONNECTIVITY SYSTEMS

19" Wall Mounted Riveted Racks

Signamax wall mounted riveted racks, both ventilated and unventilated, are modern types of cabinets that are designed for installing small-sized structured cabling systems. The skeleton of these racks is riveted and therefore welding is replaced by rivets. All Signamax riveted data racks are produced as an economical solution with very good quality industrial design. Solid firmness of these racks is the result of employing solid steel-sheet structure assembled by steel rivets. The front door is mounted using two hinges and secured by 1-point lock. The safety glass used in the door assembly provides very high safety. The center section of the 500 mm racks can be unlocked separately. There are openings in the back of the rack that enable mounting the cabinet onto the wall. The bottom and top parts of the rack as well as its non-removable side covers are equipped with several cable entries. The maximum load of these Signamax wall mounted racks is 35 kg.

Colour and Surface Finish

Surface is treated with pulverized colour for internal environment according to the RAL scale. Standard colour is grey (RAL 7035), black (RAL 9005) is available on request.

Front door lock

Perforation detail

RECW-RV-064B opened

RECW-RV-064B

19" Wall Mounted Riveted Racks

RECW-RV and RECW-RUV 19" Wall Mounted Riveted Racks RAL 7035

PART NO.	DESCRIPTION
RECW-RV-044B	19" Wall Mounted Rack, Riveted, Ventilated, Not Divided, Height 4U, Depth 400 mm
RECW-RV-064B	19" Wall Mounted Rack, Riveted, Ventilated, Not Divided, Height 6U, Depth 400 mm
RECW-RV-094B	19" Wall Mounted Rack, Riveted, Ventilated, Not Divided, Height 9U, Depth 400 mm
RECW-RV-124B	19" Wall Mounted Rack, Riveted, Ventilated, Not Divided, Height 12U, Depth 400 mm
RECW-RV-154B	19" Wall Mounted Rack, Riveted, Ventilated, Not Divided, Height 15U, Depth 400 mm
RECW-RV-184B	19" Wall Mounted Rack, Riveted, Ventilated, Not Divided, Height 18U, Depth 400 mm
RECW-RV-214B	19" Wall Mounted Rack, Riveted, Ventilated, Not Divided, Height 21U, Depth 400 mm

PART NO.	DESCRIPTION
RECW-RV-065B	19" Wall Mounted Rack, Riveted, Ventilated, Divided, Height 6U, Depth 500 mm
RECW-RV-095B	19" Wall Mounted Rack, Riveted, Ventilated, Divided, Height 9U, Depth 500 mm
RECW-RV-125B	19" Wall Mounted Rack, Riveted, Ventilated, Divided, Height 12U, Depth 500 mm
RECW-RV-155B	19" Wall Mounted Rack, Riveted, Ventilated, Divided, Height 15U, Depth 500 mm
RECW-RV-185B	19" Wall Mounted Rack, Riveted, Ventilated, Divided, Height 18U, Depth 500 mm
RECW-RV-215B	19" Wall Mounted Rack, Riveted, Ventilated, Divided, Height 21U, Depth 500 mm

PART NO.	DESCRIPTION
RECW-RUV-044B	19" Wall Mounted Rack, Riveted, Unventilated, Not Divided, Height 4U, Depth 400 mm
RECW-RUV-064B	19" Wall Mounted Rack, Riveted, Unventilated, Not Divided, Height 6U, Depth 400 mm
RECW-RUV-094B	19" Wall Mounted Rack, Riveted, Unventilated, Not Divided, Height 9U, Depth 400 mm
RECW-RUV-124B	19" Wall Mounted Rack, Riveted, Unventilated, Not Divided, Height 12U, Depth 400 mm
RECW-RUV-154B	19" Wall Mounted Rack, Riveted, Unventilated, Not Divided, Height 15U, Depth 400 mm
RECW-RUV-184B	19" Wall Mounted Rack, Riveted, Unventilated, Not Divided, Height 18U, Depth 400 mm
RECW-RUV-214B	19" Wall Mounted Rack, Riveted, Unventilated, Not Divided, Height 21U, Depth 400 mm

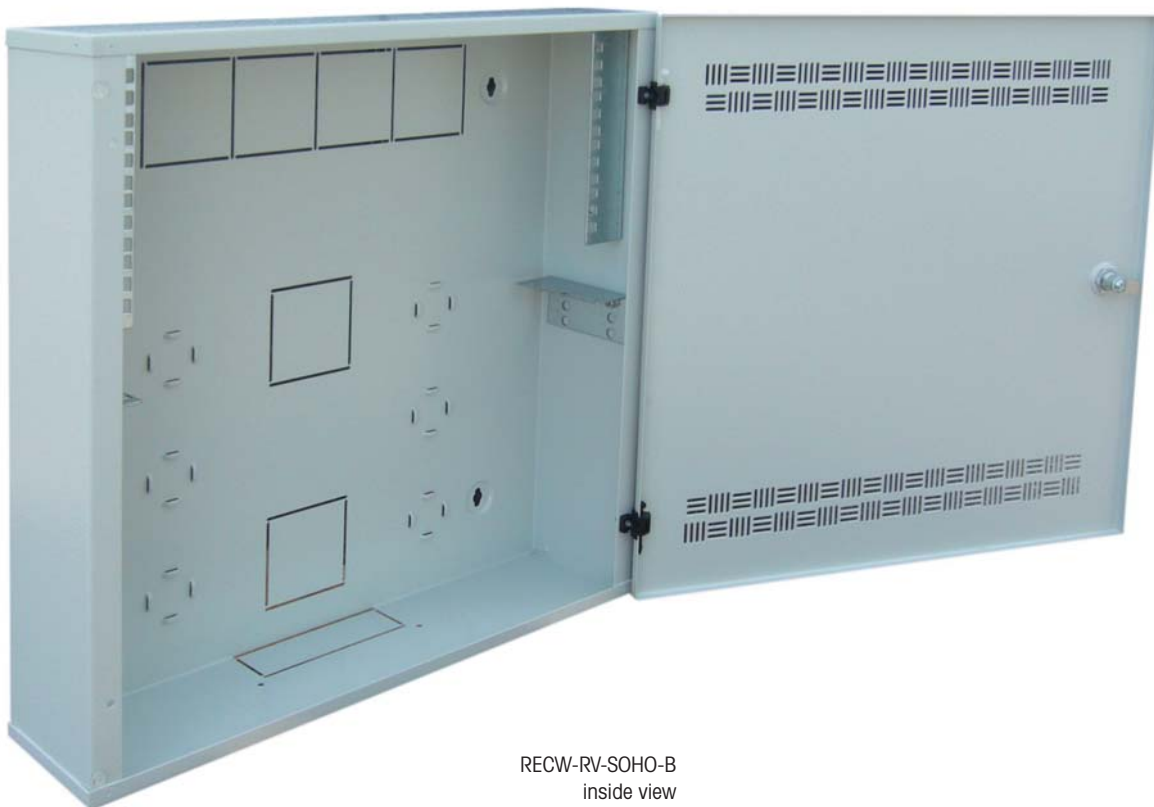| PART NO.	DESCRIPTION
RECW-RUV-065B	19" Wall Mounted Rack, Riveted, Unventilated, Divided, Height 6U, Depth 500 mm
RECW-RUV-095B	19" Wall Mounted Rack, Riveted, Unventilated, Divided, Height 9U, Depth 500 mm
RECW-RUV-125B	19" Wall Mounted Rack, Riveted, Unventilated, Divided, Height 12U, Depth 500 mm
RECW-RUV-155B	19" Wall Mounted Rack, Riveted, Unventilated, Divided, Height 15U, Depth 500 mm
RECW-RUV-185B	19" Wall Mounted Rack, Riveted, Unventilated, Divided, Height 18U, Depth 500 mm
RECW-RUV-215B	19" Wall Mounted Rack, Riveted, Unventilated, Divided, Height 21U, Depth 500 mm

19" Wall Mounted Riveted SOHO Rack

Signamax wall mounted SOHO rack is especially suitable for installing small-sized structured cabling systems in SOHO environments. Its skeleton is riveted and the rack is available in a very convenient form factor—i.e. size 550x550x150 mm. Similarly to all Signamax riveted racks, this SOHO data cabinet is also produced as an economical solution with very good quality industrial design. Its solid firmness is the result of employing solid steel-sheet structure assembled by steel rivets. The front door is mounted using two hinges and secured by 1-point lock. The door is perforated. There are openings in the back of the rack which enable mounting the cabinet onto the wall. The rear cover is equipped with several cable entries.

RECW-RV-SOHO-B

Colour and Surface Finish

Surface is treated with pulverized colour for internal environment according to the RAL scale. Standard colour is grey (RAL 7035) and black (RAL 9005) is available on request.

RECW-RV-SOHO-B
inside view

19" Wall Mounted Riveted SOHO Rack RAL 7035

PART NO.	DESCRIPTION
RECW-RV-SOHO-B	19" Wall Mounted SOHO Rack, Riveted, 4U and 2U, Height 550 mm, Width 550 mm, Depth 150 mm

10" Wall Mounted Racks

Signamax 10" wall mounted cabinets are metallic products with a small form-factor designed for installing 10" structured cabling components. The front door is mounted using two hinges and secured by 1-point lock. Safety glass used in the door assembly provides very high safety. Similarly to 19" Signamax wall mounted racks, these small racks can be mounted upside-down, enabling the door to be opened from the left or right. There are openings in the back of the rack which enable mounting the cabinet onto the wall. The bottom and top parts of these racks are equipped with cable entries. The maximum load is 15 kg.

Front door lock

Perforation detail

Front door hinge

RECW10-094B

10" Wall Mounted Racks RAL 7035

PART NO.	DESCRIPTION
RECW10-044B	10" Wall Mounted Rack, Height 4U, Depth 265 mm
RECW10-064B	10" Wall Mounted Rack, Height 6U, Depth 265 mm
RECW10-094B	10" Wall Mounted Rack, Height 9U, Depth 265 mm
RECW10-124B	10" Wall Mounted Rack, Height 12U, Depth 265 mm

10" Accessories RAL 7035

PART NO.	DESCRIPTION
REC10-SV15-B	10" Shelf
EPP10-BL1-B	10" Blind Panel, 1U
EPP10-8P-B	10" Unloaded Patch Panel 8 port
CMP10-175-B	10" Cable Organizer 1U, Steel
FP10-12ST-B	10" Fiber Optic Patch Panel, Face Plate 12 ST Included, 1U
FP10-12SC-B	10" Fiber Optic Patch Panel, Face Plate 12 SC Included, 1U

Colour and Surface Finish

Surface is treated with pulverized colour for internal environment according to the RAL scale. Standard colour is grey (RAL 7035) and black (RAL 9005) is available on request.

SIGNAMAX™
CONNECTIVITY SYSTEMS

19" Outdoor Thermo-Insulated Racks

Signamax thermo-insulated data racks are designed for installing structured cabling components and other telecommunication equipment in the outdoor environment. These IP-55 Signamax data racks can be installed as wall-mounted or free standing. For the free standing variant, a base frame is required. The outdoor racks consist of a welded skeleton that forms a solid and reliable shell. The front door is mounted using two metal hinges and secured by 3-point lock. The side covers can be opened from the inside and can be changed easily. Furthermore, both side covers can be purchased with special ventilation units adapted to the outside environment. The bottom of the rack is fitted with several cable glands. Above the top part of the rack there is a cover which serves as a protection against the rain and direct sunlight. These Signamax outdoor data racks also include four hanging lugs for easy manipulation.

REC-OWV-24UB

REC-OVR-24UB

Colour and Surface Finish
Surface is treated with pulverized colour for outdoor environment according to the RAL scale. Standard colour is grey (RAL 7035) and black (RAL 9005) is available on request.

Standard supply
• Full door with a 3-point lock and a plastic handle. The door opens up to 180°.
• Top cover that protects the rack against the rain and direct sunlight.
• Full side covers.
• Ventilation units can be fitted into the side covers on request. The rack can withstand the IP-45 environment with these ventilation units installed.
• Two pairs of 19″ frames.
• Cable glands in the bottom.
• It is essential to use the base frame REC-RBO-76B for the free-standing Signamax outdoor rack. The base frame is sold separately.

19" Outdoor Thermo-Insulated Racks RAL 7035

PART NO.	DESCRIPTION
REC-OWV-15UB	Wall Mount Outdoor Rack without a Ventilation Unit, Height 790 mm, Width 700 mm, Depth 400 mm
REC-OVR-15UB	Wall Mount Outdoor Rack with 1 Ventilation Unit in the Right Side Cover, Height 790 mm, Width 700 mm, Depth 400 mm
REC-OVL-15UB	Wall Mount Outdoor Rack with 1 Ventilation Unit in the Left Side Cover, Height 790 mm, Width 700 mm, Depth 400 mm
REC-OWV-24UB	Free Standing Outdoor Rack without a Ventilation Unit, Height 1,190 mm, Width 700 mm, Depth 600 mm
REC-OVR-24UB	Free Standing Outdoor Rack with 1 Ventilation Unit in the Right Side Cover, Height 1,190 mm, Width 700 mm, Depth 600 mm
REC-OVL-24UB	Free Standing Outdoor Rack with 1 Ventilation Unit in the Left Side Cover, Height 1,190 mm, Width 700 mm, Depth 600 mm
REC-OVRL-24UB	Free Standing Outdoor Rack with 2 Ventilation Units in Both Side Covers, Height 1,190 mm, Width 700 mm, Depth 600 mm

19" Outdoor Thermo-Insulated Rack Accessories RAL 7035

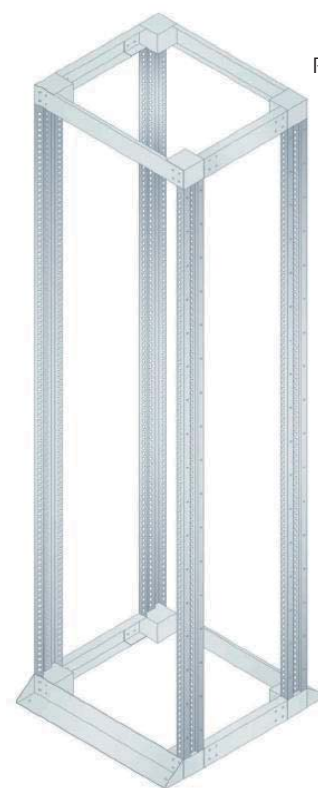| PART NO.	DESCRIPTION
REC-RBO-76B	Base Frame for Free Standing Rack, Height 800 mm, Width 700 mm, Depth 600 mm
REC-EHUB	Electric Heating Unit for Signamax Outdoor Rack, Height 65 mm, Width 130 mm, Depth 180 mm

19" High-Load Open Frames

Signamax 19″ high-load open frames provide a suitable and effective way of housing network equipment in technology-dedicated environments (e.g. dust free server rooms with authorized personnel access, data centers etc.). The frames are produced using high-quality steel sheets which allow for total load capacity of 1,200 kg and have adjustable rear posts which can be fixed anywhere between 600 to 1,000 mm of depth. This makes the Signamax high-load frames very flexible for using a variety of network equipment (e.g. large servers, UPS products, disk arrays etc.). Mounting kit for assembling the frames is included in standard delivery.

Colour and Surface Finish
Surface is treated with pulverized colour for internal environment according to the RAL scale. Standard colour is grey (RAL 7035), black (RAL 9005) is available on request.

REC-HLF-6421B

19" High-Load Open Frames RAL 7035

PART NO.	DESCRIPTION
REC-HLF-6381B	19" High-Load Open Frame, Height 38U, Width 600 mm, Adjustable Depth 600 – 1,000 mm
REC-HLF-6421B	19" High-Load Open Frame, Height 42U, Width 600 mm, Adjustable Depth 600 – 1,000 mm
REC-HLF-6451B	19" High-Load Open Frame, Height 45U, Width 600 mm, Adjustable Depth 600 – 1,000 mm

SIGNAMAX™
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Ventilation and Cooling Units

Signamax universal ventilation units are constructed to fit into all Signamax free standing racks to provide forced airflow inside. The lower or upper fan units fit in both the bottom as well as top part of the free standing Signamax rack. They can be purchased either with two or four fans and are supplied with or without a thermostat to regulate the airflow.

Signamax 19″ cooling units easily fit into any 19″ racks, including all wall mount and free standing Signamax racks. Similarly to the upper and lower universal ventilation fans mentioned above, Signamax 19″ cooling products are supplied with or without a thermostat to regulate the airflow. These 19″ units are equipped with either two or three fans. All Signamax fan units, both ventilation and cooling types, can easily be deactivated by using the main switch.

Colour and Surface Finish

Surface is treated with pulverized colour for internal environment according to the RAL scale. Standard colour is grey (RAL 7035), black (RAL 9005) is available on request.
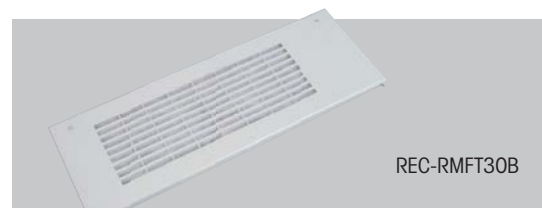
REC-RMFT3B-WT

REC-RMFT2B-WT

REC-RMFT3OB

REC-RMFT150B

REC-RMFT3OB

19″ Fan Units with Thermostat RAL 7035

PART NO.	DESCRIPTION
REC-RMFT2B-IN	19″ Cooling Unit 2x Fan with In-Built Thermostat
REC-RMFT3B-IN	19″ Cooling Unit 3x Fan with In-Built Thermostat
REC-RMFT3OB	Side wall Cooling Unit 3x Fan with Thermostat
REC-RMFT7OB	Lower or Upper Ventilation Unit 2x Fan with Thermostat
REC-RMFT150B	Lower or Upper Ventilation Unit 4x Fan with Thermostat

19″ Fan Units without Thermostat RAL 7035

PART NO.	DESCRIPTION
REC-RMFT2B-WT	19″ Cooling Unit 2x Fan without Thermostat
REC-RMFT3B-WT	19″ Cooling Unit 3x Fan with without Thermostat
REC-RMFT7OB-WT	Lower or Upper Ventilation Unit 2x Fan without Thermostat
REC-RMFT150B-WT	Lower or Upper Ventilation Unit 4x Fan without Thermostat

Vertical Cable Management Pathways

Signamax vertical cable management products are designed to provide easy management as well as protection of network cabling installed in Signamax free standing data racks, both welded and riveted.

Vertical Plastic Cable Management Pathways

These plastic cable management paths with 80 x 40 mm size can be mounted into all Signamax free standing racks. They are particularly suitable for racks with 800 mm width and are ideal for comfortable management of patch cables of different lengths. Surface of the metallic part of these pathways is treated with pulverized colour for internal environment according to the RAL scale. Standard colour is grey (RAL 7035), black (RAL 9005) is available on request. The colour of the plastic trunk is grey (RAL 7035).

VPCM-42-84B

PART NO.	DESCRIPTION
VPCM-42-84B	Vertical Plastic Cable Management Pathway 42U, 80 x 40 mm, RAL 7035
VPCM-45-84B	Vertical Plastic Cable Management Pathway 45U, 80 x 40 mm, RAL 7035

Vertical Metallic Cable Management Pathways

Signamax metallic vertical cable management products have an extra wide design to provide pathways for comfortable routing of network cabling inside Signamax free-standing data racks. Their size of 150 x 50 mm allows for efficient and reliable management of installation cables inside the racks. Mounting kits are included in standard delivery. These metallic pathways have a polished surface texture.
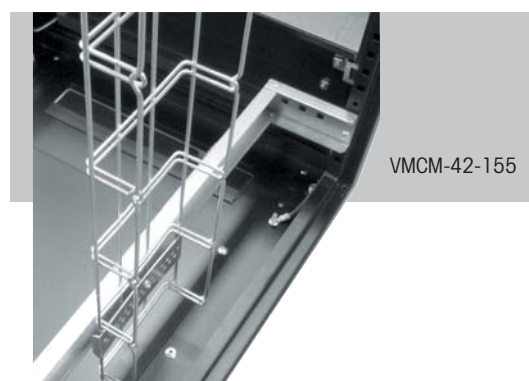
VMCM-42-155

PART NO.	DESCRIPTION
VMCM-42-155	Vertical Metallic Cable Management Pathway 42U, 150 x 50 mm
VMCM-45-155	Vertical Metallic Cable Management Pathway 45U, 150 x 50 mm

19" Adapter for Vertical Cable Management Pathways

This adapter can be used in situations when it is necessary to mount the above types of vertical cable management systems into 19" frames of Signamax free standing racks. The size of the adapter is 1U. Mounting kits are included in standard delivery. This adapter has a polished surface texture.

AVCM-19

PART NO.	DESCRIPTION
AVCM-19	19" Adapter for Vertical Cable Management Systems, VPCM and VMCM

SIGNAMAX CONNECTIVITY SYSTEMS

19" Shelves for Keyboard and Documentation

Signamax shelves for keyboard and documentation can be installed into any 19" data rack frames. Shelves with lockable drawers for safe storage of service documentation occupy the space of 1U or 2U. Signamax 19″ keyboard shelf occupies 1U. All these shelves can be purchased in grey colour (RAL 7035). Black colour (RAL 9005) is available on request.

REC-SV-KB-B
Keyboard Shelf Closed

REC-SV-KB-B
Keyboard Shelf Opened
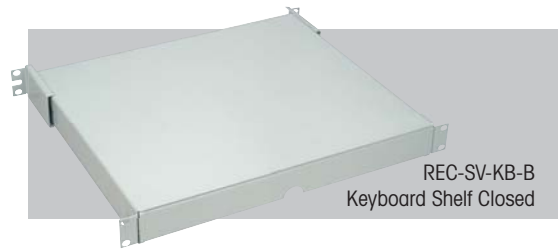
REC-SV-DOC-2U-B

19″ Documentation and Keyboard Shelves RAL 7035

PART NO.	DESCRIPTION
REC-SV-DOC-1U-B	Documentation Shelf with Lock 1U
REC-SV-DOC-2U-B	Documentation Shelf with Lock 2U
REC-SV-KB-B	Keyboard Shelf 1U

19" Fixed and Drawer-Style Shelves

These Signamax 19" shelves can be used when installing equipment not designed for 19" frame installations. The product range includes shelves for fixed and drawer-style use. Drawer-style system enables easier access to the equipment stored on the shelf. Perforated bottom ensures cooling airflow to the equipment. Shelf support parts and mounting brackets are included in the standard delivery. Signamax shelves can be purchased in grey colour (RAL 7035). Black colour (RAL 9005) is available on request.
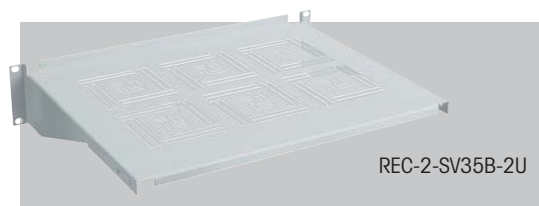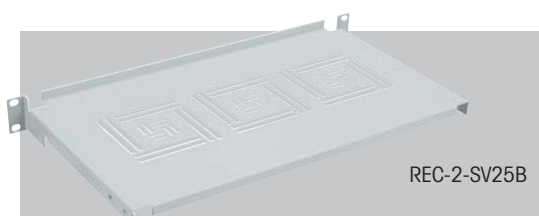
REC-2-SV35B-2U

19" Fixed and Drawer-Style Shelves RAL 7035

PART NO.	DESCRIPTION
REC-2-SV15B	Fixed Shelf, 150mm Depth, 1U, 2-Point Attachment
REC-2-SV25B	Fixed Shelf, 250mm Depth, 1U, 2-Point Attachment
REC-2-SV35B	Fixed Shelf, 350mm Depth, 1U, 2-Point Attachment
REC-2-SV35B-2U	Fixed Shelf, 350mm Depth, 2U, 2-Point Attachment
REC-2-SV45B-2U	Fixed Shelf, 450mm Depth, 2U, 2-Point Attachment
REC-2-SV55B-2U	Fixed Shelf, 550mm Depth, 2U, 2-Point Attachment

REC-2-TSV45B

PART NO.	DESCRIPTION
REC-4-SV25B	Fixed Shelf, 250mm Depth, 1U, 4-Point Attachment
REC-4-SV35B	Fixed Shelf, 350mm Depth, 1U, 4-Point Attachment
REC-4-SV45B	Fixed Shelf, 450mm Depth, 1U, 4-Point Attachment
REC-4-SV55B	Fixed Shelf, 550mm Depth, 1U, 4-Point Attachment
REC-4-SV65B	Fixed Shelf, 650mm Depth, 1U, 4-Point Attachment
REC-4-SV75B	Fixed Shelf, 750mm Depth, 1U, 4-Point Attachment
REC-4-SV75B-ZINC	Fixed Shelf, 750mm Depth, 1U, 4-Point Attachment, Zinc-Coated Sheet Metal

REC-2-SV25B

PART NO.	DESCRIPTION
REC-2-TSV25B	Drawer-Style Sliding Shelf, 250 mm Depth, 1U, 2-Point Attachment
REC-2-TSV35B	Drawer-Style Sliding Shelf, 350 mm Depth, 1U, 2-Point Attachment
REC-2-TSV45B	Drawer-Style Sliding Shelf, 450 mm Depth, 1U, 2-Point Attachment
REC-2-TSV25B-2U	Drawer-Style Sliding Shelf, 250 mm Depth, 2U, 2-Point Attachment
REC-2-TSV35B-2U	Drawer-Style Sliding Shelf, 350 mm Depth, 2U, 2-Point Attachment
REC-2-TSV45B-2U	Drawer-Style Sliding Shelf, 450 mm Depth, 2U, 2-Point Attachment

PART NO.	DESCRIPTION
REC-4-TSV25B	Drawer-Style Sliding Shelf, 250 mm Depth, 1U, 4-Point Attachment
REC-4-TSV35B	Drawer-Style Sliding Shelf, 350 mm Depth, 1U, 4-Point Attachment
REC-4-TSV45B	Drawer-Style Sliding Shelf, 450 mm Depth, 1U, 4-Point Attachment
REC-4-TSV55B	Drawer-Style Sliding Shelf, 550 mm Depth, 1U, 4-Point Attachment
REC-4-TSV65B	Drawer-Style Sliding Shelf, 650 mm Depth, 1U, 4-Point Attachment

SIGNAMAX™
CONNECTIVITY SYSTEMS

19" Lighting Units

Signamax 19" diode lighting units are designed for illuminating network equipment installed inside the data rack. The ON/OFF button and the signaling that indicates ON/OFF state are located on the front face of the unit. The rear side is equipped with a socket for power feed. The underside of the unit is fitted with the line of LED—i.e. the light is directed downwards. The unit is movable in its holders forward or backward in order to set the optimal illumination direction.

REC-LED-BK

MAIN CHARACTERISTICS
• High illuminating power
• Low electric power consumption
• Long lifespan
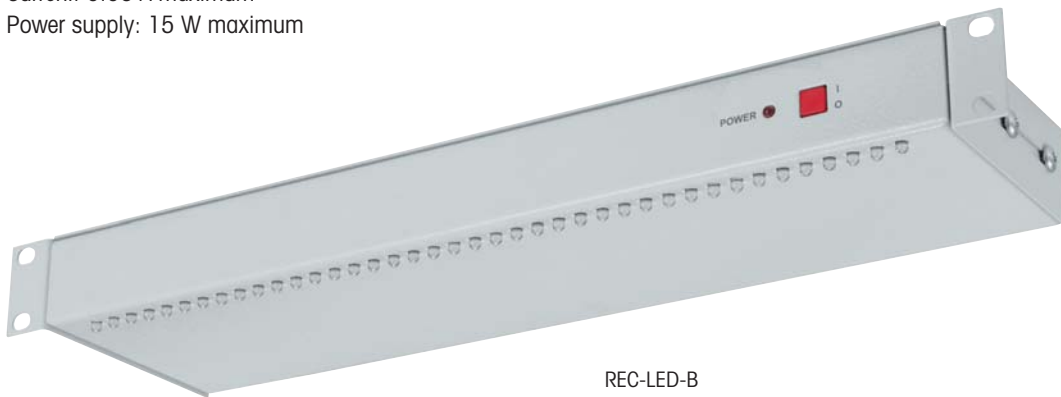• Very low heat radiation

REC-LU-B

TECHNICAL DATA
Dimensions (WxHxD): 483 x 44 x 125 mm
Weight: 3 kg without connecting cable
Voltage system: 1NPE, 230 V, 50/60 Hz, TN-S
Current: 0.06 A maximum
Power supply: 15 W maximum

REC-LED-B

Diode Lighting Units

PART NO.	DESCRIPTION
REC-LED-B	19" Diode Lighting Unit, RAL 7035, 1U
REC-LED-BK	19" Diode Lighting Unit, RAL 9005, 1U

REC-LU-BK

Other Lighting Units

| PART NO.	DESCRIPTION
REC-LU-B	19" Halogen Lighting Unit, RAL 7035, 1U
REC-LU-BK	19" Halogen Lighting Unit, RAL 9005, 1U
REC-MLU-B	Fluorescent Lighting Unit, Mounted by Magnet, RAL 7035
REC-MLU-BK	Fluorescent Lighting Unit, Mounted by Magnet, RAL 9005

REC-MLU-B

Accessories

Signamax rack accessories include a variety of products ranging from blanks panels, base frames, mounting kits to rack wheels, connecting kits, or other accessories. Most of these products are treated with pulverized colour for internal environment according to the RAL scale. Standard colour is grey (RAL 7035), black (RAL 9005) is available on request.

EPP-BL

Blank Panels RAL 7035

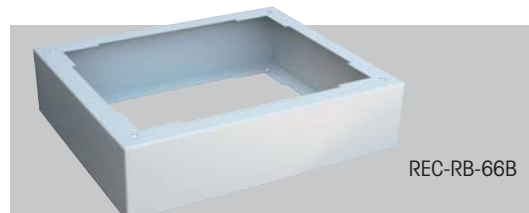| PART NO.	DESCRIPTION
EPP-BL1-B	Blank Panel 1U
EPP-BL2-B	Blank Panel 2U
EPP-BL3-B	Blank Panel 3U
EPP-BL4-B	Blank Panel 4U
EPP-BL6-B	Blank Panel 6U
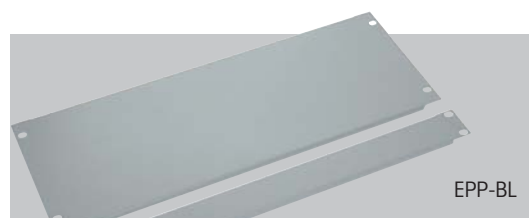
Base Frames

Signamax base frames are suitable for all Signamax free standing data racks and are used for fixing the racks to the floor to assure their best stability. They are available as standard (full plated) or can be purchased with dust filters on each side. With the latter type, the filter grid can be removed to insert cables inside.
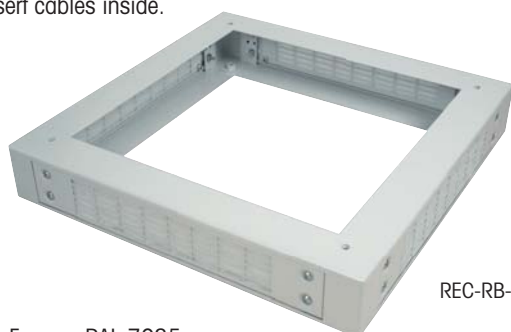
REC-RB-66B

REC-RB-88BF

Standard Base Frames RAL 7035

PART NO.	DESCRIPTION
REC-RB-66B	Base Frames for Signamax Data Rack 600x600, 10 cm, Standard
REC-RB-68B	Base Frames for Signamax Data Rack 600x800, 10 cm, Standard
REC-RB-61B	Base Frames for Signamax Data Rack 600x1,000, 10 cm, Standard
REC-RB-88B	Base Frames for Signamax Data Rack 800x800, 10 cm, Standard
REC-RB-81B	Base Frames for Signamax Data Rack 800x1,000, 10 cm, Standard

Base Frames With Filters RAL 7035

PART NO.	DESCRIPTION
REC-RB-66BF	Base Frames for Signamax Data Rack 600x600, 10 cm, with 4 Filters
REC-RB-68BF	Base Frames for Signamax Data Rack 600x800, 10 cm, with 4 Filters
REC-RB-61BF	Base Frames for Signamax Data Rack 600x1,000, 10 cm, with 4 Filters
REC-RB-88BF	Base Frames for Signamax Data Rack 800x800, 10 cm, with 4 Filters
REC-RB-81BF	Base Frames for Signamax Data Rack 800x1,000, 10 cm, with 4 Filters

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Accessories

Other Accessories

PART NO.	DESCRIPTION
REC-FPFP4	Mounting Kit M5 4pcs Set
REC-FPFP16	Mounting Kit M5 16pcs Set
REC-FPFP20	Mounting Kit M5 20pcs Set
REC-FPFP50	Mounting Kit M5 50pcs Set
REC-6-FPFP4	Mounting Kit M6 Set of 4pcs
REC-CB	Signamax Racks Wheels, Load Capacity 200 kg, Set of 4 Pieces
REC-CB4	Signamax Racks Wheels, Load Capacity 400 kg, Set of 4 Pieces
REC-CCK	Racks Connecting Kit (incl. screws and nuts)
REC-RP-01	Power Distribution Panel A-504, 5 positions 220V, incl. 2U Holder, Black
REC-RP-02	Power Distribution Panel S8 FA, 8 positions 220V, incl. 1U Holders, Black

REC-CB
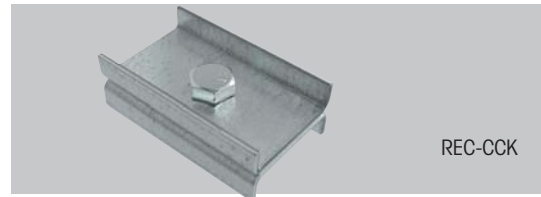
REC-CCK

REC-RP-01

Accessories

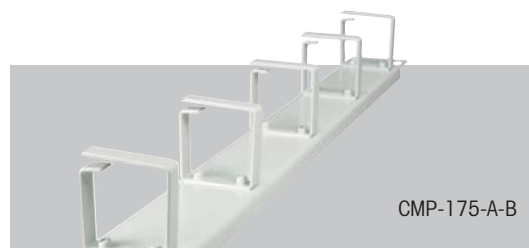## Cable Organizers

Signamax 19" cable organizers are designed for easy and fast management of patch cords inside data racks. They are available in different types (i.e. with plastic or steel lugs, plastic trunk, or brash) and sizes (i.e. 1U or 2U). These products are treated with pulverized colour for internal environment according to the RAL scale. Standard colour is grey (RAL 7035). Black colour (RAL 9005) is available on request.


REC-VP1-B

Cable Organizers

PART NO.	DESCRIPTION
CMP-175-A-B	Cable Organizer, Steel Lugs, RAL 7035, 1U
CMP-350-A-B	Cable Organizer, Steel Lugs, RAL 7035, 2U
REC-VP2-B	Cable Organizer with Plastic Trunk, RAL 7035, 1U
REC-VP1-B	Cable Organizer with Plastic Lugs, RAL 7035, 1U
PRP-1U-B	PRP Panel with Brush, RAL 7035, 1U

CMP-175-A-B

Ring Brackets

Signamax ring brackets are used for organizing cables inside the data rack. Cables can be organized either by vertical or horizontal brackets. Two mounting sets allow multiple placement possibilities within the data rack. Metal brackets have a polished surface texture.

EPCM3-4/8

EPCM1-4/8

EPC EPCM2-4/8
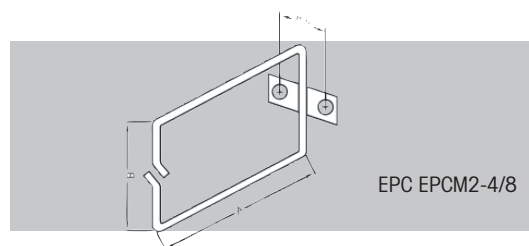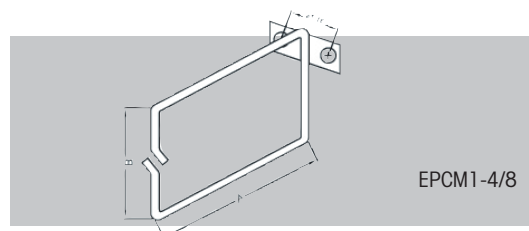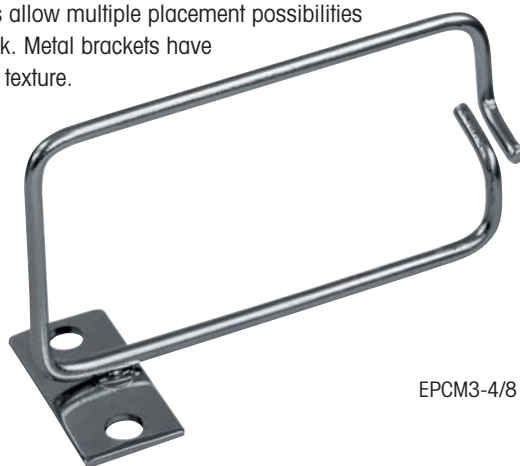
Cable Management Ring Brackets

PART NO.	DESCRIPTION
EPCM1-4/4	Cable Management Bracket 40 x 40 mm
EPCM1-4/8	Cable Management Bracket 40 x 80 mm
EPCM1-8/8	Cable Management Bracket 80 x 80 mm
EPCM2-4/4	Cable Management Bracket 40 x 40 mm
EPCM2-4/8	Cable Management Bracket 40 x 80 mm
EPCM2-8/8	Cable Management Bracket 80 x 80 mm
EPCM3-4/4	Cable Management Bracket 40 x 40 mm
EPCM3-4/8	Cable Management Bracket 40 x 80 mm
EPCM3-8/8	Cable Management Bracket 80 x 80 mm

EPCM3-4/8

SIGNAMAX
CONNECTIVITY SYSTEMS

REFERENCES

ABB elektro Zilina (Slovakia)
Adelphia Cable (USA)
Air Jamaica (USA)
Augusta National Golf Club (USA)
AVEX Oravska Lesna (Slovakia)
Axton (Slovakia)
Bayern Chemie (Germany)
Bechtel Corporation (USA)
CASINO Austria (Austria)
Catholic University (Slovakia)
CCR-Princeton (USA)
CEZ (Czech republic)
Comcast Cable (USA)
Constantin University (Slovakia)
Depository Trust (USA)
eBanka (Czech republic)
Federal Bureau of Investigation (USA)
Federal Reserve Bank (USA)
Florida Department of Transport. (USA)

Fort Lauderdale International Airport (USA)
GTS (Czech republic)
Hilton-Wien (Austria)
Hospice of Marion County (USA)
Illinois National Bank (USA)
John F. Kennedy International Airport (USA)
Kia Motors Zilina (Slovakia)
Lidl (Germany)
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Muckleshoot Indian Casino (USA)
Nestle (USA)
PepsiCola (USA)
Philadelphia International Airport (USA)
PPS Detva (Slovakia)
Prague International Airport
(Czech republic)
Public schools (Germany)
Raven (Slovakia)
Remi (Germany)

Salt Lake City International Airport (USA)
SBC Telecom (USA)
Slovak Embassy Rome (Italy)
Social Insurence Company Poprad
(Slovakia)
SPP Kosice (Slovakia)
Sprint (USA)
Stadtverwaltung DGF (Germany)
The May Company (USA)
Time Warner Cable (USA)
T-mobil Austria (Austria)
Twin City Foods (USA)
U.S. Navy (USA)
UNIQUA Insurance Company (Austria)
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