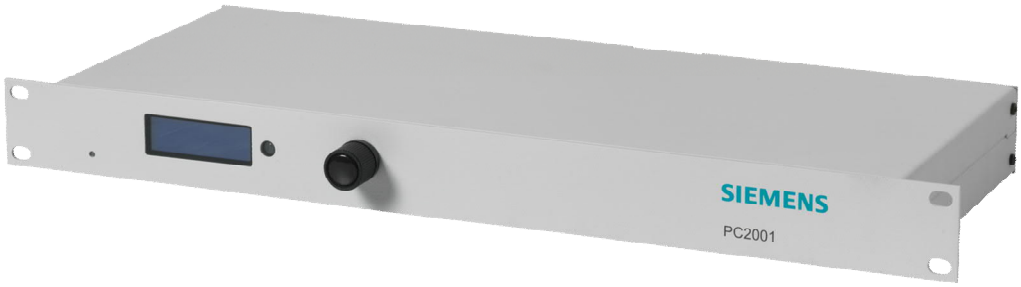
SIEMENS

Novigo

Digital audio matrix, Ethernet switches, media converter

PC2001-A1, PC2002-A1, PC2003-A1, PC2005-A1, PC2006-A1, PN2001-A1, PN2005-A1, PN2007-A1, PNA2002-A1, PNA2003-A1, PNA2004-A1



EN 54-16-certified audio input and output components for demanding digital and network-based public address and evacuation applications

- Fully redundant configurable system with no 'Single Point of Failure'
- Ethernet interface ('PACE-Net') for networking with other system components
- Serial interface ('PACE-Bus') for connecting to internal and external components
- Real-time configuration, remote maintenance, and remote monitoring via the PACE-Design system software
- Real-time audio transmission and integrated real-time recorder for delayed announcements
- Analog audio inputs and outputs, plus analog and digital control inputs and outputs
- Automatic volume control, compressor and limiter
- Speaker line monitoring with impedance monitoring or EOL element
- Speaker line monitoring and short-circuit isolation with Loop isolators
- Integrated Micro-SD card reader for alarm messages and music
- Compatible, industry-standard network components available
- Networking via copper cables or fiber-optic cables

CE

System

Novigo is a network-based voice alarm and announcement system that complies with the requirements of EN 54-16 and allows for a decentralized and redundant system structure. It is an important feature of the system that the critical risks of single point of failure vulnerabilities are eliminated.

A typical Novigo system is comprised of digital audio matrices, amplifiers, operating terminals, and call stations. Ethernet switches are used to link these components to a network via copper or fiber-optic cables.

Novigo systems are configured in real-time using the 'PACE-Design' system software.

An EN 54-4-certified power supply guarantees uninterrupted operation and high system availability.

Novigo is designed for the following applications:

- Alarm and evacuation
  - Automatic activation of acoustic alarm and evacuation announcements through a connected hazard detection system, such as a fire detection system
  - Manual activation of acoustic alarm and evacuation announcements by trained staff
  - Live announcements made by trained staff
  - Playback of announcements recorded in advance
- Announcements
  - Background music
  - Live announcements, with optional delay feature
  - Playback of announcements recorded in advance

Novigo covers both applications within one integrated system. It complies with the stringent requirements that apply to voice alarm systems in line with EN 54-16 and the extremely high standards for the audio quality and convenience of a standard announcement system.

Digital audio matrix

The Novigo audio matrices process audio signals from the digital network, the internal digital memory (flash), the micro SD card, and the analog audio inputs. The audio matrices automatically digitize analog signals so they can be processed further. Each audio signal is assigned to an audio channel. A Novigo audio matrix can manage up to 255 audio channels.

Novigo audio matrices are standard network participants. Audio matrices are connected to the network using Ethernet switches.

The parameters for audio transmission within the network are configured using the 'PACE-Design' system software. The audio matrices have sampling frequencies of up to 48 kHz / 24 bit to ensure compliance with the most stringent audio quality requirements. The Novigo audio matrices transmit up to 64 audio channels at the same time within the network. The latency of audio signals from the analog input, e.g., a microphone, up to the point of being converted back to analog and output at the speaker lines is constant at 4.6 ms. This very slight delay allows for Novigo systems to be used in 'pro sound' applications.

The network also transmits all of the control signals at the same time as the audio signals.

The Novigo audio matrices PC2001-A1, PC2002-A1, and PC2003-A1 monitor the correct function of the connected amplifiers. In case of a fault, PC2003-A1 can switch to the backup amplifiers.

The Novigo audio matrices PC2001-A1, PC2002-A1, and PC2003-A1 monitor the connected speaker lines for open lines, short circuits and ground faults. The monitoring can be conducted via speaker line impedance supervision or via EOL elements PCA2004-A1. Speaker loops with short circuit isolators PCA2005-A1 can be connected to the audio matrices PC2003-A1.

Ethernet switches

Using Ethernet switches, individual Novigo network components, such as audio matrices and call stations, can be connected to a network of up to 1500 network participants.

Each Novigo network component features two independent network connections. Combined with Ethernet switches, these two network connections make it possible to form a fully redundant network.

All Novigo Ethernet switches feature standard Ethernet sockets (RJ45) for the connection of Novigo network components. Adapters can be fitted to create further interfaces for maximum flexibility in network cable selection. Users can choose between 100 Mbit/s Ethernet and various fiber-optic adapters in any frequency range, from multi-mode to single-mode.

Media converter

The media converter converts a CAT5 copper based Ethernet section to fiber-optic based Ethernet section.

Fiber-optic adapter

Fiber-optic adapters allow the user to establish a fiber-optic connection between two network devices, such as an Ethernet switch and a media converter. A fiber-optic adapter must be connected to the SFP interface of each network device.

The type of fiber-optic adapter to use depends on the network device and the distance between the two devices.

Features and Functions

Digital audio matrices

PC2001-A1	'Digital audio matrix (4/4/4)'
	● 4 analog audio inputs and 4 analog audio outputs ● 4x 100 V speaker lines ● 8 digital control inputs and 8 digital control outputs ● 8 analog control inputs ● 19" / 1 HU housing ● 100 Mbit/s Ethernet-based network interface ● Serial interface for connection to internal and external components ● Integrated micro SD card reader for alarm messages and music ● Simultaneous transmission of up to 64 digital audio channels in studio quality (48 kHz/24 bit) with a constant latency of 1.33 ms ● Real-time audio transmission: constant latency 4.6 ms analog-in/analog-out ● Integrated real-time recorder for delayed announcements ● Speaker impedance and line monitoring in alarm mode and non-alarm mode ● Speaker line monitoring via EOL element ● Automatic volume control, compressor and limiter

PC2002-A1	'Digital audio matrix (0/4/4)'
	• 4 analog audio outputs • 4x 100 V speaker lines • 8 digital control inputs and 8 digital control outputs • 8 analog control inputs • 19" / 1 HU housing • 100 Mbit/s Ethernet-based network interface • Serial interface for connection to internal and external components • Simultaneous transmission of up to 64 digital audio channels in studio quality (48 kHz/24 bit) with a constant latency of 1.33 ms • Real-time audio transmission: constant latency 4.6 ms analog-in/analog-out • Integrated real-time recorder for delayed announcements • Speaker impedance and line monitoring in alarm mode and non-alarm mode • Speaker line monitoring via EOL element

PC2003-A1	'Digital audio matrix (4/4/16)'
	• 4 analog audio inputs and 4 analog audio outputs • 16x 100 V speaker lines • 8 digital control inputs and 8 digital control outputs • 19" / 1 HU housing • 100 Mbit/s Ethernet-based network interface • Serial interface for connection to internal and external components • Integrated micro SD card reader for alarm messages and music • Simultaneous transmission of up to 64 digital audio channels in studio quality (48 kHz/24 bit) with a constant latency of 1.33 ms • Real-time audio transmission: constant latency 4.6 ms analog-in/analog-out • Integrated real-time recorder for delayed announcements • Speaker impedance and line monitoring in alarm mode and non-alarm mode • Speaker line monitoring via EOL element • Speaker line monitoring and short-circuit isolation with loop isolators • Automatic volume control, compressor, and limiter

PC2005-A1	'Digital audio matrix no supervision (4/4/4)'
	• 4 analog audio inputs and 4 analog audio outputs • 8 digital control inputs and 8 digital control outputs • 8 analog control inputs • 19" / 1 HU housing • 100 Mbit/s Ethernet-based network interface • Serial interface for connection to internal and external components • Integrated micro SD card reader for alarm messages and music • Simultaneous transmission of up to 64 digital audio channels in studio quality (48 kHz/24 bit) with a constant latency of 1.33 ms • Real-time audio transmission: constant latency 4.6 ms analog-in/analog-out • Integrated real-time recorder for delayed announcements

PC2006-A1	'Digital audio matrix no supervision (0/4/4)'
	• 4 analog audio outputs • 8 digital control inputs and 8 digital control outputs • 8 analog control inputs • 19" / 1 HU housing • 100 Mbit/s Ethernet-based network interface • Serial interface for connection to internal and external components • Simultaneous transmission of up to 64 digital audio channels in studio quality (48 kHz/24 bit) with a constant latency of 1.33 ms • Real-time audio transmission: constant latency 4.6 ms analog-in/analog-out • Integrated real-time recorder for delayed announcements • Automatic volume control, compressor and limiter

Ethernet switch

PN2001-A1	'Ethernet switch (2x4/2)'
	• 2 separate Ethernet switches in a single housing • 2x 4 copper ports (RJ45, 10/100/1000Base-T) • 2x fiber-optic ports (duplex SC) • 19" / 1 HU housing • Enables the user to create a fully duplicated network • Operated on DC 24 V using EN 54-4-certified power supply units

PN2005-A1	'Planet IGS-10020MT Ethernet Switch'
	• 8x copper ports (RJ45, 10/100/1000Base-T) • 2x SFP interfaces (100/1000Base-X dual-mode with auto-detection) to incorporate a fiber-optic section (fiber-optic adapter required) • Slimline IP30 metal housing for demanding industrial environments • -40 to +75 °C operating temperature • DIN rail and wall mounting model • Redundant power supply with reverse polarity protection • Supports Ethernet ESD protection (<DC 6000 V) • Supports EFT protection for mains connection (<DC 6000 V) • Enables the user to create a stable, redundant network • Supports 'Ethernet Ring Protection Switching' (ERPS) for ring-shaped network structures to enable rapid switching to redundant network paths in the event of a fault • Supports 'Virtual Local Area Network' (VLAN) to divide the physical network into logical sub-networks to increase network performance and security

Media converter

PN2007-A1	'Planet IGT-805AT Media Converter'
	• 1x copper ports (RJ45, 10/100/1000Base-T with auto MDI / MDI-X function) • 1x SFP interfaces (100/1000Base-X dual-mode with auto-detection) to incorporate a fiber-optic section (fiber-optic adapter required) • Slimline IP30 metal housing for demanding industrial environments • -40 to +75 °C operating temperature • DIN rail and wall mounting model • Redundant power supply with reverse polarity protection • Supports Ethernet ESD protection (<DC 6000 V) • Supports EFT protection for mains connection (<DC 6000 V)

Fiber-optic adapter

PNA2002-A1	'Planet MGB-LX FOI Adapter'
	• SM transceiver module for fiber-optic data transfer • SFP form factor for insertion into an SFP interface • Can be inserted during operation • Conforms to SFA multi-source agreement (MSA) • Duplex LC port • Max. cable length: 10 km

PNA2003-A1	'Planet MGB-SX FOI Adapter'
	• MM transceiver module for fiber-optic data transfer • SFP form factor for insertion into an SFP interface • Can be inserted during operation • Conforms to SFA multi-source agreement (MSA) • Duplex LC port • Max. cable length: 550 m

PNA2004-A1	'D-Link DEM-211 FOI Adapter'
	• MM transceiver module for fiber-optic data transfer • SFP form factor for insertion into an SFP interface • Can be inserted during operation • Conforms to SFA multi-source agreement (MSA) • Duplex LC port • Max. cable length: 2 km

Type Overview

Digital audio matrices

Type	PC2001-A1	PC2002-A1	PC2003-A1
			
Designation	Digital audio matrix (4/4/4)	Digital audio matrix (0/4/4)	Digital audio matrix (4/4/16)
Order number	OFB:NOVIGO_2119	OFB:NOVIGO_2120	OFB:NOVIGO_2121
Housing type	19" / 1HU		
W x H x D mm	482 x 44 x 180		482 x 44 x 357
Weight	3.1 kg		8.5 kg
Inputs and outputs			
Audio inputs 0 dB (external source)	4	0	4
Audio outputs 0 dB (to amplifier / external)	4		
Number of 100 V speaker lines	4		16
Analog control inputs 0...10 V	8		0
Digital inputs	8		
Digital outputs	8		
Other			
LC display	●		–
Audio processing at each audio input (DSP)	Level, compressor, limiter, equalizer	–	Level, compressor, limiter, equalizer
Speaker line supervision	●		

Type	PC2005-A1	PC2006-A1
		
Designation	Digital audio matrix no supervision (4/4/4)	Digital audio matrix no supervision (0/4/4)
Order number	OFB:NOVIGO_2359	OFB:NOVIGO_2360
Housing type	19" / 1HU	
W x H x D mm	482 x 44 x 180	
Weight	3.0 kg	
Inputs and outputs		
Audio inputs 0 dB (external source)	4	0
Audio outputs 0 dB (to amplifier / external)	4	
Number of 100 V speaker lines	0	
Analog control inputs 0...10 V	8	
Digital inputs	8	
Digital outputs	8	
Other		
LC display	●	
Audio processing at each audio input (DSP)	–	Level, compressor, limiter, equalizer
Speaker line supervision	–	

●	Included
–	Not included

Ethernet switch

Type	PN2001-A1	PN2005-A1
		
Designation	Ethernet switch (2x4/2)	Planet IGS-10020MT Switch
Order number	OFB:NOVIGO_2123	OFB:NOVIGO_2125
Housing type	19" / 1HU	DIN rail and wall mounting model
W x H x D mm	482 x 44 x 125	56 x 135 x 88
Weight	2.4 kg	0.72 kg
Connections		
Serial interface (RS232)	2	–
Ethernet ports (RJ45)	2x 4	8
Fiber-optic ports	2x fiber-optic ports on SC connection Wavelength: 1310 nm, fiber type: Multi Mode	2x 100/1000Base-X SFP interface
Topologies	Used in chain or tree topologies	Used in ring topologies
Power supply	DC 24 V (18 V...32 V)	DC 12...48 V or AC 24 V mains adapter

Media converter

Type	PN2007-A1
	
Designation	Planet IGT-805AT Converter
Order number	OFB:NOVIGO_2126
Housing type	DIN rail and wall mounting model
W x H x D mm	32 x 135 x 87
Weight	0.46 kg
Connections	
Ethernet ports (RJ45)	1
Fiber-optic ports	1x 100/1000Base-X SFP interface
Power supply	DC 12...48 V or AC 24 V mains adapter

Fiber-optic adapter

Type	PNA2002-A1	PNA2003-A1	PNA2004-A1
			
Designation	Planet MGB-LX FOI Adapter	Planet MGB-SX FOI Adapter	D-Link DEM-211 FOI Adapter
Order number	OFB:NOVIGO_2127	OFB:NOVIGO_2129	OFB:NOVIGO_2128
Housing type	SFP (Small Form Factor Pluggable)		
Port type	Duplex-LC		
Fiber type	Single Mode	Multi Mode	
Max. cable length	10 km	550 m	2 km
Ethernet standards	IEEE 802.3ab/802.3z 1000 Mbit/s		IEEE 802.3u 100 Mbit/s FX

Accessories

You will find more information on suitable accessories in the data sheet with document ID 'A6V11467211'.

Device combinations

Fiber-optic adapter

All Novigo fiber-optic adapters are compatible with all Novigo network components that are equipped with an SFP interface.

Use the fiber-optic adapter PNA2004-A1 for the Ethernet switch PN2005-A1 or the media converter PN2007-A1 if you wish to link the Ethernet switch PN2001-A1 to these components using a fiber-optic cable.

Order numbers

Type	Designation	Order number
Digital audio matrix		
PC2001-A1	Digital audio matrix (4/4/4)	OFB:NOVIGO_2119
PC2002-A1	Digital audio matrix (0/4/4)	OFB:NOVIGO_2120
PC2003-A1	Digital audio matrix (4/4/16)	OFB:NOVIGO_2121
PC2005-A1	Dig audio no supervis (4/4/4)	OFB:NOVIGO_2359
PC2006-A1	Dig audio no supervis (0/4/4)	OFB:NOVIGO_2360
Ethernet switch		
PN2001-A1	Ethernet switch (2x4/2)	OFB:NOVIGO_2123
PN2005-A1	Planet IGS-10020MT Switch	OFB:NOVIGO_2125
Media converter		
PN2007-A1	Planet IGT-805AT Converter	OFB:NOVIGO_2126
Fiber-optic adapter		
PNA2002-A1	Planet MGB-LX FOI Adapter	OFB:NOVIGO_2127
PNA2003-A1	Planet MGB-SX FOI Adapter	OFB:NOVIGO_2129
PNA2004-A1	D-Link DEM-211 FOI Adapter	OFB:NOVIGO_2128

Product documentation

You will find more information on the Novigo system and its components in the following documents:

Title	Document ID
IT security policies	
Novigo – IT security policies	A6V11773711
System documentation	
Novigo – planning	A6V11467812
'PACE-Design' – configuration	A6V11474760
Novigo – mounting / installation	A6V11467817
Novigo – operation	A6V11467803
Data sheets	
System data sheet	A6V11467196
19" cabinets	A6V11467209
Digital audio matrix	A6V11467202
Power amplifier	A6V11467204
Operating terminals	A6V11467198
Call stations and extensions	A6V11467200
Power supply and batteries	A6V11467207
Accessories and options	A6V11467211
Loop isolator (100V)	
Loop isolator (100V) - technical manual	A6V11571319
Environmental declaration	
Novigo – environmental declaration	A6V11948779

Download center

Related documents such as environmental declarations, CE declarations, etc., can be downloaded at the following Internet address:

http://siemens.com/bt/download

Notes

Safety

⚠ CAUTION

National safety regulations

Failure to comply with national safety regulations may result in personal injury and property damage.

- Observe national provisions and comply with the appropriate safety regulations.

Disposal

The device is considered an electronic device for disposal in accordance with the European Guidelines and may not be disposed of as domestic garbage.

- Dispose of the device through channels provided for this purpose.
- Comply with all local and currently applicable laws and regulations.

Environmental compatibility

The Environmental Product Declaration (EPD) for 'Novigo VANSYS' contains data and information on the product's environmentally compatible design features and its ratings; for example, its RoHS conformity, composition, packaging, environmental benefits, and disposal information.

You can obtain the document A6V11948779 via the following Internet address:

https://siemens.com/bt/download

Enter the document ID in the search field.

Guarantee

The application-specific technical data is guaranteed only in combination with the Siemens products listed in the 'Device combinations' section. If third-party products are used, any guarantee provided by Siemens will be invalidated.

Digital audio matrices

	PC2001-A1	PC2002-A1	PC2003-A1	PC2005-A1	PC2006-A1
Supply					
Power supply	DC 24 V (18 V...32 V)				
Current consumption	0.3...0.37 A		0.5...5 A	0.3...0.37 A	
Number of inputs / outputs					
Audio inputs 0 dB (external source)	4	0	4	4	0
Audio inputs 100 V (amplifier)	4			0	
Audio outputs 0 dB (to amplifier / external)	4				
Speaker lines 100 V	4		16	0	
Analog control inputs 0...10 V	8 Plug-in terminal blocks		0	8 Plug-in terminal blocks	
Digital inputs	8 Schmitt trigger inputs on plug-in terminal blocks				
Digital outputs	8 Open collector outputs on plug-in terminal blocks				
Fault indicator relay	1				
Digital inputs					
Input voltage	Low <1.6 V / High >8 V				
Max. permissible voltage	18 V		36 V	18 V	
Input current at 10 V / 12 V / 24 V	~0.2 / – / – mA		– / ~0.5 / ~1 mA	~0.2 / – / – mA	
Digital outputs					
Max. voltage	36 V				
Max. current	200 mA per output Total of all switched outputs: 500 mA				
Analog control inputs					
Voltage range	DC 0...10 V		–	DC 0...10 V	
Resolution	8 bit		–	8 bit	
Input current at 10 V	~0.2 mA		–	~0.2 mA	
Audio inputs 100 V					
Max. power	500 W			–	
Max. current	5 A			–	
Fault indicator relay					
Contacts	Potential-free contact: max. AC / DC 48 V / 500 mA				

	PC2001-A1	PC2002-A1	PC2003-A1	PC2005-A1	PC2006-A1
Interfaces					
Serial interfaces	1x RS232 / RS485 9600, 19200, 57600, 115200 baud				
Ethernet connection 100Base-TX	2x RJ45				
Audio properties					
Frequency band	20 Hz...20 kHz / ±0.5 dB		40 Hz...20 kHz / -1 dB	20 Hz...20 kHz / ±0.5 dB	
Distortion factor	<0.005 %				
Total dynamic range	103 dB				
Inputs:	Symmetrical max. amplification freely selectable -20 dB...+60 dB	–	Symmetrical max. amplification freely selectable -20 dB...+60 dB		–
Phantom voltage	+12 V	–	+12 V Optional +24 V or +48 V	+12 V	–
Input impedance	6.6 kOhm	–	6.6 kOhm	6.6 kOhm	–
Outputs:	Symmetrical				
Max. output level	+15 dB				
Output impedance	300 Ohm				
Speaker line monitoring					
Via integrated impedance monitoring	Shorts, open line, earth fault, monitoring impedance deviation > 10%			–	
Via PCA2004-A1 EOL3 (active)	Shorts, open line, earth fault, up to 16 EOL per speaker line			–	
Via PCA2005-A1 Loop isolator (100V)	–		Shorts, open line, earth fault, short circuit isolation	–	
Ambient conditions					
Operating temperature	-5…+40 °C				
Storage temperature	-20…+70 °C				
Operation in humid environments (without moisture condensation)	10...90 % rel.				
Storage in humid environments (without moisture condensation)	5...90 % rel.				
Dimensions and weights					
W x H x D mm	482 x 44 x 180		482 x 44 x 357	482 x 44 x 180	
Weight	3.1 kg		8.5 kg	3.0 kg	

	PC2001-A1	PC2002-A1	PC2003-A1	PC2005-A1	PC2006-A1
Protection category and color					
Protection category (IEC 60529)	IP30				
Color	~RAL 7035				
Standards	EN 54-16				

Ethernet switch

	PN2001-A1	PN2005-A1
Supply		
Power supply	DC 24 V (18 V...32 V)	DC 12...48 V or AC 24 V mains adapter
Current consumption:		
● No-load operation	160 mA, +10 mA per active port	–
● Full load	260 mA	–
Power consumption	–	10 W (at full load)
Interfaces		
Serial interfaces (RS232)	2	–
Ethernet interface:		
● Copper (RJ45)	2x 4	8
● Fiber-optic ports	2x fiber-optic ports on SC connection	2x 100/1000Base-X SFP interface
● Fiber-optic wavelength	1310 nm	–
● Fiber-optic fiber type	Multi Mode	–
● Ethernet standards	IEEE 802u 100Base-TX, 100Base-FX Standard, IEEE 802.3 10Base	IEEE 802.3x
Ambient conditions		
Operating temperature	-5…+40 °C	-40…+75 °C
Storage temperature	-20…+70 °C	-40…+75 °C
Operation in humid environments (without moisture condensation)	10...90 % rel.	
Storage in humid environments (without moisture condensation)	5...90 % rel.	
Dimensions and weights		
W x H x D mm	482 x 44 x 125	56 x 135 x 88
Weight	2.4 kg	0.72 kg
Protection category and color		
Protection category (IEC 60529)	IP30	
Color	~RAL 7035	Black
Standards	EN 54-16	

Media converter

	PN2007-A1
Supply	
Power supply	DC 12...48 V or AC 24 V line adapter
Power consumption	~3.3 W at full load
Interfaces	
Ethernet interface:	
● Copper	1x RJ45, 10/100/1000Base-T
● Fiber-optic ports	1x SFP interface 1000Base-X
● Ethernet standards	IEEE 802.3x
Ambient conditions	
Operating temperature	-40…+75 °C
Storage temperature	-40…+75 °C
Operation in humid environments (without moisture condensation)	10...90 % rel.
Storage in humid environments (without moisture condensation)	5...90 % rel.
Dimensions and weights	
W x H x D mm	32 x 135 x 87
Weight	0.46 kg
Protection category and color	
Protection category (IEC 60529)	IP30
Color	Black
Standards	EN 54-16

Fiber-optic adapter

	PNA2002-A1	PNA2003-A1	PNA2004-A1
Supply			
Power supply	3.3 V		
Interfaces			
Housing type	SFP (Small Form Factor Pluggable)		
Fiber-optic ports:			
● Port type	Duplex-LC		
● Max. cable length	10 km	550 m	2 km
● Fiber type	Single Mode	Multi Mode	
● Ethernet standards	IEEE 802.3ab/802.3z 1000 Mbit/s		IEEE 802.3u 100 Mbit/s FX
● Wavelength	1310 nm	850 nm	1310 nm
Ambient conditions			
Operating temperature	0…50 °C		0…70 °C
Storage temperature	-20…70 °C		
Operation in humid environments (without moisture condensation)	10...90 % rel.		
Storage in humid environments (without moisture condensation)	5...90 % rel.		

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