Quantum Automation Platform

Transparent Factory Ethernet cabling system

Selection Guide

Product Type	Hubs		
			
Technology	Ethernet 10 Mbit/s		Ethernet 100 Mbit/s
Interfaces	4 10BASE-T ports	3 10BASE-T ports 2 10BASE-FL ports	4 100BASE-TX ports
Connection Type	Twisted pair cable	Twisted pair cable and redundant fiber optic ring	Twisted pair cable
Type of connector	Shielded RJ45	Shielded RJ45 for 10BASE-T BFOC for 10BASE-FL	Shielded RJ45
Terminal block	1 x 5-pin pluggable		
Operating voltage	18 to 32 VDC safety low voltage		9.6 to 57.6 VDC safety low voltage
Power Consumption	80 mA typical, 130 mA max at 24 VDC	160 mA typical, 350 mA max at 24 VDC	200 mA typical, 270 mA max at 24 VDC
Range	Twisted pair line length maximum 100 m	Fiber optic maximum 3100 m Twisted pair maximum 100 m	Twisted pair line length maximum 100 m
Model No.	499 NEH 004 10	499 NOH 005 10	499 NEH 041 00
Pages			

Switches		Transceivers	
			
Ethernet 10 Mbit/s and Fast Ethernet 100 Mbit/s		Ethernet 10 Mbit/s	Ethernet 100 Mbit/s
5 10BASE-T/100BASE-TX and 2 100BASE-TX ports	5 10BASE-T/100BASE-TX and 2 100BASE-FX ports	1 10BASE-T port and 1 10BASE-FL port	1 100BASE-TX port and 1 100BASE-FX port
Twisted pair cable	Twisted pair cable and redundant fiber optic ring	Twisted pair cable and fiber optic Ethernet cable	
Shielded RJ45	Shielded RJ45 for 10BASE-T and 100BASE-TX; SC for 100BASE-FX	Shielded RJ45 for 10BASE-T BFOC for 10BASE-FL	Shielded RJ45 for 100BASE-TX SC for 100BASE-FX
18 to 32 VDC, safety low voltage			9.6 to 57.6 VDC safety low voltage
800 mA maximum at 24 VDC		80 mA typical, 100 mA maximum at 24 VDC	160 mA typical, 190 mA maximum at 24 VDC
Twisted pair line length maximum 100 m	Fiber optic maximum 3100 m Twisted pair maximum 100 m	Twisted pair line length 100 m; 62.5/125µm fiber, 3100 m	
499 NES 071 00	499 NOS 071 00	499 NTR 000 10	499 NTR 001 00

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Transparent Factory Ethernet cabling system

Selection Guide

Product Type	Optical Cables		

Cable type	Standard glass fiber optic		
Pre-assembled connector type	MT/RJ-SC duplex	MT/RJ-ST	MT/RJ-MT/RJ
Cable length(s)	5 m (16.4 ft)		
Radiation susceptibility	No radiation along the cable		
Agency approvals	Category 5 of cabling standard EIA/TIA-568; Class D of IEC 11801 / EN50173		
Networks link	--		
Operating power	--		
Ports	--		
Model No.	490 NOC 000 05	490 NOT 000 05	490 NOR 000 05
Pages			

Electrical Cables		Bridges	
			
Shielded and foil twisted pair cord	Shielded and foil twisted pair crossed cord	--	
RJ45 (two per cable)		--	
2, 5, 12, 40, 80 m 6.5, 16.4, 39.4, 131.2, 262.4 ft	5, 15, 40, 80 m 16.4, 49.2, 131.2, 262.4 ft	--	
--			
UL and CSA (22.1) approval indicated by "U" after part number (example: 490 NTW 000 40U)		UL, CSA, CE	
		Modbus Plus to Ethernet	Modbus to Ethernet
		110 / 220 VAC, auto sensing	9 ... 30 VDC range; 12 or 24 VDC, nominal
		1Ethernet 10BASE-T, 10BASE-2, 10BASE-5 port; 1 dual / single cable Modbus Plus port	1 RJ45 port for 10BASE-T cable
490 NTW 000 ••	490 NTC 000 ••	174 CEV 200 30	174 CEV 300 10

Transparent Factory Ethernet cabling system

General

General

As part of its Transparent Factory family of products, Schneider Electric offers a range of industrially hardened network hubs, switches, transceivers, bridges, and cables. These Ethernet-standard communication components enable you to integrate Ethernet solutions from the device level to the control network, and beyond to the corporate intranet. Each product in the Ethernet cabling system is designed with compliance to Ethernet standards, and with third-party compatibility in mind.

- **Transparent Factory Hubs** connect segments to supply shared communication among PLCs. TF Hubs are low-cost solutions which enable communications with devices, such as Momentum I/O, to Ethernet networks.

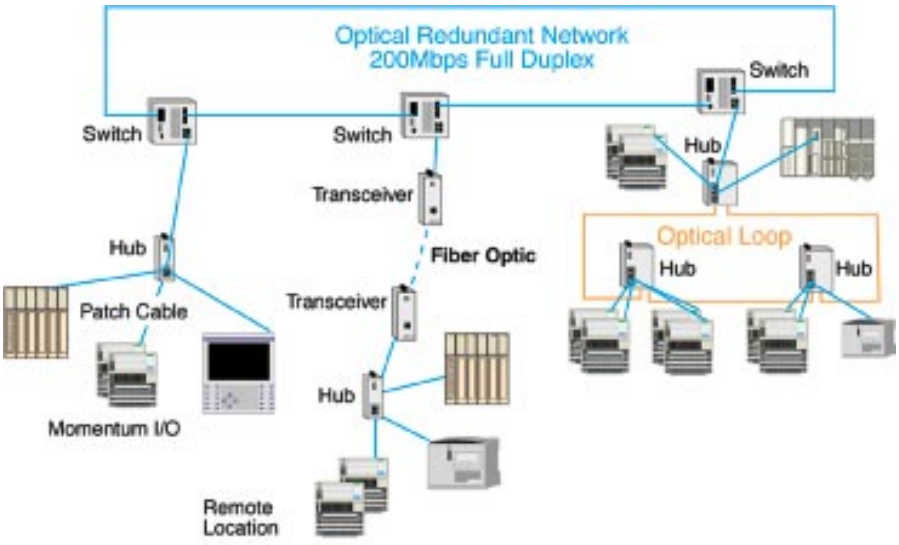
- **Transparent Factory Switches** segment the application in different zones, groups, or cells/machines. The proper placement of switches can increase network performance by relieving network congestion. TF switches implement SNMP protocol, allowing standard network management tools to monitor and diagnose the network, and thus are a key architectural component for real-time and deterministic network communication.

- **Transparent Factory Transceivers** provide connections to fiber optic networks in order to secure transmissions in areas of high electromagnetic interference. The use of multiple transceivers enables long distances between islands.

- **Transparent Factory Bridges** enable Modbus to Ethernet and Modbus Plus to Ethernet communications, with multiple ports allowing flexibility among network components.

- **Transparent Factory Cables** connect each device (such as PLC, I/O, PC, etc.) to the attached hub, switch, transceiver, patch panel, or to cascade hubs and switches. TF cables are available in fiber optic and twisted pair options, with a wide variety of connectors and cable lengths.

All TF Ethernet cabling system components are built to exacting standards, and are designed to perform in harsh environments. TF Switches and Hubs incorporate mechanisms to support a high level of resilience. With their scalable redundant features - from single to double ring structure - it is easy to build the kind of fault-tolerant network that fits the specific requirements of your environment.



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Transparent Factory Ethernet cabling system
Hubs

Characteristics

Mechanical construction

Model		499 NEH 004 10	499 NEH 041 00	499 NOH 005 10
Operating temperature	˚C (F)	0 to 60 (32 to 140)		
Relative humidity		10...90% (non-condensing)		
Dimensions W x H x D	mm (in)	40 x 125 x 80 (1.58 x 4.92 x 3.15)		80 x 140 x 80 (3.15 x 5.51 x 3.15)
Weight	g (lb)	520 (1.2)		900 (2)
Enclosure		IP 30		
Agency approvals and compliance		UL, CE, CUL 1950, FCC part B, CSA 22-2.142, CSA 22-2.213M Class 1 Div. 2 (certifications pending)		

Characteristics

Technology		Ethernet 10 Mbit/s	Ethernet 100 Mbit/s	Ethernet 10 Mbit/s
Interfaces		4 10BASE-T ports with shielded RJ45 connectors	4 100BASE-TX ports with shielded RJ45 connectors.	3 10BASE-T ports with shielded RJ45 connectors; 2 10BASE-FL ports with BFOC connectors
Connection type		Twisted pair cable		Twisted pair cable and redundant fiber optic ring
Terminal block		1 x 5-pin, pluggable		
Operating voltage	VDC	18 to 32, safety low voltage	9.6 to 57.6, safety low voltage	18 to 32, safety low voltage
Redundancy		Power supply		Power supply and optical ring
Power consumption at 24 VDC	mA	80 typical, 130 maximum	200 typical, 270 maximum	160 typical, 350 maximum
Maximum range	m (ft)	Twisted pair line length, max 100 (max 330)		Fiber optic, max 3100 (max 10,000) Twisted pair, max 100 (max 330)
Number of cascaded hubs		4 max		11 max
Number of hubs in a ring		--		11 max
Fault indicator		Wire contact to indicate power, network, or port failure (rated 1 A maximum at 24 VDC)		
LED indicators		Power, Data, Collision, and Link status per port		

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Transparent Factory Ethernet cabling system
Switches

Characteristics

Mechanical construction

Model		499 NES 071 00	499 NOS 071 00
Operating temperature	°C (F)	0 to 50 (32 to 122)	
Relative humidity		10...90% (non-condensing)	
Dimensions W x H x D	mm (in)	105 x 130 x 105 (4.1 x 5.1 x 4.1)	
Weight	g (lb)	1450 (3.2)	
Enclosure		IP 20	
Agency approvals and compliance		UL, CE, CUL 1950, FCC part B, CSA 22-2.142, CSA 22-2.213M Class 1 Div. 2 (certifications pending)	

Characteristics

Technology		Ethernet 10 Mbit/s and Fast Ethernet 100 Mbit/s	
Interfaces		5 10BASE-T/100BASE-TX ports with shielded RJ45 connectors 2 100BASE-TX ports with RJ45 connectors	5 10BASE-T/100BASE-TX ports with shielded RJ45 connectors 2 100BASE-FX ports with SC connectors
Connection type		Twisted pair cable	Twisted pair cable and redundant fiber optic ring
Terminal block		1 x 5-pin, pluggable	
Operating voltage	VDC	18 to 32, safety low voltage	
Redundancy		Power supply; optical and/or copper ring structure; fast media redundancy (< 0.3s); redundant manager	
Power consumption at 24 VDC	mA	800 maximum	
Maximum range	m (ft)	Twisted pair line length, max 100 (max 330)	Fiber optic, max 3100 (max 10,000) Twisted pair, max 100 (max 330)
Number of switches in a ring		Maximum 4 at 10 Mbit/s; maximum 50 at 100 Mbit/s	
Number of cascaded switches		50 max	
Fault indicator		Wire contact to indicate power, network, or port failure (rated 1 A maximum at 24 VDC)	
LED indicators		Power, Data, Collision, and Link status per port	

Transparent Factory Ethernet cabling system
Transceivers

Characteristics

Mechanical construction

Model		499 NTR 000 10	499 NTR 001 00
Operating temperature	˚C (F)	0 to 60 (32 to 140)	
Relative humidity		10...90% (non-condensing)	
Dimensions W x H x D	mm (in)	40 x 140 x 80 (1.58 x 5.51 x 3.15)	
Weight	g (lb)	520 (1.2)	
Enclosure		IP 30	
Agency approvals and compliance		UL, CE, CUL 1950, FCC part B, CSA 22-2.142, CSA 22-2.213M Class 1 Div. 2 (certifications pending)	

Characteristics

Technology		Ethernet 10 Mbit/s	Ethernet 100 Mbit/s
Interfaces		1 10BASE-T port with shielded RJ45 connector 1 10BASE-FL port with BFOC connector	1 100BASE-TX port with shielded RJ45 connector 1 100BASE-FX ports with SC connector
Connection type		Twisted pair cable and fiber optic Ethernet cable	
Terminal block		1 x 5-pin, pluggable	
Operating voltage	VDC	18 to 32 safety low voltage	9.6 to 57.6 safety low voltage
Redundancy		Power supply	
Power consumption at 24 VDC	mA	80 typical, 100 maximum	160 typical, 190 maximum
Maximum range	m (ft)	Twisted pair line length, 100 (330); 62.5/125µm fiber, 3100 (10 000)	
Link budget		> 11 dB for 50/125µm fiber cable; > 14 dB for 62.5/125µm fiber cable	
LED indicators		Power, Data, Collision, and Link status per port	

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Transparent Factory Ethernet cabling system
Cables, Bridges

Characteristics

Electrical cables

Model		490 NTW 000 xx	490 NTC 000 xx
Cable type		Shielded and foil twisted pair cord	Shielded and foil twisted pair crossed cord
Available cable lengths	m (ft)	2, 5, 12, 40, 80 (6.5,16.4, 39.4,131.2, 262.4)	5, 15, 40, 80 (16.4, 49.2,131.2, 262.4)
Pre-assembled connector type		RJ45 (two per cable)	
Agency approvals and compliance		UL, CSA 22.1 and NFPA 70 approval indicated by "U" after part number (example: 490 NTW 000 40U); Category 5 of international cabling standard EIA/TIA-568; Class D of IEC 11801 / EN50173; Low Smoke Zero Halogen (LSZH); flame retardant of NFC32 070 #1 (C2) and CEI 322/1	

Optical cables

Model		490 NOC 000 05	490 NOT 000 05	490 NOR 000 05
Pre-assembled connector type		MT/RJ-SC duplex	MT/RJ-ST	MT/RJ-MT/RJ
Cable type		Standard glass fiber optic		
Cable length	m (ft)	5 (16.4)		
Radiation susceptibility		No radiation along the cable		

Bridges

Model		174 CEV 200 30	174 CEV 300 10
Networks link		Modbus Plus to Ethernet	Modbus to Ethernet
Operating power		110 / 220 VAC, auto sensing	9 ... 30 VDC range; 12 or 24 VDC, nominal
Ports		1 Ethernet 10BASE-T (RJ45), 10BASE-2 (BNC), 10BASE-5 (AUI); 1 dual / single cable Modbus Plus	1 RJ45 port for 10BASE-T cable
Mounting		Vertical panel or horizontal shelf	DIN rail
Dimensions (W x H x D)	mm (in)	122 x 229 x 248 (4.8 x 9 x 9.8)	35 x 95 x 60 (1.4 x 3.7 x 2.4)

Transparent Factory Ethernet cabling system

References

Hubs

Description	Order No.	Weight g (lb)
Ethernet Hub 10 Mbps, 4 10BASE-T ports	**499 NEH 004 10**	520 (1.2)
Ethernet Hub 10 Mbps, 3 10BASE-T ports, 2 10BASE-FL ports	**499 NOH 005 10**	900 (2)
Ethernet Hub 100 Mbps, 4 100BASE-TX ports	**499 NEH 041 00**	520 (1.2)

Switches

Description	Order No.	Weight g (lb)
Ethernet Switch 10/100 Mbps, 7 100BASE-TX ports	**499 NES 071 00**	1450 (3.2)
Ethernet Switch 10/100 Mbps, 5 100BASE-TX ports, 2 100BASE-FX ports	**499 NOS 071 00**	1450 (3.2)

Transceivers

Description	Order No.	Weight g (lb)
Ethernet Transceiver 10 Mbps, 1 10BASE-T port, 1 10BASE-FL port	**499 NTR 000 10**	520 (1.2)
Ethernet Transceiver 100 Mbps, 1 100BASE-TX port, 1 100BASE-FX port	**499 NTR 001 00**	520 (1.2)

Bridges

Description	Order No.	Weight g (lb)
Modbus Plus to Ethernet Bridge	**174 CEV 200 30**	4263 (9.4)
Modbus to Ethernet Bridge	**174 CEV 300 10**	500 (1.0)

Cables

Description	Length m/ft	Order No.
Shielded and foil twisted pair cord cable	2/6.5	**490 NTW 000 02**
	5/16.4	**490 NTW 000 05**
	12/39.4	**490 NTW 000 12**
	40/131.2	**490 NTW 000 40**
	80/262.4	**490 NTW 000 80**
Shielded and foil twisted pair crossed cord cable	5/16.4	**490 NTC 000 05**
	15/49.2	**490 NTC 000 15**
	40/131.2	**490 NTC 000 40**
	80/262.4	**490 NTC 000 80**
Fiber optic cable, MT/RJ-SC duplex connectors	5/16.4	**490 NOC 000 05**
Fiber optic cable, MT/RJ-ST connectors	5/16.4	**490 NOT 000 05**
Fiber optic cable, MT/RJ-MT/RJ connectors	5/16.4	**490 NOR 000 05**

Ethernet PLC Products

Description	Platform	Order No.
Ethernet CPU with Ethernet and Modbus ports	Momentum	**171 CCC 980 20**
Ethernet CPU with Ethernet and I/O bus ports		**171 CCC 960 20**
Ethernet Communication Adapter		**170 ENT 110 00**
MMS Ethernet CPU for twisted pair cable	Quantum	**140 NOE 511 00**
MMS Ethernet CPU for fiber optic cable		**140 NOE 551 00**
TCP/IP Ethernet CPU with I/O scanner		**140 NOE 771 00**
TCP/IP Ethernet CPU with Embedded Web Server		**140 NOE 771 10**
Ethernet CPU	Premium	**TSX ETY 110 00**
Ethernet CPU with Embedded Web Server		**TSX ETY 110 WS**