

Traffic Signal Interconnect Requirements (Fiber Optic)

The following communications equipment must be included in all traffic signal installations/modifications where connection via fiber optics to City network is required. Please consult City Traffic Engineer for additional details.

Blackbox Network Services

- 1ea. - Fiber Wallmount Cabinet, open, 24 port, # JPM401A-R2
- 2 ea. - Fiber Adapter Panel 6 duplex SC pairs – Blue. #JPM412A-R2
- 2 ea. – Fiber Adapter Panel Blank Adapter Panel, #JPM408A-R2
- 2 ea. – Single Mode Fiber Patch Cable, PC SC-LC 1M, #EFN310-001M-SCLC

Teleste Video Networks

Single Uplink Location

- 1ea. Gigabit Ethernet Switch, #MPC_SGSX-GS2XXX-XXXC-X
- 2ea. Optical Single Mode 1310nm 1000 Base Fx network interface, #GS-2

Dual Uplink Location

- 1 ea. Gigabit Ethernet Switch, MPC-SGIX-GS2GS2-XXXC-X
- 3ea. Optical Single Mode 1310nm 1000 Base Fx network interface, #GS-2

Additional Equipment Required

- 1ea. APC Backup UPS XS 1500

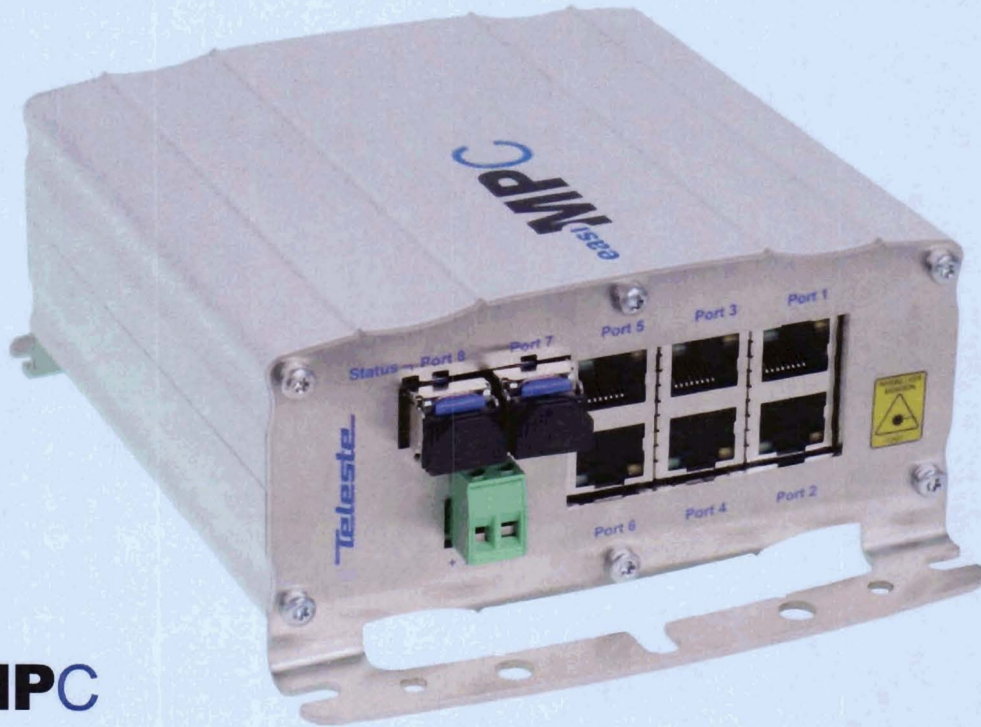
Intersections must be interconnected between signals and connected to the City's Fiber Network in accordance with the Traffic Engineering Master Communications Plan. All fiber utilized shall be single mode fiber per current national standards for fiber optic cable and shall utilize SC connectors. Fiber shall be 12 strand minimum fiber count.

Gigabit Ethernet Switch

TELESTE

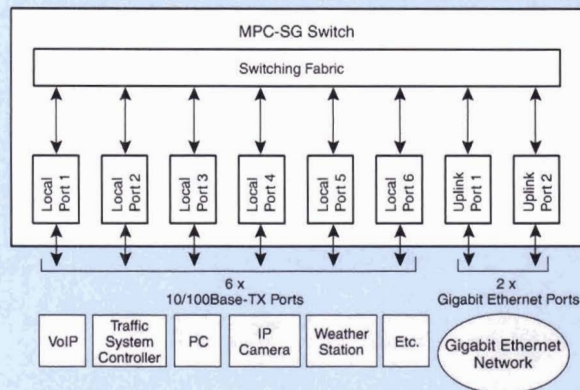
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MPC-SG EIGHT PORT GIGABIT ETHERNET SWITCH



easi **MPC**

MPC is a common nominator for compact size stand-alone units in the EASI® MP-X platform. The MPC-SG is a robust, field-hardened 8-port layer-2 managed Gigabit Ethernet Switch.



The MPC-SG family switches are designed for Ethernet networks in mission-critical real-time control applications as well as for LAN extensions.

Installations are made easy with the MDI/MDIX and auto-polarity supported by the 10/100Base-TX local ports.

The up-link interfaces, either one or two, support both electrical and optical 1000Base ports, or combination of them. The optical interface is available

for multimode and singlemode fibres in variety of link budgets and optical wavelengths. In addition to standard 1310 nm and 1550 nm outputs, the MPC-SG can be equipped with ITU-T CWDM grid compliant output.

The MPC-SG supports fast network redundancy with link recovery, either based on FRNT 0 or RSTP/STP.

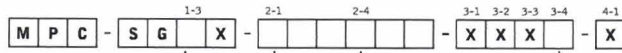
High multicast load is handled by the IGMP snooping feature.

Management of the MPC-SG switches is easy and is done via WebUI or IP Configuration tool.

Excellent real time properties are offered through both layer 2 and layer 3 priority support with four priority queues (QoS).

The MPC-SG switches are field hardened for enhanced environmental and temperature performance.

PART NUMBERING



GIGABIT ETHERNET SWITCH

FEATURES AND BENEFITS

- 6 x 10/100Base-TX local ports
- Auto-negotiation and auto sensing of speed and full duplex per TX port
- 2 x 1000Base-TX/FX full duplex up-link ports
- Small form pluggable optics (SFP), several link budget variations available
- Led indicators for each port
- FRNT v0 – redundant ring
- RSTP with STP fallback
- IGMP v1, v2 & v3 snooping
- VLAN support; port based VLAN with tag removal possibility
- SNMP v2c
- WebUI (Q2 2007)
- MAC address filtering per port
- Port mirroring
- QoS based on layer 2 (IEEE802.1p) and layer 3 (IP ToS)
- Four priority queues
- Feasible for field hardened operation (-34 ...+74 °C)

1-3 Networking

- I: Dual Up-Link
- S: Single Up-Link
- X: No Up-Link

**2-1 Network Interface 1
2-4 Network Interface 2**

- GTR: Electrical, 1000Base-T
- GS2: Single mode, 1310nm 10km, 2xLC
- GL3: Single mode, 1550nm 60km, 2xLC
- XXX: Not Available

3-4 Powering

- A: AC/DC Adapter, Euro
- B: AC/DC Adapter, UK
- C: AC/DC Adapter, USA
- X: No AC/DC Adapter

TECHNICAL SPECIFICATIONS (Typical values unless otherwise stated)

Parameter	Specification	Note	Parameter	Specification	Note
Optical			Management		
m/m 1310 nm	2 km	2 fibres	IP config tool	local via ethernet port & remote via network	
s/m 1310 nm	15 km	2 fibres	WebUI	local via ethernet port & remote via network	
s/m 1550 nm	30 / 60 km	2 fibres	SNMP	remote via network	
Ethernet			General		
Local ports			Supply voltage	10.5...14 V DC	
Number of ports	6	full duplex	Power consumption	6 W	no fiber version
Standard	10/100Base-TX	CAT-5/CAT-5e		6,7 W	one FX transceiver
Up-link ports				7,4 W	two FX transceivers
Number of ports	1 or 2	full duplex	Dimensions (H x W x D)	60 * 130 * 130 mm	(D without connectors)
Standard	1000Base-TX	CAT-5*/CAT-5e/CAT-6	Weight	1 kg	
	1000Base-FX	m/m & s/m fibre	Connectors	RJ-45	CAT-5 (UTP)
Protocols				LC	optical m/m & s/m
802.3	10Base-T		Operating temperature	-34...+74 °C	field-hardened
802.3u	100Base-TX, -FX		Storage temperature	-40...+80 °C	
802.3ab	1000Base-T		Humidity	95 %	non condensing
802.3z	1000Base-SX, -LX		Vibration	EN50130-5	1995
802.1q	VLAN		Damp heat	BS2011	p2.1
802.1d	STP		Emissions	EN61000-6-4, CE, FCC	
802.1w	RSTP		Susceptibility	EN50130-4	
802.1p	QoS	layer 2	Safety	EN60950	
802.3p	QoS	layer 3 (IP ToS)			
802.3x	flow control				
IGMP	version 1, 2 & 3				
FRNT v0	redundant ring	proprietary protocol			
SNMP	version 2c				
DHCP		IP address acquisition			
FLHP		proprietary protocol			

* Note! If your existing CAT5 cable was installed before 1995, make sure that it has been fully tested for use with 1000Base-TX.

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MPC-SG V.2 09/06

C E S) P. RATIO C I C I k. Changes with our configuration.

 **BLACK BOX**
NETWORK SERVICES

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FREE 24-hour Tech Support: 724-746-5500
blackbox.com

Fiber Wall Cabinets, Panels, and Shelf



Build your custom fiber network with
these handy fiber cabinets and accessories.

FEATURES

- Mount on a wall or in a rack.
- Choose from open or lock-style cabinets, or fiber panels or a shelf.
- Adapter panels (ordered separately) provide ST, SC, MT-RJ, or LC connectors. Mix and match panels to suit your application.
- 18-port shelf accepts three adapter panels.

To access the cabinet from the rear, just fold open the back door. Thumbscrews hold it in place.

Each side of the cabinet has a large access opening for routing cables horizontally.

The cabinet comes with front or center adjustable brackets for easy mounting in other cabinets or racks. Use the included 10-32 or 12-24 panhead screws to mount in a 19" or 23" rack.

The inner tray pulls out for easy access to the adapter panels that you install in the unloaded enclosure. A screw-lock safety catch keeps you from pulling the tray too far out.

Four rubber grommet openings enable you to route fiber cable through the top of the enclosure. Four additional openings are also provided on the bottom.

Use the interior cable ties and black spool rings to hold distribution cable in place. The spool also provides storage for excess cable lengths.

Multipair fiber optic cable terminates in the snap-in adapter panels.

Rectangle cable holders (not shown but included) also snap into the tray.

The fold-down front door has a smoked plastic front cover (not shown) that enables you to view cable terminations when it's closed.

2U 6-Adapter Panel
Rackmount Fiber Cabinet
(JPM418A-R3)

OVERVIEW

Whether you're adding a mid-sized fiber workgroup, or installing or organizing a larger fiber network, Black Box has the equipment you need. Choose from open or locked Fiber Wall Cabinets, loaded Rackmount Fiber Panels, or the Rackmount Fiber Shelf. Handy adapter panels feature ST[®], SC, MT-RJ, or LC connectors for installing in the Rackmount Cabinets or Fiber Panels.

Select from two open Fiber Wall Cabinet models. They accept two or four adapter panels. Or choose lock-style cabinets. They hold four or twelve adapter panels.

Order a loaded fiber panel with simplex ST connectors, duplex SC, or duplex LC connectors. Each panel fits in 1U of rack space and can be mounted in 19" and 23" racks.

Or select the Rackmount Fiber Shelf. It accepts 3 adapter panels, which have 6 connectors each, for a total of 18 connectors per Rackmount Fiber Shelf.

The cabinets, panels, and shelf are constructed of high-quality, 16-gauge cold-rolled steel (CRS) and are finished with a black electrostatically applied powder coat.

Our High-Density (HD) Adapter Panels are equipped with a variety of adapter connector types and snap easily into Fiber Wall Cabinets. We offer ST, SC, ST to SC, MT-RJ, or LC connectors.

The adapters work with both multimode fiber and non-angle polish single-mode fiber, and they're constructed with high-retention phosphor bronze alignment sleeves.

We also offer an unloaded adapter panel for four snap fittings or keystone jacks.



JPM401A-R2

TECH SPECS

Fiber Wall Cabinets, Open:

Size — JPM400A: 10.5"H x 8.5"W x 2.5"D (26.7 x 21.6 x 6.4 cm);

JPM401A-R2: 12.1"H x 14"W x 3.4"D (30.7 x 35.6 x 8.6 cm)

Weight — JPM401A-R2: 9.5 lb. (4.3 kg)

Fiber Wall Cabinets, Lock-Style:

Size — JPM402A-R2: 12.1"H x 14"W x 3.4"D (30.7 x 35.6 x 8.6 cm);

JPM403A: 16"H x 14"W x 6.5"D (40.6 x 35.6 x 16.5 cm)

Weight — JPM402A-R2: 10 lb. (4.5 kg);

JPM403A: 19 lb. (8.6 kg)

Rackmount Fiber Cabinets:

Size — JPM418A-R3, JPM419A: 3.5"H x 17"W x 11"D (8.9 x 43.2 x 27.9 cm);

JPM406A-R4: 5.2"H x 17"W x 11"D (13.2 x 43.2 x 27.9 cm)

Rackmount Fiber Panels, Loaded:

Capacity — Fits in 19" or 23" racks

Construction — 16-gauge cold-rolled steel

Connectors — JPM370A: (24) ST simplex;

JPM375A: (12) SC duplex;

JPM380A: (12) LC duplex;

JPM385A: (24) LC duplex

Size — 1.75"H (1U) x 17"W x 11"D (4.4 x 43.2 x 27.9 cm)

Weight — 10.3 lb. (4.7 kg)

Rackmount Fiber Shelf:

Size — 1.75"H (1U) x 17"W x 11"D (4.4 x 43.2 x 27.9 cm)

Adapter Panels, Snap-In:

Connectors — JPM404A-R2: (6) ST;

JPM405A-R2: (6) SC;

JPM408A-R2: (6) Blank;

JPM409A-R2: (6) MT-RJ;

JPM410A-R2: (6) LC

Size — 5.1"H x 1.1"W (13 x 2.8 cm)

HD Adapter Panels:

Connectors — JPM411A-R2: (4) duplex ST*;

JPM412A-R2, JPM413A-JPM414A, JPM420A-JPM421A: (6) duplex SC;

JPM415A-R2: (6) duplex ST to SC;

JPM416A-R2: (8) MT-RJ;

JPM422A: (12) duplex LC

Size — 5.1"H x 1.1"W (13 x 2.8 cm)

Item	Code
Fiber Wall Cabinets, Unloaded	
Open	
12-Port (Accepts 2 Adapter Panels)	JPM400A
24-Port (Accepts 4 Adapter Panels)	JPM401A-R2
Lock-Style	
24-Port (Accepts 4 Adapter Panels)	JPM402A-R2
72-Port (Accepts 12 Adapter Panels)	JPM403A
Rackmount Fiber Cabinets	
2U (Accepts 6 Adapter Panels)	JPM418A-R3
2U (Accepts 9 Adapter Panels)	JPM419A
3U (Accepts 12 Adapter Panels)	JPM406A-R4
Rackmount Fiber Panels, 1U, Loaded with	
(24) Single-Mode/Multimode Connectors	
ST 24 Simplex	JPM370A-R2
SC 12 Duplex	JPM375A-R2
LC 12 Duplex	JPM380A
LC 24 Duplex	JPM385A
Rackmount Fiber Shelf, 18-Port, 1U	
(Accepts 3 Adapter Panels)	JPM407A-R3
Adapter Panels, Snap-In, 6 Connectors Each	
ST	JPM404A-R2
SC	JPM405A-R2
Blank	JPM408A-R2
MT-RJ	JPM409A-R2
LC	JPM410A-R2
HD Adapter Panels	
4 Duplex, ST	JPM411A-R2
6 Duplex, SC	
Blue	JPM412A-R2
Yellow	JPM413A
Orange	JPM414A
Gray	JPM420A
Beige	JPM421A
6 Duplex, ST to SC, Blue	JPM415A-R2
8 MT-RJ	JPM416A-R2
12 Duplex, LC	JPM422A
4-Pack Jack Pack, Unloaded	JPM417A