COPPER SOLUTIONS

PRODUCT GUIDE

OCC®
OPTICAL CABLE CORPORATION

OCC INNOVATION

TOTAL INVOLVEMENT. In addition to being a pioneer in optical fiber cable solutions, OCC has been an innovator in developing copper connectivity products as well as test fixtures that are used by manufacturers and installers around the world for component and system performance verification testing.

OCC works closely with compliance organizations such as TIA and IEEE to develop and update industry standards for telecommunications cabling infrastructure. OCC also provides comprehensive training programs that have been widely adopted by field installers.

In the process, we have been awarded numerous patents for cutting-edge innovations in network products that have led to advanced solutions in both copper and fiber, ranging from piece parts to end-to-end systems.

1994

» OCC WAS AWARDED THE FIRST PATENT FOR CATEGORY 5 PCB TECHNOLOGY.

2003

» OCC'S PATENTED REDUCED CROSSTALK MODULAR PLUGS, AWARDED IN 2003, ENABLED US TO MANUFACTURE HIGH-PERFORMANCE PATCH CORDS WITH CONSISTENT, RELIABLE PERFORMANCE.

2012

» IN 2012, OCC DEVELOPED THE BALUNLESS TEST FIXTURE WHICH WAS SUBSEQUENTLY INCORPORATED INTO THE TIA STANDARDS FOR R&D LABORATORY MEASUREMENT OF CABLES AND CONNECTORS.

2016

» IN 2016, OCC WAS AWARDED A PATENT FOR PCB TECHNOLOGY IN THE FIRST CATEGORY 8 FIELD TERMINABLE PLUG.

WE GET IT. The more complex your network becomes, the more challenging it is to know which products to use, how to integrate them, how to budget for them, and how to ensure your network runs at peak performance.

CUSTOMIZED SOLUTIONS. In addition to providing an extensive copper product set, our team can assist you in building the ideal solution for your specific challenges. That's why instead of relying on OCC just for products, our customers count on our design-build expertise and broad portfolio of end-to-end solutions for the seamless integration and optimum reliability of the network.

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OCC DEVELOPS AND PROVIDES TEST FIXTURES utilized by manufacturers and installers throughout the world, including laboratory and field test instruments for structured cabling system performance verification.

The dramatic growth of high-bandwidth wireless access points and other IP-enabled devices, such as surveillance cameras and building automation equipment led to widespread practice of field terminating modular plugs and connecting directly to these devices. OCC was one of the first to introduce a robust, easy-to-terminate, high-performance field terminable modular plug.

In the absence of industry standards, installers in the field were also lacking a clearly defined test method to accurately measure the true performance of direct attach links to ensure maximum performance.

Through our participation in the telecommunications industry standards development, OCC continues to be the sole provider of test fixtures required for laboratory and field testing. Continuing in this tradition, OCC developed an accurate and reliable test method and field plug test adapter cords for field verification of direct attach/modular plug-terminated links backed by OCC's 25-year performance warranty.

The Telecommunications Industry Association (TIA) has since recognized Category 8 Direct-Attach Channels and Modular Plug Terminated Links (MPTL) through incorporation into the latest TIA-568 standards. Modern field test instruments have also incorporated this technology to provide the capability to test to these standards.

TEST HEAD JACK INCORPORATED INTO FIELD TESTERS FOR MPTL

TIA/IEEE STANDARDS

Since 1990, Ethernet data transmission speeds over copper twisted pair cabling have increased from 10Mbps to 40Gbps. At the same time, structured cabling systems bandwidth has increased from 16MHz (Category 3) to 2000MHz (Category 8).

APPLICATION	IEEE STANDARD	ANSI/TIA-568.2-D CATEGORY					
		CATEGORY 3 (16MHz)	CATEGORY 5 (100MHz)	CATEGORY 5e (100MHz)	CATEGORY 6 (250MHz)	CATEGORY 6A (500MHz)	CATEGORY 8 (2000MHz)
			1991	1995	2002	2008	2016
10BASE-T	802.3i	100m	100m	100m	100m	100m	100m
100BASE-TX	802.3u		100m	100m	100m	100m	100m
1000BASE-T	802.3ab			100m	100m	100m	100m
2.5GBASE-T	802.3bz			100m	100m	100m	100m
5GBASE-T	802.3bz				100m	100m	100m
10GBASE-T	802.3an					100m	100m
25/40GBASE-T	802.3bq						30m

THE NEED FOR 10G

Ever-increasing wireless access point speeds, HD video streaming, and the "Internet of Things" (IoT) continue to drive demand for greater network speed. As optical fiber backbones are deployed closer to the network edge, high performance Category 6A links are essential to support 10G data and enhanced PoE to the device.

OCC•10G SOLUTION

OCC's Category 6A Solution fully supports 10G performance and enhanced power delivery as defined in the latest PoE standards by mitigating alien crosstalk and temperature issues that come with running large amounts of cables for high bandwidth/high power applications.

WIRELESS ACCESS POINTS/IoT

» The latest IEEE 802.11 access point's backhaul speed requirements have significantly exceeded Gigabit Ethernet, making backward-compatible 10G essential to many infrastructures.

» TIA TSB-162-A, Telecommunications Cabling Guidelines for Wireless Access Points, state "Cabling for wireless access points should be balanced twisted-pair, Category 6A or higher."

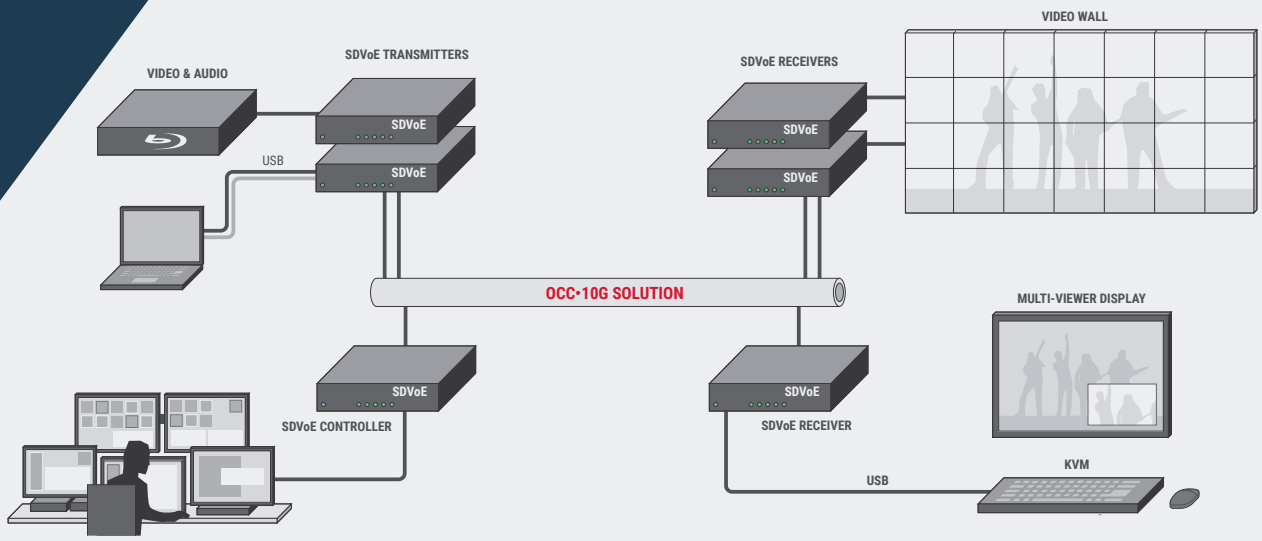
» For maximum versatility, two Category 6A cables are often installed to each access point or work station.

HD VIDEO STREAMING

» Since 2010 HDBaseT technology has enabled A/V migration to twisted pair cabling—separate from the IT network.

» SDVoE™ (Software Defined Video Over Ethernet): The transition of the AV industry to IP-based solutions is inevitable. Category 6A/10Gbps infrastructure enables AV and IT data to co-exist on the same network—true AV/IT convergence.

SOFTWARE DEFINED VIDEO OVER ETHERNET (SDVoE)



POWER OVER ETHERNET STANDARDS

*See Glossary Of Terms On Pg.14

IEEE PoE Standard	TYPE	CLASS	PAIRS	PSE PWR OUT (W)	PD PWR MIN (W)	IMAX/ PAIR	DC LOOP RESISTANCE (Ω)	PSE VOUTmin	PD VIN	PLOSS (W) (PSE OUT - PD IN)	PSE (W) PER PAIR SET (2-PR)	IMAX = PSE(W)/PSE VOUT	VDROP = PLOSS /IMAX	PD VIN = PSE VOUT - VDROP	PD PWR (W) = IMAX*PD VIN
802.3af (2003)	1	0	2	15.40	12.95	0.350	20	44.00	37.00	2.45	15.40	0.350	7.00	37.00	12.95
	1	1	2	4.00	3.84	0.091	20	44.00	42.18	0.16	4.00	0.091	1.76	42.24	3.84
	1	2	2	7.00	6.49	0.159	20	44.00	40.82	0.51	7.00	0.159	3.21	40.79	6.49
	1	3	2	15.40	12.95	0.350	20	44.00	37.00	2.45	15.40	0.350	7.00	37.00	12.95
802.3at (2009)	2	4	2	30.00	25.50	0.600	12.5	50.00	42.50	4.50	30.00	0.600	7.50	42.50	25.50
802.3bt (2018)	3	1	2	4.00	3.84	0.080	12.5	50.00	48.00	0.16	4.00	0.080	2.00	48.00	3.84
	3	2	2	7.00	6.49	0.140	12.5	50.00	46.36	0.51	7.00	0.140	3.64	46.36	6.49
	3	3	2	15.40	12.95	0.308	12.5	50.00	42.05	2.45	15.40	0.308	7.95	42.05	12.95
	3	4	2	30.00	25.50	0.600	12.5	50.00	42.50	4.50	30.00	0.600	7.50	42.50	25.50
	3	5	4	45.00	40.00	0.450	12.5	50.00	44.38	2.50	22.50	0.450	5.56	44.44	40.00
	3	6	4	60.00	51.00	0.600	12.5	50.00	42.50	4.50	30.00	0.600	7.50	42.50	51.00
	4	7	4	75.00	62.00	0.721	12.5	52.00	42.99	6.50	37.50	0.721	9.01	42.99	62.00
	4	8	4	90.00	71.00	0.865	12.5	52.00	41.19	9.50	45.00	0.865	10.98	41.02	71.00

Since 2003, power delivery over twisted-pair cabling to end point devices has increased from 12.95 watts over two pairs to nearly 100 watts over four pairs.

GUIDELINES FOR SUPPORTING POWER DELIVERY OVER BALANCED TWISTED-PAIR CABLING

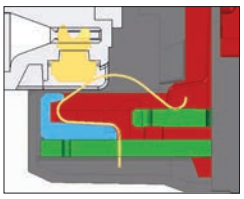
When planning new installations delivering remote power, Category 6A or higher performance 4-pair balanced twisted-pair cabling as specified in ANSI/TIA-568.2-D is recommended.

TIA TSB-184-A GUIDELINES								
CURRENT/ PAIR SET	26 AWG		CATEGORY 5e (24 AWG)		CATEGORY 6 (24 AWG)		CATEGORY 6A (23 AWG)	
	AIR	CONDUIT	AIR	CONDUIT	AIR	CONDUIT	AIR	CONDUIT
600mA	141	79	214	146	281	205	349	272
720mA	86	45	136	90	183	128	227	171
1000mA	33	16	58	36	81	53	101	71

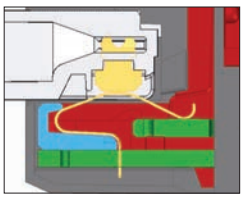
*Maximum Bundle Size For 15°C Temperature Rise @20°C Ambient

POWER SAFE CONTACTS

OCC's Category 6A modular jack design prevents contact degradation due to potential arcing caused by removal of an energized modular plug.

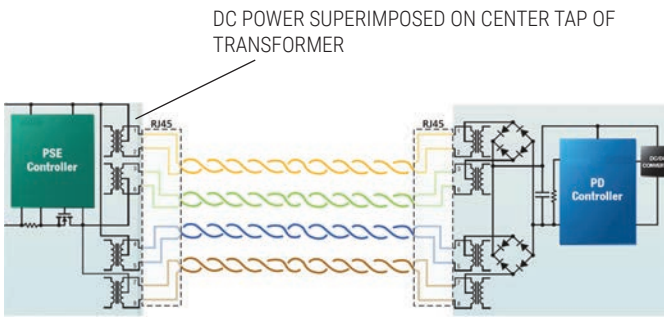


INITIAL POINT OF CONTACT



OPERATING CONTACT POSITION

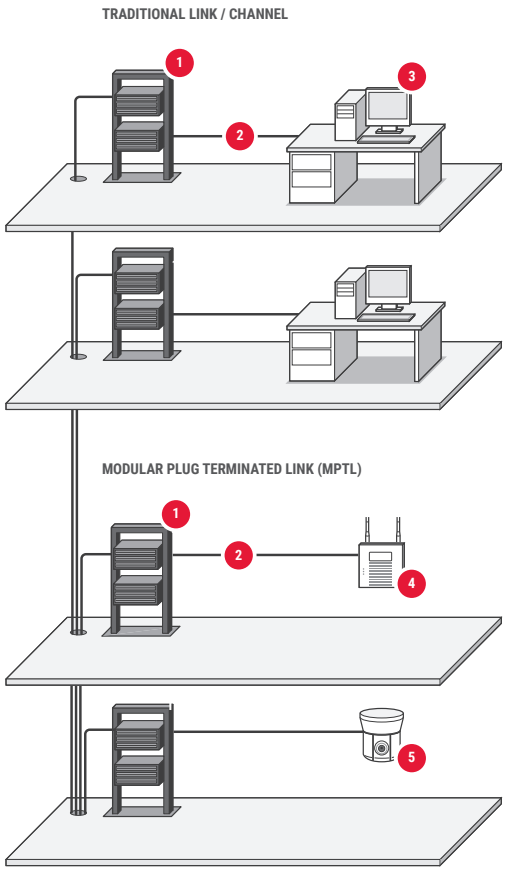
POWER DELIVERY OVER 4-PAIR CABLING



ETHERNET PoE SWITCH (PSE)

EXAMPLE: WIRELESS ACCESS POINT (PD)

DEPLOYMENT ARCHITECTURES

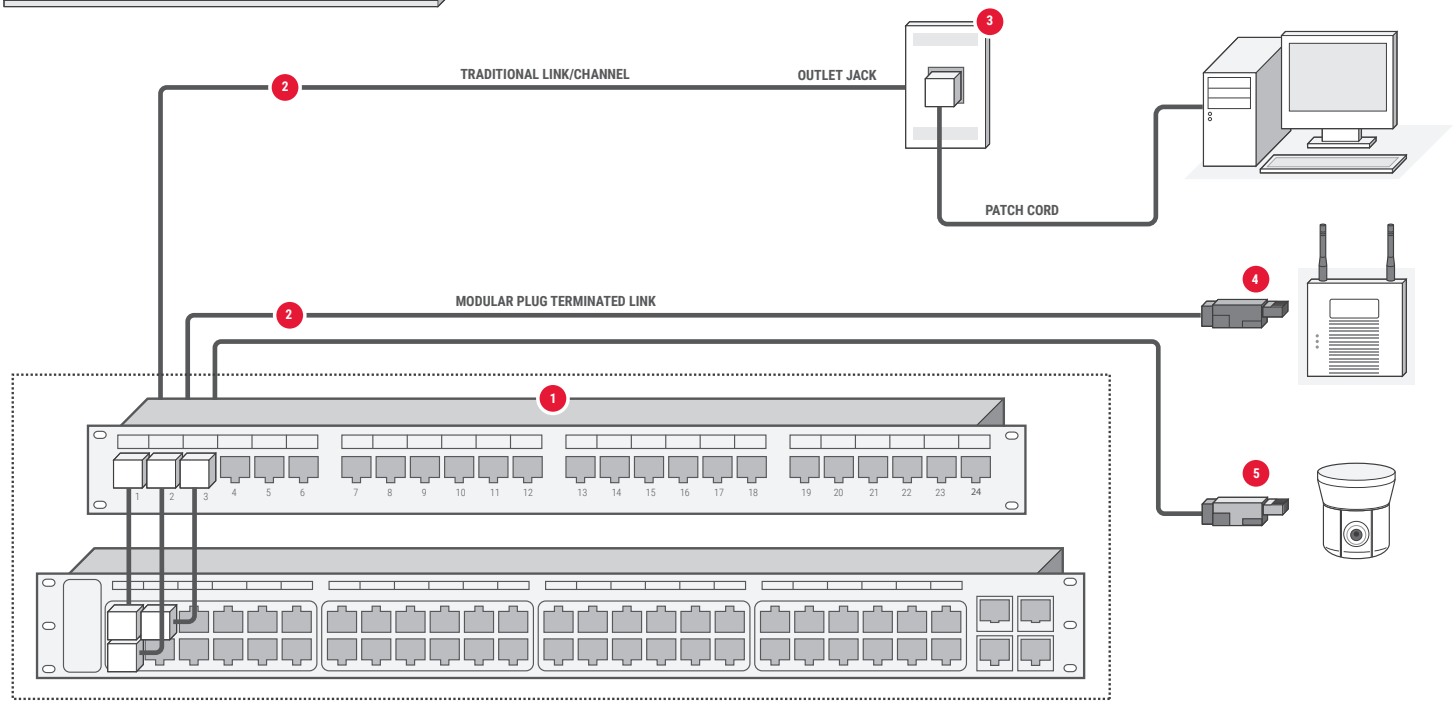


TRADITIONAL STRUCTURED CABLING VS. EVOLVED ARCHITECTURES

OCC offers cable and connectivity solutions for Category 5e, Category 6, and Category 6A traditional link and channel architectures as well as evolving standards such as modular plug terminated links (MPTL). In addition, OCC offers Category 8 field terminable plugs and pre-terminated direct attach channels. Systems installed by a certified MDIS contractor are also backed by OCC's Extended Performance 25-year Link and Guaranteed Channel Headroom Warranty.

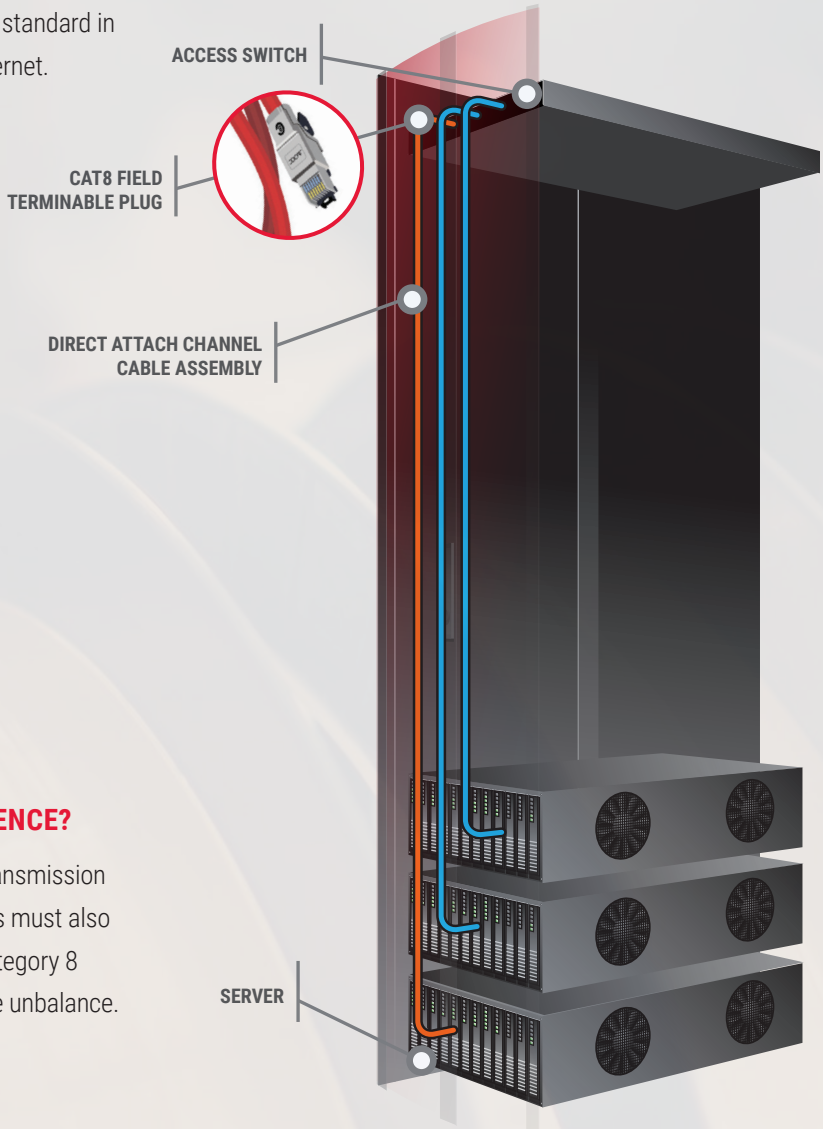
OCC provides a guaranteed channel headroom margin above and beyond ANSI/TIA-568.2-D performance specifications for OCC Category 5e, Category 6, and Category 6A end-to-end channel solutions. (See Guaranteed Headroom Margin tables on page 11.)

1. PATCH PANEL
2. HORIZONTAL CABLING
3. WORK AREA OUTLET
4. WIRELESS ACCESS POINT WITH CAT6A UNSHIELDED FIELD TERMINABLE PLUG
5. IP SECURITY CAMERA WITH CAT6A SHIELDED FIELD TERMINABLE PLUG



CATEGORY 8 DIRECT ATTACH CHANNELS

Category 8 direct attach channels were recognized by the TIA standard in September 2016 to support IEEE 802.3bq 25/40GBASE-T Ethernet.



MODULAR PLUG TERMINATED LINK VS. DIRECT ATTACH CHANNEL

	MPTL	DIRECT ATTACH CHANNEL
TIA-568 RECOGNITION	September 2018	September 2016
ELECTRICAL PERFORMANCE	Permanent Link	CAT8 Direct Attach Channel
MODULAR PLUGS	Outlet End ONLY	Both Ends
CATEGORIES	CAT5e, CAT6, CAT6A	CAT8
MAXIMUM LENGTH	90 meters	5 meters
PRIMARY APPLICATIONS	WAP, Cameras, IoT	Data Center
FIELD TERMINABLE PLUGS	OCCUFP6A, OCCSFP6A	OCCSFP8

CATEGORY 8 PATCH CORDS AND DIRECT ATTACH CHANNELS LOOK THE SAME. WHAT'S THE DIFFERENCE?

Unlike patch cords, which only have NEXT and Return Loss transmission performance specifications, Category 8 direct attach channels must also meet the additional transmission parameters specified for Category 8 permanent links, except DC loop resistance and DC resistance unbalance.

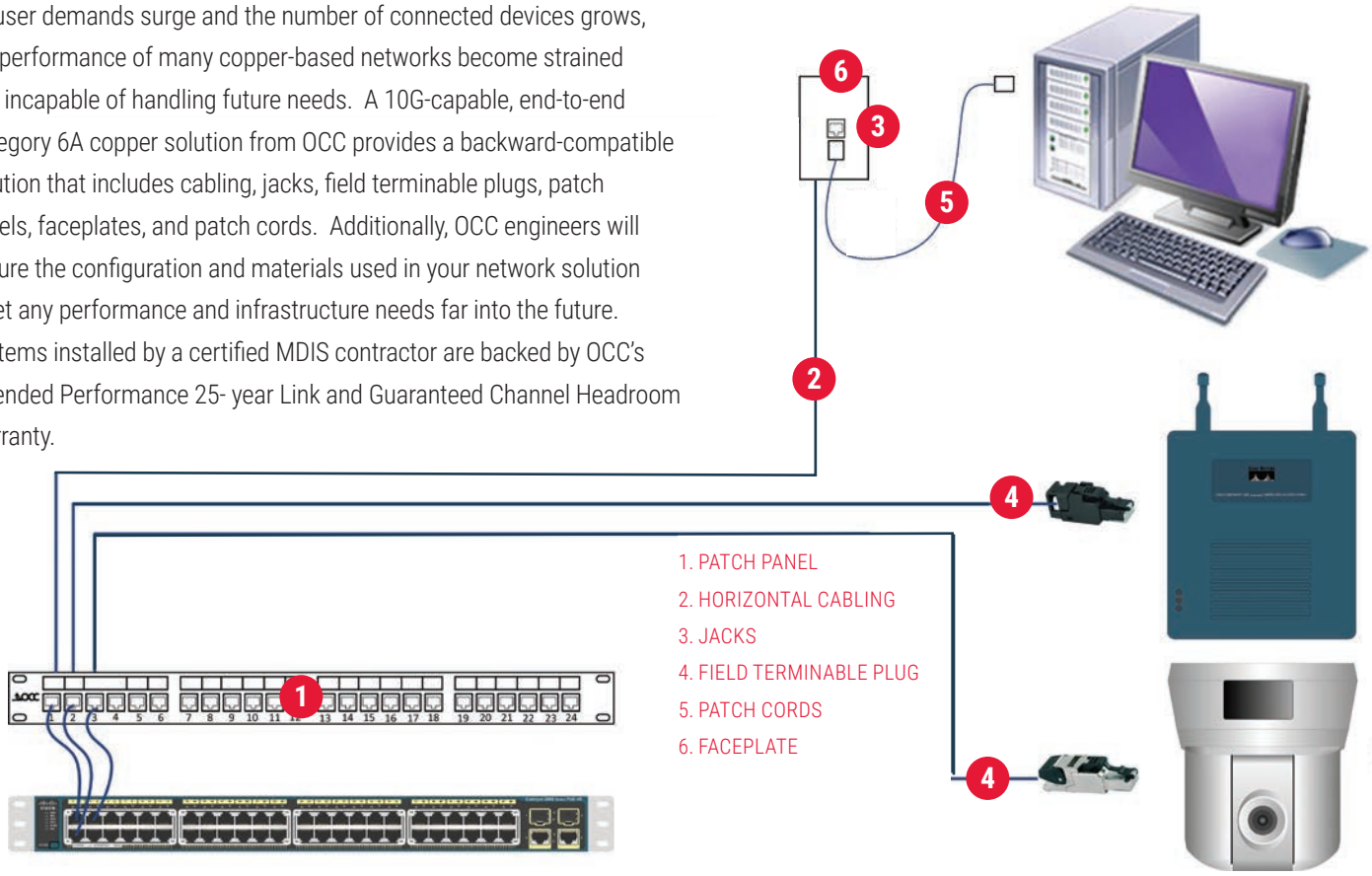
» ANSI/TIA-568.2-D contains transmission performance specifications for category 8 direct attach channels with a maximum length of 5 meters.

» OCC Category 8 Patented PCB Technology:

- » High-Frequency Low-Loss Dielectric Material
- » Split Ground Plane Technology
- » OCC Category 8 Field Terminable Plugs (OCC Part # **OCCSFP8**)
- » OCC Category 8 Pre-Terminated Direct Attach Cable Assemblies (OCC Part # **DA/SFTP8LSxxx-08** (xxx=Length, ft.))

ENTERPRISE COPPER SOLUTIONS

As user demands surge and the number of connected devices grows, the performance of many copper-based networks become strained and incapable of handling future needs. A 10G-capable, end-to-end Category 6A copper solution from OCC provides a backward-compatible solution that includes cabling, jacks, field terminable plugs, patch panels, faceplates, and patch cords. Additionally, OCC engineers will ensure the configuration and materials used in your network solution meet any performance and infrastructure needs far into the future. Systems installed by a certified MDIS contractor are backed by OCC's Extended Performance 25- year Link and Guaranteed Channel Headroom Warranty.



SOLUTION	2 CABLE		3 JACKS		4 FIELD TERMINABLE PLUGS
	CMR	CMP	KMJ	UMJ	FIELD TERMINABLE PLUG
OCC•CS6500 – CATEGORY 6A SHIELDED	OCC-FTP6A4R	OCC-FTP6A4PLM	K6AS	_	OCCSFP6A
OCC•C6500 – CATEGORY 6A UTP	OCC-U6A4R	OCC-U6A4PLM	K6A	U6A	OCCUFP6A
OCC•CS6300 – CATEGORY 6 SHIELDED	OCC-FTP64R	OCC-FTP64PLM	KMJA602S	_	OCCSFP6A
OCC•C6300 – CATEGORY 6 HIGH-PERFORMANCE UTP	OCC-U64HR	OCC-U64HPLM	KMJA6	UMJA6	OCCUFP6A
OCC•C6000 – CATEGORY 6 STANDARD UTP	OCC-UE64R	OCC-UE64PLM	KMJA6	UMJA6	OCCUFP6A
OCC•C5000 – CATEGORY 5e UTP	OCC-U5E4R	OCC-U5E4PLM	KMJA5E	UMJA5E	OCCUFP6A

OCC•C6500 SOLUTION

» OCC's Category 6A solutions are fully backed by our 25-year performance warranty without the need to perform time consuming alien crosstalk testing.
» Fully supports 2.5/5/10GBASE-T Ethernet — no need for additional qualification testing.

OCC•C6300 & OCC•C6000 SOLUTIONS

» OCC's Category 6 Cable supports running IEEE 802.3bz 2.5 and 5 gigabit per second applications when qualified per TIA TSB-5021.

OCC•C5000 SOLUTION

» OCC's Category 5e cable supports running IEEE 802.3ab 1 gigabit per second applications.

The IEEE 802.3bz 2.5/5GBASE-T standard was developed to allow the latest 802.11ax (Wi-Fi 6) wireless access points to operate over the existing installed base of Cat5e/6 cable. ***For new installations, the TIA as well as equipment vendors recommend Category 6A cabling infrastructure.***

All OCC Solutions support the latest IEEE standards for DC power delivery over 4-pair cabling when installed in accordance with TIA Telecommunications Systems Bulletin TSB-184-A, Guidelines for Supporting Power Delivery Over Balanced Twisted-Pair Cabling. (See tables on page 5 and reference TSB-184-A for specific guidelines.)

OCC'S OUTSIDE PLANT CATEGORY 6 CABLE

» OCC's Outside Plant (OSP) Category 6 cable has a UV resistant outer jacket and waterblocking gel, which makes it suitable for outdoor applications. (Part #: OCC-U64OSP)

KMJ & UMJ SERIES

OCC's KMJ series jacks are available in multiple colors and CAT5e, CAT6 and CAT6A performance levels. They are compatible with KMJ series faceplates and panels.

Unique UMJ connector style offers users a versatile design for specifying and segmenting different colored bezels in the network.

OCC's modular jacks may be easily terminated with a traditional 110-punch down tool or by using the stuffer cap (included) toolless method.

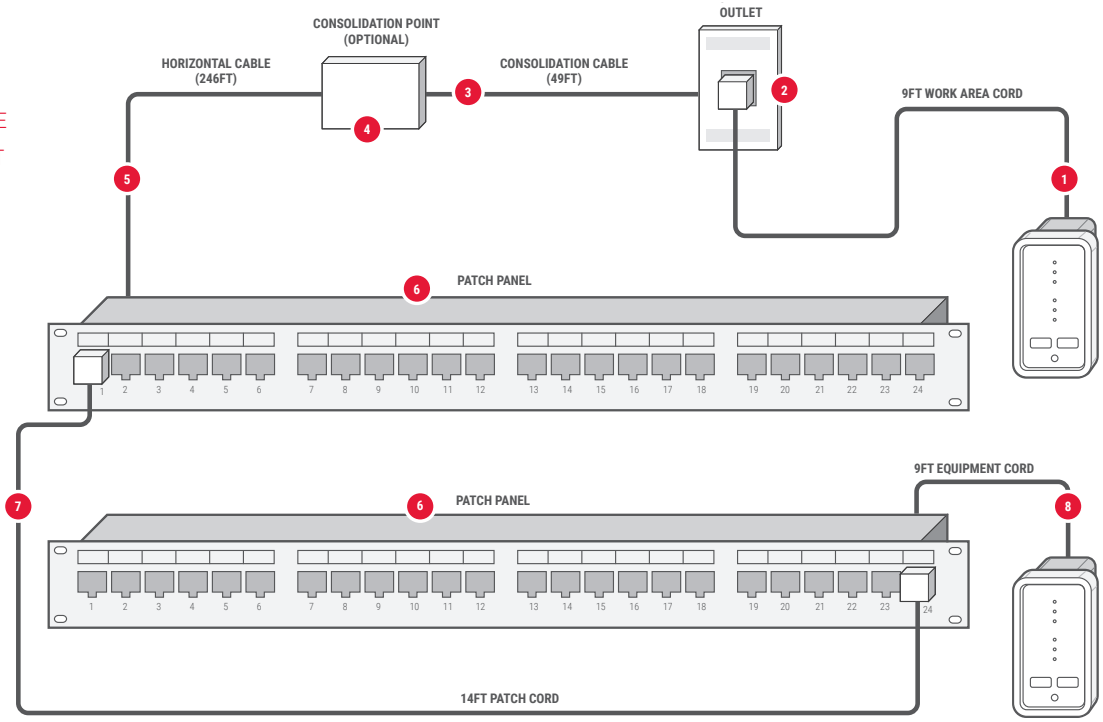
1 PATCH PANELS		5 PATCH CORDS		6 FACEPLATES			
				KMJ		UMJ	
FLAT	ANGLED	BOOTS	NO BOOTS	COMMERCIAL	RESIDENTIAL	COMMERCIAL	RESIDENTIAL
DCC2488/1106A-S DCC4888/1106A-S	ACC2488/1106A-S ACC4888/1106A-S	PC6AS-B-xxyy	PC6AS-xxyy	FPSK01 FPSK02 FPSK03 FPSK04 FPSK06	FPKS01 FPKS02 FPKS03 FPKS04 FPKS06	FPSR01 FPSR02 FPSR03 FPSR04 FPSR06	FPR01 FPR02 FPR03 FPR04 FPR06
DCC2488/1106AN DCC4888/1106AN	ACC2488/1106AN ACC4888/1106AN	PC6AU-B-xxyy	PC6AU-xxyy				
DCC2488/110SIX-S DCC4888/110SIX-S	- -	PCSIXSxxByy	PCSIXSxxyy				
DCC2488/110SIX DCC4888/110SIX	ACC2488/110SIX ACC4888/110SIX	PCSIXxxByy	PCSIXxxyy				
DCC2488/110SIX DCC4888/110SIX	ACC2488/110SIX ACC4888/110SIX	PCSIXxxByy	PCSIXxxyy				
DCC2488/110A5E-R DCC4888/110A5E-R	ACC2488/110A5E-R ACC4888/110A5E-R	PC5EBxxByy	PC5EBxxyy				

SYSTEMS PERFORMANCE WARRANTY

TEST CONFIGURATION: 100-METER 4-CONNECTOR CHANNEL

(TYPICAL WORST CASE)

1. WORK AREA CORD
2. OUTLET JACK
3. CONSOLIDATION CABLE
4. CONSOLIDATION POINT
5. HORIZONTAL CABLE
6. PATCH PANEL
7. PATCH CORD
8. EQUIPMENT CORD



EXTENDED HEADROOM PERFORMANCE ABOVE THE TIA STANDARD... GUARANTEED

	CATEGORY 6A		CATEGORY 6			CATEGORY 5E
SYSTEM	**OCC•C6500**	**OCC•CS6500**	**OCC•C6300**	**OCC•CS6300**	**OCC•C6000**	**OCC•C5000**
DESCRIPTION	Category 6A UTP 10G System	Category 6A Shielded 10G System	Category 6 High-Performance UTP System	Category 6 Shielded System	Category 6 Standard UTP System	Category 5e UTP System
CABLE	10G Category 6A UTP Cable (OCC-U6A4)	10G Category 6A F/UTP Cable (OCC-FTP6A4)	Enhanced Category 6 UTP Cable (OCC-U64H)	Category 6 F/UTP Cable (OCC-FTP64)	Category 6 UTP Cable (OCC-UE64)	Category 5e UTP Cable (OCC-U5E4)
OUTLET JACK	K6A UTP Jack	K6AS Shielded Jack	KMJA6 UTP Jack	KMJA602S Shielded Jack	KMJA6 UTP Jack	KMJA5E UTP Jack
PATCH PANEL	24/48-Port Flat or Angled Panels with K6A Jacks	24/48-Port Flat or Angled Panels with K6AS Jacks	24/48-Port Flat or Angled 110-Style Panels	24/48-Port Flat Panels with KMJA602S Jacks	24/48-Port Flat or Angled 110-Style Panels	24/48-Port Flat or Angled 110-Style Panels
PATCH CORD	PC6AU UTP Patch Cords	PC6AS Shielded Patch Cords	PCSIX UTP Patch Cords	PCSIXS Shielded Patch Cords	PCSIX UTP Patch Cords	PC5EB UTP Patch Cords

CERTIFIED INSTALLER

THE OCC EXTENDED PERFORMANCE 25-YEAR LINK AND GUARANTEED CHANNEL HEADROOM WARRANTY

certifies that OCC Link and Channel solutions installed and certified by a Multimedia Design & Integration Specialist (MDIS) Installer will support all applications designed for data transmission over Category 5e, Category 6, or Category 6A as applicable. OCC guarantees the following minimum margins beyond the ANSI/TIA-568.2-D specifications for OCC channel solutions that utilize OCC patch cords. The margin values in the typical column are commonly achieved test results of OCC channel solutions. For more information visit: **occfiber.com/warranty**

HEADROOM GUARANTEE TABLES

CATEGORY 6A	OCC•CS6500 (Typical)	OCC•CS6500 (Min Margin)	OCC•C6500 (Typical)	OCC•C6500 (Min. Margin)
Insertion Loss	10%	3%	3%	3%
NEXT	9	4	6	4
PSNEXT	10	5	8	5
ACR	11	7	8	7
PSACR	12	8	10	8
ACR-F (ELFEXT)	8	5	5	4
PSACR-F (PSELFEXT)	8	6	6	5
RL	4	3	7	4
PSANEXT	15	10	1	0
PSAACR-F	15	10	2	2

OCC•C6500 Example: OCC guarantees a minimum of 4dB headroom above the CAT6A standard for Return Loss (RL) values up to 500 MHz. Many users of OCC•C6500 typically experience performance of 7dB above the Return Loss values in the standard. CAT6A Standard RL Spec at 500MHz is 6dB. OCC Guarantees RL of 10dB. Many users typically experience 13dB.

CATEGORY 6	OCC•C6000 (Typical)	OCC•C6000 (Min. Margin)	OCC•C6300 (Typical)	OCC•C6300 (Min. Margin)	OCC•CS6300 (Typical)	OCC•CS6300 (Min. Margin)
Insertion Loss	11%	5%	12%	8%	8%	5%
NEXT	6	4	8	6	8	6
PSNEXT	7	5	8	7	8	7
ACR	8	6	9	7	9	7
PSACR	8	7	9	8	9	8
ACR-F (ELFEXT)	10	8	12	10	12	9
PSACR-F (PSEFFEXT)	12	9	12	12	12	9
RL	4	3	5	5	5	3

OCC•CS6300 Example: OCC guarantees a minimum of 3dB headroom above the CAT6 standard for Return Loss values up to 250MHz. Many users of OCC•CS6300 typically experience performance of 5dB above the Return Loss values in the standard. CAT6 Standard RL Spec at 250MHz is 8dB. OCC Guarantees RL of 11dB. Many users typically experience 13dB.

CATEGORY 5e	OCC•C5000 (Typical)	OCC•C5000 (Min. Margin)
Insertion Loss	13%	10%
NEXT	10	9
PSNEXT	11	10
ACR	12	11
PSACR	12	12
ACR-F (ELFEXT)	10	9
PSACR-F (PSEFFEXT)	11	10
RL	9	6

OCC•C5000 Example: OCC guarantees a minimum of 6dB headroom above the CAT5e standard for Return Loss values up to 100 MHz. Many users of OCC•C5000 typically experience performance of 9dB above the Return Loss values in the standard. CAT5e Standard RL Spec at 100MHz is 10dB. OCC Guarantees RL of 16dB. Many users typically experience 19dB.

OCC SOLUTION HIGHLIGHTS

OCC•C6500 – CATEGORY 6A UNSHIELDED SOLUTION

DESCRIPTION	OCC PART #
Copper Cable, CMP	**OCC-U6A4PLM-xx**
Copper Cable, CMR	**OCC-U6A4R-xx**
Modular Jack, KMJ	**K6Axx**
Modular Jack, UMJ	**U6Axx**
Field Terminable Plug, Category 6A	**OCCUFP6A**
Patch Panel, 24-Port, 1U, Flat	**DCC2488/1106AN**
Patch Panel, 48-Port, 2U, Flat	**DCC4888/1106AN**
Patch Panel, 24-Port, 1U, Angled	**ACC2488/1106AN**
Patch Panel, 48-Port, 2U, Angled	**ACC4888/1106AN**
Patch Cord–With Boots	**PC6AU-B-xxyy**
Patch Cords–No Boots	**PC6AU-xxyy**

OCC•CS6500 – CATEGORY 6A SHIELDED SOLUTION

DESCRIPTION	OCC PART #
Copper Cable, CMP	**OCC-FTP6A4PLM-xx**
Copper Cable, CMR	**OCC-FTP6A4R-xx**
Modular Jack, KMJ	**K6AS**
Field Terminable Plug	**OCCSFP6A**
Patch Panel, 24-Port, 1U, Flat	**DCC2488/1106A-S**
Patch Panel, 48-Port, 2U, Flat	**DCC4888/1106A-S**
Patch Panel, 24-Port, 1U, Angled	**ACC2488/1106A-S**
Patch Panel, 48-Port, 2U, Angled	**ACC4888/1106A-S**
Patch Cord–With Boots	**PC6AS-B-xxyy**
Patch Cords–No Boots	**PC6AS-xxyy**

OCC•C6300 – CATEGORY 6 HIGH-PERFORMANCE UNSHIELDED SOLUTION

DESCRIPTION	OCC PART #
Copper Cable, CMP, High-Performance	**OCC-U64HPLM-XX**
Copper Cable, CMR, High-Performance	**OCC-U64HR-XX**
Modular Jack, KMJ	**KMJA6xx**
Modular Jack, UMJ	**UMJA6xx**
Field Terminable Plug, Category 6A	**OCCUFP6A**
Patch Panel, 24-Port, 1U, Flat	**DCC2488/110SIX**
Patch Panel, 48-Port, 2U, Flat	**DCC4888/110SIX**
Patch Panel, 24-Port, 1U, Angled	**ACC2488/110SIX**
Patch Panel, 48-Port, 2U, Angled	**ACC4888/110SIX**
Patch Cord–With Boots	**PCSIXxxByy**
Patch Cords–No Boots	**PCSIXxxyy**

OCC•CS6300 – CATEGORY 6 SHIELDED SOLUTION

DESCRIPTION	OCC PART #
Copper Cable, CMP, Shielded	**OCC-FTP64PLM-xx**
Copper Cable, CMR, Shielded	**OCC-FTP64R-xx**
Modular Jack, KMJ	**KMJA602S**
Field Terminable Plug, Category 6A	**OCCSFP6A**
Patch Panel, 24-Port, 1U, Flat	**DCC2488/110SIX-S**
Patch Panel, 48-Port, 2U, Flat	**DCC4888/110SIX-S**
Patch Cord–With Boots	**PCSIXSxxByy**
Patch Cords–No Boots	**PCSIXSxxyy**

OCC•C6000 – CATEGORY 6 STANDARD UNSHIELDED SOLUTION

DESCRIPTION	OCC PART #
Copper Cable, CMP, Standard	**OCC-UE64PLM-xx**
Copper Cable, CMR, Standard	**OCC-UE64R-xx**
Modular Jack, KMJ	**KMJA6xx**
Modular Jack, UMJ	**UMJA6xx**
Field Terminable Plug, Category 6A	**OCCUFP6A**
Patch Panel, 24-Port, 1U, Flat	**DCC2488/110SIX**
Patch Panel, 48-Port, 2U, Flat	**DCC4888/110SIX**
Patch Panel, 24-Port, 1U, Angled	**ACC2488/110SIX**
Patch Panel, 48-Port, 2U, Angled	**ACC4888/110SIX**
Patch Cord–With Boots	**PCSIXxxByy**
Patch Cords–No Boots	**PCSIXxxyy**

OCC•C5000 – CATEGORY 5E UNSHIELDED SOLUTION

DESCRIPTION	OCC PART #
Copper Cable, CMP, Standard	**OCC-UE5E4PLM-xx**
Copper Cable, CMR, Standard	**OCC-U5E4R-xx**
Modular Jack, KMJ	**KMJA5Exx**
Modular Jack, UMJ	**UMJA5Exx**
Field Terminable Plug, Category 6A	**OCCUFP6A**
Patch Panel, 24-Port, 1U, Flat	**DCC2488/110A5E-R**
Patch Panel, 48-Port, 2U, Flat	**DCC4888/110A5E-R**
Patch Panel, 24-Port, 1U, Angled	**ACC2488/110A5E-R**
Patch Panel, 48-Port, 2U, Angled	**ACC4888/110A5E-R**
Patch Cord–With Boots	**PC5EBxxByy**
Patch Cords–No Boots	**PC5EBxxyy**

For All Tables Above, xx & yy Values Are Defined On Page 13

PRODUCT HIGHLIGHTS

COPPER CABLES

OCC copper cables support all IEEE PoE standards for DC power delivery over 4-pair cabling when installed in accordance with TIA TSB-184-A guidelines.

*xx=COLOR: 01=Yellow; 02=Black; 03=Red; 04=Green; 05=Blue; 06=Gray; 07=White; 08=Violet; 09=Orange

JACKS/FIELD TERMINABLE PLUGS

In addition to providing excellent link/channel performance, OCC KMJ and UMJ jacks meet TIA component electrical performance. Category 6A shielded and unshielded field terminable plugs are backward compatible and may also be used in Category 5e and Category 6 modular plug terminated links.

*xx=COLOR: 00=Electrical Ivory; 01=Office White; 02=Black; 03=Red; 04=Green; 05=Blue; 06=Gray; 07=White; 08=Orange; 09=Yellow; 10=Purple; 11=Brown; 12=Bright White

PATCH PANELS

OCC patch panels are available in both flat and angled styles. Category 6A patch panels utilize discrete high performance modular jacks.

PATCH CORDS

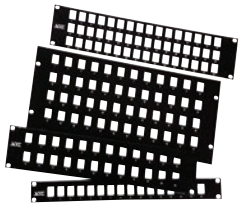
OCC's copper patch cords are 100% factory tested and a guaranteed headroom warranty is available for OCC channel solutions that utilize OCC patch cords.

Category 6A Shielded Mini 28AWG patch cords are also available. OCC mini patch cords meet Category 6A performance requirements for 28 AWG patch cords as defined by ANSI/TIA 568.2-D Annex G -28AWG, are constructed with F/UTP cable for superior alien crosstalk performance, and are 20% smaller than our standard patch cords.

*xx=LENGTH; yy=COLOR: 01=Yellow; 02=Black; 03=Red; 04=Green; 05=Blue; 06=Gray; 07=White; 08=Orange; 09=Brown; 10=Purple

SNAP-IN MULTIMEDIA PANELS (UNLOADED)

The ability to provide versatile solutions to unique customer needs has been OCC's specialty for years. With OCC's Snap-In Multimedia patch panels, any combination of UMJ or KMJ style jacks and adapters can be chosen to configure a custom patch panel. All Multimedia patch panels are mountable in any 19" rack.



KMJ/UMJ	PORTS	UNSHIELDED/ SHIELDED	FLAT/ANGLED	RU	OCC PART #
KMJ	24	Shielded	Flat	1	**AK24STP6A***
KMJ	48	Shielded	Flat	2	**AK48STP6A***
KMJ	24	Shielded	Angled	1	**ACC24KS6A***
KMJ	48	Shielded	Angled	2	**ACC48KS6A***
UMJ	24	Unshielded	Flat	2	**A24**
UMJ	48	Unshielded	Flat	2	**A48H**
KMJ	24	Unshielded	Flat	1	**AK24**
KMJ	48	Unshielded	Flat	2	**AK48H**
KMJ	48	Unshielded	Flat	1	**AK481U**
KMJ	24	Shielded	Flat	1	**AK24STP**
KMJ	48	Shielded	Flat	2	**AK48STP**
UMJ	24	Unshielded	Angled	2	**ACC24U**
UMJ	48	Unshielded	Angled	2	**ACC48U**
KMJ	24	Unshielded	Angled	1	**ACC24K**
KMJ	48	Unshielded	Angled	2	**ACC48K**
KMJ	48	Unshielded	Angled	1	**ACC48K1U**
KMJ	48	Shielded	Angled	2	**ACC48KS**
KMJ	24	Shielded	Angled	1	**ACC24KS1U**
KMJ	48	Shielded	Angled	1	**ACC48KS1U**

**For Use With Category 6A Jacks.*

PRODUCT HIGHLIGHTS

KMJ FACEPLATES

OCC's Keystone Faceplates are available in multiple port configurations and accommodate all OCC KMJ jacks and inserts for maximum versatility in the work area.

SINGLE/DOUBLE GANG	PORTS	ID WINDOWS	FLAT/ ANGLED	OCC PART #
Single Gang	1	ID Windows	Flat	**FPSK01xx**
Single Gang	2	ID Windows	Flat	**FPSK02xx**
Single Gang	3	ID Windows	Flat	**FPSK03xx**
Single Gang	4	ID Windows	Flat	**FPSK04xx**
Single Gang	6	ID Windows	Flat	**FPSK06xx**
Double Gang	6	ID Windows	Flat	**DPSK06xx**
Double Gang	12	ID Windows	Flat	**DPSK12xx**
Single Gang	1	No Windows	Flat	**FPKS01xx**
Single Gang	2	No Windows	Flat	**FPKS02xx**
Single Gang	3	No Windows	Flat	**FPKS03xx**
Single Gang	4	No Windows	Flat	**FPKS04xx**
Single Gang	6	No Windows	Flat	**FPKS06xx**
Single Gang Oversize	1	No Windows	Flat	**FPK01xx**
Single Gang Oversize	2	No Windows	Flat	**FPK02xx**
Single Gang Oversize	3	No Windows	Flat	**FPK03xx**
Single Gang Oversize	4	No Windows	Flat	**FPK04xx**
Single Gang Oversize	6	No Windows	Flat	**FPK06xx**
Double Gang	6	No Windows	Flat	**DPK06xx**
Double Gang	12	No Windows	Flat	**DPK12xx**

SURFACE MOUNT SURFACE MOUNT ENCLOSURES

OCC's Surface Mount Enclosures are a low-profile workstation solution that offers flexibility for multiple network configurations. In addition, the Surface Mount Enclosures are a cost effective approach for multiple desktop applications including cubicle settings and numerous workstation complexes.

DESCRIPTION	KMJ/UMJ	PORTS	OCC PART #
Surface Mount Enclosure	KMJ	1	**SMEK1xx**
Surface Mount Enclosure	KMJ	2	**SMEK2xx**
Surface Mount Enclosure	KMJ	4	**SMEK4xx**
Surface Mount Enclosure	KMJ	6	**SMEK6xx**
Surface Mount Enclosure	UMJ	2	**SME2xx**
Surface Mount Enclosure	UMJ	4	**SME4xx**
Surface Mount Enclosure	UMJ	8	**SME8xx**
Surface Mount Enclosure	UMJ	10	**SME10xx**
Fiber Service Outlet Box	KMJ	2	**SMEK2FSO12**

UMJ FACEPLATES

OCC's UMJ solution just isn't complete without our UMJ faceplates. Available in a multitude of configurations and designed to meet any application, the UMJ faceplates for UMJ-style jacks and adapters offer a convenient and aesthetically appealing solution for any desktop purpose.

SINGLE/DOUBLE GANG	PORTS	ID WINDOWS	FLAT/ ANGLED	OCC PART #
Single Gang	1	ID Windows	FLAT	**FPSR01xx**
Single Gang	2	ID Windows	FLAT	**FPSR02xx**
Single Gang	3	ID Windows	FLAT	**FPSR03xx**
Single Gang	4	ID Windows	FLAT	**FPSR04xx**
Single Gang	6	ID Windows	FLAT	**FPSR06xx**
Double Gang	1	ID Windows	FLAT	**DP01xx**
Double Gang	1	ID Windows	FLAT	**DP02xx**
Double Gang	1	ID Windows	FLAT	**DP03xx**
Double Gang	1	ID Windows	FLAT	**DP04xx**
Double Gang	1	ID Windows	FLAT	**DP06xx**
Single Gang	4	ID Windows	ANGLED	**FP04Axx**
Single Gang	1	No Windows	FLAT	**FPR01xx**
Single Gang	2	No Windows	FLAT	**FPR02xx**
Single Gang	3	No Windows	FLAT	**FPR03xx**
Single Gang	4	No Windows	FLAT	**FPR04xx**
Single Gang	6	No Windows	FLAT	**FPR06xx**

** For All Tables On Page 14 — xx=COLOR: 00=Electrical Ivory; 01=Office White; 12=Bright White*

GLOSSARY OF TERMS

PSE: Power Sourcing Equipment (ex. PoE Ethernet Switch)

PD: Powered Device (ex. WAP, Camera, etc.)

PWR (W): Power In Watts

IMAX (mA): I=Current; Max Per Pair For Designated PoE Class

DC LOOP RESISTANCE: Resistance (Ω=Ohms) of a 2-Pair 100 Meter Twisted Pair Loop

PSE VOUT MIN: Minimum DC Voltage Output At PSE

PD VIN MIN: Minimum DC Voltage Input At PD

CUSTOMER SUPPORT & WARRANTY INFORMATION

TECHNICAL AND DESIGN-BUILD EXPERTISE
Instead of relying on OCC just for products, more and more of our customers rely on our design-build expertise. Our design engineers and technical staff provide unprecedented service, support, and assistance.

ONE-STOP SHOP
Since we provide one of the largest network-solutions portfolios in the industry, many of our customers rely on OCC as their one-source solutions provider. From the most reliable end-to-end cabling and connectivity systems, down to the shortest patch cable, we can meet your every network need.

CUSTOMER-DERIVED INNOVATIONS
We partner with you, our customer, and listen to your needs. Thanks to our customers, we've designed, innovated, and customized some of the best solutions in the industry, providing the speed, immediate scalability, space savings, and ultra-high performance demanded by zero-downtime networks of all sizes.

COMPETITIVE WARRANTY PROGRAMS
OCC, in conjunction with certified Multimedia Design and Integration Specialist (MDIS) installers around the world, is able to offer various competitive warranty and extended warranty programs. OCC has developed warranty plans that offer a flexible approach to long-lasting network installations.

QUICK SHIPPING

FAST AS FIBER

24HR QUICK TURNAROUND

SAME DAY SHIPPING ON IN-STOCK ITEMS IF ORDERED BY 12PM, EST.

LOCATIONS

VISIT OCCFIBER.COM

OCC ROANOKE, VA

Corporate Headquarters and Fiber Optic Cable Manufacturing Facility

5290 Concourse Drive
Roanoke, VA 24019 USA
540-265-0690 or 800-622-7711

OCC DALLAS, TX

Harsh Environment and Specialty Connectivity Manufacturing Facility

1700 Capital Avenue, Suite 150
Plano, TX 75074 USA
972-509-1500 or 877-509-1500

OCC ASHEVILLE, NC

Enterprise Connectivity Manufacturing Facility

33 Superior Way
Swannanoa, NC 28778 USA
828-298-2260 or 800-880-7674

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