PANDUIT® TX5eTM Copper Cabling
Conduit Fill Capacity Table

TX5500™ Category 5e Plenum (PUP5504**) Cable										
Conduit Trade Size Inches (mm)		Internal Conduit Area						Cable Area (Plenum)		Max. No. Cables Using 40% Fill Rate (Penum)
		Internal Diameter		Area-.79D² Total 100%		Area 40% Fill				
		inches	mm	inches²	mm²	inches²	mm²	inches²	mm²	
3/4	(21)	0.82	20.9	0.53	345	0.21	138	0.0292	18.8	7
1	(27)	1.05	26.6	0.87	559	0.35	224	0.0292	18.8	11
1	(35)	1.38	35.1	1.50	973	0.60	389	0.0292	18.8	20
1	(41)	1.61	40.9	2.05	1322	0.82	529	0.0292	18.8	28
2	(53)	2.07	52.5	3.39	2177	1.35	871	0.0292	18.8	46
2-1/2	(63)	2.47	62.7	4.82	3106	1.93	1242	0.0292	18.8	66
3	(78)	3.07	77.9	7.45	4794	2.98	1918	0.0292	18.8	102
3-1/2	(91)	3.55	90.1	9.96	6413	3.98	2565	0.0292	18.8	136
4	(103)	4.03	102.3	12.83	8268	5.13	3307	0.0292	18.8	175
5	(129)	5.05	128.2	20.15	12984	8.06	5194	0.0292	18.8	276
6	(155)	6.07	154.1	29.11	18760	11.64	7504	0.0292	18.8	398
TX5500™ Category 5e Riser (PUR5504) Cable**										
Conduit Trade Size Inches (mm)		Internal Conduit Area						Cable Area (Riser)		Max. No. Cables Using 40% Fill Rate (Riser)
		Internal Diameter		Area-.79D² Total 100%		Area 40% Fill				
		inches	mm	inches²	mm²	inches²	mm²	inches²	mm²	
3/4	(21)	0.82	20.9	0.53	345	0.21	138	0.0397	25.6	5
1	(27)	1.05	26.6	0.87	559	0.35	224	0.0397	25.6	8
1	(35)	1.38	35.1	1.50	973	0.60	389	0.0397	25.6	15
1	(41)	1.61	40.9	2.05	1322	0.82	529	0.0397	25.6	20
2	(53)	2.07	52.5	3.39	2177	1.35	871	0.0397	25.6	34
2-1/2	(63)	2.47	62.7	4.82	3106	1.93	1242	0.0397	25.6	48
3	(78)	3.07	77.9	7.45	4794	2.98	1918	0.0397	25.6	75
3-1/2	(91)	3.55	90.1	9.96	6413	3.98	2565	0.0397	25.6	100
4	(103)	4.03	102.3	12.83	8268	5.13	3307	0.0397	25.6	129
5	(129)	5.05	128.2	20.15	12984	8.06	5194	0.0397	25.6	203
6	(155)	6.07	154.1	29.11	18760	11.64	7504	0.0397	25.6	293
TX5500™ Category 5e CM (PUC5504) Cable**										
Conduit Trade Size Inches (mm)		Internal Conduit Area						Cable Area (CM)		Max. No. Cables Using 40% Fill Rate (CM)
		Internal Diameter		Area-.79D² Total 100%		Area 40% Fill				
		inches	mm	inches²	mm²	inches²	mm²	inches²	mm²	
3/4	(21)	0.82	20.9	0.53	345	0.21	138	0.0277	17.9	7
1	(27)	1.05	26.6	0.87	559	0.35	224	0.0277	17.9	12
1	(35)	1.38	35.1	1.50	973	0.60	389	0.0277	17.9	21
1	(41)	1.61	40.9	2.05	1322	0.82	529	0.0277	17.9	29
2	(53)	2.07	52.5	3.39	2177	1.35	871	0.0277	17.9	48
2-1/2	(63)	2.47	62.7	4.82	3106	1.93	1242	0.0277	17.9	69
3	(78)	3.07	77.9	7.45	4794	2.98	1918	0.0277	17.9	107
3-1/2	(91)	3.55	90.1	9.96	6413	3.98	2565	0.0277	17.9	143
4	(103)	4.03	102.3	12.83	8268	5.13	3307	0.0277	17.9	185
5	(129)	5.05	128.2	20.15	12984	8.06	5194	0.0277	17.9	290
6	(155)	6.07	154.1	29.11	18760	11.64	7504	0.0277	17.9	420

TX5500™ Category 5e LSZH (PUL5504**) Cable										
Conduit Trade Size Inches (mm)		Internal Conduit Area						Cable Area (LSZH)		Max. No. Cables Using 40% Fill Rate (LSZH)
		Internal Diameter		Area-.79D² Total 100%		Area 40% Fill				
		inches	mm	inches²	mm²	inches²	mm²	inches²	mm²	
3/4	(21)	0.82	20.9	0.53	345	0.21	138	0.0294	18.9	7
1	(27)	1.05	26.6	0.87	559	0.35	224	0.0294	18.9	11
1	(35)	1.38	35.1	1.50	973	0.60	389	0.0294	18.9	20
1	(41)	1.61	40.9	2.05	1322	0.82	529	0.0294	18.9	27
2	(53)	2.07	52.5	3.39	2177	1.35	871	0.0294	18.9	45
2-1/2	(63)	2.47	62.7	4.82	3106	1.93	1242	0.0294	18.9	65
3	(78)	3.07	77.9	7.45	4794	2.98	1918	0.0294	18.9	101
3-1/2	(91)	3.55	90.1	9.96	6413	3.98	2565	0.0294	18.9	135
4	(103)	4.03	102.3	12.83	8268	5.13	3307	0.0294	18.9	174
5	(129)	5.05	128.2	20.15	12984	8.06	5194	0.0294	18.9	274
6	(155)	6.07	154.1	29.11	18760	11.64	7504	0.0294	18.9	395

PANDUIT® TX5e™ Shielded Copper Cabling System
Conduit Fill Capacity Table

TX5500™ Category 5e Plenum Shielded (PSP5504**) Cable										
Conduit Trade Size Inches (mm)		Internal Conduit Area						Cable Area (Plenum)		Max. No. Cables Using 40% Fill Rate (Penum)
		Internal Diameter		Area-.79D² Total 100%		Area 40% Fill				
		inches	mm	inches²	mm²	inches²	mm²	inches²	mm²	
3/4	(21)	0.82	20.9	0.53	345	0.21	138	0.0433	27.9	4
1	(27)	1.05	26.6	0.87	559	0.35	224	0.0433	27.9	8
1	(35)	1.38	35.1	1.50	973	0.60	389	0.0433	27.9	13
1	(41)	1.61	40.9	2.05	1322	0.82	529	0.0433	27.9	18
2	(53)	2.07	52.5	3.39	2177	1.35	871	0.0433	27.9	31
2-1/2	(63)	2.47	62.7	4.82	3106	1.93	1242	0.0433	27.9	44
3	(78)	3.07	77.9	7.45	4794	2.98	1918	0.0433	27.9	68
3-1/2	(91)	3.55	90.1	9.96	6413	3.98	2565	0.0433	27.9	91
4	(103)	4.03	102.3	12.83	8268	5.13	3307	0.0433	27.9	118
5	(129)	5.05	128.2	20.15	12984	8.06	5194	0.0433	27.9	186
6	(155)	6.07	154.1	29.11	18760	11.64	7504	0.0433	27.9	268
TX5500™ Category 5e Riser Shielded (PSR5504) Cable**										
Conduit Trade Size Inches (mm)		Internal Conduit Area						Cable Area (Riser)		Max. No. Cables Using 40% Fill Rate (Riser)
		Internal Diameter		Area-.79D² Total 100%		Area 40% Fill				
		inches	mm	inches²	mm²	inches²	mm²	inches²	mm²	
3/4	(21)	0.82	20.9	0.53	345	0.21	138	0.0494	31.9	4
1	(27)	1.05	26.6	0.87	559	0.35	224	0.0494	31.9	7
1	(35)	1.38	35.1	1.50	973	0.60	389	0.0494	31.9	12
1	(41)	1.61	40.9	2.05	1322	0.82	529	0.0494	31.9	16
2	(53)	2.07	52.5	3.39	2177	1.35	871	0.0494	31.9	27
2-1/2	(63)	2.47	62.7	4.82	3106	1.93	1242	0.0494	31.9	39
3	(78)	3.07	77.9	7.45	4794	2.98	1918	0.0494	31.9	60
3-1/2	(91)	3.55	90.1	9.96	6413	3.98	2565	0.0494	31.9	80
4	(103)	4.03	102.3	12.83	8268	5.13	3307	0.0494	31.9	103
5	(129)	5.05	128.2	20.15	12984	8.06	5194	0.0494	31.9	163
6	(155)	6.07	154.1	29.11	18760	11.64	7504	0.0494	31.9	235

TX5500™ Category 5e CM Shielded (PFC5504**) and LSZH Shielded (PFL5504**) Cables										
Conduit Trade Size Inches (mm)		Internal Conduit Area						Cable Area (CM &LSZH)		Max. No. Cables Using 40% Fill Rate (CM & LSZH)
		Internal Diameter		Area-.79D² Total 100%		Area 40% Fill				
		inches	mm	inches²	mm²	inches²	mm²	inches²	mm²	
3/4	(21)	0.82	4	0.53	345	0.21	138	0.0456	30.2	4
1	(27)	1.05	7	0.87	559	0.35	224	0.0456	30.2	7
1	(35)	1.38	12	1.50	973	0.60	389	0.0456	30.2	13
1	(41)	1.61	17	2.05	1322	0.82	529	0.0456	30.2	17
2	(53)	2.07	28	3.39	2177	1.35	871	0.0456	30.2	29
2-1/2	(63)	2.47	41	4.82	3106	1.93	1242	0.0456	30.2	42
3	(78)	3.07	63	7.45	4794	2.98	1918	0.0456	30.2	65
3-1/2	(91)	3.55	85	9.96	6413	3.98	2565	0.0456	30.2	87
4	(103)	4.03	109	12.83	8268	5.13	3307	0.0456	30.2	112
5	(129)	5.05	172	20.15	12984	8.06	5194	0.0456	30.2	176
6	(155)	6.07	248	29.11	18760	11.64	7504	0.0456	30.2	255

Appendix A-2

Rack Vertical Manager Horizontal
Cable Fill Capacity Tables

PANDUIT® TX6™ 10GigTM Copper Cabling System

		PatchRunner™ 6"				PatchRunner™ 8"				PatchRunner™ 12"			
		Front		Back		Front		Back		Front		Back	
Cable	Diameter (inches)	Channel Area (in²)	Practical Fill	Channel Area (in²)	Practical Fill	Channel Area (in²)	Practical Fill	Channel Area (in²)	Practical Fill	Channel Area (in²)	Practical Fill	Channel Area (in²)	Practical Fill
PUP6004**	0.233	34.00	319	22.20	208	50.50	473	32.90	308	83.50	783	54.40	510
PUR6004**	0.24		300		196		446		291		738		481
PUC6004**	0.225		342		223		508		331		840		547
PUL6004**	0.225		342		223		508		331		840		547
PUP6504**	0.265		246		161		366		238		605		394
PUR6504**	0.266		244		159		363		236		601		391
PUP6A04**	0.295		199		129		295		192		488		318
PUR6A04**	0.295		199		129		295		192		488		318
PUC6A04**	0.295		199		129		295		192		488		318
PUL6A04**	0.295		199		129		295		192		488		318
PUP6X04**	0.331		158		103		234		153		388		253
PUR6X04**	0.342		148		96		220		143		363		236
PUC6X04**	0.338		151		99		225		146		372		242
PUL6X04**	0.342		148		96		220		143		363		236

		Net-Access™ - End				Net-Access™ - Center			
		Front		Back		Front		Back	
Cable	Diameter (inches)	Channel Area (in²)	Practical Fill	Channel Area (in²)	Practical Fill	Channel Area (in²)	Practical Fill	Channel Area (in²)	Practical Fill
PUP6004**	0.233	42.20	396	42.20	396	84.40	792	84.40	792
PUR6004**	0.24		373		373		746		746
PUC6004**	0.225		424		424		849		849
PUL6004**	0.225		424		424		849		849
PUP6504**	0.265		306		306		612		612
PUR6504**	0.266		303		303		607		607
PUP6A04**	0.295		247		247		494		494
PUR6A04**	0.295		247		247		494		494
PUC6A04**	0.295		247		247		494		494
PUL6A04**	0.295		247		247		494		494
PUP6X04**	0.331		196		196		392		392
PUR6X04**	0.342		183		183		367		367
PUC6X04**	0.338		188		188		376		376
PUL6X04**	0.342		183		183		367		367

PANDUIT® TX6™ 10GigTM Copper Cabling System

(continued)

		Net-Access™ – End with Slack Spool				Net-Access™ – Center with Slack Spool			
		Front		Back		Front		Back	
Cable	Diameter (inches)	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill
PUP6004**	0.233	32.40	304	32.40	304	74.60	700	74.60	700
PUR6004**	0.24		286		286		659		659
PUC6004**	0.225		326		326		750		750
PUL6004**	0.225		326		326		750		750
PUP6504**	0.265		235		235		541		541
PUR6504**	0.266		233		233		537		537
PUP6A04**	0.295		189		189		436		436
PUR6A04**	0.295		189		189		436		436
PUC6A04**	0.295		189		189		436		436
PUL6A04**	0.295		189		189		436		436
PUP6X04**	0.331		150		150		346		346
PUR6X04**	0.342		141		141		324		324
PUC6X04**	0.338		144		144		332		332
PUL6X04**	0.342		141		141		324		324

PANDUIT® TX6™ 10GIG™ Shielded Copper Cabling System

		PatchRunner™ 6"				PatchRunner™ 8"				PatchRunner™ 12"			
		Front		Back		Front		Back		Front		Back	
Cable	Diameter (inches)	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill
PFC6004**	0.296	34.00	197	22.20	129	50.50	293	32.90	191	83.50	485	54.40	316
PFL6004**	0.296		197		129		293		191		485		316
PSP6004**	0.295		199		129		295		192		488		318
PSR6004**	0.308		182		119		271		176		448		292
PSL7004**	0.3		192		125		285		186		472		307
PUFL6X04**	0.279		222		145		330		215		546		356

		Net-Access™ – End				Net-Access™ – Center			
		Front		Back		Front		Back	
Cable	Diameter (inches)	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill
PFC6004**	0.296	42.20	245	42.20	245	84.40	490	84.40	490
PFL6004**	0.296		245		245		490		490
PSP6004**	0.295		247		247		494		494
PSR6004**	0.308		226		226		453		453
PSL7004**	0.3		238		238		477		477
PUFL6X04**	0.279		276		276		552		552

		Net-Access™ – End with Slack Spool				Net-Access™ – Center with Slack Spool			
		Front		Back		Front		Back	
Cable	Diameter (inches)	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill

PFC6004**	0.296	32. 40	188	32.40	188	74.60	433	74.60	433
PFL6004**	0.296		188		188		433		433
PSP6004**	0.295		189		189		436		436
PSR6004**	0.308		174		174		400		400
PSL7004**	0.3		183		183		422		422
PUFL6X04**	0.279		212		212		488		488

PANDUIT® TX6TM PLUS UTP Copper Cabling System

		PATCHRUNNER™ 6"				PATCHRUNNER™ 8"				PATCHRUNNER™ 12"			
		Front		Back		Front		Back		Front		Back	
Cable	Diameter (inches)	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill
PUP6004**	0.233	34.00	319	22.20	208	50.50	473	32.90	308	83.50	783	54.40	510
PUR6004**	0.24		300		196		446		291		738		481
PUC6004**	0.225		342		223		508		331		840		547
PUL6004**	0.225		342		223		508		331		840		547
PUP6504**	0.265		246		161		366		238		605		394
PUR6504**	0.266		244		159		363		236		601		391

		NET-ACCESS™ – End				NET-ACCESS™ – Center			
		Front		Back		Front		Back	
Cable	Diameter (inches)	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill
PUP6004**	0.233	42.20	0.233	42.20	396	84.40	396	84.40	792
PUR6004**	0.24		0.24		373		373		746
PUC6004**	0.225		0.225		424		424		849
PUL6004**	0.225		0.225		424		424		849
PUP6504**	0.265		0.265		306		306		612
PUR6504**	0.266		0.266		303		303		607

		NET-ACCESS™ – End with Slack Spool				NET-ACCESS™ – Center with Slack Spool			
		Front		Back		Front		Back	
Cable	Diameter (inches)	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill
PUP6004**	0.233	32.40	304	32.40	304	74.60	700	74.60	700
PUR6004**	0.24		286		286		659		659
PUC6004**	0.225		326		326		750		750
PUL6004**	0.225		326		326		750		750
PUP6504**	0.265		235		235		541		541
PUR6504**	0.266		233		233		537		537

PANDUIT® TX6TM PLUS UTP Copper Cabling

		PATCHRUNNER™ 6"				PATCHRUNNER ™8"				PATCHRUNNER ™ 12"			
		Front		Back		Front		Back		Front		Back	
Cable	Diameter (inches)	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill
PFC6004**	0.296	34.00	197	22.20	129	50.50	293	32.90	191	83.50	485	54.40	316
PFL6004**	0.296		197		129		293		191		485		316
PSP6004**	0.295		199		129		295		192		488		318
PSR6004**	0.308		182		119		271		176		448		292

PFC6004**	0.296	32. 40	188	32.40	188	74.60	433	74.60	433
PFL6004**	0.296		188		188		433		433
PSP6004**	0.295		189		189		436		436
PSR6004**	0.308		174		174		400		400
PSL7004**	0.3		183		183		422		422
PUFL6X04**	0.279		212		212		488		488

PANDUIT® TX6TM PLUS UTP Copper Cabling System

		PATCHRUNNER™ 6"				PATCHRUNNER™ 8"				PATCHRUNNER™ 12"			
		Front		Back		Front		Back		Front		Back	
Cable	Diameter (inches)	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill
PUP6004**	0.233	34.00	319	22.20	208	50.50	473	32.90	308	83.50	783	54.40	510
PUR6004**	0.24		300		196		446		291		738		481
PUC6004**	0.225		342		223		508		331		840		547
PUL6004**	0.225		342		223		508		331		840		547
PUP6504**	0.265		246		161		366		238		605		394
PUR6504**	0.266		244		159		363		236		601		391

		NET-ACCESS™ – End				NET-ACCESS™ – Center			
		Front		Back		Front		Back	
Cable	Diameter (inches)	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill
PUP6004**	0.233	42.20	0.233	42.20	396	84.40	396	84.40	792
PUR6004**	0.24		0.24		373		373		746
PUC6004**	0.225		0.225		424		424		849
PUL6004**	0.225		0.225		424		424		849
PUP6504**	0.265		0.265		306		306		612
PUR6504**	0.266		0.266		303		303		607

		NET-ACCESS™ – End with Slack Spool				NET-ACCESS™ – Center with Slack Spool			
		Front		Back		Front		Back	
Cable	Diameter (inches)	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill
PUP6004**	0.233	32.40	304	32.40	304	74.60	700	74.60	700
PUR6004**	0.24		286		286		659		659
PUC6004**	0.225		326		326		750		750
PUL6004**	0.225		326		326		750		750
PUP6504**	0.265		235		235		541		541
PUR6504**	0.266		233		233		537		537

PANDUIT® TX6TM PLUS Shielded Copper Cabling

		PATCHRUNNER™ 6"				PATCHRUNNER ™8"				PATCHRUNNER ™ 12"			
		Front		Back		Front		Back		Front		Back	
Cable	Diameter (inches)	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill
PFC6004**	0.296	34.00	197	22.20	129	50.50	293	32.90	191	83.50	485	54.40	316
PFL6004**	0.296		197		129		293		191		485		316
PSP6004**	0.295		199		129		295		192		488		318
PSR6004**	0.308		182		119		271		176		448		292

		NET-ACCESS™ - End				NET-ACCESS ™ - Center			
		Front		Back		Front		Back	
Cable	Diameter (inches)	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill
PFC6004**	0.296	42.20	245	42.20	245	84.40	490	84.40	490
PFL6004**	0.296		245		245		490		490
PSP6004**	0.295		247		247		494		494
PSR6004**	0.308		226		226		453		453

		NET-ACCESS ™ - End with Slack Spool				NET-ACCESS ™ - Center with Slack Spool			
		Front		Back		Front		Back	
Cable	Diameter (inches)	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill
PFC6004**	0.296	32. 40	188	32.40	188	74.60	433	74.60	433
PFL6004**	0.296		188		188		433		433
PSP6004**	0.295		189		189		436		436
PSR6004**	0.308		174		174		400		400

PANDUIT® TX5e Shielded Copper Cabling System

		PATCHRUNNER™ 6"				PATCHRUNNER™ 8"				PATCHRUNNER™ 12"			
		Front		Back		Front		Back		Front		Back	
Cable	Diameter (inches)	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill
PUP5504**	0.193	34.00	465	22.20	303	50.50	690	32.90	450	83.50	1142	54.40	744
PUR5504**	0.225		342		223		508		331		840		547
PUC5504**	0.188		490		320		728		474		1203		784
PUL5504**	0.194		460		300		683		445		1130		736

		NET-ACCESS™ - End				NET-ACCESS™ - Center			
		Front		Back		Front		Back	
Cable	Diameter (inches)	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill
PUP5504**	0.193	42.20	577	42.20	577	84.40	1154	84.40	1154
PUR5504**	0.225		424		424		849		849
PUC5504**	0.188		608		608		1216		1216
PUL5504**	0.194		571		571		1142		1142

		NET-ACCESS™ - End with Slack Spool				NET-ACCESS™ - Center with Slack Spool			
		Front		Back		Front		Back	
Cable	Diameter (inches)	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill
PUP5504**	0.193	32.40	443	32.40	443	74.60	1020	74.60	1020
PUR5504**	0.225		326		326		750		750
PUC5504**	0.188		467		467		1075		1075
PUL5504**	0.194		438		438		1010		1010

PANDUIT® TX5e Shielded Copper Cabling System

		PatchRunner™ 6"				PatchRunner™ 8"				PatchRunner™ 12"			
		Front		Back		Front		Back		Front		Back	
Cable	Diameter (inches)	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill
PFP5504**	0.235	34.00	313	22.20	204	50.50	465	32.90	303	83.50	770	54.40	501
PFR5504**	0.251		274		179		408		266		675		439
PFC5504**	0.241		298		194		443		288		732		477
PFL5504**	0.241		298		194		443		288		732		477

		Net-Access™ - End				Net-Access™ - Center			
		Front		Back		Front		Back	
Cable	Diameter (inches)	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill
PFP5504**	0.235	42.20	389	42.20	389	84.40	778	84.40	778
PFR5504**	0.251		341		341		682		682
PFC5504**	0.241		370		370		740		740
PFL5504**	0.241		370		370		740		740

		Net-Access™ - End with Slack Spool				NET-ACCESS™ - Center with Slack Spool			
		Front		Back		Front		Back	
Cable	Diameter (inches)	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill	Channel Area (in^2)	Practical Fill
PFP5504**	0.235	32. 40	298	32.40	298	74.60	688	74.60	688
PFR5504**	0.251		262		262		603		603
PFC5504**	0.241		284		284		654		654
PFL5504**	0.241		284		284		654		654

Practical Fill:
Estimate assumes a 40% fill factor (i.e. Sum of the cable cross sectional areas equals 40% of the vertical channel.)
The 40% factor is intended to account for cable routing.

Appendix A-3

Approved Test Leads for PANDUIT Patch Panels

Approved Test Leads For PANDUIT® MINI-COM® TX6™ 10GIG™ Jack Modules and DP6™ 10GIG™ Patch Panels							
Channel							
	Firmware Version	Software Version	Calibration Equipment	Autotest	Test Leads	Personality Module	Comments
Fluke: Networks DTX-1800 Series Cable Analyzer Fluke Networks Website	Software: V2.04 or later	Linkware Software V3.01 or later	-	TIA Cat6A Channel	Part # DTX-CHA001 Cat6 / Class E Channel Adapter	N/A	1. Consult Fluke Networks' website for the latest Firmware and Software Version. 2. It is **STRONGLY RECOMMENDED** that the tester is calibrated prior to testing
Agilent: WireScope Pro N2640A Agilent Technologies Website	WireScope Pro Software 2.1.9 or later	WireScope Pro (ScopeData Pro II) Software 2.19 or later	-	Cat6A: Channel	Part # N2644A-100 Universal Cat6A Channel SmartProbe	N/A	1. Consult Agilent's website for the latest Software Version. 2. Calibration with the Precision Calibration is **STRONGLY RECOMMENDED**. 3. Tester holds last calibration. Tester must be recalibrated if using a different DualRemote, upgrading the software, when transitioning from Cat7/Class F copper cable test to Cat6A/Class E or lower performance categories, or after 30 days. 4. Universal Cat6A Channel SmartProbes should be in optimal condition. See owner's manual.

Approved Test Leads For PANDUIT® MINI-COM® TX6™ PLUS Jack Modules and DP6™ PLUS Patch Panels							
Channel							
	Firmware Version	Software Version	Calibration Equipment	Autotest	Test Leads	Personality Module	Comments
Fluke: Networks DSP-4000 Series Cable Analyzer Fluke Networks Website	**DSP-43001** Software: V1.925 Standards: V5.17 **DSP-41001** Software: V4.925 Standards: V5.17 **DSP-40001** Software: V3.925 Standards: V5.17	Linkware Software V3.01 or later	-	TIA Cat 6 Channel	Part # DSPLIA012 Cat6/5e Channel Adapters or Part # DSPLIA013 Cat 6 Channel/Traffic Adapter	N/A	**1.** Consult Fluke Networks' web site for the latest Firmware and Software Version.
Fluke: Networks DTX-1800 Series Cable Analyzer Fluke Networks Website	Software: V2.04 or later	Linkware Software V3.01 or later	-	TIA Cat 6 Channel	Part # DTXCHA001 Cat 6 / Class E Channel Adapter	N/A	**1.** Consult Fluke Networks' web site for the latest Firmware and Software Version. **2.** It is STRONGLY RECOMMENDED that the tester is calibrated prior to testing.
Agilent: WireScope Pro N2640A Agilent Technologies Website	WireScope Pro Software 2.1.9 or later	WireScope Pro (ScopeData Pro II) Software 2.19 or later	-	Cat6: Channel	Part # N2644A-100 Universal Cat 6A Channel SmartProbe	N/A	**1.** Consult Agilent's web site for the latest Software Version. **2.** Calibration with the Precision Calibration Cable is **STRONGLY RECOMMENDED**. **3.** Tester holds last calibration. Tester must be recalibrated if using a different DualRemote, upgrading the software, when transitioning from CaT7/Class F copper cable test to Cat6A/ Class E or lower performance categories, or after 30 days. **4.** Universal Cat 6A Channel SmartProbes should be in optimal condition. See owner's manual.
Agilent: N2600A WireScope 350 N2610A FrameScope* 350 Agilent Technologies Website	WireScope Software 3.1 or later	WireScope Software 3.1 or later	PANDUIT Patch Cord UTPSPI7 or UTPSP7	Cat6: Channel	Part # N2604A100 Universal Cat 6 Channel Smartprobe1	N/A	**1.** Consult Agilent's web site for the latest Software Version. **2.** Tester holds last calibration. Tester must be recalibrated for switching testing from PL to Channel.
Ideal: LANTEK 6 LANTEK 6A LANTEK 7 LANTEK 7G Ideal Industries Website	Firmware: V2.510 or later	LANTEK Reporter V3.270 or later	PANDUIT Patch Cord UTPSP*	Twisted Pair Channel: Cat 6-250	Part # 0012-00-0629 Cat6/5e adapter RJ45	N/A	**1.** Consult Ideal's web site for the latest Firmware and Software Version. **2.** Tester must be recalibrated from job site to job site. **3.** Patch cords should be in optimal condition.
Fluke: Networks OMNIScanner 2 Fluke Networks Website	Version 6.12 or later	Linkware Software V3.01 or later	-	TIA Cat 6 Chan[1]	Part # 8262-42 Category 5/5e/6 Channel Adapter[2]	N/A	**1. IMPORTANT**: Make sure Channel adapters are used with Channel Autotests. **2.** Testing Channel on drops less than 20m is **NOT RECOMMENDED**.
Megger: SCT2000	Version 1.0.0	Megger LCMD	-	TIA Cat 6 Channel	Part # 6331-827 Category 6 Channel Adapter	N/A	**1.** Consult Megger website for the latest Firmware and Software Version.

* PANDUIT has not physically tested the FrameScope 350. Agilent maintains the FrameScope and WireScope have identical software and hardware for cabling testing.

Approved Test Leads For PANDUIT Mini-Com® TX5e™ Jack Modules and DP5e™ Patch Panels							
Channel							
	Firmware Version	Software Version	Calibration Equipment	Autotest	Test Leads	Personality Module	Comments
Fluke: Networks DSP-4000 Series Cable Analyzer Fluke Networks Website	**DSP-43001** Software: V1.925 Standards: V5.17 **DSP-41001** Software: V4.925 Standards: V5.17 **DSP-40001** Software: V3.925 Standards: V5.17	Linkware Software V3.01 or later	-	TIA Cat 6 Channel	Part # DSPLIA012 Cat6/5e Channel Adapters or Part # DSPLIA013 Cat 6 Channel/Traffic Adapter	N/A	**1.** Consult Fluke Networks' web site for the latest Firmware and Software Version.
Fluke: Networks DTX-1800 Series Cable Analyzer Fluke Networks Website	Software: V2.04 or later	Linkware Software V3.01 or later	-	TIA Cat 6 Channel	Part # DTXCHA001 Cat 6 / Class E Channel Adapter	N/A	**1.** Consult Fluke Networks' web site for the latest Firmware and Software Version. **2.** It is STRONGLY RECOMMENDED that the tester is calibrated prior to testing.
Agilent: WireScope Pro N2640A Agilent Technologies Website	WireScope Pro Software 2.1.9 or later	WireScope Pro (ScopeData Pro II) Software 2.19 or later	-	Cat6: Channel	Part # N2644A-100 Universal Cat 6A Channel SmartProbe	N/A	**1.** Consult Agilent's web site for the latest Software Version. **2.** Calibration with the Precision Calibration Cable is **STRONGLY RECOMMENDED**. **3.** Tester holds last calibration. Tester must be recalibrated if using a different DualRemote, upgrading the software, when transitioning from CaT7/Class F copper cable test to Cat6A/ Class E or lower performance categories, or after 30 days. **4.** Universal Cat 6A Channel SmartProbes should be in optimal condition. See owner's manual.
Agilent: N2600A WireScope 350 N2610A FrameScope* 350 Agilent Technologies Website	WireScope Software 3.1 or later	WireScope Software 3.1 or later	PANDUIT Patch Cord UTPSPI7 or UTPSP7	Cat6: Channel	Part # N2604A100 Universal Cat 6 Channel Smartprobe1	N/A	**1.** Consult Agilent's web site for the latest Software Version. **2.** Tester holds last calibration. Tester must be recalibrated for switching testing from PL to Channel.
Ideal: LANTEK 6 LANTEK 6A LANTEK 7 LANTEK 7G Ideal Industries Website	Firmware: V2.510 or later	LANTEK Reporter V3.270 or later	PANDUIT Patch Cord UTPSP*	Twisted Pair Channel: Cat 6-250	Part # 0012-00-0629 Cat6/5e adapter RJ45	N/A	**1.** Consult Ideal's web site for the latest Firmware and Software Version. **2.** Tester must be recalibrated from job site to job site. **3.** Patch cords should be in optimal condition.
Fluke: Networks OMNIScanner 2 Fluke Networks Website	Version 6.12 or later	Linkware Software V3.01 or later	-	TIA Cat 6 Chan[1]	Part # 8262-42 Category 5/5e/6 Channel Adapter[2]	N/A	**1. IMPORTANT**: Make sure Channel adapters are used with Channel Autotests. **2.** Testing Channel on drops less than 20m is **NOT RECOMMENDED**.
Megger: SCT2000	Version 1.0.0	Megger LCMD	-	TIA Cat 6 Channel	Part # 6331-827 Category 6 Channel Adapter	N/A	**1.** Consult Megger web site for the latest Firmware and Software Version.
* PANDUIT has not physically tested the FrameScope 350. Agilent maintains the FrameScope and WireScope have identical software and hardware for cabling testing.							

Appendix A-4

PANDUIT Copper Cabling System
Product Specification Details

Category 5e

Mini-Com® TX5e
Shielded Jack Module

Specifications

Eight-position jack module shall terminate 4 pair 22-26 AWG 100 ohm shielded twisted pair cable and shall not require the use of a punchdown tool. Jack module shall use forward motion termination to optimize performance by maintaining cable pair geometry and eliminating conductor untwist. The red termination cap shall be color coded for T568A and T568B wiring schemes.

Technical Information

- Class D/Category 5e channel and component performance – Exceeds all ISO 11801 2nd Edition and TIA/EIA-568-B.2 Category 5e standard requirements at swept frequencies up to 100 MHz
- FCC Compliance – Meets FCC Part 68 Subpart F; contacts plated with 50 micro inches of gold
- IEC Compliance – Meets IEC 60603-7

Key Features and Benefits

- 100% NEXT & Return Loss performance tested – Confidence that each jack module exceeds NEXT and Return Loss industry standard requirements
- Utilizes Enhanced Giga-TX™ technology – Optimizes performance by eliminating conductor untwist; reduces installation expense
- Improved termination cap – Conductor retention slots simplify termination
- Modularity – Jack modules snap in and out of all Mini-Com® Faceplates, Modular Patch Panels and
- Surface Mount Boxes for fast moves, adds and changes
- True strain relief – Controls cable bend radius for long term installed performance
- Individually serialized – Marked with quality control number for traceability
- Integral shield – No additional assembly required and provides 360 conductive path for grounding

Applications

Mini-Com® TX5e™ Shielded Jack Module is a component of the TX5500™ Shielded Copper Cabling System. The PANDUIT TX5500™ Shielded System provides end-to-end Gigabit Ethernet performance with usable bandwidth beyond 100 MHz. With certified performance to the ISO 11801 Class D and TIA/EIA-568-B.2 Category 5e standards, this system will support the following applications:

- Ethernet 10BASE-T, 100BASE-T (Fast Ethernet),
- 1000BASE-T (Gigabit Ethernet)
- 155 Mb/s ATM, 622 Mb/s ATM
- Token Ring 4/16
- Voice/data systems
- Voice over Internet Protocol (VoIP)

Part Number	Part Description	No. of Module Spaces	Std. Pkg. Quantity	Std. Ctn. Quantity
CJS5E88TGY	Category 5e, RJ45, 8-position, 8-wire universal shielded black module with integrated shield.	1	1	50
CJS5E88TGY	Category 5e, RJ45, 8-position, 8-wire, universal shielded black module with integrated shield, bulk packaged.	1	24	240

Mini-Com® TX5e™ UTP Jack Module

Specifications

Category 5e/Class D eight-position jack module shall terminate unshielded twisted 4-pair, 22 – 26 AWG, 100 ohm cable and shall not require the use of a punchdown tool. Jack modules shall use forward motion termination to optimize performance by maintaining cable pair geometry and eliminating conductor untwist. The red termination cap shall be color coded for T568A and T568B wiring schemes.

Technical Information

- Category 5e/Class D channel and component performance – Exceeds all TIA/EIA-568-B.2 Category 5e and ISO 11801 2nd Edition Class D standard requirements at swept frequencies up to 100 MHz
- FCC compliance – Meets FCC Part 68 Subpart F; contacts plated with 50 micro inches of gold
- IEC compliance – Meets IEC 60603-7

Key Features and Benefits

- 100% performance tested – Confidence that each jack module will deliver the critical electrical performance requirements
- Utilizes enhanced Giga-TX™ technology – Optimizes performance by eliminating conductor untwist; reduces installation expense
- Improved termination cap – Conductor retention slots simplify the termination clearly identified on universal label
- Modularity – Jack modules snap in and out of all Mini-Com® Faceplates, Modular Patch Panels and Surface Mount Boxes for fast moves, adds and changes
- True strain relief – Controls cable bend radius for long-term installed performance
- Individual serialized – Marked with quality control number for traceability
- Industry standard RJ45 interface – Familiar to end-users; backwards compatible

Applications

Mini-Com® TX5e™ UTP Jack Module is a component of the TX5500™ Copper Cabling System. The PANDUIT TX5500™ Copper Cabling System provides end-to-end Gigabit Ethernet performance with usable bandwidth beyond 100 MHz. With certified performance to the TIA/EIA-568-B.2 Category 5e and ISO 11801 Class D Standards, this system will support the following applications:

- Ethernet 10BASE-T, 100BASE-T (Fast Ethernet),
- 1000BASE-T (Gigabit Ethernet)
- 155 Mb/s ATM, 622 Mb/s ATM
- Token Ring 4/16
- Voice/data systems
- Voice over Internet Protocol (VoIP)

Part Number	Part Description	No. of Module Spaces	Color*	Std. Pkg. Quantity	Std. Ctn. Quantity
CJ5E88TGIW	Category 5e, RJ45, 8-position, 8-wire universal module.	1	Off White	1	50
CJ5E88TGIW-24	Category 5e, RJ45, 8-position, 8-wire universal module, bulk packaged	1	Off White	24	240

**For standard colors other than Off White, replace suffix IW (Off White) with EI (Electric Ivory), WH (White), IG (international Gray), BL (Black), OR (Orange), RD (Red), BU (Blue), GR (Green), YL (Yellow) or VL (Violet).*

TX5e™ Shielded Patch Cord

Specifications

Category 5e patch cords shall be constructed of 26 AWG shielded stranded copper cable and shielded high performance modular plugs at each end. Patch cords shall be used in all work area outlets and patch panels. Patch cords shall be offered in gray cable and a variety of boot colors and lengths. Patch cords shall be wired to be compatible with both T568A and T568B wiring schemes.

Technical Information

- Category 5e/Class channel and component performance – Exceeds all ISO 11801 2nd Edition Class D and TIA/EIA-568-B.2 Category 5e standard requirements at swept frequencies up to 100 MHz
- FCC compliance – Meets FCC Part 68 Subpart F; contacts plated with 50 micro inches of gold for superior performance
- IEC compliance – Meets IEC 60603-7
- UL rated – No. 1863

Key Features and Benefits

- 100% performance tested – Confidence that each patch cord delivers specified performance
- Integral pair manager – Optimizes performance and consistency by reducing untwist at plug
- Patented tangle free latch – Prevents snags and provides easy release, saving time on frequent moves, adds and changes
- Identification – Provides identification of performance level, length, and quality control number for future traceability
- Variety of boot colors and cable lengths – Meets individual length and color coding requirements for greater system flexibility
- Color bands (optional) – Snap onto cable, allowing additional color coding options
- RJ45 plug lock-in device (optional) – Secures plug into jack to prevent unauthorized removal of patch cord

Applications

TX5e™ Shielded Patch Cords are a component of the TX5500™ Shielded Copper Cabling System. The PANDUIT TX5500™ Shielded Copper Cabling System delivers end-to-end Gigabit Ethernet performance with usable bandwidth beyond 100 MHz. With certified performance to the ISO 11801 Class D and TIA/EIA-568-B.2 Category 5e standards, this system will support the following applications:

- Ethernet 10BASE-T, 100BASE-T (Fast Ethernet),
- 1000BASE-T (Gigabit Ethernet)
- 155 Mb/s ATM, 622 Mb/s ATM
- Token Ring 4/16
- Voice/data systems
- Voice over Internet Protocol (VoIP)

Part Number	Part Description	Boot Color	Cable Color	Std. Pkg. Quantity	Std. Ctn. Quantity
STPCH*MBBL	Category 5e, shielded patch cord with Pan-Plug® Modular Plugs on each end..	Black	Int'l. Gray	1	10

**For standard lengths 1 to 10 meters (increments of 1 meter) and 0.5, 1.5, 2.5, 15, 20, 25, 30, 35, 40 meters change the length designation in the part number to the desired length. For boot colors other than Black, replace suffix BL (Black) with BU (Blue), GR (Green), RD (Red) or YL (Yellow). For example, the part number for a 15 meter patch cord with blue boots is STPCH15MBBU.*

TX5e™ UTP Patch Cords

Specifications

Category 5e/Class D UTP patch cords shall be constructed of unshielded twisted pair stranded copper cable and a high performance modular plug at each end. Patch cords shall be used in all work area outlets and patch panels. Patch cords shall be wired to be compatible with both T568A and T568B wiring schemes.

Technical Information

- Category 5e/Class D channel and component performance – Exceeds all TIA/EIA-568-B.2 Category and ISO 11801 2nd Edition Class D standard requirements at swept frequencies up to 100 MHz
- FCC compliance – Meets FCC Part 68 Subpart F; contacts plated with 50 micro inches of gold for superior performance
- IEC compliance – Meets IEC 60603-7
- UL rated – No. 1863

Key Features and Benefits

- 100% performance tested – Confidence that each patch cord delivers specified performance
- Integral pair manager – Optimizes performance and consistency by reducing untwist at plug
- Patented tangle free latch – Prevents snags and provides easy release, saving time on frequent moves, adds and changes
- Identification – Provides identification of performance level, length, and quality control number for future traceability
- Variety of cable colors and lengths – Meets individual length and color coding requirements for greater system flexibility
- Color bands (optional) – Snap onto cable, allowing additional color coding options
- RJ45 plug lock-in device (optional) – Secures plug into jack to prevent unauthorized removal of patch cord

Applications

TX5e™ UTP Patch Cords are a component of the TX5500™ Copper Cabling System. The PANDUIT TX5500™ Copper Cabling System provides end-to-end Gigabit Ethernet performance with usable bandwidth beyond 100 MHz. With certified performance to the TIA/EIA-568-B.2 Category 5e and ISO 11801 Class D standards, this system will support the following applications:

- Ethernet 10BASE-T, 100BASE-T (Fast Ethernet),
- 1000BASE-T (Gigabit Ethernet)
- 155 Mb/s ATM, 622 Mb/s ATM
- Token Ring 4/16
- Voice/data systems
- Voice over Internet Protocol (VoIP)

Part Number	Part Description	Cable Color	Std. Pkg. Quantity	Std. Ctn. Quantity
UTPCH*Y	Category 5e, UTP patch cord with Pan-Plug® Modular Plugs at each end.	Off White	1	10

**For lengths 1 to 20 feet (increments of 1 foot) and 25, 30, 35, 40 feet change the length designation in the part number to desired length. For standard cable colors other than Off White, add suffix BL (Black), BU (Blue), GR (Green), RD (Red), YL (Yellow), OR (Orange) or VL (Violet) before the Y in the part number. For example, the part number for a blue 15-foot patch cord is UTPCH15BUY.*

TX5500™ Shielded Cable – S/FTP

Specifications

The S/FTP Shielded cable shall be constructed of 4-pair insulated AWG conductors. The twisted pairs shall be wrapped in an overall metallic foil with an overall braid within a LSZH or PVC jacket.

Technical Information

- Class E/Category 5e channel performance – Exceeds all ISO 11801 2nd Edition Class D and TIA/EIA-568-B.2 Category 5e channel standard requirements at swept frequencies up to 100 MHz
- Class E/Category 5e component performance – Exceeds all ISO 1801 2nd Edition Class D and TIA/EIA-568-B.2 Category 5e component standard requirements at swept frequencies up to 100 MHz
- Cable conductors – Polyethylene (PE) insulation
- Cable jacket – LSZH – low smoke zero halogen plastic (dark gray) PVC – low smoke flame retardant PVC (light gray)
- Cable diameter – 0.31 inches (7.87mm)
- Flame rating – LSZH – IEC 60332-1 rated PVC – NEC type CM (UL) and FT4 rated
- Temperature rating – 32 degrees to 140 degrees (0 to 60 degrees C) during installation, -4 to 140 degrees (-20 to 60 degrees C) during operation
- Installation tension – 25 lbs. (110N) maximum

Key Features and Benefits

- Foil shield – Reduces ingress of EMI interference to ensure cable performance at high frequency levels
- Braided shield – Provides superior structural integrity and reduces low frequency external interference to ensure exceptional cable performance at all swept frequencies
- Bulk packaging – 1,640 ft. (500M) per reel
- Descending length" cable markings – Easy identification of remaining cable reduces installation time

Applications

TX5500™ Shielded Copper Cable is a component of the TX5500™ Shielded Copper Cabling System. The PANDUIT TX5500™ Shielded System provides end-to-end Gigabit Ethernet with usable bandwidth beyond 100 MHz. With certified performance to the ISO 11801 Class D and TIA/EIA-568-B.2 Category 5e standards, this system will support the following applications:

- Ethernet 10BASE-T, 100BASE-T (Fast Ethernet),
- 1000BASE-T (Gigabit Ethernet)
- 155 Mb/s ATM, 622 MB/s ATM
- Token Ring 4/16
- Voice/data systems
- Voice over Internet Protocol (VoIP)

Part Number	Part Description	Std. Pkg. Quantity	Std. Ctn. Quantity
PFP5504IG-UY	Category 5e plenum (CMP) shielded copper cable	1000 ft.	39000 ft.
PFR5504IG-UY	Category 5e riser (CMR) shielded copper cable	1000 ft.	39000 ft.

TX5500™ UTP Copper Cable

Specifications

Category 5e cable shall far exceed ANSI/TIA/EIA-568-B.2 and IEC 61156-5 Category 5e component standards. The conductors shall be 24 AWG construction with FEP (CMP) or polyolefin (CMR) insulation. The copper conductors shall be twisted in pairs and covered in a low smoke flame retardant PVC (CMP) jacket or a flame retardant PVC (CMR) jacket.

Technical Information

Electrical performance – Certified channel performance in a 4-connector configuration up to 100 meters and exceeds ANSI/TIA/EIA-568-B.2 Category 5e and ISO 11801 2nd Edition Class D standards at swept frequencies up to 100 MHZ. Certified component performance up to 100 meters and exceeds the component requirements of ANSI/TIA/EIA-568-B.2 and IEC 61156-5 Category 5e component standards at swept frequencies up to 100 MHz.

- Conductors/insulators – Plenum – 24 AWG bare copper wire covered by FEP insulation
- Riser – 24 AWG bare copper wire covered by polyolefin (PE) insulation
- Flame rating – Plenum – NFPA 262
  Riser – UL 1666
- Installation tension – 25 lbs (110 N) maximum
- Temperature rating – Plenum - 32°F to 122°F (0°C to 50°C) during installation, 14°F to 140°F (-10°C to 60°C) during operation
  – Riser - 32°F to 122°F (0°C to 50°C) during installation, 14°F to 140°F (-10°C to 60°C) during operation
- Cable jacket – Plenum – low smoke, flame retardant PVC
  – Riser - flame retardant PVC
- Cable weight – Plenum – 21 lbs./1000 ft. (9.6 kg/305m)
  – Riser – 22 lbs./1000 ft. (9.9 kg/305m)
- Cable diameter – Plenum – 0.193 in. (4.9mm) nominal
  – Riser – 0.225 in. (5.7mm) nominal
- Packaging – 1000 ft. (305m), in an easy payout box, tested to ISTA Procedure 1 A
  Weight: Plenum – 24 lbs./1000 ft. (10.9 kg/305m)
  – Riser – 25 lbs./1000 ft. (11.3 kg/305m)

Key Features and Benefits

Easy payout box – Ensure proper performance and provides quick installation

Descending length cable markings – Easy identification of remaining cable reduces installation time and cable scrap

Applications

TX5500™ UTP Copper Cable is a component of the PANDUIT TX5500™ UTP Copper Cabling System. This end-to-end system provides Gigabit Ethernet performance with usable bandwidth beyond 100 MHz. With certified performance to the ANSI/TIA/EIA-568-B.2 Category 5e and ISO 11801 Class D standards, this system will support the following applications:

- Ethernet 10BASE-T, 100BASE-T (Fast Ethernet),
- 1000BASE-T (Gigabit Ethernet)
- 155 Mb/s ATM, 622 Mb/s ATM
- Token Ring 4/16

Part Number	Part Description	Cable Color	Std. Pkg. Quantity	Std. Ctn. Quantity
PUR5504BU-UY	Category 5e riser (CMR) 4-pair UTP copper cable. Copper conductors are 24 AWG construction with HDPE insulation. Conductors are twisted in pairs and placed in a flame-retardant PVC jacket.	Blue	1000 ft.	39000 ft.
Category 5e riser PUP5504BU-UY	Category 5e plenum (CMP) 4-piar UTP copper cable. Copper conductors are 24 AWG construction with FEP insulation. Conductors are twisted in pairs and placed in a low smoke, flame retardant PVC jacket.	Blue	1000 ft.	39000 ft.

***For standard cable colors other than Blue, replace BU (Blue) with WH (White), YL (Yellow), or IG (International Gray).*

DP5e™ Patch Panel

Specifications

Category 5e/Class D punchdown patch panels shall terminate unshielded twisted 4 pair, 22 – 26 AWG, 100 ohm cable and shall mount to standard EIA 19" or 23" racks. Industry standard single wire 110 punchdown tool shall be used for terminations. Patch panels shall be supplied with T568A and T568B wiring configurations. Ports and panels shall be easy to identify with pre-printed numbers and write-on areas.

Technical Information

- Category 5e/Class D channel and component performance – Exceeds all TIA/EIA-568-B.2 Category 5e and ISO 11801 2nd Edition Class D standard requirements at swept frequencies up to 100 MHz
- Dimensions – 12 port flat: 2.10"H x 10.0"W x 1.17"D (53.3 x 253.9 x 29.7mm), 89D bracket
  - 24 port flat: 1.72"H x 19.0"W x 1.17"D (43.7 x 482.6 x 29.7mm), 1 RU
  - 48 port flat: 3.47"H x 19.0"W x 1.17"D (88.1 x 482.6 x 29.7mm), 2 RU
  - 24 port angled: 1.72"H x 19.0"W x 4.77"D (43.7 x 482.6 x 121.2mm), 1 RU
  - 48 port angled: 3.47"H x 19.0"W x 4.77"D (88.1 x 482.6 x 121.2mm), 2 RU
- Mounting option – Mounts to standard EIA 19" or 23" racks (23" requires use of extender bracket); 12-port suitable for wall mount with 89D bracket
- Packaging – Packaged with M6 and #12 – 24 mounting screws

Key Features and Benefits

- 100% performance tested – Confidence that each port will deliver the critical electrical performance requirements
- Each port individually serialized – Can be quality traced to sub-components
- Common termination tooling – Terminates with industry standard 110 punchdown tool for familiar, easy and fast installation
- Port and panel identification – Write-on areas follow TIA/EIA-606-A labeling standard
- Universal wiring schemes – T568A and T568B wiring scheme clearly identified on universal label
- Industry standard RJ45 interface – Familiar to end-users; backwards compatible
- Replaceable port module – Ability to easily replace damaged port for full panel use

Applications

DP5e™ Patch Panel is a component of the TX5500™ Copper Cabling System. The PANDUIT TX5500™ Systems provides end-to-end Gigabit Ethernet performance with usable bandwidth beyond 100 MHz. With certified performance to the TIA/EIA-568-B.2 Category 5e and ISO 11801 Class D standards, this system will support the following applications:

- Ethernet 10BASE-T, 100BASE-T (Fast Ethernet),
- 1000BASE-T (Gigabit Ethernet)
- 155 Mb/s ATM, 622 Mb/s ATM
- Token Ring 4/16
- Voice/data systems

Part Number	Part Description	No. of Rack Spaces	Std. Pkg. Quantity	Std. Ctn. Quantity
DPA245E88TGY	24-port, Category 5e, patch panel with 24 RJ45, 8-position, 8-wire ports	1	1	10
DPA485E88TGY	48-port, Category 5e, patch panel with 48 RJ45, 8-position, 8-wire ports	2	1	10
DPA485E88TGY	12-port, Category 5e, patch panel with 12 RJ45, 8-position, 8-wire ports. Mounts to 89D wall mount bracket.		1	10
DPA485E88TGY	12-port, Category 5e, patch panel with 12 RJ45, 8-position, 8-wire ports. Mounts to 89D wall mount bracket.	1	1	10
DPA485E88TGY	48-port, Category 5e, patch panel with 48 RJ45, 8-position, 8-wire ports	2	1	10

Category 6

Mini-Com® TX6™ PLUS Shielded Jack Module

Specifications

8-position jack module shall terminate 4-pair 22 – 26 AWG 100 ohm shielded twisted pair cable and shall not require the use of a punchdown tool. Jack module shall use forward motion termination to optimize performance by maintaining cable pair geometry and eliminating conductor untwist. The white termination cap shall be color coded for T568A and T568B wiring schemes.

Technical Information

- Class E/Category 6 channel performance – Exceeds all ISO 11801 2nd Edition Class E and TIA/EIA-568-B.2-1 Category 6 channel standard requirements at swept frequencies up to 250 MHz
- Class E/Category 6 component performance – Exceeds all ISO 11801 2nd Edition Class E and TIA/EIA-568-B.2-1 Category 6 component standard requirements at swept frequencies up to 250 MHz
- FCC compliance – Meets FCC Part 68 Subpart F; contacts plated with 50 micro inches of gold
  IEC compliance – Meets IEC 60603-7

Key Features and Benefits

- 100% NEXT and Return Loss performance tested – Confidence that each jack module delivers NEXT and Return Loss performance
- Utilizes Enhanced Giga-TX™ Technology – Optimizes performance by eliminating conductor untwist; reduces installation expense
- Improved termination cap – Conductor retention slots simplify termination
- Modularity – Jack modules snap in and out of all Mini-Com® faceplates, modular patch panels and surface mount boxes for fast moves, adds and changes
- True strain relief – Controls cable bend radius for long term installed performance
- Individually serialized – Marked with quality control number for traceability
- Integral shield – No additional assembly required and provides 360 conductive path for grounding

Applications

Mini-Com® TX6™ PLUS Shielded Jack Module is a component of the TX6000™ Shielded Copper Cabling System. Interoperable and backward compatible, this system provides design flexibility to protect network investments well into the future. With certified performance to the ISO 11801 Class E and TIA/EIA-568-B.2-1 Category 6 standards, this system is ideal for today's high performance workstation applications. Applications of the TX6000™ Shielded Copper Cabling System include:

- Ethernet 10BASE-T, 100BASE-T (Fast Ethernet),
- 1000BASE-T (Gigabit Ethernet)
- 155 Mb/s ATM, 622 Mb/s ATM, 1.2 Gb/s ATM
- Token Ring 4/16
- Digital video and broadband/baseband analog video
- Voice over internet protocol (VoIP)

Part Number	Part Description	No. of Module Space	Std. Pkg. Quantity	Std. Ctn. Quantity
CJS688TGY	Category 6, RJ45, 8-position, 8-wire universal shielded black module with integral shield.	1	1	50
CJS688TGY-24	Category 6, RJ45, 8-position, 8-wire universal shielded black module with integral shield, bulk packaged	1	24	240

Mini-Com® TX6™ PLUS UTP Jack Module

Specifications

Category 6/Class E eight-position jack module shall terminate unshielded twisted 4 pair, 22 – 26 AWG, 100 ohm cable and shall not require the use of a punchdown tool. Jack module shall use forward motion termination to optimize performance by maintaining cable pair geometry and eliminating conductor untwist. The white termination cap shall be color coded for T568A and T568B wiring schemes.

Technical Information

- Category 6/Class E channel and component performance – Exceeds all TIA/EIA-568-B.2-1 Category 6 and ISO 11801 2nd Edition Class E standard requirements at swept frequencies up to 250 MHz
- FCC compliance – Meets FCC Part 68 Subpart F; contacts plated with 50 micro inches of gold for superior performance
- IEC compliance – Meets IEC 60603-7

Key Features and Benefits

- 100% performance tested – Confidence that each jack module will deliver the critical electrical performance requirements
- Utilizes enhanced Giga-TX™ technology – Optimizes performance by eliminating conductor untwist; reduces installation expense
- Improved termination cap – Conductor retention slots simplify termination
- Modularity – Jack modules snap in and out of Mini-Com® Faceplates, Modular Patch Panels and Surface Mount Boxes for fast moves, adds and changes
- True strain relief – Controls cable bend radius for long term installed performance
- Individually serialized – Marked with quality control number for traceability
- Industry standard RJ45 interface – Familiar to end-users; backwards compatible

Applications

Mini-Com® TX6™ PLUS UTP Jack Modules is a component of the TX6500™ and TX6000™ Copper Cabling Systems. Interoperable and backward compatible, these end-to-end systems provide design flexibility to protect network investments well into the future. With certified performance to the TIA/EIA-568-B.2-1 Category 6 and ISO 11801 Class E standards, these systems are ideal for today's high performance workstation applications. Usage of the TX6500™ and TX6000™ Copper Cabling Systems include:

- Ethernet 10BASE0T, 100BASE-T (Fast Ethernet), 1000BASE-T (Gigabit Ethernet), 10000BASE-T (10 Gigabit Ethernet over limited distances as specified in the industry 10GBASE-t standards)
- 155 Mb/s ATM, 622 Mb/s ATM, 1.2 Gb/s ATM
- Token Ring 4/16
- Digital video and broadband/baseband analog video
- Voice over Internet Protocol (VoIP)

Part Number	Part Description	No. of Module Spaces	Color*	Std. Pkg. Quantity	Std. Ctn. Quantity
CJ688TGIW	Category 6, RJ45, 8-position, 8-wire universal module	1	Off White	1	50
CJ688TGIW-24	Category 6, RJ45, 8-position, 8-wire universal module, bulk packaged	1	Off White	24	240

*For standard colors other than Off White, replace suffix IW (Off White) with EI (Electric Ivory), WH (White), IG (International Gray), BL (Black), OR (Orange), RD (Red), BU (Blue), GR (Green), YL (Yellow) or VL (Violet).

TX6™ PLUS UTP Patch Cords

Specifications

Category 6/Class E UTP patch cords shall be constructed of 24 AWG unshielded twisted pair stranded copper cable and an enhanced performance modular plug at each end. Patch cords shall be used in all work area outlets and patch panels. Patch cords shall be wired to be compatible with both T568A and T568B wiring schemes.

Technical Information

- Category 6/Class E channel and component performance – Exceeds all TIA/EIA-568-B.2-1 Category 6 and ISO 11801 2nd Edition Class E standard requirements at swept frequencies up to 250 MHz
- FCC compliance – Meets FCC Part 68 Subpart F; contacts plated with 50 micro inches of gold for superior performance
- IEC compliance – Meets IEC 60603-7
- UL rated – No. 1863

Key Features and Benefits

- 100% performance tested – Confidence that each patch cord will deliver the critical electrical performance requirements
- Integral pair manager – Optimizes performance and consistency by reducing untwist at plug
- Slender strain relief boot – Provides easy access in high-density applications
- Patented tangle free latch – Prevents snags and provides easy release, saving time on frequent moves, adds and changes
- Identification – Provides identification of performance level, length and quality control number for future trace ability
- Variety of cable colors and lengths – Meets individual length and color coding requirements for greater sys tem flexibility
- Color bands (optional) – Snap onto cable, allowing additional color coding options
- RJ45 plug lock-in device (optional) – Secures plug into jack to prevent unauthorized removal of patch cord

Applications

TX6™ PLUS UTP Patch Cords are components of the PANDUIT TX6500™ and TX6000™ Copper Cabling Systems. Interoperable and backward compatible, these end-to-end systems provide design flexibility to protect network investments well into the future. With certified performance to the TIA/EIA-568-B.2-1 Category 6 and ISO 11801 Class E standards, these systems are ideal for today's high performance workstation applications. The TX6500™ and TX6000™ Copper Cabling Systems will support the following applications:

- Ethernet 10BASE-T, 100BASE-T (Fast Ethernet), 1000BASE-T (Gigabit Ethernet), 10000BASE-T (10 Gigabit Ethernet over limited distances as specified in the industry 10GBASE-T standards)
- 155 Mb/s ATM, 622 Mb/s ATM, 1.2 Gb/s ATM
- Token Ring 4/16
- Digital video and broadband/baseband analog video
- Voice over Internet Protocol (VoIP)

Part Number	Part Description	Cable Color	Srd. Pkg. Quantity	Std. Ctn. Quantity
UTPSP*Y	Category 6, UTP patch cord with TX6™ PLUS Modular Plugs on each end.	Off White	1	10

*For lengths 1 to 20 feet (increments of 1 foot) and 25, 30, 36, 40 feet change the lengths designation in the part number to desired length. For standard cable colors other than Off White, add suffix BL (Black), BU (Blue), GR (Green), RD (Red), YL (Yellow), OR (Orange) or VL (Violet) before the Y at the end of the part number.

TX6000™ UTP Copper Cable

Specifications

Category 6 cable shall exceed ANSI/TIA/EIA-568-B.2-1 and IEC 61156-5 Category 6 component standards. The conductors shall be 23 AWG construction with FEP (CMP) or polyolefin (CMR) insulation. The copper conductors shall be twisted in pairs, separated by a cross-divider and covered by a low smoke, flame retardant (CMP) jacket or a flame retardant (CMR) jacket.

Technical Information

Electrical performance – Certified channel performance in a 4-connector configuration up to 100 meters and exceed ANSI/TIA/EIA-568-B.2-1 and ISO 11801 2nd Edition Class E Category 6 standards at swept frequencies up to 250 MHz. Certified component performance up to 100 meters and exceeds the component requirements of ANSI/TIA/EIA-568-B.2-1 and IEC 61156-5 Category 6 component standards at swept frequencies up to 250 MHz

- Conductors/insulators – Plenum – 23 AWG bare copper wire covered by FEP insulation
  - Riser – 23 AWG bare copper wire covered by polyolefin (PE) insulation
- Flame rating – Plenum – NFPA 262
  - Riser – UL1666
- Installation tension – 25 lbs (110 N)maximum
- Temperature rating – 32°F to 122°F (0°C to 50°C) during installation
  - 14°F to 140°F (-10°C to 60°C) during operation
- Cable jacket – Plenum – low smoke, flame retardant PVC
  - Riser – flame retardant PVC
- Cable diameter – Plenum – 0.236 in. (5.9mm) nominal
  - Riser – 0.240 in. (6.1mm) nominal
- Cable weight – Plenum – 28 lbs./1000 ft. (12.7 kg/305m)
  - Riser – 31 lbs./1000 ft. (14.1 kg/305m)
- Packaging – 1000 ft. (305m), reel-in-a-box
  - Plenum – 32 lbs./1000 ft. (14.5 kg/305m)
  - Riser – 35 lbs./1000 ft. (15.9 kg/305m)
  - Package tested to ISTA Procedure 1A

Key Features and Benefits

- Third party tested – Cable had been tested as part of the TX6000™ Copper Cabling System by an independent laboratory and complies with the electrical channel requirements of the following standard: ANSI/TIA/EIA-568-B.2-1 Category 6
- Integrated pair divider – Separates pairs for the exceptional cable performance
- Reel-in-a-box – Ensures proper performance and provides quick installation
- Descending length cable markings – Easy identification of remaining cable reduces installation time and cable scrap

Applications

TX6000™ UTP Copper Cable is a component of the PANDUIT TX6000™ UTP Copper Cabling System. Interoperable and backward compatible, this end-to-end system provides design flexibility to protect network investments well into the future. With certified performance to the ANSI/TIA/EIA-568-B.2-1 Category 6 and ISO 11801 Class E standards, this system will support the following applications:

- Ethernet 10BASE-T, 100BASE-T (Fast Ethernet), 1000BASE-T (Gigabit Ethernet), 10GABSE-T (10 Giga-bit Ethernet over limited distances as specified in the industry 10GBASE-T standards)
- 155 Mb/s ATM, 622 Mb/s ATM, 1.2 Gb/s ATM
- Token Ring 4/16

Part Number	Part Description	Cable Color	Srd. Pkg. Quantity	Std. Ctn. Quantity
PUR6004BU-UY	High performance Category 6 riser (CMR) 4-pair UTP copper cable. Copper conductors are 23 AWG construction with HDPE insulation. Conductors are twisted in pairs, separated by an integrated pair divider, and placed in a flame retardant PVC jacket.	Blue	1000 ft.	27000 ft.
PUP6004BU-UY	High performance Category 6 plenum (CMP) 4-pair UTP copper cable. Copper conductors are 23 AWG construction with FEP insulation. Conductors are twisted in pairs, separated by an integrated pair divider, and placed in a low smoke, flame retardant PVC jacket.	Blue	1000 ft.	27000 ft.

*For standard colors other than Blue, replace suffix BU (Blue) with WH (White), YL (Yellow), or IG (International Gray).

TX6500™ UTP Copper Cable

Specifications

Category 6 cable shall far exceed ANSI/TIA/EIA-568-B.2-1 and ISO/IEC 11801 Class E standards. The conductors shall be 23 AWG construction with FEP (CMP) or polyolefin (CMR) insulation. The copper conductors shall be twisted in pairs, separated by an integrated pair divider and shall be covered by a low smoke, flame retardant (CMP) jacket or a flame retardant (CMR) jacket.

Technical Information

Electrical performance – Certified channel performance in a 4-connector configuration up to 100 meters and exceeds ANSI/TIA/EIA-568-B.2-1 Category 6 and ISO 11801 2nd Edition Class E standards at swept frequencies up to 250 MHz. Certified component performance up to 100 meters and exceeds the component requirements of ANSI/TIA.EIA-568-B.2-1 Category 6 and IEC 61156-5 and component standards at swept frequencies up to 250 MHz.

- Conductors/insulators – Plenum – 23 AWG bare copper wire covered by FEP insulation
  - Riser – 23 AWG bare copper wire covered by polyolefin (PE) insulation
- Flame rating – Plenum – NFPA 262
  - Riser – UL 1666
- Installation tension – 25 lbs. (110 N) maximum
- Temperature rating - 32° to 122°F (0° to 50°C) during installation, 14° to 140°F (-10° to 60°C) during operation
- Cable jacket – Plenum – low smoke, flame retardant PVC
  - Riser – flame retardant PVC
- Cable diameter – Plenum – 0.264 in. (6.7mm) nominal
  - Riser – 0.265 in. (6.8mm) nominal
- Cable weight – Plenum – 35 lbs./1000 ft. (15.8 kg/305m)
  - Riser – 32 lbs./1000 ft. (14.5 kg/305m)
- Packaging – 1000 ft. (305m), reel-in-a-box
  - Plenum – 39 lbs./1000 ft. (17.7 kg/305m)
  - Riser – 36 lbs./1000 ft. (16.3 kg/305m)
  - Packaging tested to ISTA Procedure 1A

Key Features and Benefits

- Third party tested – Cable has been tested as part of the TX6500™ Copper Cabling System by an independent laboratory and complies with the electrical channel requirements of the following standard: ANSI/TIA/EIA-568-B.2-1
- Integrated pair divider – Separates pairs for exceptional cable performance
- Reel-in-a-box – Ensures proper performance and provides quick installation
- Descending length cable markings – Easy identification of remaining cable reduces installation time and cable scrap
- Reduced attenuation – Maximizes the amount of signal that reaches the receiver and increases bandwidth

Applications

TX6500™ UTP Copper Cable is a component of the PANDUIT TX6500™ Copper Cabling System. Interoperable and backward compatible, this end-to-end system provides design flexibility to protect network investments well into the future. With certified performance to the ANSI/TIA/EIA-568-B.2-1 Category 6 and ISO 11801 Class E standards, this system will support the following applications:

- Ethernet 10BASE-T, 100BASE-T (Fast Ethernet), 1000BASE-T (Gigabit Ethernet), 10GABSE-T (10 Gigabit Ethernet over limited distances as specified in the industry 10GBASE-T standards)
- 155 Mb/s ATM, 622 Mb/s ATM, 1.2 Gb/s ATM
- Token Ring 4/16

Part Number	Part Description	Color*	Srd. Pkg. Quantity	Std. Ctn. Quantity
PUR6504BU-UY	Enhanced high-performance Category 6 riser (CMR) 4-pair UTP copper cable. Copper conductors are 23 AWG construction with HDPE insulation. Conductors are twisted in pairs, separated by an integrated pair divider and placed in a flame-retardant PVC jacket.	Blue	1000 ft.	27000 ft.
PUP6504BU-UY	Enhanced high-performance Category 6 plenum (CMP) 4-pair UTP copper cable. Copper conductors are 23 AWG construction with FEP insulation. Conductors are twisted in pairs, separated by an integrated pair divider and placed in a low smoke, flame-retardant PVC jacket.	Blue	1000 ft.	27000 ft.

*For standard colors other than Blue, replace suffix BU (Blue) with WH (White), YL (Yellow) or IG (International Gray).

DP6™ PLUS Patch Panel

Specifications

Category 6/Class E punchdown patch panels shall terminate unshielded twisted 4 pair, 22 – 26 AWG, 100 ohm pair cable and shall mount to standard EIA 19" or 23"racks. Industry standard single wire 110 punchdown tool shall be used for terminations. Patch panels shall be supplied with T568A and T568B wiring configurations. Ports and panel shall be easy to identify with pre-printed numbers and write-on areas.

Technical Information

- Category 6/Class E channel and component performance – Exceeds all TIA/EIA-568-B.2-1 Category 6 and ISO 11801 2nd Edition Class E standard requirements at swept frequencies up to 250 MHz
- Dimensions – 12 port flat: 2.10"H x 10.0"W x 1.17"D (53.3 x 253.9 x 29.7mm), 89D bracket
  - 24 port flat: 1.72"H x 19.0"W x 1.17"D (43.7 x 482.6 x 29.7mm), 1 RU
  - 48 port flat: 3.47"H x 19.0"W x 1.17"D (88.1 x 482.6 x 29.7mm), 2 RU
  - 24 port angled: 1.72"H x 19.0"W x 4.77"D (43.7 x 482.6 x 121.2mm), 1 RU
  - 48 port angled: 3.47"H x 19.0"W x 4.77"D (88.1 x 482.6 x 121.2mm), 2 RU
- Mounting option – Mounts to standard EIA 19" pr 23" racks
- Packaging – Packaged with M6 and #12 – 24 mounting screws

Key Features and Benefits

- 100% performance tested – Confidence that each port will deliver the critical electrical performance requirements
- Each port individually serialized – Can be quality traced to sub-components
- Common termination tool – Terminates with industry standard 110 punchdown tool for familiar, easy and fast installation
- Port and panel identification – Write-on areas follow TIA/EIA-606-A labeling standards
- Universal wiring schemes – T568A and T568B wiring schemes clearly identified on universal label
- Industry standard RJ45 interface – Familiar to end-users; backwards compatible
- Replaceable port modules – Snaps in and out of patch panel for fast moves, adds and changes

Applications

DP6™ PLUS Patch Panel is a component of the TX6500™ and TX6000™ Copper Cabling Systems. Interoperable and backward compatible, these end-to-end systems provide design flexibility to protect network investments well into the future. With certified performance to the TIA/EIA-568-B.2-1 Category 6 and ISO 11801 Class E standards, these systems are ideal for today's high performance workstation applications. Usage of the TX6500™ and TX6000™ Copper Cabling Systems include:

- Ethernet 10BASE-T, 100BASE-T (Fast Ethernet), 1000BASE-T (Gigabit Ethernet), 10000BASE-T (10 Gigabit Ethernet over limited distances as specified in the industry 10GBASE-T standards)
- 155 Mb/s ATM, 622 Mb/s ATM, 1.2 Gb/s ATM
- Token Ring 4/16
- Digital video and broadband/baseband analog video
- Voice over Internet Protocol (VoIP)

Part Number	Part Description	No. of Rack Spaces	Srd. Pkg. Quantity	Std. Ctn. Quantity
DPA24688TGY	24-port, angled, Category 6, patch panel with 24 RJ45, 8-position, 8-wire ports.	1	1	10
DPA48688TGY	48-port, angled, Category 6, patch panel with 48 RJ45, 8-position, 8-wire ports.	2	1	10
DP12688TGY	12-port, Category 6, patch panel with 12 RJ45, 8-position, 8-wire ports. Mounts to 89D wall mount bracket.		1	10
DP24688TGY	24-port, Category 6, patch panel with 24 RJ45, 8-position, 8-wire ports.	1	1	10
DPA48688TGY	48-port, Category 6, patch panel with 48 RJ45, 8-position, 8-wire ports.	2	1	10

TX6™ 10Gig™ Shielded Jack Module

Specifications

Augmented Category 6 eight-position jack module shall terminate shielded twisted 4-pair 22-26 AWG 100 ohm cable and shall not require the use of a punchdown tool. Jack module shall use forward motion termination to optimize performance by maintaining cable pair geometry and eliminating conductor untwist. The blue termination cap shall be color coded for T568A and T568B wiring schemes. The TX6™ 10Gig™ Shielded Jack Module must be installed as part of the TX6™ 10Gig™ Shielded Copper Cabling System to achieve IEEE 10GBASE-T certified performance.

Technical Information

- Augmented Category 6/ISO 11801 Class EA Edition 2.1 – Certified channel performance in a 4-connector configuration up to 100 meters and exceeds the draft requirements of TIA/EIA 568-B.2-AD10, ISO 11801 Class EA Edition 2.1, and IEEE 802.3an-2006 ratified standard for supporting 10GBASE-T transmission over copper twisted pair cabling when used as part of the PANDUIT TX6™ 10Gig™ Shielded Copper Cabling System
- Category 6/Class E performance – Exceeds all Category 6/Class E component and channel standard requirements
- FCC compliance – Meets FCC Part 68 Subpart F
- IEC compliance – Meets IEC 60603-7

Key Features and Benefits

- 100% performance tested for wire-map, NEXT, and return loss – Guarantees that each jack module delivers specified performance
- Utilizes enhanced Giga-TX™ Technology – Optimizes performance by eliminating conductor untwist and reduces installation time and expense
- Improved termination cap – Conductor retention slots simplify terminations
- Integral 360° shield – No additional assembly required and provides a 360° conductive path to ground; shield provides seamless bonding of the jack module with a Mini-Com® All Metal Modular Patch Panel
- Modularity – Jack modules snap in and out of all Mini-Com® Faceplates, Modular Patch Panels, and Surface Mount Boxes for fast moves, adds and changes
- True strain relief – Controls cable bend radius for long term installed performance
- Individually serialized – Marked with a quality control number for traceability

Applications

TX6™ 10Gig™ Shielded Jack Modules are a component of the TX6™ 10Gig™ Shielded Copper Cabling System. This end-to-end system provides a cost-effective medium for ensuring that network bandwidth needs are easily met today and tomorrow. This shielded cabling system provides high performance, excellent EMI suppression, and aids in secure data transmission. The PANDUIT solution helps ensure organizations efficiently and reliably meet their data transmission needs. Usage of the TX6™ 10Gig™ Shielded Copper Cabling System includes high bandwidth applications within data centers and connections to high-end workstations such as:

- Stacking switches and switch-to-switch links
- Storage area networks
- Aggregation of Gigabit Ethernet channels
- Real-time intensive financial transactions
- Streaming video
- Animation
- Scientific modeling
- Medical imaging

Part Number	Part Description	No. of Rack Spaces	Srd. Pkg. Quantity	Std. Ctn. Quantity
CJS6X88TGY	Category 6A, RJ45, 10 Gb/s, 8-position, 8-wire universal shielded black module with integral shield	1	1	50
CJS6X88TGY-24	Category 6A, RJ45 10 Gb/s, 8-position, 8-wire universal shielded black module with integral shield, bulk packaged	1	24	240

Mini-Com® TX6A™ 10Gig™ UTP Jack Module

Specifications

Category 6A, 8-position jack module shall terminate unshielded twisted 4-pair, 22 – 26 AWG, 100 ohm cable and shall not require the use of a punchdown tool. The jack module shall use a forward motion termination method to optimize performance by maintaining cable pair geometry and eliminating conductor untwist. The blue termination cap shall be color-coded for T568A and T568B wiring schemes.

Technical Information

Category 6A/Class EA channel and component performance – Certified channel performance in a 4-connector configuration up to 100 meters and exceeds the requirements of ANSI/TIA/EIA-568-B.2-10 Category 6A and ISO 11801 Class EA standards for supporting 10GBASE-T transmission over twisted-pair cabling systems as part of the PANDUIT TX6A™ 10Gig™ UTP Copper Cabling System. Certified component performance to the ANSI/TIA/EIA-568-B.2-10 Category 6A and ISO 11801 Class EA standards for supporting 10GABSE-T transmission over twisted-pair cabling systems

- FCC compliance – Meets ANSI/TIA-968-A; contacts are plated with 50 micro inches of gold for superior performance
- IEC compliance – Meets IEC 60603-7
- PoE compliance – Meets IEEE 802.3af and draft requirements of IEEE 802.3at for PoE Plus
- UL rated – No. 1863
- Conductor termination range – Accepts primary conductor O.D. between 0.037 in. to 0.062 in.

Key Features and Benefits

- 100% performance tested – Confidence that each jack module delivers specified performance
- Advanced electrical compensation technology – Headroom over industry standards for lower risk and higher bandwidth network availability
- Utilizes Flex technology – Shortens the tuning length of the jack module enabling higher performance
- Alien crosstalk suppression – Innovative foil technology provides superior alien crosstalk performance enabling high density applications (48 ports in 1 RU)
- Utilizes enhanced Giga-TX™ Technology – Wire cap optimizes performance by eliminating conductor untwist and reduces installation time and expense; simplifies termination and maintains conductor twists for reliable and consistent terminations
- True strain relief – Controls cable bend radius for long term installed performance
- Modular – Jack modules snap in and out of Mini-Com® Face plates, Modular Patch Panels and Surface Mount Boxes for easy moves, adds and changes
- Individually serialized – Marked with quality control number for future traceability
- Jack module blockout device (optional) – Provides a simple and secure method to control access to data ports

Applications

The Mini-Com® TX6A™ 10Gig™ UTP Jack Module is a component of the PANDUIT TX6A™ 10Gig™ Copper Cabling System. Interoperable and backward compatible, this end-to-end system provides design flexibility to protect network investments well into the future. Key applications include:

- 10GBASE-T Ethernet
- Data center 1/O consolidation
- Data center server virtualization
- Consolidation of network interconnects
- Back-bone aggregation
- Parallel processing and high speed computing

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Part Number	Part Description	No. of Module Spaces	Color*	Std. Pkg. Quantity	Std. Ctn. Quantity
CJ6X88TGIW	Category 6A, RJ45, 10 Gb/s, 8-position, 8-wire universal module.	1	Off White	1	50
CJ6X88TGIW-24	Category 6A, RJ45, 10 Gb/s, 8-position, 8-wire universal module, bulk packaged.	1	Off White	24	240

*For standard colors other than Off White, replace suffix IW (Off White) with EI (Electric Ivory), WH (White), IG (International Gray), BL (Black), OR (Orange), RD (Red), BU (Blue), GR (Green), YL (Yellow) or VL (Violet).

TX6™ 10Gig™ Shielded Patch Cords

Specifications

Category 6A shielded patch cords shall be constructed of shielded 26 AWG stranded copper cable and an enhanced performance shielded modular plug at each end. Patch cord cable shall be offered in colored S/STP cable with a black boot. Patch cords shall be used in all work area outlets and patch panels. Patch cords shall be wired to be compatible with both T568A and T568B wiring schemes. The TX6™ 10Gig™ Shielded Patch cords must be installed as part of a complete PANDUIT TX6™ 10Gig™ Shielded Copper Cabling System in order to achieve 10GBASE-T certified performance.

Technical Information

- Category 6A/ISO 11801 Class EA channel performance tested to 650 MHz – Certified channel performance in a 4-connector configuration up to 100 meters and exceeds the draft requirement of ISO 11801 Class EA Edition 21, and IEEE 802.3an-2006, TIA/EIA568-B.2-10 ratified standards for supporting 10GBASE-T transmission over copper twisted pair cabling when used as part of the PANDUIT TX6™ 10Gig™ Shielded Copper Cabling System
- FCC compliance – Meets FCC Part 68 subpart F; contacts plated with 50 micro inches of gold for superior performance
- IEC compliance – Meets IEC 60603-7
- UL rated – No. 1863

Key Features and Benefits

- 100% performance tested for wire-map, NEXT and return loss – Confidence that each patch cord delivers specified performance
- Centered de-embedded plug – Performance in center of ANSI/EIA/TIA-568-B.2-1 component range, ensuring interoperability and optimum performance
- Integral pair manager – Optimizes performance, consistency and reliability by reducing untwist at plug
- Patented tangle free latch – Prevents snags and provides easy release, saving time on frequent moves, adds and changes
- Slender strain relief boot – Provides easy access in high-density applications
- Robust construction – Plug contact plated with 50 micro inches of gold and rated to 2500 mating cycles
- Flexible stranded cable – Copper cable made of 0.23 inch S/STP stranded 26 AWG allows for high density and superior panel cable management
- Identification – Provides identification of performance level, length, and quality control number for future traceability
- Variety of cable colors and lengths – Meets individual length and color coding requirements for greater sys tem flexibility
- Color bands (optional) – Snap onto cable, allowing additional color coding options
- RJ45 plug lock-in device (optional) – Secures plug into jack to prevent unauthorized removal of patch cord

Applications

TX6™ 10Gig™ Shielded Patch Cords are a component of the PANDUIT TX6™ 10Gig™ Shielded Copper Cabling System. This end-to-end system provides a cost-effective medium for ensuring that network bandwidth needs are easily met today and tomorrow. This shielded cabling system provides high performance, excellent EMI suppression, and aids in secure data transmission. The PANDUIT solution helps ensure organizations efficiently and reliably meet their data transmission needs. Usage of the TX6™ 10Gig™ Shielded Copper Cabling System includes high bandwidth applications within data centers and connections to high-end workstations such as:

- Stacking switched and switch-to-switch links
- Storage area networks
- Aggregation of Gigabit Ethernet channels
- Real-time intensive financial transactions
- Streaming video
- Animation
- Scientific modeling
- Medical imaging

Part Number	Part Description	Cable Color	Std. Pkg. Quantity	Std. Ctn. Quantity
STP6X*IG	Category 6A, 10 Gb/s STP patch cord with TX6™ PLUS Modular Plugs on each end.	Int'll Gray	1	10

*For lengths 2 to 20 feet (increments of one foot) and 25, 30, 35, 40 feet change the length designation in the part number to the desired length. For standard cable colors other than IG (International Gray) replace IG suffix with BL (Black), BU (Blue), GR (Green), RD (Red), YL (Yellow), OR (Orange) or VL (Violet) to the end of the part number.

TX6™ 10Gig™ UTP Patch Cords

Specifications

Category 6A UTP patch cords shall be constructed of 24 AWG solid copper cable with an enhanced performance modular plug at each end. Patch cords shall be used in all work area outlets and patch panels. Patch cords shall be wired to be compatible with both T568A and T568B wiring schemes. The TX6™ 10Gig™ Patch Cords must be installed as part of a complete PANDUIT TX6™ 10Gig™ UTP Copper Cabling System in order to achieve 10GBASE-T certified performance.

Technical Information

- Category 6A/ISO 11801 Class EA channel performance tested to 650 MHz – Certified channel performance in a 4-connector configuration up to 100 meters and exceeds the draft requirements of ISO 11801 Class EA Edition 2.1, and IEEE 802.3an-2006, TIA/EIA568-B.2-10 ratified standards for supporting 10GBASE-T transmission over twisted-pair cabling systems as part of the PANDUIT TX6™ 10Gig™ UTP Copper Cabling Systems
- FCC Compliance – Meets FCC Part 68 Subpart F; contacts plates with 50 micro inches of gold for superior performance
- IEC compliance – Meets IEC 60603-7
- UL rated – No. 1863

Key Features and Benefits

- 100% performance tested – Confidence that each patch cord delivers specified performance
- Centered de-embedded plug – Performs in center of TIA/EIA-568-B.2-1 component range ensuring interoperability and excellent performance
- Integral pair manager – Optimizes performance, consistency, and reliability by reducing untwist at plug
- Patented tangle-free latch – Prevents snags and provides easy release, saving time and providing reliability on frequent moves, adds and changes
- Slender strain relief boot – Provides easy access in high-density applications
- Robust construction – Plug contacts plated with 50 micro inches of gold and rated to 2500 mating cycles
- Identification – Provides identification of performance level, length and quality control number for future trace ability
- Variety of cable colors and lengths – Meets individual length and color coding requirements for greater sys tem flexibility
- Color bands (optional) – Snap onto cable, allowing additional color coding options

Applications

TX6™ 10Gig™ UTP Patch Cords are a component of the PANDUIT TX6™ 10Gig™ UTP Copper Cabling System. This end-to-end system provides a cost effective media for ensuring that the most challenging network bandwidth needs are easily met today and tomorrow. Businesses are placing increased reliance on their networks to efficiently pass vital and time sensitive information throughout the enterprise. The TX6™ 10Gig™ UTP Copper Cabling System will support the following applications:

- Data Center high bandwidth applications for switch-to-switch links, storage area networks, and aggregation of data
- 3-D modeling and work group file transfer
- Web-enabling applications such as Voice over Internet
- Protocol (VoIP)

Part Number	Part Description	Cable Color	Std. Pkg. Quantity	Std. Ctn. Quantity
STP6X*IG	Category 6A, 10 Gb/s STP patch cord with TX6™ PLUS Modular Plugs on each end.	Int'll Gray	1	10

*For lengths 3 to 20 feet (increments of one foot) and 25, 30, 35, 40 feet change the length designation in the part number to the desired length. For standard cable colors other than Off White, add suffix BL (Black), BU (Blue), RD (Red), GR (Green), YL (Yellow), OR (Orange) or VL (Violet) before the Y at the end of the part number. For example, the part number for a blue 15-foot patch cord is UTP6X15BUY.

TX6™ 10Gig™ Shielded Cable – U/FTP

Specifications

Augmented Category 6 Shielded Copper Cable shall be constructed of 4-piar twisted insulated 23 AWG conductors. Each individual pair shall have a metallic foil shield and all four pairs shall be covered with a flame retardant PVC jacket. The shielded cable shall provide superior alien cross-talk performance. The TX6™ 10Gig™ Shielded Cable must be installed as part of the TX6™ 10Gig™ Shielded Copper Cabling System to achieve certified 10GBASE-T performance.

Technical Information

- Augmented Category 6/ISO 11801 Class EA Edition 2.1 – Certified channel performance in a 4 –connector configuration up to 100 meters and exceeds the draft requirements of TIA/EIA 568-B.2-AD10, ISO 11801 Class EA Edition 2.1 and IEEE 802.3an-2006 ratified standard for supporting 10GBASE-T transmission over copper twisted pair cabling when used as part of the PANDUIT TX6™ 10Gig™ Shielded Copper Cabling System
- Category 6/Class E performance – Exceeds all Category 6/Class E component and channel standard requirements
- Cable jacket – Riser and Plenum: 100% low-smoke, flame retardant PVC
- Flame rating – Plenum: meets NEC type CMP (UL) – FT6 rated, Riser: meets NEC type CMR (UL) – FT4 rated
- Installation tension – 25 lbs. (110 N) maximum
- Temperature rating – 32 to 140 degrees F (0 to 60 degrees C) during installation, 14 to 140 degrees F (-10 to 60 C) during operation
- Cable outer diameter – Plenum: 0.29” (7.36mm), Riser: 0.31” (7.87mm)
- Packaging – 1,000’ (305M) per reel, CMR – 50 lbs. (22.6kg), CMP – 45 lbs. (20.4kg)

Key Features and Benefits

- Individual screened pairs – Exceptional suppression of internal and external (Alien) cross-talk which exceed IEEE 802.3an-2006 specifications and EMI protection
- Internal drain wire – Facilitates means of grounding the cable and provides for efficient performance and protection of network investment
- Descending length” cable markings – Easy identification of remaining cable reduces installation time and scrap

Applications

TX6™ 10Gig™ Shielded Cable is a component of the TX6™ 10Gig™ Shielded Copper Cabling System. This end-to-end system provides a cost effective medium for ensuring that network bandwidth needs are easily met today and tomorrow. This shielded cabling system provides high performance, excellent EMI suppression, and aids in secure data transmission. The PANDUIT solution helps ensure organizations efficiently and reliably meet their data transmission needs. Usage of the TX6™ 10Gig™ Shielded Copper Cabling System includes high bandwidth applications within data centers and connections to high-end workstations such as:

- Stacking switches and switch-to-switch links
- Storage area networks
- Aggregation of Gigabit Ethernet channels
- Real-time intensive financial transactions
- Streaming video
- Animation
- Scientific modeling
- Medical imaging

Part Number	Part Description	Cable Color	Std. Pkg. Quantity	Std. Ctn. Quantity
PSR6004BU-UGY	Category 6A riser (CMR) 4-pair U/FTP shielded copper cable. Copper conductors are 23 AWG with HDPE insulation. Conductors are twisted in pairs, each individual twisted pair includes a metallic foil shield and is protected by a flame retardant PVC jacket.	Blue	1000 ft.	15000 ft.
PSP6004BU-UGY	Category 6A plenum (CMP) 4 pair U/FTP shielded copper cable. Copper conductors are 23 AWG with FEP insulation. Conductors are twisted in pairs; each individual twisted pair includes a metallic foil shield and is protected by a low smoke, flame-retardant PVC jacket.	Blue	1000 ft.	15000 ft.

*For standard colors other than Blue, replace BU (Blue) with WH (White), YL (Yellow) or IG (International Gray).

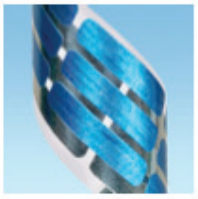
TX6A™ 10Gig™ UTP Copper Cable Specifications

Category 6A cable shall meet the ANSI/EIA/TIA-568-B.2-10 and IEC 61156-5 component standards. The conductors shall be 23 AWG construction with FEP (CMP) or PE (CMR) insulation. The copper conductors shall be twisted in pairs and separated by a cross web. All four pairs shall be surrounded by matrix tape and a flame retardant jacket. The patent pending matrix tape shall suppress the effect of alien cross-talk allowing 10 Gb/s transmission. This innovative cable design shall provide installation flexibility as cables can be routed in tight bundles through pathways and spaces.

Technical Information

Category 6A/Class EA channel and component performance – Certified channel performance in a 4-connector configuration up to 100 meters and exceeds the requirements of ANSI/TIA/EIA-568-B.2-10 Category 6A and ISO 11801 Class EA standards for supporting 10GBASE-T transmission over twisted-pair cabling systems as part of the PANDUIT TX6A™ 10Gig™ UTP Copper Cabling System. Certified component performance up to 100 meters and exceeds the ANSI/TIA/EIA-568-B.2-10 Category 6A and IEC 61156-5 Category 6A standards for supporting 10GBASE-T transmission over twisted-pair cabling systems.

- Cable diameter – 0.295 in. (7.5mm) nominal
- PoE compliant – Meets IEEE 802.3af and draft requirements of IEEE 802.3at for PoE Plus
- Conductors/insulators – 23 AEG solid copper insulated with FEP (CMP) or flame retardant PE (CMR)
- Flame rating – Plenum (CMP): NFPA 262
  – Riser (CMR): UL 1666
- Installation tension – 25 lbs. (110 N) maximum
- Temperature rating - 32°F to 140°F (0°C to 60°C) during installation, -4°F to 167°F (-20°C to 75°C) during operation



- Cable jacket – Plenum (CMP): Flame retardant PVC
  – Riser (CMR): Low smoke flame retardant PVC
- Cable weight – Plenum (CMP): 44 lbs./1000 ft. (20 kg/305m)
  – Riser (CMR): 35 lbs./1000 ft. (16 kg/305m)
- Packaging – 1000 ft. (305m) on a reel, Package tested to ISTA Procedure 1A
  – Plenum (CMP): 48 lbs./1000 ft. (22 kg/305m)
  – Riser (CMR): 39 lbs./1000 ft. (18 kg/305m)

Key Features and Benefits

- Innovative matrix tape technology – Provides superior suppression of both PSANEXT and PSAACRF; improves the installation flexibility by allowing cable combing in existing pathways without compromising performance
- Round cable design – Improves fill capacity, cable management, reduces required bend radius and allows efficient use of pathways and spaces
- Extended temperature range – Allows operation in 75°C ambient environment providing error-free performance in high-density cabinets and large cable bundles running PoE+ applications
- Cross-divider – Separates pairs for exceptional cable performance
- Descending length cable markings – Easy identification of remaining cable to reduce installation time and cable scrap

Applications

The TX6A™ 10Gig™ UTP Copper Cable is a component of the PANDUIT TX6A™ 10Gig™ Copper Cabling System. Interoperable and backward compatible, this end-to-end system provides design flexibility to protect network investments well into the future. Key applications include:

- 10GBASE-T Ethernet
- Data center I/O consolidation
- Data center server virtualization
- Consolidation of network interconnects
- Back-bone aggregation
- Parallel processing and high speed computing

Part Number	Part Description	Cable Color	Std. Pkg. Quantity	Std. Ctn. Quantity
PUR6A04BU-UG	Category 6A riser (CMR) 4-pair UTP copper cable. Copper conductors are 23 AWG. Conductors are twisted in pairs, separated by an integrated divider, surrounded by a patent-pending matrix tape and protected by a flame-retardant jacket.	Blue	1000 ft.	18000 ft.
PUP6A04BU-UG	Category 6A plenum (CMP) 4-pair UTP copper cable. Copper conductors are 23 AWG. Conductors are twisted in pairs, separated by an integrated pair divider, surrounded by a patent-pending matrix tape and protected by a low smoke, flame-retardant jacket.	Blue	1000 ft.	18000 ft.

*For standard colors other than Blue, replace BU (Blue) with WH (White), YL (Yellow) or IG (International Gray).

DP6A™ 10Gig™ Patch Panels

Specifications

Category 6A/Class EA patch panel shall terminate unshielded twisted 4-pair, 22 – 26 AWG, Category 6A cable and shall mount to standard EIA 19" or 23" racks. Patch panels shall be supplied with T568A and T568B wiring schemes. Ports and panels shall be easy to identify with pre-printed numbers, write-on areas, and optional label kits. Industry standard single wire 110 punchdown tool shall be used for terminations.

Technical Information

Category 6A/Class EA channel and component performance – Certified channel performance in a 4-connector configuration up to 100 meters and exceeds the requirements of ANSI/TIA/EIA-568-B.2-10 Category 6A and ISO 11801 Class EA standards for supporting 10GBASE-T transmission over twisted-pair cabling systems as part of the PANDUIT TX6A™ 10Gig™ UTP Copper Cabling System. Certified component performance to the ANSI/TIA/EIA-568-B.2-10 Category 6A and ISO 11801 Class EA standards for supporting 10GABSE-T transmission over twisted-pair cabling systems

- UL rated – No.1863
- FCC compliance – Meets ANSI/TIA-968-A; contacts are plated with 50 micro inches of gold for superior performance
- IEC compliance – Meets IEC 60603-7
- PoE compliance – Meets IEEE 802.3af and draft requirements of IEEE 802.3at for PoE Plus
- Mounting option – Mounts to standard EIA 19" or 23" racks
- Packaging – Packaged with M6 and #12 – 24 mounting screws

Key Features and Benefits

- 100% performance tested – Confidence that each port delivers specified performance
- Advanced electrical compensation technology – Head room over industry standards for lower risk and higher bandwidth network availability
- Each port individually serialized – Marked with quality control number for future traceability
- Common termination tooling – Terminates with indus try standard 110 punchdown tool for familiar, easy, and fast installation
- Industry standard RJ45 interface – Familiar to end-users; backwards compatible
- Identification – Pre-printed ports and write-on areas available for port and panel identification; optional label kits available for TIA/EIA-606A compliance
- Angled design (optional) – Facilitate proper bend radius control and minimizes the need for horizontal cable managers
- Blockout device (optional) – Provides a simple and secure method to control access to data ports
- Replaceable port module (optional) – Ability to replace field damaged ports for full panel use

Applications

The DP6A™ 10Gig™ Patch Panel is a component of the PANDUIT TX6A™ 10Gig™ Copper Cabling System. Interoperable and backward compatible, this end-to-end system provides design flexibility to protect network investments well into the future. Key applications include:

- 10GBASE-T Ethernet
- Data center I/O consolidation
- Data center server virtualization
- Consolidation of network interconnects
- Back-bone aggregation
- Parallel processing and high speed computing

Part Number	Part Description	No. of Rack Spaces	Std. Pkg. Quantity	Std. Ctn. Quantity
DPA246X88TGY	24-port, angled, Category 6A, 10 Gb/s patch panel with 24 RJ45 8-position, 8-wire ports.	1	1	10
DPA486X88TGY	48-port, angled, Category 6A, 10 Gb/s patch panel with 48 RJ45 8-position, 8-wire ports.	2	1	10
DPA486X88TGY	24-port, Category 6A, 10 Gb/s patch panel with 24 RJ45 8-position, 8-wire ports.	1	1	10
DPA486X88TGY	48-port, Category 6A, 10 Gb/s patch panel with 48 RJ45 8-position, 8-wire ports.	2	1	10

Data-Patch™ 10/100BASE-T Patch Panel

Specifications

10/100BASE-T patch panels shall feature RJ45 ports on the front of the panel. Panel PC board is wired for 10BASE-Tand 100BASE-T Ethernet utilizing pins 1, 2 and 3, 6. The back of the patch consists of female telco 50-pin/25-pair connectors wired per RJ21 industry standards for backward compatibility. Patch panels shall mount to standard EIA 19" or 23" racks. Patch panel does not require the use of a punchdown tool.

Technical Information

- Performance – Category 5e designed to maintain network cabling system reliability (UL 1863 Listed and CSA Certified)
- Dimensions – 24-port = 1.72"H x 19.0"W x 1.39"D (43.7mm x 4.82.6mm x 35.3mm), 1 RU
  48-port = 3.47"H x 19.0"W x 1.39"D (88.1mm x 482.6mm x 35.3mm), 2 RU
- Mounting option – Mounts to standard EIA 19" rack or 23" rack when used with optional panel extender brackets
- Packaging – Packaged with four #12 – 24 x .5" round head screws to allow fastening to racks

Key Features and Benefits

- Port and panel identification – Pre-numbered ports, write-on areas and optional label holders follow TIA-EIA-606-A labeling standards
- RJ21 connector – Female Industry Standard, meets EIA standard environmental and electrical performance, UL recognized, CSA approved
- Hook and loop/screw connector – Accommodates 180, 110 or 90 degree male patch cord connectors on back of patch panel

Applications

10/100BASE-T patch panels provide a Category 5e channel when used with PANDUIT Category 5e 25-pair cable assemblies. Panels should be used with the PANDUIT cable management system to achieve the most organized and efficient telecommunications room cabling. Patch panels provide maximum density to meet high density requirements by conserving space.

Part Number	Part Description	No. of Rack Spaces	Std. Pkg. Quantity	Std. Ctn. Quantity
DP24584TV25Y	224-port, Category 5e, patch panel with 24 RJ45 ports wired to two RJ21 Telco connectors.	1	1	10
DP24584TV25Y	48-port, Category 5e, patch panel with 48 RJ45 ports wired to four RJ21 Telco connectors.	2	1	10

QuickNet™ Copper Cabling System

The PANDUIT QuickNet™ Copper Cabling System provides a custom, pre-terminated cabling solution which meets unique requirements. Fast and simple to install, the system enables quick network deployment, increased reliability, and lowest total cost of ownership as compared to field terminated installations. Engineered for maximum design flexibility and high rack density utilization (up to 48 ports in one rack space), the system offers 100% factory tested pre-terminated cable assemblies in custom lengths and configurations. QuickNet™ Angled and Flat Patch Panels accept QuickNet™ Pre-Terminated Cassettes, Patch Panel Adapters, and Blacks, which snap in and out, with one hand, for quick installation.

Technical Information

- Each QuickNet™ Cable Assembly is factory tested to electrical permanent link specifications
- TX6™ 10Gig™ Copper Cabling System exceeds draft requirements of TIA/EIA-568-2-AD10, ISO 110801 Class EA Edition 2.1 and IEEE 802.3an ratified standard for supporting 10GBASE-T requirements
- TX6™ Copper Cabling System exceeds TIA.EIA-568-B.2-1 and ISO 11801 2nd Edition Class E standards Jack modules utilize patented Giga-TX™ Technology which optimizes performance by maintaining cable pair geometry and eliminating conductor untwist

Modular plugs meets all applicable FCC Part 68 Subpart requirements and exceed IEC 60603-7

Key Features and Benefits

- Pre-terminated – Controlled factory environment provides consistent network performance while reducing installation time and on-site waste as compared to field-terminated installations
- 100% factory tested – Eliminated the time and cost associated with on-site testing and ensures verified performance (permanent link test data supplied with each cable assembly)
- Wide range of cable types and performance levels
  – Category 6 UTP and Category 6A UTP/STP performance levels available in plenum or riser cable fire ratings
- Wide range of termination configurations and custom lengths – Cable assemblies allow customization including pre-terminated cassettes, jack modules, modular plugs, plug packs, and/or unterminated cable options to provide design flexibility for all installations in lengths from 10’ to 295’ (1’ increments)
- Pre-terminated cassettes – Snap in and out of switches and utilize an integral release tab to ensure easy on-site moves, adds and changes
- Plug Packs – Snap in and out of switches and utilize an integral release tab to ensure easy on-site moves, adds and changes
- Patch panel adapter – Snaps in and out of QuickNet™ Patch Panels and accepts Mini-Com® Modules for UTP, fiber optic and audio/visual applications
- Standard and high-density solution – QuickNet™ Patch Panels in angled and flat designs enable 24 and 48 ports in one rack unit for efficient rack space utilization
- Assembly identification – Each cable assembly label includes part number, performance level, and serialized quality assurance number for future traceability; custom cable assembly and/or individual cable labels available upon request.

Specifications

Ordering Information

Part Number Example:	Q	A	P	B	C	B	C	B	X	X	10
	1	2	3	4	5	6	7	8	9	10	11

Example – The above part number is a 10 foot *QUICKNET*™ Pre-Terminated Cable Assembly constructed of Category 6A, UTP, plenum cable (blue) with a pre-terminated cassette (blue jacks installed) on each end.

1 – Q = QuickNet

2 – Performance Level

A = Category 6A (10Gig™) UTP
B = Category 6 Enhanced UTP
C = Category 6 UTP
E = Category 6A (10Gig™) STP

3 – Flame /Smoke Rating

R = Riser or P = Plenum

4 – Cable Color

B = Blue or W = White

5 – Termination End 1

A = Plug Pack
C = Cassette
J = Jack Modules
P = Modular Plugs
K = Jack modules staggered right
L = Jack modules staggered left
Q = Modular plugs staggered right
S = Modular plugs staggered left

6 – Termination End 1 Color Options

Cassette and Jack Module Color Options:

B = Blue, E = Electric Ivory, G = Green, H = Off White,
I = International Gray, L = Black, O = Orange, R = Red,
V = Violet, W = White, Y = Yellow. Shielded Jack Modules choose option L, all Shielded Jack Modules are Black.

Plug Pack Color Options:

B = Blue, W = White, R = Red, L = Black

Modular Plug Color Options:

X = No color option available, all modular plugs are clear

7 – Termination End 2

A = Plug Pack
C = Cassette
J = Jack Modules
P = Modular Plugs
K = Jack Modules staggered right
L = Jack modules staggered left
Q = Modular plugs staggered right
S = Modular plugs staggered left
U = Unterminated
O = Unterminated with cassette & jack modules for on-site termination

8 – Termination End 2 Color Options

Cassette, Jack Module and Unterminated Color Options

B = Blue, E = Electric Ivory, G = Green, H = Off White,
I = International Gray, L = Black, O = Orange, R = Red,
V = Violet, W = White, Y = Yellow. Shielded jack modules choose option X, all Shielded Jack Modules are Black.

Plug Pack Color Options

B = Blue, W = White, R = Red, L = Black

Modular Plug Color Options

X = No color option available, all modular plugs are clear

Unterminated Color Option

X = No color option available

9 – Assembly Options

P = Pulling eye
X = No Assembly options requested

10 – Custom Labeling*

L = Custom assembly label
C = Custom cable labels
B = Custom assembly and cable labels
X = No custom labels required

11 – Assembly Length**

10 – 295 feet

**Custom cable assembly labels are available up to 18 characters; individual cable labels are available up to 15 characters*

***QuickNet™ Pre-Terminated Cable Assemblies are available in one foot increments in lengths 10 – 295 feet. All connectivity is wired T568B Category 6 Enhanced Performance level utilizes PANDUIT® TX6500™ Category 6 UTP Cable. Permanent link test results shipped with each cable assembly.*

QuickNet™ Plug Pack Assemblies

PANDUIT QuickNet™ Plug Pack Assemblies facilitate quick and easy connection and disconnection of patch cords to a variety of switches, reducing time and cost associated when installing and maintaining structured cabling links. Innovative design features of the plug pack allow multiple patch cords to be installed simultaneously with one hand for speed of deployments, while providing flexibility and ease to identify and remove individual cable links without disrupting service to the other network connections.

QuickNet™ Plug Pack Assemblies are constructed of 100% performance tested PANDUIT patch cords and assembled in a factory-controlled environment for more consistent connections with optimum reliability. Engineered for design flexibility and high-density utilization, QuickNet™ Plug Pack Assemblies are available in Category 6A, 6 and 5e performance levels. An optional lock-in security device prevents unauthorized removal of plug packs form the switch, providing an additional level of security.

Key Features and Benefits

- Compatible with Cisco Catalyst 6500 or 4500 series switches – utilizes precision for quick connection to select switches
- Integrated finger latch – Enables quick, one-handed installation and removal of QuickNet™ Plug Pack Assemblies form the switch
- Wide range of performance levels – Provides optimum flexibility with Category 6A, 6 and 5e performance levels
- Variety of configurations – Available in 6, 8 or 12 cable assemblies for optimal switch compatibility
- Variety of lengths – Enables greater design flexibility
- Modular design – Snaps modular plugs directly into switches and utilizes an integral release tab to ensure easy on-site moves, adds and changes
- Low profile design – Allows plug pack assemblies to be installed side by side or stacked on top of each other providing maximum port density in high density installations
- Removal tool (optional) – Allows individual patch cords to be removed without disrupting other network connections
- Lock-in device (optional) – Prevents unauthorized removal of patch cords from the switch for an additional level of security
- Marker ties – Enables easy identification in high density installations; provides additional level of security when combined with optional lock-in device
- Identification labels – Includes part number, performance level, and quality assurance number for future traceability; custom labels available upon request

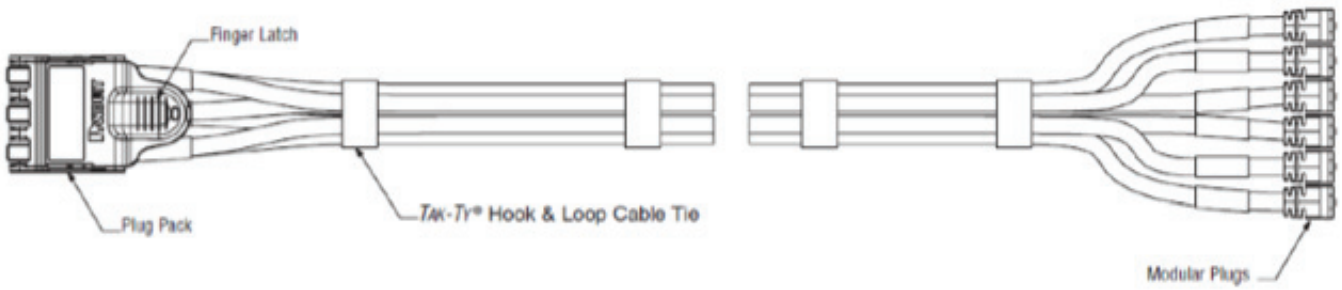
Application Information

Switch blades periodically need to be replaced or exchanged due to system upgrades or repair/replacement. Due to high port density and increasing cable diameter (as cabling requirements shift from Category 5e to Category 6A cable), removing and re-connecting each individual patch cord is time consuming.

Each QuickNet ™ plug Pack Assembly house 6, 8 or 12 patch cords, allowing them to be quickly installed, disconnected, and re-connected in significantly less time than traditional methods.

Labels on each plug pack provide easy identification further reducing the time associated with identifying and re-connecting each individual cable. As a result, you can be assured that each patch cord is installed quickly and accurately.

QuickNet™ Plug Pack Assembly Ordering Information



Ordering Information

Part Number Example:	QPP	A	C	B	A	B	3
	1	2	3	4	5	6	7

Example – The above part number is a 3 foot QuickNet™ Plug Pack Assembly constructed of Category 6A, UTP, CM cable (blue) with a 6 plug pack (blue) on one end and modular plugs on the other.

1 – QuickNet™ Plug Pack Assembly (QPP)

2 – Performance Level
- A = Category 6A (10Gig™) UTP
- E = Category 6A (10Gig™) STP*
- C = Category 6 UTP
- D = Category 5e UTP

3 – Flame/Smoke Rating
- C = CM (UTP only)
- D = Dual rated CM and LSZH (shielded only)

4 – Cable Color
- B = Blue
- W = White

5 – Plug Pack Configuration
- A = 6 pack
- B = 12 pack
- D = 8 pack

6 – Plug Pack Color**
- B = Blue
- W = White

7 – Assembly Length
- 03 = 3 feet
- 05 = 5 feet
- 07 = 7 feet
- 10 = 10 feet
- 14 = 14 feet

All UTP cable is available in CM Flame/Smoke Rating.

**All STP cable is dual rated for CM and LSZH applications*

***Non-standard plug pack colors are available in red and black.*

Mini-Com® Ultimate ID® Hybrid Box

Specifications

The hybrid box shall be a merging point for fiber and copper installations and shall accept all modules. The hybrid box shall offer independent access to each type of media providing easy installation and maintenance. The box shall provide various mounting options. A retention block shall include a built-in spool that holds a total of 12 meters of fiber buffered cable and shall accept a single gang faceplate for up to 6 modules. A cover extension shall provide additional security and bend radius protection to the connections. The hybrid box shall comply with labeling standards by including a station ID pocket and a 6 port ID pocket for all base mounted modules.

Technical Information

- Dimensions - .98”H x 4.24”W x 7.89”L (25mm x 107.6mm x 200.4mm)
  .98”H x 4.24”W x 9.56”L (25mm x 107.6mm x 242.9mm)
- Color options: Available in Electric Ivory, International White and White
- Mounting option: Mounts to single or double gang openings, compatible with DIN openings, mounts with adhesive tape to flat surfaces
- Packaging: Hybrid box and hybrid box with cover extension will both include retention block, mounting screws, adhesive tape and clear label covers

Key Features and Benefits

- Copper/Fiber in one outlet – One outlet will merge fiber and copper connections
- *ultimate ID* ® labeling system – Easy identification to help troubleshooting and maintenance, meets 606-A standard
- Optional cover extension – Provides additional security to fiber connections and offers bend radius protection
- Modularity – Multimedia flexibility simplifies moves, adds and changes
- Retention block – Will manage up to 12 meters of buffered fiber cable
- Raceway breakout – Provides routing flexibility, easy to install for low installed cost

Applications

Schools, hospitals and government/military are among many organizations that are considering fiber optic/copper solutions to reduce the amount of network upgrades required to satisfy increasing demands for higher bandwidth. Fiber, in closer proximity to the source, will ensure there is adequate bandwidth installed to support high-demand, multi-user environments.

As the demand for higher bandwidth increased, applications such as military secured networks, corporate research and development projects and digital imaging equipment in hospitals will require functional high capacity products to support high end networks.

The Mini-Com® Ultimate ID ® Hybrid box can bring fiber to the work area today, and can also serve as a future migration path, providing a merging point that will support installations requiring both fiber and copper connections.

Part Number	Part Description	Color*	Labels Required**	Used with Pan-Way® Raceway	Std. Pkg. Quantity	Std. Ctn. Quantity
UICBXH6IW-A	Hybrid box with cover accepts up to 6 Mini-Com® Modules in a single gang Mini-Com® Faceplate, and up to six Mini-Com® Fiber Optic Modules in the base.	Off White	One 1-Port, One 6-Port	LD3, LD5	1	10
DPA486X88TGY	Hybrid box with cover and cover extension accepts up to 6 Mini-Com® Modules in a single gang Mini-Com® Faceplate, and up to six Mini-Com® Fiber Optic Modules in the base.	Off White	One 1-Port, One 6-Port	LD3, LD5	1	10
DPA486X88TGY	Cover extension for hybrid box.	Off White			1	10
DPA486X88TGY	24-port, Category 6A, 10 Gb/s patch panel with 24 RJ45 8-position, 8-wire ports.	1	1	10		
DPA486X88TGY	48-port, Category 6A, 10 Gb/s patch panel with 48 RJ45 8-position, 8-wire ports.	2	1	10		

Appendix B

***PANDUIT* Fiber Opticr Cabling System Technical Information**

B: Fiber Optic Cabling System Technical Information

Opti-Core® Fiber Optic Indoor Cable

Specifications

Fiber optic indoor cable is an integral part of the end-to-end fiber optic solution, designed to support today's data needs while meeting tomorrow's ever-advancing network requirements. Fiber optic indoor cable is used within buildings to provide high-density connectivity and ease of installation. Applications include intra-building backbones, routing between telecommunications rooms and connectorized cables that require LSZH ratings. 10 GbE fiber optic interconnect cable features the highest quality OM3 laser optimized fiber to support 10 Gb/s applications while maintaining compatibility with existing 50µm multimode systems. Standard singlemode and multimode indoor cable is available in fiber counts from 4 to 72 fibers. Larger distribution cable features a 6-fiber sub-unit design that simplifies fiber identification, provides easy access and routing of the fibers, and increases cable durability with a dielectric central strength member.

Technical Information

Indoor/Outdoor Cable	Performance Measure						
	Bend Radius		Tensile Rating		Temperature		
Fiber Count	Dynamic	Static	Installation	Long Term	Storage	Installation	Operation
≤24 fibers	60mm	100mm	1500 N	700 N	-40° to 60°C	-15° to 40°C	-30° to 70°C
>24 fibers	210mm	210mm	1800 N	12000 N	-40° to 60°C	-30° to 60°C	-40° to 70°C

Part Number	Cable Type	Fiber Count	Rating	Color
FOWN6**	MM 62.5/125um (OM1)	**	Plenum or Riser	Orange
FOWN5**	MM 50/125um (OM2)	**		Orange
FOWNX**	MM *10GIG*™ 50/125um (OM3)	2		Aqua
FOWNX**	MM *10GIG*™ 50/125um (OM3)	**		Aqua
FOWN9**	SM 9/125um (OS1/OS2)	2		Yellow
FOWN9**	SM 9/125um (OS1/OS2)	**		Yellow

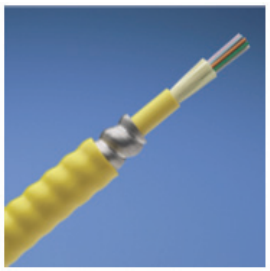
Indoor/Outdoor Cable	Performance Measure
	Attenuation

Singlemode	@ 1310nm	@ 1550nm
9µm (OS1/OS2)	0.39dB/km	0.25dB/km
Multimode	**@ 850nm**	**@ 1300nm**
62.5µm (OM1)	3.2dB/km	1.0dB/km
50µm (OM2)	2.7dB/km	0.8dB/km
10GIG™ 50µm (OM3)	3.0dB/km	1.0dB/km

Opti-Core® Fiber Optic Indoor Interlocking Armored Cable

Specifications

Used in intra-building backbone, building backbone, and horizontal installations for riser (OFCR), plenum (OFCP), and harsh environments. Interlocking aluminum armor eliminates the need for inner duct or conduit to provide a smaller crush resistant pathway for design flexibility and a lower installed cost. Available in 6, 12, 24, 36, 48, 72, 96 and 144-fiber counts. Multimode (OM3, OM2, and OM1) and singlemode (OS1/OS2) fiber available optimized) fiber available. 900µm standards-based color-coded buffer coating protects fibers during handling and allows for easy identification and stripping. Cable design and flexible buffer tubes allow for quick breakout and ease of routing. Opti-Core® 10Gig™ OM3 Cable is designed to support network transmission speeds up to 10 Gb/s for link lengths up to 300 meters with an 850nm source per IEEE 802.3ae 10 GbE standard; backward compatible for use with all 50/125µm system requirements



Technical Information

Part Number	Cable Type	Fiber Count	Rating	Color
FPDL6**	MM 62.5/125um (OM1)	**	Plenum or Riser	Orange
FPDL5**	MM 50/125um (OM2)	**		Orange
FQIX02	MM *10GIG*™ 50/125um (OM3)	2		Aqua
FQDX**	MM *10GIG*™ 50/125um (OM3)	**		Aqua
FPI902	SM 9/125um (OS1/OS2)	2		Yellow
FPDL9**	SM 9/125um (OS1/OS2)	**		Yellow

Indoor	Performance Measure						
	Bend Radius		Tensile Rating		Temperature		
Fiber Count	Dynamic	Static	Installation	Long Term	Storage	Installation	Operation
≤12 fibers	15x Cable O.D	10x Cable O.D.	667N	200N	-40° to 85°C	-20° to 40°C	-40° to 75°C
>12 fibers	15x Cable O.D	10x Cable O.D.	1334N	400N	-40° to 85°C	-20° to 60°C	-40° to 75°C

Opti-Core® Fiber Optic Indoor/ Outdoor Interlocking Armored Cable

Specifications

PANDUIT ® OPTI-CORE ® Fiber Optic Indoor/Outdoor Interlocking Armored Cable is an integral part of the PANDUIT end-to-end fiber optic solution, designed to support today's data needs while meeting tomorrow's ever-advancing network requirements. OPTI-CORE ® Fiber Optic Indoor Interlocking Armored Cable is used within buildings to provide high-density connectivity and ease of installation. Interlocking aluminum armor eliminates the need for inner duct or conduit to provide a smaller crush resistant pathway for improved design flexibility and lower installed cost. Applications include intra-building backbones, building backbones, and horizontal installations for riser (OFNR), plenum (OFNP), and harsh environments. OPTI-CORE ® 10GIG™ Fiber Optic Indoor Interlocking Armored Cable features the highest quality OM3 laser optimized fiber to support 10Gb/s applications while maintaining compatibility with existing 50µm multimode systems. RoHS compliant singlemode and multimode cable is available in fiber counts from 6 to 48 fibers.

Technical Information

Indoor/Outdoor Interlocking Armored Cable	Performance Measure						
	Bend Radius		Tensile Rating		Temperature		
Fiber Count	Dynamic	Static	Installation	Long Term	Storage	Installation	Operation
≤12 fibers	15x Cable O.D.	10x Cable O.D.	150 lbs (667 N)	45 lbs (200 N)	-40° to 185 °F	-4° to 140°F	-40° to 167°F
>12 fibers	15x Cable O.D.	10x Cable O.D.	300 lbs (1334 N)	90 lbs (400 N)	-40° to 185°F	-4° to 140°F	-40° to 167°F

Indoor/Outdoor Interlocking Armored Cable	Performance Measure	
	Attenuation	
Singlemode	**@ 1310nm**	**@ 1550nm**
9µm (OS1/OS2)	0.7dB/km	0.7dB/km
Multimode	**@ 850nm**	**@ 1300nm**
62.5µm and 50µm (OM1)	3.5dB/km	1.5dB/km

Ordering Information

Part Number	Cable Type	Fiber Count	Rating	Color
FOGR6**	MM 62.5/125um (OM1)	**	Plenum or Riser	Orange
FOGR5**	MM 50/125um (OM2)	**		Orange
FOGRX**	MM *10GIG*™ 50/125um (OM3)	2		Aqua
FOGRX**	MM *10GIG*™ 50/125um (OM3)	**		Aqua
FOGR9**	SM 9/125um (OS1/OS2)	2		Yellow
FOGR9**	SM 9/125um (OS1/OS2)	**		Yellow

Opti-Core® Fiber Optic Indoor/Outdoor Cable

Specifications

Fiber optic indoor/outdoor Cable is an integral part of the end-to-end fiber optic solution, designed to support today's data needs while meeting tomorrow's ever-advancing network requirements. This LSZH rated cable provides water-blocking, high density, and easy installation in duct applications and entrance facilities. Fiber optic indoor/outdoor cable meets the IEC 60794-1 standards. 10 GbE fiber optic indoor/outdoor cable features the highest quality OM3 laser optimized fiber to support 10 Gb/s applications while maintaining compatibility with existing 50µm multimode systems. Standard RoHS compliant multimode and singlemode indoor/outdoor cables are available in fiber counts up to 24 fibers as a "central tube" design, and up to 72 fibers as a "stranded tube" design.

Technical Information

Indoor Cable	Performance Measure						
	Bend Radius		Tensile Rating		Temperature		
Fiber Count	Dynamic	Static	Installation	Long Term	Storage	Installation	Operation
<8 fibers	50mm	100mm	1000 N	280 N	-40° to 70°C	-20° to 70°C	-20° to 70°C
Max. 16 fibers	75mm	130mm	1200 N	340 N	-40° to 70°C		
Max. 24 fibers	115mm	230mm	3300 N	1100 N	-40° to 70°C		
Max. 36 fibers	150mm	150mm	3600 N	1200 N	-20° to 70°C		
Max. 48 fibers	150mm	150mm	4200 N	1400 N	-20° to 70°C		

Indoor Cable	Performance Measure	
	Attenuation	
Singlemode	**@ 1310nm**	**@ 1550nm**
9µm (OS1/OS2)	0.39dB/km	0.25dB/km
Multimode	**@ 850nm**	**@ 1300nm**
62.5µm (OM1)	3.2dB/km	1.0dB/km
50µm (OM2)	2.7dB/km	0.8dB/km
10GIG™ 50µm (OM3)	3.0dB/km	1.0dB/km

Ordering Information

Part Number	Cable Type	Fiber Count	Rating	Color
FPDL6**	MM 62.5/125um (OM1)	**	Plenum or Riser	Orange
FPDL5**	MM 50/125um (OM2)	**		Orange
FQIX02	MM *10GIG*™ 50/125um (OM3)	2		Aqua
FQDX**	MM *10GIG*™ 50/125um (OM3)	**		Aqua
FPI902	SM 9/125um (OS1/OS2)	2		Yellow
FPDL9**	SM 9/125um (OS1/OS2)	**		Yellow

*** Substitute for fiber count: 04, 08, 12, 24, 36, 48 72*

Armored Cable Grounding Kit

Specifications

Crimped jumper wire assembly; 24" (609.6mm) length; LCC6-14, #10 mechanical clamp; provided with two each #12-24, M6 slotted hex head zinc-plated thread-forming screws, and black polypropylene terminal cover.

Technical Information

Part Number	Description
ACG24K	Crimped jumper wire assembly; 24" length; LCC6-14, #10 mechanical clamp for cables up to 0.84" diameter
ACG24K-500	Crimped jumper wire assembly; 24" length; LCC6-14, #10 mechanical clamp for cables from 0.84" to 1.03" diameter

LC OptiCam® Fiber Optic Connectors – Pre-Polished Cam Termination

Specifications

LC small form factor (SFF) pre-polished connectors with rear pivot latch shall be TIA/EIA-604 FOCIS-10 compatible and contain a factory-terminated fiber, eliminating field polishing and adhesive. LC pre-polished connectors shall have an average insertion loss of 0.3dB per mated pair for multimode fiber. LC pre-polished connectors shall captivate fiber and buffer in one action allowing for up to two re-terminations with no degradation in performance.

Technical Information

Standards requirements	TIA/EIA-604 FOCIS-10 compatible; exceeds TIA/EIA-568-B.3 requirements
Fiber compatibility	62.5/125µm OM1, 50/125µm OM2, 10Gig™ 50/125µm laser optimized OM3 and 9/125µm OS1/OS2
Fiber cable type	900µm tight-buffered cable only
Fiber cable size	1.6mm – 2.0mm and 3.0mm jacketed cable with optional boots
Ferrule type	Zirconia ceramic with a pre-polished fiber stub
Insertion loss	Ceramic: 0.3dB average (multimode and singlemode)
Return loss	Ceramic: >20dB (multimode), >26dB (10Gig™ multimode), >50dB (singlemode)

Ordering Information

Part Number	Connector Type	Ferrule Material	Fiber	Ferrule Finish
FLCSMCXAQY	Simplex	Zirconia Ceramic	10 GbE 50/125um OM3	SPC
FLCDMCXAQY	Duplex			
FLCSMC5BLY	Simplex	Zirconia Ceramic	50/125um OM2	SPC
FLCDMC5BLY	Duplex			
FLCSMC6BLY	Simplex	Zirconia Ceramic	62.5/125um OM1	SPC
FLCDMC6BLY	Duplex			
FLCSSCBUY	Simplex	Zirconia Ceramic	9/125um OS1/OS2	UPC
FLCDSCBUY	Duplex			

LC Fiber Optic Connectors – Field Polish Termination

Specifications

LC small form factor (SFF) field polish connectors with rear pivot latch are TIA/EIA-604 FOCIS-10 compatible. LC simplex and duplex connectors are field terminable. The fibers shall terminate in 1.25mm ceramic ferrules with non-optical disconnect functionality and an average insertion loss of 0.1dB per mated pair for multimode and singlemode fiber.

Technical Information

Standards requirements	TIA/EIA-604 FOCIS-10 compatible; exceeds TIA/EIA-568-B.3 requirements
Fiber compatibility	62.5/125µm OM1, 50/125µm OM2, 10Gig™ 50/125µm laser optimized OM3 and 9/125µm OS1/OS2
Fiber cable type	900µm tight-buffered cable recommended
Fiber cable size	1.6mm – 2.0mm jacketed cable
Ferrule type	Zirconia ceramic ferrule
Insertion loss	0.1dB average (multimode and singlemode)
Return loss	>20dB (multimode), >40dB (singlemode)

Ordering Information

Part Number	Connector Type	Cable Type	Fiber	Ferrule
FLCSMEI	Simplex	900µm buffered fiber and 1.6mm – 2.0mm jacketed cable	MM	Zirconia Ceramic
FLCDMEI	Duplex	1.6mm – 2.0mm jacketed cable		
FLCDM900EI	Duplex	900µm buffered fiber		
FLCSSBU	Simplex	900µm buffered fiber and 1.6mm – 2.0mm jacketed cable	SM	Zirconia Ceramic
FLCDSBU	Duplex	1.6mm – 2.0mm jacketed cable		
FLCDS900BU	Duplex	900µm buffered fiber		

SC OptiCam® Fiber Optic Connectors – Pre-Polished Cam Termination

Specifications

SC pre-polished fiber optic connectors shall be TIA/EIA-604 FOCIS-3 compliant and contain a factory-terminated fiber, eliminating field polishing and adhesive. SC pre-polished connectors shall have an average insertion loss of 0.3dB per mated pair for multimode and singlemode fiber. SC pre-polished connectors shall captivate fiber and buffer in one action allowing for up to two re-terminations with no degradation in performance.

Technical Information

Standards requirements	TIA/EIA-604 FOCIS-3 compliant; exceeds TIA/EIA-568-B.3 requirements
Fiber compatibility	62.5/125µm OM1, 50/125µm OM2, 10Gig™ 50/125µm laser optimized OM3 and 9/125µm OS1/OS2
Fiber cable type	900µm tight-buffered cable only
Fiber cable size	1.6mm – 2.0mm and 3.0mm jacketed cable with optional boots
Ferrule type	Zirconia ceramic or composite ferrule with a pre-polished fiber stub
Insertion loss	Ceramic: 0.3dB average (multimode and singlemode) Composite: 0.3dB average (multimode)
Return loss	Ceramic: >20dB (multimode), >26dB (10Gig™ multimode), >50dB (singlemode) Composite: >20dB (multimode)

Ordering Information

Part Number	Connector Type	Fiber	Ferrule Material	Ferrule Finish
FSCMCXAQ	Simplex	10 GbE 50/125um (laser optimized) OM3	Zirconia Ceramic	SPC
FSCDMCXAQ	Duplex			
FSCMC5BL	Simplex	50/125um OM2	Zirconia Ceramic	SPC
FSCDMC5BL	Duplex			
FSCMPC5BL	Simplex		Composite	
FSCMC6BL	Simplex	62.5/125um OM1	Zirconia Ceramic	SPC
FSCDMC6BL	Duplex			
FSCMPC6BL	Simplex		Composite	
FSCSCBU	Simplex	9/125um OS1/OS2	Zirconia Ceramic	UPC

SC Fiber Optic Connectors – Field Polish Termination

Specifications

SC field polish connectors are TIA/EIA-604 FOCIS-3 compliant. SC simplex and duplex connectors are field terminable. The fibers shall terminate in 2.5mm ceramic ferrules with non-optical disconnect functionality and an average insertion loss of 0.1dB (multimode) and 0.15dB (singlemode) per mated pair.

Technical Information

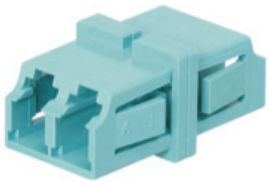
Standards requirements	TIA/EIA-604 FOCIS-3 compliant; exceeds TIA/EIA-568-B.3 requirements
Fiber compatibility	62.5/125µm OM1, 50/125µm OM2, 10Gig™ 50/125µm laser optimized OM3 and 9/125µm OS1/OS2
Fiber cable type	900µm tight-buffered cable recommended
Fiber cable size	3.0mm or 1.6mm – 2.0mm jacketed cable
Ferrule type	Zirconia ceramic ferrule
Insertion loss	0.1dB average (multimode), .15dB (singlemode)
Return loss	>20dB (multimode), >40dB (singlemode)

Ordering Information

Part Number	Connector Type	Cable Type	Fiber	Ferrule
FSCMBL	Simplex	900µm buffered fiber and 3.0 mm jacketed cable	MM	Zirconia Ceramic
FSCMRD	Simplex	900µm buffered fiber and 3.0mm jacketed cable		
FSCM2.0BL	Simplex	900µm buffered fiber and 1.6mm – 2.0mm jacketed cable		
FSCM2.0RD	Simplex	900µm buffered fiber and 1.6mm – 2.0mm jacketed cable		
FSCDM	Duplex	3.0mm jacketed cable		
FSCSBU	Simplex	900µm buffered fiber and 3.0mm jacketed cable	SM	Zirconia Ceramic
FSCS2.0BU	Simplex	900um buffered fiber and 1.6mm – 2.0mm jacketed cable		

LC Fiber Optic Adapters

Specifications



LC small form factor (SFF) fiber optic adapters with integrated panel retention clips are TIA/EIA-604 FOCIS-10 compatible. Each LC simplex adapter shall connect one LC connector pair in one module space. Each LC duplex adapter shall connect two LC connector pairs in one module space. LC adapters and adapter modules shall include phosphor bronze split sleeves for multimode applications or zirconia ceramic split sleeves for singlemode applications.

Technical Information

Standards requirements	TIA/EIA-604 FOCIS-10 compatible; exceeds-TIA/EIA-568-B.3 requirements
Fiber compatibility	62.5/125µm OM1, 50/125µm OM2, 10Gig™ 50/125µm laser optimized OM3 and 9/125µm OS1/OS2
Compatibility	Small form factor (SFF) duplex adapter fits into single module space
Split Sleeve type	Zirconia ceramic or phosphor bronze

LC Adapter Type	Description	Application Type
Sr./Sr. (Senior/Senior)	Has a FOCIS-10 senior adapter interface (without keyway) at each end. Both ends accept FOCIS-10 compatible senior LC connectors (non-keyed; spring loaded ferrules)	Typically used for patch panel and outlet applications, including behind the wall applications.
Sr./Jr. (Senior/Junior)	Has a FOCIS-10 senior adapter interface (without keyway) at one end and a FOCIS-10 compatible junior adapter interface (with keyway) at the other end. Both ends accept all FOCIS-10 compatible senior LC connectors (non-keyed; spring loaded ferrules). Junior end also accepts FOCIS-10 compatible junior LC connectors (keyed; fixed ferrule/ springless).	Shorter profile of junior end accommodates tighter applications behind the wall, allowing easier access to FOCIS-10 compatible junior (shorter) LC connectors terminated on 900µm buffered fiber. PANDUIT® Opticom® Fiber Adapter Panels and QuickNet™ Pre-Terminated Cassettes include Sr./Jr. Adapters.

Ordering Information

Part Number	Description	Split Sleeve Type	Adapter Color
FADSLCEI-L	Sr./Sr. MM Duplex	Phosphor Bronze	Electric Ivory
FASSLCZAQ-L	Sr./Sr. MM *10GIG*™ Simplex	Zirconia Ceramic	Aqua
FADSLCAQ-L	Sr./Sr. MM *10GIG*™ Duplex	Phosphor Bronze	Aqua
FADSLCZAQ-L	Sr./Sr. MM *10GIG*™ Duplex	Zirconia Ceramic	Aqua
FASSLCZBU-L	Sr./Sr. SM Simplex	Zirconia Ceramic	Blue
FADSLCZBU-L	Sr./Sr. SM Duplex	Zirconia Ceramic	Blue
FADJLCEI-L	Sr./Jr. MM Duplex	Phosphor Bronze	Electric Ivory
FASJLCZAQ-L	Sr./Jr. MM *10GIG*™ Simplex	Zirconia Ceramic	Aqua
FADJLCAQ-L	Sr./Jr. MM *10GIG*™ Duplex	Phosphor Bronze	Aqua
FADJLCZAQ-L	Sr./Jr. MM *10GIG*™ Duplex	Zirconia Ceramic	Aqua
FASJLCZBU-L	Sr./Jr. SM Simplex	Zirconia Ceramic	Blue
FADJLCZBU-L	Sr./Jr. SM Duplex	Zirconia Ceramic	Blue

-L = 50 per bag

Opticom® Fiber Adapter Panels (FAPs)

Specifications

Fiber adapter panels are TIA/EIA-604 FOCIS. Snap quickly into the front of all components. Phosphor bronze or zirconia ceramic split sleeves to fit specific network requirements; zirconia ceramic split sleeves are required for singlemode applications.

Technical Information

Standards requirements	TIA/EIA-604 FOCIS compatible for all MPO/MTP*, LC, SC, ST, MT-RJ or FC adapters
Fiber compatibility	62.5/125µm OM1, 50/125µm OM2, 50/125µm 10Gig™ and 9/125µm OS1/OS2
Compatibility	Compatible with Opticom® Enclosure and Patch Panel products for complete modularity
Split Sleeve type	Zirconia ceramic or phosphor bronze

Ordering Information

Part Number	Fiber Adapter Type	Fiber Type	No. of Adapters	Split Sleeve Type	Color
FAP6WEIDLC	LC Duplex	MM	Six	Phosphor Bronze	Electric Ivory
FAP8WEIDLC			Eight		
FAP12WEIDLC			Twelve		
FAP6WAQDLC		10Gig™ MM	Six	Zirconia Ceramic	Aqua
FAP6WAQDLCZ					
FAP12WAQDLCZ			Twelve		
FAP6WBUDLCZ	LC Duplex		Six		
FAP8WBUDLCZ			Eight		
FAP12WBUDLCZ			Twelve		
FAP6WEISC	SC Simplex	MM	Six	Phosphor Bronze	Electric Ivory
FAP12WEISC			Twelve		
FAP6WAQSC		10Gig™ MM	Six	Zirconia Ceramic	Aqua
FAP6WAQSCZ					
FAP2WEIDSC	SC Duplex	MM	Two	Phosphor Bronze	Electric Ivory
FAP3WEIDSC			Three		
FAP3WEIDSCA					
FAP4WEIDSC			Four		
FAP6WEIDSC			Six		
FAP2WAQDSC	SC Duplex	10Gig™ MM	Two	Phosphor Bronze	Aqua
FAP3WAQDSC			Three		
FAP4WAQDSC			Four		
FAP6WAQDSC			Six		
FAP2WAQDSCZ			Two	Zirconia Ceramic	
FAP3WAQDSCZ			Three		
FAP4WAQDSCZ			Four		
FAP6WAQDSCZ			Six		
FAP6WBUSCZ	SC Simplex	SM			Blue
FAP12WBUSCZ			Twelve		
FAP2WBUDSCZ	SC Duplex		Two		
FAP3WBUDSCZ			Three		
FAP4WBUDSCZ			Four		
FAP6WBUDSCZ			Six		
FAP6WAGSCZ	SC APC Simplex				Green
FAP12WAGSCZ			Twelve		
FAP2WAGDSCZ	SC APC Duplex		Two		
FAP3WAGDSCZ			Three		
FAP4WAGDXCZ			Four		
FAP6WAGDSCZ			Six		
FMP6	Unloaded	N/A		N/A	

Opticom® Rack Mounted Fiber Enclosures

Specifications

Rack mounted fiber enclosures house, organize, manage and protect fiber optic cable, terminations, splices, connectors and patch cords. The enclosures accommodate fiber adapter panels (FAP) and fiber mount panels (FMP) plus associated trunk cables, connectors and patch cords. Integral cable management and bend radius control for transition to vertical cable managers is provided. Rack mounted enclosures are constructed of steel with molded front and rear doors that are removable for cabling and connector access and installation. A flat front door enables direct access to fiber optic patch cords. The 1RU and 2RU enclosures feature a forward and backward sliding drawer for access to all fiber connections and terminations. The 3RU and 4RU enclosures use a fixed bulkhead design. Multiple knockouts allow a variety of trunk cable entry points.

Technical Information

Compatibility	Houses any PANDUIT® Opticom® Fiber Adapter Panel, or Opticom® Fiber Mount Panel (FMP). Also compatible with PANDUIT® Opticom® Fiber Optic Splice Module (FOSM) for fusion splice installations
Adapter Types	Supports MTP, LC, SC, ST, FC, and MT-RJ adapters
Sizes	1RU, 2RU, 3RU, and 4RU versions
Mounting	Universal brackets (included) allow enclosure to fit in 19” wide EIA-310 style or 23” wide EIA-310 or WECO style racks
Accessories	Mounting hardware and accessory kit with slack spools, fiber routing clips, bend radius control guides, and port labeling and identification card included

Ordering Information

Part Number	Adapter Panel (FAP) Openings	Rack Units (RU)	Height	Width	Depth
FRME1U	3	1	1.74” (44mm)	17.0” (432mm)	14.2” (361mm)
FRME2U	6	2	3.48” (88mm)	17.0” (432mm)	14.2” (361mm)
FRME3	9	3	5.00” (127mm)	17.0” (432mm)	11.8” (299mm)
FRME4	12	4	6.62” (168mm)	17.0” (432mm)	11.8” (299mm)

Opticom® Fiber Adapter Patch Panels

Specifications

Fiber adapter patch panels mount to any 19" wide EIA-310 style rack. Standard version holds QuickNet™ MTP* Cassettes and Opticom® Fiber Adapter Panels (FAPs). Angled version holds Opticom® Fiber Adapter Panels and matches Mini-Com® Angled Patch Panel profile. Used with Opticom® Fiber Mount Tray (FMT) to protect fibers and terminations.

Technical Information

Compatibility	Houses any PANDUIT® QuickNet™ Pre-Terminated MTP* Cassette or Opticom® Fiber Adapter Panel. Use with Opticom® Fiber Mount Tray (FMT) to protect fibers and terminations.
Sizes	1RU and 2RU sizes, flat panel and angled panel versions
Mounting	Mounts to any 19" wide EIA-310 style rack
Accessories	Mounting hardware included

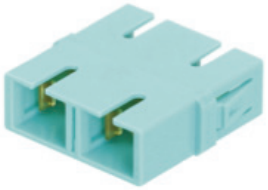
Ordering Information

Part Number	Description	No. of Rack Spaces^
Standard Fiber Adapter Patch Panels		
CFAPPBL1	Flat fiber patch panel. Holds up to four *QuickNet*™ Cassettes, *Opticom*® Fiber Adapter Panels (FAPs), or *Opticom*® Fiber Multimedia Panels (FMPs).	1
CFAPPBL2	Flat fiber patch panel. Holds up to eight *QuickNet*™ Cassettes, *Opticom*® Fiber Adapter Panels (FAPs), or *Opticom*® Fiber Multimedia Panels (FMPs).	2
Angled Fiber Adapter Patch Panels		
CFAPPBL1A	Flat fiber patch panel. Holds up to four *Opticom*® Fiber Adapter Panels (FAPs) or *Opticom*® Fiber Multimedia Panels (FMPs).	1
CFAPPBL2A	Flat fiber patch panel. Holds up to eight *Opticom*® Fiber Adapter Panels (FAPs) or *Opticom*® Fiber Multimedia Panels (FMPs).	2

^ One rack space = 1.75" (44.45mm).
All product color is black.

SC Fiber Optic Adapters

Specifications



SC fiber optic adapters with integrated panel retention clips are TIA/EIA-604 FOCIS-3 compliant. Each SC simplex adapter shall connect one SC connector pair in one module space. Each SC duplex adapter shall connect two SC connector pairs in two module spaces. SC adapters and adapter modules shall include phosphor bronze split sleeves for multimode applications or zirconia ceramic split sleeves for singlemode applications.

Technical Information

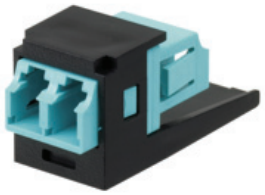
Standards requirements	TIA/EIA-604 FOCIS-3 compatible; exceeds TIA/EIA-568-B.3 requirements
Fiber compatibility	62.5/125µm OM1, 50/125µm OM2, 10Gig™ 50/125µm laser optimized OM3 and 9/125µm OS1/OS2
Compatibility	Compatible with Mini-Com® products for complete modularity
Split Sleeve type	Zirconia ceramic or phosphor bronze

Ordering Information

Part Number	Description	Split Sleeve Type	Adapter Color
FASSCEI-L	MM Simplex	Phosphor Bronze	Electric Ivory
FADSCEI-L	MM Duplex	Phosphor Bronze	Electric Ivory
FASSCAQ-L	MM *10GIG*™ Simplex	Phosphor Bronze	Aqua
FASSCZAQ-L	MM *10GIG*™ Simplex	Zirconia Ceramic	Aqua
FADSCAQ-L	MM *10GIG*™ Duplex	Phosphor Bronze	Aqua
FADSCZAQ-L	MM *10GIG*™ Duplex	Zirconia Ceramic	Aqua
FASSCZBU-L	SM Simplex	Zirconia Ceramic	Blue
FADSCZBU-L	SM Duplex	Zirconia Ceramic	Blue
FASSCZAG-L	SM APC Simplex	Zirconia Ceramic	Green
FADSCZAG-L	SM APC Duplex	Zirconia Ceramic	Green

-L = 50 per bag

LC Mini-Com® Fiber Optic Adapter Modules



Specifications

LC Sr./Sr. and Sr./Jr. small form factor (SFF) fiber optic adapter modules are TIA/EIA-604 FOCIS-10 compatible. They shall be compatible with Mini-Com® products for complete modularity. LC small form factor (SFF) fiber optic adapters with integrated panel retention clips are TIA/EIA-604 FOCIS-10 compatible. Each LC simplex adapter shall connect one LC connector pair in one module space. Each LC duplex adapter shall connect two LC connector pairs in one module space. LC adapters and adapter modules shall include phosphor bronze split sleeves for multimode applications or zirconia ceramic split sleeves for singlemode applications. They shall have phosphor bronze or zirconia ceramic split sleeves to fit specific network requirements; zirconia ceramic split sleeves are required for singlemode applications.

Technical Information

Standards requirements	TIA/EIA-604 FOCIS-10 compatible; exceeds-TIA/EIA-568-B.3 requirements
Fiber compatibility	62.5/125µm OM1, 50/125µm OM2, 10Gig™ 50/125µm laser optimized OM3 and 9/125µm OS1/OS2
Compatibility	Small form factor (SFF) duplex adapter fits into single module space.
Split Sleeve type	Zirconia ceramic or phosphor bronze

LC Adapter Type	Description	Application Type
Sr./Sr. (Senior/Senior)	Has a FOCIS-10 senior adapter interface (without keyway) at each end. Both ends accept FOCIS-10 compatible senior LC connectors (non-keyed; spring loaded ferrules).	Typically used for patch panel and outlet applications, including behind the wall applications.
Sr./Jr. (Senior/Junior)	Has a FOCIS-10 senior adapter interface (without keyway) at one end and a FOCIS-10 compatible junior adapter interface (with keyway) at the other end. Both ends accept all FOCIS-10 compatible senior LC connectors (non-keyed; spring loaded ferrules). Junior end also accepts FOCIS-10 compatible junior LC connectors (keyed; fixed ferrule/springless).	Shorter profile of junior end accommodates tighter applications behind the wall, allowing easier access to FOCIS-10 compatible junior (shorter) LC connectors terminated on 900µm buffered fiber. PANDUIT® Opticom® Fiber Adapter Panels and QuickNet™ Pre-Terminated Cassettes include Sr./Jr. Adapters.

Ordering Information

Part Number	Description	Split Sleeve Type	Adapter Color	No. of MiniCom module spaces
CMDSLCEI	Sr./Sr. MM Duplex	Phosphor Bronze	Electric Ivory	1
CMDSAQLCBL	Sr./Sr. MM *10Gig*™ Duplex		Black	
CMDSAQLCZBL		Zirconia Ceramic		
CMDSLCZBU	Sr./Sr. SM Duplex		Blue	
CMDJLCEI	Sr./Jr. MM Duplex	Phosphor Bronze	Electric Ivory	
CMDJAQLCBL	Sr./Jr. MM *10Gig*™ Duplex		Black	
CMDJAQLCZBL		Zirconia Ceramic		
CMDJLCZBU	Sr./Jr. SM Duplex		Blue	

SC Mini-Com® Fiber Optic Adapter Modules

Specifications

SC fiber optic adapter modules are TIA/EIA-604 FOCIS-3 compatible. They shall be compatible with Mini-Com® products for complete modularity. They shall have phosphor bronze or zirconia ceramic split sleeves to fit specific network requirements; zirconia ceramic split sleeves are required for singlemode applications.

Technical Information

Standards requirements	TIA/EIA-604 FOCIS-3 compatible; exceeds TIA/EIA-568-B.3 requirements
Fiber compatibility	62.5/125µm OM1, 50/125µm OM2, 10Gig™ 50/125µm laser optimized OM3 and 9/125µm OS1/OS2
Compatibility	Compatible with Mini-Com® products for complete modularity
Split Sleeve type	Zirconia ceramic or phosphor bronze

Ordering Information

Part Number	Description	Split Sleeve Type	Adapter Color	No. of MiniCom module spaces
CMSEISCEI	Simplex MM	Phosphor Bronze	Electric Ivory	2
CMDEISCEI	Duplex MM			
CMSAQSCBL	Simplex MM *10GIG*™		Black	
CMSAQSCZBL		Zirconia Ceramic		
CMDAQSCBL	Duplex MM *10GIG*™	Phosphor Bronze		
CMDAQSCZBL		Zirconia Ceramic		
CMSBUSCZBU	Simplex SM		Blue	
CMDBUSCZBU	Duplex SM			
CMSAGSCZBL	Simplex SM APC		Black	
CMDAGSCZBL	Duplex SM APC			

Mini-Com® Modular Patch Panels

Specifications

Mini-Com® Modular Patch Panels mount to any 19" wide EIA-310 style rack and accept all Mini-Com® Adapter Modules and Jack Modules including LC, SC, and MTP* fiber adapter modules. Modular patch panels are available in a variety of sizes and styles in both flat and angled patch panel versions. Individual adapter module identification is provided via pre-numbered ports and provisions for field generated port ID labels.

Technical Information

Compatibility	Compatible with all PANDUIT® Mini-Com® products for complete modularity
Adapter Types	Supports MTP*, LC, SC, ST, FC, and MT-RJ adapter modules
Sizes	1RU and 2RU sizes, flat panel and angled panel versions with 24, 48, and 72 ports
Mounting	Mounts to any 19" wide EIA-310 style rack
Mounting	Mounting hardware included

Ordering Information

Part Number	No. of RU	Patch Panel Type	Patch Panel Style	No. of Ports
CPPLA24WBLY	1 RU	Angled	Standard	24
CPPA24FMWBLY			Flush Mount	
CPPA48HDWBLY**			High Density	48
CPPL24WBLY		Flat	Standard	24
CPP24FMWBLY			Flush Mount	
CPPL24WRBLY			Recessed	
CPP48HDWBLY**			High Density	48
CPPLA48WBLY	2 RU	Angled	Standard	48
CPPA48FMWBLY			Flush Mount	
CPPA72FMWBLY			High Density	72
CPPL48WBLY		Flat	Standard	48
CPP48FMWBLY			Flush Mount	
CPPL48WRBLY			Recessed	
CPP72FMWBLY			High Density	72

*MTP is a registered trademark of US Conec Ltd.

**** CPP48HDWBLY and CPPA48HDWBLY high-density patch panels have provision for pre-printed port ID numbers (1-48) only**

Opti-Core® Traditional Trunk Cable Assemblies

Specifications

Traditional trunk cable assemblies allow for rapid deployment of high-density permanent links in a single assembly for data center applications requiring quick infrastructure deployment, such as main, horizontal, and zone distribution areas. Traditional trunk cable assemblies optimize cabling routing requirements to ensure efficient use of pathway space and significantly reduce installation time and cost. Traditional trunk cable assemblies, built with traditional simplex and duplex connectivity (LC, SC, and ST), guarantee compatibility, flexibility, and system performance in all permanent link applications. All traditional trunk cable assemblies are factory terminated and tested to deliver verified optical performance and reliability for improved network integrity. 10 GbE versions provide 10 Gb/s network performance up to 300M per IEEE 802.3ae 10 GbE standard while maintaining compatibility with legacy systems. 150M and 550M link length options are also available.

Technical Information

Application specific design	Tailors configuration and breakout construction to application requirements to minimize waste, optimize cable management, speed deployment, and improve flexibility and manageability for lower installation costs
Termination data supplied	Assures verified optical performance for improved network integrity
Plenum rated jacket	Meets NFPA 262 (OFNP) flame rating for standard compliant safety
LSZH rated jacket	Meets IEC-60332 (LSZH) flame rating for standard compliant safety
High-density cable	Uses pathway space more efficiently to improve manageability and reduce installation costs
Range of fiber configurations	Supports 10 Gb/s, multimode, and singlemode pre-terminated permanent link elements in the data center to provide design flexibility for all connectivity types

Ordering Information

Part Number	Description	Fiber Type	Flame Rating	Number of Fibers
FSPX1211FA***	LC to LC Simplex Trunk Assembly with Pulling Eye	*10GIG™* 50/125um (OM3)	OFNP	12
FSLX1211FA***			LSZH	
FSPX2411F*A**			OFNP	24
FSLX2411F*A**			LSZH	
FSPX4811F*A**			OFNP	48
FSLX4811F*A**			LSZH	
FSP51211F*A**		50/125um (OM2)	OFNP	12
FSL51211F*A**			LSZH	
FSP52411F*A**			OFNP	24
FSL52411F*A**			LSZH	
FSP54811F*A**			OFNP	48
FSL54811F*A**			LSZH	
FSP91211F*A**		9/125um (OS1/OS2)	OFNP	12
FSL91211F*A**			LSZH	
FSP92411F*A**			OFNP	24
FSL92411F*A**			LSZH	
FSP94811F*A**			OFNP	48
FSL94811F*A**			LSZH	

***Substitute for length in feet, such as 100, 150, or 200.
OFNP Cable Assemblies are available in fiber counts up to 144, and LSZH Cable Assemblies are available in fiber counts up to 96.
Refer to *OPTI-CORE®* Traditional Trunk Cable Assemblies Product Bulletin for all available options.

Fan-Out Cords

Specifications

Fan-out cords allow quick high performance field fusion splice during installation to provide the lowest installed cost. Fan-out cords are built with traditional simplex connectivity (LC, SC, and ST), guarantee compatibility, flexibility, and system performance in all permanent link applications. All Fan-out cords are factory terminated and tested to deliver verified optical performance and reliability for improved network integrity.

Technical Information

Standard Requirements	All connectors exceed TIA/EIA-455-21A: 500 mating cycles
Compliant with	TIA/EIA-568-B.3 TIA-604-5 (FOCIS-5) UL1666 (OFNR) or NFPA 262 (OFNP) flame ratings
Insertion loss	0.25dB per connector
Endface	Inspected in compliance with Telcordia GR-326-CORE, Issue 3 requirements to ensure high performance
Riser or plenum rated jacket	Meets UL1666 (OFNR) or NFPA 262 (OFNP) flame ratings for standard compliant safety
Test data	Supplied with each patch cord and pigtail Establishes a performance reference to streamline maintenance
Q.C. identification label	Quality control reference provides lifetime traceability of test data

Ordering Information

Part Number	Fiber Type	Connector Types	Number of Fibers
F66D3-NM**Y	Multimode 62.5/125um	SC	6
F612D3-NM**Y			12
F96D3-NM**Y	Singlemode 9/125um	SC	6
F912D3-NM**Y			12

Opti-Core® Fiber Optic Patch Cords and Pigtails

10Gig® 50/125um (OM3) Multi-mode Fiber Optic Patch Cords and Pigtails

Specifications

Fan-out cords allow quick high performance field fusion splice during installation to provide the lowest installed cost. Fan-out cords are built with traditional simplex connectivity (LC, SC, and ST), guarantee compatibility, flexibility, and system performance in all permanent link applications. All Fan-out cords are factory terminated and tested to deliver verified optical performance and reliability for improved network integrity.

Technical Information

Standard Requirements	All connectors exceed TIA/EIA-455-21A: 500 mating cycles
Compliant with	TIA/EIA-568-B.3 TIA-604-5 (FOCIS-5) UL1666 (OFNR) or NFPA 262 (OFNP) flame ratings
Insertion loss	0.25dB per connector
Endface	Inspected in compliance with Telcordia GR-326-CORE, Issue 3 requirements to ensure high performance
Riser or plenum rated jacket	Meets UL1666 (OFNR) or NFPA 262 (OFNP) flame ratings for standard compliant safety
Test data	Supplied with each patch cord and pigtail Establishes a performance reference to streamline maintenance
Q.C. identification label	Quality control reference provides lifetime traceability of test data

Ordering Information

Part Number	Description	Flame Rating	Fiber Type	Cable Type
FXLE10-10M*	LC to LC (Duplex)	LSZH	*10GIG*™ 50/125um	1.6mm Jacketed
FXPE10-10M*	LC to LC (Duplex)	OFNP		
FXB10-NM*	LC to pigtail (Simplex)	Non-rated		900um buffered
FXLD3-3M*	SC to SC (Duplex)	LSZH		3.0mm Jacketed
FXPD3-3M*	SC to SC (Duplex)	OFNP		
FXB3-NM*	SC to pigtail (Simplex)	Non-rated		900um buffered
FXLE3-10M*	SC to LC (Duplex)	LSZH		1.6mm Jacketed
FXPE3-10M*	SC to LC (Duplex)	OFNP		

*Indicates length in meters. Patch cords are available in 1m – 10m lengths in 1m increments and 15m, 20m, 25m and 30m lengths.
Add the letter B to the end of the part number for pair wise flip.
Pigtails are available in 1m, 2m, and 3m lengths

Multimode 62.5/125um (OM1) or 50/125 (OM2) Fiber Optic Patch Cords and Pigtails

Specifications

RoHS compliant fiber optic patch cords shall include simplex or duplex LC, SC, ST or MT-RJ connectors, or FJ or keyed FJ plugs or jacks on both ends. RoHS compliant fiber optic pigtails shall include simplex or duplex LC, SC, ST, or MT-RJ connectors, or FJ or keyed FJ plugs or jacks on one end and open (unterminated) on the other end. Patch cords and pigtails shall include laser optimized OM3 fiber or OM1, OM2 or fiber in 900µm tight-buffered fiber, 1.6mm or 3.0mm simplex or duplex zipcord jacketed cable, or 1.8mm duplex zipcord jacketed cable. Jacketed cable shall be compliant with UL1666 (OFNR) or NFPA 262 (OFNP) flame ratings. Patch cords and pigtails shall meet or exceed requirements of TIA/EIA-568-B.3-1. The fiber connectors shall be FOCIS compliant or compatible, and exceed the requirements of TIA/EIA-455-21A for 500 mating cycles.

Technical Information

Standard Requirements	All connectors exceed TIA/EIA-455-21A: 500 mating cycles
Compliant with	TIA/EIA-568-B.3 TIA-604-5 (FOCIS-5) UL1666 (OFNR) or NFPA 262 (OFNP) flame ratings
Insertion loss	Per connection: 0.10dB typical, 0.30dB max. (multimode), 0.50dB max. (MT-RJ multimode); 0.25dB typical, 0.75dB max. (singlemode), 0.35dB max. (LC singlemode)
Return loss	20dB min. (multimode); 26dB min. (10Gig™ multimode); 55dB min. (singlemode)
Riser or plenum rated jacket	Meets UL1666 (OFNR) or NFPA 262 (OFNP) flame ratings for standard compliant safety
Test data	Supplied with each patch cord and pigtail Establishes a performance reference to streamline maintenance
Q.C. identification label	Quality control reference provides lifetime traceability of test data

Ordering Information

Part Number	Description	Flame Rating	Fiber Type	Cable Type
F6LE10-10M*	LC to LC (Duplex)	LSZH	62.5/125um	1.6mm Jacketed
F6PE10-10M*	LC to LC (Duplex)	OFNP		
F6B10-NM*	LC to pigtail (Simplex)	Non-rated		900um buffered
F6LD3-3M*	SC to SC (Duplex)	LSZH		3.0mm Jacketed
F6PD3-3M*	SC to SC (Duplex)	OFNP		
F6B3-NM*	SC to pigtail (Simplex)	Non-rated		900um buffered
F6LE3-10M*	SC to LC (Duplex)	LSZH		1.6mm Jacketed
F6PE3-10M*	SC to LC (Duplex)	OFNP		

*Indicates length in meters. Patch cords are available in 1m – 10m lengths in 1m increments and 15m, 20m, 25m and 30m lengths.
Add the letter B to the end of the part number for pair wise flip.
Pigtails are available in 1m, 2m, and 3m lengths.

Part Number	Description	Flame Rating	Fiber Type	Cable Type
F5LE10-10M*	LC to LC (Duplex)	LSZH	50/125um	1.6mm Jacketed
F5PE10-10M*	LC to LC (Duplex)	OFNP		
F5B10-NM*	LC to pigtail (Simplex)	Non-rated		900um buffered
F5LD3-3M*	SC to SC (Duplex)	LSZH		3.0mm Jacketed
F5PD3-3M*	SC to SC (Duplex)	OFNP		
F5B3-NM*	SC to pigtail (Simplex)	Non-rated		900um buffered
F5LE3-10M*	SC to LC (Duplex)	LSZH		1.6mm Jacketed
F5PE3-10M*	SC to LC (Duplex)	OFNP		

*Indicates length in meters. Patch cords are available in 1m – 10m lengths in 1m increments and 15m, 20m, 25m and 30m lengths.
Add the letter B to the end of the part number for pair wise flip.
Pigtails are available in 1m, 2m, and 3m lengths.

Singlemode 9/125um (OS1/OS2) Fiber Optic Patch Cords and Pigtails

Specifications

RoHS compliant fiber optic patch cords shall include simplex or duplex LC or keyed LC, SC, ST or MT-RJ connectors, or FJ or keyed FJ plugs or jacks on both ends. RoHS compliant fiber optic pigtails shall include simplex or duplex LC, SC, ST, or MT-RJ connectors, or FJ or keyed FJ plugs or jacks on one end and open (unterminated) on the other end. Patch cords and pigtails shall be OS1/OS2fiber in 900µm tight-buffered fiber, 1.6mm or 3.0mm simplex or duplex zipcord jacketed cable. Jacketed cable shall be compliant with UL1666 (OFNR) or NFPA 262 (OFNP) flame ratings. Patch cords and pigtails shall meet or exceed requirements of TIA/EIA-568-B.3-1. The fiber connectors shall be FOCIS compliant or compatible, and exceed the requirements of TIA/EIA-455-21A for 500 mating cycles.

Technical Information

Standard Requirements	All connectors exceed TIA/EIA-455-21A: 500 mating cycles
Compliant with	TIA/EIA-568-B.3 TIA-604-5 (FOCIS-5) UL1666 (OFNR) or NFPA 262 (OFNP) flame ratings
Insertion loss	Per connection: 0.75dB max. (singlemode), 0.35dB max. (LC singlemode)
Return loss	55dB minimum
Single Mode Enface	Inspected in compliance with Telcordia GR-326-CORE, Issue 3 requirements to ensure high performance
Endface Polish	UPC finish to ensure high quality endface for higher return loss to meet application standards.
Low Water Peak Fiber	Eliminates high attenuation in the high E-band and allows operation over the entire 1280-1625nm wavelength range; excellent for CWDM and DWDM applications.
Riser or plenum rated jacket	Meets UL1666 (OFNR) or NFPA 262 (OFNP) flame ratings for standard compliant safety
Test data	Supplied with each patch cord and pigtail Establishes a performance reference to streamline maintenance
Q.C.identification label	Quality control reference provides lifetime traceability of test data

Ordering Information

Part Number	Description	Flame Rating	Fiber Type	Cable Type
F9LE10-10M*	LC to LC (Duplex)	LSZH	9/125um	1.6mm Jacketed
F9PE10-10M*	LC to LC (Duplex)	OFNP		
F9B10-NM*	LC to pigtail (Simplex)	Non-rated		900um buffered
F9LD3-3M*	SC to SC (Duplex)	LSZH		3.0mm Jacketed
F9PD3-3M*	SC to SC (Duplex)	OFNP		
F9B3-NM*	SC to pigtail (Simplex)	Non-rated		900um buffered
F9LE3-10M*	SC to LC (Duplex)	LSZH		1.6mm Jacketed
F9PE3-10M*	SC to LC (Duplex)	OFNP		

*Indicates length in meters. Patch cords are available in 1m – 10m lengths in 1m increments and 15m, 20m, 25m and 30m lengths.
Add the letter B to the end of the part number for pair wise flip.
Pigtails are available in 1m, 2m, and 3m lengths.

Connector Cleaning Tools

Features

- All tools feature a dry cloth cleaning system with an ultra clean micro-fiber cloth that captures debris and contamination
- Anti-static cloth minimizes additional debris from being attracted to connector surfaces
- Densely woven, robust cloth doesn't fray or leave fibrous materials behind
- All tools and refills can be used to clean 400 connectors

Ordering Information

Part Number	Description	For
FMTPFCT	Reel type connector cleaning tool	Cleaning MTP* female connectors (without pins)
FMTPRR6	Cleaning reel refill (includes six reels)	FMTPFCT and FMTPMFCT reel type MTP* connector cleaning tools

Fiber Optic Termination Kits

OptiCam® Pre-Polished Cam Fiber Optic Termination Kits

Features

- For termination of all PANDUIT® OptiCam® Pre-Polished Connectors
- OptiCam® Termination Tool simplifies tooling and termination, and virtually eliminates operator error by providing visual indication of proper termination after the cam step has been completed
- No adhesive or electricity required for termination
- Include installation instructions and stripping templates for all PANDUIT® OptiCam® Pre-Polished Connectors

Ordering Information

Part Number	Description
FCAMKIT	Opti-Cam Pre-Polished Cam Termination Kit
FCLEANKIT	Cleaning Consumables Replenishment Kit
FIELDKITUPG	Field Polish Kit Upgrade for OptiCam® Connector Termination

Field Polish Fiber Optic Termination Kits

Features

- For termination of all PANDUIT Field Polish Connectors
- Fast acting adhesive; no long curing epoxy required for termination
- Kit provides consumables for terminating up to 200 field polish connectors
- Include installation instructions and stripping templates for all PANDUIT Field Polish Connectors; also available on www.panduit.com

Ordering Information

Part Number	Description
FIELDKIT	Field Polish Termination Kit (110VAC, 60Hz)
FIELDKIT-G	CField Polish Termination Kit (230VAC, 50Hz)
FIELDKITRFB	Field Polish Consumables Refurbishment Kit
FCLEANKIT	Cleaning Consumables Replenishment Kit
FCAMKITUPG	OptiCam Kit Upgrade For Field Polish Connector Termination (110VAC, 60Hz)
FCAMKITUPG-G	OptiCam Kit Upgrade For Field Polish Connector Termination (230VAC, 50Hz)

Fiber Optic Splice Module

Features

The fiber optic splice module (FOSM) shall house and protect fiber optic splices, guarantee proper fiber cable management and bend radius control, and allow for clear labeling and logical organization of the fiber optic splices. The FOSM shall support 24 fusion splices or 12 mechanical splices in one module and shall be compatible with all PANDUIT rack mounted fiber enclosures. Slacking and spooling shall be self-contained within the FOSM. The FOSM shall be self-stacking with a hinged clear cover

Ordering Information

Part Number	Description
FOSMF	Splice Module Fusion
FOSMM	Splice Module Mechanical

Metal Splice Tray

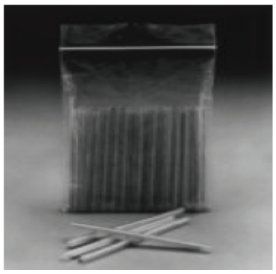
Features

Fiber splice tray kit for up to twelve mechanical or fusion splices.
Fits in PANDUIT FMT, FWME4, and FWME8 series enclosures.
Stack up to four high using FSTHE stacking unit in rack mount enclosures or using FST6H4 stacking unit in wall mount enclosures.

Ordering Information

Part Number	Description
FST6	Fiber Splice tray for up to twelve mechanical or fusion splices

Fiber Optic Protector Sleeves



Features

Fiber splice protectors help protect the fibers after fusion splicing to ensure integrity and safety in the fiber splice tray. Protection and support is provided by a stainless-steel strength member which ensures fiber rigidity after splicing.

Ordering Information

Part Number	Description
FOSP61	60mm splice protector sleeve
FOSP45	45mm splice protector sleeve

Appendix C:

PANDUIT Grounding and Bonding System Technical Information

Appendix C-1:

Example Grounding and Bonding System Specification Document for GES Connections

Direct Burial Compression Grounding System Specification Sheet

Scope

The scope of this specification includes the materials, design, marking, installation, inspectability, and performance of grounding connectors used for direct burial in earth or concrete. All connectors shall meet the requirements of this specification.

Materials

Connector body shall be of wrought or cast copper

Design

All connectors shall:

- Utilize irreversible compression technology
- Be factory-filled with an oxide-inhibiting compound
- Utilize vacuum-sealed packaging to guarantee that the oxide-inhibiting compound is not rubbed off the part during shipping or before installation

Marking

- Connector and matching installation die shall be color-coded to ensure proper die selection
- Clearly marked with manufacturer, catalog number, conductor size, and required compression tool die index number
- Marked with “DB” to indicate that the parts are for direct burial
- Labeled with the specific types, sizes, and combina tions of conductors and other items connected approved by a nationally recognized testing laboratory (NRTL)
- Listed and labeled as defined in NFPA 70 (National Electrical Code – NEC)

Installation

- Connectors shall be installed as per manufactur- er’s instructions, including surface preparation, in stallation tools, crimping dies, and the required number of crimps
- Connectors shall be installable in any weather, including wet or extreme cold (-40º F) conditions
- Completing the connections shall require that no hazardous material be brought into the work site

Inspectability

- When crimped, die index numbers shall be em bossed upon the part. The embossed die index numbers shall match the die index numbers printed on the part
- Installation process shall indicate that the perfor- mance requirements of IEEE Std 837™-2002 are met. The markings shall be an integral part of the crimping process, and must indicate that all steps have been met. Example of acceptable indication includes that the die index numbers are embossed on the part once for UL/CSA only, and twice for IEEE Std 837™-2002

Performance

Connections shall comply with the following standards:

- IEEE Std 837™-2002 – Standard for Qualifying Per manent Connections Used in Substation Grounding
- NFPA 70™ – National Electrical Code
- UL 467 – Grounding and Bonding Equipment, for
- CSA C22.1 – Canadian Electrical Code, Part I
- MIL-STD-202G (METHOD 201A) – Department of Defense: Test Method Standard: Electronic and Electrical Component Parts (Vibration)

Appendix C-2:

Example Grounding and Bonding System
Specification Document for Communications Systems

CSI SECTION 270526
GROUNDING AND BONDING FOR COMMUNICATIONS SYSTEMS

The purpose of this document is to provide documentation to cabling professionals interested in providing their customer a standard specification applicable to commercial building structured cabling applications.

The documentation includes: Product specifications, minimum product performance, structured cabling design considerations and installation guidelines.

The information contained in this document is based on our experience to date and is believed to be reliable. It is intended as a guide for use by persons having technical skill and is to be used with their own discretion and risk. We do not guarantee favorable results or assume any liability in connection with its use. Dimensions contained herein are for reference purposes only. For specific dimensional requirements consult the factory. This publication is not to be taken as a license to operate under, or a recommendation to infringe any existing patents. This supercedes and voids all previous literature, etc.

It is highly recommended and the issuer's responsibility to have any RFQ documents, including those based on this general format, reviewed by the issuing company's professional advisors before it is released to the public. In no way may this document be used in a manner that is detrimental to the interests of Panduit and/or its subsidiaries.

TABLE OF CONTENTS

SECTION 271116

Part 1 - General

1.1 Work Included

A. Provide all labor, materials, tools and equipment required for the complete installation of work called for in the Construction Documents

1.2 Scope of Work

A. This document describes the products and execution requirements relating to furnishing and installing Grounding/Earthing and Bonding for Communications Systems.

B. This section includes minimum requirements for the following:

- Grounding/Earthing System
- Telecommunications Grounding Busbar (TGB)
- Telecommunications Main Grounding Busbar (TMGB)
- Telecommunications Bonding Backbone (TBB)
- Rack Grounding/Earthing and Bonding
- Cabinet Grounding/Earthing and Bonding
- Shield Grounding/Earthing and Bonding

C. All cables and related terminations, support and grounding/earthing hardware shall be furnished, installed, wired, tested, labeled, and documented by the telecommunications contractor as detailed in this document.

D. Product specifications, general design considerations, and installation guidelines are provided in this document. Quantities grounding/earthing products, typical installation details and cable routing will be provided as an attachment to this document. If the bid documents are in conflict, this specification shall take precedence. The successful vendor shall meet or exceed all requirements for the cable system described in this document.

1.3 Regulatory References

A. The following industry standards are the basis for the grounding/earthing and bonding system described in this document.

1. NFPA
   - NFPA-70 National Electric Code (NEC)
2. IEEE
   - Std 1100 IEEE Recommend Practice for Powering and Grounding Electronic Equipment (IEEE Emerald Book)
3. TIA/EIA
   - TIA-942 Telecommunications Infrastructure Standard for Data Centers
   - J-STD-607-A Commercial Building Grounding/Bonding Requirements
   - TIA/EIA-606 Administration Standard for the Telecommunications Infrastructure of Commercial Buildings International Standard
   - BS EN 50310:2000 Application of equipotential bonding and earthing in Buildings with information technology equipment

B. The most recent versions of all documents apply to this project. If there is a conflict between applicable documents, the order above shall dictate the order of precedence in resolving the issue unless an enforce able local or national code is in effect.

1.4 Quality Assurance

A. See the Panduit Electrical Product Warranty on www.panduit.com/warranty

1.5 Approved Products

A. Approved grounding/earthing system manufacturer: PANDUIT

B. Approved telecommunications grounding busbar manufacturer: PANDUIT

C. Approved rack grounding kit manufacturer: PANDUIT

D. Approved retrofit rack grounding kit manufacturer: PANDUIT

E. Approved cabinet grounding kit manufacturer: PANDUIT

F. Approved retrofit cabinet grounding kit manufacturer: PANDUIT

G. Approved shielded cabling grounding kit manufacturer: PANDUIT

1.6 Definitions

Bonding – The permanent joining of metallic parts to form an electrically conductive path that will assure electrical continuity and the capacity to conduct safely any current likely to be imposed.

Mesh Common Bonding Network (MCBN) – The mesh CBN (MCBN) can be readily utilized for efficient direct bonding of equipment and other apparatus to the grounding system. Such an arrangement provides efficient grounding and inter/intra-unit bonding of metal cabinets, racks and miscellaneous metal objects (especially when they are not powered). Additionally, the MCBN ensures grounding reliability of the equipment in the event the equipment grounding conductor of the serving power circuit is compromised or disconnected during maintenance. Electrostatic charge buildup and dissipation is also greatly aided by the multiple grounding paths of the CBN. See Figure 1.

Ground/Earth (Earth/Earthing is an international term equivalent to grounding) – A conducting connection, whether intentional or incidental, by which an electric circuit or equipment is connected to earth, or to some con ducting body of relatively large extent that serves in place of the earth.

Retrofit Rack Grounding/Earthing – The application of grounding/earthing products and technology where equipment is already deployed and functioning within the equipment rack.

Retrofit Cabinet Grounding/Earthing – The application of grounding/earthing products and technology where equipment is already deployed and functioning within the equipment cabinet.

1.7 Overview

A primary purpose of the grounding/earthing and bonding system is to create an adequate capacity path for electrical surges and transient voltages to return to their source (which may include the earth). Lightning, fault currents, circuit switching (motors turning on and off), activation of surge protective devices (SPDs) and electrostatic discharge are common causes of these electrical surges and transient voltages. An effective grounding/earthing and bonding system minimizes the detrimental effects of these electrical surges and transient voltages, which include degraded network performance and reliability and increased safety risks.

A properly constructed protection system includes a number of subsystems including:

- Grounding electrode system
- Lightning protection system
- Surge suppression
- AC/DC power systems grounding
- Telecommunications supplemental grounding and bonding

While each subsystem is designed with a specific intent in mind, the systems interact and enhance the overall capability of the entire protection system. This specification focuses primarily on the telecommunications supplemental grounding and bonding subsystem, hereafter referred to as the grounding, bonding, or grounding/earthing system.

The grounding/earthing system must be intentional, visually verifiable, adequately sized to handle expected currents safely, and directs these potentially damaging currents away from sensitive network equipment. As such, grounding/earthing must be purposeful in its design and installation. Four issues require special consideration:

A. Although AC powered equipment typically has a power cord that contains a ground/earth wire, the integrity of this path cannot be easily verified. Thus, many equipment manufacturers require grounding/earthing above and beyond that which is specified by local electrical codes, such as the National Electrical Code, etcetera. Always follow the grounding/earthing recommendations of the manufacturer when installing equipment.

B. While the building steel and metallic water piping must be bonded to the grounding/earthing system for safety reasons, neither may be substituted for the telecommunications bonding backbone (TBB).

C. Electrical continuity throughout each rack or cabinet is required to minimize safety risks. Hardware typically supplied with bolt-together racks is not designed for grounding/earthing purposes. Additionally, most racks and cabinets are painted. Paint is an insulator. Unless rack and cabinet members are deliberately bonded, continuity between members is incidental, and in many cases, unlikely.

D. Any metallic component that is part of the data center, including equipment, racks, cabinets, ladder racks, enclosures, cable trays, etc. must be bonded to the grounding/earthing system.

1.8 Workmanship

The ground/earth system must be designed for high reliability. Therefore, the grounding/earthing system shall meet following criteria:

A. Local electrical codes shall be adhered to.

B. The grounding/earthing system shall comply with ANSI/TIA-942, J-STD-607-A, IEEE Std 1100™ (IEEE Emerald Book), and in international regions BS EN 50310:2000.

C. All grounding/earthing conductors shall be copper.

D. Lugs, HTAPs, grounding strips, and busbars shall be UL Listed and made of premium quality tin-plated electrolytic copper that provides low electrical resistance while inhibiting corrosion. Antioxidant shall be used when making bonding connections in the field.

E. Wherever possible, two-hole lugs shall be used because they resist loosening when twisted (bumped) or exposed to vibration. All lugs shall be irreversible compression and meet NEBS Level 3 as tested by Telcordia. Lugs with inspection windows shall be used in all non-corrosive environments so that connections may be inspected for full conductor insertion (battery rooms are an exception where windowless lugs may be used).

F. Die index numbers shall be embossed on all compres sion connections to allow crimp inspection.

G. Cable assemblies shall be UL Listed and CSA Certified. Cables shall be a distinctive green or green/yellow in color, and all jackets shall be UL, VW-1 flame rated.

Part 2 - Products

2.1 Equivalent Products

A. PANDUIT shall manufacture all products, including but not limited to grounding/earthing and bonding for communications systems. There will be no substitutions allowed.

2.2 Grounding/Earthing and Bonding

A Telecommunications Main Grounding Busbar (TMGB) shall be located at the service entrance. A Telecommunications Grounding Busbar (TGB) shall be located in each telecommunications space. The TGB will be grounded/earthed to the Telecommunications Main Grounding Busbar (TMGB).

The TMGB shall be bonded to building steel and grounded/earthed to the electrical service ground according to J-STD-607-A guidelines. Each TGB shall be bonded to building steel and the electrical panel serving equipment in the telecommunications space. See figure 1 below.

Figure C-1 – Service Entrance Grounding

The gauge of the connecting ground/earth cable, known as the Telecommunications Bonding Backbone (TBB) will follow J-STD-607-A guidelines, as is shown in the table below.

Sizing of the TBB	
TBB Length in Linear meters (feet)	TBB Size AWG
Less than 4 (13)	6 (16mm²)
4-6 (14-20)	4 (25mm²)
6-8 (21-26)	3 (25mm²)
8-10 (27-33)	2 (35mm²)
10-13 (34-41)	1 (35mm²)
13-16 (42-52)	1/0 (50mm²)
16-20 (53-66)	2/0 (70mm²)
Greater than 20 (66)	3/0 (95mm²)

Route the TBB to each TGB in as straight a path as possible. The TBB should be installed as a continuous conductor, avoiding splices where possible. Use PANDUIT part number series HTWC to tap into the TBB where necessary. When more than one TBB is used, bond them together using the TGBs on the top floor and every third floor in between with a conductor known as a grounding equalizer (GE). Use the J-STD-607-A guidelines for sizing of the TBB when sizing the GE (shown in the table above).

2.3 Components, Kits and Hardware

PANDUIT® STRUCTUREDGROUND™ Grounding System (STRUCTUREDEARTH™ Earthing System) kits, components, and hardware shall be used to construct the grounding/earthing system.

Use PANDUIT GB4 series BICSI/J-STD-607-A telecommunications grounding busbars for the TMGB, which is ideally located at the AC service entrance. Use a PANDUIT GB2 series busbar for the TGB in each of the other telecommunications/equipment spaces throughout the building. Use PANDUIT
LCC-W series lugs when connecting conductors to the TMGB and TGB.

2.4 Construction of the Grounding/Earthing System

Avoid routing grounding/earthing conductors in metal conduits. If the grounding/earthing conductor must be routed through a metal conduit, bond each end of the conduit to the grounding/earthing conductor. Use PANDUIT GPL series grounding clamps to bond to the conduit, a PANDUIT HTWC HTAP with clear cover to bond to the grounding/earthing conductor, and a #6 AWG copper conductor to connect the GPL grounding clamp to the HTWC HTAP.

In telecommunications spaces with a small number of racks or cabinets, it may be most convenient to bond the grounding/earthing jumper cable directly to the TGB. Larger spaces require a mesh Common Bonding Network, as described below.

Cable Sizes for Other Grounding/Earthing Applications Not Specifically Described Elsewhere in This Document	
Purpose	Copper Code Cable Size
Aisle ground (overhead) of the common bonding network	Minimum #2 AWG (35mm²)
Aisle ground (under floor) of the mesh common bonding network	Minimum # 6 AWG (16mm²)
Bonding conductor to each PDU or panel board serving the room.	Size per NEC 250.122 & manufacturer recommendations
Bonding conductor to HVAC equipment	#6 AWG (16mm²)
Building columns	#4 AWG (25mm²)
Cable ladders and trays	#6 AWG (16mm²)
Conduit, water pipe, duct	#6 AWG (16mm²)

Raised Floor (Access Floor) mesh Common Bonding Network - The following requirements shall apply when constructing the MCBN under the floor:

The under the floor MCBN shall be constructed of a #2 AWG (35mm²) or smaller gauge bonding conductor, but never smaller than a #6 AWG (16mm²) conductor. The MCBN should be connected to the Telecommunications Grounding busbar (TGB) using a 1/0 AWG (50mm²) or larger conductor.

MCBN grid shall be installed on every other pedestal, this allows for bonding of one pedestal from each access floor tile to the MCBN. A grounding clamp shall create a bond between conductors at each intersection and to the access floor by bonding the pedestals to the MCBN conductors. PANDUIT part number GPQC1/0 shall be utilized for ¾" (19.1mm) and 1" (25.4mm) round or square pedestals and where MCBN conductors range from #6 AWG (16mm²) – 1/0 AWG (50mm²). MCBN grid shall be bonded no further than every 5th pedestal to be compliant with TIA-942 standard.

Use HTCT HTAP connectors for series bonds (such as from the rack to the mesh CBN) and either HTCT or CTAPF connectors to provide parallel connections within the auxiliary grounding system (such as when bonding conductors to the outer ring that encompasses the raised floor).

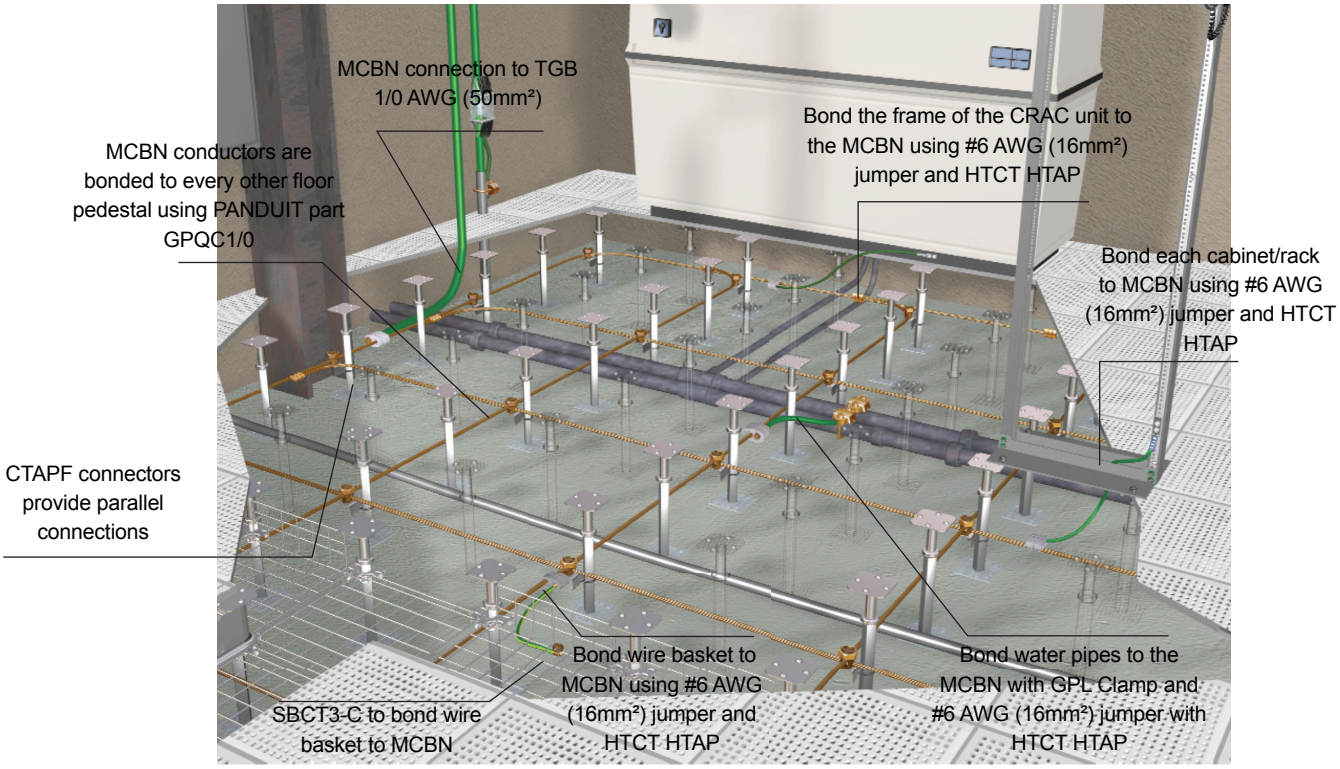


Figure 2 – Mesh Common Bonding Network and Wire Basket Bonding

Overhead Common Bonding Network and Ladder Rack Bonding

The overhead common bonding network shall be constructed of a minimum of a #2 AWG (35mm²) or larger gauge wire. The CBN shall be bonded to the TGB using a 2-hole copper compression connector, PANDUIT part series LCC-W or metric equivalent.

Ladder racks shall be bonded per the manufacturer's installation instructions. The bond shall be made in accordance with Figure 3 below to the mesh Common Bonding Network.

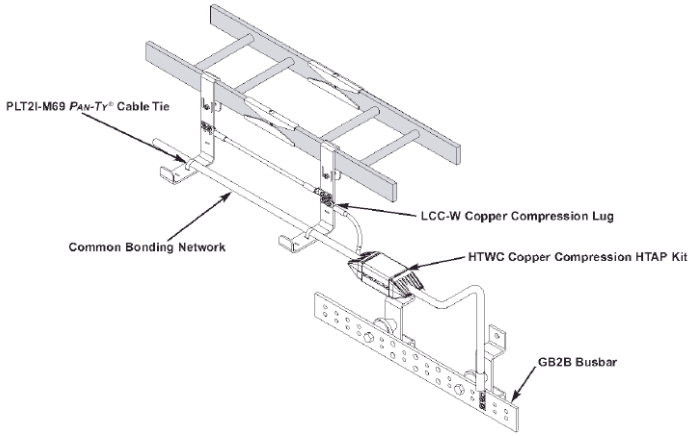


Figure 3 – Overhead Common Bonding Network and Ladder Rack Bonding

To provide electrical continuity between ladder rack segments use PANDUIT® STRUCTUREDGROUND™ Auxiliary Cable Bracket, PANDUIT part number GACB-1. When installed, the paint piercing teeth on the bracket remove paint from the ladder rack sections providing an electrical bond. There shall also be a grounding jumper, PANDUIT part number GACBJ618U, that connects to the auxiliary cable brackets to bond the sections of the ladder rack together.

2.5 Rack Grounding/Earthing

Equipment and racks shall be bonded in accordance with the methods prescribed in ANSI/TIA-942, as is shown in figure 4 below.

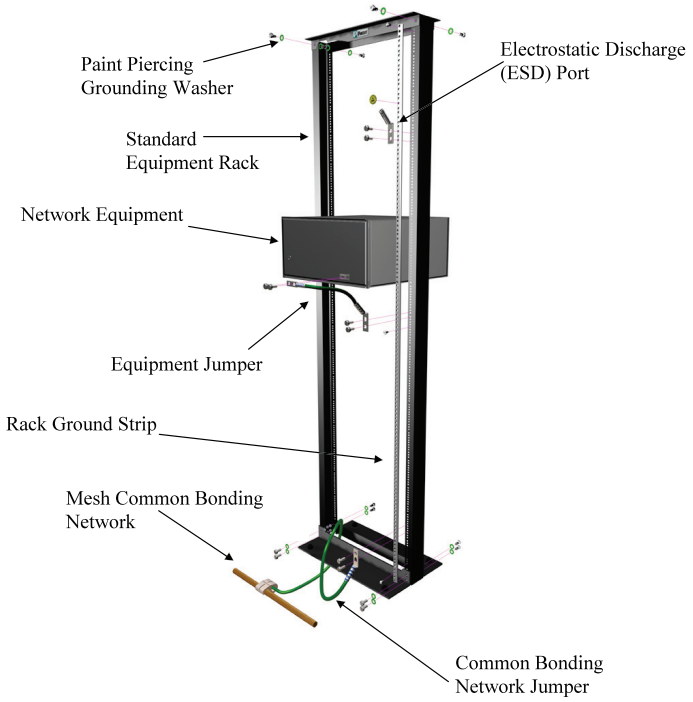


Figure 4 - Properly Grounded/Earthed Rack (Back of Rack Shown)

To provide electrical continuity between rack elements, PANDUIT paint piercing grounding washers, series RGW, shall be used where rack sections bolt together, on both sides, under the head of the bolt and between the nut and rack.

All racks shall utilize a full-length rack ground strip, PANDUIT series RGS, attached to the rear of the side rail with the thread-forming screws provided to ensure metal-to-metal contact.

Mount an electrostatic discharge (ESD) port kit, PANDUIT series RGESD, directly to the rack grounding strip on the back of the rack at approximately 48 inches (122cm) from the floor. Mount a second RGESD directly to the vertical mounting rail of the rack in the front at approximately the same height. Use the thread-forming screws provided to form a bond to the rack. Place the ESD protection identification stickers directly above the ESD ports.

When the equipment manufacturer provides a location for mounting a grounding connection, that connection shall be utilized. Use the appropriate PANDUIT RG series jumper for the equipment being installed and the thread-forming screws provided in the kit.

Use PANDUIT part number series RGCBNJ (Common Bonding Network Jumper) to attach the rack ground strip to the mesh CBN. This kit includes the #6 AWG cable with one factory installed two-hole lug and hardware to connect to the busbar and one HTCT HTAP to connect to the mesh CBN. In addition, all components can be utilized if your mesh common bonding network is below or overhead. Do not bond racks or cabinets serially. Use the HTCT HTAP that comes with the kit to bond the conductor directly to the mesh common bonding network.

Patch panels will be bonded to racks using the appropriate PANDUIT bonding screws, series RGTBS. Mounting rails may utilize cage nuts, threaded holes or thru hole mounting fasteners to secure patch panels to the rails.

2.6 Retrofit Rack Grounding/Earthing

If the racks already have network equipment installed, it may not be feasible to install the rack ground strip without disrupting data cables. Further, it may be undesirable to disassemble rack hardware to install paint piercing grounding washers, or in some cases, the construction of the rack may make grounding washer installation impossible. In these circumstances, the PANDUIT Retrofit Rack Grounding Kits, PANDUIT part family RGR, are to be installed.

For retrofit rack grounding/earthing installations, use PANDUIT part number RGRKCBNJY to ground/earth the rack to the mesh common bonding network. Use PANDUIT part number RGREJ696Y (provided with #6 AWG grounding conductor) or PANDUIT part number RGREJ1096Y (provided with #10 AWG grounding conductor) to ground/earth equipment chassis to the rack grounding busbar provided with the RGRKCBNJY as is shown in figure 5 below.

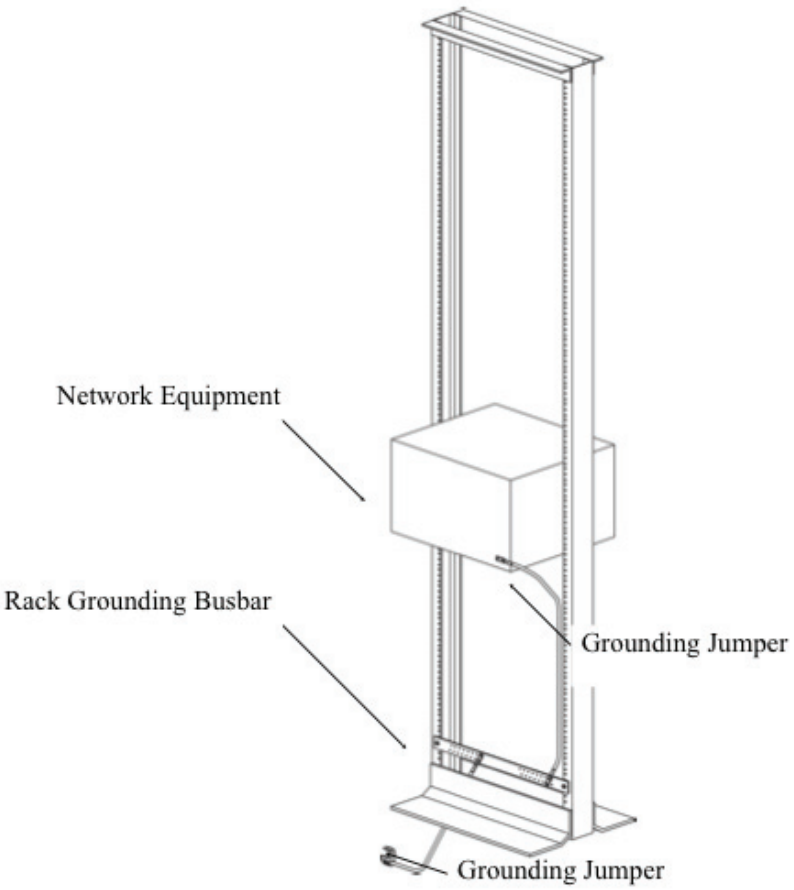


Figure 5 - Retrofit Rack Grounding/Earthing

2.7 Cabinet Grounding/Earthing

Non-PANDUIT Cabinet Grounding/Earthing

All non-PANDUIT equipment and cabinets shall be bonded in accordance with the methods prescribed in ANSI/TIA-942, as is shown in figure 6 below.

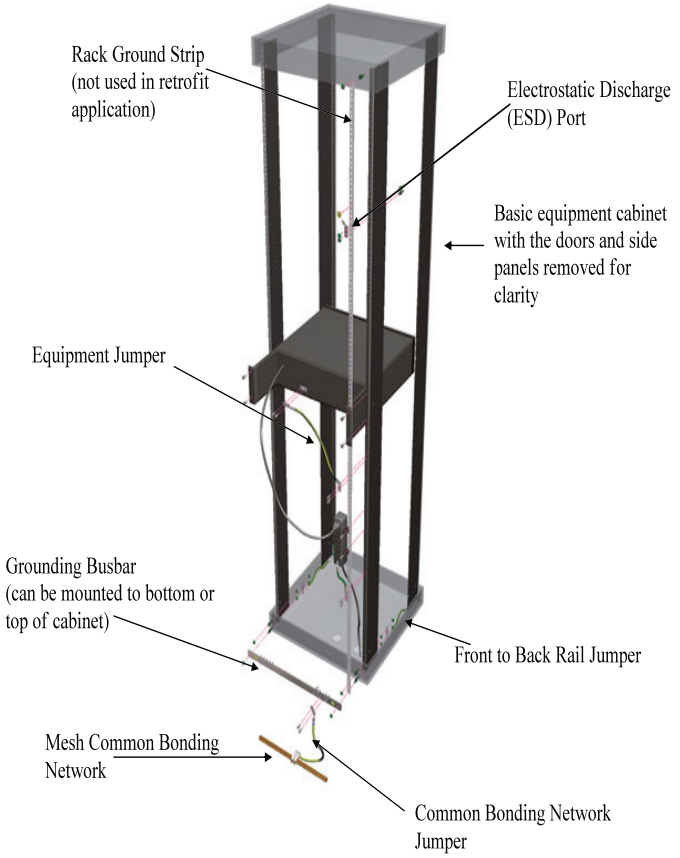


Figure 6 - Properly Grounded/Earthed Cabinet (Back of Cabinet Shown)

To provide electrical continuity between cabinet rails, PANDUIT rail jumper kit, series CGJ, shall be used to bond the front and rear equipment mounting rails. It may not be feasible or may be undesirable to disassemble the cabinet to install the paint piercing washers. Using the rail jumper kits is a more cost effective way to bond the equipment mounting rails together.

All cabinets shall utilize a full-length rack ground strip, PANDUIT series RGS, attached to one of the four mounting rails using the hardware provided to ensure metal-to-metal contact.

All cabinets shall utilize a copper busbar, PANDUIT part number RGRB19U, as a main collection point before connecting to the mesh common bonding network (MCBN). The busbar can be mounted at the top or the bottom of the cabinet depending on where the MCBN is located.

The copper busbar will then be connected to the MCBN utilizing the PANDUIT common bonding network jumper kit, part number series RGCBNJ. This kit includes the #6 AWG cable with one factory installed two-hole lug and hardware to connect to the busbar and one HTCT HTAP to connect to the MCBN. In addition, all components can be utilized if the MCBN is below or overhead.

Mount an electrostatic discharge (ESD) port kit, PANDUIT series RGESD, directly to the grounding strip on the back of the cabinet at approximately 48 inches (122cm) from the floor. Mount a second RGESD directly to the grounding strip at the front at approximately the same height. Place the ESD protection identification stickers directly above the ESD ports.

Cabinet equipment mounting rails may utilize cage nuts, threaded holes or thru-hole type mounting fasteners to secure equipment to the rails. Each kit is supplied with the unique thread-forming screws and bonding studs to provide the bond to the equipment mounting rails.

Grounding/Earthing PANDUIT Cabinets

All PANDUIT® NET-ACCESS™ Cabinets shall be bonded in accordance with the methods prescribed in ANSI/TIA-942.

Since the NET-ACCESS™ Cabinet features a fully integrated, electrically bonded structure, there is no need to bond the rails together with front to back jumpers and the 19” horizontal busbar. See figure 7 below.

2.8 Retrofit Cabinet Grounding/Earthing

If the cabinets already have network equipment installed, it may not be feasible to install the rack ground strips without disrupting data cables. In these cases the rack ground strip would not be used and equipment jumpers would be used to make the bond between network equipment and the busbar. See figure 6 for details.

All other grounding/earthing requirements apply to retrofit installations without exception.

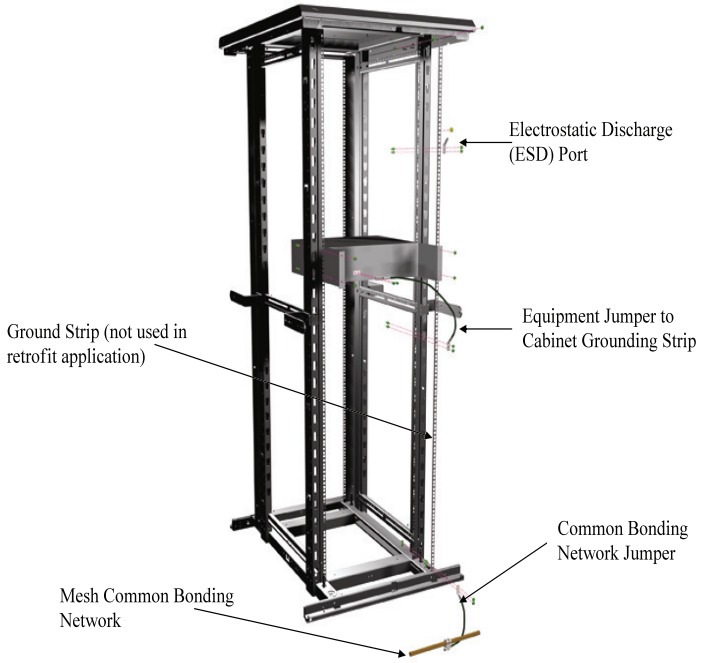


Figure 7 - Properly Grounded/Earthed PANDUIT® NET-ACCESS™ Cabinet (Back of Cabinet Shown)

2.9 Shield Grounding

A key element of a shielded copper cabling system is proper grounding. PANDUIT TX6™ 10GIG™ Shielded Copper Cabling System shall be bonded as shown in figure 8.

The cable shield shall be run continuously from port-to-port. As the shield becomes bonded to the equipment chassis when the plug is inserted into the jack on the equipment, this effectively bonds the shield conductor at both ends of the cable, and at patch panels in between. Such a system is most effective at reducing noise coupling to the data signal so long as the power sources feeding the equipment involved are bonded together.

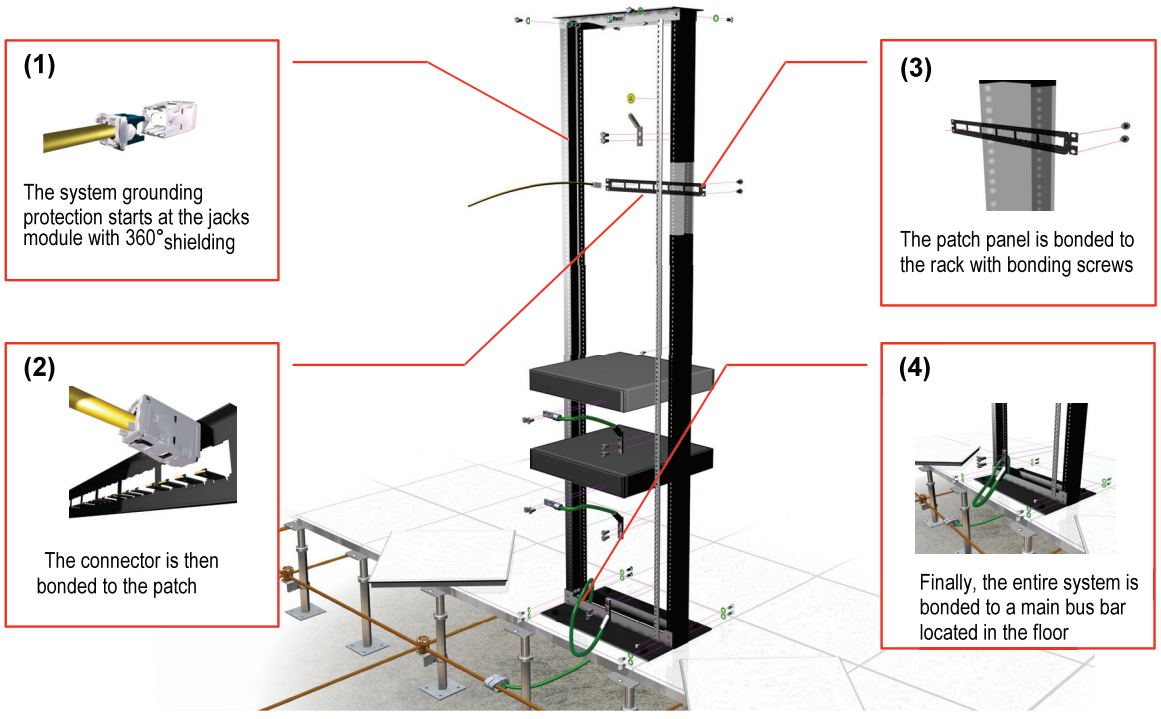


Figure 8 – Properly grounding shielded copper cabling system

2.10 Zone Box Grounding

All active equipment in the enclosure and the enclosure itself (including door) shall be bonded to a dedicated ground via a grounding bracket. The grounding bracket shall incorporate a space-saving design without stacking lugs, and it shall prevent lugs from twisting loose. An electrostatic discharge (ESD) port shall be mounted directly to the grounding bracket. PANDUIT part number PZAEGK shall be utilized. See figure 9 below.

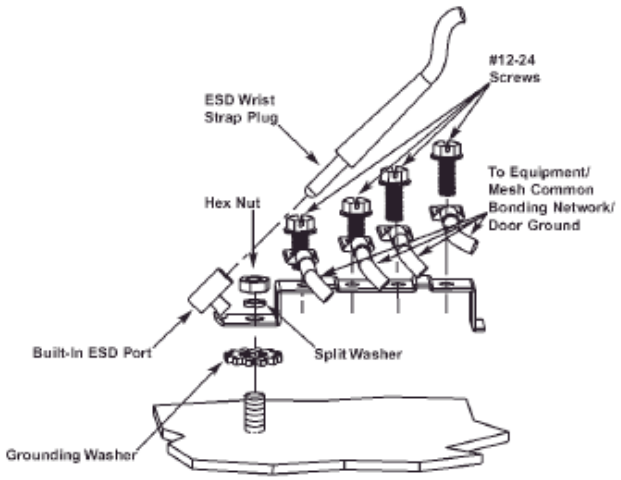


Figure 9 – Exploded view of STRUCTUREDGROUND™ Enclosure Kit

Part 3 - Execution

3.1 Grounding System

The communications grounding system shall be designed and/or approved by a qualified PE, licensed in the state that the work is to be performed. The communications grounding system shall adhere to the recommendations of the ANSI/TIA-942 and J-STD-607-A standards, and shall be installed in accordance with best industry practice. International regions shall adhere to the recommendations of the BS EN 50310:2000 standard.

A licensed electrical contractor shall perform installation and termination of the main bonding conductor to the building service entrance ground.

3.2 Inspection of the Grounding System

The communications grounding system should be inspected at time of installation and then on yearly basis thereafter. Refer to Panduit document, “ITE Supplemental Grounding and Bonding Inspection” for inspection process and documentaiton procedures.

Appendix C-3: Example Grounding and Bonding System Visual Inspection and Documentation Process

Example of a Grounding Visual Inspection and Documentation Process

Date:	
Company:	
Contact:	

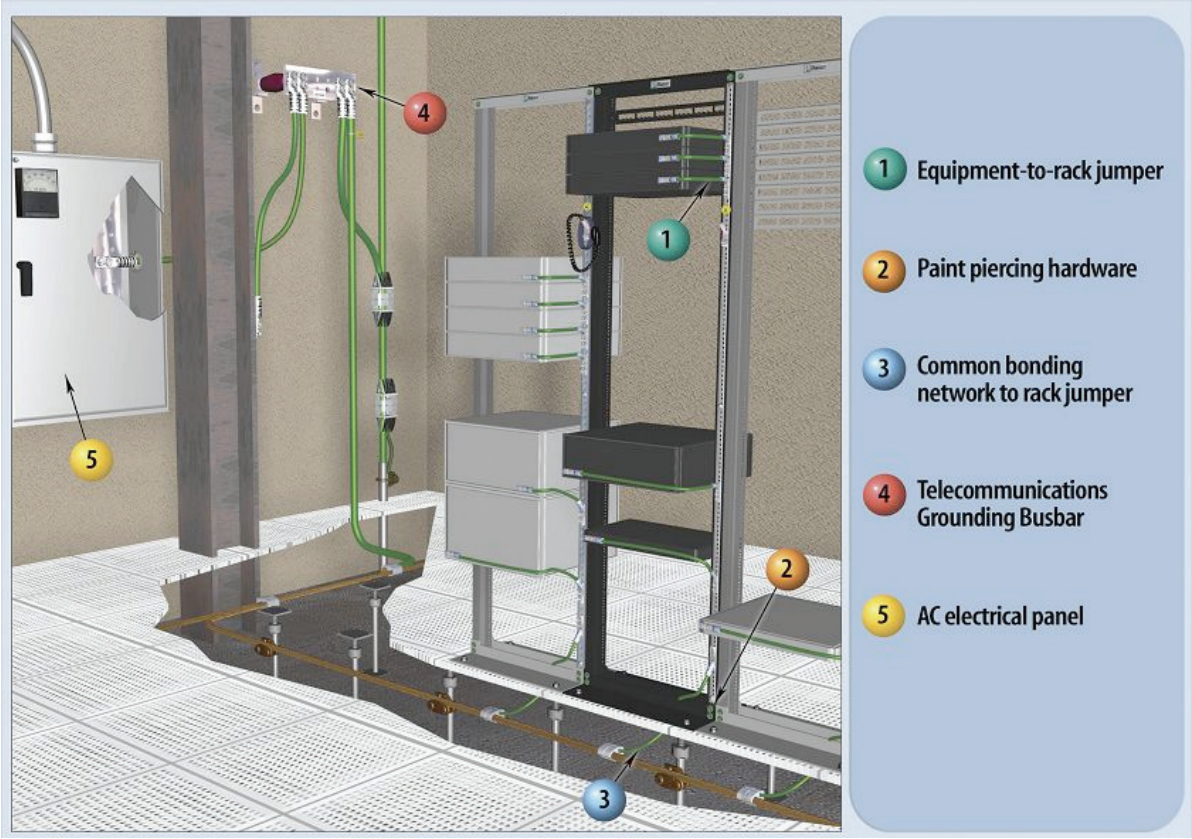
This document describes the process of properly inspecting information technology equipment (ITE) supplemental grounding and bonding systems.

An answer of “yes” for each question on the inspection list indicates that the components of the ITE supplemental grounding and bonding system have been installed to commonly referenced industry standards.

Use the room/rack/cabinet number space on each sheet to provide each measurement set with a unique identification number so that issues found during the inspection can be addressed later.

Bonding inspections for each telecommunications space

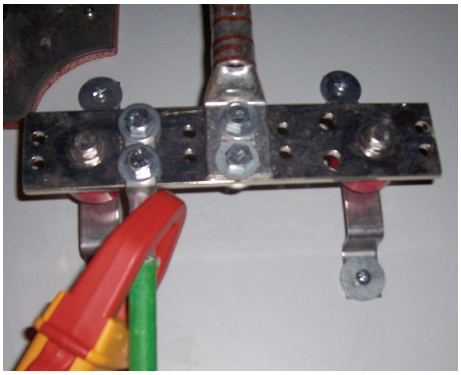
Room Number:_____



Is a Telecommunications Grounding Busbar (TGB) present?	Yes	No
Have the following bonds been made to the TGB?		
The AC electrical panel	Yes	No
Accessible building steel	Yes	No
The Mesh Common Bonding Network1	Yes	No
The Telecommunications Bonding Backbone2	Yes	No

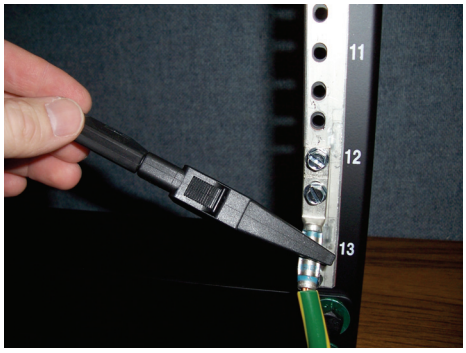
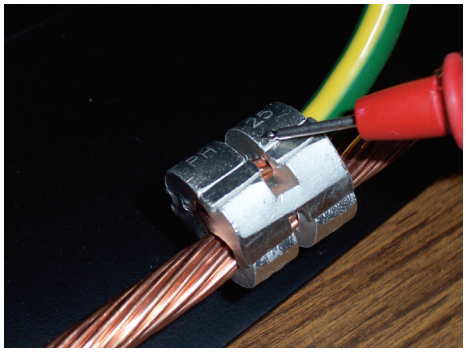
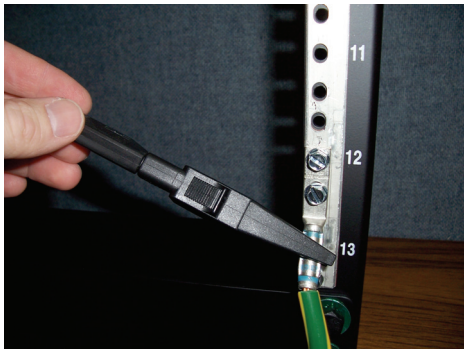
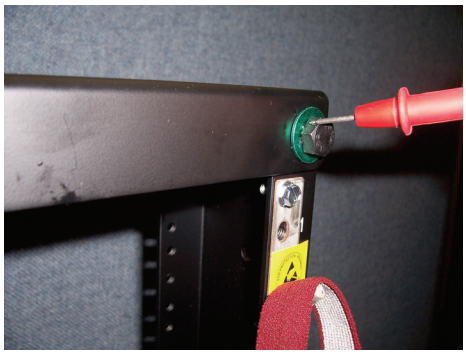
1. The Mesh Common Bonding Network (MCBN) is the conductor or group of conductors that extend from the TGB to each bay in the room. The MCBN can be installed above the bays or under the access floor.

2. The Telecommunications Bonding Backbone (TBB) is the conductor that bonds every TGB in the bonding network together. The TBB may not be present in every installation.

Using a clamp-on amp meter, check for AC and DC current on each of the bonds listed above. A reading of zero amps AC and DC may be indicative of an open connection. A reading of greater than one amp AC and 0.5 amps DC may be indicative of fault conditions somewhere in the power system.  Clamp the meter around the grounding conductor in question	Yes	No
Are the AC and DC currents at acceptable levels?	Yes	No
Are the bend radii of all these conductors greater than twelve inches?	Yes	No
Are all the bonds to the TGB made with two-hole compression lugs?	Yes	No
Is each conductor bonded to the TGB labeled or tagged as a grounding conductor as shown below? 	Yes	No

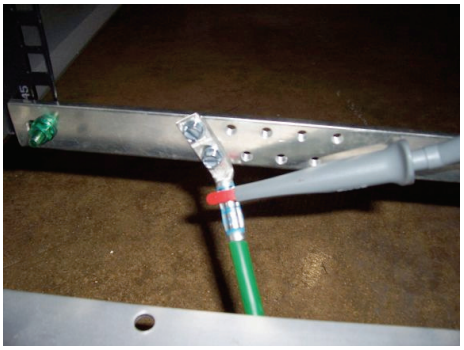
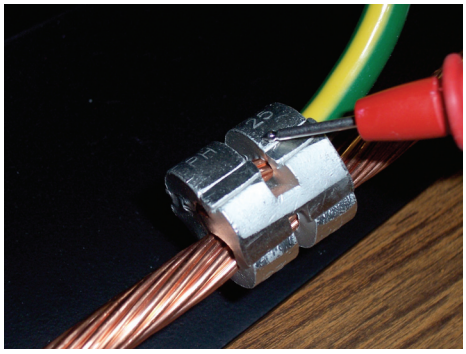
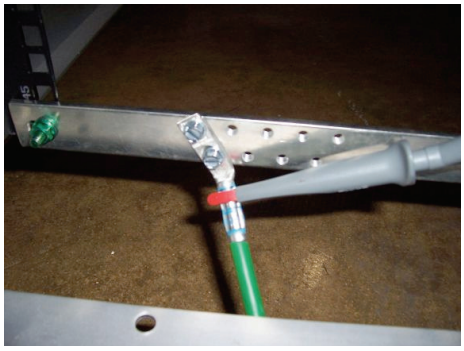
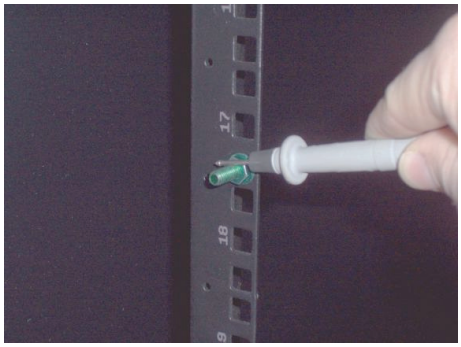
Bonding inspections for each rack:

Rack Number:_____

Are electrostatic discharge (ESD) wrist strap ports available on the front and back of each rack?	Yes	No
Are two-hole compression lugs compression HTAPs used wherever possible?	Yes	No
Using a two-point multimeter, measure the DC resistance between the common bonding network (CBN) to rack jumper and the HTAP connecting the jumper to the mesh common bonding network as shown below.   Is the DC resistance ≤ 0.1Ω?	Yes	No
Using a two-point multimeter, measure the DC resistance between each section of the rack and the common bonding network to rack jumper as shown below.   Is the DC resistance ≤ 0.1Ω for each section of rack?	Yes	No
Using a two-point multimeter, measure the DC resistance between the mounting flange of each piece of powered equipment and the common bonding network to rack jumper. Is the DC resistance ≤ 0.1Ω for each piece of equipment?	Yes	No

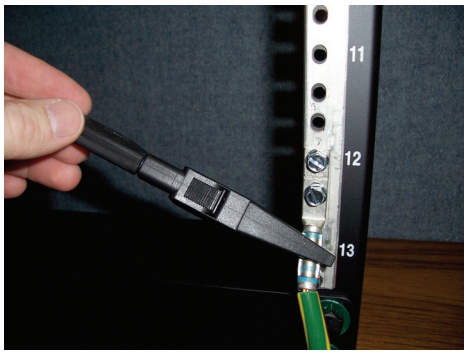
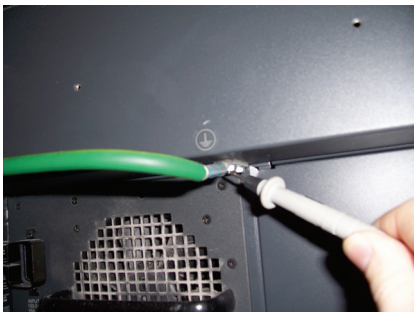
Bonding inspections for each cabinet

Cabinet Number: _____

Are electrostatic discharge (ESD) wrist strap ports available on the front and back of each rack?	❑ Yes	❑ No
Are two-hole compression lugs compression HTAPs used wherever possible?	❑ Yes	❑ No
Using a two-point multimeter, measure the DC resistance between the common bonding network (CBN) to rack jumper and the HTAP connecting the jumper to the mesh common bonding network as shown below. One probe on the CBN jumper:  One probe on the HTAP:  Is the DC resistance ≤ 0.1Ω?	❑ Yes	❑ No
Using a two-point multimeter, measure the DC resistance between the rack/cabinet's equipment mounting rails and the common bonding network jumper. One probe on the CBN jumper:  One probe on the rail:  Is the DC resistance ≤ 0.1Ω for each section of rack?	❑ Yes	❑ No
Using a two-point multimeter, measure the DC resistance between the mounting flange of each piece of powered equipment and the common bonding network to rack jumper. Is the DC resistance ≤ 0.1Ω for each piece of equipment?	❑ Yes	❑ No

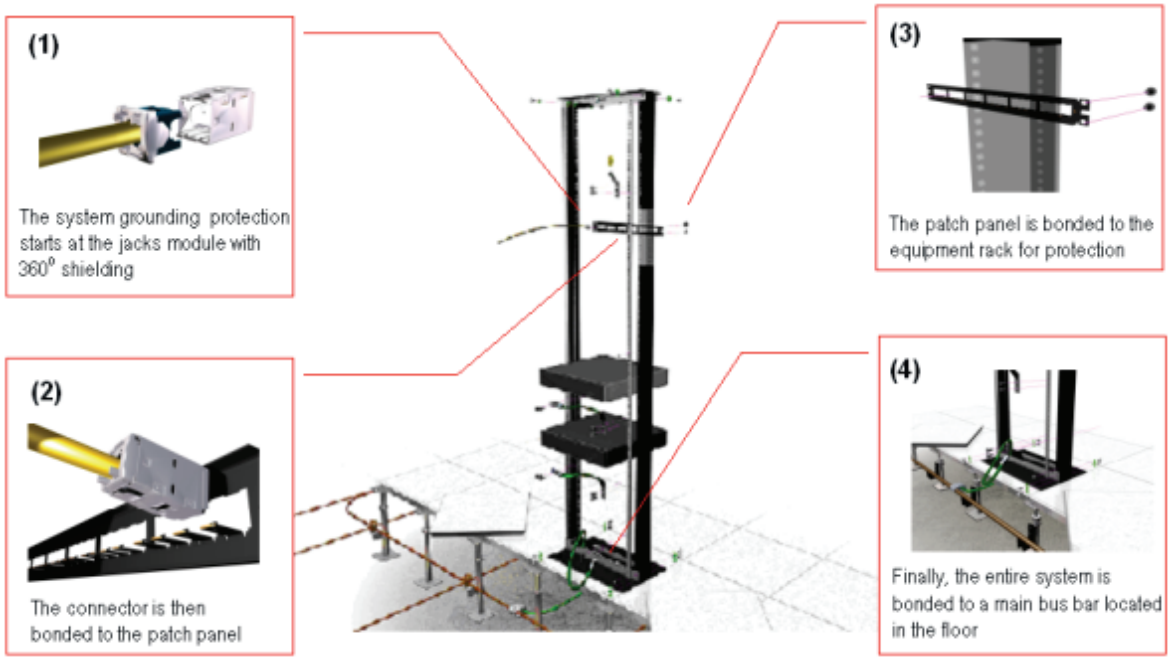
Bonding inspections for each piece of equipment:

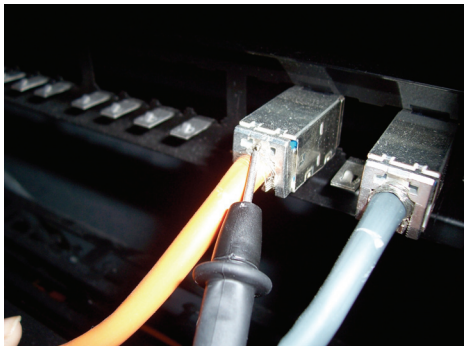
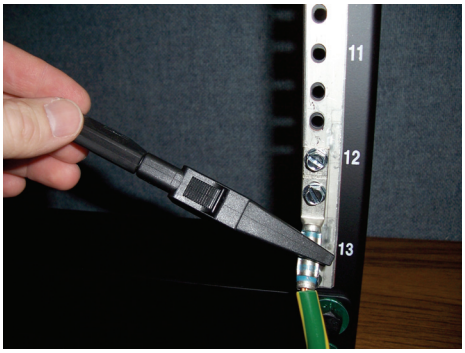
Equipment Identification Number: _____

<table>
<tr><td colspan="2">Using a two-point multimeter, measure the DC resistance between the equipment grounding jumper (when present) or the mounting flange of each piece of powered equipment and the common bonding network to rack jumper as shown below.</td><td>Yes</td><td>No</td></tr>
<tr><td>One probe on the CBN jumper:
 
</td><td>One probe on the equipment grounding jumper:
 
OR
One probe on the equipment mounting flange:
 
</td><td></td><td></td></tr>
<tr><td colspan="2">Is the DC resistance ≤ 0.1Ω for each piece of equipment?</td><td></td><td></td></tr>
</table>

Bonding inspections for shielded cables

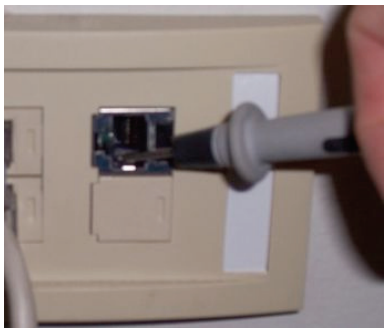
Rack/Cabinet Number: _____



Has the bay passed all the rack or cabinet bonding inspections?	☐ Yes	☐ No
Using a two-point multimeter, measure the DC resistance between each cable shield and the common bonding network (CBN) to rack jumper as shown below. One probe on the shield:  One probe on the CBN jumper:  Is the DC resistance ≤ 0.1Ω between each module and the CBN rack jumper?	☐ Yes	☐ No

Bonding inspections for shielded cables

Rack/Cabinet Number: _____

Using a two-point multimeter, measure the voltage between the module and the ground wire of the electrical outlet used to provide power to the equipment as shown below.		
One probe on the module:  One probe in the ground receptacle: 	❍ Yes	❍ No