Ruggedised/Industrial Connectivity

Siemon's line of ruggedised/industrial connectivity allows cabling professionals to deliver high-performance copper and fibre cabling in harsh environments that would damage standard connectivity. Including sealed and vibration-resistant outlets, couplers, cords and mounting accessories for twisted-pair copper and fibre systems, Siemon's ruggedised connectivity is ideal for industrial, outdoor and other harsh environments.

Section Contents

Ruggedised Copper Connectivity

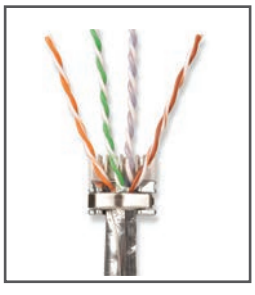
Siemon is well-known for its industry leading high performance connectivity. The same high performance copper and fibre products are available with our patented Ruggedised MAX® & Z-MAX® housings. Ruggedised outlets and modular patch cords provide an IP66/IP67-rated seal, protecting plug and outlet contacts from dust, moisture, vibration, and common cleaning chemicals. These solutions are ideal for protecting valuable connections in laboratory environments, hospitals, food processing plants and other harsh environments.

Easy Termination — The Ruggedised MAX outlets utilise a standard 110 tool for quick and easy punch-down termination while Z-MAX outlets feature an innovative record-setting termination method

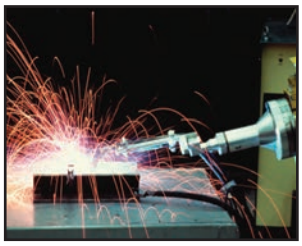
Gripping Ribs — Plug housing and dust caps feature ribs to provide additional gripping for mating and unmating

Standardised Interface — Ruggedised connector has been recognised by the Open DeviceNet Vendor Association (ODVA), IEC 61076-3-106 and TIA-1005-2009

Ensures Proper Seal — Quarter-turn bayonet-style mating ensures proper plug depth into the outlet and an IP66/IP67 rated seal

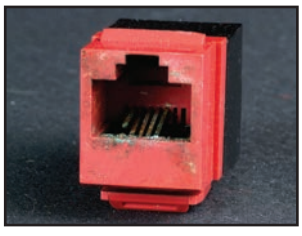


Compared to all other RJ-45 products on the market today the Z-MAX termination process embraces the principle that simpler is better. By establishing straight forward steps that eliminate potential errors, Siemon has been able to set a new benchmark for the fastest UTP and shielded category 6A outlet termination speed.



Meets Harsh Demands of the Environment
Specially designed ruggedised connectors can withstand humidity, dust and vibration.

Vibration Causes Contact Damage In Typical Outlets
Seen under a microscope after exposure to extreme vibration, contact between a typical modular plug and outlet can pit the contact pins, causing intermittent transmission problems.



Humidity Affects Typical Outlets
Humidity corrodes contact pins inside typical outlets. Repeated exposure can eventually destroy the contact pins, rendering the outlet unusable. The ruggedised outlet's special housing prevents this corrosion.

Ruggedised Z-MAX® Outlets

The Ruggedised G2 Z-MAX Outlets feature Siemon's high performance Z-MAX Outlets with innovative and fastest termination method in the industry. The combination of premium connectivity and ruggedised housing with quarter-turn bayonet-style mating design provides a high performance solution for harsh environments.

Part #	Description
XG2-Z5S	Category 5e shielded ruggedised G2 Z-MAX outlet, T568A/B
XG2-Z6	Category 6 UTP ruggedised G2 Z-MAX outlet, T568A/B
XG2-Z6A	Category 6A UTP ruggedised G2 Z-MAX outlet, T568A/B
XG2-Z6AS	Category 6A shielded ruggedised G2 Z-MAX outlet, T568A/B

Ruggedised MAX® Outlets

The Ruggedised MAX outlet features a MAX module housed in a protective shell. The outlet's outer housing is made of durable, chemical-resistant, ruggedised-grade thermoplastic and features Siemon's patented quarter-turn bayonet-style mating design. Guaranteed Category 5e and 6 performance to 160 MHz even in the most punishing environments.

Part #	Description
X5	Category 5e UTP, MAX ruggedised outlet, T568A/B
X5-X5S	Category 5e shielded, MAX ruggedised bulkhead coupler (outlet to outlet)
X6	Category 6 UTP, MAX ruggedised outlet, T568A/B

Ruggedised MAX Plugs

The Ruggedised MAX Plug features a category 5e modular plug contained in Siemon's ruggedised-grade housing with patented quarter-turn bayonet-style mating design. The plug can be terminated in the field, allowing custom lengths to be assembled quickly on site in the event a cable is cut or damaged. It terminates to twisted-pair cable with 24 – 26 AWG (0.51 – 0.40mm) solid or stranded conductors.

Part #	Description
XP85	Category 5e UTP, MAX ruggedised plug, 8-position, 8-contacts
XP85S	Category 5e shielded, MAX ruggedised plug, 8-position, 8-contacts

Ruggedised Category 6 UTP Patch cords

Siemon's Ruggedised Category 6 UTP patch cords are constructed using flame-retardant thermoplastic elastomer (TPE) outer jacket outer jacket over a polyvinyl chloride (PVC) inner jacket. Combined with a -40 to 75°C (-40 to 167°F) temperature range, high flex construction, oil resistant jacket and UL/cUL CM/CMX outdoor rating, they are ideal for use in providing end-to-end Category 6 channel performance in harsh environments.

Ruggedised to Ruggedised

Part #	Description
XC6-(XX)T	Category 6 UTP, ruggedised plug-to-ruggedised plug, TPE, black jacket

Ruggedised to Modular

Part #	Description
XC6-(XX)-B05T	Category 6 UTP, ruggedised plug-to-modular RJ-45 plug w/ yellow boot, TPE, black jacket

Use (XX) to specify length: 03 = 0.9m (3 ft.), 05 = 1.5m (5 ft.), 07 = 2.1m (7 ft.), 10 = 3.1m (10 ft.), 15 = 4.6m (15 ft.)

Ruggedised Category 6A Shielded Patch cords

These cable assemblies provide the final component necessary to contruct a Category 6A shielded channel solution for harsh environments when used in conjunction with Siemon's Category 6A shielded cable and Category 6A compatible shielded ruggedised outlets.

Ruggedised to Modular

Part #	Description
XC6A-S(XX)-B05	Category 6A patch cord, shielded (S/FTP), ruggedised-to-modular, ivory w/ yellow boot, CM/LSOH

Use (XX) to specify length: 03 = 0.9m (3 ft.), 05 = 1.5m (5 ft.), 07 = 2.1m (7 ft.), 10 = 3.1m (10 ft.), 15 = 4.6m (15 ft.), 20 = 6.1m (20ft.)

Ruggedised Category 5e UTP Patch Cords

Designed to withstand the rigors of harsh environments Siemon's Ruggedised Category 5e stranded cordage is petroleum and UV resistant, is not effected by common chemicals and water, operates in a wider temperature range and provides a longer flex life. Available in two jacket types to meet various environmental requirements (see table on last page for jacket comparison)

Ruggedised to Ruggedised

Part #	Description
XC5-(XX)	Category 5e UTP, ruggedised plug-to-ruggedised plug, PVC jacket
XC5-(XX)T	Category 5e UTP, ruggedised plug-to-ruggedised plug, TPE jacket

Ruggedised to Modular

Part #	Description
XC5-(XX)-B05	Category 5e UTP, ruggedised plug-to-modular RJ-45 plug, yellow boot, PVC jacket
XC5-(XX)-B05T	Category 5e UTP, ruggedised plug-to-modular RJ-45 plug, yellow boot, TPE jacket

Modular to Modular

Part #	Description
XC5NS-(XX)-B05T	Category 5e UTP, modular RJ-45 plug -to-modular RJ-45 plug, yellow boot, TPE jacket

PVC = Polyvinyl Chloride, TPE =Thermoplastic Elastomer

Use (XX) to specify length: 03 = 0.9m (3 ft.), 05 = 1.5m (5 ft.), 07 = 2.1m (7 ft.), 10 = 3.1m (10 ft.), 15 = 4.6m (15 ft.), 20 = 6.1m (20 ft.)
PVC jacket colour is teal. TPE jacket colour is black.

Ruggedised Category 5e Shielded Patch Cords

Designed to withstand the rigors of harsh environments, Siemon's Ruggedised Category 5e stranded cordage is petroleum and UV resistant, is not effected by common chemicals and water, operates in a wider temperature range and provides a longer flex life. Available in three ruggedised jacket types to meet various environmental requirements (see table on last page for jacket comparison)

Ruggedised to Ruggedised

Part #	Description
XC5S-(XX)	Category 5e shielded (SF/UTP) ruggedised plug-to-ruggedised plug, PVC jacket
XC5S-(XX)T	Category 5e shielded (SF/UTP) ruggedised plug-to-ruggedised plug, TPE jacket
XC5S-(XX)U	Category 5e shielded (SF/UTP) ruggedised plug-to-ruggedised plug, PUR jacket

Ruggedised to Modular

Part #	Description
XC5S-(XX)-B05	Category 5e shielded (SF/UTP) ruggedised plug-to-modular RJ-45 plug, yellow boot, PVC jacket
XC5S-(XX)-B05T	Category 5e shielded (SF/UTP) ruggedised plug-to-modular RJ-45 plug, yellow boot, TPE jacket
XC5S-(XX)-B05U	Category 5e shielded (SF/UTP) ruggedised plug-to-modular RJ-45 plug, yellow boot, PUR jacket

Modular to Modular

Part #	Description
XC5SNS-(XX)-B05T	Category 5e shielded (SF/UTP) modular RJ-45 plug-to-modular RJ-45 plug, yellow boot, TPE jacket
XC5SNS-(XX)-B05U	Category 5e shielded (SF/UTP) modular RJ-45 plug-to-modular RJ-45 plug, yellow boot, PUR jacket

PVC = Polyvinyl Chloride, PUR = Polyurethane, TPE =Thermoplastic Elastomer

Use (XX) to specify length: 03 = 0.9m (3 ft.), 05 = 1.5m (5 ft.), 07 = 2.1m (7 ft.), 10 = 3.1m (10 ft.), 15 = 4.6m (15 ft.), 20 = 6.1m (20 ft.)
PVC and PUR jacket colour is teal. TPE jacket colour is black.

Ruggedised Dust Caps

The Ruggedised dust caps are the ideal way to protect your investment in your ruggedised cabling system. Outlet dust caps can be used to protect unused outlets or to seal an outlet during wash down periods when the outlet and plug may be disconnected. Plug dust caps protect ruggedised patch cords from exposure to elements or accidental damage when not mated to an outlet.

Dust caps are constructed of industrial-grade thermoplastic for superior protection and durability. Additionally, outlet and plug dust caps feature a retention tether, which prevents them from being misplaced when not in use.

XP-CAP2. . . . . .
Ruggedised plug dust cap with metal retention tether

XG2P-CAP. . . . . .
Ruggedised G2 plug dust cap with nylon retention tether

X-CAP. . . . . .
Ruggedised MAX outlet dust cap with metal retention tether

XG2-CAP. . . . . .
Ruggedised G2 outlet dust cap with nylon retention tether

Ruggedised Surface Mount Boxes

The Siemon Ruggedised MAX Surface Mount Box (IBOX) mounts either Siemon copper or fibre ruggedised outlets. Boxes provide an IP66/IP67 (NEMA 4X) seal and can be mounted on virtually any flat surface. Available in 1, 2, 3, and 4-port versions. Compression fittings provided for cable entry.

X-IBOX-01. . . . . .
Ruggedised surface mount box, 1-port, supplied with 1 cable entry compression fitting

X-IBOX-02. . . . . .
Ruggedised surface mount box, 2-port, supplied with 2 cable entry compression fittings

X-IBOX-03. . . . . .
Ruggedised surface mount box, 3-port, supplied with 3 cable entry compression fittings

X-IBOX-04. . . . . .
Ruggedised surface mount box, 4-port, supplied with 4 cable entry compression fittings

Note: Compression fittings accommodate cable diameters from 4.1–7.9mm (0.16 - 0.31 in.)

Technical Tip!
Contact Technical Support for punch tool to create Ruggedised knockouts for custom mounting.

Ruggedised Stainless Steel Faceplates

Mount Siemon's Ruggedised outlets and adapters into these stainless steel faceplates for a protective seal from moisture and debris. The faceplates are available in 1-, 2- , 3- and 4-port options with a rear sealing gasket and carry an IP44 rating.

XFP-S-01-SS. . . . . .
Single gang faceplate, 1-port, stainless steel

XFP-S-02-SS. . . . . .
Single gang faceplate, 2-port, stainless steel

XFP-D-03-SS. . . . . .
Double gang faceplate, 3-port, stainless steel

XFP-D-04-SS. . . . . .
Double gang faceplate, 4-port, stainless steel

Faceplates include mounting screws with sealed screw head.

Ruggedised LC Fibre Connectivity

The Siemon Ruggedised LC Fibre solution provides a robust fibre connection with an IP66/IP67-rated seal and is ideal for protecting fibre connections in laboratory environments, hospitals, food processing plants and other harsh environments.

The Siemon Ruggedised Fibre solution is ideal for installations requiring extended distances, in close proximity to heavy sources of EMI, or where fibre active equipment is used.

Robust Design — Protects fibre connections in virtually any harsh environment

Specialised Bend Relief — Compression fitting provides a superior rear seal and ensures fibre meet minimum bend radius requirements

Proper Seal — Bayonet-style mating ensures proper fibre alignment and an IP66/IP67 rated seal

High Performance — Meets ISO/IEC 11801 Ed 2.0 and TIA-568-C.3 specifications for Multimode and Singlemode components

Field-Termination — Plug includes two industrial qualified Multimode LC connectors that accepts 2 strand, round, breakout style fibre optic cable

Rear of adapter accepts standard LC connectors

Precision Performance

R&D labs develop, design and implement rigorous testing programs using sophisticated instrumentation. The ruggedised LC provides reliability with leading edge technology for applications where highly accurate performance is critical.

Robust and Reliable

Ruggedised fibre connections help to streamline operations and reduce costs in manufacturing environments by avoiding regular replacement of standard connectors that cannot withstand these environments.

Meets Harsh Demands of the Environment

The ruggedised LC connector is ideal in areas where chemicals, corrosive gases and liquids are commonplace.

Ruggedised G2 LC Fibre Adapters

The Ruggedised G2 LC adapters are inserted from the front of the mounting service and feature an aggressive rear locking nut to ensure secure positioning. They can be used in conjunction with Siemon's ruggedised LC fibre plugs to provide a robust fibre connection with an IP66/67 rated seal.

Part #	Description
XG2-XLC-LC-MM	Ruggedised G2 bulkhead adapter, LC, duplex, Multimode, beige adapter
XG2-XLCQ-LCQMM	Ruggedised G2 bulkhead adapter, LC, duplex, Multimode, aqua adapter
XG2-XLC-LC-SM	Ruggedised G2 bulkhead adapter, LC, duplex, Singlemode, blue adapter
XG2-XLC-XLC-MM	Ruggedised G2 Inline adapter, LC, duplex, Multimode, beige adapter
XG2-XLCQ-XLCQMM	Ruggedised G2 inline adapter, LC, duplex, Multimode, aqua adapter
XG2-XLC-XLC-SM	Ruggedised G2 inline adapter, LC, duplex, Singlemode, blue adapter

XG2-XLC-LC-MM

XG2-XLCQ-XLCQMM

Ruggedised LC Fibre Adapters

Part #	Description
XLC-MM	Ruggedised LC bulkhead fibre adapter, Multimode, duplex, beige adapter
XLCQ-MM	Ruggedised LC bulkhead fibre adapter, Multimode, duplex, aqua adapter
XLC-SM	Ruggedised LC bulkhead fibre adapter, Singlemode, duplex, blue adapter

Note: Bulkhead adapters feature bayonet-style mating on the front of the adapter and a standard LC interface on the rear for use with sealed work area faceplates or fully sealed enclosures where the rear of the adapter is protected from the environment. Inline adapters feature bayonet-style mating on both front and rear of the adapter for use as pass through connections or with unsealed enclosures.

XLC-MM

Ruggedised LC Fibre Plugs

Part #	Description
XPLC2-MM	Ruggedised LC fibre plug, Multimode, duplex. Includes two beige Multimode LC connectors
XPLC2-SM	Ruggedised LC fibre plug, Singlemode, duplex. Includes two blue Singlemode LC connectors

XPLC2-MM

XPLC2-SM

Note: Ruggedised LC fibre plugs accepts 2 strand, round, breakout style fibre optic cable with O.D. ranges from 5mm – 8mm (0.20 - 0.31 in.) with two 2.4mm – 3.0mm (0.09 - 0.12 in.) jacketed subunits.

LightSpeed® Termination Kit Upgrade for Ruggedised LC Connectivity

Use the Ruggedised LC Kit with Siemon's *LightSpeed* Termination Kit for Ruggedised LC connector terminations. The kit contains a dual LC polishing puck, which decreases polish time by 50%.

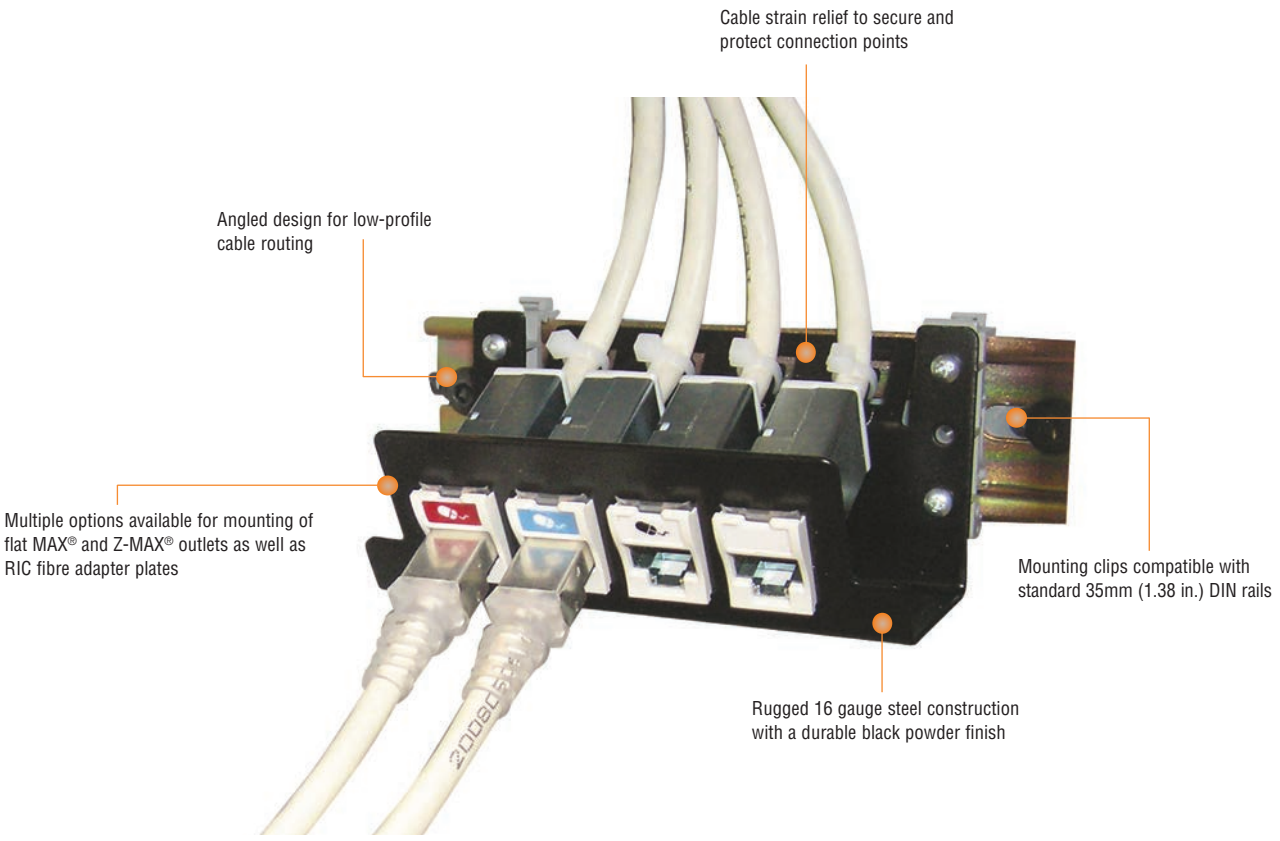
Part #	Description
FTERM-XLC	Ruggedised LC fibre termination kit used in conjunction with FTERM-L2 includes dual polishing puck
FT-LC2PUCK	Dual LC polishing puck
FT-MSLC2HEAD	Dual LC microscope adapter

Technical Information

Enclosure Protection	IP66/IP67	**Plug/Outlet**
Temperature:	-40°C to 85°C (-40 to 185°F) Service Environment Testing: IEC 61753-1 Ed. 1.0	**Plug/Outlet**
Shell Material	PBT - Polybutylene Terephthalate (Valox®), UL94V-0	**Plug/Outlet**
Collar Nut Material	PBT - Polybutylene Terephthalate (Valox®), UL94V-0	**Plug**
Gasket Material	Silicone	**Plug/Outlet**
Ferrule Material	Ceramic	**Plug**
Adapter Sleeve Material	Ceramic	**Outlet**
Mechanical Durability	500 mating cycles minimum	**Plug/Outlet**
Chemical Resistance	Materials selected to provide the widest range of protection from most solvents and common industrial chemicals. (Details available upon request)	**Plug/Outlet**
Bulkhead Thickness	0.762mm to 3.175mm (0.030 in. to 0.125 in.)	**Outlet**
Strain Relief	250 Newtons (56 lbf) typical	**Plug**
Optical Performance	ISO/IEC 11801 ED 2.2, TIA-568-C.3, Telcordia GR-326-CORE	**Plug/Outlet**

DIN Rail Mounted Patch Panels

DIN Rail Mounted Patch Panels provide an effective patching solution for industrial networks inside control panels and distribution cabinets where DIN mounted equipment is being used. The modular design accommodates copper, fibre and multimedia modules to support most applications. The low-profile angled design minimises cable bend radius in shallow enclosures where space is a premium and can be side stackable to grow with your networking changes.



APPLICATIONS

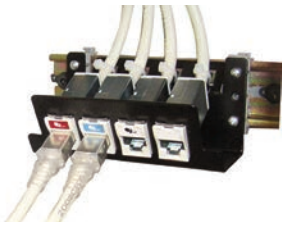
- Inside equipment cabinets with DIN rails
- Alongside Industrial Ethernet switches and PLC's

STANDARDS COMPLIANCE

- European Standard EN 50022
- IEC International Standard 60715

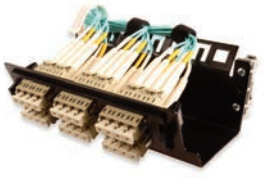
Ordering Information:

Part #	Description
DIN-PNL-04-01	4-Port MAX® DIN rail patch panel, black with individual port openings.* Includes (4) cable ties



Part #	Description
DIN-PNL-04W-01	4-Port MAX DIN rail patch panel. black with single opening.* Includes (4) cable ties

Part #	Description
DIN-PNL-RIC-01	RIC adapter DIN rail patch panel, black with a single RIC adapter plate opening. Includes (4) cable ties and (2) fibre management clips



** 1 When using shielded outlets bond other end of link to ground*
2 For use with flat MAX outlets/ modules and hybrid Z-MAX outlets mounted in flat orientation

M12 D-Coded Cable Assemblies

Siemon's M12 D-Coded connector is an industry standard interface for Ethernet and PROFINET industrial networks and meets ISO/IEC 11801 Ed 2.2 and ANSI/TIA Category 5e specifications. Designed for use in industrial automation environments or other harsh environment applications where a compact, robust, reliable connection is needed. Siemon's M12 cable assemblies combine a specially designed Polyurethane (PUR) cable jacket with an overmolded connector to provide an IP67 rating. These robust cord-sets also provide protection from other common industrial elements including EMI, chemicals and mechanical stress.

Available with straight or angled connectors and RJ45 options, the M12 D-Coded cable assemblies are part of Siemon's wide selection of industrial Ethernet cord-sets which are able to satisfy most industrial switch, sensor and control applications.

STANDARDS COMPLIANCE

- ISO/IEC 11801 Ed 2.2 Category 5e
- ANSI/TIA-568-C.2 Category 5e
- UL 1863 and CSA-C22.2 No. 182.4
- IEC61076-2-101

M12 cable assemblies can be configured with a variety of connector types including RJ45, straight and angled

Resistant to dust, vibration and shock, the M12 D-Code is ideal for any industrial networking environment

M12 D-Code

PERFORMANCE SPECIFICATIONS

Cable Attributes	PUR
Low Temperature Flexibility and Brittle Point	Excellent
Tear Resistance	Excellent
Abrasion and Scuff Resistance	Excellent
Tensile Strength and Toughness	Excellent
Ultraviolet and Weather Resistance	Good
Resistance to Acids	Fair
Resistance to Bases	Good
Resistance to Moisture	Excellent
Resistance to Ozone	Good
Resistance to Petro-Chemicals	Fair
Flame and Flame Resistance	Excellent
Zero Halogen	Yes
Flexibility and Flex Life	Excellent
RoHS Compliant and Lead Free	Yes
Dielectric strength and Electrical Performance	Fair

Electrical	
Contact Resistance	10 mΩ
Input to Output Resistance	Contact ≤ 200 mΩ
Min. Dielectric Withstand Voltage	1.4k Volts contact to contact & shield
Insulation Resistance	10 MΩ
Mechanical	
Operating Temperature	-10 to 75°C (14 to 167°F)
Flammability Rating	UL 94 V-0
Green Features	RoHS, Lead Free,
RJ45 Plug Housing Material	Polycarbonate
Contact Materials	30 Microinches Gold Plating or equivalent
Shield	360 Degree
Number of Plug Insertion Cycles	100
Cable Construction	SF/UTP
Cable Wire Size Range	26 AWG 7/34 Stranded Tinned Copper
Cable to Plug Tensile Strength (min)	89N (20 lbf)

Ordering Information:

XD5S(X)(X)(X)(XXX)(X)-U . . . Shielded assembly, PUR jacket, black

Wiring Scheme
Blank = Straight Through
X = Crossover

Connector Side A
M = Straight Male
F = Straight Female
A = Angled Male
B = Male Bulkhead
G = Female Bulkhead

Cord Length
Length must be 3 digits
Example: **003** = 3m
010 = 10ft.

Connector Side B
M = Straight Male
F = Straight Female
A = Angled Male
B = Male Bulkhead
G = Female Bulkhead
S = Straight RJ45
R = Right Angle RJ45
L = Left Angle RJ45
N = No Connector

Unit of Measure
F = Feet
M = Metres

IP RATING

SIEMON'S M12 D-CODE CABLE ASSEMBLIES ARE RATED IP67.

IP Rating Chart			
Solid Protection Against		**Liquid Protection Against**	
0	No Protection	**0**	No Protection
1	Solid objects greater than 50mm (1.96 in)	**1**	Water drops
2	Solid objects greater than 12.5mm (.49 in)	**2**	Water drops at 15° angle
3	Solid objects greater than 2.5mm (.09 in)	**3**	Water spray at 60° angle
4	Solid objects greater than 1mm (.03 in)	**4**	Water splash at any angle
5	Dust and particles	**5**	Water jets at any angle
6	Dust tight, no ingress of dust	**6**	Powerful jets and heavy seas
		7	30 minute submersion at 3 feet
		8	Permanent submersion at 15 feet