



CLIPSAL®
D A T A C O M M S

data

&

**communications
accessories**

technical data

clipsal.com

**Now the complete
end to end solution**



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AUSTRALIA'S MOST FLEXI

data & communication accessories

In just two short years, Clipsal DataComms has surpassed all expectations to become a major player in the data and communications equipment industry.

Clipsal can now provide a complete end to end solution, with products catering to any type or size of installation.

Here is a brief introduction to our many innovative products:

Belden Cables

Clipsal and Belden have recently formed a partnership aimed at enhancing each other's strengths in manufacturing, distribution and service.

Belden has been innovative in producing compounds for insulation and jackets, special armouring capability and shielding expertise that is unmatched anywhere in the world.

Belden has unlocked many secrets to engineer the world's most reliable wire and cable products, and now these are available as part of the Clipsal DataComms Range.



RJ45, PDS or Patch by Exception

Whatever your choice in cabling, Clipsal can provide the solution to suit your needs.

The Clipsal RJ45 solution provides customers with cable management unmatched by other manufacturers. Clipsal provides the neatest, and most importantly, the best performing RJ45 products available.

Clipsal's patch by exception product is the smallest available in the world. Add to this colour coding, labelling and unrivalled mounting systems, and Clipsal is a clear winner in patch by exception.

For those who prefer PDS as a solution, Clipsal's KATT connector system offers some clear advantages. The flexibility to terminate with a range of manufacturer's tools, such as Clipsal, Krone and 110, makes Clipsal the right choice.



ABLE SYSTEMS PROVIDER



Cabinets

With a mix of engineering expertise and listening to customers, Clipsal has developed the Rolls Royce range of wiring cabinets, at prices that are very competitive. Unique benefits include dust filters, brush entries, extension panels and bottom cable entries.

Active Equipment

Clipsal has introduced active equipment to provide a true end to end solution. Of course, the usual Clipsal commitment to reliability and performance is more than evident in these products.

Fibre

Clipsal Fibre is engineered with both end user and installer in mind. Access to connectors and splices make additions, moves and changes

easy for the installer, while simple labels make cable paths simple to identify for the end user. Rear cable glands ensure that cables cannot be moved or interfered with.

Labelling

Clipsal face plates enable labelling for power outlets and data outlets to match. Labelling is compliant with Australian Standards, making the choice even easier.

Conduit

Clipsal has been experts in the manufacture of conduit for many years, including a quality selection of communications conduit.

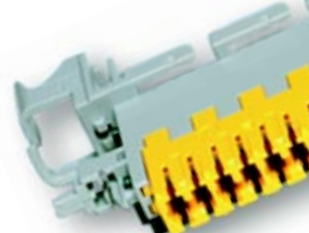
The Clipsal 20 Year Warranty

Clipsal offers guaranteed delivery of total end to end satisfaction and system performance.

Our comprehensive channel warranty ensures that your Clipsal cabling system will support all current and future applications developed to run on TIA structured cabling systems.

Coupled with our Endorsed Installer Program, Clipsal can provide you with complete peace of mind on all of our DataComms products for a total of 20 years.

Clipsal's sales representatives are also able to implement site inspections at any time during the project.



CHAPTER 1

CLIPSAL VOICE CONNECTION SOLUTIONS

As part of the DataComms Range, Clipsal offers a complete selection of voice connection accessories, including:

- Disconnection, Connection and Earthing Modules
- Frames and Mounting Systems
- Enclosures
- Accessories
- Consolidation Points

Modules

The following products are Krone Backmount Frame compatible.



Modules

Catalogue No.	Description
3100VDM10	Disconnect Module, 10 pair. Numbers 1-10 + 10-100 included.
3100VCM10	Connection Module, 10 pair. Numbers 1-10 + 10-100 included.
3100VEM10	TRC Earth Module, Red.

Technical Data

Wire diameter in mm	0.40 - 0.80
Overall diameter in mm (over insulation)	0.70 - 1.50
Number of reterminations: - 0.65 wire - Ø	> 50 x
Number of reterminations: 0.8 wire - Ø	< 50 x
Contact material	Special brass
Contact surface (standard)	3 - 5 µm Silver
Housing material	PBT
Flame protection	UL 94 V0
Insulation resistance	5 x 10 ⁴ MΩ
Volume resistance	<10mΩ
Dielectric strength	2kV _{eff} /50Hz

Accessories

The following accessories add further convenience and safety to the Clipsal Voice Connection Range.



Accessories	
Catalogue No.	Description
3100A230/1	3 Pole Arrester. 230V-10A/10kA.
3100M10/3	Overvoltage Magazine, 10 pair, for 3 pole arrester.
3100LAB1HLDR	Label Holder, 1 Position.
3100LABHLDRH	Label Holder, Hinged, 1 Position.
3100RJA5V	IDC Termination Tool. Terminates Clipsal voice and patch by exception modules with a simple swivel head operation.

Frames

Frames are available for use as a Campus Distributor or Building Distributor (MDF), Floor Distributor (IDF) or Final Distribution Point (FDP).



3100F500MDF



31003U180MDF

Frames				
Catalogue No.	Description	Dimensions		
		Height (mm)	Width (mm)	Depth (mm)
3100F500MDF	500 Pair Frame, accommodates 50 modules and 5 label holders.	1430	215	220
3100F250MDF	250 Pair Frame, accommodates 25 modules and 2 label holders.	650	184	67
3100F100MDF	100 Pair Frame, accommodates 10 modules and 1 label holder.	288	184	67
3100F100MDFC	100 Pair Frame, complete with cover, accommodates 10 modules and 1 label holder. Allows for overvoltage protection magazine to be fitted.	330	200	100
31003U180MDF	150 Pair Recessed Frame accommodates 15 modules and 3 label holders. Can also accommodate 18 modules without labels. 19" rack mountable.	155	482	74

Enclosures

These products can be used as either a Floor Distributor (IDF) or a Final Distribution Point (FDP). Weatherproof Enclosures for use as Campus or Building Distributors (MDF) are also available.

Record cards and keyed locks are included.



Enclosures

Catalogue No.	Description	Dimensions		
		Height (mm)	Width (mm)	Depth (mm)
3100E100IDF	100 Pair Enclosure, accommodates 10 modules.	150	85	60
3100E30IDF	30 Pair Enclosure, accommodates 3 modules.	190	150	80
3100E20IDF	20 Pair Enclosure, accommodates 2 modules.	160	126	65
3100E100MDFW	100 Pair IPx3 rated Weatherproof Enclosure, accommodates 10 modules.	400	255	116
3100E10IDFL	10 pair Enclosure, accommodates 1 module (loaded).	160	85	55

Consolidation Points

Consolidation Points can be used in areas which are not allocated, such as an unoccupied building, or for builder marketing.

These are category 5E rated and can be used without affecting channel integrity.



Consolidation Points

Catalogue No.	Description
DDE20/5CP	20 Pair Enclosure with connector kit. Accepts 0.4 to 0.63 solid or stranded cable.
DDM24MBK2	24 Pair Block with mounting base and 12 KATT 2 blocks.

CLIPSAL DATA CONNECTION SOLUTIONS

As part of the DataComms Range, Clipsal offers a complete selection of data connection accessories, including:

- Patch Panels
- Cable Management
- KATT IDC Patch Panels
- RJ45 Sockets and Outlets
- Multi User Telecommunications Outlets (MUTO)
- Patch Cords
- Termination Tools
- Cable Test Equipment
- Mounting Accessories
- Labelling

Patch Panels

The Clipsal high density Insulation Displacement Contact (IDC) Patch Panel is a versatile and economic means of cross connecting between trunk and horizontal cabling.

The IDC patch panel is available in 16, 24, 32 and 48 channel versions and features channel identification labelling and an optional Rear Cable Management Tray that maintains the Industry Standards approved bend radius required for Category 5E cable plant.

By keeping the signal path length within the patch panel to a minimum, consistent and balanced data transmission is assured.

All Clipsal IDC Patch Panels are manufactured using carefully controlled production methods.

The front of the IDC panel features a channel identification system that allows numbering and/or labelling to suit all needs.

The label inserts are laser-printable perforated sheets that are pre-numbered on the front and blank on the reverse.

A 'Brother P-Touch' or other 13mm label printer can also be used to provide a professional finish to the panel. Just apply the label directly to the channel identification strip.

No special tools are required for termination as contacts are compatible with MOD-TAP, Krone and AT&T IDC termination tools.

Screw packs comprising cage nuts, bolts and nylon washers are included with all panels to make installation even easier.

All panels are Category 5E compliant.



Patch Panels

Catalogue No.	Description
RJ5A1/16PP	16 port, 1RU RJ45 Patch Panel
RJ5A1/24PP	24 port, 1RU RJ45 Patch Panel
RJ5A2/32PP	32 port, 2RU RJ45 Patch Panel
RJ5A2/48PP	48 port, 2RU RJ45 Patch Panel
RJ5A1/16PPQ	16 port, 1RU RJ45 Patch Panel (tool less)

* Available in a 360° shielded version.

Fast Panel

The Clipsal Fast Panel is ideal for the installer who requires a combination of high performance and fast, simple installation.

The 16 port panel features the same channel identification labelling as the KATT IDC Patch Panels. It is supplied unloaded and can be fitted with the Clipsal Fast Mech. (See page 11)

Patch Panels

Catalogue No.	Description
RJ5A1/16PPQ	16 port, 1RU RJ45 Patch Panel (tool less)

Cable Management

Properly designed cable management products must allow installation and maintenance with minimal effort.

Clipsal's unique, rack mounted ring runs create an orderly installation, speed cable dressings during cable installation and, when combined with panels, provide an organised format for system maintenance.

One Position Ring Run

Ring Runs neatly organise patch cords on the front side of patching fields.

The One Position Ring Run has five small black rings on a graphite grey panel for small to medium cable dressing requirements.

Cable Management Panel

The Cable Management Panel provides an innovative means to manage patch cords in a modular jack patching field. A poorly managed

patch field can cause significant problems during the normal day-to-day activity of 'moves and changes' and only deteriorate with time.

The Cable Management Panel solves this problem by providing a simple yet effective means of managing the patch cords.

Clipsal recommends installing a Cable Management Panel between every two rows of modular jack patching fields. This provides a separate pathway for the patch cords to be routed to modular jacks.

The two rows of evenly spaced slots on the Cable Management Panel allow two patch cords to be accommodated in each slot.

This ensures that no outlet in the patching facility is ever obscured by patch cords.

The Cable Management Panel is easily accessible by day-to-day moves and changes and a snap-on plastic cover that provides a neat, uncluttered appearance when the patching facility is static.

Features

- Improve manageability of day-to-day moves and changes.
- Reduce clutter of patch cords.
- Accommodate up to 48, 4 pair UTP patch cords.
- 19 inch rack mount metal panel.
- Complementary to Clipsal Patch Panels, finished in graphite grey powder coat.
- Snap-on plastic cover provides neat appearance and protects cables from damage.
- Compact - only 60mm projection front of rack.
- Patch cords routed to patch panel through 12 slots in the upper and lower sides of panel.
- Provides pathways for cables through two openings in rear of wall panel.
- Supplied with screw packs comprising cage nuts, bolts and nylon washers.



RJ5/1RRP

Cable Management Panel

Catalogue No.	Description
RJ5/1RRP	One Position Ring Run Panel
RJ5/1CMP	One Position Cable Management Panel

Side Rings

Clipsal's 1U Side Ring is fastened on the side of a rack to dress cables vertically.

It is a necessity for proper vertical cable management and designed to mount in the same holes used to attach all modular panels and IDC panels to 19 inch racks.

The 1U Side Ring (Deep) is also used for vertical cable management and provides twice the cable capacity of the standard side ring.



RJ1USSR



RJ1UDSR

Cable Management Side Rings

Catalogue No.	Description
RJ1USSR	1U Plastic Side Ring - Shallow
RJ1UDSR	1U Plastic Side Ring - Deep

Rear Cable Management Tray

Achieving a full Category 5 compliant cable plant is easier than ever when you use Clipsal's Rear Cable Management Tray. This add-on option contains cable bend radius guides and Velcro[®] tie-wraps that ensure your cables do not exceed the TIA-approved bend radius. Each Rear Cable Management Tray services eight channels for a total of three trays per 24 channels.

NOTE: The RJ1URDM24/3 is supplied with nine Velcro[®] strips and the RJ1URCM16/2 is supplied with six Velcro[®] strips.

Features

- Add-on option - upgrade from the basic panel.
- Cable bend radius guides - a safeguard for the customer who wants to ensure a properly installed TIA-approved bend radius.
- Velcro[®] wraps prevent over compression of cables during installation to ensure Category 5 compliance.
- Made of clear Lexan - permits light to pass through in dimly lit areas, for easy cable identification.



RJ1URCM16/2

Cable Management Side Rings

Catalogue No.	Description
RJ1URDM24/3	Rear Cable Management Tray for 24 Port Panel
RJ1URCM16/2	Rear Cable Management Tray for 16 Port Panel

RJ45 Sockets and Outlets

30 Series Sockets

This Clipsal socket has been developed expressly for 30 Series Clipsal products, including the 2000 Series, Standard Range, Metal Plate and C2000 Classic Range. The Clipsal socket is an extremely compact, self-contained unit which simply snaps into a wide range of Clipsal wallplates.

The compact size of the Clipsal socket provides versatility in its application.

Up to six sockets can be mounted onto a single standard wallplate and orientated either vertically or horizontally to suit all regions, and match existing electrical outlets and switchplates.

Additionally, the data socket simply snaps into a range of single aperture bezels and multi aperture architrave plates for limited space applications.

Features

- Fitted with proven KATT IDC connectors.
- Suitable for termination of UTP cable.
- Fits directly into Clipsal wallplates and panel-mount bezels. No need for adaptor collars.
- Terminates building cabling using either MOD-TAP KATT, Krone or AT&T 110 tools.
- Compact design (PCB - 21mm x 21mm x 32mm) enables versatility in installation.



30RJ88SMA5

The Clipsal Shutter-Mech

This shuttered outlet provides a revolutionary alternative to shuttered solutions. The shutter operates automatically, simply retracting when a plug is inserted and returning when the plug is withdrawn.

Features

- World's smallest shuttered RJ45 outlet.
- Universal mounting into all Clipsal wallplates.
- Unique patented shutter protects against dust and accidental damage.
- Category 5E compliant.



30RJ88SMA5SH

The Angled or Shuttered Solution

These outlets are made to suit any standard European style data plate.

For thin wall cavities, the angled plate provides the ideal solution in maintaining Category 5E compliance.

The shutter has a springclip enabling dust free contacts. These outlets suit the Clipsal wallplate, Cat. No. 2032HRJSA.



RJ88SMA5 & RJ88SMA5 ES RJ45

Features

- Category 5E compliant
- Reduced flylead bend radius
- Recessed jack prevents accidental damage

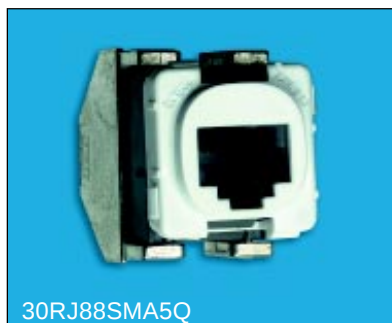
Clipsal Fast Mech

These outlets are recommended for use with the fast panel, and the Clipsal Patch by Exception solution.

They provide the performance required to meet Category 5E compliance, with easy termination.

The Fast Mech is also available in a shuttered version.

(See page 8 for Fast Panel.)



RJ45 Sockets

Catalogue No.	Description
30RJ88SMA5	Voice and Data Socket, Category 5E, 568A, RJ45
RJ88SMA5ES*	RJ45 Shuttered Connector Mechanism
RJ88SMA5AE*	RJ45 Angled Connector Mechanism
30RJ88SMA5Q	Voice and Data Socket, Category 5E, E568A/B, RJ45
30RJ88SMA5SQ	Voice and Data Socket, Cat. 5E, 568A/B, RJ45, Shuttered
30RJ88SMB5SH	RJ45 Shutter Mech. Category 5E 568B
30RJ88SMA5SH	RJ45 Shutter Mech. Category 5E 568A

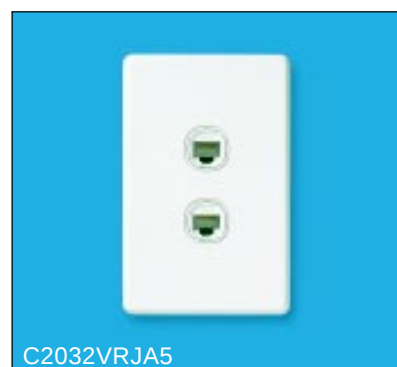
Austel Approval Number: A92/831/0340

*Suitable only in C2032 HRJ5A face plates

30RJ Face Plate Assemblies

Clipsal offers a range of pre-assembled plates with one or two data sockets fitted. Available in Standard Range, 2000 Series and C2000 Classic Ranges.

Supplied in packets of 10 complete with Adaptor Clips.



30RJ Face Plate Assemblies

Catalogue No.	Description
31VRJA5	Single Gang Plate, Standard Range, with one 30RJ88SMA5 fitted.
32VRJA5	Twin Gang Plate, Standard Range, with two 30RJ88SMA5 fitted.
2031VRJA5	Single Gang Plate, 2000 Series, with one 30RJ88SMA5 fitted.
2032VRJA5	Twin Gang Plate, 2000 Series with two 30RJ88SMA5 fitted.
C2031VRJA5	Single Gang Plate, C2000 Classic Series, with one 30RJ88SMA5 fitted.
C2032VRJA5	Twin Gang Plate, C2000 Classic Series, with two 30RJ88SMA5 fitted.

Single and Dual Surface Blocks

The Single and Dual Channel Category 5 IDC modular socket Surface Mount Block is a compact self-contained block for workstation outlet applications. Its compact size allows the outlet to be located in a wide variety of locations including skirting ducting, modular furniture service ducts, walls and partitions.

The block comes complete with screws and double sided tape to suit all fixing applications.

The Surface Block has provision on the top cover for labelling behind a transparent clip-on cover and indent to accommodate an icon label.

The modular jack is currently available in RJ45 jack (8 wire) format in the EIA 568A sequences.

The RJ45 version is Category 5 compliant, ensuring capability to support all of today's high speed LAN applications together with emerging technology applications.

Available in White Electric (WE) and Grey (GY).



SMRJ88A5/1



SMRJ88A5/2

Surface Mount Blocks

Catalogue No.	Description
SMRJ88A5/1	Single Surface Mount Block 568A, Cat. 5, RJ45.
SMRJ88A5/2	Dual Surface Mount Block 568A, Cat. 5, RJ45.

Austel Approval: A95/831/0345

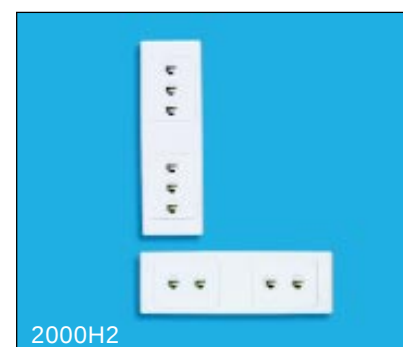
Multi User Telecommunications Outlets (MUTO)

Clipsal provides a range of Muto options which are ideal in situations where a number of terminals are required in the one area.

Floor outlet housings can also be used in desktop applications where up to 12 services are required, and fit all standard Clipsal face plates.



224/1



2000H2

MUTO

Catalogue No.	Description
224/1	Floor Outlet Housing for 2 standard plates. Can be used on desk tops.
2000/2	2000 Series, Two Gang Flush Surround, curved sides. Suits all 2000 Series grids.
2000H2	2000 Series, Horizontal Two Gang Flush Surround, curved sides. Suits all 2000 Series grids.

Patch Cords

Twisted Pair Patch/Line Cords Category 5E

Twisted Pair Line Cords are assemblies of 4 pair cable with modular plugs factory crimped at both ends. They offer a high performance addition to the Structured Cabling System to ensure the best performance of the entire system.

Cable consists of pairs of 24 AWG wire, with construction meeting performance criteria.

Twisted Pair Line Cords are currently available in Grey, Red, Blue, Green, Yellow and Black.



RJ5A8/20PL

UTP Patch Cords

Catalogue No.	Description	Length
RJ5A8/05PL	UTP Patch Cord	0.5m
RJ5A8/10PL	UTP Patch Cord	1.0m
RJ5A8/15PL	UTP Patch Cord	1.5m
RJ5A8/20PL	UTP Patch Cord	2.0m
RJ5A8/30PL	UTP Patch Cord	3.0m
RJ5A8/50PL	UTP Patch Cord	5.0m

DataTwist 350 Patch Cords Category 5E

Using Belden's unique bonded pair technology, these patch cords are made to meet the requirements of today's moving standards and technologies. They are guaranteed to perform without variation for years to come, up to 350MHz.



RJ350A8/10PL

DataTwist Patch Cords

Catalogue No.	Description	Length
RJ350A8/05PL	DataTwist 350 Patchcord	0.5m
RJ350A8/10PL	DataTwist 350 Patchcord	1m
RJ350A8/20PL	DataTwist 350 Patchcord	2m
RJ350A8/30PL	DataTwist 350 Patchcord	3m
RJ350A8/50PL	DataTwist 350 Patchcord	5m

Termination Tools

110 Punch Down Tools

The IDC Punch Down Tool is used for terminating individual conductors onto AT&T 110 and KATT IDC contacts.

The 30RJA5CT is supplied inclusive of a blade.



30RJA5CT



30RJA5CTB

Clipsal Punch Down Tools

Clipsal's IDC Termination Tools are designed to provide a reliable connection. Their 'scissors style' cut-off gives positive wire trimming even on older blocks. They have a low impact force to ease strain and prevent damage to installations.

The 3100RJAV5 Tool has a swivel head, allowing termination of the Clipsal 3100 Series modules.



RJ45KATT



3100RJAV5

Termination Tools

Cat. No.	Description
30RJA5CT	IDC Punch Down Tool with 110 blade
30RJA5CTB	110 Replacement blade
RJA5KATT	IDC Punch Down Tool (low cost)
3100RJAV5	IDC Termination Tool. Will also terminate the Clipsal 3104 & 3100 Series modules, as well as KATT and Krone terminations

Cable Test Equipment

The Clipsal Tester provides instant identification of most common voice and data cabling problems including shorts, opens, reversals, and incorrect polarity.

The master and remote units separate for end-to-end testing of installed cabling. Shorts, opens, reversals, or miswires are easily detected within seconds - the continuously-sequencing LED display immediately alerts you of problems in the cabling system.

Both pieces simply snap and lock together when not in use, making it easy to carry and store.

Designed to fit neatly into a toolbox or pocket, the tester has a convenient 'ring' feature for attaching to a belt or frame. A durable nylon carry case ensures protection of the device when not in use.

Features

- Innovative 3-in-1 design features modular sockets for testing USOC, 568A/B, and RS423 (MMJ) cabling systems.
- Accurately verifies the continuity and sequence of 1, 2, 3 and 4 pair voice and data channels.
- Continuously-sequencing LED display provides a diagnostic readout that immediately detects shorts, opens, reversals, and miswires at a glance.
- Simply snap and lock master and remote units together when not in use.
- Ergonomically designed hand-held unit is lightweight, rugged and impact resistant.
- 9 volt alkaline battery included.
- Adaptors are available for IBM and AT&T cabling systems.



5ABLTC

Cable Test Equipment

Catalogue No.	Description
5ABLTC	Tester with 9 volt battery and carry case.

Caution: Do Not Use on Live Circuits

Mounting Accessories

Clipsal supplies pre-packed bags of 100 cage nuts, and 100 sets of bolts with nylon washers.

Mounting Accessories

Catalogue No.	Description
RJ5CN/100	Number 8 Cage Nut (100 per pack)
RJ5SW/100	M6 x 0.5" Screw with nylon washer (100 per pack)

Clear Identification of services is an essential part of a structured cabling solution. It saves time and money down the track when additions, moves and changes are made.

The Clipsal Label Printing Package is designed for the C2000 Classic Series labelling series and 30PID labels. It is free as part of the Alfred Trade Product Guide on CD-ROM, and enables contractors and customers to quickly and easily print their own labels. The CD contains an extensive tutorial, which fully explains how to print labels.

The Clipsal Label Printing Package is Windows based. It requires very simple data entry, and allows for multiples of consecutive labels. Text colour selection is also available, depending on the suitability of the printer. The program provides a test and setting adjustment facility which allows for different brands of printers.

The Clipsal Label Printer ensures perfect labels every time when printing on the special C2000 or 30PID label sheets.



Clipsal Labelling	
Catalogue No.	Description
30PIDA4L	A4 Label sheet to suit 30PID circuit identifier for 30 Series apertures
C2000A4L	A4 Label sheet to suit C2000 ID label face plates.

C2000 Series Labelling

C2000 Classic Series face plates are available with labelling ID windows, in either horizontal or vertical alignment, so that circuits can be easily identified. The label clear window cover simply clips into the grid.



C2000 Series ID Face Plates

Face Plate Outlets	Horizontal ID	Vertical ID
1 Gang	C2031HI	C2031VI
2 Gang	C2032HI	C2032VI
3 Gang	C2033HI	C2033VI
4 Gang	C2034HI	C2034VI
5 Gang	C2035HI	C2035VI
6 Gang	C2036HI	C2036VI

30 Mech Labelling

The label simply sticks to the front clear window of the 30PID mech.



PATCH BY EXCEPTION
CAT. 5E VOICE AND DATA
CONNECTION SOLUTION

Patch by Exception is a jumpered Block cabling solution with the flexibility of overriding jumpers with the simple use of a patch cord.

This effectively provides the simplicity of an RJ solution without the need for patch management, eliminating messy wiring.

Clipsal 3104 Series Patch by Exception modules guarantee excellent high output transmission performance.

The short contacts enable considerable reduction in crosstalk and attenuation, providing superior headroom required to support existing and future technologies.

- Modules.
- Frames and Covers.
- Patch and Test Cords.
- Accessories.

Features

- World's highest density jumpered solution.
- Colour coded for easy identification of services.

- Jumpering and patching facility.
- Neat and clean solution without messy patchcords.
- Disconnect facility for protection of services.
- Overvoltage protection available.
- Single pair administration.
- Controlled access to services.
- Test access through disconnect facility.
- Compatible with multistrand or solid core cables.
- Simpler record management.
- Shielded solution available.

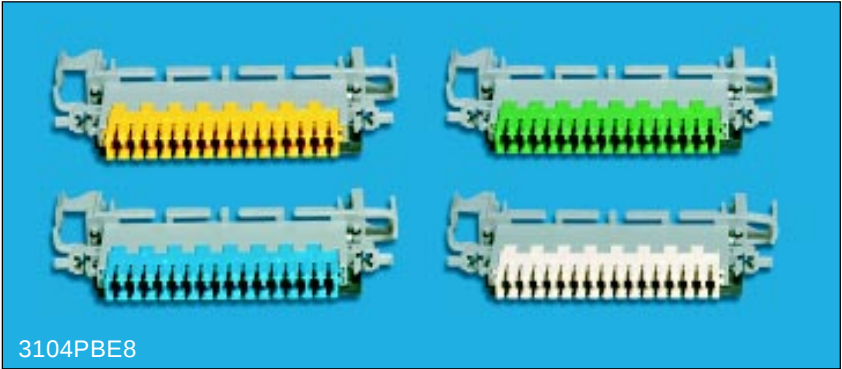
Modules

These coloured modules can be used to distinguish between services. These services can be as follows:

- Yellow** Active Equipment (Hubs)
- Green** Interfloor cabling (Backbone)
- Blue** For Horizontal Distribution (Communication Outlets)
- Ivory** Voice Services

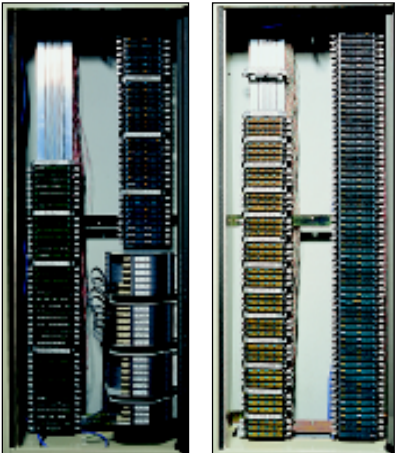
Dimensions

- Height: 16mm
- Width: 126mm
- Depth 67mm



Patch by Exception Modules	
Catalogue No.	Description
3104PBE8, YL	8 pair Module, yellow.
3104PBE8, BU	8 pair Module, blue.
3104PBE8, GR	8 pair Module, green.
3104PBE8, IV	8 pair Module, ivory.

These photos show a typical installation.



Wall Mount Frames, Rack Mount Frames and Covers

These frames accommodate the Clipsal 3104 Series modules, and are designed for all communication cabling distribution.

Options include Wall mount, Rack mount, or Rack mount with cover. Cable Management is included.



3104PBE100F



3104PBE2/41F



3104PBE82C



3104PBE10F



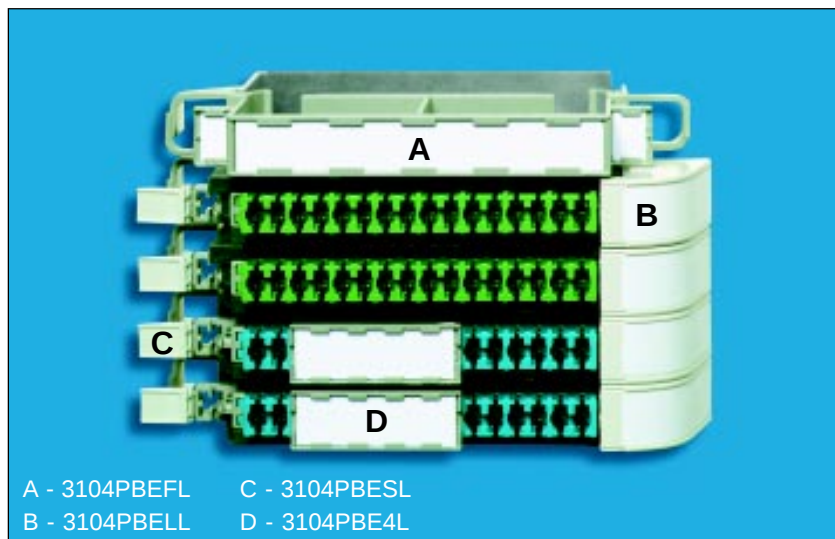
3104PBE24R4U

Product Range

Catalogue No.	Description	Height (mm)	Width (mm)	Depth (mm)
3104PBE100F	100 Way Frame allows for 100 modules. This frame is unistrut mountable with easy access from the rear.	1060	450	115
3104PBE2/65F	2 x 65 Way Frame. Allows for 130 modules. This frame is wall mounted with optional cover (Cat. No. 3104PBE130C).			
3104PBE130C	Cover to suit 3104PBE2/65F. 2 x 65 way frame.			
3104PBE2/41F	2 x 41 Way Frame. Allows for 82 modules. This frame is wall mounted. Cover (Cat. No. 3104PBE82C).	660	450	115
3104PBE82C	Cover to suit 3104PBE2/41F, 2 x 41 way frame.	680	450	300
3104PBE2/28F	2 x 28 Way Frame, allows for 56 modules. This frame is wall mounted. Cover (Cat. No. 3104PBE56C).	460	450	115
3104PBE56C	Cover to suit 3104PBE2/28F. 2 x 28 way frame.	480	450	300
3104PBE10F	10 Way Frame, allows for 10 modules with cover included. Can be used as a consolidation point.	210	175	121
3104PBE24R4U	4RU Rack Mount Frame, allows for 24 modules. Equipped with a cable management cover for neat, tidy cabling.			

Accessories

- Termination Tool
- Label Holders
- Disconnect Plug
- Marking Caps
- Overvoltage Protection

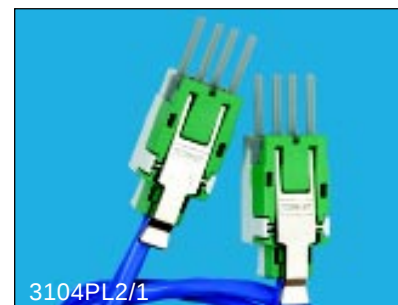


Accessories

Catalogue No.	Description
3100RJA5V	Patch by Exception 3104 Module IDC Termination Tool. This tool has a swivel head to also allow termination of the Clipsal Series modules.
3104M8/3	Overvoltage Arrester Magazine, 8 pair, 3 pole. For use with Clipsal 3104A250/1 gas arresters.
3104A250/1	3 pole, 250 Volt Gas Arrester. Suits 3104M8/3 overvoltage magazine.
3104PBEFL	Frame Label Holder. Engages one module position. Facility for labelling either side. (Set of 5)
3104PBELL	Lateral Label provides protection to jumper wire. (Set of 10)
3104PBESL	Side Label. (Set of 100)
3104PBE4L	4 Pair Label for identification of 4 pair services. Can be used to prevent accidental access to critical ports. (Set of 10)
3104PBEMC	Marking Caps. Available in yellow, blue and green for traceability of jumpers without the need for record books.
3104PBEDP	Disconnection Plug.

Patch Cords and Test Cords

The Clipsal 3104 Series Patch and Test Cords allow for isolation of pairs for voice or data transmission, and also isolating in coming and out going pairs for test purposes.



Patch and Test Cords	
Catalogue No.	Description
3104PL1/1	1 Pair Patch Lead, 1 metre
3104PL1/2	1 Pair Patch Lead, 2 metres
3104PL1/3	1 Pair Patch Lead, 3 metres
3104PL1/4	1 Pair Patch Lead, 4 metres
3104PL1/5	1 Pair Patch Lead, 5 metres
3104PL2/1	2 Pair Patch Lead, 1 metre
3104PL2/2	2 Pair Patch Lead, 2 metres
3104PL2/3	2 Pair Patch Lead, 3 metres
3104PL2/4	2 Pair Patch Lead, 4 metres
3104PL2/5	2 Pair Patch Lead, 5 metres
3104PL4/1	4 Pair Patch Lead, 1 metre
3104PL4/2	4 Pair Patch Lead, 2 metres
3104PL4/3	4 Pair Patch Lead, 3 metres
3104PL4/4	4 Pair Patch Lead, 4 metres
3104PL4/5	4 Pair Patch Lead, 5 metres
3104PL2RJ1	2 Pair Patch Lead, RJ45, 1 metre
3104PL2RJ2	2 Pair Patch Lead, RJ45, 2 metres
3104PL2RJ3	2 Pair Patch Lead, RJ45, 3 metres
3104PL2RJ4	2 Pair Patch Lead, RJ45, 4 metres
3104PL2RJ5	2 Pair Patch Lead, RJ45, 5 metres
3104PL4RJ1	4 Pair Patch Lead, RJ45, 1 metre
3104PL4RJ2	4 Pair Patch Lead, RJ45, 2 metres
3104PL4RJ3	4 Pair Patch Lead, RJ45, 3 metres
3104PL4RJ4	4 Pair Patch Lead, RJ45, 4 metres
3104PL4RJ5	4 Pair Patch Lead, RJ45, 5 metres

PREMISES DISTRIBUTION SYSTEM

The Clipsal Premises Distribution System (PDS) offers a quality, high density block-based system for structured cabling. Clipsal PDS is ideal for both voice and high speed data applications.

Rack Mount PDS Panels

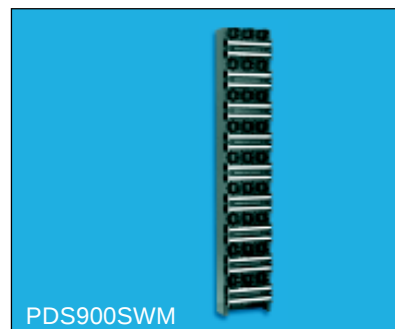
The Rack Mount PDS Panel allows the user to combine a block based system with active equipment on a 19" rack. Clipsal PDS Panels, available in 3U and 4U versions, are 200 pair patch panels with integral ring runs.

The block-based format affords individual pair management, which is not possible with modular patching. Cross connection can be defined as either 1, 2 or 4 pair channels at the installation stage.

These panels are a low cost, convenient alternative to rack mounted cross connection.



PDS200RM3UK4



PDS900SWM

Rack Mount PDS Panels

Catalogue No.	Description
PDS200RM3UK4	PDS Frame, rack mount, 3U, 200pr, w/48
PDS200RM3UK2	PDS Frame, rack mount, 3U, 200pr, w/96
PDS200RM3UK5	PDS Frame, rack mount, 3U, 200pr, w/40
PDS200RM4UK4	PDS Frame, rack mount, 4U, 200pr, w/48
PDS200RM4UK2	PDS Frame, rack mount, 4U, 200pr, w/96
PDS200RM4UK5	PDS Frame, rack mount, 4U, 200pr, w/40

Clipsal PDS Wall Mount Frame

The Clipsal PDS wall mount frame provides a complete communications cabling facility in a compact unit.

Fabricated from steel, the frame is available in 300 and 900 pair versions, and mounts easily onto a wall to suit Building or Floor Distributor applications.

The frames have pre-drilled holes for fixing all PDS equipment.

Screws to fix these items are included in the kits to make installation easier and faster.

The wallmount frames are available in kit form or as individual items to suit all applications. The frame accommodates 2, 4 or 5 pair KATT IDC connectors, catering for all cable termination requirements for both voice cabling and Category 5 high speed data cabling.

Clipsal Wall Mount PDS Frames

Catalogue No.	Description
PDS300DWM	PDS Kit, 300 pair, unloaded, shallow.
PDS300DWM	PDS Kit, 300 pair, unloaded, deep.
PDS300SWMK45	PDS Kit, 300 pair, shallow with k4 + k5 blocks.
PDS300DWMK45	PDS Kit, 300 pair, deep with k4 + k5 blocks.
PDS900SWM	PDS Kit, 900 pair, unloaded, shallow.
PDS900DWM	PDS Kit, 900 pair, unloaded, deep.
PDS900SWMK45	PDS Kit, 900 pair, shallow with k4 + k5 blocks.
PDS900DWMK45	PDS Kit, 900 pair, deep with k4 + k5 blocks.

PDS Patch Leads

PDS Patch Leads

Catalogue No.	Description
PDS58/10PL	PDS Patch Lead 4pr, Cat. 5, 1 metre (10 Per Pack.)
PDS58/20PL	PDS Patch Lead 4pr, Cat. 5, 2 metre (10 Per Pack.)
PDSRJ5B810PL	PDS-RJ45 Patch Lead, Cat. 5, 1m, 568B (10 Per Pack.)
PDSRJ5B820PL	PDS-RJ45 Patch Lead, Cat. 5, 2m, 568B (10 Per Pack.)

FIBRE OPTIC PRODUCTS

Fibre Optic is the medium forming the backbone in medium to large systems. It can be spread amongst several floors in a large building or over several buildings, with all links running to a single distribution point, the Campus Distributor.

Fibre Optics have a high data rate capability, are immune to RFI/EMR effects and provide a high quality secure transmission service.

- Fibre Management Enclosures
- Cable Entry Glands
- Splice Tray Kits
- Splitter Kits
- Patch Cords
- Pigtails
- Connectors
- Adaptors

Fibre Management Enclosures

The versatile fibre management products are capable of wall mounting for isolated applications or rack mounting for integrated applications.

The enclosure is a completely self-contained unit providing full fibre management and termination.

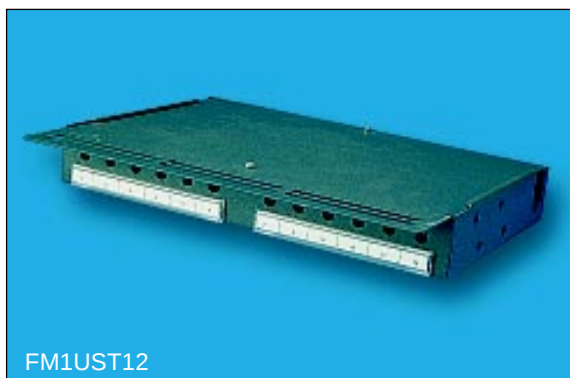
It accommodates up to 12 fibres on ST, or SC type connectors. The 20mm cable entry slots enable quick and easy installation of cable.

A removable cover is designed to enclose the unit, whilst protecting the connectors at the front of the panel.

The rugged all-steel construction of the enclosure makes it suitable for direct wall mounting in many industrial applications, while the Rack Mount Ears (optional), enable rack mounting in flush or recessed positions.

ST and SC adaptors are available separately to load into the panel.

All Enclosures are singlemode and multimode compatible.



FM1UST12

Fibre Management Enclosures

Catalogue No.	Description
FM1UST12	Fibre Management Enclosure, ST style, 12 way, unloaded.
FM1USC12	Fibre Management Enclosure, SC style, 12 way, unloaded.
FM1URME12	Fibre Management Enclosure, 12 way, rack mount ears.
FM1UST24	Fibre Management Enclosure, ST style, 24 way, unloaded.
FM1USC24	Fibre Management Enclosure, SC style, 24 way, unloaded.
FM1URME24	Fibre Management Enclosure, 24 way, rack mount ears.

Rack Mount 24 Port Enclosure

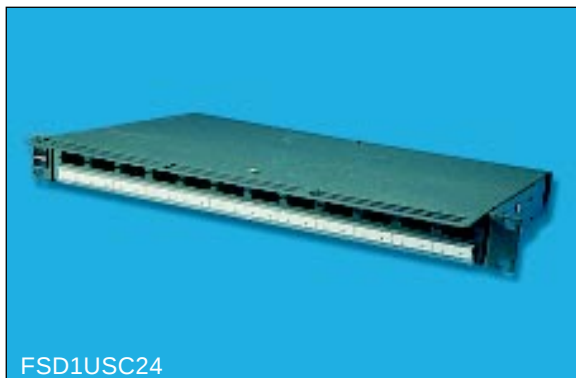
The Rack Mount 24 Port Enclosure is a fully enclosed, self contained optical fibre termination facility. Up to 24 fibres can be terminated in the enclosure which provides complete management of the optical fibre to ensure that it is securely installed and maintained.

Designed specifically to provide flexibility, the enclosure can accommodate direct termination or splice connection of fibres, and makes installation and termination on site easier with its slide-out drawer mechanism.

All of the popular splice trays can be mounted into the enclosure to further enhance its flexibility. The enclosure is available with interchangeable face plates which accommodate through adaptors for all of the major connector styles.

Features

- Fully enclosed complete optical fibre termination facility.
- Compact 1U Rack Mount enclosure provides full inter-connection, termination and management for optical fibre.
- 24 fibre capacity.
- Slide out drawer for easy access to termination facilities with innovative locking mechanism.
- Interchangeable face plates for ST, SC, FDDI*, FC*, ESCON* and SMA* through adaptor (*available from MOLEX).
- Adjustable rack mount ears for flush or recessed rack mounting.
- Mounting facilities for all popular splice trays.
- Built-in labelling facility which accommodates pointed cards or 13mm labelling systems (eg Brother, Casio).
- Rugged steel construction finished in attractive Graphite Grey finish to complement all other Clipsal rack mount equipment.
- Built-in cable strain relief post.



FSD1USC24

Rack Mount Enclosures

Catalogue No.	Description
FSD1UST24	Fibre Management Enclosure, with 24 port ST face plate, unloaded.
FSD1USC24	Fibre Management Enclosure, with 24 port SC face plate, unloaded.

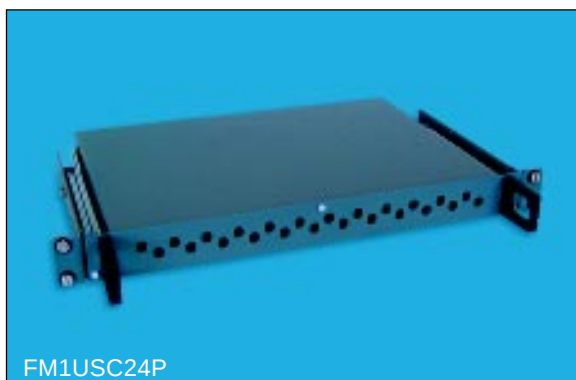
Fibre Optic Professional Series

The Clipsal Professional Series panels are engineered to meet the needs of the Private Network and also the Carrier.

All Enclosures are Single and Multimode compatible.

Features

- Complete with splice tray.
- Cable management incorporated.
- Cable entry glands ordered separately.



Professional Series Enclosures	
Cat. No.	Description
FM1USC24P	Fibre Management Enclosure with telescopic tray, 24 port SC
FM1UST24P	Fibre Management Enclosure with telescopic tray, 24 port ST
FM2USC24P	Fibre Management Enclosure with cover and hinged tray, 24 port SC
FM2UST24P	Fibre Management Enclosure with cover and hinged tray, 24 port ST

Cable Entry Glands

To suit Professional Series Panels.

Cable Entry Glands	
Catalogue No.	Description
FM1CG6/8	Cable Entry Gland, 6-8mm, o.d.
FM1CG8/12	Cable Entry Gland, 8-12mm, o.d.
FM1CG10/14	Cable Entry Gland, 10-14mm, o.d.
FM1CG12/16	Cable Entry Gland, 12-16mm, o.d.
FM1CG15/21	Cable Entry Gland, 15-21mm, o.d.

Splice Tray Kits

Clipsal offers a range of Splice Tray Kits to mechanically house and support terminations between fibre backbone or feed in fibre optic cable.



12FTK1

Splice Tray Kits

Cat. No.	Description
12FTK1	12 Fibre Splice Tray Kit
24FTK2	24 Fibre Splice Tray Kit

Optical Fibre Splitter Kits for Loose Tube Cable

Clipsal's new Optical Fibre Splitter Kits help save you money by cutting hours off splicing time and enable the direct termination of 4, 6, 8 or 12 fibre per tube cable.

The kits are designed to work with any manufacturer's cable and any industry standard connector. No special tools and no epoxy or shrink tube are required for assembly. Kits are colour-coded for easy recognition.



3102FSK6

Splitter Kits

Catalogue No.	Description
3102FSK4	Optical Fibre Splitter Kit suitable for 4 fibre per tube cable.
3102FSK6	Optical Fibre Splitter Kit suitable for 6 fibre per tube cable.
3102FSK8	Optical Fibre Splitter Kit suitable for 8 fibre per tube cable.
3102FSK12	Optical Fibre Splitter Kit suitable for 12 fibre per tube cable.

Optical Fibre Patch Cords (FDDI Grade)

Clipsal offers Patch Cords in a wide variety of configurations including simplex and duplex, in several standard lengths. Cords are available with SC, ST or combinations of connectors.



2SC20

Fibre Patch Cords - Multimode

Cat. No.	Description
2ST10	ST-ST Duplex 1.0m
2ST15	ST-ST Duplex 1.5m
2ST20	ST-ST Duplex 2.0m
2ST30	ST-ST Duplex 3.0m
2ST50	ST-ST Duplex 5.0m
2ST100	ST-ST Duplex 10.0m
2SC10	SC-SC Duplex 1.0m
2SC15	SC-SC Duplex 1.5m
2SC20	SC-SC Duplex 2.0m
2SC30	SC-SC Duplex 3.0m
2SC50	SC-SC Duplex 5.0m
2SC100	SC-SC Duplex 10.0m
2SCT10	SC-ST Duplex 1.0m
2SCT15	SC-ST Duplex 1.5m
2SCT20	SC-ST Duplex 2.0m
2SCT30	SC-ST Duplex 3.0m
2SCT50	SC-ST Duplex 5.0m
2SCT100	SC-ST Duplex 10.0m

Fibre Pigtails

Clipsal offers a range of Pigtail Patch Cords with either SC or ST termination on one end, in several standard lengths.

Complete with fusion protector.



1ST10

Fibre Pigtails - Multimode

Catalogue No.	Description
1ST10	ST, 1.0m.
1ST15	ST, 1.5m.
1ST20	ST, 2.0m.
1SC10	SC, 1.0m.
1SC15	SC, 1.5m.
1SC20	SC, 2.0m.

Fibre Optic Connectors

Clipsal offers a range of high quality multimode connectors.

SC connectors are available in metal body or plastic case with zirconia ceramic ferrules. SC duplex adaptors are also colour-coded per TIA/EIA 568A specifications.



FMMST/1



FMMST/2



FMMST3

Fibre Connectors - Multimode

Catalogue No.	Description
FMMST/1	ST Connector, polymeric nut, MM, 128µm zirconia PC & ferrule, long boot, screw nut.
FMMST/2	ST Connector, MM, zirconia, PC & ferrule polymer coupling nut, short boot crimp.
FMMST/3	ST Connector, polymeric nut, MM, 128µm zirconia PC & ferrule, 900µm buffered fibre.
FMMSC/1	SC Connector, MM.

Multimode Adaptors

Clipsal offers a range of high quality multimode adaptors, for both SC and ST applications.



FAST/1



FASC/1



FASCT/1

Adaptors - Multimode

Catalogue No.	Description
FAST/1	ST Adaptor, polymeric body and alignment sleeve.
FASC/1	SC/SC Duplex Adaptor, blue, snap-in mount phosphor bronze alignment sleeve.
FASCT/1	SC/ST Duplex Adaptor, beige flange mount, phosphor bronze alignment sleeve.

ACTIVE EQUIPMENT

Clipsal's range of active equipment brings a world of information to the desktop which is both affordable and accessible. It gives you a fast track networking solution which you can depend upon.

- Ethernet Transceivers.
- Media Converter.
- Ethernet Hubs.
- Ethernet Switch.

Ethernet Transceivers

Features

- AUI interface between connectors for linking host devices to BNC, RJ45 or FOIRL connectors.
- LED status indicators for jabber, collision, transmit, receive and link/receive.
- Signal Quality Error (SQE) setting for collision detection.
- EMC compliant.



95T10STA



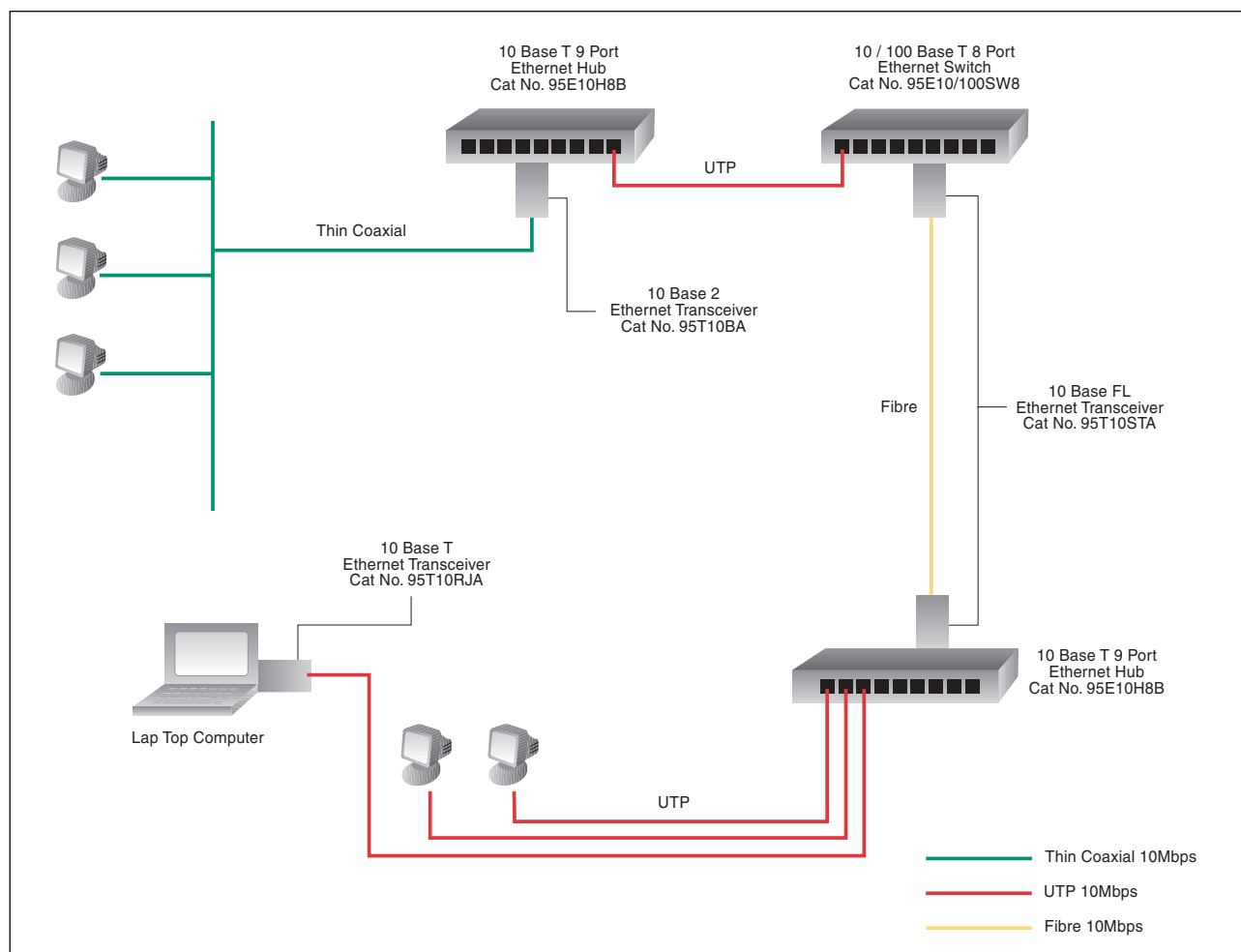
95T10BA



95T10RJA

Ethernet Transceivers

Catalogue No.	Description
95T10BA	10 Base 2 Ethernet Transceiver
95T10RJA	10 Base T Ethernet Transceiver
95T10STA	10 Base FL Ethernet Transceiver



Media Converter

Features

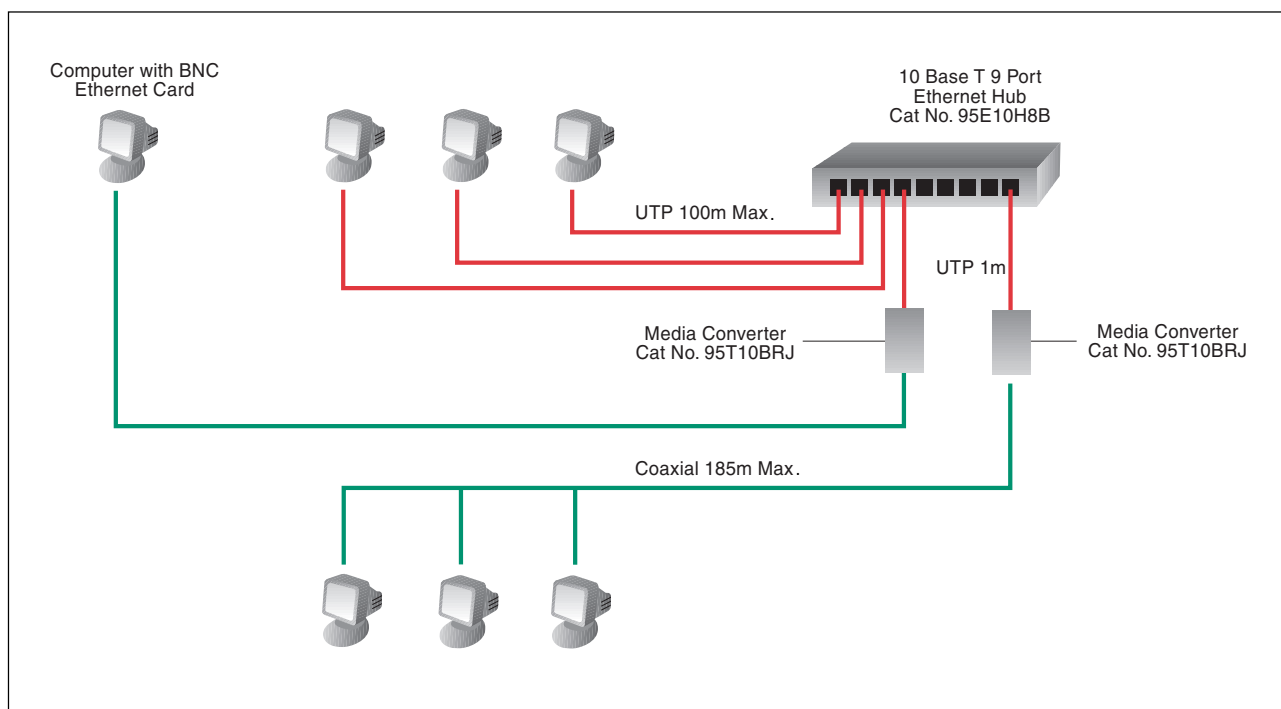
- Low cost, easy to install solution to a mixed media environment.
- Extended distances achievable with use of thin coaxial cable.
- LED indicators for receive, jabber and collision on BNC port.
- LED indicators for collision, link and power/receive on RJ45 port.



95T10BRJ

Media Converter

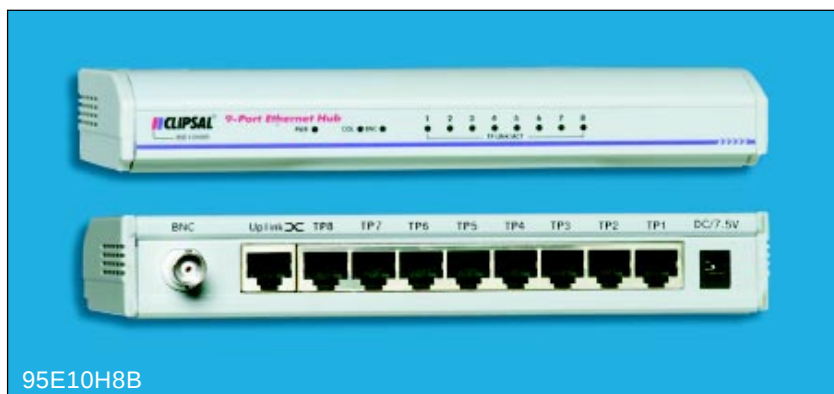
Catalogue No.	Description
95T10BRJ	Media Converter



Ethernet Hubs

Features

- Compact and lightweight design.
- Automatic partitioning function of each port to isolate network failure.
- LED indicators for each port for network link and active diagnosis.
- EMC compliant.



95E10H8B

Ethernet Hubs

Catalogue No.	Description
95E10H4B	5 Port Ethernet Hub
95E10H8B	9 Port Ethernet Hub

10 Base T Ethernet Hubs

Features

- BNC & AUI ports built in to each model.
- Automatic partitioning function for each port to isolate network failure.
- Front panel diagnosis LEDs.
- Easy cascading via uplink port to switch or another hub.
- 19 inch rack mountable.



95E10H16BA

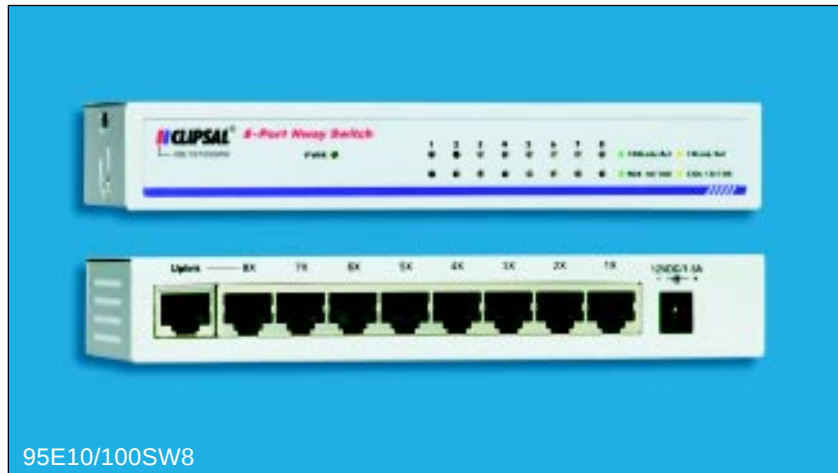
10 Base T Ethernet Hubs

Catalogue No.	Description
95E10H16BA	16 Port 10 Base T Ethernet Hub
95E10H24BA	24 Port 10 Base T Ethernet Hub

8 Port Ethernet/Fast Ethernet Unmanaged Switch

Features

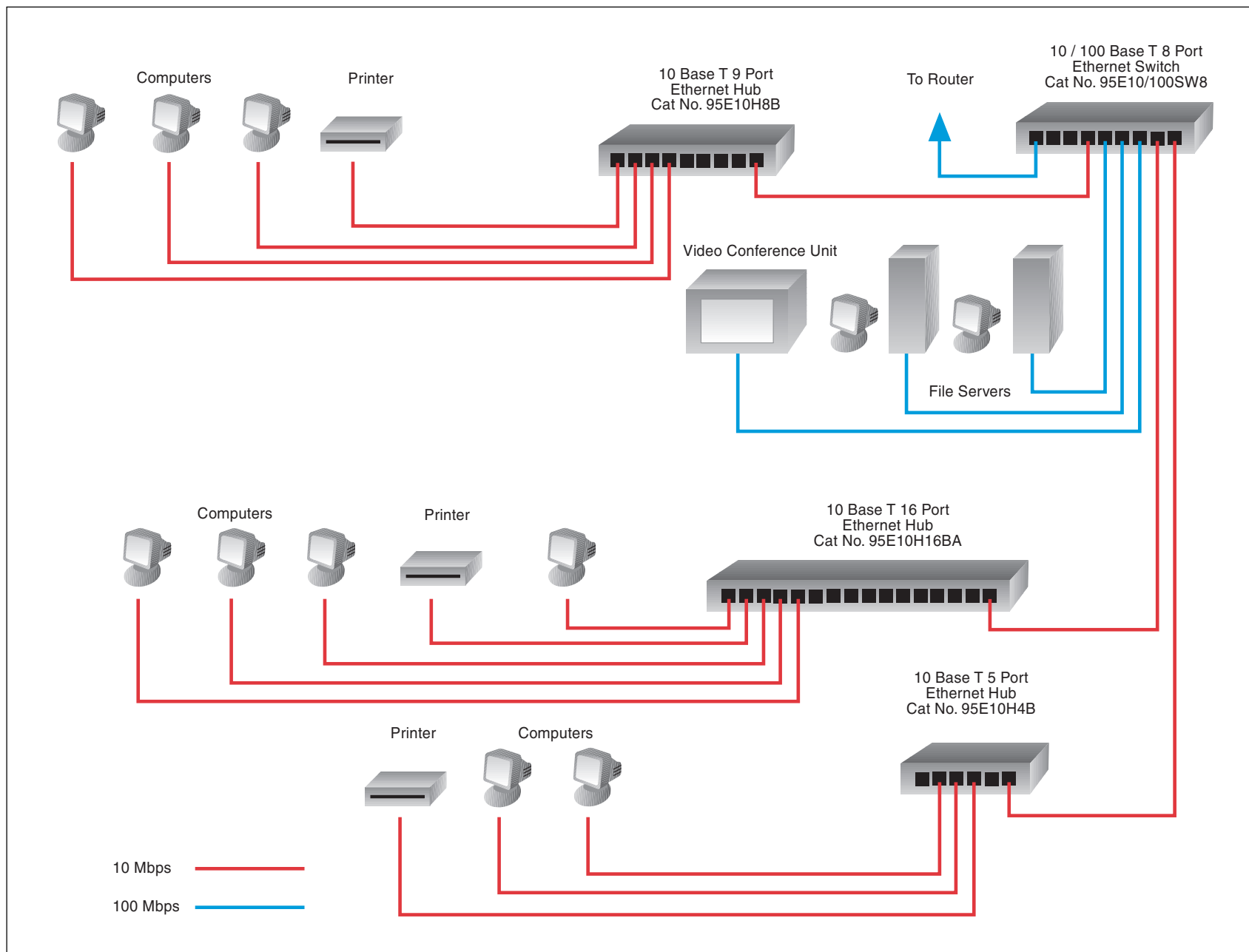
- 8 way 10/100MBPS ports.
- Flexible and easy to use.
- Full and half duplex operation.
- 10/100 Mbps auto negotiation sensing on each port.
- EMC compliant.



95E10/100SW8

Unmanaged Switch

Catalogue No.	Description
95E10/100SW8	8 Port Ethernet/Fast Ethernet, unmanaged switch



CLIPSAL BY BELDEN CABLES

Telephone Cables

Jumper Wire

Construction

2 wires 0.5 plain copper conductor, red and white, PVC insulated, twisted jumper wire.

Jumper Wires					
Catalogue No.	No. of Pairs	Conductor Size		Reel Length (m)	Approximate Overall Diameter (mm)
		(mm)	(AWG)		
TJZ790AA717RW5	1	0.5	24	500	1.84
TJZ790AA717RW2	1	0.5	24	250	1.84

Electrical Characteristics	
Conductor Resistance (max.)	Insulation Resistance (min.)
94.5 Ohm/km at 20°C	1000 MΩ/km

Internal Telephone Cables

Belden Internal Telephone Cable is for use in networks within telephone exchanges, commercial switchboards and interconnecting wiring systems. It is also suitable for some data applications.



Construction

24 gauge plain annealed copper wire, PVC insulated twisted pair or 1 quad, PVC sheath.

An optional screen of aluminium/ polyester tape is available on request.

Internal Telephone Cable						
Catalogue No.	No. of Pairs	Conductor Size		Reel Length (m)	Approximate Overall Diameter (mm)	Cap. Unbalanced Pair At pF/500m
		(mm)	(AWG)			
TLC590DA001	1 Quad (4 Wires)	0.5	24	305	3.7	1000
TLC590D5001	1 Quad (4 Wires)	0.5	24	500	3.7	1000
TLC590DA003	3	0.5	24	305	4.9	300
TJC590AA005	5	0.5	24	200	6.1	300
TJC590AA006	6	0.5	24	200	7.1	300
TJC590AA010	10	0.5	24	200	8.4	300
TJC590AA015	15	0.5	24	200	9.7	300
TJC590AA020	20	0.5	24	200	11.0	300
TJC590AA025	25	0.5	24	200	12.1	300
TJC590AA035	35	0.5	24	200	13.9	300
TJC590AA050	50	0.5	24	200	16.9	300
TJC590AA100	100	0.5	24	200	22.8	300

Colour Chart for Internal Telephone Cable

Cables 5-100 Pairs		
Pair	Wire 1	Wire 2
1	White	Blue
2	White	Orange
3	White	Green
4	White	Brown
5	White	Grey
6	White	Blue-White
7	White	Blue-Orange
8	White	Blue-Green
9	White	Blue-Brown
10	White	Blue-Grey
11	White	Orange-White
12	White	Orange-Green
13	White	Orange-Brown
14	White	Orange-Grey
15	White	Green-White
16	White	Green-Brown
17	White	Green-Grey
18	White	Brown-White
19	White	Brown-Grey
20	White	Grey-White

Note: The colour-code repeats for cables with more than 20 elements, except that wire 1 in each succeeding group of 20 elements has the following colour:

- For numbers 21-40 Yellow
- For numbers 41-60 Black
- For numbers 61-80 Violet
- For numbers 81-100 Red

Quad Cable			
Wire 1	Wire 2	Wire 3	Wire 4
White	Blue	Red	Black

3 Pair Cable		
Pair	Wire 1	Wire 2
1	White	Blue
2	Red	Black
3	Orange	Green

Jelly Filled External Telephone Cable

Belden External Jelly Filled Telephone Cable is an external distribution cable that can be directly buried or installed in conduit/piping.

It is particularly suited where security against moisture ingress is required.

Construction

Plain annealed copper wire cellular polyethylene insulated twisted unit pair, high temperature jelly compound filled, paper tape, wrap, polyethylene sheath. Optional nylon jacket.



Jelly Filled External Telephone Cable

Catalogue No.	No. of Pairs	Conductor Size		Reel Length (m)	Approximate Overall Diameter (mm)	Nom. Sheath Thickness (mm)
		(mm)	(AWG)			
TDP794FP006	6	0.40	26	500	6.7	1.15
TDP794FP010	10	0.40	26	500	8.4	1.15
TDP794FP020	20	0.40	26	500	10.5	1.15
TDP794FP030	30	0.40	26	500	12.2	1.15
TDP794FP050	50	0.40	26	500	14.8	1.15
TDP794FP100	100	0.40	26	500	20.0	1.35
TBP796FP002	2	0.64	22	500	8.0	1.15
TDP796FP006	6	0.64	22	500	9.4	1.15
TDP796FP010	10	0.64	22	500	11.2	1.15
TDP796FP020	20	0.64	22	500	14.6	1.15
TDP796FP030	30	0.64	22	500	17.1	1.15

Jelly Filled External Telephone Cable - Polyethylene Sheath with Nylon Jacket

Catalogue No.	No. of Pairs	Conductor Size		Reel Length (m)	Approximate Overall Diameter (mm)	Nom. Sheath Thickness (mm)
		(mm)	(AWG)			
TDP794FN010	10	0.40	26	500	9.4	1.15
TDP794FN020	20	0.40	26	500	11.5	1.15
TDP794FN030	30	0.40	26	500	13.2	1.15
TDP794FN050	50	0.40	26	500	15.8	1.35
TDP794FN100	100	0.40	26	500	21.0	1.86
TBP796FN002	2	0.64	22	500	8.1	1.15
TDP796FN006	6	0.64	22	500	10.4	1.15
TDP796FN010	10	0.64	22	500	12.2	1.15
TDP796FN020	20	0.64	22	500	15.6	1.15
TDP796FN030	30	0.64	22	500	18.1	1.45
TDP796FN050	50	0.64	22	500	22.6	1.65
TDP796FN100	100	0.64	22	500	30.4	2.15

Reel length - Other sizes available on application.

Jelly Filled/Moisture Barrier External Telephone Cable

Belden External Jelly Filled/Moisture Barrier Telephone Cable is an external distribution cable that can be directly buried or installed in conduit/piping.

It is particularly suited where very high security against moisture ingress is required.

Construction

Plain annealed copper wire, cellular polyethylene insulated, twisted unit pair, high temperature petroleum jelly compound filled, plastic core wrap, longitudinally applied polyethylene coated aluminium laminate moisture barrier, bonded to the polyethylene sheath.

Optional nylon jacket.



Jelly Filled/Moisture Barrier External Telephone Cable

Catalogue No.	No. of Pairs	Conductor Size		Reel Length (m)	Approximate Overall Diameter (mm)	Nom. Sheath Thickness (mm)
		(mm)	(AWG)			
TDB796FP006	6	0.64	22	500	9.7	1.15
TDB796FP010	10	0.64	22	500	11.5	1.15
TDB796FP020	20	0.64	22	500	14.6	1.15
TDB796FP030	30	0.64	22	500	17.4	1.15
TDB796FP050	50	0.64	22	500	21.9	1.35
TDB796FP100	100	0.64	22	500	29.7	1.55

Jelly Filled/Moisture Barrier External Telephone Cable - Polyethylene Sheath with Nylon Jacket

Catalogue No.	No. of Pairs	Conductor Size		Reel Length (m)	Approximate Overall Diameter (mm)	Nom. Sheath Thickness (mm)
		(mm)	(AWG)			
TDB796FN006	6	0.64	22	500	10.7	1.15
TDB796FN010	10	0.64	22	500	12.5	1.15
TDB796FN020	20	0.64	22	500	15.9	1.15
TDB796FN030	30	0.64	22	500	18.4	1.15
TDB796FN050	50	0.64	22	500	22.9	1.35
TDB796FN100	100	0.64	22	500	30.7	1.55

Reel length - Other sizes available on application.

External Aerial Telephone Cable

Belden External Aerial Telephone Cable is an external distribution cable suitable for overhead suspension in areas of high interference, for example - overhead power lines.

Construction

Plain annealed copper wire, polyethylene insulated, twisted unit pair, aluminium foil screened (no screen on TTA and TUA Series), including tinned copper drain wire, polyethylene sheath incorporating a 2.5mm galvanised solid high tensile steel bearer wire in figure 8 construction.



External Aerial Telephone Cable						
Catalogue No.	No. of Pairs	Conductor Size		Reel Length (m)	Approximate Overall Diameter (mm)	Nom. Sheath Thickness (mm)
		(mm)	(AWG)			
TTA796IB001	1	0.64	22	500	5.4 X 3.8	1.15
TUT796IB002	2	0.64	22	500	6.7 X 3.8	1.15
TAI796IB010	10	0.64	22	500	17.0 X 11.2	1.15

Note: TTA and TUA Series are unscreened. Colour-Code for 1 and 2 Pair Aerial Cable:

Pair No. 1 - Wire 1, White; Wire 2, Blue Pair No. 2 - Wire 2, Red; Wire 2, Black

External Underground Telephone Cable

Belden External Underground Telephone Cable has been manufactured for the specific purpose of direct burial or installation of conduits.

Construction

Plain annealed copper wire, polyethylene insulated, twisted unit pair, (filled only for 0.40mm conductor quad), paper tape wrapped and polyethylene sheath.

Optional nylon jacket.



External Underground Telephone Cable						
Catalogue No.	No. of Pairs	Conductor Size		Reel Length (m)	Approximate Overall Diameter (mm)	Nom. Sheath Thickness (mm)
		(mm)	(AWG)			
TEP794FP002	2	0.4	26	500	4.9	1.15
TAP794PP006	6	0.4	26	500	6.7	1.15
TAP794PP010	10	0.4	26	500	8.0	1.15
TAP794PP020	20	0.4	26	500	10.2	1.15
TAP794PP030	30	0.4	26	500	11.9	1.15
TAP794PP050	50	0.4	26	500	14.6	1.15
TAP794PP100	100	0.4	26	500	20.5	1.65
TUP796PP002	1 Quad	0.64	22	1000	5.1	1.15
TAP796PP006	6	0.64	22	500	8.9	1.15
TAP796PP010	10	0.64	22	500	10.8	1.15
TAP796PP020	20	0.64	22	500	14.1	1.15
TAP796PP030	30	0.64	22	500	17.3	1.15
TAP796PP050	50	0.64	22	500	21.8	1.65
TAP796PP100	100	0.64	22	500	30.4	2.5
TUP799PP002	1 Quad	0.9	19	1000	6.2	1.15

Reel length - Other sizes available on application.

Polyethylene Sheath with Nylon Jacket

Catalogue No.	No. of Pairs	Conductor Size		Reel Length (m)	Approximate Overall Diameter (mm)	Nom. Sheath Thickness (mm)
		(mm)	(AWG)			
TEP794FN002	2	0.4	26	500	4.9	1.15
TAP794PN006	6	0.4	26	500	7.7	1.15
TAP794PN010	10	0.4	26	500	9.0	1.15
TAP794PN020	20	0.4	26	500	11.2	1.15
TAP794PN030	30	0.4	26	500	12.9	1.15
TAP794PN050	50	0.4	26	500	15.6	1.15
TAP794PN100	100	0.4	26	500	21.5	1.65
TUP796PN002	1 Quad	0.64	22	1000	5.9	1.15
TAP796PN006	6	0.64	22	500	9.9	1.15
TAP796PN010	10	0.64	22	500	11.8	1.15
TAP796PN020	20	0.64	22	500	15.1	1.15
TAP796PN030	30	0.64	22	500	18.3	1.15
TAP796PN050	50	0.64	22	500	22.8	1.65
TAP796PN100	100	0.64	22	500	31.4	2.5
TUP799PN002	1 Quad	0.9	19	1000	7.0	1.15

A Sacrificial PVC sheath is also available on request.

External Telephone Cable

Technical Information

Colour Chart - Conductor Insulation

Pair No.	Wire 1	Wire
1	White	Blue
2	White	Orange
3	White	Green
4	White	Brown
5	White	Grey
6	Red	Blue
7	Red	Orange
8	Red	Green
9	Red	Brown
10	Red	Grey

Colour Chart - Unit Binder Tapes

Unit No.	Colour of Binder Tapes
1	Blue - Blue
2	Orange - Orange
3	Green - Green
4	Brown - Brown
5	Grey - Grey
6	Blue - White
7	Orange - White
8	Green - White
9	Brown - White
10	Grey - White

Reel length - Other sizes available on application.

Conductor Resistance					
Conductor Diameter (mm)	Diameter Nom. (mm)	Tolerance (mm)	Minimum Radial Thickness of Insulation (mm)	Maximum Conductor Resistance at 20°C (Ω/km)	Min. Elongation After removal from Completed Cable (%)
0.40	0.404	±0.007	0.16	139.3	15
0.64	0.635	±0.011	0.25	56.4	20
0.90	0.902	±0.015	0.35	27.9	20

Electrical Characteristics of Telephone Cable		
	(External) Underground	(Aerial) IB Cable
High Voltage		
- Core to Core	2.0kV RMS	2.0kV RMS
- Core to Sheath	4.5kV RMS	4.5kV RMS
- Screen to Sheath	4.5kV RMS	4.5kV RMS
Max. Mutual Capacitance	49nF/km	52nF/km
Max. Pair to Pair Unbalance	2p Cable: 500pF/500m >2p Cable: 100pF/500m	2p Cable: 500pF/500m >2p Cable: 100pF/500m
Minimum Insulation Resistance	10,000 MΩ.km	10,000 MΩ.km
Nominal Characteristic Impedance at 1 MHz	120Ω	120Ω

High Speed Data & Voice Cables

ISDN Data Cable - 120 Ohm

Belden ISDN Data Cable is a screened indoor communications cable for use in ISDN and data communications where 120 Ohm impedance is required.

This cable is suitable for transmission of digital signals up to and beyond 2MBit/s and has excellent mechanical, electrical and flame retardant properties with an unusually small cable structure.

Construction

Solid tinned annealed copper pairs of 1/0.5mm insulated with polyolefin foam with a non-halogenated fired retardant skin, polyethylen wrapped, aluminium foil shield with solid tinned copper 1/0.5mm drain wire and PVC sheath.

Also available with an optional braid, on request.



Foil Shield							
Catalogue No.	No. of Pairs	Conductor Size (mm) (AWG)		Reel Length (m)	Approximate Overall Diameter (mm)	Nom. Insulation Thickness (mm)	Nom. Pair Capacitance (nF/km)
JOCD56AA010	10	0.5	24	500	8.3	0.26	45
JOCD56AA012	12	0.5	24	500	8.9	0.26	45
JOCD56AA018	18	0.5	24	500	10.3	0.26	45
JOCD56AA025	25	0.5	24	500	11.7	0.26	45
JOMD56AA032	32	0.5	24	250	13.5	0.26	45

Reel length - Other sizes available on application.

These cables are not power cables for direct connection of equipment to mains power supplies.

Braid Shield

Catalogue No.	No. of Pairs	Conductor Size (mm) (AWG)		Reel Length (m)	Approximate Overall Diameter (mm)	Nom. Insulation Thickness (mm)	Nom. Pair Capacitance (nF/km)
JOBD56AA018	18	0.5	24	500	10.4	0.26	45
JOBD56AA025	25	0.5	24	500	12.5	0.26	45
JOBD56AA032	32	0.5	24	250	14.7	0.26	45

Electrical Characteristics

Characteristic Imp. (Ohms)	Velocity of Propagation (%)	Cond. Resistance (Ω/km)	Nominal FEXT (dB/250m @ 1MHz)	Attenuation Freq. (MHz)	Loss Max. (dB/100m)
120±10%	~ 70	94.5	65	1 10 50 100 150	2 6 15 22 27

Insulation Colour Code

Pair No.	Colour	Pair No.	Colour	Pair No.	Colour	Pair No.	Colour	Pair No.	Colour
1	White & Blue stripe	6	Red & Blue stripe	11	Black & Blue stripe	16	Yellow & Blue stripe	21	Purple & Blue stripe
2	White & Orange stripe	7	Red & Orange stripe	12	Black & Orange stripe	17	Yellow & Orange stripe	22	Purple & Orange stripe
3	White & Green stripe	8	Red & Green stripe	13	Black & Green stripe	18	Yellow & Green stripe	23	Purple & Green stripe
4	White & Brown stripe	9	Red & Brown stripe	14	Black & Brown stripe	19	Yellow & Brown stripe	24	Purple & Brown stripe
5	White & Grey stripe	10	Red & Grey stripe	15	Black & Grey stripe	20	Yellow & Grey stripe	25	Purple & Grey stripe

IBM Type 1

Construction

Bare copper, flame-retardant foam polyethylene in 2 pairs, each pair individually Beldfoil® shielded, with overall 65% tinned copper braid shield; overall Black jacket with ripcord IBM qualified Type 1A and 1 media cable for use in IBM Cabling Systems.

Also meets IEEE 802.5 and TIA/EIA 568-A specifications.

Applications include Token Ring (4/16 Mbps), FDDI over copper and video.

IBM Cat. Nos. 4716748, 33G2772

Plenum Versions: 82688, 89688



Local Area Network Cables IBM Type 1

Catalogue No. UL NEC C(UL) CEC Type	No. of Pairs	Conductor Size (mm) (AWG)		Reel Length (m)	Vel. Of Prop (%)	Freq. (MHz)	Max. Att. (dB/100m)	Min. NEXT+ (dB)
9688	2	0.64	22	305	78	4 16 100 300	2.2 4.4 12.3 21.4	58 50 38.5 31

Nominal Impedance 150Ω.

Technical Information

High Speed Data and Voice Cables

Applicable Standards						
TIA/EIA568A NEMA WC-63	DataTwist® 3 Category 3	DataTwist® 5 Category 5	DataTwist® 5E Enhanced Category 5	DataTwist® 350 Premium Category 5E	MediaTwist® Category 6*	DataTwist® 7 600 I-STP Category 7*
Electrical Considerations						
Impedance						
1-16 MHz	100Ω ±15%	-	-	-	-	100Ω ±15%
1-20 MHz	-	100Ω ±15%	100Ω ±15%	100Ω ±12%	100Ω ±12%	100Ω ±15%
20-100 MHz	-	100Ω ±15%	100Ω ±15%	100Ω ±15%	100Ω ±15%	100Ω ±15%
100-200MHz	-	-	-	100Ω ±18%	100Ω ±15%	100Ω ±15%
200-310MHz	-	-	-	100Ω ±20%	100Ω ±20%	100Ω ±15%
310-350 MHz	-	-	-	100Ω ±22%	100Ω ±22%	100Ω ±20%
350-500MHz	-	-	-	-100Ω ±25%	-	100Ω ±20%
500-600MHz	-	-	-	-	-	100Ω ±20%
Attenuation Max. (dB/100m)						
4 MHz	5.3	4.1	4.1	4.0	3.8	3.5
10 MHz	9.7	6.5	6.5	6.4	6.0	5.4
16 MHz	13.1	8.2	8.1	7.7	-	7.1
31.25 MHz	-	11.7	11.7	11.6	10.9	10.1
62.5 MHz	-	17.0	17.0	16.8	15.8	14.3
100 MHz	-	22.0	22.0	21.7	20.5	18.0
155MHz	-	-	-	28.1	26.2	-
200 MHz	-	-	-	32.0	30.3	25.0
310 MHz	-	-	-	41.3	49.2	31.0
350MHz	-	-	-	44.3	42.1	36.0
400 MHz	-	-	-	-	45.6	-
550MHz	-	-	-	-	55.3	46.0
600MHz	-	-	-	-	-	-
NEXT (Min.)						
4 MHz	32 dB	53 dB	55 dB	57 dB	63 dB	105
10 MHz	26 dB	47 dB	49 dB	51 dB	57 dB	89
16 MHz	23 dB	44 dB	46 dB	48 dB	54 dB	85
31.25 MHz	-	39 dB	41 dB	43 dB	50 dB	91
62.5MHz	-	35 dB	37 dB	39 dB	45 dB	96
100 MHz	-	32 dB	34 dB	36 dB	42 dB	89
155 MHz	-	-	-	33 dB	39 dB	-
200 MHz	-	-	-	31 dB	38 dB	86
310 MHz	-	-	-	28 dB	35 dB	83
350 MHz	-	-	-	27 dB	34 dB	78
400 MHz	-	-	-	-	33 dB	-
600 MHz	-	-	-	-	-	70

Typical Applications:	■ IEEE 802.3 10 Base T 100 Base-T4	■ IEEE 802.3 10 Base 100 Base-T4	■ IEEE 802.3 10 Base 100 Base-T4	■ IEEE 802.3 10 Base T 100 Base-T4	■ IEEE 802.3 10 Base T 100 Base-T4	■ IEEE 802.3 10 Base T 100 Base-T4
	■ IEEE 802.12 100 Base-VG	■ IEEE 802.12 100 Base-VG	■ IEEE 802.12 100 Base-VG	■ IEEE 802.12 100 Base-VG	■ IEEE 802.12 100 Base-VG	■ IEEE 802.12 100 Base-VG
	■ IEEE 802.5 4 Mbps Token Ring	■ IEEE 802.5 4/16 Mbps Token Ring	■ IEEE 802.5 4/16 Mbps Token Ring	■ IEEE 802.5 4/16 Mbps Token Ring	■ IEEE 802.5 4/16 Mbps Token Ring	■ IEEE 802.5 4/16 Mbps Token Ring
	■ IBM 3270 System 3x/	■ ATM PMD 155 Mbps	■ ATM PMD 155 Mbps	■ ATM PMD 155 & 622 Mbps	■ ATM PMD 155 Mbps & 622	■ ATM PMD 155 Mbps & 622
	■ AS400	■ ANSI X3T9.5 TP-PMD	■ ANSI X3T9.5 TP-PMD	■ ANSI X3T9.5 TP-PMD	■ ANSI CX3T9.5 TP-PMD	■ ANSI CX3T9.5 TP-PMD
				■ All fast ethernet protocols	■ Digital Video	■ Digital Video
					■ Emerging Multimedia Applications	■ Emerging Multimedia Applications
					■ All fast ethernet protocols	■ All fast ethernet protocols
					■ Shared sheath applications	■ Shared sheath applications

DataTwist® 350 and MediaTwist® Impedance is not fitted or smoothed.

* At the time of print, the Category 6 and 7 standards are yet to be ratified.

Category 3

100 Ohm UTP

DataTwist® Three Twisted Pair Data Cables

Belden DataTwist® Three Cables provide superior electricals and in many cases handle longer distances when compared to their telephone cable counterparts.

DataTwist cables support a universal cabling system, especially useful for new or renovated commercial structures.

They are also compatible with various manufacturers' hardware equipment and may be utilised in most computer applications which support twisted pair cabling.

With recent additions to current standards, Category 3 cabling is a minimum requirement for digital telephony.

Meets/Exceeds Ratings

DataTwist® Three Cables are tested up to 16 MHz.

All applicable products meet or exceed the TIA/EIA 568-A standard.

DataTwist® Three Construction

0.5mm/24AWG solid bare copper, S-R PVC insulated, twisted pair, unshielded, grey PVC jacket sequentially marked at two foot intervals.

Non-Plenum versions are S-R PVC insulated and are available with a Grey PVC jacket.

Alternatively, Plenum versions are available and are low smoke PVC insulated with a White Low Smoke PVC jacket.



DataTwist® Three												
Cat. No. UL NEC C(UL) CEC Type	No. of Pairs	Conductor Size (mm) (AWG)		Reel Length (m)	Approx. O. D. (mm)	Nom. Insul. Thick. (mm)	Nom. Pair Cap. (pF/m)	Nom. D.C.R. (Ω/100m)	Nom. Imp. (Ω)	Freq. (MHz)	Max. Att. (dB/100m)	Min. NEXT+ (dB)
1227A1	2	0.5	24	U-305	3.56	0.178	62.3	9.18	100	1	2.6	41
NEC CMR										4	5.58	32
CEC CMR										10	9.84	26
										16	13.1	23
1229A2	4	0.5	24	U-305	4.32	0.178	62.3	9.18	100	1	2.6	41
NEC CMR										4	5.58	32
CEC CMR										10	9.84	26
										16	13.1	23
JGAD06F9025	25	0.5	24	1800	10.4	0.178	70	9.37	100	1	2.56	41
NEC CMR										4	5.58	32
CEC CMR										10	9.84	26
										16	13.1	23
JGAD06F9050	50	0.5	24	1000	11.5	0.131	70	9.37	100	1	2.7	41
NEC CMR										4	6.00	32
CEC CMP										10	10.2	26
										16	13.5	23
JGAD06F9100	100	0.5	24	600	16.1	0.131	70	9.37	100	1	2.7	41
NEC CMR										4	6.00	32
CEC CMP										10	10.2	26
										16	13.5	23

+ Near End Crosstalk

Colour Code Chart

Pair No.	Colour Combination	Pair No.	Colour Combination	Pair No.	Colour Combination	Pair No.	Colour Combination
1	White/Blue Stripe Blue/White Stripe	8	Red/Green Stripe Green/Red Stripe	15	Black/Grey Stripe Grey/Black Stripe	22	Purple/Orange Stripe Orange/Purple Stripe
2	White/Orange Stripe Orange/White Stripe	9	Red/Brown Stripe Brown/Red Stripe	16	Yellow/Blue Stripe Blue/Yellow Stripe	23	Purple/Green Stripe Green/Purple Stripe
3	White/Green Stripe Green/White Stripe	10	Red/Grey Stripe Grey/Red Stripe	17	Yellow/Orange Stripe Orange/Yellow Stripe	24	Purple/Brown Stripe Brown/Purple Stripe
4	White/Brown Stripe Brown/White Stripe	11	Black/Blue Stripe Blue/Black Stripe	18	Yellow/Green Stripe Green/Yellow Stripe	25	Purple/Grey Stripe Grey/Purple Stripe
5	White/Grey Stripe Grey/White Stripe	12	Black/Orange Stripe Orange/Black Stripe	19	Yellow/Brown Stripe Brown/Yellow Stripe		
6	Red/Blue Stripe Blue/Red Stripe	13	Black & Green Stripe Green/Black Stripe	20	Yellow/Grey Stripe Grey/Yellow Stripe		
7	Red/Orange Stripe Orange/Red Stripe	14	Black/Brown Stripe Brown/Black Stripe	21	Purple/Blue Stripe Blue/Purple Stripe		

Multi-Unit Core Construction

The cable cores contain 25 pair units. A 50 pair cable has units 1 and 2. A 100 pair cable has units 1, 2, 3 and 4. The pairs in each 25 pair unit match the coding, as described in the table above. Units have a coloured binder for ease of identification.

- Unit 1: Blue-White
- Unit 2: Orange-White
- Unit 3: Green-White
- Unit 4: Brown-White

The unit binders are applied in the right-hand direction with a 125mm lay. The units/multi-units are stranded together with a left-hand lay.

Category 5

100 Ohm UTP/STP

DataTwist® Five Extended Distance High Performance Twisted Pair Data Cables.

Belden DataTwist® Five Cables are ideally suited to the challenges facing users regarding cable performance and management.

They will provide years of service life and prevent retrofitting after only a short installation period.

Whether you're employing Ethernet, Token Ring or TP-PMD* (Twisted Pair Physical Media Dependent) applications, Belden's DataTwist® Five provides the ultimate option for your network needs.

Meets/Exceeds Ratings

DataTwist® Five is tested up to 100 MHz. All products meet or exceed the TIA/EIA 568-A standard and AS/NZ 3080-1996 Standard in addition to its technical supplements, NEMA Low Loss Extended Frequency requirements, and are third party verified.

DataTwist® Five cables are UL listed, CM or CMR, and comply with the requirements outlined by the Australian Communications Authority (ACA).

DataTwist® Five

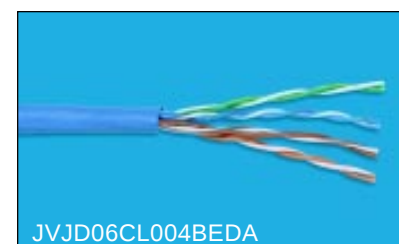
Construction

24 AWG/0.5mm solid bare copper, polyolefin insulated, twisted pairs, unshielded, ripcord, PVC jacket, colours: Grey and Blue. Sequentially marked at one metre intervals, Third party verified TIA/EIA 568-A Cat. 5, Non-Plenum versions are polyolefin insulated and are available with a Light Grey or Blue PVC jacket with ripcord.

Plenum versions are FEP insulated and are available with Natural or Blue Flammarrest® jacket with ripcord.

Shielded versions are offered with standard as well as Step insulated conductors for easy termination into modular connectors. These cables feature Beldfoil® shield with drain wire.

DATABRITE™ versions are also available with some constructions.



DataTwist® Five										
Catalogue No.	No. of Pairs	Conductor Size		Reel Length	Freq.	Max. Att.	Min. NEXT+	Min. ACR	Min. ELFEXT	Min. SRL
UL NEC C(UL) CEC Type		(mm)	(AWG)	(m)	(MHz)	(dB/100m)	(dB)	(dB/100m)	(dB/100m)	(dB)
JVJD06CL004BEDA	4	0.5	24	U-305	1	2.0	62	60	61	23
					4	4.1	53	49	49	23
JVJD06CL004BED5					10	5	47	41	41	23
					16	8.2	44	36	37	23
					31.25	11.7	39	27	31	21
CEC CM	25	0.5	24	304.8	62.5	17.0	35	18	25	18
					100	2.0	32	10	21	16
1864A					4	4.1	53	49	49	23
					10	6.5	47	41	41	23
					16	8.2	44	36	37	23
NEC CMR					31.25	11.7	39	27	31	21
CEC CMR					62.5	17.0	35	18	25	18
					100	22.0	32	10	21	16

* Near End Crosstalk

Nominal Impedance 100Ω+/-15%.

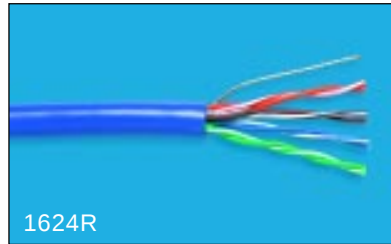
DataTwist[®] Five with Foil Shield

Construction

Category 5 STP, 0.5mm/24 AWG solid bare copper, polyolefin insulated, twisted pairs, overall Beldfoil[®] shield, 24 AWG stranded tinned copper drain wire.

PVC jacket sequentially marked at two foot intervals.

Third party verified to TIA/EIA 568-A Category 5. RJ-45 compatible.



DataTwist [®] Five with Foil Shield										
Catalogue No.	No. of Pairs	Conductor Size		Reel Length	Freq.	Max. Att.	Min. NEXT+	Min. ACR	Min. ELFEXT	Min. SRL
UL NEC C(UL) CEC Type		(mm)	(AWG)	(m)	(MHz)	(dB/100m)	(dB)	(dB/100m)	(dB/100m)	(dB)
1624R	4	0.5	24	U-305	4	4.1	53	49	49	23
					10	6.5	47	41	41	23
NEC CMR					16	8.2	44	36	37	23
CEC CMR					31.25	11.7	39	27	31	21
					62.5	17.0	35	18	25	18
					100	22.0	32	10	21	16

Reel length - 500m available on request.

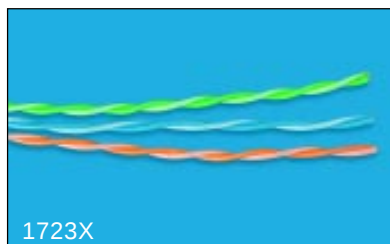
Nominal Impedance 100Ω±15%.

Colour Code Chart							
Pair No.	Colour	Pair No.	Colour	Pair No.	Colour	Pair No.	Colour
1	White & Blue	8	Red & Green	15	Black & Grey	22	Purple & Orange
2	White & Orange	9	Red & Brown	16	Yellow & Blue	23	Purple & Green
3	White & Green	10	Red & Grey	17	Yellow & Orange	24	Purple & Brown
4	White & Brown	11	Black & Blue	18	Yellow & Green	25	Purple & Grey
5	White & Grey	12	Black & Orange	19	Yellow & Brown		
6	Red & Blue	13	Black & Green	20	Yellow & Grey		
7	Red & Orange	14	Black & Brown	21	Purple & Blue		

DataTwist® Category 5 Jumper Wires

Construction

0.5mm/24 AWG solid bare copper, polyolefin insulated twisted pairs each with adjoined singles (bonded pairs) Category 5 jumper wire.



DataTwist® 350 Patch

Catalogue No.	No. of Pairs	Conductor Size		Reel Length	Freq.	Max. Att.	Min. NEXT+	Min. ACR	Min. ELFEXT	Min. SRL
UL NEC C(UL) CEC Type		(mm)	(AWG)	(m)	(MHz)	(dB/100m)	(dB)	(dB/100m)	(dB/100m)	(dB)
1721X	1	0.5	24	152	4	4.1	53	49	49	23
1722X	2				10	6.5	47	41	41	23
1723X	3				16	8.2	44	38	37	23
1724X	4				31.25	11.7	39	27	31	21
NEC CM					62.5	17.0	35	18	25	18
CEC CM					100	22.0	32	10	21	16

+ Near End Crosstalk

Reel length - 500m available on request.

Nominal Impedance 100Ω±15%.

Colour Code Chart

Pair No.	Colour Combination
1	White/Blue Stripe, Blue
2	White/Orange Stripe, Orange
3	White/Green Stripe, Green
4	White/Brown Stripe, Brown

Category 5E

100 Ohm UTP

DataTwist® 5E Enhanced Category 5 Twisted Pair Data Cable

Belden DataTwist® 5E Cable is an unshielded twisted pair extended performance Category 5 cable. This product has been developed to comply with Addendum 5 to TIA/EIA 568-A, *Additional Transmission Performance Guidelines for 100 ohm 4-pair Enhanced Category 5 Cabling*.

Belden DataTwist® 5E is designed for the data specialist and end user focused on extended performance and future transmission protocols.

It is suitable for generic cabling applications in a star network topology, and is the ideal cable medium for new buildings and replacing existing outdated networks.

With today's networking protocols and emerging protocols, DataTwist® 5E should be considered as the minimum requirement for any new network installation.

It is compliant with a whole new range of performance parameters, including:

- Powersum near end Crosstalk (PS/NEXT)
- Far and Crosstalk (FEXT)
- Equal level far end Crosstalk (ELFEXT), and
- Powersum equal level far end Crosstalk (PS/ELFEXT); indicates that this product has vast improvements over conventional Category 5 cable in order to achieve improved NEXT figures.

Improving the NEXT performance aids in improving the ACR (Attenuation-to-Crosstalk ratio) headroom, which is a networking fundamental.

Belden DataTwist® 5E achieves ACR figures of 17 dB at 100 MHz. This is an improvement of 7 dB over the AS 3080-1996 Class D link specification.

Meets/Exceeds Ratings

DataTwist® 5E is manufactured to comply with addendum Cat. 5 cabling.

All products meet or exceed the TIA/EIA 568A and addendum 5 for enhanced performance.

This product is manufactured in accordance with the ACA requirements.

It is UL listed and verified with a CMR flammability rating, which makes this product safe to use in vertical applications such as riser shafts.

Full Duplex Transmission

Being powersum near end crosstalk compliant (PS/NEXT) makes this product capable of transmitting all full duplex applications.

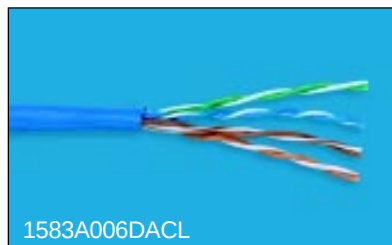
This means that data can be transmitted and received on all pairs simultaneously whilst maintaining signal integrity.

DataTwist® 5E is the ideal cable for protocols such as 100 Base T, 155Mbps ATM, 622Mbps ATM, 100Mbps token ring and gigabit ethernet.

Data Twist® 5E Construction

0.5mm/24 AWG solid bare copper, polyolefin insulated, twisted pairs, unshielded, Blue PVC sheath, metre marked at one metre intervals.

DataTwist® 5E meets the return loss requirements specified in Addendum 5 of TIA/EIA 568A.



Colour Code Chart

Pair No.	Colour Combination
1	White/Blue Stripe, Blue
2	White/Orange Stripe, Orange
3	White/Green Stripe, Green
4	White/Brown Stripe, Brown

DataTwist® 5E										
Catalogue No.	No. of Pairs	Conductor Size		Reel Length	Vol. Of Prop.	Freq.	Att.	PS/NEXT+	Worst Pair ELFEXT	PS ELFEXT
UL NEC C(UL) CEC Type		(mm)	(AWG)	(m)		(MHz)	(dB/100m)	(dB)	(dB/100m)	(dB/100m)
1583A006DACL	4	0.5	24	U-305	69%	1	2.0	62.3	63.8	60.8
						4	4.1	53.3	51.7	48.7
1583A006D5CL				U-500		10	6.5	47.3	43.8	40.8
						16	8.2	44.3	39.7	36.7
						20	9.3	42.8	37.7	34.7
UL CM						31.25	11.7	39.9	33.9	30.9
						62.5	17.0	35.4	27.8	24.8
						100	22.0	32.3	23.8	20.8

Nominal Impedance 100Ω±15%.

Category 5E Premium Enhanced 350-600 MHz UTP

DataTwist® 350

Belden DataTwist® 350 is an extended performance data cable answering future networking demands today.

They're the result of a unique, patent pending design and process which allows stable electrical performance to 350 MHz, more than triple the verified frequency range of the TIA/EIA 568-A Category 5 standard.

A Unique New Design

DataTwist® 350's superiority is the result of dimensional stability created by an innovative manufacturing process.

It affixes the individual insulated conductors together along their longitudinal axis and results in:

- Uniform conductor to conductor spacing.
- Uniform applied tensions to conductors within a pair during manufacture.

Ease of Termination

In terms of connection, the unique design of these UTP cables permits easy validation of Category 5 and enhanced Category 5 requirements in regards to pair untwisting, even after the cable has been installed.

With DataTwist® 350, there is less opportunity for human error and better cable performance assurances.

Two Easy Methods of Termination

1. Using New Separation Tool

- A new tool (Cat. No. 1797A) together with DataTwist® 350's unique design, makes correct cable termination fast and easy.
- Remove the cable sheath using the rear end of the tool.
- Insert pair into slot A or B of the tool using a twisting action simultaneously whilst inserting. Push pair until desirable separation is achieved. Pull pair straight from tool.

- Uniform twisting of insulated conductors into pairs.
- Exact dielectric constant of the insulation of both conductors.
- The assurance that the twists of the pairs will not loosen during manufacture or installation.

Superior Electrical Performance

Compared with the current Cat. 5 standard, DataTwist® 350 cables display superior performance characteristics across the frequency range.

These improvements allow for smoother, improved electrical characteristics at Cat. 5 frequencies, as well as at extended frequencies which may be required for future applications.

DataTwist® 350 greatly improves performance in a number of key electrical areas.

In a direct comparison with the Category 5 standard, Belden's new cable shows:

- A minimum of 400% improvement in Capacitance Unbalance.

- A 250% improvement in Frequency Range.
- A 35% improvement in Resistance Unbalance.
- An average of 5% improvement in Attenuation.
- On average, a minimum of 6 dB improvement in pair-to-pair Near End Crosstalk (NEXT).
- Up to 50% improvement in Impedance and Structural Return Loss.

It is important to note that the impedance and SRL values shown on this sheet are uncorrected and unaveraged values.

The TIA/EIA 568-A Cat. 5 standard allows for the use of a fitting or smoothing function which interprets and recalculates Impedance and SRL, and can make data appear better than actual measurements.

The function, however, was not used to obtain the product data shown.

This procedure will quickly and easily separate the pair perfectly every time. Repeat this procedure for all pairs (see instructions enclosed with tool for more information).

2. Using Scissors

Any standard pair of scissors can also be used for quick and easy termination of DataTwist 350.

- After removing the cable jacket, untwist or flatten the conductors of a pair approximately 25mm (or greater) by clamping a pair between your thumb and a top blunt edge of the scissors. Then pull the cable and the scissors in opposite directions.
- Make at least a 6mm cut exactly between the adjoining conductors of the pair.
- With your fingers, simply pull the two conductors apart for the length of the flattened section.

Notes: Take care not to force the separation beyond the length of the flattened section. Most punch-down tools will automatically trim excess conductor during termination.



1797A

DataTwist® 350

Construction

0.5mm/24 AWG bare copper, polyolefin insulated, 4 twisted pairs each with adjoining singled (bonded pairs), ripcord, PVC jacket in Red, Yellow, Green, Blue, Purple or Light Grey, sequentially marked at two foot intervals. Available in plenum and non-plenum versions.

- Non-plenum versions are polyolefin insulated and have a PVC jacket and ripcord. They are UL verified and listed, with a CM rating.

- Plenum versions are FEP Teflon and/or flame retardant polyolefin insulated and have a flexible Flamarrest® jacket with ripcord. They are UL listed, NEC CMP, and C(UL) listed, CEC CMP.
- Cables are available in Red, Yellow, Orange, Green, Blue, Purple and Light Grey or Natural jacket colours.

DataTwist 350 cables are third party certified to the highest TIA/EIA category.



DataTwist® 350										
Catalogue No.	No. of Pairs	Conductor Size		Reel Length	Freq.	Max. Att.	PS/ NEXT+	Worst Pair ELFEXT	PS/ELFEXT	Min. RL
UL NEC C(UL) CEC Type		(mm)	(AWG)	(m)	(MHz)	(dB/100m)	(dB)	(dB/100m)	(dB/100m)	(dB)
1700A006DACL	4	0.5	24	U-305	4	4.0	53	52.3	48.7	23
					8	5.7	48	46.1	42.7	23
1700A006D5CL				U-500	10	6.4	47	43.9	40.8	23
					16	8.1	44	39.1	36.7	23
					25	10.3	41	34.1	32.8	22
NEC CM					31.25	11.6	40	31.3	30.9	21
CEC CM					62.5	16.8	35	21.6	24.8	21
					100	21.7	32	20.1	20.8	21
					155	27.6	33	6.0	16.9	19
					200	32.0	31	3.0	14.7	19
					250	36.4	29	-	-	18
					350	44.3	27	-	-	17

+ Near End Crosstalk

Input Impedance at 100MHz, 100Ω±15%.

Colour Code Chart	
Pair No.	Colour Combination
1	White/Blue Stripe, Blue
2	White/Orange Stripe, Orange
3	White/Green Stripe, Green
4	White/Brown Stripe, Brown

DataTuff® 350

New Belden DataTuff series combines high speed UTP technology with ruggedised armour and upjacket protection connecting office LAN's and factory floor environments.

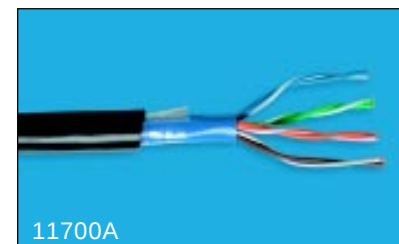
Two standard options are available to ensure your LAN and media signal integrity is maintained while wiring industrial PCs and PLCs. The oil-resistant industrial grade PVC upjacket option offers flexible protection in a small profile requiring less tray or conduit space.

The aluminium interlock armour option offers a bendable conduit-like protection and allows easy transition

from a tray or raceway into a junction box or remote cabinet. The armour and jackets are easily removed to reveal an inner core prepared to accept standard RJ connectors. Cable core selection includes DataTwist 350, featuring Belden's patented bonded pair design. Other outer jacket options are available.

Construction

0.5mm/24 AWG solid bare copper, polyolefin insulated, twisted pairs each with adjoined singles, ripcord, PVC jacket in Black and Grey, sequentially marked at two foot intervals.



DataTuff										
Catalogue No.	No. of Pairs	Conductor Size		Reel Length	Freq.	Max. Att.	PSum Min. NEXT+	PSum Min. ACR	PSum Min. ELFEXT	Min RL
UL NEC C(UL) CEType		(mm)	(AWG)	(m)	(MHz)	(dB/100m)	(dB)	(dB/100m)	(dB/100m)	(dB)
11700A Up Jacketed	4	0.5	24	305	1	2.0	62.3	50.3	60.8	23
					4	4.0	53.3	49.3	48.7	23
					8	5.7	48.8	43.1	42.7	23
					10	6.4	47.3	40.9	40.8	23
					16	8.1	44.3	36.1	36.7	23
					25	10.3	41.3	31.1	32.8	22
121700A Armoured	4	0.5	24	305	31.25	11.6	39.9	28.3	30.9	21
					62.5	16.8	35.4	16.6	24.8	21
					100	21.7	32.3	17.1	20.8	21
					155	27.6	29.5	3.0	16.9	19
					200	32.0	27.8	3.0	14.7	19
					310	32.0	26.3	-	-	19
					350	44.3	24.2	-	-	16

+ Near End Crosstalk

Nominal Impedance at 100MHz, 100Ω±15%.

Colour Code Chart

Pair No.	Colour Combination
1	White/Blue Stripe, Blue
2	White/Orange Stripe, Orange
3	White/Green Stripe, Green
4	White/Brown Stripe, Brown

DataTwist® 350 Premium Enhanced Category 5E Patch Cable

Belden is now offering DataTwist® 350 Patch Cable.

This unshielded twisted pair (UTP) patch cable delivers a level of performance that matches the best horizontal cable in the market-place today, DataTwist® 350.

By using this 100 Ohm patch cable, LAN users can be assured that they are:

- Avoiding a potential 'weak link' in their systems.
- Meeting TIA/EIA 568-A and ISO IEC 11801 standards.
- Preserving Category 5 performance throughout their networks.

Exceeding Category 5 Performance Standards

Belden's DataTwist® 350 Patch Cable (Cat. No. 1752A) provides stable performance up to 350 MHz - more than triple the verified frequency range of the TIA/EIA 568-A Category 5 standard.

This cable achieves its unique characteristics through a highly controlled, patent-pending manufacturing process.

The proprietary manufacturing technique for Belden's DataTwist® 350 cabling affixes the individual insulated conductors together along their longitudinal axes.

The results in uniform conductor-to-conductor spacing, uniform tension applied to the conductors within a pair during manufacture, uniform twisting of the insulated conductors into pairs, and pairs that will not loosen during manufacture or installation.

Compared with Category 5 standards, DataTwist® 350 Patch Cable exhibits up to a 50% improvement in Impedance and Structural Return Loss (SRL), a 400% improvement in Capacitance Unbalance, a 250% improvement in Frequency Range, and a 35% improvement in Resistance Unbalance.

Meeting the Needs of High Performance Patching

These cables are ideally suited to high performance patching applications in ATM 155 Mbps, Fast Ethernet, TP-PMD, and other premise networks.

Patching applications include cable runs from a facility's wall outlets to its desktop workstations, within its wiring closets where they are used as jumpers between patching blocks, as well as from the back of the patching blocks to the equipment itself (see channel diagram).

Superior Reliability

DataTwist® 350 Patch Cable provides unparalleled attenuation performance. To verify this superior performance, Belden compared DataTwist® 350 Patch Cable and patch cable samples from three major competitive manufacturers against the effects of temperature, humidity and ageing.

To consider the effect on attenuation in the cables' application environment, half of the cables were placed in a test lab where temperatures ranged from 60-75°C and humidity ranged from 40-70 percent.

To evaluate the effects of ageing on the cables' attenuation, the second group of cable samples were placed in an accelerated ageing chamber.

Using a network analyser, each cable's attenuation was then measured and recorded from 0.772 MHz to 250 MHz at weekly intervals (the environment test) or every 24 hours until stabilised (the ageing test).

Overall, the Belden patch cables showed a 3.35% increase in attenuation to 21.6 dB/100 metres, well under the TIA/EIA requirement at 100 MHz of 26.4 dB/100 metres.

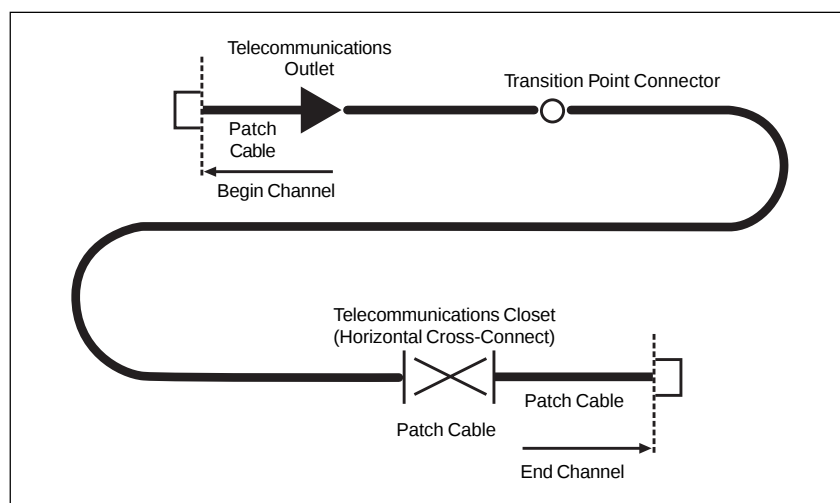
However, the three competitive manufacturers failed the TIA/EIA requirements with their increased attenuations; 20.27% (26.7 dB/100m), 23.40% (29.0 dB/100m) and 42.74% (34.4 dB/100m).

Belden DataTwist® 350 Patch Cable was the only cable to provide immunity from attenuation failures.

Performance Characteristics

DataTwist® 350 Patch Cable is UL-certified to Category 5 standards, meeting all requirements to TIA/EIA 568-A and the 100 Ohm Impedance specifications on ISO/IEC 11801, which is a non-averaged measurement.

They are UL listed, National Electric Code (NEC) CM, and C(UL) listed, Canadian Electric Code (CEC) CM, and meet the UL 1581 vertical tray test.



TIA/EIA 568-A channel schematic - showing areas where DataTwist 350 Patch Cable can be used.

DataTwist® 350 Patch Cable

Construction

7/0.20mm/24 AWG stranded tinned copper, polyolefin insulated, 4 twisted pairs each with adjoining singles (bonded pairs), PVC jackets in Red, Yellow, Green, Orange, Blue, Purple or Light Grey, sequentially marked at two foot intervals.

DataTwist® 350 Patch Cable is RJ45 compatible.



DataTwist® 350 Patch										
Catalogue No.	No. of Pairs	Conductor Size		Reel Length	Freq.	Max. Att.	PS/ NEXT+	Worst Pair ELFEXT	PSum Min. ELFEXT	Min. RL
UL NEC C(UL) CEC Type		(mm)	(AWG)	(m)	(MHz)	(dB/100m)	(dB)	(dB/100m)	(dB/100m)	(dB)
1752A NEC CM CEC CM	4	0.5	24	305	4	4.8	53	51.2	48.7	23
					8	6.8	48	41.2	42.7	23
					10	7.7	47	39.2	40.8	23
					16	9.8	44	34.2	36.7	23
					25	12.4	41	28.6	32.8	22
					31.25	13.9	40	26.1	30.9	21
					62.5	20.2	35	14.9	24.8	21
					100	26.1	32	5.9	20.8	21
					155	33.2	30	-	16.9	19
					200	38.4	28	-	14.7	19
					310	49.5	25	-	10.9	17
					350	53.2	24	-	9.9	16

+ Near End Crosstalk

Input Impedance at 100MHz, 100Ω+/-12%.

Colour Code Chart	
Pair No.	Colour Combination
1	White/Blue Stripe, Blue
2	White/Orange Stripe, Orange
3	White/Green Stripe, Green
4	White/Brown Stripe, Brown

DataTwist® 350 vs Competitor Enhanced Category 5

ACR and “Headroom” Issues

Attenuation to crosstalk ratio (ACR), also known as signal to noise ratio (SNR), is defined as the differential between crosstalk and attenuation, measured in dB, at a given frequency.

This differential is necessary to ensure that the signal being sent down a twisted pair is stronger at the receiving end of the cable than any interference signals imposed on the pair by way of crosstalk.

When the ACR diminishes to zero, or becomes a negative, then the interference signals picked up by the pair can overpower the signal which was intended to be sent down that pair.

The general rule of thumb is that a cable should exhibit at least 10 dB of differential at the frequency of interest in order to transmit data reliably.

Any additional margin above the specification is commonly referred to as “headroom”. A minimum of 10 dB ACR is built into the TIA/EIA Cat. 5 specification.

The following information compares a leading competitor's enhanced Category 5 cables to DataTwist® 350 Cables, focusing on the attenuation and crosstalk measurements, as well as the usable advantages of ACR enhancements.

Measuring Techniques

The attenuation and crosstalk measurements for the competitors' products were made on five reels of plenum cable and five reels of non-plenum cable, each selected at random and from different production lots.

The DataTwist® 350 data was derived from a minimum of 15 samples of plenum and non-plenum cables from multiple production lots.

A statistical capability analysis was used to determine the performance distribution for each product tested.

The headroom and length calculations that follow were based on the 90th percentile. In other words, in a statistically normal distribution, 90% of the products would exhibit this performance.

Attenuation Measurements

The attenuation was measured using a 401 point frequency sweep from .772 to 31.25 MHz on a 1000' length of cable and another 401 point frequency sweep from .772 to 350 MHz on a 100' length of cable.

The attenuation values up to and including 20 MHz were based on a 1000' measurement, and the values above 20 MHz were based on the 100' measurement.

The performance distribution of attenuation margins (dB from specification) at each of the eleven discrete frequencies referenced in the EIA/TIA TSB-36 document was then calculated for each period.

Crosstalk Measurements

The crosstalk measurements were taken on the near end (NEXT) with a 401 point frequency sweep from .772 to 350 MHz.

The crosstalk performance was analysed in two separate ranges: .772 to 100 MHz and 100 to 350 MHz.

Since the Category 5 NEXT specification extends to 100 MHz, the requirements to 350 MHz were extrapolated.

The crosstalk margin was calculated using the worst-pair combination (closest to the specification) in the frequency range, independent of frequency, giving a single value for each reel in each of the two frequency ranges.

Two performance distributions were then calculated for each product, one for each frequency range described above.

Attenuation Results

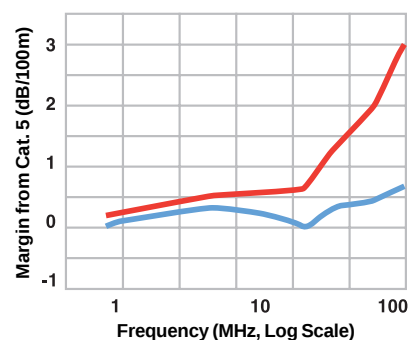
When graphed over the frequency range, attenuation is represented by a smooth curve, assuming that there are no severe problems with the return loss or any other parameters of the cable.

Therefore, it is quite accurate to characterise attenuation based on a relatively small number of data points, such as the eleven specific frequencies called out in the EIA/TIA TSB-36 document.

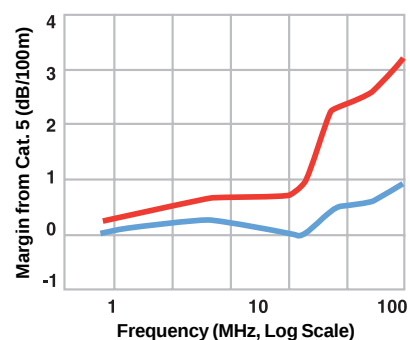
Generally speaking, the attenuation of a cable remains at a certain percentage of the total attenuation away from the specification, regardless of frequency.

This means that the margin in dB will be much larger at high frequencies than at low frequencies. Since ACR becomes more of a concern at higher frequencies, the attenuation of the cable can play a big part in the ACR equation at these frequencies.

Non-Plenum



Plenum



The previous charts show the attenuation margins for DataTwist® 350 and a leading competitor's enhanced Category 5 cables.

At 100 MHz Belden DataTwist® 350 has an average attenuation of 3dB/100 metres better than the Category 5 specification.

Crosstalk Results

The Belden DataTwist® 350 non-plenum product performs 5.5dB better than the Category 5 crosstalk requirement across the entire frequency range, based on the 90th percentile.

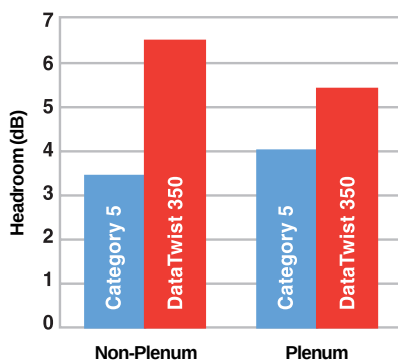
The plenum version is 3.5dB better than the specification. DataTwist® 350 has consistent crosstalk performance from .772 to 350 MHz, but the competitor's enhanced Category 5 cables' performance deteriorated above 100 MHz.

Headroom

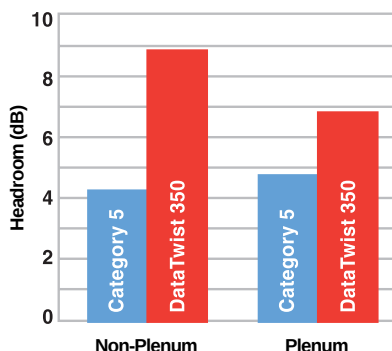
Given the attenuation and crosstalk margins, Belden's non-plenum and plenum DataTwist® 350 products exhibit 8.7 and 6.8 dB of headroom, respectively, at 100 MHz for 100 metre lengths.

DataTwist® 350 non-plenum (1700A) and plenum (1701A) are compared to the competitor's enhanced Category 5 cables in the charts below.

Headroom at 31.25 MHz



Headroom at 100 MHz



Extended Frequency Performance

As new networking systems are developed, the frequency range of the cable may have to increase.

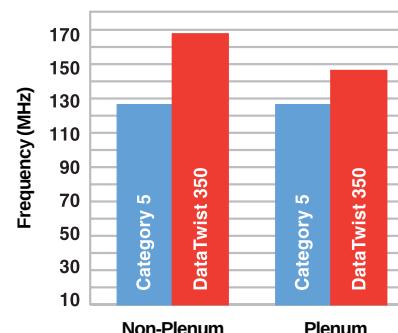
The chart below shows how high in frequency DataTwist® 350 and a competitor's enhanced Category 5 cable could be used in a 100 metre run and still preserve a 10 dB ACR.

For use beyond these frequencies, the length of the cable would have to be shortened in order to maintain a 10 dB ACR.

If a cable performs exactly at the Category 5 specifications, the only way to maintain a 10 dB ACR at any frequency above 100 MHz would be to shorten the length of the run.

The chart below relates the maximum lengths of cable that could be used to assure a 10 dB ACR in a system if operating at 350 MHz.

10dB ACR Frequency for a 100 Metre Length



Note that the 1700A DataTwist® 350 can be used for runs approximately 50% longer than those with the competitor's enhanced non-plenum Category 5 cable.

Extended Lengths

Although the TIA/EIA 568A draft specifies a horizontal run of no more than 90 metres, it may be possible to utilize longer distances with DataTwist[®] 350 and still maintain a 10dB ACR, even at 100 MHz.

The table at right shows the maximum distances in metres that DataTwist[®] 350 could be used while maintaining the desired 10 dB of differential.

Performance Data		
Frequency (MHz)	Maximum Length for a 10 dB ACR (Metres)	
	1700A	1701A
4	1272	1253
8	826	808
10	709	686
16	518	497
20	446	431
31.25	337	349
62.5	206	199
77.5	171	159
100	147	137

Conclusion

ACR is obviously an important concern for reliable data transmission, especially at the high frequencies.

When comparing cable performance, it is important to look at both attenuation and crosstalk, since both are significant to the cable's ACR and headroom.

DataTwist[®] 350 cables exhibit superior crosstalk and attenuation when compared to the Category 5 specification as well as to a leading competitor's enhanced Cat. 5 cables.

Whatever the frequency range, DataTwist[®] 350 maintains a larger ACR than standard Category 5 cables.

Its superior performance also gives the end user more flexibility in an installation, allowing for both extended frequency performance above 100 MHz and potentially longer cable runs, independent of frequency.

Although only some of these advantages may be realized today, they may all be important in the future as data transmission speeds increase.

Link Testing

DataTwist[®] 350 Vs. DataTwist[®] Five

Today many manufacturers are promoting improved electrical performance on TIA/EIA Category 5 compliant components.

While one may question why performance superior to the specifications of the standard is worthwhile, many opportunities exist for system performance degradation in the end-to-end link.

Simply understanding the specifications of each individual component is not sufficient in terms of understanding how the cabling system may perform.

The upcoming TIA/EIA 568A Standard will contain an informative 'Annex', or supplement to the Standard, describing worst-case performance specifications of an UTP link made up of Category compliant sections of cable and connecting hardware.

The unique design of Belden DataTwist[®] 350 allows for precise conductor-to-conductor spacing. As a result of uniformity, the cable displays extremely stable electrical performance, both before and after termination.

The following test analysis demonstrates the impact on the electrical performance of cable based on connecting hardware and termination practices.

It compares the Belden DataTwist[®] 350 to traditional Cat. 5 product and demonstrates how easily product performance can be degraded.

Test Analysis and Results

Cabling links can be tested from either end, as well as from different points in the link. The initial testing focused on the work area RJ-45/ outlet termination and a wiring closet 110 punchdown block termination.

Step one was to measure attenuation and Near-End Crosstalk (NEXT) on a 300' length of each cable. Step two was to measure attenuation and NEXT through the work area RJ-45/outlet and the horizontal cable.

Finally, the same was measured through the 110 punchdown and the horizontal cable. In each case, 401 data points were measured over the frequency range of .772 to 350 MHz for NEXT and attenuation.

All connecting hardware components were TIA/EIA TSB-40 compliant to Category 5 per their manufacturer and are widely used in the industry.

The work area termination consisted of a single RJ-45/outlet combination while the 110 block termination consisted of a 100 pair block and Cat. 5 110 connection blocks.

Two different termination techniques were employed for each cable type, as follows:

1583A

1. 2" jacket removal, .5" pair untwist.
2. 6" jacket removal, 2" pair untwist.

1700A

1. 2" jacket removal, .5" separation.
2. 6" jacket removal, 2" pair untwist, 0.5" separation.

Technique 1 is a TIA/EIA compliant Category 5 termination. Technique 2 is not TIA/EIA compliant and is considered to be a general worst-case termination.

Limiting the jacket removal to 2" maximum may not be difficult to control. Limiting the pair untwist to 0.5" maximum is often difficult to control.

With standard Category 5 product the twist of the pairs may tend to loosen up and separate as they are being terminated.

Due to the unique design of the DataTwist® 350 product, this scenario will not occur.

Work Area RJ-45/Outlet

In order to perform the tests, a 3" length of 1700A was terminated into an RJ-45 per TIA/EIA Connecting Hardware Transmission Testing guidelines (Annex B, 568A DRAFT).

This served as the test leads required to hook up to the network analyser. Wire configuration was done per TIA/EIA T568B. Three hundred feet of horizontal cable was then punched down into the back of the outlet.

Attenuation

The attenuation results of both termination techniques were analysed. The following graphs show the average change in attenuation of all of the pairs after the cable was terminated, as well as the results of the cable itself. A negative (-) dB change means added signal loss or more attenuation.

Belden DataTwist® 5 1583A Attenuation dB Change (300' with RJ-45/Outlet)

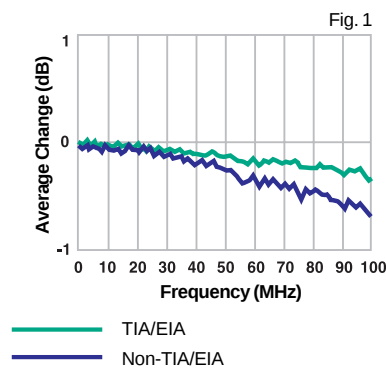


Figure 1 shows that with DataTwist® Five at 100MHz, there was a 0.3 to 0.4 dB degradation in the attenuation performance when the cable was terminated per TIA/EIA recommendations.

Belden DataTwist® 5 1700A Attenuation dB Change (300' with RJ-45/Outlet)

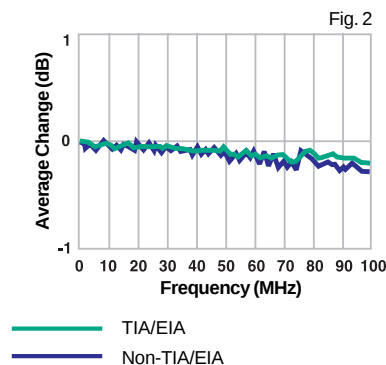


Figure 2 shows that with the DataTwist® 350, there is no real difference in the attenuation performance due to the termination technique (TIA/EIA compliant or non-compliant). It also shows an overall effect similar to, but slightly better than, that of a properly terminated Category 5 cable.

For analytical purposes, the results were examined by breaking the frequency sweep of .772 to 100 MHz into several equal frequency ranges. The worst-case data point in that range, out of all six pair-to-pair combinations, was found and recorded.

To clarify, the worst-case data point was that point closest to the Category 5 spec or the point which failed the Category 5 spec to the greatest degree.

Because the dB magnitude of NEXT gets smaller as frequency increases, the worst-case point was recorded at the highest frequency of a defined range.

This process was repeated for all of the defined ranges. The results are shown in Figures 3 and 4.

Belden DataTwist® 5 1583A NEXT dB from Spec (300' with RJ-45/Outlet)

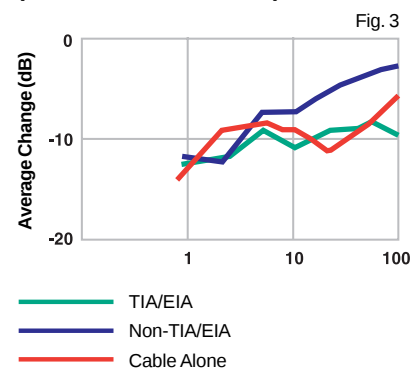


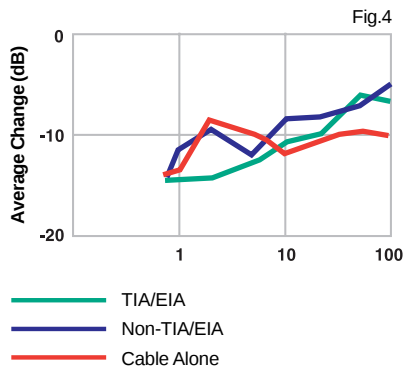
Figure 3 shows DataTwist® Five at 100 MHz. The NEXT performance of the 1583A cable and connecting hardware is 5 dB worse than the cable itself when the termination is TIA/EIA Category 5 compliant. The non-compliant termination is 8 dB worse than the cable itself.

Near-End Crosstalk (NEXT)

In a four pair cable, there are six pair-to-pair combinations. Near-End Crosstalk (NEXT) data was collected for all six combinations.

The measurement process began by first measuring the cables alone. Then each cable was terminated per the termination techniques 1 and 2 previously described, and NEXT was measured.

Belden DataTwist® 5 1700A NEXT dB from Spec (300' with RJ-45/Outlet)



110 Punchdown Block

In order to perform the tests, a 3" length of 1700A was prepared to serve as the test leads required to hook up to the network analyser.

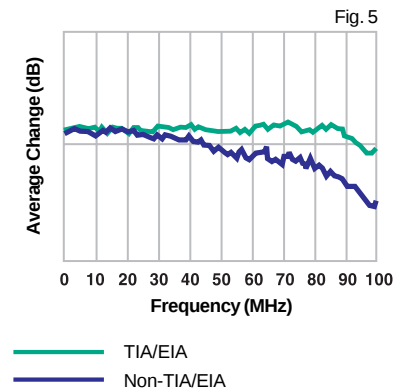
Three hundred feet of horizontal cable was then punched down into the 110 block and terminated with an eight position Category 5 rated 110 connection block.

The same two termination techniques used in the work area RJ-45/outlet analysis were used on the 110 block.

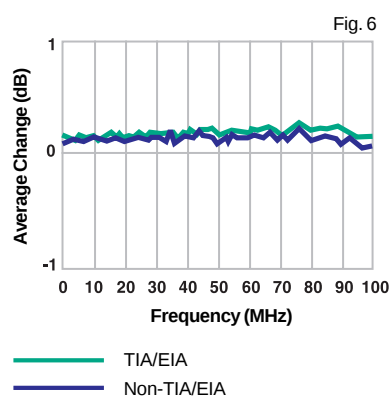
Attenuation

The attenuation data was analysed in the same method as the work area RJ-45/outlet analysis. The results are shown in Figures 5 and 6.

Belden DataTwist® 5 1583A Attenuation dB Change (300' with 110 Block)



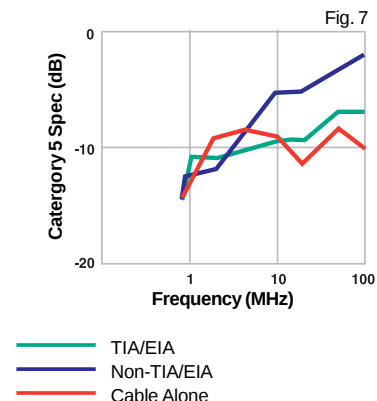
Belden DataTwist® 5 1700A Attenuation dB Change (300' with 110 Block)



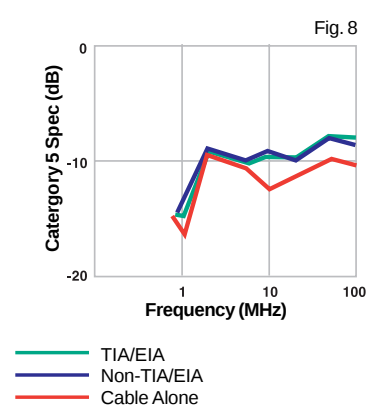
Near-End Crosstalk (NEXT)

Near-End Crosstalk (NEXT) data was collected and analysed in the same manner as the work area RJ-45/outlet analysis. The results are shown in Figures 7 and 8.

Belden DataTwist® 5 1583A NEXT dB from Spec (300' with 110 Block)



Belden DataTwist® 5 1700A NEXT dB from Spec (300' with 110 Block)



Conclusions

Based on repeated testing, the DataTwist® 350 Cables provide superior electrical performance over Cat. 5 cables when terminated into system link components. This shows that even with improper termination techniques, the DataTwist® 350 cable still maintains the enhanced electrical performance.

These improvements are listed in the tables at left for the frequencies of 31.25 and 100 MHz. Also shown is the net dB impact on ACR (attenuation to crosstalk ratio) for each cable & connection type.

Performance Data						
Wire	Avg dB Degradation in Attenuation		Worst-Class NEXT dB Degradation from Spec.		Net ACR dB Degradation	
	TIA/EIA Compliant	Non-Compliant	TIA/EIA Compliant	Non-Compliant	TIA/EIA Compliant	Non-Compliant
RJ45/Outlet						
1583A	.10 dB	.10 dB	2.0 dB	6.0 dB	2.1 dB	6.1 dB
1700A	.05 dB	.05 dB	2.0 dB	3.0 dB	2.05 dB	3.05 dB
110 Block						
1583A	0.0 dB	0.0 dB	2.0 dB	6.0 dB	2.0 dB	6.0 dB
1700A	0.0 dB	0.0 dB	2.0 dB	2.0 dB	2.0 dB	2.0 dB

Data based on frequency of 31.25 MHz

Performance Data						
Wire	Avg dB Degradation in Attenuation		Worst-Class NEXT dB Degradation from Spec.		Net ACR dB Degradation	
	TIA/EIA Compliant	Non-Compliant	TIA/EIA Compliant	Non-Compliant	TIA/EIA Compliant	Non-Compliant
RJ45/Outlet						
1583A	0.3 dB	0.7 dB	5.0 dB	8.0 dB	5.3 dB	8.7 dB
1700A	0.2 dB	0.2 dB	3.0 dB	5.0 dB	3.2 dB	5.2 dB
110 Block						
1583A	0.0 dB	0.5 dB	3.0 dB	8.0 dB	3.0 dB	8.5 dB
1700A	0.0 dB	0.0 dB	2.0 dB	2.0 dB	2.0 dB	2.0 dB

Data based on the frequency of 100 MHz.

The above tables clearly show the importance of terminating DataTwist® 350 and Category 5 cables per the TIA/EIA installation recommendations.

These are substantial performance enhancements which DataTwist® 350 offers over Category 5 cable when installed per TIA/EIA guidelines and even when not installed per these guidelines. This is summarized in the graphs (Figures 9 and 10).

Net ACR Degradation with TIA/EIA Termination

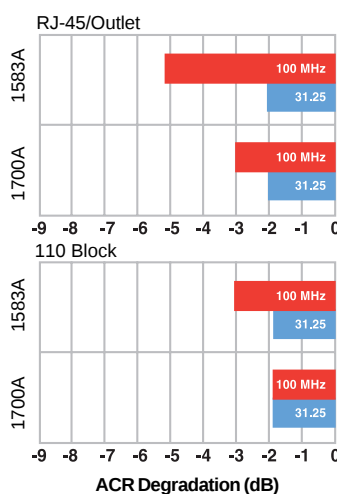


Fig. 9

Net ACR Degradation with Non-Compliant Termination

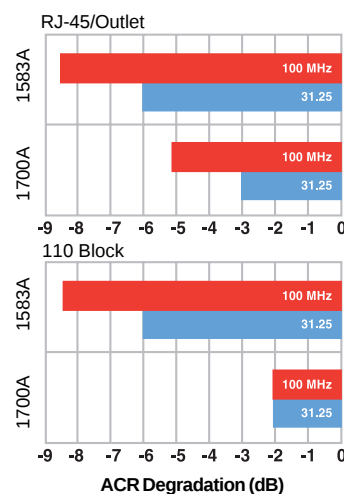


Fig. 10

MediaTwist® Belden's Category 6* Performance Cable

Through Media twist Belden has created a unique cable design delivering the ultimate in UTP performance. Media Twist utilizes a unique patent pending design and manufacturing process to produce a 4 pair cable with extremely uniform dimensions and internal physical spacing. Unlike other "enhanced" cables, only Media Twist provides proven performance beyond 100MHz. In fact it delivers stable performance to 350MHz, with electrical characteristics exceeding TIA/EIA Category 5 standards by such a wide margin that Category 5 has become an obsolete benchmark.

Advanced Manufacturing Technology

Belden's patented bonded pair technology has always been a cornerstone of stable electrical performance. With Media Twist, Belden has taken bonded pair technology a step further. Through its unique crescent shaped design, each pair is "locked" into place. This ensures that pair to pair movement is greatly minimized during the installation process. This provides stable cross talk and impedance performance before and after installation. Electrical variations, especially beyond 100MHz, can be increased with traditional UTP design approaches. Only MediaTwist performs across all verified frequency ranges, even after installation, nullifying any electrical degradation that can result from various individual installation techniques.

Ultimate Balanced pair Characteristics

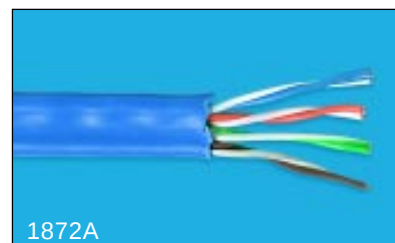
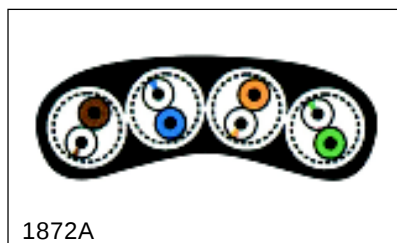
It is crucial that each conductor of a twisted pair be a "mirror image" of the other in order for the pair to be balanced. By doing this, noise rejection can be optimized for common mode signals. Belden MediaTwist ensures the ultimate in balanced pair characterization. This benefits not only signal integrity, but also helps in the reduction of cable radiation as well.

Construction

0.5mm/24 AWG solid bare copper, polyolefin, polyethylene or FEP Teflon insulated, 4 twisted pairs - each with adjoined singles (bonded pairs), ripcord, PVC jacket sequentially marked at two foot intervals, available in Blue, Natural, Grey, Red, Yellow, Orange, Green, Gold or Purple.

Important Notes: Impedance and SRL values shown are uncorrected/unaveraged numbers. The TIA/EIA 568-A Category 5 standard allows for the use of a fitting function which interprets and recalculates impedance and SRL. This smoothing function can make data appear better than actual measurements. The product data shown here does not employ this method.

1875GA is T568A wiring scheme



* At the time of print, the Category 6 standard is yet to be ratified.

MediaTwist®										
Cat. No.	No. of Pairs	Conductor Size		Reel Length	Freq.	Max. Att.	PSum. Min. NEXT	PSum. Min. ACR	PSum. Min. ELFEXT	Min. RL
UL NEC C(UL) CEC type		(mm)	(AWG)	(m)	(MHz)	(dB/100m)	(dB)	(dB/100m)	(dB/100)	(dB)
1872A	4	0.5	24	305	1	2.0	70	68.3	52.0	23
					4	4.1	61	57.2	48.7	23
					8	5.8	57	51.0	48.3	23
					10	6.5	55	48.8	46.3	23
					16	8.2	52	44.0	42.1	23
					20	9.3	51	41.5	39.2	23
					25	10.4	49	38.9	38.1	22
					31.25	11.7	48	36.2	36.0	21
					62.5	17.0	43	26.4	29.7	21
					100	22.0	40	18.3	25.3	21
					155	31.5	37	6.0	17.7	21
					200	36.4	36	-	14.7	21
					310	47.0	33	-	9.1	18
					350	50.5	32	-	7.5	17
					400◆	45.6	-	-	-	16
					550◆	55.3	-	-	-	16

◆ Values about 350 MHz are provided as reference only for those using the product for broadband signals above 350MHz. Input Impedance at 100MHz, 100Ω+/-15%.

Colour Code Chart

Pair No.	Colour Combination
1	White/Blue Stripe, Blue
2	White/Orange Stripe, Orange
3	White/Green Stripe, Green
4	White/Brown Stripe, Brown

MediaTwist®

Cat. No.	Capacitance Unbalance (pF/1000ft)	Resistive Unbalance	Delay Skew	Worst Case Pair Velocity
1872A	150	2.5%	18ns	70%

MediaTuff UTP Cable for Industrial Networks

New Belden MediaTuff series combines high speed UTP technology with ruggedised armour and upjacket protection connecting office LANs and factory floor environments. Two standard options are available to ensure your LAN and media signal integrity is maintained while wiring industrial PCs and PLCs. The oil-resistant industrial grade PVC upjacket option offers flexible protection in a small profile requiring less tray or conduit space. The aluminium interlock armour option offers a bendable conduit-like protection and allows easy transition from a tray or raceway into a junction box or remote cabinet. The armour and jackets are easily removed to reveal an inner core prepared to accept standard RJ connectors. Cable core selection features Belden's patented bonded pair design and Belden's ultra-high performance MediaTwist. Other outer jacket options are available.

Construction

0.5mm/24 AWG solid bare copper, polyolefin insulated, twisted pairs - each with adjoined singles, ripcord, PVC jacket, sequentially marked at two foot intervals.
Available in Black and Grey.

Colour Code Chart

Pair No.	Colour Combination
1	White/Blue Stripe, Blue
2	White/Orange Stripe, Orange
3	White/Green Stripe, Green
4	White/Brown Stripe, Brown

MediaTuff®										
Cat. No.	No. of Pairs	Conductor Size		Reel Length	Freq.	Max. Att.	Min. Next	PSum. Min Next	PSum. Min. ACR	Min. SRL
UL NEC C(UL) CEC type		(mm)	(AWG)	(m)	(MHz)	(dB/100)	(dB)	(dB)	(dB)	(dB)
11872A	4	0.5	24	305	1	1.9	72	70	68	23
Up Jacketed					4	3.8	63	61	57	23
					10	6.0	57	55	49	23
12872A					16	7.7	54	52	44	23
Armoured					32.25	10.9	50	48	17	21
					62.5	10.9	50	43	27	21
NEC CM					100	20.5	42	40	20	21
CEC CM					155	26.2	39	37	11	19
					200	30.3	38	36	5	19
					310	39.2	35	33	-	17
					350	42.1	34	32	-	16
					400◆	45.6	33	31	-	16
					550◆	55.3	-	-	-	16

◆ Values about 350 MHz are provided as reference only for those using the product for broadband signals above 350MHz. Nominal Impedance at 100MHz, 100Ω±15%.

MediaTwist® Patch Cable Belden's Category 6* Performance Cable

1875GA & 1875GB Non-plenum CM/CMG rated UTP Patch Cable

MediaTwist® Patch is the choice for high-end performance patch cables.

Designed and manufactured with the same MediaTwist® crescent shape patented technology, it is a robust cable capable of tolerating more than the average installation abuse, while guaranteeing a level of performance unequalled in today's market.

Additionally, it aims at future proofing by satisfying tomorrow's anticipated needs.

MediaTwist® Patch suits both end users looking for high-end performance, and end users looking for Category 5 patch cables capable of running longer lengths to give overall system savings and work station layout flexibility.

Multimedia Application

MediaTwist® Patch is the answer for the weakest component in high speed networks. For simultaneous operations over four pairs, MediaTwist® Patch guarantees Powersum crosstalk performance that exceeds 40 dB at 100 MHz.

The physical construction of the cable provides the needed ACR for the best performing connectivity in the market, yet it achieves attenuation performance equal to Category 5 horizontal cables.

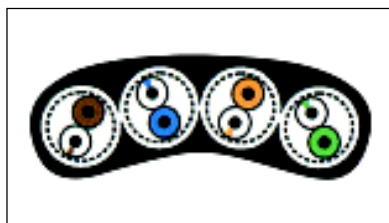
The bonded-pair technology assures the cable impedance and RL stability. The net result is a patch cable for high performance and multimedia applications.

T568A and T568B Wiring Schemes

For ease of termination, MediaTwist® Patch is available in two types if there is a preference to the wiring scheme:

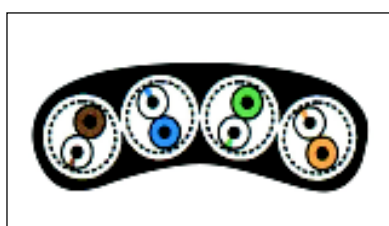
1875GA is T568A wiring scheme where pair colour alignment is:

Brown Blue Orange Green



1875GB is T568B wiring scheme where the pair colour alignment is:

Brown Blue Green Orange



Robust Design

Since any cable's physical attributes fundamentally determine its electrical performance, Belden combined its patented crescent shape construction, pre-bonded tinned copper, and patented bonded pair technology to produce a physically robust patch cable.

This cable is capable of tolerating considerable abuse, and ageing over time.

Its pairs are well protected in their own channels to deliver the needed performance for high end applications.

MediaTwist® Patch is what all patch cables need to be.

Savings for Category 5 Users

MediaTwist® Patch offers unique features to the Category 5 UTP user. It enjoys an exceptional ACR performance. It is a patch cable with Category 5 horizontal attenuation performance.

Belden's MediaTwist® Patch attenuation is 20% better than any Category 5 patch on the market.

Such performance provides the ability to use patch cord lengths well beyond the maximum 10 metres specified for Category 5 patch cables. (See table on page 61.)

Main Features

- Category 5 horizontal attenuation up to 100 MHz for 20% longer patch cable than Cat. 5 patch.
- Best Powersum NEXT in the industry for multimedia users.
- Bonded pairs for robust performance even with severe cable abuse.
- Tinned bonded copper for lifelong conductor integrity.
- High ACR to work with the best performing connectors in the industry.
- CMG, CM, UL rated.
- Exceeds ISO/IEC 11801 requirements.
- Superior bonded pair impedance/RL for stable network performance.
- Ideal for open office applications.
- Lower than 3% DCR unbalance.
- Less than 66 pF/100m capacitance unbalance.
- Increased cable maximum pull tension to 18.1 kg from 11.3 kg.
- Examples of applications: Gigabit Ethernet, ATM 155, 100Base-VG Anylan.

Installation Characteristics

Horizontal Category 5 (metre)	Max. Length of Work Area for Cat. 5 Patch (metre)	Max. Length of Work Area for MediaTwist® Patch (metre)	Max. Length Combined of Cat. 5 Patch & Cat. 5 Horizontal (metre)	Max. Length Combined MediaTwist® Patch & Cat. 5 Horizontal (metre)
90	3	5	10	12
85	7	10	14	17
80	11	15	18	22
75	15	20	22	27

Assumes 7 metres of patch and equipment cable in equipment closet.

* At the time of print, the Category 6 standard is yet to be ratified.

MediaTwist® Patch Cable

Construction

0.5mm/24 AWG stranded tinned copper, polyolefin insulated, 4 twisted pairs each with adjoining singles (bonded pairs) PVC jacket. Colour rotation available for T568A or T568B wiring schemes. RJ-45 compatible.

Available in Red, Yellow, Green, Orange, Blue, Purple, White or Grey jacket colours.



MediaTwist® Patch Cable											
Cat. No. UL/NEC C(UL) CEC type	No. of Pairs	Conductor Size		Reel Length (m)	Nom. O.D (mm)	Freq. (MHz)	Max. Att. (dB/100m)	PSum. Min. Next+ (dB)	PSum. Min. ACR (dB/100m)	PSum. Min. ELFEXT (dB/100)	Min. SRL (dB)
		(mm)	(AWG)								
1875GA	4	0.5	24	305	9.27 x 4.1	1	2.0	70	68.3	52.0	23
						4	4.1	61	57.2	48.7	23
						8	5.8	57	51.0	48.3	23
						10	6.5	55	48.8	46.3	23
						16	8.2	52	44.0	42.1	23
						20	9.3	51	41.5	39.2	23
						25	10.4	49	38.9	38.1	21
						31.25	11.7	48	36.2	36.0	21
						62.5	17.0	43	26.4	29.7	21
						100	22.0	40	18.3	25.3	21
1875GB	4	0.5	24	305	9.27 x 4.1	155	31.5	37	6.0	17.7	21
						200	36.4	36	-	14.7	21
						310	47.0	33	-	9.1	18
						350	50.5	32	-	7.5	17
NEC CM											
CEC CM											

+ Near End Crosstalk

Nominal Impedance at 100MHz, 100Ω+/-15%.

Colour Code Chart		
Pair No.	1875GA Colour Combination	1875GB Colour Combination
1	White/Brown Stripe, Brown	White/Brown Stripe, Brown
2	White/Blue Stripe, Blue	White/Blue Stripe, Blue
3	White/Orange Stripe, Orange	White/Green Stripe, Green
4	White/Green Stripe, Green	White/Orange Stripe, Orange

DataTwist® 7
Belden's Category 7*
Performance Cable

DataTwist® 600 I-STP

Future Proof Your Network Today

Belden 1888ANH 600I-STP cable satisfies ISO/IEC 11801 and EN50173 (DIN 44312-5) Category 7 standards. Furthermore, the data transmission characteristics specified are valid up to frequencies of 600 MHz.

The excellent electrical properties of these cables are achieved as a result of the implementation of a Foam Skin Core®-extrusion technique. The pairs are shielded using a foil with 2-Fold technique. In this way the pairs are optionally decoupled and excellent contact is guaranteed between the individual shields.

Advantages:

Outstanding electrical features at high frequencies offer tremendous headroom at today's frequencies.

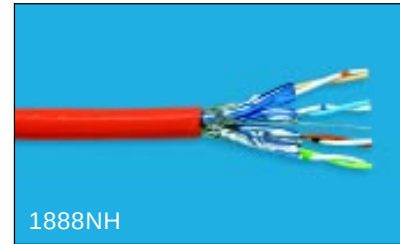
The extraordinary shielding technique provides excellent EMC behaviour even in extreme installations.

Exceptional high specification of electricals of 1888ANH ensure compatibility with future 600MHz standards.

Construction

0.64mm/23 AWG solid bare copper, foam-skin insulation, 4 pairs, each with individual aluminium/polyester foil shield, overall tinned copper braid shield, tinned drain wire and ripcord.

Green or Orange halogen-free outer jacket with metre marking.



1888NH

DataTwist® 600 I-STP										
Catalogue No.	No. of Pairs	Conductor Size		Reel Length	Vel. Of Prop.	Freq.	Att.	Nom. NEXT+	Min. SRL	Typ. ACR
UL NEC C(UL) CEType		(mm)	(AWG)	(m)	(%)	(MHz)	(dB/100m)	(dB)	(dB)	(dB/100m)
1888NH	4	0.57	23	500	76	1	1.9	103	23	101
						4	3.5	105	23	102
						10	5.4	89	23	84
						16	7.1	85	23	78
						20	7.9	88	23	80
						31.25	10.1	91	21	81
						62.5	14.3	96	18	82
						100	18.0	89	16	71
						200	25.0	86	13	61
						300	31.0	83	11	52
						400	36.0	78	10	42
						600	46.0	70	8	24

+ Near End Crosstalk

Nominal Impedance at 100mHz 100Ω±/-15%.

Colour Code Chart	
Pair No.	Colour Combination
1	White/Blue Stripe, Blue
2	White/Orange Stripe, Orange
3	White/Green Stripe, Green
4	White/Brown Stripe, Brown

* At the time of print, Category 7 standard is yet to be ratified.

Product Summary				
	AWG	No. of Pairs	Unshielded	Shielded
DataTwist®	24	2	1227A1	1624R
		4	1229A1	
		25	JGAD06FG025	
		50	JGAD06FG050	
		100	JGAD06FG0100	
DataTwist® 5	24	4	JGAD06AA004	
		25	1864A	
Category 5 Patch	24	4	JWTP37AA004	
Category 5 Jumper	24	1	1721X	
		2	1722X	
		3	1723X	
		4	1724X	
DataTwist® 5E	24	4	1583A	
DataTwist® 5E Patch	24	4	JYJP37FG004	
DataTwist® 350	24	4	1700A	
		2 x 4	1702A	
		4	1732A	
DataTwist® 350 Patch	24	4	1732A	
MediaTwist®	24	4	1872A	
MediaTwist® Patch	24	4	1875GA/1875GB	
DataTwist® 600	23	4	1888NHR	

Note: Plenum and Low Smoke, Zero Halogen Cables available on request.

Sequence Options

Sequence is defined as the order in which the incoming pairs are terminated into the modular interface pins. Each pair is designated as a Transmit conductor and a Receive conductor.

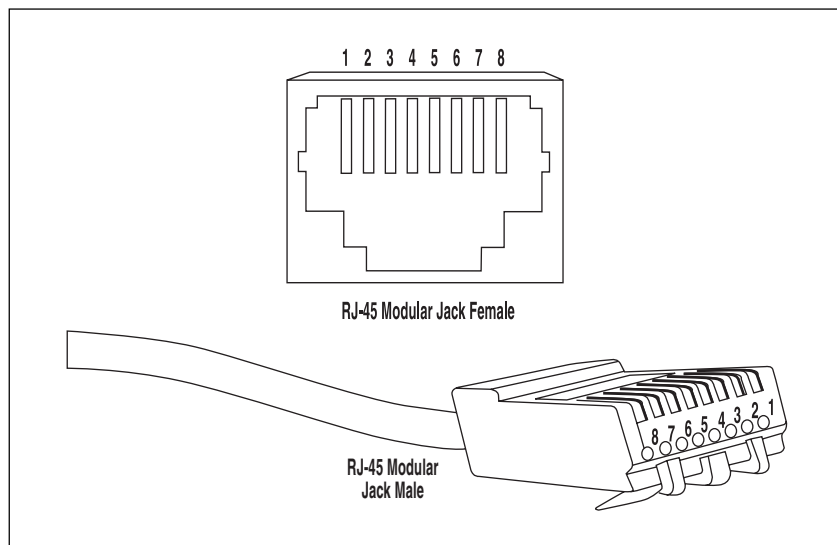
EIA 568A This is the preferred connection sequence for Australia and New Zealand as stated in AS/NZS 3080-1885; also the EIA Commercial Cabling Specification Draft 9.0 for termination of UTP data cable. The international standard for ISDN also states this standard.

This is similar to the 568B sequence except that pairs #2 and #3 are transposed. This provides backward compatibility to the USOC sequence for two pairs instead of the single pair of 568B.

EIA 568B This is the preferred connection sequence for the U.S. and is derived from ISO 11801 and is a sub-set of IEEE 802.3 10 Based - T Ethernet over twisted pair. This standard is only applicable to eight wire polarisation (WE8W).

In the 568B sequence, pair #1 and pair #3 correspond to pair #1 and pair #2 of the USOC sequence, providing backward compatibility with 2 pair systems (such as analogue voice).

Pair #1 is therefore designated as 'T1 and R1'. The sequence defines which pins of the modular interface are defined as T1, R1, T2, R2 etc. Some sequences are only applicable to certain polarisation.



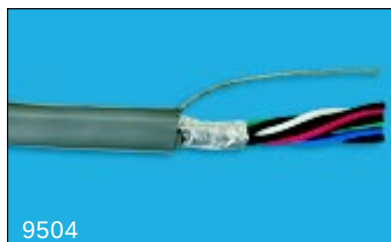
Data Cables

Computer Cables for RS232 Applications

Construction

Tinned copper, S-R PVC insulated twisted pairs, overall Beldfoil® aluminium-polyester shield, 0.5mm/24AWG stranded, tinned copper drain wire, chrome PVC jacket, 100% jacket, 100% shield coverage.

Rating: 300V 80°C.



9504

Computer Cables for RS232 Applications

Cat. No. Industry Standards	No. of Pairs	Conductor Size		Cond. Type	Reel Length (m)	Nom. O.D (mm)	Vel. Of Prop. (%)
		(mm)	(AWG)				
9501	1	0.5	24	7x32 TC	305	3.96	66
9502	2					5.64	
9504	4					6.73	
9508	8					8.23	
NEC C MG							
CEC CMG							
CSA AWM							

Reel length - Other sizes available on request.

Computer Cables Low Capacitance RS232 and RS432 Applications

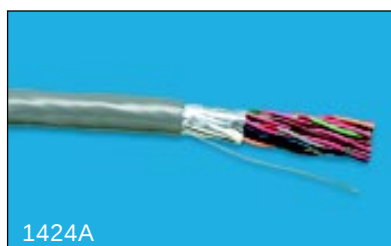
Construction

Tinned copper, Datalene® insulated, twisted pairs (12 pairs plus 1 single). Overall Beldfoil® aluminium-polyester shield. 0.5mm/24 AWG stranded tinned copper drain wire, chrome PVC jacket, 100% shield coverage.

Rating: 30v 80°C.

Datalene® insulation features are low dielectric constant and a dissipation factor for high speed, low distortion data handling.

Physical properties include good crush resistance and light weight.



1424A

Computer Cables Low Capacitance RS232 & RS422 Applications

Cat. No. Industry Standards	No. of Pairs	Conductor Size		Cond. Type	Reel Length (m)	Nom. DCR Cond. Shield (Ω/km)		Nom. O.D (mm)	Vel. Of Prop. (%)
		(mm)	(AWG)						
1424A	12+1	0.5	24	7x32 TC	305	78.7	42.7	10.62	78
UL AWM 2919									
NEC CM									

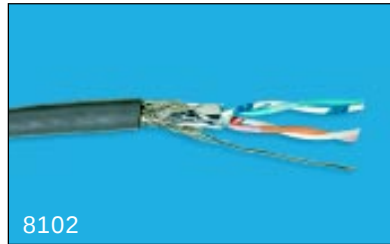
Reel length - Other sizes available on request.

Pair sizes - 2, 3, 4, 5, 6 & 15 available on request.

Construction

Overall Beldfoil® aluminium-polyester shield, 0.5mm/24 AWG stranded tinned copper drain wire, overall tinned copper braid shield 65% coverage, chrome PVC jacket. 100% shield coverage.

Rating: 30V 80°C.



Computer Cables Low Capacitance RS232 & RS422 Applications									
Cat. No. Industry Standards	No. of Pairs	Conductor Size		Cond. Type	Reel Length (m)	Nom. DCR Cond. Shield (Ω/km)		Nom. O.D (mm)	Vel. Of Prop. (%)
		(mm)	(AWG)						
8102	2	0.5	24	7x32 TC	305	78.7	15.1	6.86	78
UL AWN 2919 NEC CM									

Reel length - Other sizes available on request.

Pair sizes - 3, 4, 5, 6, 7, 8, 10, 12.5, 18 & 25 available on request.

Computer Cables for RS485 Applications

Construction

Overall Beldfoil® aluminium-polyester shield, 0.5mm/24 AWG stranded tinned copper drain wire, single pair, overall tinned copper braid shield 90% coverage, chrome PVC jacket, 100% shield coverage.

Rating: 30V 80°C.



Computer Cables for RS485 Applications							
Cat. No. Industry Standards	No. of Pairs	Conductor Size		Cond Type	Reel Length (m)	Nom. O.D (mm)	Vel. Of Prop. (%)
		(mm)	(AWG)				
9841	1	0.5	24	7x32	305	5.89	66
9842	2			TC		8.64	
UL AWM 2919 NEC CM CEC CM							

Reel length - Other sizes available on request.

Pair Sizes - 3 and 4 available on request.

Audio Control and Instrumentation Cables

Construction

Bare copper, polyethylene insulated, conductors cabled, tinned copper braid shield 95% coverage, matte PVC jackets in Red, Green, Yellow, Blue, Grey and Black. 2 Blue Conductors, 2 White Conductors.

Rating: 100V, 75°C.

Note: One Blue Conductor and one White Conductor are striped for use in MIDI and other four conductor applications.



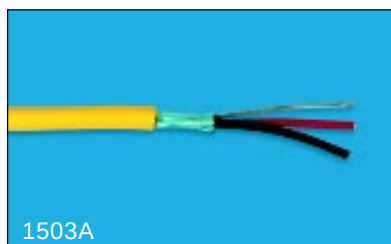
Audio Control and Instrumentation Cables								
Catalogue No. Industry Standards	No. of Cond.	Conductor Size (mm) (AWG)		Cond. Type	Reel Length (m)	Nom. O.D (mm)	Insul. Thick. (mm)	Jacket. Thick. (mm)
1192A	4 2 Blue 2 White	0.58	24	42x40 BC	305	6.22	0.41	1.14

Reel length - Other sizes available on request.

Construction

Beldfoil® Aluminium-Polyester Shield, 0.5mm/24 AWG stranded tinned copper drain wire, PVC jacket in Brown, Orange, Violet, Grey, White, Blue, Green, Red, Yellow and Black, 100% shielded coverage.

Colour code: Black, Red.

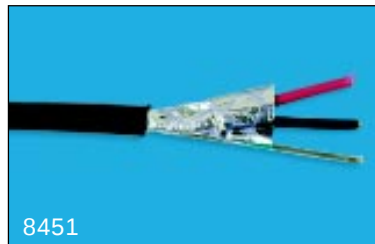


Audio Control and Instrumentation Cables								
Catalogue No. Industry Standards	No. of Pairs	Conductor Size (mm) (AWG)		Cond. Type	Reel Length (m)	Nom. O.D (mm)	Insul. Thick. (mm)	Jacket. Thick. (mm)
1503A NEC CM CEC CM	1	0.76	22	7x30 TC	305	3.61	0.25	0.51

Reel length - Other sizes available on request.

Construction

Beldfoil[®] aluminium-polyester shield, 22 AWG solid tinned copper drain wire, paper wrap, Grey or Black PVC jacket, Belden Miniature Type Broadcast Audio and Instrumentation Cables occupy $\frac{1}{2}$ to $\frac{2}{3}$ less space than standard cables, suggested working voltage: 300V RMS, Beldfoil[®] 100% shield coverage. Colour code: Black, Red.

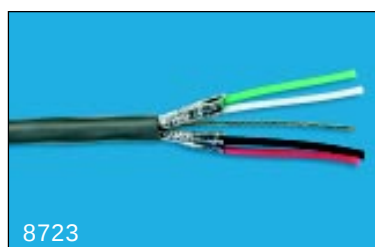


Audio Control and Instrumentation Cables								
Catalogue No. Industry Standards	No. of Pairs	Conductor Size		Cond. Type	Reel Length (m)	Nom. O.D (mm)	Insul. Thick. (mm)	Jacket. Thick. (mm)
		(mm)	(AWG)					
8451 NEC CM CEC CM	1	0.76	22	7x30 TC	305	3.51	0.20	0.51

Reel length - Other sizes available on request.

Construction

Black and Red under Beldfoil[®] aluminium-polyester shield, Green and White under Beldfoil[®] aluminium-polyester shield, 24 AWG common stranded tinned copper drain wire, chrome PVC jacket, pairs cabled on common axis to reduce diameter, suggested working voltage: 300V RMS, Beldfoil[®] 100% shield coverage, colour code: Red/Black, Green/White.



Rating 60°C.

Plenum Versions: 88723, 82723, 87723

Audio Control and Instrumentation Cables							
Catalogue No. Industry Standards	No. of Pairs	Conductor Size		Cond. Type	Reel Length (m)	Nom. O.D (mm)	Vel. of Prop. (%)
		(mm)	(AWG)				
8723 NEC CM CEC CM	1	0.76	22	7x32 TC	305	4.27	66

Reel length - Other sizes available on request.

Construction

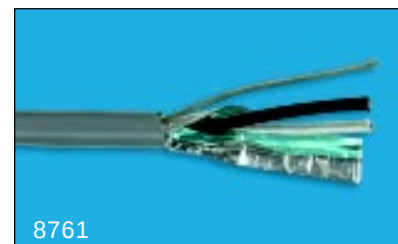
Beldfoil® aluminium-polyester shield, 0.89mm/20 AWG stranded tinned copper drain wire, single pair, chrome PVC jacket, Beldfoil® 100% shield coverage, low capacitance, colour code: Black, Clear.

Rating 300V 60°C.

Plenum Versions: 88761, 87761, 82761.



8760



8761

Audio Control and Instrumentation Cables

Catalogue No. Industry Standards	No. of Pairs	Conductor Size (mm) (AWG)		Cond Type	Reel Length (m)	Nom. O.D (mm)	Insul. Thick. (mm)	Jacket. Thick. (mm)
8760	1	1.2	18	16x30 TC	305	5.64	0.48	0.71
8761 UL AWM 2092 NEC CM CEC CM	1	0.76	22	7x30 TC	305	4.45	0.41	0.64

Reel length - Other sizes available on request

Coaxial and Twinaxial Cables

Ethernet Coaxial Trunk Cable - Thicknet

Construction

Solid bare copper centre conductor with foam polyethylene dielectric; DuoBond® II, 94% tinned copper braid Duofoil® shield and 90% tinned copper braid, Yellow PVC jacket with ring-band stripes marked every 2.5 m to aid users in placement of taps.

Rating: 30V, 60°C

IECQ certification available upon request - products with IECQ (International Electronics Commission) designation may be used confidently by buyers throughout the world without the need for further domestic testing.

DEC Cat. No. 17-00451-00



9880

Ethernet Coaxial Trunk Cable-Thicknet

Catalogue No. Industry Standards	Conductor Size (mm) (AWG)		Cond Type	Shield Type	Reel Length (m)	Nom. O.D (mm)	Insul. & Core O.D (mm)	Vel. Of Prop. (%)
9880 UL AWM 1478 NEC CM CEC CM	2.05	12	Solid BC	Duobond® II 94% TC Braid Duofoil® 90% TC Braid	500	10.29	6.17	78

Reel length - Other sizes available on request

Nominal Impedance 50Ω.

RG58/U Coaxial Trunk Cable - Thinnest Construction

0.94mm/20 AWG stranded tinned copper conductor with foam polyethylene insulation. DuoBond[®] II plus 93% tinned copper braid, 100% coverage, Grey PVC jacket, (CPE jacket optional.)

Rating: 30V, 80°C

DEC Cat. No: 17-02148-00

Plenum Versions: 89907, 82907



RG58/U Coaxial Trunk Cable - Thinnest								
Catalogue No. Industry Standards	Conductor Size		Cond Type	Shield Type	Reel Length (m)	Nom. O.D (mm)	Insl. & Core O.D (mm)	Vel. Of Prop. (%)
	(mm)	(AWG)						
9907 UL AWN 1354 NEC CM CEC CM	0.94	20	19x32 TC	Duobond [®] II 93% TC Braid	305	4.7	2.59	80

Reel length - Other sizes available on request

Nominal Impedance 50Ω

RG62 A/U Coaxial Computer Cable Construction

0.64mm/22 AWG solid bare copper coated steel conductor with semi-solid polyethylene insulation, bare copper braid, 95% coverage, Black PVC jacket.

Rating: 30V, 80°C

Plenum Versions: 89269, 82269



RG62 A/U Coaxial Cable								
Catalogue No. Industry Standards	Conductor Size		Cond Type	Shield Type	Reel Length (m)	Nom. O.D (mm)	Insl. & Core O.D (mm)	Vel. Of Prop. (%)
	(mm)	(AWG)						
9269 UL AWM 1478 NEC CM CL2	0.64	22	Solid BCCS	95% BC Braid	305	6.15	3.71	84

Reel length - Other sizes available on request

Nominal Impedance 93Ω

Twinaxial Computer Cable

Construction

0.9mm/20 AWG stranded conductors (1 conductor tinned copper, the other bare copper) with polyethylene insulation, Duofoil® shielded and tinned copper braid, 86% coverage, Black PVC jacket. (CPE jacket optional)

Rating: 75°C.

Plenum Versions: 89207, 82207.



Twinaxial Computer Cable										
Catalogue No. Industry Standards	Conductor Size (mm) (AWG)		Cond. Type	Shield Type	Reel Length (m)	Nom. DCR Cond. Shield (Ω/km)		Nom. O.D (mm)	Insl. & Core O.D (mm)	Vel. Of Prop. (%)
9207 NEC CM CLS2 CEC CM	0.9	20	7x28 1 TC 1 BC	Duofoil® 96% TC Braid	305	31.0	8.2	8.38	5.99	66

Reel length - Other sizes available on request.

Nominal Impedance 100Ω.

Twinaxial Computer Cable

Construction

20 AWG stranded tinned copper conductors with colour coded polyethylene insulation (Clear, Blue), Beldfoil® shield and tinned copper braid, 55% coverage, Blue PVC jacket, CPE Jacket optional.

Rating: 300V, 80°C.



Twinaxial Computer Cable									
Catalogue No. Industry Standards	Conductor Size (mm) (AWG)		Cond. Type	Shield Type	Reel Length (m)	Nom. O.D (mm)	Insl. & Core O.D (mm)	Vel. Of Prop. (%)	
9463 UL AWM 2464 NEC CM CEC CM	0.89	20	7x28 TC	Beldfoil® 55% TC Braid	305	6.17	3.81	66	

Reel length - Other sizes available on request.

Nominal Impedance 78Ω.

RG58 Coaxial MIL-C-17G QLP

Construction

0.94mm/20 AWG stranded tinned copper conductor with polyethylene insulation, tinned copper braid, 95% coverage, Black non-contaminating PVC jacket.

Rating: 80°C.



RG58 Coaxial MIL-C-17G QLP								
Catalogue No. Industry Standards	Conductor Size		Cond. Type	Shield Type	Reel Length (m)	Nom. O.D (mm)	Insl. & Core O.D (mm)	Vel. Of Prop. (%)
	(mm)	(AWG)						
8262	0.94	20	19x33 TC	95% TC Braid	305	4.9	2.95	66

Reel length - Other sizes available on request.

Nominal Impedance 50Ω.

RG142 B/U Coaxial MIL-C-17 High Temperature Cable

Construction

1.02mm/18 AWG solid silver coated copper coated steel (SCCS) conductor with TFE Teflon® insulation. 2 silver coated copper braids, 96% shield coverage, Brown tint FEP jacket.

Rating: 1400V, 200°C.



RG142 B/U Coaxial MIL-C-17 High Temperature Cable								
Catalogue No. Industry Standards	Conductor Size		Cond. Type	Shield Type	Reel Length (m)	Nom. O.D (mm)	Insl. & Core O.D (mm)	Vel. Of Prop. (%)
	(mm)	(AWG)						
83242 NEC CL2P	1.02	18	Solid	2 Silver Coated Copper Braids 96%	305	4.95	2.95	69.5

Reel length - Other sizes available on request.

Nominal Impedance 50Ω.

RG 59 SDI - Digital Video Cable

Construction

0.83mm/20AWG solid bare copper conductor with gas injected foam polyethylene insulation Duofoil® shielding plus 95% tinned copper braid, 100% shield coverage, PVC jacket available in the following colours - Black, Red, Green, Blue, Yellow, White, Brown, Orange, Purple or Grey, Sweep Tested: 5 MHz - 216 MHz, SRL 27 dB minimum, 216 MHz - 450 MHz, SRL 23dB minimum.

Rating: 80°C.

Plenum Version: 1506A



RG 59 SDI - Digital Video Cable

Catalogue No. Industry Standards	Conductor Size		Cond Type	Shield Type	Reel Length (m)	Nom. O.D (mm)	Insl. & Core O.D (mm)	Vel. Of Prop. (%)
	(mm)	(AWG)						
1505A NEC CM CEC CM	0.83	20	Solid BC	Duofoil® 95% TC Braid	305	5.97	3.68	83

Reel length - Other sizes available on request

Nominal Impedance 75Ω

RG 59/U Brilliance® Standard Analog Video Cable

Construction

0.76/22 AWG stranded bare copper conductor with foam polyethylene insulation, bare copper braid, 95% shield coverage, Black PVC jacket.

Rating: 30V, 80°C

Plenum Versions: 89259, 82259



RG 59/U Brilliance® Standard Analog Video Cable

Catalogue No. Industry Standards	Conductor Size		Cond Type	Shield Type	Reel Length (m)	Nom. O.D (mm)	Insl. & Core O.D (mm)	Vel. Of Prop. (%)
	(mm)	(AWG)						
9259 UL AWM 1354 NEC CM CEC CM CEC CM	0.76	22	7x30 BC	95% BC Braid	305	6.15	3.71	78

Reel length - Other sizes available on request

Nominal Impedance 75Ω

RG 59/U Brilliance® Standard Analog Video Cable

Construction

0.57mm/23 AWG solid bare copper covered steel conductor with polyethylene insulation, bare copper braid, 95% shield coverage, Black polyethylene jacket, Red, Yellow, Green, Light Blue, White and Orange.

Rating: 30 V, 80°C

Plenum Versions: 88241, 82241



8241

RG 59/U Brilliance® Standard Analog Video Cable								
Catalogue No. Industry Standards	Conductor Size		Cond. Type	Shield Type	Reel Length (m)	Nom. O.D (mm)	Insl. & Core O.D (mm)	Vel. Of Prop. (%)
	(mm)	(AWG)						
8241 UL AWM 1354 NEC CMX CEC CMX	0.57	23	Solid BC	95% BC Braid	305	6.15	3.71	66

Reel length - Other sizes available on request.

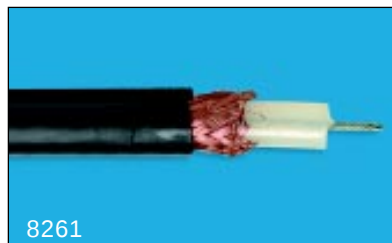
Nominal Impedance 75Ω.

RG11/U Brilliance® Standard Analog Video Cable

Construction

1.2mm/18 AWG stranded tinned copper conductor with polyethylene insulation, bare copper braid 97% shield coverage, black non-contaminating PVC jacket.

Rating: 80°C.



8261

RG11/U Brilliance® Standard Analog Video Cable								
Catalogue No. Industry Standards	Conductor Size		Cond Type	Shield Type	Reel Length (m)	Nom. O.D (mm)	Insl. & Core O.D (mm)	Vel. Of Prop. (%)
	(mm)	(AWG)						
8261	1.22	18	7x26	97% BC Braid	305	10.29	7.24	66

Reel length - Other sizes available on request.

Nominal Impedance 75Ω.

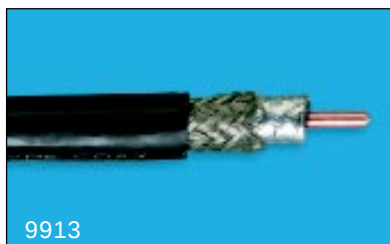
RG 8/U Brilliance®
Low Loss, Transmission
and Computer Cable, 50 Ohm

Product Description

2.6mm/10 AWG stranded bare copper conductor with semi-solid polyethylene insulation, DuoBond® II plus tinned copper braid, 90% coverage, Black PVC jacket.

Rating: 80°C.

Plenum Version: 89913.



9913

RG 8/U Brilliance® Low Loss, Transmission and Computer Cable, 50 Ohm

Catalogue No. Industry Standards	Conductor Size		Cond Type	Shield Type	Reel Length (m)	Nom. O.D (mm)	Insl. & Core O.D (mm)	Vel. Of Prop. (%)
	(mm)	(AWG)						
9913 UL AWM 2464 NEC CM CEC CM	2.6	10	Solid BC	Duobond®II 90% TC Braid	305	10.29	7.26	84

Reel length - Other sizes available on request.

Nominal Impedance 50Ω.

RG 59 Coaxial Precision Video Cable
Construction

0.81mm/20 AWG solid bare copper conductor with polyethylene insulation, tinned copper braid, double braid, 98% shield coverage, polyethylene jacket available in the following colours - Black, Red, Green, Light Blue, Yellow, White and Orange, Sweep Tested 5MHz - 216 MHz, SRL 27 dB minimum.

Rating: 80°C.



8281

RG 59 Coaxial Precision Video Cable

Catalogue No. Industry Standards	Conductor Size		Cond. Type	Shield Type	Reel Length (m)	Nom. O.D (mm)	Insl. & Core O.D (mm)	Vel. Of Prop. (%)
	(mm)	(AWG)						
8281	0.81	20	Solid BC	98% Double TC Braid	305	7.75	5.03	66

Reel length - Other sizes available on request.

Nominal Impedance 75Ω.

RG6 Broadband Series 6 Drop Cable

Construction

1.02mm/18 AWG solid bare copper covered steel conductor with gas injected foam polyethylene insulation, DuoBond[®] II shield plus 60% aluminium braid, Black, White, Neutral or Beige PVC Jacket, Beige Jacket, 100% Sweep Tested: 5MHz - 1GHz, SRL 20 dB minimum.

Rating: 80°C.



RG6 Broadband Series 6 Drop Cable								
Catalogue No. Industry Standards	Conductor Size		Cond. Type	Shield Type	Reel Length (m)	Nom. O.D (mm)	Insl. & Core O.D (mm)	Vel. Of Prop. (%)
	(mm)	(AWG)						
9116 NEC CATV CMC MX CEC CM	1.02	18	Solid	Duobond [®] 60% Aluminium Braid	U 305	6.86	4.57	82

Reel length - Other sizes available on request.

Nominal Impedance 75Ω.

RG6 Quad Broadband Series 6 Drop Cable

Construction

0.9mm/18 AWG solid bare copper covered steel conductor with gas injected foam polyethylene insulation. DuoBond[®] IV shield, DuoBond[®] II, 60% aluminium braid, Duofoil Tape, 40% aluminium braid, Black, White, Neutral or Beige PVC Jacket, White, Neutral, Beige in UnReel[®] only, 100% Sweep Tested: 5 MHz - 1 GHz, SRL 20 dB minimum.

Rating: 200°C.



RG6 Quad Broadband Series 6 Drop Cable								
Catalogue No. Industry Standards	Conductor Size		Cond. Type	Shield Type	Reel Length (m)	Nom. O.D (mm)	Insl. & Core O.D (mm)	Vel. Of Prop. (%)
	(mm)	(AWG)						
1189A NEC CM CEC CM	0.9	18	Solid BC	Duobond [®] IV 60% & 40% Aluminium Braids	305	7.57	4.57	82

Reel length - Other sizes available on request.

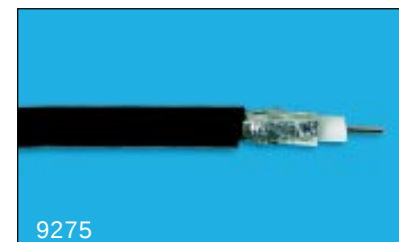
Nominal Impedance 75Ω.

RG 59 MATV Drop Cable

Construction

0.81mm/20 AWG solid bare copper covered steel conductor with gas injected foam polyethylene insulation, Duofoil® shield plus 40% aluminium braid, Black PVC jacket, also White jacket in U-1000 only, 100% Sweep Tested: 5-550 MHz., SRL 18dB minimum.

Rating: 80°C.



RG 59 MATV Drop Cable

Catalogue No. Industry Standards	Conductor Size		Cond. Type	Shield Type	Reel Length (m)	Nom. O.D (mm)	Insl. & Core O.D (mm)	Vel. Of Prop. (%)
	(mm)	(AWG)						
9275 NEC CATV CEC CM	0.81	20	Solid	Duobond® 40% Aluminium Braid	305	6.02	3.66	82

Reel length - Other sizes available on request.

Nominal Impedance 75Ω.

Fibre Optic Cables

Light Duty Riser Cables

Belden's Optical Fibre Light Duty Riser Cables are specifically designed for Internal or Internal/ External use.

Each LCF optical fibre is jacketed so that the optical element can be fitted directly to connectors.

Featuring high crush resistance, colour coding of fibres for ease of identification and designed for ease of break-out, the Belden Internal, Internal/External Optical Fibre Light Duty Riser Cables are suitable for all riser applications.

Internal Light Duty Riser Cable

Construction

Belden Internal Optical Fibre Light Duty Riser Cable has individually buffered fibres surrounded by aramid yarn reinforcement with an external PVC sheath.

The LCF fibre utilises enhanced bandwidth and tight attenuation limits to meet and exceed the EIA/TIA-TSB72 300 metre backbone length.

The LCF multi mode fibre is suitable for lengths of up to 600m for Gigabit Ethernet.

Other construction options include higher pulling tension, eg <1000 N and/or a dual jacket of PE & Low Smoke Zero Halogen (LSOH) sheath.



Internal Light Duty Riser Cable							
Cat. No	No. of Fibres	Fibre Type	Nom. O.D. (mm)	Nom. Weight (kg/km)	Min. Bending Radius (mm)		Drum Size (m)
					No load	Full load	
NRAP10AA004	4	Single Mode 9/125/250 µm	4.8	17	75	100	2100±100
NRAP10AA006	6	Single Mode 9/125/250 µm	5.3	21	78	110	2100±100
NRAP10AA008	8	Single Mode 9/125/250 µm	5.3	22	78	110	2100±100
NRAP10AA012	12	Single Mode 9/125/250 µm	7.0	35	105	140	2100±100
NRAP10AA016	16	Single Mode 9/125/250 µm	7.0	35	105	140	2100±100
NRAP10AA024	24	Single Mode 9/125/250 µm	9.0	53	135	180	2100±100
NRAP62AA004	4	Multi Mode 62.5/125/250 µm	4.8	17	75	100	2100±100
NRAP62AA006	6	Multi Mode 62.5/125/250 µm	5.3	21	78	110	2100±100
NRAP62AA008	8	Multi Mode 62.5/125/250 µm	5.3	22	78	110	2100±100
NRAP62AA012	12	Multi Mode 62.5/125/250 µm	7.0	35	105	140	2100±100
NRAP62AA016	16	Multi Mode 62.5/125/250 µm	7.0	35	105	140	2100±100
NRAP62AA014	24	Multi Mode 62.5/125/250 µm	9.0	53	135	180	2100±100

Note: Fibre element diameter 0.9mm.

Internal/External Light Duty Riser Cable

Construction

Belden Internal/External Optical Fibre Light Duty Riser Cable has individually buffered LCF fibres (PVC), surrounded by water swellable aramid yarn reinforcement with an external Flame Retardant Non-Corrosive (FRNC) sheath.

The LCF fibre utilises enhanced bandwidth and tight attenuation limits to meet and exceed the EIA/TIA-TSB72 300 metre backbone length.

The LCF multi mode fibre is suitable for lengths of up to 600m for Gigabit Ethernet.

Other construction options include higher pulling tension eg. <1000 N and/or a dual jacket of PE & Low Smoke Zero Halogen (LSOH) sheath.



Internal/External Light Duty Riser Cable							
Cat. No.	No. of Fibres	Fibre Type	Nom. O.D. (mm)	Nom. Weight (kg/km)	Min. Bending Radius (mm)		Drum Size (m)
					No load	Full load	
NRBP10AA004	4	Single Mode 9/125/250 µm	4.8	17	75	100	2100±100
NRBP10AA006	6	Single Mode 9/125/250 µm	5.3	21	78	110	2100±100
NRBP10AA008	8	Single Mode 9/125/250 µm	5.3	22	78	110	2100±100
NRBP10AA012	12	Single Mode 9/125/250 µm	7.0	35	105	140	2100±100
NRBP62AA004BKAA	4	Multi Mode 62.5/125/250 µm	4.8	17	75	100	2100±100
NRBP62AA006BKAA	6	Multi Mode 62.5/125/250 µm	5.3	21	78	110	2100±100
NRBP62AA008BKAA	8	Multi Mode 62.5/125/250 µm	5.3	22	78	110	2100±100
NRBP62AA012BKAA	12	Multi Mode 62.5/125/250 µm	7.0	35	105	140	2100±100

Note: Fibre element diameter 0.9mm.

Heavy Duty Riser Cable

Belden Internal Optical Fibre Cord Heavy Duty Riser Cable is suitable for computer data links, terminal links and remote instrumentation connections.

It is also ideal for terminations which use optical connectors, such as in patch panels, as optical connectors are easily attached to a single fibre cord.

Internal Heavy Duty Riser Cable

Construction

Simplex Cord: A 900 micron PVC buffered LCF optical fibre protected by aramid yarn and a PVC sheath.

Duplex Cord: A figure 8 construction of two single LCF fibre cords, each cord has a 900 micron PVC buffered optical fibre protected by aramid yarn and a PVC sheath.

Multi Cord: Constructed from single element cords stranded around

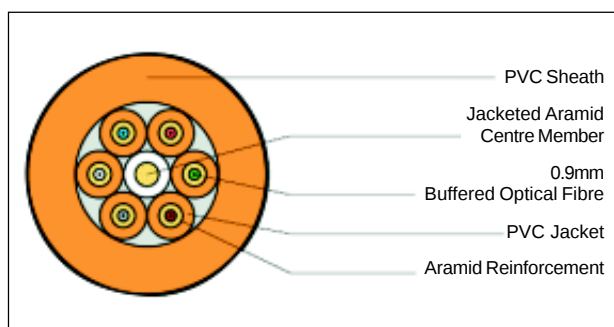
a tension member of PVC jacketed aramid yarn, tape and a PVC sheath.

Other construction options include mixed fibre types and a Low Smoke Zero Halogen (LSOH) sheath.

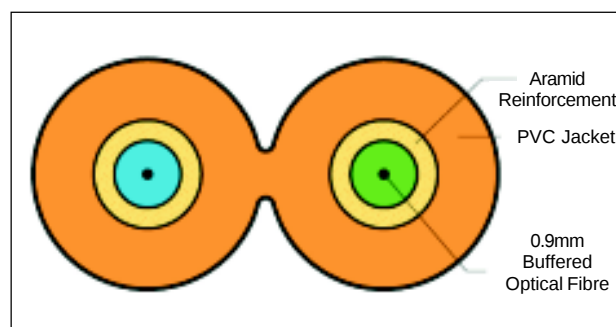
The LCF fibre utilises enhanced bandwidth and tight attenuation limits to meet and exceed the EIA/TIA-TSB72 300 metre backbore length. The LCF multi mode fibre is suitable for lengths of up to 600m for Gigabit Ethernet.



6 Cord Cable



Duplex Cable



Heavy Duty Riser Cable

Cat. No.	No. of Fibres	Fibre Type	Nom. O.D. (mm)	Nom. Weight (kg/km)	Min. Bending Radius (mm)		Drum Size (m)
					No load	Full load	
NYCP10TA001*	1	Single Mode 9/125/250 µm	2.8	7	30	60	4100±100
NEYP10AA002	2	Single Mode 9/125/250 µm	28 x 5.7	13.2	30	60	2100±100
NCAP10AA004	4	Single Mode 9/125/250 µm	8.2	51	85	170	2100±100
NCAP10AA006	6	Single Mode 9/125/250 µm	9.8	73	100	200	2100±100
NCAP10AA008	8	Single Mode 9/125/250 µm	11.6	104	120	240	2100±100
NCAP10AA012	12	Single Mode 9/125/250 µm	12.2	106	125	250	2100±100
NCAP10AA018	18	Single Mode 9/125/250 µm	15.2	166	150	300	2100±100
NCAP10AA024	24	Single Mode 9/125/250 µm	17.6	205	180	360	2100±100
NCAP10AA036	36	Single Mode 9/125/250 µm	20.2	275	200	400	2100±100
NCBP62AA002	2	Multi Mode 62.5/125/250 µm	28 x 5.7	13.2	30	60	2100±100
NCAP62AA004	4	Multi Mode 62.5/125/250 µm	8.2	51	85	170	2100±100
NCAP62AA006	6	Multi Mode 62.5/125/250 µm	9.8	73	100	200	2100±100
NCAP62AA008	8	Multi Mode 62.5/125/250 µm	11.6	104	120	240	2100±100
NCAP62AA012	12	Multi Mode 62.5/125/250 µm	12.2	106	125	250	2100±100
NCAP62AA018	18	Multi Mode 62.5/125/250 µm	15.2	166	150	300	2100±100
NCAP62AA024	24	Multi Mode 62.5/125/250 µm	17.6	205	180	360	2100±100
NCAP62AA036	36	Multi Mode 62.5/125/250 µm	20.2	275	200	400	2100±100

External Cables

External Stranded Loose Tube Cables Multi Mode & Single Mode

Belden External Optical Fibre Loose Tube Cable is non-metallic cable (in standard form) designed for use externally by telecommunications carriers. It can be either directly buried or installed in ducts and trays outdoors.

The fibres provide optimum performance due to the tube construction containing the fibres in a stress-free state with the tube construction also allowing for easy break-out of the fibres.

Each fibre is colour coded for ease of identification.

The standard design of this cable provides high strength and high crush resistance.

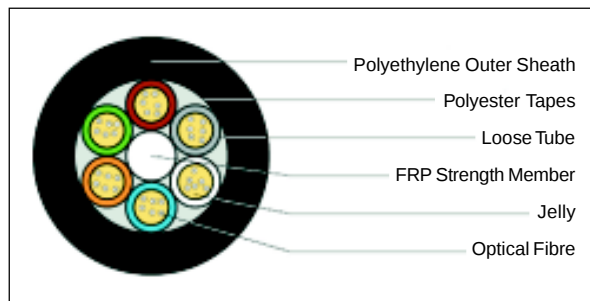
Construction

Single Mode: The 10/125 single mode optical fibres are contained in jelly filled 2.35mm loose tubes laid up around an FRP central strength member with a polyethylene sheath.

Multi Mode: The 62.5/125 multi mode optical fibres are contained in 2.35mm jelly filled loose tubes, laid up around an FRP central strength member with a polyethylene sheath.

Various construction options include:

- Fibre counts from 2 to 144 fibres
- Steel central strength member
- PVC sacrificial sheath higher crush resistance specifications
- Composite of multi mode and single mode fibres
- Nylon outer jacket for termite protection
- Additional armouring (rodent proof corrugated steel tape)



Operating Temperature - 10°C to 70°C

Note: Standard configuration is with 6 fibres per tube for up to 36 fibre cable and 12 fibres per tube for higher fibre counts

External Stranded Loose Tube Cables

Cat. No. Polyethylene Sheath (1)	Cat. No. Poly/Nylon Sheath (2)	No. of Fibres	Fibre Type	Nom. O.D.		Nom. Weight		Min. Bending Radius (mm)		Rated Tensile Strength (kg)	Maximum Crush Resistance (kg/100mm)
				(1)	(2)	(1)	(2)	No Ld	Full Ld		
NKCU10BA006	NKDU10BA006	6	Single Mode 9/125/250 µm	10.2	10.61	85	99.0	100	200	200	200
NKCU10BA008	NKDU10BA008	8	Single Mode 9/125/250 µm	10.2	10.61	85	99.0	100	200	200	200
NKCU10BA012	NKDU10BA012	12	Single Mode 9/125/250 µm	10.2	10.61	85	99.0	100	200	200	200
NKCU10BA018	NKDU10BA018	18	Single Mode 9/125/250 µm	10.2	10.61	85	99.0	100	200	200	200
NKCU10BA024	NKDU10BA036	24	Single Mode 9/125/250 µm	10.2	10.61	85	99.0	100	200	200	200
NKCU10BA036	NKDU10BA036	36	Single Mode 9/125/250 µm	10.2	10.61	85	99.0	100	200	200	200
NPCU10BA048	NPDU10BA048	48	Single Mode 9/125/250 µm	11.76	12.7	120.5	137.9	100	200	200	200
NMCU10BA060	NMDU10BA060	60	Single Mode 9/125/250 µm	11.8	12.7	120.47	137.9	100	200	200	200
NKCU62BA006	NKDU62BA006	6	Multi Mode 62.5/125/250 µm	10.2	10.3	85	99.0	100	200	200	200
NKCU62BA008	NKDU62BA008	8	Multi Mode 62.5/125/250 µm	10.2	10.61	85	99.0	100	200	200	200
NKCU62BA012	NKDU62BA012	12	Multi Mode 62.5/125/250 µm	10.2	10.61	85	99.0	100	200	200	200
NKCU62BA018	NKDU62BA018	18	Multi Mode 62.5/125/250 µm	10.2	10.61	85	99.0	100	200	200	200
NKCU62BA024	NKDU62BA24	24	Multi Mode 62.5/125/250 µm	10.2	10.61	85	99.0	100	200	200	200
NKCU62BA036	NKDU62BA036	36	Multi Mode 62.5/125/250 µm	10.2	10.61	85	99.0	100	200	200	200
NPCU62BA048	NPDUBA048	48	Multi Mode 62.5/125/250 µm	11.76	12.7	120.53	137.0	100	200	200	200
NMCU62AA060	NMCU62AA060	60	Multi Mode 62.5/125/250 µm	11.8	12.7	120.0	137.0	100	200	200	200

**External Single Tube Cables
Multi Mode & Single Mode**

Optical fibre cable is now the standard medium for communications. It can carry more traffic than coaxial cable, at greater speed, with total security and excellent tolerance to high temperatures, and electro-magnetic or radio interference.

But for applications where small fibre counts are required, conventional cables have been over-engineered - larger and heavier than is really necessary.

Being 17% smaller and 47% lighter than standard loose tube designs, makes this cable more flexible with a bending radius of 85mm instead of 100mm. This, of course, allows you to fit more cable into each duct.

Belden external optical fibre single tube cable is a non-metallic cable (in standard form) designed for use externally either directly buried or installed in ducts and trays outdoors.

The fibres provide optimum performance due to the tube construction containing the fibres in a stress-free state with the tube construction also allowing for easy break-out of the fibres.

Each fibre is colour coded for ease of identification.

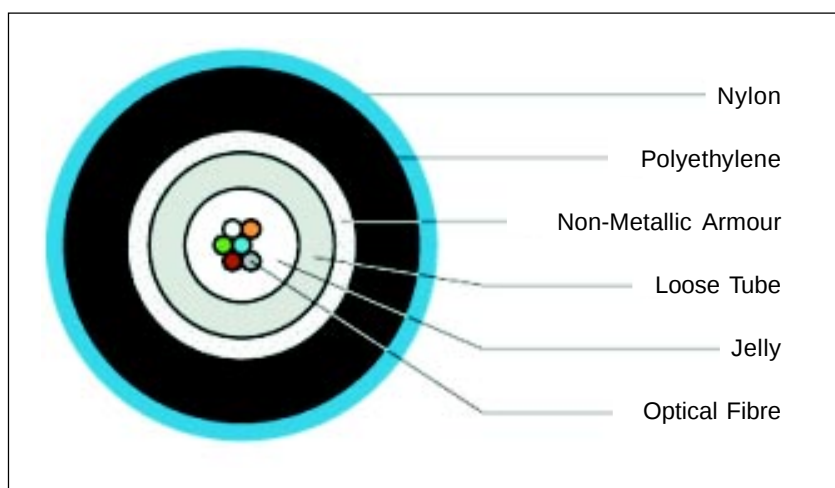
The standard design of this cable provides high strength and high crush resistance.

Construction

The LCF optical fibres are contained in a jelly filled loose tube, external strength member, polyethylene sheathed with an additional nylon jacket.

This cable is also available without the additional nylon jacket.

The LCF fibre utilises enhanced bandwidth and tight attenuation limits to meet and exceed the EIA/TIA-TSB72 300 metre backbone length. The LCF multi mode fibre is suitable for lengths of up to 600m for Gigabit Ethernet.

**External Single Tube Cables**

Cat. No.	No. of Fibres	Fibre Type	Nom. O.D. (mm)	Nom. Weight (kg/km)	Min. Bending Radius (mm)		Rated Tensile Strength (kg)	Max. Crush Resistance (kg/100m)
					No load	Full load		
NQDU62AA004BEB3	4	Multi Mode 62.5/125/250 μ m	8.5	62	85	170	150	200
NQDU62AA006BEB3	6	Multi Mode 62.5/125/250 μ m	8.5	62	85	170	150	200
NQDU62AA008BEB3	8	Multi Mode 62.5/125/250 μ m	8.5	62	85	170	150	200
NQDU62AA012BEB3	12	Multi Mode 62.5/125/250 μ m	8.5	62	85	170	150	200
NQDU10AA006	6	Single Mode 9/125/250 μ m	8.5	62	85	170	150	200
NQDU10AA012	12	Single Mode 9/125/250 μ m	8.5	62	85	170	150	200

Operating Temperature - 10°C to +70°C

Note: 4km length maximum.

Light Bridge Aerial Cables

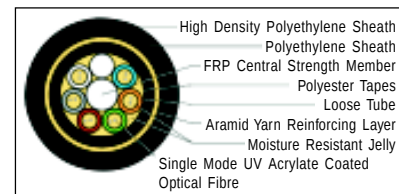
Belden's Short Span and Integral Bearer Light Bridge Aerial Cable was designed for spans of up to 150 metres where, for practical or economical reasons, underground cable is not suitable.

Belden offers two options for this cable; an all dielectric cable for high voltage environments or a metallic integral bearer solution.

Short Span

Construction

Up to 150m: The single mode UV Acrylate Coated Optical Fibres are contained in moisture resistant jelly filled loose tubes, FRP central strength member, polyethylene inner sheathed, an aramid yarn reinforcing layer with an external high density polyethylene sheath.



Light Bridge Aerial Cable Short Span								
Cat. No.	No. of Fibres	Nom. O.D. (mm)	Nom. Weight (kg/km)	Max. Tension (kg)	Min. Bending Radius (mm)		Min. Breaking Load (kN)	Max. Crush Resistance (kg/100m)
					No load	Full Load		
NAJU10CA006	6	15	167	450	150	300	27.7	200
NAJU10CA012	12	15	167	450	150	300	27.7	200

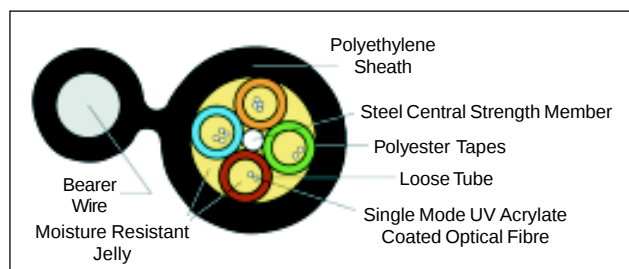
Integral Bearer

Construction

Up to 150m: The single mode UV acrylate coated optical fibres are contained in moisture resistant jelly filled loose tubes surrounding a steel central strength member, with a polyethylene sheath incorporating a high tensile steel strength member in a figure 8 construction.

Different construction options include:

- Multi mode 62.5/125/250 micron fibres
- Available in higher fibre counts - eg. 24 or 26 fibres
- 100m span also available.



Light Bridge Aerial Cable Internal Bearer								
Cat. No.	No. of Fibres	Nom. O.D. (mm)	Nom. Weight (kg/km)	Max. Tension (kg)	Min. Bending Radius (mm)		Min. Breaking Load (kN)	Max. Crush Resistance (kg/100m)
					No load	Full Load		
NARU10BA012	12	17.8 X 9.8	150	250	115	220	6.48	200

CHAPTER 8

CABINETS AND 19 INCH RACKING EQUIPMENT

Clipsal offers an extensive and cost effective range of cabinets, frames and accessories. They are ideally suited for today's structured cabling requirements, and are certified to AS/NZ5, ISO9002.

- Floor cabinets
- Wall mount cabinets
- Wall mount frames

Cabinets

Clipsal's 3105 Series Cabinet is an economical cabinet with many accessories available. A solid construction with capabilities to carry all styles of heavy active equipment.

Features

- Adjustable rails
- Key lockable doors
- Left and right hinged doors
- No assembly required

All cabinets are supplied with the following:

- Sides
- Glass front door (lockable)
- Adjustable front rails



3105C45U600



3105C38U600

Cabinets

Cat. No.	Description
3105C45U600	45RU, 600mm wide x 600mm deep
3105C45U800	45RU, 600mm wide x 800mm deep
3105C38U600	38RU, 600mm wide x 600mm deep
3105C38U800	38RU, 600mm wide x 800mm deep
3105C25U600	25RU, 600mm wide x 600mm deep

Accessories

Telescopic Shelf

Cat. No.	Description
3105S450T	450mm deep telescopic shelf. Requires front and rear mounting.

Front Mount Shelf

Cat. No.	Description
105S450	450mm deep front mount shelf.

10 Way Power Rail

Cat. No.	Description
3105P10	10 way power rail

Front and Rear Mount Shelves

Cat. No.	Description
3105S450F	450mm deep shelf. Requires front and rear mounting.
3105S650F	650mm deep shelf. Requires front and rear mounting.

Wall Mount Cabinets

Clipsal's range of wall mount cabinets cover small to medium installations, up to 12 rack units in height.

Ample depth is provided for active equipment.

Features

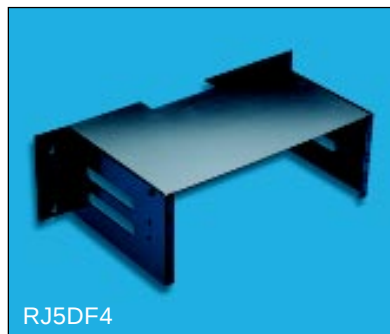
- Glass front door
- Swing bases available

Wall Mount Cabinets	
Cat. No.	Description
3105WC6U400	Wall mount cabinet. 6RU x 400mm deep
3105WC9U400	Wall mount cabinet. 9RU x 400mm deep
3105WC12U400	Wall mount cabinet. 12RU x 400mm deep
3105WC12U500S	Wall mount cabinet. 12RU x 500mm deep with swing base

Wall Mount Frames

Clipsal's range of wall mount frames are made to cater for the more economical installation. The frames are a simple and cost effective housing for active hardware and patching facilities in a single fixture.

The frames are simply mounted to a wall with screws using conveniently located mounting holes.



Wall Mount Frames	
Cat. No.	Description
RJ58F2U	2U rack. Wall mount, shallow
RJ5DF2UL	2U rack. Wall mount, deep
RJ5DF4	4U wall mount frame with top shelf
RJ5SF4U	4U rack, wall mount, shallow
RJ5WMF4	4U deep, wall mount frame
RJ5TS	Shelf for 4U wall mount frame
RJ5DF4UL	4U rack. Wall mount, deep
RJ5DF14UL	14U rack. Wall mount, deep
RJSF14U	14U rack. Wall mount, shallow

CONDUIT AND FITTINGS

Clipsal provides a range of conduit to suit many types of data installations - from the secure application for defence, to the smaller, less secure application using standard white conduit.

All Clipsal conduit is ACA approved, with a range of fittings to suit.

Clipsal meets these requirements with a comprehensive range of white conduit and fittings that suits every application and enables telecommunications cabling to be instantly identified.

Clipsal Telecommunications Conduit and Fittings are manufactured from high quality, high impact Polyvinyl Chloride (PVC) containing Titanium Dioxide for UV and chemical resistance.

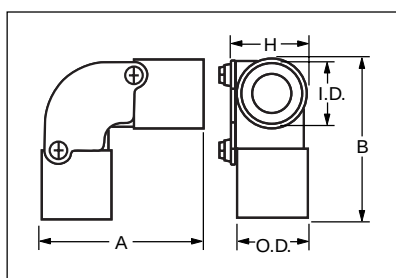
White Conduit and Fittings

Regulations require the Telecommunications industry to protect communications cabling in white conduit to ACA standards.



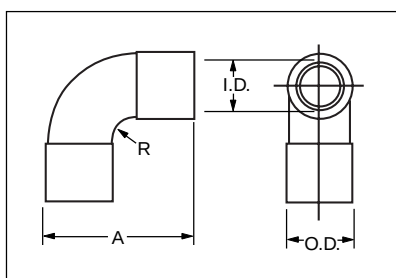
PVC Conduits

Cat. Number	Nominal Outside Diameter	Nominal Wall Thickness	Length
C9020	20mm	1.8mm	4m
C9025	25mm	1.8mm	4m
C9032	32mm	2.1mm	4m
C9050	50mm	2.8mm	4m
C9080	80mm	3.7mm	6m
C9100	100mm	4.5mm	6m



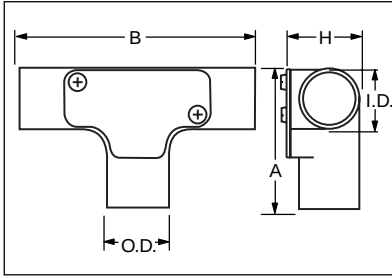
Inspection Elbows - 90° Angle

Cat. Number	Nominal Size	I.D.	O.D.	A	B	Height (include lid)
C244/20	20mm	20mm	25mm	59mm	59mm	28mm
C244/25	25mm	25mm	30mm	66mm	66mm	35mm
C244/32	32mm	32mm	37mm	80mm	80mm	41mm



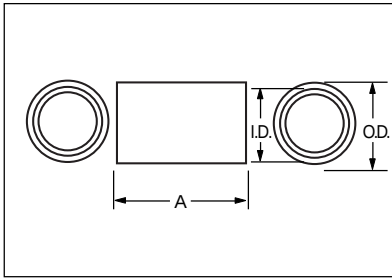
Solid Elbows - 90° Angle

Cat. Number	Nominal Size	I.D.	O.D.	A	R
C245/20	20mm	20mm	25mm	54mm	22mm
C245/25	25mm	25mm	30mm	66mm	28mm



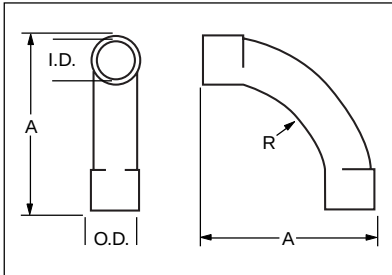
Inspection Tees

Cat. Number	Nominal Size	I.D.	O.D.	A	B	Height (include. lid)
C246/20	20mm	20mm	25mm	55mm	92mm	29mm
C246/25	25mm	25mm	30mm	69mm	108mm	37mm
C246/32	32mm	32mm	37mm	82mm	127mm	44mm



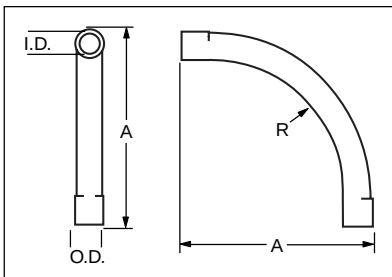
Couplings

Cat. Number	Nominal Size	I.D.	O.D.	L
C242/20	20mm	20mm	25mm	42mm
C242/25	25mm	25mm	30mm	42mm
C242/32	32mm	32mm	37mm	52mm



Bends - 90° Angle

Cat. Number	Nominal Size	I.D.	O.D.	A	R
C247/20	20mm	20mm	24mm	83mm	47mm
C247/25	25mm	25mm	29mm	106mm	64mm



Large Sweep Bends - 90° Angle

Cat. Number	Nominal Size	I.D.	O.D.	A	R
C247L20	20mm	20mm	22mm	185mm	150mm
C247L25	25mm	25mm	28mm	192mm	150mm
C247L32	32mm	32mm	35mm	350mm	312mm
C247L50	50mm	50mm	53mm	360mm	320mm

Clear Conduit and Fittings

With the increasing need for certainty of integrity of data and security cabling systems, Clipsal now offers a range of transparent conduit and fittings.

Clipsal's security conduit and fittings are specially designed for cabling systems used in high security areas for carrying highly sensitive or confidential data.

Being transparent, it enables the integrity of the cable to be inspected at all points along the route, ensuring that any damage or tampering is immediately identified.

Transparent conduit also ensures that a security conduit run isn't mistaken for electrical or other data and communications circuitry, and opened in error.

Another advantage is that it allows easy identification of entry of pests, vermin, moisture or other contaminants which may affect the performance of the system.

Normal clear conduit cement is ideal for bonding of the joints.



Clear Conduit

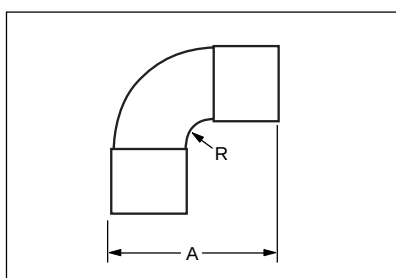
Cat. No.	Description
SC9016	16mm Conduit. 4 metre length
SC9020	20mm Conduit. 4 metre length
SC9025	25mm Conduit. 4 metre length
SC9032	32mm Conduit. 4 metre length
SC9040	40mm Conduit. 4 metre length
SC9050	50mm Conduit. 4 metre length



SC263/32

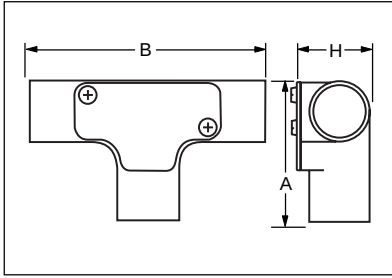
Plain to Screwed Adaptors

Cat. Number	Male Thread Diameter	Nominal Inside Diameter	Nominal Outside Diameter	Length
SC263/16	16mm	16mm	21mm	33mm
SC263/20	20mm	20mm	25mm	36mm
SC263/25	25mm	25mm	32mm	42mm
SC263/32	32mm	32mm	38mm	46mm
SC263/40	40mm	40mm	47mm	50mm
SC263/50	50mm	50mm	59mm	59mm



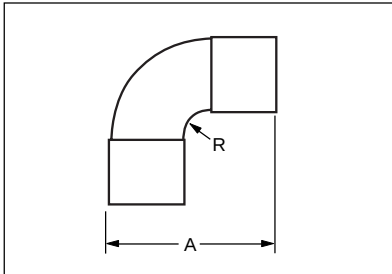
90° Bends

Cat. No.	Nominal Size	A	R
SC247/16	16mm	68mm	41mm
SC247/20	20mm	83mm	47mm
SC247/25	25mm	106mm	64mm
SC247/32	32mm	134mm	83mm
SC247/40	40mm	155mm	100mm
SC247/50	50mm	205mm	120mm



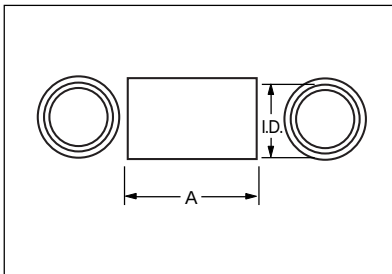
Inspection Tees

Cat. Number	Nominal Size	Inside Diameter	Outside Diameter	A	B	Height (H)
SC246/16	16mm	16mm	20mm	55mm	92mm	29mm
SC246/20	20mm	20mm	25mm	55mm	92mm	29mm
SC246/25	25mm	25mm	30mm	69mm	108mm	37mm
SC246/32	32mm	32mm	37mm	82mm	127mm	44mm



Solid Elbows

Cat. No.	Nominal Size	Nominal Outside Diameter	A
SC245/16	16mm	20mm	50mm
SC245/20	20mm	25mm	54mm
SC245/25	25mm	30mm	66mm



Couplings

Cat. Number	Nominal Size (I.D.)	Outside Diameter	Length (A)
SC242/16	16mm	20mm	38mm
SC242/20	20mm	25mm	42mm
SC242/25	25mm	30mm	42mm
SC242/32	32mm	37mm	52mm
SC242/40	40mm	45mm	58mm
SC242/50	50mm	57mm	80mm



Junction Box Lid

Cat. No.	Description
SC240L	240 Series Junction Box Lid

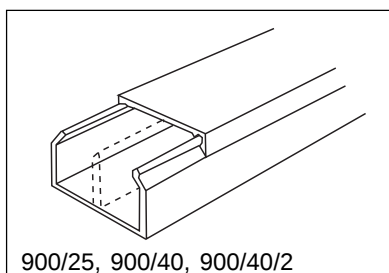
DUCTING SYSTEMS

Duct systems are the ideal alternative to conduit for surface wiring in domestic, commercial, and industrial environments, particularly when renovations, rewiring, and additions are being undertaken.

Duct systems are easily installed, either fastened with screws or with double sided tape. A broad range of accessories makes installation easy. Butt or mitre joints are also suitable. The range extends from 12mm x 7mm through to 100mm x 100mm. Colour options are White Electric (WE), Grey (GY), and Brown (BR). Not all products are available in all colours.

900 Series Mini Duct

Clipsal Duct is divided into Mini Duct and Maxi Duct. Colours - White Electric (WE), Brown (BR) and Grey (GY). Standard length 4 metres. Some 3.1 metre products also available.



900/25, 900/40, 900/40/2



900/40/16

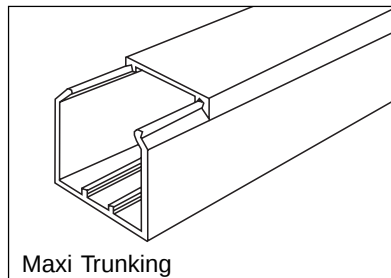
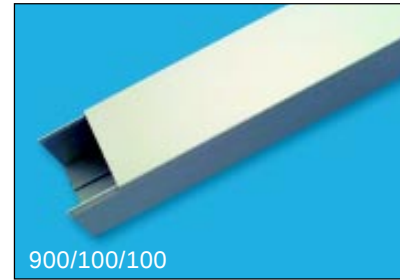
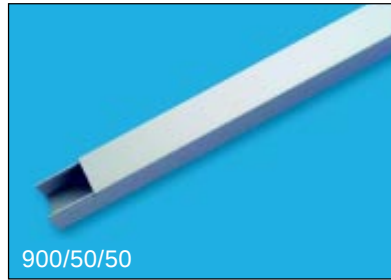
900 Series Mini Duct

Cat. No.	Description
900/12/7PT	12 x 7mm Pre-Taped Mini Duct With Hinged Lid.
900/16/10	16 x 10mm Mini Duct.
900/16/10PT	16 x 10mm Pre-Taped Mini Duct.
900/16/16	16 x 16mm Mini Duct.
900/16/16PT	16 x 16mm Pre-Taped Mini Duct.
900/19/7	19 x 7mm Bevel Edged Duct
900/19/7PT	19 x 7mm Pre-Taped Bevel Edged Duct
900/25/16	25 x 16mm Mini Duct.
900/25/16PT	25 x 16mm Pre-Taped Mini Duct.
900/25/25	25 x 25mm Mini Duct.
900/25/25PT	25 x 25mm Pre-Taped Mini Duct.
900/40/16	40 x 16mm Mini Duct.
900/40/16PT	40 x 16mm Pre-Taped Mini Duct.
900/40/25	40 x 25mm Mini Duct.
900/40/25PT	40 x 25mm Pre-Taped Mini Duct.
900/40/25/2	40 x 25mm Twin Compartment Rectangular Mini Duct.
900/40/25/2PT	40 x 25mm Twin Compartment Rectangular Pre-Taped Mini Duct.
900/60/25	60 x 25mm Mini Duct.
900/60/25PT	60 x 25mm Pre-Taped Mini Duct.
900/60/40	60 x 40mm Mini Duct.
900/60/40PT	60 x 40mm Pre-Taped Mini Duct.
900/12/7PT3	12 x 7mm Pre-Taped Duct with hinged lid. 3.1 metres.
900/16/16PT3	16 x 16mm Pre-Taped Duct. 3.1 metres.
900/25/25PT3	25 x 25 Pre-Taped Duct. 3.1 metres.

900 Series Maxi Duct

Standard colour Grey (GY).
Some products also available in White Electric (WE).

Standard length - 4 metres.



900 Series Maxi Duct	
Cat. No.	Description
*900/50/50	50 x 50mm Maxi Trunking.
*900/50/50	50 x 50mm Pre-Taped Maxi Trunking.
900/50/75	50 x 75mm Maxi Trunking.
900/50/100	50 x 100mm Maxi Trunking.
900/75/75	75 x 75mm Maxi Trunking.
*900/75/100	75 x 100mm Maxi Trunking.
*900/100/100	100 x 100mm Maxi Trunking.
900/150/50	150 x 50mm Maxi Trunking.
900/150/75	150 x 75mm Maxi Trunking.

*Available in White Electric.

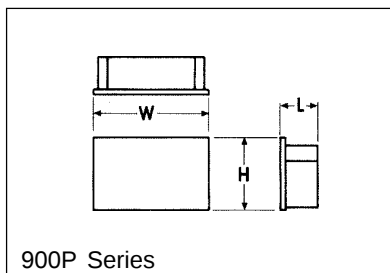
Duct Fittings

A broad range of Clip Fit Fittings is available for the various duct sizes. The range varies between sizes. Not all fittings are available in all colours.

Standard colour Grey (GY).

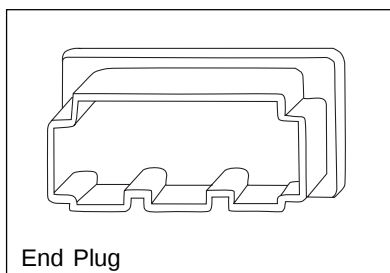
End Plugs

End Plugs are used to blank off a duct end.



Mini Duct End Plugs

Cat. No.	Description	Length (L)	Width (W)	Height (H)
900/16/16P	Plug for 16 x 16mm duct	13mm	16mm	16mm
900/25/16P	Plug for 25 x 16mm duct	13mm	25mm	16mm
900/40/25P	Plug for 40 x 25mm duct	14mm	40mm	25mm

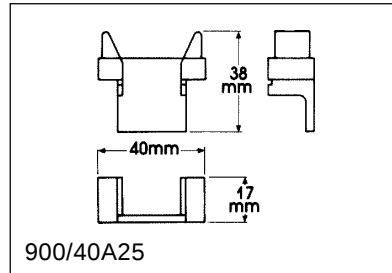


Maxi Duct End Plugs

Cat. No.	Description
900/50/50P	50 x 50mm End Plug.
900/50/75P	50 x 75mm End Plug.
900/50/100P	50 x 100mm End Plug.
900/75/75P	75 x 75mm End Plug.
900/75/100P	75 x 100mm End Plug.
900/100/100P	100 x 100mm End Plug.

Adaptors

Adaptors allow conversion of various duct sizes to 16mm x 25mm duct and accessories.

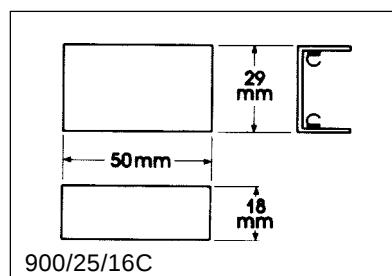


Adaptors			
Cat. No.	Length	Width	Depth
900/40TA25	60mm	66mm	22.8mm
900/16A10	47.4mm	17.75mm	25.2mm
900/16A16	47.4mm	17.75mm	25.2mm
900/25A25	47.4mm	27mm	29.81mm
900/40A16	42.70mm	40mm	17.3mm
900/40A25	37.80mm	40mm	17.3mm

Adaptors	
Cat. No.	Description
900/40TA25	Allows 25 x 16mm duct to Tee off a 40 x 25mm duct.
900/16A10	Converts 16 x 10mm duct to 25 x 16mm duct and accessories with 25 x 16mm entries.
900/16A16	Converts 16 x 16mm duct to 25 x 16mm duct and accessories with 25 x 16mm entries.
900/25A25	Converts 25 x 25mm duct to 25 x 16mm duct and accessories with 25 x 16mm entries.
900/40A16	Converts 40 x 16mm duct to 25 x 16mm duct and accessories with 25 x 16mm entries.
900/40A25	Converts 40 x 25mm duct to 25 x 16mm duct and accessories with 25 x 16mm entries.

Mini Duct Couplings

Couplings are clip on covers to butt joints in duct.

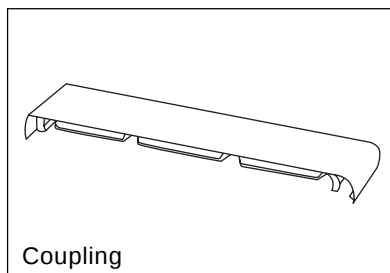


Mini Duct Couplings			
Cat. No.	Length	Width	Height
900/16/16C	50mm	20mm	18mm
900/25/16C	50mm	29mm	18mm
900/40/25C	44mm	37mm	21mm

Mini Duct Couplings	
Cat. No.	Description
90/16/16C	Coupling for 16 x 16mm duct.
900/25/16C	Coupling for 25 x 16mm duct.
900/40/25C	Coupling for 40 x 25mm duct.

Maxi Duct Couplings

Clip on covers to butt joints in duct. Colour - Grey.

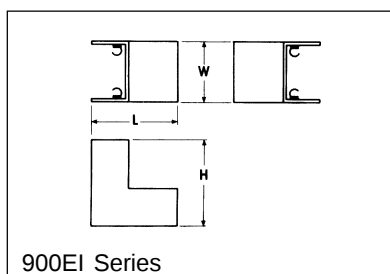


Maxi Duct Couplings

Cat. No.	Description
900/50C	50mm Coupling.
900/75C	75mm Coupling.
900/100C	100mm Coupling.

Mini Duct Internal Elbows

Mini Duct Elbows are clip on covers for internal corners.



Mini Duct Internal Elbows

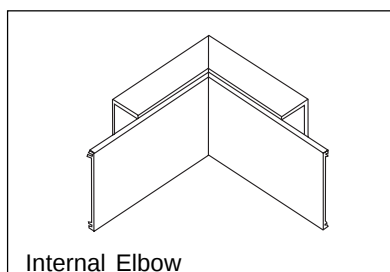
Cat. No.	Length	Width	Height
900/16/16EI	43mm	20mm	43mm
900/25/16EI	41mm	29mm	41mm
900/40/25EI	57mm	39mm	57mm

Mini Duct Internal Elbows

Cat. No.	Description
900/16/16EI	Internal Elbow for 16 x 16mm duct.
900/25/16EI	Internal Elbow for 25 x 16mm duct.
900/40/25EI	Internal Elbow for 40 x 25mm duct.

Maxi Duct Internal Elbows

Maxi Duct Elbows are a prefabricated corner piece. Colour - Grey.

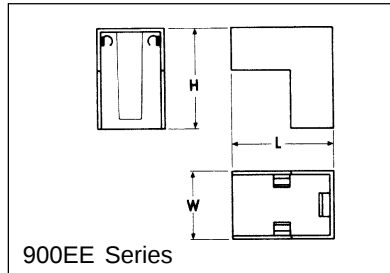


Mini Duct Internal Elbows

Cat. No.	Description
900/50/50EI	50 x 50mm Internal Elbow.
900/50/75EI	50 x 75mm Internal Elbow.
900/50/100EI	50 x 100mm Internal Elbow.
900/75/75EI	75 x 75mm Internal Elbow.
900/75/100EI	75 x 100mm Internal Elbow.
900/100/100EI	100 x 100mm Internal Elbow.

Mini Duct External Elbows

Mini Duct Elbows are clip on covers for internal corners.



Mini Duct External Elbows

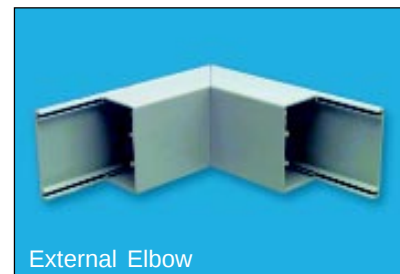
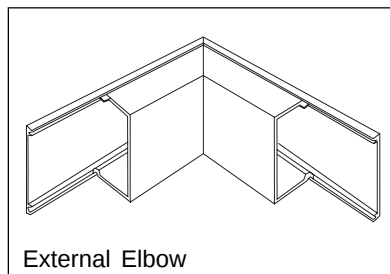
Cat. No.	Length	Width	Height
900/16/16EE	43mm	20mm	43mm
900/25/16EE	43mm	29mm	43mm
900/40/25EE	59mm	44mm	59mm

Mini Duct External Elbows

Cat. No.	Description
900/16/16EE	External Elbow for 16 x 16mm duct.
900/25/16EE	External Elbow for 25 x 16mm duct.
900/40/25EE	External Elbow for 40 x 25mm duct.

Maxi Duct External Elbows

Maxi Duct Elbows are a prefabricated corner piece. Colour - Grey.



Maxi Duct External Elbows

Cat. No.	Description
900/50/50EE	50 x 50mm External Elbow.
900/50/75EE	50 x 75mm External Elbow.
900/50/100EE	50 x 100mm External Elbow.
900/75/75EE	75 x 75mm External Elbow.
900/75/100EE	75 x 100mm External Elbow.
900/100/100EE	100 x 100mm External Elbow.

Intersection Tees

Clip on covers to tee off a flat elbow at right angles. Left and right hand versions are available. Only available in some Mini Duct sizes.

Intersection Tees			
Cat. No.	Length	Width	Height
900/25/16TR	52mm	40mm	52mm
900/25/16TL	52mm	40mm	52mm

Intersection Tees	
Cat. No.	Description
900/25/16TR	Right Tee (Intersection) for 25 x 16mm duct.
900/25/16TL	Left Tee (Intersection) for 25 x 16mm duct.

Clip-in Separators

Clip-in divider to provide segregation in 50mm, 75mm and 100mm maxi duct.

Standard Length - 4 metres.
Colour - White Electric.



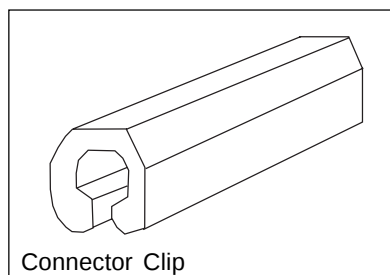
900D100S

Intersection Tees	
Cat. No.	Description
900D50S	Suits 50 x 100mm maxi trunking.
90075S	Suits 75 x 100mm maxi trunking.
900D100S	Suits 100 x 100mm maxi trunking.

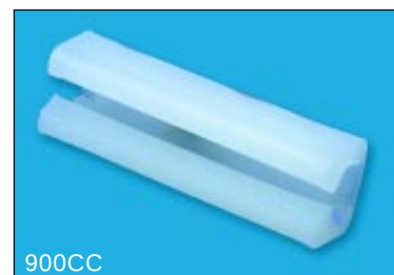
Connector Clips

Connector Clip to join maxi duct sections independent of the lid. Lid must be trimmed to accommodate. Not suitable for 50mm x 50mm.

Colour - White Electric.



Connector Clip



900CC

Connector Clips	
Cat. No.	Description
900CC	Connector Clip to join all sizes of maxi trunking (50 x 50mm size excepted).

Clip-in Cable Retainers

Clip to retain cable in duct prior to installation of the lid.

Colour - White Electric.

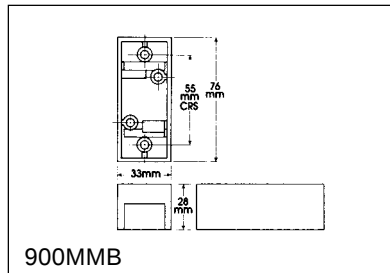
Clip-in Cable Retainers	
Cat. No.	Description
900C50	50 x 100mm maxi trunking.
900C75	75 x 100mm maxi trunking.
900C100	100 x 100mm maxi trunking.

Mounting Accessories

Architrave Mounting Block

The 900MMB is a Miniature Surface Mounting Block for architrave mounting accessories. Internal depth - 24mm. Features 2 - 25 x 16mm trunking entries - one each end. Supplied with 1 Cat. No. 900MBC Clip-in/push out Cap 2 Cat. No. 9 Insulating Caps and 2 M3.5 x 0.8 x 12mm long pan head screws. Screws thread into brass inserts.

Available in White Electric (WE) and Brown (BR).



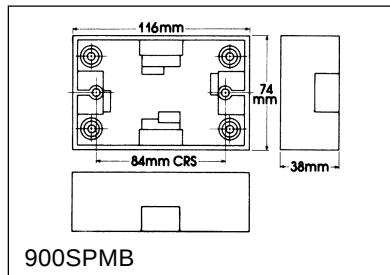
Architrave Mounting Block

Cat. No.	Length	Width	Height
900MMB	76mm	33mm	28mm

Standard Pattern Mounting Box

The 900SPMB is a standard pattern Surface Mounting Box for single gang accessories. Internal depth - 33mm. Features 4 - 25 x 16mm Trunking Entries, including one each end and side. Supplied with 3 - Cat. No. 900MBC Clip-in/push out caps, 4 - Cat. No. 220/10 Insulating Caps and 2 - M3.5 x 0.8 x 16mm long pan head screws. Screws thread into brass inserts.

Available in White Electric (WE), Brown (BR) and Grey (GY).



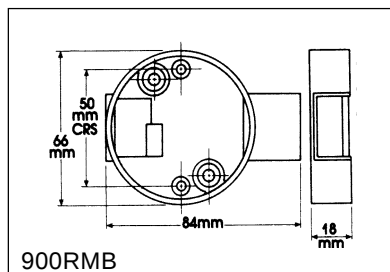
Standard Pattern Mounting Block

Cat. No.	Length	Width	Height
900SPMB	116mm	74mm	38mm

Round Mounting Block

The 900RMB is a Round Surface Mounting Block, for mounting round accessories. Internal depth - 15mm. Features 2 - 25 x 16mm trunking entries. Through entries. Number of mounting positions - 2. Supplied with 1 Cat. No. 900MBC Clip-in/push-out Cap, 2 - Cat. No. 220/10 Insulating Caps, and 2 - 3/16" BSW x 12mm long pan head screws.

Available in White Electric (WE) and Brown (BR).



Skirting Mounting Block

The 900SKMB is a single gang Skirting Mounting Block. Accepts 25 x 16mm trunking through 4 of 25 x 16mm cut outs. Supplied with 3 x Cat. No. 900MBC Mounting Block Entry Caps and 20mm mounting screws and screw caps.

Available in White Electric (WE) and Brown (BR).



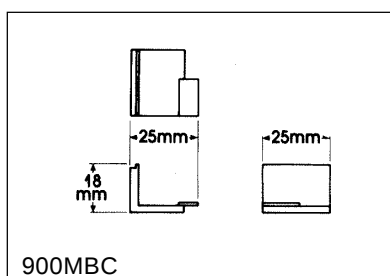
900SKMB

Skirting Mounting Block

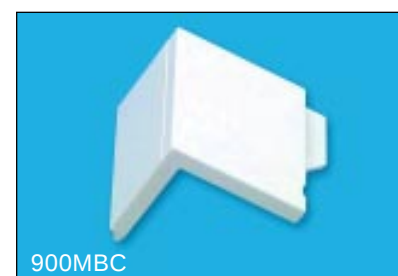
Cat. No.	Length	Width	Height Centres	Mounting
900SKMB	10mm	49mm	38mm	78mm

Mounting Block/Box Entry Cap

Spare Entry Blanking Cap for mounting accessories.



900MBC



900MBC

Mounting Block/Box Entry Cap

Cat. No.	Description
900MBC	Mounting Block Entry Cap suitable for 25 x 16mm trunking entries. Available in White Electric and Brown.

Standard Pattern Mounting Block

The 900SPBP is a single gang standard pattern Mounting Block. Accepts 25 x 16mm and 16 x 16mm trunking through 12 of 16 x 16mm and 8 of 25 x 16mm combination head screws for mounting.

Available in White Electric (WE), Brown (BR) and Grey (GY).



900SPBP

Standard Pattern Mounting Block

Cat. No.	Length	Width	Height Centres	Mounting
900SPBP	120mm	76mm	20mm	84mm

Double Sided Adhesive Tape

Double Sided Tape provides a quick and convenient method of mounting duct. Surfaces must be clean and dry, and free of dirt, dust, moisture, grease and flaking paint. It must be firmly applied along the full length of the duct to ensure secure fixing. Large sizes may require two rows of tape.



900AT Series

Double Sided Adhesive Tape

Cat. No.	Description
900AT12	12mm wide Double Sided Impact Adhesive Tape. 50 metre roll.
900AT18	18mm wide Double Sided Impact Adhesive Tape. 50 metre roll.
900AT24	24mm wide Double Sided Impact Adhesive Tape. 50 metre roll.

Polymeric Cable Cover

The Polymeric Cable Cover is an economical and convenient way to provide the mechanical protection for Category B underground wiring systems as required by AS/NZ S3000. Clipsal's range includes 2 metre slabs in both 150mm and 250mm widths, which are an excellent option for smaller installations, and 25 metre rolls in widths from 150mm to 300mm in both light duty and heavy duty gauges.

Available in Orange (EO) only.

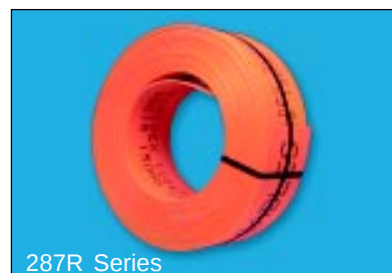
Construction

HD series Cable Covers are manufactured from High Density Polyethylene and have been tested and found to comply with the requirements of DR94102 and AS1462.3. (DR94102 is a Draft Australian Standard for Cable Cover. This draft has not yet been issued as an approved Standard, but has become a defacto Standard in the electrical industry).

LD Series Cable Covers are manufactured from High Density Polyethylene and have been tested to the requirements of DR94102 and AS1462.3. LD Series passes the requirements of AS1462.3, but will not necessarily comply with Section 10.2 of DR94102 "Impact Resistance Test". However, it will comply with all other aspects of DR94102.



287 Series



287R Series

Cat. No.	Description
287/150	150mm wide. Length 2 metres - 3mm thick.
287/250	250mm wide. Length 2 metres 3mm thick.
287R150LD	150mm wide, 4mm thick. Length - 25 metres.
287R200LD	200mm wide, 4mm thick. Length - 25 metres.
287R250LD	250mm wide, 4mm thick. Length - 25 metres.
287R300LD	300mm wide, 4mm thick. Length - 25 metres.
287R150HD	150mm wide, 5mm thick. Length - 25 metres.
287R200HD	200mm wide, 5mm thick. Length - 25 metres.
287R250HD	250mm wide, 5mm thick. Length - 25 metres.
287R300HD	300mm wide, 5mm thick. Length - 25 metres.

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