



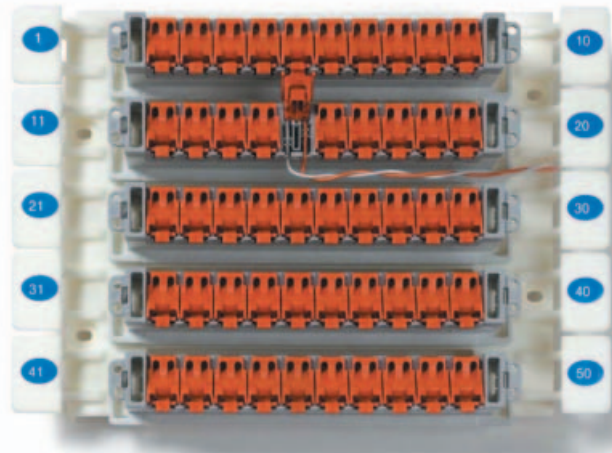
2.3 Cross connection product range

2.3.1 Connection modules

3M™ SLIC™ Quick Connecting System

Description

Intended for use primarily in cross-connect cabinets in the outside plant, the 3M™ SLIC™ Quick Connecting System is a simple, tool-less copper termination system that provides increased signal integrity, network reliability and improved performance characteristics at higher frequencies for broadband applications. As operators upgrade their access plants for higher bandwidth, the SLIC quick connecting system offers unique features to enable simple and economical broadband deployment. This all-in-one IDC connector is designed with every feature you need in one integrated and simple design.



Highlights:

- Integrated wire-cutting facility
- Security of connection and ability to see termination
- Tool-less design
- Low termination force
- Pair-at-once termination
- Gel-filled and moisture-sealed
- Cat.5 performance
- Look-both-ways testing
- Double jumpering ability

Please consult your local representative

2.3 Cross connection product range

2.3.1 Connection modules

Quante™ SID™-C

Description

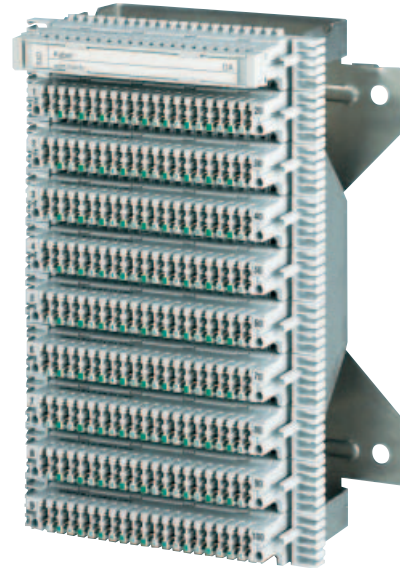
Quante SID-C connection and disconnection cable terminal blocks

With the Quante SID-C product family 3M is setting the standards for high density IDC termination combined with improved handling within applications in main telecommunications and data networks.

The SID-C insulation displacement contacts are enclosed by the plastic housing of the module. This improves the insulation performance and helps in providing a safer working practice.

Using SID-C within the InCa cross connection cabinets increases the capacity from 300 to 400 pairs, per vertical. This results in the capacity of the cabinet increasing to 1600 pairs (instead of 1200 pairs), without affecting the well-proved handling of the cabinet.

A wide range of accessories and a comprehensive overvoltage protection solution complete the product family.



Highlights:

- High density
- One wire per slot 0.32 - 0.80 mm
- Optimised cable conductor guide
- Long-life tools
- Flexible mounting systems
- Removal without the need for special tooling
- Comprehensive overvoltage protection system

2.3 Cross connection product range

2.3.1 Connection modules

Quante™ SID™-C

Type/Order text

Ref.-No.

The compact SID-C connection and disconnection cable terminal blocks provide orderly termination of plastic-coated cable conductors and jumper wires. They are suitable for fitting on distribution frames, in cabinets.

Design:

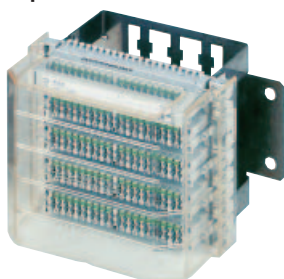
- SID EVs, fitted with SID connection modules 10 pairs;
 - SID TrEVs, fitted with SID disconnection modules;
- 10 pairs, each in units of 50 and 100 pairs.

Each block is equipped with:

SID-C EVs back mount frame, for either 5 or 10 connection modules / disconnection modules (10 pairs)

- 1 Label holder;
- 1 Plug-in number set;
- 1 Dust cover;
- 1 Fixing set for mounting between two frame rails.

**Quante SID-C-EVs/
50 pairs**



SID-C EVs

with 5 connection modules for 50 pairs
PU: 1 pc, Weight: 0,45 kg

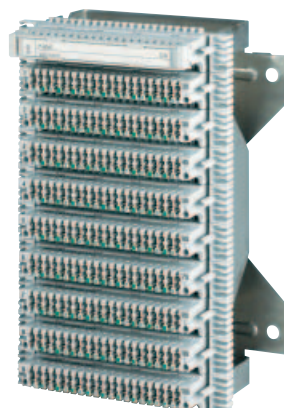
10-050-00400

SID-C TrEVs

with 5 disconnection modules for 50 pairs
PU: 1 pc, Weight: 0,45 kg

15-050-00400

**Quante SID-C-EVs/
100 pairs**



SID-C EVs

with 10 connection modules for 100 pairs
PU: 1 pc, Weight: 0,8 kg

10-100-00400

SID-C TrEVs

with 10 disconnection modules for 100 pairs
PU: 1 pc, Weight: 0,8 kg

15-100-00400

2.3 Cross connection product range

2.3.1 Connection modules

Quante™ SID™-C EXTREME

Description

Quante SID-C EXTREME concept for extreme conditions

The SID-C EXTREME system has been introduced to provide increased environmental protection for cross connection systems located with harsh environments.

The concept allows the operator the opportunity to provide the level of protection suitable for each separate location.

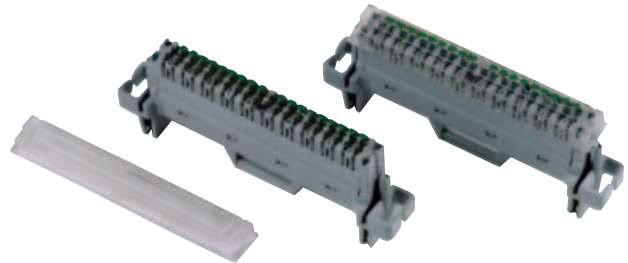
BASIC DUST PROTECTION

Basic protection against dust ingress.



BASIC AMBIENT PROTECTION

For protection against contamination, corrosive atmospheres, and increased atmospheric humidity.



Highlights:

- Improved reliability
- Low cost solution
- High density
- Suitable for all applications

2.3 Cross connection product range

2.3.1 Connection modules

Quante™ SID™-C EXTREME



Type/Order text

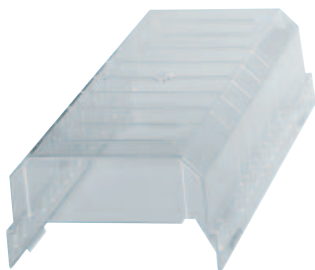
Ref.-No.

SID-C EVs / SID-C TrEVs basic dust protection.

Kit containing: SID-C EVs with connection modules, or SID-C TrEVs with disconnection modules complete with dust protection cover.

SID-C EVs
SID-C TrEVs

10-100-00400
15-100-00400



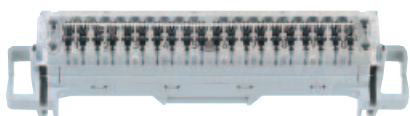
Dust protection cover
100 pairs, grid 17,5
PU: 1 pc

15014-505 004



SID-C disconnection modules
10 pairs, gel filled,
with dust protection caps
PU: 10 pcs

79103-534 35



SID-C connection modules
10 pairs, gel filled,
with dust protection caps
PU: 10 pcs

79101-553 35

2.3 Cross connection product range

2.3.1 Connection modules

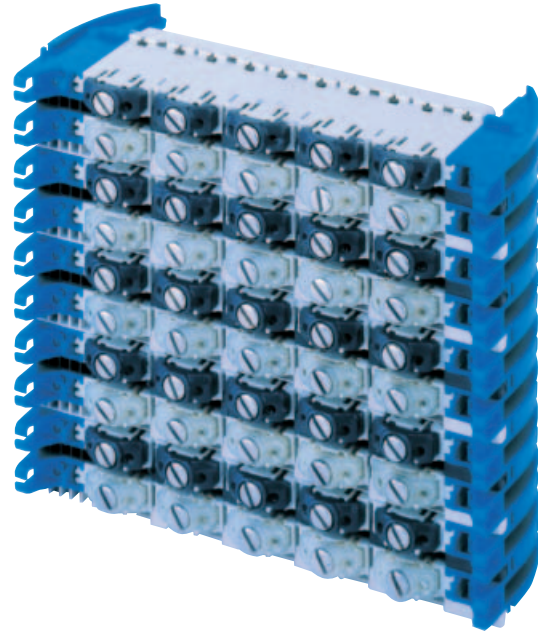
Quante™ SX

Description

The Quante SX module is based upon our years of experience within gel filled, tool free, IDC products coupled with our knowledge in cross connection products.

The module provides a solution for use within cross connection points where high reliability is of the utmost importance.

The SX has been designed to suit all types of cross connection cabinets in our range and is also suitable for mounting on several types of backmount frames. The compact dimensions of the SX allows for upgrades to existing cross connection points as well as providing a durable and more advanced system solution.



The excellent reliability of the SX is achieved by:

- **reliability by design**

The fully watertight SX connection point works in full immersion conditions even after multiple re-terminations. The product is designed to avoid any current leakages in between lines by an increased distance between contacts and encapsulation of the wires using gel technology. The gel provides a superb corrosion protection.

- **reliability by operation**

The screw driver operated jumper IDC connects and cuts the unwanted over length of the jumper wire in one simultaneous operation. The hidden cable side protects all incoming cabling from accidental disconnection.

Incoming cables are quickly terminated using the scissor action termination tool.

Strain relief devices are included to ensure the correct mooring the cable wires. Once terminated, each connection is encapsulated in a gel-filled cover.

SX works as a normal cross connection cabinet block with a front facing jumper termination field, the equipment cable (once terminated) is 'hidden' at the rear of the product. SX blocks may be supplied pre-cabled upon request.

Although SX offers facilities similar to those found in existing terminal block technologies, SX is a modular concept consisting of 5 pair IDC elements. These elements can be bayed together with wire guide channels between to form a terminal block. Even though the internal contact distances are wide to with stand the harshest environmental conditions, SX still offers a 22,5mm pitch per 10 pairs. This compactness allows the use of SX in cross connected cabinet.

SX is available in two mounting versions:

- for fixing on E10 Back mount frames
- for fixing on QSA Back mount frames

2 test points are provided on each pair and are accessible using standard pins of test meters.

Highlights:

- Fully watertight connection module for use in CCC applications
- No specific tool termination (screwdriver operated IDC)
- 0,4 to 0,8 mm conductors diameters
- Automatic cutting of jumper and cable overlengths
- Jumper guide channels
- 22,5 mm vertical pitch
- Modular solution



2.3 Cross connection product range

2.3.1 Connection modules

Quante™ SX

Type/Order text

Ref.-No.

SX terminal block

Each block is supplied with:

connection modules jumper guide channels, gel-filled covers to encapsulate cable termination mounting accessories

SX for Euro Profile (E10)

50 pairs block
PU: 1 pc

C253800A0000

SX for QSA backmount frame

50 pairs block
PU: 1 pc

C253802A0000

SX on Euro Profile (E10)

100 pairs block
PU: 1 pc

C253801A0000

Termination tool for the cable side

C234030A0000

2.4 Drop wire distribution point product range

2.4.1 High reliability drop wire connectors

Quante™ MX 2000

Description

Quante MX 2000 high reliability connection module for overhead plant

MX 2000 dropwire connectors are in use world wide to build and upgrade overhead networks with a fully watertight connection technology. When considering the fact that the highest fault rates are measured in overhead networks, it's indispensable to use a high reliable technology like MX 2000.

MX 2000 is designed to operate under harshest environmental conditions. The user friendly design prevents any possible incorrect installations.

This product is suitable for distribution, protection as well as customer termination in overhead lines. This new generation fits all existing networks and can accommodate all existing dropwire sizes, whatever the core conductor material is (copperweld, steel, bronze, copper cadmium).

No specific tools are required to perform IDC termination, a simple screw driver eases the dropwire termination. Both sides of this connector can be re-terminated multiple times with different conductor sizes.

A central disconnection area offers test facilities for both sides; multipair testing; disconnection and overvoltage protection. The overvoltage protected version is able to drain high currents up to 10kA.

The very flexible built-in protection allows to upgrade unprotected distribution points into protected ones.

The unique MX 2000 design allows to snap this modules on both IEC 715 25mm and 35mm profiles.

Earthing (10kA) is automatically completed through this mounting rail. The MX 2000 one pair module offers a very high flexibility compared to multipair systems.



Highlights:

- Watertight encapsulated contacts
- No specific termination tool needed
- for 0,4 to 1,1 mm dropwire conductors (all kinds of materials)
- Multiple re-terminations possible
- Comprehensive product range
- 10kA drain current capacity



2.4 Drop wire distribution point product range

2.4.1 High reliability drop wire connectors

Quante™ MX 2000

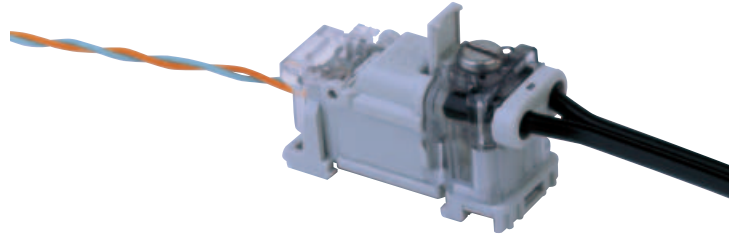
Technical characteristics

Dropwire terminations

- Screwdriver operated IDC
- Steel, copperweld, copper cadmium, bronze drop-wires
- From 0,4 to 1,1 mm conductor diameter copper wires
- Overall insulation diameter: 5 mm max.

Cable termination

- Tool free IDC
- Solid copper conductors
- From 0,4 to 0,8 mm conductor gauges
- Overall insulation diameter: 1,8 mm max.



Type/Order text

Ref.-No.



MX 2000 C disconnection module

C249800A0000



MX 2000 disconnection module with protection facility
(delivered without protection arrester,
please consult us)

C249801A0000



MX 2000 PP protection module equipped with
250 V surge arrester with fail-safe and PTCR

C249812A0000



MX 2000 T disconnection module with protection
and test facility without interrupting the service

C249811A0000

MX 2000 P protection module equipped with
350 V surge arrester with fail-safe

C249804A0000

MX 2000 P protection module equipped
with 250 V surge arrester with fail-safe

C249802A0000

Three-pole surge arrester for MX 2000
250 V with fail-safe
350 V with fail-safe

C231039A0000

C231040A0000

2.4 Drop wire distribution point product range

2.4.2 Drop wire distribution points

Overview

Description

Quante MX modules for outside plant

	MX 2000 C	MX 2000	MX 2000 P	MX 2000 P 350 V
General product features				
single pair configuration	yes	yes	yes	yes
type of drop wire	all	all	all	all
mounting	clip on both DIN 35 and DIN 25	clip on both DIN 35 and DIN 25	clip on both DIN 35 and DIN 25	clip on both DIN 35 and DIN 25
retermination on dropwire side	yes	yes	yes	yes
retermination on cable side	yes	yes	yes	yes
disconnection	yes	yes	yes	yes
protection	no	upgradable	yes	yes
test	yes	yes	yes	yes
DROP WIRE				
type of termination (operation of IDC)	screwdriver	screwdriver	screwdriver	screwdriver
-> conductor diameters	0,4 -1,1 mm	0,4 -1,1 mm	0,4 -1,1 mm	0,4 -1,1 mm
-> overall insulation diameter	5 mm max	5 mm max	5 mm max	5 mm max
-> overall insulation diameter	copper, bronze, steel	copper, bronze, steel	copper, bronze steel	copper, bronze steel
number of reterminations with same drop wire	30	30	30	30
number of reterminations with different diameters (typical)	10	10	10	10
CABLE				
type of termination (operation of IDC)	tool free or screwdriver	tool free or screwdriver	tool free or screwdriver	tool free or screwdriver
-> conductor diameters	0,4 - 0,8 mm	0,4 - 0,8 mm	0,4 - 0,8 mm	0,4 - 0,8 mm
-> overall insulation diameter	1,8 mm max	1,8 mm max	1,8 mm max	1,8 mm max
-> conductor material	copper	copper	copper	copper
number of reterminations with same cable				
number of reterminations with different diameters (typical)				
Electrical features				
contact resistance	< 3mΩ	< 3mΩ		< 1mΩ
leading through resistance	< 20mΩ	< 10mΩ	< 10mΩ	< 10mΩ
insulation resistance @ 500 V	> 10 GΩ	> 10 GΩ	> 10 GΩ	> 10 GΩ
dielectric strength @ 50 Hz	5 kV RMS-50 Hz	5 kV RMS-50 Hz		
protection				
type of protection	-	upgradable	built-in	built-in
protection when line is disconnected (detent position)	-	yes	yes	yes
replaceable components	-	yes	yes	yes
static breakdown voltage	-	250 V +/-20%	250 V +/-20%	350 V +/-20%
dynamic breakdown voltage	-	< 800 V	< 800 V	< 800 V
impulse discharge current @ 8/20 μs	--	10 kA	10 kA	10 kA
alternative discharge current @ 50 Hz	-	< 10 kA	< 10 kA	< 10 kA
fail safe response time @ 5 A	-	< 10 s	< 10 s	< 10 s
test				
4 points	yes	yes	yes	yes
test probe	crocodile clamps	crocodile clamps	crocodile clamps	crocodile clamps
multipair test (2)	yes	yes	yes	yes
design features				
plastic materials	polycarbonate	polycarbonate	polycarbonate	polycarbonate
contact material	CuSn9P	CuSn9P	CuSn9P	CuSn9P
contact coating	tin/lead 60/40	tin/lead 60/40	tin/lead 60/40	tin/lead 60/40
self-extinguishing plastic material class	UL 94 V0	UL 94 V0	UL 94 V0	UL 94 V0
colour	clear plastic and grey	clear plastic and grey	clear plastic and grey	clear plastic and grey
watertightness				
self-healing feature	yes	yes	yes	yes
working conditions				
immersion test under 48 V	yes	yes	yes	yes
working temperatures	-30 to + 200°C	-30 to + 200°C	-30 to + 200°C	-30 to + 200°C



2.4 Drop wire distribution point product range

2.4.2 Drop wire distribution points Overview

Description

Range of outdoor boxes for outside plant

	3M™ BMX	3M™ BDX3000	3M™ ATS 2000**	3M™ EDB
Applications				
application	dropwire distribution and protection box	multipurpose	dropwire distribution and protection box	Multipair IDC block distribution box
possible internal equipment capacities	MX 2000* or classic 10, 20, 30, 50 pairs	MX*, SID*, STS*, MX2000*, STG2000*	MX 2000* 1, 5, 10, 20, 30pairs	SID-C, Sic™ QCS, QSA, SID-CT, STG2000K
Product features				
pole mounting	mounting bracket or steel band	mounting bracket	no bracket, screw or steel band	No bracket, with screws
wall mounting	with or without bracket	without bracket	without bracket	No bracket, with screws
type of cover	10 pairs:hinged others:sliding cover	hinged	hinged	hinged
type of box	5 types	6 types	4 types	1 type
type of lock	optional lock with key	optional lock with key	snap lock	screw
cable ties	yes	optional	no	no
cable routing devices	yes	optional	no	no
Technical features				
type of material	10 pairs: PVC 20, 30,50 pairs: polyester re-Inforced fibre glass	PVC	polycarbonate	Fiber reinforced polycarbonate
UV resistance	yes	yes	yes	yes
colour	light grey	light/dark grey	light grey	light grey
standard water tightness (NF EN 50529)	10 pairs hinged IP 44 Other IP 43	IP 55	IP 54	IP 54
mechanical resistance (NFC 20015)	10 pairs: IK 08 others: IK 10	IK 07	IK 07	IK 07
self-extinguishible material (UL 94)	UL94 V0	V0	V0	V0
temperature range	-25°to +70°C	-25°to +70°C	-25° to +70°C	-25° to +70°C
Outside dimensions (w x h x d) in mm				
-> size 1 hinged	240 x 270 x 80	255 x 292 x 86	41 x 95 x 67	116 x 230 x 95
-> size 2	240 x 320 x 73	255 x 292 x 116	204 x 248 x 71	
-> size 3	240 x 511 x 73	255 x 292 x 156	204 x 372 x 71	
-> size 4	240 x 856 x 73	255 x 400 x 86	204 x 422 x 71	
-> size 5 sliding	240 x 213 x 73	255 x 400 x 116		
-> size 6	-	255 x 400 x 156		

** Values should be reconfirmed

* These products are trademarked by Quante.

2.4 Distribution point product range

2.4.2 Drop wire distribution points

3M™ BMX

Description

3M BMX 10-50 pair distribution box

Application

The boxes in the BMX range are used for connecting and protecting subscriber lines and terminals. Developed to accommodate the MX connection modules, they guarantee the operator reliable and consistent connection assemblies.

Numerous configuration are possible:

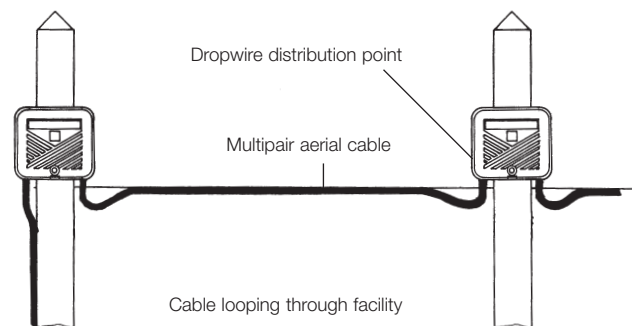
- 4 box sizes for distribution and secondary cross connection applications
- hinged lid available (10 pair only)
- standard sizes from 10 to 50 pairs
- connection modules can be installed when required.

Easy to assemble:

- rubber 'press-out' cable entries
- equipped with cable routing devices.

Simple to operate and maintain:

- boxes are compatible with all types of supports
- modular connections starting from one pair
- MX module insulation displacement contact reduces cabling time
- total reliability due to watertight connections
- high capacity boxes are aimed to be used as transition point between underground and overhead networks. It is recommended to offer a protection at this point in the network as electronic devices can be installed in the network. For these applications BMX boxes are made of glass fibre reinforced polyester to withstand specific conditions due to the location at the top of the pole.
- In the 10 pair box, multipair cable can 'loop through' the box with only the 10 distributed pairs required taped out. As a result, one 50 pair cable can feed 5 distribution boxes without using any additional overhead joint closure.



Highlights:

- Comprehensive range
- Enhanced weather-proofing
- Insect proof
- Automatic lid closure
- Swivelling cover (10 pairs)
- Protection of the incoming cables
- Accommodate all types of MX modules
- Glass fibre reinforced polyester for large capacities

Box dimensions overall in mm

Model	10 pairs	10 pairs	20 pairs	30 pairs	50 pairs	100 pairs**
Width	240	240	240	240	240	240
Height	270	213	320	511	856	856
Depth	80	73	73	73	73	73
Cover	swivelling	sliding	sliding	sliding	sliding	sliding

** The 100 pair configurations are achieved by assembling two 50 pair boxes.

2.4 Distribution point product range

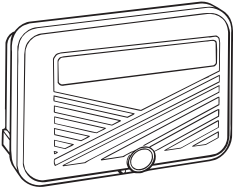
2.4.2 Drop wire distribution points

3M™ BMX

Type/Order text

Ref.-No.

Distribution/protection boxes



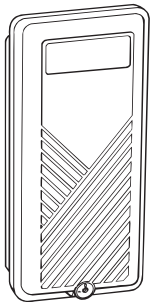
These 2 boxes can not be mounted directly with stainless steel 7/10 bracket

10 pair box with swivelling cover, equipped with 10 MX 2000 P 250 V

N501186A0000

10 pair empty box with swivelling cover, rail and earth post

N501187A0000



These boxes can be pole mounted directly with stainless steel 7/10 bracket

Simple mounting 2 points bracket
for pole mounting (Mexico type)

C231599A0000

Mounting bracket with 4 fixing points
for pole mounting

N801161A0000

10 pair empty box with sliding cover, rail and earth post
(MX classic)

NN3450600000

Mounting bracket (France Telecom)

NN8809590000

20 pair empty box with sliding cover, rail and earth post
(MX classic)
(MX 2000)

NN3450610000

N451054A0000

Mounting frame
(20 pair)

NN7803400000

30 pair empty box with sliding
(MX classic)
(MX 2000)

NN3450620000

N451055A0000

Mounting frame
(28/30 pair)

NN7803410000

50 pair empty box with sliding cover, rail and earth post
(MX classic)
(MX 2000)

NN3450630000

N451056A0000

Mounting frame
(50/56 pair)

NN7803420000

Treated steel 7/10 bracket, height 20 mm, 50 meters long

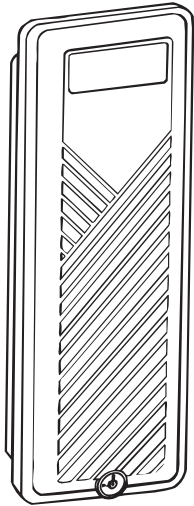
NN9019630000

Stainless steel fixing part for treated bracket / (100 pieces)

NN2650540000

Key lock kit

N691009A0000



2.4 Distribution point product range

2.4.2 Drop wire distribution points

3M™ ATS 2000, 3M™ EDB

Description

3M ATS2000 boxes are suitable for accommodating the "Pair-at-a-time" sealed Insulation Displacement Connector (IDC) service wire and drop wire termination blocks (MX 2000).

ATS2000 boxes are available in 4 standard sizes. 1 pair, 10 pair (both used for 5 pair), 20 pair and 30 pair. The 30 pair box can be used for accommodating 25 pairs IDC modules, too.

ATS boxes are supplied with DIN 35 rails and all the necessary parts to mount the IDC modules. Boxes are supplied without the IDC modules.



Type/Order text

Description	Packaging	Minimum Order
1 pair box w/o module	1 each /box, 100/case	10ea (1 cs)
5 pair box w/o module	1 ea/box, 10ea/cs	10ea (1 cs)
10 pair box w/o module	1 ea/box, 10ea/cs	10ea (1 cs)
20 pair box w/o module	1 ea/box, 10ea/cs	10ea (1 cs)
30 pair box w/o module	1 ea/box, 10ea/cs	10ea (1 cs)

Ref.-No.

ATS 2001

ATS 2005

ATS 2010

ATS 2020

ATS 2030

Description

EDB box is made of UV resistant fiber glass reinforced polycarbonate for outdoor/indoor 10/20 pair distribution point applications. Protection class is IP55. Box consists of 2 main injection molded parts, base and lid.

Designed with the necessary depth to accommodate the IDC modules with the protection magazine. Lid is attached to the base with a hinge mechanism at the top. Two main parts are sealed together by means of a rubber gasket fixed at the edge of the lid and locked through a (-) head screw that is supplied on the box. When the lid is open, it is kept in position by the holder attachment part of the lid and base.

One size, compact box for Outside Plant distribution point applications.

Accommodates 1 or 2 each 10 pairs IDC block types SID-C, QSA+, STG2000K and Slic QCS.

Designed to accept modules with protection magazines (where applicable).



Type/Order text

Description	Packaging	Minimum Order
1 box w/o module	1 each/box, 20 each/carton	20 each (1 carton)

Ref.-No.

Please consult us



2.4 Distribution point product range

2.4.2 Drop wire distribution points 3M™ BDX

Description

3M BDX Multipurpose outdoor box

BDX boxes are designed to accommodate different equipment configurations in outside plant. Based on a modular concept, 2 sizes of BDX box are available each with the choice of three different hinged front cover depths..

A slotted internal base allows the mounting equipment whatever the position. The specific grooves are designed to mount the equipment with specific self-tapping screws.

BDX can be equipped with specific strain relief devices for drop wire distribution applications. They are equipped with a gasket and rubber grommets in the cable entry area. The relevant protection class is IP 55.

Suitable for both pole and wall mount applications via a steel strap for pole mount and direct mount without additional mounting bracket for wall mounted applications.

BDX boxes can be secured with either a triangular shaped nut or a standard key type lock. The standard colour is light grey for the cover and dark grey for the base. Additional colours may be ordered upon request.

A specific version with reinforced ventilation is available to accommodate any electronic equipment.



Material

Thermoplastic

Colours

Base: dark grey RAL 7037

Cover: light grey RAL 7035

(Ivory or black available upon request).

Dielectrical strength

> 4 kV.

Degree of protection (EN 60 529 standard)

IP 43 without rubber seal

IP 55 with rubber.

Mounting

By 20 mm metal strap

On a standard RP-type fixing bracket

By screws (4 x Ø 6 mm).

Highlights:

- 3 depths available
- Free mounting with self tapping screws
- Outstanding weather proofness (IP55)
- Lockable
- Specific version with reinforced ventilation for electronic equipment.

2.4 Distribution point product range

2.4.2 Drop wire distribution points

3M™ BDX

Technical characteristics

External dimensions (mm)

Types	Box	Width	Height	Depth
Size 1 low cover (T1 B)	BDX 3000	255	292	86
Size 1 medium cover (T1 M)	BDX 3000	255	292	116
Size 1 high cover (T1 H)	BDX 3000	255	292	156
Size 2 low cover (T2 B)	BDX 3000	255	400	86
Size 2 medium cover (T2 M)	BDX 3000	255	400	116
Size 2 high cover (T2 H)	BDX 3000	255	400	156

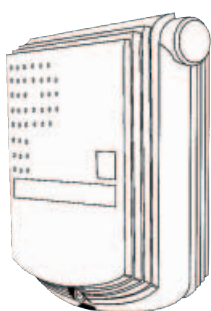
Maximum internal dimensions (mm)

Types	Box	Width	Height	Depth slotted bottom	Depth plain bottom
T1 B	BDX 3000	230	190	60	70
T1 M	BDX 3000	230	190	90	100
T1 H	BDX 3000	230	190	130	140
T2 B	BDX 3000	230	300	60	70
T2 M	BDX 3000	230	300	90	100
T2 H	BDX 3000	230	300	130	140

Type/Order text

Ref.-No.

3M BDX 3000 boxes



Made up of:

- Body with bottom entirely slotted (FR)
- Hinged cover with built-in locking system
- Strong watertightness
- ETR: Body/cover sealing ring
- Sealing on cable entry
- Ventilation on high side

Colours:

Base: dark grey
 Cover: light grey
 (Ivory and black upon request)

T1 B ETR FR	N501053A0000
T1 M ETR FR	N501054A0000
T1 H ETR FR	N501055A0000
T2 B ETR FR	N501056A0000
T2 M ETR FR	N501057A0000
T2 H ETR FR	N501058A0000

2.4 Distribution point product range

2.4.2 Drop wire distribution boxes

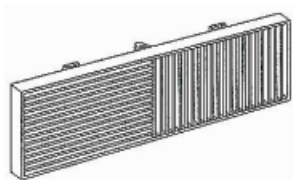
3M™ BDX



Type/Order text

Ref.-No.

Accessories for 3M BDX Multipurpose outdoor box



Set of slotted right angles (EQR)
Mounting at 90° on materials in boxes by self-tapping screws Ø 3 mm
Right angle size: 215 x 70 mm
Compatible with all boxes
Automatically delivered in FL EQR boxes

N711119A0000

Set of 10 quarter turn triangles
Compatible with all covers
Can be mounted on site

N691022A0000

Set of 10 key-locks No 1242 E
Other numbers upon request

NN3690310000



Set of 100 self-tapping screws Ø 3 mm
Fixing on slotted bottoms or on right angles

N901038A0000

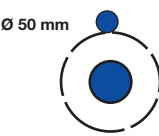
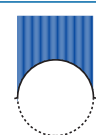
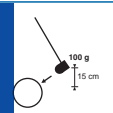
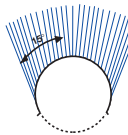
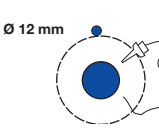
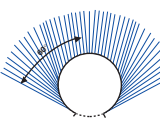
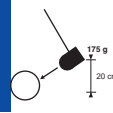
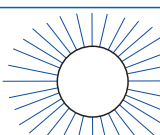
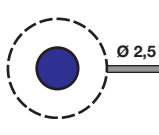
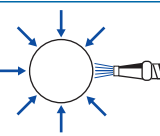
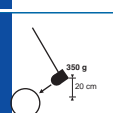
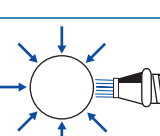
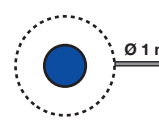
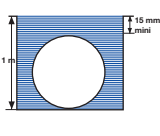
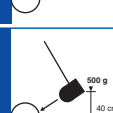
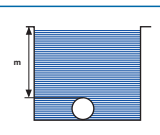
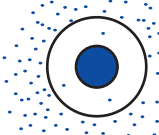

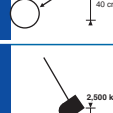
2.4 Distribution point product range

2.4.3 Protection and mechanical resistance for enclosures

Description

IP protection degree for enclosures of electrical equipment according to EN 60 529 standard.

IK shock protection according to EN 50 102 draft standard.

1st digit: Protection against solid bodies			2nd digit: Protection against liquids			Protection against mechanical impacts		
IP		TEST	IP		TEST			TEST
0	No protection		0	No protection		00	No protection	
1	Protection against solid bodies greater than 50 mm (e.g. inadvertent hand contact)		1	Protection against dripping water falling vertically (condensation)		01	Impact energy 0.150 joule	
			2	Protection against water drops falling up to 15° from the vertical				02
2	Protection against solid bodies greater than 12 mm (e.g. fingers)		3	Protection against rainwater falling up to 60° from the vertical		03	Impact energy 0.350 joule	
			4	Protection against splashing water from all directions				04
3	Protection against solid bodies greater than 2,5 mm (e.g. tools, wires)		5	Protection against water jets from all directions		05	Impact energy 0.700 joule	
			6	Protection against splashing water comparable with large waves				06
4	Protection against solid bodies greater than 1 mm (e.g. precision tools, small wires)		7	Protection against the effects of immersion		07	Impact energy 2.00 joules	
			8	Protection against the effects of prolonged immersion in specified conditions				08
5	Protection against dust (no aggressive deposits)		9	Total protection against dust		09	Impact energy 10.00 joules	
								6

2.4 Distribution point product range

2.4.4 Cross connection product range

3M™ Quante™ EVz 78



Description

Quante EVz 78 outdoor distribution box

The EVz provides weather-proof termination for up to 20 pair of cable. Additional overvoltage arrester magazines can be added. These must be ordered separately.

Housing: Polyester, reinforced glass-fibre
 Colour: RAL 7001, silver-grey
 Protection class: IP 64
 Contacts: Brass or spring bronze, nickel-coated

EVz 78, 10 pairs, cable inlets

- 1 inlet with earth-clamp for screened cables up to Ø14 mm
- 2 inlets with cable restraining facilities for cables up to Ø16 mm
- 2 inlets with cable restraining facilities for cables up to Ø12 mm
- 4 inlets without cable restraining facilities for cables and wires up to Ø9 mm

- 1 inlet without cable restraining facilities for earth wire up to Ø 7 mm
- The cable openings are sealed by plastic grommets.

EVz 78, 20 pairs, cable inlets: Inlet seal for synthetic cables:

- 1 inlet for cable up to Ø16 mm
- 2 inlets for cables up to Ø14 mm
- 2 inlets for cables up to Ø12 mm
- 3 inlets for cables up to Ø 9 mm
- 1 inlet for ground conductor up to Ø7 mm.

All inlets without cable restraining facilities.

Type/Order text

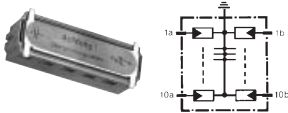
Ref.-No.



EVz 78 10 pairs

PU: 1 pce. Weight: 1.042 kg

25-510-00000

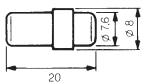


M 78 surge arrester magazine

Form F (8 x 20)
 Dimensions (H x W x D) 89 x 34 x 27 mm
 Circuit for EVz 78, for overvoltage surge arrester
 PU: 1 pce. Weight: 0.052 kg

25126-501 00

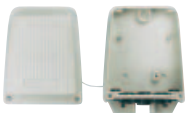
To be ordered separately



F surge arrester

230 V - 20 A/20 kA
 Form F (8 x 20)
 Requirements per magazine: max. 10 units
 Dimensions (H x W x D) 89 x 34 x 37 mm
 PU: 1 pce. Weight: 0.005 kg

39081-701 26



EVz 78 for 20 pairs SID-C

with protection magazines, empty box, with high cover
 PU: 1 pce. Weight: 0.94 kg

05-769-01900



Mounting plate for SID-C in EVz 78

Complete with all accessories
 PU: 5 pcs. Weight: 0.5 kg

25140-500 00



SID-C connection module

for 10 pairs
 PU: 5 pcs. Weight: 0.2 kg

79101-553 00

2.4 Distribution point product range

2.4.4 Cross connection product range

3M™ DDB

Description

3M™ DDB, Durable Distribution Box for copper cable based networks is designed to accommodate Quante™ SID™ -CT or QSA modules. The box is prepared for surge protection. Locking system is optional available.

- Housing with hinged cover (DDB 200 with door)
- Opening of the covers approx. 110° (DDB200 180°)
- Prepared for mounting on wall or pole (wood, metal or concrete)
- No additional pole mounting kit necessary
- Protection class IP 54 / IP 64 with sealing
- Cable sheath grounding clamp

Material

Housing: PC/ABS, UV resistant, UL94 V-0
Cover: glass-fibre reinforced polyester colour RAL 7032
Grommets: polyethylene, UV resistant
Back mount frame: stainless steel
Screws: stainless steel
Cable sheath grounding clamp: steel tin plated

Delivery content

DDB Box with back mount frame for SID™ -CT / QSA modules, with Cable sheath grounding clamp

Type/Order text

Ref.-No.



DDB 20
for max. 2 modules

25-020-01200



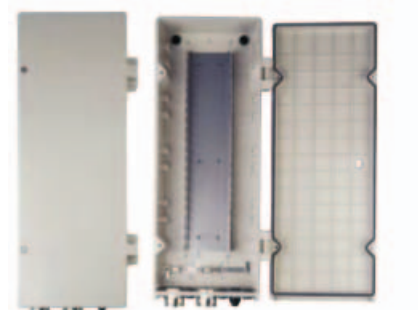
DDB 50
for max. 5 modules

25-050-01200



DDB 100
for max. 10 modules

25-100-01200



DDB 200
for max. 20 modules

25-200-01200

Modules see pg. 36 and 52 - 53



2.4 Distribution point product range

2.4.4 Cross connection product range

3M™ CDS

Description

3M CDS secondary cross connection boxes

CDS range of products are used for cross connection in the secondary network. Made up of 2 verticals, incoming and outgoing cables can be easily identified. The standard boxes are equipped with Europe E10 backmount frame to accommodate the STG range of connection modules or SX high reliability terminal block. These boxes are designed for pole or wall mount applications with the relevant mounting brackets.

Manufactured in glass fibre reinforced polyester the mechanical resistance is appropriate for use at the base of poles. With an IP44 protection rating the CDS box offers good resistance to weather and insect ingress in external plant application.

The boxes are delivered as standard, with the following: earth post, strain relief devices, jumper routing devices.



CDS 400 / 600 / 800 pair box

- 3 sizes available
- CDS box is delivered without backmount frames
- Locking by triangular shaped nut
- Hinged cover with wind latch

Highlights:

- Comprehensive range
- From 300 to 800 pairs
- Water and insect proof
- Good mechanical resistance



Technical characteristics

Type	Capacity			Overall dimensions (mm)		
	STG	SID	SX	Height	Width	Depth
CDS 400	400	400	200	446	406	117
CDS 600	600	500	400	606	436	117
CDS 800	800	700	600	766	436	117

2.4 Distribution point product range

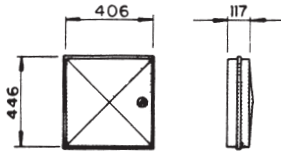
2.4.4 Cross connection product range

3M™ CDS

Type/Order text

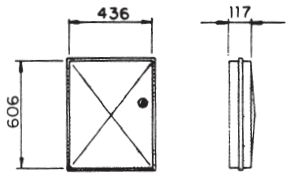
Ref.-No.

3M CDS boxes



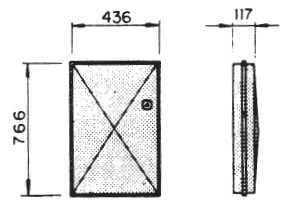
400 pair box
with jumper routing devices

M002324A0000



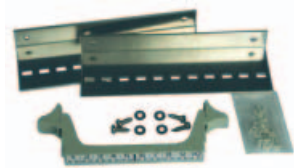
600 pair box
with jumper routing devices

M002326A0000



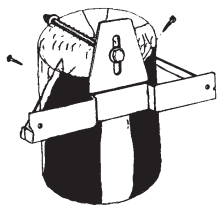
800 pair box
with jumper routing devices

M002327A0000



"L type" profile for mounting of 10 STG modules
(100 pairs)

MPA025KB0000



Accessories for CDS boxes

Pole support

MPA0600A0000

Copper Test Equipment

3M™ Dynatel™ 900 Series

Subscriber Loop Test Products

Description

Rugged and portable for harsh environments, Dynatel 900 Series test sets offer the right mix of functions, from loop diagnostic routines to fault locating, transmission testing and combination test/terminal capabilities.

Enhanced customer services are in high demand, such as fast Internet and data access and video conferencing. The 3M™ Dynatel™ Qualification Test Sets 949 & 950 ADSL help you make sure such enhanced customer services can be provided.

Dynatel 965DSP/SA Subscriber Loop Analyser

The Dynatel 965DSP/SA Subscriber Loop Analyser is a microprocessor controlled integrated test set that provides full-featured POTS, wideband and DSL-specific testing. The functions include fault location and repair verification on twisted-pair and drop cables (utilising capacitance bridge, resistance bridge and Time Domain Reflectometer (TDR) functions).

The Dynatel 965DSP/SA subscriber loop analyser executes a wide range of individual tests, or performs automatic test routines to categorise and sectionalise problems. The hand-held 965DSP/SA test set is housed in a lightweight, ergonomically designed case for portability and ease of handling.

The unit is weather-resistant and weighs only 4.3 pounds (1,95 kg).



Dynatel 965AMS Advanced Modular System

The new rugged, dependable and customizable Dynatel Test Platform will test the latest voice, data and video technologies with just the touch of a single button. Thanks to its knowledge-based auto-test feature and interchangeable test modules and software options, you can bring over a hundred years of Dynatel team experience with you into the field. And share modules with other Dynatel 965AMS users.

This new Dynatel platform can enable you to quickly, easily and accurately analyze and troubleshoot the local loop and services of today as well as the future, and help reduce support costs and increase productivity.



2.5 Copper Test Equipment

3M™ Dynatel™ Qualification Test Set 949ADSL

Description

General Specifications

Size:	60 mm high x 100 mm wide x 200 mm long
Weight:	Less than 2.5 lb. with battery
Battery:	NiMH 2.1 Ahr – shrink wrap pack, user replaceable through access door on back of unit
Battery life:	8 hours standby (Backlite Off) + 20 full ADSL qualification tests AC/DC adapter connects to the unit through the RJ-45 test lead jack The unit cannot make measurements while powered by the AC/DC adapter Auto shutoff after 5 minutes with no activity, except during charging
Display:	64 x 128 pixel , 57 mm x 31 mm viewing area with LED backlight
Test leads:	Red, black and green leads. 1.5 meter long. Connected to unit via RJ-45 jack
Breakdown Voltage:	360 Vdc, 250 Vac. (the unit will be damaged if exposed to voltages exceeding these limits)
Operating temperature:	-10°C to 60°C except for ADSL and battery charger functions 0°C to 60°C ADSL functions (temperatures > 50°C performance could degrade) 0°C to 50°C battery charger operation
Humidity:	0 to 80% non-condensing
Rain proof/splash proof:	Conforms to IP42
Shock:	Will survive 3 foot drop to concrete
Regulatory:	CE / FCC
ADSL Test Storage:	200 sets of results identified with an alphanumeric label
Stored results can be viewed in the test set.	
Languages:	English
RS232	Port An RJ45 to DB9 adapter cable is provided to permit connecting the 949 and 950ADSL to a PC The serial connection supports the following: <ul style="list-style-type: none"> • Upload of test results to the PC • Field software updates

Pots Measurement Specifications

Function	Range	Resolution	Accuracy*	Test Leads
AC voltage:	0 to 250 Vac (input resistance = 1M Ohm ± 5%)	± 1 V ± 2%	R-T, R-G, T-G	
DC voltage	0 to 250 Vdc (input resistance = 1M Ohm ± 5%)	± 1 V ± 2%	R-T, R-G, T-G	
Resistance	0 ohm to 999 ohms 1K ohm to 9.9K ohms 10K ohms to 99.9K ohms 10K ohms to 999K ohms 1M ohm to 9.9M ohms 10M ohms to 30M ohms Active pair: 0 to -60 VDC R-T voltage, 600 ohm to 7K ohms Inactive pair: 0 to -90 VDC R-T voltage, 600 ohms to 1 Megohm	1 ohm 10 ohms 100 ohm 1K ohm 100K ohms 1M ohm ± 10%	± 5 ohm ± 3% ± 3% ± 3% ± 3% ± 3%	R-T, R-G, T-G
Longitudinal Balance	0 – 65 dB	1 dB	±2 dB	TR-G
Precision tone	Frequency 404Hz, 1004Hz, 2804Hz (preset) Source Impedance 600 ohms +/- 5%		Amplitude 0 ± 0.5 dBm	R-T
	Frequency 8000 – 2Mhz (user settable) +/- 10% Source Impedance 100 ohms +/- 5% 577 Hz intermittent trace tone		Amplitude 0 ± 0.5 dBm Amplitude 5V P-P	R-T

*Percent of reading

3M™ Dynatel™ Qualification Test Set 949 & 950ADSL



Description

General Specifications

POTS Test	Storage 10 Sets of results, each identified with a 10 digit numeric identifier Stored results can be viewed in the test set
POTS Autotest	Autotest will run the following tests: V (T, R, G), mA, Ground Resistance, Ohms (T, R, G), Opens (T, R, G), Load Coil Count, Noise, PI, LB and Loss (up to 10 voiceband frequencies)

Additional Pots Measurement Specifications (950ADSL)

Function	Range	Resolution	Accuracy*	Test Leads
Loop Current (DC)	0 to ±110 mA	1 mA	±2mA	R-T (Impedence = 430 Ω)
Loop Resistance	0 ohm to 999 ohms	1 ohm	± 5 ohm ± 3% R-T, R-G, T-G	
Loop Loss	-50 to +10 dBm 200 to 5000 Hz	1 dB	±1 dB	R-T (Impedence = 600 Ω)
Frequency during loss, single frequency only	200 to 5,000 Hz	1 Hz	±3 Hz	R-T
Noise Metallic with C-message weighting**	0 to 60 dBrc	1 dB	±2 dB	R-T (Impedence = 600 Ω)
Noise to Ground with C-message weighting**	40 to 100 dBrc	1 dB	±2 dB	R & T-G (Impedence = 100KW)
Opens	0 to 9,999 ft 10,000 to 99,999 ft (0 to 9,999 m) (10,000 to 30,000 m)	1 ft 100 ft (1 m) (100 m)	± 20 ft ±5% +/- 5% (± 6m, ±5%) (+/- 5%)	Ring, Tip, Mutual
Longitudinal Balance	0 – 65 dB	1 dB	±2 dB	TR-G.
Ground Resistance	0 to 50 Ω	1 Ω	±3 Ω	
Load Coils Count	0,1,2,3,4 or >4 coils Note: First load must be >3000' from the unit and 3000' of cable must extend beyond the last load coil for an accurate count		+/-1 coil	

Notes: * Percent of reading

** C-message specification has additional frequency dependent tolerance. Refer to "Subscriber Loop Transmission Test Set Specification", Bell System PUB 55020, January 1982.

ADSL Measurement Specifications

ADSL Standards	ANSI T1.413 ITU-T G.992.2 (G.LITE) ITU-T G.992.1 (G.DMT) - Annex A
IP Encapsulation	LLC SNAP or VC MUX
IP Transport Protocols	DHCPoE – IP on Ethernet over ATM DHCPoA - IP over ATM StaticIPoE – IP on Ethernet over ATM StaticIPoA - IP over ATM PPPoE - PPP over Ethernet over ATM PPPoA - PPP over ATM
PPP Authentication	CHAP or PAP
Line Impedance	100 ohms, nominally

Function	Measurement	Accuracy
ADSL Status	Fast Rate Up/Down	+/- 1 kbps
	Interleaved Rate Up/Down	+/- 1 kbps
	Max Rate Up/Down	+/- 1 kbps
	Margin Up/Down	+/- 1 dB
	Attenuation Up/Down	+/- 1 dB
	Capacity Up/Down	+/- 1 %
ADSL Information	FEC Errors Up/Down	+/- 1
	CRC Errors Up/Down	+/- 1
	HEC Errors Up/Down	+/- 1
	Bin Graph	
ADSL Alarms	Loss of Signal (LOS)	
	Loss of Frame (LOF)	
	Loss of Power (LOP)	
	Loss of Margin (LOM)	
Ping	Connection Time	+/- 10mS

2.5 Copper Test Equipment

3M™ Dynatel™ 900 Series Subscriber Loop Test Products

Description

Features for the Dynatel 900 Series Subscriber Loop Test Products

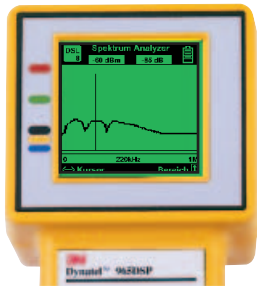
Features	965DSP	965DSP/SA	965DSP/ADSL	945DSP/SA/ADSL
Resistance fault locate	•	•	•	•
Open fault locate	•	•	•	•
Load coil count	•	•	•	•
Longitudinal balance	•	•	•	•
Caller Identification (CID)	•	•	•	•
Split fault locate	•	•	•	•
Voltage measurement	•	•	•	•
Tone source	•	•	•	•
Current measurement	•	•	•	•
Ohms measurement	•	•	•	•
Soak test	•	•	•	•
Ohms-to-distance conversion	•	•	•	•
Loss measurement	•	•	•	•
Noise measurement	•	•	•	•
Ringers count	•	•	•	•
Self-test and self-calibration	•	•	•	•
Wideband noise/loss for ISDN and xDSL		•		•
Line Prequalification tests for basic rate ISDN service	•	•	•	•
TDR	•	•	•	•
IR port (communication port)	•	•	•	•
Stored results internal memory	•	•	•	•
Communications craft set	•	•	•	•
Measurement units	Feet, metres, Fahrenheit, Celsius	Feet, metres, Fahrenheit, Celsius	Feet, metres, Fahrenheit, Celsius	Feet, metres, Fahrenheit, Celsius
Graphic display (backlit)	•	•	•	•
Auto diagnostic DC testing (loop)	•	•	•	•
Auto diagnostic AC testing (transmission)	•	•	•	•
High insulation resistance test	•	•	•	•
Resistance difference and loop resistance	•	•	•	•
Spectrum analyser (includes E, F, G noise filters)	Optional	•	Optional	•
Fast kick test	•	•	•	•
Onboard operating instructions	•	•	•	•
ADSL active modem testing	Optional	Optional	•	•



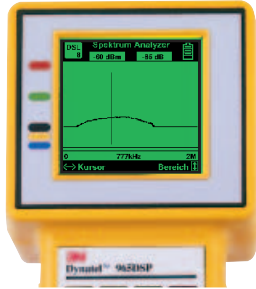
Technical characteristics

Wideband Spectrum Analyser

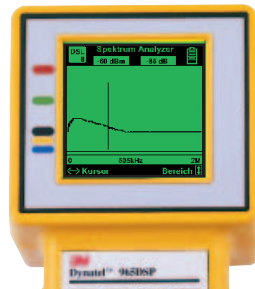
Sample Screens



ISDN 2BIQ Crosstalk



T1 Crosstalk



ADSL Downstream Crosstalk

Wideband Autotest

Inactive & Wideband Loss Frequencies

Service Type	Single Frequency (kHz)	Sweep Frequency (kHz)
POTS	1004 (Hz)	404, 804, 1004, 1204, 1404, 1604, 1804, 2004, 2804, 3004 (Hz)
56 kB	28	20, 28, 32, 40, 48, 82 64 kB 32 20, 28, 32, 40, 48, 82
ISDN	40	20, 28, 32, 40, 48, 60, 70, 82
HDSL	196	20, 30, 50, 70, 90, 110, 130, 196, 400
T1	772	200, 400, 500, 700, 772, 1024
E1	1024	200, 400, 500, 700, 772, 1024
ADSL	138	20, 30, 50, 69, 90 1100 110, 138, 276, 400, 600, 800, 1000, 110016

Wideband Test (with FED)

Test	Basic	Full	Pass/Fail
Vdc	Yes	Yes	No
Ohms	Yes	Yes	Yes
Opens	Yes	Yes	Yes
Capacitive balance	Yes	Yes	Yes
Longitudinal balance	Yes	Yes	Yes
Sweep loss	No	Yes	Yes
Single tone loss	Yes	No	Yes
Loop resistance	Yes	No	Yes
Loop ohms	No	Yes	Yes
Resistive balance	No	Yes	Yes
Load coil	Yes	Yes	No

Wideband Autotest Results

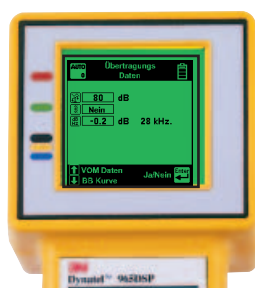
Sample Screens



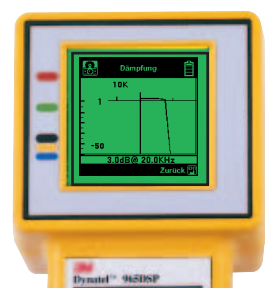
Pass/Fail



Numeric Value



Transmission



Graphic View of Slope

2.5 Copper Test Equipment

3M™ Dynatel™ 965DSP Subscriber Loop Analyser

Description

Complete testing of POTS, wideband\par services and digital subscriber lines

The 3M Dynatel 965DSP series subscriber loop analysers are microprocessor-controlled integrated test sets that provide full-featured POTS, wideband and DSL-specific testing.

Test functions include fault location and repair verification on twisted-pair and drop cables (utilising capacitance bridge, resistance bridge and Time Domain Reflectometre). The Dynatel 965DSP subscriber loop analysers execute a wide range of individual tests and perform automatic test routines to categorise and sectionalise problems.

Specific tests and measurements performed by the units include:

- Voltage – detects and measures the presence of central office (exchange) or foreign DC or AC voltages.
- Tone – provides test tones for conductor identification and transmission testing with ten default tones, user selectable as ID tone (up to 1,000Hz), voiceband (to 20kHz) or wideband (to 1.2MHz).
- Current – measures DC loop current.
- Resistance – measures conductor and insulation resistance up to 1000 megohms.
- TDR – full-featured Time Domain Reflectometre with user-selectable pulse widths, length, gain zoom, filter and Vp.

Five modes of operation:

Single trace – provides graphical representation of events on a pair.

Dual trace – allows active comparison of two traces.

Differential – displays difference between two circuits.

Crosstalk – displays the crosstalk from one pair to another.

Memory – allows comparison of an active trace with a trace stored in memory.

Peak – displays a history of maximum and minimum values with the live trace.

- Resistive fault location – displays distance to fault.
- Opens – locates opens at distances up to 100,000 ft. (30 km).
- Load coil count – counts the number of load coils (up to 5) and provides distance to the first load coil.
- Wideband loss and noise – loss and noise measurements to 1.2 MHz for pre-qualifying ISDN/IDSL, HDSL and ADSL.
- Loss – measures voiceband loss.
- Noise – measures noise metallic and noise to ground in dBmrc or dBmOp.
- Longitudinal balance – provides active measurement of line balance.
- Autotest – allows an automatic test of active, inactive and wide band (56K/64K DDS, ISDN/IDSL, HDSL, T1, E1 and ADSL) lines with pass/fail limits.
- Ground resistance – measures protector ground potential compared to central office ground.
- Special resistance – allows the 965DSP to measure the loop resistance and the resistance difference between two conductors on a pair.

- K-Test – allows RFL measurement when both wires in a pair are faulted and there is no separate good pair available.
- Ringers – measures and displays capacitance associated with one or more ringers and the equivalent count.
- Level Trace – measures and displays the AC impedance of the unterminated line as a function of frequency.
- 3M™ Far End Device and CTC's Smartstrap™ support for wideband autotest.
- Soak Test – provides a digital display of the resistance between tip/ground and ring/ground prior to stressing the pair; then displays the resistance values while stressing the pair with a DC Voltage.
- Fast kick – provides the technician a fast voltage, length and resistance measurement between tip/ring, tip/ground and ring/ground.

The 3M Dynatel 965DSP/SA Subscriber Loop Analyser offers two additional test features. Wideband noise measurements are made with the E (ISDN/IDSL), F (HDSL) and G (ADSL) filters. The Spectrum Analyser test function enables the operator to view the high-frequency communications spectrum and identify spectral interference such as crosstalk noise generated by other services.

Flexible, practical features

The 965DSP series subscriber loop analysers are designed for functionality and ease of use.

Features of the units include:

- IR port – infrared port for downloading future software programs and uploading test results to a PC or printer.
- Self-calibration – internal instrument calibration and set-up procedures.
- Graphical user interface – user-friendly, icon-based display of test results.
- Replaceable test leads.
- HELP function – an internal help menu provides information as needed during operation.
- Telephone – internal telephone or “talk set.”
- Rechargeable nickel metal hydride batteries – with battery charger and alkaline battery holder.
- Backlit high resolution/high contrast LCD display.

Rugged, weather-resistant design

The hand-held 965DSP test sets are housed in lightweight, ergonomically designed cases for portability and ease of handling. The units are weather-resistant and weighs only 4.3 lb. (1.95 kg). The Dynatel brand and its distinctive Dynatel yellow cases are your assurance of rugged dependability.

3M™ Dynatel™ 965DSP (A, B & SA) Subscriber Loop Analyser



Description

Dynatel™ 965DSP Subscriber Loop Analyser (A, B & SA)

Electrical Specifications

Main Functions	Range	Resolution	Accuracy
Voltage (DC)	0 to 99,9 V 100 to 300 V	0,1 V 1 V	1% ± 0,5 V 3%
Voltage (AC)	0 to 99,9 V 100 to 250 V	0,1 V 1 V	1% ± 0,5 V 3%
Current	0 to 59,9 mA 60 to 110 mA	0,1 mA 0,1 mA	1% ± 0,3 mA 2%
Resistance (DC) and soak test with CO voltage	0 to 9999 Ω 0 to 9999 Ω 10 k to 99,9 kΩ 100 k to 999 kΩ 1 M to 9,9 MΩ 10 M to 99 MΩ 100 M to 990 MΩ	1 Ω 1 Ω 0,1 k Ω 1 k Ω 0,1 M Ω 1 M Ω 10 M Ω	1% ± 5Ω 1% ± 50Ω 1% 3% 3% 5% 10%
Opens (no noise)	0 to 3,000 ft (0 to 1000 m) 3000 to 10000 ft (1 km to 3 km) 10000 to 50000 ft (3 km to 15 km) 50000 to 100000 ft (15 km to 30 km)	1 ft (1 m) 1 ft (1 m) 10 ft (10 m) 100 ft (100 m)	1% ± 3 ft (1 m) 3% 5% 10%
RFL			
Fault range	0 to 20 MΩ	—	—
Resistance to fault (no noise)	0 to 99,99 Ω RTS 100 to 999,9 Ω RTS 1 kΩ to 7 k Ω RTS	0,01 Ω 0,1 Ω 1,0 Ω	0,1% of RTS ± 0,01 Ω 0,2% of RTS ± 0,01 Ω 1,0% of RTS ± 0,01 Ω
Loss (& frequency) with 600 Ω Zin with 135 Ω Zin	-40 to +10 dBm, 200 to 20 kHz -50 to +2 dBm, 20 k to 1200 kHz	0,1 dB, 1 Hz, 1 kHz 0,1 dB, kHz	0,5 dB, 1% 2 dB, 1%
Noise metallic 600 Ω Zin	0 to 50 dBrc (-90 to -40 dBm0p)	1 dB	2 dB
Noise to ground	40 to 100 dBrc (-50 to 10 dBm0p)	1 dB	2 dB
Longitudinal balance	0 to 70 dB	1 dB	2 dB
Tone output			
ID	200 to 1000 Hz, fixed level	—	—
Precision - 600 Ω Zout	200 to 9999 Hz, -20 to +1 dBm 10 k to 19,99 kHz, -20 to +1 dBm	1 Hz, 0,1 dB 1 Hz, 0,1 dB	1% Hz, 0,2 dB 2% Hz, 1 dB
Wideband - 135 Ω Zout	20 k to 1200 kHz, 0 dBm	1 kHz	1 dB
Dial mode	DTMF, Pulse	—	—
TDR			
Under typical conditions a range 500 ft bridge tap can be seen at 18,000 ft on a 20,000 ft 24 AWG cable. (150 m bridge tap at 5500 m on a 6000 m 0,5 mm cable).	100, 200, 500, 1000, 2000 5000, 10000, 20000, 30000 ft (30, 60, 150, 300, 600, 1500 3000, 6000, 10000 m)	1 ft (1 m)	0,6%
Pulse width	5 nS, 34 nS, 235 nS, 1600 nS	—	Fixed values
Velocity input	0,50 to 0,99 (150 to 299 m/μs)	0,01 (1 m/μs)	—
Modes	Single trace, dual trace, differential, memory, crosstalk, peak	—	—
Auto tests	Same specifications as full tests	See above	See above
SA Functions (ISDN/IDSL, HDSL, ADSL)			
ISDN (2B1Q)			
Link test	active / inactive	—	—
Error test (US & Canada only)	Near-end & far-end block errors	1 block error	1 block error
DSL			
Loss (& frequency) with 100 Ω or 135 Ω Zin	-75 to +5 dBm, 20 kHz to 1200 kHz	1 dB	1 dB
Noise (with E, F, & G filters)			
Metallic with 100 Ω /135 Ω Zin	+10/+20/+30 to +90 dBm	1 dB	2 dB
Longitudinal with 10 k Ω Zin	+40/+50/+60 to + 120 dBm	1 dB	2 dB
Wideband Spectrum Analyser			
Range	10 kHz to 1,8 MHz	—	—
5 Spans	from 120kHz to 2 MHz	—	—
Dynamic range	-90 to +10 dBm	—	—
Frequency resolution	1% of span	—	—
Input impedance	135 Ω	—	—

2.5 Copper Test Equipment

3M™ Dynatel™ 965DSP (A, B & SA) Subscriber Loop Analyser

Description

Dynatel™ 965DSP Subscriber Loop Analyser (A, B & SA)

Specifications

Physical Specifications		Environmental Specifications		
Size H x W x D in. (cm)	10.3 x 4.7 x 3.2 (26,2 x 12 x 8,1)	Operating temperature	0° to 140°F (-18 to 60°C)	
Net weight lbs. (kg)	4.3 (1,95) with battery and soft case	Storage temperature	-40° to 165°F (-40 to 75°C)	
Shipping weight lbs. (kg)	7.8 (3,54)	Humidity	0 to 95%, non-condensing	
Material	GE Xenoy			
Accessories		Description		
Test leads	U.S. – 5 ft (1,5 m) test leads with 2 mm gold-plated banana plugs on one end and chrome-plated alligator clips on other end (black/red, blue/yellow, green) European – 5 ft (1,5 m) test leads with 2 mm gold-plated banana plugs on one end and 4 mm gold-plated banana plugs on other end (black/red, blue/yellow, green)			
RFL strap	U.S. – 1.5 ft (0,5 m) with alligator clips on ends European – 1.5 ft (0,5 m) with banana plugs on ends			
AC/DC battery charger	100-250 VAC (50/60 Hz) input; 12 VDC (1 A) output. For charging only. Do not operate when using charger.			
Soft case	Heavy-duty fabric case for unit and test leads			
Battery holder	Plastic holder for 6 AA (LR6) batteries			
Battery pack	Custom 1,5 amp-hour nickel metal hydride			
Toolbox Functions		Range	Resolution	Accuracy
Load coil count	0 to 5		1	±1
Ohms/distance calculator	0 to 9999 ohms		0,01 Ω	–
	0 to 99999 ft (0 to 30 km)		1 ft (0,1 m)	–
Caller ID (U.S. & Canada only)	Date, time, number, name		–	–
Carrier level	-4 to -32 dBm		1 dBm	2 dBm
Self-calibrate	Pass/fail		–	–
Loop resistance	0 to 99,9 Ω		0,01 Ω	0,1% ± 0,01 Ω
	100 to 999,9 Ω		0,1 Ω	0,2% ± 0,01 Ω
	1000 to 7000 Ω		1 Ω	1,0% ± 0,01 Ω
Resistance difference	0 to 99,99 Ω		0,01 Ω	1% of loop resistance ± 0,01 Ω
Ground resistance	5 to 500 Ω		1 Ω	1% ± 1 Ω
K-Test				
Loop resistance	0 to 7K Ω		–	–
Fault ratio	(Fault Res1) > twice (Fault Res2)		–	–
Resistance to fault (no noise)	0 to 99 Ω		0,01 Ω	5%
	100 to 999 Ω		0,1 Ω	5%
	1K to 3,5K Ω		1 Ω	5%
Stored results (Autotest and TDR)	100 results of each, minimum		–	–
Ringers	0,0 to 4,0		0.1	ringer equivalent
General Specifications				
Ruggedness Survives	5 ft (1,5 m) drop in soft case			
Water-resistance	Splashproof; may be used in light to moderate rain			
Standards	Meets FCC part 15, class A: Digital Devices for the US, and EN55022 (radiated emissions), EN55024-2 (electrostatic discharge), EN55024-3 (radiated immunity) EN55024-4 (transient immunity) and IEC1010 (product safety) for Europe. Built to ISO9001 certification for manufacturing facilities. Built to Bellcore (Telcordia Technologies) TSY000078 manufacturing methods. Meets UL50 Rain Test.			
Language	English and multi-languages			
Units	Feet or meters, Fahrenheit or Celsius, dBmC or dBmOp, m/uS or Vp			
Battery life	Rechargeable battery pack, 12 hours typical usage (no backlight), 4 hours typical (with backlight); typical usage defined as 30 minutes on, 30 minutes off			
Charging time	Minimum 2,5 hours from low to full			
Keypad	24-key membrane keypad with tactile feedback			
Display in. (cm)	2.5 x 2.5 (74 x 74), 192 by 192 pixel resolution, backlight			

Note: Routine calibration is not recommended or required.



Description

Dynatel™ 965DSP Subscriber Loop Analyser with ADSL Modem

Specifications

Physical Specifications	
Size H x W x D in. (cm)	10.3 x 4.6 x 3.75 (26,2 x 11,7 x 9,5)
Net weight lbs. (kg) with soft case and test leads	4.5 (2)
Shipping weight lbs. (kg)	8 (3,6)
Environmental Specifications	
Operating temperature	0° to 140° F (-18° to 60° C)
Storage temperature	-40° to 165° F (-40° to 75° C)
Humidity	0 to 95%, non-condensing
Vibration	Random 3-axis vibration for 20 minutes
Water resistance	Meets UL50 Rain Test
Shock	10 drops on corners and sides from 30 in. (without soft case) and 10 drops on corners and sides from 60 in. (with soft case)
Safety	IEC950
General Specifications	
Product will incorporate all the features of the 965DSP and/or 965DSP/SA subscriber loop analyzers at the accuracy currently specified for these products (see 965DSP family product documentation). ADSL datalink capability is limited to link synchronization. No 'PING' or data application capability is provided. Modem will initiate a connection with the far-end under operator command. Status messages indicating link progress will be returned.	
ANSI/ITU standards supported	ITU G.992.2 (G.Lite), ITU G.992.1 (G.DMT), ANSI T1.413 Issue 2
ADSL modes	ANSI, G.DMT, G.Lite, MultiMode
Reach	Designed to synchronize at distances from 0 ft to 18,000 ft
Statistics	Actual and maximum upstream and downstream connect rates Upstream and downstream percent used ADSL line capacity Upstream and downstream noise margin Upstream and downstream signal attenuation Upstream and downstream power levels Modem manufacturer identification (ANSI mode only) Upstream and downstream FEC, CRC, and HEC counts Alarm codes including LOS, LOF, LCD and LOM Graphical display of bits-per-bin count for the DMT signal
Operating modes	Captured – Modem auto-disconnects from the far-end after statistics gathered Continuous – Modem gathers statistics for up to ten minutes

2.5 Copper Test Equipment

3M™ 1342 Far End Device II

Description

3M™ 1342 Far End Device II

Remote controlled far end testing assistance

The perfect companion to the 3M Dynatel 965DSP Subscriber Loop Analyser, the 3M 1342 Far End Device II (FEDII) provides remote controlled far end testing assistance during subscriber loop testing. Designed to enhance technician productivity, the FEDII connects to the far end on a cable pair to enable diagnostic testing to be performed from the near end controlled by the 3M Dynatel 965DSP.

Support of “auto” test function on Dynatel 965DSP, 965DSP-SA and 965DSP-B to facilitate loss measurement:

- Insertion loss to 1.2 MHz
- Slope
- Loop resistance
- Resistance balance

One technician, one test set: Pair Qualification

With a 3M Far End Device II (FEDII), one technician with a 3M™ Dynatel™ 965DSP Subscriber Loop Analyser can perform end-to-end testing of metallic cable pairs. Commanded by the Dynatel 965DSP, the FEDII provides trace tone to verify cable pair connection, supports the 965DSP auto testing feature and qualifies loop performance up to 1.2 MHz (ADSL). Controlled by DTMF signaling from the 965DSP, the FEDII can be commanded to remotely power-up, respond to test signaling, transmit tone on technician-selected conductors, or close relays to short the pairs in any combination. The unit can also be powered-up and commanded manually. The new FEDII may be connected in series with a working pair or bridged on to the test pair. In addition, the FEDII may be connected to two separate pairs allowing the end users to test two pairs.

Pocket accessory

Housed in a rugged, pocket-sized plastic case within a protective Cordura pouch, the 3M Far End Device features a power on/off LED and a test lead. The FED optimises its replaceable 9V-battery life with an automatic power-down feature.

Ordering Information: Model 3M™ 1342

To order, specify the 3M1342 Far End Device II.

Included with the unit are:

- 1 set test leads with alligator clips (non-insulation-piercing)
- Cordura carrying case
- Operating instructions
- Warranty card

Replacement Parts are available from 3M Service and Repair Department

Ordering Information: Model 3M™ 1343

To order, specify the 3M 1343 Far End Device II.

Included with the unit are:

- 1 set test leads with bed of nails clips
- Cordura carrying case
- Operating instructions
- Warranty card

Replacement Parts are available from 3M Service and Repair Department



Technical characteristics:

Size	4.7”H X 2.6”W X 0.9”D (11,9 cm X 6,6 cm X 2,3 cm)
Weight	5.6 oz. (159 g) with battery
Operating temperature	0° to +140°F (-18° to +60°C)
Storage temperature	-40° to +165°F (-40° to +75°C)
Battery life	40 hours typical
Battery shelf life	2 months (installed)
Replacement battery	Recommend: Duracell™ MN1604 9V Alkaline or equivalent
Strap resistance	Less than 0.2 ohms
DC input impedance	>100 megohms tip-ring-ground
AC input impedance	~100 kohms in series with 470 pf tip-ring
Voltage rating	250 Vdc, 150 Vac
ID tone frequency	577 Hz and 1004 Hz
ID tone amplitude	8 volts peak to peak; no load typical
Transmitted tones	0 dBm ± 0.5 dBm 400 Hz to 100 kHz 0 dBm ± 1.0 dBm 100 kHz to 1.2 Mhz