Solutions for Outside Plant

3M Telecommunications offers an extensive range of housings and closures for outside plant. They are available in a variety of sizes, made from either plastic or metal. For housings, the preferred connection technologies are SID or QSA/LSA plus. For closures the proven splice methods Scotchlok or MS2 are more appropriate. These give the maximum number of splices in the smallest possible space. With optical fibre cable, fibre management is more important than density. 3M Telecommunications extensive 'know-how' has produced a variety of closure sealing options. Both encapsulated and mechanically-closed closures are available. For example, the BPEO family of closures are re-enterable several times and do not require specialist tools or additional materials such as gaskets or mastic.

2

2.1 Copper splicing
2.1.1 3M™ Scotchlok™ Connectors and Tools

Description

Over 40 years ago, 3M™ introduced the industry's original U element connector, the Scotchlok UR Connector. The latest series of connectors, the Scotchlok UR2, UY2, and UB2A Connectors, feature that same originality in technology advantages, building on the successful Scotchlok Connector's design, shape, color-coded cap concepts, and element technology.

The Series 2 Connectors additionally offer full wire range capability, increased port size to accommodate up to 2.08 mm (0.082") insulation sizes, double elements in all products, and a solvent resistant plastic construction.
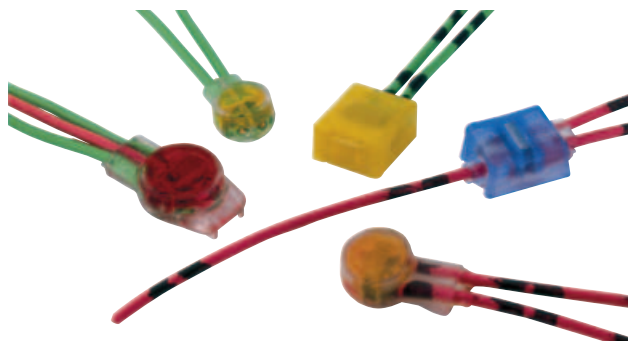
Scotchlok™

UR2/UR2-D Butt Connectors
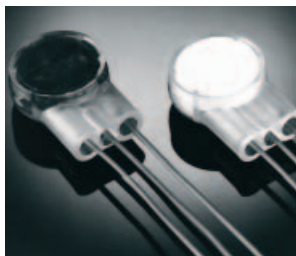
The UR2 Connector accepts two or three solid copper conductors that can be of different wire gauges for butt splicing. The connector is filled with a moisture resistant sealant and the UR2-D Connector is a dry version. **RUS Listed**

UY2/UY2-D Butt Connectors

The size of the UY2 Connector reduces the splicing bundle O.D. to a minimum. The wires joined can be of different wire gauges. Factory inserted sealant seals out moisture. In addition, the UY2 Connector is available in a dry version, UY2-D Connector. **RUS Listed**

UB2A/UB2A-D Tap Connectors

The UB2A Connector has a pre-crimp feature that gives the user a time-saving edge. By positioning the connector on the conductor and pre-crimping, the conductor is prevented from slipping out of the connector before the crimp is completed.

Like the UR2 Connector, a factory sealant insulates against moisture and seals out corrosion. The UB2A Connector permits tapping directly onto an existing conductor without interrupting service. In ready access closures, the UB2A Connector eliminates cutting cable pairs, opening circuits, and piecing out wires. The UB2A-D Connector is a dry version of the UB2A Connector. **RUS Listed**

211 Trim-Out Connector

The Scotchlok™ 211 Trim-Out Connector is a polypropylene, moisture-resistant, self-stripping insulation displacement contact device with a built-in cut-off blade and a test port. Wires are positioned in the connector from the sides, allowing the 211 Connector to be used as a maintenance connector for replacing problem connectors without interrupting service. The 211 Connector may also be used for standard two-wire butt type splicing operations.

A pre-crimp feature permits easy, positive connector positioning by gripping the conductors until the crimp is completed. Excess wire is cut off when the connector is crimped. **RUS Listed**

557TG Self-Stripping Dropwire Connector

Use the Scotchlok 557TG aerial connector to electrically connect two dropwire solid copper legs, insulate and provide moisture protection for the connection.

2.1   Copper splicing
2.1.1 3M™ Scotchlok™ Connectors and Tools

Description

UP2 Butt Connector

A dry flame retardant two-wire, UL Listed connector for use on paper, pulp or PIC cable where moisture resistance is not a requirement.

UP3 Butt Connector

The UP3 Butt connector is a dry, flame-retardant two or three-wire connector for paper, pulp or PIC cable where moisture moisture resistance is not a requirement.

UPB Tap Connector

A dry, flame-retardant, two-wire UL Listed connector with a pre-crimp feature for use on pulp, paper or PIC cable where moisture resistance is not a requirement.

U1B Inline Connectors

The U1B connector is a sealed moisture-resistant four-wire (1 full pair) inline connector for larger gauge solid copper

U1R Inline Connectors

The U1R connector is a sealed moisture-resistant four-wire (1 full pair) inline connector for larger gauge solid copper.

UDW2 Inline connetor

A sealed moisture-resistant, four-wire (1 full pair) inline aerial connector for copper or copper-coated steel conductors. Not for mid-span splices unless strain-relief is provided. Tape over-wrap is not required.

E-9Y Crimping Tool

Stepped jaws and long nose provide parallel crimping action. Features include a side wire cutter, insulated handles, and a return spring. Not recommended for any 19 gauge, 3 wire application due to fatigue factor.

E-9J Crimping Tool

The E-9J tool is a lightweight, handheld tool featuring a single-stroke, parallel crimping action with a work-saving 10-to-1 mechanical advantage over applied hand force. For use with Scotchlok butt and tap connectors.

E-9BM Crimping Tool

The E-9BM has parallel closing action with adjustable jaws, and features high mechanical advantage. For use with all Scotchlok Connectors.

E-9C Cartridge Tool with Case & Gauge

The E-9C tool holds the connectors (in cartridges) firmly in place, allowing the user the use of the other hand for guiding wires. This time-saving tool holds cartridges of UR2, UR2-D, UR, UY2, UY2-D, UY, UAL, ULG, UCC, UPC, UP2 and UP3 Connectors. Its automatic feed, ratchet, and parallel jaw action assure perfect crimps every time.

2

2.1.1 3M™ Scotchlok™ Connectors and Tools

Description

Specification Chart

Connector	Type Connector	Special Features	Maximum Insulation O.D.		PIC-unfilled and PIC-filled		Pulp or Paper	
			Metric (mm)	Inches	AWG	Metric (mm)	AWG	Metric (mm)
UR2		Gel-filled RUS and UL Listed Polypropylene	2,08	0,082	19-26	0,9-0,4	N/A	N/A
UR2-D		Dry Polypropylene	2,08	0,082	19-26	0,9-0,4	19-26	0,9-0,4
UR		Gel-filled RUS and UL Listed Polycarbonate	1,52	0,060	19-26	0,9-0,4	N/A	N/A
UY2		Gel-filled RUS and UL Listed Polypropylene	2,08	0,082	19-26	0,9-0,4	N/A	N/A
UY2-D		Dry Polypropylene	2,08	0,082	19-26	0,9-0,4	19-26	0,9-0,4
UY		Gel-filled UL Listed Polycarbonate	1,52	0,060	22-26	0,7-0,4	N/A	N/A
***557TG**		Gel-filled Flame Retardant Polypropylene	3,0	0,12	16-22	1,3-0,6	N/A	N/A
UYF		Gel-filled UL Listed Polycarbonate	1,52	0,060	20-26	0,8-0,4	N/A	N/A
UP2		Dry Flame Retardant RUS and UL Listed Polycarbonate	1,52	0,060	22-26	0,7-0,4	22-26	0,7-0,4
UP3		Dry Flame Retardant RUS and UL Listed Polycarbonate	1,52	0,060	19-26	0,9-0,4	19-26	0,9-0,4
UAL		Gel-filled For Aluminum Polycarbonate	2,08	0,082	17-20 AL 19-24 CU	1,2-0,8 AL 0,9-0,5 CU	N/A	N/A
211		Gel-filled RUS and UL Listed Polypropylene	2,08	0,082	19-26	0,9-0,4	N/A	N/A

Butt Splicing

*Inline and drop wire connectors can only be used with E-9BM.

2.1   Copper splicing
2.1.1   3M™ Scotchlok™ Connectors and Tools

Description

Specification Chart

	Connector	Type Connector	Special Features	Maximum Insulation O.D. Metric (mm)	Inches	PIC-unfilled and PIC-filled AWG	Metric (mm)	Pulp or Paper AWG	Metric (mm)
Tap Splicing	UB2A		Gel-filled RUS and UL Listed Polypropylene	2,08	0,082	19-26	0,9-0,4	N/A	N/A
	UB2A-D		Gel-filled RUS Listed Polypropylene	2,08	0,082	19-26	0,9-0,4	N/A	N/A
	UG		Gel-filled RUS Listed Polycarbonate	Butt 1,54 Tap 1,12	0,051 0,044	19-26 22-26	0,9-0,4 0,7-0,4	N/A	N/A
	UPB		Dry UL Listed Flame Retardant Polycarbonate	1,27	0,050	22-26	0,7-0,4	22-26	0,7-0,4
Inline Splicing	*UDW2		Full Pair Drop Pair Polycarbonate	4,4	0,175	16-19	1,3-0,9	N/A	N/A
	*U1B		Gel-filled Full Pair Polycarbonate	3,18	0,125	16-19	1,3-0,9	N/A	N/A
	*U1R		Gel-filled Full Pair Polypropylene	3,18	0,125	19-24	0,9-0,5	N/A	N/A

To reduce fatigue, use tool within each group with highest mechanical advantage indicated in ( ).

E-9BM (10:1)	E-9C (7:1)	E-9Y* (3:1)	E-9Y** (3:1)	E-9R (10:1)	E-9J (10:1)

*Inline and drop wire connectors can only be used with E-9BM.

**Not recommended for 19 gauge (0,9 mm) conductor and larger.

Type/Order text				Ref.-No.

Ordering Information

Connector	Box Packaging Weight kg (lbs.) Minimum Order	Bulk Packaging Weight kg (lbs.) Minimum Order	Cartridge Packaging Weight kg (lbs.) Minimum Order	
UR2	100/box, 1000/cs. 1,36 (3) Min. Order: 1000 connectors	500/box, 5000/cs. 6,7 (15,2) Min. Order: 5000 connectors	10/cart, 100/pak., 1000/cs. 2,09 (4,6) Min. Order: 1000 connectors	UR2
UR2-D	N/A N/A N/A	500/box, 5000/cs. 6,7 (15,2) Min. Order: 5000 connectors	10/cart, 100/pak., 1000/cs. 2,09 (4,6) Min. Order: 1000 connectors	UR2-D
UR	100/box, 1000/cs. 1,36 (3) Min. Order: 1000 connectors	500/box, 5000/cs. 6,7 (15,2) Min. Order: 5000 connectors	10/cart, 100/pak., 1000/cs 2,09 (4,6) Min. Order: 1000 connectors	UR
UY2	100/box, 1000/cs. 0,9 (1,3) Min. Order: 1000 connectors	1000/box, 5000/cs. 2,8 (6,1) Min. Order: 5000 connectors	12/cart, 120/pak., 1200/cs. 1,4 (3,5) Min. Order: 1200 connectors	UY2
UY2-D	N/A N/A N/A	1000/box, 5000/cs. 2,8 (6,1) Min. Order: 5000 connectors	12/cart, 120/pak., 1200/cs. 1,4 (3,5) Min. Order: 1200 connectors	UY2-D
UY	100/box, 1000/cs. 0,9 (1,3) Min. Order: 1000 connectors	1000/box, 5000/cs. 2,8 (6,1) Min. Order: 5000 connectors	16/cart, 160/pak., 1600/cs. 1,4 (3,5) Min. Order: 1600 connectors	UY
557TG	N/A N/A N/A	500/bag, 5000/box 9,09 (20) Min. Order: 5000 connectors	N/A N/A N/A	557TG
UYF	500/box, 2500/cs. 2,15 (4,75) Min. Order: 2500 connectors	N/A N/A N/A	N/A N/A N/A	UYF
UP2	N/A N/A N/A	1000/box, 5000/cs. 2,4 (5,4) Min. Order: 5000 connectors	16/cart, 160/pak., 1600/cs. 1,4 (3,2) Min. Order: 1600 connectors	UP2
UP3	N/A N/A N/A	1000/box, 5000/cs. 7,1 (13,3) Min. Order: 5000 connectors	10/cart, 100/pak., 1000/cs. 2,0 (4,4) Min. Order: 1000 connectors	UP3
UAL	N/A N/A N/A	N/A N/A N/A	10/cart, 100/pak., 1000/cs. 2,1 (4,7) Min. Order: 1000 connectors	UAL

| TOOLS	E-9BM CRIMPING TOOL	E-9C CARTRIDGE TOOL	E-9R CRIMPING TOOL	E-9Y CRIMPING TOOL*	E-9J CRIMPING TOOL
Packaging kg (lbs.)/cs.	4,3 (9,5)	1/cs., 0,91 (2)	1/bag, 10/cs., 2,59 (5,7)	1/bag,10/cs., 1,53 (3,3)	1/bag, 10/cs., 4,1 (9,02)
Minimum Order	10 each	1 each	10 each	10 each	10 each

Ordering Information

Connector	Box Packaging Weight kg (lbs.) Minimum Order	Bulk Packaging Weight kg (lbs.) Minimum Order	Cartridge Packaging Weight kg (lbs.) Minimum Order	
211	100/box, 1000/cs. 1,2 (2,6) Min. Order: 1000 connectors	N/A N/A N/A	N/A N/A N/A	211
UB2A	100/box, 1000/cs. 1,2 (2,6) Min. Order: 1000 connectors	500/box, 5000/cs. 5,9 (12,9) Min. Order: 5000 connectors	N/A N/A N/A	UB2A
UB2A-D	100/box, 1000/cs. 1,2 (2,6) Min. Order: 1000 connectors	500/box, 5000/cs. 5,9 (12,9) Min. Order: 5000 connectors	N/A N/A N/A	UB2A-D
UG	100/box, 1000/cs. 1,1 (2,5) Min. Order: 1000 connectors	1000/box, 5000/cs. 5,2 (11,6) Min. Order: 5000 connectors	N/A N/A N/A	UG
UPB	N/A N/A N/A	1000/box, 5000/cs. 3,0 (6,6) Min. Order: 5000 connectors	N/A N/A N/A	UPB
UDW2	25/bag, 100/box N/A Min. Order: 1000 connectors	N/A N/A N/A	N/A N/A N/A	UDW2
U1B	100/box, 1000/cs. 7,3 (16,0) Min. Order: 5000 connectors	N/A N/A N/A	N/A N/A N/A	U1B
U1R	100/box, 1000/cs. 7,4 (16,2) Min. Order: 2500 connectors	N/A N/A N/A	N/A N/A N/A	U1R

*Not recommended for 19 AWG and larger.

For more information, please contact your local 3M representative.

Solutions for Outside Plant

2

2.1.2 3M™ MS2™ Splice Modules and Accessories

Description

MS² 25-Pair Super-Mini Splicing Modules

The MS² Super-Mini 25-pair and MS² Super Mate 25-pair Splicing Modules provide the reliability of soldered connections, the efficiency of multi-pair splicing, plus the proven performance of MS² splicing system.

The MS2 4000TR Series Super-Mini and 4005TR Series Super Mate Modules are the basic components of MS² Modular System Splicing from 3M™. The modules are building blocks of a systematized splicing technology that can reduce installation time of outside or inside plant, and in addition can reduce reworking demands, saving both time and effort in your construction and maintenance programs. To make your job easier, all MS² modules are now transparent.

U-shaped contacts enable solder-equivalent connections

The MS² 4000TR 25-pair Series Super-Mini and MS² 4005TR Super Mate Modules feature an array of U-shaped, phosphor-bronze contacts and stainless steel cut-off blades.

As a module is crimped, each contact strips the insulation from the positioned wire and securely grips the conductor. During this crimping operation, the cut-off blades inside each module trim the excess wire.

A single crimp completes a gas-tight connection on all 25-pairs in the module. It's simple and fast, because there's no need to strip or trim any of the individual pairs.

Pair testing is easy

Test entry ports on the front side of all modules provide access for testing individual pairs. All tests can be accomplished without opening the module, stripping insulation, or otherwise interrupting service.

The rugged design and construction of the modules can withstand crimping and reopening to facilitate transfers or cable rearrangements.

MS² 4000-G/TR Super-Mini Splicing Module

The new 4000-G/TR Super-Mini Splicing Module not only meets CAT-5 requirements of the TIA/CIA 568A and the ISO/IEC 11801:1995 for high-speed connectors, but it also delivers in place performance withstanding extended exposure to various conditions of extremely high humidity, including water immersion, while maintaining insulation resistance and circuit integrity.

MS² 4000-DWP/TR Module with Sealant Box
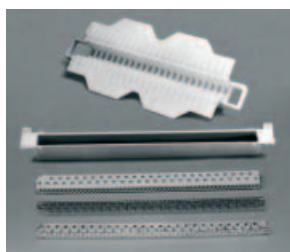
The 4000-DWP/TR 25-pair module combines a 4000-D/TR Super-Mini Module with a 4075-S Sealant Box. This combination offers waterproof splicing of copper in buried, aerial, and under ground applications.

The module also makes re-entry into splices encapsulated with re-enterable gel much easier. Because the sealant box prevents the encapsulants from filling the wire channels and test entry ports, modules may be tested at any time once the sealant box is removed.

The term "waterproof" applies to this system as determined according to 3M™ Test Method No. TP0200-05. Users should write for this method to determine suitability for application.

The MS² 4008D/TR 25-pair Series Super-Mini Modules are similar to the 4000TR Series, except that the cut-off blades have been removed from the bottom of the modules. This allows the run of through wires to be half-tapped without cutting the conductors. The wires in the base are electrically connected, but are not cut off. Both 4000TR and 4008TR Series Modules are available dry, or encapsulated. **RUS Listed**

Description

MS² 4075-S Sealant Box
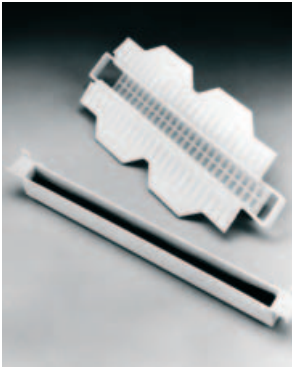
The 4075-S Sealant Box is a molded PBT polyester box designed to be used with the MS² 4000 Series Super-Mini Modules.
One applicator tool is included with every order.
RUS Listed

MS² 4005-DPM/TR Super Mate Pluggable Module
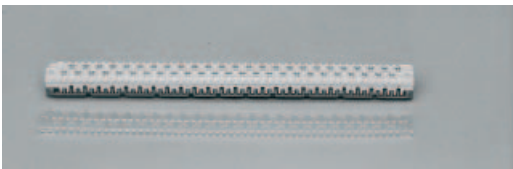
4005-DPM/TR 25-pair Series Super Mate Pluggable Modules increase productivity and reduce expense by avoiding the time and cost-intensive job of cutting and re-splicing conductors for re-arrangement, addition, and removal of apparatus and stubs. The 4005-DPM/TR Series Super Mate Modules plug into other Super Mate Modules and onto the top of the 4000-D/TR Super-Mini Module Series for bridging applications. The 4005-CBM/TR Series Modules is for bridging to encapsulated 4000-C Series Modules, as a bridge only. The UL Listed 4005-DPM/FR is for applications which require a flame-retardant module.

MS² 4077 Series Sealant Boxes

Designed for use with MS² 4005-DPM/TR Super Mate Modules and/or in combination with 4000-D/TR Modules. The Sealant Boxes provide water-proof protection in PIC splicing applications where one or more modules are plugged together.
One applicator tool is included with each box of 12 sealant boxes.
The term "waterproof" applies to this system as determined according to 3M™ Test Method No. TP0200-05. Users should write for this method to determine suitability for application.
RUS Listed

4077-A One   4005-DPM/TR Module
4077-B One   4000-D/TR and one 4005-DPM Module
4077-C Two   4005-DPM/TR Modules
4077-D Three   4005-DPM/TR Modules

Type/Order text   Ref.-No.

Sealant Boxes

Packaging & kg (lbs.)/cs.	Minimum Order	Ref.-No.
12/box, 120/cs & 7,5 (16.6)	120 each	**4000DWP/TR**
12/box, 120/cs & 4,1 (9.1)	120 each	**4075-S**
12/box, 120/cs. & 4,9 (10.8)	120 each	**4077-A**
12/box, 120/cs. & 5,4 (12)	120 each	**4077-B**
12/box, 120/cs. & 6,0 (13.3)	120 each	**4077-C**
12/box, 120/cs. & 7,5 (16.6)	120 each	**4077-D**
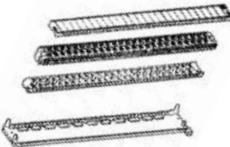
2.1.2 3M™ MS²™ Splice Modules and Accessories

Specifications for all MS² 4000/4005/4008 Series Splicing Modules
(Super-Mini and Super Mate)

Maximum Insulation O.D.	
Metric (mm)	1,65 [4000G/TR has maximum insulation O.D. of 1,35 mm (0.053")]
Inches	0.065

Cable Type PIC, Pulp or Paper	
AWG	22-28
Metric (mm)	0,7-0,3

3M MS² 4000 Series Straight Splicing Modules

Splicing Module	4000-D/TR	4000-G/TR	4000-DCO	4000-DT/TR	4000-GT/TR
Modular Type					
	RUS Listed Dry transparent	Gelled transparent	Dry/flame-retardant	Dry/test transparent	Gelled transparent
Colour					
Cover	Transparent	Transparent	Grey	Transparent	Transparent
Body top	Yellow	Yellow	Grey	Yellow	Yellow
Body bottom	Dark gold	Dark gold	Grey	Dark gold	Dark gold
Base	Transparent smoked	Transparent smoked	Grey	Transparent smoked	Transparent smoked
Sealant Boxes for 4000 Modules	4075-S	N/A	N/A	4075-S	N/A

Sealant Boxes

Packaging & kg (lbs.)/cs.	Minimum Order	Ref.-No.
12/bag, 120/cs & 2,95 (6.5)	120 each	**4000-D/TR**
12/bag, 120/cs. & 3,7 (8.3)	120 each	**4000-G/TR**
12/bag, 120/cs. & 2,9 (6.4)	120 each	**4000-DCO**
12/bag, 120/cs. & 2,8 (6.3)	120 each	**4000-DT/TR**
12/bag, 120/cs. & 3,7 (8.3)	120 each	**4000-GT/TR**

Note: 4077-A protects one 4005-DPM Module, 4077-B protects one 4000-D and one 4005-DPM Module, 4077-C protects two 4005-DPM Modules, 4077-D protects three 4005-DPM Modules.

3M

Solutions for Outside Plant
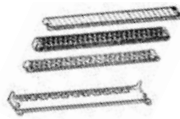
MS² 4005 Series Pluggable/Bridge Splicing Modules

Splicing Module	4005-GBM/TR	4005-DPM/FR
Module Type		
	Filled bridge transparent	Dry flame-retardant
Colour		
Cover	Transparent	Grey
Body top	Yellow	Grey
Body bottom	Blue	Dark blue
Insulator	Red	Maroon

MS² 4008 Series Splicing Modules

Splicing Module	4008-D/TR	4008-G/TR	4008-DCO
Module Type	**RUS Listed**		
	Dry transparent	Gelled transparent	Dry flame-retardant
Colour			
Cover	Transparent	Transparent	Grey
Body top	Yellow	Yellow	Grey
Body bottom	Green	Green	Grey
Base	Transparent smoked	Transparent smoked	Grey
Sealant Boxes for 4008 Modules	4075-S after cut out	N/A	N/A

3M Sealant Boxes

| Packaging & kg (lbs.)/cs.	Minimum Order	
12/bag, 120/cs. & 5,1 (11.3)	120 each	**4005-GBM/TR**
12/bag, 120/cs. & 3,5 (7.8)	120 each	**4005-DPM/FR**
12/bag, 120/cs. & 2,9 (6.6)	120 each	**4008-D/TR**
12/bag, 120/cs. & 2,9 (6.6)	120 each	**4008-G/TR**
12/bag, 120/cs. & 2,9 (6.3)	120 each	**4008-DCO**

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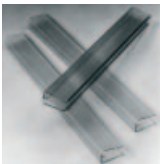
2.1.2 3M™ MS²™ Splice Modules and Accessories

Type/Order text			Ref.-No.

MS² Components and Accessories

		Pkg & kg (lbs.)/cs.	Min. Order	
	Super-Mini Module Cover The 4003-D/TR Super-Mini Module Cover is identical to the 4003-D Cover with the exception that it is clear to allow for the visual inspection of conductors.	12/bag 120/cs. 0,6 (1.4)	120 each	**4003-D/TR**
	Super-Mini Module Base The 4004-D/TR Super-Mini Module Base is identical to the 4004-D Super-Mini Module Base with the exception that it is smoked transparent.	12/bag 1 120/cs. 0,6 (1.4)	20 each	**4004-D/TR**
	Super-Mini Test Base The 4004-DT/TR Super-Mini Test Base is identical to the 4004-DT Super-Mini Test Base with the exception that it is smoked transparent.	12/bag 120/cs. 0,6 (1.3)	120 each	**4004-DT/TR**
	4005-DPM/TR/36PTJ Preterminated Jumper Assemblies The assemblies consist of 24 AWG, PIC, unsheathed 25-pair binder group terminated on each end with a 4005-DPM Module. It enablesquick restoration of cut cable and is available in 91,4 cm (36") and 182,9 cm (72") lengths with transparent covers.	12 assy./kit 12/cs. 36" 2,63 (5.8) 72" 3,8 (8.5)	12 each 12 each	**4005-DPM/TR/36PTJ** **4005-DPM/TR/72PTJ**
	Bottom Test Plug The 4005-DPM/BTP is a test plug assembly consisting of a 4005-DPM module attached by a 60,9 cm (24") jumper to a module designed to plug into the bottom of a Super-Mini module. This assembly enables re-entry into any Super-Mini/Super Mate combination splice without interruption of service.	1/bag 12/cs.	12 each	**4005-DPM/BTP**
	Marking Pen Use the 4039 Marking Pen for permanent marking of MS² modules for easy identification at a later date.	12/box 144/cs. 0,5 (1.1)	144 each	**4039**
	Half-Tap Cover Used to protect wire ends after the half-tap has been cut out of the MS² Super-Mini 4008 Half-Tap Module in pulp/paper and pressurized PIC cable and vault splices.	12/bag 120/cs. 1,4 (3.1)	120 each	**4078-C**

2.1.2 3M™ MS²™ Splice Modules and Accessories

Description

MS² 10-Pair Super-Mini Splicing Modules
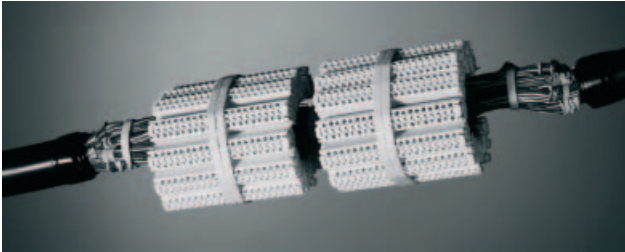
Multi-pair splicing; full wire range

The MS² 10-Pair Super-Mini Splicing Modules provide the reliability of soldered connections, plus the efficiency of multi-pair splicing in 10-pair units. This eliminates the need to strip or trim any of the individual pairs, saving time and simplifying the process.

For added convenience and efficiency, all MS² super-mini modules accept 0.35 mm - 0.9 mm (26-19 AWG) solid copper up to a maximum insulation outside diameter of 1.8 mm (0.70) PIC, pulp and paper-insulated conductors.

Solder-equivalent connections

The MS² 10-pair super-mini modules feature an array of U-shaped, phosphor-bronze contacts and stainless steel cut-off blades. As a module is crimped, each contact strips the insulation from the positioned wire and securely grips the conductor. During this crimping operation, the cut-off blades inside each module trim the excess wire.
A single crimp completes a gas-tight, solder equivalent connection on all pairs in the module.

* The term "water resistant" applies to this system as determined according to 3M™ Test Method Number TPO200-05.

MS² 9700-10/TR Module for two-wire straight splicing

The 9700-10/TR module provides for two-wire straight splicing. Like all super-mini modules, the 9700-10 module is designed so that wire gauges and insulation types may be mixed in the module.

MS² 9700-G/TR Super Mini Module

Encapsulated Super-Mini Module for protection against humidity and condensation.

MS² 9708-10/TR Module for half-tap splicing

The 9708-10 Super-Mini Module is similar to the 9700-10 module, except that the cut-off blades have been eliminated from the bottom of the modules. This allows the through wires to be half-tapped without cutting the conductors. The wires in the base are electrically connected, but are not cut off.

MS² 9700-DWP/TR Module for water resistant* splicing

The 9700-DWP/TR System consists of a 9700-10/TR Module, a 9777-S Sealant Box, and an insertion tool for seating the module.

Designed specifically for buried and underground plant applications where PIC cable is not pressurized, the sealant box protects the splice by filling the module wire channels and test ports with a moisture resistant sealant. This simplifies reentry and reworking when necessary. The 9700-DWP Module is also recommended for use in aerial applications where additional moisture protection is desired.

The 9777-S Sealant Box may be ordered separately. An applicator tool is provided to facilitate installation.

Type/Order text   Ref.-No.

Description	Pkg., kg (lbs.)/ctn.	Min. Order	Ref.-No.
10-pair Splicing Module/Sealant Box Combination (10 modules, 1 applicator & 10 sealant boxes/box)	5 boxes/ctn., 0,29 (.63)	50 each	**9700-DWP/TR**
10-pair Super-Mini Splicing Module (100 covers, 100 bases & 100 bodies/box)	10 boxes/ctn., 1,07 (2.35)	100 each	**9700-10/TR**
Super Mini Module (encapsulated transparent) (100 covers, 100 bases & 100 bodies/box)	10 boxes/ctn., 1,34 (2.95)	1000 each	**9700-G/TR**
10-pair Super-Mini Half-Tap Module (100 covers, 100 bases & 100 bodies/box)	10 boxes/ctn., 1,06 (2.33)	1000 each	**9708-10/TR**
10-pair Super-Mini Sealant Box (20 sealant boxes & 1 applicator/box)	5 boxes/ctn., 0,28 (.61)	100 each	**9777-S**

International Shipments only, source of supply – 3M Germany. Contact your local 3M Representative for additional ordering information.

2.1.2 3M™ MS²™ Splice Modules and Accessories

Description

MS² 9700 Series 10-Pair Super Mate Pluggable Modules

MS² 9705-10TR Super Mate Pluggable Modules transfer without interupting service

MS2 9705-10TR Super Mate Pluggable Modules increase productivity and reduce expenses by avoiding the time- and cost-intensive job of cutting and resplicing conductors for re-arrangements, additions, and removals of apparatus and stubs.

With super mate pluggable modules you can do it all, 10 pairs at a time, in "make before break" fashion — without interrupting service. Once a splice is in place, you have the flexibility to complete future transfers by simply plugging and unplugging the existing modules. Using simple handtools, super mate modules mate with other super mate modules, allowing multiple counts as necessary.

- Cut apparatus in or out without re-splicing
- Easy pair testing
- Full wire range
- Rugged design
- Ideal for lightweight tooling applications

MS² 9755-10 Lightweight Rig

Type/Order text

Ref.-No.

Description	Pkg., kg (lbs.)/ctn.	Min. Order	
10-pair Super Mate Pluggable Module (10 covers, 10 bases and 10 bodies/bag)	10 boxes/ctn., 1,18 (2.6)	1000 each	**9705-10/TR**
Pluggable Module Sealant Box (20 sealant boxes and 1 applicator/box)	5 boxes/ctn., 0,37 (.81)	100 each	**9777-B**
Pluggable Module Sealant Box (20 sealant boxes and 1 applicator/box)	5 boxes/ctn., 0,41 (.90)	100 each	**9777-C**
Hand Presser	1/cs., 1,5 (3.4 lbs.)	1 each	**4270-A**
Separator Tool	1/cs., 0,4 (2.0 lbs.)	1 each	**9753-PM**
Lightweight Rig	1/ctn., 3,3 (7.3)	1 each	**9755-10**

International Shipments only, source of supply – 3M Germany. Contact your local 3M Representative for additional ordering information.

2.1   Copper splicing
2.1.3   3M™ MS²™ Modular Splicing Rigs & Equipment

Description

MS² 25-Pair Super-Mini Splicing Modules

3M MS² splicing tools and equipment are easy to use in any kind of splicing operation, regardless of the environment or working conditions. By designing system components and techniques that are interchangeable, 3M simplifies the splicing task and reduces potential inventory headaches. Included in the system are detailed step-by-step instructions for each splicing application, user-friendly parts and components, and testing equipment to optimize splice accuracy.

Systemized splicing technology

MS² splicing simplifies wire joining and terminating operations by allowing many jobs to be performed with the same components, tools, and techniques. Any of five standard splicing rigs with MS² splicing modules could meet all your multi-pair splicing requirements in inside or outside plant — new construction, cable rearrangements or maintenance. Easily learned procedures, designed to assure both splicing accuracy and good housekeeping, make the system's components simple to master.

MS² 4020-M Splicing Rig

The 4020-M Splicing Rig is a splicing rig designed for one-person fold-back or inline splicing. The 4020-M Splicing Rig contains the same components as the 4021-M Splicing Rig, except the crimping unit.

MS² 4021-M Splicing Rig

The 4021-M Splicing Rig is a complete splicing rig designed for one-person fold-back or inline splicing.

MS² 4021-M/36 Splicing Rig

The 4021-M/36 Splicing Rig is a complete splicing rig designed for one-person fold-back or inline splicing. This rig contains the 4036-25 Hand Crimper.

MS² 4021-M2/36 Splicing Rig

The 4021-M2/36 Splicing Rig is a complete splicing rig designed for one-person fold-back or inline splicing. This rig contains the 4036-25 Hand Crimper.

MS² 4049 Lite Rig

The MS² 4049 Lite Rig is a complete splicing rig and provides many features and benefits.

MS² 4026-A Module Maintenance Kit

The 4026-A Module Maintenance Kit contains the tools necessary for reentry of Super-Mini and Super Mate Modules

2.1.3 MS²™ Splicing Kit Components

Description

Complete MS² Splicing Rigs and MS² Maintenance Kits

Product Number For Kits	4020-M	4021-M	4021-M/36	4021-M2/36	4049	
Application	Designed for one-person fold-back or inline splicing.	A complete splicing rig designed for one-person fold-back or inline splicing. Contains 4031 Crimper.	A complete splicing rig designed for one-person fold-back or inline splicing. Contains 4036 Crimper.	A complete splicing rig designed for one-person fold-back or inline splicing Contains 4036 Crimper.	A lightweight, portable splicing rig in a pail. Contains 4036-25. Hand/Hydraulic Tool.	
Kit Components						
(can be ordered separately; see accessories)						
4049 Rig Container/Pail					1	
4036 Tool Holder					1	
4028 Rubbermaid Rig Case	1	1	1	1		
4031 Hand/Hydraulic Crimping Unit		1				
4036-25 Hand Crimper			1	1	1	
4041 SH Splice Head Holder					1	
4040 Splicing Head Assembly Includes:						
4041 Splicing Head	1	1	1	2		
Pedestal	1	1	1	1		
Traverse Clamp Assembly With Long Bar	1	1	1	1		
Head Clamp	1	1	1	1		
4041-P Splicing Head and "T" Bar Pedestal Support					1	
4042 Support Tube Assembly	1	1	1	1		
4047 Pair Test Plug	1	1	1	1		
4051 Wire Insertion Tool	1	1	1	1	1	
4052T Tester Check Comb	2	2	2	2	1	
4053 Cover Removal Tool	1	1	1	1		
Short Traverse Bar	1	1	1	1		
4049 Variable Traverse Brace Assembly					1	

Type/Order text   Ref.-No.

Packaging & kg (lbs.)/cs.	Minimum Order	Ref.-No.
11,3 (25)	1 each	**4049**
20 (44)	1 each	**4020-M**
24,95 (55)	1 each	**4021-M**
25,0 (55)	1 each	**4021-M/36**
25,4 (56)	1 each	**4021-M2**
25,4 (56)	1 each	**4021-M2/36**

Solutions for Outside Plant

Type/Order text			Ref.-No.

MS² Rig Components

		Pkg & kg (lbs.)/cs.	Min. Order	
	Rubbermaid Rig Case 66 x 29.2 x 28.2 cm (26 x 11.5 x 11.1") Cube: 9.8 kg. (21.7 lbs.) Ctn. size:67.1 x 30 x 58.4 cm (26.4 x 11.8 x 23")	2/cs. 9,8 (16.5)	2 each	**4028**
	Air/Hydraulic Crimping Unit The 4030 Air/Hydraulic Crimping Unit is designed for use with an air or nitrogen supply. An air cylin- der or compressor with output pressure of 5.37kg/cm 21 (90-100 PSI) must be used. The unit is either hand ororperated.	1/cs. 8,3 (18.2)	1 each	**4030**
	Hand/Hydraulic Crimping Unit The 4031 Hand Crimping Unit is lightweight and- hand-operated. When the correct crimping pres- sure is reached, a bypass valve opens.	1/cs. 6,3 (13.8)	1 each	**4031**
	Aerial Strand Clamp A 4035-A Aerial Strand Clamp is designed to hold a 4041-P Splicing Head in aerial splicing applications. Anchored to the suspension strand, the aerial strand clamp, clamps behind and belo- wthe splice bundle and can be used with strands from 5mm (3/16") diameter to 10 mm (3/8").	1/cs. 1,7 (3.7)	1 each	**4035-A**
	Hand Crimper The 4036 Hand/Hydraulic Crimper is a self-con- tained, pistol-gripped crimper designed to crimp MS² Modules in the 4041 Splicing Head.	1/cs. 6,3 (13.8)	1 each	**4036-25**
	Splicing Head Assembly This assembly contains a splicing head, a pede- stal, a traverse clamp assembly with a longbar, & a head clamp for use with two manfold-back splicing.	1/cs. 3,2 (7.1)	1 each	**4040**
	Splice Head The 4041 Splicing Head is the standard MS² Splicing Head without any support components.	1/cs. 1,3 (2.9)	1 each	**4041**
	Splicing Head and "T" Bar Additional Splicing Head and "T" Bar support for use with the MS² System.	1/cs. 1,7 (3.7)	1 each	**4041-P**

2.1.3 3M™ MS²™ Modular Splicing Rigs & Accessories

Type/Order text			Ref.-No.

MS² Rig Components

		Pkg & kg (lbs.)/cs.	Min. Order	
	Universal Splicing Head Support Assembly The 4045 Universal Splicing Head Support Assembly is designed to hold an MS² Splicing Head so it can be used in all applications.	1/cs. 3,2 (7)	1 each	**4045**
	Split Support Tube Collapsable for easy transport and set up.	1/cs. 3.2 (7)	1 each	**4046**
	Pair Test Plug This plug is a module probe which permits one pair checking without damaging wire insulation. The prongs fit the test entry port of all MS² modules. The cord permits easy connection to a talk block or test set.	1/box 10/cs. 1,0 (2.3)	10 each	**4047**
	Wire Insertion & Cut-Off Tool The 4051 tool is used on MS² modules to replace conductors back into the module.	1/bag 10/cs. 0,7 (1.5)	10 each	**4051**
	In-Head Tester Check Comb The check comb eliminates wiring errors by double-checking tip and ring placement prior to crimping and to insulate pairs when using the in-head tester without a cover.	1/box 10/cs. 0,6 (1.3)	10 each	**4052-T**
	Cover Removal Tool The 4053 Cover Remote Tool is recommended for removing either the base or cover from 25-pair Super-Mini and Super Mate Modules.	1/box 10/cs. 0,4 (0.8)	10 each	**4053**
	Separation Tool The only recommended tool to separate MS² Super Mate 4005-DPM/TR Modules from any other module. Note: The 4053 Cover Removal Tool cannot be used with DPM Modules.	1/cs. 0,6 (1.3)	1 each	**4053-PM**
	Hand Presser The 4270-A presser is used to plug up to seven Super Mate Modules together.	1/cs. 1,5 (3.4)	1 each	**4270-A**
	Hand Presser* (not pictured)	1/cs. & 1,5 (3.4)	1 each	**4270-10**
	10/25 part splice Head (not pictured)			**9741**
	9753-PM Separator Tool*	1/cs. & 0,4 (2.0)	1 each	**9753-PM**

* International shipments only, source of supply - 3M Germany.
Contact your local 3M Representative for additional ordering information.