



## M12 D-CODE CORDSETS

### M12 D-CODE TO RJ45 CORDSETS

TE Connectivity's M12 Ethernet Cat5e communication package is now being extended by introducing the female configurations as well as the D-code to RJ45 cordsets.

The extended 4-pole D-coded cordsets comply with Profinet, EtherCAT and Ethernet/IP protocols offering multiple options that are suitable for drag chain applications or torsional stress, depending on customer performance requirements.

Our Cat5e cable jackets vary between PVC, PUR and TPE which offer a unique solution toward satisfying the stringent needs of motion systems supporting both flexing and stationary industrial Ethernet requirements.

The new M12 D-coded cordsets, which are UL certified and have an IP67 rating for dust-tight and waterproof applications ensure efficient, high-quality and reliable connectivity and high integrity signal transmission.

TE's portfolio is further complemented with overmolded M12 D-code to RJ45 cable assemblies which are key components to an overall Industrial Ethernet application and designed for connection within control cabinets, machinery and in-the-field operations. This further simplifies the concurrent use of both connector types (M12 and RJ45) within a single system.

Assemblies are produced in many customer-specific plug-and-play configurations to enable design flexibility and quick installation in most industrial environments.

### APPLICATIONS

- Industrial communications
- Process control systems
- Industrial machinery
- Robotics
- Industrial control and factory automation
- Test equipment
- Machine tools

### BENEFITS

- Unit remains protected and fully operational in most industrial applications
- Secured signal connections and data transmission
- Ensure the application of cable assembly in flexible installation environment
- Ensure the application of cable assembly in torsion application environment
- Oil-resistant for in oil industrial applications
- Application of UV-resistant environment

### FEATURE

- Enclosure rating of IP67
- 360 degrees shielding
- Jacketing is in halogen-free flame-retardant thermoplastic polyurethane (PUR)
- PVC provides a competitive and economic solution for occasional movement or vibration, but PUR and TPE is more suited to more demanding applications in for example, drag chains and harsh environments where operational reliability is crucial
- Depending on the material, the assemblies withstand up to 3 million flexes, machine oils, abrasion and UV. Our TPE cables can withstand 35M cycles for C-track applications
- Category 5e cables can realize transmission rates of 100Mbps to meet network requirements in the field and at supervisory management levels
- The new assemblies are available with several standard cable length options from 0.5m through to 30m

### ELECTRICAL

- **Voltage proof:** 1400V
- **Insulation resistance:** 100MΩ min
- 30° C max under loaded rating current
- 2 pair is for D-Code CAT5E performance, which is based on channel level

### MATERIALS

- PA66 for M12 connector housing
- TPU or PVC material for cable assembly over-molding depending cable jacket type
- PP for inner over-molding
- **Contact:** Brass, Gold Plating 30um
- Nut and Shells: Brass, Nickel plating
- **O-ring:** Silicon rubber
- **Over-molding:** PUR/PVC
- **Housing:** PA
- **Cable Jacket materials:** PUR, PVC and TPE

### MECHANICAL

- **Waterproof:** IP67 for D code M12 cable side: IP20 requirement for RJ45 male side
- **Mating/Un-mating force:** 15N/15N max.
- Sinusoidal vibration meet IEC60512, test 6d
- Mechanical shock meet EIA364-27
- **Durability:**
  - 1M for PUR drag chain cable
  - 3M for TPE torsion cable
  - 35M for TPE C-track
- **Degree of protection:** IP67
- **Temperature Ratings:**
  - Industrial Ethernet Profinet Type B PVC: Cat5e 22AWG
    - Operating temperature -40°C to +80°C (fixed)
    - -20°C to +60°C (flexible)
  - Industrial Ethernet Profinet Type C PUR: PUR Cat5e 22AWG
    - Operating temperature -30°C to +70°C (fixed)
    - -20°C to +60°C (flexible)
  - Industrial Ethernet/IP Hi-Flex Cat5e TPE SF/UTP 24AWG
  - Industrial Ethernet/IP Hi-Flex Cat5e TPE U/UTP 24AWG
    - Operating temperature: -20°C to +80°C (fixed)
    - -40°C to +80°C (flexible)









### STANDARDS

- UL1683
- UL1863
- **IEC 61076-2-101:** Detail specification for M12 connectors with screw-locking (but True Position 0.1mm requirement for male side is not required)
- **IEC 60512:** Electromechanical components for electronic equipment; basic testing procedure and measuring methods
- **IEC-60529:** Degree of protection provided by enclosures (IP Code)
- ISO/IEC 11801 Category 5e









## M12 D-code Cordsets / M12 D-code to RJ45 Cordsets

### PART NUMBER LIST

#### M12 D-CODE MALE TO FEMALE CORDSETS

| Part Number     | Part Description                 | Application                                     | Code | POS | Type                                                                                            | Cable Material                                                                                                         | Shielded |
|-----------------|----------------------------------|-------------------------------------------------|------|-----|-------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|----------|
| TAD14545101-001 | M12D4-MS-FS-PUR-22SH-TYPE C-0.5M | Profinet, EtherCAT, Ethernet/IP (up to 100Mbps) | D    | 4   | M12 MS-FS<br> | CAT5E TYPE C, PUR, 22AWG, GREEN<br> | Yes      |
| TAD14541111-001 | M12D4-MS-FS-PVC-22SH-TYPE B-0.5M |                                                 |      |     | M12 MS-FS<br> | CAT5E TYPE B, PVC, 22AWG, GREEN<br> |          |
| TAD1453A201-001 | M12D4-MS-FS-TPE-24SH-0.5M        |                                                 |      |     | M12 MS-FS<br> | CAT5E TPE, SF/UTP 24AWG TEAL<br>    |          |
| TAD2453A201-001 | M12D4-MS-FS-TPE-24UNSH-0.5M      |                                                 |      |     | M12 MS-FS<br> | CAT5E TPE, U/UTP 24AWG, TEAL<br>    |          |





#### M12 D-CODE MALE TO RJ45 CORDSETS

| Part Number     | Part Description                   | Application                                     | Code | POS | Type                                                                                                  | Cable Material                                                                                                           | Shielded |
|-----------------|------------------------------------|-------------------------------------------------|------|-----|-------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|----------|
| TCD14745101-001 | M12D4-MS-RJ45-PUR-22SH-TYPE C-0.5M | Profinet, EtherCAT, Ethernet/IP (up to 100Mbps) | D    | 4   | M12 MS - RJ45<br> | CAT5E TYPE C, PUR, 22AWG, GREEN<br> | Yes      |
| TCD14741111-001 | M12D4-MS-RJ45-PVC-22SH-TYPE B-0.5M |                                                 |      |     | M12 MS - RJ45<br> | CAT5E TYPE B, PVC, 22AWG, GREEN<br> |          |
| TCD1473A201-001 | M12D4-MS-RJ45-TPE-24SH-0.5M        |                                                 |      |     | M12 MS - RJ45<br> | CAT5E TPE, SF/UTP 24AWG TEAL<br>    |          |
| TAD2473A201-001 | M12D4-MS-RJ45-TPE-24UNSH-0.5M      |                                                 |      |     | M12 MS - RJ45<br> | CAT5E TPE, U/UTP 24AWG, TEAL<br>    |          |

## M12 D-code Cordsets / M12 D-code to RJ45 Cordsets





### M12 D-CODE MALE SINGLE ENDED CORDSETS

(Extended to TPE jacketed cables; for PUR and PVC refer to original M8M12 Cordset catalog)

| Part Number     | Part Description         | Application                                                | Code | POS | Type                                                                                                         | Cable Material                     | Shielded |
|-----------------|--------------------------|------------------------------------------------------------|------|-----|--------------------------------------------------------------------------------------------------------------|------------------------------------|----------|
| TAD2413A201-001 | M12D4-MS-TPE<br>USH-0.5M | Profinet,<br>EtherCAT,<br>Ethernet/IP<br>(up to<br>100Mbs) | D    | 4   | Male Straight (MS)<br>    | CAT5E TPE<br>SF/UTP<br>24AWG, TEAL | Yes      |
| TAD2423A201-001 | M12D4-MR-TPE<br>USH-0.5M |                                                            |      |     | Male Right Angle (MR)<br> |                                    |          |
| TAD1413A201-001 | M12D4-MS-TPE<br>SH-0.5M  |                                                            |      |     | Male Straight (MS)<br>    | CAT5E TPE<br>U/UTP 24AWG,<br>TEAL  | No       |
| TAD1423A201-001 | M12D4-MR-TPE<br>SH-0.5M  |                                                            |      |     | Male Right Angle (MR)<br> |                                    |          |

### M12 D-CODE MALE DOUBLE ENDED CORDSETS

(Extended to TPE jacketed cables; for PUR and PVC refer to original M8M12 Cordset catalog)

| Part Number     | Part Description             | Application                                                | Code | POS | Type                                                                                           | Cable Material                     | Shielded |
|-----------------|------------------------------|------------------------------------------------------------|------|-----|------------------------------------------------------------------------------------------------|------------------------------------|----------|
| TAD1473A201-001 | M12D4-MS-MS-<br>TPE SH-0.5M  | Profinet,<br>EtherCAT,<br>Ethernet/IP<br>(up to<br>100Mbs) | D    | 4   | MS-MS<br> | CAT5E TPE<br>SF/UTP<br>24AWG, TEAL | Yes      |
| TAD1483A201-001 | M12D4-MS-MR-<br>TPE SH-0.5M  |                                                            |      |     | MS-MR<br> |                                    |          |
| TAD2473A201-001 | M12D4-MS-MS-<br>TPE USH-0.5M |                                                            |      |     | MS-MS<br> | CAT5E TPE<br>U/UTP 24AWG,<br>TEAL  | No       |
| TAD2483A201-001 | M12D4-MS-MR-<br>TPE USH-0.5M |                                                            |      |     | MS-MR<br> |                                    |          |

## M12 D-code Cordsets / M12 D-code to RJ45 Cordsets

### PART NUMBER GUIDE FOR M12 D-CODE CORDSETS

**T** **A** **D** **S** **B** **X** **W** **Y** **O** **M** **N** **-XXX**

|          |            |
|----------|------------|
| <b>T</b> | TE Brand   |
| <b>A</b> | M12 series |
| <b>D</b> | D code     |

| <b>S</b> | Application Type                                      |
|----------|-------------------------------------------------------|
| 1        | Shielding industrial ethernet Cate5e                  |
| 2        | Unshielding industrial ethernet Cate5e *only with TPE |

| <b>B</b> | Poles No. |
|----------|-----------|
| 4        | 4 Poles   |

| <b>X</b> | Interface Type                   |
|----------|----------------------------------|
| 1        | Male straight                    |
| 2        | Male angled                      |
| 5        | Male straight to female straight |
| 7        | Male straight to male straight   |
| 8        | Male straight to male angled     |

| <b>W</b> | Wire Gauge             |
|----------|------------------------|
| 3        | 24 AWG (*for TPE)      |
| 4        | 22 AWG (*for PUR, PVC) |

| <b>Y</b> | Cable Jacket          |
|----------|-----------------------|
| 1        | PVC Moderate flexible |
| 5        | PUR high flex         |
| A        | TPE Extreme high flex |

| <b>O</b> | Cable Color |
|----------|-------------|
| 1        | Green       |
| 2        | Teal        |
| 3        | Red         |

| <b>M</b> | Over-Molding                              |
|----------|-------------------------------------------|
| 0        | Black TPU Over-molding (*for PUR and TPE) |
| 1        | Black PVC Over-molding for PVC            |

| <b>N</b> | Other                                                                    |
|----------|--------------------------------------------------------------------------|
| 1        | Standard screw nut with nickel plated<br>Stamping contact 30u" AU plated |

| <b>-00L</b> | Cable Length |
|-------------|--------------|
| -001        | 0.5M         |
| -002        | 1.0M         |
| -003        | 1.5M         |
| -020        | 2.0M         |
| -004        | 3.0M         |
| -005        | 5.0M         |
| -006        | 7.0M         |
| -007        | 10.0M        |

| <b>-XXX</b> | Customized Cable Length |
|-------------|-------------------------|
| -XX0        | XX.0M                   |
| -XX5        | XX.5M                   |
| -99X        | (<1M) 0.XM              |
| -993        | 0.3M                    |
| -155        | 15.5M                   |

#### FOR ETHERNET/IP (TPE CABLE)

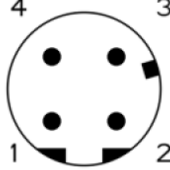
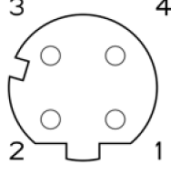
| Wiring Diagram-M12 Cable Cordset Shielded |              |          |
|-------------------------------------------|--------------|----------|
| From Pin                                  | 4 Poles      | To Pin   |
| 1                                         | White-Orange | 1        |
| 2                                         | White-Green  | 2        |
| 3                                         | Orange       | 3        |
| 4                                         | Green        | 4        |
| Shielded                                  | Metal Nut    | Shielded |

#### FOR PROFINET/ETHERCAT (PUR, PVC CABLE)

| Wiring Diagram-M12 Cable Cordset Shielded |           |          |
|-------------------------------------------|-----------|----------|
| From Pin                                  | 4 Poles   | To Pin   |
| 1                                         | Yellow    | 1        |
| 2                                         | White     | 2        |
| 3                                         | Orange    | 3        |
| 4                                         | Blue      | 4        |
| Shielded                                  | Metal Nut | Shielded |

| Wiring Diagram-M12 Cable Cordset Unshielded |              |        |
|---------------------------------------------|--------------|--------|
| From Pin                                    | 4 Poles      | To Pin |
| 1                                           | White-Orange | 1      |
| 2                                           | White-Green  | 2      |
| 3                                           | Orange       | 3      |
| 4                                           | Green        | 4      |

## M12 D-code Cordsets / M12 D-code to RJ45 Cordsets

| Application | Code   | Pin Assignment                                                                                                                                                                                                  | Male                                                                              | Female                                                                              | Shielding           |
|-------------|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------|
| Ethernet    | D code | (For Profinet/EtherCAT)<br>PIN1 TD+ YELLOW<br>PIN3 TD- ORANGE<br>PIN2 RD+ WHITE<br>PIN4 RD- BLUE<br><br>(For EtherNET/IP)<br>PIN1 TD+ WHITE-ORANGE<br>PIN3 TD- ORANGE<br>PIN2 RD+ WHITE-GREEN<br>PIN4 RD- GREEN |  |  | Option on metal nut |

## M12 D-code Cordsets / M12 D-code to RJ45 Cordsets

### PART NUMBER GUIDE FOR M12 D-CODE MALE TO RJ45 CORDSETS

|   |   |   |   |   |   |   |   |   |   |   |      |
|---|---|---|---|---|---|---|---|---|---|---|------|
| T | C | D | S | B | X | W | Y | O | M | N | -XXX |
|---|---|---|---|---|---|---|---|---|---|---|------|

|   |             |
|---|-------------|
| T | TE Brand    |
| C | M12 to RJ45 |
| D | D code      |

| S | Application Type                                      |
|---|-------------------------------------------------------|
| 1 | Shielding Industrial Ethernet Cate5e                  |
| 2 | Unshielding Industrial Ethernet Cate5e *only with TPE |

| B | Poles No. |
|---|-----------|
| 4 | 4 Poles   |

| X | Interface Type                      |
|---|-------------------------------------|
| 7 | Male straight to RJ45 male straight |

| W | Wire Gauge             |
|---|------------------------|
| 3 | 24 AWG (*for TPE)      |
| 4 | 22 AWG (*for PUR, PVC) |

| Y | Cable Jacket          |
|---|-----------------------|
| 1 | PVC Moderate flexible |
| 5 | PUR High flex         |
| A | TPE Extreme high flex |

| O | Cable Color          |
|---|----------------------|
| 1 | Green (*PUR and PVC) |
| 2 | Teal (*TPE)          |

| M | Over-Molding                              |
|---|-------------------------------------------|
| 0 | Black TPU Over-molding (*for PUR and TPE) |
| 1 | Black PVC Over-molding (*for PVC)         |

| N | Other                                                                    |
|---|--------------------------------------------------------------------------|
| 1 | Standard screw nut with nickel plated<br>Stamping contact 30u" AU plated |

| -00L | Cable Length |
|------|--------------|
| -001 | 0.5M         |
| -002 | 1.0M         |
| -003 | 1.5M         |
| -020 | 2.0M         |
| -004 | 3.0M         |
| -005 | 5.0M         |
| -006 | 7.0M         |
| -007 | 10.0M        |

| -XXX | Customized Cable Length |
|------|-------------------------|
| -XX0 | XX.0M                   |
| -XX5 | XX.5M                   |
| -99X | (<1M) 0.XM              |
| -993 | 0.3M                    |
| -155 | 15.5M                   |

#### FOR ETHERNET/IP (TPE CABLE)

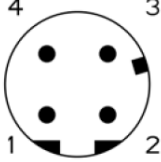

| Wiring Diagram-M12 Cable Cordset Shielded |              |             |
|-------------------------------------------|--------------|-------------|
| From D code Pin                           | 4 Poles      | To RJ45 Pin |
| 1                                         | White-Orange | 1           |
| 2                                         | White-Green  | 2           |
| 3                                         | Orange       | 3           |
| 4                                         | Green        | 4           |
| Shielded                                  | Metal Nut    | Shielded    |

#### FOR PROFINET/ETHERCAT (PUR, PVC CABLE)

| Wiring Diagram-M12 Cable Cordset Shielded |           |             |
|-------------------------------------------|-----------|-------------|
| From D Code Pin                           | 4 Poles   | To RJ45 Pin |
| 1                                         | Yellow    | 1           |
| 2                                         | White     | 2           |
| 3                                         | Orange    | 3           |
| 4                                         | Blue      | 4           |
| Shielded                                  | Metal Nut | Shielded    |

| Wiring Diagram-M12 Cable Cordset Unshielded |              |             |
|---------------------------------------------|--------------|-------------|
| From D Code Pin                             | 4 Poles      | To RJ45 Pin |
| 1                                           | White-Orange | 1           |
| 2                                           | White-Green  | 2           |
| 3                                           | Orange       | 3           |
| 4                                           | Green        | 4           |

## M12 D-code Cordsets / M12 D-code to RJ45 Cordsets

| Application | Code   | Pin Assignment                                                                | M12 D Code Male                                                                    | RJ45 Plug                                                                           | Shielding           |
|-------------|--------|-------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------|
| Ethernet    | D code | (For Profinet/EtherCAT PUR, PVC jacketed cables)<br><b>M12 D code TO RJ45</b> |  |  | Option on metal nut |
|             |        | Pin1 TD+    Yellow    Pin1                                                    |                                                                                    |                                                                                     |                     |
|             |        | Pin3 TD-    Orange    Pin2                                                    |                                                                                    |                                                                                     |                     |
|             |        | Pin2 RD+    White    Pin3                                                     |                                                                                    |                                                                                     |                     |
|             |        | Pin4 RD-    Blue    Pin6                                                      |                                                                                    |                                                                                     |                     |
|             |        | (For EtherNET/IP TPE jacketed cable)<br><b>M12 D code TO RJ45</b>             |                                                                                    |                                                                                     |                     |
|             |        | Pin1 TD+    White-Orange    Pin1                                              |                                                                                    |                                                                                     |                     |
|             |        | Pin3 TD-    Orange    Pin2                                                    |                                                                                    |                                                                                     |                     |
|             |        | Pin2 RD+    White-Green    Pin3                                               |                                                                                    |                                                                                     |                     |
|             |        | Pin4 RD-    Green    Pin6                                                     |                                                                                    |                                                                                     |                     |

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