

## 9950 Multi-Conductor - Computer Cable for EIA RS-232 Applications



### Description:

22 AWG stranded (7x30) TC conductors, S-R PVC insulation, overall Beldfoil® (100% coverage) + TC braid shield (65% coverage), PVC jacket.

### Physical Characteristics (Overall)

#### Conductor

##### AWG:

| # Conductors | AWG | Stranding | Conductor Material |
|--------------|-----|-----------|--------------------|
| 50           | 22  | 7x30      | TC - Tinned Copper |

#### Insulation

##### Insulation Material:

| Insulation Material                     |
|-----------------------------------------|
| S-R PVC - Semi-Rigid Polyvinyl Chloride |

#### Outer Shield

##### Outer Shield Material:

| Layer # | Outer Shield Trade Name | Type  | Outer Shield Material        | Coverage (%) |
|---------|-------------------------|-------|------------------------------|--------------|
| 1       | Beldfoil®               | Tape  | Aluminum Foil-Polyester Tape | 100          |
| 2       |                         | Braid | TC - Tinned Copper           | 65           |

#### Outer Jacket

##### Outer Jacket Material:

| Outer Jacket Material    |
|--------------------------|
| PVC - Polyvinyl Chloride |

#### Overall Cabling

##### Overall Cabling Color Code Chart:

| Number | Color           |
|--------|-----------------|
| 1      | Black           |
| 2      | White           |
| 3      | Red             |
| 4      | Green           |
| 5      | Orange          |
| 6      | Blue            |
| 7      | White/Black     |
| 8      | Red/Black       |
| 9      | Green/Black     |
| 10     | Orange/Black    |
| 11     | Blue/Black      |
| 12     | Black/White     |
| 13     | Red/White       |
| 14     | Green/White     |
| 15     | Blue/White      |
| 16     | Black/Red       |
| 17     | White/Red       |
| 18     | Orange/Red      |
| 19     | Blue/Red        |
| 20     | Red/Green       |
| 21     | Orange/Green    |
| 22     | Black/White/Red |

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|    |                    |
|----|--------------------|
| 23 | White/Black/Red    |
| 24 | Red/Black/White    |
| 25 | Green/Black/White  |
| 26 | Orange/Black/White |
| 27 | Blue/Black/White   |
| 28 | Black/Red/Green    |
| 29 | White/Red/Green    |
| 30 | Red/Black/Green    |
| 31 | Green/Black/Orange |
| 32 | Orange/Black/Green |
| 33 | Blue/White/Orange  |
| 34 | Black/White/Orange |
| 35 | White/Red/Orange   |
| 36 | Orange/White/Blue  |
| 37 | White/Red/Blue     |
| 38 | Black/White/Green  |
| 39 | White/Black/Green  |
| 40 | Red/White/Green    |
| 41 | Green/White/Blue   |
| 42 | Orange/Red/Green   |
| 43 | Blue/Red/Green     |
| 44 | Black/White/Blue   |
| 45 | White/Black/Blue   |
| 46 | Red/White/Blue     |
| 47 | Green/Orange/Red   |
| 48 | Orange/Red/Blue    |
| 49 | Blue/Orange/Red    |
| 50 | Black/Orange/Red   |

Overall Nominal Diameter: 0.555 in.

### Mechanical Characteristics (Overall)

|                                        |                          |
|----------------------------------------|--------------------------|
| Operating Temperature Range:           | -30°C To +80°C           |
| UL Temperature Rating:                 | 80°C (UL AWM Style 2464) |
| Bulk Cable Weight:                     | 234 lbs/1000 ft.         |
| Min. Bend Radius (Install)/Minor Axis: | 5.500 in.                |

### Applicable Specifications and Agency Compliance (Overall)

#### Applicable Standards & Environmental Programs

|                                       |                            |
|---------------------------------------|----------------------------|
| NEC/(UL) Specification:               | CMG                        |
| CEC/C(UL) Specification:              | CMG                        |
| AWM Specification:                    | UL Style 2464 (300 V 80°C) |
| EU CE Mark:                           | Yes                        |
| EU Directive 2000/53/EC (ELV):        | Yes                        |
| EU Directive 2002/95/EC (RoHS):       | Yes                        |
| EU RoHS Compliance Date (mm/dd/yyyy): | 10/01/2005                 |
| EU Directive 2002/96/EC (WEEE):       | Yes                        |
| EU Directive 2003/11/EC (BFR):        | Yes                        |
| CA Prop 65 (CJ for Wire & Cable):     | Yes                        |
| MII Order #39 (China RoHS):           | Yes                        |

#### Flame Test

|                   |                    |
|-------------------|--------------------|
| UL Flame Test:    | UL1685 FT4 Loading |
| C(UL) Flame Test: | FT4                |

## 9950 Multi-Conductor - Computer Cable for EIA RS-232 Applications

## Plenum/Non-Plenum

Plenum (Y/N): No

## Electrical Characteristics (Overall)

## Nom. Capacitance Conductor to Conductor:

Capacitance (pF/ft)

35

## Nom. Capacitance Cond. to Other Conductor &amp; Shield:

Capacitance (pF/ft)

63

## Nom. Conductor DC Resistance:

DCR @ 20°C (Ohm/1000 ft)

14.7

## Nominal Outer Shield DC Resistance:

DCR @ 20°C (Ohm/1000 ft)

2.3

## Max. Operating Voltage - UL:

Voltage

300 V RMS (UL AWM Style 2464)

## Max. Recommended Current:

Current

1.3 Amps per conductor @ 25°C

## Put Ups and Colors:

| Item #       | Putup    | Ship Weight | Color  | Notes | Item Desc           |
|--------------|----------|-------------|--------|-------|---------------------|
| 9950 060100  | 100 FT   | 25.200 LB   | CHROME | C     | 50 #22 PVC SHLD PVC |
| 9950 0601000 | 1,000 FT | 238.000 LB  | CHROME | C     | 50 #22 PVC SHLD PVC |
| 9950 060500  | 500 FT   | 118.000 LB  | CHROME | C     | 50 #22 PVC SHLD PVC |

## Notes:

C = CRATE REEL PUT-UP.

## Introduction

Belden® multi-conductor cables are manufactured in a wide variety of gage sizes, dimensions, insulation materials, shielding configurations, and jacketing materials including Plenum and High-Temperature versions. These cables meet the technical requirements of many different types of systems. In fact, Belden offers one of the broadest lines of UL Listed, NEC and CEC multi-conductor cables available from any single source.

Applications for multi-conductor cables include computers, communications, instrumentation, sound, control, audio, and data transmission. Each of these cables is designed to protect signal integrity under critical conditions by reducing hum, noise, and crosstalk.

To assist you in selecting the proper cable for your application, both the suggested working voltages and the maximum temperature ratings are indicated for each applicable product in this section.

Most of our multi-conductor cables are available from stock. Many of these are available off the shelf from distributors. If you have a new or unusual application or you cannot find a multi-conductor cable in this catalog section that meets your technical requirements, contact Technical Support at 1-800-BELDEN-1.

### Multi-Conductor Cables Packaging

Belden's unique UnReel® cable dispenser is available for many of the multi-conductor products listed in this section. The letter "U" before the specified put-up length denotes UnReel packaging.

## Selection Guide

### Shielded Multi-Conductor Computer Cables for RS-232 Applications

| Specifications                  |                    | Cable Series* |      |      |      |
|---------------------------------|--------------------|---------------|------|------|------|
|                                 |                    | 9925          | 9608 | 9533 | 9939 |
| <b>Conductor Size:</b><br>(AWG) | 28                 |               |      |      |      |
|                                 | 24                 | ✓             | ✓    | ✓    |      |
|                                 | 22                 |               |      |      | ✓    |
|                                 | 20                 |               |      |      |      |
|                                 | 18                 |               |      |      |      |
| Page No.                        |                    | 4.18          | 4.17 | 4.11 | 4.19 |
| <b>Insulation:</b>              | S-R PVC            |               | ✓    | ✓    | ✓    |
|                                 | Polyethylene       |               |      |      |      |
|                                 | Polypropylene      |               |      |      |      |
|                                 | Datalene®†         | ✓             |      |      |      |
| <b>Shield:</b>                  | Overall Foil       |               |      | ✓    |      |
|                                 | Drain Wire         | ✓             |      | ✓    |      |
|                                 | Overall Foil/Braid | ✓             | ✓    |      | ✓    |
|                                 | Braid Coverage     | 65%           | 65%  |      | 65%  |
| <b>Drain Wire Overall:</b>      |                    | Yes           | No   | Yes  | No   |
| <b>No. of Cond. Available:</b>  | 1                  |               |      |      |      |
|                                 | 2                  |               |      |      |      |
|                                 | 3                  | ✓             | ✓    | ✓    | ✓    |
|                                 | 4                  | ✓             | ✓    | ✓    | ✓    |
|                                 | 5                  | ✓             | ✓    | ✓    | ✓    |
|                                 | 6                  | ✓             | ✓    | ✓    | ✓    |
|                                 | 7                  | ✓             | ✓    | ✓    | ✓    |
|                                 | 8                  | ✓             | ✓    | ✓    | ✓    |
|                                 | 9                  | ✓             | ✓    | ✓    | ✓    |
|                                 | 10                 | ✓             | ✓    | ✓    | ✓    |
|                                 | 11                 |               |      |      |      |
|                                 | 12                 |               |      |      |      |
|                                 | 13                 |               |      |      |      |
|                                 | 15                 | ✓             | ✓    | ✓    | ✓    |
|                                 | 17                 |               |      |      |      |
|                                 | 18                 |               |      |      |      |
|                                 | 19                 |               |      |      |      |
|                                 | 20                 |               |      | ✓    |      |
|                                 | 25                 | ✓             | ✓    | ✓    | ✓    |
|                                 | 27                 |               |      |      |      |
|                                 | 30                 |               |      | ✓    |      |
|                                 | 31                 |               |      |      |      |
|                                 | 37                 | ✓             | ✓    |      | ✓    |
|                                 | 40                 |               |      | ✓    |      |
|                                 | 50                 |               | ✓    | ✓    | ✓    |
| <b>Capacitance ** (pF/ft.)</b>  |                    | 12.0          | 30.0 | 30.0 | 35.0 |

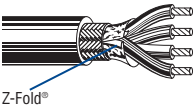
\*All cables are UL-listed.

\*\*Capacitance may vary on some cables.

† Foam high density polyethylene.

## Overall Foil/Braid Shield

Computer Cables for EIA RS-232 Applications

| Description                                                                                                                            | Part No.       | UL NEC/<br>C(UL) CEC<br>Type | No.<br>of Cond.        | Color<br>Code          | Standard Lengths |       | Standard<br>Unit Weight |      | Nominal OD |          | Nominal DCR |          | Nominal Capacitance |               |                  |                |  |
|----------------------------------------------------------------------------------------------------------------------------------------|----------------|------------------------------|------------------------|------------------------|------------------|-------|-------------------------|------|------------|----------|-------------|----------|---------------------|---------------|------------------|----------------|--|
|                                                                                                                                        |                |                              |                        |                        | Ft.              | m     | Lbs.                    | kg   | Inch       | mm       | Cond.       | Shield   | *<br>pF/<br>Ft.     | *<br>pF/<br>m | **<br>pF/<br>Ft. | **<br>pF/<br>m |  |
| <b>22 AWG Stranded (7x30) Tinned Copper Conductors • Overall Beldfoil® (100% Coverage) + Tinned Copper Braid Shield (65% Coverage)</b> |                |                              |                        |                        |                  |       |                         |      |            |          |             |          |                     |               |                  |                |  |
| <b>Semi-rigid PVC Insulation • Chrome PVC Jacket</b>                                                                                   |                |                              |                        |                        |                  |       |                         |      |            |          |             |          |                     |               |                  |                |  |
| <br>UL AWM Style 2464<br>(300V 80°C)                  | <b>9939</b>    | NEC:                         | 3                      | See                    | 100              | 30.5  | 3.6                     | 1.6  | .202       | 5.13     | 14.7Ω/M'    | 6.2Ω/M'  | 37                  | 121           | 67               | 220            |  |
|                                                                                                                                        |                | CMG:                         |                        | Chart 1                | 500              | 152.4 | 14.0                    | 6.4  |            |          | 48.2Ω/km    | 20.3Ω/km |                     |               |                  |                |  |
|                                                                                                                                        |                | CEC:                         |                        | (Tech Info<br>Section) | 1000             | 304.8 | 27.0                    | 12.3 |            |          |             |          |                     |               |                  |                |  |
|                                                                                                                                        |                | <b>CMG FT4</b>               |                        |                        |                  |       |                         |      |            |          |             |          |                     |               |                  |                |  |
|                                                                                                                                        | <b>9940</b>    | NEC:                         | 4                      | See                    | 100              | 30.5  | 4.0                     | 1.8  | .215       | 5.46     | 14.7Ω/M'    | 5.0Ω/M'  | 37                  | 121           | 67               | 220            |  |
|                                                                                                                                        |                | CMG:                         |                        | Chart 1                | 500              | 152.4 | 16.5                    | 7.5  |            |          | 48.2Ω/km    | 16.4Ω/km |                     |               |                  |                |  |
|                                                                                                                                        |                | CEC:                         |                        | (Tech Info<br>Section) | 1000             | 304.8 | 32.0                    | 14.5 |            |          |             |          |                     |               |                  |                |  |
|                                                                                                                                        |                | <b>CMG FT4</b>               |                        |                        |                  |       |                         |      |            |          |             |          |                     |               |                  |                |  |
|                                                                                                                                        | <b>9941</b>    | NEC:                         | 5                      | See                    | 100              | 30.5  | 4.2                     | 1.8  | .230       | 5.84     | 14.7Ω/M'    | 7.1Ω/M'  | 37                  | 121           | 67               | 220            |  |
|                                                                                                                                        |                | CMG:                         |                        | Chart 1                | 500              | 152.4 | 19.0                    | 8.6  |            |          | 48.2Ω/km    | 23.3Ω/km |                     |               |                  |                |  |
|                                                                                                                                        |                | CEC:                         |                        | (Tech Info<br>Section) | 1000             | 304.8 | 38.0                    | 17.3 |            |          |             |          |                     |               |                  |                |  |
|                                                                                                                                        |                | <b>CMG FT4</b>               |                        |                        |                  |       |                         |      |            |          |             |          |                     |               |                  |                |  |
| <b>9942</b>                                                                                                                            | NEC:           | 6                            | See                    | 100                    | 30.5             | 4.7   | 2.1                     | .245 | 6.22       | 14.7Ω/M' | 7.9Ω/M'     | 35       | 115                 | 63            | 207              |                |  |
|                                                                                                                                        | CMG:           |                              | Chart 1                | 500                    | 152.4            | 22.0  | 10.0                    |      |            | 48.2Ω/km | 25.9Ω/km    |          |                     |               |                  |                |  |
|                                                                                                                                        | CEC:           |                              | (Tech Info<br>Section) | 1000                   | 304.8            | 43.0  | 19.5                    |      |            |          |             |          |                     |               |                  |                |  |
|                                                                                                                                        | <b>CMG FT4</b> |                              |                        |                        |                  |       |                         |      |            |          |             |          |                     |               |                  |                |  |
| <b>9943</b>                                                                                                                            | NEC:           | 7                            | See                    | 100                    | 30.5             | 5.0   | 2.3                     | .245 | 6.22       | 14.7Ω/M' | 7.0Ω/M'     | 35       | 115                 | 63            | 207              |                |  |
|                                                                                                                                        | CMG:           |                              | Chart 1                | 500                    | 152.4            | 23.5  | 10.8                    |      |            | 48.2Ω/km | 23.0Ω/km    |          |                     |               |                  |                |  |
|                                                                                                                                        | CEC:           |                              | (Tech Info<br>Section) | 1000                   | 304.8            | 46.0  | 20.9                    |      |            |          |             |          |                     |               |                  |                |  |
|                                                                                                                                        | <b>CMG FT4</b> |                              |                        |                        |                  |       |                         |      |            |          |             |          |                     |               |                  |                |  |
| <b>9944</b>                                                                                                                            | NEC:           | 8                            | See                    | 100                    | 30.5             | 5.5   | 2.5                     | .260 | 6.60       | 14.7Ω/M' | 6.0Ω/M'     | 35       | 115                 | 63            | 207              |                |  |
|                                                                                                                                        | CMG:           |                              | Chart 1                | 500                    | 152.4            | 26.0  | 11.8                    |      |            | 48.2Ω/km | 19.7Ω/km    |          |                     |               |                  |                |  |
|                                                                                                                                        | CEC:           |                              | (Tech Info<br>Section) | 1000                   | 304.8            | 52.0  | 23.6                    |      |            |          |             |          |                     |               |                  |                |  |
|                                                                                                                                        | <b>CMG FT4</b> |                              |                        |                        |                  |       |                         |      |            |          |             |          |                     |               |                  |                |  |
| <b>9945</b>                                                                                                                            | NEC:           | 9                            | See                    | 100                    | 30.5             | 6.1   | 2.8                     | .280 | 7.11       | 14.7Ω/M' | 5.1Ω/M'     | 35       | 115                 | 63            | 207              |                |  |
|                                                                                                                                        | CMG:           |                              | Chart 1                | 500                    | 152.4            | 28.5  | 12.9                    |      |            | 48.2Ω/km | 16.7Ω/km    |          |                     |               |                  |                |  |
|                                                                                                                                        | CEC:           |                              | (Tech Info<br>Section) | 1000                   | 304.8            | 57.0  | 25.9                    |      |            |          |             |          |                     |               |                  |                |  |
|                                                                                                                                        | <b>CMG FT4</b> |                              |                        |                        |                  |       |                         |      |            |          |             |          |                     |               |                  |                |  |
| <b>9946</b>                                                                                                                            | NEC:           | 10                           | See                    | 100                    | 30.5             | 6.6   | 3.0                     | .300 | 7.62       | 14.7Ω/M' | 4.6Ω/M'     | 35       | 115                 | 63            | 207              |                |  |
|                                                                                                                                        | CMG:           |                              | Chart 1                | 500                    | 152.4            | 31.5  | 14.3                    |      |            | 48.2Ω/km | 15.1Ω/km    |          |                     |               |                  |                |  |
|                                                                                                                                        | CEC:           |                              | (Tech Info<br>Section) | 1000                   | 304.8            | 62.0  | 28.1                    |      |            |          |             |          |                     |               |                  |                |  |
|                                                                                                                                        | <b>CMG FT4</b> |                              |                        |                        |                  |       |                         |      |            |          |             |          |                     |               |                  |                |  |
| <b>9947</b>                                                                                                                            | NEC:           | 15                           | See                    | 100                    | 30.5             | 8.7   | 4.0                     | .340 | 8.64       | 14.7Ω/M' | 4.1Ω/M'     | 35       | 115                 | 63            | 207              |                |  |
|                                                                                                                                        | CMG:           |                              | Chart 2R               | 500                    | 152.4            | 42.5  | 19.3                    |      |            | 48.2Ω/km | 13.5Ω/km    |          |                     |               |                  |                |  |
|                                                                                                                                        | CEC:           |                              | (Tech Info<br>Section) | 1000                   | 304.8            | 83.0  | 37.7                    |      |            |          |             |          |                     |               |                  |                |  |
|                                                                                                                                        | <b>CMG FT4</b> |                              |                        |                        |                  |       |                         |      |            |          |             |          |                     |               |                  |                |  |
| <b>9948</b>                                                                                                                            | NEC:           | 25                           | See                    | 100                    | 30.5             | 13.3  | 6.0                     | .410 | 10.41      | 14.7Ω/M' | 3.1Ω/M'     | 35       | 115                 | 63            | 207              |                |  |
|                                                                                                                                        | CMG:           |                              | Chart 2R               | 500                    | 152.4            | 66.5  | 30.2                    |      |            | 48.2Ω/km | 10.2Ω/km    |          |                     |               |                  |                |  |
|                                                                                                                                        | CEC:           |                              | (Tech Info<br>Section) | 1000                   | 304.8            | 132.0 | 59.9                    |      |            |          |             |          |                     |               |                  |                |  |
|                                                                                                                                        | <b>CMG FT4</b> |                              |                        |                        |                  |       |                         |      |            |          |             |          |                     |               |                  |                |  |
| <b>9949</b>                                                                                                                            | NEC:           | 37                           | See                    | 100                    | 30.5             | 16.1  | 7.3                     | .460 | 11.68      | 14.7Ω/M' | 2.7Ω/M'     | 35       | 115                 | 63            | 207              |                |  |
|                                                                                                                                        | CMG:           |                              | Chart 2R               | 500                    | 152.4            | 87.5  | 39.7                    |      |            | 48.2Ω/km | 8.9Ω/km     |          |                     |               |                  |                |  |
|                                                                                                                                        | CEC:           |                              | (Tech Info<br>Section) | 1000                   | 304.8            | 180.0 | 81.7                    |      |            |          |             |          |                     |               |                  |                |  |
|                                                                                                                                        | <b>CMG FT4</b> |                              |                        |                        |                  |       |                         |      |            |          |             |          |                     |               |                  |                |  |
| <b>9950</b>                                                                                                                            | NEC:           | 50                           | See                    | 100                    | 30.5             | 25.2  | 11.4                    | .555 | 14.10      | 14.7Ω/M' | 2.3Ω/M'     | 35       | 115                 | 63            | 207              |                |  |
|                                                                                                                                        | CMG:           |                              | Chart 2R               | 500                    | 152.4            | 118.0 | 53.6                    |      |            | 48.2Ω/km | 7.5Ω/km     |          |                     |               |                  |                |  |
|                                                                                                                                        | CEC:           |                              | (Tech Info<br>Section) | 1000                   | 304.8            | 238.0 | 108.1                   |      |            |          |             |          |                     |               |                  |                |  |
|                                                                                                                                        | <b>CMG FT4</b> |                              |                        |                        |                  |       |                         |      |            |          |             |          |                     |               |                  |                |  |

DCR = DC Resistance

\*Capacitance between conductors.

\*\*Nominal capacitance conductor to conductor and shield.