Application note

DIN 1.0/2.3 Coaxial Connectors

Introduction

The DIN 1.0/2.3 coax connector was originally developed as a 50Ω RF connector solution for the Southern Europe Telecommunications market in the 1980s. Since then, millions of these connectors have been installed in Central Offices worldwide.

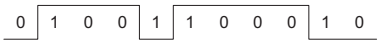
The DIN 1.0/2.3 connector has also been developed as a 75Ω connector with a 2 GHz rating. (See GHz vs. Gb/s, following.) This makes the connector an ideal solution for digital broadcast signal formats such as AES audio, SD video, HD video, and 3Gig video, especially in high-density assemblies.

AXON originally deployed the DIN 1.0/2.3 connector in the NV7512 audio router—a 512×512 AES audio matrix of just 14RU. Typical installations use Belden 1855A cable terminated with mating DIN 1.0/2.3 male connectors on one end and male BNC connectors on the other. This system provides *twice* the density of a comparable BNC solution.

AXON has also introduced the NV8288 digital video router. Called "the smallest big router in the world," each NV8288 frame can support up to 288×576 SDI or HD-SDI channels in just 10RU. The NV8288 represents *triple* the density found in a comparable BNC solution. NV8288 systems use the same Belden DIN 1.0/2.3 connector configuration that is used with the NV7512.

GHz vs. Gb/s

Because of NRZI encoding, there are 2 bits per "Hertz" on the cable or connector:



(Digital video, in all cases, uses NRZI encoding.)

Thus, a 2 GHz connector with a 2 GHz cable can produce good results for data rates up to 4 Gb/s—more than enough for a SMPTE 424M 3 Gb/s signal.

The mating connectors described in this document have been swept to 3 GHz which means that they support good data up to 6 Gb/s!

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Features and Benefits

The connector is based on a simple push-pull latching design providing these benefits:

- Quick installation.
- Safe connector coupling.
- Vibration resistance. It cannot vibrate loose like an unlatched BNC.
- Connectors can be laid out in pitch densities as small as 8 mm providing ***twice*** the density of BNC layouts.

Figure 1-1. BNC and 1.0/2.3 Size Comparison

- The connectors use the same stripping and crimping process as BNC connectors, making them easy to learn for experienced broadcast cable installers.
- The connectors support industry-leading AXON signal quality.

Mating Connectors

Male mating connectors for Belden 1855A and Gepco VDM230 cable are available through connector distributors and from AXON, in bags of 25 (AXON part number 1.0/2.3-CONN).

Assembly

As mentioned, DIN 1.0/2.3 connectors terminate with the same process as BNC connectors.

▲ A visual inspection of the male center conductor for straightness and non-protrusion beyond the connector collar is recommended to avoid bent pin errors. (See Assembly

▲ .)

▲ **Caution:** It is recommended that a mating connector adapter be used for continuity testing because the insertion of a test probe directly into the connector can bend the center conductor pin.

The following sections provide detailed installation, tooling, and performance information:

- Assembly
-
- Tooling

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- Eye

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Assembly

ITT

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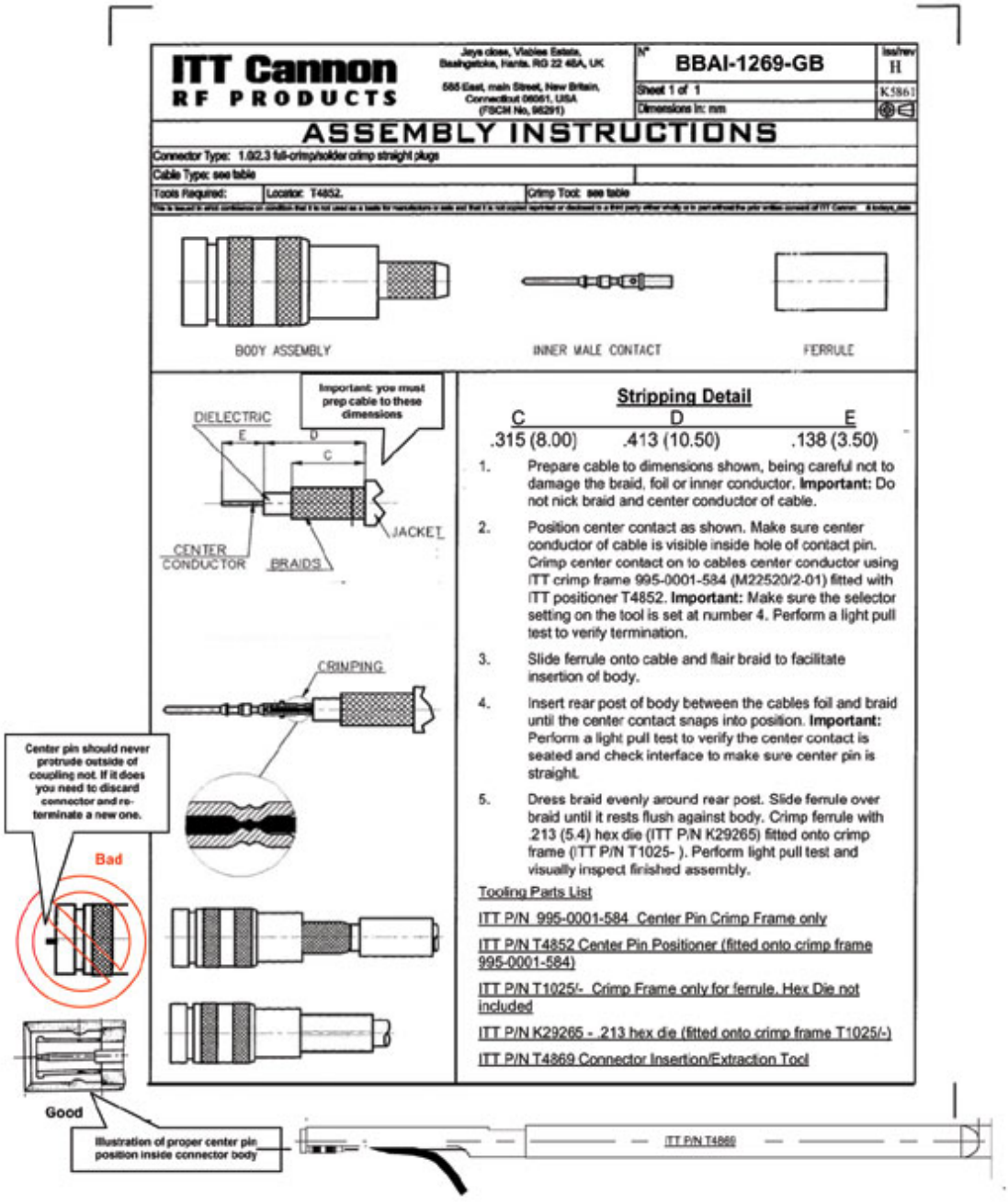

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White Sands Engineering

White Sands Engineering's 1.0/2.3FP plug features a fixed pin, one-piece design that can be installed quickly and reliably in the field. It is compatible with the YR46940 mini RG59 precision video cables as well as Belden 1855A, Gepco VDM230, Commscope 7538B, and Coleman 99401. The small profile of this connector supports high-density broadcast applications such as AXON's NV8288 digital video router. White Sands can provide connectors and tools, cable assembles terminated with 1.0/2.3FP, and other connectors as needed.

Assembly Instructions for 1.0/2.3FP Plug to Mini RG59 Cable

The positive locking mechanism in this connector ensures secure mating that will not be affected by vibration or accidental tugs on the cable. Connectors can only be unmated from high density panels using the "1.0REMTOOL."

This is an excerpt from the White Sands documentation.

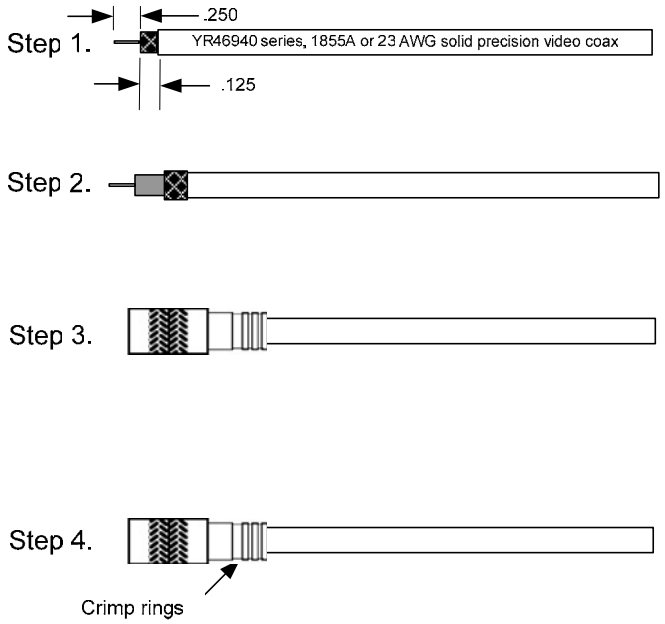
STEP 1: Use CPT7538125 tool to strip cable to proper dimensions as shown. Make sure there is no braid wrapped around the center conductor creating a short.

STEP 2: Fold Braid back over jacket. Leave foil on dielectric, ensuring foil is smooth all around dielectric.

STEP 3: Insert the center conductor and dielectric with foil into the center diameter of connector. Push connector onto the cable while rotating the connector ½ a turn. Ensure cable is inserted completely into the connector with no braid visible behind the connector.

Note - Continuity test cable before crimping to ensure a good connection.

STEP 4: Crimp one time on all 3 rings of the connector where shown using the .213 die on the ACT483 crimp tool.



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DIN 1.0/2.3 Coaxial Connectors

Tyco

This and the next illustration are excerpts from the Tyco datasheet:

DIN 1.0/2.3 Coaxial Connectors

tyco Electronics

DIN 1.0 / 2.3 (75Ω) Connectors

Application Specification
114-71037
16DEC2005 Rev. A

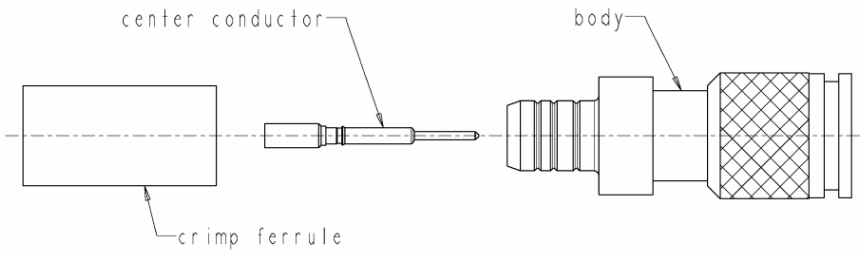
1. INTRODUCTION

This specification covers the requirements for application of Tyco Electronics DIN 1.0 / 2.3 (75Ω) straight cable jack and plug connectors. The cable is connected by crimping the cable braid to the plug or jack body and also the inner conductor is crimped with 8 indent tool.

The component drawings may differ from the parts supplied.

2. DATA TABLE

PART NUMBER	CABLE	OUTER CONTACT CRIMP TOOL	CENTER CONTACT 8 indent CRIMP TOOL	DIM. TABLE FOR CABLE PREPARATION	INTERMED. LAYER
619226-1	Belden 1855A or Gepco VDM230	734595-1 hex 4.47	986651-1 pos. 4 Use positioner K41	3.1.1.1	Yes



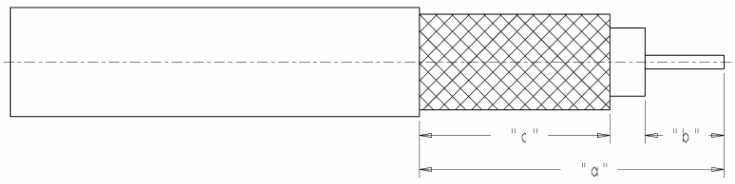
3. INSTRUCTIONS

3.1 Prepare cable

- Prepare the cable according to the dimension table 3.1.1.
- It's recommended not to remove the foil; if that causes problems with high voltage performance you can remove the foil up to the braid but leave the foil beneath the braid.
- Slide crimp ferrule over

3.1.1 Dimension table (recommended dimensions)

DIMENSION	"a"	"b"	"c"
3.1.1.1	$10_{+0/-0.2}$	$3_{\pm 0.2}$	$6_{+0/-0.5}$



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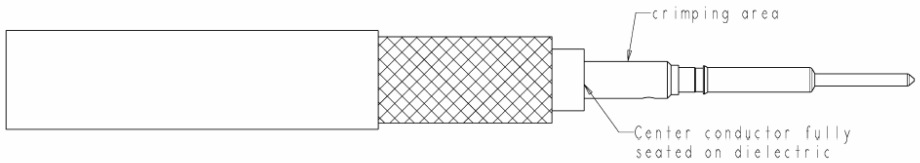
This is a continuation from the previous page:

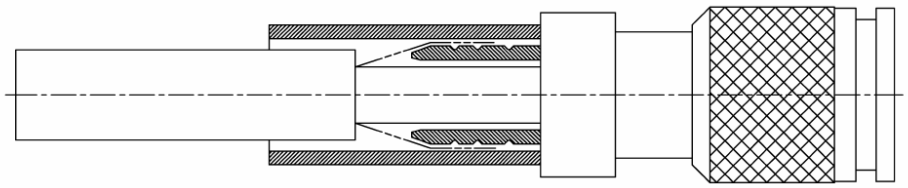
3.2 Crimp on center conductor

- Slide center contact over cable center conductor.
- Make sure that the center conductor butts on the cable dielectric.
- Crimp center conductor as close as possible to the dielectric of the cable; using the appropriate crimp mentioned in the data table section 2 page 1.



3.3 Contact assembly

- Flare braid and insert contact into the crimp of the body. The contact must bottom on the internal dielectric of the connector.
- Slide the crimp ferrule over the braid until it bottoms against the body. Crimp the ferrule using the appropriate crimp dies mentioned in the data table section 2 page 1.



Tooling

ITT

This is an excerpt from the ITT data sheet:

ITT Cannon Coaxial Cable Power Stripping Kit (P/N: TOK-000-0004)

Driver
Rechargeable Battery
Battery charger
1 (Belden 1855A cable)
Cutter head (the illustration shows two cutter heads)
Carrying Case with foam inserts
Instruction and maintenance manual

ITT Replacement 1855A Cutter Head (P/N: TOK-000-0008)

This kit preps Belden 1855A cable to terminate to the ITT Electronic Components D55-F24-3069GDA 1.0/2.3 RF connector.

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White Sands Engineering

1.0/2.3FP Cable Assembly Tools

CPT7538125	Strip tool, 1/4□×1/8□ for mini RG59 cable	
ACT483	Crimp tool, 0.270□ and 0.213□ hex dies for mini RG59 connectors	
1.0REMTOOL	Removal tool for 1.0/2.3FP connectors	

Belden 1855A Cable

Cable Plug (ITT Cannon D55-F24-3069GDA, 6–8 weeks):

Pin Crimp Tool:	Daniels M22520/2-01
Crimp Setting:	Turret set to 4
Pin Positioner:	Daniels K1335
Hex Crimp Die:	0.213" (Paladin 2653)
Strip Tool:	Paladin model Vario 3240
Strip Dimensions:	See ITT Cannon assembly instructions
BBAI:	1269

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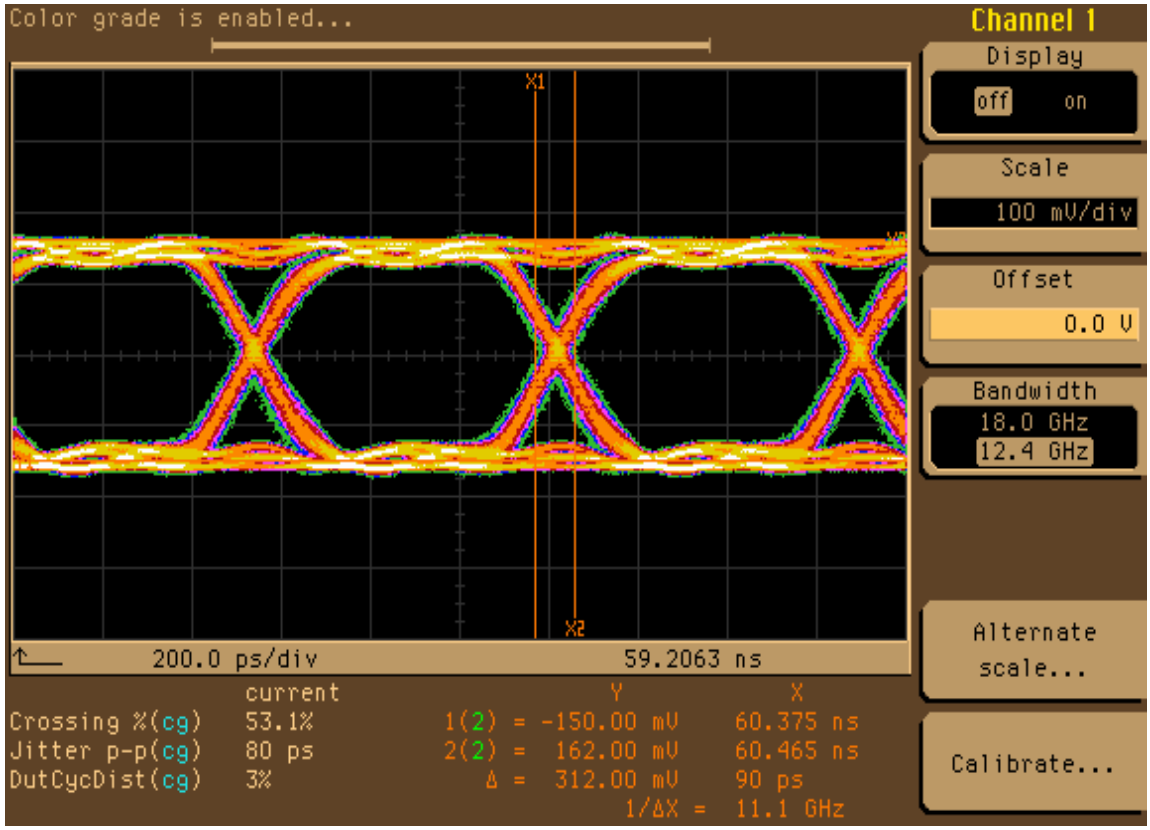
Eye Pattern

This is an 800 mV BERT signal at 1.485 Gb/s, passed through a DIN 1.0/2.3 input connector, equalizer, cable driver, and DIN 1.0/2.3 output connector:



This is a 3Gig (2.97 Gb/s) signal:

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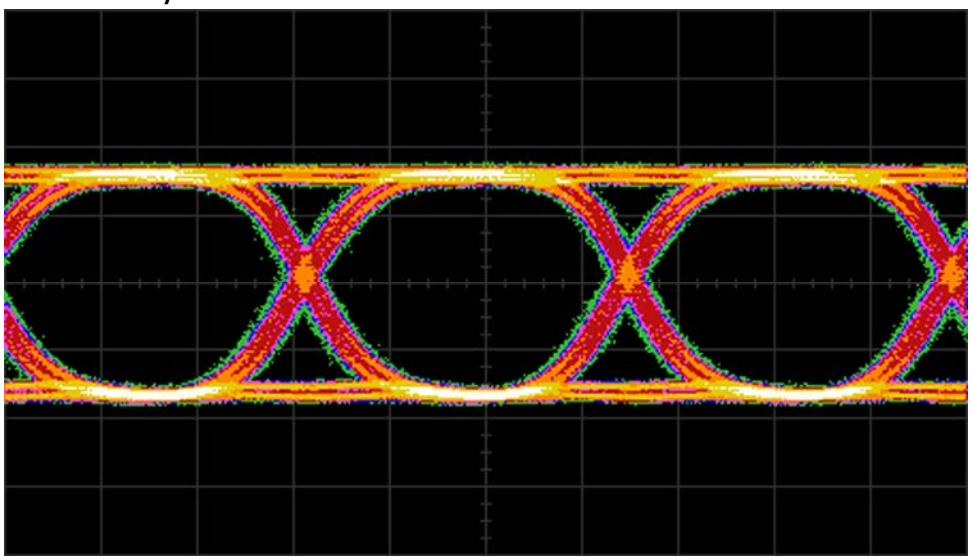

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