

BTeV Pixel System Cable and Cable Connector Selection - 7/31/01 Revision

100 conductor data cable

3M .025" Pleated Foil Shielded 90201 series

Data sheet:

http://multimedia.mmm.com/mws/mediawebserver.dyn?mmmmmmWUeyAmGQnm_OnmmmT_pxpMMMML-

Cross section dimensions: 2.54"x.06"

Comments: 13 cables for every two ¼ pixel stations. Cables are terminated with Robinson Nugent low profile P50LE series connectors. A total of 780 cables each for the entire Pixel system.

100 conductor data cable termination

Robinson Nugent Low Profile P50LE series Part#: P25LE-100S-TGF

Data sheet: <http://www.robinsonnugent.com/support/page287.pdf>

Drawing: <http://www.robinsonnugent.com/support/page289.pdf>

Comments: Has strain relief and locking/eject mechanism. With locking mechanism in the open position the 100 contact termination has a width of 3.17". With locking mechanism in locked position, width is 3.29". This connector is used to mate to the 100 contact header on the feethrough PCB. A total of 1560 terminations for the entire Pixel system (one on each end of each 100 conductor cable)

28 conductor Low Voltage Analog and Low Voltage Digital cable

3M .100" Round Conductor Flat Cable 8124 Series. 22AWG.

Data sheet:

http://multimedia.mmm.com/mws/mediawebserver.dyn?ffffff5myruf_3GfT3GffhPWQiFFFFd-

Cross section dimensions: 2.768"x.06"

Comments: With 22AWG over 30' @ 1A, the voltage drop should be ~500mV (22AWG is 16.8Ω per 1000'). Of the 28 conductors, 14 are power, and 14 are ground. There is 1 cable for 1 pixel ¼ station. Conductors will need to be zipped apart for discrete termination with Hirose Electric crimp and socket. A total of 248 cables for the entire Pixel System.

28 conductor Low Voltage cable termination

Hirose Electric DF11 series Crimp Socket

Product #: DF11-28DS-2C

<http://www.hirose.com/cat98e/pdf/internal/edf11005.pdf>

Comments: This connector is used to terminate the both the low voltage analog and low voltage digital cables. This is a discrete wire termination, so the low voltage cable will need to be zipped into discrete wires. Digi-Key Catalog Q012 p.45. A total of 496 terminations for the entire Pixel system (one on each end of each 28 conductor low voltage cable).

Low Voltage cable termination socket crimp

Hirose Electric DF11 series Crimp Socket

Product #: DF11-22SC

<http://www.hirose.com/cat98e/pdf/internal/edf11011.pdf>

This socket crimp is used for both the low voltage analog and low voltage digital cable. For crimping 22AWG wire. Crimps are housed in the 28 conductor DF11 series Crimp Socket. Digi-Key Catalog Q012 p.45. A total of 13,888 crimps (28 for each low voltage cable termination) for the entire Pixel system.

68 conductor Low Voltage Sense cable

3M .025" Pleated Foil Shielded 90201 series

Data sheet:

http://multimedia.mmm.com/mws/mediawebserver.dyn?mmmmmmWUeyAmGQnm_QnmmmT_pxpMMML-

Cross section dimensions: 1.74"x.06"

Comments: Cable carries both the analog and digital sense for 1 pixel ¼ station. A total of 124 cables for the entire Pixel system.

68 conductor low voltage sense termination

Robinson Nugent Low Profile P50LE series Part#: P25LE-068S-TGF

Data sheet: <http://www.robinsonnugent.com/support/page287.pdf>

Drawing: <http://www.robinsonnugent.com/support/page289.pdf>

Comments: Has strain relief and locking/eject mechanism. With locking mechanism in the open position, width is 2.38" (68 contact). With locking mechanism in locked position, width is 2.50". This connector is used to mate to the 68 contact header on the feethrough PCB. A total of 248 terminations for the entire Pixel system (1 for each end of each 68 conductor low voltage sense cable).

High Voltage wire

Discrete wire: Daburn #2722/22, 22AWG, 5kVDC rated.

Data sheet: <http://www.daburn.com/2722.html>

Outer Diameter each wire: .1”

Comments: 56 Discrete wires are made into a bundle. 56 discrete wires for every 2 pixel ¼ stations. Of the 56 conductors, 28 are high voltage (operated at 1kV DC max) and 28 are GND. Wires are enclosed in a zipperable shield. Wires are soldered directly from the feedthrough PCB to a 56 position HV connector plug. Approximate bundle cross section of 56 discrete wires (assuming square packing): $56 \times .1 \times .1 = .56$ sq in. A total of 3472 HV discrete wires for the entire Pixel system. A total of 60 bundles of 56 wires and 4 bundles of 28 wires for the entire Pixel system. Digi-Key Catalog Q012 p.571.

High Voltage Connector Plug

EDAC inc 516 series 56 position Plug: EDAC #516-056-000-301

Data sheet: <http://www.edac.net/Series516-1.htm>

Comments: This connector is used to terminate the high voltage wire pigtailed from the feedthrough board. It is mated to the high voltage connector receptacle. This plug can be used for both the 56 HV wire bundles and the 28 HV wire bundles. A total of 64 HV connector plugs for the entire pixel system (not accounting for the connector at the HV supply end). Digi-Key Catalog Q012 p.173.

High Voltage Connector Receptacle

EDAC inc 516 series 56 position Plug: EDAC #516-056-000-402

Data sheet: <http://www.edac.net/Series516-1.htm>

Comments: This connector is used to terminate the high voltage wire bundle from the HV supply. It is mated to the high voltage connector plug. This receptacle can be used for both the 56 HV wire bundles and the 28 HV wire bundles. A total of 64 HV connector receptacles for the entire pixel system (not accounting for the connector at the HV supply end). Digi-Key Catalog Q012 p.173.

High Voltage Connector Contacts

EDAC inc Solder Eyelet Contacts: EDAC #516-290-500

Comments: Contact is used for both plug and receptacle. Digi-Key Catalog Q012 p.173. A total of 6944 contacts for the entire Pixel system (contacts in both the receptacle and the plug) (not accounting for the connector/contacts at the HV supply end). Digi-Key Catalog Q012 p.173.

High Voltage Connector Metal Connector Cover

EDAC inc cover for plug and receptacle: EDAC #516-230-656

Data sheet: [Data sheet: http://www.edac.net/Series516-1.htm](http://www.edac.net/Series516-1.htm)

Comments: Cover top entry used for both plug and receptacle. Only side entry cover available in Digi-Key. A total of 128 for the entire Pixel system (1 for each HV plug and 1 for each HV receptacle).

High Voltage Wire Bundle Shield

Chomerics ZIP-EX-2 Zippered Cable Shielding.

Data sheet: http://www.chomerics.com/products/zippered_cable_shielding.htm

Comments: For 56 HV wires, will need ~2.5" inner diameter. A total of 64 wire bundle shields for the entire Pixel system (1 for each HV wire bundle).