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NI Connector Reference Library for Multisim & Ultiboard

Updated Nov 19, 2021

Overview

This document provides engineers with a group of connectors (symbols and landpatterns/footprints) for you to define custom circuitry, breakout boards, user defined modules and daughter cards for NI hardware.

These symbols and footprints for NI circuit design tools represent common interface connectors to NI DAQ, Single-Board RIO and CompactRIO.

All symbols and footprints for these connectors are free for you to use in NI Multisim capture (schematic symbols), and NI Ultiboard layout (footprints). By leveraging these resources, you can quickly and easily build custom hardware that interface complex signals to your prototypes.

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- Why do I need these Connectors?
- Resource Content
- NI Hardware Connectors
- Installing your Database Update

Why do I need these Connectors?

Defining symbols and footprints for hardware specific connectors can be both time consuming and difficult. Ensuring that pin spacing, mapping and dimensions are all correct can take as much as a few hours to design.

Engineers who use NI hardware products must sometimes expand their hardware needs outside of off-the-shelf parts. For example it may be necessary to take the output from a DAQ card, and use a break-out board to break out each individual signal for specific use. For prototyping platforms such as CompactRIO or Single-Board RIO, you may need to create some form of accessory such as a C-Series Module, or daughter card, which will allow you to do perform additional conditioning upon a signal.

Due to the custom nature of such designs, you need access specific connectors. Much of this information can be found within datasheets, but can be difficult to either read, or time consuming to create manually. As such the ability to have these connectors in a readily available form – ready to use within your NI Multisim and NI Ultiboard design tools - can significantly aid the design process.

Support of Connectors

These connectors have been made available through our Applications Engineering and Marketing department, however are not supported components. They can assist you in completing your design needs, but are not a product to be purchased or supported through Technical Support, as an individual product.

Software Requirements

You will require the Circuit Design Suite software (containing Multisim and Ultiboard) to be able to utilize the attached resources. You can download an evaluation edition of Multisim and Ultiboard at the following online destination.

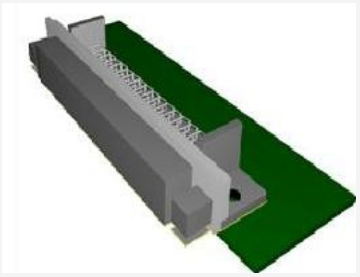
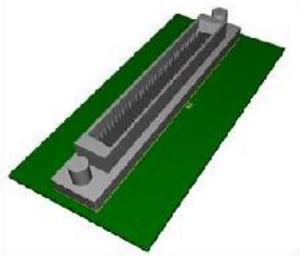
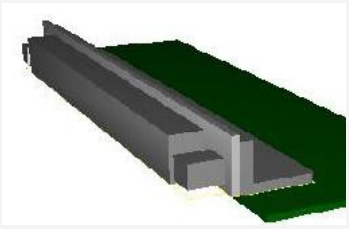
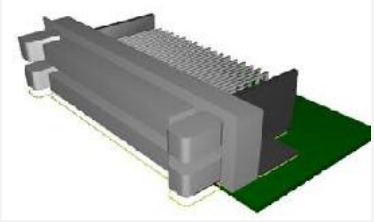
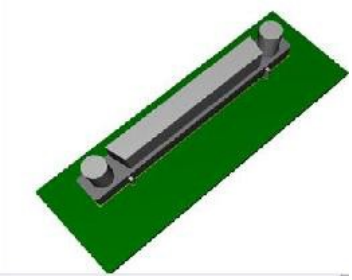
To learn more about licensing options please visit the following link.

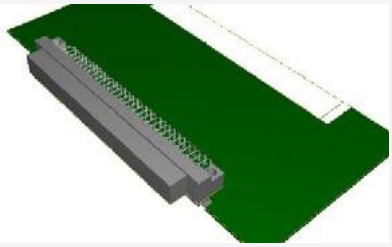
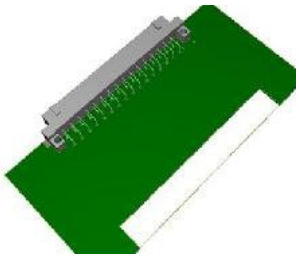
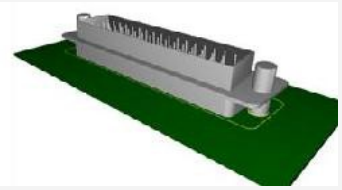
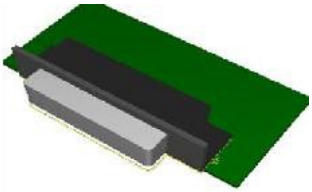
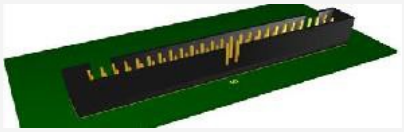
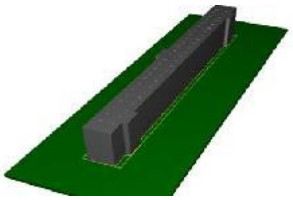
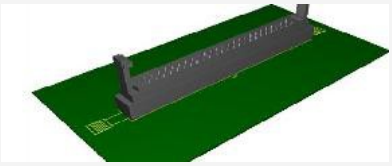
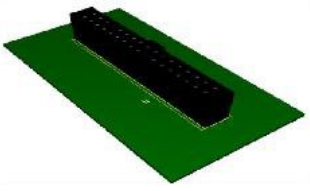
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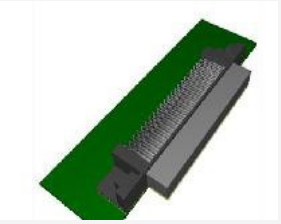
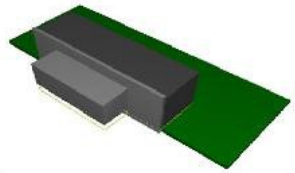
In this zipped folder attached to this document (**8215_connector_lib.zip**) you fill find the following resources:

1. **... Database/NI_Hardware_db.prz**: This Multisim database file contains symbols for the connectors.
2. **... Database/NI_Hardware_db.usr**: This Ultiboard database file contains footprints for the connectors.
3. **... Datasheets/*.pdf**: You will find attached a folder of datasheets for the corresponding connectors
4. **... Files/NI Hardware Connectors.ewprj:** Ultiboard file containing the landpattern of each associated connector (as well as the 3D image)

NI Hardware Connectors

Connector	Details	Image
Conn_68pin_DAQ_SCSI_Male_RA ***Part Number:*** **777600-01 (connector + screw jack socket)**	▪ **NI 68 Pin connector in Right Angle configuration.** ▪ **Connector is common for E, M and R Series DAQ Accessories.** ▪ **Examples include CB-68LPR, SCB-68, many others**	
Conn_68pin_DAQ_SCSI_Male_VERT ***Part Number:*****777601-01 (connector + screw jack socket)**	▪ **NI 68 Pin connector in Vertical configuration.** ▪ **Connector type is common for E, M and R Series DAQ Accessories.** ▪ **Example: CB-68LP, TBX-68**	
Conn_100pin_SCSI_Female_Vert ***Part Number*****: 777779-01**	▪ **NI 100 Pin SCSI Connectors (common for 100 pin DAQ products)**	
Conn_68pin_VHDCI_RCPT_RA ***Part Number*****: 785633-01 (connector + screw jack socket)**	▪ **NI 68 Pin VHDCI Connectors in single stack, right-angle configuration (common for HSDIO boards)**	
Conn_68pin_VHDCI_RCPT_RA_DUAL ***Part Number*****: 785634-01 (connector + screw jack socket)**	▪ **NI 68 Pin VHDCI Connectors in dual stack, right-angle configuration (common for HSDIO boards)**	
Conn_68pin_VHDCI_RCPT_VERT ***Part Number*****: 785753-01 (connector + screw jack socket)**	▪ **NI 68 Pin VHDCI Connectors in vertical configuration (common for HSDIO boards)**	

CONN_96pin_DIN_FEMALE_RA ***Part Number*: 777687-81K (as a kit - kit includes connector + mechanical enclosure and strain relief)**	▪ **NI 96 Pin DIN Connectors (commonly used in most SCXI terminal blocks)** ▪ **Example: SCXI-1302, SCXI-1300 (Note: for high voltage SCXI connector, see 32pin DIN connector)**	
CONN_32pin_DIN_FEMALE_RA	▪ **NI 32 Pin DIN Connectors (commonly used in SCXI terminal blocks for isolated SCXI modules)** ▪ **Example: SCXI-1327, SCXI-1313, SCXI-1321**	
CONN_50pin_DSUB_MALE_VERT	▪ **50 Pin 3 row DSUB Connectors (Switch terminal blocks for high density 2575 switches)** ▪ **Example: TBX-50**	
CONN_37pin_DSUB_FEMALE_RA	▪ **37 pin DSUB Connectors (accessory for 37 pin devices such as NI-6221 or cRIO NI-9205 DSUB)** ▪ **Example: NI CB-37F-LP, NI-9933**	
CONN_50pin_IDC_MALE_VERT	▪ **50 pin IDC header (Used on sbRIO products)**	
Conn_50pin_IDC_Female_Vert	▪ **50 pin IDC receptacle (Used on custom sbRIO daughter cards for DIO and AI 50pin headers)**	
Conn_50pin_IDC_Latch_Male_Vert	▪ **50 pin IDC header with a cable latch (Used on several legacy E series accessory products)** ▪ **Example: SC-2070, AMUX-64T**	
Conn_34pin_IDC_Female_Vert	▪ **34 pin IDC receptacle (Used for sbRIO daughter card – analog output)**	

Conn_176pin_HD_RA	▪ **176 pin HD receptacle (Used for some high density switch modules)**	
Conn_25pin_Infiniband_4x	▪ **25 pin Infiniband 4X Connector (Used on NI-449X Dynamic Signal Acquisition Devices)**	
Conn_73pin_Infiniband_12x ***Part Number*: 779157-01**	▪ **73 pin Infiniband 12X Connector (Used on some NI HSDIO devices with SHB12X-B12X Cable)**	

Connectors Format

Each of the connectors included in this online resource have generic pin mappings. This means although the connector landpattern are defined accurately for physical shape, size and format (all to IPC standards), the specific pin names for each individual connector are not contained.

For additional information on the specific pin names for each 'product' please consult the product specific links above to see pin mappings.

Installing your Database Update

To install the attached custom connectors (from **8215_connector_lib.zip**)in your database:

Multisim:

1. Open Multisim (**Start > All Programs > National Instruments > Circuit Design Suite 10.1 > Multisim 10.1**).
2. Double-click on the **NI_Hardware_DB.prz** file.
3. In the *Database Merge* dialog box select *User Database* as the Target Database
4. Click on the **Start** button.
5. Once status is "Done" click on the **Close** button.

Ultiboard:

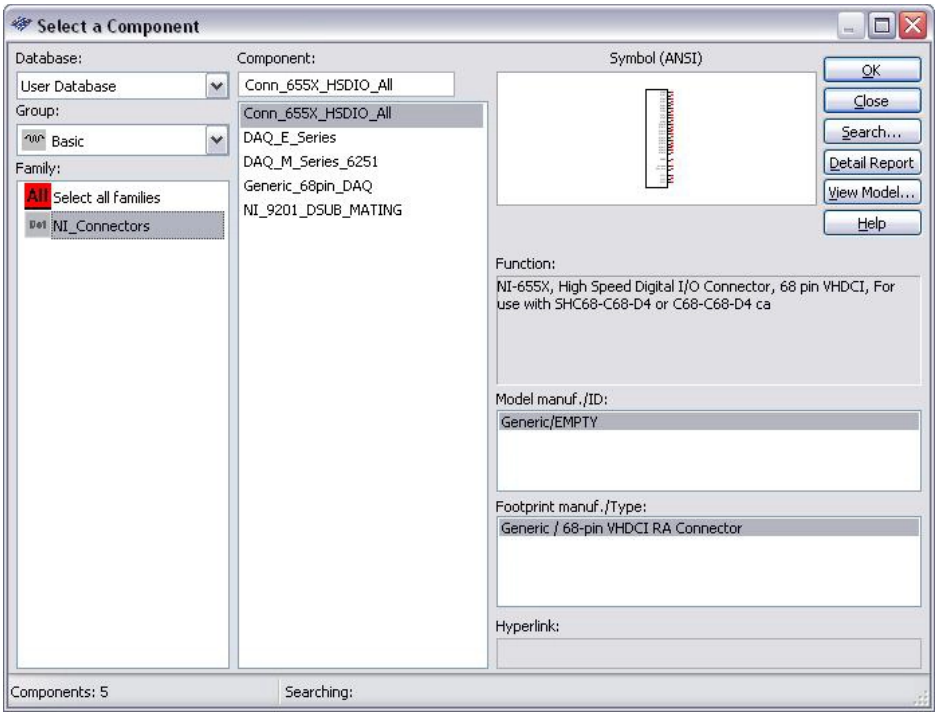
1. Open Ultiboard (**Start > All Programs > National Instruments > Circuit Design Suite 10.1 > Ultiboard 10.1**).
2. Select **Tools > Database > Merge Database...**
3. Select the **User Database** as the Target Database
4. Click on **Select a Component Database Name** button
5. Browse to the **NI_Hardware_db.usr** database file, and click on **Open.**
6. Click on the **Start** button.
7. Select the **Auto-Rename** option.
8. Click on **OK.**
9. Once status is "Done" click on the **Close** button.

Using the Components

To view these connectors in Multisim, simply:

1. Open Multisim (Start >> All Programs >> National Instruments >> Circuit Design Suite 10.1 >> Multisim 10.1).
2. Open the database interface (Place >> Components).
3. Select the **User Database** in the database field.
4. Select the **Basic** group in the group field.
5. Select the **NI_Connectors** family.

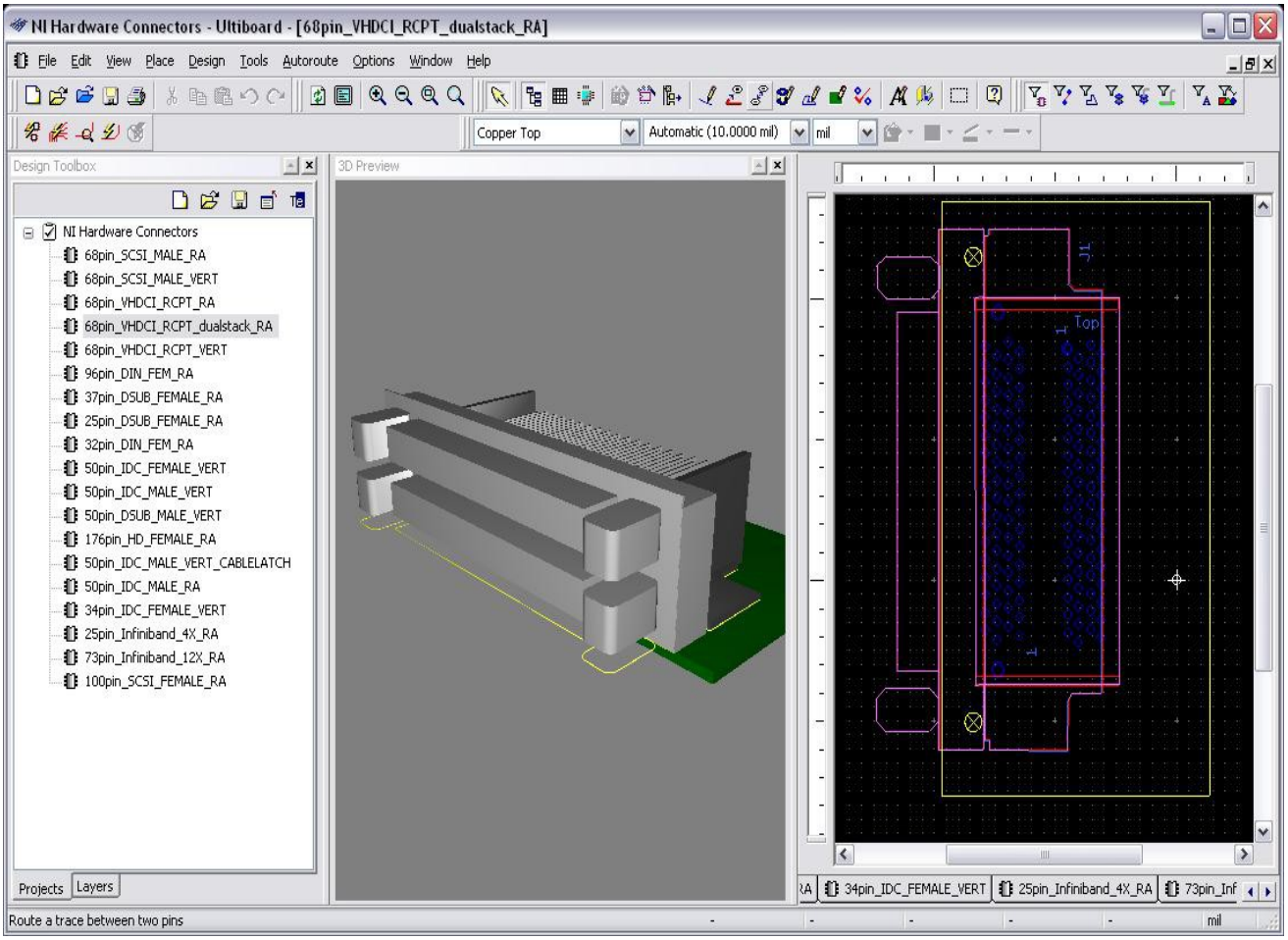
You can now place any of the connector components, by selecting the component and clicking on **OK**.



You can also open the attached Ultiboard file (...Files/NI Hardware Connectors.ewprj), and view the landpattern and 3D image for each of these landpatterns:

1. Open Ultiboard (Start >> All Programs >> National Instruments >> Circuit Design Suite 10.1 >> Ultiboard 10.1).
2. Select **File > Open**
3. Browse to the **NI Hardware Connectors.ewprj** file
4. Click on the **Open** button
5. Select **View > 3D Preview**

You will now see a multiple layout project which shows the landpattern and 3D view of each NI hardware connector.



Downloads

8215_connector_lib.zip

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