



COM Express™ conga-Cdebug

Detailed description of the conga-Cdebug, a COM Express™ evaluation and debug card

User's Guide

Revision 1.0



Revision History

Revision	Date (dd.mm.yy)	Author	Changes
1.0	11.12.07	GDA	Official release

Preface

This user's guide provides information about the components, features and connectors available on the conga-Cdebug card.

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Intended Audience

This user's guide is intended for technically qualified personnel. It is not intended for general audiences.



Symbols

The following symbols are used in this user's guide:



Warnings indicate conditions that, if not observed, can cause personal injury.



Cautions warn the user about how to prevent damage to hardware or loss of data.

Note

Notes call attention to important information that should be observed.



Describes the connector that must be used with the conga-Cdebug card, not the connector found on the conga-Cdebug card.



Link to connector layout diagram

This link icon is located in the top left corner of each page. It provides a direct link to the connector layout diagram on page 9 of this document.

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Terminology

Term	Description			
PCI Express (PCIe)	Peripheral Component Interface Express – next-generation high speed Serialized I/O bus			
PCI Express Lane One PCI Express Lane is a set of 4 signals that contains two differential lines for				
	Transmitter and two differential lines for Receiver. Clocking information is embedded into the data stream.			
USB	Universal Serial Bus			
SATA	Serial AT Attachment: serial-interface standard for hard disks			
LPC	Low Pin-Count Interface: a low speed interface used for peripheral circuits such as Super I/O controllers, which typically combine legacy-device support into a single IC.			
I ² C Bus	Inter-Integrated Circuit Bus: is a simple two-wire bus with a software-defined protocol that was developed to provide the communications link between integrated circuits in			
	a system.			
CRT	Cathode Ray Tube			
DDC	Display Data Channel is an I ² C bus interface between a display and a graphics adapter.			
N.C.	Not connected			
N.A.	Not available			
T.B.D.	To be determined			

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Electrostatic Sensitive Device



All electronic parts described in this user's guide are electrostatic sensitive devices and are packaged accordingly. Do not open or handle a carrier board or module except at an electrostatic-free workstation. Additionally, do not ship or store electronic devices near strong electrostatic, electromagnetic, magnetic, or radioactive fields unless the device is contained within its original manufacturer's packaging.



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Concept of COM Express™

The concept of Computer On Modules or COMs are off the shelf technology in embedded computer industries since years. A Computer On Module integrates all the core components and standard I/O interfaces of a common PC onto an application specific carrier board. The key advantage of the COM in the embedded computer industries is, that all high integrated, high speed components like CPU, chipsets and memory are combined on a small module form factor for easy adaptation into different applications across multiple market segments.

COM Express[™] modules have standardized form factors and have specified pinouts on the two system connectors that remain the same regardless of the vendor. The COM Express[™] module reflects the functional requirements for a wide range of embedded applications. These functions include, but are not limited to PCI Express, PCI, Graphics, High Definition Audio, parallel ATA, serial ATA, Gigabit Ethernet and USB 2.0 ports. Two ruggedized, shielded connectors provide the carrier board interface and carry all the I/O signals to and from the COM Express[™] module.

Carrier board designers can utilize as little or as many of the I/O interfaces as deemed necessary. Therefore the carrier board can provide all the interface connectors required to attach the system to the application specific peripherals. This versatility allows the designer to create a dense and optimized package, which results in a more reliable product while simplifying system integration. Most importantly COM Express™ applications are scalable, which means once a product has been created there is the ability to diversify the product range through the use of different performance class COM Express™ modules. Simply unplug one module and replace it with another, no redesign is necessary.

Lead-Free Designs (RoHS)

All congatec AG designs are created from lead-free components and are completely RoHS compliant.

Certification

congatec AG is certified to DIN EN ISO 9001:2000 standard.





Contents

1	Introduction	8
2	Connector Layout	9
3	conga-Cdebug and CEEA	10
4	Specifications	
4.1 4.2	Mechanical Dimensions Environmental Specifications	
5	Connector Descriptions	12
5.1 5.2 5.3 5.4 5.5 5.6 5.7 5.8	Connector Pinout XAB_UP and XAB_DOWN Connector Pinout XCD_UP and XCD_DOWN Connector X1 JTAG Connectors X2 and X4 USB Connector X5 VGA Connector X6 Power Power and Reset Buttons Connectors X8 and X9 SATA	
6	Additional Features	
6.1 6.2 6.3 6.4 6.4.1 6.4.2 6.4.3 6.4.4	DIP Switch M2 PLCC Socket S1 Debug Display LEDs Green LEDs Yellow LEDs Red LEDs Test Points	
7	Mechanical Drawing conga-Cdebug	22
8	Industry Specifications	23



1 Introduction

The conga-Cdebug is a COM Express[™] module debug platform and evaluation card. It has a 3.5" Floppy Power Connector and therefore can be used as a carrier board for the COM Express[™] module on it's own. It's also possible to use the conga-Cdebug as a transparent debug interface between your application specific carrier board and the COM Express[™] module.

conga-Cdebug features:

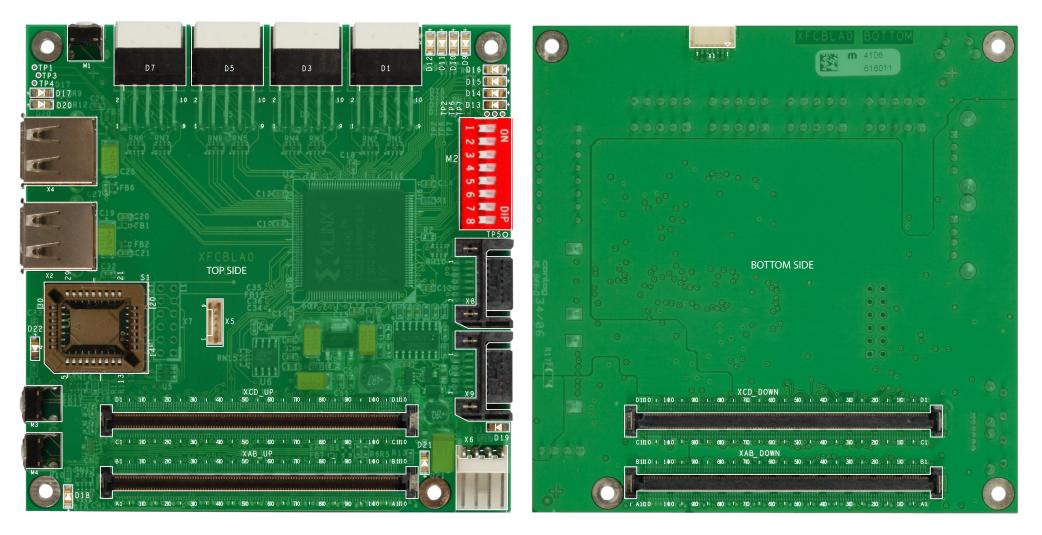
- LPC Bus and PCI Bus PORT80 Postcode Display
- PLCC socket for LPC Firmware Hub Flash (FWH), which helps to evaluate customized BIOS versions
- 2x SATA Connector provides access to SATA devices
- Power Connector for baseboard independent operation
- VGA / USB peripheral connectors that provide full debug capabilities
- Power and Reset Buttons
- 4x Status LED's for Command Byte Enable (CBE), which shows PCI bus activity

The conga-Cdebug is supplied with the necessary cables required for connecting VGA.



2 Connector Layout

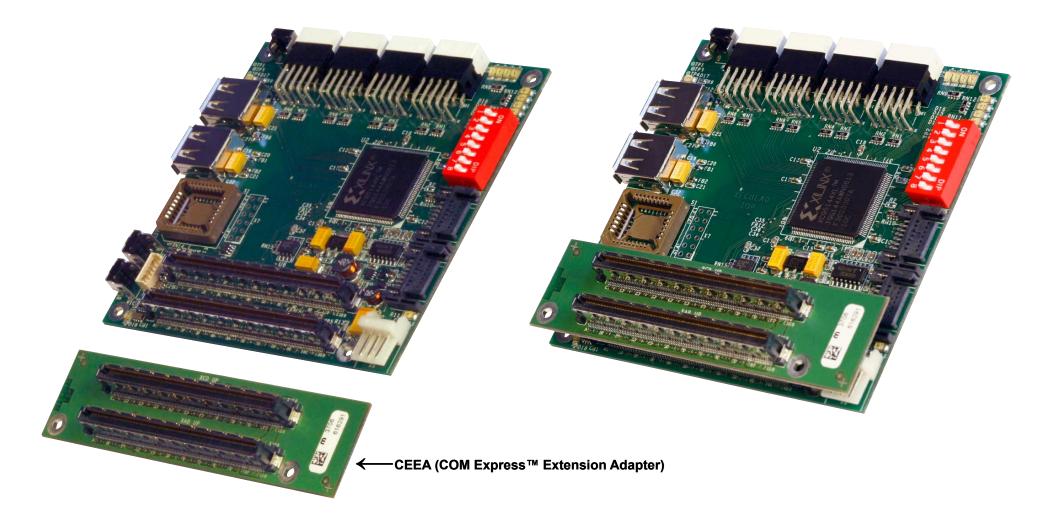
The connector layout pictures below feature a component description overlay that includes pinout indicators as well as name designators. Pin 1 is marked with a quadratic pad on the bottom side of the conga-Cdebug. Select the Adobe 'Zoom-In-Tool' and zoom in on a given component to see the descriptive text. Hover over the component and the 'Zoom-In-Tool' will change indicating there is a link. Click on the link to navigate to the area in the document where the component is described in detail. Use the mouse icon in the top left hand corner of the destination page to return to the connector layout picture.





3 conga-Cdebug and CEEA

The conga-Cdebug is supplied with a CEEA (COM Express[™] Extension Adapter) that can be inserted between the conga-Cdebug and COM Express[™] module for a better mechanical fit by providing more clearance between the module and debug card. The adapter is a simple passive connection from the conga-Cdebug connectors to the module connectors. Although it's not mandatory it's highly recommend that this adapter be used. The conga-Cdebug is pictured below with and without the CEEA installed.





4 Specifications

4.1 Mechanical Dimensions

- 95mm x 95mm
- Height approx. 13mm

4.2 Environmental Specifications

TemperatureOperation:0° to 60°CStorage:-20° to +80°CHumidityOperation:10% to 90%Storage: 5% to 95%



The above operating temperatures must be strictly adhered to at all times. The maximum operating temperature refers to any measurable spot on the modules surface.

Humidity specifications are for non-condensing conditions.



5 Connector Descriptions

5.1 Connector Pinout XAB_UP and XAB_DOWN

Module Type 2 Connector Pinout Rows A and B

Pin	Row A	Pin	Row B	Pin	Row A	Pin	Row B
A1	GND (FIXED)	B1	GND (FIXED)	A56	PCIE_TX4-	B56	PCIE_RX4-
A2	GBE0_MDI3-	B2	GBE0_ACT#	A57	GND	B57	GPO2
A3	GBE0_MDI3+	B3	LPC_FRAME#	A58	PCIE_TX3+	B58	PCIE_RX3+
A4	GBE0_LINK100#	B4	LPC_AD0	A59	PCIE_TX3-	B59	PCIE_RX3-
A5	GBE0_LINK1000#	B5	LPC_AD1	A60	GND (FIXED)	B60	GND (FIXED)
A6	GBE0_MDI2-	B6	LPC_AD2	A61	PCIE_TX2+	B61	PCIE_RX2+
A7	GBE0_MDI2+	B7	LPC_AD3	A62	PCIE_TX2-	B62	PCIE_RX2-
A8	GBE0_LINK#	B8	LPC_DRQ0#	A63	GPI1	B63	GPO3
A9	GBE0_MDI1-	B9	LPC_DRQ1#	A64	PCIE_TX1+	B64	PCIE_RX1+
A10	GBE0_MDI1+	B10	LPC_CLK	A65	PCIE_TX1-	B65	PCIE_RX1-
A11	GND (FIXED)	B11	GND (FIXED)	A66	GND	B66	WAKE0#
A12	GBE0_MDI0-	B12	PWRBTN#	A67	GPI2	B67	WAKE1#
A13	GBE0_MDI0+	B13	SMB_CK	A68	PCIE_TX0+	B68	PCIE_RX0+
A14	GBE0_CTREF	B14	SMB_DAT	A69	PCIE_TX0-	B69	PCIE_RX0-
A15	SUS_S3#	B15	SMB_ALERT#	A70	GND (FIXED)	B70	GND (FIXED)
A16	SATA0_TX+	B16	SATA1_TX+	A71	LVDS_A0+	B71	LVDS_B0+
A17	SATA0_TX-	B17	SATA1_TX-	A72	LVDS_A0-	B72	LVDS_B0-
A18	SUS_S4#	B18	SUS_STAT#	A73	LVDS_A1+	B73	LVDS_B1+
A19	SATA0_RX+	B19	SATA1_RX+	A74	LVDS_A1-	B74	LVDS_B1-
A20	SATA0_RX-	B20	SATA1_RX-	A75	LVDS_A2+	B75	LVDS_B2+
A21	GND (FIXED)	B21	GND (FIXED)	A76	LVDS_A2-	B76	LVDS_B2-
A22	SATA2_TX+	B22	SATA3_TX+	A77	LVDS_VDD_EN	B77	LVDS_B3+
A23	SATA2_TX-	B23	SATA3_TX-	A78	LVDS_A3+	B78	LVDS_B3-
A24	SUS_S5#	B24	PWR_OK	A79	LVDS_A3-	B79	LVDS_BKLT_EN
A25	SATA2_RX+	B25	SATA3_RX+	A80	GND (FIXED)	B80	GND (FIXED)
A26	SATA2_RX-	B26	SATA3_RX-	A81	LVDS_A_CK+	B81	LVDS_B_CK+
A27	BATLOW#	B27	WDT	A82	LVDS_A_CK-	B82	LVDS_B_CK-
A28	ATA_ACT#	B28	AC_SDIN2	A83	LVDS_I2C_CK	B83	LVDS_BKLT_CTRL
A29	AC_SYNC	B29	AC_SDIN1	A84	LVDS_I2C_DAT	B84	VCC_5V_SBY
A30	AC_RST#	B30	AC_SDIN0	A85	GPI3	B85	VCC_5V_SBY
A31	GND (FIXED)	B31	GND (FIXED)	A86	KBD_RST#	B86	VCC_5V_SBY
A32	AC_BITCLK	B32	SPKR	A87	KBD_A20GATE	B87	VCC_5V_SBY

- PCI Express
- SATA
- USB
- Digital Audio Interface
- Gigabit Ethernet
- LPC Bus
- I²C Bus
- VGA
- LVDS
- TV-Out
- Power Control
- Power Management





Dim	Dow A	Din	Dow D	Din		Dim	Dow P
Pin	Row A	Pin	Row B	Pin	Row A	Pin	Row B
A33	AC_SDOUT	B33	I2C_CK	A88	PCIE0_CK_REF+	B88	RSVD
A34	BIOS_DISABLE#	B34	I2C_DAT	A89	PCIE0_CK_REF-	B89	VGA_RED
A35	THRMTRIP#	B35	THRM#	A90	GND (FIXED)	B90	GND (FIXED)
A36	USB6-	B36	USB7-	A91	RSVD	B91	VGA_GRN
A37	USB6+	B37	USB7+	A92	RSVD	B92	VGA_BLU
A38	USB_6_7_OC#	B38	USB_4_5_OC#	A93	GPO0	B93	VGA_HSYNC
A39	USB4-	B39	USB5-	A94	RSVD	B94	VGA_VSYNC
A40	USB4+	B40	USB5+	A95	RSVD	B95	VGA_I2C_CK
A41	GND (FIXED)	B41	GND (FIXED)	A96	GND	B96	VGA_I2C_DAT
A42	USB2-	B42	USB3-	A97	VCC_12V	B97	TV_DAC_A
A43	USB2+	B43	USB3+	A98	VCC_12V	B98	TV_DAC_B
A44	USB_2_3_OC#	B44	USB_0_1_OC#	A99	VCC_12V	B99	TV_DAC_C
A45	USB0-	B45	USB1-	A100	GND (FIXED)	B100	GND (FIXED)
A46	USB0+	B46	USB1+	A101	VCC_12V	B101	VCC_12V
A47	VCC_RTC	B47	EXCD1_PERST#	A102	VCC_12V	B102	VCC_12V
A48	EXCD0_PERST#	B48	EXCD1_CPPE#	A103	VCC_12V	B103	VCC_12V
A49	EXCD0_CPPE#	B49	SYS_RESET#	A104	VCC_12V	B104	VCC_12V
A50	LPC_SERIRQ	B50	CB_RESET#	A105	VCC_12V	B105	VCC_12V
A51	GND (FIXED)	B51	GND (FIXED)	A106	VCC_12V	B106	VCC_12V
A52	PCIE_TX5+	B52	PCIE_RX5+	A107	VCC_12V	B107	VCC_12V
A53	PCIE_TX5-	B53	PCIE_RX5-	A108	VCC_12V	B108	VCC_12V
A54	GPI0	B54	GPO1	A109	VCC_12V	B109	VCC_12V
A55	PCIE_TX4+	B55	PCIE_RX4+	A110	GND (FIXED)	B110	GND (FIXED)





5.2 Connector Pinout XCD_UP and XCD_DOWN

Module Type 2 Connector Pinout Rows C and D

Pin	Row C	Pin	Row D	Pin	Row C	Pin	Row D
C1	GND (FIXED)	D1	GND (FIXED)	C56	PEG_RX1-	D56	PEG_TX1-
C2	IDE_D7	D2	IDE_D5	C57	TYPE1#	D57	TYPE2#
C3	IDE_D6	D3	IDE_D10	C58	PEG_RX2+	D58	PEG_TX2+
C4	IDE_D3	D4	IDE_D11	C59	PEG_RX2-	D59	PEG_TX2-
C5	IDE_D15	D5	IDE_D12	C60	GND (FIXED)	D60	GND (FIXED)
C6	IDE_D8	D6	IDE_D4	C61	PEG_RX3+	D61	PEG_TX3+
C7	IDE_D9	D7	IDE_D0	C62	PEG_RX3-	D62	PEG_TX3-
C8	IDE_D2	D8	IDE_REQ	C63	RSVD	D63	RSVD
C9	IDE_D13	D9	IDE_IOW#	C64	RSVD	D64	RSVD
C10	IDE_D1	D10	IDE_ACK#	C65	PEG_RX4+	D65	PEG_TX4+
C11	GND (FIXED)	D11	GND (FIXED)	C66	PEG_RX4-	D66	PEG_TX4-
C12	IDE_D14	D12	IDE_IRQ	C67	FAN_PWMOUT	D67	GND
C13	IDE_IORDY	D13	IDE_A0	C68	PEG_RX5+	D68	PEG_TX5+
C14	IDE_IOR#	D14	IDE_A1	C69	PEG_RX5-	D69	PEG_TX5-
C15	PCI_PME#	D15	IDE_A2	C70	GND (FIXED)	D70	GND (FIXED)
C16	PCI_GNT2#	D16	IDE_CS1#	C71	PEG_RX6+	D71	PEG_TX6+
C17	PCI_REQ2#	D17	IDE_CS3#	C72	PEG_RX6-	D72	PEG_TX6-
C18	PCI_GNT1#	D18	IDE_RESET#	C73	SDVO_DATA	D73	SVDO_CLK
C19	PCI_REQ1#	D19	PCI_GNT3#	C74	PEG_RX7+	D74	PEG_TX7+
C20	PCI_GNT0#	D20	PCI_REQ3#	C75	PEG_RX7-	D75	PEG_TX7-
C21	GND (FIXED)	D21	GND (FIXED)	C76	GND	D76	GND
C22	PCI_REQ0#	D22	PCI_AD1	C77	FAN_TACHOIN	D77	IDE_CBLID#
C23	PCI_RESET#	D23	PCI_AD3	C78	PEG_RX8+	D78	PEG_TX8+
C24	PCI_AD0	D24	PCI_AD5	C79	PEG_RX8-	D79	PEG_TX8-
C25	PCI_AD2	D25	PCI_AD7	C80	GND (FIXED)	D80	GND (FIXED)
C26	PCI_AD4	D26	PCI_C/BE0#	C81	PEG_RX9+	D81	PEG_TX9+
C27	PCI_AD6	D27	PCI_AD9	C82	PEG_RX9-	D82	PEG_TX9-
C28	PCI_AD8	D28	PCI_AD11	C83	RSVD	D83	RSVD
C29	PCI_AD10	D29	PCI_AD13	C84	GND	D84	GND
C30	PCI_AD12	D30	PCI_AD15	C85	PEG_RX10+	D85	PEG_TX10+
C31	GND (FIXED)	D31	GND (FIXED)	C86	PEG_RX10-	D86	PEG_TX10-
C32	PCI_AD14	D32	PCI_PAR	C87	GND	D87	GND
C33	PCI_C/BE1#	D33	PCI_SERR#	C88	PEG_RX11+	D88	PEG_TX11+
C34	PCI_PERR#	D34	PCI_STOP#	C89	PEG_RX11-	D89	PEG_TX11-
C35	PCI_LOCK#	D35	PCI_TRDY#	C90	GND (FIXED)	D90	GND (FIXED)
C36	PCI_DEVSEL#	D36	PCI_FRAME#	C91	PEG_RX12+	D91	PEG_TX12+

- PCI Express Graphics
- SDVO
- PCI Bus
- IDE



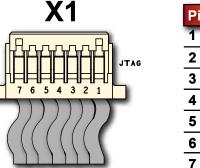


Pin	Row C	Pin	Row D	Pin	Row C	Pin	Row D
C37	PCI_IRDY#	D37	PCI_AD16	C92	PEG_RX12-	D92	PEG_TX12-
C38	PCI_C/BE2#	D38	PCI_AD18	C93	GND	D93	GND
C39	PCI_AD17	D39	PCI_AD20	C94	PEG_RX13+	D94	PEG_TX13+
C40	PCI_AD19	D40	PCI_AD22	C95	PEG_RX13-	D95	PEG_TX13-
C41	GND (FIXED)	D41	GND (FIXED)	C96	GND	D96	GND
C42	PCI_AD21	D42	PCI_AD24	C97	RSVD	D97	PEG_ENABLE#
C43	PCI_AD23	D43	PCI_AD26	C98	PEG_RX14+	D98	PEG_TX14+
C44	PCI_C/BE3#	D44	PCI_AD28	C99	PEG_RX14-	D99	PEG_TX14-
C45	PCI_AD25	D45	PCI_AD30	C100	GND (FIXED)	D100	GND (FIXED)
C46	PCI_AD27	D46	PCI_IRQC#	C101	PEG_RX15+	D101	PEG_TX15+
C47	PCI_AD29	D47	PCI_IRQD#	C102	PEG_RX15-	D102	PEG_TX15-
C48	PCI_AD31	D48	PCI_CLKRUN#	C103	GND	D103	GND
C49	PCI_IRQA#	D49	PCI_M66EN	C104	VCC_12V	D104	VCC_12V
C50	PCI_IRQB#	D50	PCI_CLK	C105	VCC_12V	D105	VCC_12V
C51	GND (FIXED)	D51	GND (FIXED)	C106	VCC_12V	D106	VCC_12V
C52	PEG_RX0+	D52	PEG_TX0+	C107	VCC_12V	D107	VCC_12V
C53	PEG_RX0-	D53	PEG_TX0-	C108	VCC_12V	D108	VCC_12V
C54	TYPE0#	D54	PEG_LANE_RV#	C109	VCC_12V	D109	VCC_12V
C55	PEG_RX1+	D55	PEG_TX1+	C110	GND (FIXED)	D110	GND (FIXED)



5.3 Connector X1 JTAG

Connector X1 provides a JTAG (Joint Test Action Group) connection to the XILINX CPLD located on the conga-Cdebug. It's function is to provide a programmable interface to the the XILINX CPLD. The pinout table describes the pinout of the connector found on the conga-Cdebug.



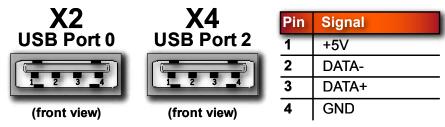
	Pin Signal		
	1	+5V	
-	2	GND	
	3	TCK_XLNX	
	4	Not Connected	
-	5	TDO_XLNX	
	6	TDI_XLNX	
	7	TMS_XLNX	

Connector Type

1.0mm Pitch Wire to Board Connector 7 Pos. (female)

5.4 Connectors X2 and X4 USB

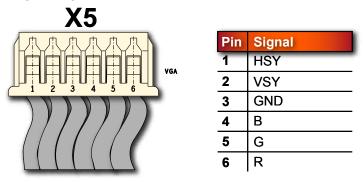
The conga-Cdebug features two USB connectors (X2 and X4) that are connected to USB ports 0 and 2 respectively and these ports originate from COM Express[™] connector rows AB. The connectors are both USB 2.0 and 1.1 compliant and support the connection of USB 2.0 and 1.0 devices.





5.5 Connector X5 VGA

A monitor can be attached to the conga-Cdebug through the use of connector X5. This connection does not support DDC detection.

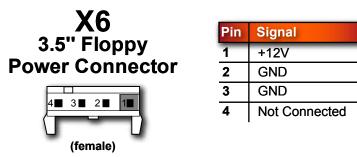


Connector Type

1.25mm Pitch Wire to Board Connector 6 Pos. (female) congatec part number 047245 conga-adapVGA

5.6 Connector X6 Power

The conga-Cdebug has a 3.5" Floppy Power Connector that provides a connection to a 12V power source. This power connector can be used when the conga-Cdebug is to be used as a stand-alone carrier board. If the conga-Cdebug is to be used as a transparent debug interface between your application specific carrier board and the COM Express[™] module, then no power connection is necessary to the conga-Cdebug. The pinout table below describes the pinout of the connector found on the conga-Cdebug.





Standard AT/ATX 3.5" Floppy power connector (female)



5.7 **Power and Reset Buttons**

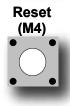
The conga-Cdebug is equipped with a power button (M3) and a reset button (M4).

The power button (M3) can be used to start up the system when the conga-Cdebug is used as a debug interface between your application specific carrier board and the COM Express[™] module. The carrier board must be connected to an ATX power supply for this feature to work. Additionally, the power button can be used to invoke the COM Express[™] module's PWRBTN# signal, which can be helpful when debugging.

The COM Express[™] module and all connected components will perform a hard reset when the reset button (M4) is pressed. The reset button is connected to the COM Express[™] module's SYS_RESET# signal.

Button M1 currently has no function and is reserved for future use.

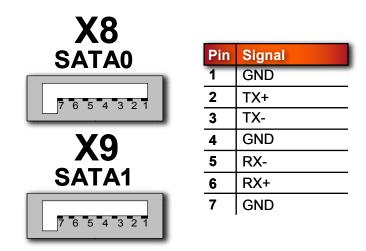






5.8 Connectors X8 and X9 SATA

The conga-Cdebug also offers two SATA connectors (X8 and X9) that are connected to Serial ATA channel 0 and 1 respectively. These channels originate from COM Express™ connector rows AB.







6 Additional Features

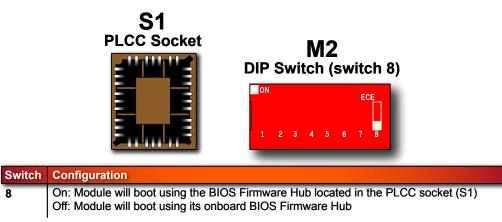
6.1 DIP Switch M2

There is an 8 position DIP Switch located on the conga-Cdebug. It provides the ability to control some of the features of the debug card. Switches 1-7 do not have assigned functions and are reserved for future use. Switch 8 is implemented and its functional description can be found in the table below as well as a picture of the DIP Switch displaying all switches in the 'Off' position.

Switch	Configuration	M-0
1	No function, reserved for future use	M2
2	No function, reserved for future use	DIP Switch
3	No function, reserved for future use	ON
4	No function, reserved for future use	
5	No function, reserved for future use	
6	No function, reserved for future use	1 2 3 4 3 0 7
7	No function, reserved for future use	_
8	On: Module will boot using the BIOS Firmware Hub located in the PLCC socket (S1) Off: Module will boot using its onboard BIOS Firmware Hub	

6.2 PLCC Socket S1

conga-Cdebug includes a 32-lead PLCC socket (S1) for LPC firmware hubs. This can be very useful when a customized BIOS must be evaluated. When using the DIP Switch (M2), the user can configure if the COM Express[™] module should boot from its onboard BIOS firmware hub or from the firmware hub located in the PLCC socket (S1).

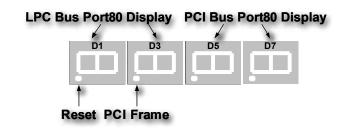






6.3 Debug Display

The conga-Cdebug decodes LPC Bus Port80 and PCI Bus Port80 and displays their contents on 4 seven-segment displays (D1, D3, D5 and D7). During the POST (Power On Self Test), the BIOS generates diagnostic progress codes (POST-codes) to I/O port 80h. If the POST fails, execution stops and the last POST code generated is left at the respective port. This code is useful for determining the point where an error occurred. The dots in the first two displays show the state of the Reset and the PCI Frame signals.

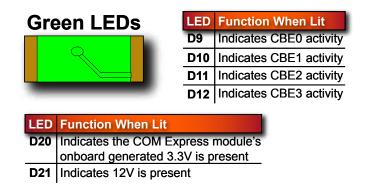


6.4 LEDs

The conga-Cdebug has several LEDs that indicate certain activities and events. These LEDs can either display the color green, yellow, or red depending on their function. The following sections describe the LEDs functions. Each LED has been named using the letter 'D' and a number, for example 'D9'. Refer to the connector diagram on page 9 for their location on the conga-Cdebug.

6.4.1 Green LEDs

There are total of six green LEDs located on the conga-Cdebug. LEDs D9-D12 indicate PCI Bus activity by displaying the activity of the PCI Bus Command and Byte Enables signals. A description of the green LEDs can be found in the tables below.

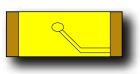




6.4.2 Yellow LEDs

There are also a total of six yellow LEDs located on the conga-Cdebug. LEDs D9-D12 are currently not functional and are reserved for future use. A detailed of the yellow LEDs can be found in the tables below.

Yellow LEDs

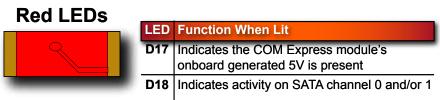


	LED	Function When Lit
		No function, reserved for future use
	D14	No function, reserved for future use
	D15	No function, reserved for future use
	D16	No function, reserved for future use

I.	LED	Function When Lit
	D19	Indicates 5VSB is present
•	D22	Indicates that the COM Express module is booting usir
•		theBIOS Firmware Hub located in the PLCC socket (S

6.4.3 Red LEDs

There are two red LEDs found on the conga-Cdebug. A description of them can be found in the table below.



6.4.4 Test Points

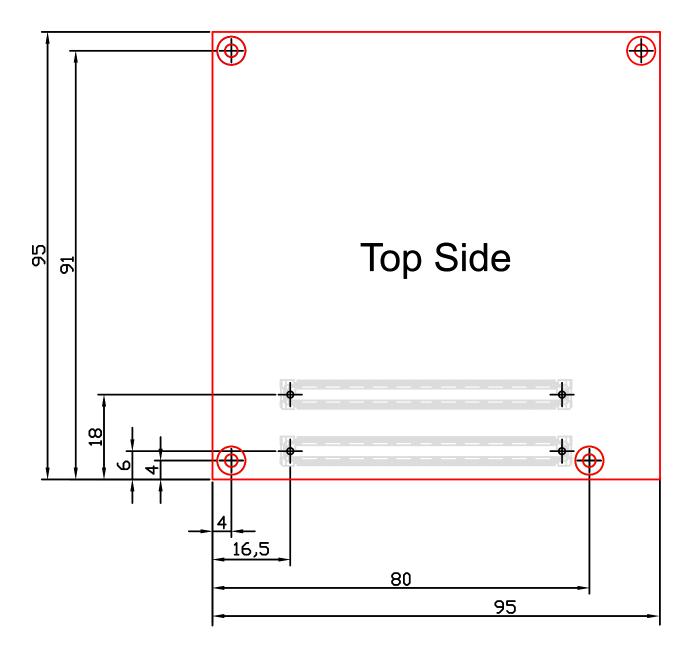
The conga-Cdebug has seven test points (TP) that are directly connected to the XILINX CPLD. Each TP has been named using the letters 'TP' and a number, for example 'TP5'. Refer to the connector diagram on page 9 for their location on the conga-Cdebug. The test point functions have yet to be defined and are reserved for future use.

TP	(test point)

TP	Function
TP1	No function, reserved for future use
TP2	No function, reserved for future use
TP3	No function, reserved for future use
TP4	No function, reserved for future use
TP5	No function, reserved for future use
TP6	No function, reserved for future use
TP7	No function, reserved for future use



7 Mechanical Drawing conga-Cdebug





8 Industry Specifications

The list below provides links to industry specifications that apply to congatec AG COM Express™ modules.

Specification	Link
PICMG [®] COM Express Module [™] Base Specification	http://www.picmg.org/
PCI Express Base Specification, Revision 2.0	http://www.pcisig.com/specifications
PCI Local Bus Specification, Revision 2.3	http://www.pcisig.com/specifications
Universal Serial Bus (USB) Specification, Revision 2.0	http://www.usb.org/home
ExpressCard Standard Release 1.0	http://www.expresscard.org/
Serial ATA Specification, Revision 1.0a	http://www.serialata.org
Low Pin Count Interface Specification, Revision 1.0 (LPC)	http://developer.intel.com/design/chipsets/industry/lpc.htm
Audio Codec '97 Component Specification, Version 2.3	http://www.intel.com/design/chipsets/audio/
High Definition Audio Specification, Rev. 1.0	http://www.intel.com/standards/hdaudio/
LVDS Owner's Manual	http://www.national.com
Extended Display Identification Data Standard Version 1.3 (EDID™)	http://www.vesa.org
Enhanced Display Data Channel Specification Version 1.1 (DDC)	http://www.vesa.org
IEEE standard 802.3ab 1000BASE T Ethernet	http://www.ieee.org/portal/site
Advanced Configuration and Power Interface Specification Rev. 3.0a	http://www.acpi.info/