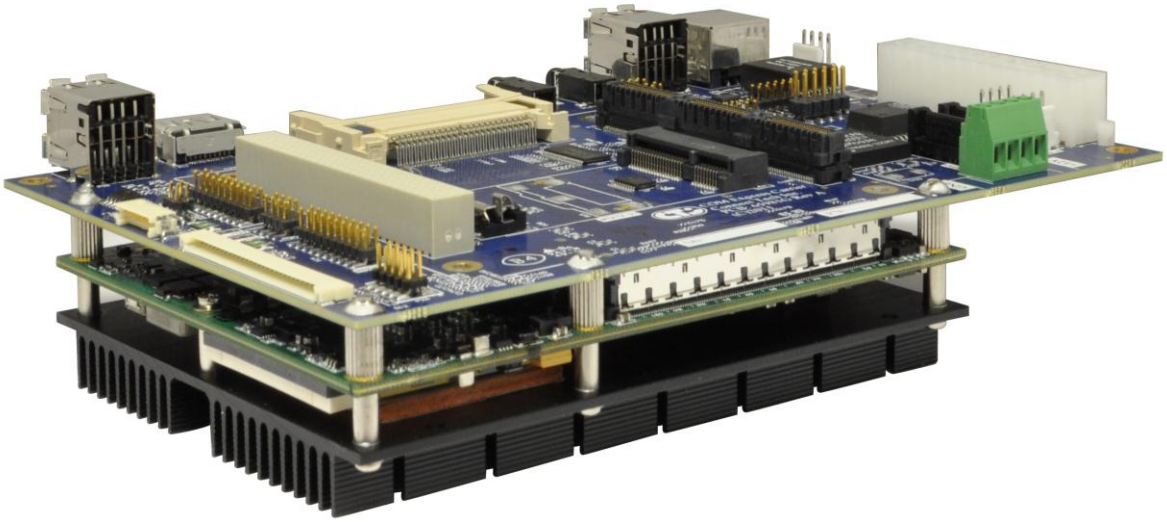
Connect Tech Inc.

COM Express Carrier User Manual



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CTIM-00312 Revision: 0.01, September 6, 2012

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Customer Support Overview

If you experience difficulties after reading the manual and/or using the product, contact the Connect Tech reseller from which you purchased the product. In most cases the reseller can help you with product installation and difficulties.

In the event that the reseller is unable to resolve your problem, our highly qualified support staff can assist you. Our support section is available 24 hours a day, 7 days a week on our website at: www.connecttech.com/sub/support/support.asp. See the contact information section below for more information on how to contact us directly. Our technical support is always free.

Contact Information

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Canada N1K 1S6

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www.connecttech.com

Note:
Please go to the **Download Zone** or the **Knowledge Database** in the **Support Center** on the Connect Tech website for product manuals, installation guides, device driver software and technical tips.
Submit your technical support questions to our customer support engineers via the **Support Center** on the Connect Tech website.

Telephone/Facsimile
Technical Support representatives are ready to answer your call Monday through Friday, from 8:30 a.m. to 5:00 p.m. Eastern Standard Time. Our numbers for calls are:

Toll Free: 800-426-8979 (North America only)
Telephone: 519-836-1291 (Live assistance available 8:30 a.m. to 5:00 p.m. EST, Monday to Friday)
Facsimile: 519-836-4878 (on-line 24 hours)

Limited Lifetime Warranty

Connect Tech Inc. provides a Lifetime Warranty for all Connect Tech Inc. products. Should this product, in Connect Tech Inc.'s opinion, fail to be in good working order during the warranty period, Connect Tech Inc. will, at its option, repair or replace this product at no charge, provided that the product has not been subjected to abuse, misuse, accident, disaster or non-Connect Tech Inc. authorized modification or repair.

You may obtain warranty service by delivering this product to an authorized Connect Tech Inc. business partner or to Connect Tech Inc. along with proof of purchase. Product returned to Connect Tech Inc. must be pre-authorized by Connect Tech Inc. with an RMA (Return Material Authorization) number marked on the outside of the package and sent prepaid, insured and packaged for safe shipment. Connect Tech Inc. will return this product by prepaid ground shipment service.

The Connect Tech Inc. Lifetime Warranty is defined as the serviceable life of the product. This is defined as the period during which all components are available. Should the product prove to be irreparable, Connect Tech Inc. reserves the right to substitute an equivalent product if available or to retract Lifetime Warranty if no replacement is available.

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Revision History

Revision	Date	Changes
0.00	February 28, 2012	Original
0.01	July 05, 2012	- Updated “COM Express Carrier Current Sourcing Capabilities “ section. - Added “+5V Standby selection” section. - Added hole sizes section - Added PCIe/104 signals section

Introduction

Connect Tech's COM Express Carrier Boards are small feature rich, super flexible carrier boards that integrate with any industry standard type II COM Express module. These bus-independent carrier boards offer easy connection to SATA HDD, USB, Ethernet, HDMI Video, LVDS Video, VGA video, RS-232 and RS485 serial.

Connect Tech's COM Express carrier boards are ideal for compact and high performance computing applications in mobile entertainment, kiosks, digital signage, automation, ROVs and gaming applications.

ESD Warning

Electronic components and circuits are sensitive to ElectroStatic Discharge (ESD). When handling any circuit board assemblies including Connect Tech COM Express carrier assemblies, it is recommended that ESD safety precautions be observed. ESD safe best practices include, but are not limited to:

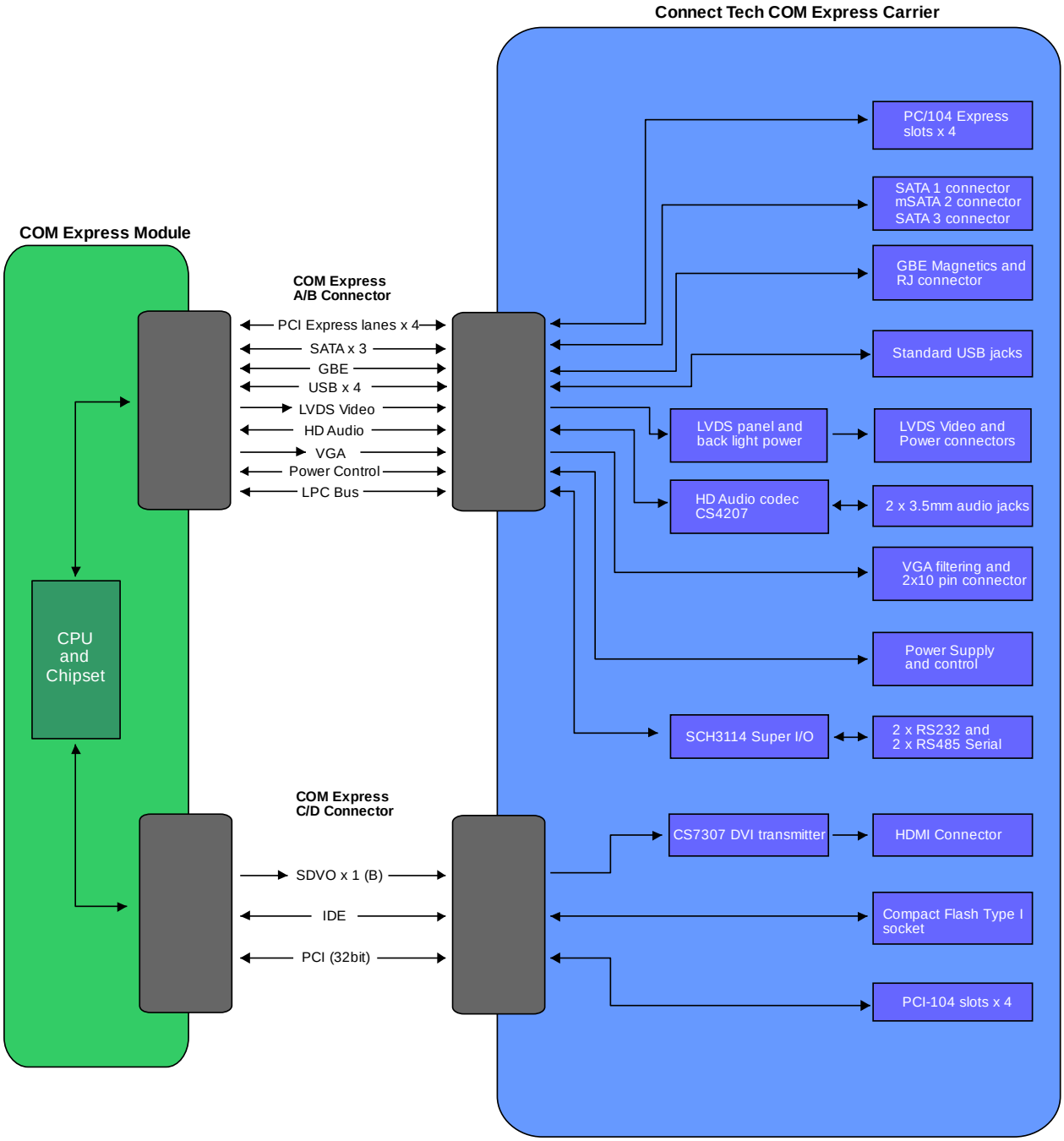
- Leaving circuit boards in their antistatic packaging until they are ready to be installed.
- Using a grounded wrist strap when handling circuit boards, at a minimum you should touch a grounded metal object to dissipate any static charge that may be present on you.
- Only handling circuit boards in ESD safe areas, which may include ESD floor and table mats, wrist strap stations and ESD safe lab coats.
- Avoiding handling circuit boards in carpeted areas.
- Try to handle the board by the edges, avoiding contact with components.

Product Features and Specifications

Feature	CCG001 (PCI-104 and PCIe-104 Expansion)	CCG002 (no PC/104 Expansion)	CCG003 (PCI-104 Expansion)
PCB Size / Overall Size	174mm x 114mm / 174mm x 116.5mm		
PCI-104 Expansion	Y	N	Y
PC104 Express Expansion	Y	N	N
Gigabit Ethernet Jack	Y		
LVDS Video & Backlight power	Y		
Standard HDMI Video connector	Y		
VGA	Y, with optional cable.		
3.5mm Audio Connector	1 Stereo Input / 1 Stereo Output		
mSATA connector	Y		
Compact Flash Connector	Y		
USB Ports	4		
SATA HDD connector	2		
SATA HDD power connector	2		
Power Connector	4 Position screw terminal		
CMOS / RTC 3.3V Battery	Y		
Accessories	Optional Cable Kit (SATA HDD/Power Cable, VGA, Serial, Pushbutton)		
Operating Temperature	-30 to +80 Celsius *		
Power Input	+12V +/- 5%		
Warranty and Support	Lifetime warranty and free technical support		

* Depends on the peripherals attached, the modules used and the amount of available airflow.

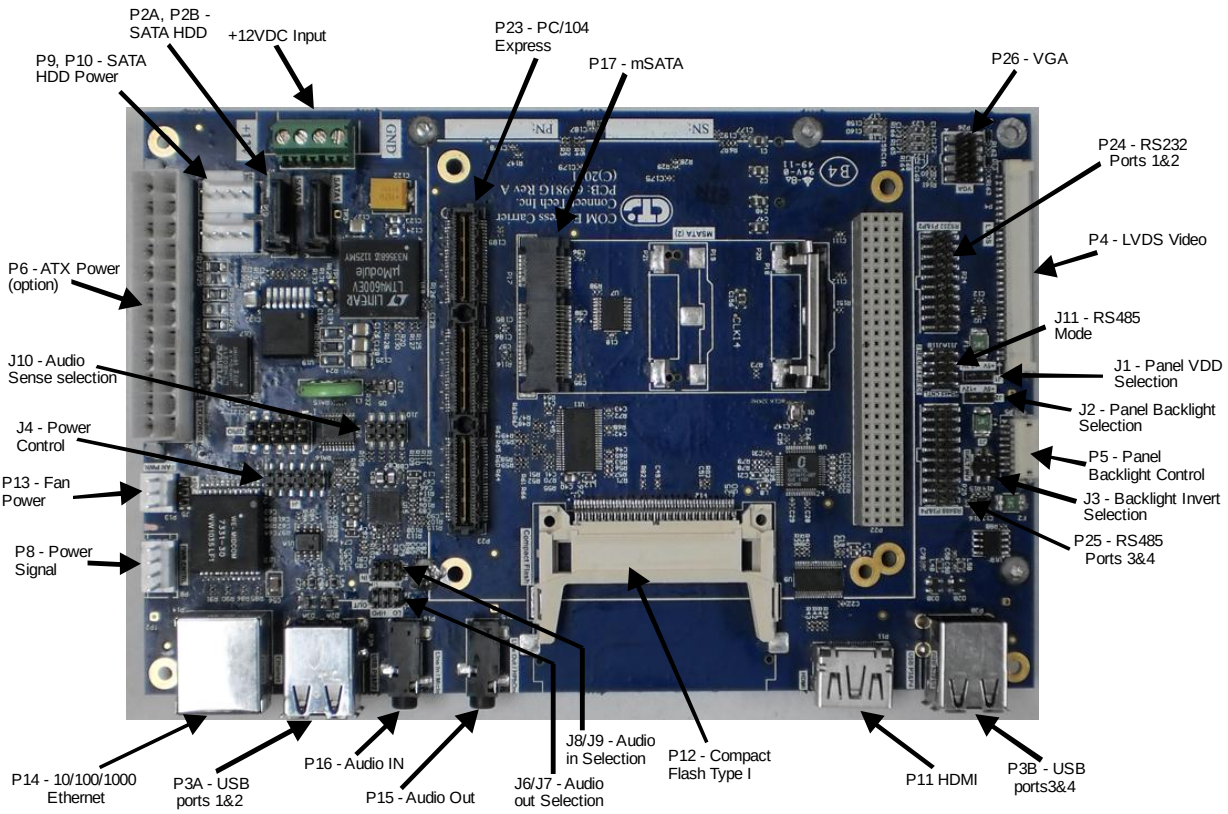
System Block Diagram



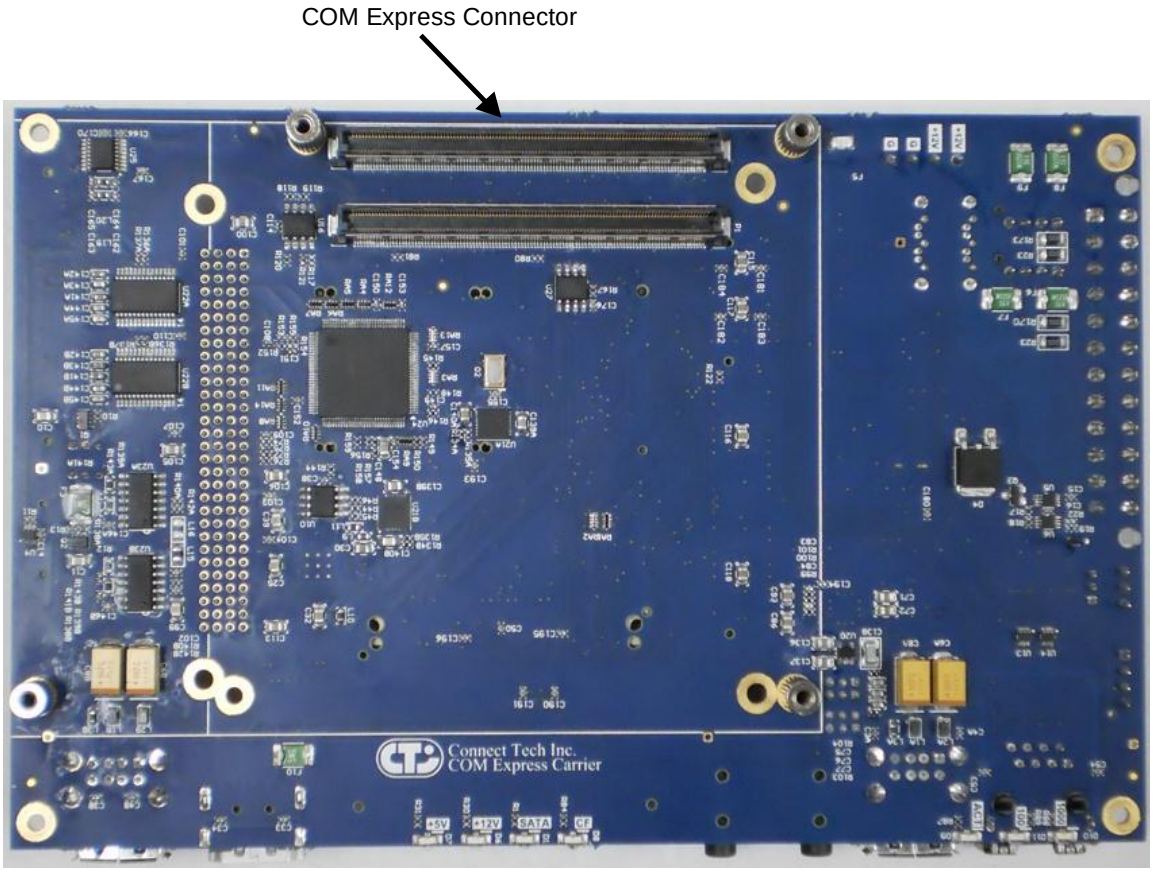
Hardware Description

CCG0xx Carrier Board Connector Locations

Top Side



Bottom Side


COM Express Connector
Connect Tech Inc.
COM Express Carrier
+5V
+12V
SATA
GF

Jumper and Connector Summary

Connector Summary

Location	Connection
P1	COM Express Type II connector
P2A, P2B	SATA HDD connector
P3A, PSB	USB
P4	LVDS Video and Panel Power
P5	LVDS Backlight Power and control
P7	+12V in DC Power
P8	Power Control
P9, P10	HDD Power connector
P11	HDMI
P12	Compact Flash Type I
P13	Fan Power
P14	GBE Ethernet
P15	Audio Output
P16	Audio Input
P17	mSATA connector
P22	PCI-104 stacking connector
P23	PC104 Express stacking connector
P24	2 x RS485 Header
P25	2 x RS232 Header
P26	VGA Header

Jumper Summary

Jumper	Function
J1	Panel VDD selection
J2	Panel backlight voltage selection
J3	Backlight enable invert
J4	Power Control
J5	Fan power selection
J6/J7	Audio out selection
J8/J9	Audio in selection
J10	Audio Sense Selection
J11	RS485 Mode selection
J12	+5V Standby to module (Rev B models)

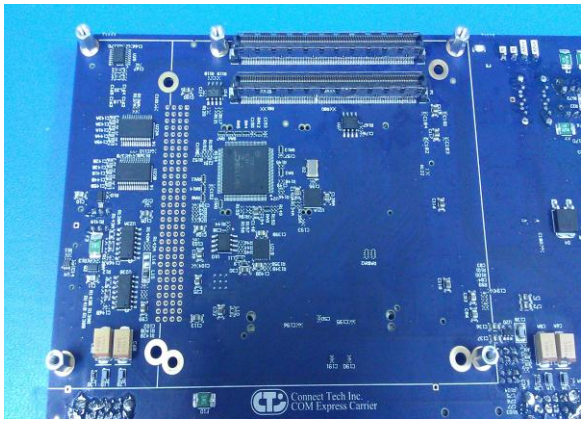
COM Express Module Interface

Description

The processor and chipset are implemented on the COM Express CPU module, which connects to the COM Express carrier via a Tyco fine pitch stacking connector.

Connector

Function	**COM Express interface**
Location	P1
Type	Tyco fine pitch stacking connector, part number: 3-5353652-6
Pinout	Refer to COM Express specification



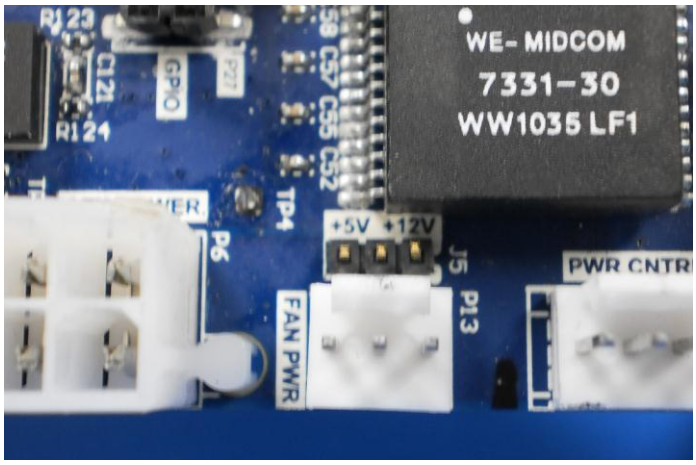
Module Installation

Ensure that the Male/Female Hex Standoffs are securely installed and tight. There is a specific technique to installing COM Express modules. It is highly recommended to follow your vendor's documentation.

There are also good instructional videos on YouTube www.youtube.com on this subject. You can search for these videos with the following string, "installation of a com express module" – enter this into the YouTube search without the quotes!

Module Fan Power Connector

Function	Fan Power
Location	P13
Type	Molex: 22-23-2031
Pinout	Pin 1: NC Pin 2: +V Pin 3: GND
Function	Fan Voltage Select
Location	J5
Selection	+5V or +12V



A jumper must be installed on J5 for the fan to operate. The fan speed is fixed by the voltage selected via the jumper.

Power

Description

The COM Express carriers are designed to be powered from a single +12V power supply. The carrier board features a 3.5mm screw terminal style connector.

The COM Express carrier generates all of the necessary voltages on board.

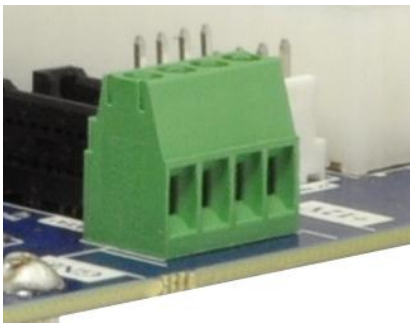
A Panasonic BR1225A/FA Lithium battery provides the VBAT for the COM Express module.

Power Connector

Function	**+12V DC Power Connector**
Location	P7
Range	11.4 VDC to 12.6 VDC (+/-5%). Recommend no less than 12VDC at terminal block input.
Type	4 Position terminal block Tyco PN: 284391-4
Fuse	+12V is protected with a one-time 15A fuse, at F5.
Pinout	

Pin	Signal	Description
1	GND	Power Return
2	GND	Power Return
3	+12V	Power Input
4	+12V	Power Input

DO NOT REVERSE POLARITY!



COM Express Carrier Current Sourcing Capabilities

The following are the maximum current capabilities of the CCG0xx unit. These values cannot be exceeded.

Voltage	Current capability as per temperature range.			
	50C and Below	60C	70C	80C
+12V	13.5A	13.3A	13.2A	12.5A
+5V	8.5A	8A	6.5A	2.5A
+5VSB	0.45A	0.4A	0.35A	0.3A
+3.3V	2.8A	2.7A	2.5A	2.4A

Current Consumption information

The majority of the current consumption is from the COM Express module, the PCI-104 and PC104 Express cards. Other sources of current consumption are USB, SATA HDD drives, etc.

The following table can be used to help estimate the total current consumption of you COM Express carrier solution. When building up your COM Express solution you should use your vendor provided datasheets to help create an more precise power estimate.

Module	Current (typical)	Power Rail
CCG0xx Carrier	200mA	+12V
COM Express Module	1000-4000mA	+12V
mSATA Flash Drive	130-250mA	+3.3V
USB Ports	100mA (keyboard)	+5V
SATA HDD	500mA	+12V
	700mA	+5V
LVDS Panel	230mA	+3.3V
LVDS Backlight	420mA	+5V
Ethernet	40mA	+12V
PC/104 Plus or Express Card	See vendor documentation	+12V, +5V or +3.3V rail.

Power Supply Control

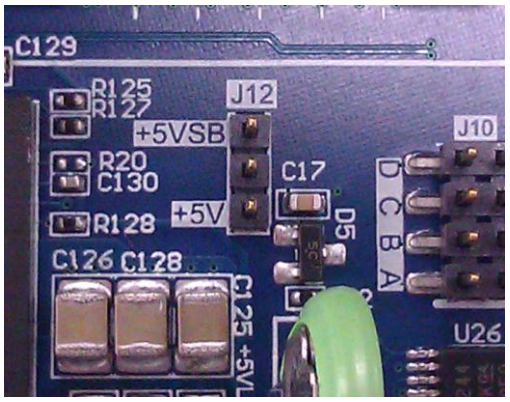
Function	Power Supply Control
Location	P8
Type	4 Position Connector, NOTE! Rev B units will feature a JST B4B-XH-AM(LF)(SN)(P)
Pinout	

Position	Description
1	No Connect, +5VSB in (Rev B)
2	PS_ON Output from Carrier
3	Power Button input to COM Ex module
4	Ground

These signals can be used with +12V power supplies that provide Power Good and can utilize a Power Good signal. Power Good is an open drain signal and is pulled up to +5V on the COM Express carrier.

+5V Standby selection

Function	+5V Standby Selection (Rev B and greater only)
Location	J12
Type	3x1 position 2mm
Usage	Jumper +5VSB and middle pin for ATX or applications where standby power is available. Jumper +5V and middle pin for +12V operations. Also refer to your COM Express module manual for more information about standby power.



PCI-104 and PC/104 Express Expansion

Description

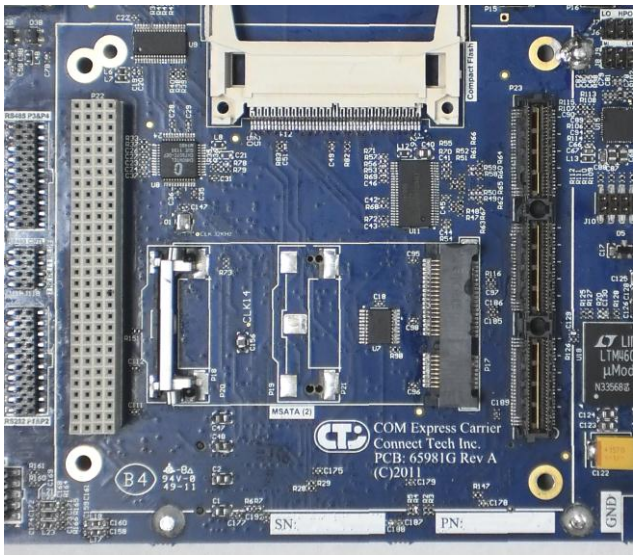
Depending on the model, CCG0xx Carrier Boards have PCI-104 expansion or PC/104 Express expansion or both.

A PCI-104 interface is provided on the COM Express carrier. The stack up can consist of up to four PCI-104 or PC/104 Express cards in any combination.

- V-I/O on the PCI-104 is set to +3.3V.
- All power rails are sourced by the COM Express Carrier, except for -12V.

PCI-104 and PC/104 Express connectors

Function	**PCI-104 and PC/104 Express**
Location	P22 and P23
Type	PCI-104: EPT 264-60303-02 PCI/104 Express: Samtec ASP-129637-03



PCIe/104 Connector

The PCIe/104 connector features PCIe/104 Type 1 connections as follows:

Bank 0	
Qty	**Description**
4	x1 PCIe lanes
2	USB 2.0 Ports (USB Ports 5 and 6 from module)
1	SMB Bus
1	Misc signals including #Reset and #Wake

Bank 1 and Bank 2 signals are not connected and are left open.

Video

Description

The COM Express carrier features three video outputs, VGA, HDMI and LVDS. The availability of the graphics interfaces depends on the COM Express module selected.

The configuration of either interface as the primary or secondary or tertiary display depends on the COM Express module's BIOS capabilities and settings. Refer to the COM Express module's documentation for more details.

HDMI

An HDMI connector is provided on the COM Express carrier.

HDMI Connector

Function	**HDMI**	
Location	P11	
Type	Standard HDMI Type A	

LVDS Video

Description

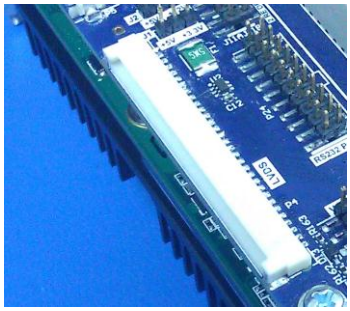
The COM Express carrier provides dual 18 or 24 bit LVDS display channels via P4, which are connected directly from the COM Express module. LVDS panel supply power is selected with jumper J1 and backlight power is selected with jumper J2. Both are current limited to 500 mA with Raychem resettable ploy fuses.

LVDS Video Header

Function	**LVDS Graphics**
Location	P4
Type	Hirose DF14-30P-1.25H connector

Pinout

Pin	Signal	Description
1	VCC_PNL	Panel Power
2	VCC_PNL	Panel Power
3	GND	Digital ground
4	GND	Digital ground
5	LVDS_A3_N	Channel A Data
6	LVDS_A3_P	Channel A Data
7	LVDS_CLK_N	Channel A Clock
8	LVDS_ACLK_P	Channel A Clock
9	GND	Digital ground
10	LVDS_A2_N	Channel A Data
11	LVDS_A2_P	Channel A Data
12	LVDS_A1_N	Channel A Data
13	LVDS_A1_P	Channel A Data
14	LVDS_A0_N	Channel A Data
15	LVDS_A0_P	Channel A Data
16	GND	Digital ground
17	LVDS_B3_N	Channel B Data
18	LVDS_B3_P	Channel B Data
19	LVDS_BCLK_N	Channel B Clock
20	LVDS_BCLK_P	Channel B Clock
21	GND	Digital ground
22	LVDS_B2_N	Channel B Data
23	LVDS_B2_P	Channel B Data
24	LVDS_B1_N	Channel B Data
25	LVDS_B1_P	Channel B Data
26	LVDS_B0_N	Channel B Data
27	LVDS_B0_P	Channel B Data
28	GND	Digital ground
29	LVDS_DID_CLK	Display ID Clock (3.3V)
30	LVDS_DID_DATA	Display ID Data (3.3V)

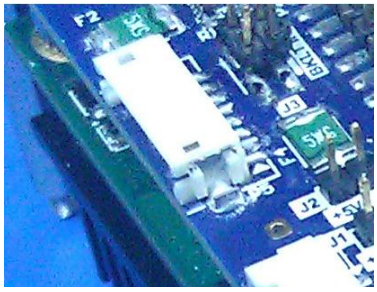


LVDS Backlight

LVDS Backlight connector

Function	**LVDS backlight power**
Location	P5
Type	Hirose DF13-8P-1.25H connector
Pinout	

Pin	Signal	Description
1	+12V	+12 V DC, max. 1A
2	+12V	+12 V DC, max. 1A
3	+5V	+5 V DC, max. 1A
4	+5V	+5 V DC, max. 1A
5	LVDS_BLEN	Backlight enable, level selected with J4
6	VCC_BKL	Back light power, selected with J6
7	GND	Digital ground
8	GND	Digital ground

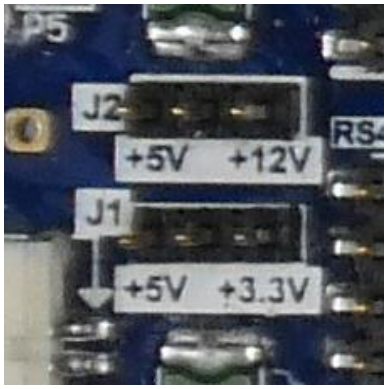


LVDS Backlight Power Jumper

Function	**LVDS backlight power select** Selects either +12V or +5V. Refer to the display panel's documentation for proper configuration.
Location	J2
Type	1x3 0.100" jumper block
Pinout	

Position	Description
1-2	+5V
2-3	+12V
off	floating

Default	off

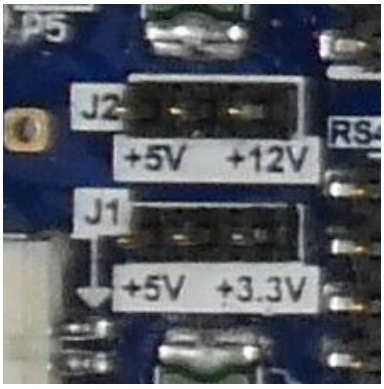


Power for LVDS Panel Circuits

Function	**LVDS panel power select** Selects either +3.3V or +5V. Refer to the display documentation for proper configuration.
Location	J1
Type	1x3 0.100" jumper block
Pinout	

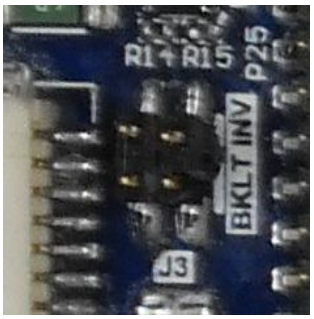
Position	Description
1-2	+5V
2-3	+3.3V
off	floating

Default	off



LVDS backlight enable polarity

Function	**LVDS backlight enable polarity** Selects either positive or negative. Refer to the inverter power supply documentation for proper configuration.
Location	J3
Type	2x2 2mm jumper block
Pinout	**Position 1-2** / **Description** Off / Positive polarity On / Negative polarity 3-4 / No Connect
Default	off



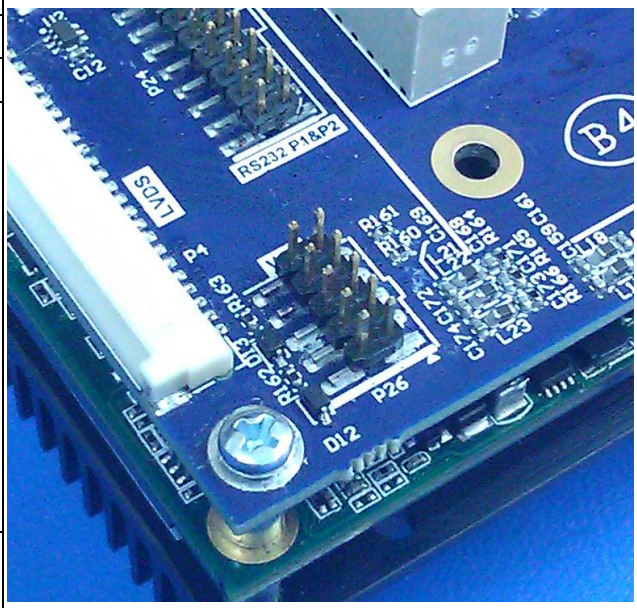
Pins 1-2 marked with white line

VGA

Standard 15 Pin VGA is available at P26. This header can be adapted to a standard DB15 female the CBG070 cable.

VGA Pinouts

Function	Standard VGA
Location	P26
Type	2x5 2mm pitch header
Pinout	**Pin** / **Description** 1 / Red 2 / GND 3 / Green 4 / NC 5 / Blue 6 / SC DDC 7 / HSYNC 8 / SD DDC 9 / VSYNC 10 / GND
Optional Cable	CBG070



USB 2.0

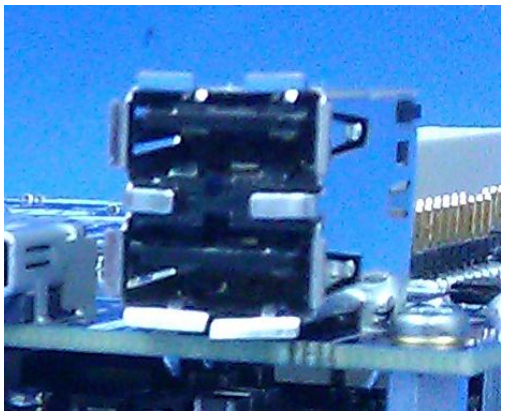
Description

The COM Express carrier implements four USB 2.0 connections via two USB connectors. Over current protection and power supply filtering is provided.

Only the USB host features of the COM Express specification have been implemented, USB client features are not supported.

Connector

Function	**USB 2.0**
ocations	P3A, P3B
Type	Standard Dual USB jacks
Pinout	Top – Ports 1 or 3 Bottom - Ports 2 or 4 Port pairs labelled on PCB.



Compact Flash Interface

A Type I Compact Flash socket is available. The Compact Flash utilizes the COM Express Module IDE interface.

Note that this Compact Flash interface is NOT a hot swappable interface. The Compact Flash is only detected at bootup by the BIOS. The unit should be powered off before installing or removing the Compact Flash card.

Compact Flash Connector

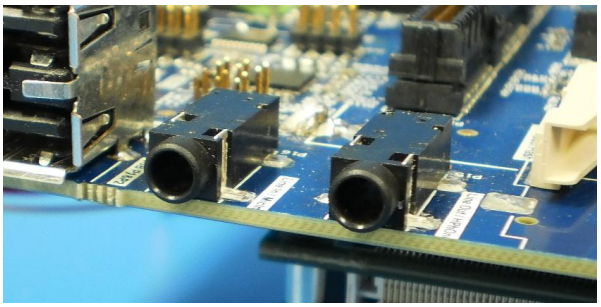
Function	**Compact Flash**
Location	P12
Type	3M 53856-5070

Audio Interface

The COM Expres Carrier features two 3.5mm stereo audio jacks that function as follows:

Audio Connectors

Function	**Audio Input**	**Audio Output**
Location	P16	P15
Function	Jumper Selectable Line In or Microphone In	Jumper Selectable Line Out or Headphone Out
Type	3.5mm Stereo Jack	



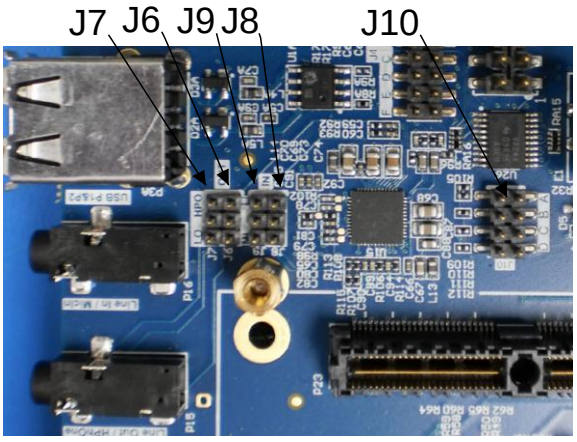
Input **Output**

Notes:

1. The Microphone input is equipped with a Phantom Power circuit.
2. The Headphone output is amplified by the CS4207 Codec.

Audio Selection Jumpers

Jumper	**Selection Choice**
J7	Line Out / Head Phone Out Right
J6	Line Out / Head Phone Out Left
J9	Line In / Microphone In Right
J8	Line In / Microphone In Left
J10-A *	Line Out Enable
J10-B *	Line In Enable
J10-C *	Microphone In Enable
J10-D *	Headphone Out Enable

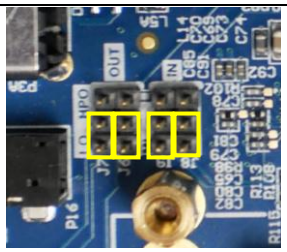
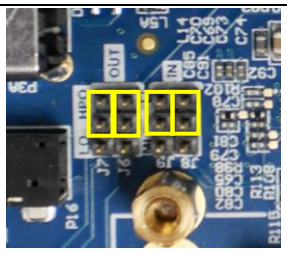


* J10 Provides the CS4207 Audio Codec with the Sense input:

The Sense input is used by Audio Codecs to detect the presence of an audio plug being installed into an audio jack, via a switch inside the jack. The Audio jacks on the COM Express carrier do NOT have this switch, so we have provided these jumpers to mimic that function.

Not all operating systems require this sense input to be satisfied, for example audio under Ubuntu 10.04 LTS will function fine without the Jumpers, however audio under Windows XP will not.

Audio Jumpering Examples

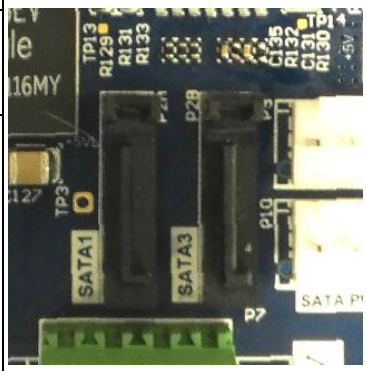
Audio output jumpered for Line Out Audio input jumpered for Microphone In	
Audio output jumpered for Headphone Out Audio input jumpered for Line In	

SATA

Description

The COM Express carrier provides two SATA HDD connections and one mSATA socket. Note the logical order of the SATA ports in the table below.

SATA HDD Connectors

Function	**SATA host**	
Locations	P2A SATA Port 1 P2B SATA Port 3	
Type	Industry standard right angle SATA host connector Molex 0470804005 (or equivalent)	
Pinout		

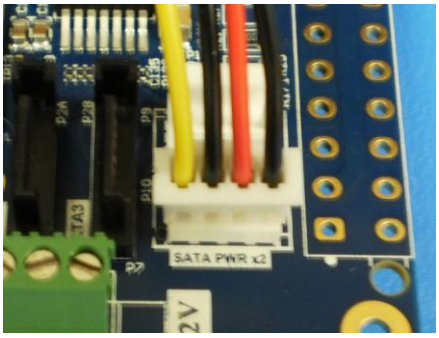
Pin	Signal
1	GND
2	SATA_TX_P
3	SATA_TX_N
4	GND
5	SATA_RX_N
6	SATA_RX_P
7	GND

SATA HDD Power Connectors

Function	**SATA HDD Power**
Locations	P9, P10
Type	4 Pos 0.100” connector
Pinout	See table below

Pin	Signal
1	GND (Black)
2	+5V (Red)
3	GND (Black)
4	+12v (Yellow)

+12V and +5V are protected with 1200mA Raychem Poly fuses.

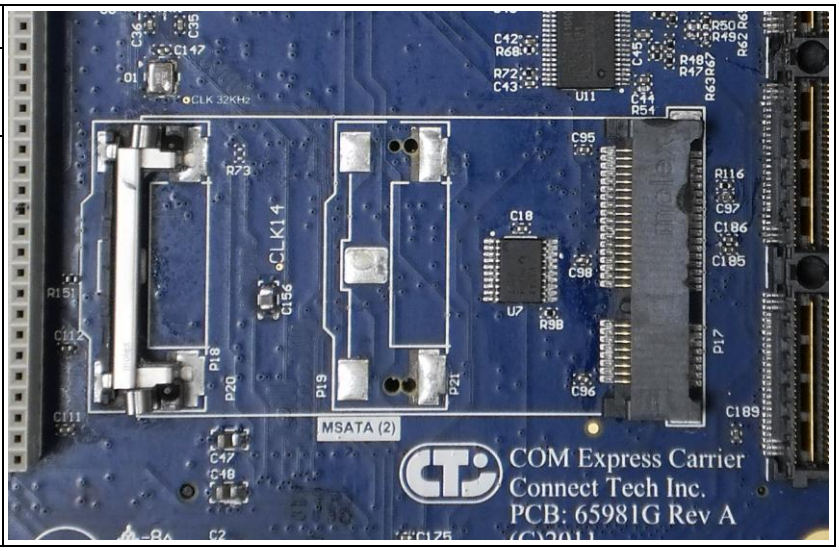


Power connector shown inserted. Pine 1 is on the right.

The SATA power connectors are fused independently from the main +12V fuse that provides +12V power to the board, i.e. the SATA power connectors are not double fused.

mSATA Socket

Function	**mSATA**
Locations	P17 SATA Port 2
Type	Molex miniPCIe in SATA configuration.



10/100/1000 Ethernet

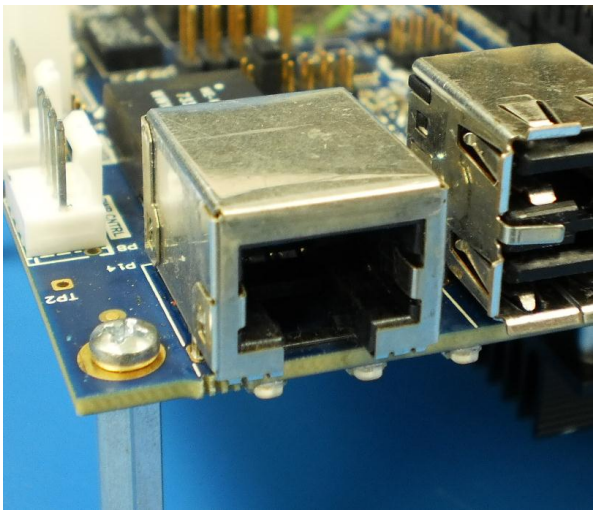
Description

The CCG0xx COM Express carriers features a standard RJ Jack and magnetics for Ethernet communications. The Ethernet MAC and PHY are located on the COM Express module.

10/100/1000 Ethernet RJ Connector

Function	**LAN Connector**
Locations	P14
Type	Standard 8 position RJ connector
Pinout	

Pin	Signal
1	MX1P
2	MX1N
3	MX2P
6	MX2N
4	MX3P
5	MX3N
7	MX4P
8	MX4N



Standard Serial

Description

The CCG0xx series of COM Express adapters features four serials ports. Port1 and Port2 are standard RS232 and Port3 and Port4 are RS485. The SMSC SCH3114 Super I/O chip is used to facilitate the serial I/O. This chip requires both an LPC bus connection from the module and BIOS support to operate. Ask your module vendor or examine your module documentation to determine of BIOS support is available for the SCH3114.

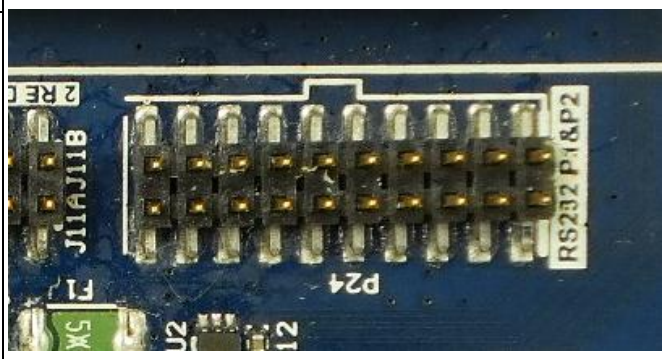
The pinouts are as followss

Serial Connector RS232

Function	**RS232 Serial**
Location	P24
Type	2x10 2mm Header

Pinout

Header Pin	Signal	DB9 Pin
1	DCD	1
2	DSR	6
3	RXD	2
4	RTS	7
5	TXD	3
6	CTS	8
7	DTR	4
8	RI	9
9	GND	5
10	No Connect	
11	DCD	1
12	DSR	6
13	RXD	2
14	RTS	7
15	TXD	3
16	CTS	8
17	DTR	4
18	RI	9
19	GND	5
20	No Connect	

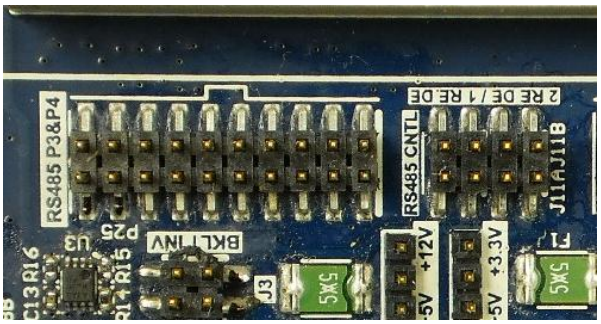


Serial Connector RS485

Function	**RS485 Serial**
Location	P25
Type	2x10 2mm Header

Pinout

Header Pin	Signal	DB9 Pin
1	RXD+	1
3	TXD+	2
5	TXD-	3
7	RXD-	4
9	GND	5
11	RXD+	1
13	TXD+	2
15	TXD-	3
17	RXD-	4
19	GND	5



RS485 Control Jumpers

The RS485 Control Jumpers are used for implementing the following RS485 modes of operations:

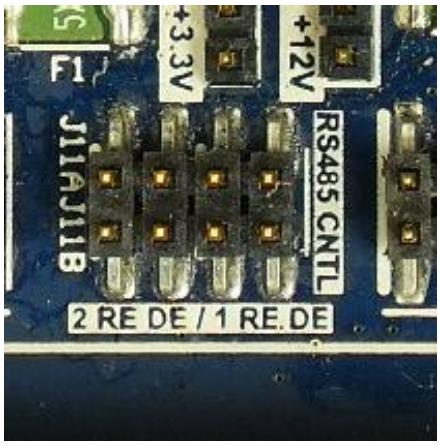
- ½ Duplex Multidrop
- Full Duplex Multidrop

The UART RTS signal is used along with the J11 jumpers to facilitate these modes.

Function	**RS485 ½ Duplex and Multi-drop controls**
Location	J11
Type	2x4 2mm Header

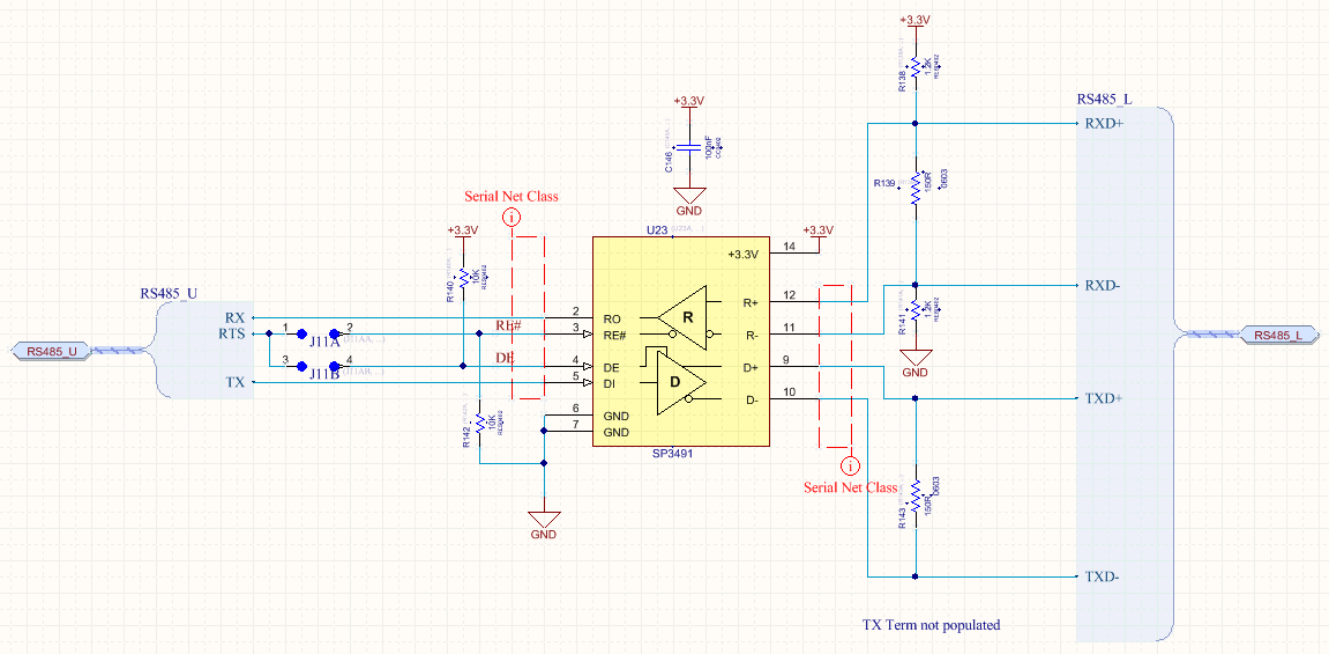
Pinout

Header Pins	Signal
1-2	Port 1 Driver Multidrop Enable
3-4	Port 1 Receiver ½ Duplex Enable
5-6	Port 2 Driver Multidrop Enable
7-8	Port 2 Receiver ½ Duplex Enable

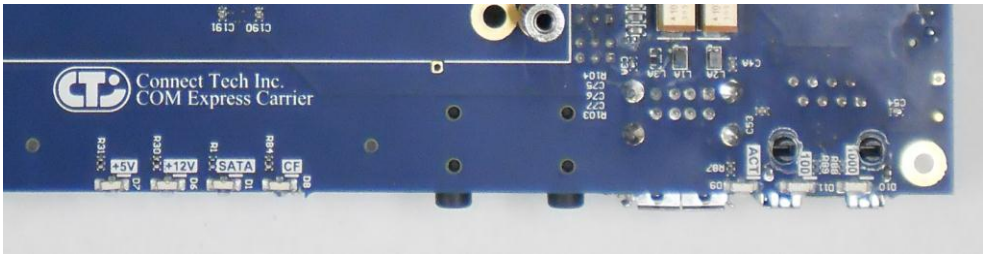
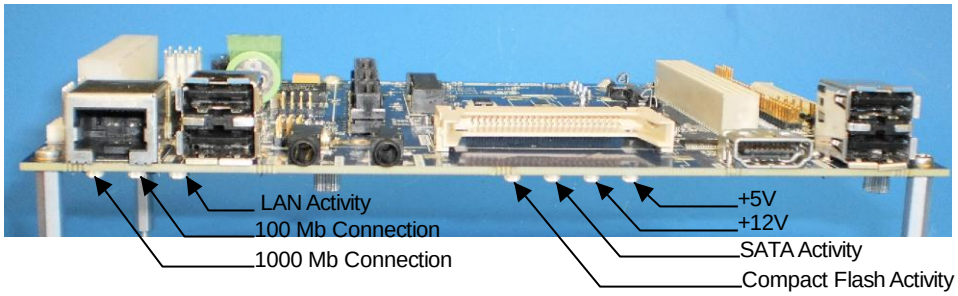


RS485 Schematic Snippit

The following RS485 schematic snippit is presented to assist in the understanding of the CCG0xx RS485 circuit.



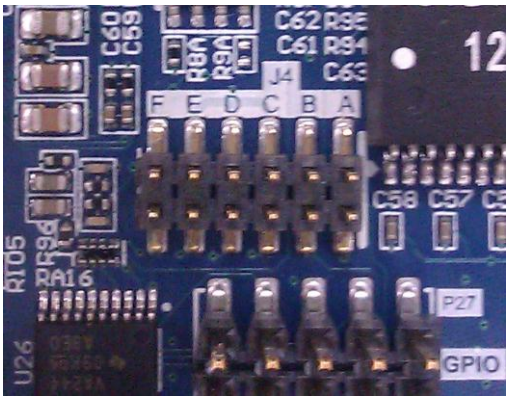
Status LEDs

Function	Status LEDs
Bottom view	Status LEDs are labeled on the PCB. They are located on the bottom side of the PCB. 
Front view	

J4 Miscellaneous Power Control Jumpers

Function	Miscellaneous Power Control Jumpers
Location	J4
Type	2x6 2 mm
Pinout	

Position	Description
A	Force PS_ON
B	Power Good when using +12V Supply
C	Reset input to module
D	Power Button input to module
E	External Battery
F	No Connect



Notes:

- Position A: If ATX power supplies are used, this signal can be used to override the PS_ON signal from the Carrier board and simply force the PS_ON signal to 0V. The ATX supply should switch on as soon as it is powered.
- Position B: Used when operating with a +12V power input. This jumper will route 5V to the POWER_OK pin on the COM Express module.
- Position C: SYSTEM RESET input to the COM Express Module
- Position D: POWER_BUTTON input to the COM Express Module
- Position E: An External Battery could be wired here if the one on the carrier not needed.

Typical Hardware Installation for +12V power input

1. Ensure all external system power supplies are off.

2. Install the COM Express module into P1. Be sure to follow the manufacturer's direction for proper heatsink/heatspreader installation and any other cooling instructions from the manufacturer.

3. Verify all jumper settings from the relevant sections, paying special attention the power selection jumpers. Some typical settings are outlined below.

Jumper	Function	Position
J4	Power Good +12V Power	3-4
J12	+5V To standby	+5V to middle

4. Install the necessary cables for the application. At a minimum, this would include:

   a) +12V Power cable to P7
   b) Video display cable VGA, and/or HDMI.
   c) Keyboard and mouse via USB
   d) SATA Power and Signal to SATA HDD

   For the relevant cables, see the Cables & Interconnect section of this manual

5. Connect the power cable to power supply

6. Switch on the power supply. DO NOT power up your COM Express system by plugging in live power.

Software Installation & Configuration

In general, always refer to the COM Express module's manual for proper installation of software drivers and configuration software; as well as for appropriate BIOS settings.

The following sections provides some specific notes and hints for successful module integration

Operating System Notes

Linux

None at this time.

Windows

The Windows XP Driver for the CS4207 Audio codec may experience issues. Please contact Connect Tech Customer support for more information. The issues involve:

- Microphone input
- Line input

Audio output should be OK.

Cables & Interconnect

The following table summarizes the COM Express carrier's headers and lists the matching cables included with the optional cable kit CKG007.

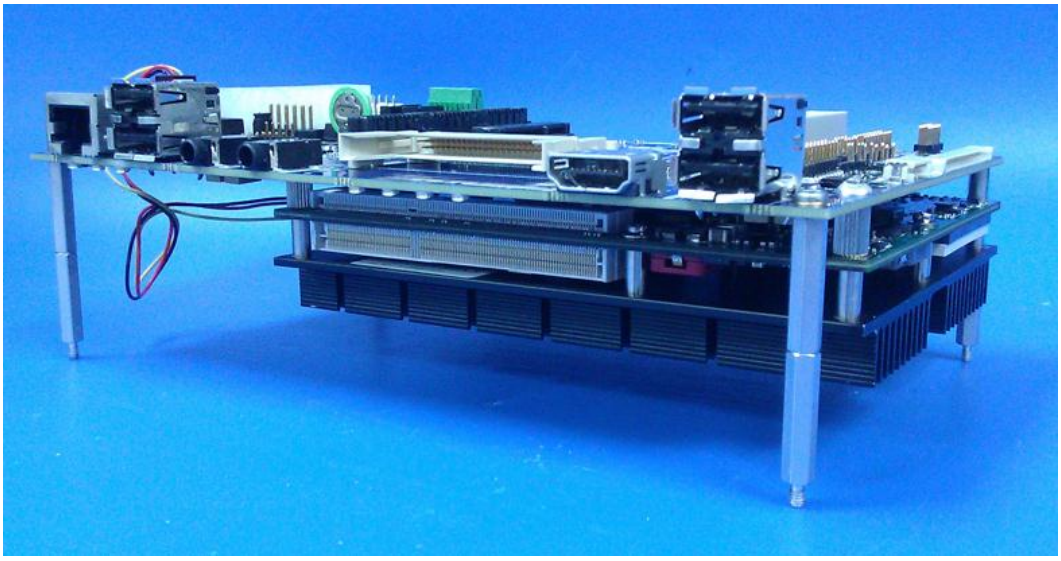
PCB Connector	Cable Part Number	Description	PCB End	Interface End
2x10 2mm at P24, P25	CBG073	2 x Serial Cable	2x10 2mm header	2 x DB9 Male
Hirose DF14-30P-1.25H(25)	CBG076	LVDS un-terminated	Hirose DF14-30S-1.25C	N/A
Hirose DF13-8P-1.25H(50)	CBG078	Backlight un-terminated	Hirose DF13A-8S-1.25C	N/A
P2A, P2B, P9, P10	CBG090	SATA Power and Signal	SATA Power and Signal	SATA Power and Signal
Samtec TMM-102-02-L-S	CBG080	Reset Button	1x2 2mm socket	Momentary Pushbutton
2x5 2mm at P26	CBG070	VGA Cable	2x5 2mm	HDB15 Female

Cable drawings are available upon request. Send an email request to: support@connecttech.com.

Mechanical

Devkit standoffs

A Devkit, part number DEV005 can be purchased to facilitate bench top development. The Devkit includes screws, standoffs and spacers. See picture below.



Devkit (DEV005) parts list

Quantity	Part Number	Manufacturer	Description
8	FM2115-2545-A	Fascomp / Mouser	20mm, 4.5mm dia Male/Female hex standoffs
1	607-251	Spaenaur	8mm M3 Spacer
1	388-245	Spaenaur	25mm M2.5 Cheese Head screw
4	388-340	Spaenaur	5mm M2.5 Cheese Head screw

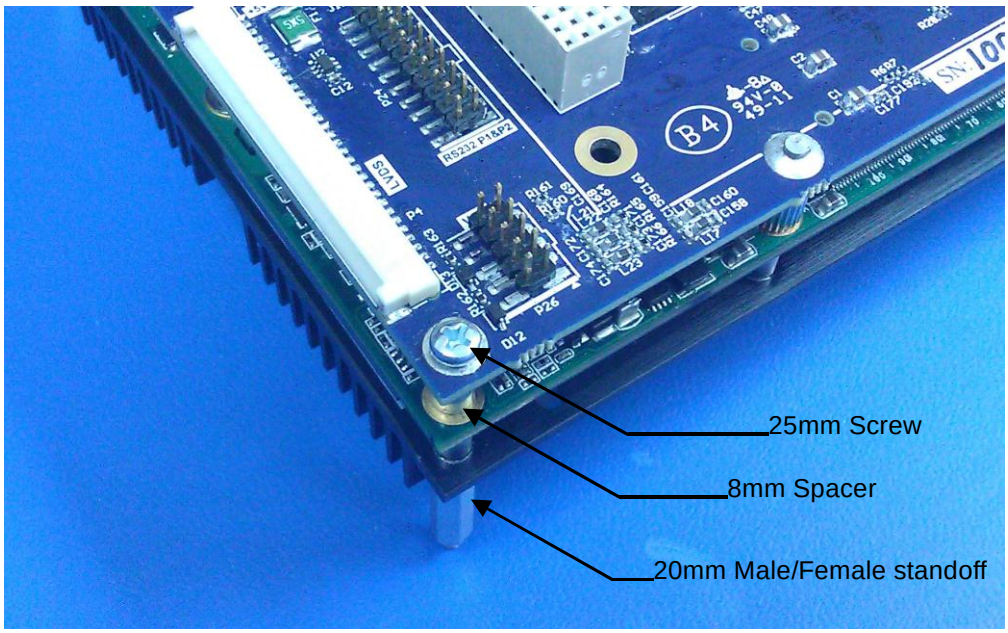
Devkit Installation Example

Three corners of the PCB:

- Qty (6) 20mm Male/Female Hex Stand offs. Stack in pairs to achieve height as needed.
- Qty (3) 5mm M2.5 Screws

Corner of PCB as seen in picture below:

- Qty (1) 20mm Male/Female Hex Stand offs
- Qty (1) 25mm M2.5 Screw
- Qty (1) 8mm M3 spacer



Hole Sizes

Hole category	Pad Size	Drill Hole Size
COM Express module	6mm	3.2mm
PC/104	6.35mm	3.175mm
PCB Mounting	6mm	3.2mm

COM Express Carrier Board Dimensions