

MicroStrain INTERFACE CONTROL DOCUMENT

C-Series Connectivity Board and Reference Design

Introduction

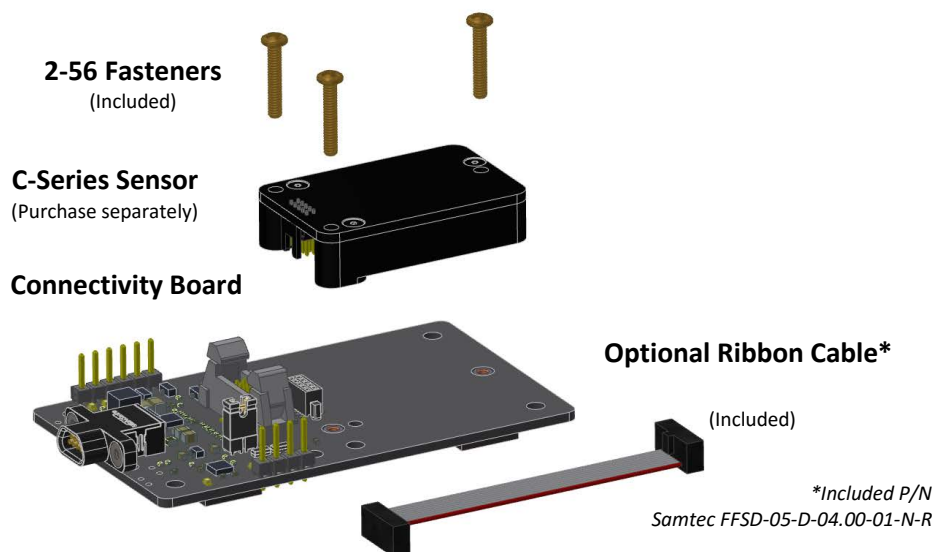
The C-Series Connectivity Board is a demonstration board that allows customers to directly interface with any 3DM[®]-C-Series product, such as the 3DM[®]-CV5-10 sensor.

The board may be used with a micro DB9/USB cable (Included in USB Connectivity Kit-P/N 6212-3009) or with a microDB9/RS-232 cable (Included in Serial Connectivity Kit-P/N 6212-3010) to directly interface with a Windows PC running SensorConnect.

Full schematics are provided here as a reference design for incorporating 3DM-C series products into OEM products.

The 3DM[®]-C-Series IMU is screwed to the connectivity board with 2-56 fasteners. Alternatively, the IMU may be directly mounted to the chassis of the vehicle and wired to the connectivity board using the included 4" ribbon cable or a custom length cable may be ordered from Samtec's FFSD ribbon connector series*.

Connector Wiring



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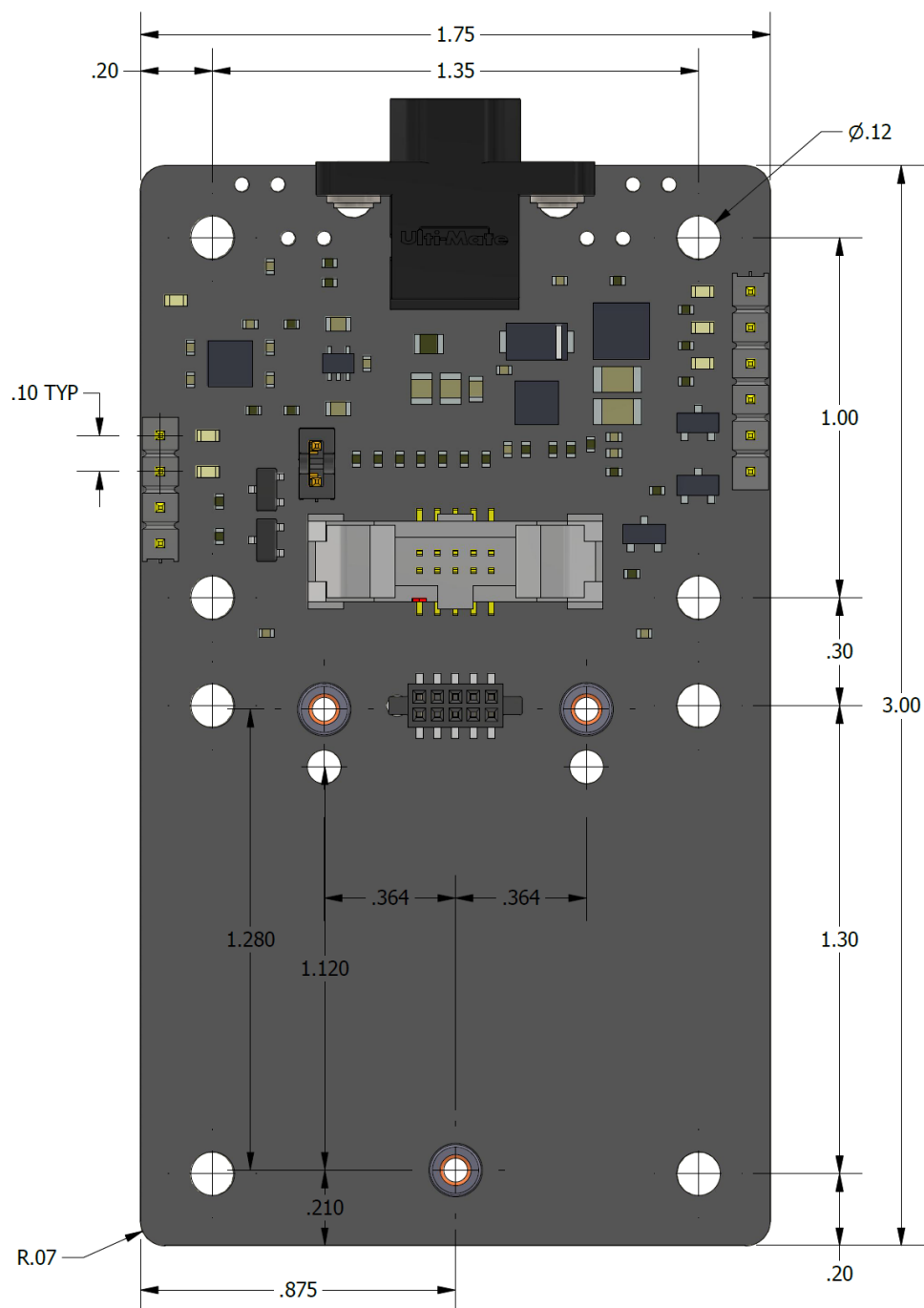
Connectivity Board Pin Number	Signal
1	USB D-
2	USB D+
3*	+4V to +5.5VDC
4	RS232 RxD
5	RS232 TxD
6*	+4V to +35VDC
7	GPIO1
8	GND
9	GPIO2

*use either pin 3 OR pin 6 for power

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Mechanical Overview

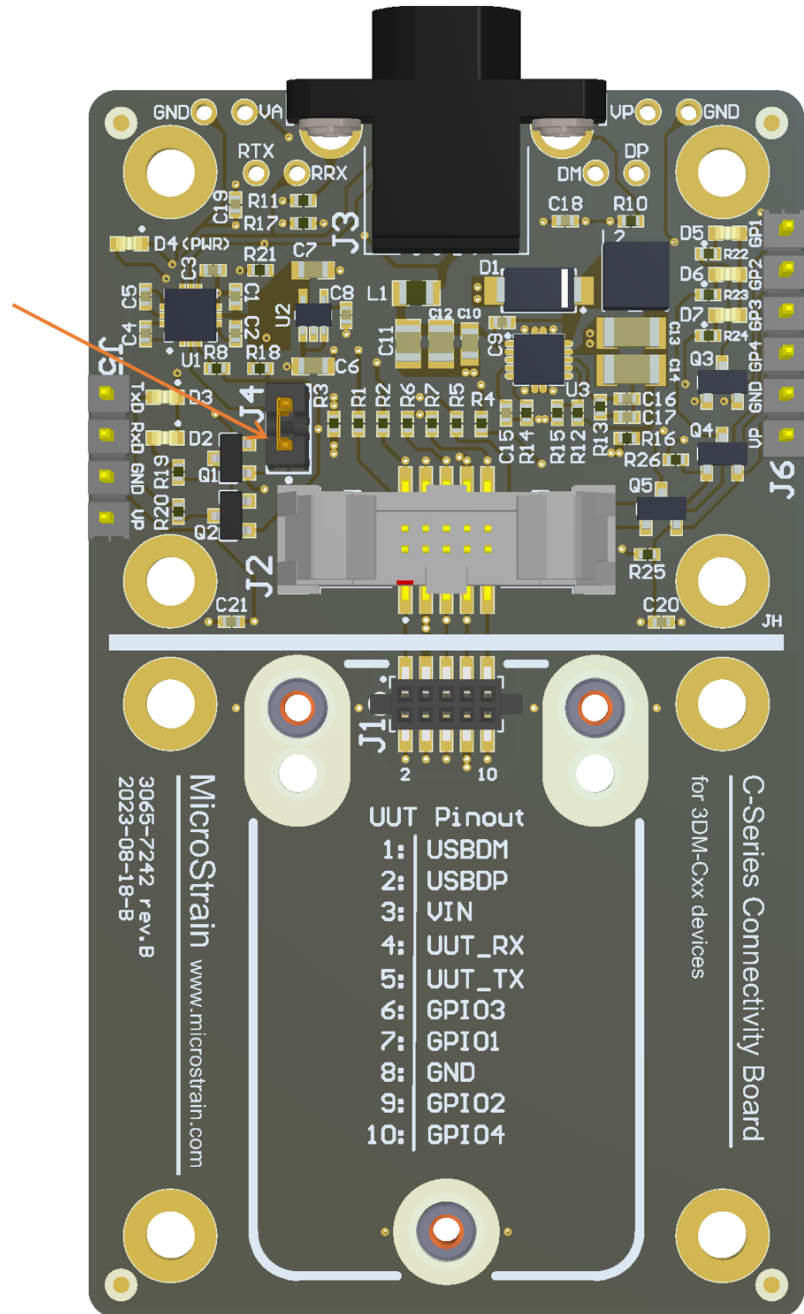


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Assembly Diagram

This jumper shorts J4. It connects the RS232 transceiver's TTL TX output to the sensor. Remove the jumper when transmitting TTL serial data to the sensor via the header on the left side of the board.



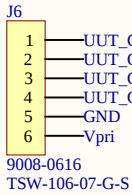
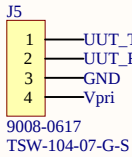
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Table 1: Connectivity Board Bill of Materials

Refdes	Qty	Description	Manufacturer	Manufacturer Part #
BP1-4	4	BUMPER,0.413X0.413,BLK	3M	SJ-5007 (BLACK)
C1-5,C9	6	CAP,,1UF,0402,CERX7R,16V,10%	Murata Electronics North America	GRM155R71C104KA88D
C6-7	2	CAP,1.0UF,0603,CERX7R,16V,10%	TDK Corporation	C1608X7R1C105K
C8,C15,C18-21	6	CAP,.01UF,0402,CERX7R,25V,10%	Kemet	C0402C103K3RACTU
C10	1	CAP,,1UF,0603,CERX7R,50V,10%,HR	TDK Corporation	CGJ3E2X7R1H104K080AA
C11-12	2	CAP,2.2UF,0805,CERX7R,50V,10%	TDK Corporation	C2012X7R1H225K125AC
C13-14	2	CAP,22UF,1206,CERX7R,10V,10%	Samsung Electro-Mechanics	CL31B226KPHNNNE
C16	1	CAP,150PF,0402,CERNP0,50V,5%	TDK Corporation	C1005C0G1H151J050BA
C17	1	CAP,4700PF,0402,CERX7R,50V,10%	Murata Electronics North America	GRM155R71H472KA01D
D1	1	DIODE,SCHOTTKY,B360A,SMA	Diodes Inc.	B360A-13-F
D2	1	LED,YELLOW,PCB-SMD-0603	LITE-ON INC	LTST-C190KSKT
D3,D5,D6,D7	4	LED,ORANGE,PCB-SMD-0603	LITE-ON INC	LTST-C190KFKT
D4	1	LED,GREEN,PCB-SMD-0603	LITE-ON INC	LTST-C190KGKT
J1	1	CONN,HEADER,010,,050,SMD-V,R,+PEGS	Harwin	M50-3110542
J2	1	CONN,SAM,EHF-105-01-L-D-SM-LC	Samtec	EHF-105-01-L-D-SM-LC
J3	1	CONN,MICRO-D,009,PCB,R,POSTS,SHRTLD	Ulti-Mate Connector Inc	SD-836419004
J4	1	CONN,HEADER,VERT,2POS,0.1"	Samtec	TSW-102-07-G-S
J5	1	CONN,HEADER,VERT,4POS,0.1"	Samtec	TSW-104-07-G-S
J6	1	CONN,HEADER,VERT,6POS,0.1"	Samtec	TSW-106-07-G-S
L1	1	FERRITE BEAD,2A,600OHM@100MHZ,0805	TDK Corporation	MPZ2012S601A
L2	1	INDUCTOR,10UH,XAL4040	Coilcraft	XAL4040-103ME
MH1-3	3	NUT,SMT,2-56,BRASS,PEM SMTSOB-256-2ET	Penn Engineering	SMTSOB-256-2ET
Q1,Q2	2	TRANS,DMP31D1U-7,P-CHANNEL,SOT-23	Diodes Inc.	DMP31D1U-7
Q3-5	3	TRANS,2N7002LT1G,DN,SOT23	ON Semiconductor	2N7002LT1G
R1-5,R8,R10-11,R16	9	RES,0 OHM,0402,1/16W,5%	Panasonic - ECG	ERJ-2GE0R00X
R6-7,R17,R25-26	5	RES,1 MOHM,0402,1/16W,1%	Vishay	CRCW04021M00FKED
R12	1	RES,52.3 KOHM,0402,1/10W,1%	Panasonic - ECG	ERJ-2RKF5232X
R13	1	RES,6.65 KOHM,0402,1/16W,1%	Panasonic - ECG	ERJ-2RKF6651X
R14	1	RES,147 KOHM,0402,1/16W,1%	Panasonic - ECG	ERJ-2RKF1473X
R15,R18	2	RES,10 KOHM,0402,1/16W,1%	Panasonic - ECG	ERJ-2RKF1002X
R19-21	3	RES,100 OHM,0402,1/16W,1%	Panasonic - ECG	ERJ-2RKF1000X
R22-24	3	RES,200 OHM,0402,1/16W,1%	Panasonic - ECG	ERJ-2RKF2000X
U1	1	IC,ITF,ADM3101EACPZ,QFN-10	Analog Devices	ADM3101EACPZ
U2	1	IC,REG,3.3V,TPS71733DCK,SC70-5	Texas Instruments	TPS71733DCK
U3	1	IC,REG,TPS54260DRCT,SON-10	Texas Instruments	TPS54260DRCT
JUMPER	1	CONN,JUMPER/SHORTING,0.1",002	Sullins Electronics Corp.	QPC02SXGN-RC

Through-Hole Connectors

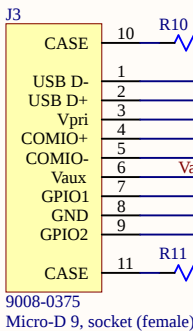


POWER REQUIREMENTS:

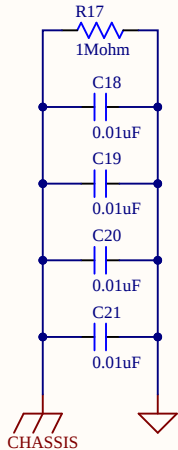
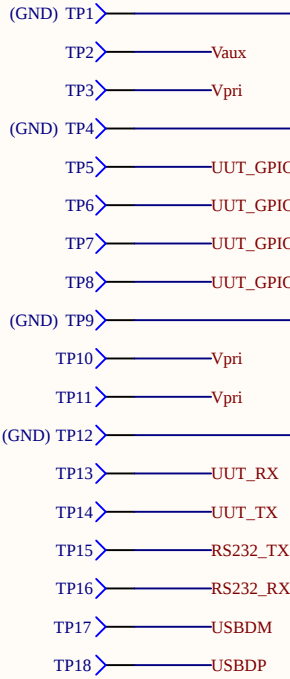
Vpri = 3.2V min, 5.2V max
Vaux = 5.2Vmin, 28V max

Connect either Vpri OR Vaux, NOT BOTH.

Host Connector

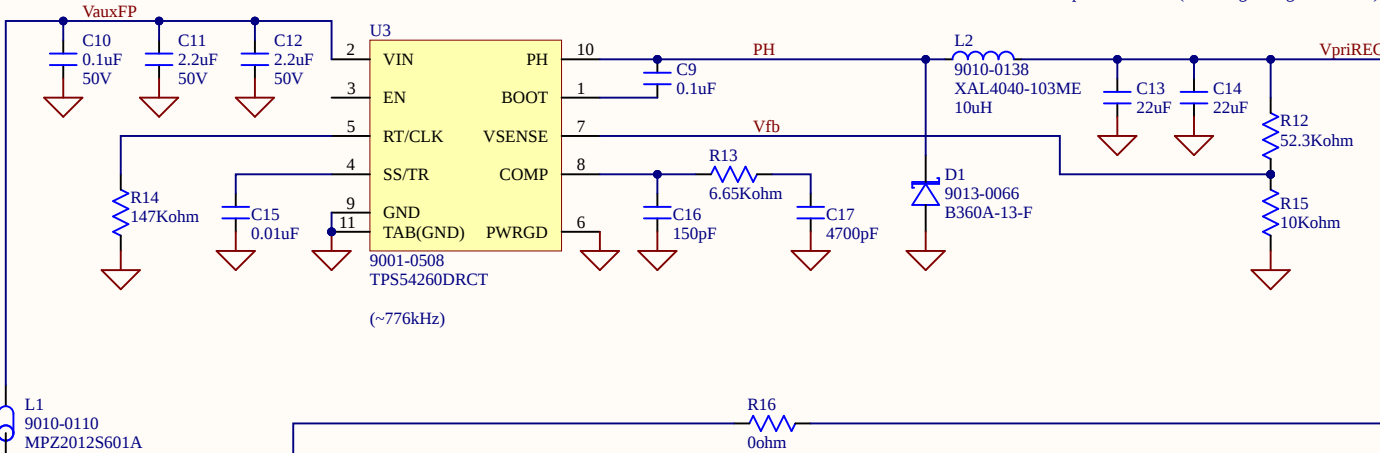


Test Points

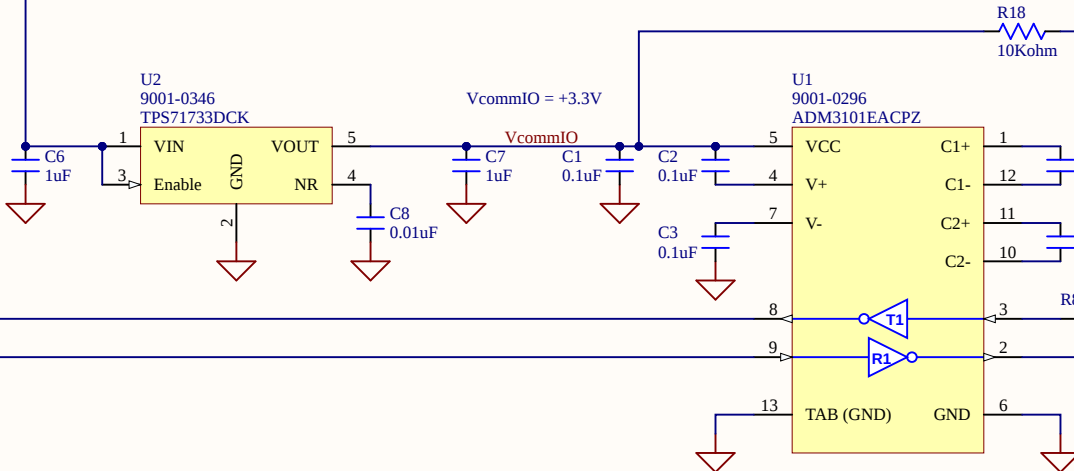


Vaux Regulator

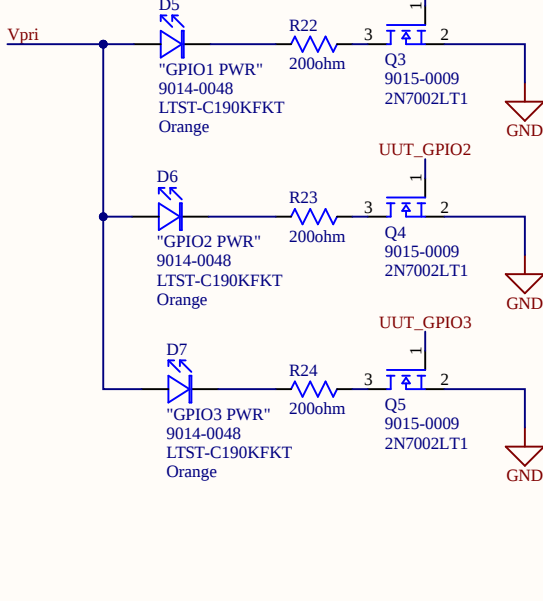
(completely inactive when powered by Vpri input)



RS232 Level Translation

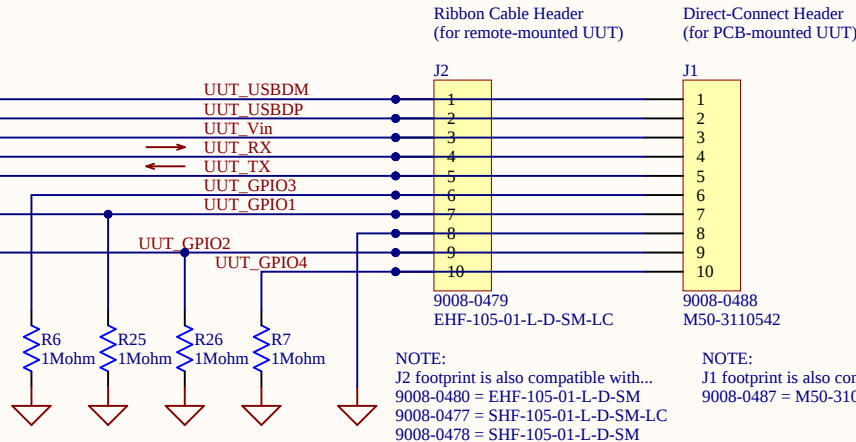


LEDs

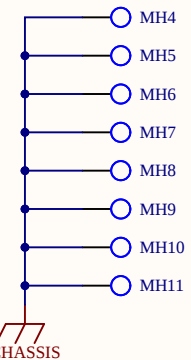


UUT Connectors

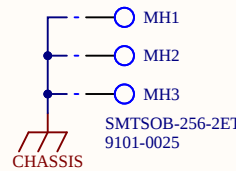
(connect one -OR- the other)



PCB Mounting Holes



UUT Mounting Holes



Adhesive Bumpers



Revision History:
Rev B (12/2023): Changed Q1 and Q2 (DMP2240UW MOSFETs replaced with DMP31D1U-7 for less input capacitance).
Removed R9. Added Q3, Q4, Q5, D5, D6, D7, J4, J5, J6, and JUMPER.
Added round corners.

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Title C-Series Connectivity Board, Schematic			
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Date:	12/11/2023	Sheet1 of 1	
File:	C:\Users\... \3065-7242-SCH.SchDoc	Drawn By: Grayson King, Jason Hanna	

PWB
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