M-G32EV031

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Data Sheet
USB Evaluation Cable Interface / Breakout Board for EPSON IMU

■ OVERVIEW

This USB Evaluation Cable Interface/Breakout Board is designed to convert the 1mm pitch connector of the Epson IMU to a 2.54mm pitch connector. This USB Evaluation Cable Interface/Breakout Board enables a PC to control the Epson IMU via USB interface when used with the USB Evaluation Cable:M-C30EV041. The USB evaluation tools simplify the initial evaluation and rapid testing of the Epson IMU products.

■ BLOCK DIAGRAM（When used with USB evaluation cable）

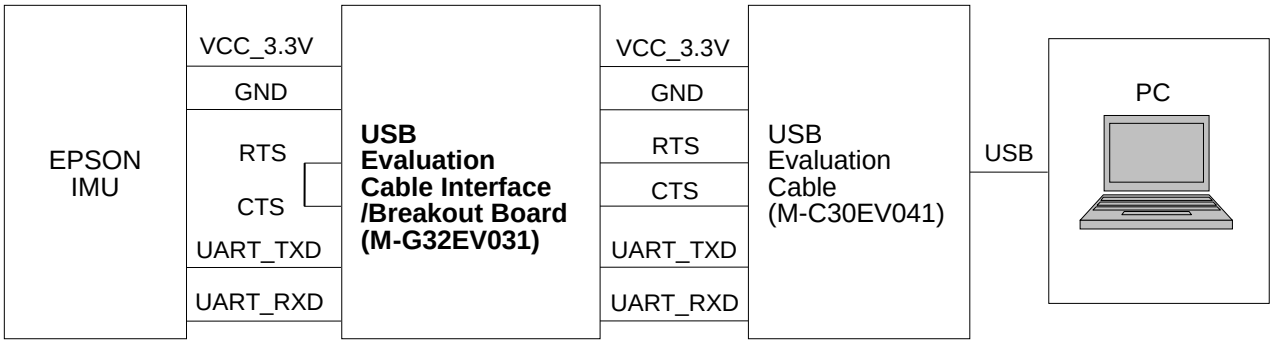


Fig1. Block Diagram

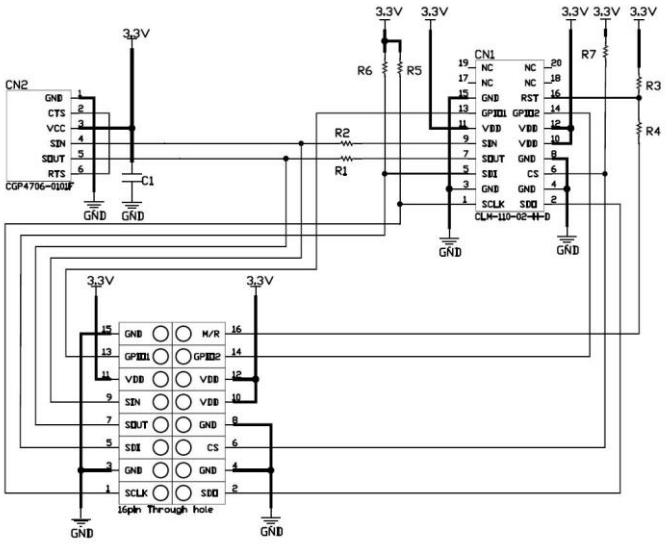
■ RECOMMENDED OPERATING CONDITION

Microsoft Windows7/ 8.1/ 10 (64bit) are supported when the USB interface of the USB Evaluation Cable is connected to the PC. Other hardware connection or software environments are not tested by Epson.

Table1. Recommended Operating Condition

Support OS	Windows 7/ 8.1/ 10 (64bit)
USB Specification	1.1 / 2.0
Operation Temperature	Room Temperature

■CIRCUIT



1) USB Evaluation Cable Interface Board Mode

・This is the default board setting:

・R3（10k ohm）mounted

・R4 (0ohm) not mounted

2) Breakout Board Mode

・Please remove R3（10k ohm）

・Please mount resistor R4 (0ohm)

＊chip size = 10x5 [mm]

Fig2. USB Evaluation Cable Interface/Breakout Board Circuit Diagram

■ OUTLINE DIMENSIONS AND PIN LAYOUT

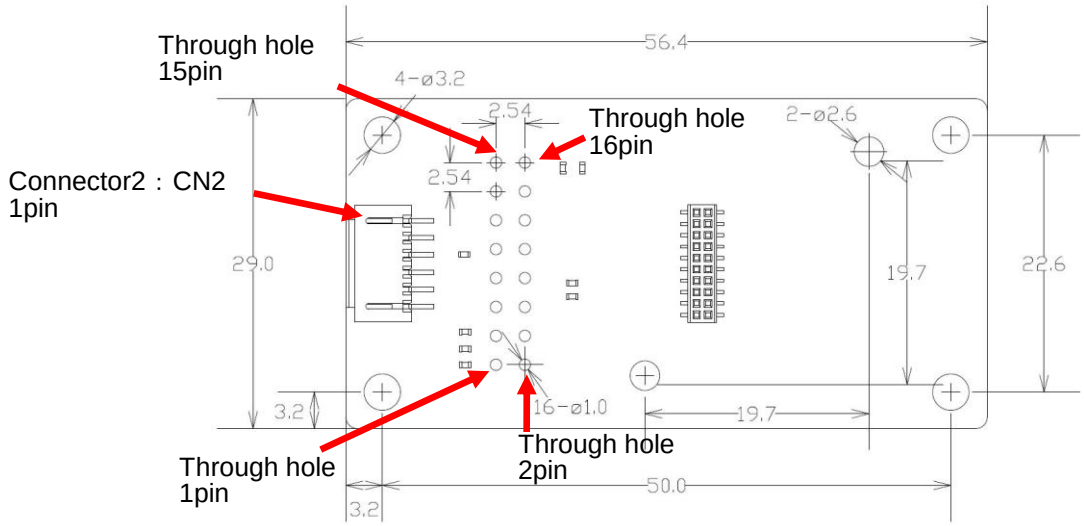


Fig3. Board Outline Dimensions (millimeters)

■ PIN FUNCTION

Table2. Though-hole Pinout Description

Pin No.	Mnemonic	Type*1	Description
1	SCLK	I	SPI Serial Clock *2
2	SDO	O	SPI Data Output *2
5	SDI	I	SPI Data Input *2
6	/CS	I	SPI Chip Select *2
7	SOUT	O	UART Data Output *2
9	SIN	I	UART Data Input *2
13	DRDY (GPIO1)	I/O	Data Ready *3 (General Purpose I/O1)
14	GPIO2 (EXT)	I/O	General Purpose I/O2 *4 (External Trigger Input or External Counter Reset Input)
16	/RST	I	Reset *5
10,11,12	VCC	S	Power Supply 3.3V
3,4,8,15	GND	S	Ground

*1) Pin Type I: Input, O: Output, I/O: Input/Output, S: Supply, N/A: Not Applicable
*2)Connect either SPI or UART but not both. Connecting both SPI and UART at the same time may result in malfunction of the device.
Regarding unused pins, please connect unused input pins to VCC through resistor.
*3) Regarding pin function selection, please refer to the **DRDY_ON** at register MSC_CTRL[0x02(W1)],bit[2]
*4) Regarding pin function selection, please refer to the **EXT_SEL** at register MSC_CTRL[0x02(W1)],bit[7:6]
*5) If the /RST pin is not used, keep the pin at High (VCC) voltage level.
Note) All input pins have weak pull up resistors inside the IMU.

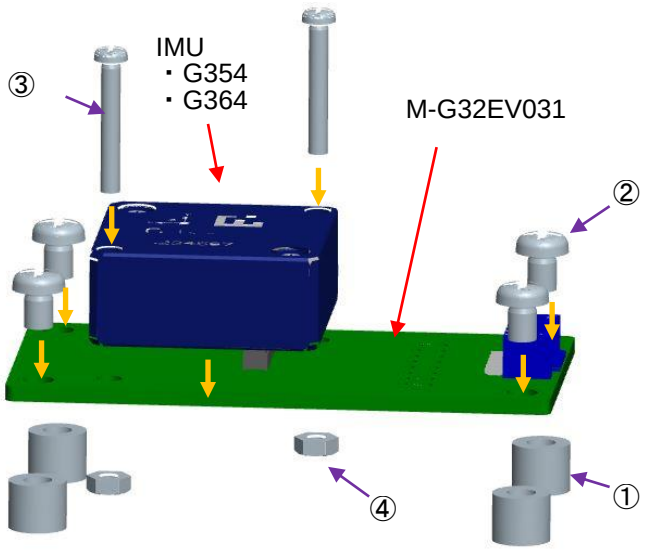
Table3. Pin Function Description (CN2)

Pin	Mnemonic	Type*1	Description
1	GND	S	Ground
2	CTS	I	Handshake Signal*2
3	VCC	S	Power Supply 3.3V

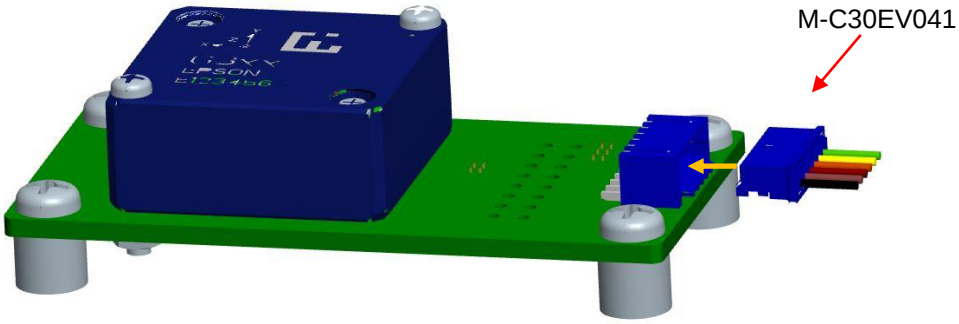
Pin	Mnemonic	Type*1	Description
4	SIN	I	UART Data Input
5	SOUT	O	UART Data Output
6	RTS	O	Handshake Signal*2

*1) Pin Type I :Input, O :Output, I/O :Input/Output, S :Supply
*2) RTS terminal and CTS terminal are shorted-circuited on the PCB.

■ INSTALLATION INSTRUCTION



(1) Assembling Instruction



(2) Connecting Instruction

Fig4. IMU Installation

■ BUNDLED PARTS

Table4. Bundled Parts List

Product Number	Product Name	Specifications	Quantity
①	Spacer	M3-5 Stainless	4
②	Screw	M3-4 Stainless	4

Product Number	Product Name	Specifications	Quantity
③	Sems Screw	Sems M2-16 Stainless	2
④	Nut	Hex Nut M2 Stainless	2

■ SUPPORTED DEVICES

Table5. Supported Devices

USB Evaluation Cable Interface / Breakout Board	USB Evaluation Cable	Supported IMU Models
M-G32EV031	M-C30EV041	M-G354PDH0
		M-G364PDC0
		M-G364PDCA

■ SOFTWARE REQUIREMENT

FTDI Driver

If the driver software (USB Serial Converter, USB Serial Port (COMx)) is requested when the USB Evaluation Cable is connected, install the driver using either of the following two methods.

- Update the driver via Windows Device Manager. (Automatic Update over the Internet is recommended.)
- Access the FTDI website (http://www.ftdichip.com/Drivers/VCP.htm) and download the appropriate driver for the OS.

■ IMU LOGGER SOFTWARE

The IMU logger software is provided for use with the USB Evaluation Cable and USB Evaluation Cable Interface Boards to allow easy evaluation of the Epson IMUs. For information about the IMU logger software, contact our representatives.

For Contact
SEIKO EPSON CORPORATION
Wearable Products Operations Division
WP Sales and Marketing Department
TEL: +81-266-61-0614, FAX: +81-266-61-2045

Software & Manuals Download Website:
http://global.epson.com/products_and_drivers/sensing_system/technical_info/evaluation_tools/

■ IMPORTANT NOTES OF USE

⚠ CAUTION

- Please read the caution sheet that is bundled before use.
- This “USB Evaluation Cable Interface / Breakout Board” communicates with IMU through the “USB Evaluation Cable (M-C30EV041)”. Please refer to the list in the ‘Supported Devices’ section to determine the supported IMU model.
- Please ensure that the IMU & USB Evaluation Cable Interface Board is properly connected before inserting or removing the USB cable.
- Do not insert or remove the USB cable immediately after connecting.
- The IMU & USB Evaluation Cable Interface Board can be easily moved by the USB cable resulting in possible damage by the impact. Please take precaution to prevent impact by restraining the IMU & USB Evaluation Cable Interface Board.
- When removing the IMU from USB Evaluation Cable Interface Board, do not remove the IMU casing assembly bonded-screws. Removing the IMU casing assembly bonded-screws will void the product warranty.

■ PRODUCT NUMBER AND ORDER INFORMATION

Please order using the following number.

Order Number	Product Number	Comment
E92E609031	M-G32EV031	USB Evaluation Cable Interface/Breakout Board

Evaluation Board/Kit and Development Tool Important Notice

⚠ CAUTION

1. This evaluation board/kit or development tool is designed for engineering evaluation, demonstration, or development purposes only. Do not use it for any other purposes. The conformance test for this product in accordance with European EMC regulations and United States FCC regulations has not been conducted.
2. This evaluation board/kit or development tool is intended for use by electronics engineers and is not a consumer product. Malfunction by the electrical noise may result from usage depending on your environment. The user should ensure it is used in a safe and proper manner.
3. Seiko Epson does not assume any responsibility or liability of any kind from damage and/or fire caused by the use of this evaluation board/kit or development tool. The user should cease using this evaluation board/kit or development tool if any abnormal issue occurs even during proper and safe usage.
4. When disposing of this evaluation board/kit or development tool, discard in accordance with domestic law concerning disposal.
5. The parts used for this evaluation board/kit or development tool may be changed without notice.
6. Do not allow heaters, human body or metal parts to contact the non-insulated parts of this evaluation board/kit or development tool.
7. Do not allow the human body or metal parts to contact any openings of this evaluation board/kit or development tool.
8. Do not allow excessive stress on mounted components, board wiring, and electric wire of this evaluation board/kit or development tool.
9. When exporting the products or technology described in this material, the user should comply with the applicable export control laws and regulations and follow the procedures required by such laws and regulations. Do not use, resell, export and/or otherwise disclose of these products (and any technical information, if any) for the development and/or manufacture of weapons of mass destruction or other military purposes.

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SEIKO EPSON CORPORATION

MSM BUSINESS PROJECT

281, Fujimi, Fujimi-cho, Nagano 399-0293, JAPAN
Phone: +81-266-61-0614 FAX: +81-266-61-2045

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