

CW25 R2 Evaluation Board User Manual



QUICK
START
GUIDE

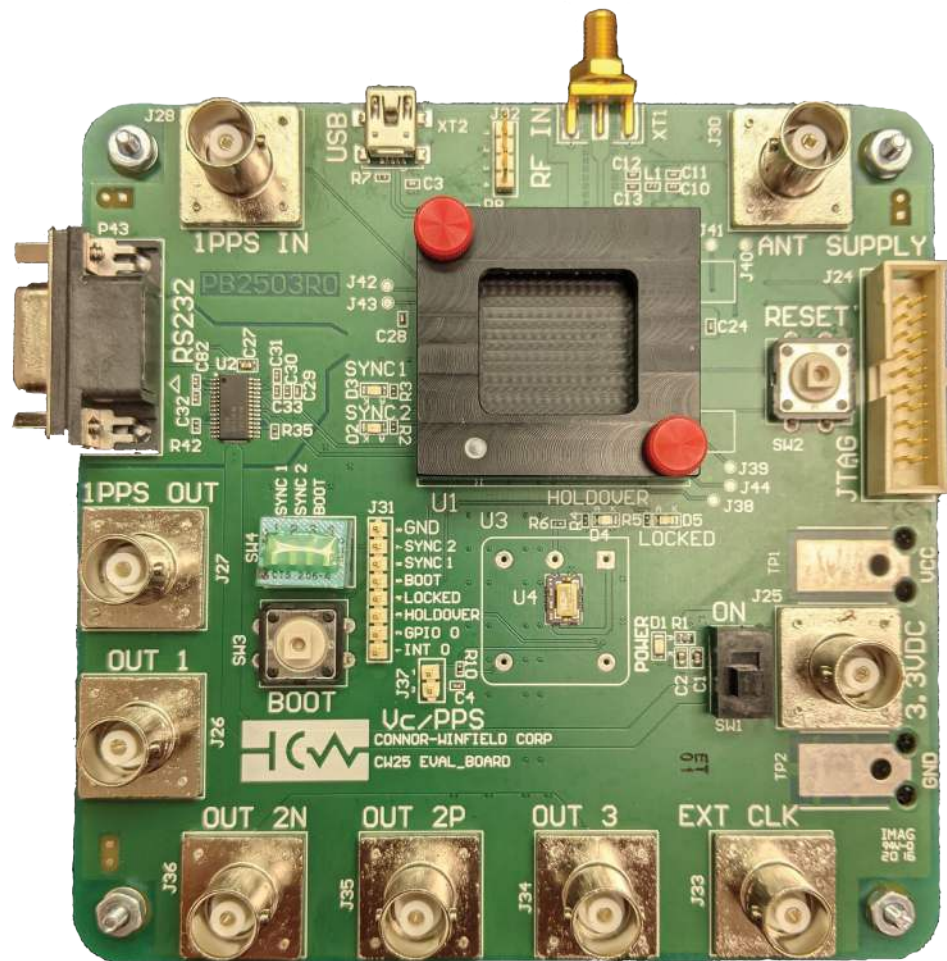


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1. Introduction

The CW25 R2 Evaluation Board was designed to provide easy accessibility to functions and features of the various CW25 Revision 2 modules. It provides the connectivity for the 3.3Vdc power supply input, an RS232 interface and easy access to the various inputs and outputs to observe the CW25 R2 functionality. The board has a socket than can accept any of the module options available in the CW25 Revision 2 line. An SMA bulk head connector provides the connection for an active antenna. Nine BNC connectors on-board make easy connection to: supply power to the board, module and antennae, provide connectivity for optional external 1PPS and external 10MHz REF master clock inputs, and provide access to the 1PPS and all frequency clock outputs available from the module. Access to the Event-In pin is also available through an SMA connection. The antenna power is provided by on-board circuitry. A connection point (TP1 and TP2) is available as an alternate to the BNC Socket for a DC power supply.

2. CW25 R2 Evaluation Board Overview

The CW25 R2 modules must be purchased separately. The Evaluation Board is also available as part of the CW25 R2 Evaluation Kit with all required accessories included (serial cable, power supply and patch antenna).

The Evaluation Board Provides:

- Socket for CW25 R2 compatible modules, e.g. CW25-GDO and CW25-TIM
- BNC COAX connector for +3.3Vdc Power supply
- RS232 Interface for NMEA commands
- RF-IN female bulk head SMA connector
- Optional on board 10MHz OCXO for fixed EXT10 MHz
- BNC COAX connector for EXT1PPS and EXT10MHz Frequency inputs
- BNC COAX connector for the 1PPS and all available clock outputs
- LED Indicators for Power, 1PPS Lock, Holdover, Ext 1PPS
- Reset and Power switches

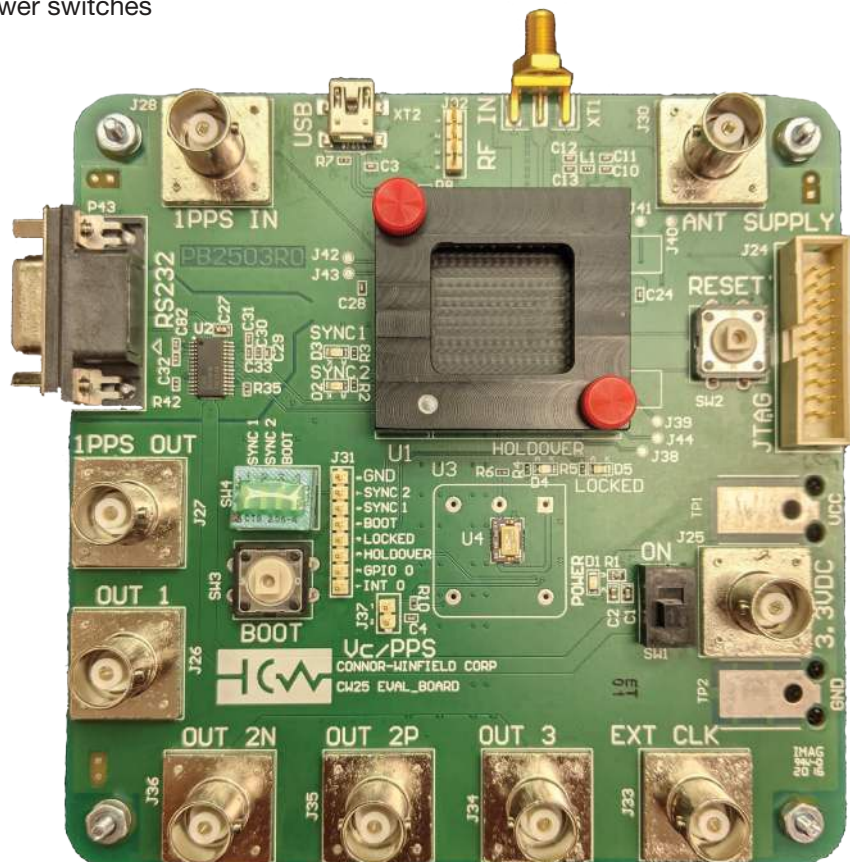


Figure 1 CW25 R2 Evaluation Board

3. General Specifications

If not otherwise specified, all performance data refers to the CW25 R2.

3.1 Operating Specifications

Parameter	Min	Typical	Max	Units
Operating Temperature	-30		+70	°C
Power Supply Voltage (Vcc)	3.15	3.3	3.45	Vdc
Power Consumption (depends on configuration)		1		W
RS232 Interface J1	2311765-1 TE CONNECTIVITY CONN D-SUB RCPT R/A 9POS			
Patch Antenna Connector	SMA Bulkhead Socket Female			
Power Connector (DC)	Vertical Jack 50 Ohm BNC TYCO 227699-1			
Dimensions	125 x 120 x 30mm (approx, Board Only)			
Weight	128g (approx, Board Only)			

4. Interfaces

4.1 Power

The CW25 R2 Evaluation Board must be provided with +3.3Vdc from an external DC power source using either a standard DC Power adapter with a BNC male Plug connected to J25, or the alternative connection points TP1 and TP2 using DC cables which can be soldered directly to the \pm terminals.

4.2 CW25 R2 (U3)

The CW25 R2 Evaluation board has an on-board socket to mate with the CW25-GDO and CW25-TIM modules. The modules are not provided with the evaluation board and must be obtained separately.

4.3 Serial Connections

The CW25 R2 Evaluation board provides a RS232 level shifting (TX, RX, GND) to interface the CW25 R2 GPS receiver with a PC via either a standard serial port or a USB-serial adapter (example Roline USB serial DB9ST). For detailed information of data streams and command format refer to User Manual.

4.4 Antenna Connection (XT1)

This evaluation board makes available a female SMA bulk head socket connection at XT1 to connect a standard patch antennae. The evaluation board also provides a BNC connector at J30 to power active antennas.

4.5 Power On and Reset Switches

The Power-On Slide Switch, SW1, enables the 3.3VDC power to the board. When power is connected to the board and SW1 is in the 'ON' position, the RED LED, D1 will be on continuously.

The Reset Push switch, SW2, is available to reset the CW25 R2 unit. Certain functions that affect the register settings of the internal Phase Lock Loop require a reset of the module. An example of this is when changing to or from the internal 10MHz MCLK. If an external 10MHz reference is activated, the CW25 R2 module must be reset for the change in MCLK source to take place. Using the reset switch will restart the module in the socket.

Boot Push switch, SW3 for firmware updates, is available to activate BootSel however there is a BOOTSEL command that can be used. The use of this switch is not common..

4.6 LED Indicators

Power-ON LED, D1

This RED LED is fully on when 3.3VDC is applied to the Board.

SYNC 1 LED, D2

This RED LED is ON when the SYNC 1 control pin is set for an EXTERNAL 1PPS REF IN signal.

SYNC 2 LED, D3

This RED LED is ON when the SYNC 2 control pin is set to FORCE HOLDOVER mode

HOLDOVER STATUS, D4

This RED LED is ON when the module is in HOLDOVER Mode.

LOCKED LED, D5

This GREEN LED is ON when the module is LOCKED to 1PPS.

4. Indicators continued

4.7 Timing Outputs

1PPS Output

BNC, J27- Filtered 1PPS output originating from either the on board receiver or from an External 1PPS input on BNC connector J2. Upon start up, the module will generate a 1PPS output; however, until a “Lock” signal is indicated on GREEN LED D5, the 1PPS should not be considered “valid”.

Variable Frequency Output 1

BBNC, J26 - female standard socket. The default frequency from the CW25 R2 is 10MHz. See the module data sheet for instructions to change the frequency on this pin's output.

Frequency Clock Output 2N

BNC, J36 - female standard socket. Frequency output from pin 3 on the CW25 R2 module.

Note, on the CW25 R2 modules, output 2N/and 2P can be configured as either 2 CMOS outputs or a differential pair (LVDS or LVPECL). This evaluation board does not support the termination for either LVDS or LVPECL.

Frequency Clock Output 2P

BNC, J35 - female standard socket. Frequency output from pin 4 on the CW25 R2 module.

Note: on the CW25 R2 modules, output 2N/and 2P can be configured as either 2 CMOS outputs or a differential pair (LVDS or LVPECL). This eval board does not support the termination for either LVDS or LVPECL.

Frequency Clock Output 3

BNC, J34 - female standard socket. 3.3V CMOS level frequency output from pin 6 on the CW25 R2 module. (Note: OUT3 may not be used on all versions of CW25 R2 modules.)

4.8 Timing Inputs

Optional External 1PPS Input

BNC, J28 - female standard socket. Accepts 3.3V CMOS level 1PPS from an external source. Using this feature replaces the 1PPS generated from the on board receiver as the input to the internal PLL. No quantization error correction is available when using this mode.

Optional External 10 MHz Reference Input

BNC, J33 - female standard socket. External 10MHz 3.3V CMOS input replaces the on board TCXO as the MCLK to the internal PLL, replacing it with this external reference source.

5. Operating Instructions

1. Connect the antenna to the SMA Bulk head socket, XT1
2. Place the Patch antenna in a sky view location
3. Connect a RS232 data cable to the NMEA Port, P43
4. Connect the remaining end of the cable to the RS232 COM port on a PC
5. Open Terminal Window or NavSync NS3K View GPS parser on the PC, with communications setting set to match the COM port used and the baud rate set to 38400 (default)
6. Connect the Power supply to the Board (+3.3Vdc)
7. Place the Slide Switch, S1, to position 1 to switch Power ON
8. The unit should start to stream data
9. Once the unit achieves a GPS lock, timing outputs will be valid and present

6. Connector Pin Outs

6.1 J24 JTAG Socket Connection

Pins	Description	Pins	Description	Pins	Description
1	VCC 3.3VDC	8	GND	15	NPOR
2	VCC 3.3VDC	9	TCK	16	GND
3	NC	10	GND	17	NC
4	GND	11	NC	18	GND
5	NC	12	GND	18	NC
6	GND	13	TDO	20	GND
7	TMS	14	GND		

6.2 RS232 DB9 Connectors

P43 - NMEA and Command	
Pins	Description
2	TX0 RS232 Levels
3	RX0 RS232 Levels
5	GND

6.3 DC Power Connector

The DC power connector is a 227699-1

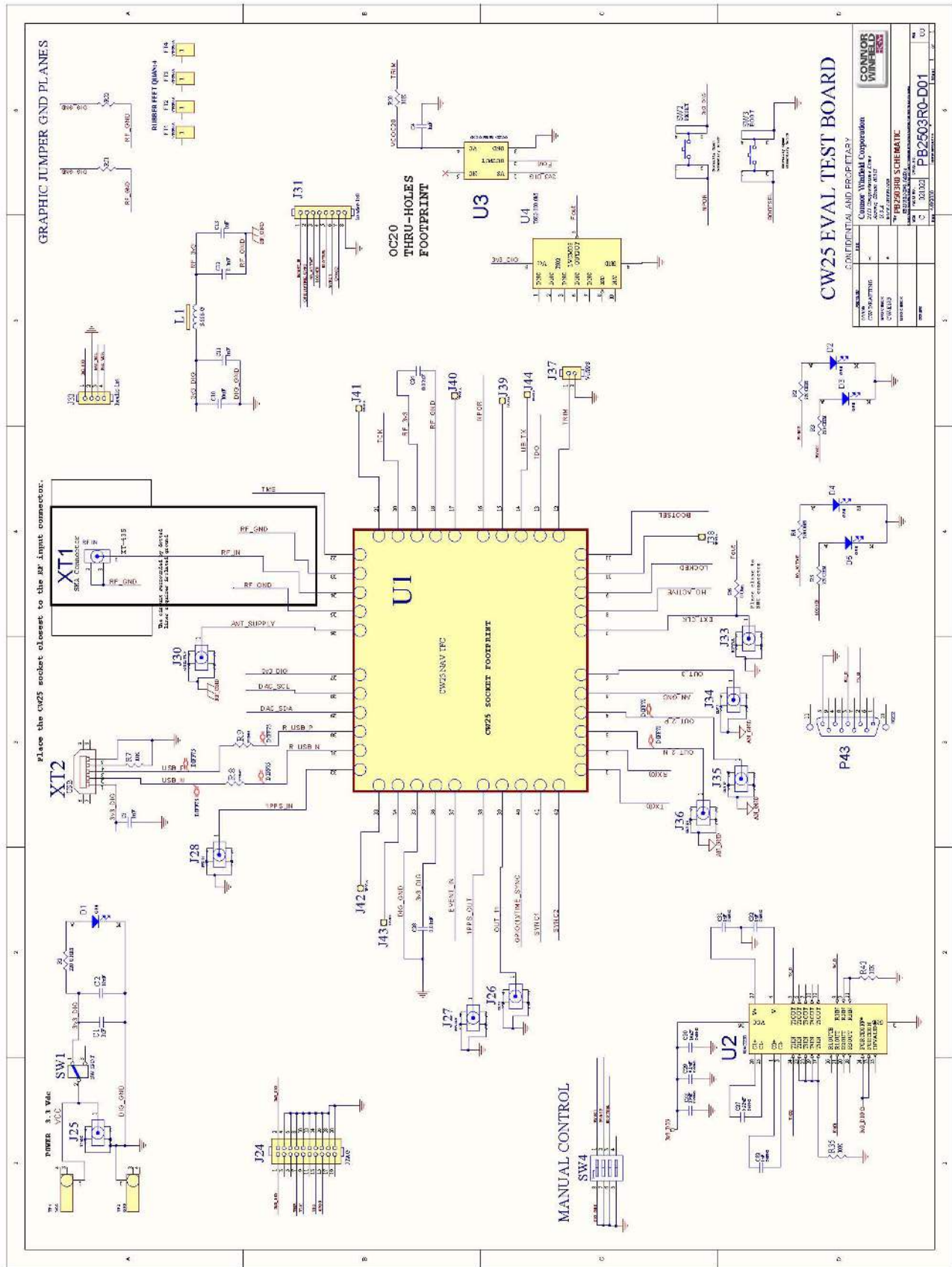
J25- DC -IN

Pins	Description
CENTER	DC Power in + (3.3Vdc)
OUTER	DC Power in - (GND)

6.4 TX1 (RF-IN) SMA Bulkhead Antenna Connector

This female SMA Bulkhead is a standard SMA socket

Appendix 1 Evaluation Board Schematic



Appendix 2 CW25 R2 Evaluation Board Bill of Material List

BILL OF MATERIAL

Quantity	Designator	Description
1	B1	130 C 4L .062 LPImask Pb HASL CW25 EVAL Test Board
1	C1	.1 uf 0603 X7R 5% 16V Capacitor
1	C2	10 uf 0603 X5R 20% 6.3V Capacitor
7		.1 uf 0402 X7R 10% 16V Cap C3, C4, C11, C12, C24, C28, C29
5		1.0 uf 0402 X5R 10% 6.3V Capacitor Murata GRM155R60J105KE19D C10, C31, C32, C33, C82
1	C13	.01 uf 0402 X7R 10% 25V Capacitor
1	C27	.22 uf 0603 X7R 10% 16V Capacitor
1	C30	10uF 0402 X5R 6.3V 20% Capacitor
4	D1, D2, D3, D4	17-215SURC/S530-A2/TR8 Everlight 0805 Hyper Red LED
1	D5	LTST-C170GKT LED Green Clear 0805 Lite-On Inc.
1	L1	BLM15EG121SN1D 0402 Murata Chip Ferrite Bead
1	R1	220 ohm 0603 5% Resistor
5	R2, R3, R4, R5, R6	220 ohm 0402 5% Resistor
4	R7, R10, R35, R42	10K ohm 0402 5% Resistor
2	R8, R9	27 ohm 0402 5% Resistor
1	U2	MAX3238CPWR TSSOP 28 Texas Instruments 3V to 5.5 V Multi Channel RS-232 Line Driver Receiver
1	U4	TCXO Oscillator - 5x7mm SMD(Surface Mount) - 3.3V
1	U3	Parts not required for these designators
1	U1	CW25 EVAL Socket used on PB-2503 -- Reference T19005 Tool Room
2	U1	90295A380 #6 Off-White Nylon Plastic Washer 0.156" ID, 0.312" OD
2	U1	92949A144 6-32 x 1/4" 18-8 SS Button Head Hex Drive Screw
1	J24	HTST-110-01-L-D 10X2 Samtec Shrouded High temp .1 ctr terminal
9		Vertical Jack 50 Ohm BNC TYCO 227699-1 J25, J26, J27, J28, J30, J33, J34, J35, J36
2	J31-J32	1X 8 .1 CTRS HTSW-108-07-G-S Samtec
1	J37	2 pos .1 ctrs straight Single Row Header .230 /.120 X .025 SQ pins HTSW-102-07-G-S
1	SW1	Switch Slide SPDT .5a 125v G107-0513 Digi key #SW-101
2	SW2, SW3	Switch - (Momentary Tact) - SW413-ND
1	SW4	206-4ST CTS SPST 4 Position DIP Switch
42	P1-P42	P13-4023 Harwin 1.27mm Two Part Probe - Serrated
1	P43	2311765-1 TE CONNECTIVITY CONN D-SUB RCPT R/A 9POS GOLD/FL
1	XT1	SMA Bulk Head Emerson 142-0701-871
1	XT2	MUSB-05-S-B-SM-A Samtec Wire Solder Low Temp SN63PB37 245 1.1% .020 No Clean Kester
4	J1-J4	Recessed Bumpers - 727K-ND
4	J1-J4	Washers - (#4 Internal Tooth Lock) - H236-ND
4	J1-J4	4-40 Hex Nuts - H216-ND
4	J1-J4	Machine Screws (4-40 x 1/2) - H146-ND Solder Paste SN62PB36AG02 500gm per Jar (Indium)

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Available at Digi-Key
www.digikey.com

Revision	Date	Notes
00	07/07/21	Release
01	07/08/21	Updated Power Supply Voltage specs

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