



CONDOR C2626 GPS RECEIVER MODULE

TECHNICAL HIGHLIGHTS

Receiver: GPS L1 frequency
(1575.42 MHz), C/A code,
22-channel continuous tracking

NMEA output and input: serial port

On-board low noise amplifier

SBAS (WAAS, EGNOS, MSAS)
capable

aGPS capable

PPS timing output

C2626 is also available in a starter
kit (70897-05)

Condor C2626

Samtec
Connector

Samtec P/N:
ASP-69533-01

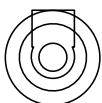
VBAT	8	7	VCC
RXD	6	5	TXD
PPS	4	3	Reserved
GND	2	1	Reserved

Pin Out Diagram

The mating connector for the C2626:
• Samtec P/N CLP-104-02-G-D

RF Connector is a
Hirose
Connector

Hirose P/N:
H.FL-R-SMT (10) 50 Ω



GENERAL OVERVIEW

The Condor C2626 is a high performing, NMEA protocol-only alternative to the Trimble Lassen iQ module. The C2626 is supplied in the same mechanical package as the Lassen iQ, but features greatly improved sensitivity and tracking abilities.

By copying the popular Lassen iQ form factor, the C2626 continues Trimble's tradition of advancing technology while preserving the customer's investment.

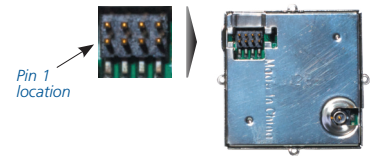
The C2626 uses a single 8-pin (2x4) male header connector for both power and data I/O. The power and I/O connector is a surface mount micro terminal strip (Samtec P/N ASP 69533-01).

The Condor C2626 provides an L1 Frequency GPS receiver, with NMEA protocol from a serial port, and also a PPS timing output.

The C2626 has an onboard low noise amplifier (LNA) that is compatible with both active and passive antenna implementations. It includes an onboard RTC and TCXO.



Top View: Condor C2626



Bottom View: Condor C2626

The C2626 has built-in antenna detection for open and short circuit conditions; alerts are on by default, but can be turned off by command. This module is available mounted in a complete starter kit for quick testing and integration (P/N 70897-05).

Choose the Condor C2626 for top tier positioning performance, the best components, and the highest production quality standards.

PIN OUT TABLE

PIN#	FUNCTION	I/O	DESCRIPTION
1	Reserved		Can be used for TXD instead of pin 5
2	GND	Ground	Ground for power and signal input
3	Reserved		Can be used for RXD instead of pin 6
4	PPS	Output	Pulse-Per-Second Interface Time pulse, @ 2.8 V LVTTTL
5	TXD	Output	Serial port Transmit @ 2.8 V LVTTTL
6	RXD	Input	Serial port Receive @ 2.8 V LVTTTL
7	VCC	Power	Main power supply 3.0 V to 3.6 V
8	VBAT	Power	Battery backup power 2.0 V to V _{CC}

GPS PERFORMANCE SPECIFICATIONS

GPS performance statistics are clear view, stationary.
Sensitivity based on signals measured at the antenna.

PARAMETER	VALUE(S)
Update Rate	1 Hz (default), up to 5 Hz
Number of Channels	22
Accuracy	
Position (autonomous)	<2.5 m 50%, <5 m 90%
Position (SBAS)	<2 m 50%, <4 m 90%
Altitude (autonomous)	<5 m 50%, <8 m 90%
Altitude (SBAS)	<3 m 50%, <5 m 90%
PPS	< ±25 ns @ 50%
Acquisition time	
Re-Acquisition	2 s 50%
Hot Start	2 s 50%
Warm Start	35 s 50%
Cold Start	38 s 50%
Sensitivity	
Tracking	-160 dBm
Acquisition	-146 dBm
Dynamics	
Acceleration	2 g
Max Operational Velocity	515 m/s

ELECTRICAL SPECIFICATIONS

PARAMETER	VALUE(S)
Serial Interface – UART	1 bidirectional NMEA
Level	2.8 V LVTTTL level
PPS Interface	1 Hz timing pulse, output
Level	2.8 V LVTTTL level
PPS Accuracy to UTC	< ±25 ns @ 50%
Pulse Width	4.2 µs default (configurable)
GPS Input RF Interface	GPS signal input 50 Ω unbalanced (coaxial) RF input
Main Power Supply	
V _{cc} DC Levels	3.0 V to 3.6 V; 3.3 V typical
Consumption (current)	37 mA
RTC and Backup Power Supply	
V _{rtc} DC Levels	2.0 V to V _{cc}
Consumption (current)	5 µA typ @ +20°C

GPS COMMUNICATION PARAMETERS

GPS output is available from a serial interface (UART). The output adheres to NMEA 0183 protocol with the following characteristics.

PARAMETER	VALUE(S)
Protocol	NMEA 0183
Baud Rate	
Default	9600
Other	4800, 19200, 38400, 57600, 115200
Message Output Rate	Up to 5 Hz
Number of message types restricted by baud rate	

NMEA 0183 MESSAGES

MESSAGE	DEFAULT	DESCRIPTION
GGA	Default	GPS fix data
GSA	Default	GPS DOP and active satellites
GSV	Default	GPS satellites in view
RMC	Default	Recommended minimum specific GPS/Transit data
CHN	Other	GPS channel status
GLL	Other	Geographic position – Latitude/ Longitude
VTG	Other	Track Made Good and Ground Speed
ZDA	Other	Time and date

ENVIRONMENTAL SPECIFICATIONS

PARAMETER	VALUE(S)
Temperature	
Operating	-40 °C to +85°C
Storage	-40 °C to +105°C
Humidity	5% to 95% non-condensing @ 60°C
Vibration	
5 Hz to 20 Hz	0.008 g ² /Hz
20 Hz to 100 Hz	0.05 g ² /Hz
100 Hz to 900 Hz	-3 dB/octave

PHYSICAL SPECIFICATIONS

PARAMETER	VALUE(S)
Dimensions	26.0 x 26.0 x 6.0 mm
Weight	6.486 g including metal shield

ABSOLUTE MAXIMUM RATINGS

CAUTION–Absolute maximum ratings indicate conditions beyond which permanent damage to the device may occur. Electrical specifications do not apply when operating the device outside its recommended operating conditions.

PARAMETER		MIN	MAX	UNIT
Main power supply voltage	(V _{CC})	-0.3	4.0	V
RTC power supply voltage	(V _{RTC})	-0.3	4.0	V
Antenna input power at RF input	(dBm)		+10 max	dBm
Storage temperature	(T _s)	-40	+105	°C

RECOMMENDED CONDITIONS OF OPERATION

PARAMETER		MIN	MAX	UNIT
Primary power supply voltage ¹	(V _{CC})	3.0	3.6	V
RTC power supply voltage	(V _{RTC})	2.0	V _{CC}	V
Input pin threshold voltage (RXD, Reserved Pins, XRESET)				
with Status = High	(V _{IH})	2.0	V _{CC}	V
with Status = Low	(V _{IL})	-0.3	0.8	V
Output pin threshold voltage (TXD)				
with Status = High (I _{OH} = 1.6 to 14 mA)	(V _{OH})	2.4	V _{CC}	V
with Status = Low (I _{OL} = 1.6 to 14 mA)	(V _{OL})	-0.3	0.4	V
Hardware XRESET (assert XRESET pin)	(XRESET)	100		ms
Ambient operating temperature	(T _A)	-40	+85	°C

¹ See "Supply Voltage Requirement" below.

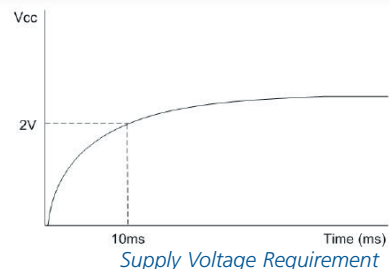
ELECTRICAL CHARACTERISTICS

Characteristics apply to corresponding operating conditions as stated, with typical @20 °C. Measurements are made over temperature range -40 °C to +85 °C. Measured results are typical and do not guarantee performance.

PARAMETER	MIN	TYP	MAX	UNIT
Current Draw, continuous tracking (excluding antenna supply)	31	37	44	mA
Power Consumption, continuous tracking (excluding antenna supply)	93.00	122.10	151.20	mW
Current Draw, standby mode (V _{rtc} pin only; V _{RTC} = 2.96)		5		µA
Current Draw, standby mode using serial command (V _{CC} and V _{rtc} pins)		2.42		mA
Supply Ripple Noise, 1 Hz to 1 MHz			50	mV _{pp}
Supply Ripple Noise, GPS TCXO freq 16.368 MHz ± 5 kHz			1	mV _{pp}
Input Gain at RF Input	0 (passive antenna)		25	dB
External LNA noise figure			2	dB

SUPPLY VOLTAGE REQUIREMENT

The Primary Supply Voltage (V_{CC}) slope from 0 V to 2 V must have a rise time that is less than 10 ms.



FEATURES

Reserved (Pin 1)

For backward compatibility purposes, pin 1 is tied to pin 5. This will enable any previous Lassen iQ designs using port A to use the Condor C2626 module for NMEA output. Use either pin 1 or pin 5, but not both.

GND (Pin 2)

Ground for power and signal.

Reserved (Pin 3)

For backward compatibility purposes, pin 3 is tied to pin 6. This will enable any previous Lassen iQ designs using port A to use the Condor C2626 module for NMEA output. Use either pin 3 or pin 6, but not both.

PPS – Pulse-Per-Second Output (Pin 4)

This logic level output provides a 1 Hz timing signal to external devices. The default pulse width of this signal is 4.2 μs. (The pulse width is configurable by using the \$PMTK324 command.)

For timing applications, you must capture the time from the ZDA timing message. Position messages contain a timestamp that can be 1 to 2 seconds in the past. Therefore, you can take the following steps to ensure that you acquire the correct time.

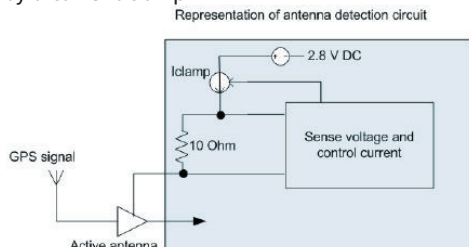
Do the following to acquire the correct time:

1. Confirm that the UTC offset has been downloaded (\$PMTK457) and that the receiver is generating 3D fixes (GSA). This eliminates the UTC offset jump.
2. Confirm that the receiver is configured so that it only outputs a PPS on a 3D fix (\$PMTK424).
3. Capture the time from the ZDA packet. Once time is acquired, add 1 to the whole second on the next PPS for the correct time.

Antenna Detection in C2626

The C2626 has built-in antenna circuit status detection for open and short circuit conditions (for use with active antenna applications). By default, the open and short alerts are turned on. You can turn them off using the \$PMTK324 command.

The SHORT alert is triggered if more than 19 mA is drawn from the antenna pin; the current is further restricted to a maximum of 33 mA by a current clamp.



Antenna Detection Circuit (Built-In)

This diagram shows the active antenna drawing current through an internal 10 Ω sense resistor, supplied by an internal 2.8 V regulator. As a result, there will be an associated voltage drop as the current increases.

Serial Port Default Settings (Pins 5, 6)

The Condor C2626 GPS module supports one serial port. Baud rate is user configurable. Data bits, parity and stop bits are not. Flow control is not available.

Serial Port Default Settings

PORT DIRECTION	PIN #	PROTOCOL	CHARACTERISTICS				
			Default Baud Rate	Data Bits	Parity	Stop Bits	Flow Control
TXD	5	NMEA out	9600	8	None	1	None
RXD	6	NMEA in	9600	8	None	1	None

ACCESSORIES

66801-00 – Unpackaged antenna.



3.3V active miniature unpackaged antenna. Cable length: 8 cm. Dim: 22 mm W x 21 mm L x 8 mm H (0.866" x 0.827" x 0.315"). Connector: H.FL; mates directly to the on-module RF connector.

66800-50 – Magnetic Mount antenna with MCX.



3V active micropatch antenna with magnetic mount. Cable length: 5 m. Dim: 42 mm W x 50.5 mm L x 13.8 mm H (1.65" x 1.99" x 0.55"). Connector: MCX, mates through the optional RF transition cable to the module's RF connector.

66800-52 – Magnetic Mount antenna with SMA.



3V active micropatch antenna with magnetic mount. Cable length: 5 m. Dim: 42 mm W x 50.5 mm L x 13.8 mm H (1.65" x 1.99" x 0.55"). Connector: SMA, mates through the optional RF transition cable to the module's RF connector.

58542 – Antenna transition cable with MCX connector.



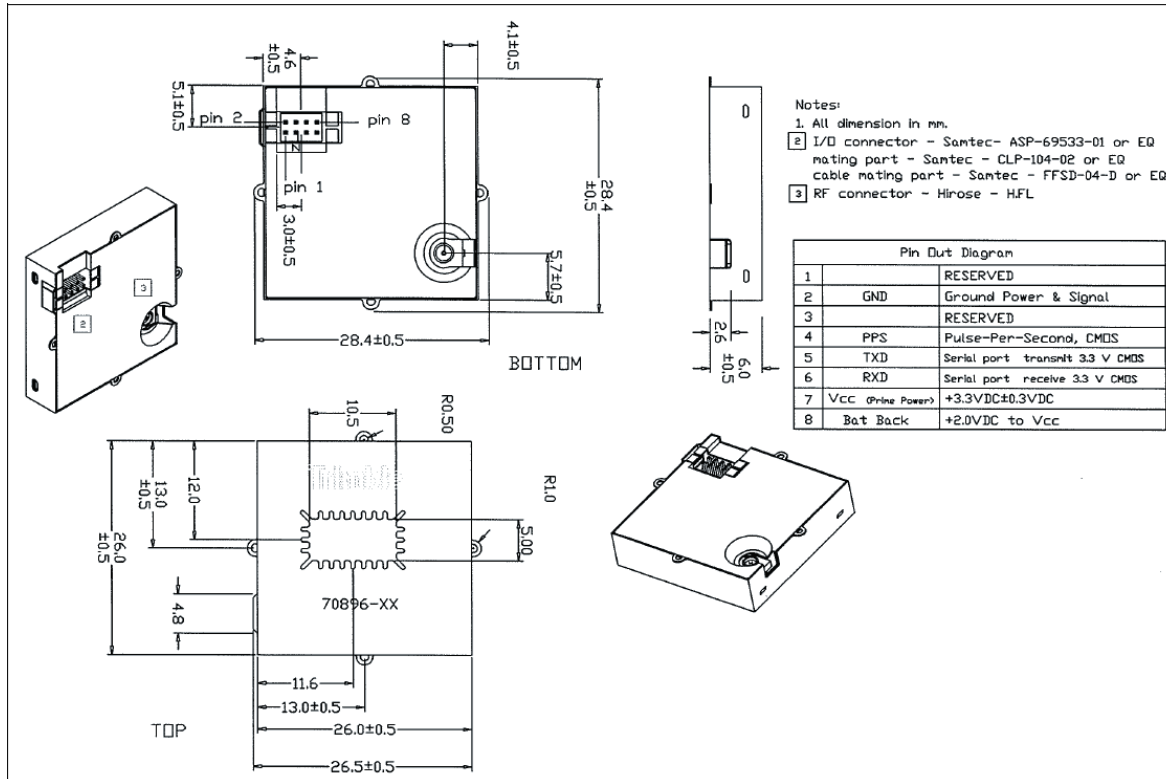
RF cable for connecting antennas with MCX connector to the on-module H.FL RF connector. Cable length: 10 cm.

58541-05 – Antenna transition cable with SMA connector.



RF cable for connecting antennas with SMA connector to the on-module H.FL RF connector. Cable length: 12.9 cm.

MECHANICAL OUTLINE DRAWING



ORDERING INFORMATION

Note: Also see ACCESSORIES on page 4.

Model	Part #	Packaging	Starter Kit P/N
		250-piece box	
C2626	70896-00	√	70897-05

SUPPORT INFORMATION

Get support information, including documentation and support software, at trimble.com:

<http://www.trimble.com/embeddedsystems/condor-gps-module.aspx?dtID=support>

Note: See the *Condor Series GPS Modules User Guide* for RF Layout Considerations.

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