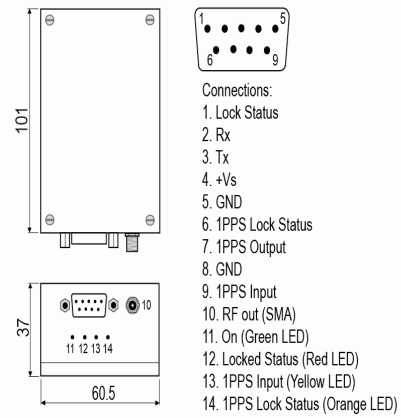
ISSUE 1; December 2020

Description

- The IQRB-3 low noise Rubidium atomic clock oscillator in sub-miniature housing, combined with 'active noise filter' technology.
  This Rubidium atomic clock oscillator has 100 times less drift than OCXOs and with short term stability of 0.002ppb/s at 100s. The Rubidium atomic clcock oscillator provides significant improvements in performance over other rubidium components.
- FEATURES:
  Sine wave or CMOS/TTL output
  Short term stability 0.002ppb at 100sec
  Accuracy 0.05ppb
  Phase noise □115dBc/Hz at 1Hz
  Phase□locks to external 1PPS
  1µ sec. holdover per 24hrs
  Compatible with 50Ω or 75Ω load
- APPLICATIONS:
  Where sizes are restricted this 'breakthrough' low noise rubidium oscillator will enable new applications
  Extended holdover for CDMA, WiMAX and LTE base stations
  High stability and low phase noise for communication and surveillance applications
  Compact designs and portable and mobile applications
  Production Test Reference for instrumentation
  Microwave Test Bench or Test solution

Outline (mm)



Connections:
1. Lock Status
2. Rx
3. Tx
4. +Vs
5. GND
6. 1PPS Lock Status
7. 1PPS Output
8. GND
9. 1PPS Input
10. RF out (SMA)
11. On (Green LED)
12. Locked Status (Red LED)
13. 1PPS Input (Yellow LED)
14. 1PPS Lock Status (Orange LED)

Frequency Parameters

- Frequency 10.0MHz
- Frequency Tolerance ±0.05ppb
- Tolerance Condition @ 25°C
- Frequency Stability ±0.30ppb to ±0.50ppb
- Short Term Stability (AVAR):

	Option 'A'	Option 'B'
1s	0.002ppb max	0.0007ppb max
10s	0.005ppb max	0.003ppb max
100s	0.006ppb max	0.002ppb max
1000s	0.004ppb max	0.001ppb max

- Standard Ageing (after 30days):
  ±0.005ppb max/day
  ±0.05ppb max/month
  ±0.5ppb max/year

  Ageing Option 'D' (after 30 days):
  ±0.003ppb max/day
  ±0.03ppb max/month
  ±0.3ppb max/year
- Retrace (after 1 hour of continuous operation): ±0.03ppb
- Note: Standard operating temperature range is -40 to 60°C

Sales Office Contact Details:
UK: +44 (0)1460 270200
France: 0800 901 383
Email: info@iqdfrequencyproducts.com
Germany: 0800 1808 443
USA: +1.760.318.2824
Web: www.iqdfrequencyproducts.com

Electrical Parameters

- Supply Voltage 12.0V +3V
- Note: The device will operate over the Supply Voltage Range 12V to 15V.
- Power Consumption: 22W max at start-up @ 25°C, 6W @ steady-state
- Warm Up Time:
  8mins max to lock @ 25°C
  7min max to 0.5ppb at 25°C
- Lock Status (10MHz @ pin 1): high (3.3V) when out of lock and low (0V) when locked.
- 1PPS Input Lock Status (pin 6): High (1.7V) when out of lock. Low (0V) when in lock and synchronised to external 1PPS for automatic frequency correction.
- Digital GND (pin 5) and analogue-power GND (pin 8): It is recommended to separate the digital and analogue ground for best performance. The digital ground is used for RS232.
- LEDs on front panel:
  LED 11 (Green):
  On indicates that the power supply is on.
  LED 12:(Red):
  On- Rubidium Not Locked
  Flashing - Rubidium locked and the PLL is fine tuning the frequency
  Off indicates that the internal OCXO is locked to the internal rubidium.
- LED 13: (Yellow):
  Flashing - LED will flash 1s intervals when an external 1PPS signal is present
  LED 14: (Orange);
  On - Not Locked to external 1PPS
  Flashing - Locked to external 1PPS and is fine tuning the frequency.
  Off - Locked to external 1PPS

Frequency Adjustment

- Electronic frequency adjustment: available digitally via the RS232 connection by using HEX words.
- Electrical frequency adjustment using external voltage control: please contact the IQD sales office to discuss this option.

Operating Temperature Ranges

- -20 to 60°C
- -30 to 65°C
- -50 to 65°C

Output Details

- Output Compatibility Sine
- Drive Capability 50Ω
- Output Level (@ 50Ω): +8dBm ±2dBm
- For TTL/CMOS output (15pF), please contact IQD sale office.
- Output Connector Type: SMA
- Rx and Tx connections for RS232 communication of the status of the oscillator (9600 baud).

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Noise Parameters

- Phase Noise (Option 1):
  -110dBc/Hz @ 1Hz
  -135dBc/Hz @ 10Hz
  -145dBc/Hz @ 100Hz
  -155dBc/Hz @ 1kHz
  -158dBc/Hz @ 10kHz
- Phase Noise (Option 2):
  -113dBc/Hz @ 1Hz
  -138dBc/Hz @ 10Hz
  -152dBc/Hz @ 100Hz
  -155dBc/Hz @ 1kHz
  -158dBc/Hz @ 10kHz
- Phase Noise (Option 3):
  -115dBc/Hz @ 1Hz
  -140dBc/Hz @ 10Hz
  -154dBc/Hz @ 100Hz
  -155dBc/Hz @ 1kHz
  -160dBc/Hz @ 10kHz
- Standard Harmonics: -30dBc max
  Harmonics Option 'C': -45dBc max
- Spurious (100kHz BW): -100dBc max

Environmental Parameters

- Storage Temperature Range: -40 to 90°C
- Mechanical Shock: IEC 60068-2-27, Test Ea: Acceleration of 50g peak amplitude for 11ms duration.
- Vibration: IEC 60068-2-06, Test Fc: 10Hz-55Hz 1.5mm displacement, 55Hz-500Hz 10g acceleration.
- Atmospheric Pressure: $1x10^{-13}$/mbar
- Magnetic field sensitivity: $5x10^{-12}$/Gauss

Manufacturing Details

- MTBF (Stationary): Approx 100000hrs

Ordering Information

- Ordering Information (*minuimum required):
  Frequency*
  Model*
  Output*
  Frequency Stability*
  Operating Temperature Range*
  Allan Deviation option A or B*
  Phase Noise option, 1, 2 or 3*
  Harmonics (standard or option C)
  Ageing (standard or option D)
  Frequency Adjustment (or mechanical adjustment option H)

Compliance

RoHS Status (2015/863/EU)	Compliant
REACh Status	Non-Compliant
MSL Rating (JDEC-STD-033):	Not Applicable

Packaging Details

- Pack Style: Bulk Bulk pack
  Pack Size: 1

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