

Atomic Clock Stability Frequency Source with the Rubidium™ MG362x1A Signal Generator

Introduction

Metrology and calibration labs, satellite earth stations, backhaul communication links, university research, and many defense applications need very stable and accurate frequency references to which other signal generators can be locked. The Rubidium signal generator provides two options that users can choose to obtain atomic clock stability, which is an order of magnitude better than a typical OCXO.

GNSS/GPS Atomic Clock Receiver

The Rubidium signal generator has an option to include the GNSS/GPS receiver (Option 66) in the instrument, which locks to the satellite signal and decodes the 1PPS reference clock. This 1 PPS clock is used to calibrate the signal generator's internal OCXO or a rubidium clock time base. Clocks on GNSS/GPS satellites are ultimately traceable to national frequency standards. For example, the clock on GPS satellites are referenced to the United States Naval Observatory (USNO) that is traceable to the NIST US national standard.

Ultra Stability Rb Time Base

Atomic frequency stability is also provided through a rubidium frequency reference (Option 56). This option will benefit defense users who need very high frequency stability without being dependent on an external reference such as that derived from a GNSS/GPS satellite signal for security and reliability reasons. The Rubidium signal generator features a high quality rubidium reference that provides excellent mid- and long-term frequency stability with T&M grade phase noise performance.

For both options of atomic clock stability, the Rubidium signal generator can output a 1 PPS reference clock signal to lock other Rubidium signal generators. Alternatively, it can provide a 10 MHz OCXO reference that is calibrated by GNSS/GPS or a rubidium clock as output, which can then be used to lock another Rubidium signal generator.

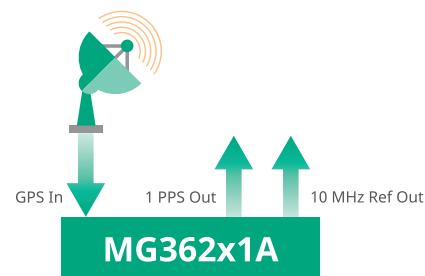
Stable and Accurate Atomic Frequency Reference

Reference	Aging Rate	Stability	Accuracy
OCXO	Not Good	Short term: Good Long term: Not Good	Not Good
Rubidium (Option 56)	Very Good	Short term: Good Long term: Very Good	Very Good
GNSS/GPS (Option 66)	Very Good	Short term: Acceptable Long term: Very Good	Very Good

Options 56 and 66 are ideal for signal generator applications in metrology and calibration labs, astronomy research, and satellite ground stations. Option 56 (rubidium clock) is well suited for defense applications that require a very stable and independent reference without connecting to any external signal such as GPS/GNSS.



Sig Gen with Ultra Stability Time Base –Rb (Option 56)



Sig Gen with GNSS/GPS Atomic Clock Receiver (Option 66)



Specifications are subject to change without notice.

• **United States**

Anritsu Americas Sales Company

490 Jarvis Drive, Morgan Hill, CA 95037-2809, U.S.A.
Phone: (408)-778-2000

• **Canada**

Anritsu Electronics Ltd.

Americas Sales and Support

490 Jarvis Drive, Morgan Hill, CA 95037-2809, U.S.A.
Phone: +1-800-Anritsu (1-800-267-4878)

• **Brazil**

Anritsu Eletrônica Ltda.

Praça Amadeu Amaral, 27 - 1 Andar
01327-010 - Bela Vista - São Paulo - SP, Brazil
Phone: +55-11-3283-2511

• **Mexico**

Anritsu Company, S.A. de C.V.

Blvd Miguel de Cervantes Saavedra #169 Piso 1, Col. Granada
Mexico, Ciudad de Mexico, 11520, MEXICO
Phone: +52-55-4169-7104

• **United Kingdom**

Anritsu EMEA Limited

900 Capability Green, Luton, Bedfordshire, LU1 3LU, U.K.
Phone: +44-1582-433200

• **France**

Anritsu SA

12 avenue du Québec, Immeuble Goyave,
91140 VILLEBON SUR YVETTE, France
Phone: +33-1-60-92-15-50

• **Germany**

Anritsu GmbH

Nemetschek Haus, Konrad-Zuse-Platz 1,
81829 München, Germany
Phone: +49-89-442308-0

• **Italy**

Anritsu S.R.L.

Spaces Eur Arte, Viale dell'Arte 25, 00144 Roma, Italy
Phone: +39-6-509-9711

• **Sweden**

Anritsu AB

Kistagången 20 B, 2 tr, 164 40 Kista, Sweden
Phone: +46-8-534-707-00

• **Finland**

Anritsu AB

Technopolis Aviapolis, Teknobulevardi 3-5 (D208.5),
FI-01530 Vantaa, Finland
Phone: +358-20-741-8100

• **Denmark**

Anritsu A/S

c/o Regus Winghouse, Ørestads Boulevard 73, 4th floor,
2300 Copenhagen S, Denmark
Phone: +45-7211-2200

• **Spain**

Anritsu EMEA GmbH

Representation Office in Spain

Calle Manzanares 4, Primera planta, 28005 Madrid, Spain
Phone: +34-91-572-6761

• **Austria**

Anritsu EMEA GmbH

Am Belvedere 10, A-1100 Vienna, Austria
Phone: +43-(0)1-717-28-710

• **United Arab Emirates**

Anritsu A/S

Office No. 164, Building 17, Dubai Internet City
P. O. Box - 501901, Dubai, United Arab Emirates
Phone: +971 (0) 4-2424919

• **India**

ANRITSU INDIA PRIVATE LIMITED

6th Floor, Indique ETA, No.38/4, Adjacent to EMC2,
Doddanekundi, Outer Ring Road, Bengaluru - 560048, India
Phone: +91-80-6728-1300
Fax: +91-80-6728-1301

• **Singapore**

ANRITSU PTE LTD

1 Jalan Kilang Timor, #07-04/06 Pacific Tech Centre
Singapore 159303
Phone: +65-6282-2400

• **Vietnam**

ANRITSU COMPANY LIMITED

16th Floor, Peakview Tower, 36 Hoang Cau Street, O Cho Dua Ward,
Hanoi, Vietnam
Phone: +84-24-3201-2730
Fax: +84-24-3201-2740

• **P.R. China (Shanghai)**

Anritsu (China) Co., Ltd.

Room 2301-2303, Tower A, New Caohejing International Business
Center No. 391 Gui Ping Road, Shanghai, 200233, P.R. China
Phone: +86-21-6237-0898

• **P.R. China (Hong Kong)**

ANRITSU COMPANY LIMITED

Unit 1302, 13th Floor, New East Ocean Center,
No.9 Science Museum Road, TsimShaTsui East,
Kowloon, Hong Kong
Phone: +852-2301-4980

• **Japan**

ANRITSU CORPORATION

8-5, Tamura-cho, Atsugi-shi, Kanagawa, 243-0016 Japan
Phone: +81-46-296-1244
Fax: +81-46-296-1239

• **Korea**

Anritsu Corporation Limited

8F, A TOWER, 20, Gwacheondaero 7-gil, Gwacheon-si,
Gyeonggi-do, 13840, Republic of Korea
Phone: +82-2-6259-7300

• **Australia**

Anritsu Pty Ltd

Unit 20, 21-35 Ricketts Road, Mount Waverley, Victoria 3149, Australia
Phone: +61-3-9558-8177

• **Taiwan**

ANRITSU COMPANY, INC.

7F, No. 316, Sec. 1, NeiHu Rd., Taipei 114, Taiwan
Phone: +886-2-8751-1816

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