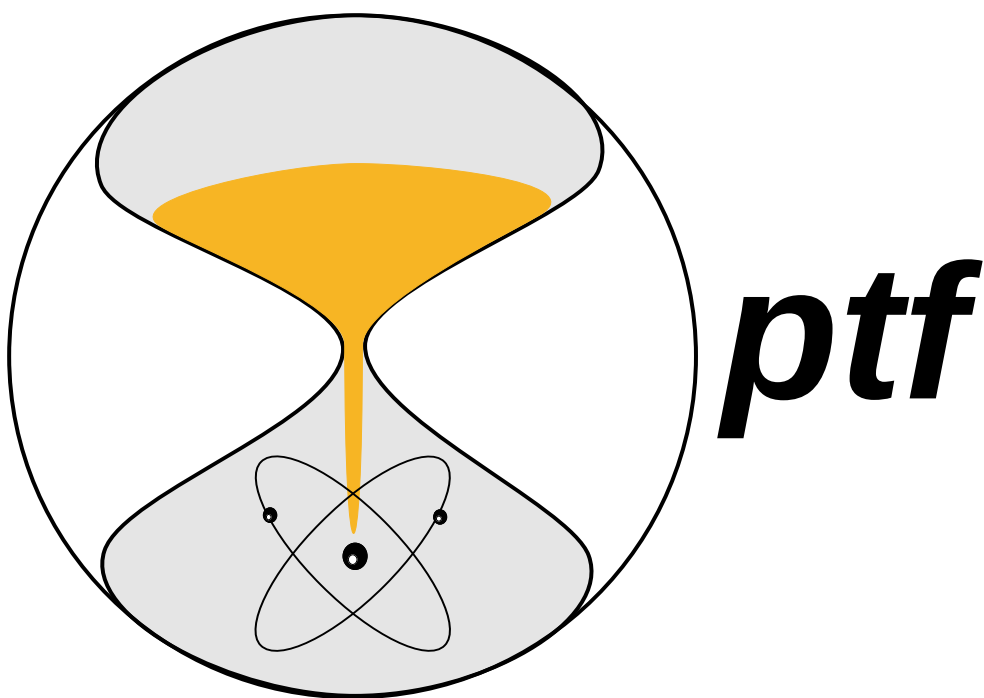




Precise Time and Frequency, LLC

***ptf* 1212A-SMA Frequency Doubler**

Operation and Maintenance Manual



Document # 10916
Revision A

Certificate of Conformance

This certificate confirms that the following equipment:

Unit type: ***ptf*** 1212A Frequency Doubler

Serial Number: 911-01746-18

has successfully passed a FINAL ACCEPTANCE TEST and conforms in all respects of form, fit, and function to current specifications, including regulatory requirements and certifications.

Inspected and verified by:

Date:

Julie Sawyer

02/23/2024

For Precise Time and Frequency, Inc

Declaration of Conformity

This certificate confirms that the following equipment:

Unit type: **ptf 1212A** Frequency Doubler is in conformity with the relevant provisions of the following standard(s) or other normative document(s):

EU EMC Directive 89/336/EEC:

EN55022	Limits and methods of measurements of radio disturbance characteristics of information technology equipment
EN61000-3-2 (2001)	Limits for harmonic current emissions (equipment input current up to and including 16A per phase)
EN61000-3-3 (1995)	Limitation of voltage fluctuations/flicker in low voltage supply systems for equipment with rated current # 16A
EN55024 (1998)	Information technology equipment – immunity characteristics - Limits and methods of measurement
EN61000-4-2 (1995)	Electrostatic discharge immunity
EN61000-4-3 (1997)	Radiated, radio frequency, electromagnetic field Immunity
EN61000-4-4 (1995)	Electrical fast transient/burst immunity
EN61000-4-5 (1995)	Surge Immunity
EN61000-4-6 (1996)	Immunity to conducted disturbances, induced by radio frequency fields
EN61000-4-8 (1994)	Power frequency magnetic field immunity
EN61000-4-11 (1994)	Voltage Dips, short interruptions and voltage variations immunity

EU Low Voltage Directive 72/23/EEC:

EN 60950-1 (2000)	Safety of Information Technology Equipment, including electrical business equipment
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Introduction

Congratulations on your purchase of the **ptf** 1212A Frequency Doubler unit !

This product meets the highest standards of quality and reliability, and Precise Time and Frequency, Inc wants to insure that you enjoy the maximum benefits and functionality that this unit can provide.

The technology within this unit uses the decades of experience in time and frequency applications of our engineering team, to provide a unit that is highly advanced, and gives a very powerful feature set in an inexpensive and compact package,

Operation of the unit is straightforward and the contents of this manual are designed to provide a basic understanding of the product, set-up and functionality, and procedures for maintenance and repair.

If you have any questions or concerns, please do not hesitate to contact our technical service department who will be pleased to provide assistance.

Please help us to live up to our stated objectives, our company motto is:

KNOW THE NEEDS AND EXPECTATIONS OF YOUR CUSTOMER...THEN DELIVER!

Once again, thank you for purchasing our product, and we look forward to you utilizing Precise Time and Frequency, Inc. for your future time and frequency instrumentation needs.



President
Precise Time and Frequency, LLC.

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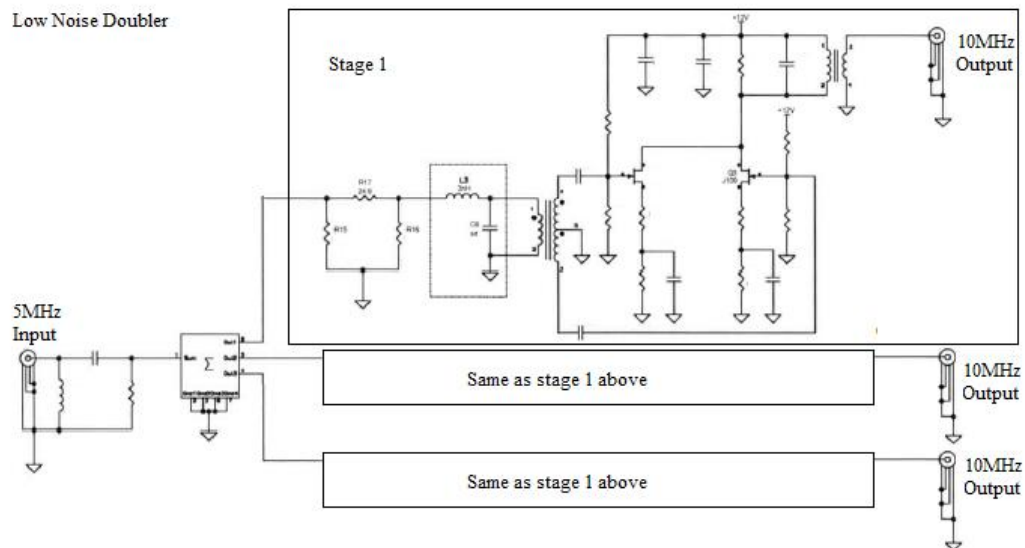
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1. *ptf* 1212A Frequency Doubler - Technical Overview

The *ptf* 1212A is designed to accept one, very low phase noise, 5MHz input, and to provide two, very low phase noise, 10MHz outputs, together with one 100MHz output. The unit design combines the latest technology in low noise components, with decades of experience in low noise layout design, to buffer high quality input signals while preserving the integrity and purity of input signal by minimizing any phase noise addition.

The unit develops three separate 10MHz outputs, from the single 5MHz input. Two of the outputs are provided directly onto the rear panel SMA connectors, while the third is used to drive a phase locked loop driving a low noise 100MHz oven-controlled oscillator. The 100MHz output is provided on a rear panel SMA connector.

With a noise floor of -170dBc the *ptf* 1212A is designed to be compatible with the absolute best in frequency reference standards.



Schematic Diagram Showing the 5MHz to 10MHz Low Noise Doubler

2. ptf 1212A Frequency Doubler - Specifications

2.1.1. Electrical

RF Output

Frequency 1 (2 outputs)	10MHz
Frequency 2	100MHz
Level	1V rms/13dBm(+/-2)
Harmonic Distortion	<-40 dB
Non-Harmonic Signals	<-80 dB
Load Impedance	50 ohms
Connectors	SMA

Additive SSB Phase Noise referenced to input

(1 Hz Bandwidth) Offset

1 Hz	-141dBc
10 Hz	-159dBc
100 Hz	-166dBc
1,000 Hz	-168dBc
10,000 Hz	-170dBc

RF Input

Frequency 5MHz	
Level 1 V rms/13dBm (nominal)	
Impedance	50 ohms
Connector	SMA

Alarm Output

Summary alarm	failure of output signal
Non-alarm condition:	Relay energized
Connector:	9 pin D-male

Controls & Indicators

Power Green LED	Alarm Red LED
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ENVIRONMENTAL & PHYSICAL

Temperature:	0° to 55° C
Relative Humidity:	0 to 95%, non-cond.
Power Requirements	
AC Input (±15%)	90 - 264 VAC, <10W
DC input (optional)	18 to 75VDC
I/O Connector types	SMA
Dimensions (HxWxD):	1Ux19"x16"



Rear Panel View

3. Unpacking/Inspection/Installation

3.1. Unpacking/Inspection

The **ptf** 1212A Frequency Doubler together with accessories is shipped in a custom designed package. Upon receipt the equipment should first be visually inspected for any signs of visible damage.

If visible damage is apparent immediate notification should be given to both Precise Time and Frequency, LLC., and the carrier responsible for shipment. Do not discard the shipping container, which should be made available for inspection by the carrier.

For purposes of unit reference, the unit serial number located on the rear panel of the unit should be quoted in all communications.

3.2. Chassis Installation

The **ptf** 1212A chassis is supplied with rack ears ready for simple installation into a standard 19-inch rack frame/cabinet.

For adequate support when mounted into the rack, a rear supporting bar or tray should be used as the rack ears are designed to secure the unit in the rack, NOT to support the full weight of the unit.

Attention should be given to the internal rack environment to ensure the unit operates within its specified operating temperature range of 0 to 55 deg. C also noting that the unit relies upon convection for cooling, so there should be sufficient air flow to accommodate this.

3.3. Power Connection

Power is supplied by connecting the supplied ac power cable to and AC source, at between 110 to 240 V AC, +/-15%, 50/60 Hz. The AC input is a universal input – no range switching is required.

3.4. Input/Output Connections

SMA connectors are provided for the **ptf** 1212A-SMA inputs and outputs.



Fault Relay	
pin 1	Common
pin 2	Normally Open
pin 3	Normally Closed

4. **ptf** 1212A – Operation

Operation of the **ptf** 1212A is extremely straightforward. Once all of the required input and out connections have been made power can be applied for the unit.

5. Maintenance

5.1. Overview

The ***ptf*** 1212A Frequency Doubler uses state-of-the art solid state and semi-conductor, primarily surface mount, components.

All of the components are selected for their inherent high reliability, and as advanced techniques with highly sophisticated equipment, are used for assembly and test of the unit.

Due to the above, no periodic maintenance of the unit is required, and the units can be expected to deliver many years of trouble-free operation.

Any maintenance or service of the unit should be performed at a Precise Time and Frequency, Inc. authorized facility, to ensure the appropriate equipment and expertise is available.

6. Contact Information – Technical Assistance

The Precise Time and Frequency, Inc service department normal hours of operation are from Monday to Friday, between the hours of 8.00 a.m. and 4.30 p.m. US Eastern Standard Time.

24 hour, 7-day technical assistance is available under special contract.

Before returning any equipment for service or repair please contact our service department for an RMA (Return Material Authorization) number.

Tel: (+1) 781 245 9090

Fax: (+1) 781 245 9099

E-mail: [service@ ptf-llc.com](mailto:service@ptf-llc.com)

Shipping address is:

Precise Time and Frequency, LLC.
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Wakefield, MA 01880
USA

Attn: Service Manager

Billing address is:

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Wakefield, MA 01880
USA

Attn: Accounts