# PUL 070A
# PULA00702150SZB000
## Agile 70 MHz to L-Band Data Grade Upconverter

## General Description:

The **PULA00702150SZB000** is an ultra-stable agile frequency converter that features phase noise and stability performance that exceeds the IESS 308/309 standard, and is suitable for all current high-speed data transmission rates and advanced digital modulation schemes. It is capable of translating 70 MHz IF signals to L-Band signals (950-2150 MHz) in 125 KHz steps. The L-Band frequency and frequency sense is selectable via the front panel keypad and LCD display.

## Specifications:

| | |
|---|---|
| **Input Frequency:** | 70 MHz |
| **Impedance:** | 75 Ω |
| **Output Bandwidth (-3 dB):** | $\pm$ 18 MHz |
| **Input Power Level:** | -50 to -10 dBm |
| **Overall Gain (Loss):** | 0 dB $\pm$ 3 dB |
| **Output Frequency:** | 950-2150 MHz |
| **L.O. Stability:** | $\pm$1 ppm |
| **Input Return Loss:** | 14 dB |
| **Output Return Loss:** | 10 dB |
| **Spurious:** | -40 dBc, signal related<br>-11 dBm, L.O. leakage |

**Phase Noise:**

| Offset (Hz) | (dBc/Hz) |
|---|---|
| 10,000 | -76 |
| 100,000 | -101 |
| 1,000,000 | -109 |

| | |
|---|---|
| **Control:** | Front Panel Keypad with LCD Display |
| **Frequency Step:** | 125 KHz |
| **Frequency Sense:** | Non-Inverting or Inverting, selectable |
| **Output Connector:** | Type "F", 75 Ω |
| **Input Connector:** | BNC, 75 Ω |
| **Power Requirements:** | 100-240 V~, 50/60 Hz |
| **Power Consumption:** | 17 W |
| **Operating Temperature:** | +10$^o$ to +50$^o$ C |
| **Mechanical:** | 1 RU (1.75" H x 19" W x 14" D) |
| **Weight:** | 7.5 lbs. Gross (boxed), 5.0 lbs. net |

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PULA00702150SZB000  Rev F, CO# 12640 (page 1 of 4)

## Operating Instructions:

The front panel keypad and LCD screen are used to set various operating parameters and to monitor and control the agile PUL. Depending on the task being performed, various submenu screens will appear.

Upon applying power to the agile PUL, a product identification screen will be displayed briefly, followed by the Main Menu.

```
Ch#1 1200.000 MHz Inverting
F1-->Menu  Up/Dn-->Ch#
```

### Main Menu

The agile PUL is capable of storing between one and four user-designated L-Band frequencies and their corresponding frequency sense (inverting/non-inverting) in the agile PUL's internal memory (channels 1 through 4). The L-Band frequency to which the 70 MHz IF signal is converted is that which is contained in the memory channel that is currently displayed in the Main Menu. For example if the channel in the Main Menu is displaying channel 1 and it has a specified frequency of 1200.000, the 70 MHz IF signal will be translated to an L-Band frequency of 1200 MHz.

**NOTE: Before the translation process can occur, it is necessary to apply a 70 MHz signal to the 70 MHz port on the rear panel. No L-Band frequency can be generated unless a 70 MHz signal is present on this port.**

By default, all four L-Band frequency channels are pre-populated at the factory with frequencies of 950 MHz. You will need to replace one or more of these factory-specified frequencies with those that meet your particular needs. Instructions on how to do this are included later in this description.

To select which L-Band frequency is used in the translation process, press the up or down arrow key until the desired channel # is displayed in the Main Menu.

To edit the contents of the four memory channels and to test the frequency translation process, press F1. Upon pressing F1 from the Main Menu, you will be asked to enter a password.

```
ENTER PASSWORD: _
```

**Password Screen**

The parameter screens have been password protected to prevent unintentional changes to the agile PUL's configuration. Enter "732" as the password. Once this is done, the Configuration Menu will be displayed.

```
F1-->Test Menu
F2-->Edit Memory Channels       F4-->Exit
```

**Configuration Menu**

From the Configuration Menu, you can edit the contents of each memory channel or test a particular frequency translation.

Pressing F1 from the Configuration Menu will display the Test Mode screen.

```
1200.000 MHz Inverting          *TEST MODE*
F3-->Invert/Noninvert           F4-->Exit
```

**Test Mode Screen**

The Test Mode screen displays the L-Band frequency to which the 70 MHz IF signal will be translated and the frequency sense that will be used. Note that the phrase "*TEST MODE*" is displayed in the upper right corner of the screen indicating that the agile PUL is in test mode.

From this screen, it is possible to change both the frequency and frequency sense on the fly. Press the up and down arrow keys on the front panel to increase or decrease the displayed frequency in 125 kHz steps. Press the F3 key to toggle between inverting and non-inverting. You can also specify an L-Band frequency by entering the required frequency digits from the front panel keypad. This process is described in further detail on the next page. To exit back to the Configuration Menu, press F4.

Pressing F2 in the Configuration Menu displays the Edit Memory Channels Screen.

```
Ch#1 1200.000 MHz Inverting
F2-->Ch#   F3-->Invert/Noninvert        F4-->Exit
```
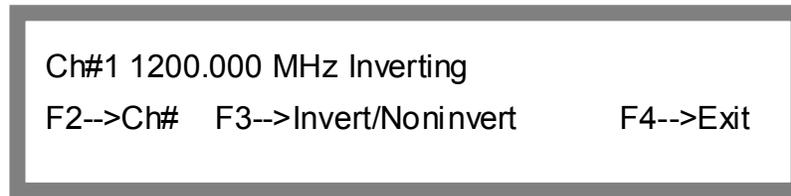
**Edit Memory Channels Screen**


From the Edit Memory Channels screen, the contents of all four memory channels can be specified or modified.  By default, the Edit Memory Channels screen displays the content of memory channel #1.  To change to a different memory channel, press the F2 key.  Pressing F2 cycles between the four memory channels in a circular fashion.

When the desired memory channel is displayed, specify an L-Band frequency by entering the appropriate digits using the keypad.  The frequency field has been designed to accept 4 digits before the decimal point and 3 digits after.

**Note that all digit places must be utilized and the frequency must be an even multiple of 125 kHz.**  Preceding and trailing zeros should be used as required.  Some examples of acceptable frequency designations are:

1200.000
0950.125
1470.250

If the frequency entered is not an even multiple of 125 kHz, the frequency will be rounded up to the next acceptable frequency.  For example, if a frequency of 1200.248 is entered, the frequency will be rounded up to 1200.250.

If desired, the frequency can also be designated by using the up and down arrow keys to advance the frequency up or down in 125 kHz steps.

Once the frequency is specified, press the F3 key to toggle between inverting and non-inverting for that particular memory channel.

After you have finished specifying the contents of the memory channels, press F4 to return to the Main Menu.  The specified frequencies will not become effective until you return to the Main Menu.