User Manual

Specification:	**AXDA9000-X_Rev.2**	
Type:	Selective Distribution Amplifier (DA)	
Frequency:	10.000 MHz	
Author:	HH	
Revision / Date:	1	06.05.2022

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1 Introduction

The AXDA9000-X with option for 8 or 16 channels output is an ultra-low noise selective distribution amplifier with very low residual inter-channel stability. The amplifier design ensures a constant output level, which is independent of the input level.

The amplifier exhibits very high inter-channel and reverse isolation to suppress any potential interference between the channels or the input. Due to the selectivity excellent spectral purity and ultra-low residual phase noise is achieved. The amplifier topology is highly symmetric to yield low phase unbalance between the output ports. Full correlation between all channels up to the final amplifier stage allows for very low residual inter-channel stability.

This makes the AXDA9000 ideal for the distribution of ultra-low noise 10 MHz signals and very high stability references like atomic or optical clocks.

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2 Enclosure drawing and connections

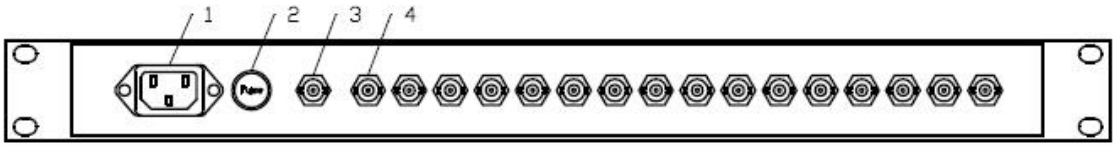

Figure 1: Rear Panel

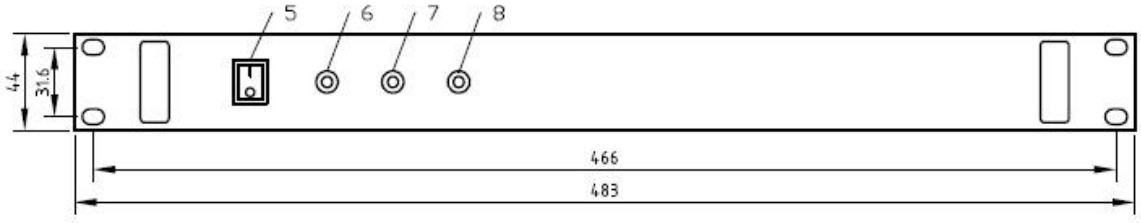

Figure 2: Front Panel

#	Panel	Symbol	Function
1	**Rear**	POWER IN	AC Supply Input (IEC 60320-1 / C14)
2		FUSE	2 A Slow 5x20 mm Fuse
3		IN	RF input
4		OUT	RF outputs 8…16
5	**Front**	POWER SWITCH	Power Switch ON/OFF
6		POWER ON	LED – Power ON Indicator
7		AC INPUT	LED – RF Input Indicator
8		AC OVERLOAD	LED – RF Overload Indicator

Table 1: Connections

3 Safety

Do not install or operate the unit without having read this manual and the detail specification.

Verify that the AC input voltage and power capacity are within the specification before connecting the unit. Ensure proper grounding and ESD precautions.

The unit shall be handled by skilled persons only. Do not open the unit to modify or repair the unit by yourself. Any damage or malfunction shall be reported to AXTAL.

Do not replace the fuse, if the unit is powered on!

4 Unpacking & Mounting

4.1 Unpacking

Carefully remove the unit from the shipping box and ensure ESD precautions.

Inspect the unit for any visible damage before mounting or operation. Immediately report any damage to AXTAL and in case of a damaged shipping box also to the forwarder.

Check that the correct model was delivered. The label on the side of each unit shows the detail part number of the unit.

4.2 Cooling

The unit does not require cooling, but ensure that the maximum operating temperature is not exceeded. The unit shall not be submitted to direct airflow and a stable operating temperature is recommended for best performance.

4.3 Mounting

If the unit is placed on a table, then apply the sockets, which were shipped with the unit, to the bottom plate. The unit is preferably mounted in a 19” rack with suitable rack slides. It is allowed to obstruct the air inlets of the housing as it is not required for cooling.

The unit can operate independent of the mounting orientation, but horizontal mounting is recommended. Do not obstruct the front panel to ensure reading the LED indicators.

5 Power-on & Warm-up

5.1 Power line quality

The quality of the AC power supply shall be compatible with the surge and burst testing levels of IEC 61000. This ensures that the unit is not damaged and that the performance is as defined in IEC 61000.

5.2 Power-on

Connect a matching power cable to the AC supply input (#1) and switch on the unit (#5). The LED indicator (#6) at the front panel must be lid, if the unit is properly powered. Check the fuse (#2), if the unit does not power-on even though proper power supply is applied. Please contact AXTAL, if the fuse repeatedly burns. See also Safety precautions above.

5.3 Warm-up

The amplifier is ready for operation immediately after powering on, but it must be warmed-up for at least one hour to guarantee the specified performance. Ensure a stable temperature environment.

6 Environmental Specifications & Maximum Ratings

Please refer to the detail specification for environmental conditions, operating range and maximum ratings. Do not exceed any of the stated limits! Otherwise, the unit may be permanently damaged including adjacent units and risk for the user may arise in extreme cases.

The instrument is designed to be installed in a clean room or laboratory environment. Thus, no more pollution than pollution degree 1 shall occur to the equipment. External cleaning may be done with a wet soft cloth, but no water shall enter the unit!

7 Operation

The amplifier AXDA9000-X distributes one 10 MHz sine wave input signal to 8 or 16 output channels within a 50 Ohm impedance environment. Please refer to the datasheet for details and read carefully before operating the amplifier.

7.1 Input

The specified input level must be ensured. Levels below the minimum limit may result in significantly degraded performance and decreasing output level. Levels above the maximum limit may result in significantly degraded performance and may damage the unit. Input levels above the allowed limit are signaled via the red LED indicator (#8) on the front panel. In this case, immediately disconnect the input cable to prevent permanent damage.

The recommended input level range specifies the range, where the best noise performance is achieved. The blue LED indicator (#7) signals, if the input level is within this range.

7.2 Output

The output ports shall be used in conjunction with high-quality coaxial cables to ensure best performance. Unused output ports may be left open and termination is not required for proper operation. Nevertheless, it is recommended to terminate with 50 Ohm to achieve the best possible residual inter-channel stability.

All output ports are protected against continuous short-circuit, but this should be prevented in any case. Even though this will not damage the unit, no proper operation and performance can be guaranteed for a permanent short-circuit at any output port.

The amplifier is designed to ensure a constant output level of typical +14 dBm ±1 dB, which is independent of the input level as long as it is within the specified operating range. The very high inter-channel and reverse isolation suppresses any interference between output ports or the input. But poor termination should be prevented to ensure proper signal levels and best performance.

7.3 Performance

Please see the detail specification for residual noise and stability limits. Those limits are guaranteed over the full input level range. Ensure a constant input level within the recommended range for best performance. Use of high-quality coaxial cables is highly recommended.

Even though the unit is not sensitive to vibration, it should only be used under static conditions. Please make sure, that no air flow is applied to the unit and that temperature fluctuations are kept to a minimum. Otherwise, the residual inter-channel stability may be degraded.