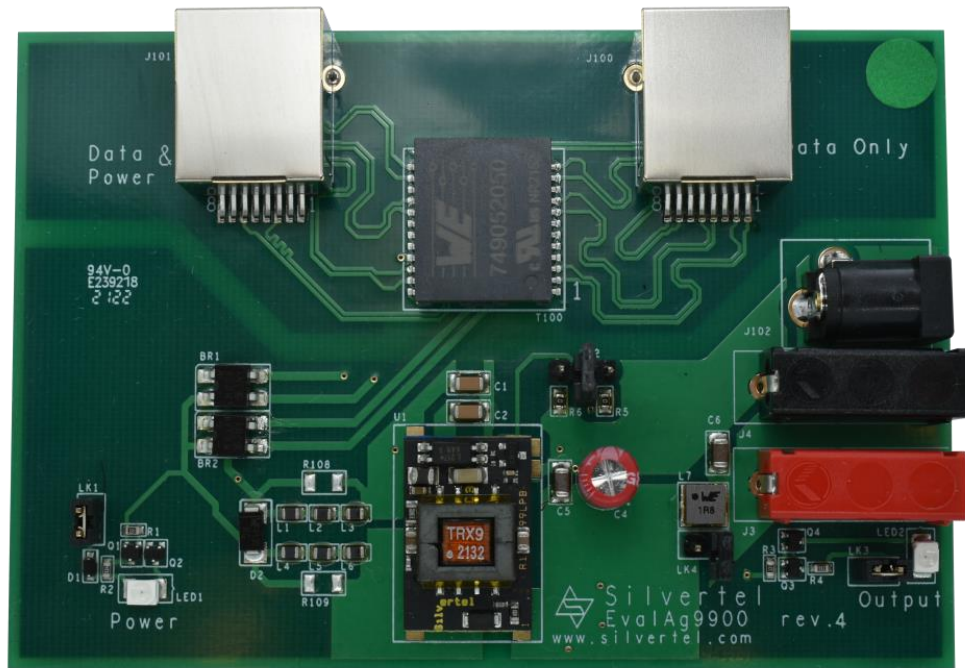




# Evaluation Board User Manual



## EvalAg9900 Evaluation Board User Manual

Version 1.0 – June 2022

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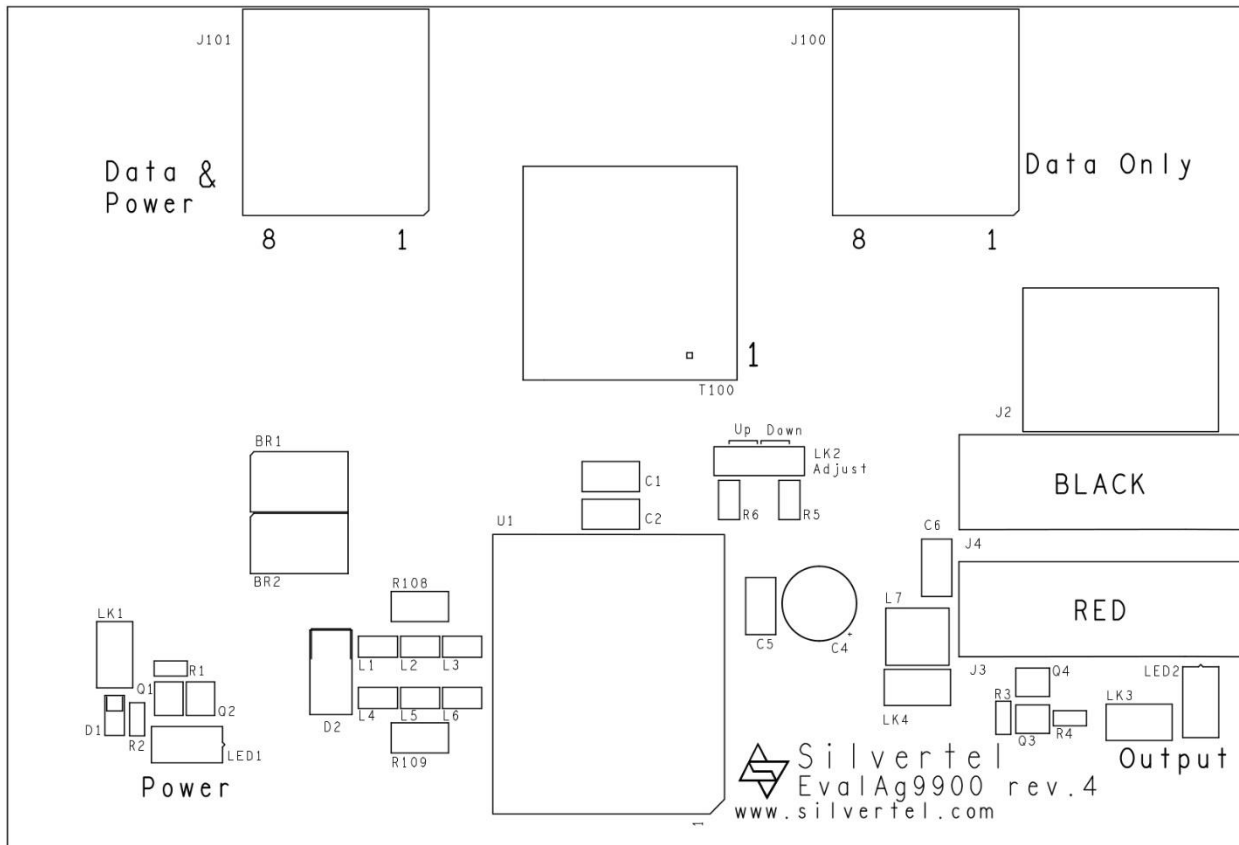
## 1 Introduction

This Manual is a guide to using the EvalAg9900 evaluation board fitted with one of Silvertel’s Ag9900 ultra miniature PoE module with block or pin terminations for use in a wide variety of power over ethernet (PoE) applications. as such, it has been designed to pass through Ethernet data signals (10/100/1000/10GBASE-T) from the Midspan PSE (Power Sourcing Equipment) or PoE enabled switch connected to J101, onto the system connected to J100.

## 2 Kit Contents

- EvalAg9900 Evaluation Board
- Ag9900 series Module Soldered to Evaluation Board

## 3 Board Layout



**Figure 1: EvalAg9900 Board Layout**

### 3.1 Link Settings

- LK1 – Power In LED
- LK2 – Output Adjust
- LK3 – Power Out LED
- LK4 – Pi filter bypass

### 3.2 Input Output Connections

- J100 – RJ45 Data pass through
- J101 – RJ45 PoE connection
- J2 – 2.5mm DC Load Output
- J3&J4 – Load Output



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## 4 Compatible Models

Output Voltage (V)	Package	Variant
3	SMT	Ag9903MTB
	Low Profile SMT	Ag9903LPB
	Low Profile DIL	Ag9903LP
	Gull Wing SMT	Ag9903MT
	Gull Wing SMT	Ag9903M
5	SMT	Ag9905MTB
	Low Profile SMT	Ag9905LPB
	Low Profile DIL	Ag9905LP
	Gull Wing SMT	Ag9905MT
	Gull Wing SMT	Ag9905M
12	SMT	Ag9912MTB
	Low Profile SMT	Ag9912LPB
	Low Profile DIL	Ag9912LP
	Gull Wing SMT	Ag9912MT
	Gull Wing SMT	Ag9912M
24	SMT	Ag9924MTB
	Gull Wing SMT	Ag9924MT
	Gull Wing SMT	Ag9924M

## 5 Input

### 5.1 Supply

The EvalAg9900 evaluation board can be powered using a compliant IEEE802.3af, or higher power, PoE PSE. The Power is extracted from the data pairsets using the LAN transformer T100. Data is then passively passed on to any peripheral equipment via J100, while the power is rectified to the correct polarity for the Ag9900 module using BR1 and BR2.

### 5.2 Power LED

LED1 illuminates when the module is being supplied with greater than 36V. This can be disabled by removing the jumper link LK1, removing this link does not affect the power being delivered to the Ag9900.

### 5.3 Operation

To ensure that the PSE does not apply power to a non-PoE enabled device the output port first checks for a valid PoE signature. If the PSE does not see a valid signature, then it will disconnect, wait approximately 2 seconds then try again.

Once a valid signature has been detected the PSE may then perform classification to determine the power requirement of the PD, only after this has occurred will the PSE supply power to the powered device.

## 5.4 Class Programming

The Ag9900 is internally set to Class 0, to be supplied with the full IEEE802.3af power allocation. As such, the EvalAg9900 does not contain any Class programming circuitry.

## 6 Output

### 6.1 Output Voltage Adjust

By default, with no jumper present on LK2, the nominal output voltage of the fitted module will be present on the output connectors. This can be adjusted up or down by fitting a jumper to the adjust connector, LK2.

The EvalAg9900 is fitted with two adjust resistors. The down adjust resistor R5 and the up adjust resistor R6, both are fitted with a 0Ω resistor for the maximum adjustment.

To increase the output voltage the jumper should be positioned connecting the centre pin to the left pin of LK2, above R6.

To decrease the output voltage the jumper should be positioned connecting the centre pin to the right pin of LK2, above R5.

For configuring the output voltage to a user specific value, a different value resistor can be fitted in place of R5 or R6 to configure the module output the desired voltage. Contact Silvertel applications support for assistance selecting an appropriate value resistor.

### 6.2 Output Filter

The EvalAg9900 is configured to Output filter B, see Ag9900 datasheet, when LK4 is not populated with a jumper. To change to Output Filter A, a jumper can be fitted to LK4, this will bypass the inductor in the pi filter, L7.

See the relevant datasheet for more details, regarding the output filter.

### 6.3 Output LED

LED2 illuminates when the module is outputting. This can be disabled by removing the jumper link LK3, removing this link does not affect the power being supplied by the Ag9900.

### 6.4 Output Power

The output voltage will be present on both the 2.5mm DC connector, J2 and the banana plug terminals J3 and J4.

J3 and the centre pin of J2 are the positive outputs, with the outer ring of J2 and J4 being the negative output.

### 6.1 Data Output

Any data that is provided over the PI (Ethernet cable) connected to the Data & Power port, J101 will be transposed onto the Data output port, J100 via the data transformer.

The data traces on the evaluation board have been designed to pass through 10/100/1000/10GBASE-T Ethernet data signals. No processing or amplification of this signal will be performed on the evaluation board.

## 7 EMI

The EvalAg9900 contains the recommended components for EMI filtering, see ANX-POE-EMI for more details.

The board is fitted with ferrite beads, L1-6; if these are not required, they can be effectively removed from the circuit by fitting R108 and R109 with 0Ω resistors.

## 8 Test Setup

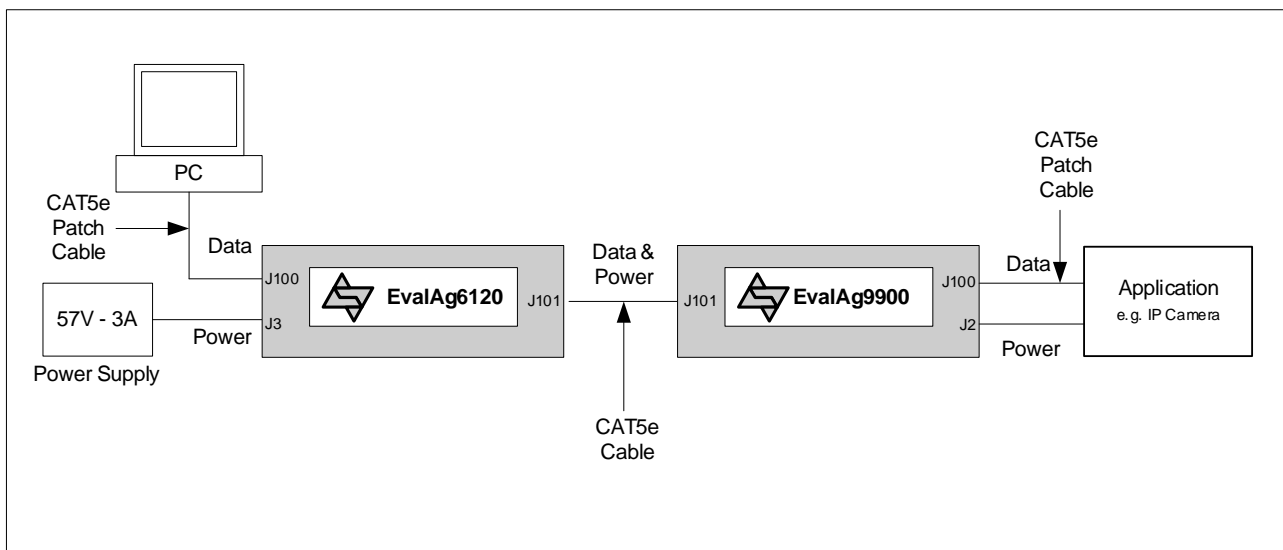
Figure 2 shows the basic set up using the EvalAg9900 evaluation board powered by Silvertel's EvalAg6120 PSE.

The equipment required: -

- EvalAg9900 fitted with compatible Silvertel Ag99xx PD Module.
- EvalAg6120 or other IEEE802.3 compliant PSE
- Power supply unit, +44-57V output e.g. 60V bench power supply
- CAT5e or greater cables
- Application Circuit

Optional equipment: -

Data source e.g. PC



**Figure 2: Basic Test Setup**

## 9 Additional information

Full operating conditions and feature set can be found in the Ag9900 product datasheet, available from [www.silvertel.com](http://www.silvertel.com).

