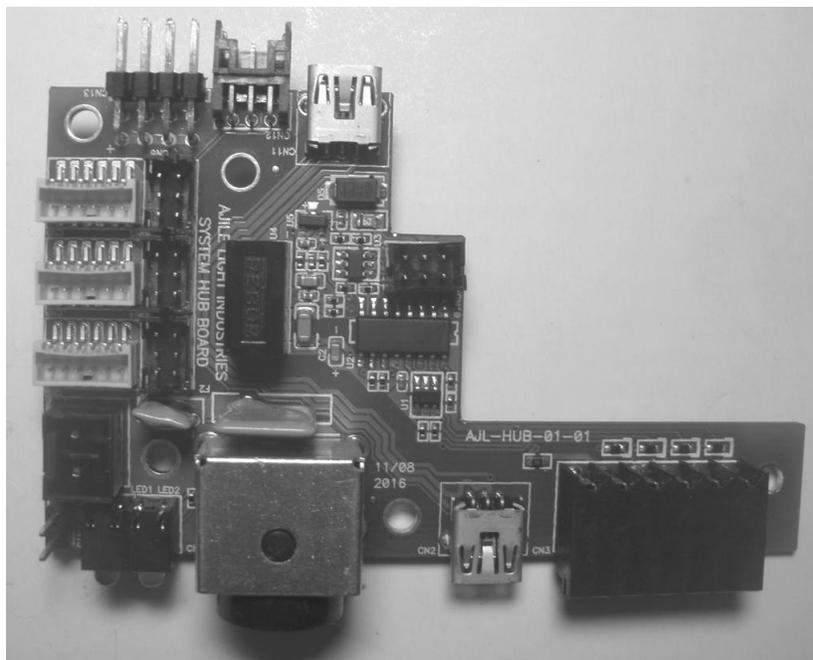




Ajile AJ-4500 System Hub Board Hardware User's Guide

AJL-HUB-01-01

Draft Version 1.0 – March 23rd, 2018



Revision History

March 23 rd , 2018	DSO	Initial Release

Table of Contents

1.0 - INTRODUCTION	4
1.1 - Board Overview.....	4
1.2 - Basic Installation and Mounting	5
1.3 - External Connections and Indicators.....	6
1.3.1 - Power In connector	7
1.3.2 - USB connectors	7
1.3.3 - External Trigger connector	7
1.3.4 - Trigger/Power connector	7
1.3.5 - LED Drive Inputs.....	7
1.3.6 - Thermistor connector.....	7
1.3.7 - Fan Power Header	7
1.3.8 - LED Drive Outputs	7
1.3.9 - Internal Power Out	8
1.3.10 - Auxiliary Power Out.....	8
1.3.11 - Overload LED.....	8
1.3.12 - Power LED.....	8
2.0 - BOARD CONNECTOR USAGE INFORMATION	9
2.1 - Board Connector Details.....	9
2.1.1 – CN1 – (External) Power Input connector	9
2.1.2 – LED Indicators.....	9
2.1.3 – CN2, CN11 – Mini USB Passthrough	9
2.1.4 – CN4, CN5, CN6 – LED Drive Input connectors.....	11
2.1.5 – CN7, CN8, CN9 – LED Drive Output connectors.....	11
2.1.6 – CN10 - Trigger/Power connector.....	12
2.1.7 – CN12 – Thermistor Connector	12
2.1.8 - CN13 - Fan Power Header	13
2.1.9 – CN14 – Primary Power Header.....	13
2.1.10 – CN15 – Auxiliary Power Header.....	14
3.0 - FIELD TROUBLESHOOTING	15
4.0 - SPECIFICATIONS	16

1.0 - Introduction

1.1 - Board Overview

Congratulations on your choice of the Ajile AJL-HUB-01-01 system hub board. This board is designed for use with an Ajile AJ-4500 DMD projector assembly, and provides a central point of system signal and power distribution including an integral optically-isolated (850v) high-speed trigger interface. Designed to complement the modular hardware design of these units, this board simplifies wiring and maintenance by translating all relayed signaling and power through to direct Ajile board-compatible interface and peripheral connectors. The arrangement of connectors found across the back of this board is configured to be compatible with panel configurations for typical system usage, or optionally can be left as bare connectors. Panel mounting is not a mechanical requirement for these connectors, and there are no mechanical issues if the connectors are left bare on the standard PCB provided all mounting standoffs are used.

This board also features a 4 channel optically-isolated trigger interface, configured for use in the AJ-4500 system as an input and output Zynq PL-based trigger, and an input and output Zynq PS-based trigger. Trigger pins are hard-wired as either inputs or outputs, with no allowances for bi-directional triggering. The optically-isolated trigger interface features 850v of isolation between the external trigger ports and the rest of the system, ensuring clean, accurate triggering in even the most challenging environments.

Overview of Ajile AJ-4500 System Hub Board Features:

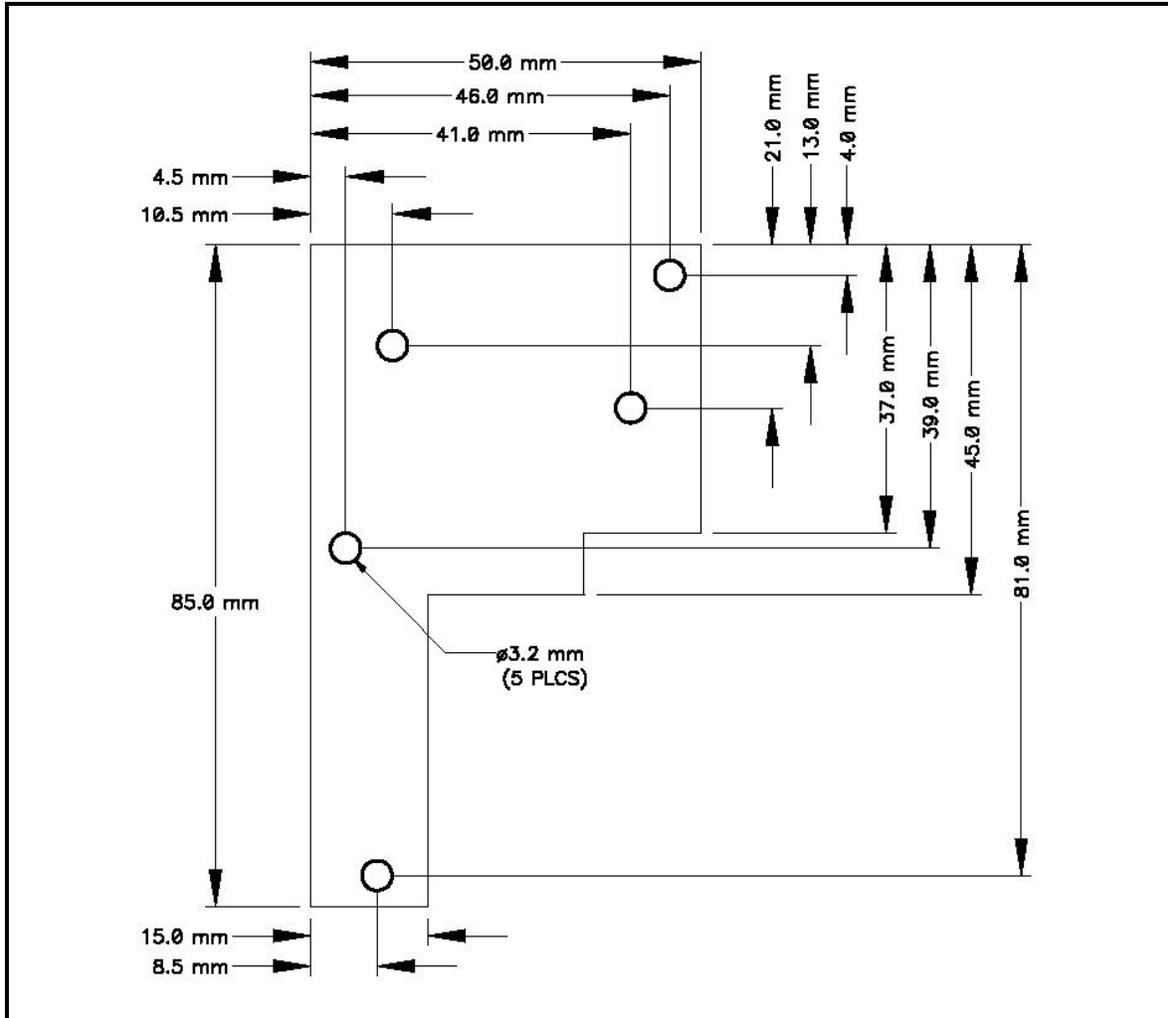
- *Power/signal distribution hub for Ajile AJ-4500 DMD projectors*
- *Internal +15v primary power distribution features integral PTC fuse protection*
- *Auxiliary power connector to power external high-voltage (+15v) devices*
- *Micro-USB passthrough connection externalizes internal USB2.0 module connections and brings them to a convenient back-panel location*
- *4 Zynq-attached +5v high-speed, low-latency triggers (PL 1x In/Out, PS 1x In/Out)*
- *Triggers provide full optical-isolation at up to 850V and operate from a single +5v supply provided through 6-pin trigger/power cable*
- *Flexible external trigger input structure allows for compatibility with most single-ended I/O standards*
- *Trigger Output pins can be safely zener clamped to a lower voltage if +5v is excessive*
- *Internal board wiring redistributes power from LED driver board to compatible connectors to greatly simplify optical-assembly LED cabling*
- *Thermistor connector exposes 3 temperature channels to allow for convenient distribution of temperature sensors*
- *Fan power header provided to allow for driving 3 fans from one fan power source*
- *Status indicators for board power and primary power internal overload*

The Ajile AJL-HUB-01-01 is designed for reliable, high-performance service as part of a typical Ajile AJ-4500 DMD projector, providing a centralized connection point for much of the projector wiring and power through compatible connectors. This ensures both consistent wiring and operation, and provides for excellent maintainability in the field.

1.2 - Basic Installation and Mounting

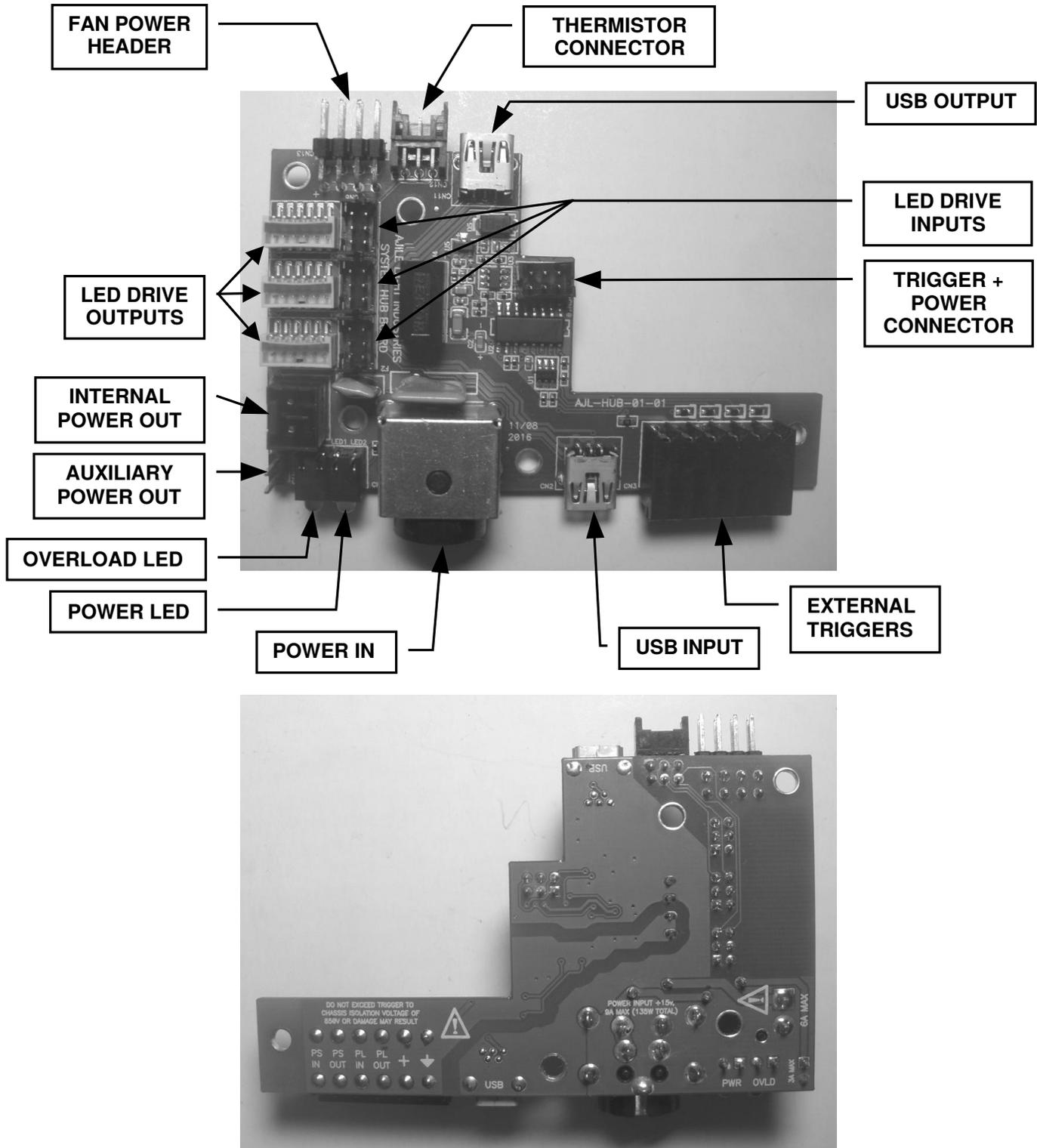
Five (5) mounting holes are provided to suitably affix the board to a support plate or chassis in the end-use device. This configuration is designed to work with the Ajile AJ-4500 series of DMD projectors, and thus have a custom mechanical configuration. Overall board dimensions and hole locations are as noted below:

Ajile AJ-4500 System Hub Board, Mechanical Dimensions for Mounting, Top View



Note that these dimensions are circuit-board dimensions, and do not take into account peripheral space required for connectors. Mounting should also take into consideration overall cooling considerations and issues.

1.3 - External Connections and Indicators



1.3.1 - Power In connector

This is the primary power input connector. Power provided here should nominally be +15v, and is fused internally to 6A on the primary internal buss and 3A on the auxiliary buss. Under normal operating conditions primary current is generally under 6A, and power is provided through a standard 4-pin locking-DIN style power connector.

1.3.2 - USB connectors

Two mini-USB connectors are provided as a simple board passthrough connection. The internal connection would typically be connected through a small USB cable to the Ajile DMD controller board, exposing this interface on the back-panel of the projector for system control.

1.3.3 - External Trigger connector

This connector has the optically-isolated external trigger inputs and outputs. There are 6 pins, with 2 allocated as channel inputs, 2 allocated as channel outputs, a ground pin, and a +5.0v reference pin. This +5.0v pin is not suitable for driving external devices, however if it is connected to a trigger input, it will drive the pin high. This is to allow for easy connection of dry-contact triggers into the system in addition to triggers that are active drive.

1.3.4 - Trigger/Power connector

This is the main connection to the Ajile controller board. This carries the 4 raw triggers from the connected Ajile controller board, plus includes a +5.0v power feed and a system ground input for integrated board power.

1.3.5 - LED Drive Inputs

These connectors interconnect the hub board to a compatible Ajile LED driver board through three 6-pin cables, one for each of red, green, and blue drive channels. LED drive and channel thermistor wiring for each channel presented here is then redistributed to output connectors for direct peripheral connection.

1.3.6 - Thermistor connector

This 6-pin connector breaks out the three individual LED channel temperature thermistor connections into 3 pairs on one connector, and provides a convenient connection point for a thermistor wiring harness.

1.3.7 - Fan Power Header

This 8-pin header is used to distribute fan power from one source to three fans through this connector block. In this usage, all horizontal pins are wired together, creating 4 pairs of power connections for this usage. Total power available for fans is limited by the fan current limit of the attached fan power-source.

1.3.8 - LED Drive Outputs

These connectors are used for cables connecting the individual optical-assembly LED assemblies to their appropriate drive channels. Note that these connectors only provide LED drive and do not support on-assembly LED thermistors.

1.3.9 - Internal Power Out

This connector normally provides +15v to the projector LED board for primary power. It is fused to 6A (PTC) and features an overload indicator to indicate when the fuse has tripped.

1.3.10 - Auxiliary Power Out

This connector normally provides +15v to an auxiliary assembly, and is fused to 3A (PTC). Note that this connector is not polarized, however a polarity marking is shown on the printed-circuit board and should be used as a reference when in use.

1.3.11 - Overload LED

This red LED lights when the primary power PTC fuse has tripped. This power source is usually used as the primary power for the Ajile AJ-4500 DMD projector, thus when lit indicates that the projector core is drawing more than 6A of current.

1.3.12 - Power LED

When +15v primary power is present, this green LED lights to indicate this power state.

Please visit <https://ajile.ca/support/>

and [log in](#) or [register](#)

to download full document text

