



## **User Manual**

**ED12DSS Shutter Driver**

**14-0045**

**Version 2.00**

**2013**

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Version 2.00

2013

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## Warranty

**LIMITED PRODUCT WARRANTY:** All Products manufactured by VINCENT ASSOCIATES® (MANUFACTURER) are warranted to meet published specifications and to be free of defects in materials and workmanship as defined in the specifications for 365 days - one year - (WARRANTY PERIOD) from the date of original shipment of the product. DSS series shutters are additionally warranted to achieve two million cycles within the WARRANTY PERIOD (as defined in the CYCLE WARRANTY CRITERION). MANUFACTURER will, at its own option within the WARRANTY PERIOD, repair or replace without charge any listed item discovered to be defective excepting transportation charges. Burned out or otherwise damaged actuator coils are not covered under this warranty. Any defective product returned to the MANUFACTURER must follow the RETURN MATERIAL AUTHORIZATION PROCEDURE as defined below. This warranty does not extend to cover damage resulting from alteration, misuse, negligence, abuse, normal wear and tear, or accident. The MANUFACTURER will consider the return of unused equipment if returned within 30 days from the original date of shipment, subject to a 20% restocking charge. This offer does not apply to used or damaged equipment. This warranty extends only to the original purchase and is not available to any third party, including any purchaser assemblies or other Products of which the goods may become component equipment.

**CYCLE WARRANTY CRITERION:** One "cycle" is considered one open and one closure of the shutter. DSS Shutter must be operated with the **ED12DSS** driver or equivalent H-Bridge type shutter driver circuit at +10.7VDC across the actuator coil for the specified duration. DSS Shutter must be operated within the defined environmental, electrical and mechanical specifications as listed on the device's data sheet. After one year (WARRANTY PERIOD), the cycle warranty is null and void. If returned, the device must be accompanied by a written statement indicating the approximate number of cycles contained on the device, include all parameters to which the shutter was operated and follow the RETURN MATERIAL AUTHORIZATION PROCEDURE as defined below.

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## General Safety Summary

Review the following safety precautions to avoid injury and prevent damage to this product or any products connected to it. To avoid potential hazards, use the product only as specified.

Only qualified personnel should perform service procedures.

### Injury Precautions

- **Avoid Electric Overload** – To avoid electrical shock or fire hazard, do not apply a voltage to a terminal that is outside the range specified for that terminal.
- **Avoid Electric Shock** – To avoid injury or loss of life, do not connect or disconnect line cord while it is connected to the line voltage.
- **Ground the Product** – This product is grounded through the **ED12DSS** 5-pin (P1) connector,. To avoid electrical shock, the grounding connector must be connected to earth ground. Before making connections to the input or output terminals of the product, ensure that the product is properly grounded.
- **Use Proper Fuse** – To avoid fire hazard, use only the fuse type and rating specified for this product.
- **Do Not operate in Wet/Damp Conditions** – To avoid electric shock, do not operate this product in wet or damp conditions.
- **Do Not Operate in an Explosive Atmosphere** – To avoid injury or fire hazard, do not operate this product in an explosive atmosphere.

### Product Damage Precautions

- **Use Proper Power Source** – Do not operate this product from a power source that applies more than the voltage specified.
- **Provide Proper Ventilation** – To prevent product overheating, provide proper ventilation.
- **Do Not Operate with Suspected Failures** – If you suspect there is damage to this product, have it inspected by qualified service personnel.

## Safety Terms and Symbols

These terms appear in this manual

### **WARNING**

*Warning statements identify conditions or practices that could result in injury or loss of life.*

### **CAUTION**

*Caution statements identify conditions or practices that could result in damage to this product or other property.*

## Preface

This Manual provides information for the **ED12DSS Shutter Driver**. The manual contains the following chapters:

- *Getting Started* contains a brief product description, information needed to power on the driver and a brief procedure to verify that it functions.
- *Operating Basics* gives further details to the operational features of the driver.
- *Specifications* are described for all input/output controls as well as operational features of the **ED12DSS**.
- *Index* contains a full index.

*What follows is the complete operator's manual for the **UNIBLITZ® II N-CAS® ED12DSS Shutter Driver**. Please read this manual completely before operating the unit. Due to the construction of this unit, Vincent Associates recommends that the unit be returned to the manufacturer for repair. There are no user-serviceable parts inside.*



# Getting Started

## Features

- Open-frame printed circuit card suitable for OEM applications.
- RoHS Compliant
- Operates DSS or NS series bi-stable shutter devices.
- 2-Pin JST shutter interface connector
- **203D** Shutter interconnect cable included – JST 2-pin to JST 2-pin, 1 meter in length
- Exposure determined by external pulse (BNC,TTL active-high) or switch contact closure when switching internal +5 VDC into trigger input
- In-line PULSE INPUT BNC active-high +5.0 V TTL
- Selectable pulse high-current duration for specific DSS/NS series shutters via 4-position piano switch
- Internal fuse protection for SHUTTER OUTPUT
- Operates on +12 to +24 VDC at 1.5 A
- Power input to controller via 2-wire input harness
- **ED-IOP** Input cable harness included for power and trigger signal input.
  - +5.0 V TTL signal input (BNC)
  - +5.0 VDC output to enable driver from external switch contact or transistor switch closure.
  - Input/output interface cable
    - 18-inch red/black bare power leads
    - 6-inch BNC trigger input with reference ground.
    - Both terminate to Tyco/Amp 5-pin polarized connector for connection to ED12DSS.
- Requires +12 to +24 VDC External power supply (user supplied) for operation
- Size: 0.50 x 2.25 x 2.25 inches (12.7 x 57.2 x 57.2 mm)
- Weight: 0.730 ounces (0.021 Kg)

## Introduction

The **ED12DSS** is the optimal driver for the new UNIBLITZ® N-CAS® DSS Shutter Series. This device will operate a single DSS shutter or a single NS series bi-stable shutter from a +12 to 24 VDC power supply. The bi-stable mode only requires power when switching the shutter's state.

The repeat exposure specification of the **ED12DSS** is limited by the type of shutter used and the open/close pulse duration selected by the 4-position piano DIP switch, S1.

Please note that at higher shutter cycling frequencies heat will begin to rise in the shutter coil especially if the shutter is in an area with limited air flow. This heat can cause premature failure. Please contact the factory for specific information concerning shutter modifications and/or drive modifications that may be necessary for operating shutters at their higher frequency. Please note that the shutter output is fuse protected.

Please see **SPECIFICATIONS, GENERAL CHARACTERISTICS, S1 Settings** Chart for further information.

Note: Under certain circumstances multiple ED12DSS drive units can be operated from one power supply. If the user requirement does not require that shutters open simultaneously, two drivers may be operated from one supply. For further information and guidance please discuss your particular application with a Vincent Associates technical service representative.

## Start Up

### CAUTION

*Be sure to observe Electro-Static Discharge (ESD) anti-static unpacking procedures when removing the ED12DSS from the static shielding bag. Improper handling can result in destruction of the CMOS integrated circuits on the board.*

After unpacking your unit inspect for any defects. Upon inspection if a visible defect is found, or a part (or parts) is missing, notify Vincent Associates immediately.

Prior to the connection of input/output signals to the **ED12DSS** be sure that:

1. The 5-pin connector of the **ED-IOP** (power/trigger input connector) is disconnected from the 5-pin post connector P1 of the **ED12DSS**.
2. The power supply is in the off position.
3. Set S1 to the pulse duration required for the shutter being used. See **SPECIFICATIONS** and Figure 1 elsewhere in this manual for required settings.
4. Connect the Red wire of the **ED-IOP** harness to the (+) side of a +12 VDC to +24 VDC 1.5A power supply.
5. Connect the Black wire of the harness to the (-) return side of the power supply.
6. Connect the 5-pin female connector of the **ED-IOP** onto P1 of the **ED12DSS**. (The connector is polarized and can only be properly connected in one orientation)
7. Connect the **203D** shutter interconnect cable between the 2-pin P2 connector on the **ED12DSS** to the 2-pin connector on the shutter's flex interconnect.
8. Turn on the power supply.
9. Connect an input signal, active-high TTL to the input BNC.

## Initial Operation and Testing

The **ED12DSS** provides the circuitry necessary to drive DSS shutter units.

The on-board microprocessor accepts a pulse with determined exposure time and produces a bi-stable open and close pulse whose duration is selected by the on-board piano switch, S1. Please see Figure 1.

When the **ED12DSS** receives the correct initiating control signal, the shutter will open and close on command.

Once the **ED12DSS** receives an input signal, the shutter should open at the rising edge of the input pulse and close at the falling edge of the input pulse. Please see Figure 2.

If the requirement is to operate the shutter from a switch contact closure, follow this procedure:

1. Connect a wire to pin #5 of the **ED-IOP** harness, this is the +5 VDC output.
2. Switch the +5 VDC output voltage to the BNC input.

The shutter will open and remain open for as long as the switch contact is depressed. When the +5 VDC is removed from the input, the shutter will close. Please see Figure 2.

After connecting the input and output harnesses, the user selects the open and close pulse duration using the on-board, 4-position piano switch and connects a user supplied power supply. After the shutter and TTL input signals are connected, the shutter's exposure can be controlled via a TTL square pulse input.

Pulse duration is determined by exposure time.

The **ED12DSS** can be easily integrated into OEM applications where a +12 to +24 VDC power supply is available.

*Please read the entire manual carefully before attempting to operate the unit.*

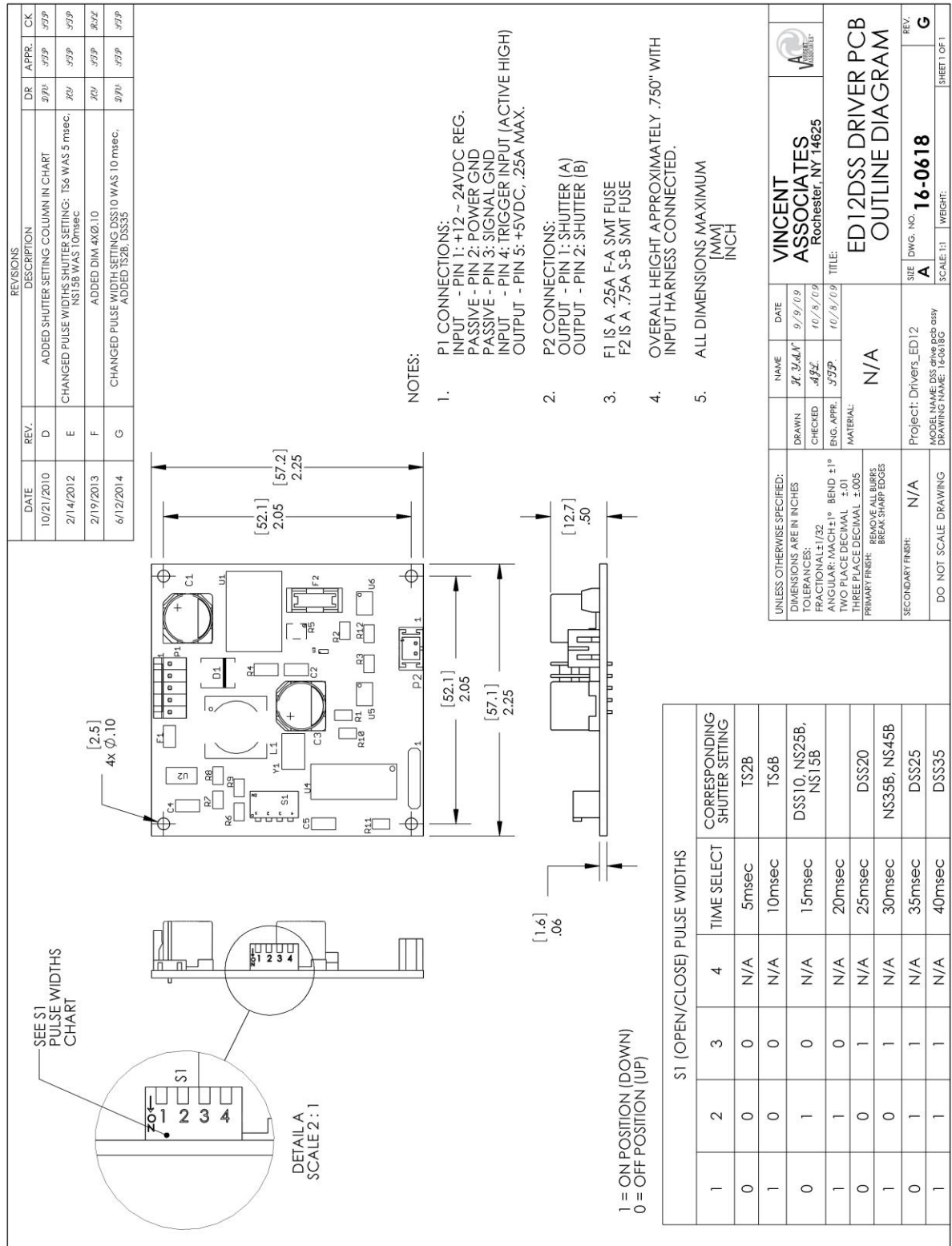
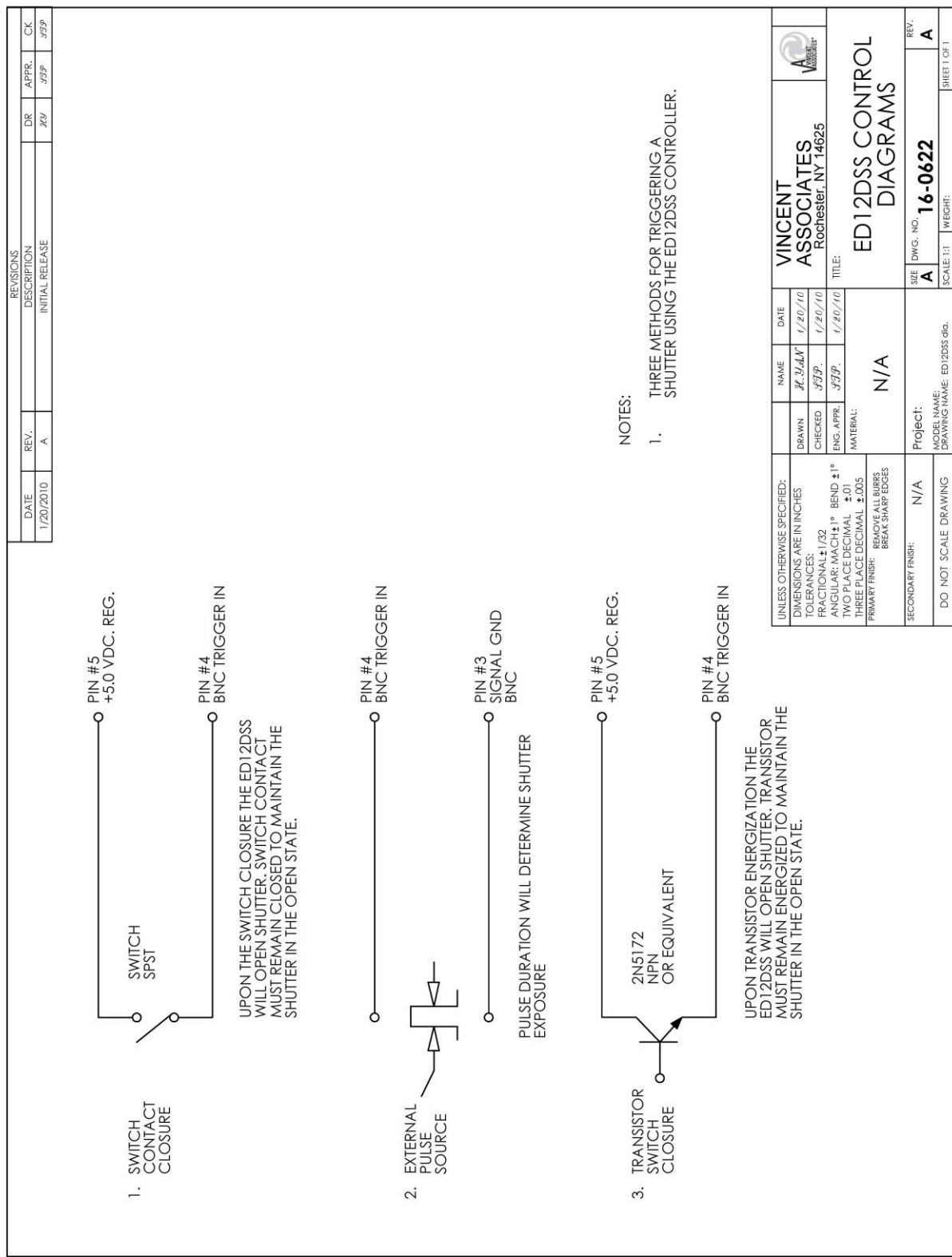


Figure 1: ED12DSS Connection – I/O Layout



**Figure 2: ED12DSS Control Diagrams**

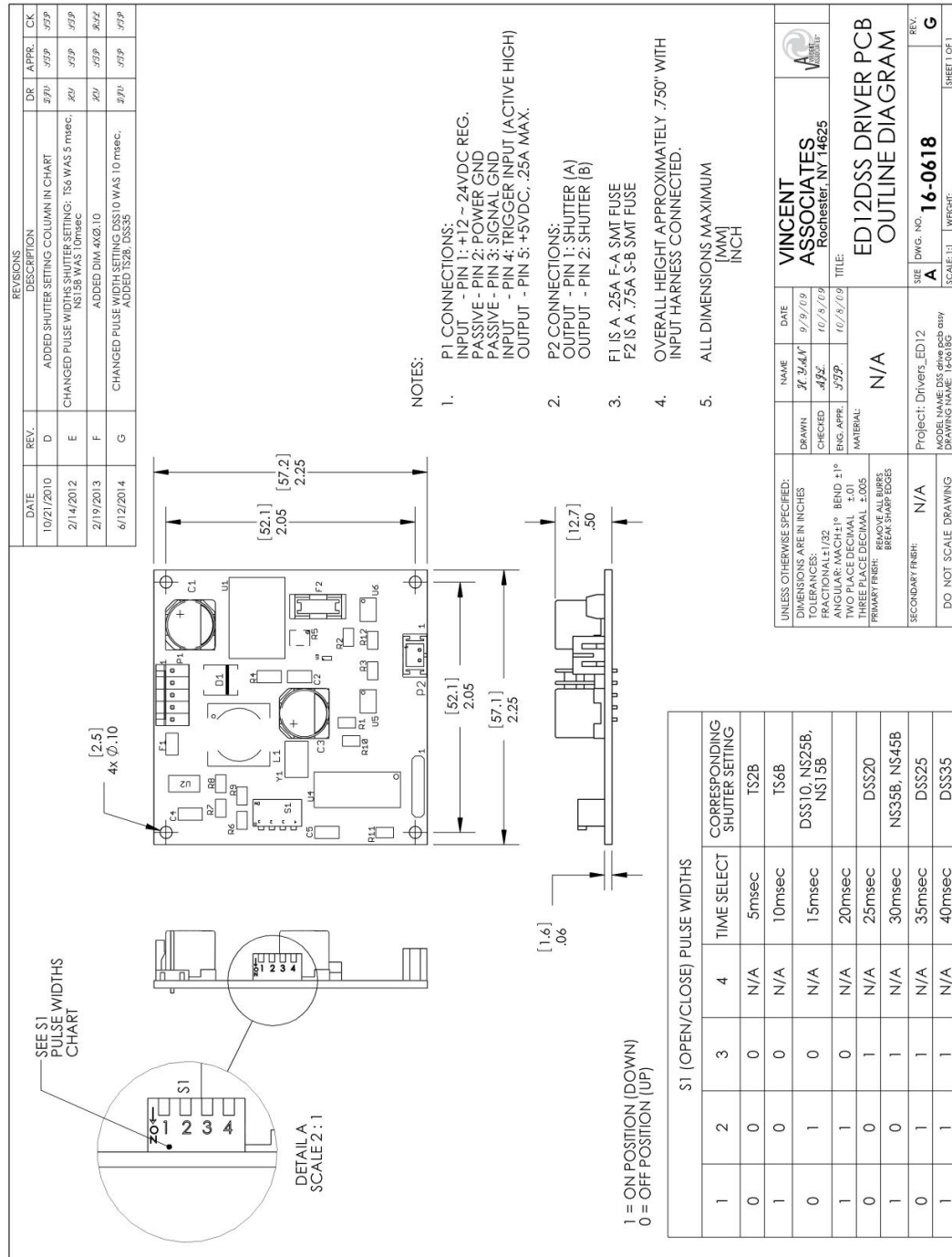
## Fuse Replacement

### CAUTION

*Be sure to observe Electro-Static Discharge (ESD) and anti-static procedures when replacing the fuse.*

1. F1 is a 0.25A fast-acting SMT fuse that is soldered to the **ED12DSS** PCB. This fuse is *non-replaceable*.
2. F2 is an SMT *user-replaceable* fuse rated for 0.75 A, 125 V, time lag.
3. This fuse can be removed and replaced in the field. Fuses can be procured from the manufacturer.

The overall dimensions of the **ED12DSS** driver board are shown below in Figure 3.



### Figure 3: ED12DSS Dimensions



## **Maintenance**

Proper care and maintenance of the **ED12DSS** should be taken as with any sensitive electronic instrument.

There are no user-serviceable parts on the **ED12DSS** except for F2.

Although the stability of the drive voltage is checked and calibrated prior to shipment, it may become necessary to make some minor adjustments to the operating systems of the **ED12DSS** over time.

It is highly recommended that if a problem is suspected with the unit that it be returned to the factory for checkout, proper adjustments and calibration. Failure to do this may damage the unit's circuitry and/or functionality and will void the factory warranty.

## **Inspection**

Inspect the **ED12DSS** for damage, wear, and missing parts. If the unit appears to show signs of damage, it should be checked thoroughly to verify correct operation and performance. If damage is suspected, please return the unit to the factory for repair – there are no user-serviceable parts on the board.

If there is a significant build-up of dust or other material, follow the cleaning procedure below.

## **Cleaning Procedure**

Do not use any tools to brush or scrape away accumulated materials.

Do not use any liquids to clean the board.

Simply use low-pressure air to blow away any dust.

There is no other cleaning required.

## Specifications

### System Characteristics

Name	Description
Repeat Exposure	Minimum time between exposures is determined by shutter used and open close pulse duration.
Shutter Drive	<ul style="list-style-type: none"><li>Continuously variable exposure frequency from DC to the shutter's maximum rate.</li><li>Pulse Voltage: +10.7 VDC</li></ul>
Power Supply	<ul style="list-style-type: none"><li>+ 12 to +24 VDC regulated <math>\pm 2\%</math></li><li>1.5 A, minimum</li><li>User Supplied</li></ul>

### External Input Characteristics

Name	Description
TRIGGER INPUT P1	<ul style="list-style-type: none"><li>Trigger Input: P1-Pin 4</li><li>Ground Return: P1-Pin 3</li><li>Active-high input</li><li>TTL compatible:<ul style="list-style-type: none"><li>Minimum high-level +2.0 VDC</li><li>Maximum low-level +0.8 VDC.</li></ul></li></ul>
POWER REQUIREMENTS P1	<ul style="list-style-type: none"><li>Power In: P1-Pin 1</li><li>Ground Return: P1-Pin 2</li><li>+12 VDC to +24 VDC at 1.5A for operating shutter to its maximum rated exposure and frequency.</li></ul>

## External Output Characteristics

Name	Description
REGULATED OUTPUT P1	<ul style="list-style-type: none"><li>• Output: P1- Pin 5</li><li>• +5 VDC, 50 mA max</li><li>• Regulated output provided for use in remote switching and/or control circuits.</li><li>• Internal fuse protected.</li></ul>
SHUTTER OUTPUT (JST 2-pin connector) P2	<ul style="list-style-type: none"><li>• P2-Pin 1</li><li>• P2-Pin 2</li><li>• Shutter drive signal H Switch output.</li><li>• Factory adjusted to +10.7 VDC.</li><li>• This circuit provides a drive pulse to open and drive pulse to close at the output.</li><li>• These pulse durations are set by 4-position piano switch, S1. See PULSE SELECTION chart of Figure 1 for open/close pulses.</li></ul>

## ED12DSS General Characteristics

Name	Description
Dimensions (HWD)	0.50 x 2.25 x 2.25 inches (12.7 x 57.2 x 57.2 mm)
Weight	0.730 oz (0.021 kg)
S1 Pulse widths (open/close)	Pin 1 2 3 4 TIME SELECT
Key:	0 0 0 N/A 5msec
1 = on - down position	1 0 0 N/A 10msec
0 = off- up position	0 1 0 N/A 15msec
	1 1 0 N/A 20msec
	0 0 1 N/A 25msec
	1 0 1 N/A 30msec
	0 1 1 N/A 35msec
	1 1 1 N/A 40msec
Recommended Pulse Width Settings (See S1 Chart)	DSS10B 10 msec DSS20B 25 msec DSS25B 35 msec NS15B 10 msec NS25B 15 msec NS35B 20 msec NS45B 25msec NS65B 40 msec
Fuse Requirements	<ul style="list-style-type: none"> <li>F1: 0.25A Fast Acting SMT fuse – non-replaceable (+5VDC – pin #5 output protection)</li> <li>F2: 0.75A Time Delay SMT fuse – user replaceable (Shutter Fuse)</li> </ul>
Accessories (supplied)	<ul style="list-style-type: none"> <li><b>203D</b> Shutter interconnect cable</li> <li><b>ED-IOP</b> Power/Trigger Input cable</li> </ul>

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