



VINCENT
— ASSOCIATES —

User Manual

VED24 Shutter Driver

14-0071

Version 1.42

2021

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Revision Table

Version 1.42 - 2021

7/29/21 STP Added warranty link, removed warranty, updated logo – Rev c

Version 1.41 - 2020

10/21/20 STP Updated Table 4, all VS, all LS, and all CS Series with new Pulse Duration levels. This document was version 1.40 prior to these changes.

Version 1.40 - 2020

6/25/20 STP Updated Warranty to current version. Updated Table 4 with ES6B, NS65B, NS25S, CS65E, and CS90HE settings. LS series no longer requires special adapter. This document was version 1.31 prior to these changes.

Version 1.31 - 2016

6/14/16 STP Added Appendix A with DoC. This document was version 1.30 prior to these changes.

Version 1.30 - 2016

6/1/16 STP Added applicable (CE) certifications. Updated Warranty to current version. Index and TOC were updated. This document was version 1.10 prior to these changes.

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Printed in the U.S.A.

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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

- **Use Proper Supply Power and Proper Power Cord (Included)** – To avoid fire hazard, use only correct power and cable as specified elsewhere in this manual. Model **PS24** Power supply and line cord are provided.
- **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 (of power supply) while it is connected to the line voltage.
- **Ground the Product** – This product is grounded through the **VED24** DC input. Before making connections to the input or output terminals of the product, ensure that the product is properly grounded. **DO NOT DEFEAT THE GROUND CONNECTION OF THE INCLUDED POWER SUPPLY.**
- **Access to On/Off Switch** – Due to the position of the unit's power switch at the rear, **do not** position the unit such that it is difficult to operate the on/off switch.
- **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. It is recommended to use the **PS24** (included) or equivalent DC Power Supply.
- **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 **VED24 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.
- *Operator Controls* provide an outline of the control functions at the front and rear panels of the VED24 device. This also includes the location and function of the input/output signals.
- *Operating Basics* gives further details to the operational features of the driver.
- *Specifications* are described for all input/output levels including other pertinent details and information required for the USB interface.
- *Index* contains a full index.

*What follows is the complete operator's manual for the **UNIBLITZ® VED24 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 of the VED24

- Microprocessor controlled
- CE Certified to IEC/EN 61010-1:2010 (LVD) and EN 61326-1:2013(for EMC). See page 31 for applicable certification information.
- RoHS Compliant
- Operates all shutters in a bi-stable or uni-stable configuration – user configurable via FUNCTION switches.
- 5-pin Male SwitchCraft locking shutter interface connector.
- Operates most **UNIBLITZ**[®] shutters such as CS, DSS, NS, LS, TS and VS series. (See Table #4 on page 21 for additional exclusions.) The **510F** interconnect cable (included) is required when connecting shutters to the **VED24**.
- Normally open or normally-closed shutter operation in the uni-stable mode.
- Indicators for POWER, DRIVER active, and SYNC output status.
- Exposure determined by external pulse width (TTL) or switch contact closure to the PULSE INPUT BNC.
- SYNC OUTPUT BNC is TTL, for active-high operation.
- PULSE INPUT BNC is TTL, for active-low operation.
- USB Type B input receptacle for computer interface control.
- Selectable voltage output for operation of larger aperture shutter devices.
- 32 Selectable pulse width durations for specific shutters via 8-position octal switch.
- Internal fuse protection for all DC output voltages (including shutter).
- Operates on +24 VDC, 40W switching power supply, included
- Power supply input via 2.0 mm DC jack.
- Size (HWD): 1.61 x 5.47 x 4.60 in. (41 x 139 x 116.8 mm)
- Weight: 12.27 oz. (0.35 kg)

Power Supply, Cables, and Misc.

- **PS24** +24 VDC, 40W Power Supply, 100 – 240 VAC, 50/60 Hz (Included)
- **510F** Shutter interconnect cable, 5-pin female SWC to 5-pin female SWC, 3 meters. (Included)
- **5M203D** Shutter Adapter Cable, 5-pin male Switchcraft to 2-pin JST adapter for DSS & TS shutter series. (Included)
- **701A-S5** Shutter Adapter Cable 7-pin female WPI to 5-pin male SWC, (Included)
- **USB-AB** USB "A" plug to USB "B" Plug, 1 meter (Included)
- **710R** Remote hand-held trigger cable (used with active-low BNC - Optional)
- **710R/F** Remote foot-switch trigger cable (used with active-low BNC - Optional)

Introduction

The **VED24** is a versatile, user-friendly driver for all **UNIBLITZ**[®] shutters. The **VED24** has the capability to drive most shutters in the **UNIBLITZ** line and includes all of the adapters necessary for their interconnection. Additionally, the **VED24** has shown to increase the lifetime of some shutters series due to the new novel type of driver system originally designed for the DSS, NS and TS shutter systems.

The driver has user-selectable **FUNCTION** switches allowing it to handle a variety of shutter configurations. It will operate shutters configured as uni-stable (normally open or normally closed), or bi-stable where no power is required to hold the shutter open or closed. In addition to this capability, the **VED24** can also operate most standard CS, LS and VS series shutters.

Simple and straightforward controls on the front panel allow the **VED24** to be easy to use and configure. LED indicators indicate shutter status at a glance. A toggle switch allows easy selection of normally-open or normally-closed operation. A **PULSE INPUT BNC** is provided for direct control of the shutter from a digital signal (TTL) and is configured active low. This will also allow the direct connection of our 710R or our 710R/F remote switch cables. A bank of four user-selectable **FUNCTION** switches is accessible on the front panel. These switches will set the **VED24** in a number of configurations to allow most **UNIBLITZ** shutter types to be driven. The rotary octal switch establishes 16 different **PULSE DURATION** selections for each uni-stable and bi-stable shutter selections for a total of 32 timing pulse selections.

The rear of the unit contains an output for the electronic synchronization via the **SYNC OUTPUT BNC** connector. Power is supplied to the **VED24** via a 2.0 mm DC POWER jack. The Shutter output is a male 5-pin locking SwitchCraft connector. In addition, computer control is also available via the USB “B” connector and a USB “A” to USB “B” cable is included with the **VED24**. A power ON/OFF slide switch is also located on the rear panel.

Start Up

After unpacking your unit inspect for any defects. If upon inspection a problem is found, or a part (or parts) is missing, notify Vincent Associates immediately. A check list is provided for a quick inventory of included cables and accessories.

After the initial inspection the unit is ready to use. To properly install and power on the **VED24**, perform this procedure:

1. Verify that the **VED24** power slide switch is selected to the “OFF” (“0”) position.
2. Connect the 2 mm power plug of the supplied power supply to the DC POWER input jack of the **VED24**. *Be sure the power switch of the **VED24** is in the “OFF” (“0”) position before connecting the power supply’s AC plug to the AC line. Attach line cord to the power supply first before plugging into the AC power source.*
3. Plug the provided power supply into a 100-240 VAC, 50/60 Hz power source.
4. Power the **VED24** unit ON by sliding the power switch to the “ON” (“1”) position. Power LED (lower green) indicator will illuminate (see front panel).
5. Due to the position of the unit’s power switch at the rear of the **VED24**, **do not** position the unit such that it is difficult to operate the ON/OFF switch.

Initial Operation and Testing

The **VED24** will operate from a supplied +24 VDC power supply, the **PS24**.

CAUTION

*Be sure power switch of the **VED24** is in the “OFF” position before connecting the power supply’s AC plug to the line. Attach line cord to the power supply first before plugging into the AC power source.*

See **Start Up** section for connection to power source. Insert the 5-pin female SwitchCraft connector of the **510F** shutter interconnect cable into 5-pin male SwitchCraft receptacle at rear of unit. Connect the 5-pin female connector of the Model **510F** shutter interconnect cable to 5-pin male connector on shutter to be driven or use the proper provided adapter to interconnect to your shutter.

Set the **FUNCTION** and the **PULSE DURATION** switches for the shutter being used, see charts on pages 20 and 21.

Place the **POWER** switch to the ON (“1”) position, the green **POWER LED** will illuminate. Place the **N.O./N.C.** switch to the **N.O.** position. The shutter will open and remain open until the switch is returned to the **N.C.** position. When in the uni-stable mode, the green **DRIVER LED** will illuminate when this switch is in the **N.O.** position, when the driver is in the bi-stable mode, on the opening transition the green **DRIVER LED** will flash. The operation of the shutter described assumes that the **FUNCTION** switches are configured for the proper shutter used; uni-stable or bi-stable. Please see **FUNCTION Select** under **GENERAL CHARACTERISTICS**.

The **VED24, UNIBLITZ**[®] driver provides the circuitry necessary to support shutters equipped with the solid state synchronization option. Simply plug the shutter-interconnect cable into the driver. If your shutter is equipped with this option, the green **SYNC LED** will illuminate when the shutter is in the open position. In addition, the **SYNC OUTPUT BNC** will change to the active state when the shutter is open. The absence of the solid state synchronization option will only inhibit the operation of the **SYNC output** and **SYNC LED**. The remainder of the **VED24** systems will not be affected.

See **SPECIFICATIONS** and **OPERATOR CONTROLS** for additional operational information concerning other systems of the **VED24**.

Should the shutter and/or driver not respond as described previously, be sure the DC power plug from the power supply (provided) is properly seated into the DC power input jack and connections to the shutter are made properly to the rear of the driver.

CAUTION

*Turn off the unit and remove the plug from the AC source before removing the DC power plug from the **VED24**.*

Be advised, all fuses are internal to the unit. It is recommended that if a fuse blows, to return the unit for fuse replacement. Also, particular shutter units respond to different minimum pulse widths. For example, a standard **DSS35B** shutter (equipped with Teflon blades) has a minimum exposure pulse of 45 msec. If the exposure or pulse width presented to the **VED24**’s **PULSE INPUT** is less than 45 msec, the shutter may not open fully. If the unit still does not operate

properly when the proper pulse width is presented to the PULSE INPUT, please notify Vincent Associates immediately.

See Figure #1 for the **VED24** driver's overall dimensional layout. See Figure #2 for the 24VDC Power Supply overall dimensional layout.

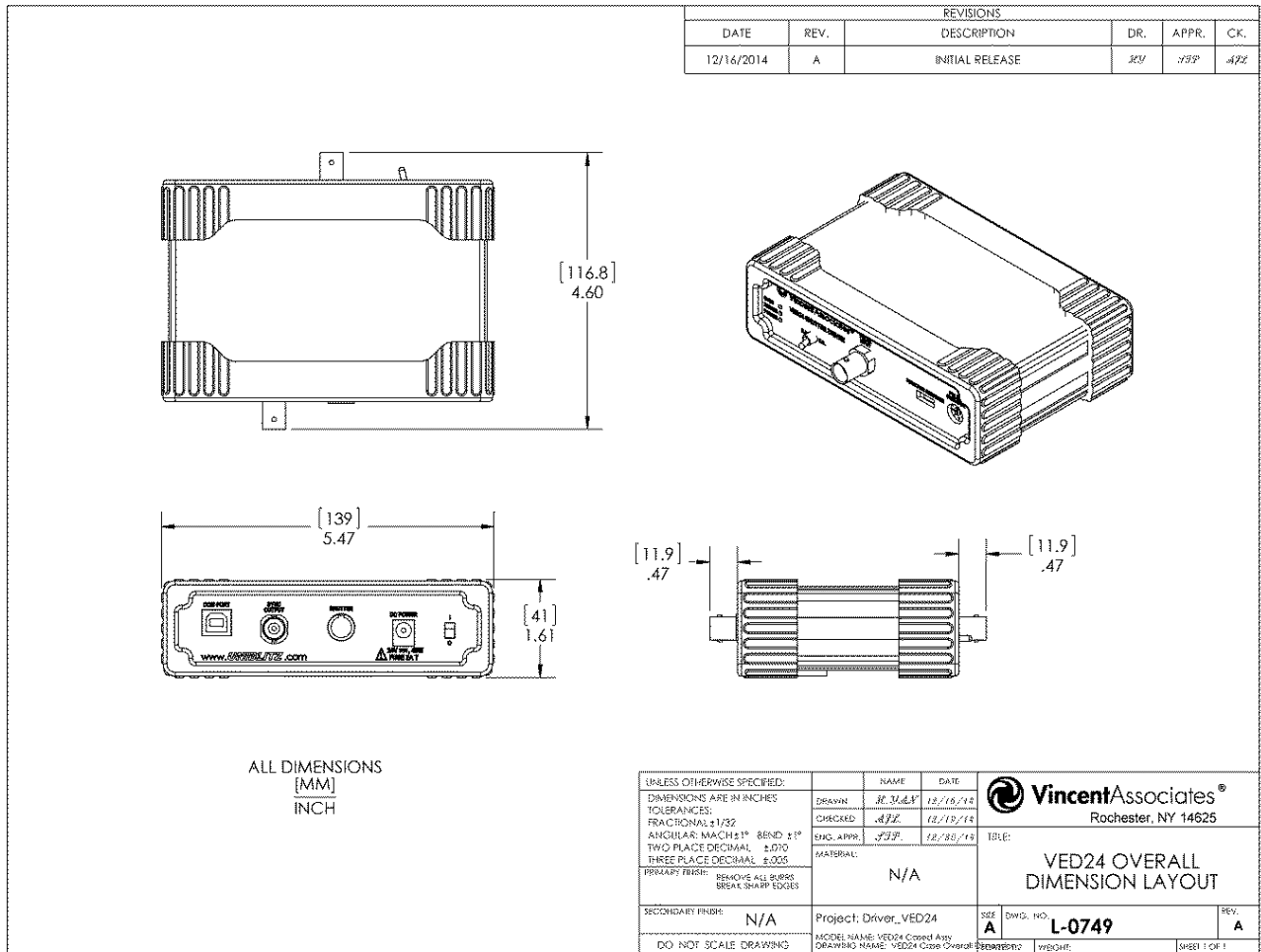


Figure 1, VED24 Overall Dimensional Layout

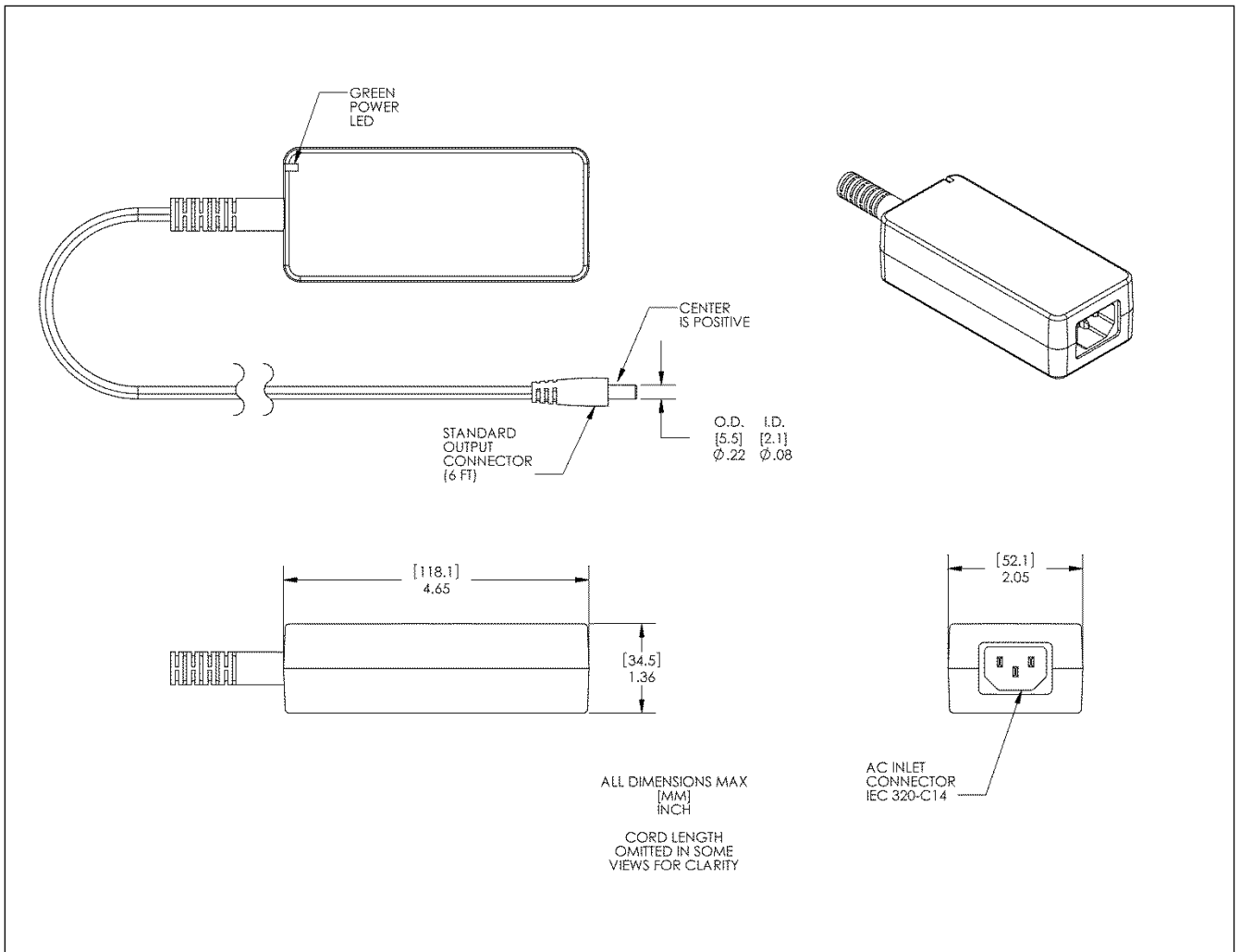


Figure 2, PS24, 24VDC Power Supply Overall Dimensional Layout

Operator Controls

VED24 Front Operator Controls

Please Refer to Figure 3.

1. **POWER** LED indicator.

A green LED indicating that DC power is being provided to the unit.

2. **DRIVER** LED indicator.

A green LED indicating when the internal shutter driver circuit input has an active signal present.

3. **SYNC** LED indicator.

Indicates the status of Solid State Synchronization output. This green LED is illuminated when shutter's electronic SYNC sensor is activated. This LED functions only if the shutter used is equipped with the Solid State Synchronization system.

4. **N.O./N.C.** Toggle switch.

The N.O./N.C. switch acts to invert the shutter operation. The position of this switch determines shutter status BEFORE a trigger signal is received by **VED24**. In the N.C. position the shutter will be triggered open by an input pulse signal. In the N.O. position the shutter will be triggered closed.

5. **PULSE INPUT** BNC.

Allows control of the shutter's exposure and frequency from a TTL signal source. The pulse duration determines the shutter exposure interval. The frequency of the signal presented to this input determines the frequency of shutter exposures. This input is active low.

6. **FUNCTION** Switches: Four edge actuated piano-DIP slide switches.

a. Switch **1** is used to select the LOCAL or REMOTE status of the controller. The LOCAL (up) control disables COM PORT (USB) communication; the BNC PULSE INPUT and N.O./N.C. switch are enabled. The REMOTE (down) enables the COM PORT (USB) communication; the BNC PULSE INPUT and N.O./N.C. switch are disabled.

b. Switch **2** is used to select the voltage level provided to the internal shutter driver. Standard +10.7VDC is provided in the (up) position, +18VDC is provided in the (down) position. The chart in Table #2 indicates the voltage level for the particular shutter used.

c. Switch **3** allows the user to select between bi-stable (up) and uni-stable (down) modes. The chart in Table #2 indicates the voltage level for the particular shutter used.

d. Switch **4** allows selection of the PULSE SET as indicated in Table #3. Pulse set #1 is selected with this switch in the (up) position. Pulse set #2 is selected with this switch in the (down) position. See Table #3 for a summary of the timing selections available.

7. **PULSE DURATION** Rotary Switch:

Rotation of the 8-position octal rotary switch (labeled 0 to 7) selects the duration of the drive pulses to the shutter. These timing selection values are determined by the setting of FUNCTION SWITCHES #3 and #4. See Table #3 for a listing of timing selections available. This will allow a total of 16 timing selections for bi-stable shutters and 16 selections for uni-stable shutters. A total of 32 timing selections are available.

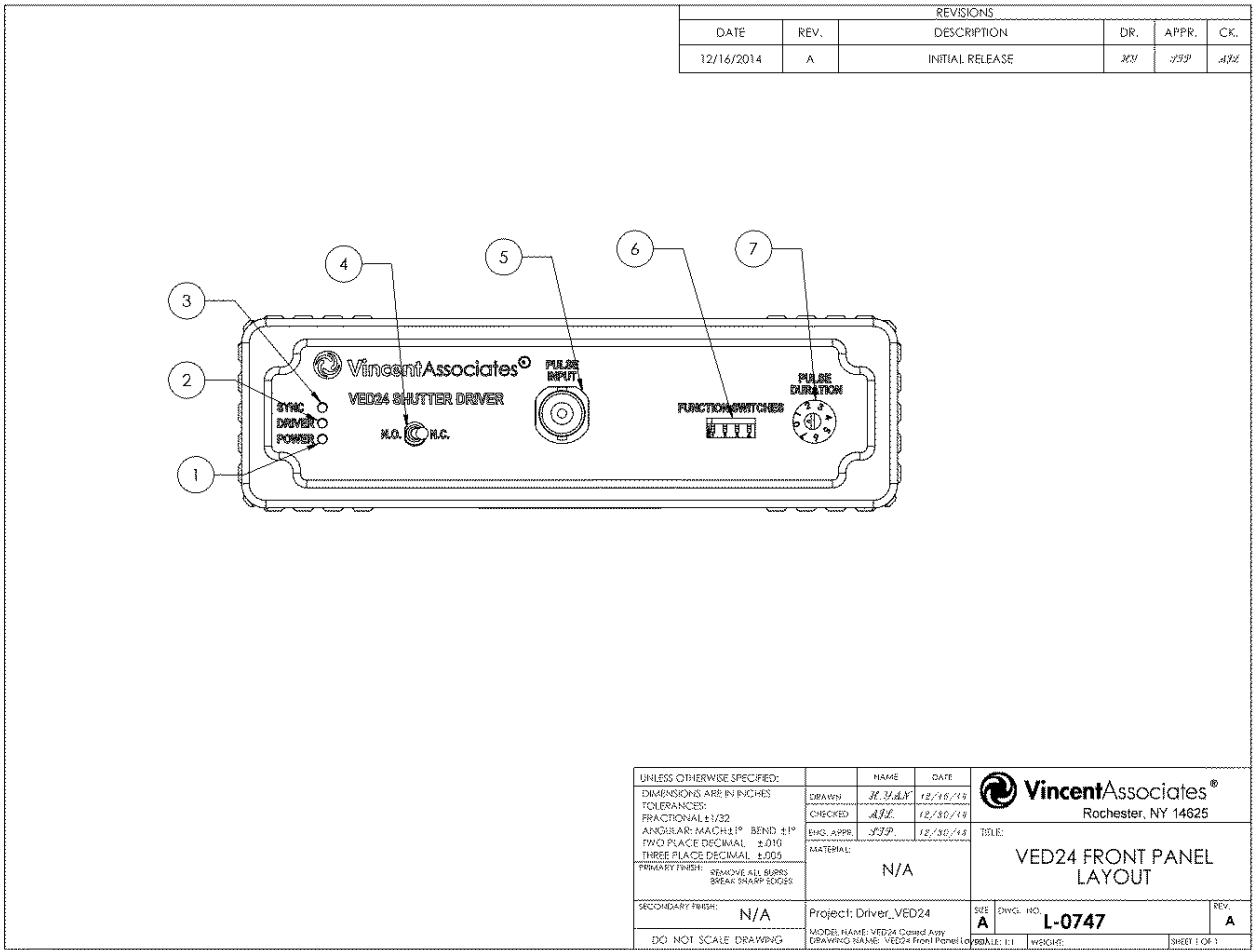


Figure 3, VED24 Front Panel Layout

VED24 Rear Operator Controls

Please Refer to Figure 4:

1. **USB Serial Control Port**

Provides access to the **VED24 COM PORT (USB)** interface allowing the user to control functions via commands sent from a computer serial USB port. The INPUT jack accepts commands directly from a computer's USB port. This is a listen only device and the status of the SYNC is not available at this time.

2. **SYNC OUTPUT BNC.**

This output is for shutters equipped with the Electronic Synchronization (SYNC) System option. The shutter's internal SYNC circuit sets the BNC output to an active state when the SYNC sensor becomes energized. The output goes active when the shutter reaches 80% of full open and goes to the inactive state when the shutter reaches 20% closed. The front panel SYNC LED (green) illuminates when the shutter's electronic SYNC is active. This output is an active high signal.

3. **SHUTTER Output.**

A 5-pin SwitchCraft male locking type connector. Pin-out as follows in Table 1, wire colors indicate **510F** cable (included) and shutter wiring layout, respectively. Be advised, there is no drain (ground) connection available from the molded 5-pin output connector.

Connector	Description	Shutter	510F
Pin 1	Shutter Actuator Drive Output (A)	Red ¹	Pin 1
Pin 2	Shutter Actuator Drive Output (B)	Brown ²	Pin 2
Pin 3	+5.0VDC Power Supply Output	Blue	Pin 3
Pin 4	SYNC Ground	Green	Pin 4
Pin 5	SYNC Detector Transistor Input	Yellow	Pin 5

Table 1: 5-Pin SwitchCraft Male Receptacle Pin-Out

4. **DC POWER Connector.**

A 2 mm jack for DC POWER input from the PS24 Power Supply (provided). Center terminal is PLUS (+).

5. **ON/OFF Power Switch.**

Power slide switch – lower (“0”) position is “OFF”, upper (“1”) position is “ON”

¹ On DSS type shutters, this connection is part of a Flex circuit

² On DSS type shutters, this connection is part of a Flex circuit

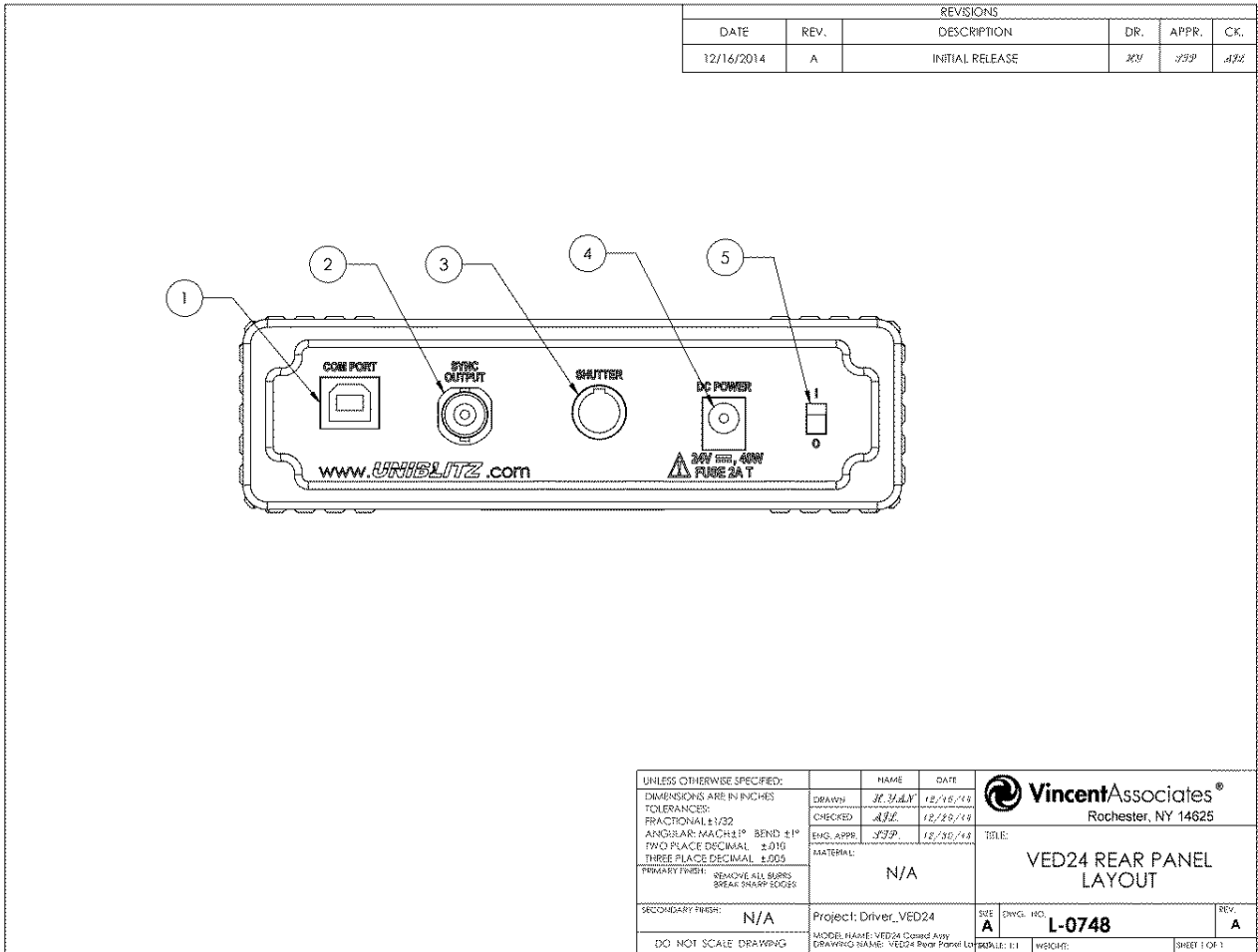


Figure 4, VED24 Rear Panel Layout

VED24 Function Operator Controls

Please see the tables below for recommended Function & Octal switch settings to provide device status and timing values for all available shutter series.

FUNCTION SWITCHES			
1	LOCAL / REMOTE	LOCAL = UP	REMOTE = DOWN
2	VOLTAGE SELECT	+10.7VDC = UP	+18VDC = DOWN
3	BI-STABLE / UNI-STABLE	BI-STABLE = UP	UNI-STABLE = DOWN
4	TIME SELECT 1 / 2	PULSE SET 1 = UP	PULSE SET 2 = DOWN

Table 2: FUNCTION DIP Switch Settings

<u>Octal Switch</u>	<u>Bi-stable Mode</u>		<u>Uni-stable Mode</u>	
	<u>Time Select Switch</u> (in milliseconds)		<u>Time Select Switch</u> (in milliseconds)	
	<u>Set 1</u> <u>UP</u>	<u>Set 2</u> <u>DOWN</u>	<u>Set 1</u> <u>UP</u>	<u>Set 2</u> <u>DOWN</u>
0	5	45	3	40
1	10	50	5	45
2	15	55	10	55
3	20	60	15	65
4	25	65	20	75
5	30	70	25	80
6	35	75	30	90
7	40	80	35	100

Table 3: VED24 Octal Switch Pulse Duration Settings

VED24 Drive Controller Settings Chart							
SHUTTER SERIES	FUNCTION				PULSE DURATION	ADAPTER REQUIRED³	
	(Local - Up Remote - Down) 1	(+10.7V -Up +18 - Down) 2	(Bi-stable – Up Uni-stable – Down) 3	(Set 1 - Up Set 2 -Down) 4			
TS2B	X	UP	UP	UP	0	5M203D	
ES6B	X	UP	UP	UP	1	5M203D	
DSS10	X	UP	UP	UP	2	5M203D	
DSS20	X	UP	UP	UP	4	5M203D	
DSS25	X	UP	UP	UP	6	5M203D	
DSS35	X	UP	UP	DOWN	0	5M203D	
NS15B⁴	X	UP	UP	UP	2	510F Cable Only	
NS25B	X	UP	UP	UP	2	510F Cable Only	
NS35B	X	UP	UP	UP	5	510F Cable Only	
NS45B	X	UP	UP	UP	5	510F Cable Only	
NS65B	X	DOWN	UP	DOWN	5	510F Cable Only	
VS14	X	DOWN	DOWN	UP	2	701A-S5	
VS25	X	DOWN	DOWN	UP	3	701A-S5	
VS35	X	DOWN	DOWN	UP	6	701A-S5	
LS2	X	DOWN	DOWN	UP	0	510F Cable Only	
LS3	X	DOWN	DOWN	UP	0	510F Cable Only	
LS6	X	DOWN	DOWN	UP	1	510F Cable Only	
NS25S	X	DOWN	DOWN	UP	6	510F Cable Only	
CS25	X	DOWN	DOWN	UP	4	510F Cable Only	
CS35	X	DOWN	DOWN	UP	6	510F Cable Only	
CS45	X	DOWN	DOWN	DOWN	0	701A-S5	
CS65	X	DOWN	DOWN	DOWN	4	701A-S5	
CS90HS	X	DOWN	DOWN	DOWN	6	701A-S5	
X= Don't Care							

Table 4: Function & Octal Switch Settings for All Available Shutter Series

³ Additional adapters are required (for use with the 510F Cable) as listed.

⁴ Must use adapter included with the NS15B and then use the 510F only.

Notes

Operating Basics

Refer to the section describing the **Initial Operation and Testing** for initial preparation to put the **VED24** into operation.

Function Switches

There are four piano-DIP slide switches located on the unit's front panel.

For specific functions see **FUNCTION Select** under GENERAL CHARACTERISTICS or Table #2

The switch actuators can be moved to the up or down position with a small non metallic tool.

Be sure the power is off and disconnected from the unit before attempting to change the FUNCTION switch settings.

1. Switch **1** is used to select the LOCAL or REMOTE status of the controller. The LOCAL (up) control disables COM PORT (USB) communication; the BNC PULSE INPUT and N.O./N.C. switch are enabled. The REMOTE (down) enables the COM PORT (USB) communication; the BNC PULSE INPUT and N.O./N.C. switch are disabled.
2. Switch **2** is used to select the voltage level provided to the internal shutter driver. Standard +10.7VDC is provided in the (up) position, +18VDC is provided in the (down) position. The chart in Table #2 indicates the voltage level for the particular shutter used.

CAUTION

Switch 2 (in the down position) must be used only for designated shutter aperture types. Use of the +18VDC Voltage Level switch position for other than designated shutter types will damage the shutter used and will void the limited warranty.

3. Switch **3** allows the user to select between bi-stable (up) and uni-stable (down) modes. The chart in Table #2 indicates the voltage level for the particular shutter used.
4. Switch **4** allows selection of the PULSE SET as indicated in Table #3. Pulse set #1 is selected with this switch in the (up) position. Pulse set #2 is selected with this switch in the (down) position. See Table #3 for a summary of the timing selections available.

Be sure the PULSE DURATION Rotary Switch is in the correct position for the shutter used with the controller

Rotation of the 8-position octal rotary switch (labeled 0 to 7) selects the duration of the drive pulses to the shutter. These timing selection values are determined by the setting of FUNCTION SWITCHES #3 and #4. See Table #4 for a listing of timing selections available. This will allow a total of 16 timing selections for bi-stable shutters and 16 selections for uni-stable shutters. A total of 32 timing selections available.

I/O Considerations

The PULSE INPUT BNC is an Active Low input. When a signal transitions from the high state to the low state, the shutter driver will be initiated, and the shutter will transition. Because this is an Active Low input, the controller can be triggered from a remote activate cable such as the optional 710R or the 710R/F.

Be advised the SYNC OUTPUT is also designated as an Active High output. These remote activate cables cannot be connected to any output.

CAUTION

Do not connect a 710R or 710R/F to the SYNC OUTPUT BNC. This will damage the SYNC OUTPUT.

USB Operation

The VED24 can also be controlled via a serial command from a computer's USB port (configured as a virtual COM port). A USB cable is included with the controller. Once the device is connected to a computer, in most instances, the driver for the USB interface will be installed. If this connection does not occur, a USB driver program can be downloaded from:

<http://www.ftdichip.com/Drivers/CDM/CDM%20v2.12.04%20WHQL%20Certified.exe>

This USB driver is also included on the Flash Drive which is included with your VED24 controller. In fact, in addition to the link above, the USB driver can be found on the same Flash Drive that this PDF User Manual is located. Once communication is established, the shutter can be commanded to the open position by sending the ASCII "@" symbol. The shutter will close by sending a capital "A" symbol. See USB Commands in the "SPECIFICATION" section on page #27.

Testing the communication can be accomplished with a terminal emulation program such as Termite 3.1, found at http://www.compuphase.com/software_termite.htm. (Termite 3.1 is copyrighted software that is free for personal and commercial use. You may use it and distribute it without limitations. You may however not remove or conceal the copyright. There are no guarantees or warranties whatsoever; use it at your own risk.)

Trigger Cautions and Trouble Shooting Tips

1. The **VED24** system's capability is greatly enhanced by external control as described previously, however, extreme care must be taken to ensure that high voltages (see SPECIFICATIONS) are not inadvertently switched into external control inputs. Also, note that large negative voltages can cause irreparable damage to the unit's internal circuitry. Exercise extreme caution.
2. Fuses are located internally on the PCB. If a fuse is inadvertently blown, it is not recommended that the user change a fuse.
3. Particular shutter units respond to different minimum pulse widths. For example, a standard DSS35B shutter (equipped with Teflon blades) has a minimum exposure pulse of 45 msec. If the exposure or pulse width presented to the **VED24**'s PULSE INPUT is less than 45 msec, the shutter may not open fully. If the unit still does not operate properly, when the proper pulse width is presented to the PULSE INPUT, please notify Vincent Associates immediately.
4. Please be sure that FUNCTION switches are set correctly before operating the shutter. Incorrect switch settings can damage the shutter and/or trip the internal fuses. Additionally, this could result in the shutter not opening fully when triggered or opening fully and immediately returning to the closed position thereby risking failure or loss of capture.
5. Unless otherwise indicated, based on the shutter used with the **VED24**, be sure that FUNCTION switch #2 is in the "up" position. This setting ensures the internal shutter driver voltage is set to +10.7VDC. The "lower" FUNCTION switch #2 position sets the internal shutter drive voltage to +18VDC. This should only be set to this position when the shutter used indicates this setting should be made. Use of this voltage setting for smaller aperture devices could cause irreparable damage to the shutter used and WILL void the shutter's limited warranty.

Maintenance

Proper care and maintenance of the unit should be taken as with any electronic instrument.

With the exception of the external DC power supply, there are no user-serviceable parts in the **VED24**.

There is no service to be performed by the user other than inspection for visible damage.

Although the stability of the timing and drive voltage is assured and calibrated prior to shipment, it may become necessary to make some minor adjustments and upgrades to the firmware of the **VED24** over time.

WARNING

It is highly recommended that if you suspect a problem with your unit, that it be returned to the factory for proper adjustments and calibration. The unit's complicated circuitry will be damaged and/or not function as specified if inadvertently adjusted improperly.

General Care

Perform routine inspection of the **VED24** on a regular basis.

Inspect the unit for any signs of visible damage.

Follow the procedures below.

Inspection

Inspect the **VED24** for damage, wear, and missing parts. A device that appears to have been dropped or shows other signs of exterior damage 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.

Cleaning Procedure

CAUTION

Do not use any liquid to attempt to remove dust from the unit.

Remove loose dust on the **VED24** with a low pressure stream of compressed (canned) air.

Specifications

System Characteristics

Name	Description
Repeat Exposure	<ul style="list-style-type: none">• Minimum time between exposures is determined by shutter used and open / close pulse duration.
Shutter Drive	<ul style="list-style-type: none">• Continuously variable frequency of exposures from DC to the shutter's maximum rate• Maximum peak pulse power: 41 W• Pulse voltage Max.: +18VDC Max• Pulse current Max.: 2.25A (Test conditions: 18 Volts, 8Ω - not continuous)
Power Requirements	<ul style="list-style-type: none">• +24VDC, PS24 Included, AC power supply.• Required AC Input: 100-240 VAC, 50/60 Hz• Power Supply Output: +24 VDC, 1.67A, 40W• Input Plug (to VED24 Controller): 2 mm DC plug, Center is positive

External Input Characteristics

Name	Description
PULSE INPUT (BNC) Front Panel	<ul style="list-style-type: none"> • Active-low • Input impedance: 1K Ohms • Maximum source current: 100 μA • Maximum sink current: 1μA • Minimum pulse width determined by applicable shutter • Maximum pulse width unlimited • TTL compatible: <ul style="list-style-type: none"> - Minimum high-level: +2.0 VDC - Maximum low-level +0.8 VDC
USB Input (USB B) Rear Panel	<ul style="list-style-type: none"> • USB 2.0 – Driver automatically loads – Driver is supplied if the computer will not load proper driver. • 2 Input commands recognized – Shutter Open, Shutter Close
USB-Serial UART Interface Settings	Baud Rate – 9600, 8 Data bits, 1 Stop bit, No Parity, No flow control
USB Serial Global Address Code Locations	
<u>Commands</u>	<u>Decimal</u> <u>HEX</u> <u>Octal</u> <u>Binary</u> <u>ASCII</u>
Open	64 40 100 01000000 @ (receive data)
Close	65 41 101 01000001 A (receive data)

External Output Characteristics

Name	Description
SYNC OUTPUT (BNC) Rear Panel	<ul style="list-style-type: none"> • Active-high • Maximum source current: 3.0 mA • Maximum sink current: 20 mA • Maximum low-level: +0.5 VDC • Minimum high-level: +4.5 VDC. This output becomes active when shutter used is equipped with electronic synchronization sensor.

General Characteristics

Name	Description																								
POWER Indicator Front Side	<ul style="list-style-type: none"> Green 3mm LED indicates when DC power is present. 																								
DRIVER Indicator Front Side	<ul style="list-style-type: none"> Green 3mm LED indicates when the shutter driver circuit is active. This LED will illuminate with or without the load of a shutter's actuator coil. 																								
SYNC Indicator Front Side	<ul style="list-style-type: none"> Green 3mm LED indicates when a shutter's electronic synchronization sensor is active. SYNC OUTPUT (BNC) will be active (high) only when this LED is illuminated. Shutter used must have the electronic synchronization option installed for this LED to operate. 																								
FUNCTION Select (4-position piano DIP switch) Front Panel	<p>A 4-position DIP switch used for configuration of different VED24 operating modes</p> <ul style="list-style-type: none"> Switch 1 is used to select the LOCAL or REMOTE status of the controller. The LOCAL (up) control disables COM PORT (USB) communication; the BNC PULSE INPUT and N.O./N.C. switch are enabled. The REMOTE (down) enables the COM PORT (USB) communication; the BNC PULSE INPUT and the N.O./N.C. switch are disabled. Switch 2 is used to select the voltage level provided to the internal shutter driver. Standard +10.7VDC is provided in the (up) position, +18VDC is provided in the (down) position. The chart in Table #2 indicates the voltage level for the particular shutter used. Switch 3 allows the user to select between bi-stable (up) and uni-stable (down) modes. The chart in Table #2 indicates the voltage level for the particular shutter used. Switch 4 allows selection of the PULSE SET as indicated in Table #3. Pulse set #1 is selected with this switch in the (up) position. Pulse set #2 is selected with this switch in the (down) position. See Table #3 for a summary of the timing selections available. 																								
<table border="1"> <thead> <tr> <th data-bbox="147 1675 599 1711"><u>Function</u></th> <th colspan="3" data-bbox="599 1640 1474 1675">DIP Switch Position</th> </tr> <tr> <th data-bbox="147 1711 599 1747"></th> <th data-bbox="599 1711 808 1747"><u>DIP Switch</u></th> <th data-bbox="808 1711 1117 1747"><u>Up</u></th> <th data-bbox="1117 1711 1474 1747"><u>Down</u></th> </tr> </thead> <tbody> <tr> <td data-bbox="147 1747 599 1782">Local/Remote</td> <td data-bbox="599 1747 808 1782">(1)</td> <td data-bbox="808 1747 1117 1782">Local</td> <td data-bbox="1117 1747 1474 1782">Remote</td> </tr> <tr> <td data-bbox="147 1782 599 1818">Voltage Select</td> <td data-bbox="599 1782 808 1818">(2)</td> <td data-bbox="808 1782 1117 1818">+10.7VDC</td> <td data-bbox="1117 1782 1474 1818">+18.0VDC</td> </tr> <tr> <td data-bbox="147 1818 599 1856">Uni-stable / Bi-stable</td> <td data-bbox="599 1818 808 1856">(3)</td> <td data-bbox="808 1818 1117 1856">Uni-stable</td> <td data-bbox="1117 1818 1474 1856">Bi-Stable</td> </tr> <tr> <td data-bbox="147 1856 599 1892">Time Select Set#1 / Set#2</td> <td data-bbox="599 1856 808 1892">(4)</td> <td data-bbox="808 1856 1117 1892">Set #1</td> <td data-bbox="1117 1856 1474 1892">Set #2</td> </tr> </tbody> </table>	<u>Function</u>	DIP Switch Position				<u>DIP Switch</u>	<u>Up</u>	<u>Down</u>	Local/Remote	(1)	Local	Remote	Voltage Select	(2)	+10.7VDC	+18.0VDC	Uni-stable / Bi-stable	(3)	Uni-stable	Bi-Stable	Time Select Set#1 / Set#2	(4)	Set #1	Set #2	
<u>Function</u>	DIP Switch Position																								
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Time Select Set#1 / Set#2	(4)	Set #1	Set #2																						

General Characteristics (cont'd)

Name	Description																																																		
PULSE DURATION Select (Octal Rotary Switch) Front Panel	8-position octal switch allows selection of a number of different open / close pulse durations in units of msec. <ul style="list-style-type: none"> Two sets of timing pulses are available depending on the setting of the Bi-Stable / Uni-stable Function switch. 																																																		
	PULSE DURATION Switch Locations (values in msec)																																																		
<u>Octal Switch Setting</u>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;"></th> <th colspan="2" style="text-align: center;"><u>Bi-Stable Timing Range</u></th> <th colspan="2" style="text-align: center;"><u>Uni-Stable Timing Range</u></th> </tr> <tr> <th></th> <th style="text-align: center;"><u>Up</u></th> <th style="text-align: center;"><u>Down</u></th> <th style="text-align: center;"><u>Up</u></th> <th style="text-align: center;"><u>Down</u></th> </tr> </thead> <tbody> <tr><td style="text-align: center;">0</td><td style="text-align: center;">5</td><td style="text-align: center;">45</td><td style="text-align: center;">3</td><td style="text-align: center;">40</td></tr> <tr><td style="text-align: center;">1</td><td style="text-align: center;">10</td><td style="text-align: center;">50</td><td style="text-align: center;">5</td><td style="text-align: center;">45</td></tr> <tr><td style="text-align: center;">2</td><td style="text-align: center;">15</td><td style="text-align: center;">55</td><td style="text-align: center;">10</td><td style="text-align: center;">55</td></tr> <tr><td style="text-align: center;">3</td><td style="text-align: center;">20</td><td style="text-align: center;">60</td><td style="text-align: center;">15</td><td style="text-align: center;">65</td></tr> <tr><td style="text-align: center;">4</td><td style="text-align: center;">25</td><td style="text-align: center;">65</td><td style="text-align: center;">20</td><td style="text-align: center;">75</td></tr> <tr><td style="text-align: center;">5</td><td style="text-align: center;">30</td><td style="text-align: center;">70</td><td style="text-align: center;">25</td><td style="text-align: center;">80</td></tr> <tr><td style="text-align: center;">6</td><td style="text-align: center;">35</td><td style="text-align: center;">75</td><td style="text-align: center;">30</td><td style="text-align: center;">90</td></tr> <tr><td style="text-align: center;">7</td><td style="text-align: center;">40</td><td style="text-align: center;">80</td><td style="text-align: center;">35</td><td style="text-align: center;">100</td></tr> </tbody> </table>		<u>Bi-Stable Timing Range</u>		<u>Uni-Stable Timing Range</u>			<u>Up</u>	<u>Down</u>	<u>Up</u>	<u>Down</u>	0	5	45	3	40	1	10	50	5	45	2	15	55	10	55	3	20	60	15	65	4	25	65	20	75	5	30	70	25	80	6	35	75	30	90	7	40	80	35	100
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6	35	75	30	90																																															
7	40	80	35	100																																															
Fuse Requirements	Fuses are internal to unit. Not user serviceable.																																																		
Operating Temperature	5° C to 40° C (41° F to 104° F)																																																		
Storage Temperature	-20° C to 55° C (-4° F to 131° F)																																																		
Size (HWD)	1.61 x 5.47 x 4.60 in. (41.0 x 139.0 x 116.8 mm)																																																		
Weight	12.27 oz. (0.35 kg)																																																		
Supplied Accessories with VED24 (See Checklist)	<p>User's Manual (Driver Files) on USB Flash Drive.</p> <p>PS24 +24 VDC, 40W UL/CE Power Supply, 100 – 240 VAC, 50/60 Hz.</p> <p>510F Shutter interconnect cable, 5-pin female SWC to 5-pin female SWC, 3 meters.</p> <p>5M203D Shutter Adapter Cable, 5-pin male SwithCraft to 2-pin JST adapter for DSS & TS shutter series.</p> <p>701A-S5 Shutter Adapter Cable 7-pin female WPI to 5-pin male SWC</p> <p>USB-AB USB "A" plug to USB "B" Plug, 1 meter</p>																																																		
Optional Accessories	<p>710R remote hand-held trigger cable (used with active-low BNC)</p> <p>710R/F remote foot-switch trigger cable (used with active-low BNC)</p>																																																		

Appendix A (Declaration of Conformity)

Declaration of Conformity

VA, Inc. dba Vincent Associates®



Vincent Associates
803 Linden Avenue
Rochester, NY 14625
Tel: [800-828-6972](tel:800-828-6972)
www.uniblitz.com

Description of Equipment:

The following product is manufactured in the United States of America by Vincent Associates:

Uniblitz VED24 Single-Channel Optical Shutter Controller

EU Declaration of Conformity (EMC):

Vincent Associates hereby declares that under its sole responsibility, and based on tests performed by G&M Compliance Inc., that the aforementioned product meets the requirements of the **EU EMC Directive 2014/30/EU** by means of conformity to the following harmonized standards:

EN 61326-1: 2013 – EMC requirements for electrical equipment for measurement, control, and laboratory use — Part 1: General requirements

IEC 61000-4-2:2008 – Electromagnetic compatibility (EMC) - Part 4-2: Testing and measurement techniques - Electrostatic discharge immunity test

IEC 61000-4-3:2010 – Electromagnetic compatibility (EMC) - Part 4-3: Testing and measurement techniques - Radiated, radio-frequency, electromagnetic field immunity test

IEC 61000-4-4:2012 – Electromagnetic compatibility (EMC) - Part 4-4: Testing and measurement techniques - Electrical fast transient/burst immunity test

IEC 61000-4-5:2015 – Electromagnetic compatibility (EMC) - Part 4-5: Testing and measurement techniques - Surge immunity test

IEC 61000-4-6:2013 – Electromagnetic compatibility (EMC) - Part 4-6: Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency fields

IEC 61000-4-8:2009 – Electromagnetic compatibility (EMC) – Part 4-8: Testing and measurement techniques – Power frequency magnetic field immunity test

IEC 61000-4-11:2004 – Electromagnetic compatibility (EMC) - Part 4-11: Testing and measurement techniques - Voltage dips, short interruptions and voltage variations immunity tests

CISPR 11:2015 – Industrial, scientific and medical equipment - Radio-frequency disturbance characteristics - Limits and methods of measurement

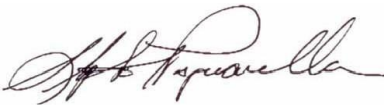
EU Declaration of Conformity (LVD):

Vincent Associates hereby declares that under its sole responsibility, and based on tests performed by G&M Compliance Inc., that the aforementioned product meets the requirements of the **EU Low Voltage Directive 2014/35/EU** by means of conformity to the following harmonized standard:

IEC/EN 61010-1:2010 – Safety requirements for electrical equipment for measurement, control, and laboratory use — Part 1: General requirements

CE Mark

CE Mark first applied to this product April 25, 2016.



Stephen T. Pasquarella
President

Original Date: April 25, 2016
Updated: June 8, 2016

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