



PULSAR 320E STROBE CONTROLLER

OPERATION AND MAINTENANCE MANUAL

Version 4
10/4/2023

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1 DESCRIPTION

1.1 KEY FEATURES – PULSAR 320E

1.1.1 The Pulsar 320E provides the ultimate in lighting control for strobe-only, high power applications.

1.1.2 Two outputs for controlling 2 lights independently, each capable of 50A @ 100V DC.

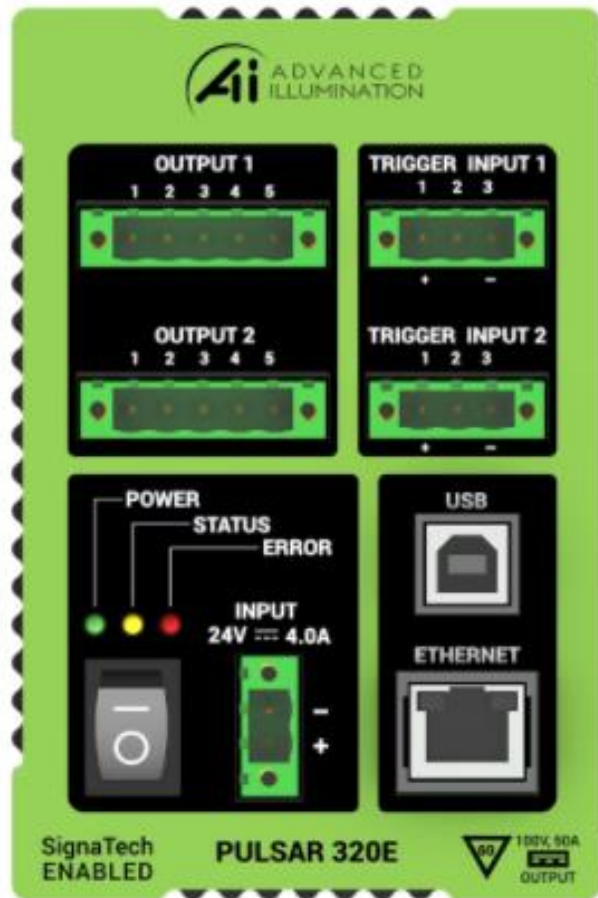


Figure 1. Pulsar 320E

1.2 SPECIFICATIONS

Controller Style	Discrete Control System (External, Detachable)
User Interface	Software GUI
Operating Modes	Pulsed (Overdrive Strobe), Repeat Pulsed
Light Head Connection	Via Proprietary Header Block with Embedded EEPROM in light head connector (C5 connector)
Input Supply Requirements	24V DC Nominal, Minimum 4.0A Recommended 21V Min - 30V Max; Power Inputs Reverse-Polarity Protected
Output Channels	Number of Outputs: 2 Number of Channels per Output: 1
Output Power	Pulsed: 5000W Peak Total, 2500W Peak per Channel*
Output Voltage	Pulsed: 100V Max*
Trigger Signal	2.5V Min - 30V Max, <=5mA
Trigger Protection	Protected up to 30V
Trigger Latency	<2 μ s
Trigger Frequency Limit	2KHz
User Programmable Settings	
Output Current	Pulsed: 100A Max Total, 50A per Channel*
Pulse Width Range	1 μ s - 100ms
Pulse Delay Range	1 μ s - 100ms
Duty Cycle Range	Typical <1% for high current overdrive, up to 15% Dependent on the limitations of the connected light.
Dimming Range	0% - 100%, 1mA Increments via Software Settings
Hardware and Software	
Status Indicator LEDs	Green: Power, Yellow: Communication, Red: Error
Communication	10/100 Base-T USB (Custom HID) C++ Library
Operating System Software Support	GUI: Windows 7+ x86 and x86-64, Linux x86 and x86-64 (requires Kernel 2.6.39+ with libudev installed)
Operating Temperature	0°C to +55 °C
Storage Temperature	-25°C to +85 °C
IP Rating	Not Rated

Dimensions	4.40" x 3.37" x 5.10" (111.6mm x 85.6mm x 129.5mm)
Weight	1.63lb (739g)
Mounting	DIN Rail, 35mm
Case Material	Aluminum and Steel
Warranty	5 yrs
Compliance	CE, RoHS

*Values shown are based on controller component limitations. Actual limitations will vary depending on the limits set for the connected light head. These limits are determined using Advanced Illumination's proprietary SignaTech™ (Signature Technology) in order to ensure safe peak performance.

Table 1. Specifications

2 HARDWARE

2.1 PULSAR 320E OVERVIEW AND DIMENSIONS

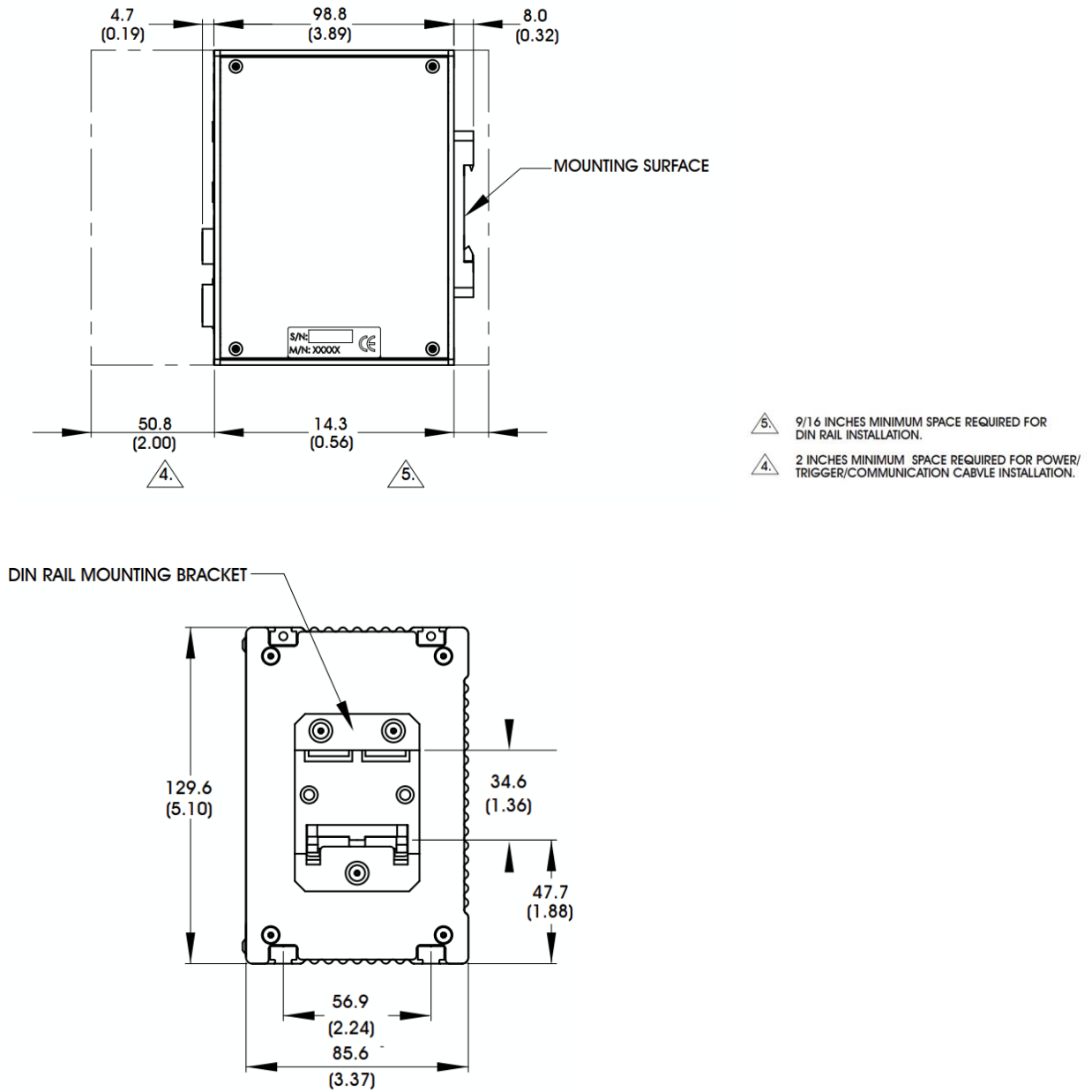


Figure 2. Pulsar 320E Dimensions

2.2 CONTROLLER ARCHITECTURE

The Pulsar 320E Controller, used in conjunction with an external 24VDC power supply, is a compact, 2 output, high power pulse (strobe only) current source incorporating a wide range of flexibility in selecting the operating parameters. The unit may be controlled and operated locally (with optional local control interface) or remotely via a USB interface and host computer. In addition, the unit employs built in Ethernet connectivity.

2.3 SAFETY

The Pulsar 320E is designed to protect Advanced illumination light heads having the Signatech II light head identification parameters.

In certain modes of operation, the output voltages and currents provided by the Pulsar 320E could result in a potentially injurious or fatal electrical shock. **For this reason, light heads should be connected BEFORE the power switch is turned on.** At no time should the operator touch the output connector pins or light head leads when the power is on.

During normal operation, the Pulsar 320E may reach light head output voltages as high as 100 volts. For specific applications, or to comply with local codes, the Pulsar 320E may be configured to limit the light head output voltage to a maximum of 48 volts (see 4.6.3). Please contact Advanced illumination when this requirement exists.

Advanced illumination makes no warranty, expressed or implied, if illumination or other devices produced by manufacturers other than Advanced illumination are connected to the Pulsar 320E.

2.4 PULSAR 320E CONTROLLER CABLE CONNECTIONS

Four physical connections, one of which needs to be a USB or Ethernet will be required to operate the Pulsar 320E and light head. Refer to figure 1 for an illustration of the Pulsar 320E's front panel.

2.4.1 Power: The input power connector is located near the bottom center of the Pulsar 320E's front panel. The Pulsar 320E requires an external 24-volt DC supply for operation. The power supply needs to have sufficient amperage rating to drive the light head in the desired mode of operation. Advanced illumination recommends a minimum of **4A for full output operation.** Observe the polarity markings on the cable while connecting the 2-pin connector into the socket labeled "INPUT".



Figure 3. Input Power

Recommended cable gauge for power leads is 18AWG, with or without wire ferrules. 22 AWG absolute minimum.

2.4.2 Trigger: The trigger input connectors are located at the upper right of the Pulsar 320E's front panel. The differential trigger levels are CMOS/TTL compatible but will accept input pulses as great as 30 V. Two input trigger connectors are provided, one for each output.

One trigger may be mapped to both outputs. For more detailed triggering information refer to section 4.11 "External Trigger Interface".



Figure 4. Trigger Input connectors

2.4.3 Ethernet: An RJ45 connector is located to the lower right of the front panel and is provided for Ethernet connectivity. Standard protocols supported are TCP/IP, UDP, TFTP via 10/100Base-T. For more detailed information on Ethernet connectivity.

2.4.4 USB: The USB connector is located to the right and center of the front panel. A host computer will communicate with the Pulsar 320E via this USB connection. Connect the provided USB cable between the USB connection on the host computer and the connector labeled USB on the Pulsar 320E.

2.4.5 Light Head: Two outputs capable of high power are provided. Each will provide up to 50A of pulse current drive. The current of each channel is independently selectable. Output pulse widths can be set between 1 and 100 milliseconds in 1 microsecond increments at pulse repetition rates up to 400 Hz.

Signatech lamp data, stored in the embedded EEPROM, determines the maximum drive current and thermal characteristics of the lamp and is required for the Pulsar controller to function.

***Note:** Removing the Signatech enabled connector for the purpose of bypassing the EEPROM and Pulsar controller to power directly to 24 volts DC will likely damage or destroy the light head, and also voids the Ai warranty.



Figure 5. Output Connectors

3 HARDWARE SETUP

3.1 MOUNTING

The Pulsar 320E controller has an integrated 35mm din-rail clip. The clip is non-removeable and can be actuated with a flat-blade screwdriver or similar tool, located towards the bottom of the controller.



Figure 6. Mounting Clip

3.2 CONNECTORS

The Trigger and Power Input connectors are screw terminal equipped and are shipped with the controller. They may be removed to make wiring easier. **Note: the lamp output connector, C5, is not shipped with the controller. The output connector is attached to a compatible “C5” lighthouse from Advanced Illumination.**



QTY		Description	Phoenix Part #
1		2 Pin, Power Input Connector	1777989
2		3 Pin, Trigger Input Connectors	1805314

Table 2. Connectors

4 SOFTWARE

4.1 SOFTWARE INSTALLATION

Pulsar 320E Controller user interface software is required to set the operational parameters of the Pulsar 320E. This utility program is included online at our website and is installed as follows:

Note: Administrator Access to the system is usually required to install the software.

Note: Supported operating systems are Windows 7 through Windows 11 and Linux (requires kernel version 2.6+).

4.1.1 The software is available for download under: Products->Controllers->Pulsar320E Downloads.

<https://www.advancedillumination.com/products/pulsar-320-2-channel-outputs/>

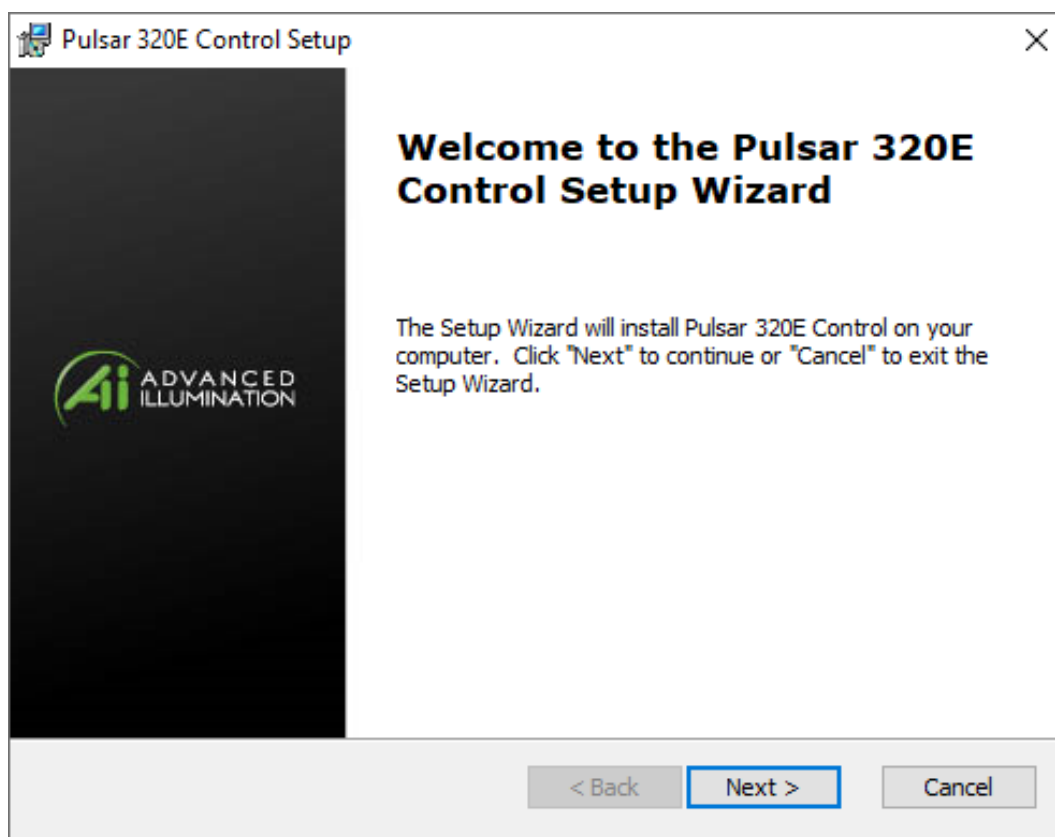


Figure 7. Control Setup

4.1.2 Select Setup_Pulsar320E_Control.exe

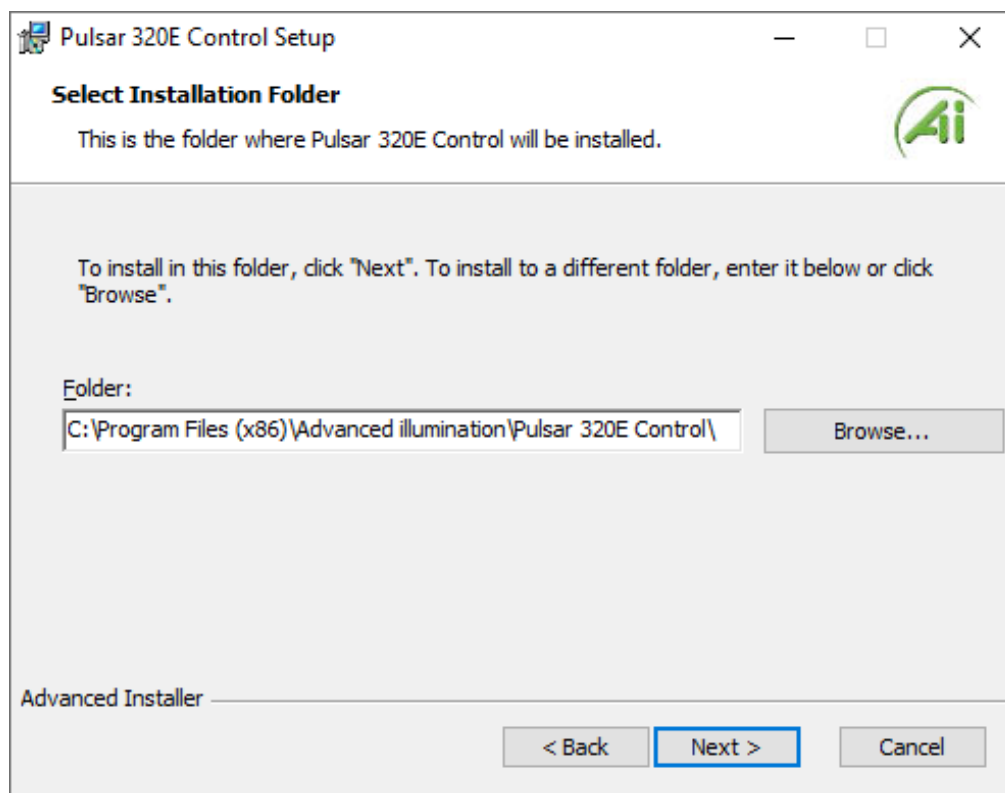


Figure 8. Software Install Window

4.1.3 Close all open applications if prompted and press **Next**.

4.2 RUNNING THE SOFTWARE

4.2.1 Launch Pulsar 320E Control

4.2.2 Choose USB

4.2.3 Select a USB port. Use port 0 by default. Click “Connect”.

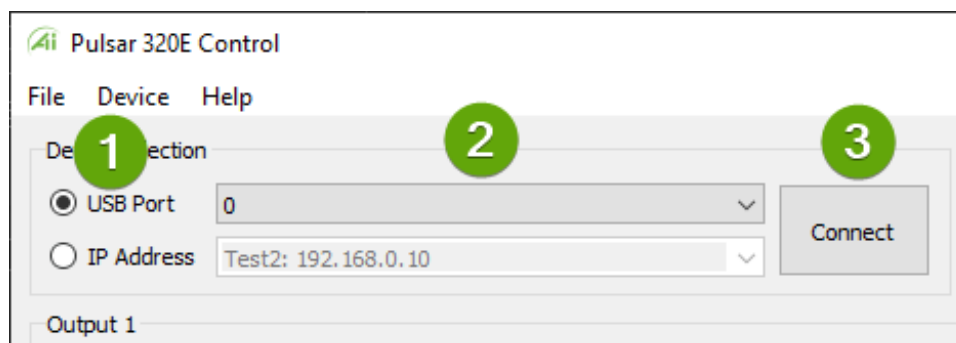


Figure 9. Pulsar Control

4.2.4 Upon connecting to a USB Port, the output configuration sections will be enabled – Grayed out outputs means no light is connected.

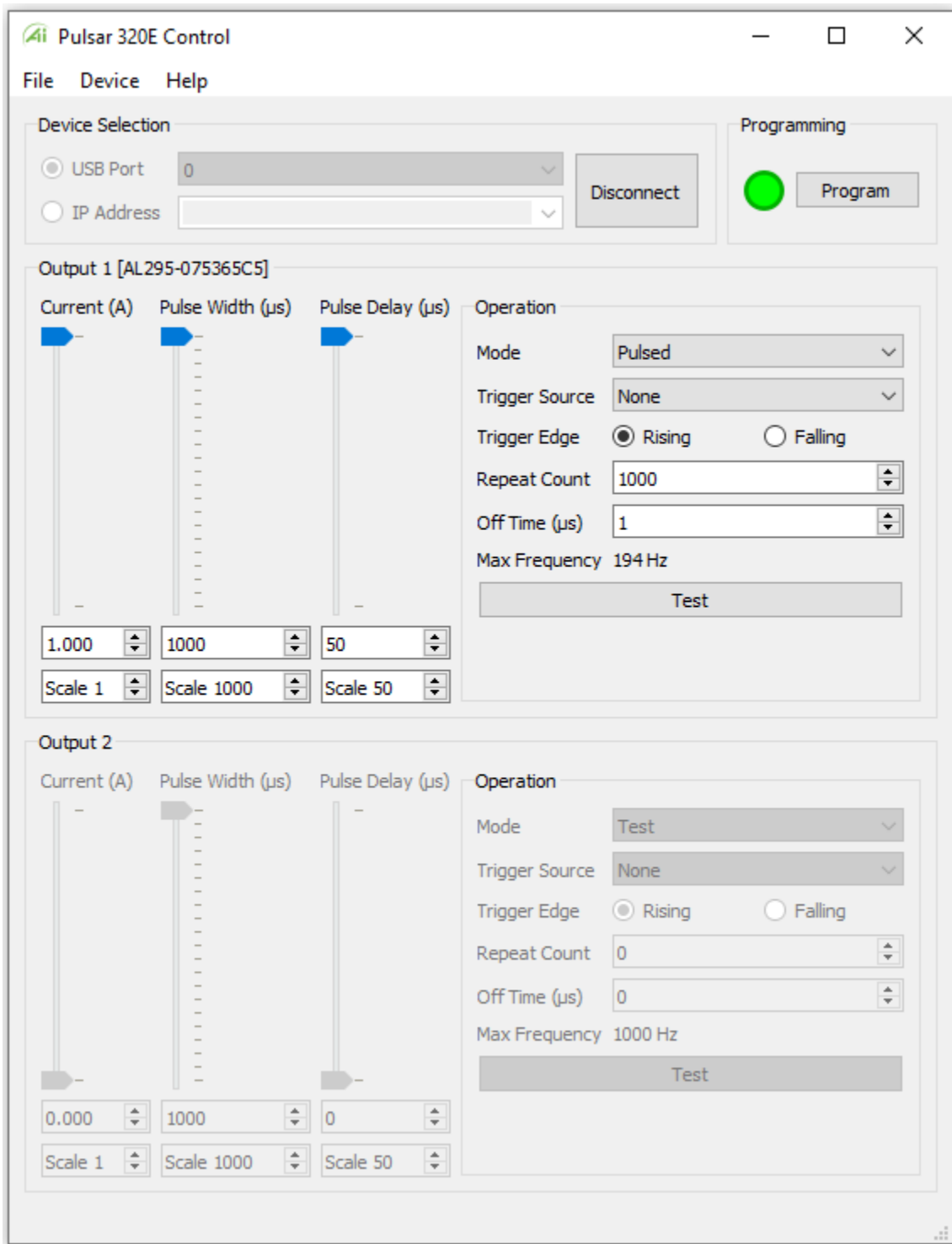


Figure 10. Pulsar Control

4.2.5 Test the light head:

4.2.5.1 Set the output Mode to Setup.

4.2.5.2 Click Program in the upper right.

4.2.5.3 The light head should enter a continuous current mode that will allow for visible detection that the light is working. This mode is useful for orienting the light in the system. This mode should NOT be used for inspection purposes as it will provide inconsistent results. This mode may also make the light appear to flicker- this is normal.

4.2.6 Test the light in Test Mode.

4.2.6.1 Set Mode to Test.

4.2.6.2 Set the Pulse Width slider to 1000.

4.2.6.3 Set the current to 10.

4.2.6.4 Click Program. The light should flash at 10Hz with no external trigger applied.

4.3 FILE MENU

4.3.1 (A) Save Configuration: save active configuration to a file.

4.3.2 (B) Load Configuration: open saved configuration file.

4.3.3 (C) Manage Connections: open saved device connections.

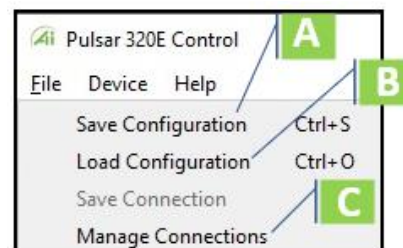


Figure 11. File Menu

4.4 DEVICE MENU

4.4.1 (D) Advanced Settings: Open device settings.

4.4.2 (E) Network Settings: Open device network configuration.

4.4.3 (F) Information: shows device information

4.4.4 (G) Errors

4.4.5 (H) Priorities:

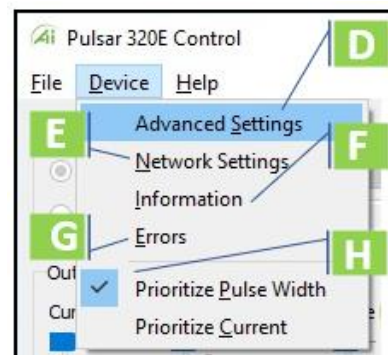


Figure 12. Device Menu

- Prioritize Pulse Width: when enabled, the Pulsar will lower the working current to maintain configured pulse width.
- Prioritize current: when enabled, the Pulsar will shorten the working pulse width to maintain the configured current.

4.5 DEVICE INFORMATION

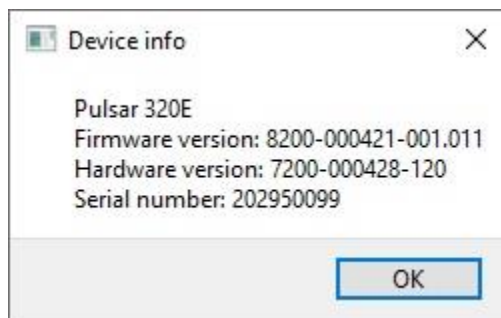


Figure 13. Device Information

4.6 ADVANCED SETTINGS WINDOW

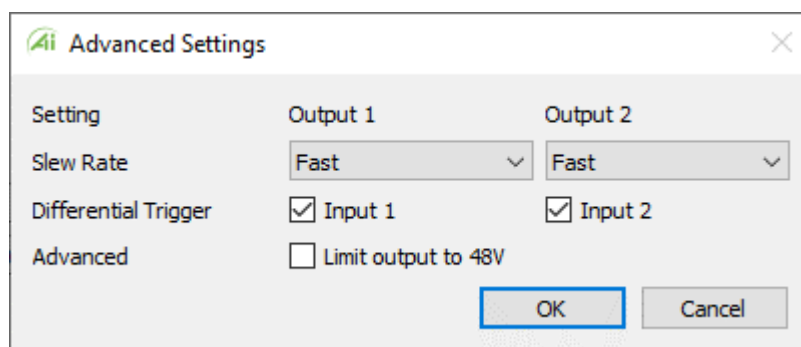


Figure 14. Advanced Settings

4.6.1 Slew Rate: used to reduce output ripple/ringing on the output light pulse. Using the proper slew rate setting may improve lighting performance. **Note: for most applications, it is not required to change this setting. The default of Fast works for the majority of applications.**

4.6.1.1 Fast: used when strobing below 100 μ s (**default setting**)

4.6.1.2 Medium-fast: used when pulsing 100-500 μ s.

4.6.1.3 Medium-slow: used when pulsing 500-1000 μ s.

4.6.1.4 Slow: used when pulsing above 1000 μ s.

4.6.2 Differential Trigger: Default checked. Activates the differential trigger inputs. Recommendation is to leave this on unless otherwise instructed.

4.6.3 Advanced: 48V output limit. Default unchecked. Apply this setting to clamp the output strobe voltage to 48V. This may reduce performance significantly for certain light sources.

4.7 Pulsar 320E Utility Dialog Box Status Indicator

Output: Output 1 and Output 2 group boxes will appear active (not grayed-out) to indicate there is a light head connected to the Pulsar 320E. The type of light head will also be displayed when available.

4.8 Pulsar 320E User Interface Output Controls

4.8.1 Operation: None of the settings described below will take effect until the Pulsar 320E is programmed. Pressing the program button will transfer the settings from the host computer to the Pulsar 320E allowing the settings to take effect. When there are new settings that have not yet been transferred to the Pulsar 320E, the program button will turn yellow as a warning indication.

4.8.2 Output Settings: There are three parameters that can be set to control the output of the Pulsar 320E. Each parameter can be set by adjusting its slider control or by entering the value directly in the text box. Each slider control has a scale adjustment. All settings are internally checked by the Pulsar 320E for compatibility with the attached light head. Settings that will overdrive the light head will not be allowed. If an unsafe setting is attempted, either the current or the pulse width will automatically be reduced to a safe level and a message will be displayed in the status box. The protection setting determines whether pulse width or current is adjusted.

4.8.2.1 Current (A): The current setting determines the brightness of the light output. Units are in Amps.

4.8.2.2 Pulse Width (μ s): This is the length of the output pulse in microseconds.

4.8.2.3 Pulse Delay(μ s): This is the time in microseconds, between detection of a trigger signal and the start of the output pulse.

4.8.3 Mode: One of three modes can be selected here.

4.8.3.1 Pulsed: The Pulsar 320E generates a succession of output pulses for every single trigger event. Output then ceases until the next trigger event occurs. The Repeat Count (pulse count) and the Off Time (time between pulses) are entered in the appropriate text boxes within the user control interface. Setting the number of pulses to 1 or 0 will produce only a single pulse, per trigger event. This is equivalent to the Pulsed mode from the Pulsar 320E.

4.8.3.2 Setup: The light head should enter a continuous current mode that will allow for visible detection that the light is working. This mode is useful for orientating the light in the system.

4.8.3.3 Test: The Pulsar 320E outputs pulses at 10 hertz. The current and timing are determined by the control settings.

4.8.4 Trigger Source: This selection determines which trigger input drives the selected channel in Pulse, Timing Bypass, and Repeat modes. Use the Trigger Edge selection to choose the rising or falling edge.

4.8.5 Test: This selection provides a ‘One Shot’ trigger pulse to test trigger settings and light head output.

Note: In some cases current may be adjusted when Adjust Timing is selected. This happens when the current setting exceeds the absolute maximum current setting for the light head. In this case current would be reduced to the absolute maximum current and then timing adjusted as necessary.

4.9 USB Control

4.9.1 Connect Pulsar 320E USB cable to host PC, 24vDC, and applicable light head

4.9.2 Switch the main rocker power switch ON. A green power LED will illuminate, followed by a flashing amber LED.

4.9.3 Launch Pulsar 320E Utility

4.9.4 Choose USB

4.9.5 Select a USB port. Use port 0 by default. Press Connect.

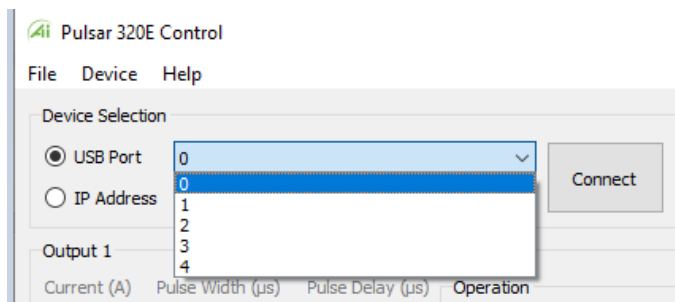


Figure 15. USB Dialog Open

4.9.6 Upon Connecting to a USB port, the strobe settings window will open (Fig 10) - Grayed-out outputs mean no light is connected.

4.9.7 Test the light head: Press SETUP radio button, press PROGRAM.

4.9.7.1. The light head should immediately enter a continuous current mode that will allow for visible detection that the light is working. This mode is useful for orientating the light in the system.

4.9.7.2 This mode should NOT be used for inspection purposes as it will provide inconsistent results.

4.9.7.3 This mode may make the light appear to flicker - this is normal.

4.9.8 Test the light in TEST MODE

4.9.8.1 Press the TEST mode.

4.9.8.2 Set Pulse Width slider to 1000

4.9.8.3 Set current to 10

4.9.8.4 Press PROGRAM

4.9.9 The light should flash at 10Hz with no external trigger applied. At this point the attached light head(s) will be ON. Any further adjustments can be made at any time using the same procedure as above. Adjusting PW will change the duration of the output pulse, and adjusting CURRENT will change the output level of the output pulse. Keep in mind that TEST mode always produces a 10Hz repetition rate pulse.

The Pulsar 320E can communicate via ETHERNET. For instructions on this, please refer to the TCP/IP setup guide in Appendix D.

4.10 Host Computer Control (REMOTE)

To take full advantage of the flexibility of the Pulsar 320E, software is provided which permits the operating parameters to be set by a host computer. The host computer will be connected to the Pulsar 320E via a USB port utilizing a USB Type B connector. (See Figure 16) The USB port is Microsoft HID compliant



Figure 16. Computer Connections

4.11 External Trigger Interface

The Pulsar 320E employs two independent trigger inputs utilizing RS485 receivers. These differential trigger inputs are effective in suppressing excessive noise and EMI that could be present in the installation area or when long trigger lines are required. Advanced illumination recommends using shielded, twisted pair cable for the trigger inputs. Table 2 identifies the “standard” function of each pin within the two external trigger interface connectors on the front panel of the Pulsar 320E as shipped from the factory.

The wiring of the trigger input is dependent upon the trigger source. Though the Pulsar 320E utilizes differential trigger inputs, single ended sources may also be utilized.

Refer to Appendix “A” Figure 21 for common trigger connection schematics.

When utilizing a single ended trigger source it is important to realize that the Pulsar 320E requires a “sourcing” output (PNP or Pull Up) as the trigger input is “sinking”.

Figure 21 in appendix “A” is a connection diagram for the Trigger Input connector. Suggested wiring conventions are shown depicting the most common types of trigger sources. After setting the power switch to the “OFF” position, connect an external trigger in accordance with this diagram.

For special trigger requirements not shown please contact Advanced illumination.

Trigger selection is performed using a host computer and the Pulsar 320E software.

In the single-ended trigger configuration, the input will accept TTL/CMOS compatible signals and is internally clamped so that trigger inputs of up to 30 V may be applied. If the differential trigger connection is chosen, the Pulsar 320E will recognize input logic levels that are compliant with RS232/485 protocol. For all triggered modes, the trigger signal should have a minimum width of 2 microseconds and a rise and fall time of less than 200 nanoseconds.

4.11.1 Alternate Trigger Configurations:

If the Pulsar 320E will be triggered by a PLC refer to Appendix “A” for schematics depicting different PLC configurations.

5 INPUTS AND OUTPUTS

5.1 INPUTS

Power Input		
Pin	Function	Notes
1	24VDC	4A recommended minimum for best performance
2	DC GND	

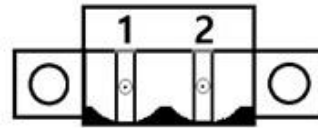


Figure 17. Power Connector

External Trigger Input	
Pin	Function
1	SIG +
2	SIG -
3	COMMON (GND)

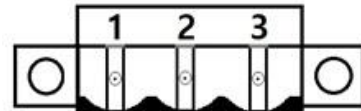


Figure 18. External Trigger Connector

Output Connector	
Pin	Function
1	+V (LED+)
2	RET (LED-)
3	SIG 1 / ID1
4	SIG 1 / ID2, SIG2, Light Head Detect
5	Power GND

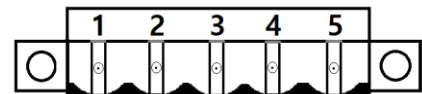


Figure 19. Output Connector (C5)

5.2 OUTPUTS

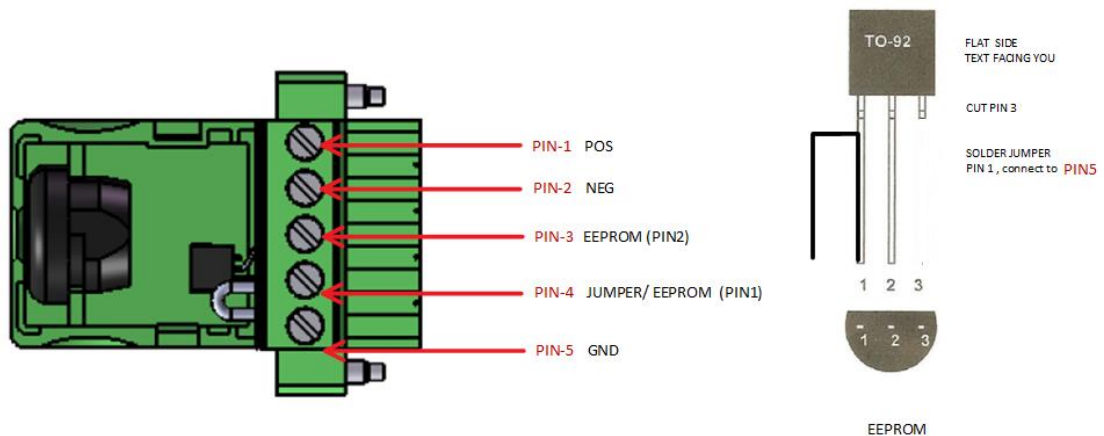


Figure 20. C5 Pinout

6 TROUBLESHOOTING

6.1 STATUS INDICATOR LIGHTS

The Pulsar 320E has three LED indicator lights as shown in Figure (1).

6.1.1 Green

This light indicates that the Pulsar 320E has power either from the USB connection to the host computer or the main 24VDC power connection.

6.1.2 Amber

The amber light indicates the operational status of the Pulsar 320E. A blink rate of once per second indicates normal operation. A blink rate of 5 times per second indicates an error condition.

6.1.3 Red

The red light blinks an error code in the case of an error condition. The condition is indicated by three sets of sequential flashes. For example: 4 flashes followed by 2 flashes followed by 3 flashes indicate an error code of 423 which signifies that the main power switch is off.

Please note that there are several hundred error codes. Most of these are for factory use in diagnosing problems which occur during initial test and calibration procedures. Only the codes most commonly encountered in use are listed here, together with a few which would indicate an internal fault. If a code is encountered which is not listed here, the operator should contact Technical Support at Advanced illumination for further assistance. If the corrective action suggested for the listed error code does not resolve the problem, the operator should contact Advanced illumination.

6.2 ERROR CODES

The codes are listed below in bold face with a description of the fault indicated and a corrective action.

351 - No light head detected.

Corrective action – Be sure light head is plugged into an output connector. Check wiring of light head to connector.

354 - Signatech II light head definition data is invalid.

Corrective action – Check light head wiring to connector. Verify that the Signatech II identifier integrated circuit (EEPROM) is present in the connector. It should be attached to pins 11, 12, and 13. Call Ai if identifier integrated circuit is present, the wiring is correct, and problem persists.

411 - The specified drive channel is invalid.

Corrective action – Select valid drive channel. Check to see if light head wiring in connector is such that light head is connected to selected channel. Error codes 212 through 219 indicate that internal voltage levels are not correct. If these, or any codes other than those listed above occur, contact Technical Support at Advanced illumination for assistance. Under no circumstances should the user attempt repairs on the unit.

7 REGULATORY REQUIREMENTS AND COMPLIANCE

7.1 COMPLIANCE INFORMATION



7.2 WARRANTY INFORMATION

Every Advanced illumination, Inc. (Ai) product is thoroughly inspected and tested before leaving the factory. Products are warranted to be free of defects in workmanship and materials for a period of FIVE YEARS from the original date of purchase. Should a defect develop during this period, customers may return the complete product, freight prepaid, to one of Ai's distributors or to the Ai factory. All product warranty returns require a Return Merchandise Authorization (RMA) number which is obtained from Customer Service. The RMA number must be clearly marked on the outside of the package. Ai will inspect the unit, and if a defect is found will, at our option, repair or replace the product without charge. Ai disclaims liability for any implied warranties, including implied warranties of "merchantability" and "fitness for a specific purpose." For products under warranty that have since been discontinued, Ai will make an effort to replace with equivalent parts; for circumstances that do not allow for equivalent replacement, Ai reserves the right to repair or replace these products with an updated version. Ai cannot be held responsible for the unauthorized or inappropriate use of its products. Any unauthorized repair or modifications will result in a voided warranty. No Liability for Consequential Damages: In no event shall Ai be liable for any consequential, special, incidental, or indirect damages of any kind arising from the sale or use of the products.

7.3 RETURN POLICY

Standard Products may be returned within 30 days of receipt of the order. Products must be in resalable condition, in function and appearance, with shipping charges prepaid. A restocking fee of 15% will be applied to all items accepted for return to stock. If you need to make a return, please call our Customer Service Department at 802.767.3830 for a Return Merchandise Authorization (RMA) number. Clearly mark the outside of the package with the RMA number.

NO RETURNS CAN BE ACCEPTED FOR STANDARD VARIATION, CUSTOM VARIATION, AND CUSTOM PRODUCTS.

There are currently over 100,000 unique configurations of the Ai product line. Therefore, we cannot restock a light built to your specifications. We would be glad to help you order your light if you are unsure of the correct part number or your exact requirements.

7.4 ELECTROMAGNETIC COMPATIBILITY

This product was tested and complies with the regulatory requirements and limits for electromagnetic compatibility (EMC) as stated in the product specifications. These requirements and limits are designed to provide reasonable protection against harmful interference only when the product is operated in its intended industrial electromagnetic environment. To minimize the potential for electromagnetic interference or unacceptable performance degradation, install and use this product in strict accordance with the instructions in the product documentation.

7.5 CUSTOMER SERVICE

For information on existing orders, or to make an order adjustment, contact us Monday through Friday 8:00 am to 5:00 pm ET or send an email to orders@advancedillumination.com.

Company Information

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440 State Garage Road, Rochester, VT 05767

Phone: 802.767.3830 Fax: 802.767.2636

Email: info@advancedillumination.com

Web: advancedillumination.com

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8 APPENDIXES

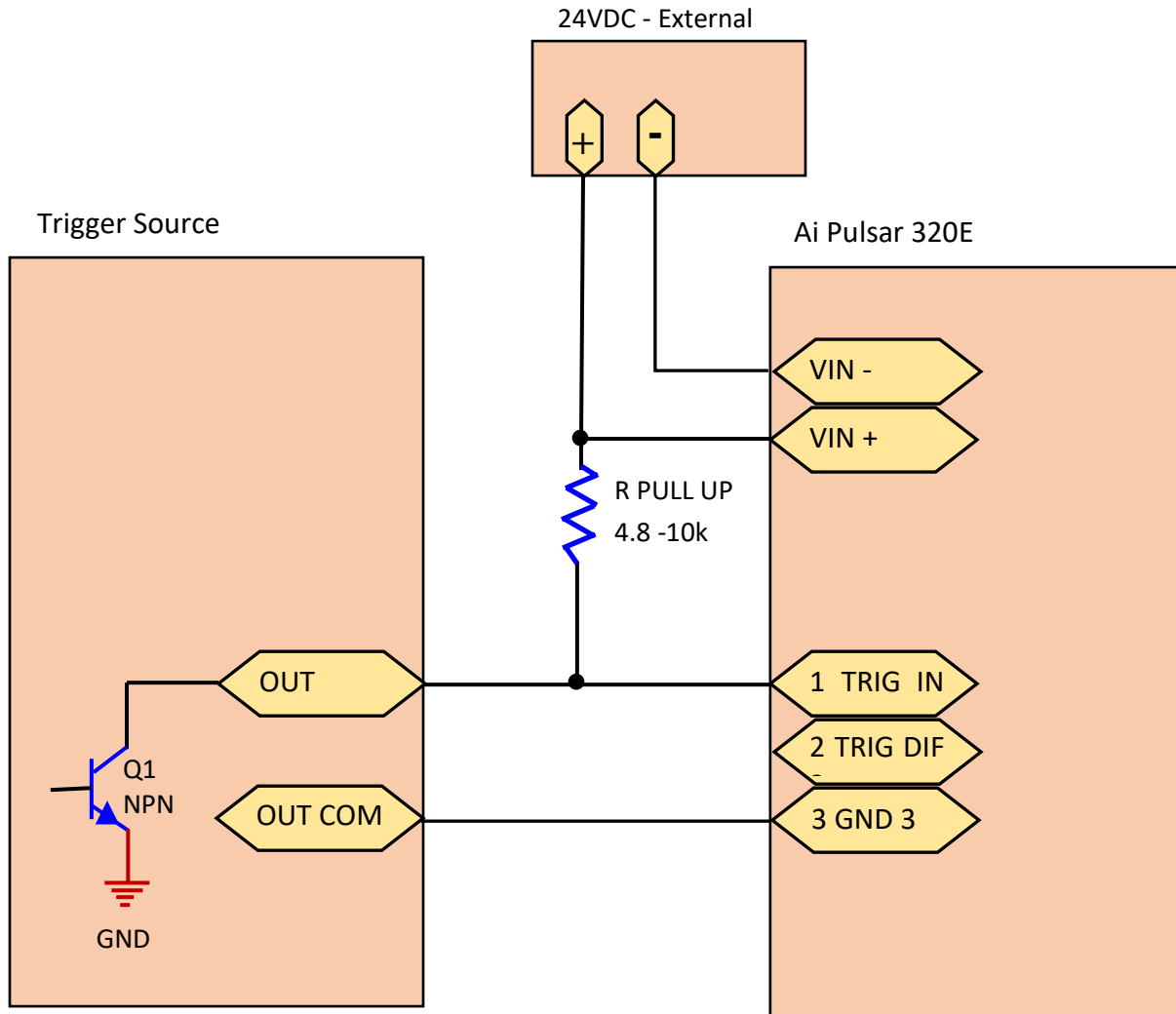
Appendix A: Trigger Connection Diagram

Appendix B: Pulsar 320E TCP/IP Setup Instructions

Appendix C: Definition of Terms

APPENDIX A: TRIGGER CONNECTION DIAGRAM

TYPICAL PULSAR TRIGGER WIRING



Typical NPN – Sinking Output, common to many vision systems.
Pullup resistor value may vary based on the trigger source provider.

Figure 21. Connection Diagram

APPENDIX B: PULSAR 320E TCP/IP SETUP INSTRUCTIONS

Configure network settings for the PC

- Connect through a network or router
- Direct connect with a single PC connection 2.0 Connection to the Pulsar 320E
- Pulsar 320E TCP/IP setup

TCP/IP CONNECTION THROUGH NETWORK TO PULSAR 320E: PC SETUP

Find your current IP address and determine whether it is static or dynamic:

1. Open Windows Start Menu
2. Search for “Control Panel”
3. Open the Control Panel
4. Under View By, select “Small Icons”
5. Click “Network and Sharing Center”

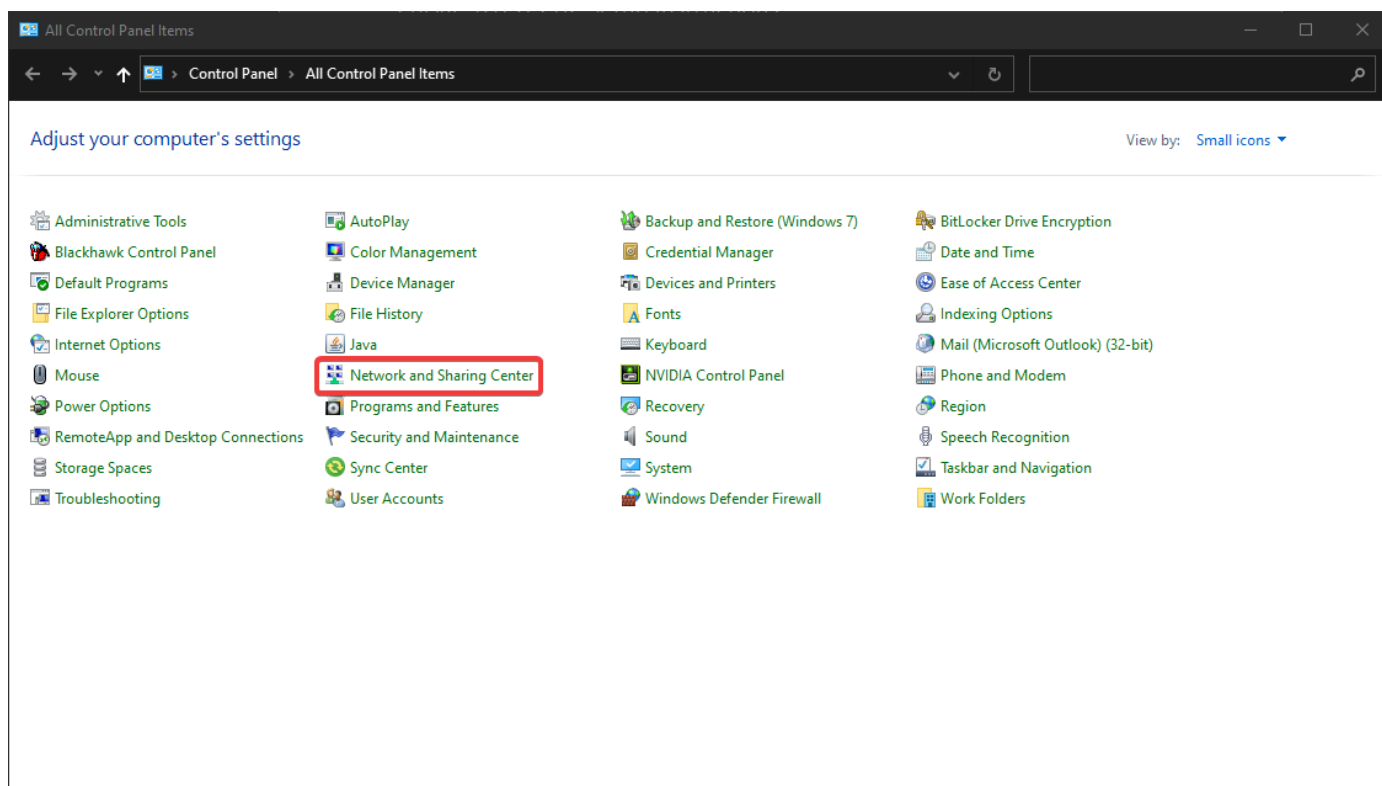


Figure 22. Net Connections

6. Under Active Connections, click “Ethernet”

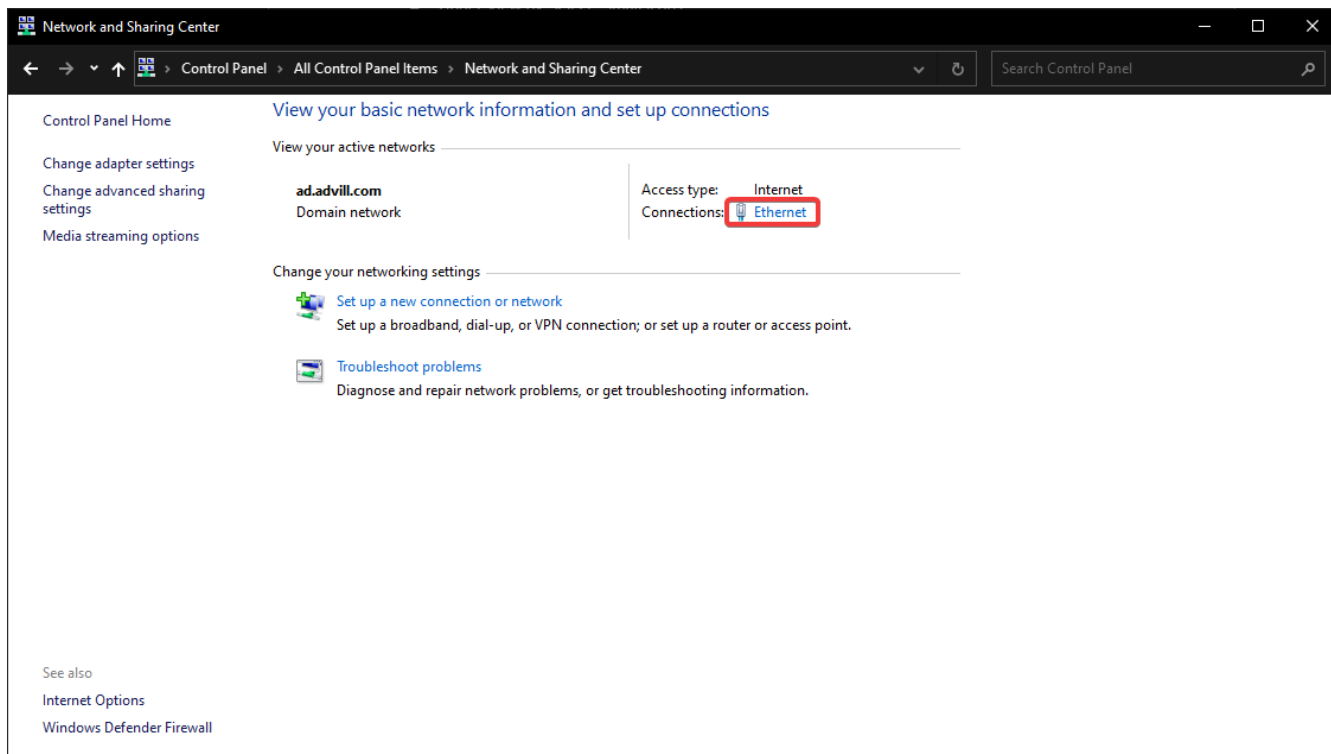


Figure 23. Access Type

7. Under Connection, click Details

8. Look for these entries in the list:

- **DHCP enabled.** “No” means your IP address is static. “Yes” means it is dynamic.
- **IP Address.** This is your current IP address
- **Subnet Mask.** This is the local subnet range
- **Default Gateway.** Gateway address of any routers or hubs.

If the current IP address is:

- **Static**, then this IP will need to be changed to Dynamic with DHCP
- **Dynamic**, then take note of: IP Address, Subnet Mask, Default Gateway, then continue to Pulsar Setup

Enable DHCP (Windows 10/11):

9. Close the Network Connection Details window if it is open.

10. Click Properties

11. Select “Internet Protocol Version 4 (TCP/IPv4)” and click Properties.

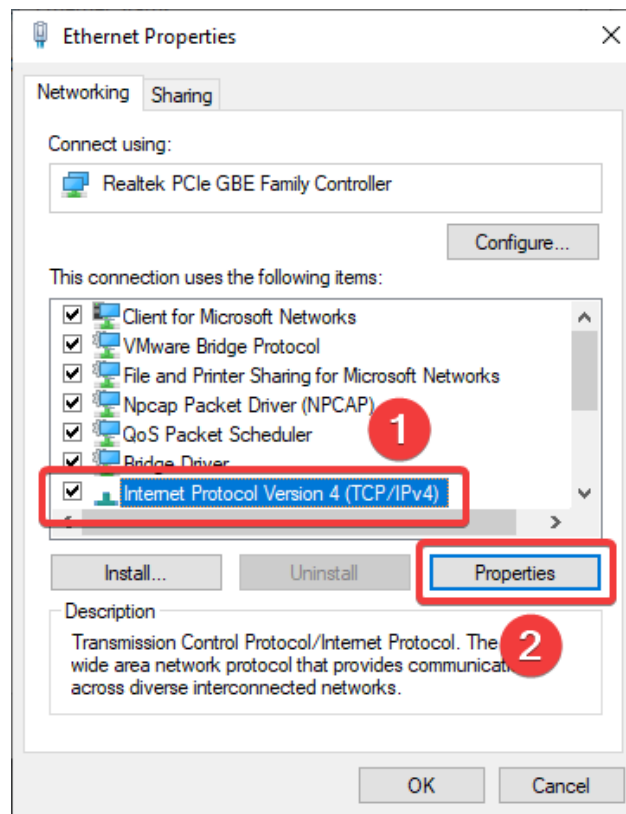


Figure 24. Ethernet Properties

12. Enable **Obtain IP address automatically**. Enable **Obtain DNS automatically** unless advised otherwise by your network administrator.

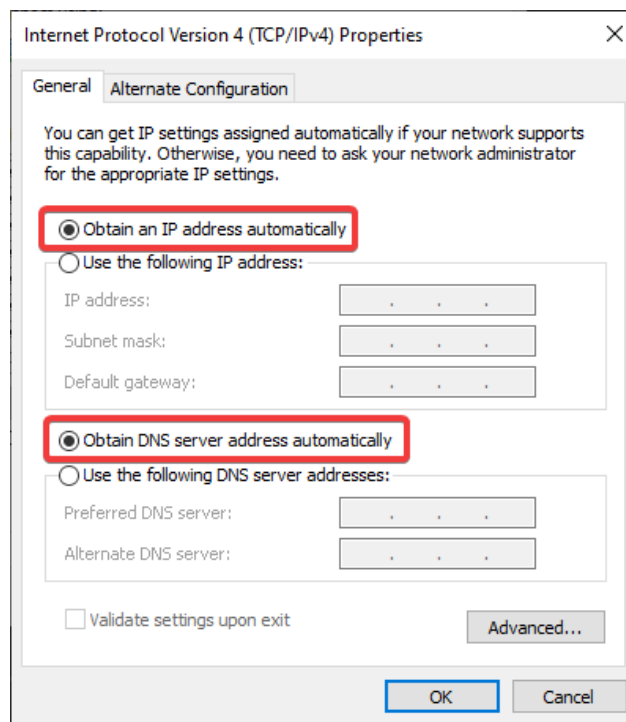


Figure 25. Internet Protocol

DIRECT TCP/IP CONNECTION FROM SINGLE PC TO PULSAR 320E

PC SETUP

You will need to assign a static IP to the host PC.

Find your current IP address and whether it is static or dynamic:

1. Open Windows Start Menu
2. Search for “Control Panel”
3. Open the Control Panel
4. Under View By, select “Small Icons”
5. Click “Network and Sharing Center”
6. Under Active Connections, click “Ethernet”
7. Under Connection, click Details
8. Look for these entries in the list:
 - **DHCP enabled.** “No” means your IP address is static. “Yes” means it is dynamic.
 - **IP Address.** This is your current IP address
 - **Subnet Mask.** This is the local subnet range
 - **Default Gateway.** Gateway address of any routers or hubs.

If the current IP address is:

- Static, then make note of the IP address, subnet mask, and default gateway. You will need to assign the Pulsar 320E network settings so they work in the same range.
- Dynamic, then assign a static IP address instead (covered in the following pages).

If your IP is already Static, then you can skip to Pulsar Setup. You only need to do these steps if you want to adjust any of the TCP settings (IP, Gateway, Subnet).

Choose an IP Address

- Choose an IP address, and collect other information needed in order to assign a static IP address to your computer. This only needs to be done if you have a router with multiple PCs and/or other devices connected with different IP addresses.
- In your router administration program, find an IP address that can be assigned as a static IP. The address:
 - Must not be one that might be assigned to someone as a dynamic address.
 - Must not be one that has been assigned to another device
 - Must be lower than the range of dynamic addresses.

- This may be handled by an administrative group or network engineers. Have this group assign an IP that you can use for both the host PC and target Pulsar 320E unit. This will prevent any IP conflicts from occurring.

Assign the address to the PC

1. Open Windows Start Menu
2. Search for “Control Panel”
3. Open the Control Panel
4. Under View By, select “Small Icons”
5. Click “Network and Sharing Center”
6. Under Active Connections, click “Ethernet”
7. Under Connection, click Details
8. Click Properties
9. Select “Internet Protocol Version 4 (TCP/IPv4)”, and click Properties
10. In the General tab, click Use the following IP address, and then enter:
 - **IP address.** The static IP address you want to assign to this computer.
 - **Subnet Mask.** Subnet Mask used by your router.
 - **Default Gateway.** IP address of your router’s default gateway
11. In **Use the following DNS server addresses**, enter all the IP addresses for the DNS servers your router uses if applicable. If DNS server addresses do not pertain to you, use **Obtain DNS server address automatically**

Then:

12. Click **OK** to close each window

APPENDIX C: DEFINITION OF TERMS

The following terms are used within this manual and, more generally, in relation to machine vision illumination.

Term	Definition
Duty Cycle	The ratio of the time the light head is “on” (pulse width, Pw) to the time it is “off” (period, Tp). Calculated as $(Pw / Tp) \times 100$. The result is expressed in percent. The <i>Signatech II</i> feature of the Pulsar 320E allows the Pulsar 320E to limit the maximum duty cycle based on the characteristics of the driven light head.
Latency	The time between the receipt of a trigger signal and initiation of the output drive pulse. The latency is the sum of the rise-times and propagation delays within the trigger processing circuitry. This time is purposely kept to a minimum.
LED and Light Head Characteristics	Many factors contribute to the operational parameters of an LED light head. To optimize Pulsar 320E/light head operation, these characteristics are stored as part of the information provided to the Pulsar 320E by the <i>Signatech II</i> circuit within the light head. Some of the variables that affect how the light head can be driven are outlined below.
LED Forward Voltage	The forward voltage drop across an LED (VFWD) depends upon the nature of the semiconductor junction and the current through the LED. The specified VFWD for an LED is usually given at its recommended operating current. Please note that when driven by high current pulses, VFWD can increase by 10 to 20 times. For this reason voltage levels at the Pulsar 320E output can be as high as 100 volts.
LED Thermal Resistance	A measure of temperature difference between the LED junction and the LED connection to an external heat sink. Overheating of the junction is the primary cause of failure in LEDs. The value of the LED thermal resistance, combined with the heat sink thermal resistance and the overall thermal time constant determine the maximum pulse width, pulse current, and duty cycle of the light head.
LED Voltage Slope	The relationship between VFWD and the forward current IFWD, used by <i>Signatech II</i> to calculate the voltage required to provide the desired current.
Light head Characteristics	Also contained within the data provided by <i>Signatech II</i> to the Pulsar 320E are the number and type of LEDs in each string and the number of parallel strings connected to each channel.

Period	The length of time between two successive pulses or the reciprocal of the pulse frequency.
Pulse Width	The length of time the light head is activated by the Pulsar 320E. This is typically measured between the 50% amplitude points of the pulse.
Repetition Rate	The rate at which successive pulses are initiated. Also known as frequency, which is measured in Hertz (cycles per second). Repetition rate is usually multiple times per second.
Signatech II™	A proprietary feature of Ai light heads and the Pulsar 320E. <i>Signatech II</i> identifies the type of light head connected to the Pulsar 320E and maintains safe operating limits for each type. The Pulsar 320E can be set so that <i>Signatech II</i> preferentially limits pulse current, pulse width, or period to remain within the safe power dissipation range of the light head.
Strobe Modes	The strobe mode is used to “freeze” a moving item at a particular moment in time. Typically, with LED illumination sources, the strobe mode involves driving the light head with a high current, short duration pulse. This provides a very intense light output pulse. As long as the duty cycle is kept short, no damage to the LEDs occurs as a result of the high current.
Trigger	The signal which initiates an output from the Pulsar 320E to the light head. The trigger signal is normally generated by an external source such as a camera or other sensor. Several modes of trigger operation are provided for in the Pulsar 320E. The trigger may start on either a rising or falling edge. For test purposes, the Pulsar 320E also has an internal trigger source
Trigger Delay	Certain applications require that a known, fixed time elapse between the receipt of a trigger signal and the initiation of an output pulse. This is the trigger delay. For example, if the trigger signal is received from a position sensor, prior to the arrival of the item to be inspected, a delay to account for that transit time would be introduced. If the trigger signal originates from the camera at the start of the shutter opening, a short delay might be introduced to ensure the shutter is fully open or that the illumination pulse occurs elsewhere within the frame time.