



IDT LED Lights
User Manual
(Honeycomb, Constellation)

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1. System Overview

1.1. Introduction to the LED-based Light System



IDT's LED-based Constellation series illuminators offer the benefits of high luminosity in a structured beam that can be pulsed in synchronization with the repetition rate of a high-speed camera.

The **second-generation** LED-based Honeycomb and Constellation illuminators are now available with more features and delivering higher luminosity structured beams than the first-generation predecessors.

The new electronics boasts an especially designed micro-controller flexible operation of the light modules. The modules can be switched ON in full power mode for 100% continuous duty cycle with an external dongle connected to the synchronization BNC. The same high luminosity output level is maintained at any exposure level when an external synchronization input is provided. This breakthrough technology allows the light module to deliver the same power output level regardless on the synchronization signal duty cycle.

The **first-generation** LED lights can reach a maximum duty cycle of 25% when an external synchronization input is provided. Without any external sync the lights are ON in full power mode for continuous illumination mode.

These highly configurable light sources are small in size and can be mounted directly to an IDT camera or standard tripod $\frac{1}{4}$ 20 mounts.

1.2. LED-based Light models and part numbers

The second-generation LED models and part numbers are shown in the table below:

Description	Part Number
Honeycomb 1-LED Light Head	MM-LED
Honeycomb 1-LED 8 ports controller and power supply	MM-CON
Constellation 7-LED Light Head and power supply	7-LED
Constellation 8 LED Light head	8-LED
Constellation 8-LED 4 ports controller and power supply	8-CON
Constellation 19-LED Light Head and power supply	19-LED
External dongle for 100% duty cycle	LED-ON

1.3. General specifications

The specifications of all the LED-light models are shown below.

Description	Value
LED	
Type	Luxeon K2
Light color	Cool white
Color temperature	4500K – 10000K
Life (measured when output falls to 75% of maximum)	50,000 Hours
Switching times	
Rise time	< 50 ns
Fall time	< 50 ns
Delay time (from input signal)	< 100 ns
Sync In	
Pulse Frequency	100 KHz
Pulse Duty cycle	0 to 100%
Sync In Voltage	3.3 V (CMOS) or 5.0 V (TTL)
Sync In protection	50 V
Sync In impedance	20 K Ω
Sync Out	
Sync Out Voltage	0 to 5 V (TTL)
Sync Out impedance	75 Ω

1.4. Connectors Pin-Out

Control connector

PIN Number	Value
1	Signal
2	+ 12 V
3	GND
4	GND

The control connector is designed to connect the LED lights to one of IDT Galileo™ devices. The +12 V pin provides power to the device and the device provides the correct square wave signal to the light system via the signal pin.

An external signal source that generates 3.3 V signals can be connected to the control connector and replace the Sync In connector.

4 pins power connector (7 and 19 LED systems)

PIN Number	Value
1	+ 36 V
2	GND
3	GND
4	+ 36 V

1.5. Warranty

IDT, Inc. provides warrants to the original purchaser that, from the date of delivery, the hardware components of the **LED Light System** (the “Product”) will be in good working condition for a period of one (1) year on all parts. Should any of the components of this Product fail to be in good working order at any time during this warranty period, IDT, Inc. will either repair or replace those components at its factory at no additional cost. This warranty does not include service to repair damage to the Product caused by accident, disaster, misuse, abuse, or non-IDT modification of the Product. All service shipments to IDT must be sent pre-paid. Warranty service may be obtained by contacting IDT in writing during the warranty period.

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Note: It is requested that the product be returned to INTEGRATED DESIGN TOOLS, Incorporated for warranty service in its original packaging.

CAUTION: opening or removing the housing of the LED light or the cover of the power supply may expose you to the risk of electric shock, and may cause the LED system failure. **DO NOT OPEN THE HOUSING OF THE LED OR THE COVER OF THE POWER SUPPLY. TO DO SO COULD VOID YOUR WARRANTY.**

2. LED-based light models

2.1. 1-LED Honeycomb System with Controller



The picture above shows a honeycomb LED light with the 8-port controller. The controller is capable of driving 8 single LED lights. Each LED has a unique inter-connectable design that allows the lights to be connected together for infinite configurations. Both the single LED and the controller are crash-rated for automotive applications. The table below shows the specifications. Lights are now shipping with second-generation features.



1-LED	1 st Gen	2 nd Gen
Power supply	12 V – 10 A	12 V – 10 A
Power consumption (8 LED)	130 W	60 W
Reflected beam angle degrees	-	-
Reflected cone diameter at 1 m	-	-
Maximum duty cycle	25 %	100 %
Density of light (30 cm)	3,200 Lux	4,800 Lux
Density of light (60 cm)	830 Lux	1,250 Lux
Density of light (90 cm)	330 Lux	500 Lux

2.2. 8-LED Constellation System with Controller



The 8-LED constellation cluster uses a remote controller to simultaneously operate up to 4 units with a total number of 32 synchronized LED lights. Each cluster is compact, ruggedized for outdoor applications and crash rated for automotive tests.

Description	8-LED (2 nd gen)
Power supply	12 V – 10 A
Power consumption	80 W
Reflected beam angle degrees	-
Reflected cone diameter at 1 m	-
Maximum duty cycle	100 %
Density of light (30 cm)	25,000 Lux
Density of light (60 cm)	Not measured
Density of light (90 cm)	Not measured
Density of light (1.5 m)	2,500 Lux
Density of light (3 m)	Not measured

2.3. 7-LED and 19-LED Constellation Systems

2.3.1. Overview

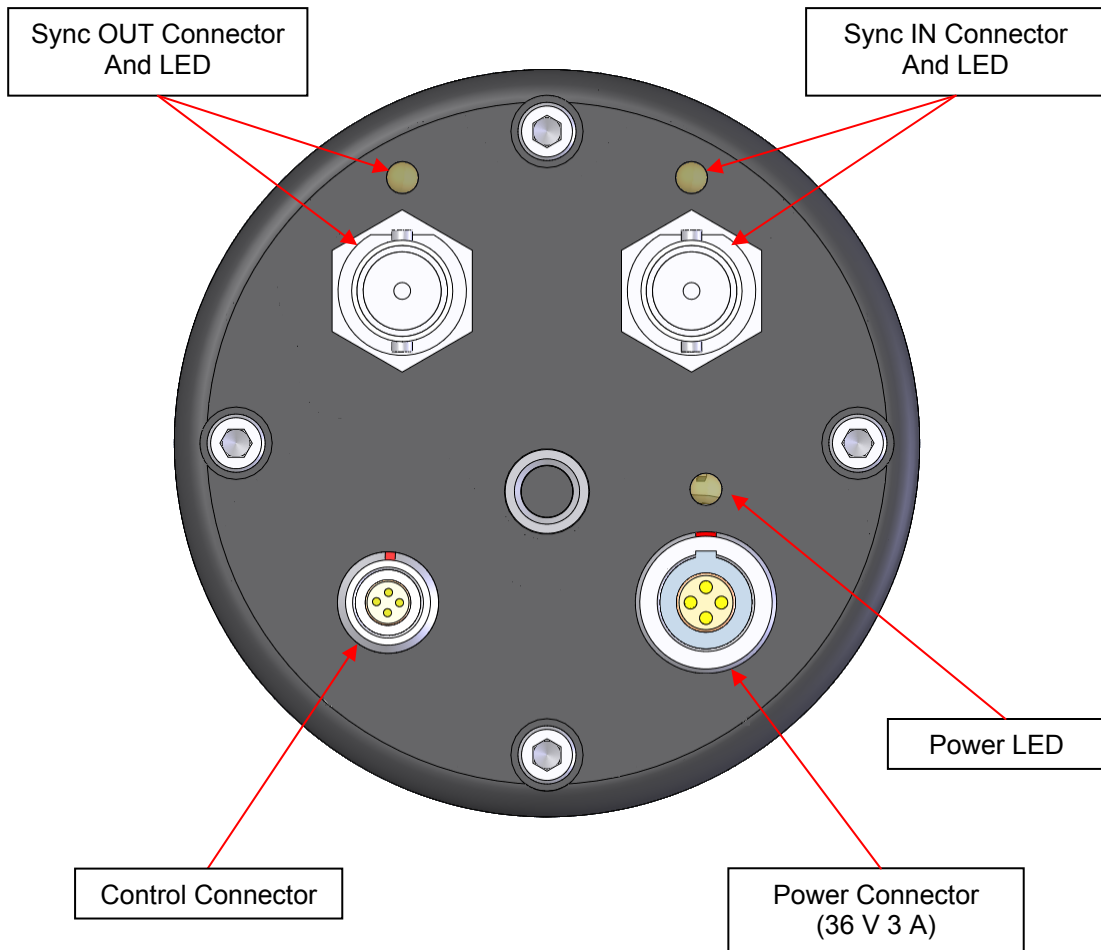


The 7-LED and 19-LED clusters include 7 or 19 single LED in a compact and light weight enclosure. The beam is collimated. Both are trigger ready for synchronization with digital cameras.

7-LED Specificatons	1 st Gen	2 nd Gen
Power supply	36 V – 1.67 A	36 V – 1.67 A
Power consumption	60 W	60 W
Reflected beam angle degrees	12,5°	12,5°
Reflected cone diameter at 1 m	250 mm	250 mm
Maximum duty cycle	250%	100 %
Density of light (30 cm)	15,000 Lux	22,000 Lux
Density of light (1.5 m)	1,500 Lux	2,200 Lux

19-LED Specificatons	1 st Gen	2 nd Gen
Power supply	36 V – 4.2 A	36 V – 4.2 A
Power consumption	130 W	130 W
Reflected beam angle degrees	12,5°	12,5°
Reflected cone diameter at 1 m	250 mm	250 mm
Maximum duty cycle	25 %	100 %
Density of light (30 cm)	40,000 Lux	60,000 Lux
Density of light (1.5 m)	4,000 Lux	6,000 Lux

2.3.2. Back panel and connectors



2.4. Dongle for 100% duty cycle operation



The second-generation LED lights require an additional tool to operate at 100% continuous duty cycle. The light weight and size dongle is equipped with a C battery that provides the necessary voltage for 100 % duty cycle to run the lights in continuous mode.

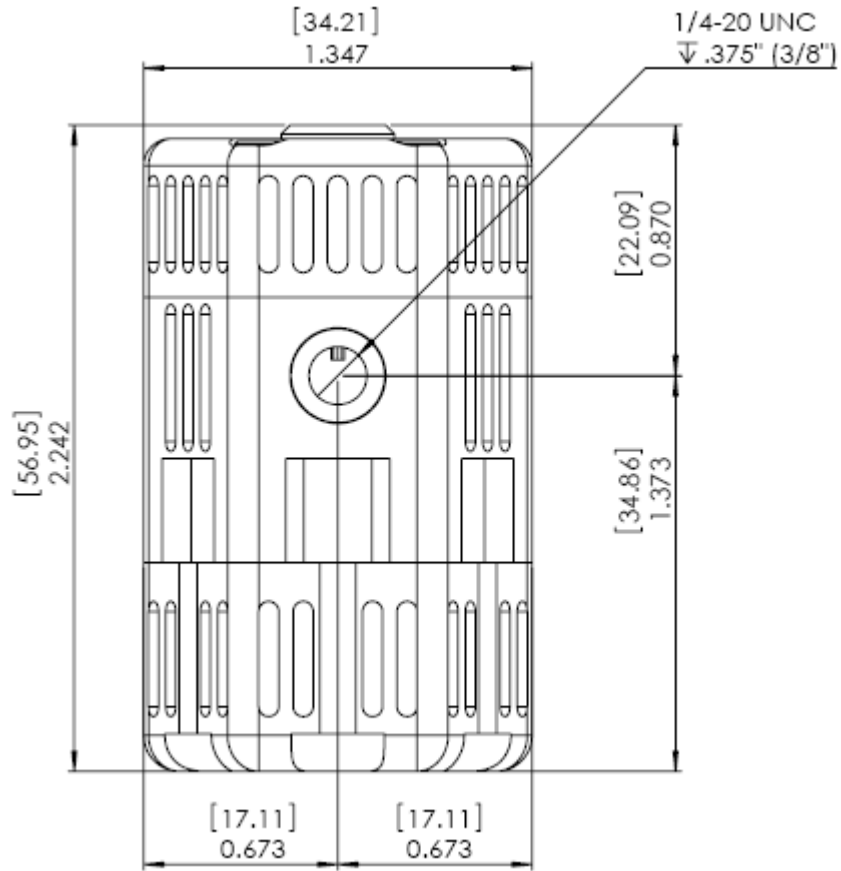
3. Mechanical and hole mounts

3.1. Legend

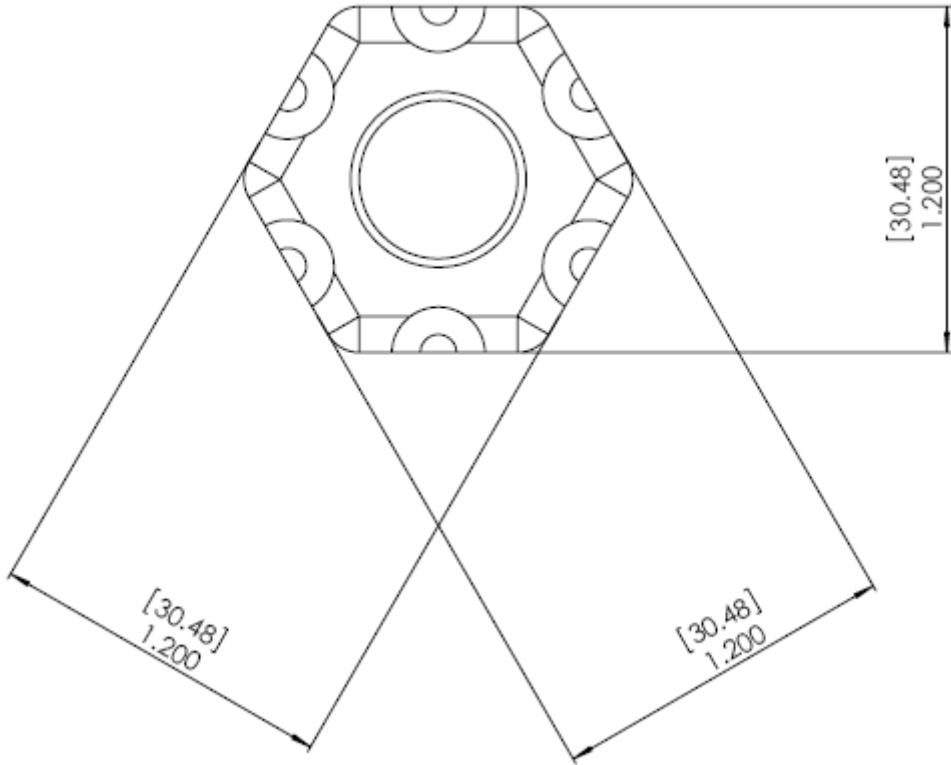
The drawings with the main dimensions of the LED-based lights are below. The dimensions are in inches and millimeters (in square brackets).

3.2. 1-LED Honeycomb

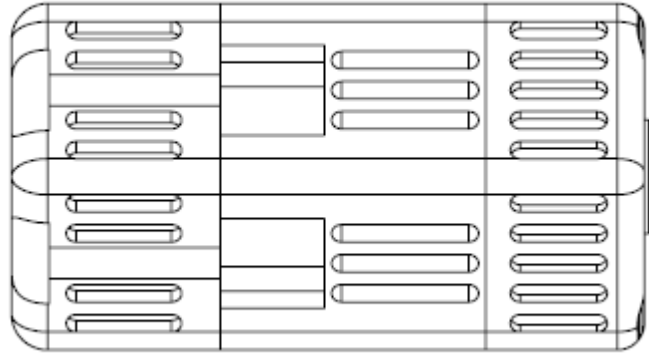
3.2.1. Bottom View



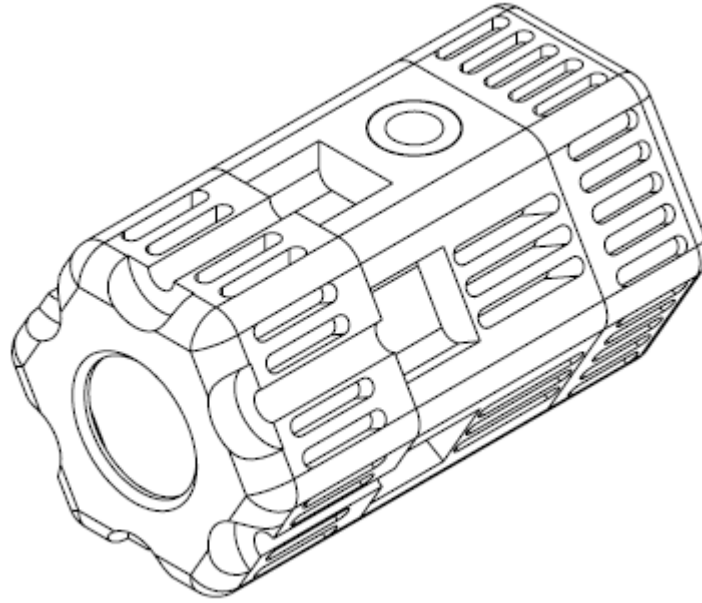
3.2.2. Front View



3.2.3. Side View

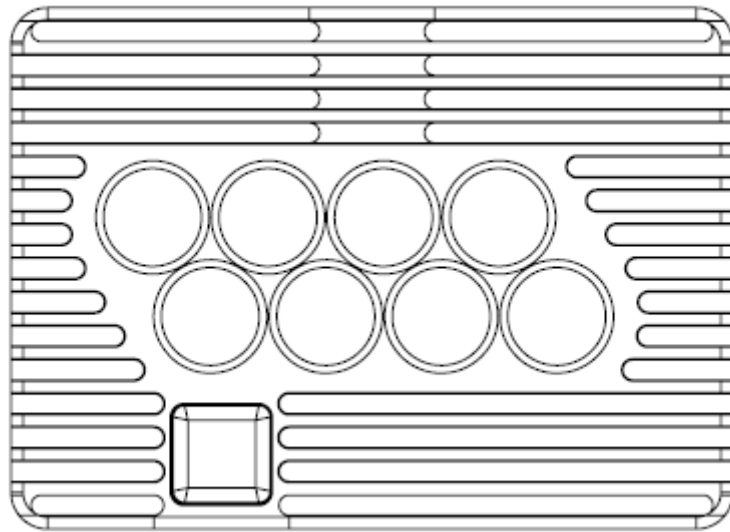


3.2.4. Isometric View

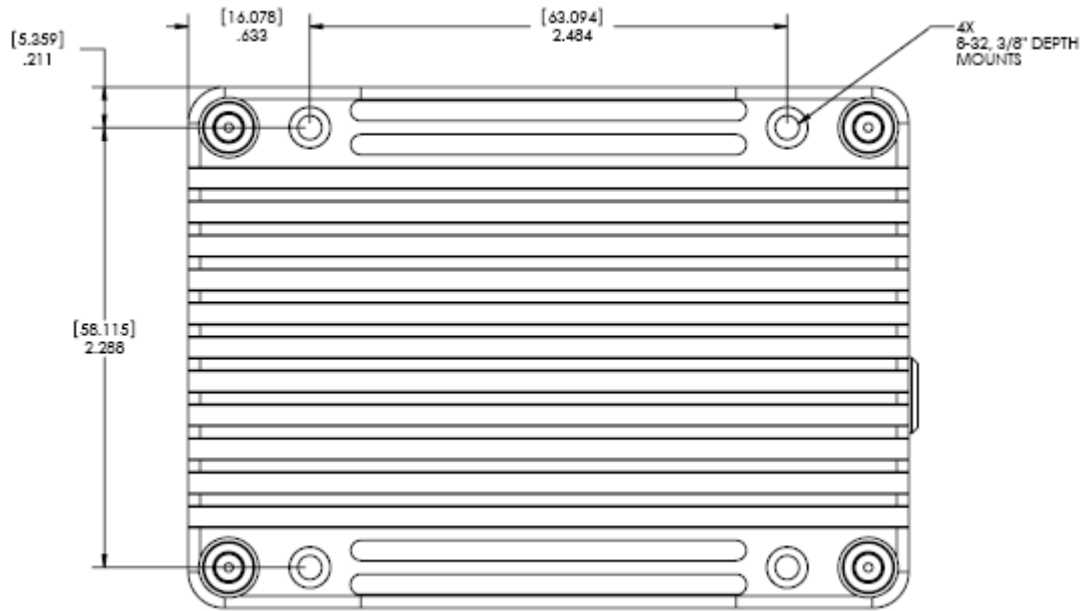


3.3. 8-LED Constellation

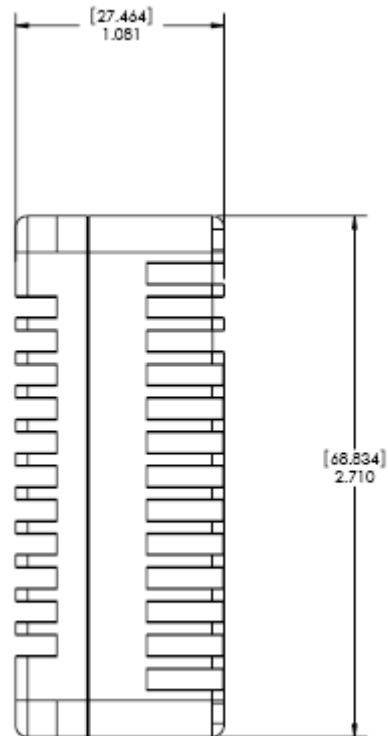
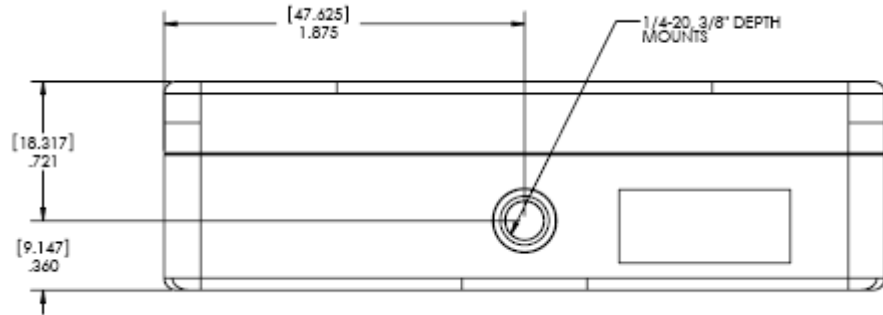
3.3.1. Top View



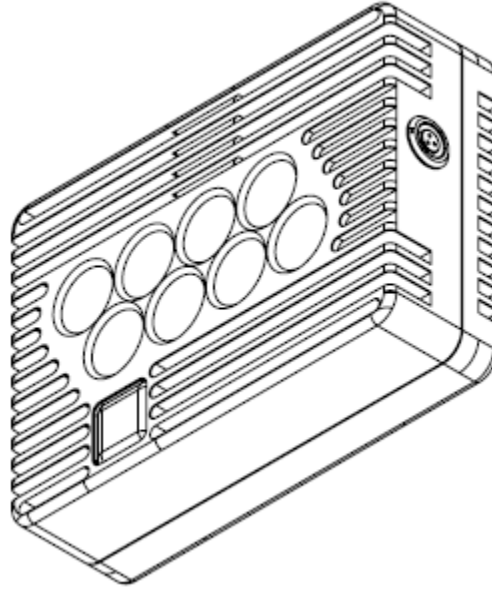
3.3.2. Bottom View



3.3.3. Side Views

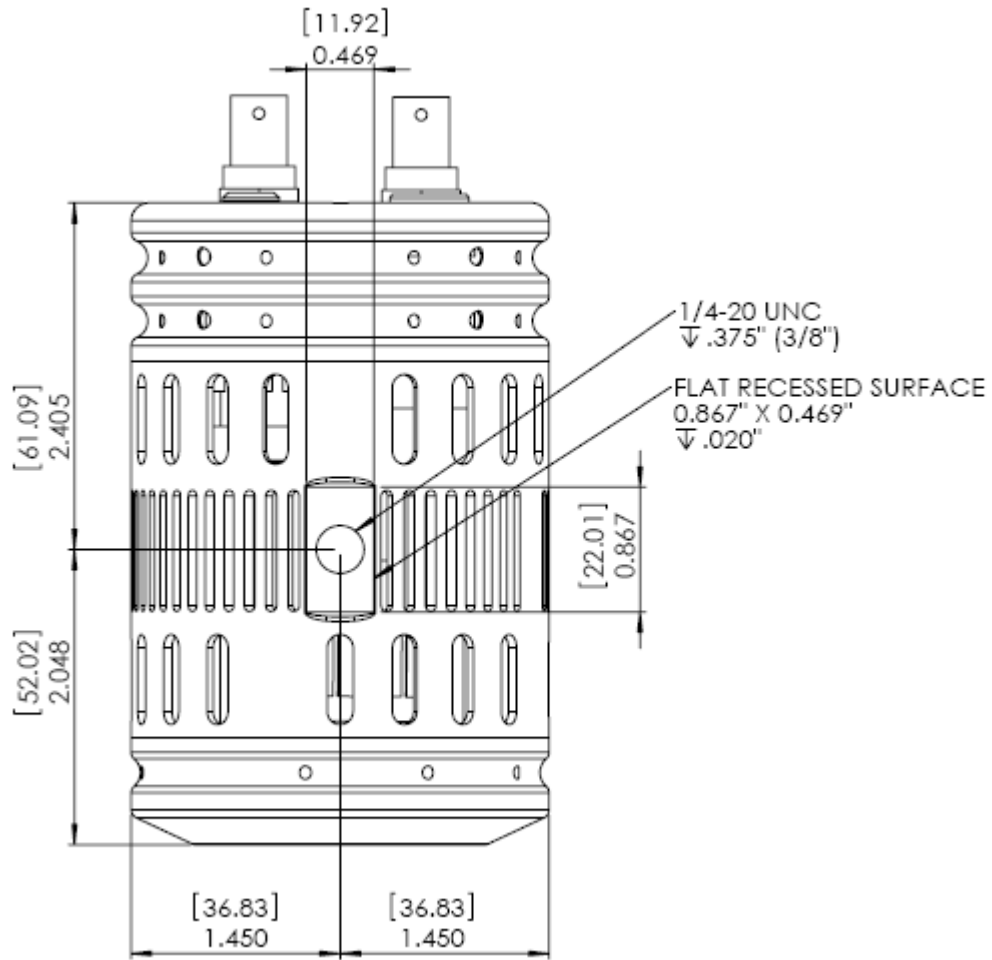


3.3.4. Isometric View

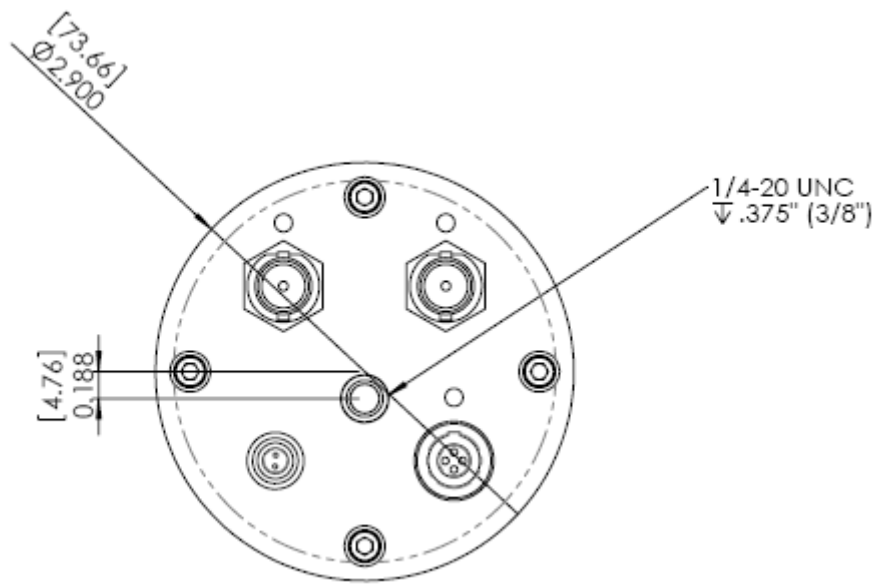


3.4. 7-LED Constellation

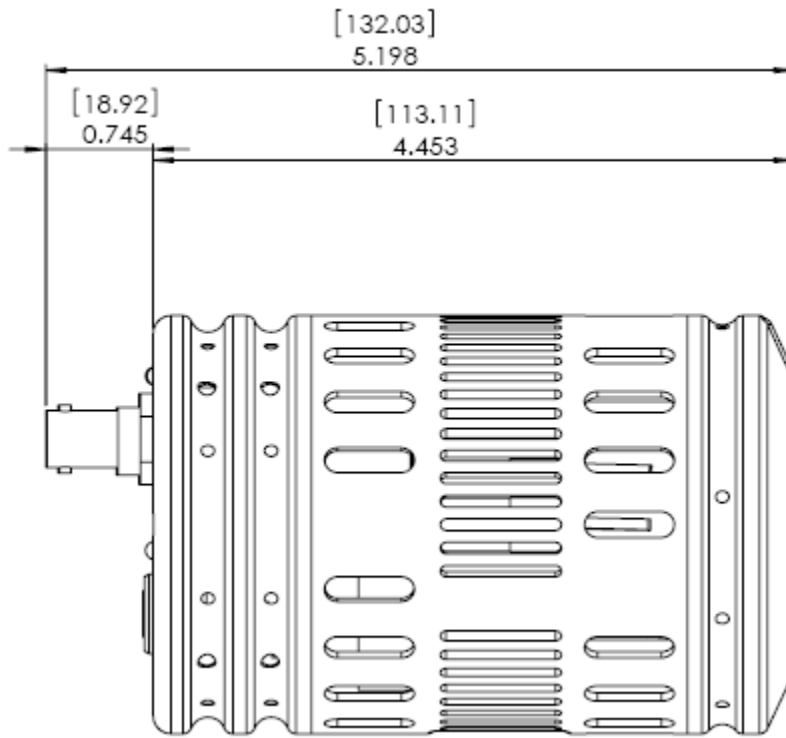
3.4.1. Bottom View



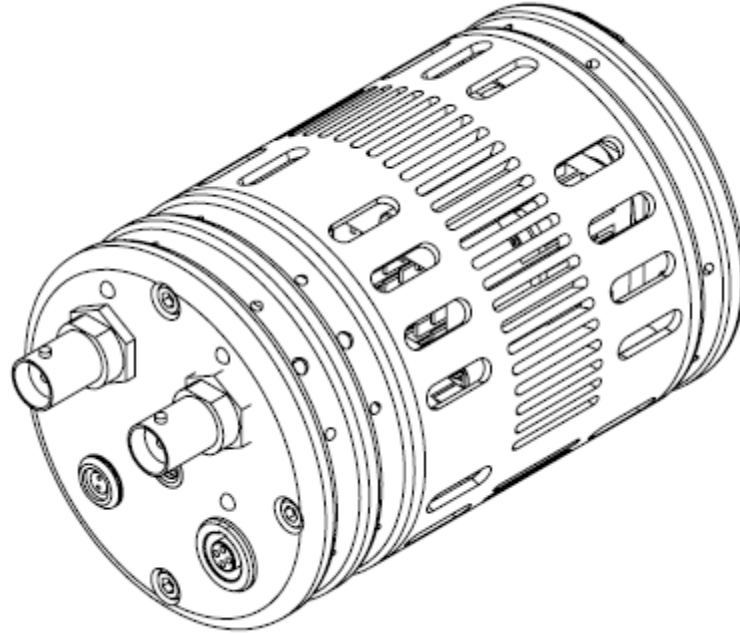
3.4.2. Back View



3.4.3. Side View

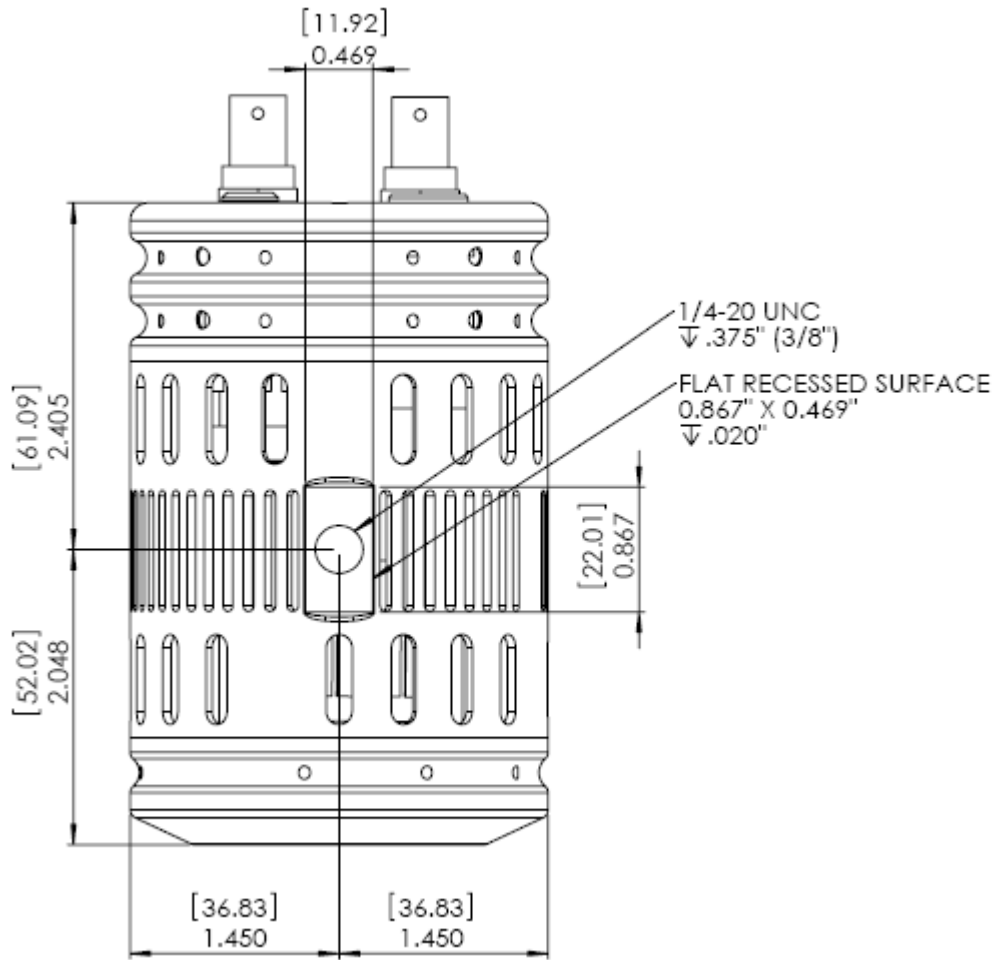


3.4.4. Isometric View

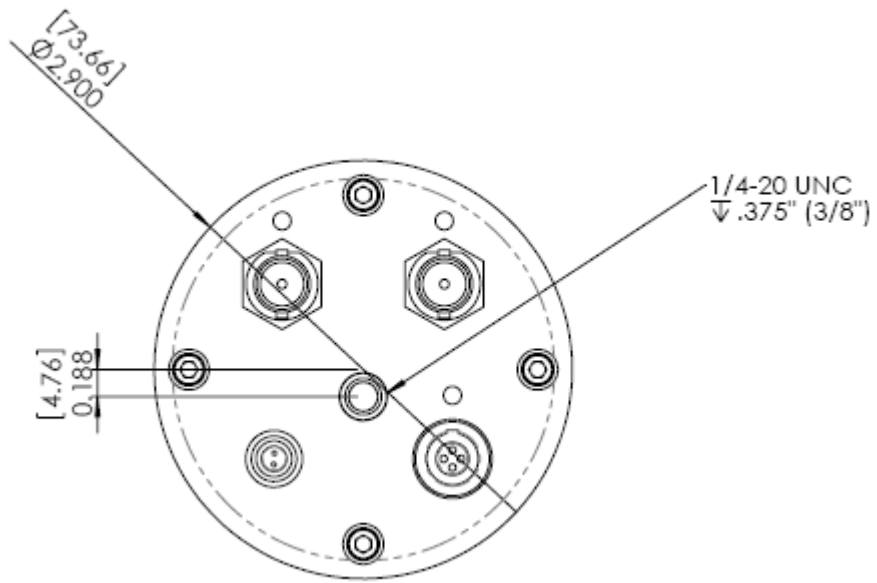


3.5. 19-LED Constellation

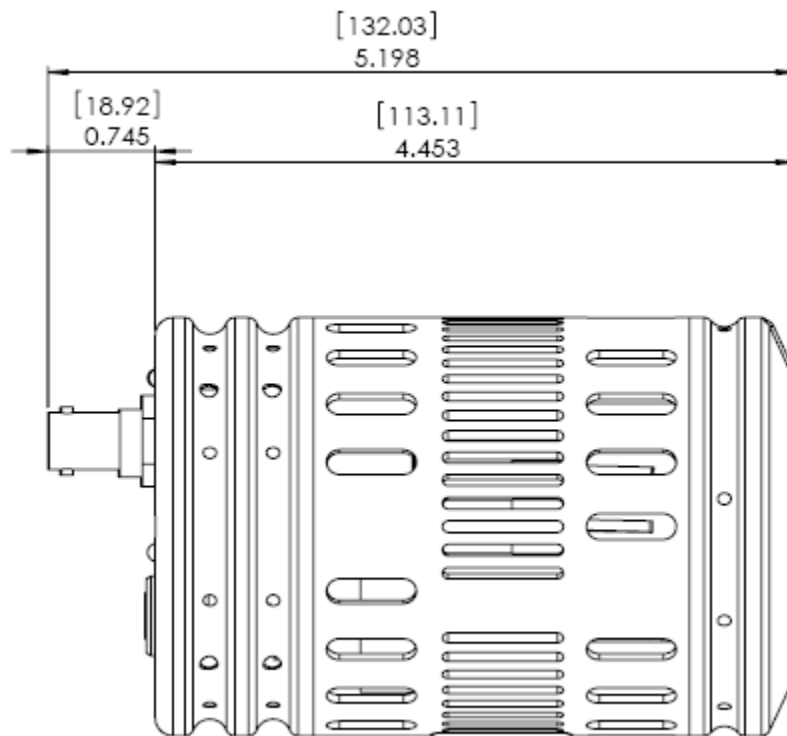
3.5.1. Bottom View



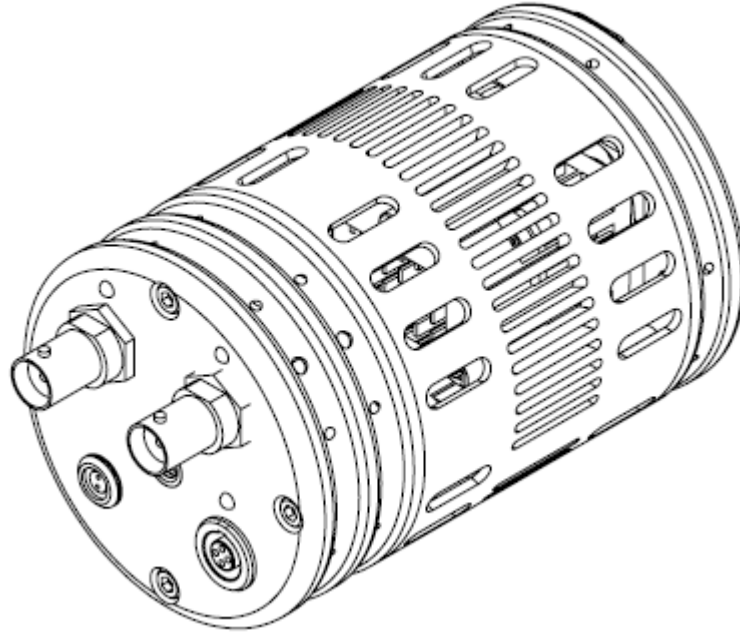
3.5.2. Back View



3.5.3. Side View



3.5.4. Isometric View



4. Troubleshooting

4.1. Troubleshooting the LED Light

Symptom	Possible Remedy
The power LED is not ON	Connect the power connector from the Power Outlet to the back panel of the power supply. Then connect the power supply 4-pins connector to the back panel of the LED light (or the 2 pins power connector to the “power in” of the controller).
I have a first-generation LED system and the light is not emitting.	Make sure that the “Sync In” connector is connected to a device that generates a TTL square wave (camera, timing generator) and that the device is ON. For a 100% continuous duty cycle make sure that you have restarted the LED light after disconnecting from a sync generator. If you have just powered up the light and the problem persists, contact the IDT technical support.
I have a second generation LED system and the light is not emitting	Make sure that the sync In connector is connected to a device that generates a TTL square wave (camera, timing generator) and that the device is ON. Make sure that the 100% continuous duty cycle dongle is connected to the “Sync In” connector. If one of the above conditions is true and the problem persists, contact the IDT technical support.
The “Sync In” LED is not blinking	Make sure that the “Sync In” connector is connected to a device that generates a TTL square wave (camera, timing generator) and that the device is ON.
The “Sync Out” LED is not blinking	Make sure that the “Sync In” connector is connected to a device that generates a TTL square wave (camera, timing generator) and that the device is ON. Make sure that the Sync In LED is blinking. If one of the above conditions is true and you still do not see the Sync Out LED blinking, contact the IDT technical support.