WDI
WISE DEVICE INC

White FPHPLED Illuminator Datasheet

2025

White FPHPLED Illuminator Description

The White FPHPLED Illuminator is a high power LED illuminator designed for modern inspection and review applications. It is designed to provide high intensity light and optimally cover the FOV of the objective lenses. It utilizes a high-speed controller enabling short pulse high intensity strobe operation. It couples directly to WDI's MMS (Modular Microscope Systems), eliminating the need for fiber optic bundles.

The White FPHPLED Illuminator has the following features:

- One high power white LED pulsed as short as 1.3µs to provide extremely bright white illumination without pronounced pixel smearing for today's fastest area scan cameras.
- Onboard controller and several modes of operation enable configurable synchronization, simplifying integration and supporting many different applications.
- Adjustable optics allow using this illuminator in a variety of system configurations with different working distances. Refer to "*Optical Specifications*" *on page 5* for more information.

Ordering Info

Table 1 White FPHPLED Illuminator Types

Type	Part Number
White Fast Pulse High Power Illuminator (ILL-PBI-FPHPLED10-MHR)	977810

Product Specifications

Table 2 White FPHPLED Illuminator Specifications

Parameter	Value
Max Current (Continuous, Pulse, Surge)	3A, 8A, 10A
Minimum Pulse Width	1.3 µs
Surge Mode Maximum Pulse Width	10 µs (Maximum Duty Cycle 0.5%)
Pulse Mode Maximum Pulse Width	1000 µs (Maximum Duty Cycle 0.5%)
Pulse Width Resolution	0.1 µs
Pulse Trigger Delay Resolution	0.01 µs
Camera Trigger Delay Resolution	0.01 µs
Working Distance Range	The working distance is adjustable from 101 mm to 160 mm (factory default is 128 mm)
Compliance	Clean Room Class 1000 (ISO6)

Electrical Connections

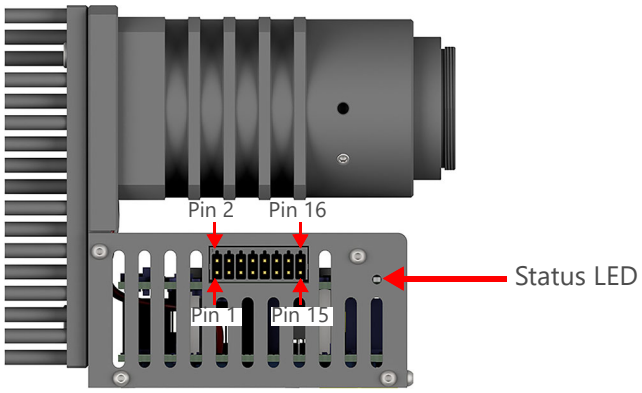


Figure 1 *Controller Connector*

Table 3 Controller Connector Pinouts

Pin #	Signal Name	Description
1,2	+24V	+24V Power Supply.
3,4	GND	Power Supply Return
5	Reserved	Reserved
6	Reserved	Reserved
7	IO1	Digital Input/Output 1
8	GND	IOs Return
9	IO3	Digital Input/Output 3
10	IO2	Digital Input/Output 2
11	RS485-	Inverting RS485 Receiver Input and Driver Output
12	RS485+	Non Inverting RS485 Receiver Input and Driver Output
13	GND	IOs Return
14	IO4	Enable IN (optional – not used with factory settings)
15	IO5-	Inverting Differential IO5 Receiver Input and Driver Output
16	IO5+	Non Inverting Differential IO5 Receiver Input and Driver Output

NOTE: *Digital IOs (IO1 to IO5) can be assigned as input sync (trigger) or camera sync, or other signals that may be defined as needed.*

NOTE: *Mating connector is Phoenix Contact 1844633. *Pin 1 from manufacturer is overwritten as pin 2.*

Electrical Specifications

Table 4 White FPHPLED Illuminator and Integrated Controller Electrical Specifications

Parameter	Condition	Minimum	Typical	Maximum	Units
Input Voltage		21.6	24	26.4	V
Input Current				0.8	A
Output Ripple			3		%
Duty Cycle	0.1% increment. Pulse width condition applies.	0.1		100	%
PWM Frequency		1.526		100,000	Hz
Analog Dimming	0.1% increment.	2		100	%
Optical Output Rise Time			0.2		µs
Optical Output Fall Time			0.2		µs
Minimum Pulse Width	Minimum pulse width is defined as time between rising and falling edges crossing 50% of the peak level.		1.3		µs
Trigger to Optical Pulse Latency	Time measured between the rising edge of the external trigger signal on DIO and rising edge of the optical pulse read on an oscilloscope with a photodiode.		0.5		µs
RS485, DIO5					
Differential Driver Output Voltage		2.0		3.3	V
Receiver Differential Threshold Voltage		10	105	200	mV
Differential Termination Resistor	Turned on under software control. Not applicable for DIO5		120		Ω
RS485 Baudrate	Not applicable for DIO5		115,200		bps
Digital Inputs (IO1,IO2,IO3,IO4)					
Input Voltage High (VIH)	All IOs except IO4	2		5.5	V
Input Voltage Low (VIL)	All IOs except IO4	-0.5		0.7	V
Input Voltage High (VIH)	IO4	2.8		28	V
Input Voltage Low (VIL)	IO4	-0.5		1	V
Input Resistance			5		KΩ
Output Voltage High (VOH)		4.5	5		V

Table 4 White FPHPLED Illuminator and Integrated Controller Electrical Specifications (continued)

Parameter	Condition	Minimum	Typical	Maximum	Units
Output Voltage Low (VOL)		0		0.4	V
Output Impedance	All IO except IO4 which is 6KΩ		40.2		Ω

Optical Specifications

White LED

Table 5 Luminous Flux Parameters

Parameter	Value
Luminous Flux (Minimum)	1320 lm I_F = 6A (See *Figure 2*)
Luminous Flux (Maximum)	2120 lm I_F = 6A (See *Figure 2*)
Color	Cool White

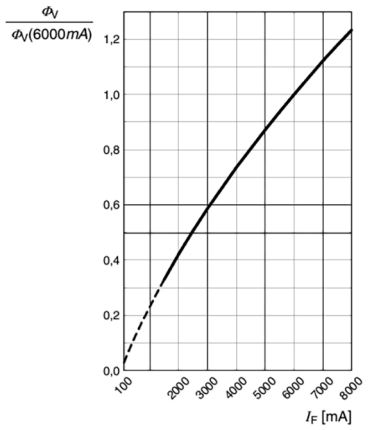


Figure 2 *Relative Luminous Flux*

$\Phi_{rel} = f(\lambda)$; I_F = 6000 mA; T_J = 25 °C

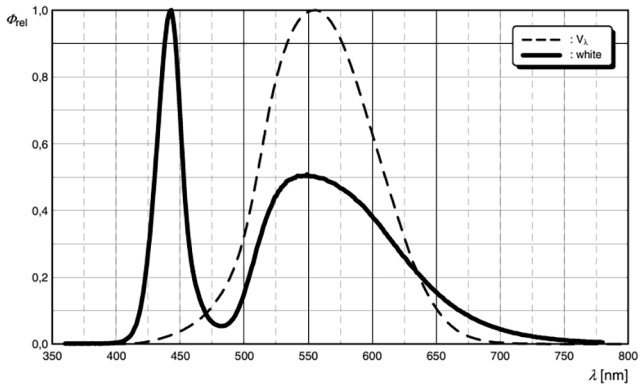


Figure 3 *Output Spectrum*

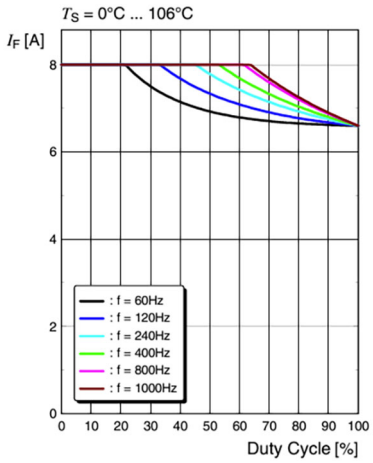


Figure 4 *Permissible Frequency Handling*

$I_F = f(t_p)$; D: Duty cycle

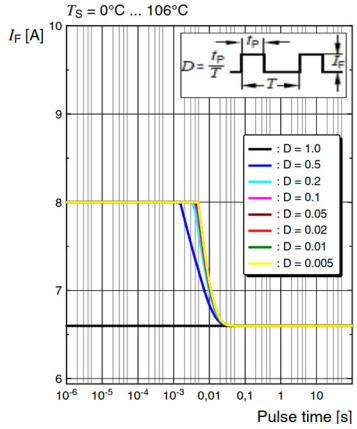


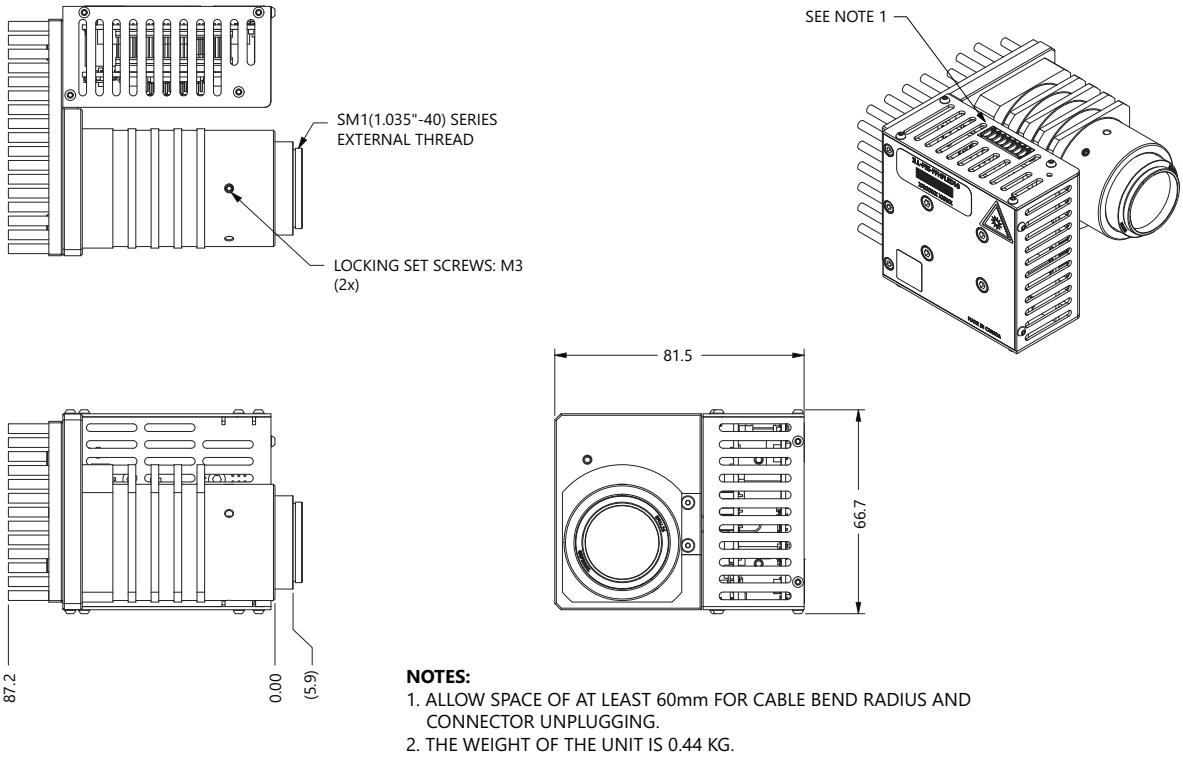
Figure 5 *Permissible Pulse Handling*

Environmental Specifications

Table 6 White FPHPLED Illuminator Environmental Specifications

Description	Value
Operating Ambient Temperature	20ºC to 30ºC
Transport Temperature (sealed container)	-20ºC to 50ºC
Storage Temperature	10ºC to 40ºC
Humidity Temperature	10% to 80% non-condensing

Mechanical Dimensions



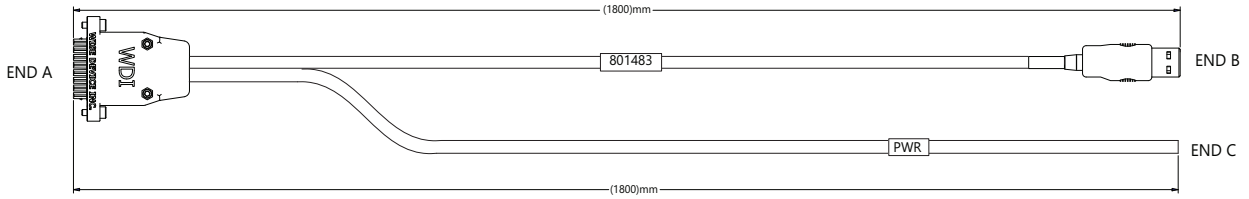
NOTES:
1. ALLOW SPACE OF AT LEAST 60mm FOR CABLE BEND RADIUS AND CONNECTOR UNPLUGGING.
2. THE WEIGHT OF THE UNIT IS 0.44 KG.

Figure 6 *White FPHPLED Illuminator Dimensions*

Accessories

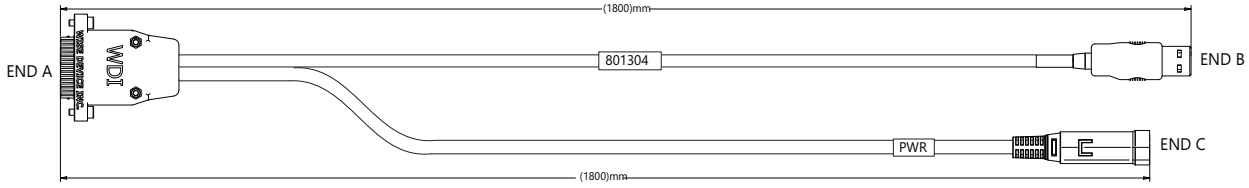
Table 7 White FPHPLED Illuminator Accessories

KIT Accessories	Part Number	Remarks
Cable (CAB-PFABUS-PWR/USB TO RS485),1800mm	801483	This is flying leads terminated.
Cable (CAB-PFABUS-PWR/USB TO RS485),DIN4,1800mm	801304	This is DIN4 terminated.

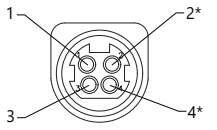


Pin# at end A	Signal	Wire color at end C
1	24V	Red
3	Ground	Black
14	E-Stop	White

Figure 7 *CAB-PFABUS-PWR/USB TO RS485 Cable Wiring*



Pin# at end A	Signal	Pin# at end C	Wire color at end C
1	24V	1	Red
3	Ground	3	Black
14	E-Stop	1	White



DIN4 front view

*Pins 2 and 4 not connected

Figure 8 *CAB-PFABUS-PWR/USB TO RS485 DIN4 Cable Wiring*