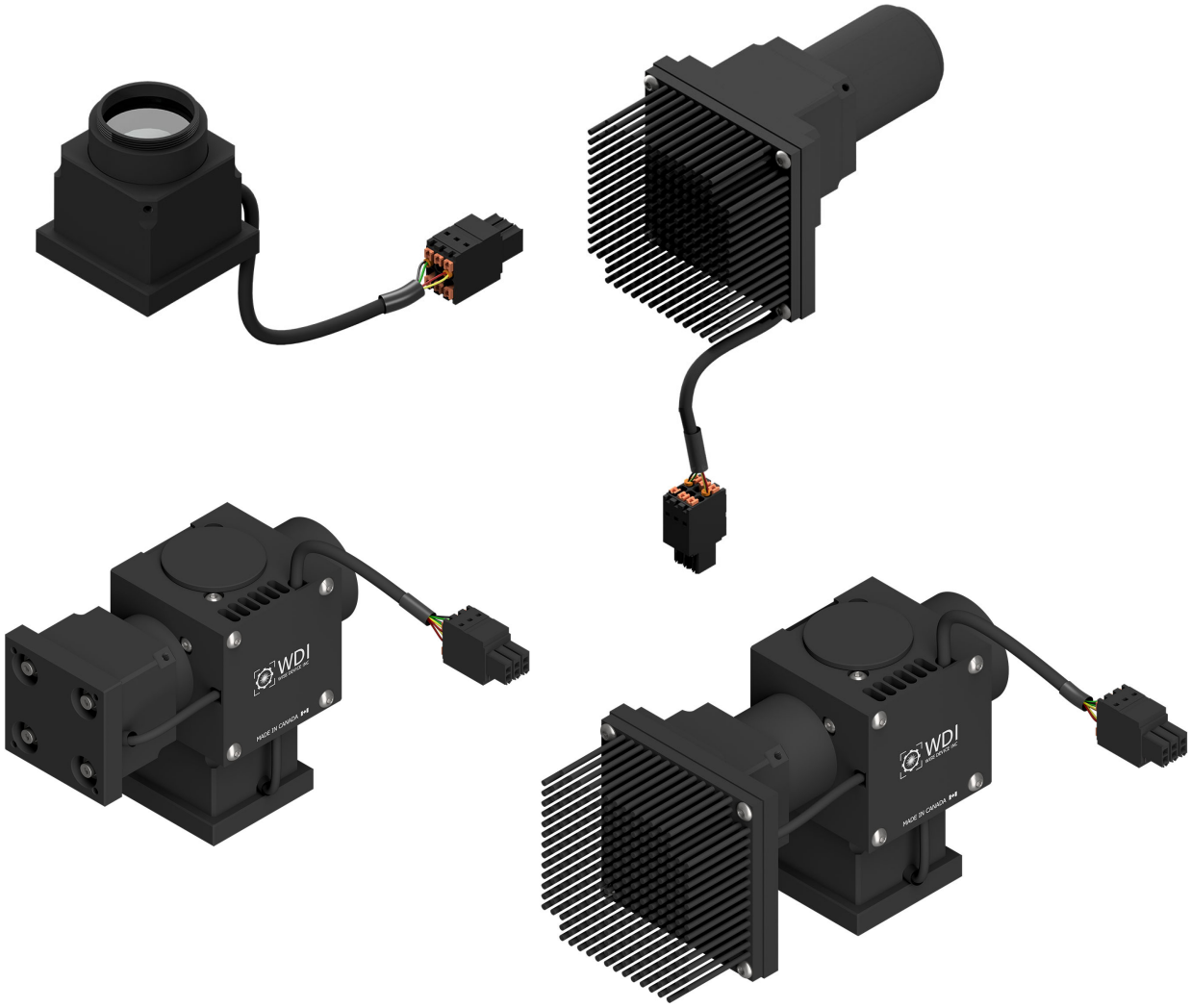
WDI™
WISE DEVICE INC

SWIR and VIS-SWIR Illuminator

Datasheet



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SWIR and VIS-SWIR Illuminator Description

Shortwave Infrared (SWIR) light penetrates many materials, including Silicon, to expose internal and buried features not revealed by visible light. The SWIR and Visible SWIR (VIS-SWIR) illuminator family is an LED-based microscope component designed to provide modular illumination options for SWIR or visible (VIS) imaging. WDI offers four SWIR product categories:

1) Single wavelength SWIR (available in different wavelengths)
2) Broadband SWIR (broad-spectrum emission)
3) Dual channel single wavelength: SWIR + VIS light
4) Dual channel broadband SWIR: + VIS light

Broadband SWIR provides powerful and wide-range wavelength illumination, thus enabling high contrast imaging, revealing buried structures and defects by leveraging the unique spectral properties of materials in a wider SWIR range than single wavelength. Six single SWIR wavelength options are also available for targeting specific material and feature types.

In each product category, different models are available depending on the working distance between the illuminator and the objective.

Ordering Info

Table 1 Single SWIR Illuminator Types and Part Numbers

SWIR Wavelength Options (nm)	Single SWIR (Single Channel) (ILL-i-SWIR-1.5-MHR-ZG-NA/LC)		Single SWIR + White (Dual Channel) (ILL-i-SWIR+VIS-1.5-MHR-ZG-NA/LC)	
	-NA (without WDI LLC)	-LC (with WDI LLC)	-NA	-LC
1150	977820	977822	977844	977846
1200	977824	977826	977848	977850
1300	977828	977830	977852	977854
1370	977832	977834	977856	977858
1450	977836	977838	977860	977862
1550	977840	977842	977864	977866

Table 2 Broadband SWIR Illuminator Types and Part Numbers

SWIR Wavelength Options (nm)	SWIR Broadband (Single Channel) (ILL-i-SWIRBB-1.5-MHR-ZG-NA/LC)		SWIR Broadband + White (Dual Channel) (ILL-i-SWIRBB+VIS-1.5-MHR-ZG-NA/LC)	
	-NA	-LC	-NA	-LC
~1150 to ~1650	977868	977870	977872	977874

Table 3 Additional Illuminators

Part Number	Description
977876	Illuminator (ILL-i-SWIRBB+VIS-1.5-MHR-LP-LC-LSCM)

Product Specifications

Table 4 SWIR and VIS-SWIR Illuminator Specifications

Parameter	Value			
	Single SWIR	**Single SWIR & Visible**	**Broadband SWIR**	**Broadband SWIR & Visible**
# of Channels	1	2	1	2
SWIR Wavelength Options	1150, 1200,1300, 1370, 1450, 1550 nm		Approximately 1150 to 1650 nm	
Compatible Controllers	iZAA/iZPS Stages, CTR-AFML, and CTR-ML, and other compatible controllers[a].			
Cable Length	Approximately 440 mm			
Working Distance[b]	MHR-ZG-NA: 101 mm, MHR-ZG-LC: 126 mm, MHR-LP-LC-LSCM: 180 mm			

a. Controller may be compatible if it's designed to drive the LED up to 1.5 A per channel.

b. Distance between the illuminator output optic and objective back aperture.

Table 5 SWIR and VIS-SWIR Illuminator Electrical Specifications

Illuminator Wavelength	Approximate Maximum Forward Voltage	Maximum Current
1150 nm	1.8 V	1.5 A
1200 nm	1.7 V	
1300 nm	1.7 V	
1370 nm	2 V	
1450 nm	1.7 V	
1550 nm	1.7 V	
Visible (White)	3.5 V	
Broadband SWIR	6.8 V	

Electrical Connections

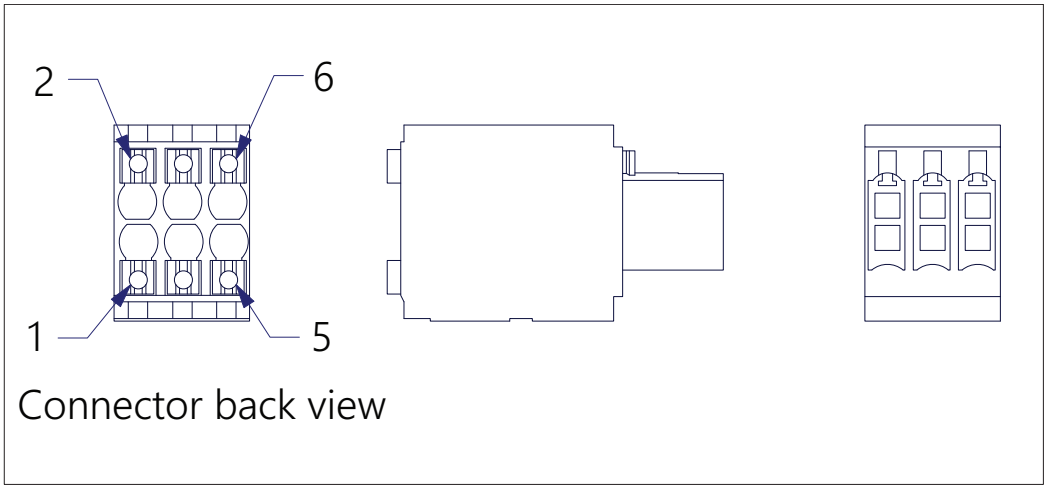

Figure 1 *Illuminator Connector*

Table 6 Controller Illuminator Connector Pin Outs

Pin #	Signal Name	Description
1	LED1 Anode for SWIR	LED1 Anode current output
2	LED2 Anode for White	LED2 Anode current output
3	Reserved	Not Connected, do not connect
4	Reserved	Not Connected, do not connect
5	LED1 Cathode for SWIR	LED1 Cathode (return)
6	LED2 Cathode for White	LED2 Cathode (return)

Optical Specifications

Table 7 White LED Luminous Flux Parameters

Parameter	Value
Luminous Flux (Minimum)	1320 lm I_F = 6 A (approximately 460 lm I_F = 1.5 A) (See *Figure 2*)
Luminous Flux (Maximum)	2120 lm I_F = 6 A (approximately 740 lm I_F = 1.5 A) (See *Figure 2*)
Color	Cool White

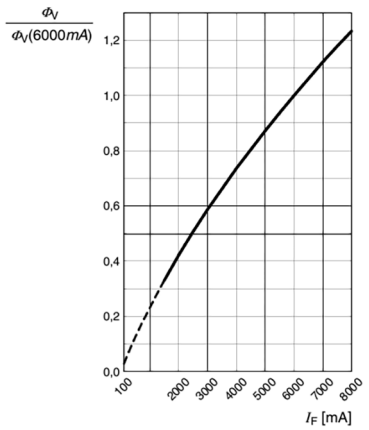

Figure 2 *Relative Luminous Flux*

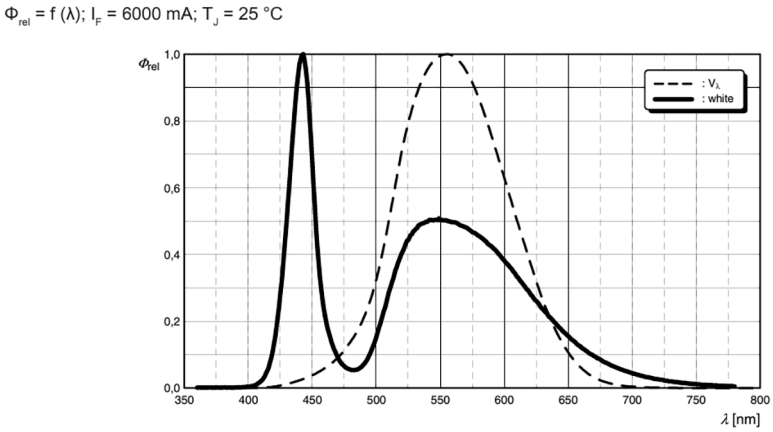

Figure 3 *Output Spectrum*

Table 8 SWIR Emitter Parameters

Central Wavelength, nm	Total Radiated Power (I = 1.5 A), mW
1150	320
1200	290
1300	240
1370	130
1450	110
1550	75
Broadband SWIR	368 (I = 1 A)

Single SWIR

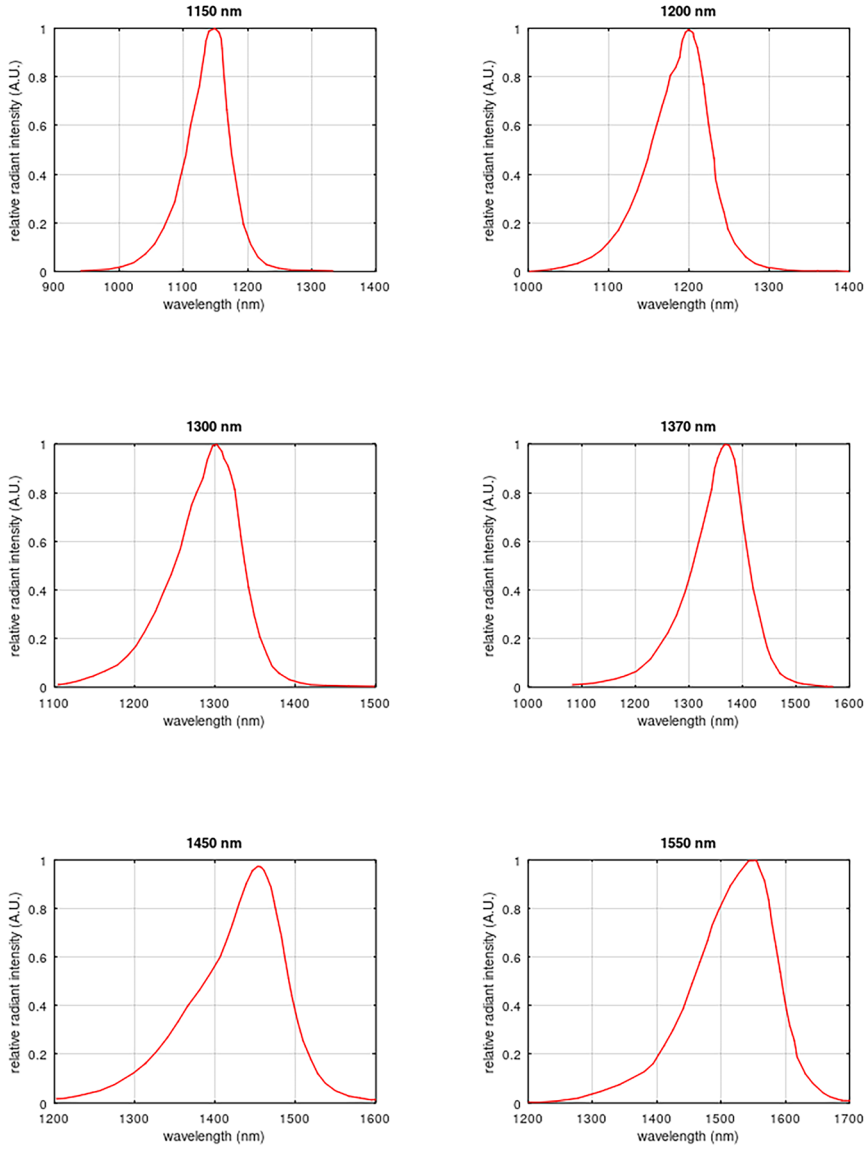

Figure 4 *Relative Spectral Emissions*

Broadband SWIR

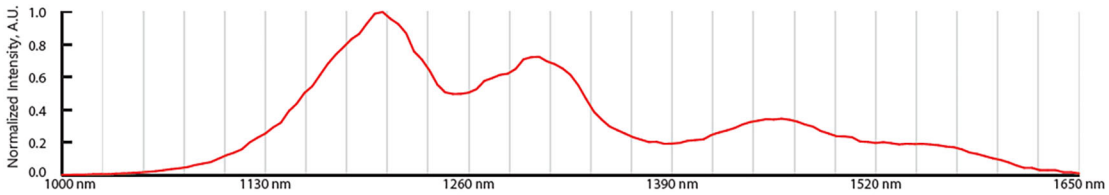

Figure 5 *Broadband SWIR Illuminator Wavelength Spectrum*

Environmental Specifications

Table 9 SWIR and VIS-SWIR Illuminator Environmental Specifications

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

Mechanical Dimensions

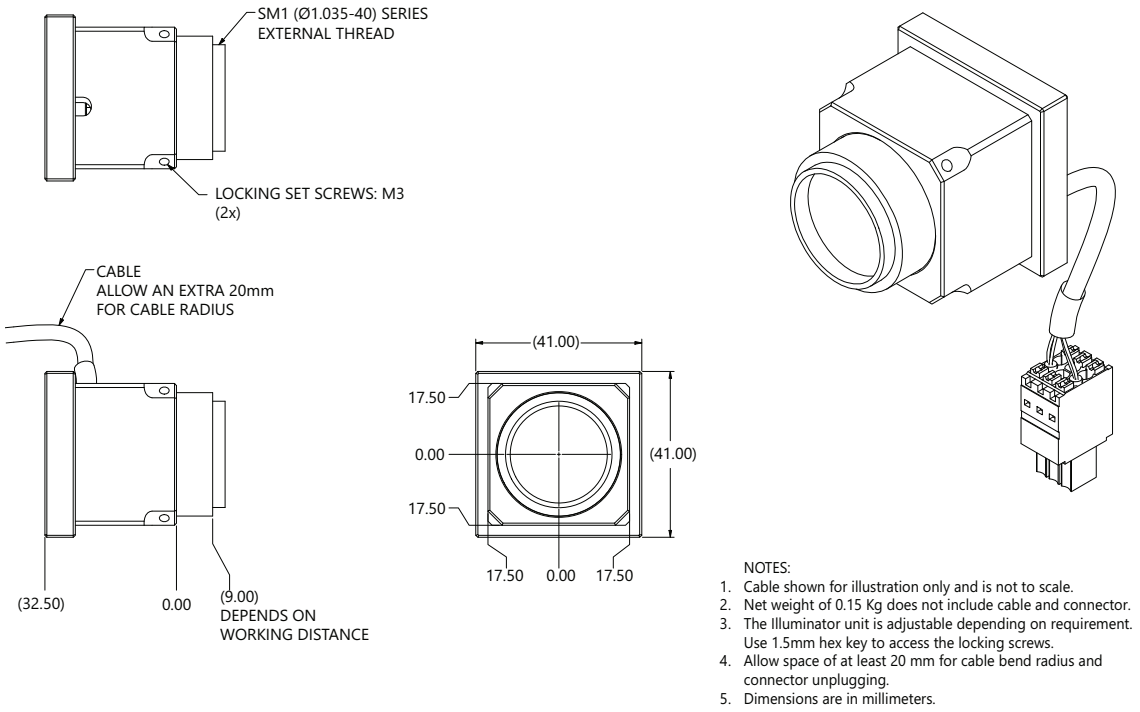

Figure 6 *Single Wavelength SWIR Illuminator Dimensions*

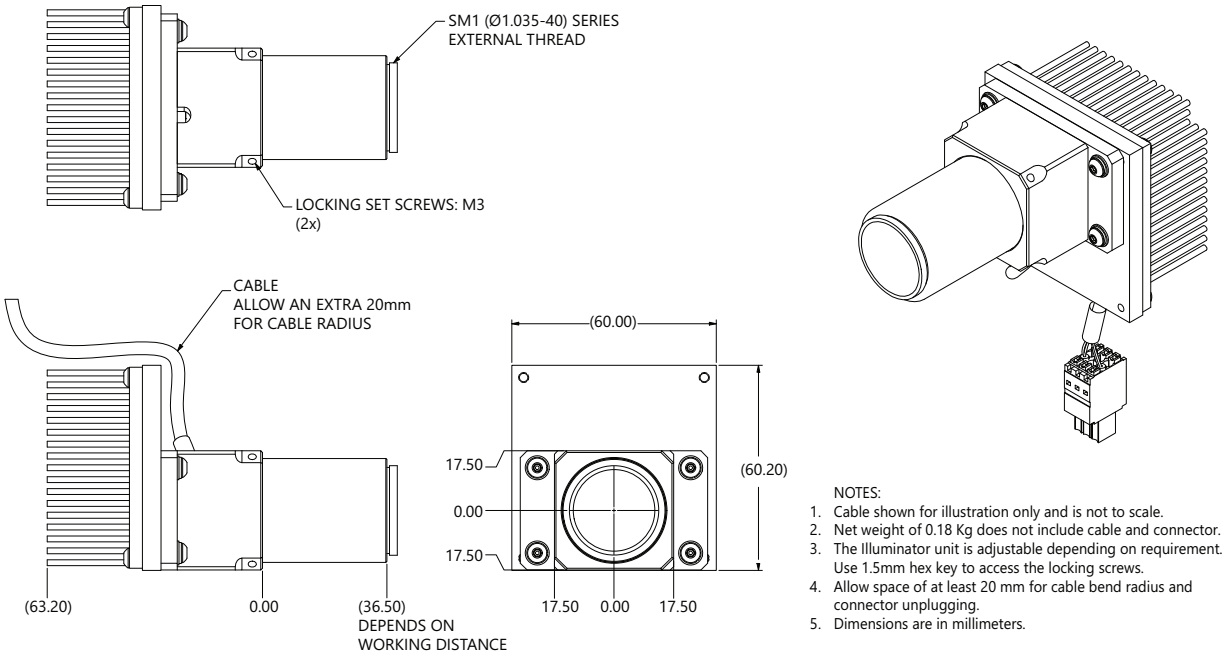

Figure 7 *Broadband SWIR Illuminator Dimensions*

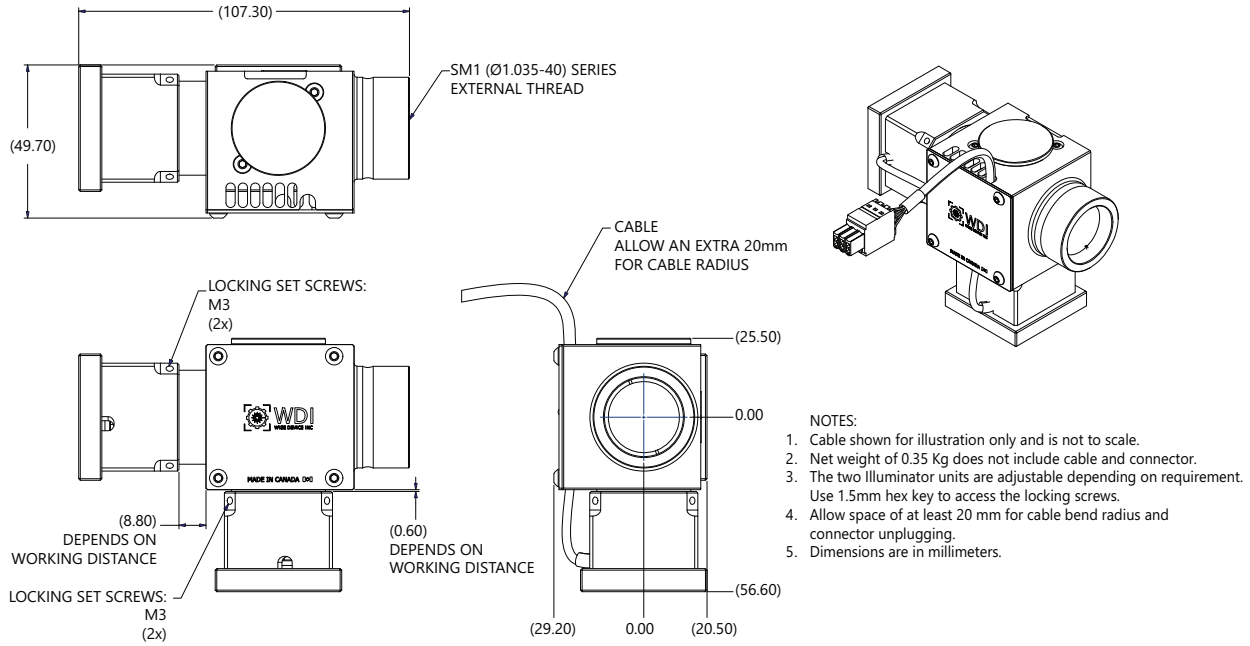

Figure 8 *Visible and Single Wavelength SWIR Illuminator Dimensions*

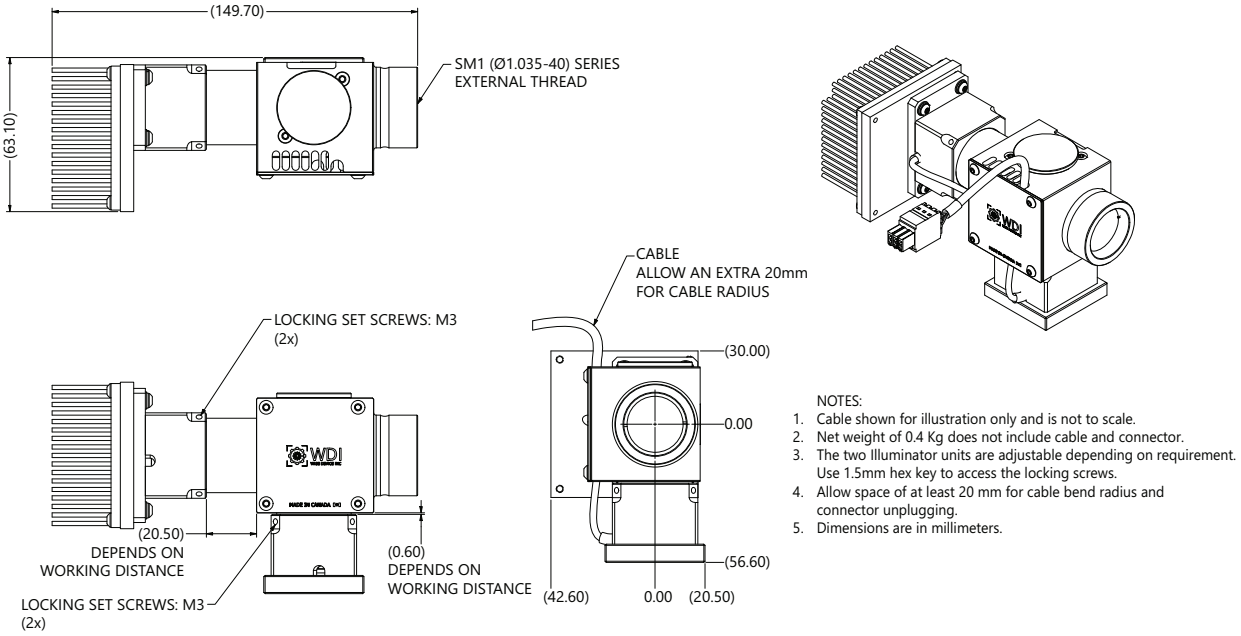

Figure 9 *Visible and Broadband SWIR Illuminator Dimensions*