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PSI ASC HH Imaging System

Enclosure Hardware	The ASC HH imaging systems' outer enclosure comprises of a rugged anodised aluminium housing with an optional easy grip handle. A soft Nitrile rubber protective sheath encases the camera to provide additional protection.
Internal Components	The ASC HH imaging system employs:- • The ASC HH employs global shutter imaging technology available in either colour or monochrome NIR. • An advanced state of the art pulsed high brightness NIR LEDs illumination system provides high levels of illumination whilst being powered off of a standard USB2 connection. • Application specific optical filtering is incorporated in the NIR version, designed to remove virtually all visible light and results in a peak operational wavelength of 850nm.
ASC HH Operation	The ASC HH system is powered via a single USB2 connection. All camera functions and illumination control are performed via the USB2 high-speed interface. The unit has two status LEDs controlled over the USB2 interface. Using appropriate commands over the USB2 interface each LED is independently set to be either off, red or green.
Operating Modes	The ASC HH system has two operating modes: Normal vision Normal vision mode uses natural ambient lighting and requires sufficient ambient NIR light to allow the camera to capture a usable image.

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	As a norm, sunlight and tungsten lighting provide sufficient NIR light for successful camera operation. This is not so in low energy artificial lighting environments as insufficient light is available or in instances where the target is positioned such that the target is in silhouette with the light source behind it. LED LED mode is used for capturing normal images in environments having low levels of lighting. In this mode the camera controls the duration of the high intensity LEDs such that they are illuminated only when the global electronic shutter is open. This results in low power operation whilst capturing a clear, well defined image.
Light Output	Average light output from the system is significantly lower than that of the average tungsten reading lamp. This low average power, together with the NIR operation, results in the ASC HH unit being non intrusive and almost invisible in operation to the end user. This provides an imaging system which discards the need for power hungry, high brightness, steady state lighting employed in other imaging systems. The pulsed operation ensures maximum efficiency and provides good image compatibility with other products in the ASC range.
Camera	The ASC bespoke camera design is capable of operating over a wide dynamic range. Total control of exposure time, gain, linearisation etc., allows the camera to operate over an extremely diverse range of lighting conditions ranging from very low light environments to those of bright daylight. With the correct illumination mode of operation, the camera has the ability to capture high quality images in lighting conditions from total darkness to bright sunlight. The camera is able to operate in either automatic mode whereby the camera makes all adjustments to exposure, gain etc., when acquiring the image or in controlled mode whereby full control of camera settings are available on a frame-by-frame basis via the USB2 link.

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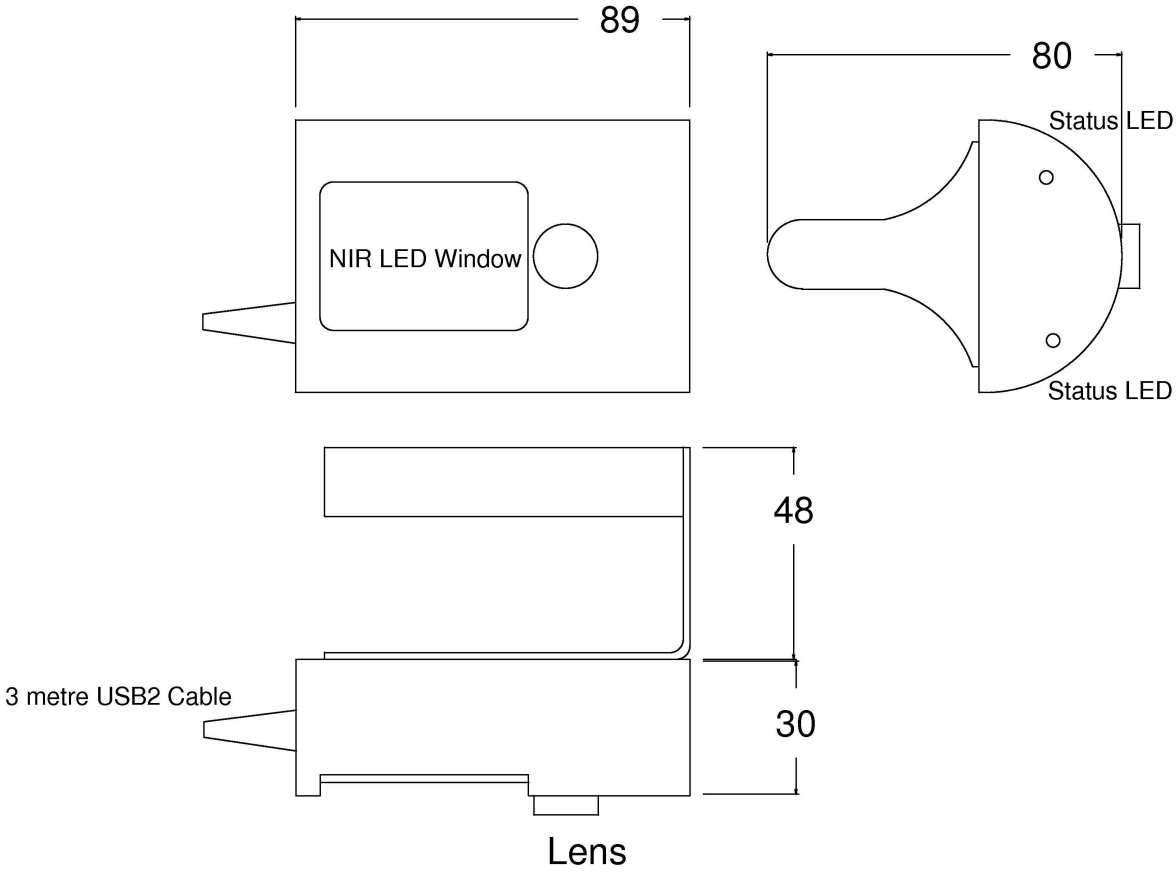

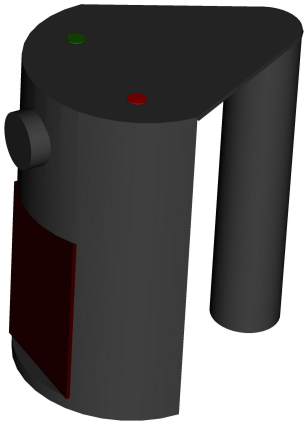

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Software	The ASC HH camera and illumination system has been designed specifically to operate in tandem with custom software running on a PC or an equivalent system. Whilst employing the USB2 data transfer protocol, the ASC imaging unit has not been designed as a general purpose imaging system. Specific software drivers have been created and provide very specific optimised performance for specific applications. The ASC is therefore not compliant with standard plug and play imaging devices employed in operating systems such as Windows, and should not be considered as a standard imaging device.
Safety	All connections to the unit are very low voltage and do not present any risk of shock. Internally, the illumination system stores energy for the short pulses required by the flash system. This energy is stored at 3.5V and does not present any risk of shock. Access to all internal components requires the use of specialist tools and there are no user serviceable components with the unit. If access to internal components is required by service personnel, the unit must be disconnected from the external USB2 port prior to opening of the enclosure. During operation the instrument employs high brightness light sources which operate in pulsed mode, resulting in low average powers. The light sources are of a wide dispersal nature resulting in low average light levels at typical operating distances. LEDs are almost a point source, therefore they produce high intensities at close proximity. The distance of the LEDs from the front of the optical window is such that the light intensity is within safe limits for short term exposure. It is inadvisable however to place the eye within a few millimetres of the optical window and look directly into the light source, just as would be avoided with a simple lamp or torch. There are no emissions of UV light or visible, other that that seen by the residual eye response to wavelengths around 800nM. The ASC imaging product has been designed to current legislation including the EU low voltage directive EMC (Electromagnetic Compatibility) directive and waste directives.

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	All components are RoHS (Restriction of Hazardous Substances) compliant and require no special handling during the shipment or the disposal of the product. At the end of product life the equipment should be disposed of in-line with the legislation current at that time covering the disposal of RoHS compliant electrical systems.

Perception Sensors and Instrumentation Ltd reserves the right to make corrections, modifications, enhancements, improvements, and other changes to its products and services at any time. Customers should obtain the latest relevant information before placing orders and should verify that such information is current and complete. Perception Sensors and Instrumentation Ltd does not assume any liability arising out of the application or use of any product or circuit described herein. In no event shall any liability exceed the purchase price of Perception Sensors and Instrumentation Ltd products. Perception Sensors and Instrumentation Ltd products are not warranted nor intended to be used for medical, life support, life saving, critical control or safety applications..

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PSI ASC HH Specification

Camera

Interface	USB2 High-speed (480Mbs)
Resolution	756x482 pixels
Frame speed	33fps maximum
Angle of view (vertical)	90º
Angle of view (horizontal)	56º
Wavelength	NIR with 850nm centre wavelength
Operating current	450mA maximum
Maximum cable length	3 metres
Weight	300 grams

Illumination

Light source	LED
LED peak power input	10W for 20mS
LED average power input	1.8W when streaming in normal conditions
LED wavelength	NIR with 850nm centre wavelength

Power supply

Input voltage	5V Powered from USB interface

Enclosure

Material main body	Anodised aluminium
Outer sheath & handle grip	Nitrile rubber
Length	93mm
Width (excluding handle)	65mm
Handle length	84mm
Handle Diameter	16mm

Approvals

CE compliant
RoHS compliant
EMC compliant
(Class B conducted and radiated emissions and susceptibility)

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