

LWIR THERMAL IMAGER

INSTALLATION GUIDE

PUBLICATION N° 814975

LANGUAGE: ENGLISH

ISSUE: 1

DATE: 07 DECEMBER 2021



📍 Long Wavelength Infrared Thermal Imaging Camera



Health and Safety Information



Read all of the instructions in this booklet - including all the **WARNINGS** and **CAUTIONS** - before using this product. If there is any instruction which you do not understand, **DO NOT USE THE PRODUCT.**

Safety Signs



WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in death or personal injury.



CAUTION

Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury to the user or users, or result in damage to the product or to property.

NOTE

Indicates a potentially hazardous situation which, if not avoided, could result in damage or loss of data.

Signs and Symbols used on equipment and Documentation



Caution, risk of electric shock.



Caution, attention to possibility of risk of damage to the product, process or surroundings. Refer to instruction manual.



Caution, hot surface.



Protective Conductor Terminal.



Observe precautions for handling electrostatic discharge sensitive devices.

Equipment Operation

Use of this instrument in a manner not specified by AMETEK Land may be hazardous. Read **and understand** the user documentation supplied **before** installing and operating the equipment.

The safety of any system incorporating this equipment is the responsibility of the assembler.

Protective Clothing, Face and Eye Protection

It is possible that this equipment is to be installed on, or near to, machinery or equipment operating at high temperatures and high pressures. Suitable protective clothing, along with face and eye protection must be worn. Refer to the health and safety guidelines for the machinery/equipment before installing this product. If in doubt, contact AMETEK Land.



Wear Protective Gloves



Wear Protective Clothing



Wear Eye Protection



Wear Ear Protection



Wear Safety Boots



Wear Face Protection

Electrical Power Supply

Before working on the electrical connections, all of the electrical power lines to the equipment must be isolated. All the electrical cables and signal cables must be connected exactly as indicated in these operating instructions. If in doubt, contact AMETEK Land.

Contact Us

UK - Dronfield

Land Instruments International

Tel: +44 (0) 1246 417691

China

AMETEK Land China Service

Tel: +86 21 5868 5111 ext 122

USA - Pittsburgh

AMETEK Land, Inc.

Tel: +1 412 826 4444

India

AMETEK Land India Service

Tel: +91 - 80 67823240

Email: land.enquiry@ametek.com

Web: www.ametek-land.com

For further details on all AMETEK Land offices, distributors and representatives, please visit our website.

Storage

The instrument should be stored in its packaging, in a dry sheltered area.

The maximum storage temperature is 10°C (18°F) higher than the maximum operating temperature.

The minimum storage temperature is 10°C (18°F) lower than the minimum operating temperature.

Refer to the Technical Specification for details of the operating temperature limits.

Unpacking

Check all packages for external signs of damage. Check the contents against the packing note.

Lifting Instructions

Where items are too heavy to be lifted manually, use suitably rated lifting equipment. Refer to the Technical Specification for weights. All lifting should be carried out in accordance with local and national regulations.

Return of Damaged Goods

IMPORTANT If any item has been damaged in transit, this should be reported to the carrier and to the supplier immediately. Damage caused in transit is the responsibility of the carrier not the supplier.

DO NOT RETURN a damaged instrument to the sender as the carrier will not then consider a claim. Save the packing with the damaged article for inspection by the carrier.

Return of Goods for Repair

If you need to return goods for repair please contact our Customer Service Department for details of the correct returns procedure.

Any item returned to AMETEK Land should be adequately packaged to prevent damage during transit.

You must include a written report of the problem together with your own name and contact information, address, telephone number, email address etc.

Design and Manufacturing Standards

The Quality Management System of Land Instruments International is approved to BS EN ISO 9001 for the design, manufacture and on-site servicing of combustion, environmental monitoring and non-contact temperature measuring instrumentation.

Registered ISO9001 Management System approvals apply in the USA.

UK Calibration Laboratory: UKAS 0034.

USA Calibration Laboratory: ANAB Accredited ISO/IEC 17025.

National Accreditation Board for Testing and Calibration Laboratories approvals apply in India.

Operation of radio transmitters, telephones or other electrical/electronic devices in close proximity to the equipment while the enclosure doors of the instrument or its peripherals are open, may cause interference and possible failure where the radiated emissions exceed the EMC directive.

The protection provided by this product may be invalidated if alterations or additions are made to the structural, electrical, mechanical, pneumatic, software or firmware components of this system. Such changes may also invalidate the standard terms of warranty.

Copyright

This manual is provided as an aid to owners of AMETEK Land's products and contains information proprietary to AMETEK Land. This manual may not, in whole or part, be copied, or reproduced without the expressed written consent of AMETEK Land.

Contents

1	Introduction	1-1
	1.1 Points to note on installation	1-1
	1.2 Using compressed air for air purging	1-1
2	Specifications	2-0
	2.1 Nomenclature	2-0
	2.2 Specification Table	2-1
	2.3 LED Status Indicators	2-2
3	Electrical Connections	3-1
	3.1 Connecting the mains input to the TRACO Power Supply Unit	3-1
	3.2 Using an alternative Power Supply Unit	3-3
4	Installation Diagrams	4-0
5	Using the Web Server Interface	5-1
	5.1 Connecting to the Web Server	5-1
	5.2 About the Web Server Interface	5-3
	5.3 About the Web Server Menu	5-4
	5.4 Settings	5-4
	5.5 Frame Settings	5-5
	5.6 Regions of Interest (ROI)	5-6
	5.7 Working with Regions of Interest (ROI)	5-7
	5.8 I/O	5-9
	5.9 Selecting a Colour Palette	5-12
	5.10 Adjusting the Temperature Span	5-12
	5.11 Time Function Processing	5-13
6	Spares & Accessories	6-0
	6.1 Standard Power Supplies	6-0
	6.2 Power over Ethernet (PoE) Power Supplies	6-0
	6.3 Power I/O Cables	6-0
	6.4 Communications/PoE Cables	6-1
	6.5 Housings and Accessories	6-2

1

INTRODUCTION

This guide gives you information on how to install the LWIR thermal imaging camera and its installation accessories.

These instructions are provided as a series of simple installation diagrams, covering the installation of the LWIR thermal camera and its mountings, accessories and services.

The equipment must be used, maintained and serviced by properly trained personnel, capable of following the procedures given in these instructions. Safety may be impaired if the system is not used as indicated.

It is important to check the equipment with which you have been supplied and then read these instructions thoroughly before proceeding with installation.

1.1 Points to note on installation

- When choosing a location to install the LWIR thermal imaging camera, ensure that the camera has an unobstructed view of the target to be measured.
- Try to choose a mounting location that permits easy access to the system components wherever possible, as this will speed up any system maintenance and repair.
- Ensure that the mounting locations chosen for the camera and its accessories are as free as possible from vibration, dust, steam and smoke etc.
- Ensure that the mounting locations chosen for the camera and its accessories allow for the lengths of interconnecting cables that you have ordered. Also, ensure that all cable runs are as secure and unobtrusive as possible.

1.2 Using compressed air for air purging

If your application requires the use of the air purging and you intend to use compressed air to supply air to the purge, then the following points must be noted:

- If possible, connect the compressed air supply to the purge via a 1 m length of 35 mm diameter smooth bore tube. This will increase the air flow rate slightly.
- The minimum recommended air pressure is 20 psi (1.4 bar).
- The minimum recommended flow rate is 350 l/min.
- Occasional cleaning will be required to prevent the build up of everyday dirt on site when the purge is off.

2

SPECIFICATIONS

2.1 Nomenclature

The thermal imager detail label is on the rear face of the thermometer above the LAND logo label.

Make a note of your thermometers instrument **Type** and **Serial Number** in the space provided below.

Type:

Serial Number:

In the example in the table below, we examine the nomenclature for a thermal imager with an instrument type label which reads:

TYPE: LWIR 640 0/500C 50 LF

Example	Description	Options	Meaning
LWIR	Series Name	LWIR	Long wavelength infrared
640	Pixel Resolution	640	640 x 480 pixels
0/500C	Temperature Range	0/500C	0 to 500°C
		100/1000C	100 to 1000°C
50	Horizontal Field of View	25	25°
		50	50°
LF	Frame Rate	HF	60fps
		LF	7.5fps

From the table above, it can be seen that the camera in our example has the following specification:

- Long wavelength infrared thermal imager
- 640 x 480 pixel resolution
- 0 to 500 °C temperature range
- 50° horizontal field of view
- 7.5 frames per second frame rate

Refer to this table when checking your instrument Type label details.

2.2 Specification Table

Camera Unit	
Measurement Range:	0 to 500 °C / 32 to 932 °F 100 to 1000 °C / 212 to 1832 °F
Pixel Resolution:	640 x 480
Pixel Size/ Pitch	17 µm
Spectral Response:	8 to 14 µm
Max Frame Rate: *	60fps / 7.5fps
Detector:	640 x 480 Amorphous Silicon
Optic (HFOV x VFOV):	50° x 37° 25° x 17°
Focus Range:	Min 0.3m to infinity (motorised focus)
Accuracy:	2 °C or 1.5% °C of reading
NETD:	40mk (@ 20 °C) (-20 to 120 °C) 7.5Hz
Dimensions:	80 x 80 x 222 mm (max) / 3.14 x 3.14 x 8.7 in (including lens)
Power Rating:	12 to 24 VDC, +/-10% 12W / IEEE 802.3 at PoE+
Weight:	1.6 kg / 3.5lb
Ambient Temperature:	-20 to 60 °C (-4 to 140 °F) 0 to 95% humidity (non-condensing)
Environmental Rating:	IP65/NEMA 4
Compliance	EMC (EN 61326-1)
Camera Supply and I/O	
Digital Connections:	M12 X coded 8-way connector: 10/100/1000 Ethernet & IEEE 802.3 at PoE+
Analog Connections:	8-pin Binder Connector: 2 pins - 12-24V DC Power Input 6 pin Functions can be assigned to internal image processing algorithms 1 x 4 to 20 mA output 1 x 4 to 20 mA output OR relay output 1 x 4 to 20 mA input OR Digital Input OR relay output Camera Web Browser for alignment & internal image processing analog I/O setup
Signal-LED:	Visible on rear of camera only (not with jacket) 3 x LED - Power / Status, Ethernet Comms & Camera internal temperature
Service:	Water, instrument air for optional cooling enclosures
SMART Functionalities	
Integrated Web Server:	Remote access via Gbit Ethernet interface Integrated Web Server provides live thermal image
Autonomous Operation:	3 ROIs and configuration of integrated I/Os for full autonomous operation

Continued...

Thermal Imaging PSU Module (UL Approved)	
Components & Connections:	Power supply, Gb Ethernet communications (switch)/PoE+ Fibre optic data connection (option)
Environmental Rating:	IP65 / NEMA 4
Size:	380 x 380 x 211 mm / 15 x 15 x 8.3 in
Weight:	15 kg (33.1 lbs)
UL Approval:	Listed to UL508A & CSA-C22.2 No. File Number E499440
Image Processing	
Software:	IMAGEPro and IMAGEViewer IMAGEPro Application (e.g Asset Monitor)
Workstation:	PC-Workstation (option)
Interfacing:	Open Data Interface, Modbus TCP, Moxa I/O unit
Standard Accessories	
Accessories (optional):	Thermal Imaging PSU Module (UL Approved), Process Imager Power Supply, LWIR/MWIR Industrial Housing Assembly and Purge, Light Housing with Purge, cables, brackets, Blower System, Software and Workstation

2.3 LED Status Indicators

The LEDs on the rear face of the LWIR Thermal Imaging Camera (Fig 2-11) are used to indicate the status of the camera operation.

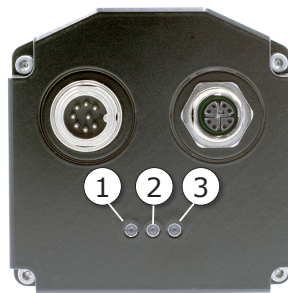


Fig. 2-1 LWIR Thermal Imaging Camera status LEDs

The table below gives an explanation of the LEDs.

LED	Function	Colour	Meaning
1	Power/Firmware status	Green	Power ON
		Yellow (Flashing)	Warning. Readings may be intermittent
		Yellow (Solid)	Alarm. Camera unable to function correctly
		OFF	No Power
2	Ethernet Client Connection status e.g. IMAGEPro	Green	Connected to Client
		Off	NO Client Connected
3	Camera Temperature Status	Green	Camera Temperature OK
		Yellow (Flashing)	Camera Temperature Warning
		Red	Camera Temperature Alarm

3

ELECTRICAL CONNECTIONS

The basic system electrical connections are as follows:

- Mains input to the TRACO Power Supply Unit*
- 24V output from TRACO Power Supply Unit* to the LWIR camera
- Ethernet cable from LWIR Camera to the Process Imaging Workstation

* The LWIR Camera can be powered by an alternative power supply, via cable Part N° 806032 or Part N° 806033 (See section 3.2).

3.1 Connecting the mains input to the TRACO Power Supply Unit



The TRACO Power Supply Unit is supplied with a 3-pin AC input connector (Fig. 3-1). You will need to disassemble this connector to install the cable.

- 1) Unscrew the cover from the mains **Input** on the Power Supply Unit.



- 2) The easiest way to disassemble the 3-pin AC input connector is to first screw the connector assembly onto the input socket (Fig. 3-2).



Fig. 3-3

- 3) Grip the rear section of the input connector and unscrew it from the Power Supply Unit (Fig. 3-3).



Fig. 3-4

The connection terminals inside the input connector will now be revealed (Fig. 3-4).

- 4) Unscrew the connector front section from the Power Supply Unit and disassemble the remaining parts of the connector.
- 5) Slide the rear locking ring, gasket and shell body over the mains input cable.

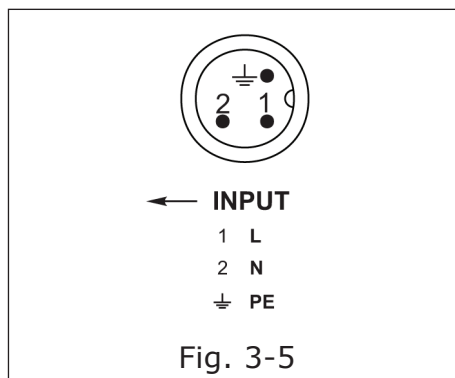


Fig. 3-5

- 6) Strip back the mains cable wires to the appropriate lengths and connect them to the **Input** connector terminals (Fig. 3-5) as per the wiring schedule below:

Pin 1 = Live
Pin 2 = Neutral
Pin 3 = N/C
E = Earth

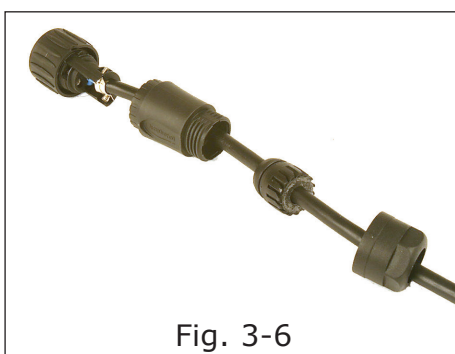


Fig. 3-6

- 7) The mains input cable connector is now ready for re-assembly and connection to the Power Supply Unit (Fig. 3-6). Re-assemble the mains input connector.



- 8) Attach the mains cable to the Input connector of the Power Supply Unit (Fig. 3-7).

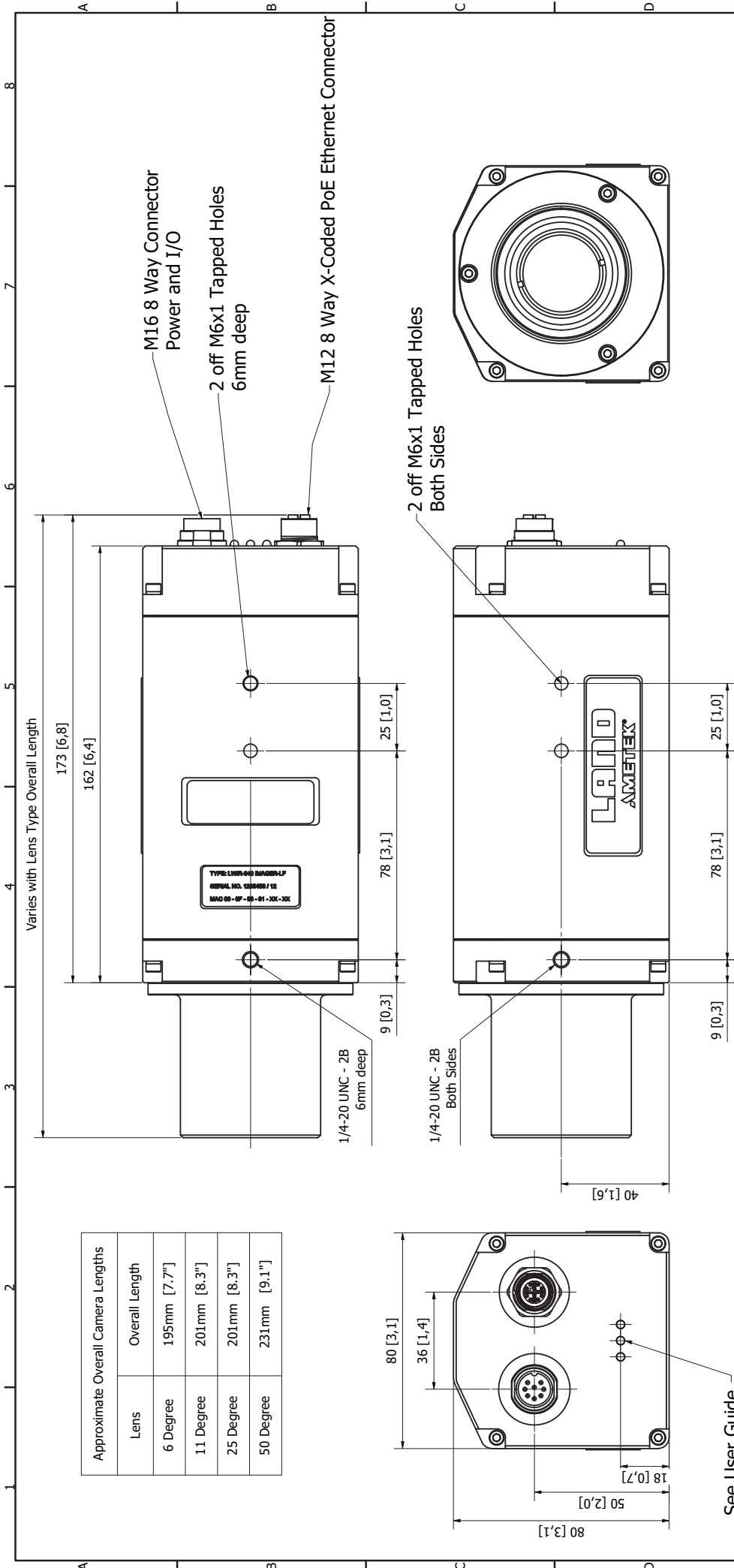
You can now connect the TRACO Power Supply Unit to the LWIR camera via Interface PCB (Part N° 807941).

Refer to the Installation Diagrams in Section 4.

4

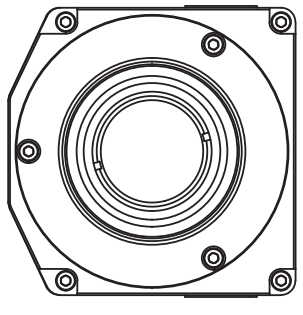
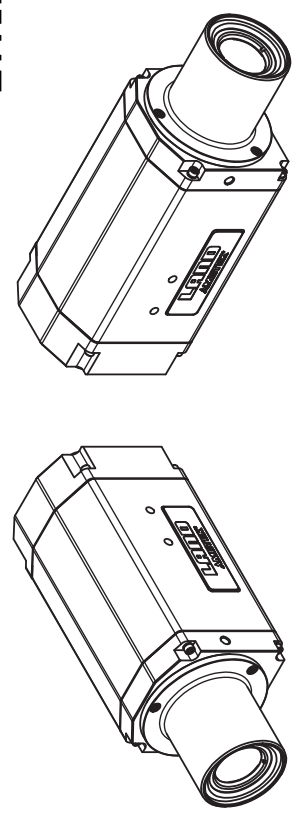
INSTALLATION DIAGRAMS

This section of the Installation Guide provides a series of simple installation diagrams, covering the installation of the LWIR thermal camera and its mountings, accessories and services.



Approximate Overall Camera Lengths	
Lens	Overall Length
6 Degree	195mm [7.7"]
11 Degree	201mm [8.3"]
25 Degree	201mm [8.3"]
50 Degree	231mm [9.1"]

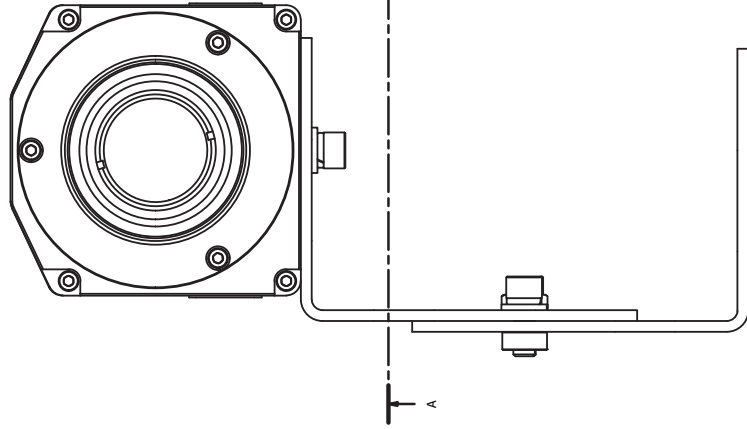
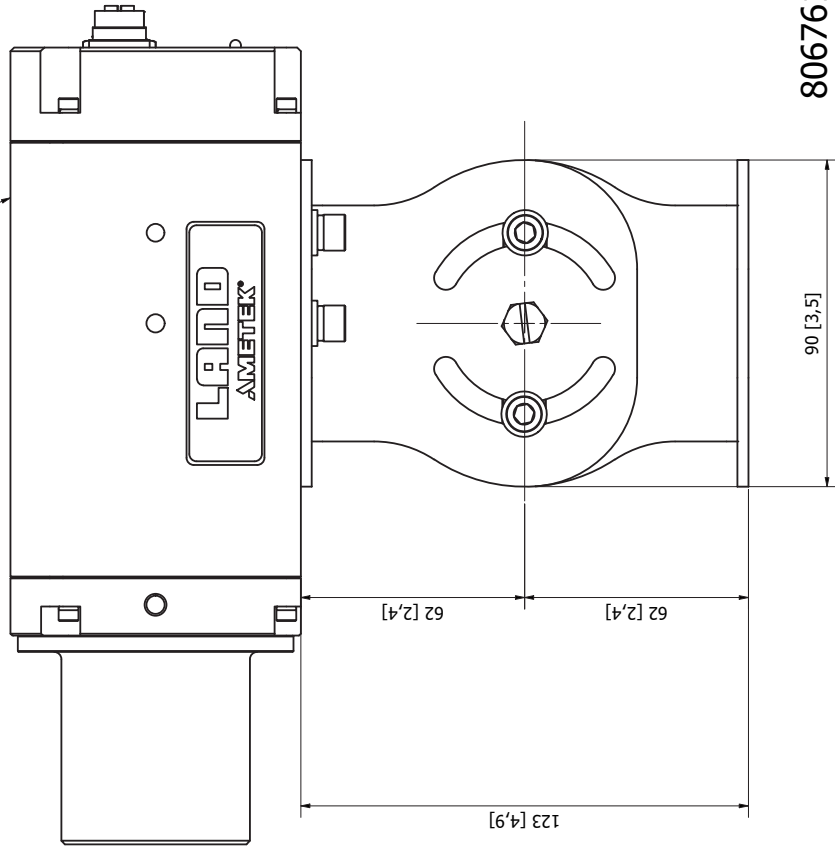
LWIR/MWIR 640 Imager



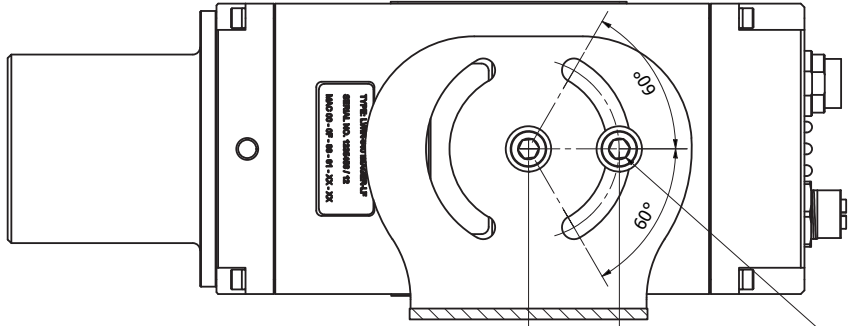
REV	DESCRIPTION	DATE
0		
DOCUMENT TYPE		
Standard Assembly		
DRAWING TITLE		
0310 LWIR 640 Camera Accessories		
DRAWING SCALE		
Not to Scale		
DRAWING SHEET		
1 of 17		
DRAWING NUMBER		
740.123		
DRAWING REVISION		
1		

All Materials and Finishes to be RoHS Compliant to Directive 2011/65/EU & (EU) 2015 / 863
 Chemicals in breach of EU REACH or US TSCA limits in this product must be reported to Land Instruments
 RESPONSIBLE DEPT
 Design Engineering
 PRODUCTION
 ORIGINALY USED ON PRODUCT TYPE
 0310 LWIR 640 Camera Accessories
 DATE TITLE
 Installation Drawings for LWIR-MWIR 640 Imager System
 COMPANY BY
 S.Lonsdale DATE 25/08/2021
 APPROVED BY
 D.Bramhall SCALE Not to Scale
 TECHNICAL REFERENCE
 DRAWING No. SHEET 1 of 17
 DWG SIZE A2 740.123 REVISION 1
 LAND INSTRUMENTS INTERNATIONAL LTD, DROWNFIELD, S18 1DJ

LWIR-MWIR Imager



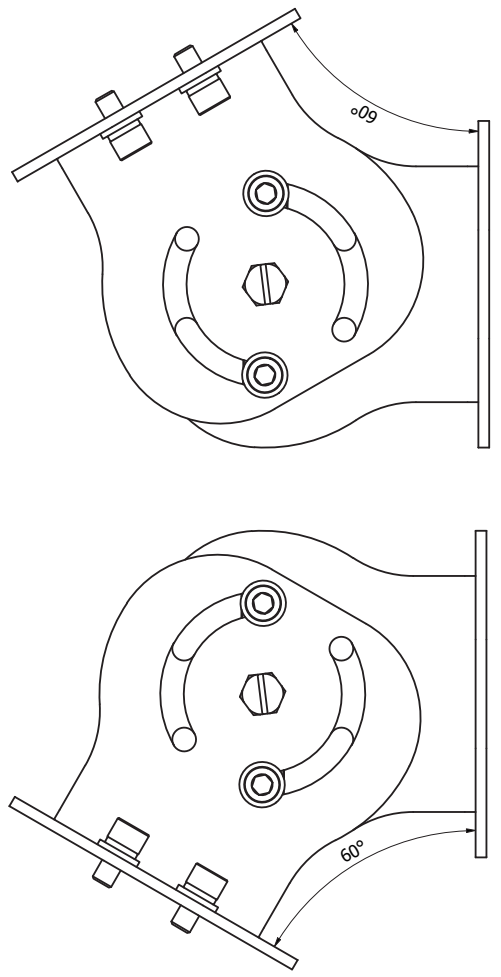
806761 Pan and Tilt Bracket



2off M6 Cap Head Screws

A-A (1:1)

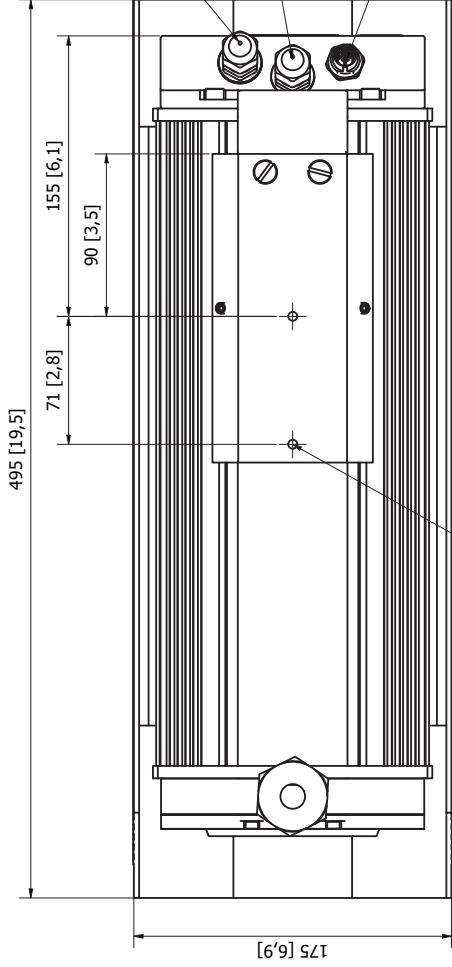
All Materials and Finishes to be RoHS Compliant to Directive 2011/65/EU & (EU) 2015 / 863 Chemicals in breach of EU REACH or US TSCA limits in this product must be reported to Land Instruments		REV. 0	DESCRIPTION	DATE
RESPONSIBLE DEPT Design Engineering	PRODUCTION	DOCUMENT TYPE Standard Assembly		
ORIGINAL NAME ON PRODUCT TYPE 0310 LWIR 640 Camera Accessories		DRG. TITLE Installation Drawings for LMIR-MWIR 640 Imager System		
CONFORMS TO BS 8888 TOLERANCING ISO 8015 ISO 2768 - c L		CREATED BY S.Lonsdale	DATE 25/08/2021	SCALE Not to Scale
SURFACE FINISH MATERIAL		APPROVED BY D.Bramhall	TERMINATION SHEETS	REVISION SHEET
ALL SHARP CORNERS REMOVED		DRG. SIZE A2		DRG. NO. 740.123
		FINISH		REVISION 1



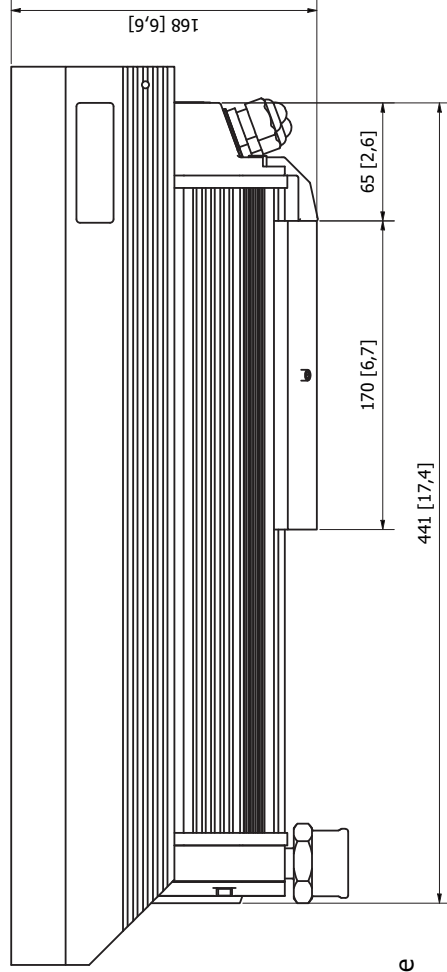
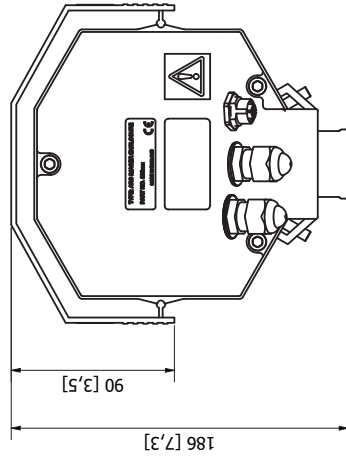
LAND INSTRUMENTS
PROCESS & ANALYTICAL INSTRUMENTS
LAND INSTRUMENTS INTERNATIONAL LTD, DROWFIELD, S18 1D

Operating temperature with heater:
From -20°C up to +60°C.

See Videotec HEG Aluminium Camera Housing Manual for further details



2 off M6x1 Tapped Holes

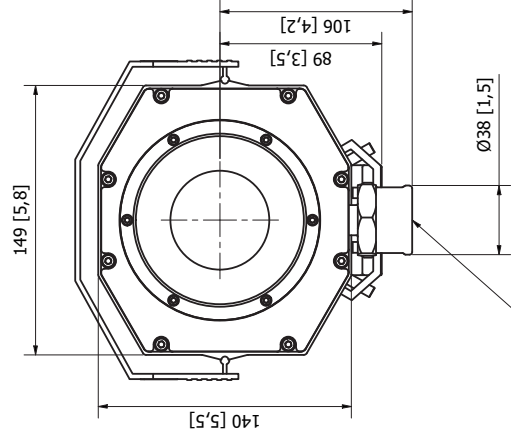


Air Inlet for Purge

This Enclosure Is NOT Cooled

Required Air Supply Conditions:

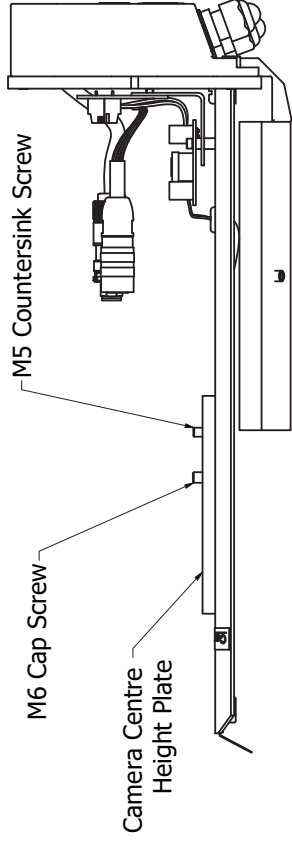
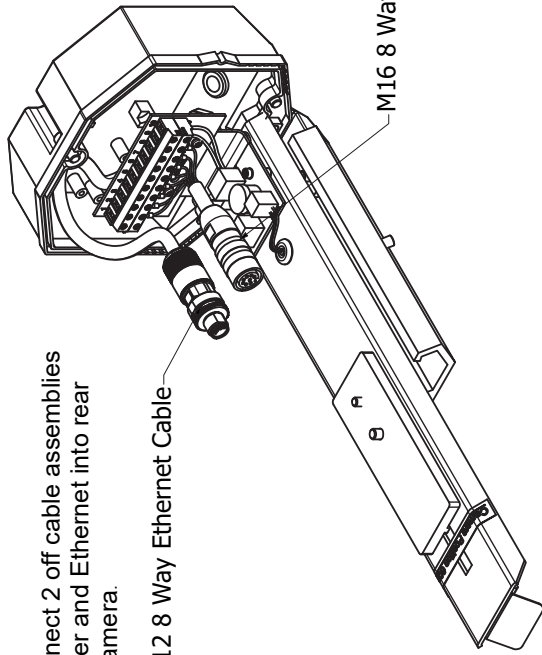
- Air supply must be clean filtered and regulated instrument air.
- MIN Flow Rate= 350 l/m for use in applications up to 1000°C
- MIN Pressure = 1.4 bar for use in applications up to 1000°C
- MAX Outlet Air temperature = 40°C



All Materials and Finishes to be RoHS Compliant to Directive 2011/65/EU & (EU) 2015 / 863
Chemicals in breach of EU REACH or US TSCA limits in this product must be reported to Land Instruments

RESPONSIBLE DEPT Design Engineering	PRODUCTION	ORIGINALS USED ON PRODUCT TYPE 0310 LWIR 640 Camera Accessories	DOCUMENT TYPE Standard Assembly
CONFORMS TO BS 8888 TOLERANCING ISO 8015	CONFORMS TO BS 8888 TOLERANCING ISO 8015	DRG. TITLE Installation Drawings for LMIR-MWIR 640 Imager System	DATE 11/10/2021
SURFACE FINISH MATERIAL	ALL SHARP CORNERS REMOVED	THIS DRAWING MUST NOT BE COPIED OR USED OTHER THAN FOR THE PURPOSE OR WHICH IT WAS ISSUED WITHOUT THE WRITTEN PERMISSION OF: LAND INSTRUMENTS INTERNATIONAL LTD. 2021	SCALE Not to Scale
FINISH		LAND INSTRUMENTS INTERNATIONAL LTD. DROPPFIELD, S18 1JD	SHEET 3 of 17
			REVISION A2 815130

Connect 2 off cable assemblies power and Ethernet into rear of camera.

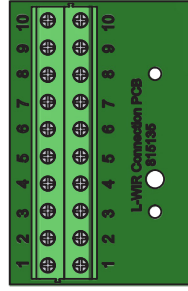


M16 8 Way Mains and I/O Cable

Gland Entry for the Power-I/O Cable
or Power Only Cable
(High Temp 815071 25m & 815072 50m)
(STD 815155 20m & 815156 50m)

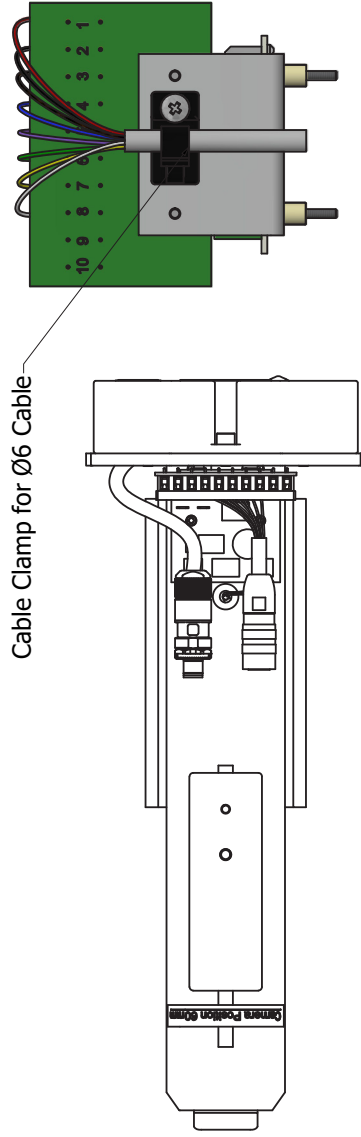
Customer Wiring
Land Supplied
M12 Ethernet X-Coded Cable Assembly

Customer Connections
Terminal Connections
Power and I/O Wire



LWIR PCB Terminal No.	Wire Colour	Function
1	Red	+24V
2	Black	0V
3	Brown	+mA Out 1
4	Blue	-mA Out 1
5	Purple	+mA Out 2/Relay 1
6	Green	-mA Out 2/Relay 1
7	Yellow	+ Main/Digin+/Relay 2
8	White	- Main/Digin+/Relay 2
9	N/A	+24V
10	N/A	0V

Position front face of camera Lens in to the flange on the purge.
Ensure the lens is located onto the recess face.
Fasten securely in place.



Assembly Instructions for Mounting Camera to Housing.

- 1, Locate the M5 countersink screw to Camera Centre Height Plate
- 2, Locate mounting plate into slot on mounting.
- 3, Fit Camera to mounting plate locating the M5 screw into the rear M6 hole.
- 4, Fasten Camera in position using the M6 Disc spring washer and M6 cap screw.
Ensure the washer is fitted the correct way.

All Materials and Finishes to be RoHS Compliant to Directive 2011/65/EU & (EU) 2015 / 863
Chemicals in breach of EU REACH or US TSCA limits in this product must be reported to Land Instruments

REASONABLE DEPT PRODUCTION (ORIGINALLY BASED ON PRODUCT TYPE)

Design Engineering 0310 LWIR 640 Camera/Accessories

CONFORMS TO BS 8888 TOLERANCING ISO 8015

ISO 2768 - c L

SURFACE FINISH MATERIAL FINISH

ALL SHARP CORNERS REMOVED

THIS DRAWING MUST NOT BE COPIED OR USED OTHER THAN FOR THE PURPOSE OR WHICH IT WAS ISSUED WITHOUT THE WRITTEN PERMISSION OF-

LAND INSTRUMENTS INTERNATIONAL LTD, DROPFIELD, S18 1JD

© 2021

LAND INSTRUMENTS INTERNATIONAL LTD, DROPFIELD, S18 1JD

DOCUMENT TYPE Standard Assembly

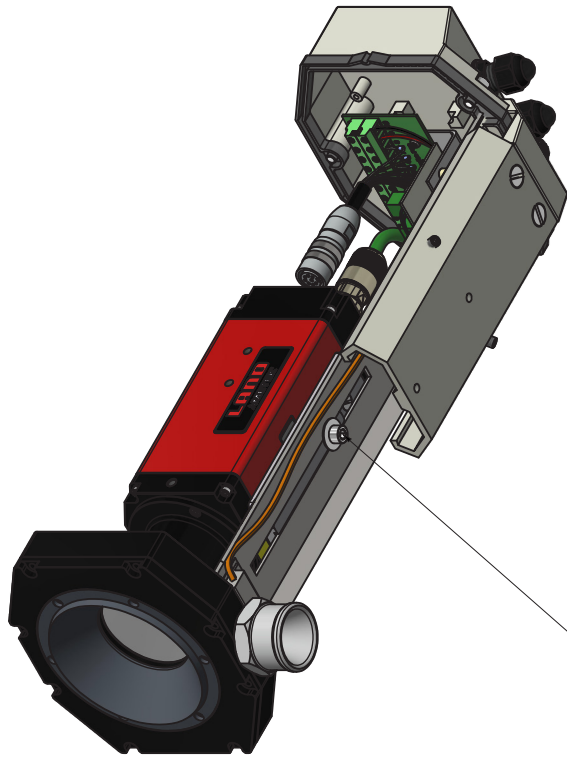
Installation Drawings for LMIR-MWIR 640 Imager System

Created by S.Lonsdale DATE 11/10/2021

Approved by D.Ramhall SCALE Not to Scale

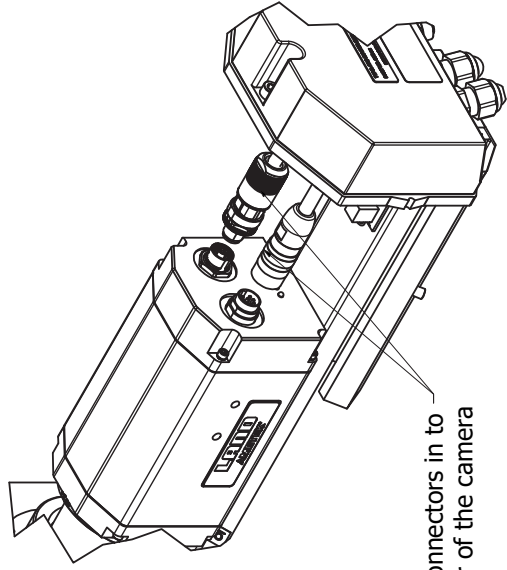
DWG No. 1863 No. SHEET 4 of 17

Revision A2 815130 1



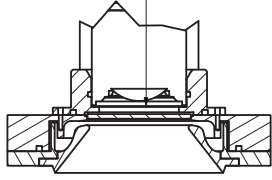
1. Fit the Camera on to the support plate. Position the camera forward of the camera position label and lightly clamp in place so the camera and can plate move up and down the slot.

E (1:1.2)



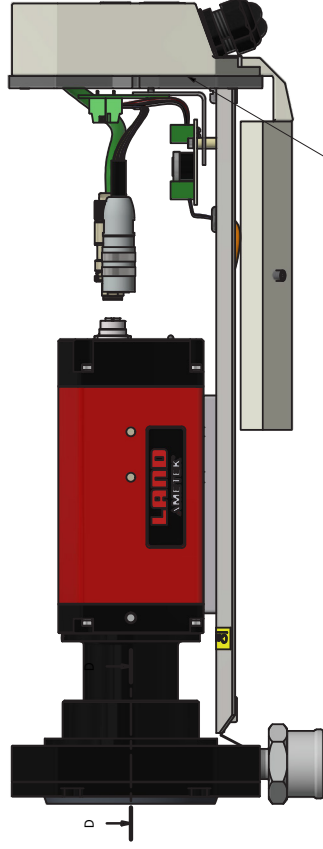
Connect connectors in to the rear of the camera

D-D (1:1.2)



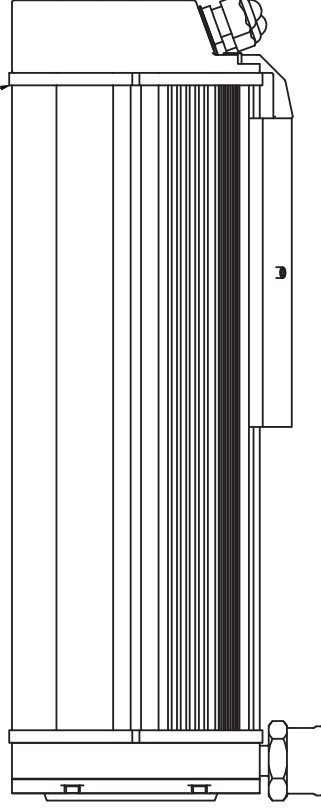
Slide the assembled unit in to the main housing. Carefully locate the lens into the flange on the back of the purge

Ensure end face of lens is located up to the bottom of the recess in the flange



Push the assembly in to the housing so the rear gasket is fully engaged with the Housing.

Remove the assembly with camera carefully such that the position of the camera is not disturbed. Tighten the screw to firmly secure the camera.



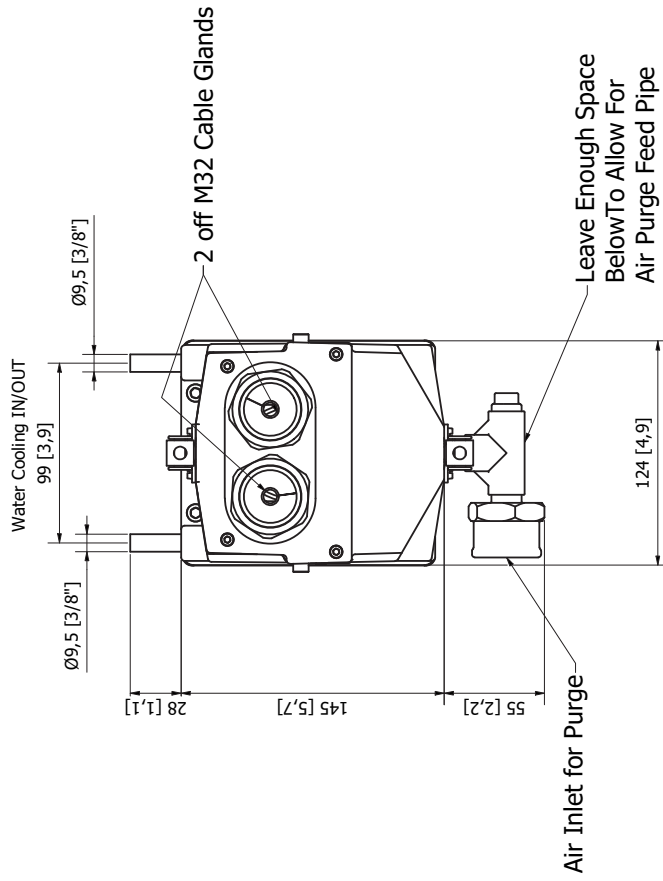
All Materials and Finishes to be RoHS Compliant to Directive 2011/65/EU & (EU) 2015 / 863

Chemicals in breach of EU REACH or US TSCA limits in this product must be reported to Land Instruments

RESPONSIBLE DEPT Design Engineering	PRODUCTION	PRODUCTION	DOCUMENT TYPE Standard Assembly
CONFORMS TO BS 8888 TOLERANCING ISO 8015	ORIGINALS USED ON PRODUCT TYPE 0310 LWIR 640 Camera/Accessories	DRG. TITLE Installation Drawings for LMIR-MWIR 640 Imager System	DATE 11/10/2021
SURFACE FINISH MATERIAL FINISH	ALL SHARP CORNERS REMOVED	THIS DRAWING MUST NOT BE COPIED OR USED OTHER THAN FOR THE PURPOSE OR WHICH IT WAS ISSUED WITHOUT THE WRITTEN PERMISSION OF:- LAND METEK PROCESS & ANALYTICAL INSTRUMENTS LAND INSTRUMENTS INTERNATIONAL LTD, DROMFIELD, S18 1JD	CREATED BY S. Lonsdale
			SCALE Not to Scale
			APPROVED BY D. Bramhall
			TEMPERATURE 5 of 17
			DRG. SIZE A2
			REVISION 815130
			1

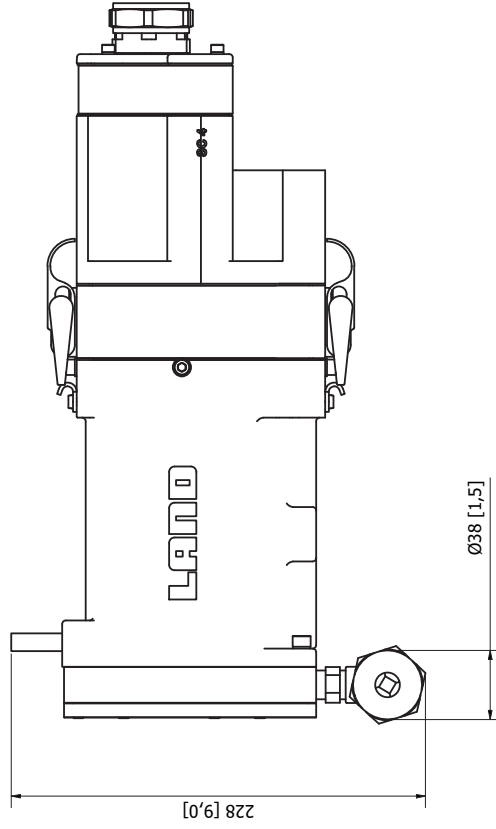
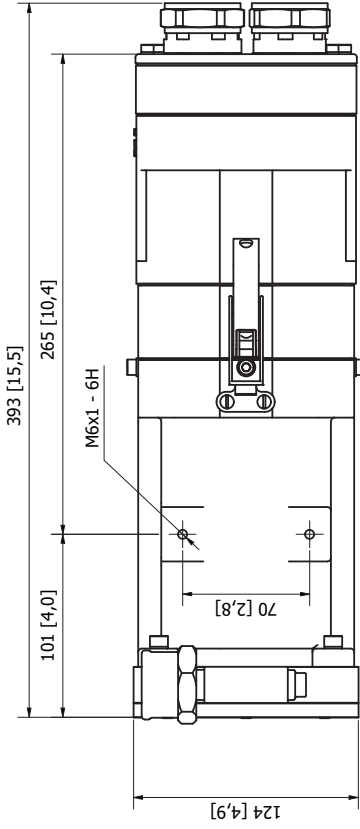
Required Water Supply Conditions:

- Water supply must be clean filtered water with a pH level between 6.5 and 8.5
- Rate of Water Hardness = <150mg/l Calcium Carbonate
- Water cooled: Flow < 1 l/min / 13Gal/hr
- Air cooled: Flow < 450l/min / 16cfm
- Maximum working pressure: 700kN/m² / 7 Bar (100psi)
- Plain pipe connections 3/8in / 9.5mm dia
- MAX Inlet Water temperature = 40°C



Required Air Supply Conditions:

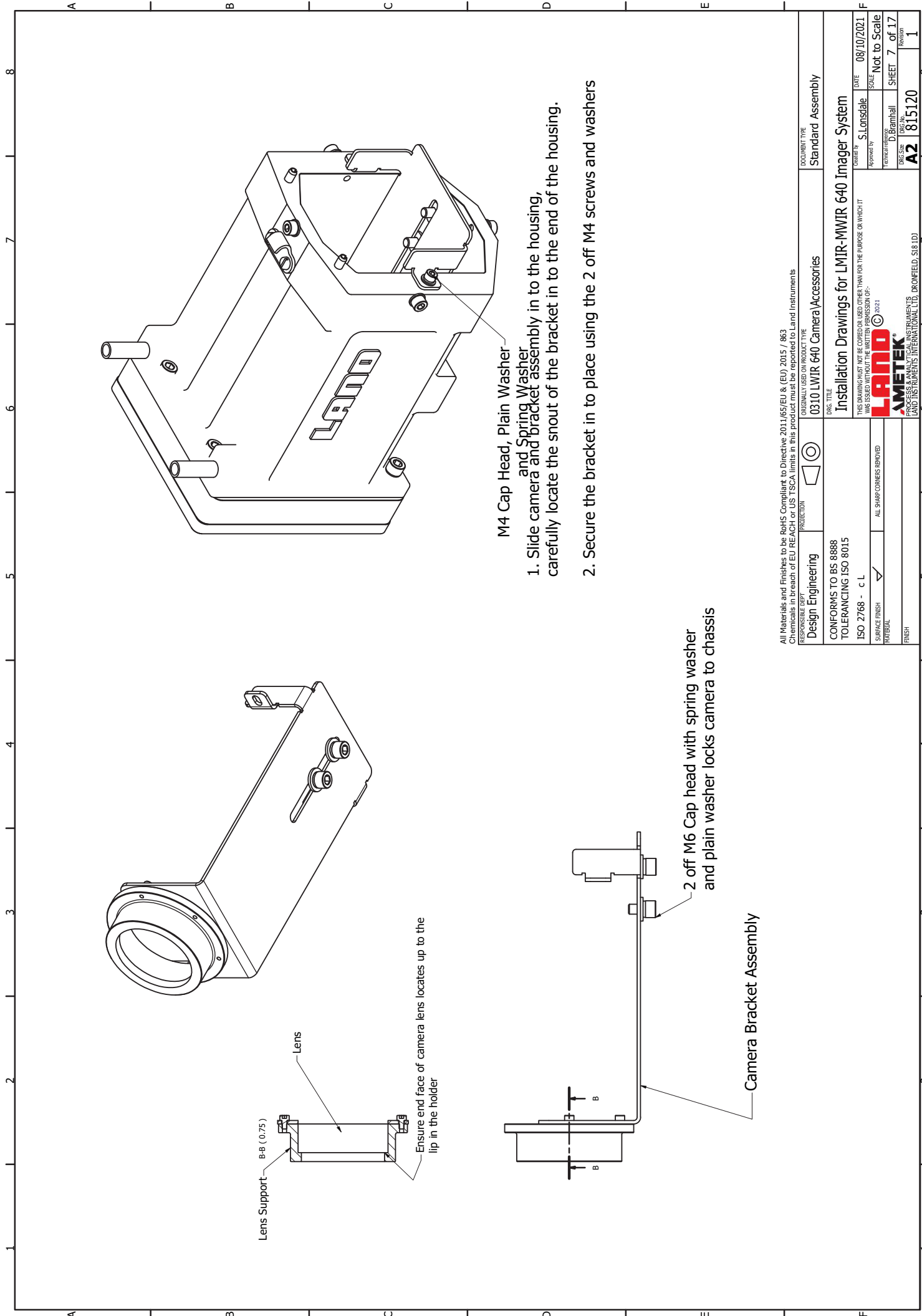
- Air supply must be clean filtered and regulated instrument air.
- MIN Flow Rate= 350 l/m for use in applications up to 1000°C
- MIN Pressure = 1.4 bar for use in applications up to 1000°C
- MAX Outlet Air temperature = 40°C



All Materials and Finishes to be RoHS Compliant to Directive 2011/65/EU & (EU) 2015 / 863
Chemicals in breach of EU REACH or US TSCA limits in this product must be reported to Land Instruments

RESPONSIBLE DEPT Design Engineering	PRODUCTION	DOCUMENT TYPE Standard Assembly
CONFORMS TO BS 8888 TOLERANCING ISO 8015	ORIGINALS USED ON PRODUCT TYPE 0310 LWIR 640 Camera Accessories	DATE 08/10/2021
ISO 2768 - C L	DRG. TITLE Installation Drawings for LMIR-MWIR 640 Imager System	SCALE Not to Scale
SURFACE FINISH MATERIAL	ALL SHARP CORNERS REMOVED	TERMINATED BY D Bramhall
FINISH		DRG. NO. A2 815120
		REVISION 6 of 17
		1

THIS DRAWING MUST NOT BE COPIED OR USED OTHER THAN FOR THE PURPOSE OR WHICH IT WAS ISSUED WITHOUT THE WRITTEN PERMISSION OF:
LAND INSTRUMENTS
LAND INSTRUMENTS INTERNATIONAL LTD, DROPPFIELD, S18 1DQ



Lens Support

Lens

Ensure end face of camera lens locates up to the lip in the holder

2 off M6 Cap head with spring washer and plain washer locks camera to chassis

Camera Bracket Assembly

M4 Cap Head, Plain Washer and Spring Washer

1. Slide camera and bracket assembly in to the housing, carefully locate the snout of the bracket in to the end of the housing.
2. Secure the bracket in to place using the 2 off M4 screws and washers

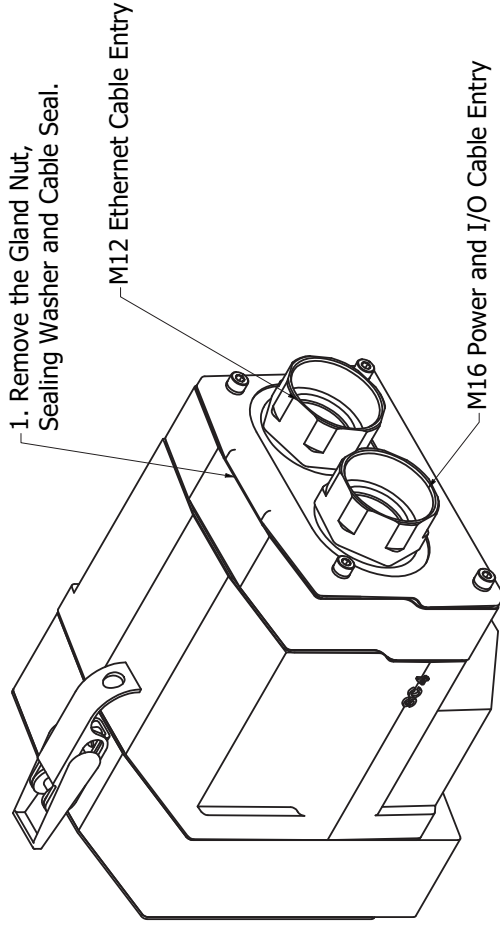
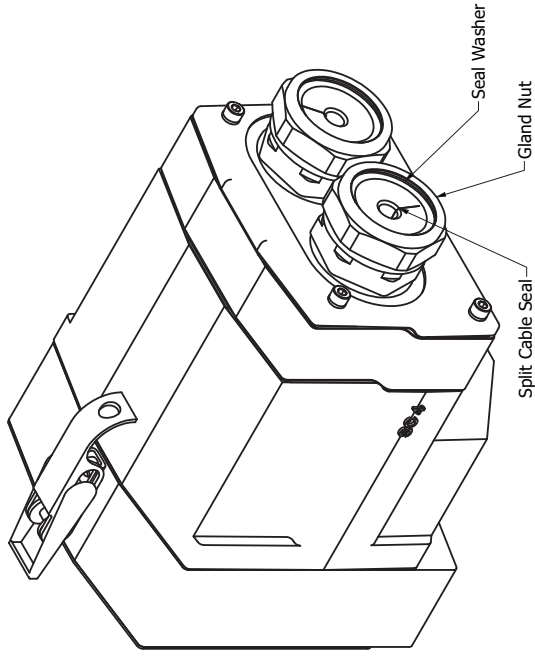
All Materials and Finishes to be Referenced to Directives 2011/65/EU & (EU) 2015 / 863
 Changes in Reach of EU REACH or US TSCA limits in this product must be reported to Land Instruments
 RESPONSIBLE PARTY: ORIGINAL USER OF PRODUCT TYPE

Design Engineering	PROJECTOR	DOCUMENT TYPE	Standard Assembly
CONFORMS TO BS 8888 TOLERANCING ISO 8015	DWG. TITLE	0310 LWIR 640 Camera Accessories	0310 LWIR 640 Imager System
ISO 2768 - c L	THIS DRAWING MUST NOT BE COPIED OR USED OTHER THAN FOR THE PURPOSE FOR WHICH IT WAS ISSUED WITHOUT THE WRITTEN PERMISSION OF:-	CONTROL BY	S. Lonsdale
SURFACE FINISH	ALL SHARP CORNERS REMOVED	APPROVED BY	D. Bramhall
MATERIAL		TEMPERATURE	Room
FINISH		DATE	08/10/2021
		SCALE	Not to Scale
		SHEET	7 of 17
		REVISED	1
		FIG. NO.	A2 815120



LAND INSTRUMENTS INTERNATIONAL LTD. DROMFIELD, S18 1DJ

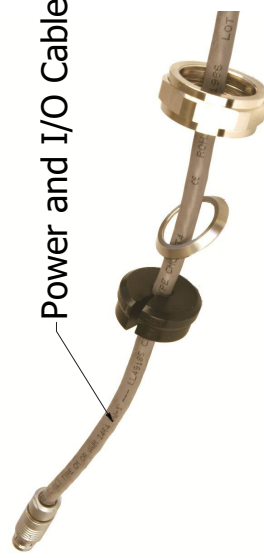
Assembly of the Cables into the Backcap



1. Remove the Gland Nut, Sealing Washer and Cable Seal.

2. Slide the Gland Nut and Seal Washer over the cable connector and place the Cable Seal around the Cable approximately 100mm from the connector. (See below)

3. Pass the connector through the gland, press the cable seal into the gland and loosely fasten the nut. This will allow the cable to reposition when attached to the camera.

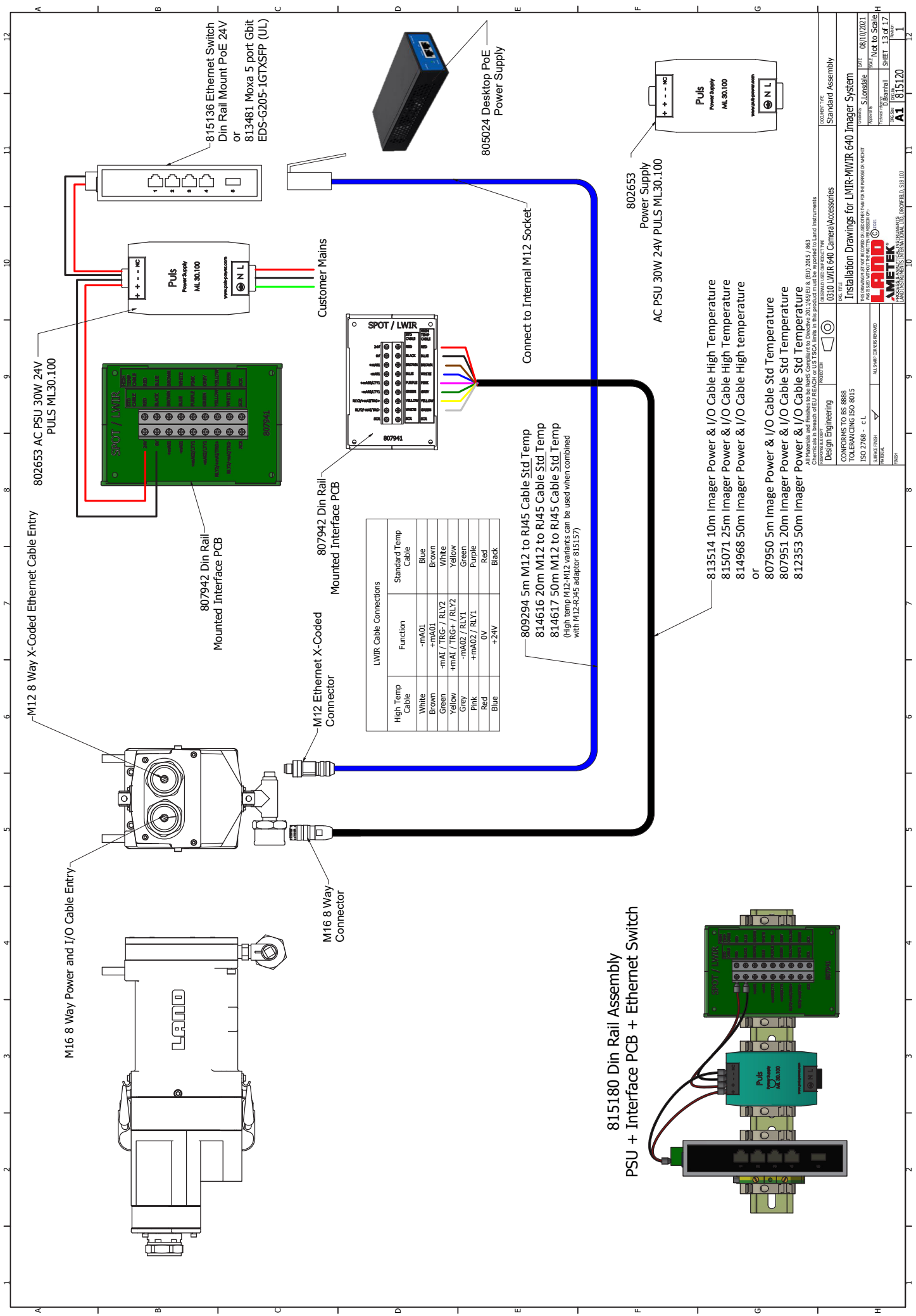


Images are for reference ONLY.
Cable types may change

All Materials and Finishes to be RoHS Compliant to Directive 2011/65/EU & EU 2015 / 863
Chemicals in breach of EU REACH or US TSCA limits in this product must be reported to Land Instruments

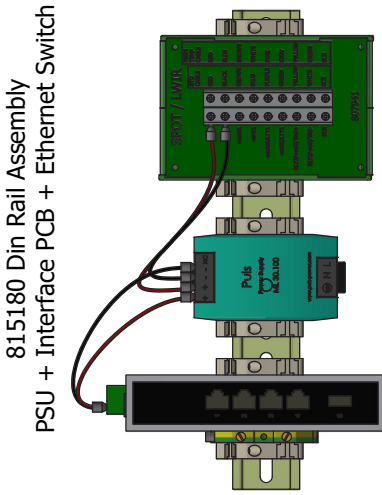
RESPONSIBLE DEPT Design Engineering	PRODUCTION	ORIGINALS USED ON PRODUCT TYPE 0310 LWIR 640 Camera Accessories	DOCUMENT TYPE Standard Assembly
CONFORMS TO BS 8888 TOLERANCING ISO 8015	DRG. TITLE Installation Drawings for LMIR-MWIR 640 Imager System	DESIGNED BY S. Lonsdale	DATE 08/10/2021
ISO 2768 - C L	THIS DRAWING MUST NOT BE COPIED OR USED OTHER THAN FOR THE PURPOSE OR WHICH IT WAS ISSUED WITHOUT THE WRITTEN PERMISSION OF-	APPROVED BY D. Bramhall	SCALE Not to Scale
SURFACE FINISH MATERIAL	ALL SHARP CORNERS REMOVED	DRG. NO. A2 815120	SHEET 8 of 17
FINISH		REVISION	1

LAND
METEK
PROCESS & ANALYTICAL INSTRUMENTS
LAND INSTRUMENTS INTERNATIONAL LTD, DROPFIELD, S18 1DQ



High Temp Cable	Function	Standard Temp Cable
White	-mA01	Blue
Brown	+mA01	Brown
Green	-mAL / TRG- / RLY2	White
Yellow	-mAL / TRG+ / RLY2	Yellow
Grey	-mA02 / RLY1	Green
Pink	+mA02 / RLY1	Purple
Red	0V	Red
Blue	+24V	Black

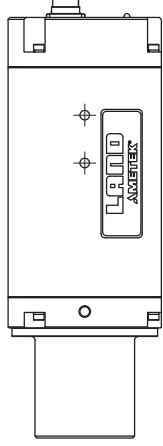
- 809294 5m M12 to RJ45 Cable Std Temp
- 814616 20m M12 to RJ45 Cable Std Temp
- 814617 50m M12 to RJ45 Cable Std Temp
- (High temp M12-M12 variants can be used when combined with M12-RJ45 adaptor 815157)



Chemicals in breach of EU REACH or US TSCA limits in this product must be reported to Lead Instruments

0310 LVWR 640 Camera/Accessories
 Standard Assembly
 CONFORMS TO BS 8888
 TOLERANCING ISO 9015
 ISO 2768 - C L
 SERIAL FINISH: ALL DIMS UNLESS OTHERWISE SPECIFIED
 RETAIL: ALL DIMS UNLESS OTHERWISE SPECIFIED
 FINISH:

Design Engineering
 0810/2021
 5.1.05/5616
 Not to Scale
 13 of 17
 A1 815120



MWIR/LWIR 640 Imager

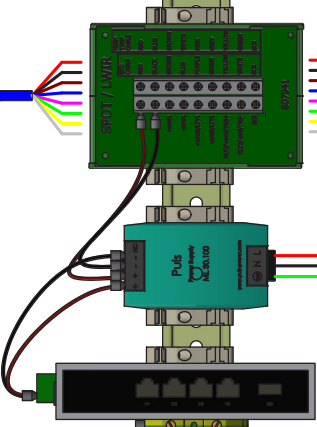
- 807950 5m Imager to Interface PCB Cable Std
- 807951 20m Imager to Interface PCB Cable Std
- 807952 50m Imager to Interface PCB Cable Std

Recommended Cable - Power & I/O

8 Core Screened Industrial Cable, 0.22 mm² Black
 Number of Cores 8
 Cross Sectional Area 0.22 mm²
 Screened/Unscreened Screened
 Length 25m
 Sheath Colour Black
 Screen Type Polyester Tape
 Screen Electrical Temperature +65°C
 Voltage Rating 440 V
 Minimum Operating Temperature -15°C
 Series 7/2/8C
 Conductor Material Tinned Copper

LWIR PCB Terminal No.	Wire Colour	Function
1	Red	+24V
2	Black	0V
3	Brown	+mA Out 1
4	Blue	-mA Out 1
5	Purple	+mA Out 2/Relay 1
6	Green	-mA Out 2/Relay 1
7	Yellow	+mA1 / TRG+ / RL12
8	White	-mA1 / TRG- / RL12
9	Screen	Screen

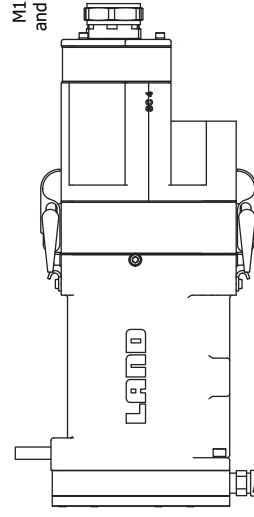
815180 Din Rail Assembly PSU + Interface PCB + Ethernet Switch



Connect to RJ45
 Connect from Ethernet Switch or Desktop PoE Straight to PC or Laptop
 Connect to RJ45

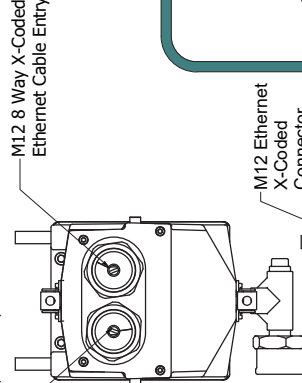
815130 MWIR/LWIR Light Housing with Purge

- 809294 5m M12 to RJ45 Cable Std Temp
 - 814616 20m M12 to RJ45 Cable Std Temp
 - 814617 50m M12 to RJ45 Cable Std Temp
- (High temp M12-M12 variants can be used when combined with M12-RJ45 adaptor 815157)



815120 MWIR/LWIR Industrial Housing

- 813514 10m Imager Power & I/O Cable High Temperature
 - 815071 25m Imager Power & I/O Cable High Temperature
 - 814968 50m Imager Power & I/O Cable High Temperature
- or
- 807950 5m Image Power & I/O Cable Std Temperature
 - 807951 20m Imager Power & I/O Cable Std Temperature
 - 812353 50m Imager Power & I/O Cable Std Temperature



- 810794 25m M12 to M12 Cable High Temp
 - 810889 50m M12 to M12 Cable High Temp
- (Std temp M12-RJ45 variants can be used if required)

Connect from Ethernet Switch or Desktop PoE Straight to PC or Laptop

Customer Supplied Cable
 See Recommended Cable Spec.

Customer Supplied Mains

Connect to RJ45

M12 Ethernet X-Coded Connector (F)
 M12 Ethernet X-Coded Connector (M)

M12 8 Way X-Coded Ethernet Cable Entry

M16 8 Way Power and I/O Cable Entry

M12 Ethernet X-Coded Connector

M16 8 Way Connector

ALL Materials and Finishes to be RoHS Compliant to Directive 2011/65/EU (EU) 2015 / 863
 Chemicals in breach of EU REACH or US TSCA limits in this product must be reported to Lant Instruments

DESIGN ENGINEERING
 CONFORMS TO BS 6888
 TOLERANCING ISO 8015
 ISO 2768 - C L

PRODUCT
 0310 LWIR 640 Camera Accessories

COMPONENT
 Standard Assembly

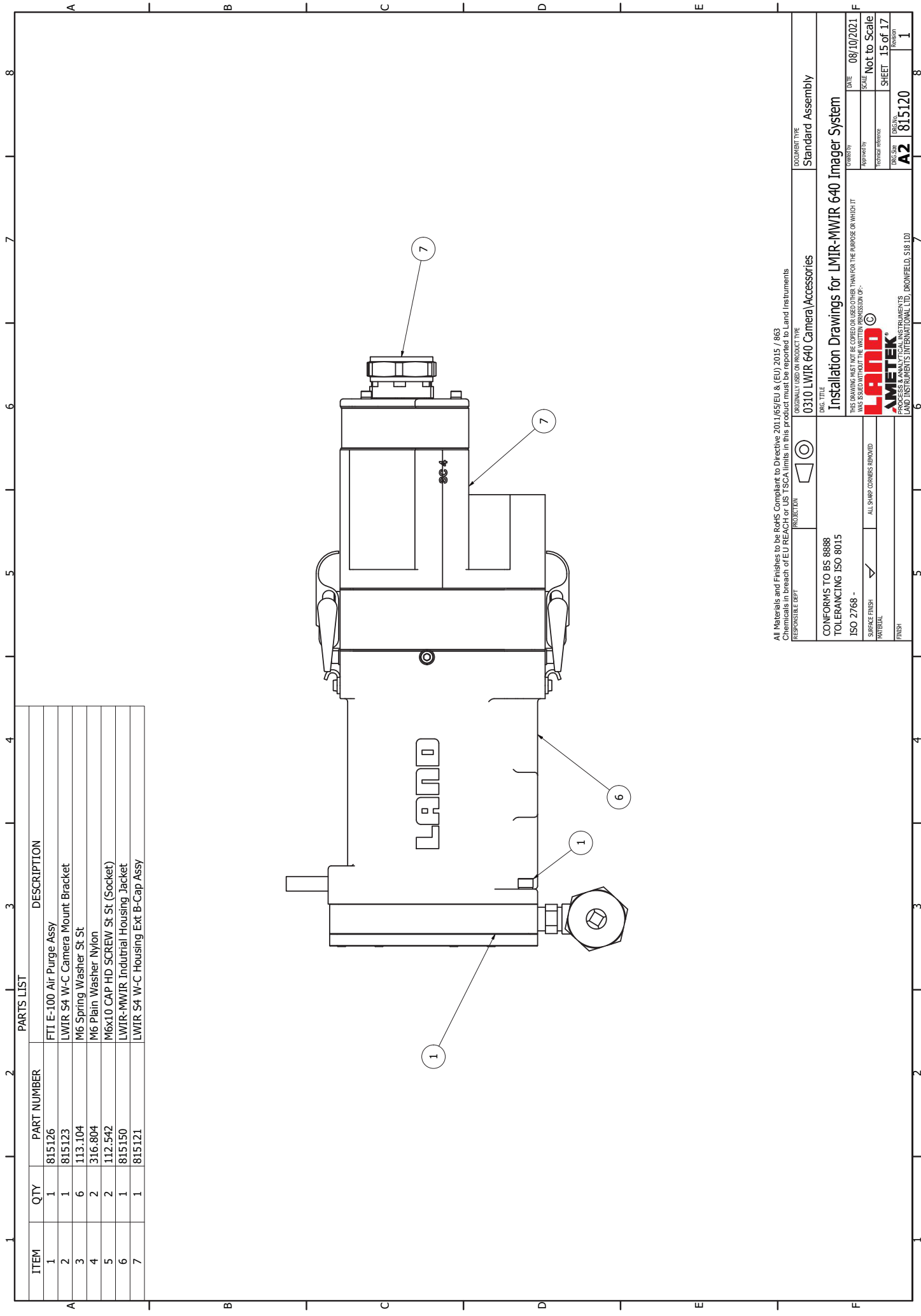
INSTALLATION DRAWINGS FOR LWIR-MWIR 640 Imager System

REVISED BY: S.Lonsdale
 DATE: 09/11/2021
 DRAWN BY: S.Lonsdale
 SHEET: 14 of 17

PROJECT
 ALUMINUM POWER BRACKET

DATE
 01/15/18

SCALE
 1:1



PARTS LIST		
ITEM	QTY	DESCRIPTION
1	1	FTI E-100 Air Purge Assy
2	1	LWIR S4 W-C Camera Mount Bracket
3	6	M6 Spring Washer St St
4	2	M6 Plain Washer Nylon
5	2	M6x1.0 CAP HD SCREW St St (Socket)
6	1	LWIR-MWIR Industrial Housing Jacket
7	1	LWIR S4 W-C Housing Ext B-Cap Assy

RESPONSIBLE DEPT: PRODUCTION
 ORIGINAL TITLE: 0310 LWIR 640 Camera Accessories
 DOCUMENT TYPE: Standard Assembly

CONFORMS TO BS 8888
 TOLERANCING ISO 8015

ISO 2768 - SURFACE FINISH
 ALL SHARP CORNERS REMOVED

DATE: 08/10/2021
 SCALE: Not to Scale
 SHEET: 15 of 17
 DRAWING NO: A2 815120
 PACK NO: 1

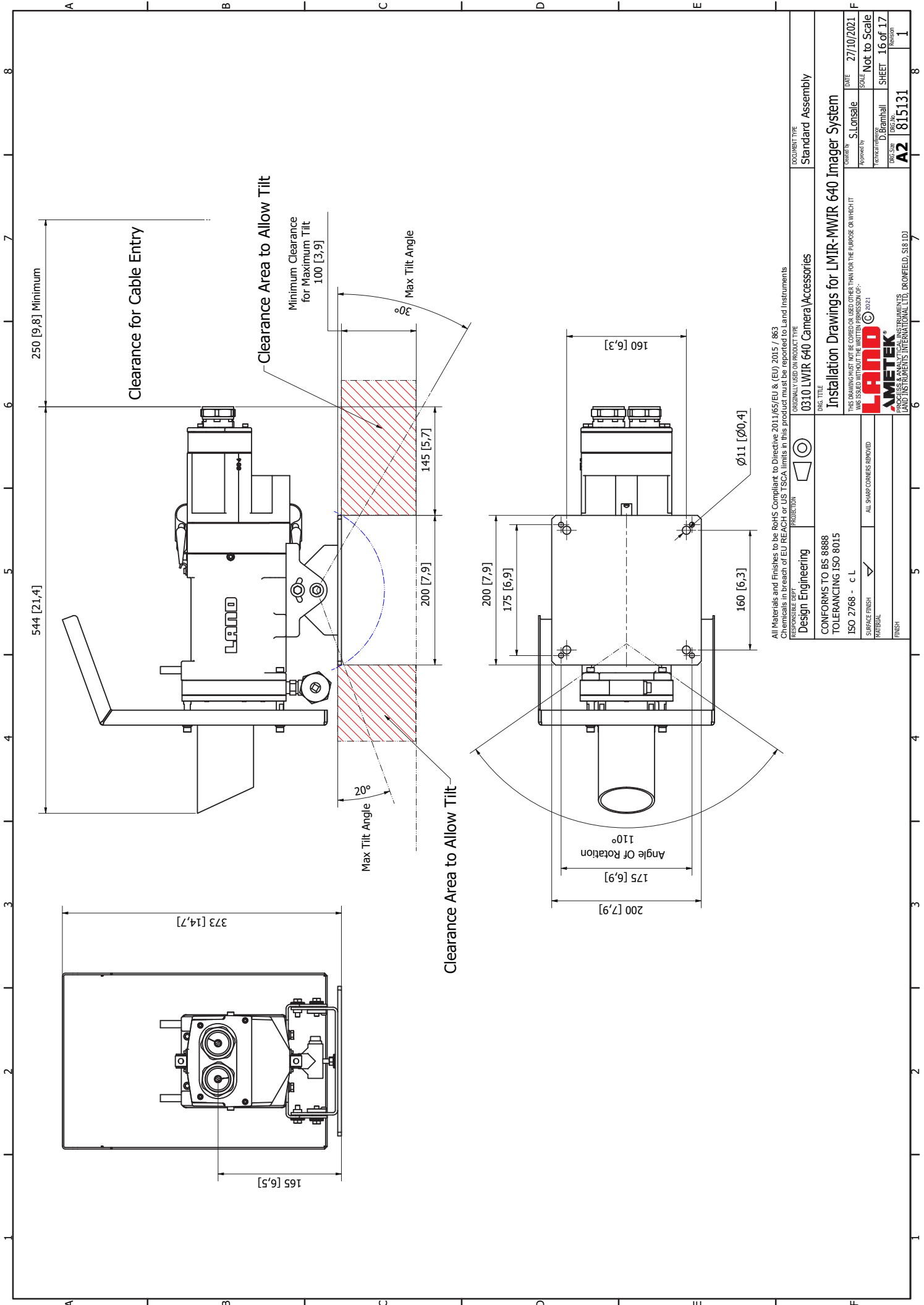
PKG TITLE: Installation Drawings for LMIR-MWIR 640 Imager System

THIS DRAWING MUST NOT BE COPIED OR USED OTHER THAN FOR THE PURPOSE OR WHICH IT WAS DESIGNED WITHOUT THE WRITTEN PERMISSION OF:-



PROCESS & ANALYTICAL INSTRUMENTS
 LAND INSTRUMENTS INTERNATIONAL LTD, BRONFIELD, S18 1LD

All Materials and Finishes to be RoHS Compliant to Directive 2011/65/EU & (EU) 2015 / 863
 Chemicals in breach of EU REACH or US TSCA limits in this product must be reported to Land Instruments



All Materials and Finishes to be RoHS Compliant to Directive 2011/65/EU & (EU) 2015 / 863
 Chemicals in breach of EU REACH or US TSCA limits in this product must be reported to Land Instruments

RESPONSIBLE DEPT Design Engineering	PRODUCTION	ORIGINAL NAME ON PRODUCT TYPE 0310 LWIR 640 Camera/Accessories	DOCUMENT TYPE Standard Assembly
CONFORMS TO BS 8888 TOLERANCING ISO 8015	DRG. TITLE Installation Drawings for LMIR-MWIR 640 Imager System	DATE 27/10/2021	CREATED BY S.Lonsdale
ISO 2768 - c L	THIS DRAWING MUST NOT BE COPIED OR USED OTHER THAN FOR THE PURPOSE OR WHICH IT WAS ISSUED WITHOUT THE WRITTEN PERMISSION OF:-	SCALE Not to Scale	APPROVED BY D.Ramhall
SURFACE FINISH MATERIAL FINISH	ALL SHARP CORNERS REMOVED	DRG. NO. 1866/01	TERMINATION 1866/01
		DRG. SIZE A2	REVISION 1



5

USING THE WEB SERVER INTERFACE

5.1 Connecting to the Web Server

You can access the LWIR Web Server via a computer/device with Internet access that is on the network to which the LWIR thermal imaging camera is connected.

The following web browsers are supported by the LWIR Web Server:

- Google Chrome
- Microsoft Edge
- Mozilla Firefox

Connection can be made either directly to the Ethernet port on the camera or via an Ethernet switch on the network.

A simple connection overview is given in Fig. 5-1. Refer to the Installation Drawings (Section 4) for more details of network connections.

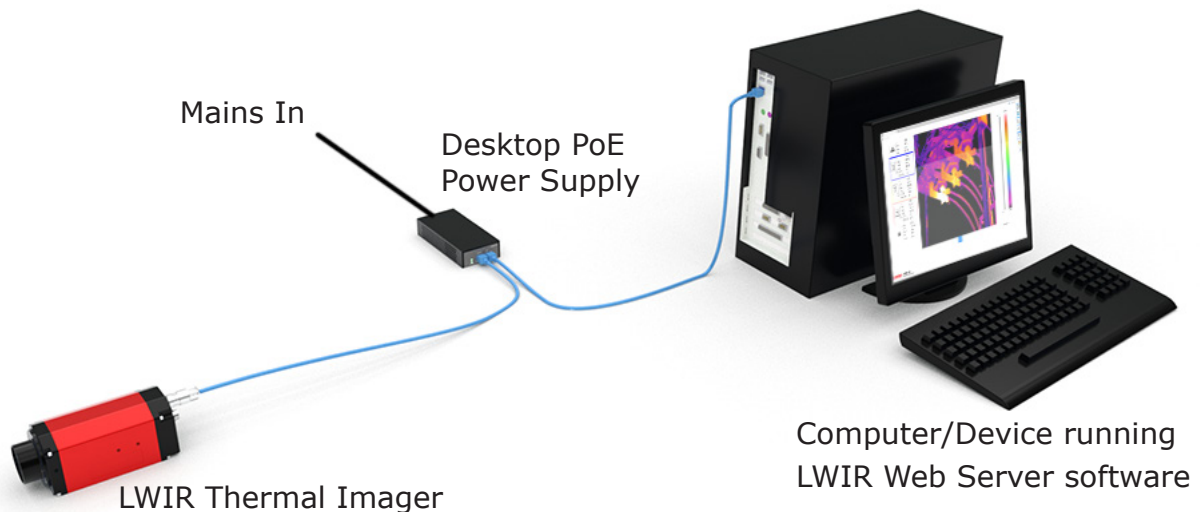


Fig. 5-1 Connecting to the Web Server

5.1.1 Network Adapter Settings

To communicate with the LWIR thermal imaging camera, you need to specify the correct Network Adapter Settings on your computer/device.

The instructions below apply to Windows 10 systems. If you have a different operating system, refer to the user guide/help files for your system.

- 1) In your computer's **Type here to search** box (bottom left of screen), type **Network Connections**.
The Network Connections window displays details of each network to which your computer is connected.
- 2) Right-click on the Network containing your LWIR thermal imaging camera and select the **Properties** option.
- 3) Select the **Internet Protocol** option and click on **Properties**.
- 4) Select the **Use the following IP address** option and enter the values:
IP address: **10 . 1 . 10 . 150****
Subnet mask: **255 . 255 . 0 . 0**
****** the default IP address for the LWIR thermal imaging camera is 10.1.10.102. For your computer, you can select any IP address from 10.1.10.1 to 10.1.10.255 *apart from 10.1.10.102*.
- 5) Click on **OK** to save these settings.
Your computer/device is now on the same network as the LWIR thermal imaging camera.

5.1.2 Opening the Web Server interface

- 1) Make sure the computer/device is connected to your LWIR's network and that all system components are connected and operating correctly.
- 2) Open a web browser.
- 3) In the web browser address bar, type **10.1.10.102**
The LWIR Web Server interface opens in your browser window.
Refer to Sections 5.2 to 5.10 for full details of the LWIR Web Server interface.

5.2 About the Web Server Interface

A typical Web Server Interface is shown in Fig. 5-2.

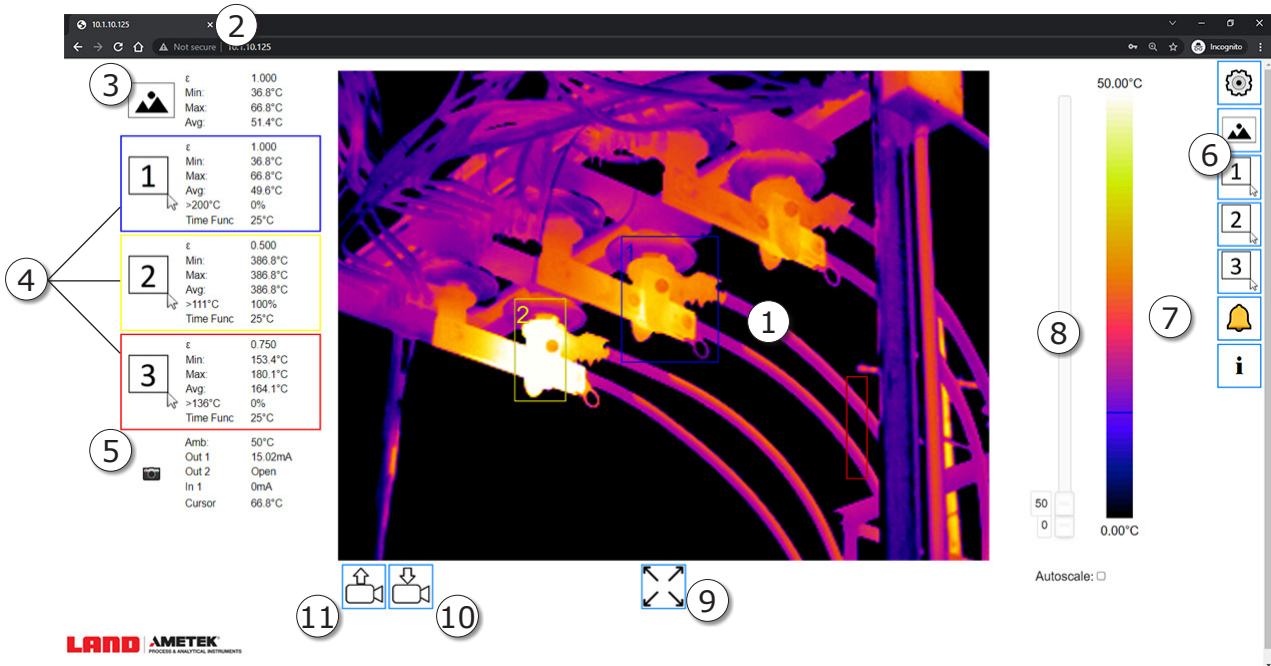


Fig. 5-2 Typical Web Server Interface

Item	Description
1	Thermal image (live image from LWIR)
2	IP Address of Web Server
3	Frame settings summary details
4	Regions of Interest (ROI) controls and summary details. Up to three ROIs are available. See sections 5.6 and 5.7.
5	LWIR camera summary details
6	Web Server menu. See section 5.3
7	Colour/Greyscale of temperature range (Palette). Choice of six Palettes available.
8	Temperature measurement span (user-adjustable). Upper and lower limits can be set to any points within measurement range of LWIR.
9	Full screen ON/OFF control
10	Save Camera Settings. Allows you to save any changes to the settings of the LWIR Thermal Imager.
11	Load Camera Settings. Allows you to upload previously saved settings into the LWIR Thermal Imager.

5.2.1 Web Server Interface Password

The Password prompt will appear whenever:






- Any **Settings** button *other than the Info* button is pressed, or
- Any Region of Interest (ROI) is switched On or Off

The default Password is **123456**.

The Password protection can be switched on or off, and the Password changed, in the **Settings** menu (See section 5.4).



5.3 About the Web Server Menu

The Web Server menu buttons are explained in the table below.

Item	Description
	Settings - opens the camera settings options, which allow you to Focus the camera in/out, perform a non-uniform correction (NUC) on the camera, select the Unit of temperature measurement, and change the system Password . For more information see Section 5.4.
	Frame Settings - allows you to set the Emissivity , Background Temperature , and any Time Function to be used in temperature measurement for the entire thermal image. For more information see Section 5.5.
	Regions of Interest (ROI) - you can create up to three Regions of Interest (ROI) on the thermal image. For each ROI you can specify the Emissivity , Background Temperature , Temperature Threshold , and any Time Function to be used in temperature measurement for the ROI. These settings will override any set in the Frame settings. For more information see Sections 5.6 and 5.7.
	I/O - allows you to set up to three outputs, or two outputs and one input. For more information see Section 5.8.
	Information - gives read-only information relating to the system, including camera type, serial number, software versions, latest calibration date, and MAC address.

5.4 Settings

The following options are available in the Settings menu.

Item	Description
	Focus in/Focus out - moves the camera lens in or out as required. Press and let go to move the lens only a short distance. Press and hold to move the lens a longer distance.
	Non-Uniformity Correction (NUC) - a non-uniformity correction adjusts the thermal image for minor errors that are introduced gradually over time due to the heat of the camera. Press the NUC button to reset the thermal image.
	Unit (Temperature) - allows you to select either °C (Celsius) or °F (Fahrenheit) as your unit of temperature measurement.
	Security - use the check-box to select whether or not you want to password-protect your system. Click on the Change Password button to set a new password. Follow the on-screen instructions to set the password.



5.5 Frame Settings

Frame Settings are applied to the entire area covered by the thermal image. To use different settings for individual areas, you can set up Regions of Interest (ROI).

For details of ROI refer to Section 5.6.

The following options are available in the Frame Settings menu.

Item	Description
Emissivity	<p>To measure temperature correctly with an infrared camera, the Emissivity of the target must be known.</p> <p>You can select a Source for the Emissivity:</p> <ul style="list-style-type: none"> • Manual - If you know the Emissivity of the area covered by the thermal image, use the slider to set the required value, or type it into the text-input box. • mA In - with this option, you can use a current loop input to set the emissivity value, where: 4 mA = 0.10 and 20 mA = 1.00 <p>For more information on Emissivity, visit www.ametek-land.com.</p>
Background Temperature	<p>The temperature of the area surrounding an object being measured can have an effect on the temperature value calculated by the thermal imaging camera e.g. if an object is inside a heated chamber or furnace, the temperature of the furnace wall will affect the reading.</p> <p>You can select a Source for the Emissivity:</p> <ul style="list-style-type: none"> • None - no correction. • Manual - If you know the Background Temperature of the area covered by the thermal image, use the slider to set the required value, or type it into the text-input box. • ROI (1,2 or 3) - Uses the temperature of the ROI as the background temperature. • mA In - with this option, you can use a current loop input to set the background temperature value, where: 4 mA = 0°C and 20 mA = 2000°C • Camera Ambient - uses the ambient temperature of the LWIR thermal imaging camera as the background temperature.

- 1
- 2
- 3

5.6 Regions of Interest (ROI)

Regions of Interest (ROI) allow you to create up to three areas within the thermal image and apply individual measurement settings to each one.

The settings applied to an ROI will override any settings specified in the Frame Settings.

The following options are available for each ROI.

Item	Description
Emissivity	To measure temperature correctly with an infrared camera, the Emissivity of the target must be known. If you know the Emissivity of the area covered by an ROI, use the slider to set the required value, or type it into the text-input box. For more information on Emissivity, visit www.ametek-land.com .
Background Temperature	The temperature of the area surrounding an object being measured can have an effect on the temperature value calculated by the thermal imaging camera e.g. if an object is inside a heated chamber or furnace, the temperature of the furnace wall will affect the reading. You can use the Background Temperature setting to input this temperature value which will be taken into account when calculating the actual temperature of the target in the ROI.
Threshold	This option allows you to set a value against which all measurements in the ROI are compared. The Threshold value is a percentage, so its value can be 0 to 100% and you can use the High or Low option to show the percentage of pixels either above or below the set value.
Time Function	This option allows you to select a temperature Input value from the ROI. You can select either the Minimum , Maximum , Mean or a percentage greater than value (>%) for the input. You can then apply one of the following time function processing calculations to the input: None , Average , Peak Picker , Rate of Change , Sample and Hold . For example, to display the maximum temperature measured in an ROI over a period of time, select the Max input and apply the Peak Picker function to it. For more information on Time Functions, refer to Section 5.11.

5.7 Working with Regions of Interest (ROI)

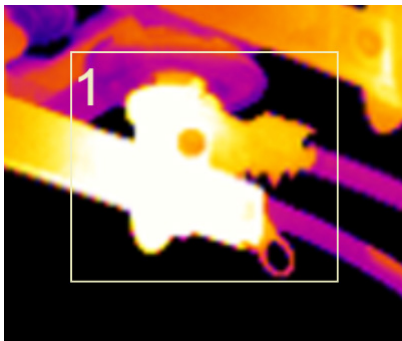
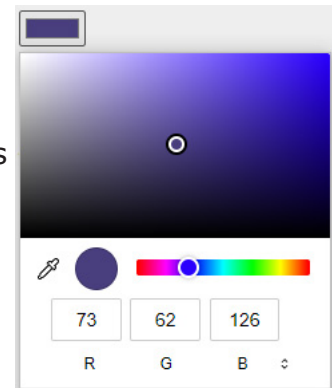
You can create up to three areas within the thermal image and apply individual measurement settings to each one.

Creating an ROI

- 1) To create an ROI, click on the required ROI information panel to the left of the Web Server thermal.
The ROI information panel is highlighted and the ROI is displayed on the thermal image in the same colour as the Information panel border.

1	ϵ	1.000
	Min:	-°C
	Max:	-°C
	Avg:	-°C
	>100°C:	-%
	Time Func	25°C

- 2) On the thermal image, click and drag the mouse pointer to create a rectangle in the location where you want the ROI to be.
The ROI details are updated to show the co-ordinates and size of the ROI.
- 3) To help see the ROI, use the colour swatch controls to select a colour for the ROI that contrasts against the thermal image.
- 4) The ROI is updated.



Resizing an ROI

- 1) To resize an ROI, hold your mouse pointer over the corner of the ROI.
The mouse pointer becomes a double-headed arrow.
- 2) Click to drag the corner to the required position on the thermal image.
- 3) Repeat the process for any other corner you want to relocate.

Alternatively, you can simply redraw the ROI in the required location.

Showing and Hiding an ROI

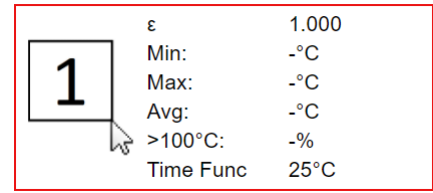
When an ROI is active, a box the same colour as the ROI is displayed around the ROI information panel to the left of the thermal image.

To hide the ROI, click on its information panel.

The ROI disappears from the thermal image and information panel is greyed-out.

To activate the ROI, simply click on its information panel again.

Note: The ROI will still function in the thermal imaging camera, but will not shown in the Web Server.



ROI Settings

- 1) To adjust the settings of an ROI, click on the required ROI numbered button in the Web Server menu, to the right of the thermal image.



The ROI settings are displayed.

- 2) You can adjust the colour of the ROI by clicking on the colour swatch and selecting the required colour from the palette.
- 3) To set the **Emissivity** of the area covered by the ROI, you can either select a **Manual** input and type in the required Emissivity value (or set it via the slider), or you can choose to have the Emissivity set via a 4 to 20 mA current input (**mA In**). For more details on using the **mA In** option, see Section 5.8 I/O.
- 4) For **Background Temperature**, the following options are available:
 - **None** - No background temperature correction.
 - **ROI** - uses the temperature value of another ROI in the thermal image to set the background temperature value.
 - **mA In** - uses a 4 to 20 mA current input to set the background temperature value.

ROI 1

StartX: 1
StartY: 1
Width: 628
Height: 468

Emissivity
Manual ▾
1
0.100 1.000

Background Temperature
None ▾
150 °C

Threshold
200 °C
High ▾

Time Function
Input: Mean ▾
Function: Average ▾
Period: 1 S

For more details on using the **mA In** option, see I/O options in Section 5.8.

- 5) **Threshold** - allows you to set a temperature value against which all pixels in the thermal image can be compared. For example, if you set a Threshold temperature value of 200 °C and select the High option, the ROI information panel will display >200°C - x%, where x is the percentage of pixels above 200 °C in the thermal image. Similarly, the Low option will display the percentage of pixels below the Threshold value.

- 6) **Time Function** - this option allows you to select an Input value from the ROI - either the **Min, Max, Mean** or **>%** (Percentage above Threshold) and apply a time function to it.

The time functions available are **Average, Peak Picker** or **Sample and Hold**.

For more information on Time Functions, see Section 5.11.



5.8 I/O

You can use the Web Server to set up and control up to three outputs, or two outputs and one input for the LWIR thermal imaging camera.

A typical I/O interface is shown in Fig. 5-3.

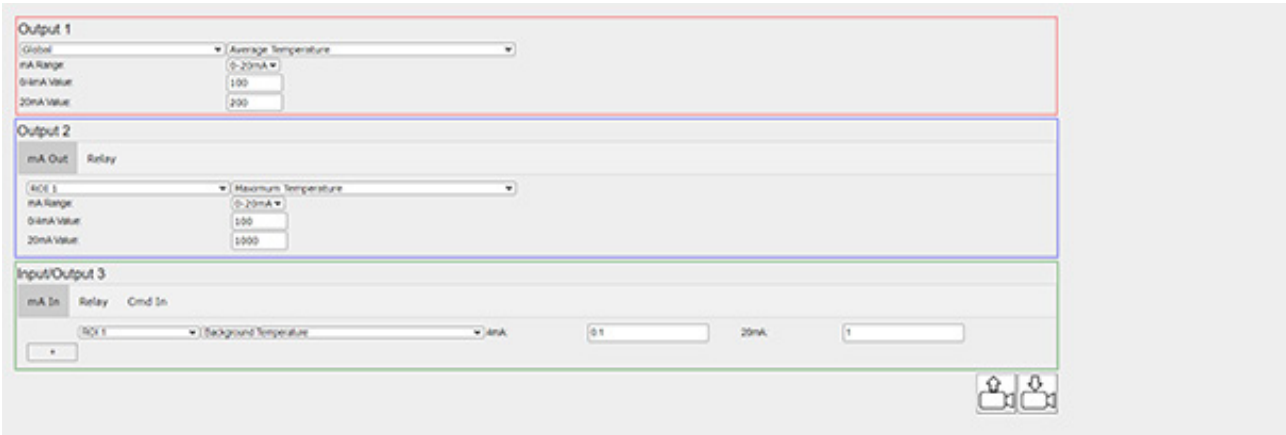


Fig. 5-3 Typical Web I/O Interface

The interface also shows the pin connections for the outputs/ inputs on the LWIR cable connector.

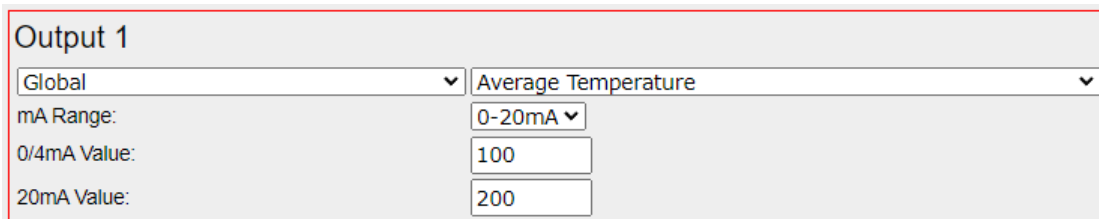
The following outputs/inputs are available:

- **Output 1** - 0 to 20 mA or 4 to 20 mA current output;
- **Output 2** - 0 to 20 mA or 4 to 20 mA current output **or** Relay output;
- **Input/Output 3** - 0 to 20 mA current input **or** Relay output **or** Command input.

Output 1

For Output 1, use the drop-down boxes and text input fields to set the required values for this output.

For example, you could set the **Frame** (i.e full thermal image) **Average Temperature** to be output across **0-20 mA**, where **0 mA** corresponds to 100 °C and **20 mA** corresponds to 200 °C.



Output 2

For Output 2, the **mA Out** settings are identical in operation to those of Output 1.

For the **Relay** settings, use the drop-down boxes to select the source of the output e.g. ROI 1, and the type of output required e.g. Maximum temperature. Use the text input field or the slider bars to set the upper and lower limits for this setting

For example, for **ROI 1** you could set the **Maximum Temperature** to activate the relay output if it goes outside the range **600 °C** to **750 °C**.

Output 2

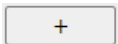
mA Out **Relay**

ROI 1 | Maximum Temperature | 600.00 | 750.00

Alarm logic: AND

Normal State: Closed

You can specify multiple triggers for the relay by simply clicking on the **Add** button.



For a relay output with multiple triggers, if the **Alarm logic** control is set to **OR**, the relay is triggered when *at least one* of the alarm conditions is met. If the **Alarm logic** control is set to **AND**, the relay is triggered when *all* of the alarm conditions are met simultaneously.

For example, you can set the relay output to be activated if the **Maximum Temperature** of **ROI 1** goes outside the range **600 °C** to **750 °C**, **OR** the **GLOBAL** Maximum Temperature goes outside the range **400 °C** to **500 °C**

Output 2

mA Out **Relay**

ROI 1 | Maximum Temperature | 600.00 | 750.00

- | Global | Maximum Temperature | 400.00 | 500.00

Alarm logic: OR

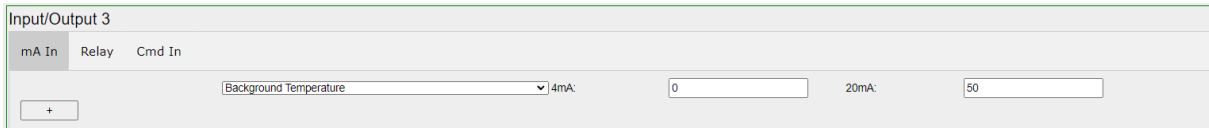
Normal State: Closed

To delete a relay setting, click on its **Remove** button

Input/Output 3

For **mA In**, use the drop-down boxes and text input fields to set the required values for this input.

For example, you could set a **Background Temperature** input for **ROI 1** where **4 mA** corresponds to 0°C and **20 mA** corresponds to 50°C.



For Input/Output 3, the **Relay** settings are identical in operation to those of Output 2.

The options available for the Command input (**Cmd In**) for Input/Output 3 each relate to the LWIR **Camera** and are as follows:

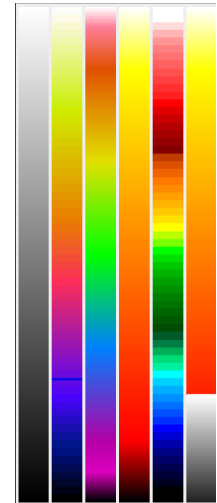
- **NUC** - the command input will trigger a Non-Uniformity Correction in the Camera;
- **Auto NUC Disable** - the command input will switch off the automatic Non-Uniformity Correction in the Camera;
- **Reset Time Function** - The command input will reset any time functions that are active e.g. Peak Picker, Averager, Track and Hold etc.

5.9 Selecting a Colour Palette

The LWIR Web Server has a range of colour/greyscale palettes available.

You can select which colour/greyscale give you the best results for your particular application.

- 1) To select a palette, click on the colour/greyscale to the right of the thermal image.
A pop-up window displays the range of available palettes.
- 2) Click on the required palette to activate it.
The thermal image is displayed using the new palette.

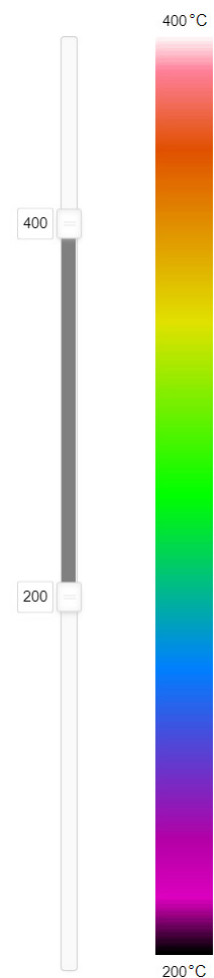


5.10 Adjusting the Temperature Span

By default, the LWIR Web Server colour/greyscale palette covers the entire temperature range of your LWIR Thermal Imaging Camera - either 0 to 500°C, or 100 to 1000°C. However, your application may have temperatures which are well within these lower and upper limits.

You can adjust the temperature measurement span limits as follows:

- 1) On the grey vertical bar to the left of the palette, drag the upper and lower temperature limit setting boxes to match the temperature span you want to measure e.g. 200 to 400°C.
The values displayed at the top and bottom of the palette are adjusted to match your span settings, and the thermal image will be updated to use these values.
- 2) You can also use the **Autoscale** feature, which will automatically adjust the measurement span limits to match the highest and lowest temperatures measured in the thermal image.



5.11 Time Function Processing

The LWIR Web Server software contains a number of Time Function algorithms which help deliver a more consistent temperature reading from a sometimes noisy, changeable reading from the LWIR thermal imager.

The following sections help you choose and configure the time function most appropriate for your application.

5.11.1 None

The Web Server will display the raw output from the LWIR thermal imaging camera.

5.11.2 Averager

Refer to Fig. 4-2. The Averager time function can be used to 'smooth' the temperature output signal in relation to the temperature input. The Averager response can be adjusted to suit your application. With a fast response speed, the temperature output signal tracks the input signal closely, any rapid fluctuations in the input are reflected in the output. With a slow response speed, the temperature output signal is much smoother, displaying more the 'trend' of the input signal rather than rapid changes.

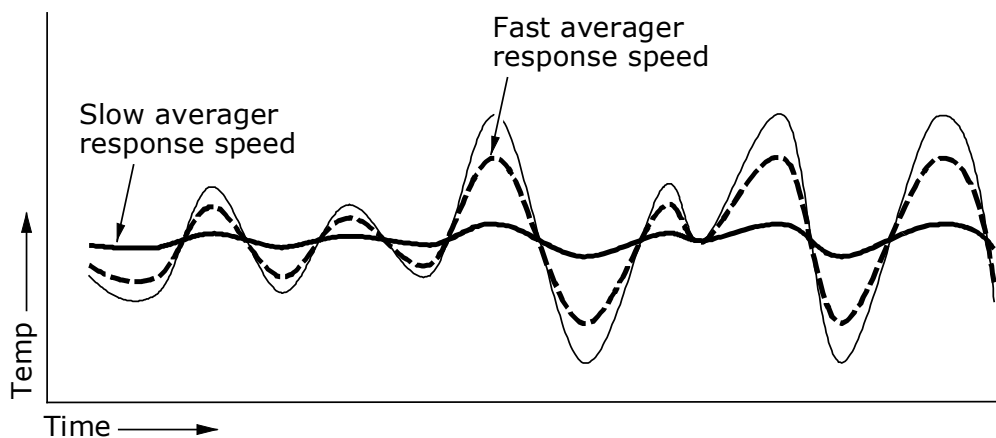


Fig. 5-4 Graphical representation of the Averager time function

5.11.3 Peak Picker

The Peak Picker function can be used to monitor the highest temperature measured in the thermal image (or ROI). This feature is useful especially for moving targets and/or where the target is obscured partially e.g. a steel slab on a rolling mill where parts of the surface are covered with scale. The 'clean' area will be at the higher (i.e. true) temperature. The Peak Picker used in the LWIR Web Server processors has the following features.

- Threshold level Temperature above which the Peak Picker is active, used in conjunction with the ON and OFF delay.
- ON delay Time period between the temperature rising above the threshold level and the Peak Picker function switching on.
- OFF delay Time period between the temperature falling below the threshold level and the Peak Picker function switching off.
 - In 'Hold' mode, at the end of the 'OFF' delay, the temperature output value is held constant until the temperature input next rises above the threshold level.
 - In 'Reset' mode, at the end of the 'OFF' delay, the temperature output signal falls to 'under-range' until the temperature input next rises above the threshold level.
 - In 'Sample' mode the peak picker samples for a pre-defined period, then outputs this value.
- Decay rate A user-adjustable value at which the stored temperature output signal decays.

The Peak Picker function can be reset via the CMD (Command) input.

For typical Peak Picker and Peak Sampler responses, see Fig. 5-5 and Fig. 5-6 respectively.

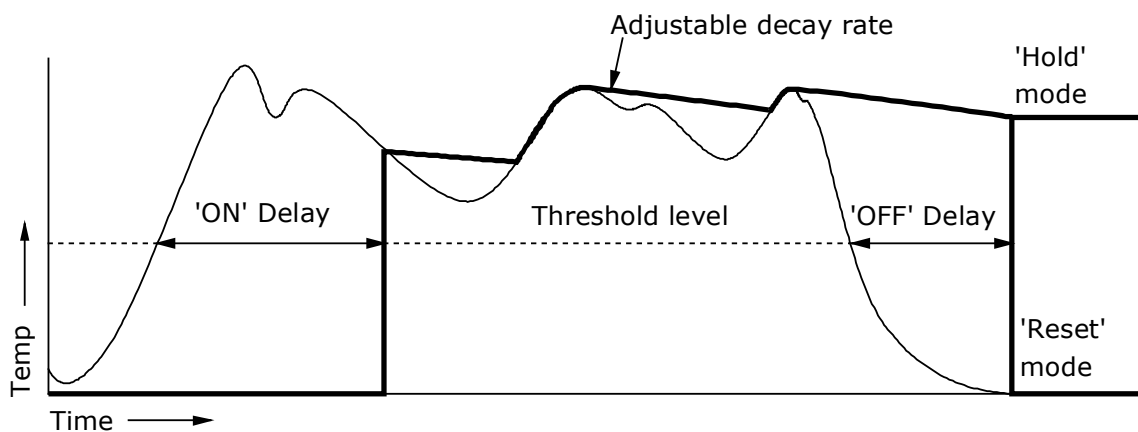
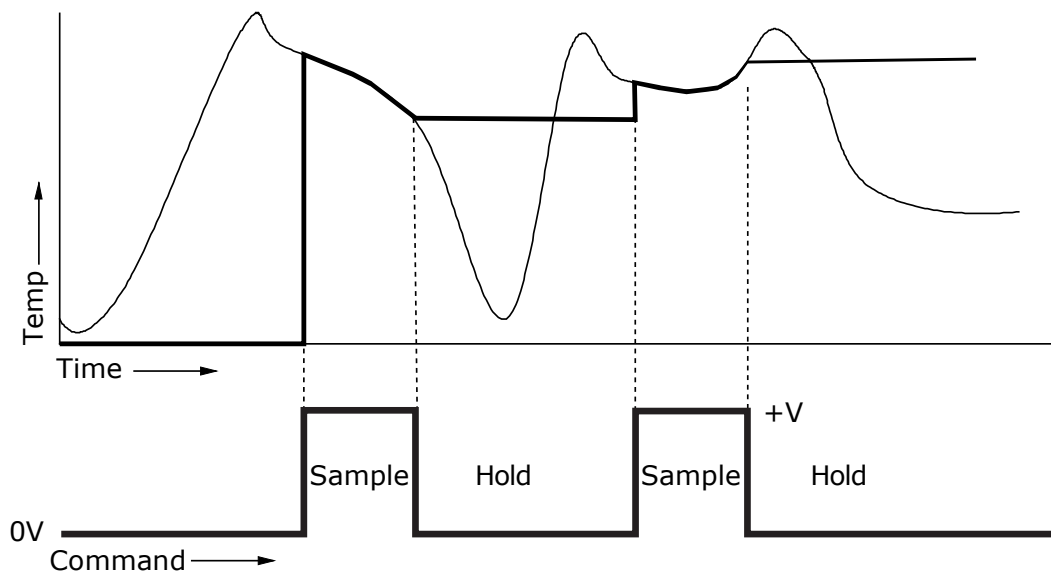


Fig. 5-5 Graphical representation of the Peak Picker time function

5.11.4 Sample and Hold



Command signal = Closure of potential-free contacts, s/c = Hold
 TTL level (0 to 5V) +5V = Track
 or 0 to 24V +24V = Track
 0V = Hold

Fig. 5-6 Graphical representation of Sample and Hold time function

Refer to Fig. 5-6. The Sample and Hold time function is useful especially for measuring intermittent processes e.g. items on a conveyor belt. The presence of a hot object can be used to activate the Sample function, which displays a live thermal temperature of the object. When the object moves from the measurement area, the Sample function can be switched off and the thermal image not updated until the next hot object appears.

The Sample and Hold function is controlled via the CMD (Command) input.

6

SPARES & ACCESSORIES

6.1 Standard Power Supplies

Description	Part N°
Thermal Imaging Power Supply (UL Approved)	813478
Thermal Imaging Power Supply PoE+ (UL Approved)	815177
Process Imager Power Supply	805753
Process Imager PSU Mains Power Connector	805755
DIN Rail Mounted 24V PSU	404.156

6.2 Power over Ethernet (PoE) Power Supplies

Description	Part N°
DIN Rail Mounted 24V PSU and PoE Switch Assembly	815153
DIN Rail PSU, Interface PCB and Ethernet Switch	815180
Desktop PoE Power Supply	805024

6.3 Power I/O Cables

Standard Temperature Cables

Camera to DIN Rail PSU/Connection PCB/Thermal Imaging PSU

Description	Part N°
5m Imager to Power Cable with 1 x Connector	807950
20m Imager to Power Cable with 1x Connector	807951
50m Imager to Power Cable with 1x Connector	814968

High Temperature Cables

Camera to DIN Rail PSU/Connection PCB/Thermal Imaging PSU

Description	Part N°
10m Imager to Power Cable with 1 x Connector	813514
20m Imager to Power Cable with 1x Connector	815071
50m Imager to Power Cable with 1x Connector	814968

Camera to Process Imager PSU only

Description	Part N°
5 m Imager to Power Cable with 2 x Connectors Standard temperature	815154
20 m Imager to Power Cable with 2 x Connectors Standard temperature	815155
50 m Imager to Power Cable with 2x Connectors Standard temperature	815156

6.4 Communications/PoE Cables**Camera to Thermal Imaging PSU only**

Description	Part N°
25 m M12 to M12 communication cable 2 x Connectors Standard temperature	810794
50 m M12 to M12 communication cable 2 x Connectors Standard temperature	810889

Camera to RJ45 Ethernet port (Thermal Imaging PSU/PC/Switch)

Description	Part N°
5 m M12 to RJ45 communication cable with 2 x Connectors Standard temperature	809294
20 m M12 to RJ45 communication cable with 2 x Connectors Standard temperature	814616
50 m M12 to RJ45 communication cable with 2 x Connectors Standard temperature	814617

Convert high temperature cables to be RJ45 at one end

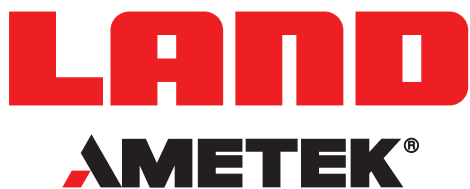
Description	Part N°
M12F to RJ45M Adaptor Cable	815157

6.5 Housings and Accessories

Description	Part N°
LWIR/MWIR Industrial Jacket	815150
LWIR/MWIR Industrial Air Purge	815126
LWIR/MWIR Industrial Back cap	815121
LWIR/MWIR Industrial Housing	815120
Industrial Mounting Pan and tilt assembly	813472
Industrial Mounting Splash protection plate Suitable for use with cameras with Horizontal FOV 11 or 6 deg	813479
Industrial Mounting Splash protection plate Suitable for use with cameras with Horizontal FOV 50 or 28 deg	814876
LWIR-640 light housing with purge	815130
Light Housing - Provides basic protection of the camera with an air purge to keep the lens clean. A prewired connection PCB is located inside the housing for making terminal connections.	
Pan and tilt bracket assembly	806761
For mounting camera only (without protective housings)	
Wall bracket assembly	808251
For installing light housing onto wall or ceiling	
LWIR/MWIR Interface PCB	815131

LWIR

HIGH PRECISION LONG WAVELENGTH
THERMAL IMAGING CAMERA



CONTACT US



www.ametek-land.com



land.enquiry@ametek.com



AMETEK Land's AMECare Performance Services ensure peak performance and maximum return on investment over the life of your equipment.

We deliver this by:

- Proactively maintaining your equipment to maximize availability.
- Optimizing solutions to meet your unique applications.
- Enhancing user skills by providing access to product and application experts.

AMETEK Land's global service network provides unparalleled after-sales services to ensure you get the best performance and value from your AMETEK Land products. Our dedicated service centre teams and on-site engineers are trained to deliver the highest standard of commissioning, maintenance and after-sales support.

Our worldwide network of Service Centres includes:

UNITED KINGDOM | USA | UAE | ITALY | INDIA | GERMANY | CHINA

WWW.AMETEK-LAND.COM/SERVICES

For a full list of international offices, please visit our website www.ametek-land.com

Copyright © 2021 LAND Instruments International.

Continuous product development may make it necessary to change these details without notice.

LWIR Camera Installation Guide, Issue 1, 07 December 2021