

Interface Control Document

Under Slung Load Camera (USLC)

**CAMV-1500-01 (PAL)
CAMV-1500-02 (NTSC)**





Interface Control Document

Under Slung Load Camera (USLC)

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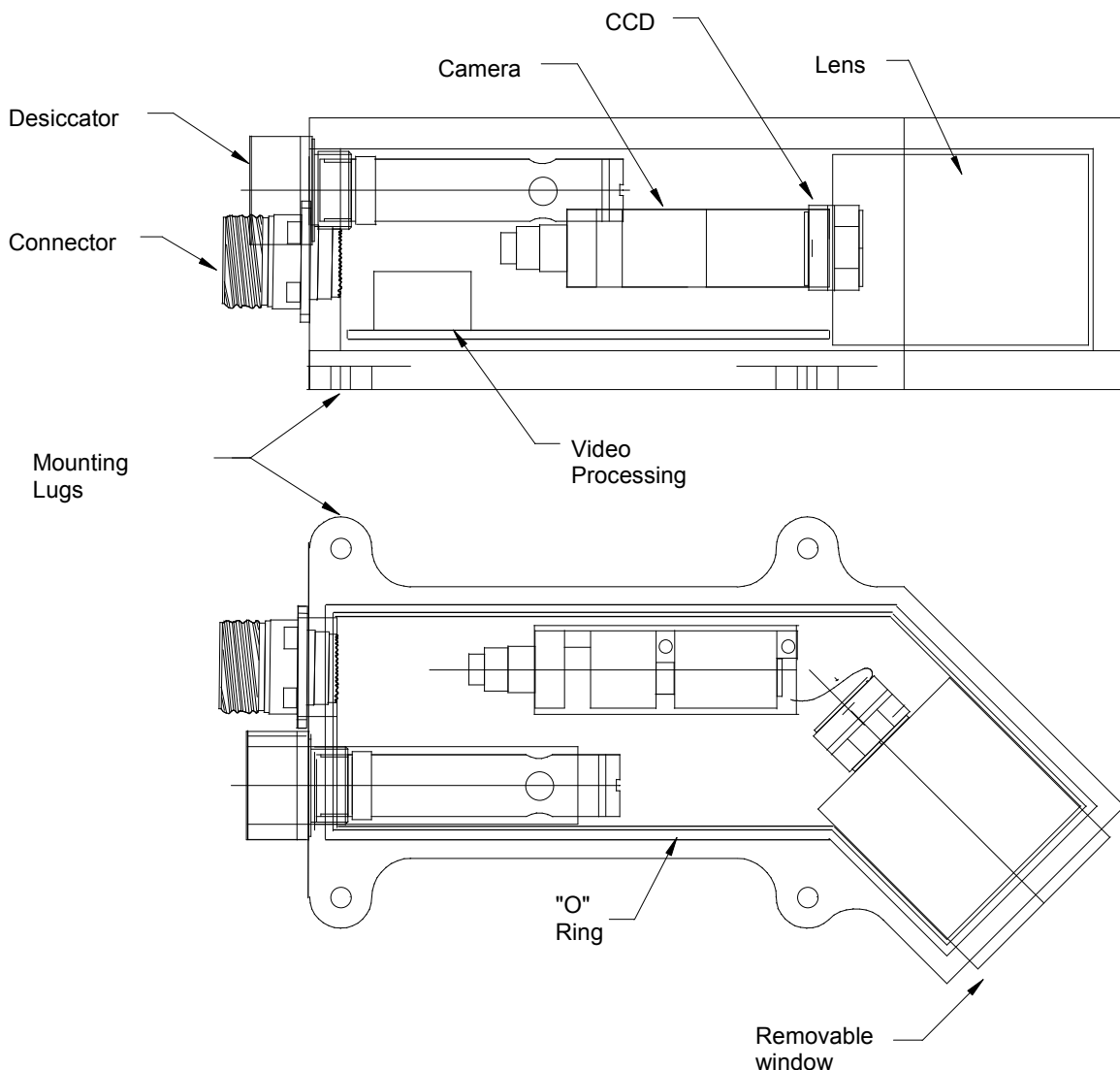
Interface Control Document



1 Purpose

The purpose of this document is to outline all the external interfaces for the Underslung Load Camera CAMV-1500-01.

The principal components of the system are shown in the diagram below





2 References

2.1 The following documents and drawings are referenced:

Document No.	Name	Rev	Date
MIL-C-38999,	Connector, Electrical.	-	-
DEF STAN 00-18	(RGB video to STANAG 3350 Class B).	-	-

3 Interfaces

3.1 Mounting position on the Aircraft

The unit is intended to be mounted on a suitable vertical surface on the belly of the aircraft providing a view of the Cargo hook assembly and the under slung load below.

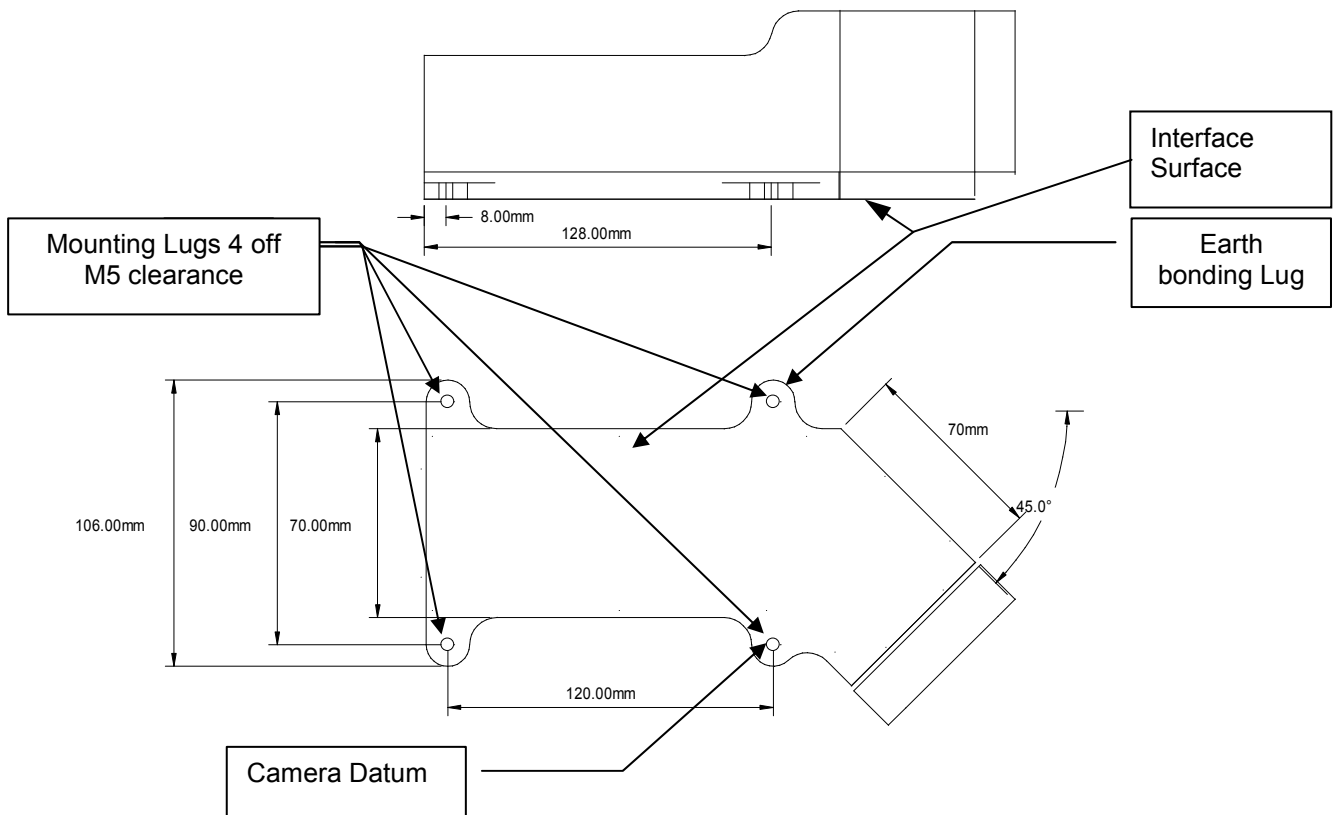
A single electrical connector provides Power to and carries video from the unit.

An optional data bus provides remote operation, status monitoring and control of the camera operating parameters which are set to "Automatic" by default.

3.2 Mounting dimensions

The Underslung Load camera unit CAMV-1500-01 is to be mounted using M5 bolts through 4 off M5 clearance mounting bosses to the port side vertical face of a suitable fairing. The mounting feet dimensions of the unit are shown below.

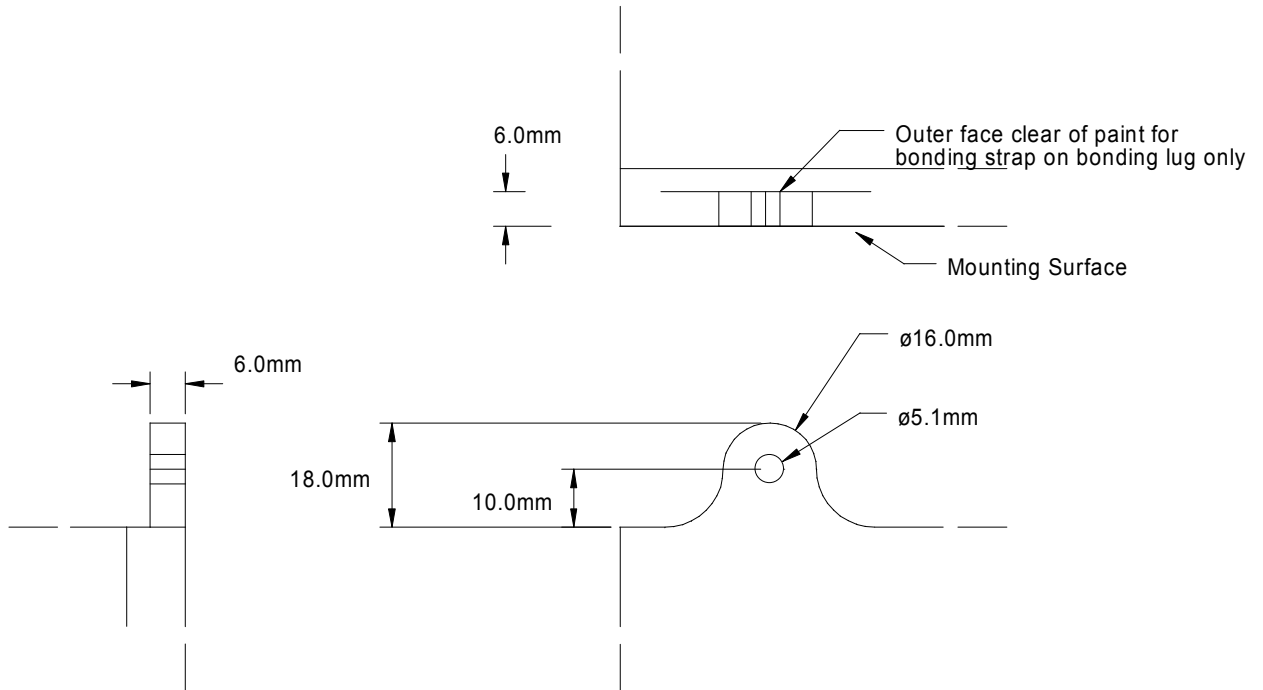
The drawing below details the location of the mounting feet of the unit .



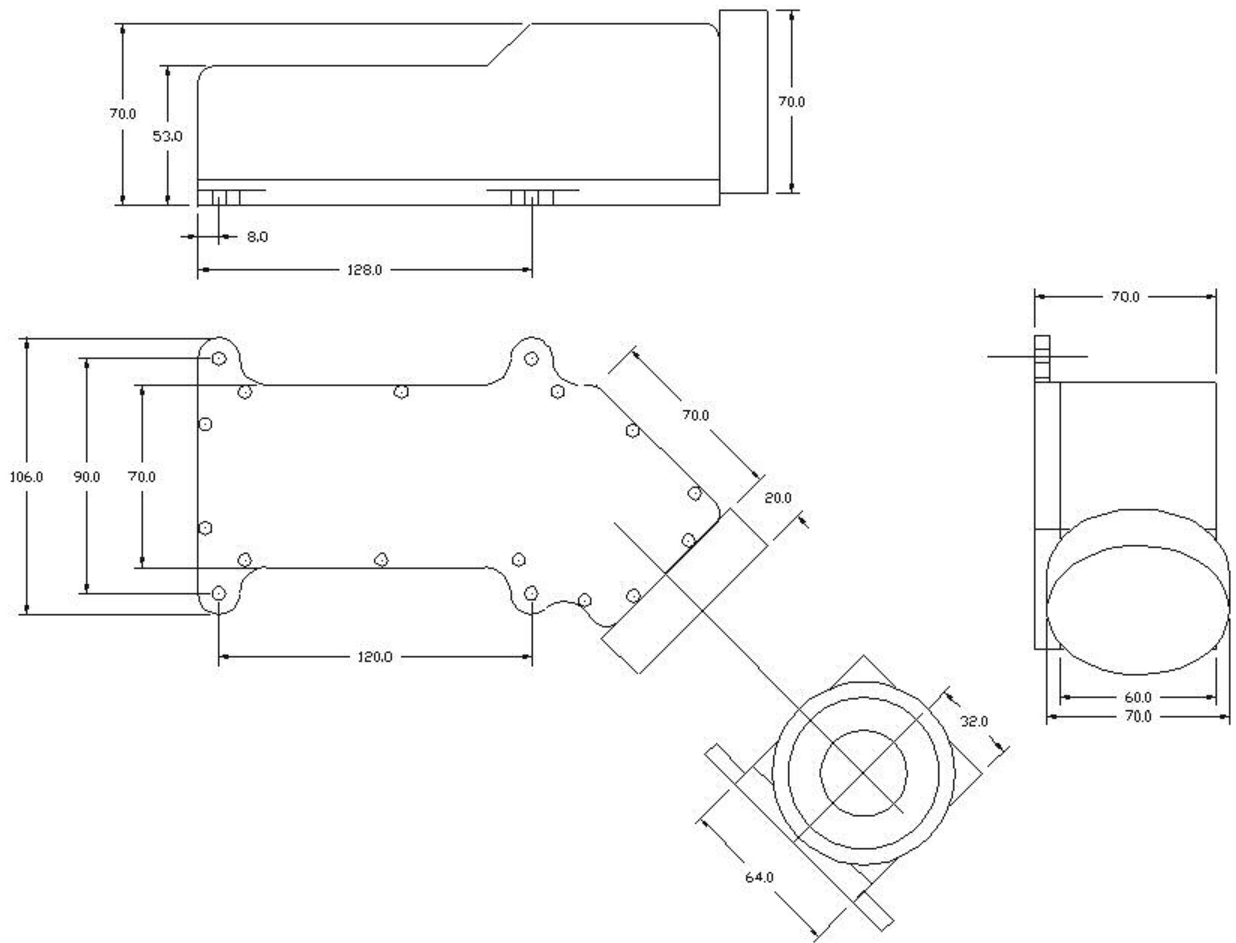
3.3 Electrical Bonding

The forward, upper mounting foot is prepared and cleaned off on its port face to form an RF bonding surface for the unit. The installation will ensure that the unit is bonded to the aircraft through a strap to this mounting foot where necessary.

The drawing below shows the detail of the mounting lug geometry.



3.4 Physical Dimensions



3.5 Mass
1.2kg

3.6 Centre of Gravity

With respect to the camera mounting datum [lower forward mounting foot]

Aft	17mm
Port	30mm
Vertical	38mm

3.7 Power consumption and dissipation

Power – Nominal 0.8A, 1.2A Peak@28V DC

3.8 Paint finish

The unit is usually supplied with the following finish to allow the installer to match the aircrafts paint scheme:

- Primer BLACK Low V.O.C High Adhesion BS X33 Type B

Type:	Primer Black Low V.O.C. High Adhesion BS X33 Type B
Base:	PR205 C9553 (Black)
Curing Agent:	Activator No. 205
Thinner:	None
Mixing Ratio:	3 : 1
Viscosity:	Used as mixed. (Without additional thinners)

3.9 Sightline angle datum

Responsibility for ensuring the camera enclosure is mounted on a vertical plane rests with the installer. This forms the datum for the sightline of the unit.

3.10 Camera sightline geometry

Camera optical offset angle from aircraft centre line (Camera Pan)	Zero degrees
Camera optical offset angle from aircraft vertical axis (Look down)	Centre of image 45 degrees down from the horizontal
Image should encompass:	Top of image to just above the cargo hook eye. Bottom of image to just below 16ft (5m vertically) from the cargo hook
Camera Vertical field of view	Nominal 90 degrees
Camera Horizontal field of view	Nominal 120 degrees to match vertical FOV (4:3 aspect ratio) may have some vignette in the uncropped image

Approximate location of camera optical origin, the origin of the field of view cone (wrt. camera datum [Lower forward mounting lug])

Forward	52mm
Port	40mm
Vertical	7 mm

3.11 Camera video signal definition

The video from the camera is presented both as a composite colour image and as red green and blue signals with synchronisation information carried on the green channel.

Composite

- Single 75 ohm coax
- 1V p-p (Sync tip to peak white level)
- Signal timing 625 or 525 line standards (4:3 aspect ratio)
- Colour encoding to PAL or NTSC

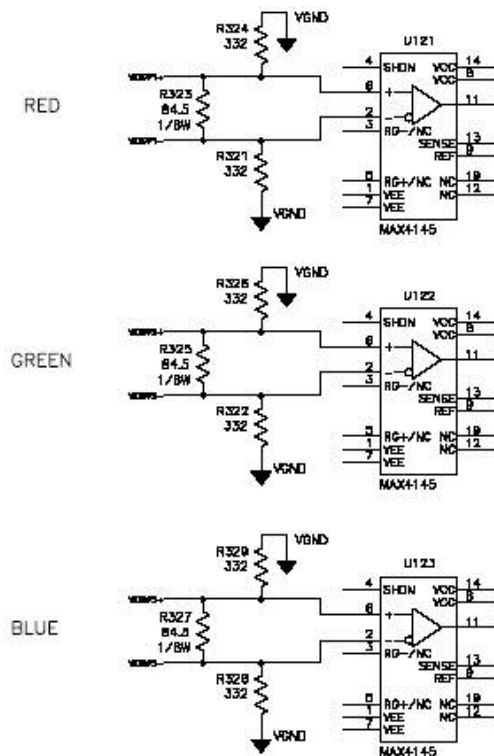
Component (RGsB)

- Three twisted pairs (R,Gs,B) Sync on Green
- Driver levels and impedances – to drive:
 - <10m Twisted pair terminated at the remote end in a 75Ohms
 - 1V p-p (Sync tip to peak white level on Green channel only)
 - Max offset $\pm 0.5V$
- Signal timing to STANAG 3350B

Typical cable type for aircraft installation:

- Cheminax (Multiplex Data Bus MIL1553) Raychem 10605 REV D
- Twisted Pair (Light blue/White) White = plus
- Characteristic Impedance $77 \pm 5\Omega$
- Capacitance 30pF/ft (Maximum)
- Attenuation 1.0dB/100ft @1MHz (Maximum)
- 22AWG (19 strands of 34AWG Tin Coated)

To drive a typical component receiver configuration as follows:



Note that the input impedance is 75 ohms differential, and 166 ohms common mode.

A true differential signal will see a 75 ohm termination. If the input is single-ended, the (-) lead will be connected to a common ground. The signal will then see a 67 ohm termination.

If the transmission line has a 75 ohm impedance, the mismatch will not be serious. But the signal will be about 6% low.

i.e. if the source has a 75 ohm output impedance and would produce 1 Volt into a 75 ohm load, a 67 ohm load will see 0.94 volts.

3.12 Unit electrical connector type

Under Slung Load Camera Unit connector					
<p>Size 20 Contacts Wire size 24,22,20 Gauge 3, 5, 7.5A max</p>		D38999/20JD 19PN	FLANGE MT RECEP 19 WAY PIN Composite shell		
	Typical Corresponding cable connector				
		D38999/26JD 19SN or D38999/26WD 19SN	PLUG 19 WAY SKT		
		G8801-15M	SIZE 15 Backshell		

3.13 Connector pin out

Unit connector - D38999/20JD 19PN (Composite shell)	
Pin	Function
A	+28V DC
B	0V (Return)
P	Chassis
C	Data + (Used for Testing and adjustment or remote operation)
D	Data- (Used for Testing and adjustment or remote operation)
R	Data Screen (Used for Testing and adjustment or remote operation)
E	Red Video +
F	Red Video -
S	Red Video screen (optionally connected externally)
G	Green Video +
H	Green Video -
T	Green Video Screen (optionally connected externally)
J	Blue Video +
K	Blue Video -
U	Blue Video screen (optionally connected externally)
L	Composite Video
M	Composite Video Screen
N	Composite Video Shield
V	Inhibit (On/off – Short to pin B to turn unit off) (Optionally connected to external switch) Do not connect this pin to voltages higher than +5V DC wrt pin B (weak internal pull up)