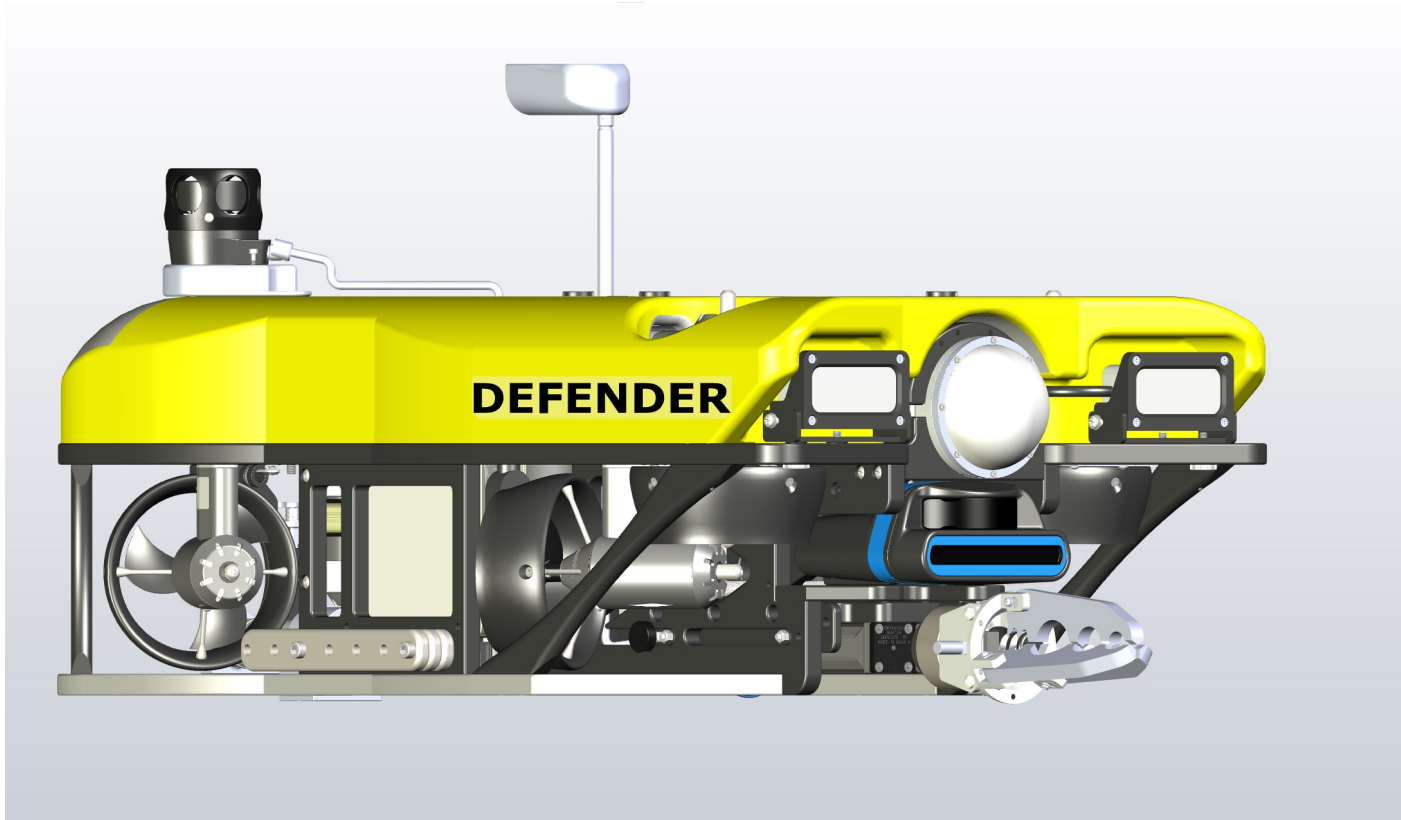


VideoRay Defender Typical EODROV configuration

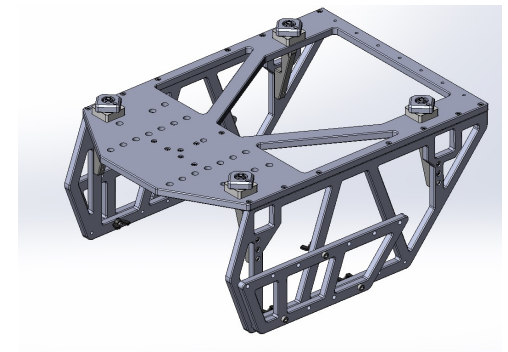


Base ROV:

- 7 thruster (4 vectored horizontal, 3 vertical) with surge, sway, yaw, heave, pitch and roll control.
- Forward looking Full HD IP (h.264) camera with internal tilt actuation.
- Dual forward LED illumination
- Attitude heading reference system (AHRS) with integral depth sensor
- Power and Communications modules

Sensors and Actuators:

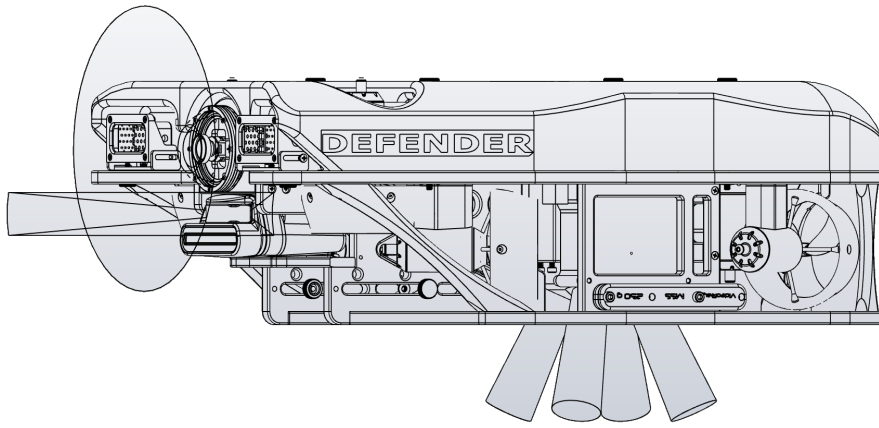
- Forward Look Sonar: Oculus 750d
- DVL: Nortek mini 500
- USBL: seatrac
- GPS
- 2-DOF manipulator with interchangeable end effectors
- Rear facing HD IP camera (optional)
- Rear facing LED (optional)



Example Payload Skid (p/n: 73755)

Skids are used for payload mounting or vehicle standoff.
Different skids and custom designs are available

VideoRay Defender Interfaces



Defender Keep outs:

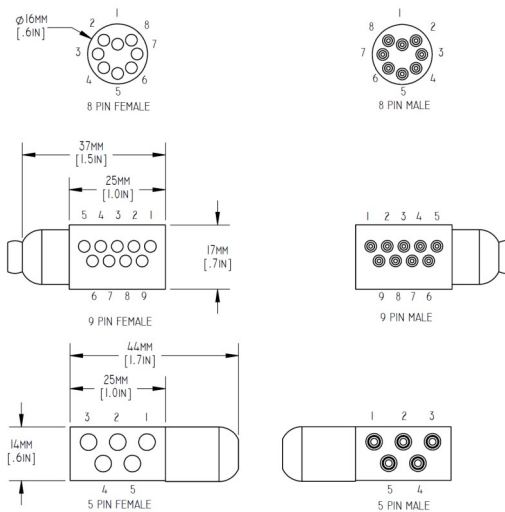
DVL beam pattern, Forward look sonar and camera field of view

Camera: 160 degrees Tilt (180-degree FoV), H: 132° V: 91°

FLS: 130° horizontal x 20° vertical

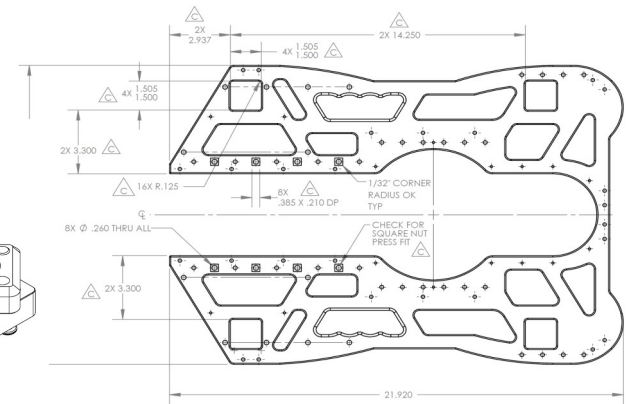
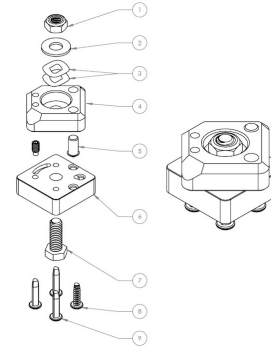
DVL: 4-beam Janus array convex transducer, 25° beam angle, 2.9° beam

SIGNAL NAME	CONNECTOR TYPE			
	5 PIN	9 PIN	8 PIN	9 PIN MALE WHIP COMMS MODULE
48V+	PIN 1	-	-	-
48V RETURN	PIN 3	-	-	-
24V+	-	PIN 3	-	PIN 3
12V+	-	PIN 9	-	PIN 9
SUB LOCAL GND (12V, 24V RETURN)	PIN 2	PIN 5	-	PIN 5
ETH_RXP+	-	PIN 1	-	-
ETH_RXP-	-	PIN 2	-	-
ETH_TXP+	-	PIN 4	-	-
ETH_TXP-	-	PIN 6	-	-
RS485A	PIN 4	PIN 7	PIN 7	PIN 7
RS485B	PIN 5	PIN 8	PIN 8	PIN 8
TETHER SUPPLY VOLTAGE (+75V, +400V)	-	-	PIN 3	-
TETHER SUPPLY VOLTAGE RETURN	-	-	PIN 5	-
INTERLOCK_GND	-	-	PIN 1	-
INTERLOCK_SENSE	-	-	PIN 2	-
M100+	-	-	PIN 4	PIN 4
M100-	-	-	PIN 6	PIN 6



VideoRay Standard Connector Pinouts

5 PIN AND 9 PIN CONNECTORS ARE STACKABLE FOR EXPANSION



Quick payload connections: Cam-lock socket and plug

P/N: 70771: Defender lower frame plate

Standard specifications:

Total Available Power:

48V: 1500 W

24V: 300 W

12V: 120 W

Standard Communications:

Local communications:

RS-485 1/2 duplex multiparty

Ethernet 100 MB/s local network

Tether communications:

Maximum aggregate bandwidth:

Copper: ~60 Mb/s

Long haul modem, max distance 500m

Fiber: > Gb/s

2 Single mode 9/125 (FO only and Hybrid options)

Reserve Buoyancy:

Float	Buoyancy Fresh Water kg (lb)	Reserve Buoyancy Fresh Water kg (lb)
P/N: 70779 Standard 300m rated	7.4 (16.31)	0.8 (1.76)
P/N: 72316 Large 300m rated	14 (30.86)	7.4 (16.31)
P/N: 71028 2 km rated	11.2 (24.69)	4.6 (10.14)