Vertigo™ ISTAR140Z Product overview.

V.01/07_2026



General info

ISTAR140Z is a three-sensor, gyro-stabilized electro-optical payload designed for Intelligence, Surveillance, Target Acquisition, and Reconnaissance (ISTAR) missions. The system features advanced onboard image-processing capabilities, enabling real-time video compression and transmission over low-bandwidth radio links—a critical requirement for modern Unmanned Aerial Vehicles (UAVs). The processed video stream and still images can also be recorded onboard in Full HD resolution.

The system supports automatic tracking of moving targets. Its onboard image processor continuously keeps the selected target centered in the field of view, regardless of aircraft motion. This capability is essential for long-range reconnaissance missions and law-enforcement operations, particularly when monitoring targets moving relative to the ground.

ISTAR140Z is designed for reliable operation in all weather conditions. Its IP64-rated enclosure protects the internal electronics against dust and heavy rain, while the dome, filled with dry inert gas, prevents condensation on the optical components.

Digital image stabilization with roll correction compensates for high-frequency vibrations, significantly reducing operator workload and enabling the operator to focus on mission objectives. ISTAR140Z delivers a stable, centered image, ensuring excellent situational awareness and reliable target observation, even at extreme tele-zoom settings.

System Specification

Key Specification

STABILIZATION	<30 µrad RMS
MASS	1800 G
DIMENSIONS	Ø140 MM × 214 MM
ENVIRONMENTAL PROTECTION	IP64
DOME GAS FILLING	DRY NITROGEN / ARGON
OPERATING TEMPERATURE	-40 to +55˚C
ROTATION LIMITS	360˚ continuous pan, -105˚ to +90˚ tilt
SLEW RATE	225˚/s
POWER CONSUMPTION	25 W TYPICAL / 90 W PEAK
SUPPLY VOLTAGE	22.0 - 28.0 V
VIDEO OUTPUT	DIGITAL ENCODED H.264 / H.265
CONTROL INTERFACE	ETHERNET, RS-422

EO – Visible-Light Sensor

SENSOR TYPE	1/2.8" CMOS
FIELD OF VIEW	HFOV 2.4 – 64.0°
RESOLUTION	FULL HD (1920×1080)
OPTICAL ZOOM	30x
DIGITAL ZOOM	12x
FRAME RATE	30 FPS

IR – Thermal Sensor

SENSOR TYPE	LWIR UNCOOLED BOLOMETRIC FPA
FIELD OF VIEW	HFOV 8.2 – 43.4°
RESOLUTION	640 × 480
OPTICAL ZOOM	5x
DIGITAL ZOOM	4x
FRAME RATE	50 FPS

LRF – Laser Rangefinder

TYPE	1550 NM
CLASS	CLASS 1
RANGE	10 000 M
ACCURACY	0.75 M (1 Σ)

System Specification

Onboard Image Processor

ROLL COMPENSATION	YES
DIGITAL IMAGE STABILIZATION	YES
SCENE TRACKING	YES
OBJECT TRACKING	YES
PICTURE-IN-PICTURE (PIP)	YES
VIDEO OUTPUT	720P/1080P FULL HD, 30 FPS
ONBOARD RECORDING	VIDEO AND SNAPSHOTS, 512 GB MEMORY
RECORDING AND IMAGE ENCRYPTION	ONBOARD RECORDING AND IMAGE ENCRYPTION
VIDEO ENHANCEMENT	DEFOG, DENOISE, SHARPEN, LOCAL AREA PROCESSING - LAP, CONTRAST LIMITED ADAPTIVE HISTOGRAM EQUALIZATION - CLAHE
MOVING TARGET INDICATOR	YES
VIDEO ENCODING	H.264 / H.265
VIDEO STREAM	COMPLIANT WITH MISB ST 0601
METADATA	KLV

System Functionality

Gimbal Motion Control

CONTROLLER	MANUAL GIMBAL CONTROL USING A HANDHELD CONTROLLER
IMAGE-BASED CONTROL	THE GIMBAL TRACKS A POINT SELECTED BY THE USER IN THE IMAGE WINDOW
MAP-BASED CONTROL	THE GIMBAL TRACKS A GEO-REFERENCED POINT SELECTED BY THE USER IN THE MAP WINDOW

Operating Modes

NORMAL	STANDARD OPERATING MODE
STOW	GIMBAL SECURED IN THE STOWED POSITION
STANDBY	IDLE MODE. SENSORS AND MOTORS ARE POWERED OFF
OFF	SYSTEM FULLY POWERED DOWN. SOFTWARE POWER-UP IS NOT POSSIBLE; A PHYSICAL POWER CYCLE IS REQUIRED

Control Modes

RELATIVE [REL]	UNSTABILIZED PAN/TILT ANGLE CONTROL RELATIVE TO THE AIRCRAFT
FOLLOW [FOL]	LOW PASS FILTERED PAN/TILT ANGLE CONTROL WITH VIBRATION REJECTION
RATE [RATE]	STABILIZED ANGULAR RATE CONTROL ABOUT THE PAN/TILT AXES
LINE OF SIGHT [LOS]	STABILIZED LINE-OF-SIGHT CONTROL [INS-AIDED]
GEO HOLD [GEO]	STABILIZED TRACKING OF A FIXED GEOGRAPHIC LOCATION [INS-AIDED]
SCENE TRACK [SCN]	STABILIZED SCENE TRACKING [IMAGE-BASED]
OBJECT TRACK [TRCK]	STABILIZED OBJECT/VEHICLE TRACKING [IMAGE-BASED]

System Functionality

Joystick Modes

SPD	CONTROLS THE GIMBAL'S INERTIAL ANGULAR RATE
ACC	CONTROLS THE GIMBAL'S INERTIAL ANGULAR ACCELERATION
ARI	PROVIDES COMBINED ANGULAR RATE AND ANGULAR ACCELERATION CONTROL, ENABLING SMOOTH MANUAL TRACKING OF MOVING VEHICLES

Target Geolocation

MEASUREMENT TYPES	**SINGLE** – SINGLE-SHOT MEASUREMENT [CONTINUOUS] **MULTI** – MULTIPLE MEASUREMENTS [USER-DEFINED]
TARGET RANGE SOURCES	LASER RANGEFINDER **LRF** – RANGE 10 000 M DIGITAL ELEVATION MODELS **DEM**

Image Processing

- MISB ST 0601 COMPLIANT VIDEO STREAM
- ROLL COMPENSATION
- DIGITAL STABILIZATION
- SCENE TRACKING
- OBJECT TRACKING
- KLV METADATA
- IMAGE ENHANCEMENT
- PICTURE-IN-PICTURE
- OBJECT DETECTION
- EO/IR IMAGE FUSION
- VIDEO RECORDING
- SCREEN CAPTURING

Graphical user Interface [GUI]

- FULL SYSTEM FUNCTIONALITY AVAILABLE THROUGH THE VERTIGO SENTINEL APPLICATION
- ON-SCREEN DISPLAY [OSD] WITH CONFIGURABLE VIDEO OVERLAY
- VIDEO AND SNAPSHOT RECORDING ON THE USER'S PC
- TOUCHSCREEN AND TABLET SUPPORT
- USER INTERFACE CUSTOMIZABLE FOR A WIDE RANGE OF LIGHTING CONDITIONS

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