SensorTec

MTDU-20LP200
20 Km Multi-Technologies Detection and tracking Unit

MTDU is a one unit, which has a wide range of mission capabilities with flexible, and high-performance multi-sensor technologies. Including 200 MP panoramic view, 20 Km Land **Radar and 26 Km thermal tracking technologies and optional** Gyro-stabilization.

MTDU unit boosting the following modules:

Module	Coverage response
3D Tracking Radar	20 km Vehicle detection range
Long-range thermal camera with LRF	26 km Vehicle Detection (DRI)
Long-range visible day/night camera	10 km Vehicle Detection range
200Mp 180° panoramic camera	1 Km Vehicle Detection range

* All above ranges are based on ideal environmental conditions

The main functions of the MTDU are:

- Early warning
- Remote and on-border detection
- Identification of illegal activities
- Detection and situation assessment by transforming raw data into essential information.
- Allowing timely coordinated Interception of potential intruders.

The MTDU consists of the following early-warning modules:

- Ground/Sea-surveillance electronic scan radar detection.
- Panoramic view with video content analysis.
- Thermal /day-night visual tracking.

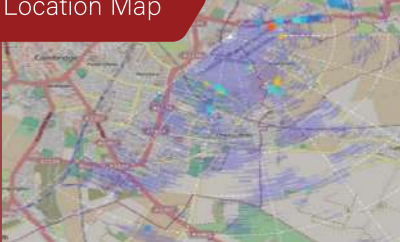MTDU-20LP200

General Functions

- The MTDU increases the probability of early detection with low false alarm and false negative rates under various environmental conditions.

- It supports and help everyday work of Land/Sea Border Security and any other public authorities may be engaged during abnormal events.

- The system performs continuous monitoring and surveillance of potential intrusion threats, within a given time frame, preventing their entry into the protected territory allowing the forces to intercept and capture the prospect intruders in a timely manner.

- The system observes the object initially detected by seamlessly combined 3D tracking rotating radar technology and panoramic video content analytic to provide early warning of intruders over long rand short ranges and detect the target by assessing its key characteristics and provide automatic, semi-automatic and manually directing of the thermal tracking unit to observe the target.

- It detects moving targets under various environmental condition for 20 km range using 3D tracking precision radar, and slue to cue function to Visually track the detected target using the thermal, day/night vision.

- The panoramic features enable the system to view, monitor and track multiple target at the same time in addition to the ability to zoom in on covered area (180 degree) in both live and recorded mode thanks to 200MP ultra-high resolution imaging.

- Using Zoning feature gives the ability to overlay different types of zones, with different priorities and to program the zones to be sensitive to target size and/or speed.

Radar detection	Panoramic & VCA View	Visual Tracking

Object Detected at 20 Km → *Target Information* → **Object Detected at 1 Km** → *Tracking Position* → **26km thermal detection 10km day/nigh detection**

Location Map

Early object detection and tracking identifying location, speed , size and direction.

Panoramic View

Zoomed-in windows within Panoramic View

Multiple target detection and tracking

Visual Tracking

Day/night   Thermal

Selected Target close up

Alarm Response

Upon receiving an alarm from MTDU the control center initiate audible and visual notification and display the following:

- Alarm area map showing the exact location detected target along with target information Such as type, speed and direction.
- Large Panoramic View of the target area.
- Panoramic View zoomed-in on target.
- Visual tracking view.
- Show the nearest available patrolling unit with its current location.

* All parts are designed to withstand harsh environments to meet Military application requirements for shock, vibration, temperature and dust/water ingression.

Panoramic Camera Module

Description	200Mp-180° Panoramic ip camera, Auto Back Focus with CR function for Day/Night switching
Resolution	55040 (H) x 3648 (V)
Frame rate	20 fps @ 200 MP
Video compression	JPEG2000 - Wavelet MPIX24 Signal Processor
Image sensor	Each Image Sensor is 1" color 20.48 Megapixel CMOS
Auto focus	Motorized back focus adjustment
Scanning system	Progressive, no interlaced scanning
Shutter type	Electronic rolling shutter (ERS)
Shutter mode	1/10 - 1/20 000 s, 1/1 low shutter mode
Sensitivity	0.02 lux F1.4 Day mode or 0.002 lux F1.4 Night mode
Gain control	Fix, auto, blur or noise priority
Back-light compensation	Whole picture or any area selectable
Lens	Standard C/CS mount DC auto/manual IRIS, P-IRIS lens
Inputs/Outputs	1 programmable IO connections
Sound	Built-in microphone, 1 ch external 24 kHz/16bit, sound in/output
Intelligence	Integrated motion detection
Ethernet connection	10 Gbit SFP

Thermal Camera Module

Detector	Cooled MWIR
Resolution	1280 x 720
Frame rate	25 / 30Hz
Detector pitch	10 μm
Spectral range	3 to 5 μm
NETD	≤ 25mK
Focal length	70 to 1200 mm
Field of View	10.4° to 0.60° (H)
Continuous Optical Zoom	Yes, up to 17x
Continuous Digital Zoom	Yes, up to 16x
Focus	Automatic or Manual (remote)
Image stabilization	Yes (using VPU/ST)
Image processing	Tuneable Digital Detail Enhancement Histogram Equalization Non uniformity correction White Hot / Black Hot Colour Palette
Video outputs	HD-SDI, optional RTSP H.264 Ethernet stream (using VPU/ST)
Control interface	Serial, Ethernet
Consumption	35 W typical, < 120 W maximum with heaters / lens defrost
Operating voltage	18 - 48 Vdc
Operating temperature range	-32°C to +60°C
IP rating	IP67, built according to MIL-810

MTDU-20LP200

HD Day/Night Camera

Sensor	1/2.4" CMOS sensor
Pixels (H x V)	1920 (H) x 1080 (V)
Sensitivity	Colour 0.02 Lux @ (F2.1, 25 fps); B&W 0.001 Lux @ (F2.1, 25 fps);
Focal length	11 to 1100 mm
Field of view	28°- 0.29°
Continuous Optical Zoom	Yes, up to 100x
Continuous Digital Zoom	Yes, up to 16x
Focus	Automatic or Manual (remote)
Image stabilization	Yes* (using VPU/ST)
Optical filters	Colour: IR Cut filter / B&W: VIS + NIR / B&W: Defog Filter – NIR only
Image processing	Auto / Manual White Balance - Auto / Manual Gain Control True Wide Dynamic Range - Digital Fog Removal / Auto Contrast Dynamic Noise Reduction
Video outputs	HD-SDI or analog, optional RTSP H.264 Ethernet stream (using VPU/ST)
Control interface	Serial, Ethernet
Consumption	15 W typical, < 60 W maximum with heaters / lens defrost
Operating voltage	18 - 48 Vdc
Operating temperature	-32°C + 60°C
IP rating	IP67, built according to MIL-810
Dimensions	777 x 216 x 206 mm
Weight	18 kg

MS Pan/Tilt System Module

Load capacity / Torque	30 kg + 30 kg / 60 Nm
Static top load capacity	50 kg
Weight	43 kg (full configuration)
Dimensions (H x W x L)	412 x 735 x 302 mm
Materials	Aluminium
Protection / IP rating	IP 67
Operating temperature	-32°C to +60°C
Pan axis range / angle	n x 360°
Pan axis speed	0.001°/s - 125 °/s
Tilt axis range / angle	± 90° (depends on application)
Tilt axis speed	0.001°/s -125 °/s
Accuracy	0.02°
Backlash	None
Stabilisation (Optional)	±300µrad
Operating voltage	24 - 48 VDC
Maximum power	120 W
Communication to the unit	Eth 10/100 Base-T, RS-232, RS-485/422(optional)
Control protocol	DC-PT standard protocol

Precise 3D tracking Radar

DETECTION

Minimum detection range		1 m
Maximum detection range		
Nano UAVS,	RCS 0.01 m2	5 km
Pedestrian,	RCS 1 m2	11 km
Light vehicle,	RCS 5 m2	15 km
Heavy Vehicle	RCS 30 m2	50 km
Range accuracy		3 m
Range resolution		10 m
Minimum/maximum target altitude		1 m/50 km
Coverage, azimuth/elevation		180/30 (2x Radars)
Frequency		X-Band
Technologies		AESA/MIMO
Tx output power (peak)		24 W

TRACKING AND CLASSIFICATION

Update rate Technologies	4 Hz
	MHT
Software features included in every MIMO radar.	Computationally efficient Multiple Hypothesis Tracking. Tracker is used to convert single radar detection events into real targets and their motion models (tracks). AI-powered target classification combined with traditional classification techniques.

OPERATIONS

Interface protocols	Ethernet
Input power	24 VDC
Power consumption	90 W
Dimensions (W x H x D, cm)	38 x 43.5 x 15
Cooling method	passive
Enclosure	Rugged, milled aluminum, powder coated.
Mean Time Between Failure	50 000 hours
Operational availability	99%
Fault tolerant architecture	Remote monitoring, operational parameters adjustment and restart.

Environmental

Working Temperature	-30°C to +65°C
IP rating	IP 67
Weight	152.5

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