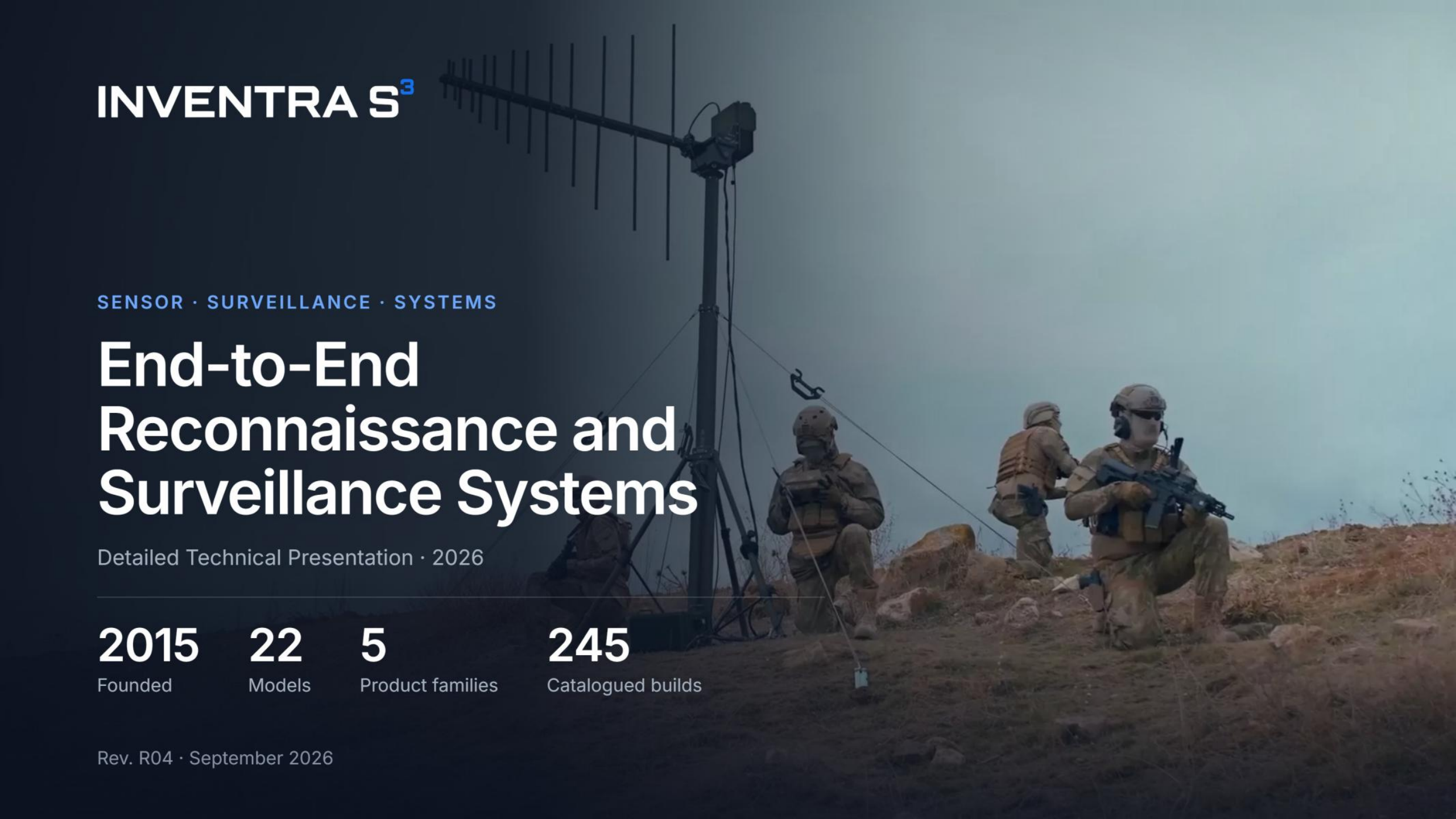


The background of the slide features a photograph of three soldiers in desert camouflage gear positioned on a rocky hillside. They are operating a large, black, Yagi-Uda style surveillance antenna mounted on a tripod. The sky is overcast and grey.

INVENTRA S³

SENSOR · SURVEILLANCE · SYSTEMS

End-to-End Reconnaissance and Surveillance Systems

Detailed Technical Presentation · 2026

2015

Founded

22

Models

5

Product families

245

Catalogued builds

Rev. R04 · September 2026

WHAT WE DO

"Define the payload; the positioning, elevation and mobilisation around it are ours to solve."

Design, manufacture and test sit in the same company, so the sensor, the positioner and the mast are specified against one another rather than integrated after the fact.

Inventra in Numbers

2015

Founded; two facilities in Ankara today

22

Models in five product families

245

Catalogued builds, before options

119

Component and option codes in the catalogue

33

Finish and colour codes

4

Patented designs in the current range

4 weeks

Typical delivery of a configured unit

2 years

Standard warranty, all four product families

CONTENTS

Five Chapters, One System

71 slides, from the company to every model in the range and the platforms they serve on.



01

Company

Who we are, where we work and how we have been recognised

02



02

Engineering

Design, analysis, hardware-in-the-loop, precision, manufacturing and qualification

09



03

One System

Five product families that mount to one another

25



04

Product Families

All 22 models: electro-optical systems, positioners, masts, tripods and supporting equipment

29



05

In the Field

Applications, deployed platforms, case studies and contact

63

Two Facilities, Both in Ankara



R&D Centre

Melih Gökçek Bulvarı, Teknopark No: 61/19, İvedik OSB, 06378 Yenimahalle, Ankara, Türkiye

- Mechanical, electromechanical and electronic design
- Hardware-in-the-loop simulation and embedded software
- Structural and thermal analysis, multi-body dynamics
- Design decisions verified before anything is cut



Integration and Test Centre

Ahi Evran Cad. No: 134, Ostim OSB, 06374 Yenimahalle, Ankara, Türkiye

- 5-axis machining and turning, 5-axis CMM inspection
- Coating, painting, cabling and integration
- Hot / cold and humidity test chambers
- HIL bench for motor-driver software, commissioned 2026

Milestones, 2013 to 2026

- **2013** Two awards at the METU Technopolis New Ideas New Business competition for our magnetorheological damper project
- **2015** Inventra founded
- **2019** Patent TR 2013 12816 B granted; ASELSAN approved sub-industry certificate
- **2023** IDEF 2023: gimbals, positioners and masts shown together as one surveillance chain
- **2024** EYDEP ES 201-B competency certificate; ASELSAN localisation appreciation at SAHA EXPO 2024
- **Apr 2026** Hardware-in-the-loop test bench commissioned for motion-control software
- **May 2026** ASELSAN highest-value export award at SAHA 2026
- **Jun 2026** SEB20 completes its environmental qualification campaign

Certifications

Certified management systems, and a defence industry competency rating from the Presidency of Defence Industries.

QUALITY ISO 9001 Quality management system Edition 2015 Certificate No. 102033456	ENVIRONMENT ISO 14001 Environmental management system Edition 2015 Certificate No. 102033457	INFORMATION SECURITY ISO 27001 Information security management system Edition 2022 Certificate No. 102033458	CUSTOMER SATISFACTION ISO 10002 Customer satisfaction management system Edition 2018 Certificate No. 102033459	DEFENCE INDUSTRY EYDEP ES 201-B competency level, Presidency of Defence Industries Valid until 1 May 2028 Certificate No. ES-2024-650
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Recognition and Patents



- 2026** **ASELSAN award, SAHA 2026.** Highest-value exporting company category, "1000 Products Localisation Journey" programme
- 2024** **ASELSAN localisation appreciation certificate,** presented at SAHA EXPO 2024
- 2019** **ASELSAN approved sub-industry company certificate**

PATENTS BY OUR TEAM



TR 2013 12816 B
Magnetorheological semi-active damper system

Examined patent, granted 2019. Y. Dabakoğlu, F. Aydoğan, A. Bodur

TR 2017 17205 A1
On/off apparatus for thermal-magnetic circuit breakers

Patent application, 2017. Applicant Enerjisa; co-invented by Y. Dabakoğlu

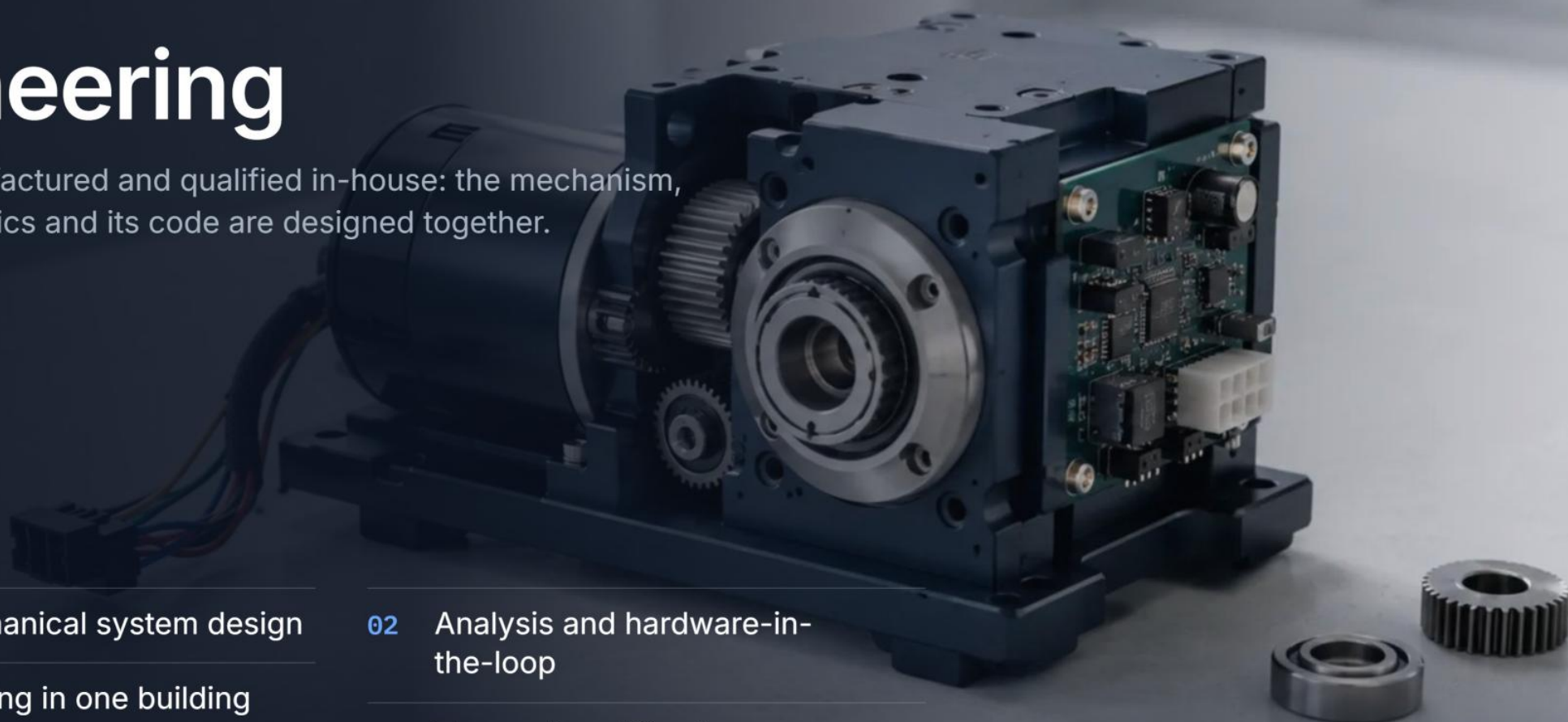
In the current range
Patented designs

Hybrid screw-shaft drive (MES20), hybrid actuator (MMS20), tripod and cam lock (MMT10), zero-clearance tripod (TML10)

02

Engineering

Designed, manufactured and qualified in-house: the mechanism, its drive electronics and its code are designed together.



01 Electromechanical system design

03 Manufacturing in one building

02 Analysis and hardware-in-the-loop

04 Test and qualification

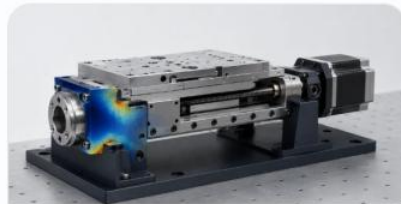
From Model to Qualified System



01

Design

Mechanism, structure, actuator and control loop are designed as one



02

Analysis

Static, modal and harmonic; random vibration, drop and shock



03

Simulation

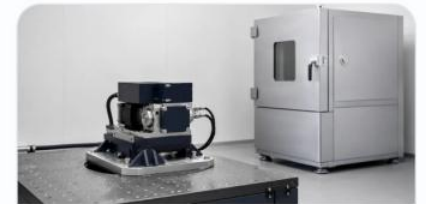
Multi-body dynamics and hardware-in-the-loop on the real driver board



04

Manufacturing

Machining, finishing, cabling and assembly in one building



05

Qualification

MIL-STD-810G and MIL-STD-461G, in our chambers and at external laboratories

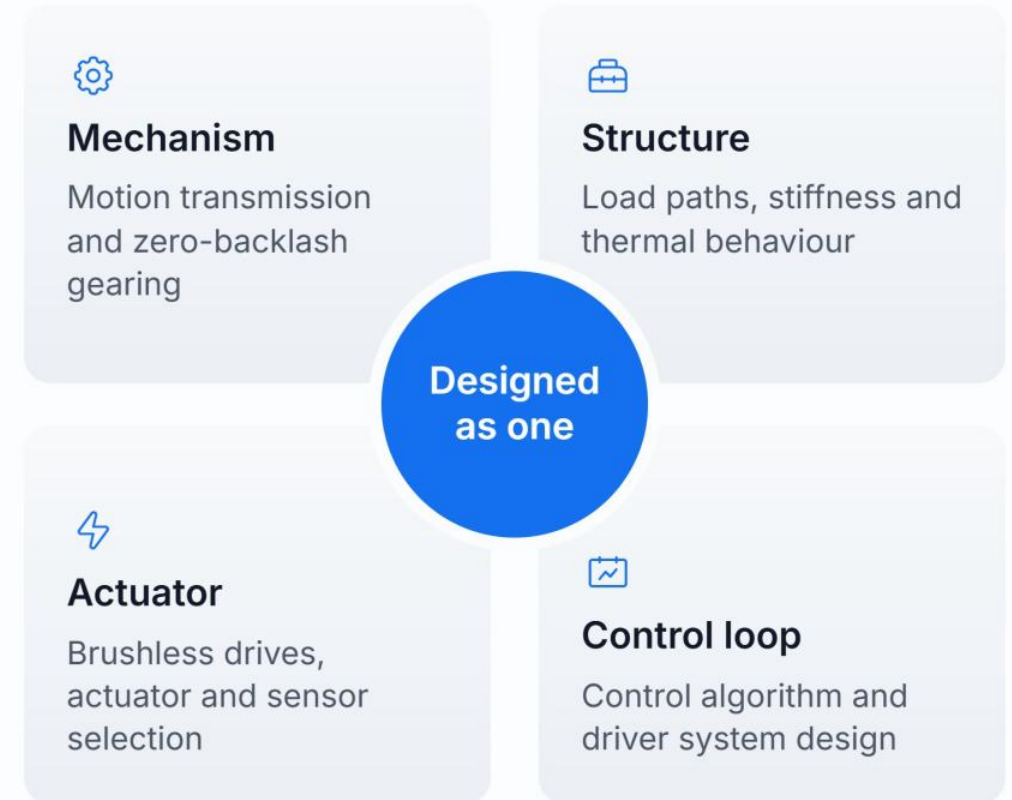
Everything is established before a part reaches the chamber, so the qualification test confirms a prediction instead of discovering a failure.

Electromechanical System Design

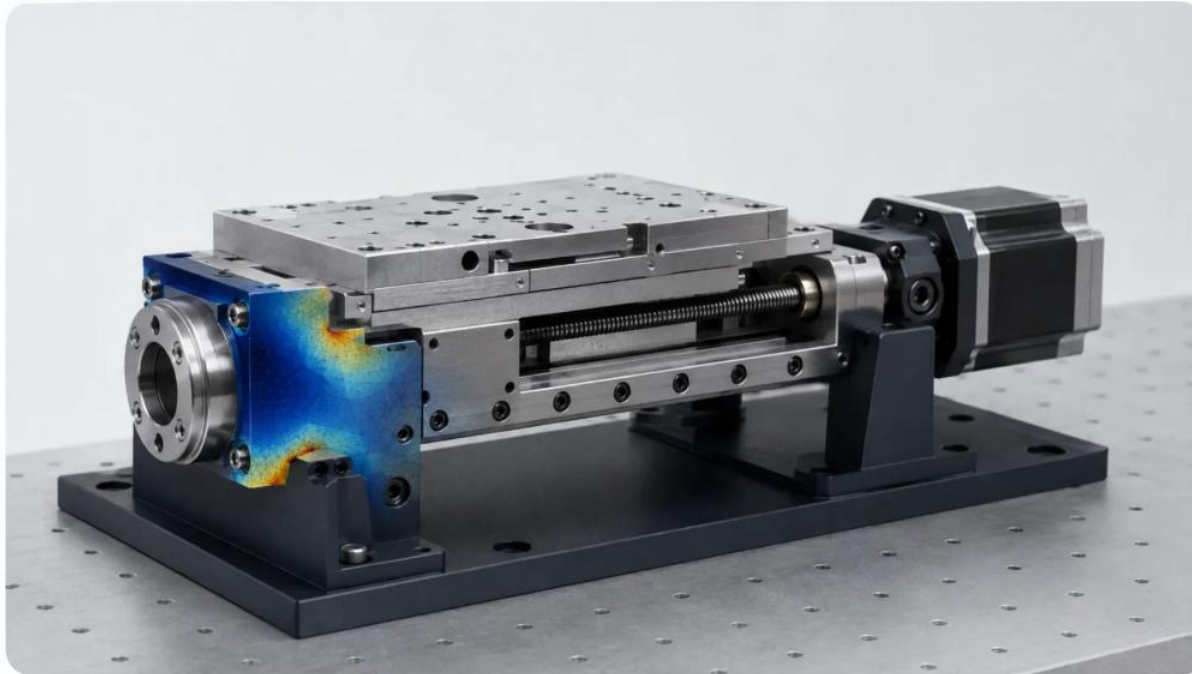
The mechanism, its structure, its actuator and its control loop are designed as one.

Load paths, stiffness, thermal behaviour, pointing accuracy and backlash are properties of that whole rather than of a purchased motor, and they are settled before manufacture.

- ✓ Parametric modelling
- ✓ Structural analysis
- ✓ Motion transmission mechanism design
- ✓ Control algorithm and driver system design
- ✓ Static and dynamic system design
- ✓ Thermal analysis
- ✓ Actuator and sensor selection



Analysis Before the Test



A ballscrew stage on an optical table; the end block carries the stress map from its structural analysis.

Stress, thermal, vibration and shock behaviour is established before a part is selected and before it reaches the chamber.

- 01 Static analysis, linear and non-linear
- 02 Modal extraction and harmonic response
- 03 Random vibration, drop and shock
- 04 Multi-body dynamics (MBD)
- 05 Hardware-in-the-loop (HIL)
- 06 Rapid virtual prototyping
- 07 Control algorithm verification on the microprocessor

ENGINEERING · HARDWARE-IN-THE-LOOP, COMMISSIONED APRIL 2026

Control Software, Verified Before the Hardware Exists

A real-time model of the motor and mechanism answers the driver board the way the hardware will, on a bench at the Ostim Integration and Test Centre.

Real-time plant model

BLDC/PMSM behaviour with phase-current dynamics, friction, backlash and load inertia

Microsecond electrical step

Follows the driver's PWM switching; the mechanical domain runs at a lower loop rate

Fault injection

Phase loss, encoder faults and supply dropout, injected in a controlled, repeatable way

Automated regression

Every software change comes back as a coverage and deviation report

Pointing Precision, in Numbers

0,002°

Axis resolution from 22-bit optical encoders

PED08 · PED10 · PED12
· PES10

0,001°

With dual-loop control and a secondary encoder

PED10 · PED12 · DLPC

±0,01°

Servo-drive pointing of the gimbal

SEG12 · SEG14

100 μrad

Better than this positioning accuracy on a positioner

SEB20

0,04°

Stabilization accuracy on an unstable platform

PED12

0,031°

Repeatability of the rotator

PES10

Zero

Measurable backlash in the gear train

PED · PES

30.000.000

Revolutions rated for the slipping

SR60 · SR24

What the Sensors Reach

Thermal channel with
target tracker

32 km

Laser range finder, eye-safe 1,5 μ m
[LR32](#)

15 mK

NETD, cooled MWIR 640 × 512
[M0620X](#)

1,17°

Narrowest thermal horizontal field of view
[M1220X](#)

50 mJ

Laser designator, 1.064 nm, STANAG 3733
[LD50](#)

68×

Day camera optical zoom
[E1968X](#)

750 mm

Longest thermal focal length, 20× zoom
[M1220X](#)

0,001 lx

Day camera minimum illumination
[E1950X](#)

1.280 × 1.024

Megapixel LWIR and MWIR detectors
[L1203X](#) · [L1206X](#) · [M1220X](#)

Mechanisms That Hold the Line of Sight



MES10

Flange locking system

Sections lock mechanically at height; the load path bypasses the actuator. In field service since 1977.



MEM10

A screw shaft in every node

A steel telescopic screw shaft per node and four-way keyways: rated for use on the move.



MES20

Patented hybrid screw-shaft drive

One screw shaft opens all sections together and locks at any height: 78 kg on a 32 kg mast.



MMS20

Patented hybrid actuator

Trapezoidal screws with steel wires: 58 kg on a 32 kg mast, with no motor and no power draw.



MMT10 · MMT20

Self-locking crane-arm masts

Sections added at ground level; the drive cannot back-drive, so the mast cannot collapse.



TML10 · TMM10 · TMH10

Zero-clearance tripods

Joints and leg sections preloaded, so the optics stay where they were pointed; patented on TML10.

Manufacturing and Test Infrastructure



Machining, surface finishing, cabling and integration happen in one building, which is what makes a four-week configured delivery possible.

- 01 5-axis CNC vertical machining centre**
Housings, gimbal yokes and mast sections
- 02 5-axis CNC turning centre**
C- and Y-axis turning of rotating parts
- 03 5-axis coordinate measuring machine**
Every machined part checked against its model
- 04 Hot / cold test chamber**
- 05 Humidity test chamber**
- 06 Coating, painting and cabling**
In the same building as assembly



Qualification Standards

Condition	MIL-STD-810G method and level
High temperature	Mtd. 501.5 · +60 °C operating, +70 °C storage
Low temperature	Mtd. 502.5 · -32 °C operating, -40 °C storage
Low pressure	Mtd. 500.5 · 10.500 ft operating, 37.000 ft storage
Humidity	Mtd. 507.5 Proc. II · 90 % RH at +60 °C, 10 × 24 h
Rain	Mtd. 506.5 Proc. I · 1,7 mm/min with 18 m/s wind
Salt fog	Mtd. 509.5 · 5 % NaCl, 2 × (24 h fog + 24 h drying)
Blowing dust and sand	Mtd. 510.5 · Proc. I dust, Proc. II sand
Vibration	Mtd. 514.6 Proc. I · Cat. 4, secured cargo
Shock	Mtd. 516.6 Proc. I · 20 g, 11 ms

One profile across the range. SEG10, SEG12 and SEG14 without humidity; SEB20 to 40 g shock; TML10, TMM10, TMH10, MMT10 and MMT20 to transit drop in their case (Mtd. 516.6 Proc. IV).

EMI / EMC

MIL-STD-461G

- CE102
- CS101
- CS114
- CS115
- CS116
- CS118
- RE102
- RS103

ELECTRICAL INTERFACE

MIL-DTL-38999

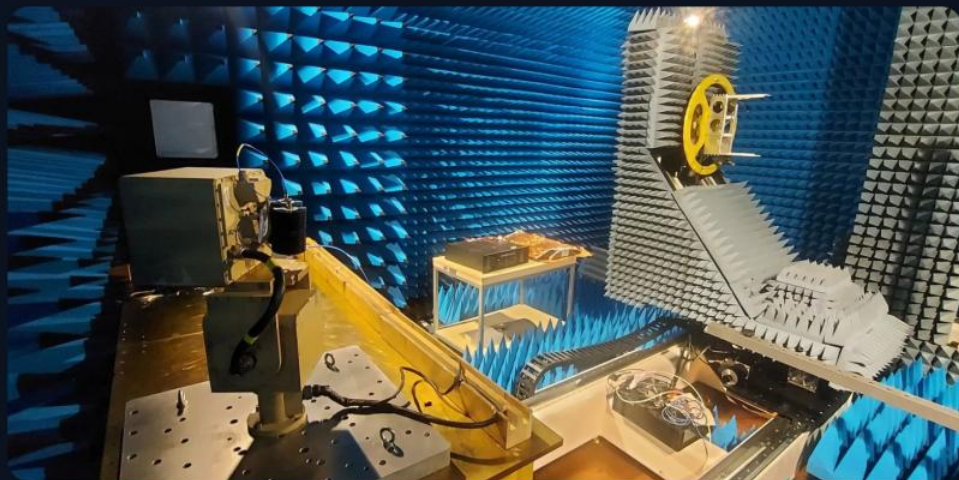
Connectors on every electronic unit, 18-32 VDC supply, RS-422 with optional Ethernet

STRUCTURE AND FINISH

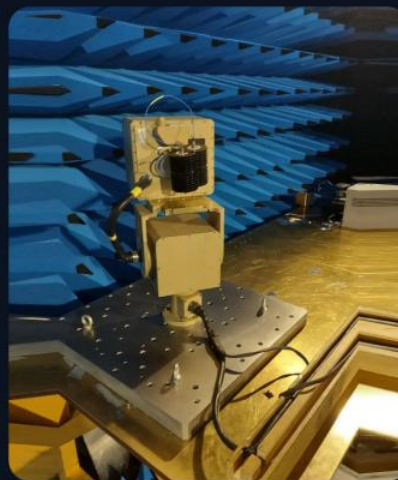
Aluminum 6061-T6

Electrostatic powder coating, RAL 9005 matte black; ACP20 in RAL 7001 gray

Qualified in the Chambers, Measured Against Methods



PED10 test rig in the anechoic chamber



PED10 on the positioner table



MMT10 in the climatic chamber



ACP20 in the test chamber

SEB20 environmental qualification, June 2026

MIL-STD-810 random vibration and mechanical shock, temperature-humidity cycling across the operating range and sealing verification, at the Ostim Integration and Test Centre.

Reports with the quotation

The MIL-STD-810G environmental qualification report and the MIL-STD-461 EMI/EMC test report are supplied with the quotation, not after the order.

One Interface Standard Across the Range

Because the imager, the positioner, the mast and the tripod are all ours, the mechanical and electrical interfaces between them already match.



18-32 VDC

Supply on every DC-powered unit, 28 VDC nominal to MIL-STD-1275



RS-422

Control on every electronic unit, Ethernet as an option



MIL-DTL-38999

Circular connectors on every electronic unit



HD-SDI + Ethernet

Video from every electro-optical system



60 lines

Slipping on the pan-tilts: 1 Gbit Ethernet and 52 × 2 A lines; 24 lines on PES10



15 lines

Maximum payload lines carried inside the MES01 mast



6061-T6

Aluminium main body, electrostatic powder coat, RAL 9005 matte black

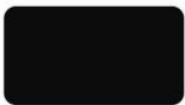
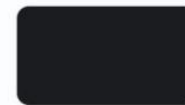
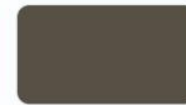


MIL-STD-461G

EMI/EMC test list on every product with drive electronics

33 Finish and Colour Codes

Blocks are a guide, not a colour match: order by the AMS-STD-595 or RAL designation.

										
FA01	FT01	FT02	FT03	FT04	FT05	FT06	FT07	FT08	FT09	FT10
										
FT11	FT12	FT13	FT14	FT15	FT16	FT17	FT18	FT19	FT20	FT21
										
FT22	FT23	FT24	FT25	FT26	FT27	FT28	FT29	FT30	FT31	FT32

FA01 Black anodise to MIL-A-8625, Type II, Class 2	FT01-FT25 Enamels, powder coats and MIL-PRF-85285 topcoats to AMS-STD-595, RAL and BS 381C	FT09 Yellow-olive that reflects in the near infrared, so it does not read as a cold flat panel to a thermal sensor	FT26-FT32 CARC to MIL-DTL-53039, which survives chemical decontamination; FT30 has no measured block
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ENGINEERING · CONFIGURED TO ORDER

Every Part Number Is a Build

One code from each build step, then any options: the part number states the complete configuration.

FAMILY

MES10

Locked
electromechanical
mast

BUILD STEPS

-1700

Retracted height
1.700 mm

-5005

Extended height
5.005 mm

-0061

Rated payload
61 kg

OPTIONS

-LPEK

Lightning
protection and
earthing kit

-IHIF

Instant height
information

-LGES

Labels in
Spanish

245

Catalogued builds, before options

33

Finish and colour codes

4 weeks

Typical delivery of a configured unit

01 Company

02 Engineering

03 One System

04 Product Families

05 In the Field

Inventra S³ · Sensor · Surveillance · Systems

Three Levels of Engineering

Custom engineering is the core of the business: every catalogue product began as that kind of work.

Level 01

Configuration of a catalogue product

Payload plate, connectors, surface finish and colour, gear ratio, slip ring line count, communication protocol, speed and torque limits.

Level 02

Variant of an existing platform

A different section count, stroke or drive type on a proven structure.

Level 03

Clean-sheet design to your specification

Delivered against your interface control document and qualification plan.

Published case: a custom two-axis positioner for a prime contractor, fitted to the existing host interface, with 0,04° pointing, 180 °/s slew and 500 N·m output torque required together.

SUPPLIED ON REQUEST



Interface control documents

Mechanical, electrical and software



MIL-STD-810G report

Environmental qualification



MIL-STD-461 report

EMI/EMC test results



3D model and manual

STEP solid model and user manual

Engineering Knowledge, Published

7

White papers

6

Technical blog posts

3

Webinars

10

Documentation families

6

Application notes

3

Case studies

3

Engineering tools

39

Glossary terms

WHITE PAPERS

- 01 Unlimited Rotation, Finite Electrical Margin
- 02 The Better Stabilisation Ratio Can Give the Worse Result
- 03 A Precise Map Pin Can Share the Wrong Reference
- 04 Why a Repeatable Positioner Can Still Point Wrong
- 05 Why an Identical Replacement Can Bind in the Cold
- 06 It Passed After the Heat. Did It Work During the Heat?
- 07 The Encoder Is Right. The Optics Have Moved.

Published in the Resource Centre at inventras3.com, with application notes, case studies and engineering tools.

ONE SYSTEM

Product Families

Four core families mount to one another; the fifth integrates them in the field.

ONE RECONNAISSANCE AND SURVEILLANCE SYSTEM



01 Electro-Optical Systems

4 models
Stabilized EO/IR
gimbals and
targeting sight



02 Positioners

6 models
Zero-backlash pan-
tilts, rotator and
goniometer



03 Mast Systems

8 models
Motorized and manual
masts up to 15 m



04 Tripods

3 models
Zero-clearance
tripods from 25
to 150 kg

+



05 Supporting Equipment

1 model
Climatic rack cabins
for the system
electronics



ONE SYSTEM

One Chain, Top to Bottom

- 1 Sensor or payload.** What has to see, measure or transmit, and what it weighs.
[SEG10](#) · [SEG12](#) · [SEG14](#) · [SEB20](#) · [antennas](#) · [radar](#)
- 2 Positioner.** The torque, travel and pointing accuracy the payload demands.
[PED08](#) · [PED10](#) · [PED12](#) · [PES10](#) · [PEG03](#) · [PMD01](#)
- 3 Elevation or support.** How high it has to go, and what holds it in the wind.
[Eight masts to 15 m](#) · [three tripods to 150 kg](#)
- 4 Field integration.** A climate-controlled, shielded rack in a transit case.
[ACP20](#)

"How accurately the system points is decided at the top of the structure, not inside the camera."

What visitors asked at IDEF 2023

ONE SYSTEM

Integrated, Not Assembled

A complete elevated surveillance chain, specified from one source rather than integrated from four suppliers.



SEB20 on a pan-tilt and a field tripod



PED10 with a sensor block on a mast



MES01 half extended with a sensor head



TML10 carrying an observation payload



MMS20 carrying its payload above a vehicle, IDEF 2023

Which Products Go Together

	Positioners		Mast Systems								Tripods		
	PED08	PED10	MES01	MES10	MES20	MEM10	MMS20	MMW10	MMT10	MMT20	TML10	TMM10	TMH10
SEG10	—	—	●	●	◐	◐	◐	◐	◐	◐	○	◐	◐
SEG12	—	—	●	●	◐	◐	◐	◐	◐	◐	○	◐	◐
SEG14	—	—	◐	◐	◐	◐	◐	◐	◐	◐	○	◐	◐
SEB20	○	●	—	●	◐	●	—	—	—	—	—	—	◐
PED08			○	●	●	◐	◐	◐	◐	◐	○	●	●
PED10			—	●	◐	●	○	○	—	◐	○	●	●
PES10			—	●	◐	●	○	○	—	◐	○	●	●

● Highly compatible: qualified and delivered
 ◐ Recommended
 ○ Less common: near a limit
 — Not listed

From the catalogue Cross Combination Guide. PED12, PEG03, PMD01 and ACP20 are not yet assessed in it.

PRODUCT FAMILY 01

Electro-Optical Systems

Day, thermal, laser range finding and designation channels in stabilized gimbals and a targeting sight, carried by our positioners, masts and tripods.

32 km

Laser range finder

68×

Day camera zoom

15 mK

Cooled MWIR NETD

- **01 Electro-Optical Systems**

SEG10 · SEG12 · SEG14 · SEB20

- 02 Positioners
- 03 Mast Systems
- 04 Tripods
- + Supporting Equipment



**4,4 kg**Weight, 155 mm
diameter**30×**Day camera
optical zoom**180 °/s**Pan and tilt
nominal speed**SEG10** 1 catalogued build

SEG10-L0625-E1930X

Dual Channel (EO-LWIR) Stabilized Gimbal

Ruggedized dual-channel thermal imaging system for unmanned ground vehicles and EO/IR defence surveillance

✓ On MES01 above ASELSAN's AVAZ acoustic system, on a tracked UGV

- ✓ Two-Axis Stabilization
- ✓ 30× Optical Zoom Day Camera
- ✓ Compact Ruggedized Housing
- ✓ Uncooled LWIR Detector
- ✓ Simultaneous Dual Display

Thermal channel	LWIR 640 × 512 px, 12 μm, 50 mK, 25 mm, HFOV 17,7°
Day channel	1.920 × 1.080 px, 30× optical, HFOV 63,7-2,3°, 0,01 lx
Tracker	25 Hz refresh, 100 ms lag, target 16 × 16-128 × 128 px
Axes	360° continuous pan, ±45° tilt, 180 °/s
Video and control	HD-SDI and Ethernet video; RS-422, Ethernet optional
Power and envelope	18-32 VDC, 150 W max; Ø155 × 235 mm

**4,6 kg**

Weight, three sensors

5 km

Eye-safe range finder

 $\pm 0,01^\circ$

Servo drive pointing

SEG12 1 catalogued build

SEG12-L0625-E1930X-LR05

Triple Channel (EO-LWIR-LRF) Compact Gimbal

Ultra-compact, low cost of ownership multi-sensor gimbal for unmanned ground vehicles and EO/IR defence surveillance

✓ Vehicle case: a usable image under 90 s after the vehicle stops

- ✓ Triple-Channel Simultaneous Operation
- ✓ Digital Image Blending
- ✓ Servo Drive Pointing Accuracy
- ✓ Integrated Laser Range Finder
- ✓ 160 mm Envelope

Thermal channel	LWIR 640 × 512 px, 12 μ m, 50 mK, 25 mm, HFOV 17,7°
Day channel	1.920 × 1.080 px, 30× optical, HFOV 63,7-2,3°, 0,01 lx
Range finder	5-5.000 m, 1,5 μ m, eye-safe
Tracker	25 Hz refresh, 100 ms lag, target 16 × 16-128 × 128 px
Axes	360° continuous pan, $\pm 45^\circ$ tilt, 180 °/s
Power and envelope	18-32 VDC, 150 W max; Ø160 × 256 mm

**32 km**Range finder
reach**30 mK**NETD, megapixel
LWIR**3,2×**Thermal optical
zoom**SEG14** 3 catalogued builds

SEG14-L1203X-E1930X-LR32

Long Range Triple Channel (EO-LWIR-LRF) Stabilized Gimbal

Long-range thermal imager with optical zoom and 32 km laser range finder for precision targeting, surveillance and intelligence gathering

🔗 Fixed-site case: on a 14 m mast, linked to existing radar

- ✓ Thermal Optical Zoom
- ✓ 32 km Laser Range Finder
- ✓ Stabilized Servo Control
- ✓ 1280 × 1024 LWIR Detector
- ✓ Digital Image Blending

Thermal channel	LWIR 1.280 × 1.024 px, 30 mK, 28-90 mm, HFOV 4,89°
Field of view	Diagonal 19,92° at 28 mm to 6,26° at 90 mm
Day channel	1.920 × 1.080 px, 30× optical, HFOV 63,7-2,3°, 0,01 lx
Range finder	5-32.000 m, 1,5 μm, eye-safe
Builds	3, by thermal module: L1203X, L0605X or L0625
Weight and envelope	8,0 kg; 325 × 257 × 178 mm



SEB20 18 catalogued builds

SEB20-M1220X-E1950X-LR32-LD50

Quad Channel (EO-MWIR-LRF-LD) Targeting Sight

Multi-channel thermal imager with laser designator for weapon systems, main battle tanks and long-range surveillance

🔄 Environmental qualification campaign completed in June 2026

- ✓ Laser Designator
- ✓ Fibre-Gyro Stabilization
- ✓ Weapon-Station Accuracy
- ✓ Cooled MWIR Channel
- ✓ Built for Weapon Systems

Thermal channel	MWIR 1.280 × 1.024 px, 20 mK, 37,5-750 mm, 20×, 1,17°
Day channel	1.920 × 1.080 px, 50× optical, HFOV 61,9-1,3°, 0,001 lx
Laser channels	LRF 5-32.000 m; designator 50 mJ, STANAG 3733 I & II
Accuracy	0,05°; better than 100 µrad on a positioner
Weight and envelope	18,4 kg; 325 × 360 × 155 mm

50 mJ

Laser designator

20 mKCooled MWIR
NETD**40 g**

Functional shock

Sensor Modules, Configured to the Mission

Code	Module	Sensitivity or reach	Optics	Used by
L0625	LWIR 640 × 512	50 mK · 12 μm	25 mm · HFOV 17,7°	SEG10 · SEG12 · SEG14 · SEB20
L0605X	LWIR 640 × 512	30 mK · 12 μm	30-150 mm, 5× · HFOV 2,93°	SEG14 · SEB20
L1203X	LWIR 1.280 × 1.024	30 mK · 12 μm	28-90 mm, 3,2× · HFOV 4,89°	SEG14 · SEB20
L1206X	LWIR 1.280 × 1.024	50 mK · 12 μm	30-180 mm, 6× · HFOV 4,89°	SEB20
M0620X	MWIR 640 × 512	15 mK · 15 μm	15-300 mm, 20× · HFOV 1,83°	SEB20
M1220X	MWIR 1.280 × 1.024	20 mK · 12 μm	37,5-750 mm, 20× · HFOV 1,17°	SEB20
E1930X	Day 1.920 × 1.080	0,01 lx	30× · HFOV 63,7-2,3°	SEG10 · SEG12 · SEG14 · SEB20
E1950X	Day 1.920 × 1.080	0,001 lx	50× · HFOV 61,9-1,3°	SEB20
E1968X	Day 1.920 × 1.080	0,005 lx	68× · HFOV 66,0-1,0°	SEB20
LR05	Laser range finder	5-5.000 m	1,5 μm, eye-safe	SEG12
LR32	Laser range finder	5-32.000 m	1,5 μm, eye-safe	SEG14 · SEB20
LD50	Laser designator	50 mJ · 1.064 nm	10-25 ns · STANAG 3733 I & II	SEB20

Part number = gimbal + thermal module + day camera + range finder (+ designator), for example SEB20-M0620X-E1968X-LR32-LD50.

Electro-Optical Systems — Key Specifications

	SEG10	SEG12	SEG14	SEB20
Channels	EO · LWIR	EO · LWIR · LRF	EO · LWIR · LRF	EO · MWIR · LRF · LD
Thermal detector	LWIR 640 × 512 px, 50 mK	LWIR 640 × 512 px, 50 mK	LWIR 1.280 × 1.024 px, 30 mK	Cooled MWIR 1.280 × 1.024 px, 20 mK
Thermal optics	25 mm	25 mm	28-90 mm, 3,2× zoom	37,5-750 mm, 20× zoom
Day camera	1.920 × 1.080 px, 30×	1.920 × 1.080 px, 30×	1.920 × 1.080 px, 30×	1.920 × 1.080 px, 50×
Laser range finder	—	5-5.000 m	5-32.000 m	5-32.000 m
Laser designator	—	—	—	50 mJ, 1.064 nm, STANAG 3733
Stabilization	Two-axis IMU + encoder	Two-axis IMU + encoder	Two-axis IMU + encoder	Fibre gyro + encoder
Weight	4,4 kg	4,6 kg	8,0 kg	18,4 kg

Common to all four: HD-SDI and Ethernet video, 25 Hz tracker, RS-422 (Ethernet optional), 18-32 VDC, MIL-DTL-38999, 150 W max.

PRODUCT FAMILY 02

Positioners

Zero-backlash pan-tilts and a rotator with brushless servo drives and 22-bit encoders, plus a digital goniometer and a manual head: the link between sensor and structure.

0,002° **1.032 Nm** **180 °/s**

Axis resolution

Highest torque

Highest speed

- 01 Electro-Optical Systems
- 02 **Positioners**
PED08 · PED10 · PED12 · PES10 · PEG03 · PMD01
- 03 Mast Systems
- 04 Tripods
- + Supporting Equipment



**10 W**Typical power
draw**135 Nm**

Highest tilt torque

9,0 kg

Weight

PED08 24 catalogued builds

PED08-0120-0060-0060-0085

Compact Electromechanical Pan-Tilt

Lightweight pan-tilt with true servo control for thermal imagers and directional antennas

- ✓ Brushless Motor and Controller
- ✓ High-Resolution Optical Encoder
- ✓ Ultra-Low Power Consumption
- ✓ Zero-Backlash Gearing
- ✓ 30-Million-Revolution Slipring

Drive table	Pan and tilt 6-48 °/s, 30-85 Nm; tilt-only to 135 Nm
Standard build	Pan 12 °/s, 60 Nm; tilt 6 °/s, 85 Nm; peak 120 Nm
Axes	N × 360° pan, ±45° tilt
Resolution, accuracy	0,002°, 0,04°
Slipring	60 lines: 1 Gbit Ethernet, 52 × 2 A; 30.000.000 rev
Envelope	220 × 160 × 287 mm; 18-32 VDC, RS-422, MIL-DTL-38999

**0,001°**

With dual-loop control

180 °/s

Highest drive speed

275 Nm

Highest tilt torque

PED10 24 catalogued builds

PED10-0480-0150-0280-0185

Ultra Precision Electromechanical Pan-Tilt

Zero Backlash, 0,002° Resolution, 180 °/s Speed, 30M Revolutions without Maintenance Pan-Tilt Unit for Mission Critical Applications such as Thermal Imaging and Target Tracking

🔍 Photographed in the anechoic chamber where it was qualified

- ✔ Zero-Backlash Gearing
- ✔ High-Resolution Optical Encoder
- ✔ Configurable Drive Pairing
- ✔ Brushless Motor and Controller
- ✔ 30-Million-Revolution Slipring

Drive table	Pan and tilt 28-180 °/s, 60-185 Nm; tilt-only to 275 Nm
Standard build	Pan 48 °/s, 150 Nm; tilt 28 °/s, 185 Nm; peak 225 Nm
Resolution, accuracy	0,002° (0,001° with DLPC), 0,04°
Slipring	60 lines: 1 Gbit Ethernet, 52 × 2 A; 30.000.000 rev
Options	Stabilization, hand controller, multiple payload interface
Weight and envelope	16,1 kg; 250 × 202 × 350-395 mm

**PED12** 24 catalogued builds

PED12-0480-0150-0280-0185

Stabilized Electromechanical Pan-Tilt

High-Capacity, Motorized Pan/Tilt for Long-Range Surveillance, Homeland Security, Vehicle, and Fixed Installations

- ✓ Gyro Stabilization
- ✓ Brushless Motor and Controller
- ✓ 30-Million-Revolution Slipring
- ✓ Zero-Backlash Gearing
- ✓ High-Resolution Optical Encoder

Drive table	Pan and tilt 28-180 °/s, 60-185 Nm; tilt-only to 275 Nm
Standard build	Pan 48 °/s, 150 Nm; tilt 28 °/s, 185 Nm; peak 225 Nm
Payload interface	Width-adjustable U-arm for large sensor suites
Resolution, accuracy	0,002° (0,001° with DLPC), 0,04°
Slipring	60 lines: 1 Gbit Ethernet, 52 × 2 A; 30.000.000 rev
Weight and envelope	16,1 kg; 430 × 270 × 445 mm

0,04°Stabilization
accuracy**180 °/s**Highest drive
speed**275 Nm**

Highest tilt torque

**1.032 Nm**Highest nominal
torque**0,031°**

Repeatability

135 mmDiameter, all
drives**PES10** 4 catalogued builds

PES10-0250-0185

Ultra Precision Electromechanical Rotator

Zero Backlash, High Torque Single Axis Rotator Units for Radar and Directional Antenna Applications

- ✓ Zero-Backlash Gearing
- ✓ High-Resolution Optical Encoder
- ✓ Cross-Roller Bearing Support
- ✓ Brushless Motor and Controller
- ✓ 30-Million-Revolution Slipring

Drive units	25 °/s 185 Nm · 10 °/s 435 Nm · 6 °/s 756 Nm
Heaviest drive	4,5 °/s, 1.032 Nm nominal, 1.114 Nm peak
Precision	0,002° resolution, 0,04° accuracy, 0,031° repeatability
Slipring	24 lines: 1 Gbit Ethernet, 16 × 2 A; 30.000.000 rev
Interface	18-32 VDC, RS-422 (Ethernet optional), MIL-DTL-38999
Weight and envelope	9,5 kg; Ø135 × 215 mm



PEG03 1 catalogued build

PEG03-0012

Lightweight Goniometer

High-Resolution Digital Goniometer for Military Surveillance, Target Acquisition, and Man-Portable Operations

- ✓ High-Resolution Optical Encoder
- ✓ Independent Fine Adjustment
- ✓ Digital Magnetic Compass Compatible
- ✓ Zero-Backlash Movement
- ✓ Low Power Consumption

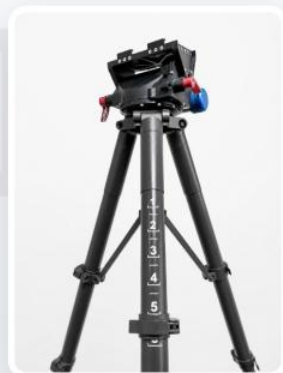
Axes	N × 360° pan, ±45° tilt
Fine adjustment	±0,8438° (15 mil) on each axis, set independently
Braking	Independent on each axis
Battery option	BT74 Li-Ion, 7,4 V, 3.250 mAh
Interface	18-32 VDC, RS-422 (Ethernet optional), MIL-DTL-38999
Weight and envelope	2,9 ± 0,1 kg; 180 × 205 × 130 mm

0,1 milResolution,
0,0056°**1 mil**

Accuracy, 0,056°

12 kg

Rated payload

**PMD01** 1 catalogued build

PMD01-0010

Lightweight Manual Pan-Tilt

Lightweight, Precise, and Durable Pan/Tilt Head for Critical Alignment
Application for Military EO Sensors, Designators, and Long-Range Optics

✓ No emissions: the preferred head under radar, EW and antennas

- ✓ Zero-Backlash Movement
- ✓ Independent Braking
- ✓ Elevation Scale and Compass Compatibility
- ✓ Fine Adjustment on Both Axes
- ✓ Axis Damping Control

Axes	N × 360° pan, ±45° tilt
Fine adjustment	±2,50° pan, ±1,13° tilt
Braking	Independent on each axis
Damping	Viscous damping for smooth manual tracking
Resolution	0,0056°
Weight and envelope	1,4 kg; 173 × 120 × 110 mm

1,4 kg

Weight

10 kg

Rated payload

0,0056°

Axis resolution

POSITIONERS · DRIVE TABLE

Torque Against Speed, Every Drive

PED08 6-48 °/s at 30-85 Nm; tilt-only drives to 135 Nm

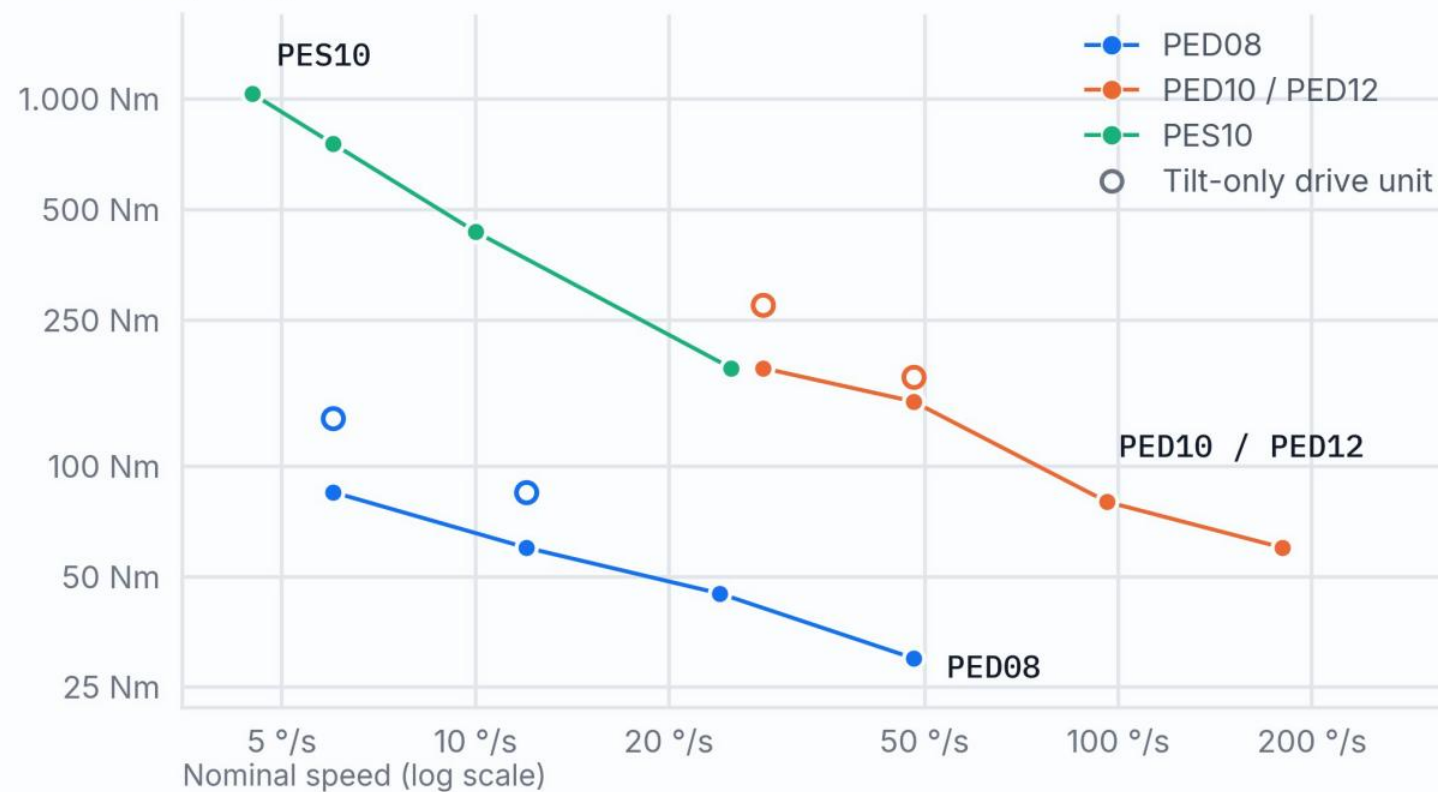
PED10 28-180 °/s at 60-185 Nm; tilt-only drives to 275 Nm, same on PED12

PES10 4,5-25 °/s at 185-1.032 Nm, peaks to 1.114 Nm

24 Builds per pan-tilt model: pan and tilt drives are chosen independently

Hollow markers: tilt-only drive units.
Nominal values, $\pm 5\%$ unless stated.

Nominal torque (log scale)



Positioners — Key Specifications

	PED08	PED10	PED12	PES10	PEG03	PMD01
Type	Pan-tilt	Pan-tilt	Stabilized pan-tilt	Rotator	Goniometer	Manual pan-tilt
Nominal torque	30-135 Nm	60-275 Nm	60-275 Nm	185-1.032 Nm	—	—
Speed	6-48 °/s	28-180 °/s	28-180 °/s	4,5-25 °/s	—	—
Axis resolution	0,002°	0,002°	0,002°	0,002°	0,0056°	0,0056°
Accuracy	0,04°	0,04°	0,04°	0,04°	0,056°	—
Rated payload	—	—	—	—	12 kg	10 kg
Slipping	60 lines	60 lines	60 lines	24 lines	—	—
Weight	9,0 kg	16,1 kg	16,1 kg	9,5 kg	2,9 kg	1,4 kg

Torque and speed span the catalogued drive units of each model. PED and PES units: zero-backlash gearing, brushless drives, 22-bit optical encoders. Electronic units: 18-32 VDC, RS-422 with optional Ethernet, MIL-DTL-38999.

PRODUCT FAMILY 03

Mast Systems

Motorized and manual telescopic masts for vehicles, shelters and the field: from a 4 kg UGV mast to portable masts reaching 15 m, and 18 m on a custom build.

15 m

Catalogued height

192 kg

Highest payload

120 km/h

Wind rating

○ 01 Electro-Optical Systems

○ 02 Positioners

● **03 Mast Systems**

MES01 · MES10 · MES20 · MEM10 · MMS20 · MMT10
· MMT20 · MMW10

○ 04 Tripods

○ + Supporting Equipment



Electro-Optical Systems

Positioners

Mast Systems

Tripods

+

Supporting Equipment

ONE SYSTEM



MES01 2 catalogued builds

MES01-0535-1160-0005

Ultra Compact Electromechanical Mast System

The World's Most Compact and Lightweight Motorized Mast for Unmanned Ground Vehicles

✓ Raises SEG10 on HAVELSAN BARKAN and on the AVAZ carrier UGV

- ✓ Unmatched Compactness
- ✓ Plug-and-Play Interface
- ✓ Up to 15 Payload Lines
- ✓ All-in-One Electromechanical Assembly
- ✓ Fully Enclosed and Maintenance-Free

Builds	535 to 1.160 mm, 5 kg · 700 to 1.500 mm, 10 kg
Construction	Threaded rod drive, 3 sections, Ø92-100 mm node
Wind load	120 km/h over 0,4 m ²
Power	18-32 VDC to MIL-STD-1275; RS-422, Ethernet optional
Payload lines	Up to 15; TTL, RS-485 and RS-422 mast control

4 kg

Mast weight

535 mm

Retracted height

30 s

Opening time

Electro-Optical Systems

Positioners

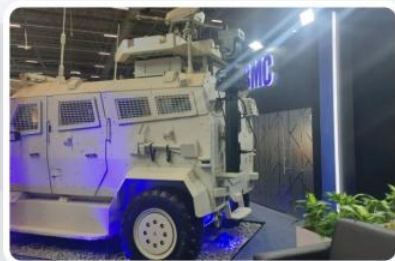
Mast Systems

Tripods

+

Supporting Equipment

ONE SYSTEM



192 kg

Highest rated
payload

10 m

Highest extended
height

65

Catalogued builds

MES10 65 catalogued builds

MES10-1200-3005-0072

Locked Electromechanical Mast System

Reliable flange-lock mast with extensive payload capacity for Electro-Optical Imaging, Radar and Communication Tasks

✓ Flange locking in field service since 1977

✓ Flange Locking System

✓ Minimal Stowed Length

✓ Universal Mounting

✓ Up to 192 kg Payload

✓ Wide Configuration Range

Extended height	3.005-10.005 mm; retracted from 1.150 mm
Rated payload	45-192 kg, falling as height rises
Construction	4-9 sections; main tube Ø150-250 mm
Wind load	120 km/h over 0,4 m ²
Power	18-32 VDC to MIL-STD-1275; RS-422, Ethernet optional
Options	Vehicle remote, cable bundling, instant height readout

Electro-Optical Systems

Positioners

Mast Systems

Tripods

+

Supporting Equipment

ONE SYSTEM



MES20 4 catalogued builds

MES20-1200-2500-0078

Modular Electromechanical Mast System

High Performance Weight Ratio Mast Unit Wide Configurations Suitable for Electro-Optical Imaging, Radar and Communication Tasks

- ✓ Patented Hybrid Drive Architecture
- ✓ Lock at Any Height
- ✓ Square Profile Body
- ✓ Manual Backup Operation

Builds	2.500 / 6.000 / 8.000 / 14.000 mm extended
Rated payload	78 / 72 / 70 / 41 kg; mast weight 32-85 kg
Drive	Patented hybrid screw shaft; sections open together
Section	140-180 mm square profile, 3-5 sections
Wind load	120 km/h over 0,4 m ²
Power	18-32 VDC to MIL-STD-1275; RS-422, Ethernet optional

78 kg

Payload on a
32 kg mast

14 m

Highest extended
height

60 s

Opening time

Electro-Optical Systems

Positioners

Mast Systems

Tripods

+

Supporting Equipment

ONE SYSTEM

MEM10 4 catalogued builds

MEM10-1000-2200-0125

Ultra Stable Electromechanical Mast System

Mast Unit with Minimum Twist and Deflection for Long Range Thermal Imaging, Target Tracking Tasks

- ✓ Telescopic Screw-Shaft Actuation
- ✓ Use in Motion
- ✓ Closed Mechanical Architecture
- ✓ Four-Way Keyways
- ✓ 125 kg at High Rigidity

Builds	2.200 / 3.000 / 6.000 / 7.200 mm extended
Rated payload	125 / 120 / 100 / 100 kg
Drive	A steel telescopic screw shaft in every node
Nodes	Ø180-230 mm, 3-5 sections; mast weight 72-219 kg
Wind load	120 km/h over 0,4 m ²
Power	18-32 VDC to MIL-STD-1275; RS-422, Ethernet optional

125 kg

Rated payload

180 mm

Node diameter

45 s

Opening time

Electro-Optical Systems

Positioners

Mast Systems

Tripods

+

Supporting Equipment

ONE SYSTEM



58 kg

Payload on a
32 kg mast

14 m

Highest extended
height

5 min

One-operator
deployment

MMS20 4 catalogued builds

MMS20-1200-2500-0058

Modular Manual Mast System

Minimal Deflection and Twist Performance Manual Mast Configurations for Electro-Optical Surveillance, Radar and Communication Tasks

✓ Shown at IDEF 2023, and raised on a pickup bed at SAHA 2026

- ✓ Patented Hybrid Actuator
- ✓ Synchronized Section Actuation
- ✓ Five-Minute Deployment
- ✓ High Specific Strength Construction
- ✓ Shares the MES20 Body

Builds	2.500 / 6.000 / 8.000 / 14.000 mm extended
Rated payload	58 / 52 / 40 / 21 kg; mast weight 32-85 kg
Drive	Trapezoidal screws with steel wires; no power draw
Deployment	5-20 min by one operator, no tools
Section	140-180 mm square profile, 3-5 sections
Wind load	120 km/h over 0,4 m ²

Electro-Optical Systems

Positioners

Mast Systems

Tripods

+

Supporting Equipment

ONE SYSTEM



15 m

Catalogued height

53 kg

Highest rated
payload

19 kg

Lightest build

MMT10 15 catalogued builds

MMT10-X3-3300

Ultra Portable Tripod/Mast System

Single Mast, Unlimited Configurations Tactical and Commercial Communications, Video Surveillance and Wireless Data Configurations

✓ Two MMT10 masts shown beside KANGAL and BUKALEMUN

- ✓ Crane-Arm Height Expansion
- ✓ Self-Locking Reverse Drive
- ✓ Complete Field Kit
- ✓ Patented Tripod and Cam Lock
- ✓ Up to 53 kg Payload at 120 km/h Wind

Builds	X2-X16: 2.395-15.065 mm, 53-11 kg
Custom height	XC build to 18.000 mm
Drive	Push or cable driven, self-locking reverse drive
Deployment	One person, 5-30 min; nested length 1.110 mm
Base	Ø1.760 mm base circle; colour-coded guy rings
Weight	19-39,4 kg without accessories

Electro-Optical Systems

Positioners

Mast Systems

Tripods

+

Supporting Equipment

ONE SYSTEM

**95 kg**Highest rated
payload**15 m**

Catalogued height

+79 %Payload over the
MMT10**MMT20** 13 catalogued builds

MMT20-Y8-8020

Heavy Duty Portable Tripod/Mast System

Portable, Heavy-Duty Mast With Crane-Assisted Height Expansion for Tactical and Commercial Communications, Video Surveillance and Wireless Data Configurations

- ✓ Reinforced Body for Heavy Payloads
- ✓ Self-Locking Reverse Drive
- ✓ Complete Field Kit
- ✓ Crane-Arm Height Expansion
- ✓ One-Person Installation

Builds	Y3-Y15: 2.720-15.440 mm, 95-35 kg
Custom height	YC build to 18.000 mm
Drive	Push or cable driven, self-locking reverse drive
Nested length	1.400 mm; Ø2.450 mm base circle
Weight	34,1-87,6 kg without accessories
Transport	Two wheeled hard cases, tripod and tubes

Electro-Optical Systems

Positioners

Mast Systems

Tripods

+

Supporting Equipment

ONE SYSTEM

MMW10 1 catalogued build

MMW10-1310-2500-0050

Telescopic Winch-Type Manual Mast System

High performance-to-weight ratio manual mast with a wide configuration range for electro-optical imaging, radar and communication tasks

- ✓ Locking Winch System
- ✓ High Specific Strength Construction
- ✓ Protected Rope Mechanism
- ✓ Synchronous Section Deployment
- ✓ One-Person Deployment

Height	2.500 mm extended; 1.310 mm stowed
Drive	Winch arm with locking mechanism, 3 sections
Section width	98 mm; mast body 1.200 mm retracted
Deployment	About 5 min by one person; opening time 60 s
Wind load	120 km/h over 0,4 m ²
Power	None required

**50 kg**

Rated payload

25 kg

System weight

1.310 mm

Stowed height

MAST SYSTEMS · BUILD MAP

Payload Against Height, Every Build

108 Catalogued mast builds, each one a point on the map

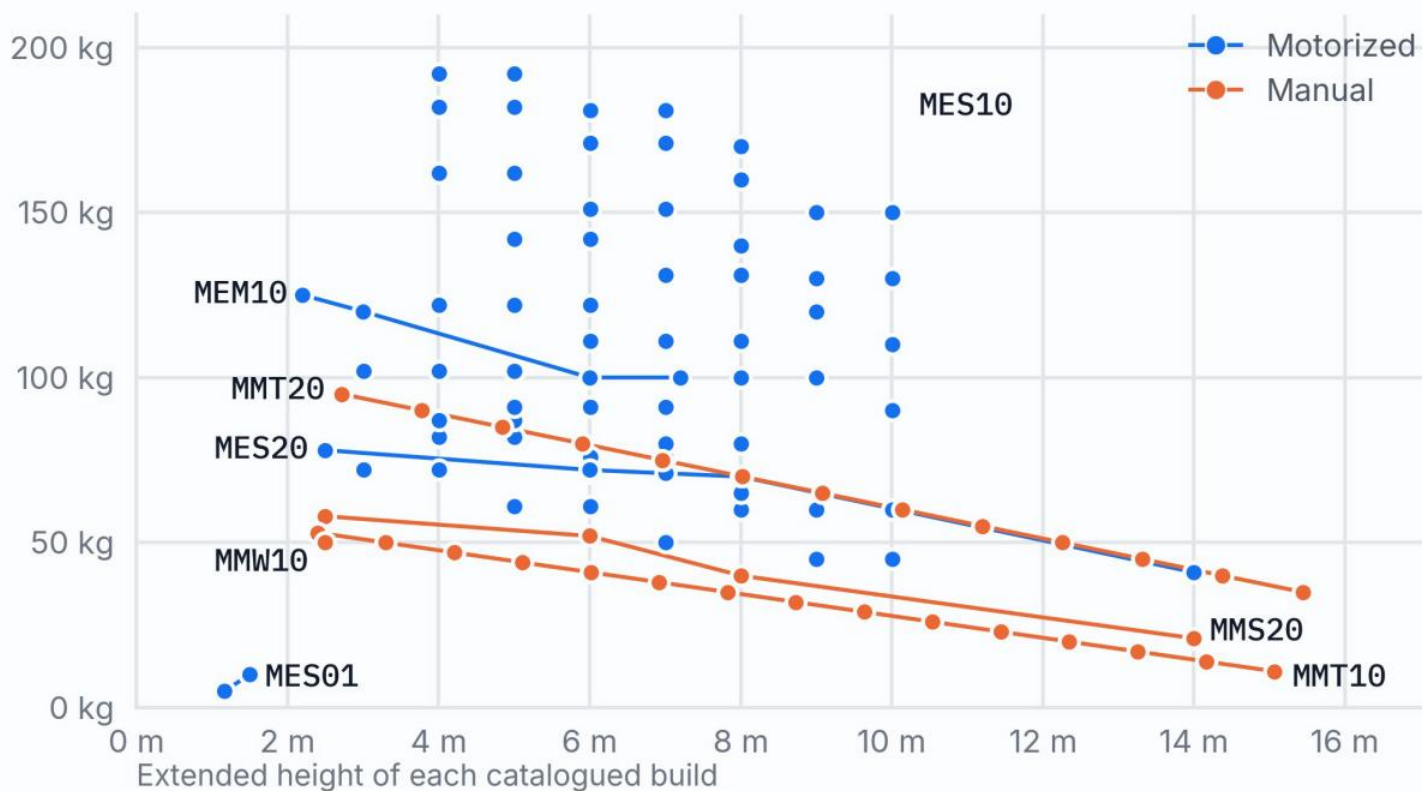
192 kg Highest payload: MES10 at 4-5 m

15,4 m Highest catalogued build: MMT20 Y15

18 m Custom height on MMT10 and MMT20

Payload falls as height rises, so each family publishes a range. Wind rating 120 km/h over 0,4 m².

Rated payload



Mast Systems — Key Specifications

Model	Actuation	Drive type	Extended height	Rated payload	Catalogued builds
MES01 Ultra compact	Motorized	Threaded rod	1.160-1.500 mm	5-10 kg	2
MES10 Locked	Motorized	Flange-locked telescopic	3.005-10.005 mm	45-192 kg	65
MES20 Modular	Motorized	Hybrid screw shaft	2.500-14.000 mm	41-78 kg	4
MEM10 Ultra stable	Motorized	Telescopic screw shaft	2.200-7.200 mm	100-125 kg	4
MMS20 Modular	Manual	Trapezoidal screw + steel wire	2.500-14.000 mm	21-58 kg	4
MMT10 Ultra portable	Manual	Push or cable driven	2.395-15.065 mm	11-53 kg	15 + custom
MMT20 Heavy duty	Manual	Push or cable driven	2.720-15.440 mm	35-95 kg	13 + custom
MMW10 Winch-type	Manual	Winch arm, locking	2.500 mm	50 kg	1

Ranges span catalogued builds; payload falls as height rises. All masts rated for 120 km/h wind; motorized masts to MIL-STD-1275.

PRODUCT FAMILY 04

Tripods

Zero-clearance aluminium tripods from 25 to 150 kg: preloaded joints leave no play, so the line of sight holds.

150 kg

Highest payload

1,95 kg

Lightest build

140 mm

Lowest working height

- 01 Electro-Optical Systems
- 02 Positioners
- 03 Mast Systems
- 04 **Tripods**
 - TML10 · TMM10 · TMH10
- + Supporting Equipment



**1,95 kg**

Lightest build

35 kgHighest rated
payload**140 mm**Lowest working
height**TML10** 2 catalogued builds

TML10-0600-1450-0025

Ultra Lightweight Tripod

Lightweight, Stable and Rugged High-Performance Tripod for Military Observation and Border Surveillance, Handheld Sensors with Manual or Motorized Pan/Tilt Heads

- ✓ Patented Zero-Clearance Design
- ✓ One-Motion Leg Lock
- ✓ Interchangeable Feet and Ground Anchors
- ✓ Three Operational Heights
- ✓ Independently Adjustable Legs

Builds	1.450 mm, 25 kg, 2,50 kg · 975 mm, 35 kg, 1,95 kg
Working height	From 150 mm; 140 mm on the 975 mm build
Retracted	600 mm and 585 mm; Ø150 mm packed
Extended radius	600 mm and 420 mm
Feet	Flat, claw, spike or ball: FTFL, FTCL, FTSP, FTBL
Carry	PCBG padded carry bag

Electro-Optical Systems

Positioners

Mast Systems

Tripods

+

Supporting Equipment

ONE SYSTEM



60 kg

Highest rated
payload

4,3 kg

Lightest build

875 mm

Extended radius

TMM10 2 catalogued builds

TMM10-0637-1266-0040

Medium Duty Tripod

Payload Capacity up to 60 kg with superb torsional stability for Tactical Radar, Reconnaissance Optics and Battlefield Communication Systems

- ✓ Zero-Clearance Mechanical Design
- ✓ Tool-Free Foot Replacement
- ✓ Ground Anchor and Pinning
- ✓ Torsional Stability
- ✓ Digital Magnetic Compass Compatible

Builds	1.266 mm, 40 kg, 5,2 kg · 864 mm, 60 kg, 4,3 kg
Retracted	637 mm and 588 mm
Sections	3 and 2; extended radius 875 mm and 632 mm
Construction	6061-T6 thick-walled tubes, AISI 316 hardware
Feet	Flat, claw, spike or ball, changed by hand
Carry	PCBG padded carry bag

Electro-Optical Systems

Positioners

Mast Systems

Tripods

+

Supporting Equipment

ONE SYSTEM

TMH10 2 catalogued builds

TMH10-0725-0995-0150

Heavy Duty Tripod

Payload Capacity up to 150 kg with Rigid, Stable and V Design Architecture for Long-Range Thermal Imaging Devices, Sensor Arrays and Surveillance Radars

- ✓ Zero-Clearance Mechanical Design
- ✓ Large Centre Column
- ✓ Replaceable Feet
- ✓ V Mechanical Architecture
- ✓ Off-Centre Payload Balancing

Builds	995 mm, 14,7 kg · 1.250 mm, 18,4 kg; both 150 kg
Working height	From 640 mm and 895 mm
Retracted	725 mm and 1.055 mm; Ø280 mm packed
Extended radius	685 mm and 900 mm
Feet	Flat, claw, spike or ball
Carry	PCBG padded carry bag



150 kg

Rated payload

14,7 kg

Lightest build

685 mm

Extended radius

PRODUCT FAMILY + 1

Supporting Equipment

ACP20 portable climatic rack cabins house, cool and shield the system electronics in the field, beside the sensor, positioner and mast they serve.

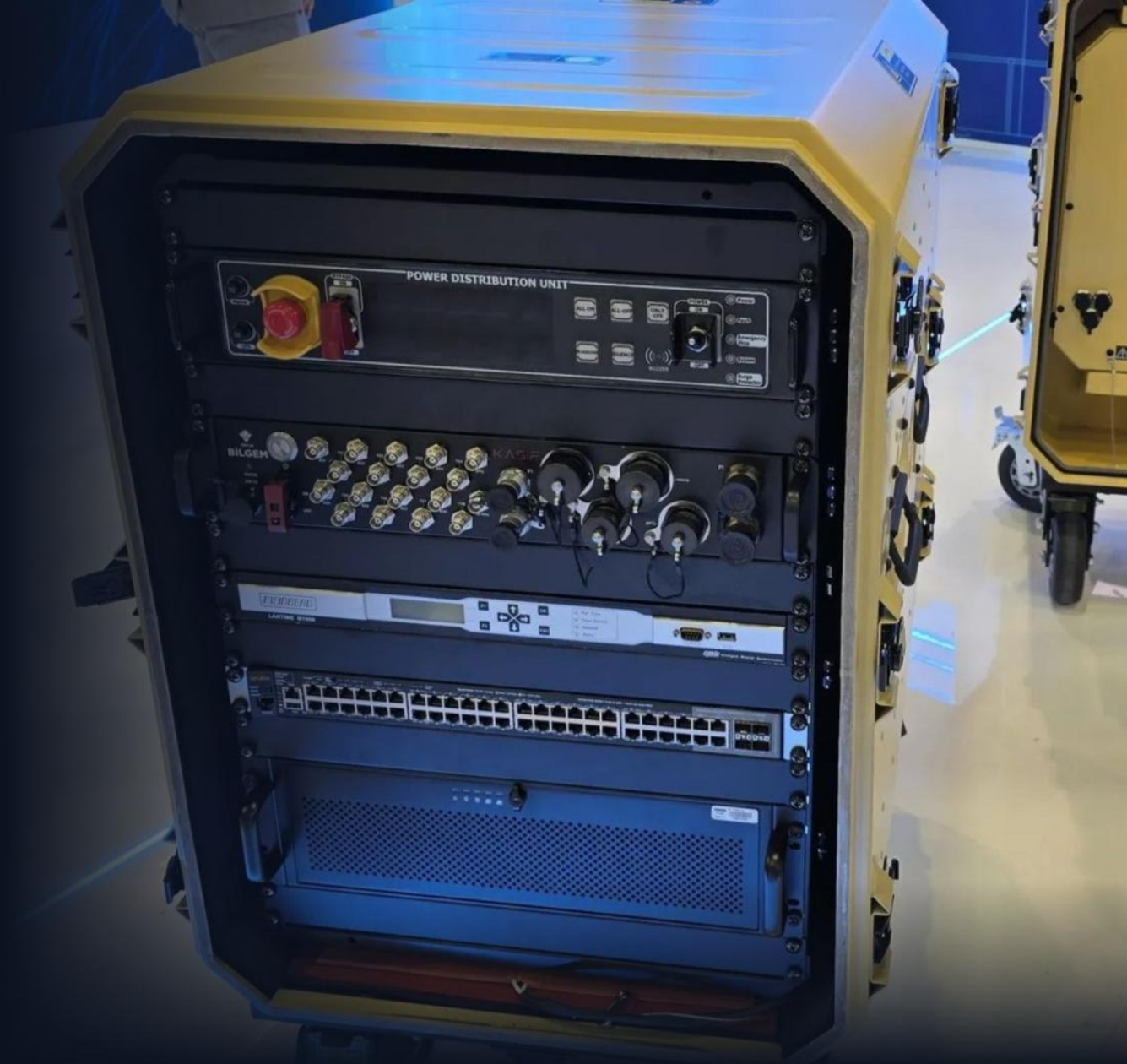
1.500 W **8U-18U** **30**

Cooling

Cabin heights

Catalogued builds

- 01 Electro-Optical Systems
- 02 Positioners
- 03 Mast Systems
- 04 Tripods
- + **Supporting Equipment**
ACP20



Electro-Optical Systems

Positioners

Mast Systems

Tripods

+

Supporting Equipment

ONE SYSTEM

ACP20 30 catalogued builds

ACP20-10U-610-WDLY

Portable Climatic Rack Cabins

Protective Equipment Cases for housing and transporting of Electronic Equipment

✓ Shown at SAHA 2026 with a 19-inch rack fit-out

- ✓ Vapour Compression Cooling
- ✓ Faraday Cage EMI/EMC Shielding
- ✓ Optional Heating
- ✓ One-Person Setup
- ✓ Accessory Kit

Cabin and depth	8U, 10U, 12U, 15U or 18U; 610, 740 or 870 mm
Heating	750 W or 1.500 W silicone heater mat
Shielding	Conductive gaskets, wire mesh braid, embedded wire
Wheels	Wheel dolly or fixed wheels; 300 kg four-wheel dolly
Mains	220 VAC, 50 Hz; RAL 7001 grey as standard
Options	Pressure relief valve, 50 kg shelf, EMI-filtered panel

1.500 W **8U-18U** **30**

Cooling capacity

Cabin heights

Catalogued builds

Electro-Optical Systems

Positioners

Mast Systems

Tripods

+

Supporting Equipment

ONE SYSTEM

ACP20, Inside the Cabin



Power and network gear in the rack bay, SAHA 2026



ACP20 closed



Both doors off, rack bay empty



Air-conditioning pack fitted



Cutaway, cooling module inside

05

In the Field

From trials to service: our masts and sensors on unmanned ground vehicles, armoured vehicles, pickups and portable field positions.

01 Six applications

02 Deployed platforms

03 Published case studies

04 Exhibitions and awards

IN THE FIELD

Six Applications, One Catalogue

Border and Perimeter Surveillance

Day and thermal cameras watched from a control room.

Start with SEG14

Armoured Vehicle Thermal Imagers

A camera raised above the vehicle, viewed from inside.

Start with MES10 + SEB20

Unmanned Ground Vehicles

A camera on a ground robot, controlled from a separate station.

Start with MES01 + SEG14

Target Acquisition and Designation

From a portable field position or a camera-equipped vehicle.

Start with PEG03 + SEB20

Radar and Antenna Positioning

Turn and tilt a radar or antenna on a powered support.

Start with PED10

Tactical Communications Masts

A field antenna raised on a portable manual mast.

Start with MMT20

Applications

Bold blue: recommended starting point

Application	Electro-Optical Systems	Positioners	Mast Systems	Tripods	Supporting Equipment
 Border and perimeter surveillance	SEG14 SEB20 SEG10 SEG12	PED08 PED10 PED12	MEM10 MES10 MES20 MMS20 MMT10 MMT20 MMW10	TMH10 TMM10	ACP20
 Armoured vehicle thermal imagers	SEB20 SEG14	PED10 PED12	MES10 MEM10	—	—
 Unmanned ground vehicles	SEG14 SEG10 SEG12	—	MES01 MES10	—	—
 Target acquisition and designation	SEB20 SEG14	PEG03 PED10 PMD01	—	TMH10 TML10	—
 Radar and antenna positioning	—	PED10 PED08 PES10	MEM10 MES10 MES20 MMS20 MMW10	TMH10 TMM10	—
 Tactical communications masts	—	PMD01	MMT20 MES10 MES20 MMS20 MMT10 MMW10	—	ACP20

IN THE FIELD · ILLUSTRATIVE VIEWS

Night, Same Scene

Visible channel

A person is difficult to see on the dark road beside the fence.

Thermal channel

The same person stands out from the darker surroundings.

Published Case Studies

10 March 2026

SEG12

< 90 s

A Faster Mast Can Save No Time: The 90-Second Question

A SEG12 sensor, a pan-tilt positioner and a four-metre pneumatic mast on a 4×4: a usable image in under 90 s from the vehicle stopping, and no crew contact with the mast.

17 February 2026

SEG14

14 m

A 14-Metre View Needs a Service Route

SEG14 on a 14 m electromechanical mast, connected to existing radar: identified, ranged observations without anyone climbing the mast.

20 January 2026

Custom positioner

500 N·m

Replacing the Positioner Without Rewriting the Host

A custom two-axis positioner for a prime contractor, installed at the existing host interface, with 0,04° pointing and 180 °/s slew required together.

Programme figures as published in the case studies at inventras3.com; they are not catalogue specifications.

IN THE FIELD · SHOWN AT IDEF 2023, SAHA EXPO 2024 AND SAHA 2026

Deployed Platforms



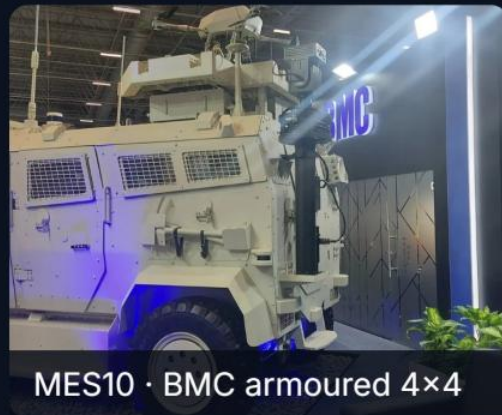
SEG10 on MES01 · UGV with ASELSAN AVAZ



SEG10 on MES01 · HAVELSAN
BARKAN UGV



SEG14 on a raised mast ·
HAVELSAN BARKAN



MES10 · BMC armoured 4x4



Two MMT10 masts · KANGAL
and BUKALEMUN



MMS20 with a radar head ·
TURAN pickup

IN THE FIELD

On Show and Recognised

IDEF 2023

Istanbul, July 2023

Gimbals, positioners and masts shown together as one surveillance chain.



MES01 and SEG10 on a tracked UGV



MMS20 with a directional antenna array



ASELSAN localisation programme ceremony

SAHA 2026

May 2026

ACP20, MMS20 and SEG14 on show; ASELSAN highest-value export award.



SEG14 on a mast above a tracked UGV



SEG14 at the head of the mast



Award ceremony at the ASELSAN stand

Six Reasons to Specify One Source



One team, design to qualification

Mechanism, drive electronics and code are designed together, then built and tested in the same company.



Precision you can specify

Zero-backlash gearing and 22-bit encoders; accuracy, repeatability and resolution published separately.



One interface standard

18-32 VDC, RS-422 with optional Ethernet and MIL-DTL-38999 on every electronic unit.



Qualified, reports up front

MIL-STD-810G and MIL-STD-461G; test and analysis reports come with the quotation.



Configured in weeks

245 catalogued builds and 33 finishes, with a typical four-week delivery.



Maintenance designed out

Sealed masts, independent axis braking, automatic flange locking; a two-year warranty.

INVENTRA S³

22 MODELS · 5 FAMILIES · ONE SYSTEM

Tell us the platform and the constraint.

Our engineering team answers with a configuration that fits it, usually within two working days.

R&D CENTRE

Melih Gökçek Bulvarı, Teknopark No: 61/19, İvedik OSB
06378 Yenimahalle, Ankara, Türkiye

INTEGRATION AND TEST CENTRE

Ahi Evran Cad. No: 134, Ostim OSB
06374 Yenimahalle, Ankara, Türkiye

inventras3.com

05 In the Field



SEG10



SEG12



SEG14



SEB20



PED08



PED10



PED12



PES10



PEG03



PMD01



MES01



MES10



MES20



MEM10



MMS20



MMT10



MMT20



MMW10



TML10



TMM10



TMH10



ACP20

Inventra S³ · Sensor · Surveillance · Systems