ECONOMAT DES ARMEES

Procurement of marksmanship training systems, accessories, consumables and related services for the Moldovan Armed Forces

DESCRIPTION OF THE NEED		
Designation	**Mandatory equipment/configuration**	**Estimated quantities**
Retractable stationary infantry target (SIT - Stationary Infantry Target)	SIT (Stationary Infantry Target), solar panel, smart target system for SIT LOMAH - Location of Miss and Hit, lighting for infantry target	10
	SIT (Stationary Infantry Target), solar panel, lighting for infantry target	50
Moving infantry target (MIT - Moving Infantry Target)	MIT (Moving Infantry Target), smart target system for MIT LOMAH - Location of Miss and Hit, lighting (with muzzle flash simulator), rails (min. 100 m)	2
	MIT (Moving Infantry Target), lighting (with muzzle flash simulator), rails (min. 100 m)	4
Retractable stationary armor target (SAT - Stationary Armor Target)	SAT (Stationary Armor Target), lighting (with muzzle flash simulator)	10
Retractable moving armor target (MAT - Moving Armor Target)	MAT (Moving Armor Target), lighting (with muzzle flash simulator), rails (min. 300 m)	1
Infantry target	Silhouette	150
Thermal kit for SIT (Stationary Infantry Target) / MIT (Moving Infantry Target) targets		66
Thermal kit for SAT (Stationary Armor Target) / MAT (Moving Armor Target) targets		11
Muzzle flash simulator		75
Sound effects simulator (SES)		5
Fixed control computer / Firing range control	Article 10 mandatory solution A “Firing range computerised control and supervision system” of this document	1
Firing range control tablet	Article 10 mandatory solution B “Firing range computerised control and supervision system” of this document	1
Shooting instructor	Article 10 mandatory solution C “Firing range computerised control and supervision system” of appendix 2 to the SCC	3

Toolkit for the management and maintenance of the firing range and remote maintenance modem		1
Multi-charger	5-slot multi-charger	5
20-foot ISO-standard container		4
Installation supervision and training	Installation of the rail system for MIT (Moving Infantry Target) and MAT (Moving Armor Target), general commissioning, LOMAH (Location of Miss and Hit) calibration, testing. Deployment of all targets with the support of the Moldovan army. Training in English for operators and instructors in the use and first-level maintenance of the equipment.	1

TECHNICAL SPECIFICATIONS

General cross-cutting requirements

- Interoperability and communication in accordance with the FASIT open standard.
- IP67 protection rating for all targets, sensors and mechanisms exposed to the field, and minimum IP65/IP56 for specific electronic equipment (tablets, loudspeakers) in accordance with the relevant Articles.
- Off-the-shelf (COTS) products, tried, tested and commercially available.
- Logistical continuity: the contractor must demonstrate the capacity to provide maintenance, after-sales service and the supply of spare parts within the European Union or NATO.

Article 1 - Retractable stationary infantry target (SIT)

Fixed firing post with a retractable silhouette, designed for infantry marksmanship training.

Movement	Vertical retraction 0°-90°, adjustable limit controls
Cycle time	0.5 to 1 s (no wind); ≤ 2 s in winds of 55 km/h
Target support	Interchangeable, compatible with standard 2D/3D silhouettes (Ivan, E and F types), up to 5 kg
Scenarios	Simple retraction, erasure on impact(s), automatic re-exposure
Impact detection	Mechanical contact sensor, adjustable sensitivity; rate of up to 1,200 shots/min (burst = 1 impact)
Structure and finish	Portable transport frame; robust, impact-resistant, corrosion-resistant and weatherproof casing; powder-coated finish (RAL colour of the contracting authority's choice, e.g. RAL 1001)
Power supply	Built-in 80-240 VAC transformer; battery-powered operation; optional solar or generator charging
Maintenance	Connection port for a maintenance tool, enabling full monitoring and configuration of the device
Diagnostic (BIT)	Local display showing the battery charge status and a self-diagnostic test covering at least 8 functions (including the impact sensor)
Lighting	External module connected via a standard M12 connector; multi-mode technology (shot simulation, continuous lighting, infrared, warning light)
Safety	Reduced speed of movement in maintenance mode; closing that ensures IP67 waterproofing and prevents unauthorised opening
Communication	Wired and/or wireless (UHF/VHF, Wi-Fi, LTE); FASIT-compliant
Temperatures	Operating temperature: -25°C to +65°C (optional: -40°C); storage temperature: -30°C to +72°C
Mass	15 to 25 kg depending on configuration; can be carried by one person, stackable

Required scalability (native, without major modifications)

- LOMAH module for tracking successful and missed shots**
- Muzzle flash simulator
- Thermal kit
- Swivelling adapter and ballistic shield

Article 2 - Mobile Infantry Target (MIT)

Self-propelled rail-mounted target, combining displacement and retraction, for dynamic scenarios.

Common requirements	All Article 1 requirements apply (support, impact detection, finish, power supply, maintenance, diagnostics, lighting, safety)
Integration	Lifting mechanism integrated directly onto the trolley, without a separate transport frame
Displacement	Bidirectional on a rail, speed adjustable up to 16 km/h in 1 km/h increments
Evasive movements	Start, stop, speed change and reversal of direction at any point; position and speed transmitted in real time
Rail track	Modular system, usable length of up to 100 m (extendable according to supplied configuration), capable of handling bends and gradients
Power supply	On-board batteries recharged via a docking station, solar power or a generator
Mass	Complete trolley approximately 45 to 60 kg; transport by two people

Required scalability (native, without major modifications)

- Height and angle adjustment of the target
- Conversion to swivel / swivel-and-retract mode
- LOMAH module**

Article 3 - Retractable stationary armor target (SAT)

Large-format fixed post for armored vehicle silhouettes.

Movement	Hydraulic retraction, electromechanical or equivalent, 0°-90°, adjustable limit stops
Cycle time	5 to 7 s (no wind); ≤ 12 s in winds of 55 km/h
Target support	Pair of supports, full-scale silhouettes up to 7 x 3 m, up to 180 kg (400 lb)
Impact detection	Mechanical contact sensors on each support, for all live and training ammunition, with a rate of fire of up to 1,200 rounds per minute
Structure and finish	Portable transport frame; robust, impact-resistant, corrosion-resistant and weatherproof casing; powder-coated finish (RAL colour as chosen)
Power supply	Built-in 80-240 VAC transformer; battery-powered operation
Maintenance / Diagnostics (BIT)	Same as Article 1 (connection port, display, ≥ 8 functions tested)
Lighting	Multi-point system (at least 2 to 3 units) ensuring uniform lighting of the entire silhouette; standard M12 connector; multiple modes (shot activation, continuous, infrared, alarm)
Safety	Closing that ensures IP67 waterproofing and prevents unauthorised opening
Communication / temperatures	Same as Article 1
Mass	80 to 100 kg mechanism depending on configuration; can be carried by four persons, stackable

Required scalability (native, without major modifications)

- Muzzle flash simulator
- LOMAH acoustic module or measurement barrier (native compatibility required; without control at this stage)**
- Enemy fire simulators
- Ballistic protection shield

Article 4 - Retractable moving armored target (MAT)

On-rail armored target combining electromechanical displacement and retraction (or equivalent) for realistic scenarios involving moving vehicles.

Displacement	Bidirectional on a rail, minimum speed 32 km/h, adjustable in 1 km/h increments
Timing performance	Capable of completing at least 8 full cycles per hour on a 300 to 350 m track
Evasive movements	Start, stop, speed change and reversal of direction at any point; position / speed transmitted in real time
Retraction	Hydraulic electromechanical or equivalent, 0°-90°, independent of displacement; cycle 5 to 7 s / ≤ 12 s under wind
Lifting reliability	The lifting mechanism must ensure a level of reliability and structural rigidity compatible with operation at 32 km/h and a high cycle rate (≥ 8 cycles per hour), without any mechanical play that could compromise the precision of the retraction
Rail track	Modular system, usable length up to 300 m, height adjustable to several positions (at least three), capable of handling bends and gradients, wind-resistant
Track safety	Safety braking system that is automatically activated in the event of a loss of communication
Maintenance	A maintenance controller that can remain connected at all times to operate the trolley during maintenance operations
Maximum load	Silhouettes up to 7 x 3 m, up to 180 kg
Impact detection / finishing / power supply / communication / temperatures	Same as Article 3
Weight / dimensions	Trolley suitable for the target; handled by a lifting trolley (lifting lugs)

Required scalability (native, without major modifications)

- Muzzle flash simulator
- Housing for units for night/IR illumination
- Thermal kit and enemy fire simulators
- LOMAH acoustic module or measurement barrier (native compatibility required; without control at this stage)**

** Clarification for Articles 1-4 - System for tracking successful and missed shots (wide-angle LOMAH)

Analysis and scoring system for shots to assist with adjustment.

Angular coverage	Approximately ±20° in azimuth and ±5° in elevation
Ammunition	Supersonic only
Detection window	Infantry: approximately 3 x 2.5 m - Armored vehicles: approximately 10 x 5 m
Calibers	Infantry up to .50 (12.7 × 99 mm); Armored vehicles from 5.56 mm to 120 mm
Cadence	Single-shot and burst fire at up to 1,200 rounds/minute without data loss
Compliance / power supply	FASIT-compliant; PoE interconnect mode or standalone mode; self-diagnostic (BIT)
Protection / temperatures	IP67; -25°C to +65°C (operating), -30°C to +72°C (storage)

Article 5 - Infantry target (Silhouette)

Interchangeable panels for SIT/MIT mechanisms.

Compliance	Silhouettes of ground troops, in accordance with infantry training standards (Ivan types 3D, E and F)
Attachment	Standardised anchor points, SIT and MIT compatible
Resistance	Absorption of multiple supersonic impacts (5.56 mm to 12.7 mm) without shattering, accurate signal transmission at the sensor

Article 6 - Thermal kit for SIT/MIT targets

Additional infrared signature for infantry silhouettes.

Function	Heating film or panel that can be fitted to the silhouette
Performance	Clear visibility via optical and thermal imaging, day and night
Integration	SIT/MIT-compatible power supply, resistant to rapid movements

Article 7 - Thermal kit for SAT/MAT targets

Large-format infrared signature for heavy silhouettes.

Dimensioning	Heating elements suitable for silhouettes weighing up to 180 kg
Performance	High-contrast thermal signature, visible from a long distance
Integration	Direct connection to SAT/MAT power supply, vibration-resistant

Article 8 - Muzzle flash simulator

Simulation of enemy fire and night-time lighting of targets.

Firing modes	Single shot and burst fire
Lighting	Multi-mode (flash, continuous, infrared, alarm), adjustable, between 350 and 500 lux
Installation	Mounted on a target holder or free-standing on a stake, adjustable; standard M12 connector
Power supply	Connected (via host device) or standalone 12 VDC / 80-240 VAC
Control	Remote control, event-driven automatic triggering
Protection / dimensions	IP67; compact design (max. diameter 150 mm, max. height 350 mm)
Temperatures	-25°C to +65°C (operating), -40°C to +72°C (storage)

Article 9 - Sound Effects Simulator (SES)

Recreation of combat soundscapes in coordination with the targets.

Library	Up to 100 sounds, transfer via USB stick, WAV/MP3/IMA ADPCM formats
Noise level	Adjustable between 70 and 130 dB at 1 m
Electronics	2-channel amplifier ≈ 500 W bridged at 4 Ω; compact 2-way loudspeaker, adjustable position
Power supply / communication	Sector or battery; LAN or radio connection; self-diagnosis (BIT)
Protection / temperatures	IP56 loudspeaker; -25°C to +65°C (operating)

Article 10 - Computerised firing range control and monitoring system

Supervision software suite and associated control terminals

Network capacity	Simultaneous monitoring and control of up to 1,000 units
Functions	Control of fixed/moving targets, activation of simulators, cluster management
Scenarios	A graphical editor for time-based and event-based scenarios, with no scripting language required

Scoring / LOMAH	Calculation of points per target/shooter/lane; graphical integration of LOMAH data by zone
AAR	Session recording and generation of exportable reports
Compatibility	Windows 10/11 or equivalent; multi-screen; touchscreen interface; secure access levels; multilingual; FASIT-compliant
Fixed control computer / Firing range control (solution A is mandatory)	Multi-screen control room monitoring station
Firing range control tablet (solution B is mandatory)	Sunlight-readable touchscreen; ≥16 GB RAM, ≥256 GB SSD or more; MIL-STD-810G-compliant toughening, IP65; battery life of at least 12 hours; radio range of at least 5 km; weight under 2 kg
Shooting instructor (solution C is mandatory)	Screen positioned alongside the firing lane, displaying scores, hits and misses in real time

Article 11 - Toolkit for the management and maintenance of the firing range and remote maintenance modem

Field tools and remote diagnostics link.

Tools	Waterproof, compartmentalised toolboxes for preventive/corrective maintenance
Modem	LTE and/or Wi-Fi connectivity, Gigabit Ethernet interface, FASIT-compatible
Safety	VPN tunnels (IPsec, OpenVPN), FIPS 140-2-equivalent encryption
Protection / power supply	IP67; PoE power supply

Article 12 - Multi-charger

Shared charging station for removable battery packs.

Capacity	5 independent, simultaneous charging slots
Safety	Protection against overload, short circuit and reverse polarity; LED indicator for each slot

Article 13 - 20-foot ISO standard container

Secure storage unit for removable equipment at the firing range.

Type	20-foot ISO maritime container, new (first voyage), Corten steel, treated timber floor
Usage	Waterproof and secure storage when not in use
Closure	Double locking system with a reinforced padlock

Article 14 - Supervision of installation and training

Fixed-price deployment support service.

Installation	Installation of rail system for moving targets (MIT and MAT) and general commissioning of all equipment
Calibration	Calibration of LOMAH systems and functional acceptance tests
Deployment	Deployment of all targets, in logistical coordination with the relevant local authorities
Training	Training in English for operators and instructors in the use and first-level maintenance of the equipment
Content of the package	Travel expenses (transport and associated administrative costs), accommodation costs, meal costs, any training materials, and all other related costs.