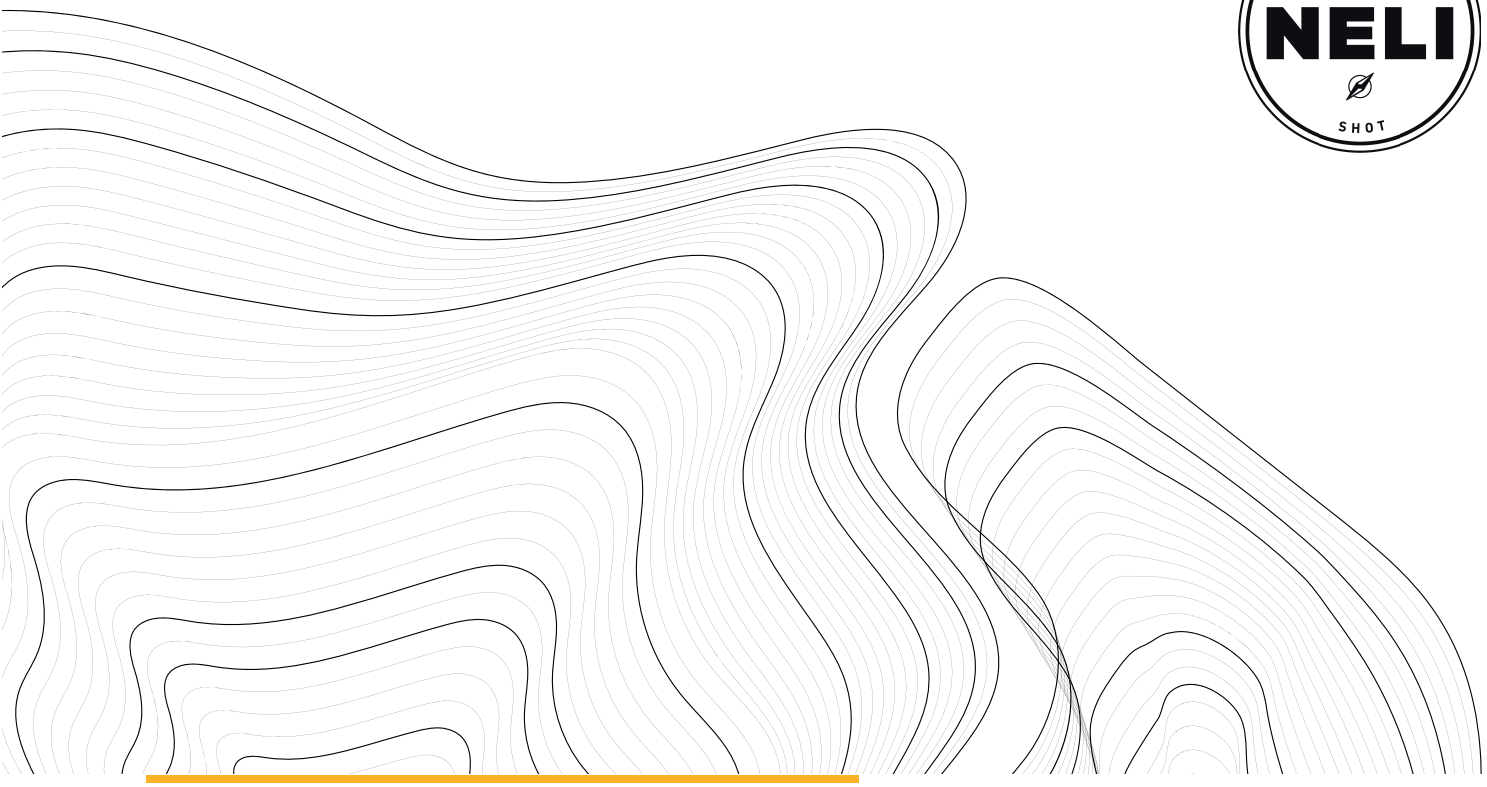
TECHNICAL OFFER

NELI INERTIAL NAVIGATION SHORT DATA



Integrated Defense Solutions

NELI INERTIAL NAVIGATION
SHORT DATA

TECHNICAL OFFER

IDS Integrated Defense Solutions

TECHNICAL OFFER

NELI INERTIAL NAVIGATION SHORT DATA

It is a powerful ballistic calculation and aiming system, composed of robust hardware with military characteristics that includes an inertial navigator based on fiber optic gyroscope technology, GNSS system, a power pack, state-of-the-art computing and processing equipment as well as the powerful NELI software, capable of processing multiple ballistic calculations in a short time, providing the commander with the information necessary for a fast and accurate execution of artillery shots.

OTAN

Ballistic Model
STANAG 4355

Creation of new ammunition

Meteorological bulletin
STANAG 4082

Power pack option and more than 50 hours of autonomy

Grid and trajectory graphics

All the shooting data the commander needs on a single screen

NELI SOFTWARE

Never before has there been software that does ballistic calculations while moving the direction or elevation of the barrel. The weapon commander will have the greatest versatility and mastery of ballistics, fulfilling his goal in a truly short time.

THE HOME

View ballistic results, coordinates and shooting parameters.
All in 1 screen!!!

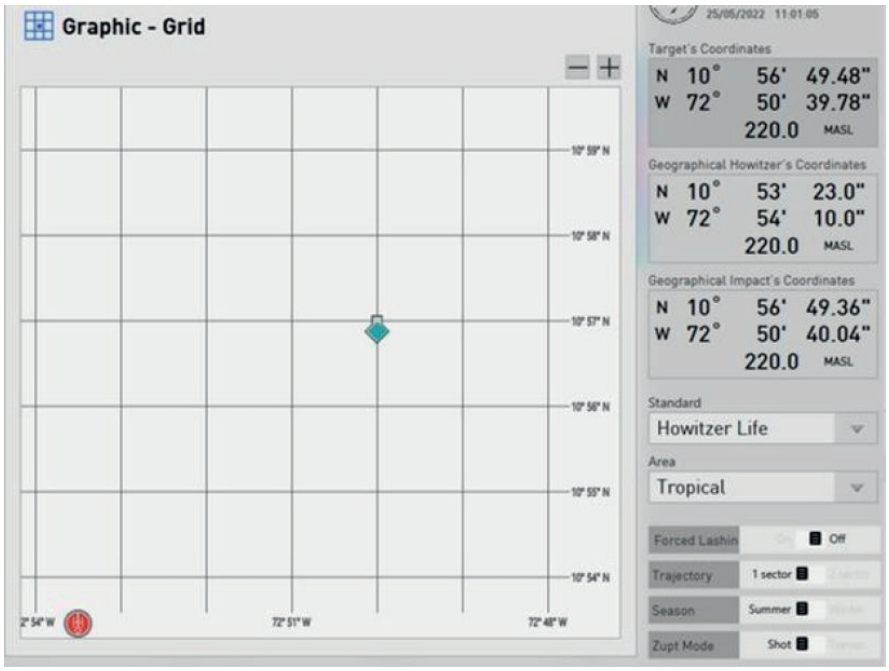
THE HOME INFO

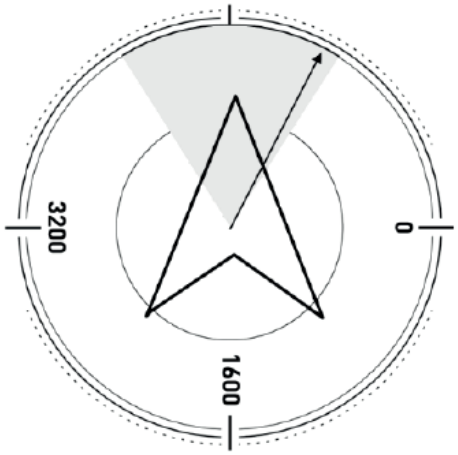
Nav. buttons
State bar
Aiming mechanism
Target Coordinates
Howitzer coordinates
Aiming Coordinates
Max order
Direction Graph
Aiming Graph
Deflection adjust
Magnetic Orientation

Error management
Standard
Met Área
ZUPT mode
Azimuth
Pitch graph
Ammo configuration
Fuse
Propellant

BALLISTIC CONFIGURATION

Configure the ammunition parameters
for indoor ballistics. Based on STANAG 4355 coefficients.





TARGET ENTRY

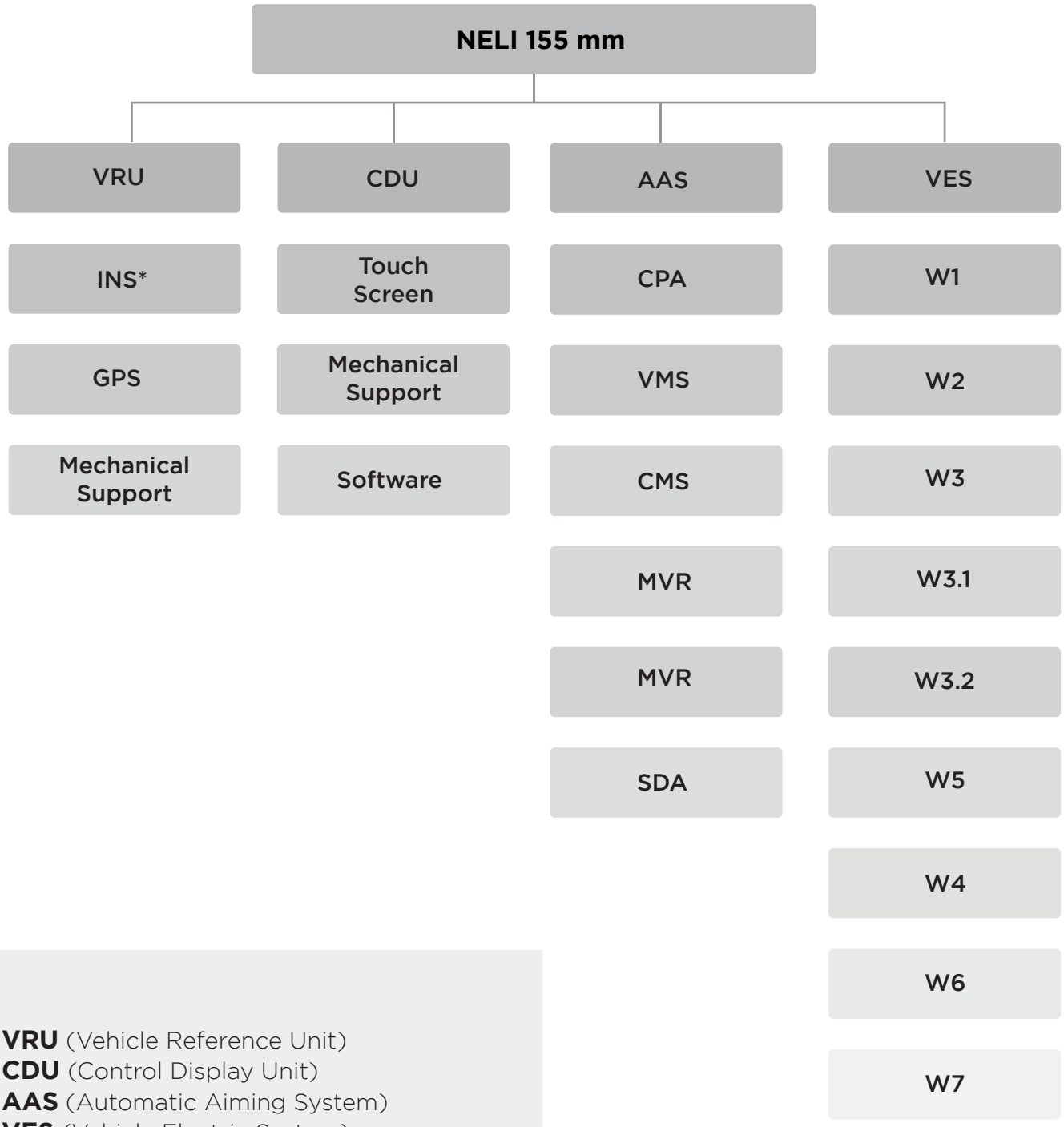
Entry of targets by means of geographic coordinates, UTM, Polar and by external data. Neli is able to establish the correction requested by a forward observer, bringing the projectile to the target

CORRECTIONS FROM FORWARD OBSERVER

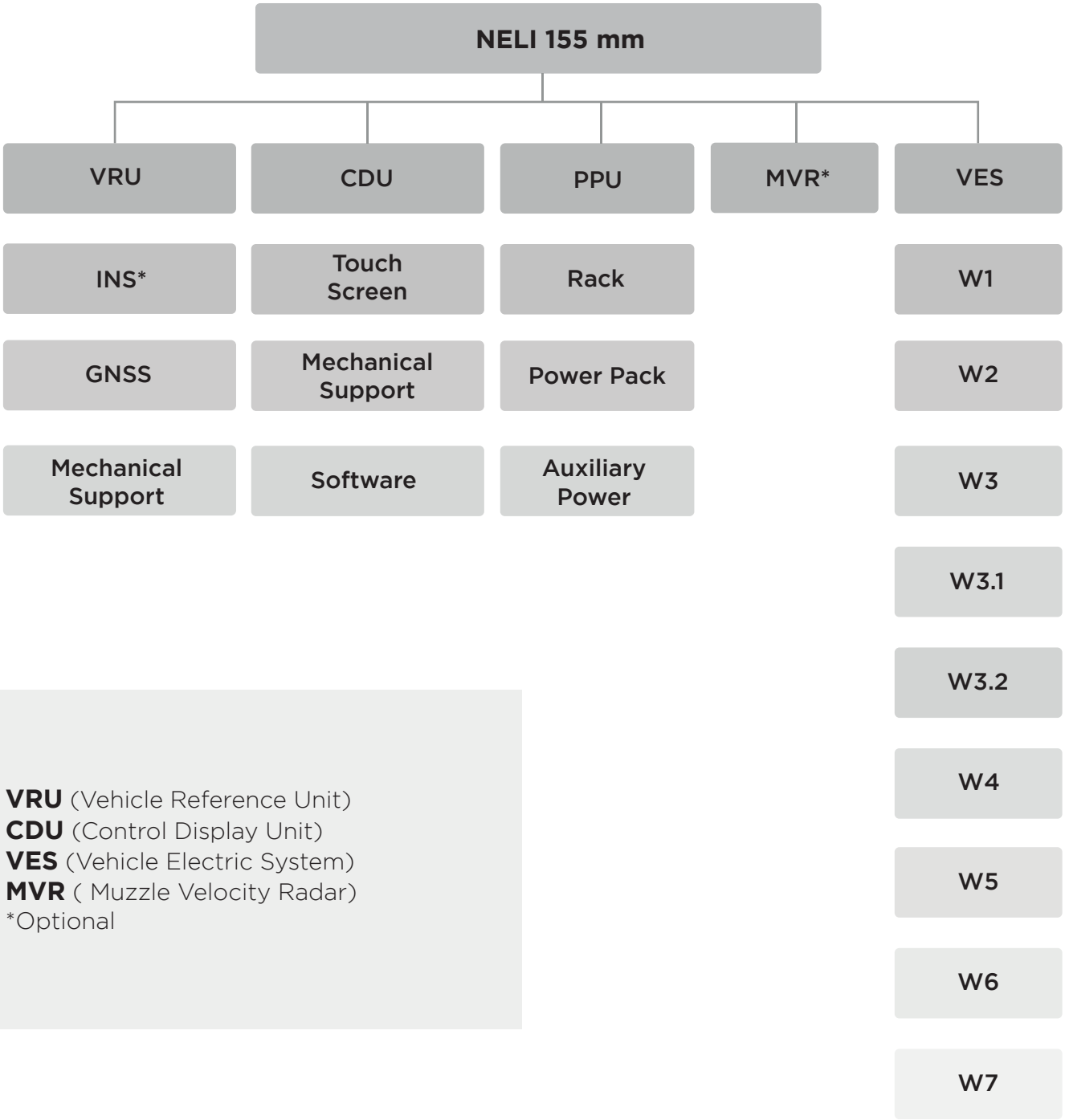
Neli is able to establish the correction requested by a forward observer, bringing the projectile to the target

HARDWARE CONFIGURATION

- NELI has a mechanical configuration specifically adapted to each type of weapon.
- The mechanical mounts standard does not set any permanent changes to the weapon.



VRU (Vehicle Reference Unit)
CDU (Control Display Unit)
AAS (Automatic Aiming System)
VES (Vehicle Electric System)
CMS (Canon Management System)
MVR (Muzzle Velocity Radar)



VRU (Vehicle Reference Unit)
CDU (Control Display Unit)
VES (Vehicle Electric System)
MVR (Muzzle Velocity Radar)
*Optional

VRU (VEHICLE REFERENCE UNIT)

The vehicle reference unit is in charge of effectively guaranteeing the geographical position and attitude angles of the system in which it is installed. This assembly is connected by the VES (Vehicle Electrical System) assembly to the CDU (Control Display Unit) and is made up of the following subsystems:

INS
GPS or GNSS
Mechanical support

PPU (POWER PACK UNIT)

If the system does not have its own power supply. NELI will provide a power supply installed on the weapon, which can provide an electrically protected output for each of the components and can be charged with DC voltage, AC voltage and solar panels. The maximum autonomy that it can support exceeds 50 continuous hours of use.

CDU (Control Display Unit)

The control and display unit is configured by means of specially adapted and robust computer equipment to withstand the shooting conditions, its layout is always designed to ensure that the user has easy access to the interface

TECHNICAL CHARACTERISTICS VRU

Horizontal position (CEP 50)(1)	0.1% DT
Vertical position (EP50)(1)	0.1% DT
Heading accuracy (RMS)(2)	0.3 mil
Roll / pitch accuracy (RMS)(2)	0.2 mil
Static set-up time	‹ 4 min
Typical dynamic set-up time(3)	10 min
Fast alignment (stored values)	30 sec

INTERFACES

Power consumption (24 DC)	‹ 18W no cooling required
Power input range	12 to 32 DC
Input / outputs format	RS232/422 – Ethernet TCP/UDP
Compatible with any standard GNSS (4)	NMEA 0183
Update rate	Up to 200 Hz

ENVIRONMENTAL FACTORS

MTBF	Up to 80.000 h
Standard operation temperature	-35°C +71°C
Storage temperature	-40 °C +80 °C
Angular rates	› 200°/s
Electrical environment	MIL STD 1275
EMC	MIL STD 461
Shocks (without dumpers)	40 g, 10 ms
Shocks (with dumpers)	Howitzer and mortar qualified
Orientation	Can be mounted in any orientation
Roll & pitch	No limitation

GNSS

Receiver	Multi-band GNSS
Input voltage	9VDC – 33 VDC
Constellations	GPS, GALILEO, GLONASS, BEIDOU (concurrent tracking)
Signals	GPS: L1 C/A, L2C GLONASS: L1OF, L2OF GALILEO: E1-B/C, E5b BEIDOU: B1I, B2I
Acquisition time	< 60 seconds for first position
Storage temperature	-40°C +80ºC
Operating temperature	-32°C +71ºC
EMC	MIL-STD-461G – 'Ground Army'
Power network	MIL-STD-1275E

CONTROL DISPLAY UNIT CDU

Size	12"
Resolution	1024 x 768 (XGA)
Contrast Ratio	800 : 1
Touch screen characteristics	Resistive 5 wires Glass to Glass technology
Microprocessor	Intel® Core™ i7-7600U (2 x 2.8GHz) (7th Generation
Memory	24GB DDR4 Memory down
Operating system	Windows 10 IOT 64Bits
Ports	Ethernet, Serial Ports, USB 2.0
Power supply	Power 18/36V DC / MIL-STD-1275E
Power consumption	50W normal environment
Weight	8 Kg
Connectors	Type MIL-DTL-38999 III, UP Black Zinc Nickel
Random Vibrations	STANAG 4370 AECTP400
Shocks / Bump	DEF-STAN 0035 : TEST M12, 40gx6ms - 1000
Operating temperature	MIL-STD-810F, procedure II, -32°C / +63°C
Waterproofness	IP 68

POWER PACK UNIT PPU

Capacity (Typical)	166 A/h
Energy	4200 Wh
Life cycle	1000 cicles to 80%
Dimensions (W;H;L),	286 X 292 X 398 mm
Weight	43 Kg
Random Vibrations	STANAG 4370 AECTP400
Connectors	Type MIL-DTL-38999 III, UP Black Zinc Nickel
Operating temperature	MIL-STD-810F, procedure II, -32°C / +63°C
Waterproofness	IP 66

MUZZLE VELOCITY RADAR MVR

Antenna type	Micro strip array technology
Transmitter type	FETDRO / Amplifier
Output power	300 mW ±100 mW
Antenna gain	21 dB ±1 dB
Horizontal beam	10° ±1°
Vertical beam	20° ±1°
Signal memory	128K samples, 1M samples optional
Trigger source	Doppler, Acoustic,
Central processor	Intel 80386EX
Velocity range	30-3000 m/s
Rate of fire	Up to 10.000 rounds pr. min.
Weight	5 kg
Power supply	18-32 VDC, 20 Watt maximum4

EXPERIENCE

155/52 SBT APU
HOWITZER (QTY: 13)

105/30 LG MKIII
HOWITZER (QTY: 10)

105/30 L 119
HOWITZER (QTY: 01)

GENERAL CONSIDERATIONS

Training

NELI's technical team provides training on the use and maintenance of the system, in addition, optionally, it can provide differential training on the practical use of STANAG 4355, STANAG 4119, STANAG 4082, STANAG 4061. These trainings are certified by 70 hours of study and practical evaluations in the development of the course. The course includes differential training for the end customer on diagnostic procedures and maintenance of the i and ii echelon for NELI system

Support

NELI will provide an entry and diagnosis mechanism to the VRU with the purpose of avoiding the installation of costly maintenance laboratories.

Technical Guarantee

The technical guarantee on the VRU is initially offered with a term of 5 years, where we guarantee that the system works correctly, free of maintenance.
NELI offers an initial 2-year technical warranty for the other sets (CDU, MVR, VES) that can be extended according to customer needs.

System Integration Work

In case of not having the system previously integrated with NELI, technical access to a weapon will be required (which implies knowing mechanical and electrical architecture) in addition to access to the manuals and electrical plans of the same. The NELI team together with the technical team responsible for the weapon will propose the best mechanical and electrical installation strategy. In case of requiring connection to the automatic control of a weapon, each specific integration must be addressed and quoted. If there are signal

connection requirements or additional instrumentation, this will be coordinated specifically for each requirement.

Integration to Automatic Aiming Systems

NELI is able to integrate into the automatic targeting systems established by each weapon manufacturer, this integration process requires a bilateral analysis between the weapon manufacturer and the NELI engineering team.

Ballistic Adjustment

The client has the ballistic coefficient entry module available to the system under STANAG 4355, however the acquisition of said coefficients and their use is the responsibility of the client and not of the NELI technical or administrative team.

OFFER CLARIFICATIONS

- Any new integration requires technical access to one of the weapons systems in the client's Location, as well as access to electrical and mechanical drawings (if necessary), availability of the technical team that manufactures the weapon to answer questions about the integration and authorization from the manufacturer for the installation of the components. (NELI always respects intellectual property and is willing to sign any confidentiality agreement required)

- Integration in the first system can take around 6 months.

- The production of 1 or up to 10 NELI systems requires a time of 6 months from the generation of the purchase order by the client.

- The NELI technical team can follow the ballistic adjustments of the ammunition in the software and guarantee the behavior predicted in the shooting tables provided by the manufacturer of the weapon, but is not responsible for the correspondence of said shooting tables with the shooting test on field. The cost does not include any ballistic shooting test in the field.

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