

UMRS

UNDERWATER MAGNETIC RANGE STATION

The Underwater Magnetic Range Station (UMRS) comprises a fixed sensor installation and data processing system facility for vessel magnetization measurements in accordance with NATO AMP-14.

Features

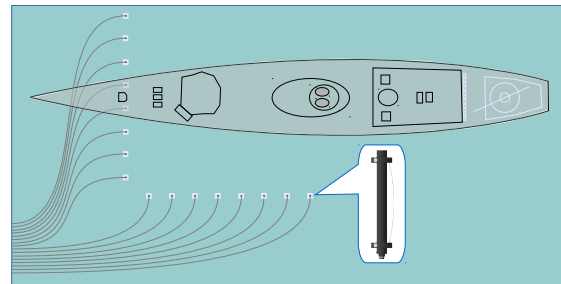
- North/South – East/West (NS/EW) sensor pattern for longitudinal and vertical measurements
- Underwater cables with wave protection conduits
- 24-bit signal processing subsystem
- Signal analysis subsystem
- Global Navigation Satellite System (GNSS) for ship position recording
- Line of Sight (LOS) subsystem for real-time ship-to-shore communications (data & voice)
- Shore facility with uninterruptible power supply, air conditioning, lightning protection, lighting and security system

Standard Equipment

UMRS-100_9	Underwater NS/EW sensor subsystem (9 x 9 sensors, underwater cables) 24-bit signal processing subsystem, data analysis hardware and SDMSv2 software
UMRS-410	Manuals and documentation

Optional Equipment

UMRS-133	Ship location display and recording equipment (ship & shore GNSS receivers, antennas, laptop with mapping software)
UMRS-140	Ship-to-shore communications (LOS WiFi, Antenna, switch, VoIP terminals, transceivers)
UMRS-300	Shore facility (ISOBOX, power distribution panels, lighting, UPS, environmental control unit, lightning protection, underwater cable protection kit, equipment racks, furniture, alarm system with CCTV camera).
UMRS-315	Spares and expendables
UMRS-320	Special support tools



ELECTROMAGNETIC MEASUREMENT RANGE LAYOUT



UMRS PROCESSING FACILITY LAYOUT



ELECTROMAGNETIC MEASUREMENT RANGE SENSORS

Application

The Underwater Magnetic Range Station (UMRS) provides a facility for performing electromagnetic vessel measurements and analysis, useful for subsequent de-gaussing or magnetic treatment.

A 9x9 N/S – E/W sensor array, installed in cement (non-magnetic) supports allows the simultaneous vertical and longitudinal field measurements.

The system is suitable for steady-state magnetic (SM), static electric (SE), alternating magnetic (AM) and alternating electric (AE) field measurements.

The software records the vessel's magnetic parameters, evaluating the data in real time, and produces reports aiming at minimizing the ship's magnetic signature.

UMRS Specifications

Number of sensors	Nine (9) by nine (9) in a typical NS/EW configuration
Sensor type	Bartington 3-axis fluxgate magnetometer, DC to 3 kHz, $\pm 100\mu\text{T}$
Sensor base	Cement, 2.2 W x 2.2 D x 1.2 H weighing ~3 tons each
Operating depth	> 50m
GNSS subsystem	GPS / GLONASS Differential GPS (ship, shore) for precise platform position tracking
Data acquisition subsystem	UEI 3 x 16-channel, 24 bit, 120 kS/s A/D
Measurement error	$< \pm 0.5\%$ or $< \pm 1.5\text{nT}$
UMRS application software	EPOS SDMSv2 <ul style="list-style-type: none">• Magnetic signature recording with real time vessel angle evaluation• Measurement of permanent and induces magnetic field• Presentation of the vessel's magnetic signature for different de-gaussing system conditions; prediction for different depths, courses, and geographic locations• Isometric diagrams of magnetic signatures• De-gaussing coil status• Magnetic anomaly detection (MAD)
Calibration requirements	Every 5 years
Fixed facility	ISO BOX, power distribution panels, lighting, furniture, magnetometer cable entry panel, equipment rack, environmental control unit, lightning protection, burglar alarm equipment with CCTV, GNSS and communications antennas.
UPS	CyberPower 5 kVA, sealed batteries for 60 min autonomy
Environmental	-10°C to $+50^{\circ}\text{C}$, 20 – 80% relative humidity, non-condensing
MTBF	> 40000 hrs
Applicable standards and recommendations	NATO AMP-14

List of Services Offered

Training	Operating and Maintenance Personnel.
Pre-Installation	Application planning, installation study.
Installation	Installation, Setting to work.
Post-Installation	After sales technical support.



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