GEM elettronica

Frequency Diversity Radar

SeaFalcon/N

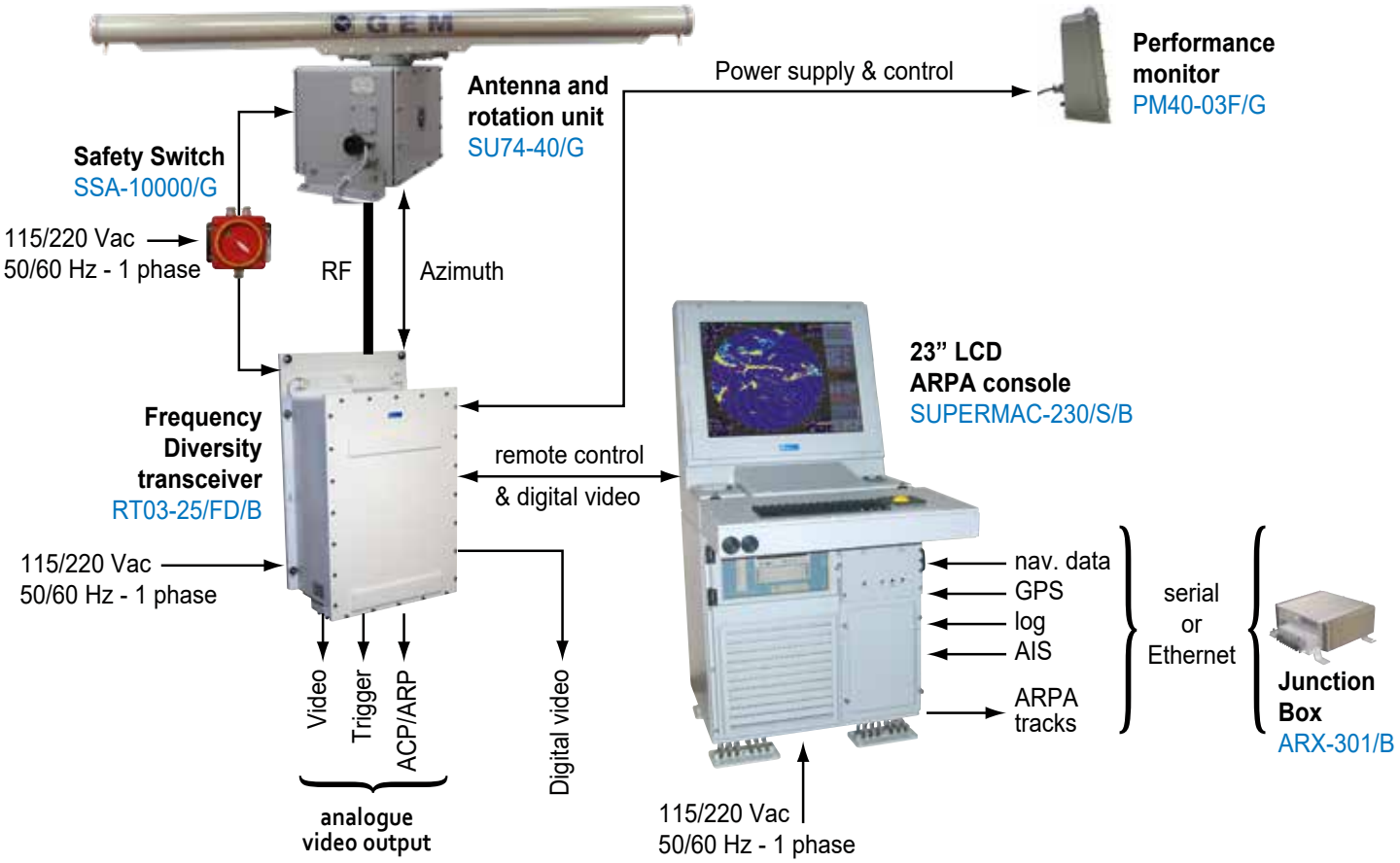
The new X-Band radar stems from GEM extensive experience in designing and producing state-of-the-art maritime navigation & long radar systems.

GENERAL DESCRIPTION

The SeaFalcon/N Frequency Diversity Radar System exploits the latest technology in the field of digital video processing, thus optimizing the radar performances on every scale.
Able to discriminate targets also in presence of adverse conditions of sea clutter and rain and to reject interferences by other radar emissions through suitable filters; signal/noise ratio is increased using sophisticated correlation techniques.

RADAR SEAFALCON/N

GENERAL DIAGRAM OF CONNECTION



ANTENNA

Polarization:	horizontal
Longitudinal size:	2342 mm
Gain:	≥ 30 dBi
Horizontal beam width (at -3dB):	≤ 1.1°
Vertical beam width (at -3dB):	25° typical
Side lobes within 10°:	< -26 dB
Side lobes outside 10°:	< -30 dB
Rotation speed:	50 ± 2 r.p.m. (with short and medium pulses) 22 ± 2 r.p.m. (with long and extra long pulses)
Wind relative speed:	up to 100 Knots

TRANSMITTER

Magnetron peak power:	25 kW (nominal)
Frequencies:	F1= from 9195 to 9255 MHz F2= from 9415 to 9460 MHz
Pulse width (nominal):	short (from 50 to 190 ns) medium (from 200 to 590 ns) long (from 600 to 990 ns) extra long (from 1000 to 1200 ns)
Pulse repetition frequency:	from 3120 to 4000 Hz (short pulse) from 1255 to 3008 Hz (medium pulse) from 785 to 1236 Hz (long pulse) 600 Hz (extra long pulse)
PRF staggering:	± 6 % around the PRF

ARPA functionality

- acquisition and tracking up to 250 targets, manual or automatic
- guard zones, in order to generate automatic alarms once a target enter or exit such zones
- tracking inhibition areas, In order to disable target initialisation and tracking
- clutter maps, to adaptively modify plot extraction thresholds in presence of areas with different sea and noise levels

RECEIVER

Limiter:	with RF STC functionality
Receiver Type:	fully solid-state low-noise front end
Dynamic range (nominal):	100 dB (125dB with RF STC limiter)
Overall noise figure:	≤ 3.5 dB
Intermediate Frequency:	60 MHz
IF bandwidth	20 MHz short pulse 5 MHz medium pulse 2 MHz long & extra long pulse
Tuning:	Automatic and manual

RADAR SEAFALCON/N

Display type:

- colour 23” flat screen monitor
- very wide selection of radar controls (e.g. range scale, PRF, PW, interference rejection), video controls (STC, FTC, gain) and tools (EBL, VRM...)

Processing and presentation:

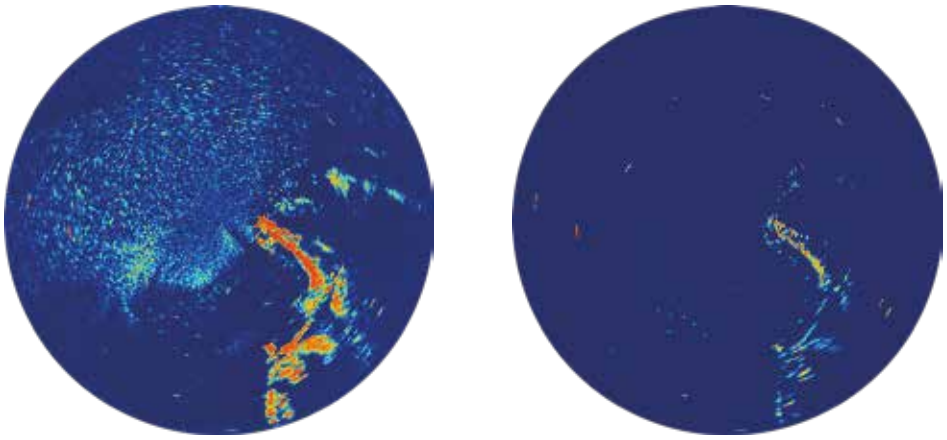
- ease of usage through a user-friendly interface with keyboard and graphic presentation based on pop-up/pull-down menus allowing to open/close windows for data and functions management through a trackball-controlled cursor
- range scales: from 0.0625 to 96 n.m. (130 n.m. with off-center)
- two VRM, two EBL and an electronic marker with off-centre capability
- echo stretch, allowing the enhancement of small radar returns
- plot function of all echoes preceding positions with automatic decay, user programmable
- PPI off-centre: off-centre representation of radar image in all directions
- signal processing functions: FTC, STC, interference rejection, CFAR, pulse-to-pulse correlation, scan-to-scan correlation, echo stretcher

System interfaces:

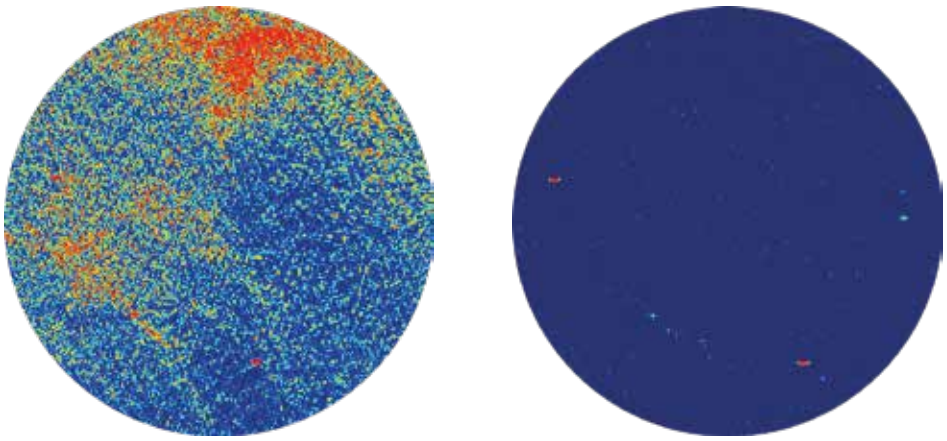
- all the on-board navigation sensors, such as GPS, compass or gyrocompass, LOG, plotter, etc.
- other devices, such as AIS, TLC, etc.
- high-speed Ethernet connection for data sharing

System management and maintenence:

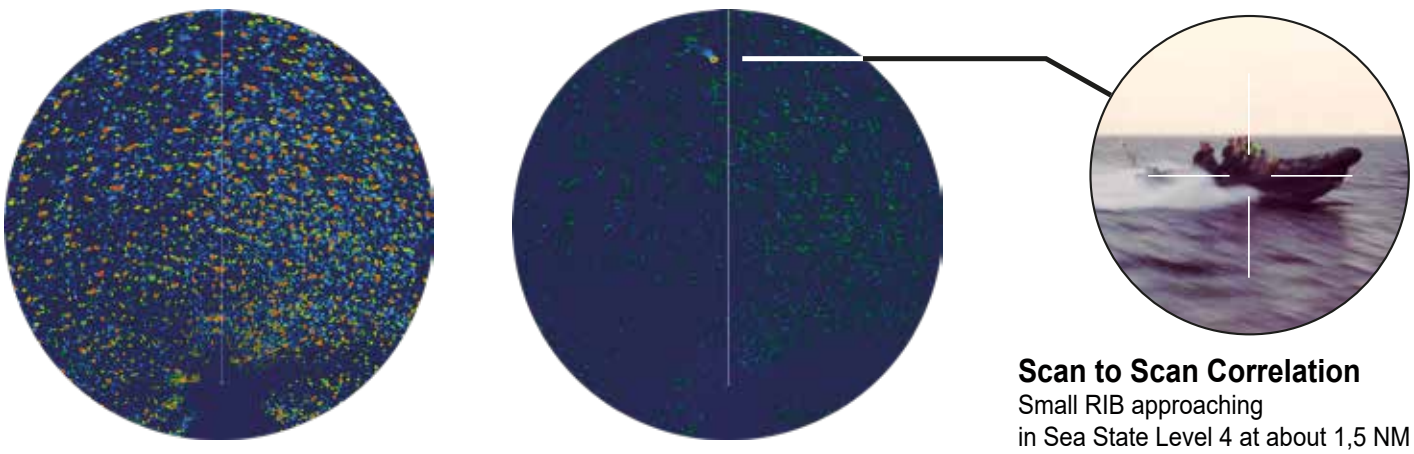
- ease of fault detection, due to comprehensive BITE system
- ease of access for maintenance, due to easy access to all replaceable parts



Automatic STC
Non-Isotropic Clutter Distribution
due to strong wind in coastal area



CFAR
Three small fishing boats
masked by dense rain clutter

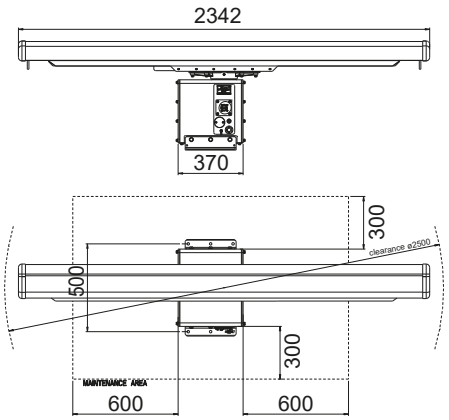


Scan to Scan Correlation
Small RIB approaching
in Sea State Level 4 at about 1,5 NM

RADAR SEAFALCON/N

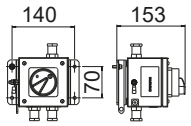
OUTLINE DRAWING (dimensions in mm)

ANTENNA



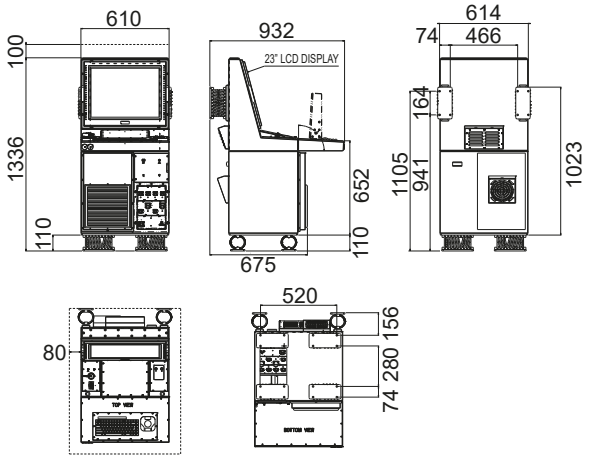
Weight: 65 Kg

SAFETY SWITCH



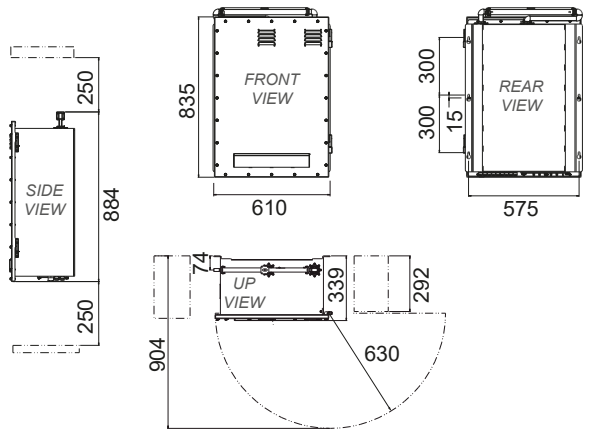
Weight: 2 Kg

ARPA CONSOLE



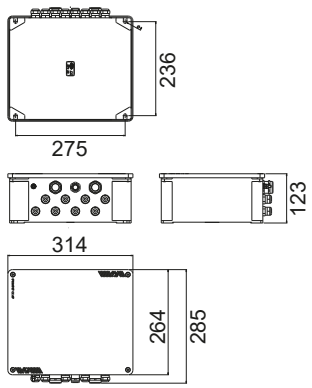
Weight: 120 Kg

TRANSCEIVER UNIT



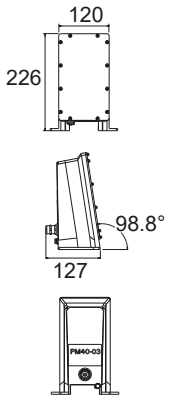
Weight: 65 Kg

JUNCTION BOX



Weight: 3.5 Kg

PERFORMANCE MONITOR



Weight: 2 Kg

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