

NAVIGATION RADAR

MANTADIGITAL™ RADAR SYSTEMS



Kelvin Hughes offers a range of radar systems. From the state of the art SharpEye™ solid state technology to conventional magnetron transceivers, all with our innovative multifunction MantaDigital™ displays and low profile antennas.

Variants include: 10kW and 25kW in X band frequency, 30kW magnetron and SharpEye™ 200W solid state transceiver in S band frequency.

DISPLAY TECHNOLOGY

The MantaDigital™ multifunction navigation workstation provides radar, chart radar, ECDIS and Conning functionality in a single station. The different Type Approved modes can all be displayed with a simple 'point and click' at the relevant screen icon.

Key features include dual PPI, ETD (Enhanced Target Detection), ice detection, chart radar, dynamic clutter suppression, vessel predictor and radar overlay.

ENHANCED TARGET DETECTION

ETD significantly enhances the display of all targets without interfering with the normal radar appearance or operation. This is achieved by correlating returns over a long period of time and then allocating colour shades depending on the persistency of a return and using different colours for stationary and moving targets. When combined with the dual PPI, the operator can continue using the radar in the normal way with the addition of an advanced detection view on the secondary PPI. ETD is of great benefit in ice or for detecting floating debris and small boats.

DUAL PPI

The modern radar display risks becoming cluttered with information such as from ARPA symbology, Trails, AIS and Chart data. When looking for small intermittent contacts, this is not ideal and so we have introduced a second PPI screen. This allows the navigator to benefit from the data while still being able to keep a clear screen for small target searches. The second screen can be configured independently of the first and so, for example, trails can be set to True on one and Relative on the other, giving the Navigator a better and instant visual appreciation of the risk of collision and course and speed of other vessels.

SHARPEYE™ SOLID STATE TECHNOLOGY

No magnetron equals no routine maintenance, ultra high reliability, and low cost of ownership.

Despite the low (200W) peak power, the detection performance, especially in poor weather conditions, is superior to that of magnetron radars. Radar performance also benefits from the transceiver being positioned upmast, thereby minimising signal loss in the waveguide while also simplifying installation. The high reliability and lack of routine maintenance means the need to subsequently access the transceiver is almost removed.

ANTENNA AND TURNING UNITS

Antennas available are 1.3m, 1.9m and 2.5m in X band frequency and 3.9m in S band frequency, and are all of the patented low profile design to reduce wind loading and increase in-service life. The antennas use the polyrod lens principle that allows a reduced vertical dimension enabling a significantly lighter and low profile design that reduces the stress on the motor and gearbox.



SITUATIONAL INTELLIGENCE, THE WORLD OVER

MANTADIGITAL™ RANGE

SYSTEM	SIZE	DESCRIPTION	TRANSCIVER	ANTENNA
10kW	MD1	22" DISPLAY	10kW X-BAND UPMAST INTEGRATED TRANSCIVER WITH PERFORMANCE MONITOR	1.3m / 1.9m / 2.5m ANTENNA OPTIONS
	MD5	26" DISPLAY		
25kW	MD10	22" DISPLAY	25kW X-BAND DOWNMAST TRANSCIVER WITH PERFORMANCE MONITOR	TURNING UNIT (PROVIDES HOUSING FOR 10kW TRANSCIVER)
	MD11	26" DISPLAY		
SHARPEYE™	MD12	22" DISPLAY	S-BAND SHARPEYE™ SOLID STATE UPMAST INTEGRATED TRANSCIVER WITH HEALTH MONITOR	3.9m ANTENNA
	MD13	26" DISPLAY		
30kW	MD14	22" DISPLAY	30kW S-BAND DOWNMAST TRANSCIVER WITH PERFORMANCE MONITOR	TURNING UNIT (PROVIDES HOUSING FOR SHARPEYE™ TRANSCIVER)
	MD15	26" DISPLAY		

TRANSCIVER SPEC	10kW	25kW	SHARPEYE™	30kW
PEAK POWER	10kW	25kW	>170W (200W TYPICAL)	30kW
MAGNETRON LIFE	10,000 HRS TYPICAL	10,000 HRS TYPICAL	NO MAGNETRON MTBF >150,000 HOURS	10,000 HRS TYPICAL
SIGNAL PROCESSING	N/A	N/A	PULSE COMPRESSION 660:1	N/A
FREQUENCY BAND	9,410MHz +/- 30MHz	9,410MHz +/- 30MHz	2,930 - 3,070MHz 8 SELECTABLE CHANNELS	3,050MHz +/- 10MHz
FREQUENCY	X-BAND	X-BAND	S-BAND	S-BAND
PULSE LENGTH/PRF (S)	55ns/3000Hz	70ns/3000Hz	*	55ns/3000Hz
PULSE LENGTH/PRF (M)	230ns/1500Hz	260ns/1500Hz	*	260ns/750Hz
PULSE LENGTH/PRF (L)	600ns/750Hz	900ns/750Hz	*	600ns/750Hz
RECEIVER NOISE	6dB NOM	6dB NOM	<4dB NOM	6dB NOM
RECEIVER IF FREQUENCY	60MHz	60MHz	60MHz	60MHz
RECEIVER BANDWIDTH	6/22MHz	6/22MHz	20MHz	6/22MHz
MINIMUM RANGE	<40m	<40m	<40m	<40m
RANGE RESOLUTION	S <7.5m M >15m L >30m	S <7.5m M >15m L >30m	15m	S <7.5m M >15m L >30m

* SharpEye™ transmits a non linear sequence of S, M and L pulses simultaneously. Each transmission is unique, enabling pulse compression.

ANTENNA SPEC	1.3m	1.9m	2.5m	3.9m
BEAMWIDTH (H)	1.8° -3dB	1.25° -3dB	0.95° -3dB	2.0° -3dB
BEAMWIDTH (V)	24.4°	24.4°	24.4°	26°
ANTENNA GAIN	>31dB	>31dB	>31dB	>28dB
POLARISATION	HORIZONTAL	HORIZONTAL	HORIZONTAL	HORIZONTAL
SIDELOBES (+/- 10)	< -30dB	< -30dB	< -30dB	< -26dB
SIDELOBES >10	< -40dB	< -40dB	< -40dB	< -32dB

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