

OVERVIEW

The new solid state Phalcon-NT RACON works seamlessly with traditional and solid state radar solutions, and does not require the solid state radar to change its transmission mode. The new Phalcon-NT RACON “learns” its environment and responds accordingly saving energy.

Conventional RACON solutions have been around for many years, they are highly valued by mariners but changes in radar technology may limit their effectiveness. RACONs are designed to work with conventional radar systems that use short high power and fixed frequency transmissions from magnetrons and vacuum tube based sources. These conventional radar systems are now being replaced by solid state transmitters that have much longer operating lives and do not require 1000’s of volts to initiate them. Conventional RACONs will potentially need to be replaced as they will not automatically be triggered, or will do but at a significantly reduced rate by a solid state radar.

The new solid state Phalcon-NT RACON is now available and has lower power from ten to a few hundred milliwatts. This solid state radar contains a non-lived radar source that does not require repetitive servicing, and the voltages required to generate the radar signal are low and safe. Solid state radars now have swept frequencies and numerous transmissions pulse widths which allows the radar to more effectively pull real targets from noisy responses which conventional RACONs will struggle with.

The Phalcon-NT also provides a AIS message 21 through modulation of the leading dash for location identification as a future option.

KEY FEATURES

- Capable of responding to S-Band and X-Band pulsed radars in compliance with the ITU recommendations ITU-R.824-4
- Compliant to IALA Recommendation R-101, and IALA Guideline No. 1010
- Ensures that swept frequency pulses from solid state radars are identified and correctly characterised
- Resolves frequency information of 50ns pulses within accuracy of around ± 1 MHz
- Much less probability of false triggers by employing clever digital algorithms
- Higher frequency accuracy in the presence of simultaneous signals
- Affordable (average) power consumption is achievable by employing low-power techniques
- Capability to handle new technology radars with minimal overhead
- Designed to support AIS message 21 as a feature option through modulation of the leading dash



ELECTRICAL

Frequency of Operation	
S-band	2.9 to 3.1 GHz
X-band	9.2 to 9.5 GHz
Output power to antenna	30dBm min
Lightning protection - Surge protection (1ms)	3000V
Current during idle period	Less than 10mA @ 12VDC nominal
Current during transmission	270mA @ 12VDC nominal
Effective Isotropic Radiated Power (EIRP)	4W
Quiescent and active periods	>4 seconds
X-band	
Gain	6dBi
Polarisation	Horizontal
Vertical divergence	22 degrees
Effective Isotropic Radiated Power (EIRP)	36dBm
S-band	
Gain	1dBi horizontal, 0dBi vertical
Polarisation	Horizontal and vertical
Vertical divergence	22 degrees
Effective Isotropic Radiated Power (EIRP)	30 to 31dBm
Amplitude Detection (Firmware Programmable)	
Terminal sensitivity	-47 to -27dBm
Pulse on Pulse Detection	>3dB (TBC) amplitude change intra pulse
Side lobe detection	>13dB (TBC) drop in amplitude for tagged emitter
Frequency Performance	
Frequency accuracy (50ns to 200ns pulse widths)	± 3.5MHz
Frequency accuracy (>200ns pulse widths)	±1.5MHz
Modulation - Plain Pulse	
Morse pulse	As per IALA Recommendation
Output duration for Morse letter (750m to 8km)	Chirp duration +5us to 53 us
Pulse width	50ns to 200µs (Longer pulses required for solid state activities)
Modulation - Response to Linear Chirp Pulse	
Morse pulse	Derived from IALA Recommendation
Output duration for Morse letter (750m to 8km)	Chirp Duration +5us to 53us
Response Timing	
Range to start position	As per IALA Recommendation
Angular width of displayed response	Greater of 5° or angle emitter rotates in 2 PRI
Response Delay	<700ns as per ITU-R
Firmware Control Functions (Via Terminal and RS232 interface)	BITE Monitoring / Communication (Via Terminal and RS232 interface)
Morse selections	Input voltages
Firmware updates	Firmware version
Firmware version number	Serial number
Transmitted pulse length vs received pulse length	Unit ID
Wake up timing	Alarms
Turn on/off timings (for a pulse stream)	

ENVIRONMENTAL

Operating Temperature range:	
GMU & ATEX Category 3	-40°C to +70°C
ATEX Category 2	-20°C to +40°C
Ingress Protection	IP-67

INTERFACE

External interface:	
+10V to +36V DC (operating - 10% Tx duty cycle): <10W	
+10V to +36V DC (standby)	
Power (Connector types - MIL-C-38999): Rated power cable	
Control Interface M&C and in field programming: RS 23	

BLANKING

RACON Blanking	External Blanking control ports
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ALARM SIREN CONTROL

Closed Fully Floating contacts on fault: Trigger
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PULSEWIDTH RESPONSE

Minimum	50ns
Maximum	100,000ns

RACON RESPONSE TIMING

I/P Pulse width (±50ns typical): Selected Value or Automode
800 nanoseconds to MAX nanoseconds: Selected Value or Automode
450 nanoseconds to 800 nanoseconds: Selected Value or Automode
215 nanoseconds to 450 nanoseconds: Selected Value or Automode
50 to 215 nanoseconds: Selected Value or Automode

MECHANICAL

Height	810mm
Diameter	390mm (Including lift ring)
Weight	10.5kg (Transponder with standard base ring)
Base Housing	Plastic moulding
Submersion Capability	1m - 30 minutes

**All values are subject to change without notice.*

