PHALCON-NT

New Technology Solid State Radar Beacon (RACON)
ATEX/IECEX version for ZN1 also available

OVERVIEW

The new Solid-State **Phalcon-NT RACON fully works seamlessly with traditional and solid state radar solutions (X and S bands), 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-lifted 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, thanks to their solid state transceivers, uses power, frequency, swept frequency, pulse width and antenna rotation rate detection (quintuple-token SLS)**. Current conventional Racons can only use dual token suppression (power and frequency).

KEY FEATURES

- Capable of responding to S-Band and X-Band **traditional and solid state 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 characterized
- Resolves frequency information of 50ns pulses within accuracy of around ±1MHz
- Much less probability of false triggers by employing clever digital algorithms
- Higher frequency accuracy in the presence of simultaneous signals
- Very low power achievable by employing smart algorithms and solid state transceiver
- Antenna sweep rate detection improves the bearing information by keeping the Morse character a thin line for high power
- Quintuple-token side low suppression (SLS)
- Capability to handle new technology radars with minimal overhead

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
Polarization	Horizontal
Vertical divergence	22 degrees
Effective Isotropic Radiated Power (EIRP)	36dBm

S-band

Gain	1dBi horizontal, 0dBi vertical
Polarization	Horizontal and vertical
Vertical divergence	22 degrees
Effective Isotropic Radiated Power (EIRP)	30 to 31dBm

Amplitude Detection (Firmware Programmable)

Terminal Sensitivity	-50 to -38 dBm *firm. program.*
Pulse on Pulse Detection	>Automatic
Side Lobe Supression	Power, Frequency, Swept frequency, Pulse width and antenna rotation rate detection (quintuple token)

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 *26 English letters A through Z*
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 Recommendations
Angular Width of Displayed Response (Firmware programmable)	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
- Firmware updates
- Firmware version number
- Transmitted pulse length vs received pulse length
- Wake up timing
- Turn on/off timings (for a pulse stream)

- Input voltages
- Firmware version
- Serial number
- Unit ID
- Alarms

All values are subject to change without notice.

ENVIRONMENTAL

Operating Temperature Range

Tamb	-40°C to +70°C	(-40°+55 °C in ATEX version)
Certification for HA (ATEX/IECEX):	II 2 G Ex db eb mb [ibGb] II B T5 Gb	
Ingress Protection	IP-67	(IP-66 ATEX version)

INTERFACE

External interface

+10V to +36V DC (operating - 50% Tx duty cycle): <1.75W

+10V to +36V DC (standby)   <0.12W

Power (Connector types - MIL-C-38999): Rated power cable

Control Interface M&C and in field programming: RS 232

BLANKING

RACON Blanking	External Blanking control ports

ALARM SIREN CONTROL

Closed Fully Floating contacts on fault: Trigger

PULSE WIDTH 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 (1041mm ATEX version)
Diameter	390mm (Including lift ring)
Weight	11kg (40kg ATEX version) (Transponder with standard base ring)
Housing	Polycarbonate (316L ATEX version)
Submersion Capability	1m - 30 minutes

ATEX/IECEX ZN1 version