



NEW

# Introducing Northstar Broadband Radar

The NewWave in Marine Radar Technology

Crystal clear image of your immediate surroundings

InstantOn™ with no tuning required

Low power consumption, ideal for smaller boats

Extremely low radiation, mount anywhere



# Northstar is Changing the Pulse of Marine Radar

Northstar has introduced a revolutionary new radar system unlike anything else on the recreational boating market. Utilizing solid-state technology, this breakthrough radar solution provides superior target detection and separation, ease of operation, and a new level of navigational safety to a wide range of boats.

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The exclusive technology and performance characteristics of Broadband Radar make it an ideal match for almost any vessel. Unparalleled short-range resolution and discrimination make it an ideal complement to large radar systems on power and sailing yachts. User-friendly operation makes it an ideal primary radar for small to medium-sized vessels. And its small size, minimal power requirements and safer transmission energy levels open up the advantages of sophisticated radar to all boats.

## Truly Different Technology.

Traditional "pulse" radars use high-powered magnetrons to generate microwave signals with very short pulses of applied voltage. Northstar has developed the first solid-state X-band radar technology, which utilizes FMCW techniques. Northstar Broadband Radar sends a continuous transmission wave with linear increasing frequency (hence the term Broadband). The wave retains its frequency as it travels out and reflects back from any objects. Meanwhile, the transmitter continues to output an increasing frequency. The difference between the currently transmitted and received frequencies, coupled with the known rate of frequency increase, is the basis for precisely calculating a "time of flight" and target distance. Since FMCW constantly builds up radar return energy (vs. a single pulse), this system provides target detection superior to pulse radars while transmitting at far lower energy levels.

## Broadband Radar. Your Easiest Choice.

With Broadband Radar — you will "get" radar like never before. With no magnetron, no tuning or adjustment is ever needed. You will get:

- Crystal clear image of your immediate surroundings
- InstantOn™ with no tuning required
- Low power consumption, ideal for smaller boats
- Extremely low radiation, mount anywhere

Add it all up, and Broadband Radar is the easiest choice you will ever make.

## Unparalleled Short Range Target Discrimination — Where it Matters Most

Northstar's Broadband Radar provides amazing target resolution, even at an unprecedented 1/32 nm range. Docks, channel markers, moored vessels and other critical targets are displayed

with clarity and separation, for added confidence in close quarters. Broadband technology also eliminates the "main bang" of a pulse radar — the obscured "dead zone" immediately around the vessel — which interferes with close target detection.

## Lowest RF Transmission for Safe, Flexible Installation

Because Northstar Broadband Radar transmits at 1/20,000<sup>th</sup> the power of typical pulse radars (emitting 10 times less energy than an average cell phone), the radome is safe to mount in locations never before possible. In addition, the lowest DC power draw of any X-band marine radar makes this system ideally suited for sailboats and other vessels with limited power.

## Navigation in an Instant

No more waiting 2-3 minutes for a magnetron to warm up — 100% solid-state design provides InstantOn™ capability. When darkness falls or the fog rolls in, you will always be ready. Ideal for sailboats wishing to save power, or boats at anchor not wishing to run the radar continuously.



# See For Yourself — The Clear Advantages of Northstar Broadband Radar.

Actual Navigation Screen Images

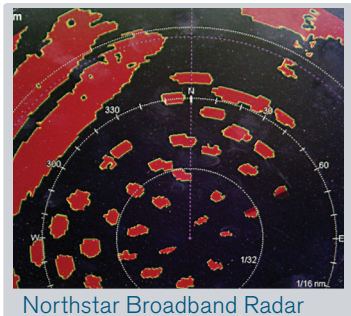
▼ Northstar Broadband Radar

▼ 4kW HD Pulse Radar

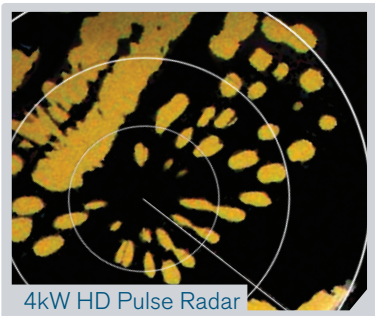
## Harbor / Marina



Boats and docks separated due to superior target definition



- Superior short-range target discrimination clearly shows docks, boats and moored vessels.

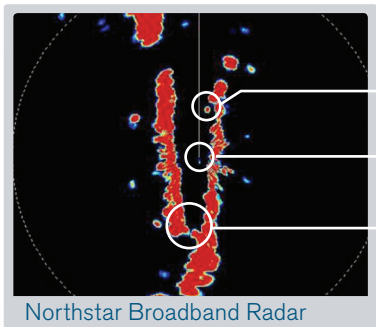


- Inferior separation of boats, docks and other features, further obscured by “main bang” (where it matters most) closest to the vessel

## Channel



Approximate position of boat

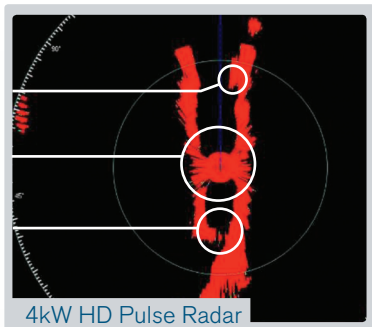


- Broadband Radar clearly defines this narrow 35-meter channel, showing a small vessel moored near shore and a small footbridge.

Moored Boat

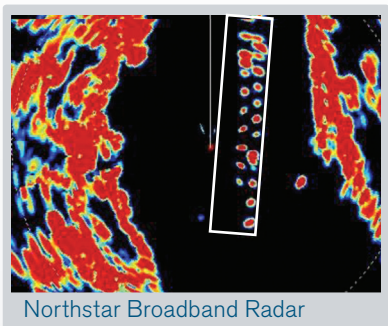
Main Bang

Foot Bridge

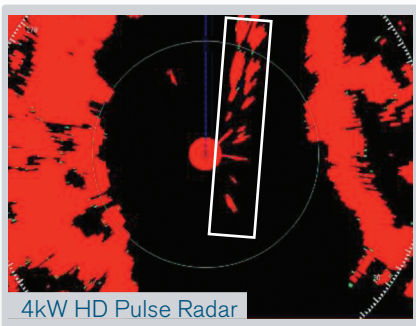


- 4 kW HD pulse radar can not discriminate the moored vessel from shoreline, “main bang” obscures width of channel.

## Pile Moorings



- Broadband Radar clearly shows staggered mooring poles, differentiating moored vessel.



- Poles and vessel are less defined on pulse radar display.

## Broadband Radar for a Broad Range of Navigation Systems

Advanced Broadband Radar technology is available for a range of popular navigation systems, integrating superior radar performance with state-of-the-art charting, echosounding and entertainment displays.

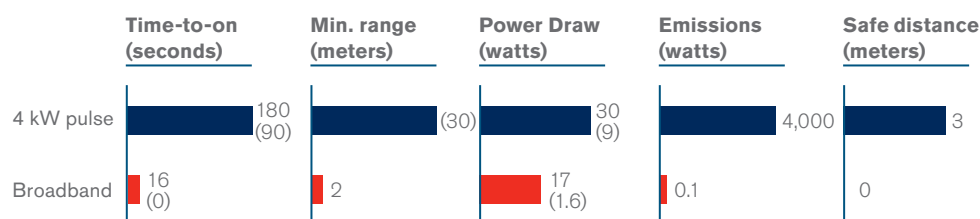
### Compatible Products:



Northstar 8000i (12,15)  
Northstar M121  
Northstar M84



With straightforward installation (with an easy-to-route 13.5mm/.5" diameter scanner cable), flexible antenna placement options and low power draw, Broadband Radar is the clear choice for every type of vessel.



## BR-24 BroadBand Radar Scanner Specifications

Characteristic	Technical Data
General	
Compliance	FCC/IC/R&TTE/AUS Type Certification pending FCC ID: RAYBR24; IC ID: 4697A-BR24 Human Exposure General Public Safety Limit – touch dome anywhere.
Environmental	IEC60945 4 <sup>th</sup> edition 2002-2008 Operating Temperature: -25° to +55°C Relative humidity: +35°C, 95% RH Waterproof: IPX6
Relative wind velocity	51 m/sec (Max:100 Knots)
Power consumption	Operating: 17W (Typ.) @ 13.8Vdc Standby: 1.6W (Typ.) @ 13.8Vdc – only 110ma
DC input (at end of radar cable)	9V to 31.2Vdc (12/24 Volt systems). Reverse polarity protection
Outside dimensions	Height 280mm (11.02") x Diameter 488mm (19.27")
Weight (no cable)	7.4 kg (16.3 lbs.)
Radar and Antenna Parameters	
Radar Ranges	1/32 to 24nm with 16 range settings (nm/sm/km)
Rotation	24 rpm +/- 10%
Transmitter frequency	X-band - 9.3 to 9.4Ghz
Transmitter source (warm up time)	No Magnetron – all solid state. InstantOn

Characteristic	Technical Data
Radar and Antenna Parameters contd.	
Plane of polarization	Horizontal Polarization
Transmitter peak power output	100mW nominal
Main Bang Dead Zone & Tuning	None – not a pulse radar
Sea and Rain Clutter	4-5X less than a pulse radar
Sweep Repetition Frequency	200Hz
Sweep Time	1ms
Sweep Bandwidth	65MHz max
Horizontal Beam width (Tx and Rx antenna)	5.2°+/-10% (-3dB width)
Vertical Beam width (Tx and Rx antenna)	30°+/-20% (-3dB width)
Side lobe level (Tx and Rx antenna)	Below -18dB (within ±10°); Below -24dB (outside ±10°)
Noise figure	Less than 6dB
Coms/Cabling/Mounting	
Com Protocol	Both High Speed Ethernet and Serial
Heading	NMEA 2000®/NMEA 0183 with adapter/cable kit into display
Inter Connecting cable length	10m (32.8') standard with RJ45 thin custom connector – Display model dependent
Maximum Inter Connecting cable length	30m (98.4')
Bolts (4)	4x30xM8 - 304 stainless steel
Footprint	Port to Starboard W233.0mm (9.17") x Bow to Stern L141.5mm (5.57") - matches Garmin GMR18HD/Raymarine RD218 footprint

Product specifications are subject to change without notice. No liability can be accepted for errors or omissions in this document