# Main Characteristics

<table>
<thead>
<tr>
<th>Operational Frequency Range</th>
<th>2.7 - 2.9 GHz (PSR); 1030 MHz &amp; 1090 MHz (SSR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transmitter</td>
<td>Solid-State GaN</td>
</tr>
<tr>
<td>Instrumented Range</td>
<td>120 NM / 80 NM</td>
</tr>
<tr>
<td>Detection Range</td>
<td>120 NM with RCS = 2 m², Pd = 80%, Sw1, Pfa = 10⁻⁶, linear pol</td>
</tr>
<tr>
<td>Minimum Detection Range</td>
<td>0.2 NM</td>
</tr>
<tr>
<td>Target Cross-Section</td>
<td>0.5 ... 10,000 m²</td>
</tr>
<tr>
<td>Scan Rate</td>
<td>12 rpm / 15 rpm</td>
</tr>
<tr>
<td>Elevation Coverage</td>
<td>- 1°... + 35°, mechanical tilt range: ± 5°</td>
</tr>
<tr>
<td>Plot Accuracy</td>
<td>• Range &lt; 30 m bias, &lt; 60 m Sigma</td>
</tr>
<tr>
<td></td>
<td>• Azimuth &lt; 0.1 deg bias, &lt; 0.1 deg Sigma</td>
</tr>
<tr>
<td>Resolution (same target size)</td>
<td>Probability of Resolution = 0.8, SNR &lt; 30 dB, targets are in long pulse range, same RCS</td>
</tr>
<tr>
<td></td>
<td>• Range (same azimuth) &lt; 150 m</td>
</tr>
<tr>
<td></td>
<td>• Azimuth (same range) &lt; 2.9°</td>
</tr>
<tr>
<td>Antenna Beams</td>
<td>Three Antenna beams: two Cosec² High Beams and one Pencil Low Beam</td>
</tr>
<tr>
<td>Number of Operational Frequencies</td>
<td>2 - 4</td>
</tr>
<tr>
<td>Subclutter Visibility</td>
<td>≥ 60 dB (Long pulse range, Pd = 80%, Pfa ≤ 10⁻⁶, Sw1 target, radial velocity distribution 20 to 700 knots, clutter and target separated in elevation)</td>
</tr>
<tr>
<td>Polarisation</td>
<td>Linear and circular</td>
</tr>
<tr>
<td>Processing Channels</td>
<td>Triple-channel architecture,</td>
</tr>
<tr>
<td></td>
<td>Three fully independent channels with intra-channel data fusion</td>
</tr>
<tr>
<td>Weather Detection</td>
<td>Six-level intensity classification according to U.S. National Weather Service. Format ASTERIX CAT 008</td>
</tr>
<tr>
<td>Number of Tracks (sensor tracker)</td>
<td>up to 900</td>
</tr>
<tr>
<td>Secondary Radar MSSR 2000 I</td>
<td>Modes 1, 2, 3 A / C, 4, 5, S</td>
</tr>
<tr>
<td>Application Layer Protocols</td>
<td>ASTERIX (Cat. 007, 008, 017, 021, 034, 048, 253), NTP</td>
</tr>
</tbody>
</table>

Detection Coverage with NG-Antenna (Pencil, Cosec² and 3rd Horn)
RCS = 2 m²
Pd ≥ 80% at green shades (right scale)
PFA = 10⁻⁶
Linear polarisation
Swerling Case 1
Scan Rate: 12 rpm

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Future Proof Technology for Safe Skies

Exceptional Detection & Tracking from Ultralight to Supersonic

The airspace worldwide is shared between civil and military users, between general aviation traffic and sports or leisure time aircraft.

To avoid safety-critical situations, state-of-the-art ATC radars have to deliver excellent detection performance, from the smallest aircraft like ultralight gliders to the largest passenger airliner. Modern radars also have to be capable of differentiating between slow-moving rotary-wing aircraft and fast-moving military supersonic fighters without any significant blind speed gaps. The non-awareness of potentially uncooperative air traffic, e.g. in case of military exercises, might lead to near-miss incidents or incorrect air-traffic-controller advice.

ASR-NG can detect the smallest 0.5m² as well as 10,000m² targets with uppermost probability of detection. It offers exceptional no-blind speed coverage between 0 to 1,200 knots.

Wind Farm Clutter & 4G/LTE Resistance

In the rapidly growing presence of disturbing environments like wind farms or telecommunication influences e.g. 4G/LTE coverage, it is of utmost importance for air traffic control radars to cope with highly dynamic clutter environments and capability to resist 4G/LTE impacts.

Unique 3D Capability

Using a third horn antenna feed the ASR-NG also provides a unique feature of 3D target detection. This third beam allows the measurement and calculation of altitudes of uncooperative targets such as aircraft with either no transponders or defective Identification Friend-Foe (IFF) signals (e.g. during military exercises or flight operations).

Built-In Operational Safety Design

ASR-NG has been specified, designed, developed, manufactured, installed and commissioned in accordance to the strictest international safety standards and requirements. Based on the previously distributed ASR model, currently applied technology is certified by the German authorities to be compliant with RTCA DO-278, ED 109 AL4, EATMP SWAL3, IEC 61508 SIL2 and hence guarantees inherent functional safety.

New Multi-Beam Processing

While previous generations of ATC radars could not suppress false alarms originated from wind farms, ASR-NG provides highest detection, resolution and tracking performance by the use of its worldwide-first, concurrent, triple-beam processing and electronic beam forming capabilities. Its detection and tracking of small rotary-wing aircraft over wind farms is field-proven, witnessed by the UK Ministry of Defence.

Mode S MSSR/Mode 5 IFF

ASR-NG includes a dual redundant Monopulse Secondary Surveillance Radar, MSSR 2000 H DFL, which enables Mode S Enhanced Surveillance, Mode S Clustering, ADS-B capabilities as well as the military Identification Friend-Foe in Mode 4 and Mode 5.

Lowest Life-Cycle Costs & Long-Term Sustainability

With nearly no preventive maintenance, the ASR-NG system has been designed for fully autonomous, unmanned and completely remotely controlled 24/7/365 operation. The transfer of maintenance knowledge to the customer or a preferred local partner serves as standard logistic support approach. Fixed-price support agreements and supply guarantees are provided for 25 years and more.

Compactness & Deployability

ASR-NG radar electronics has been designed to fit into a single, fully self-contained 20ft ISO shelter. The mobile antenna option can also be deployed within a 2nd 20ft ISO container envelope. Altogether, the complete ASR-NG Deployable solution can be transported within, for example, one C130 or A400M aircraft.

Inspected Performance

Independently witnessed and evaluated flight trials were documented in a full Flight Inspection Report, certifying the extraordinary detection performance of ASR-NG.