

# Complete coverage – unrivalled coverage with lower costs

**For a TETRA network, excellent, reliable coverage is a necessity. Yet, building coverage is expensive, while most OPEX is racked up by base station sites and transmission costs. Nokia's solutions are geared to bring the best of all worlds.**

Providing network coverage everywhere, at any time, for the small numbers of officers that are typically using a TETRA network is certainly a tall order. But this is just what Nokia's revolutionary TB3 TETRA base station was designed to achieve. With the improved uplink connection, an operator using the Nokia TB3 can improve his quality of service, provide more coverage, or achieve a combination of the two.

As well as coverage, Nokia TB3 also helps the TETRA operator deal with that other major headache – operating costs. In TETRA networks, base station site rentals and transmission costs can account for up to 80% of operating expenses (OPEX). Selecting the most cost-effective transmission options without compromising resilience is therefore a worthwhile consideration. And, because the transmission units are integrated into the base station, there is no additional cost for transmission equipment. Roll-out of the network is also simplified, making it less costly as well as faster.

Site visits to maintain and upgrade base stations are a major and ongoing cost that operators face. Remote operation and maintenance greatly reduces these costs and is an important area pioneered by Nokia TETRA. Nokia TETRA base station software can be downloaded and configured remotely. And Nokia NetAct for TETRA brings further



savings, allowing all elements of the TETRA network, including radio access, to be controlled from a central network management centre.

### **Resilience brings personal safety**

Based on a modular design and built-in redundancy, Nokia TETRA base stations such as the TB3 can be used in a variety of network topologies, giving designers the freedom to choose the options with the best network availability and security. Using Nokia TETRA solutions results in tough, resilient networks.

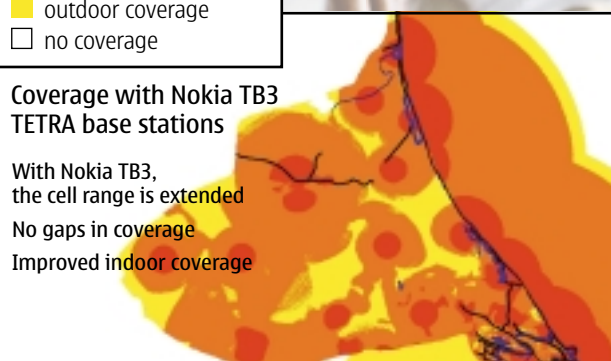
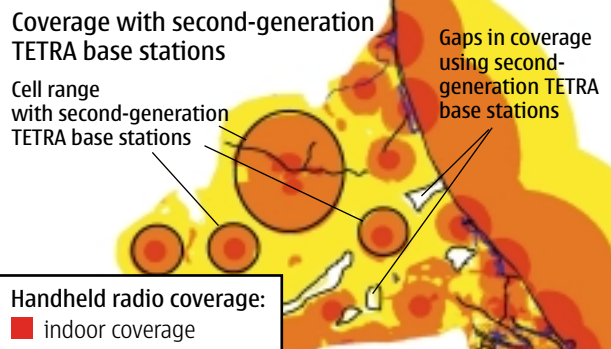
With thousands of Nokia TETRA base stations in operation, statistics have shown that mean operating time between base station failure is in excess of 20 years. Also, should a base station fail, the ability to select a multidrop loop network means that the transmission system will automatically recover, keeping all call connections intact and ensuring the safety of users.

Resilience, redundancy and recovery are the watchwords on which Nokia TETRA is built, leading to the overall criterion that PMR users demand – reliable coverage.

**NOKIA**  
CONNECTING PEOPLE

# Nokia TB3 TETRA base station – Data sheet

<b>Frequency bands</b> <ul style="list-style-type: none"> <li>Tx: 380–390 MHz and Rx: 390–400 MHz</li> </ul>	<b>TBS transmit mode</b> <ul style="list-style-type: none"> <li>Downlink continuous (D-CT) (as specified in the TETRA standard) Only carriers that are needed to carry the traffic are keyed.</li> </ul>
<b>Max. TBS power at top of cabinet</b> <ul style="list-style-type: none"> <li>25 W</li> <li>40 W (with combiner by-pass configuration and duplexer)</li> </ul>	<b>Transmission</b> <ul style="list-style-type: none"> <li>Three E1 interfaces with inbuilt multiplexer and loop protection capability with remote configuration.</li> <li>Support for satellite transmission.</li> </ul>
<b>Max power at TTRX output</b> <ul style="list-style-type: none"> <li>65 W</li> </ul>	<b>TBS management</b> <ul style="list-style-type: none"> <li>Integrated into the DXT exchange</li> </ul>
<b>Dynamic sensitivity at top of cabinet</b> <ul style="list-style-type: none"> <li>-113 dBm (TCH 7.2, BER 4%, TU50) without diversity</li> <li>&lt; -112 dBm (according to EN 300 392-2) without diversity</li> </ul>	<b>O&amp;M functions</b> <ul style="list-style-type: none"> <li>Remote and local configuration. Remote and local alarm handling. Remote and local SW downloading. Remote and local test services. Eight remote outputs.</li> </ul>
<b>Static sensitivity at top of cabinet</b> <ul style="list-style-type: none"> <li>&lt; -119 dBm (TCH 7.2, BER 4%) without diversity</li> </ul>	<b>Additional base station features</b> <ul style="list-style-type: none"> <li>Superior and versatile coverage solutions</li> <li>Intelligent Radio Resource Management</li> <li>Fallback</li> <li>Automatic Main Control Channel change-over</li> <li>Standby TTRX for redundancy with optimised transmission</li> <li>Modular design for redundant base station main units</li> <li>Jamming detection</li> <li>Dynamic air encryption with two simultaneous encryption algorithms</li> <li>Adaptive random access window for congestion control</li> <li>Additional signaling channel for Automatic Vehicle Location use</li> <li>Load directed roaming</li> <li>Dynamic channel allocation between voice or packet data Optional Global Positioning System (GPS)</li> </ul>
<b>Receiver class</b> <ul style="list-style-type: none"> <li>Class A and B EN 300 392-2</li> </ul>	<b>Values shown in the table are typical for network planning.</b>
<b>Diversity reception</b> <ul style="list-style-type: none"> <li>Maximum ratio combining (MRC) improving the uplink budget by 3...8dB compared to single receiver antenna solutions.</li> </ul>	
<b>Number of receivers per radio</b> <ul style="list-style-type: none"> <li>6 receivers with MRC for e.g. three-sector X-pol panel antennas</li> </ul>	
<b>Sectorized reception</b> <ul style="list-style-type: none"> <li>Three sector topology improves receiver C/I by 5 dB compared to omnidirectional solution</li> </ul>	
<b>Duplex spacing</b> <ul style="list-style-type: none"> <li>10 MHz</li> </ul>	
<b>Switching range</b> <ul style="list-style-type: none"> <li>≤ 5 MHz</li> </ul>	
<b>Carrier spacing</b> <ul style="list-style-type: none"> <li>25 kHz</li> </ul>	
<b>Combiner options</b> <ul style="list-style-type: none"> <li>Auto-tuned cavity. Manually tuned cavity. Wideband hybrid combiner with duplexers. Combiner by-pass with duplexer.</li> </ul>	
<b>Supply voltage options</b> <ul style="list-style-type: none"> <li>230 VAC (184 VAC...276 VAC)</li> <li>-48 VDC (-36 VDC...-60 VDC)</li> <li>-60 VDC (-44 VDC...-75 VDC)</li> </ul>	
<b>Power consumption</b> <ul style="list-style-type: none"> <li>Nominal 0.5 kW with one TTRX at 65 W/100% duty cycle.</li> <li>Max. 1.4 kW with four TTRXs keyed</li> <li>Max. 2.5 kW with eight TTRXs keyed</li> <li>Power consumption varies according to the traffic volume.</li> </ul>	
<b>Width x Height x Depth</b> <ul style="list-style-type: none"> <li>60 x 162 x 48 cm, one cabinet</li> </ul>	
<b>Weight (max.)</b> <ul style="list-style-type: none"> <li>200 kg (1 cabinet) 380 kg (2 cabinets)</li> </ul>	
<b>Operating temperature (ambient)</b> <ul style="list-style-type: none"> <li>-10°C ... +55°C</li> </ul>	



**NOKIA CORPORATION**  
 Networks  
 P.O. Box 325  
 FIN-0045 Nokia GROUP, Finland  
 Phone: +358 (0) 7180 08000  
[www.nokia.com/tetra](http://www.nokia.com/tetra)

**NOKIA**  
 CONNECTING PEOPLE