

# Remote Management

## of Cellular Base Stations

### Quality of Service is Vital

As competition increases, cellular service providers must concentrate on improving customer service, including guaranteeing a certain level of network performance. Network downtime is not acceptable in a competitive environment, where uninterrupted service is the norm.

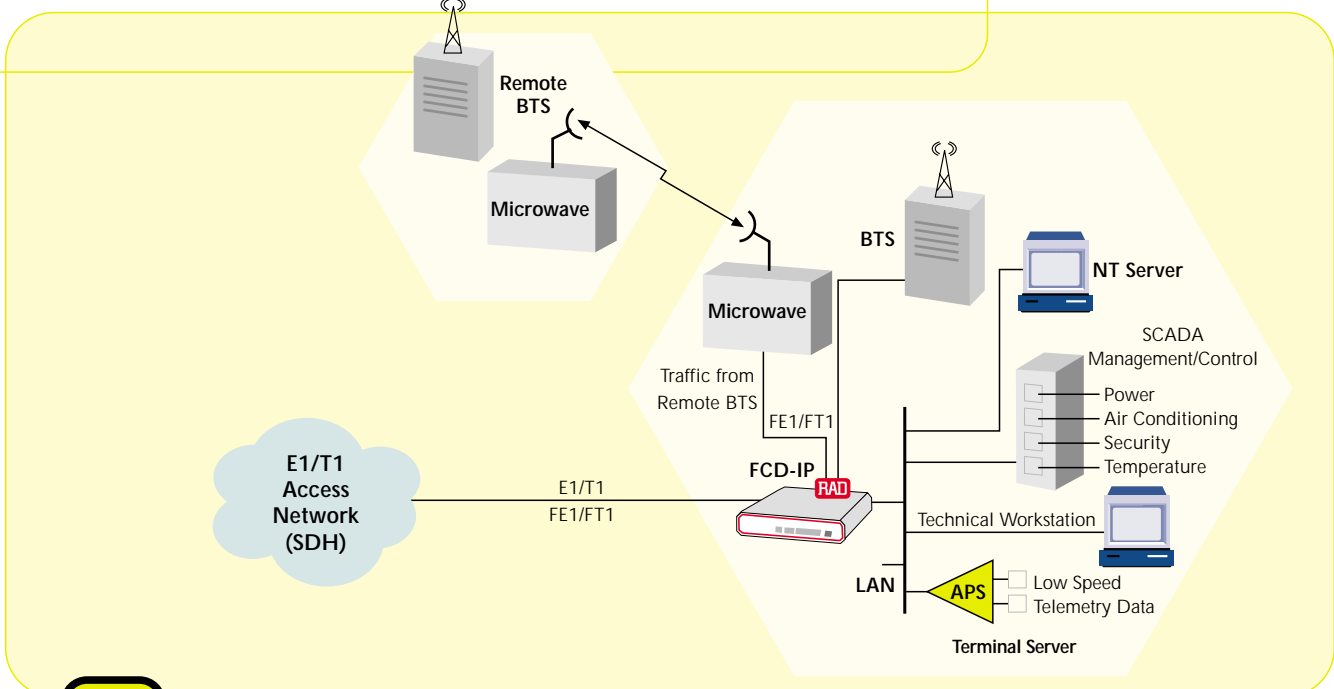
### Real-Time Management Assures Network Uptime

RAD's FCD-IP™ access unit with integrated router enables real-time remote management of cellular base stations (BTSs) over the same transmission media that carries the cellular traffic (e.g., E1 lines). It also allows continuous monitoring of all base station site equipment (such as microwave equipment and SCADA devices) from the operations and maintenance center (OMC). Remote management significantly reduces the number of maintenance visits to base station sites. The automatic sub-E1/T1 bypass mechanism of the FCD-IP provides dependable, fail-safe voice transmission and reliably transmits voice traffic even in case of power failure.

### Continuous End-to-End Management

Management information travels together with cellular voice traffic over the E1/T1 link between the mobile switching center (MSC) and OMC, and the base station. The Ethernet port of the FCD-IP diverts management traffic to the LAN of the base station. This affords the MSC continuous on-line monitoring and control of cellular base stations and enables remote configuration and software download, eliminating the need for separate management links.

## Integrating Control/Management Data into BTS Traffic



For more information on the FCD-IP

<http://www.rad.com/products/family/fcd-ip/fcd-ip.htm>

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## Advantages of the FCD-IP Solution for Remote Cellular Management

Features	Benefits
Real-time, continuous status reports	<ul style="list-style-type: none"> <li>Enables preventive fault management and immediate reaction to problems, with minimum disruption to transmissions</li> </ul>
Complete network view	<ul style="list-style-type: none"> <li>Provides an accurate picture of the entire network at all times</li> </ul>
Dedicated timeslot assignment	<ul style="list-style-type: none"> <li>One or several timeslots are assigned to manage the entire chain of sites connected by E1/T1 lines</li> </ul>
Automatic bypass	<ul style="list-style-type: none"> <li>Voice traffic gets through even in the event of a power failure</li> </ul>
Redundant data path	<ul style="list-style-type: none"> <li>V.24 port enables remote dial-up access via the PSTN if the E1/T1 link fails</li> </ul>
Integrated router	<ul style="list-style-type: none"> <li>Virtual internetworking over the transmission network</li> </ul>
Uses same cellular transmission infrastructure for management	<ul style="list-style-type: none"> <li>Reduces costs by eliminating the need for an additional management link</li> </ul>
Improves bandwidth utilization	<ul style="list-style-type: none"> <li>Cost-effective</li> </ul>
Reduces visits to remote sites	<ul style="list-style-type: none"> <li>Significant savings on maintenance; fewer overtime hours</li> </ul>
Flexible	<ul style="list-style-type: none"> <li>Wide range of interfaces suits many applications</li> </ul>
Half 19" size	<ul style="list-style-type: none"> <li>Compact unit saves space; fits easily into cramped BTS</li> </ul>

Alternative solutions	Disadvantages of alternative solutions
Dial-up modem at each base station	<ul style="list-style-type: none"> <li>Lacks global network view</li> <li>Delays response time to faults</li> <li>Needs separate modem for each remotely controlled device or an additional router</li> </ul>
Dedicated data connection (e.g., Frame Relay)	<ul style="list-style-type: none"> <li>Requires additional equipment</li> <li>Takes up more space</li> <li>Increases the required number of data links</li> </ul>



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