SMART BLADE RADIO SYSTEM

Totally integrated, scalable turnkey solution for ATC communications upgrades
As the world’s air traffic continues to grow, airport planners and operators are facing the need to expand their facilities’ capabilities to safely and efficiently handle the increasing demands for both civil and military operations.

At the heart of these efforts is the ongoing need to provide clear, available and reliable VHF/UHF Air Traffic Control (ATC) communications. Easier said than done. Because signal interference is often caused by the high-power transmitters used in current-generation VHF/UHF transmitters being located too close to receivers (i.e., “co-location pollution”), airport designers are forced to house the receivers and transmitters in separate buildings – often miles apart.

Separate locations not only limit the airport designer’s options for runway and facility expansion, they also require more ongoing system maintenance. Airports dedicate maintenance technicians at each location just to ensure uninterrupted VHF/UHF communications availability.

Communications is key.

A smarter VHF/UHF ATC solution

These limitations may have been tolerated in the past, however today’s airport designers and operators need a much more flexible and reliable Software Defined Radio (SDR) ATC solution that not only eliminates co-location problems, but also meets current communications needs and is easily and cost-effectively upgradable to future requirements and functionality.

To further maximize its value, this new-generation VHF/UHF ATC radio system must deliver “lights out” operation, which eliminates the need for dedicated technicians, greatly reduces the system’s initial capitalization costs and significantly lowers the cost of ownership.

The only new-generation solution that exceeds these and many other requirements is the SMART Blade Radio System from Rockwell Collins.

The SMART Blade Radio is the core of our networked ATC communications system.
Rockwell Collins SMART Blade Radio System is a fully networked, scalable turnkey ATC communication solution that applies all of our extensive experience in Software Defined Radio (SDR) technology to create a system that offers a number of capabilities that are unavailable in current-generation systems, including:

- Turnkey, off-the-shelf solution
- Easily scalable for a variety of ATC operations
- Full “lights out” unattended operation
- VoIP for standard digital audio interfacing and control
- Robust built-in test capabilities
- Tunable filters for excellent co-location performance – multiple buildings are not required
- Open system architecture for ease of VHF/UHF customization
- Compact hardware footprint – minimizes rack space
- Modular building-block system architecture for easy, rapid upgrades and expansion
- Clarity™ Noise Reduction algorithms increase talk power and link margins
- Tailorable user menus and commands
- Operates from a wide range of AC voltages and frequencies
- System boot-up time < 8 seconds
- Lab-grade internal metering, and more

Proven communications from a proven leader

Already known for our extensive product offerings for airborne radios, Rockwell Collins is also a global leader in developing, manufacturing and supporting advanced ground-based VHF/UHF communications radios. In fact, after extensive evaluation, the U.S. Air Force selected the SMART Blade Radio System for its Air Traffic Control radio upgrade program involving more than 100 U.S. air bases around the world.

Along with our successful Air Force radio upgrade program, Rockwell Collins has extensive experience designing, manufacturing, installing and supporting ATC radio systems and subsystems for a variety of U.S. and international civil, governmental and military customers.

The SMART Blade Radio System is the next step in our ongoing commitment to provide more secure, capable and cost-effective VHF/UHF ATC communications solutions to our global customers.

So when planning an upgrade to your airport’s outdated VHF/UHF ATC radios, make the switch to the new-generation SMART Blade Radio System from Rockwell Collins.

SMART Blade is not just a new radio. It’s a paradigm shift in how the VHF/UHF communications needs of a modern air traffic control system are addressed.

At the heart of the system is a new-generation modular “building block” system architecture derived from our experience with other successful ATC programs, including the U.S. military’s Joint Tactical Radio System (JTRS) and the International FlexNet™ program.

Based on Rockwell Collins’ proven 721S Fixed Site Radio, the SMART Blade meets – and in many parameters, exceeds – the reliability, performance and operational requirements of currently installed ATC radio systems.

SMART Blade’s “low risk implementation” strategy ensures that the system is easily adaptable to each customer’s site and configuration, and minimizes support and product-upgrade costs throughout the life cycle of the entire system.

The SMART Blade Radio System’s unique building block architecture enabled our engineers to design in a number of performance features and capabilities that are not available on legacy radio systems, including:

**Superior co-location performance**
To help airport designers and operators maximize all available land at their location while providing greater installation flexibility, SMART Blade eliminates the need to locate the transmitters and receivers in separate buildings. SMART Blade’s unparalleled co-location performance is the result of the high spectral purity of our transmitters combined with the high dynamic range and front-end selectivity of our receiver and transceivers. To ensure optimal performance and signal clarity, SMART Blade also features individually tunable bandpass and notch filters, allowing frequency spacings as little as 300 kHz with very close antenna spacings.

**Smaller footprint means bigger flexibility**
The SMART Blade Radio System consists of a modular, small form-factor TCP/IP-based RF transceiver, along with a compact
power amplifier. The system is integrated into a standard telecommunications-style, 19" rack mount chassis.

This configuration gives SMART Blade a much smaller physical footprint than legacy radios, translating to lower operating costs in prime power and equipment cooling. It offers a four- to six-times reduction in cabinet height and a two- to three-times reduction in the overall footprint of the equipment cabinets.

**Optimized VHF/UHF configurability**

The SMART Blade Radio System gives customers a level of configuration flexibility never before available. For example, the radio subsystem includes three types of remotely tuned cavity filters: VHF bandpass, VHF notch and UHF bandpass.

The subsystems are available in a variety of R/T module combinations, including:

- VHF-only 10-watt transceivers or 50-watt transceiver/transmitter (116-150 MHz)
- UHF-only 10-watt transceivers or 50-watt transceiver/transmitter (225-400 MHz)
- Dual band (VHF/UHF) 50-watt transceiver (116-400 MHz)
- Receive-only module (116-150 and 225-400 MHz)

The 10-watt transceivers and receiver have a single-pitch form factor of 2.5" (64 mm) and can be mixed in any combination in a six-slot 7.0" (178 mm) high tray. The 50-watt transceivers/transmitters have a double-pitch form factor of 5.0" (128 mm) and can be mixed with single-pitch modules or housed three in each six-slot tray.

**Centralized device control for greater operational capabilities**

The SMART Blade Radio System’s Communications Management System (CMS) is the information hub for the entire system. It manages all control operations, VoIP audio switching, uninterrupted power supply monitoring, automatic radio switchovers and security access to the SMART Blade system.

The CMS will also maintain log files and monitor the health and operational status of each component. The CMS’s software architecture is based on Rockwell Collins’ history and experience with radio control systems.
Increasing air traffic is placing growing pressure on airport operators and planners to ensure clear, reliable and available ATC communications. Radio downtime is not an option. Unfortunately, the cost for legacy VHF/UHF radios to provide this type of capability can be very high – operators not only have to stock expensive replacement units, they must also have full-time technicians on staff to handle troubleshooting and repairs – 24/7.

Because the SMART Blade Radio System is a new-generation software defined radio, it has self-testing and repair capabilities that were unheard of when most of today’s ATC communications radios were developed and installed.

The SMART Blade Radio System is the first VHF/UHF ATC radio system to be created with an automated, self-healing architecture. The system employs overlapping radio layers, sophisticated built-in test and unmatched system redundancy to create a “pooled asset architecture” where failed transmitters, receivers and transceivers are automatically identified and switched out with on-line spares.

This fail-safe recovery protocol operates with total transparency and with no on-site operator involvement.

SMART Blade’s totally automated system delivers “lights out” reliability while eliminating the need for extensive and potentially unused spares stocks, and minimizing the need for trained technicians.

When SMART Blade radios do receive scheduled on-site maintenance, because the units are all “hot swappable,” they can be removed and replaced with no need for any specialized tools or to power down the entire chassis.

The net result is that SMART Blade has shown an incredibly high system availability – greater than 99.95 percent.

The SMART communications solution for today and tomorrow
The SMART Blade Radio System is fully network enabled to provide remote control and audio monitoring over Ethernet. The system also fully supports all current legacy interfaces, enabling the SMART Blade Radio System to seamlessly integrate with currently installed ATC radios.
Because the system is software based, it supports a seamless transition to fully digital audio switching capabilities. SMART Blade radios can be upgraded with new functionality and operating modes via simple firmware changes – ensuring that your communications system is always operating with the most advanced VHF/UHF radios available.

Another benefit from having all the SMART Blade Radio System components interconnected via high-speed Ethernet is the ability to communicate with all devices from any remote or local site within your network. For example, enhanced firmware can be copied from the maintenance laptop to the CMS and then "pulled" via the Web server to each individual radio during scheduled downtime – alleviating the need to individually upgrade each radio and ensuring that your SMART Blade Radio System is always performing with the latest operating enhancements.

**SMART Blade’s new-generation software is a self-testing and self-healing architecture which saves you costly downtime and repairs.**

**Total system support – you have our name on it**

With tens of thousands of airport and airborne VHF/UHF radios fielded, no one has more experience with supporting the communication needs of the world’s air traffic controllers than Rockwell Collins.

The SMART Blade Radio System is the commercial version of our proven solution for the U.S. Air Force. With more than 4,000 radios already in service, the SMART Blade’s commonality with the USAF system will ensure both low-risk implementation today and long-term logistics management in all critical support areas, including: parts availability, elimination of parts/equipment obsolescence, and ongoing global maintenance/repair support.

The bottom line is the SMART Blade Radio System will give your airport the cost-effective, reliable and available VHF/UHF ATC communications solution it needs today and well into the future.
Building trust every day.
Rockwell Collins delivers smart communication and aviation electronic solutions to customers worldwide. Backed by a global network of service and support, we stand committed to putting technology and practical innovation to work for you whenever and wherever you need us. In this way, working together, we build trust. Every day.

For more information, contact:
Rockwell Collins
400 Collins Road NE
Cedar Rapids, Iowa 52498
800.321.2223
319.295.5100
Fax: 319.378.1172
Email: learnmore@rockwellcollins.com
Web site: www.rockwellcollins.com