NFPA 1802 EXECUTIVE SUMMARY GUIDE

UNDERSTANDING THE NFPA 1802 STANDARD ON TWO-WAY, PORTABLE RF VOICE COMMUNICATION DEVICES FOR USE BY EMERGENCY PERSONNEL IN THE HAZARD ZONE

MOTOROLA SOLUTIONS

NFPA 1802 OVERVIEW

Released by the National Fire Protection Association (NFPA) in January 2021, The NFPA 1802 standard is a new standard that identifies the operating parameters and minimum requirements for portable two-way RF voice communications devices (RF devices) such as radios, as well as remote speaker microphones (RSMs) for use by emergency service personnel in the hazard zone during emergency incident operations. The operating parameters and requirements identified in the standard pertain to the design, performance, testing and certification of RF devices as the primary voice communications link without compromising compatibility with field emergency services communications networks.

WHAT DEVICES DOES THE NFPA 1802 STANDARD APPLY TO?

The NFPA 1802 standard applies to RF communication devices (ie. two-way radios) and remote speaker mics (RSMs) used in the hazard zone

WHO DOES THE NFPA 1802 STANDARD APPLY TO?

The NFPA 1802 standard applies to Emergency Services Personnel (ie firefighters) using RF devices and RSMs in the hazard zone, or the area where members might be exposed to hazard or hazardous atmosphere; or a particular substance, device, event, circumstance, or condition that presents a danger.

ARE NFPA 1802-CERTIFIED RF DEVICES & RSMS A REQUIREMENT?

At this time, use of certified equipment may depend on the individual requirements/preferences determined by your department or state or local mandates. There is no national mandate at this time requiring all departments to use certified RF devices and RSMs.

BACKGROUND:

The fire service has long recognized the durability and ruggedness of radio products and accessories used in the market today. However, with the changing needs of users operating in the hazard zone, the market has identified an opportunity to define a minimum standard for a portable RF device designed for the rigors and utmost extremes of interior firefighting, hazmat, and wildland operations. Similar standards have been in existence for SCBA (Self Contained Breathing Apparatus) equipment, TICs (Thermal Imaging Cameras), and PASS (Personal Alert Safety System) devices.

WHO CREATED THE STANDARD?

This standard was developed by the National Fire Protection Association (NFPA) Electronic Safety Equipment committee consisting of users (firefighters), manufacturers (including Motorola Solutions), certifying agencies and researchers.

WHAT'S REQUIRED

DESIGN SPECIFICATIONS REQUIRED FOR CERTIFIED RF DEVICES

Design specifications have been outlined around hardware performance in areas such as extreme heat, immersion, drop/impact, battery life, and remote speaker mic connections. Specifications are also outlined for RF device software to include features such as data logging and safety alerts when in the hazard zone. A full list of test requirements can be found below in Table 1.

KEY TAKEAWAYS

- A certified RF device must display the compliance label indicating certification, which is only applied during the manufacturing process.
- Manufacturers must submit their RF device or RSM to be tested and certified NFPA 1802 compliant by a 3rd party certification organization accredited in accordance with ISO/IEC 17065.
- An RF device and/or RSM must be certified in all applicable specifications (hardware and software) of the standard to be claimed NFPA 1802 compliant. Manufacturers cannot claim compliance to portions of the standard.
- Existing RF devices and RSMs in the field cannot be upgraded in whole, or in part, to be certified NFPA 1802-compliant.

FREQUENTLY ASKED QUESTIONS

Q Is the use of NFPA 1802-certified RF devices and RSMs mandatory for my department?

A At this time, use depends on department requirements/preferences and state or local mandates.

Q Do all positions in my department require an NFPA 1802 certified RF device and RSM?

A At this time, use may depend on department requirements/preferences and state or local mandates.

Q How will I know my RF device or RSM is NFPA 1802 certified?

A The compliance label shall be permanently attached to certified RF devices, RSMs, and accessories.

Q Whose responsibility is it to get a device certified NFPA 1802 compliant?

A There is no responsibility for the user to seek certifying their existing RF devices or RSMs for NFPA-1802 compliance, nor can they. Devices must be certified during the manufacturing process and it is the responsibility of the manufacturer to obtain this certification in order to claim a device as NFPA 1802-certified. Any responsibility to obtain or acquire NFPA 1802-certified equipment may exist at the discretion of an individual department or state and local government. Please refer to your department and/or local government policy for any information pertaining to the purchase or use requirements for NFPA 1802-certified equipment.

Q Can my current RF device or RSM be upgraded to be compliant with NFPA 1802?

A No. Manufacturers or end users cannot claim compliance to portions of the standard or upgrade an RF device and/or RSM to be certified NFPA 1802 compliant. In order to claim NFPA 1802 compliance, the RF device and/or RSM must be certified in all applicable specifications (hardware and software) of the standard.

Q Will I be able to mix and match NFPA 1802 certified RSMs and RF devices from different vendors?

A Yes. NFPA 1802 allows the end user the option of combining certified devices, both radios and RSMs. Those devices would remain NFPA 1802 certified when connected to any other device certified to the standard. Users also need to ensure the RSM they choose meets the correct entity parameters, without voiding the radio Hazloc certification.

Q Is the NFPA 1802 certification a one-time process?

A No. Manufacturers need to have their NFPA 1802 compliant products recertified by the certification organization on an annual basis. Manufacturers may also be audited twice per year to ensure RF devices and RSMs continue to be manufactured to a quality in accordance with the standard. Customers who purchase NFPA 1802 certified RF devices and RSMs will not need to be audited or renew certification.

Q Does Motorola have an NFPA 1802 compliant solution?

A Yes, The APX NEXT XN and XVN500 RSM are NFPA 1802 certified.

(TABLE 1) NFPA 1802 TEST SUMMARY

View Full Published Standard

MECHANICAL TESTING	DESCRIPTION
Audio Speech Quality	A Perceptual Objective Listening Quality Analysis (POLQA) test is performed.
Heat and Immersion Leakage Resistance	Devices placed in a high-temperature test chamber, heated to 350ºF (177°C) for 15 minutes then immersed into 4.9ft (1.5m) of water at 72ºF (22ºC) for 15 minutes. Repeated 6 times then tested for speech quality, basic radio operation in hazard zone mode, and data logging.
Vibration Resistance	Devices placed in package tester compartments and vibrated for 4 hours then tested for speech quality and data logging.
Impact Acceleration	Three devices (one exposed to 72ºF (22ºC), one exposed to -4ºF (-20ºC), one exposed to 160ºF (71ºC)), are dropped from 9.8ft (3m) 8 times onto concrete to impact each face, one corner, one edge then tested for speech quality and data logging.
Corrosion	Salt spray the devices for 48 hours. Then store the devices in 50% humidity for 48 hours then tested for speech quality.
Display Surface Abrasion	Abrasive pad to be rubbed on display with 2.2lb (1kg) load, for 200 cycles.
High Temperature Functionality	Devices placed in a chamber heated to 500ºF (260ºC) for 5 min then tested for speech quality and data logging.
Heat and Flame	Devices placed in a chamber and exposed to direct flame for 10 sec. Exterior of device/RSM (Housings, knobs, buttons, cables, display, etc) and data logging are evaluated.
Product Label Durability	Device product labels are examined after heat and immersion test, corrosion test, high temperature test.
Cable Pullout	A force of 35lbf (156N) applied in an axial direction to device wiring.
Case Integrity	442lb (200kg) applied to the right, left, front, back sides of the device housing then tested for speech quality and data logging.
Water Drainage	Water is introduced into all openings, indentations, and grills until water overflows. Speech and data logging is tested.
Tumble	Devices are placed in a specified tumbling apparatus rotating at 15rpm for 3 hours. (2,700 tumbles)
TIA Transmit Power	Devices tested for carrier output and RF power output.
TIA Carrier Frequency Stability	Devices tested for frequency stability and operating frequency accuracy.
TIA Receiver Sensitivity	Devices tested for analog and digital reference sensitivity.
Power Source Performance	Devices continuously operated for at least 8 hours on standard duty cycle 10-10-80 at max rated transmit power.
Electronic Temperature Stress	Devices are operated after temperature exposure of -20°C for 4-hours, and +71°C for 4-hours.
Antenna VSWR Swept Frequency	Antenna performance must be maintained after Drop/Impact, Tumble and Corrosion tests.
SOFTWARE SAFETY FEATURES	
Hazard Zone Mode	Device default powers up in hazard zone mode, minimum volume is 64dB, +0/-6 dB, and capable of two actions to power off. Channel, talkgroup, talk path and other programmed voice announcements when in hazard zone mode and transitioning out of hazard zone mode are at a minimum of 82dBa.
Self-checks	Device self-checks on initial power up, periodic self-checks and self-diagnostics every 5 minutes. Device checks RSM connectivity, antenna connection, temperature exposure, battery level of at least 50%.
Data Logging	Device logs the 2000 most recent device actions/events and is downloadable by the emergency services organization.
Audible and Visual Alerts	Alerts during RSM connection failure, battery levels, emergency, self-check failure, over temperature, power cycle, connecting new bluetooth or wired accessory, out-of-range and loss of connection to a system.
Visual Indicators	LEDs and display backlights illuminate during emergency, connected RSM failure, internal over-temperature, out-of-range, transmit and receive, bluetooth activity, self-check failure.

WE ARE HERE TO HELP

At Motorola Solutions, we are dedicated to developing the products and solutions that meet the greatest demands of our first responder customers. Visit our Quick Answers Page to stay updated with the latest information regarding NFPA 1802 and Motorola Solutions, or contact your Motorola Solutions account representative.

ADDITIONAL RESOURCES

Download the full, published NFPA 1802 standard by visiting the Codes & Standards page on NFPA.org

Learn more at: https://www.motorolasolutions.com/en_us/solutions/what-is-nfpa-1802.html

MOTOROLA SOLUTIONS

UPDATED DEC. 2022