SPECIFICATIONS

1. **PURPOSE AND SCOPE:** The West Virginia Department of Homeland Security – Division of Administrative Services (DAS) is soliciting bids on behalf of West Virginia Emergency Management Division (EMD) to establish an open-end contract for Viavi 8800SX Digital Radio Test set (Service Monitor) or equal.

2. **DEFINITIONS:** The terms listed below shall have the meanings assigned to them below. Additional definitions can be found in section 2 of the General Terms and Conditions.

    2.1. **"Contract Item" or "Contract Items"** means the list of items as identified in Section 3.1 below and on the Pricing Pages.

    2.2. **"Pricing Page"** means the schedule of prices, estimated order quantity, and totals, contained in wvOASIS or attached hereto as Exhibit A, and used to evaluate the Solicitation responses.

    2.3. **"Solicitation"** means the official notice of an opportunity to supply the State with goods or services that is published by the West Virginia Division of Administrative Services.

    2.4. **"dBm"** means an abbreviation for the power ratio in decibels (dB) of the measured power referenced to one milliwatt (mW). It is used in radio, microwave, and fiber-optical networks as a convenient measure of absolute power because of its capability to express both very large and very small values in a short form. Compare dBW, which is referenced to one watt (1000 mW). Since it is referenced to the watt, it is an absolute unit, used when measuring absolute power. By comparison, the decibel (dB) is a dimensionless unit, used for quantifying the ratio between two values, such as signal-to-noise ratio. In audio and telephony, dBm is typically referenced relative to a 600-ohm impedance, while in radio-frequency work dBm is typically referenced relative to a 50-ohm impedance.

    2.5. **"AC/DC" (AC)** is an electric current which periodically reverses direction, in contrast to direct current (DC) which flows only in one direction.

    2.6. **"RF"** means Radio Frequency

    2.7. **"T/F"** means Transmit and Receive

2.8.   **"AM"** is a modulation technique used in electronic communication, most commonly for transmitting information via a radio carrier wave. In amplitude modulation, the amplitude (signal strength) of the carrier wave is varied in proportion to the waveform being transmitted. That waveform may, for instance, correspond to the sounds to be reproduced by a loudspeaker, or the light intensity of television pixels. This technique contracts with frequency modulation, in which its phase is varied. AM was the earliest modulation method used to transmit voice by radio. It was developed during the first two decades of the 20th century beginning with Landell de Moura and Reginald Fessenden's radiotelephone experiments in 1900. It remains in use today in many forms of communication; for example, it is used in portable two- way radios, VHF aircraft radio, Citizen's Band Radio, and in computer modems (in the form of QAM). "AM" is often used to refer to medium wave AM radio broadcasting.

2.9.   **"FM"** Is the encoding of information in a carrier wave by varying the instantaneous frequency of the wave. This contrasts with amplitude modulation, in which the amplitude of the carrier wave varies, while the frequency remains constant. In analog frequency modulation, such as FM radio broadcasting of an audio signal representing voice or music, the instantaneous frequency deviation, the difference between the frequency of the carrier and its center frequency, is proportional to the modulation signal.

2.10. **"Hz"** The hertz (symbol: Hz) is the derived unit of frequency in the International System of Units (SI) and is defined as one cycle per second. It is named for Heinrich Rudolf Hertz, the first person to provide conclusive proof of the existence of electromagnetic waves. Hertz are commonly expressed in multiples: kilohertz (103 Hz, kHz), megahertz (106 Hz, MHz), gigahertz (109 Hz, GHz), and terahertz (1012 Hz, THz). Some of the unit's most common uses are in the description of sine waves and musical tones, particularly those used in radio and audio related applications. It is also used to describe the speeds at which computers and other electronics are driven.

2.11. **"VSWR"** (Voltage Standing Wave Ratio), is a measure of how efficiently radio-frequency power is transmitted from a power source, through a transmission line, into a load (for example, from a power amplifier through a transmission line, to an antenna).

2.12. **"(~)"** The symbol for approximate indicates an imprecise or nominal value where variations will be acceptable.

2.13. **"dBm"** is an abbreviation for the power ratio in decibels (dB) of the measured power referenced to one milliwatt (mW). It is used in radio, microwave, and fiber optical networks as a convenient mearsure of absolute power because of its capability to express both very large and very small values in a short form. Compare dBW, which is referenced to one watt (1000 mW). Since it is referenced to the watt, it is an absolute unit, used when measuring absolute power. By comparison, the decibel (dB) is a dimensionless unit, used for quantifying the ration between two values, such as signal to noise ration.

2.14. **"dBc"** (decibels relative to the carrier) is the power ratio of a signal to a carrier signal, expressed in decibels. For example, phase noise is expressed in dBc/Hz at a given frequency offset from the carrier. dBc can also be used as a measurement of Spurious-Free Dynamic Range (SFDR) between the desired signal and unwanted spurious outputs resulting from the use of signal converters such as a digital to analog converter or a frequency mixer. If the dBc figure is positive, then the relative signal strength is greater than the carrier signal strength. If the dBc figure is negative, then the relative signal strength is less than carrier signal strength.

2.15. **"CW"** A continuous wave or continuous waveform (CW) is an electromagnetic wave of contract amplitude and frequency; almost always a sine wave, that for mathematical analysis is considered to be of infinite duration. Continuous wave is also the name given to an early method of radio transmission, in which a sinusoidal carrier wave is switched on and off. Information is carried in the varying duration of the on and off periods of the signal, for example by Morse code in early radio. In early wireless telegraphy radio transmission, CW waves were also known as "undamped waves", to distinguish this method from damped wave signals produced by earlier spark gap type transmitters.

2.16. **"SINAD"** Signal to noise and distortion ratio (SINAD) is a measure of the quality of a signal from a communications device, SINAD is usually expressed in dB and is quoted alongside the receiver RF sensitivity, to give a quantitative evaluation of the receive sensitivity. Note that with this definition a SINAD reading can never be less than 1 (i.e., it is always positive when quoted in dB).

2.17. **"NXDN"** is an open standard Common Air Interface (CAI) technical protocol for mobile communications. It was developed jointly by Icom Incorporated and Kenwood Corporation. NXDN is implemented by Icom in their IDAS system and by Kenwood as NEXEDGE.

2.18. **"P25"** is a suite of standards for digital radio communications for use by federal, state/province and local Public safety organizations in North America to enable them to communicate with other agencies and mutual aid response teams in emergencies.

2.19. **"DMR"** is an open digital mobile radio standard defined in the European Telecommunications Standards Institute (ETSI) Standard TS.

2.20. **"dPMR"** digital private mobile radio, is a Common Air Interface (CAI) for digital mobile communications. dPMR is an open, non-proprietary standard that was developed by the European Telecommunications Standards Institute>

2.21. **"ARIB T98"** is the Association of Radio Industries and Business standard for Digital Convenience Radio Equipment for Simplified Service.

2.22. **"PTC"** is Positive Train Control System.

2.23. **"rms"** in a cyclically alternating electric current, root mean square (RMS) is equal to the value of the direct current that would produce the same average power dissipation in a resistive load.

2.24. **"ppm"** Is a temperature coefficient that describes the relative change of a physical property that is associated with a given change in temperature.

2.25. **"DTMF"** Dual-tone multi-frequency signaling (DTMF) is an in-band telecommunication signaling system using the voice-frequency band over telephone lines between telephone equipment and other communications devices and switching centers. DTMF was first developed in the Bell System in the United States and became known under the trademark Touch-Tone for use in push-button telephones supplied to telephone customers, starting in 1963. DTMF is standardized as ITU-T Recommendation Q.23.

2.26. **"DCS"** DCS (Digital Code Squelch) is digital date or code word that is transmitted with the voice audio. This data is sub-audible with most of its energy below 300 Hz. However, it does have a wide bandwidth from two (2) to three hundred (300) Hz. Unlike CTCSS (Continuous Tone Coded Squelch System) which used continuous tones below 300 Hz., DCS uses digital data or code words. Each code work is unique, and all code works may be used on the same channel without interference. At the end of the radio transmission and about ½ second before the transmitter un-keys, the raio will encode a 134 Hz tone that serves as a turn off code. The FM deviation level of DCS data should be in the range of 500 to 800 Hz.

2.27. **"ohm"** The ohm is defined as an electrical resistance between two points of a conductor when a constant potential difference of one volt, applied to these points, produces in the conductor a current of one ampere, the conductor not being the seat of any electromotive force in many cases the resistance of a conductor in ohms is approximately constant within a certain range of voltages, temperatures, and other parameters. These are called linear resistors. In other cases, resistance varies (e.g., thermistors). In alternating current circuits, electrical impedance is also measured in ohms.

2.28. **"Z"** Electrical impedance is the measure of the opposition that a circuit presents to a current when a voltage is applied. The term complex impedance may be used interchangeably. Quantitatively, the impedance of a two-terminal circuit element is the ratio of the complex representation of the current flowing through it. In general, it depends upon the frequency of the sinusoidal voltage. Impedance extends the concept of resistance to AC circuits, and possesses both magnitude and phase, unlike resistance, which has only magnitude. When a circuit is driven with direct current (DC), there is no distinction between impedance and resistance, the latter can be thought of as an impedance with zero phase angle. The notion of impedance is useful for performing AC analysis of electrical networks because it allows relating sinusoidal voltages and currents by a simple linear law. In multiple port networks, the two-terminal definition of impedance is inadequate, but the complex voltages as the ports and the currents flowing through them are still linearly related by the impedance matrix. Impedance is a complex number, with the same units as resistance, for which the SI unit is the ohm (Ω). Its symbol is usually Z, and it may be represented by writing its magnitude and phase in for form |Z|<O. However, cartesian complex number representation is often more powerful for circuit analysis purposes.

2.29. **"C-WT"** Continuous wavelet transforms (continuous shift and scale parameters) In continuous wavelet transforms; a given signal of finite energy is projected on a continuous family of frequency bands. For instance, the signal may be represented on every frequency band of the form then, the original signal can be reconstructed by a suitable integration over all the resulting frequency components.

2.30. **"uS"** Symbol for the micro siemens, as SI unit of electrical conductance equal to 10-6 siemens.

3. **GENERAL REQUIREMENTS:**

3.1. Contact Items and Mandatory Requirements: Vendor shall provide Agency with the Contract Items listed below on an open-end and continuing basis. Contract Items must meet or exceed the mandatory requirements as shown below. Descriptive product literature shall be provided by the Vender and may be attached to the Request for Quotation (RFQ). Vendors bidding an "or equal" must ensure that or equal product items are compatible and must work in the Agency's current environment.

    3.1.1. **Viavi 8800SX Digital Radio Test Set (Service Monitor) or Equal.**

        3.1.1.1. Test set shall have an AM/FM/P25 Monitor.
        3.1.1.2. Must have a AM/FM/P25 Generator.
        3.1.1.3. Shall have a Duplex Generator.
        3.1.1.4. Shall have a Signal Strength Meter.
        3.1.1.5. Test Set shall have an RF Power Meter.
        3.1.1.6. Must have a minimum of two (2) spectrum analyzers available.
        3.1.1.7. Shall have a Tracking Generator.
        3.1.1.8. Test Set shall be capable of performing RF cable fault location.
        3.1.1.9. Test Set shall have a frequency Counter.
        3.1.1.10. Test Set shall have a Frequency Error Meter.
        3.1.1.11. Must have an AM modulation Meter.
        3.1.1.12. Must have an FM modulation Meter.
        3.1.1.13. Shall have an SINAD Meter.
        3.1.1.14. Test Set shall have a Distortion Meter.
        3.1.1.15. Must have an Audio Synthesizer.
        3.1.1.16. Test Set shall have an Oscilloscope.
        3.1.1.17. Test Set shall have a Digital voltmeter which includes an AC/DC Ammeter.
        3.1.1.18. Test Set must be capable of performing Auto Test and Auto Tune on each of the following radio models:
        3.1.1.18.1. BK Technologies P25
        3.1.1.18.2. Kenwood P25
        3.1.1.18.3. Motorola APX
        3.1.1.18.4. Motorola Next
        3.1.1.18.5. Motorola Astro XTS/XTL
        3.1.1.18.6. EF Johnson P25
        3.1.1.18.7. Harris P25
        3.1.1.18.8. Tait P25

    3.1.2. **Time Base**
        3.1.2.1. Must have at a minimum temperature stability of ±0.15 ppm of -20°C to 70°C.
        3.1.2.2. Aging must be a minimum of 0.5 ppm for First Year and a minimum of 0.3 ppm after.

3.1.3. External 10 MHz Reference Input

3.1.3.1. Must have a minimum External Input Frequency Range of 10 MHz ± 150 Hz.

3.1.3.2. External Input Level must be a minimum -10dBm to +10 dBm.

3.1.3.3. Must have a Max Input: +15 dBm.

3.1.4. Frequency Flex (Externally Reference Time base Calibration)

3.1.4.1. Input Frequency Range must be a minimum of 2MHz to 1,000 MHz

3.1.4.2. Reference Input Port must have a minimum T / R of -20dBm to and the Antenna must be a minimum of -40dBm.

3.1.4.3. Frequency Flex Accuracy must be a minimum of 0.5 Hz from external source applied + Stability + Aging. For Example: 10 MHz External Input, after Frequency Flex = ±0.05 Hz to external input.

3.1.4.4. Must have a minimum 10MHz ± 0.5Hz = 0.05 ppm + Stability + Aging.

3.1.5. RF Generator

3.1.5.1. Port Input Protection must have at a minimum: Gen Port: +20 dBm (Input Port Alarm Typical), T/R Port: +52 dBm CW (Input Power Alarm Typical), T/R Port: >+90°C (Temperature Alarm Typical).

3.1.6. Frequency

3.1.6.1. Must have a minimum usable range of 2 MHz to 1,000 MHz.

3.1.6.2. Accuracy must be that same as Time Base.

3.1.6.3. Resolution must be a minimum of 1Hz.

3.1.7. Output Level

3.1.7.1. Must have a minimum T/R Port: -50 to -125 dBm.

3.1.7.2. Ant Port shall be a minimum of -30 to -90 dBm.

3.1.7.3. Gen Port shall be a minimum of -5 to -65 dBm.

3.1.8. Accuracy

3.1.8.1. Accuracy must have at a minimum: ±2 dB; ±1.5 dB (typical), with the minimum Resolution of 0.1 dB, 0.1 dB (0 to -6 relative to selected level with 0.1dB Step On);

3.1.9. Port VSWR

3.1.9.1. Must have an ANT Port < 1.5:1 Typical.

3.1.9.2. Gen Port must be < 1.5:1 Typical.

3.1.9.3. T/R Port must be < 1.2:1.

3.1.10. SSB Phase Noise

3.1.10.1. SSB Phase Noise shall be a minimum of -90dBc/Hz at 20 kHz at 20 kHz offset with a minimum of -95 dBc/Hz at 1 GHz at 20 kHz Offset, Typical.

3.1.11. Spurious

    3.1.11.1. Must have minimum Harmonics of -30 dBc, -42 dBc Typical.

    3.1.11.2. Non-Harmonics must be a minimum -40 dBc, -50 dBc Typical (±20 kHz offset from carrier; 0 to 1 GHz).

3.1.12. Residual FM

    3.1.12.1. Must be < 20 Hz rms in 300 Hz to 3 kHz Band Width.

    3.1.12.2. Must be < 4 Hz rms, Typical and maximum 100 MHz.

    3.1.12.3. Must be < 6 Hz rms, Typical and maximum 800 MHz.

    3.1.12.4. Must be < 11 Hz rms, Typical and maximum 800 MHz.

3.1.13. Residual AM

    3.1.13.1. Must have a minimum 0.5% rms in 300 Hz to 3 kHz Band Width.

3.1.14. RF Generator Modulation

    3.1.14.1. RF Generator Modulation must have the following:

        3.1.14.1.1. Analog Modulation: FM, and AM.

        3.1.14.1.2. Digital Modulation: P25, (C4FM, H-CPM, H-DQPSK), DMR, dPMR, ARIB, T98, NXDN, PTC.

        3.1.14.1.3. DTMF Modulation: FM, AM.

        3.1.14.1.4. DCS Modulation: FM, AM.

        3.1.14.1.5. Two-Tone Sequential Modulation: FM, AM.

        3.1.14.1.6. Tone Remote Modulation: FM, AM.

        3.1.14.1.7. Tone Sequential: FM, AM.

        3.1.14.1.8. CTCSS: FM, AM using modulation generators.

3.1.15. FM Modulation – Internal (Gen 1 Gen 2) Modulation Frequency Range.

    3.1.15.1. FM Modulation must have the following at a minimum:

        3.1.15.1.1. Range: 0 Hz to 20 kHz.

        3.1.15.1.2. Resolution: 0.1 Hz.

        3.1.15.1.3. Accuracy: Time Base ±2 Hz.

        3.1.15.1.4. FM Deviation Range: OFF, 0 Hz to 100 kHz (Gen 1 and Gen 2 Selectable).

        3.1.15.1.5. Total Harmonic Distortion: 3% (1,000 Hz rate, > 2 Hz Deviation, 300 Hz – 3 kHz Band Pass Filter).

        3.1.15.1.6. Resolution: 1 Hz

        3.1.15.1.7. Accuracy: ±5% at 1 kHz rate; 2kHz to 50 kHz deviation (±1% Typical), ± 10% at 150 Hz to 3 kHz rate; 2 kHz to 50 kHz deviation.

3.1.16. FM Modulation – External (Mic, Audio In)

    3.1.16.1. Microphone In

        3.1.16.1.1. Must have Alternate Mic Configurations Mic Connector Pins with the following at a minimum:

            3.1.16.1.1.1. Range 1:2-15 mVrms (8 mVrmw Typical) Pin 2 – OPEN, Pin 6-GND.

3.1.16.1.1.2. Range 2:35-350 mVrms (100 mVrms Typical) Pin 2-GND, Pin 6-Open (Range 2 enables a nominal 3 Vdc Bias Voltage).

3.1.16.1.1.3. Range 3:2-32 mVrms (20 mVrms Typical) Pin 2 OPEN, Pin 6-Open

3.1.16.1.1.4. Mic Frequency Range: 300 Hz to 3 kHz.

3.1.16.1.1.5. Mic Level: OFF, 0 Hz to 80 kHz.

3.1.16.1.1.6. Mic Modulation Accuracy: ±20% (300 Hz to 1.2 Khz).

3.1.16.1.1.7. Mic Slope: Positive voltage yields Positive Deviation.

3.1.17. Audio In

    3.1.17.1. Audio in must have the following minimum functionality:

        3.1.17.1.1. Audio In, Input Range: 30 V, 3V.

        3.1.17.1.2. Audio In, Switchable Loads: 3 V Range: 150 ohms, 600 ohms, 1K ohms, High Z, 30 V Range; High Z.

        3.1.17.1.3. Audio In, Input Levels: 3V Range; 0.05 to 3.2 Vrms, 30V Range; 3 Vrms – 30 Vrms.

        3.1.17.1.4. Audio In, 300 Hz to 5 kHz.

        3.1.17.1.5. Audio In, 3V Range; 1 khZ / 35 mVrms Typical, 30 V Range; 1 kHz 350 mVrms Typical.

        3.1.17.1.6. Audio In, Positive voltage yields Positive Deviation.

3.1.18. AM Modulation – Internal (Gen 1, Gen 2) Modulation Frequency Range.

    3.1.18.1. AM Modulation Internal (Gen 1, Gen 2) Modulation Frequency Range must have the following minimum functionality.

        3.1.18.1.1. Minimum Range of 0 Hz to 20 kHz.

        3.1.18.1.2. Minimum Resolution 0.1 Hz.

        3.1.18.1.3. Minimum Accuracy; Time Base ±2 Hz.

        3.1.18.1.4. Range; OFF, 0 to 100% (Gen 1, Gen 2 Selectable).

        3.1.18.1.5. Minimum Resolution of 0.1%.

        3.1.18.1.6. Minimum Total Harmonics Distortion; 3% (20% to 90% mod, 1,000 Hz rate, 300 Hz to 3kHz Band Pass Filter).

        3.1.18.1.7. Minimum Modulation Accuracy; ±5% setting @ 1 kHz rate; ±10% setting @ 150 Hz to 5 kHzx rate 10% to 90% modulation.

3.1.19. AM Modulation – External (Mic, Audio In).

    3.1.19.1. Microphone In must have the following minimum functionality:

        3.1.19.1.1. Alternate MIC Configurations, MIC Connector Pins.

        3.1.19.1.2. Minimum Range 1: 2-15 mVrms (8 mVrms Typical), Pin 2 – OPEN, Pin 6-GND.

        3.1.19.1.3. Minimum Range 2: 35-350 mVrms (100 mVrms Typical), Pin 2 – GND, Pin 6 – OPEN (Range 2 enables a nominal 3 Vdc Bias Voltage).

3.1.19.1.4. Minimum Range 3: 2-32 mVrms (20 mVrms Typical), Pin 2 – OPEN, Pin 6 – GND.

3.1.19.1.5. Minimum Mic Frequency Range; 300 Hz to 3 kHz.

3.1.19.1.6. Minimum MIC Modulation; 0% to 80%.

3.1.19.1.7. Minimum MIC Modulation Accuracy; ± 20% (300 Hz to 1.2 kHz), ±30% (> 1.2 kHz).

3.1.20. Audio In

3.1.20.1. Audio In must have the following minimum functionality:

3.1.20.1.1. Audio In, minimum input; Range 30V, 3V.

3.1.20.1.2. Audio In, Switchable Loads minimum 3V Range; 150 ohms, 600 ohms, 1K ohms, High Z, 30V Range; High Z.

3.1.20.1.3. Audio In, minimum Input Levels: 3V Range; 0.05 to 3.2 Vrms, 30V Range 3 Vrms – 30 Vrms.

3.1.20.1.4. Audio In, AM Frequency Range minimum 300 Hz to 5 kHz.

3.1.20.1.5. Audio In, minimum Level Sensitivity: 3V Range: 1% / 35 mVrms Typical (High Z Load) 30V Range: 1% / 350 Vrms Typical (High Z Load).

3.1.21. Audio Frequency Gen 1 & Audio Gen 2

3.1.21.1. Frequency must have the following minimum range of 0.0 Hz to 20.0 kHz.

3.1.21.2. Must have a resolution of a minimum 0.1 kHz.

3.1.21.3. Must have a minimum Accuracy: Time base ±2 Hz.

3.1.22. Output Level

3.1.22.1. Must have Audio Out Port Impedance with a < 1 ohm.

3.1.22.2. Must have an Audio Level Out with a minimum of 0 Vrms to 1.57 Vrms.

3.1.22.3. Shall have a minimum resolution of 0.001 Vrms.

3.1.22.4. Must have a minimum Accuracy ±10%; 100 mVrms, 30 Hz to 3kHz.

3.1.22.5. Must have a minimum Distortion of <3% (1kHz rate, sine 300 Hz to 3kHz).

3.1.23. RF Receiver

3.1.23.1. RF Receiver must port input protection with the following minimum functionality:

3.1.23.1.1. Minimum Ant Port of +20 dBm (Input Power Alarm Typical).

3.1.23.1.2. Minimum T/R Port of +52 dBm CW.

3.1.23.1.3. Minimum T/R Port of > +90°C (Temperature Alarm Typical).

3.1.23.2. RF Receiver Range must be a minimum of 2 MHz to 1,000 MHz and < 2 MHz to 100 kHz Usable Range.

3.1.23.3. Accuracy shall be same as time base.

3.1.23.4. Resolution shall be a minimum of 1 Hz.

3.1.24. Input Amplitude
    3.1.24.1. Sensitivity must have the following minimum functionality:
        3.1.24.1.1. ANT: -80dBm, typical 10 dBm SINAD (-110 dBm with preamp).
        3.1.24.1.2. T/R -40 dBm, typical, 10 dB SINAD.
    3.1.24.2. Minimum Level Receiver Measurements must have the following minimum functionality:
        3.1.24.2.1. ANT: -60 dBm Preamp off, -80 dBm Preamp on, RF Error Meter.
        3.1.24.2.2. T/R -20 dBm Preamp off, -40 dBm Preamp ON, RF Error Meter.

3.1.25. DEMOD Meters
    3.1.25.1. Must have ANT Distortion, SINAD, Modulation, AF Counter.
    3.1.25.2. Shall have T/R: Modulation, Distortion, SINAD, AF Counter.
    3.1.25.3. Must have Maximum Input Level Receiver Measurements ANT: +10 dBm (Auto, Preamp off) T/R: +47 dBm CW, FM +41 dBm AM.

3.1.26. Receiver Demodulation Types
    3.1.26.1. Must have the following demodulation types: AM, FM, DMR, dPMF, ARIB, T98, NXDN, P25 (C4FM, H-CPM, H- DQPSK), PTC.

3.1.27. AM Modulation – External (Mic, Audio IN)
    3.1.27.1. Must have the following IF Bandwidth for FM: 5 kHz, 6.25 Khz, 8.33 kHz, 10 kHz, 12.5 kHz, 25 kHz, 30 kHz, 100 kHz, 300kHz.
    3.1.27.2. Must have the following AM functionality: 5 kHz, 6.25 kHz, 8.33 kHz, 10 kHz, 12.5 kHz, 25 kHz, 30 kHz.
    3.1.27.3. Audio Filters Bandwidth must have the following:
        3.1.27.3.1. FM: C-WT Band Pass, CCITT BP, None, 15 kHz, LP, 300 Hz LP, 300 Hz HP, 5 kHz LP, 300 Hz to5kHz BP, 300 Hz to 3 kHz BP, 300 Hz to 20 kHz BP, 3 kHz LP.
        3.1.27.3.2. AM: C-WT BP, CCITT BP, None, 15 kHz LP,0.3 kHZ LP, 0.3 kHz HP, 5 kHz LP, 300 Hz to 5 kHz BP, 300 Hz to 3 kHz BP, 0.3 kHz to 20 kHz BP, 3 kHz LP.
    3.1.27.4. Audio Output, Level Sensitivity must have the following at a minimum:
        3.1.27.4.1. FM: 3Vrms / kHz Dev / IF Band Width (kHz, ± 15%), AM: 7 mVrms/%AM, ± 15%.
        3.1.27.4.2. LO Emissions must be < – 50dBc.

3.1.28. RF Frequency Error Meter
    3.1.28.1. Units must be Hz, PPM.
    3.1.28.2. Range must be a minimum of ±200 kHz, ±1,000 PPM.
    3.1.28.3. Resolution must be a minimum of 1Hz.
    3.1.28.4. Accuracy Time Base must be a minimum of ±1 Hz.

3.1.29. RSSI (Receive Signal Strength Indicator) RF Power Within Receiver RF Bandwidth.

3.1.29.1. Units must be dBm, Watts, Microwatts.

3.1.29.2. Range must be a minimum -120 dBm to +60 dBm.

3.1.29.3. RF Level Range must have the following at a minimum:

3.1.29.3.1. T/R Port: (preamp OFF) with minimum -50 dBm to +47 dBm.

3.1.29.3.2. ANT Port: (preamp OFF) with minimum -90dBm to +10 dBm.

3.1.29.3.3. ANT Port (preamp ON) with minimum -110 dBm to -10 dBm.

3.1.29.4. Resolution must be a minimum 0.01 dBm.

3.1.29.5. Accuracy must be a minimum ±3 dB; (1.5 Typical) Normalized.

3.1.29.6. Ext Attenuation must be a minimum -50 to +50dB, 0.01 dB resolution.

3.1.30. RF Power Meter (Broadband RF Power into T/R Port)

3.1.30.1. Maximum Input Level must be a minimum of 50 Watts continuous, +25°C, ±10°C and 125 Watts Cyclical (Max "ON" of 30 sec and Min "OFF" for 90 sec) for power levels less than 50 Watts.

3.1.30.2. Alarms must be a minimum of +49 dBm (Input RF Power Alarm) in greater than +90°C (Temperature Alarm).

3.1.30.3. Meter Range must be a minimum of +20 to +53 dBm.

3.1.30.4. Meter Floor must be a minimum of 0.10 W / +20 dBm.

3.1.30.5. Measurement Modes: Average, Maximum, Minimum, Peak.

3.1.30.6. Averaging Range must be 1 to 99

3.1.30.7. Display Units must have Watts, dBm.

3.1.30.8. Must have a minimum accuracy of 10% of reading, (6% Typical).

3.1.30.9. Ext Attenuation must be a minimum -50 to +50 dB, 0.01 dB resolution.

3.1.31. FM Deviation Meter.

3.1.31.1. Must have a minimum range of 500 Hz to ±100 kHz.

3.1.31.2. Meter Type must be Peak+, Peak-, (Peak to Peak)/2, RMS.

3.1.31.3. Resolution must be a minimum of 0.1 Hz.

3.1.31.4. Must have accuracy of a minimum of ±10% of reading, 500 Hz to 100 kHz Deviation ±5% of reading, 1kHz to 10 kHz Deviation (150 Hz to 1kHz rate) ±3% of reading, 1 kHz to 10 kHz Deviation (1 kHz to 1.5 kHz rate).

3.1.32. AM Percent Meter.

3.1.32.1. Must have a minimum range of 5% to 100%.

3.1.32.2. Must have the following modes at a minimum:

3.1.32.2.1. Peak+, Peak-, (Peak to Peak)/2, RMS.

3.1.32.2.2. Resolution must be a minimum 0.001%

3.1.32.2.3. Must have a minimum accuracy of ±5% of reading, 1 kHz rate 30% to 90% Modulation, 3 kHz LPF.

3.1.33. SINAD Meter.
   3.1.33.1. Measurement Sources must contain Audio In, Demodulation with the following functionality at a minimum:
      3.1.33.1.1. FM must be a minimum 2kHz Deviation (IF BW set Appropriately for received Modulation BW).
      3.1.33.1.2. AM must be a minimum 25% Modulation (IF BW set Appropriately for received Modulation BW).
   3.1.33.2. Audio In, Port must have a minimum frequency range of 300 Hz to 10 kHz.
   3.1.33.3. Input Level must have the following functionality at a minimum:
      3.1.33.3.1. 3V (Audio config setup): 0.9 Vp-p to 9 Vp-p.
      3.1.33.3.2. 30V (Audio config setup): 9Vp-p to 90Vp-p.
      3.1.33.3.3. Audio Frequency Notch with a minimum of 1 kHz.
      3.1.33.3.4. Minimum reading range of 0dB to 60dB.
      3.1.33.3.5. Minimum resolution of 0.01 dB.
      3.1.33.3.6. Accuracy of ±1.5 dB reading must be a minimum of 8dB with a maximum of 40dB.

3.1.34. Distortion Meter.
   3.1.34.1. Measurement sources must contain Audio Demodulation DEMOD with the following functionality at a minimum:
      3.1.34.1.1. FM with a minimum 2kHz Deviation (IF BW Set Appropriately for received Modulation BW).
      3.1.34.1.2. AM must have a minimum 25% Modulation (IF BW Set Appropriately for received Modulation BW).
   3.1.34.2. Must have an Audio Port In with a minimum frequency range 300Hz to 10kHz.
   3.1.34.3. Must have a minimum Input Level of 3V (Audio config setup) and 0.9 Vp-p to 9 Vp-p with 30V (Audio config setup) 9 Vp-p to 90 Vp-p.
   3.1.34.4. Must have a minimum audio frequency notch of 1kHz.
   3.1.34.5. Must have a minimum resolution of 0.001% and minimum accuracy of ±10% of reading +0.1% Distortion, and greater than 1% to less than 20%.

3.1.35. Audio Frequency Counter
   3.1.35.1. Measurement Sources must have the following:
      3.1.35.1.1. Audio In, Demodulation
      3.1.35.1.2. DEMOD with minimum FM: 15 Hz to 20 kHz rate (IF BW set appropriately for received modulation BW) and minimum AM: 100 Hz to 10 kHz rate (IF BW set appropriately for received modulation BW)
   3.1.35.2. Audio In, Port must have the following at a minimum:
      3.1.35.2.1. FREQUENCY range with a minimum 300 Hz to 20 kHz

3.1.35.2.2. Input Level with a minimum 3 V (Audio Config. Setup): 28 m Vp-p to 90 Vp-p; 30 V (Audio Config Setup) 280 mVp-p to 90 Vp-p.

3.1.35.2.3. Must have a minimum frequency range of 15 Hz to 20 kHz

3.1.35.2.4. Must have minimum Resolution of 0.1 Hz

3.1.35.2.5. Must have a minimum Accuracy of ± 1 Hz

3.1.36. Audio Frequency Level Meter

3.1.36.1. Measurement Sources Audio In, Scope must have the following minimum functionality:

3.1.36.1.1. Input Range with Audio In, Range of a minimum of 3V, 30V with a minimum Scope Range of 2VDC, 40VDC

3.1.36.1.2. Must have a minimum Frequency Range of 200 Hz to and must be less than 5 kHz

3.1.36.1.3. Must have load selection

3.1.36.1.4. Must have scope with High Z

3.1.36.1.5. Must have Audio In with a minimum 3V Input Range: High Z, 150 ohms, 600 ohms, and 1K ohms

3.1.36.1.6. Must have a 30 V Input Range with a minimum 10K

3.1.36.2. Input Level must have the following at a minimum:

3.1.36.2.1. Audio In, Port with a minimum 3V Range: 10 mV rms to 3.2 V rms 30 V Range: 1 V rms to 30 V rms

3.1.36.2.2. Must have a Scope Port with a minimum 2.0 VDC Range: 10 mV rms to 1 V rms; 40 VDC Range: 1 V rms to 28.28 V rms

3.1.36.2.3. Must have display unit resolution minimum Volts of 0.001 V, mV: 0.001 mV, dBuV with a minimum of 0.001 dBuV, dBm with a minimum of 0.001 dBm and a minimum of 0.001 Watts

3.1.36.2.4. Must have a minimum Accuracy of ± 5% AUDIO IN Port

3.1.37. P25 Measurements

3.1.37.1. Must have Modulation Fidelity with a minimum range of 0 to 10%, minimum Resolution of 0.1%, and Accuracy with a minimum of 5.0% of reading (2.5 to 10%)

3.1.37.2. Must have Symbol Deviation with a minimum range of 1620 to 1980Hz, a minimum Resolution of 0.1Hz and a minimum accuracy of ± 10Hz (1620 to 1980Hz)

3.1.37.3. Must have Symbol Clock Error with minimum range of ± 12 ppm, a minimum resolution of 0.01 ppm, and a minimum Accuracy of 1 ppm (±0.0048 Hz)

3.1.38. DMR Measurements

3.1.38.1. Must have FKS Error with a minimum range of 0 to 10 %, minimum resolution of 0.1%, and Accuracy less than 5.0% of reading (2.5 to 10%)

3.1.38.2. Must have Symbol Deviation with a minimum range of 1745 to 2140 Hz, minimum resolution of 0.1 Hz, and a minimum accuracy of ±10 Hz

3.1.38.3. Must have Symbol Clock Error with range of ±12 ppm, resolution of 0.01 ppm, accuracy of 1 ppm (±0.0048 Hz)

3.1.39. Oscilloscope

3.1.39.1. Must have Scope with Audio IN, Demodulation that includes a minimum band width of 5 kHz

3.1.39.2. Must have Input Impedance

3.1.39.3. Must have Scope Input with a minimum 2.0 V Range and 53 K ohms and 40 V Range: 1M ohms

3.1.39.4. Audio I/O Input must have a minimum 3 V Range with 150 ohms, 600 ohms, 1K ohm, High Z and a minimum 30 V Range with 10 K ohms

3.1.39.5. Must have coupling scope with the following:

    3.1.39.5.1. AC, DC, and GND

    3.1.39.5.2. Audio In with AC only

    3.1.39.5.3. FM Internal Demodulation with DC

    3.1.39.5.4. AM Internal Demodulation with AC

3.1.39.6. Vertical Range must have the following at a minimum

    3.1.39.6.1. Scope, Audio In with 10m V to 10V -div in a 1, 2, 5 sequence

    3.1.39.6.2. FM Internal Demodulation with 0.1 kHz to 50 kHz / div in a 1, 2, 5 sequence

    3.1.39.6.3. AM Internal Demodulation with 5, 10, 20, 50% / div

    3.1.39.6.4. Vertical Accuracy with a minimum 10% of full Scale (DC to 5 kHz)

    3.1.39.6.5. Horizontal Sweep with a minimum 0.5 ms / div to sec / div

    3.1.39.6.6. Horizontal Accuracy with a minimum 3% of Full Scale

    3.1.39.6.7. Trigger Type with Internal (Auto, Normal)

    3.1.39.6.8. Trigger Level with Variable on Vertical Scale

    3.1.39.6.9. Two markers display vertical measurement (Voltage, kHz, % modulation) must display delta in time between markers

3.1.40. Channel Analyzer

3.1.40.1. Must have a minimum range of 2 MHz to 1 GHz

3.1.40.2. Must have a minimum span of 10 kHz to 5 MHz (1,2,5 steps)

3.1.40.3. Windows must be Hanning, Flat Top, Rectangle

3.1.40.4. Vertical Scale shall be a minimum of 2, 5, 10, 15, 20 db/div

3.1.40.5. Marker Bandwidth shall be a minimum of 1 kHz to 5 MHz (1, 2, 5 steps)

3.1.40.6. Marker Offset shall be a minimum ± 1 kHz to ± ½ Span (1, 2, 5 steps)

3.1.40.7. Shall have a minimum Power Band Width (PdB) Accuracy ±3 dB t typical (30 dB signal to noise)

3.1.40.8. Noise Floor shall be a minimum -123 dBm (preamp OFF) and a minimum -140 dBm (preamp ON) (Span 100 kHz), Typical.

3.1.40.9. Wide Analyzer: 10 kHz to 50 MHz in 1, 2, 5 sequence.

3.1.41. Digital Multimeter (DMM)

3.1.41.1. Must have AC/DC Voltmeter with a minimum Range of 200 mV, 2 V, 20 V, 200 V, , 2000 V, Auto (150 VAC RMS to VDC MAX input, Category II)

3.1.41.2. Resolution must be a minimum of 3.5 digits (2000 Counts)

3.1.41.3. Must have a minimum Accuracy of DC ±1% FS ± 1 count and AC: ±5% FS ±1 count +25mV

3.1.41.4. AC/DC Ammeter must have a minimum range of 200mA, 2A, 20A, Auto

3.1.41.5. Maximum Open Circuit Input Voltage shall have a minimum 30V RMS referenced to Common or EARTH GROUND, Category 1

3.1.41.6. Resolution must be a minimum of 3.5 digits (2000 counts) with a minimum accuracy of DC; ±5% FS ±1 Count, AC; ±5% FS ±1 Count

3.1.41.7. AC Volts Frequency Range must be a minimum of 50 Hz to 10 kHz

3.1.42. Ohmmeter

3.1.42.1. Must have a minimum range of 200 ohms, 2 ohms, 20 k ohms, 200 k ohms, 2M ohms, 20M ohms, Auto

3.1.42.2. Resolution must be a minimum of 3.5 digits (2000 Counts)

3.1.42.3. Must have a minimum accuracy of ±5% FS ± 1 count.

3.1.43. IN-Line Power Meter

3.1.43.1. Must be RF Measurement Type

3.1.43.2. Shall have Average Power, Peak, Burst, Crest, CCDF

3.1.43.3. Shall have a frequency range of a minimum of 25 MHz to 1 GHz

3.1.43.4. Shall have a minimum Power Range of 500 mW to 500 W Average, 13W to 1300 W Peak.

3.1.43.5. Insertion VSWR shall be less than 1.05

3.1.43.6. Insertion Loss shall be less than 0.05 dB

3.1.43.7. Directivity shall be a minimum 29 dB up to 50 MHz, 30 dB from 51 to 1000 MHz

3.1.43.8. Shall have an average power with the following minimum functionality:

    3.1.43.8.1. Average Forward Power Range with a minimum of 500mV to 200W average

    3.1.43.8.2. Peak / Average Ratio, Max of 12 dB

    3.1.43.8.3. Accuracy, Average Forward Power with a minimum of ±4% of reading + 166 mW Maximum accuracy performance at 25°C (± 10°C)

    3.1.43.8.4. Return Loss of a minimum 0 to 23dB

    3.1.43.8.5. VSWR minimum of 1.15 to 99.9

3.1.43.9. Burst Average Power must have the minimum functionality:

    3.1.43.9.1. Burst Average Power Range with a minimum of 13.5 to 500 W Average

3.1.43.9.2. Burst Width of a minimum of 1 μs to5 ms

3.1.43.9.3. Repetitions Rate Min of 200 Hz

3.1.43.9.4. Duty Cycle (D) with minimum of 0.001 to 1.0 (D=Burst Width / Period)

3.1.43.9.5. Accuracy, Bust Average Power must be a minimum of ±6% of reading +0.116 / D mW

3.1.43.10. Peak Envelope Power must have the following minimum functionality:

3.1.43.10.1. Peak Envelope Power must be a minimum of 13.3 to 1300W

3.1.43.10.2. Peak Envelope Power Accuracy must have a Burst width greater than 200 μs: ±7% of reading, + 0.70 W, 1 μs burst width less than 200 μs: ±10% of reading, +1.40W

3.1.43.10.3. 0.5 μs burst width less than 1 μs with ±15% of reading, +1.40W

3.1.43.10.4. Burst width less than 0.5 μs: ±20% of reading, +1.40W

3.1.43.11. Must have Crest Factor with a minimum Measurement Range of 500 mW to 300W, 13.3W Minimum Peak and accuracy with Liner Sum of Peak and Average Power Accuracies

3.1.43.12. Must have Complementary Cumulative Distribution Function (CCDF) with a minimum Measurement Range of 0.1 to 100%, minimum Threshold Measurement of 13.5 to 500W, minimum Measurement Uncertainty of ±0.2%. Must have Level set Accuracy of As Peak Envelope, Power Accuracy +2.0%

3.1.44. Speaker Output

3.1.44.1. Must have Speaker with ON or OFF

3.1.44.2. Output must be minimum of 75 dBa Min at 0.5 m, 600 to 1800 Hz, max volume

3.1.44.3. Must have speaker disconnects when headphones are installed

3.1.45. Volume Control

3.1.45.1. Must have level range with a minimum scale of 0 to 100

3.1.46. Input / Output Connections

3.1.46.1. Input / Output Connections must have the following at a minimum:

3.1.46.1.1. T / R Connector Type: N-Type Female

3.1.46.1.2. Antenna Connector Type: N-Type Female

3.1.46.1.3. Generator Connector Type: N-Type Female

3.1.46.1.4. Scope Connector Type: BNC Female

3.1.46.1.5. Audio In Connector Type: BNC Female

3.1.46.1.6. Audio Out, Connector Type: BNC Female

3.1.46.1.7. Headphone Jack with 3.5mm Jack

3.1.46.1.8. USB Connectors (Qty-3) Type with USB type A

3.1.46.1.9. External 10 MHz Reference Input with BNC Female

3.1.46.1.10. Ethernet Connector type RJ45

3.1.46.1.11. DC Power In Connector: 2 position 2.5mm Jack

3.1.46.1.12. GND Connector Banana

3.1.46.1.13. DMM (Qty-3) Banana

3.1.46.1.14. IN (In-line power meter): N-Type Female

3.1.46.1.15. Out (In-line power meter): N Type Female

3.1.47. Front Panel Indicators

3.1.47.1. Must have System Indicator with the following functions:

3.1.47.1.1. Power on / Awake mode

3.1.47.1.2. Sleep Mode

3.1.47.1.3. Shutting Down

3.1.47.1.4. When battery temperature when greater than 60°C

3.1.47.1.5. When battery life when less than 5%

3.1.47.1.6. When battery is full charge and when charging

3.1.48. Microphone Connector

3.1.48.1. Must have six pin microphone connectors with the following as a minimum:

3.1.48.1.1. Pin number 1, Ground

3.1.48.1.2. Pin number 2, Speaker + Output, 75 dBm min at 0.5 m, 600 to 1000 Hz, Max Volume

3.1.48.1.3. Pin number 3, PTT, Input, GND, open (with internal pullup)

3.1.48.1.4. Pin number 4, Mic / Audio, Input, 0 to 30 m Vrms, Voiced tone (Whistle) 300 Hz to 3 kHz

3.1.48.1.5. Pin number 5 Mic select 1, Ground, Open with pullup GND=3V DC Bias (Active Mic) and Mic audio gain of 2 open = 0V DC bias and Mic Audio Gain 3

3.1.48.1.6. Pin number 6 Mic Select 2, Ground, open with pullup

3.1.49. Environmental / Physical

3.1.49.1. Overall Dimensions shall not exceed 14"(inches) Wide, a maximum of 12"(inches) Long, and maximum 6"(inches) Deep

3.1.49.2. Test Set Weight shall not exceed 17 pounds

3.1.49.3. Test Set shall meet or exceed MIL-PRF- 28800F, Class 3. EN61326-1 Class A, EN61000-3-2, EN61000-3-3, UL 61018-1, EN61010-1, CSA C22.2 No 61010-1

3.1.50. AC Input Power (AC to DC Converter / Charger Unit)

3.1.50.1. AC Input Voltage Range shall be a minimum of 100 to 250 VAC, 3 A max, 63 Hz

3.1.50.2. AC Input Voltage Fluctuation shall be less than 10% of the normal input voltage

3.1.51. DC Input Power

3.1.51.1. Must have minimum voltage range of 11 to 24 VDC

3.1.51.2. Maximum Power shall be 55 W, 65 W Charging battery

3.1.51.3. Typical Power shall be minimum of 30W

3.1.51.4. Shall have Fused 5 A, 32 VDC, Type F

3.1.52. Battery
    3.1.52.1. Battery type shall be Lithium Ion (Li Ion) battery pack
    3.1.52.2. Battery Operation Time shall be 100% Backlight with minimum of 2 ½ hours Typical
    3.1.52.3. Minimum Backlight (Still Viewable) of 3 hours Typical
    3.1.52.4. Battery Charge Time of a minimum of 4 hours Unit power OFF Typical and a minimum 4 hours Unit power ON Typical

3.1.53. Viavi 8800SX Options and Accessories or Equal
    3.1.53.1. **Standard Accessories shall include at a minimum:**
        3.1.53.1.1. Fuse, 5A, 32V, Mini Blade
        3.1.53.1.2. AC Power Cord – USA
        3.1.53.1.3. Adapter , N (male) to BNC (female), Qty-3
        3.1.53.1.4. Internal Battery
        3.1.53.1.5. Power Supply
        3.1.53.1.6. Front Cover
    3.1.53.2. **Options shall include at a minimum:**
        3.1.53.2.1. All available and developed options to include warranty options.

3.1.54. Extended Warranties
    3.1.54.1. Extended Standard Warranty must be a minimum of 60 Months with Scheduled Calibration.

3.1.55. Agency reserves the right to add additional, newer equipment to said contract, when pricing is agreed upon between both parties.

3.2. Alternative 'or Equal' Submission
    3.2.1. Vendor submitting an alternate brand must provide alternate brand information with alternative product number on Pricing Page when submitting bid response. Vendors bid will be disqualified for failure to submit said documentation.

4. CONTRACT AWARD:

4.1. Contract Award: The Contract is intended to provide Agency with a purchase price for the Contract Items. The Contract shall be awarded to the Vendor that provides the Contract Items meeting the required specifications for the lowest overall total cost as shown on the Pricing Pages.

The Vendor may, thirty (30) days prior to the contract anniversary date, request a price adjustment. Said price adjustment will be considered based on the prior year CPI Index compared to the current year CPI, or 3%, whichever is less. Agency must approve all price adjustments prior to implementation and price adjustments are not guaranteed.

4.2. Pricing Page: Vendor should complete the Pricing Page by inserting a unit price, multiplied by the estimated quantity to arrive at an extended price. Vendor must complete the Pricing Page in full as failure to complete the Pricing Page in its entirety shall result in Vendor's bid being disqualified.

Vendor should electronically enter the information into the Pricing Pages through wvOASIS, if available, or as an electronic document. In most cases, the Vendor can request an electronic copy of the Pricing Pages for bid purposed by sending an email request to the following address: Herbert.M.Skeens@wv.gov.

4.3. Piggyback Clause: The West Virginia Emergency Management Division (WVEMD) reserves the right to extend the terms, conditions, and prices of this contract to other Agencies/Institutions who express an interest in piggybacking on this contract. Each of the piggyback Agencies/Institutions will issue their own purchasing documents for the goods/services. Vendor agrees that WVEMD shall bear no responsibility or liability for any agreements between Vendor and the other Agency/Institutions who desires to exercise this option.

5. ORDERING AND PAYMENT:

5.1. Payment: Vendor shall accept payment in accordance with the payment procedures of the State of West Virginia.

5.2. Ordering: Vendor shall accept orders through wvOASIS, regular mail, facsimile, email, or any other written form of communication. Vendor may, but is not required to, accept on-line orders through a secure internet ordering portal/website. If Vendor has the ability to accept on-line orders, it should include in its response a brief description of how Agencies may utilize the on-line ordering system. Vendor shall ensure that its on-line ordering system is properly secured prior to processing Agency orders on-line.

6. DELIVERY AND RETURN:

6.1. Shipment and Delivery: Vendor shall deliver standard orders within thirty (30) calendar days after order is received. Contract Items must be delivered to Agency at: West Virginia Division of Emergency Management, 2403 Fairlawn Avenue, Dunbar, WV 25064.

6.2. Late Delivery: The Agency placing the order under this Contract must be notified in writing if the shipment of the Contract Items will be delayed for any reason. Any delay in delivery that could cause harm to an Agency will be grounds for cancellation of the Contract in accordance with clause 7.2 below, and/or obtaining the Contract Items from a third party.

Any Agency seeking to obtain the Contract Items from a third party under this provision must first obtain approval of the Division of Administrative Services.

6.3. Delivery Payment/Risk of Loss: Vendor shall deliver the Contract Items F.O.B. destination to the Agency's location. Vendor shall include the cost of standard order delivery charges in its bid pricing/discount and is not permitted to charge the Agency separately for such delivery. The Agency will pay delivery charges on all emergency orders provided that Vendor invoices those delivery costs as a separate charge with the original freight bill attached to the invoice.

6.4. Return of Unacceptable Items: If, upon receipt of the Contract Items, they do not perform as advertised, the Agency may deems the Contract Items to be unacceptable., The Agency shall inform the Vendor of the findings and the Contract Items shall be returned to Vendor at Vendor's expense, and with no restocking charge, according to the Vendor's Return Material Authorization process. Vendor shall either make arrangements for the return within five (5) days of being notified that items are unacceptable, or permit the Agency to arrange for the return and reimburse Agency for delivery expenses. If the original packaging cannot be utilized for the return, Vendor will supply the Agency with appropriate return packaging upon request. All returns of unacceptable items shall be F.O.B. the Agency's location. The returned product shall either be replaced, or repaired, at the Vendor's discretionthe Agency shall receive a full credit or refund for the purchase price, at the Agency's discretion.

6.5. Return Due to Agency Error: Items ordered in error by the Agency will be returned for credit within 30 days of receipt, F.O.B. Vendor's location. Vendor shall not charge a restocking fee if returned products are in a resalable condition. Items shall be deemed to be in a resalable condition if they are unused and in the original packaging. Any restocking fee for items not in a resalable condition shall be the lower of the Vendor's customary restocking fee or 5% of the total invoiced value of the returned items.

7. VENDOR DEFAULT:

7.1. The following shall be considered a vendor default under this Contract.

    7.1.1. Failure to provide Contract Items in accordance with the requirements contained herein.

    7.1.2. Failure to comply with other specifications and requirements contained herein.

    7.1.3. Failure to comply with any laws, rules, and ordinances applicable to the Contract Services provided under this Contract.

    7.1.4. Failure to remedy deficient performance upon request.

7.2. The following remedies shall be available to Agency upon default after the Agency provides the Vendor a fifteen (15) day cure period.

    7.2.1. Immediate cancellation of the Contract.

    7.2.2. Immediate cancellation of one or more release orders issued under this Contract.

    7.2.3. Any other remedies available in law or equity.

8. **MISCELLANEOUS:**

8.1. **No Substitutions:** Vendor shall supply only Contract Items submitted in response to the Solicitation unless a contract modification is approved in accordance with the provisions contained in this Contract. Vendors bidding an "or equal" must ensure that the or equal product items are compatible and must work in the Agency's current environment.

8.2. **Vendor Supply:** Vendor must carry sufficient inventory of the Contract Items being offered to fulfill its obligations under this Contract. By signing its bid, Vendor certifies that it can supply the Contract Items contained in its bid response.

8.3. **Reports:** Vendor shall provide quarterly reports and annual summaries to the Agency showing the Agency's items purchased, quantities of items purchased, and total dollar value of the items purchased. Vendor shall also provide reports, upon request, showing the items purchased during the term of this Contract, the quantity purchased for each

of those items, and the total value of purchases for each of those items. Failure to supply such reports may be grounds for cancellation of this Contract.

8.4. **Contract Manager:** During its performance of this Contract, Vendor must designate and maintain a primary contract manager responsible for overseeing Vendor's responsibilities under this Contract. The Contract Manager must be available during normal business hours to address any customer service or other issues related to this Contract. Vendor should list its Contract Manager and his or her contact information below.

Contract Manager:	Kim Taylor
Telephone Number:	316-529-5521
Fax Number:	316-524-2623
Email Address:	Kim.taylor@viavisolutions.com

INSTRUCTIONS TO VENDORS SUBMITTING BIDS

1.   REVIEW DOCUMENTS THOROUGHLY: The attached documents contain a solicitation for bids. Please read these instructions and all documents attached in their entirety. These instructions provide critical information about requirements that if overlooked could lead to disqualification of a Vendor's bid. All bids must be submitted in accordance with the provisions contained in these instructions and the Solicitation. Failure to do so may result in disqualification of Vendor's bid.

2.   MANDATORY TERMS: The Solicitation may contain mandatory provisions identified by the use of the words "must," "will," and "shall." Failure to comply with a mandatory term in the Solicitation will result in bid disqualification.

2A.   PREBID MEETING: The item identified below shall apply to this Solicitation.

☐   A pre-bid meeting will not be held prior to bid opening

☐   A MANDATORY PRE-BID meeting will be held at the following place and time:

All Vendors submitting a bid must attend the mandatory pre-bid meeting. Failure to attend the mandatory pre-bid meeting shall result in disqualification of the Vendor's bid. No one individual is permitted to represent more than one vendor at the pre-bid meeting. Any individual that does attempt to represent two or more vendors will be required to select one vendor to which the individual's attendance will be attributed. The vendors not selected will be deemed to have not attended the pre-bid meeting unless another individual attended on their behalf. The required attribution of attendance to a single vendor should be addressed during the pre-bid but may occur at any time deemed appropriate by the Agency.

An attendance sheet provided at the pre-bid meeting shall serve as the official document verifying attendance. Any person attending the pre-bid meeting on behalf of a Vendor must list on the attendance sheet his or her name and the name of the Vendor he or she is representing.

Additionally, the person attending the pre-bid meeting should include the Vendor's E-Mail address, phone number, and Fax number on the attendance sheet. It is the Vendor's responsibility to locate the attendance sheet and provide the required information. Failure to complete the attendance sheet as required may result in disqualification of Vendor's bid.

All Vendors should arrive prior to the starting time for the pre-bid. Vendors who arrive after the starting time but prior to the end of the pre-bid will be permitted to sign in, but are charged with knowing all matters discussed at the pre-bid.

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Questions submitted at least five business days prior to a scheduled pre-bid will be discussed at the pre-bid meeting if possible. Any discussions or answers to questions at the pre-bid meeting are preliminary in nature and are non-binding. Official and binding answers to questions will be published in a written addendum to the Solicitation prior to bid opening.

3. **BID SUBMISSION:** All bids must be submitted electronically through wvOASIS or signed and delivered by the Vendor to the Agency on or before the date and time of the bid opening. Any bid received by the Agency staff is considered to be in the possession of the Agency and will not be returned for any reason.

3A. **BID SUBMISSION**

A bid that is not submitted electronically through wvOASIS should contain the information listed below on the face of the envelope or the bid may be rejected by the Agency.

SEALED BID: _____
BUYER: _____
SOLICITATION NO.: _____
BID OPENING DATE: _____
BID OPENING TIME: _____
FAX NUMBER: _____

4. **ADDENDUM ACKNOWLEDGEMENT:** Changes or revisions to this Solicitation will be made by an official addendum issued by the Agency. Vendor should acknowledge receipt of all addenda issued with this Solicitation by completing an Addendum Acknowledgment Form, a copy of which is included herewith. Failure to acknowledge addenda may result in bid disqualification. The addendum acknowledgement should be submitted with the bid to expedite document processing.

5. **BID FORMATTING:** Vendor should type or electronically enter the information onto its bid to prevent errors in the evaluation. Failure to type or electronically enter the information may result in bid disqualification.

6. **ALTERNATE MODEL OR BRAND:** Unless the box below is checked, any model, brand, or specification listed in this Solicitation establishes the acceptable level of quality only and is not intended to reflect a preference for, or in any way favor, a particular brand or vendor. Vendors may bid alternates to a listed model or brand provided that the alternate is at least equal to the model or brand and complies with the required specifications. The equality of any alternate being bid shall be determined by the State at its sole discretion. Any Vendor bidding an alternate model or brand should clearly identify the alternate items in its bid and should include manufacturer's specifications, industry literature, and/or any other relevant documentation demonstrating the equality of the alternate items. Failure to provide information for alternate items may be grounds for rejection of a Vendor's bid.

☐   This Solicitation is based upon a standardized commodity. Vendors are expected to bid the standardized commodity identified. Failure to bid the standardized commodity will result in your firm's bid being rejected.

7.   EXCEPTIONS AND CLARIFICATIONS: The Solicitation contains the specifications that shall form the basis of a contractual agreement. Vendor shall clearly mark any exceptions, clarifications, or other proposed modifications in its bid. Exceptions to, clarifications of, or modifications of a requirement or term and condition of the Solicitation may result in bid disqualification.

8.   REGISTRATION: Prior to Contract award, the apparent successful Vendor must be properly registered with the Agency and must have paid the $125 fee, if applicable.

9.   UNIT PRICE: Unit prices shall prevail in cases of a discrepancy in the Vendor's bid.

10.   ELECTRONIC FILE ACCESS RESTRICTIONS: Vendor must ensure that its submission in *wv*OASIS can be accessed and viewed by the Agency staff immediately upon bid opening. The Agency will consider any file that cannot be immediately access and viewed at the time of the bid opening (such as, encrypted files, password protected files, or incompatible files) to be blank or incomplete as context requires, and therefore unacceptable. A vendor will not be permitted to unencrypt files, remove password protections, or resubmit documents after bid opening to make a file viewable if those documents are required with the bid. A Vendor may be required to provide document passwords or removed access restrictions to allow the Agency to print or electronically save documents provided that those documents are viewable by the Agency prior to obtaining the password or removing the access restriction.

11.   NON-RESPONSIBLE: The Director of Emergency Management Division reserves the right to reject the bid of any vendor as Non-Responsible, when the Director determines that the vendor submitting the bid does not have the capability to fully perform, or lacks the integrity and reliability to assure good-faith performance.

12.   ACCEPTANCE/REJECTION: The Agency may accept or reject any bid in whole, or in part.

13.   YOUR SUBMISSION IS A PUBLIC DOCUMENT: Vendor's entire response to the Solicitation and the resulting Contract are public documents. As public documents, they will be disclosed to the public following the bid/proposal opening or award of the contract, Freedom of Information Act in West Virginia Code §§ 29B-1-1 et seq.
DO NOT SUBMIT MATERIAL YOU CONSIDER TO BE CONFIDENTIAL, A TRADE SECRET, OR OTHERWISE NOT SUBJECT TO PUBLIC DISCLOSURE.

Submission of any bid, proposal, or other document to the Agency constitutes your explicit consent to the subsequent public disclosure of the bid, proposal, or document. The Agency will disclose any document labeled "confidential," "proprietary," "trade secret," "private," or labeled with any other claim against public disclosure of the documents, to include any "trade secrets" as defined by West Virginia Code § 47-22-1 et seq. All submissions are subject to public disclosure without notice.

<p style="text-align:center">GENERAL TERMS AND CONDITIONS:</p>

1.   CONTRACTUAL AGREEMENT: Issuance of a Award Document signed by the Agency and approved as to form by the Attorney General's office, if required, constitutes acceptance of this Contract made by and between the State of West Virginia and the Vendor. Vendor's signature on its bid signifies Vendor's agreement to be bound by and accept the terms and conditions contained in this Contract.

2.   DEFINITIONS: As used in this Solicitation/Contract, the following terms shall have the meanings attributed to them below. Additional definitions may be found in the specifications included with this Solicitation/Contract.

2.1. "Agency" or **"Agencies"** means the agency, board, commission, or other entity of the State of West Virginia that is identified on the first page of the Solicitation or any other public entity seeking to procure goods or services under this Contract.

2.2. "Bid" or "Proposal" means the vendors submitted response to this solicitation.

2.3. "Contract" means the binding agreement that is entered into between the State and the Vendor to provide the goods or services requested in the Solicitation.

2.4. "Director" means the Director of the West Virginia Emergency Management Division.

2.5. "Award Document" means the document signed by the Agency that identifies the Vendor as the contract holder.

2.6. "Solicitation" means the official notice of an opportunity to supply the State with goods or services.

2.7. "State" means the State of West Virginia and/or any of its agencies, commissions, boards, etc. as context requires.

2.8. "Vendor" or **"Vendors"** means any entity submitting a bid in response to the Solicitation, the entity that has been selected as the lowest responsible bidder, or the entity that has been awarded the Contract as context requires.

3.   CONTRACT TERM; RENEWAL; EXTENSION: The term of this Contract shall be determined in accordance with the category that has been identified as applicable to this Contract below:

Term Contract

Initial Contract Term: This Contract becomes effective on the date indicated on the awarded contract and extends for a period of ___one (1)___ year(s).

Renewal Term: This Contract may be renewed upon the mutual written consent of the Agency, and the Vendor. Any request for renewal should be delivered to the Agency thirty (30) days prior to the expiration date of the initial contract term or appropriate renewal term. A Contract renewal shall be in accordance with the terms and conditions of the original contract. Unless otherwise specified below, renewal of this Contract is limited to ___four (4)___ successive one (1) year periods or multiple renewal periods of less than one year, provided that the multiple renewal periods do not exceed the total number of months available in all renewal years combined. Automatic renewal of this Contract is prohibited.

☐   **Alternate Renewal Term** – This contract may be renewed for _____ successive _____ year periods or shorter periods _____ provided that they do not exceed the total number of months contained in all available renewals. Automatic renewal of this Contract is prohibited. Renewals must be approved by the Vendor and Agency.

Delivery Order Limitations: In the event that this contract permits delivery orders, a delivery order may only be issued during the time this Contract is in effect. Any delivery order issued within one year of the expiration of this Contract shall be effective for one year from the date the delivery order is issued. No delivery order may be extended beyond one year after this Contract has expired.

☐   **Fixed Period Contract:** This Contract becomes effective upon Vendor's receipt of the notice to proceed and must be completed within _____ days.

☐   **Fixed Period Contract with Renewals:** This Contract becomes effective upon Vendor's receipt of the notice to proceed and part of the Contract more fully described in the attached specifications must be completed within _____ days. Upon completion of the work covered by the preceding sentence, the vendor agrees that maintenance, monitoring, or warranty services will be provided for _____ year(s) thereafter.

☐   **One Time Purchase:** The term of this Contract shall run from the issuance of the Award Document until all of the goods contracted for have been delivered, but in no event will this Contract extend for more than one fiscal year.

☐   **Other:** See attached.

4.   NOTICE TO PROCEED: Vendor shall begin performance of this Contract immediately upon receiving notice to proceed unless otherwise instructed by the Agency. Unless otherwise specified, the fully executed Award Document will be considered notice to proceed.

5. **QUANTITIES:** The quantities required under this Contract shall be determined in accordance with the category that has been identified as applicable to this Contract below.

☐ **Open End Contract:** Quantities listed in this Solicitation are approximations only, based on estimates supplied by the Agency. It is understood and agreed that the Contract shall cover the quantities actually ordered for delivery during the term of the Contract, whether more or less than the quantities shown.

☐ **Service:** The scope of the service to be provided will be more clearly defined in the specifications included herewith.

☐ **Combined Service and Goods:** The scope of the service and deliverable goods to be provided will be more clearly defined in the specifications included herewith.

☐ **One Time Purchase:** This Contract is for the purchase of a set quantity of goods that are identified in the specifications included herewith. Once those items have been delivered, no additional goods may be procured under this Contract without an appropriate change order approved by the Vendor, Agency, and Attorney General's office.

6. **REQUIRED DOCUMENTS:** All of the items checked below must be provided to the Agency by the Vendor as specified below.

☐ **PERFORMANCE BOND:** The apparent successful Vendor shall provide a performance bond in the amount of 100% of the contract value. The performance bond must be received by the Agency prior to Contract award.

☐ **LABOR/MATERIAL PAYMENT BOND:** The apparent successful Vendor shall provide a labor/material payment bond in the amount of 100% of the Contract value. The labor/material payment bond must be received by the Agency prior to Contract award.

☐ **MAINTENANCE BOND:** The apparent successful Vendor shall provide a two (2) year maintenance bond covering the roofing system. The maintenance bond must be issued and delivered to the Agency prior to Contract award.

☐   **LICENSE(S) / CERTIFICATIONS / PERMITS:** In addition to anything required under the Section of the General Terms and Conditions entitled Licensing, the apparent successful Vendor shall furnish proof of the following licenses, certifications, and/or permits upon request and in a form acceptable to the State. The request may be prior to or after contract award at the State's sole discretion.

☐

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The apparent successful Vendor shall also furnish proof of any additional licenses or certifications contained in the specifications regardless of whether or not that requirement is listed above.

7.   **INSURANCE:** The apparent successful Vendor shall furnish proof of the insurance identified by a checkmark below and must include the State as an additional insured on each policy prior to Contract award. The insurance coverages identified below must be maintained throughout the life of this contract. Thirty (30) days prior to the expiration of the insurance policies Vendor shall provide the Agency with proof that the insurance mandated herein has been continued. ~~Vendor must also provide Agency with immediate notice of any changes in its insurance policies, including but not limited to, policy cancelation, policy reduction, or change in insurers~~. The apparent successful Vendor shall also furnish proof of any additional insurance requirements contained in the specifications prior to Contract award regardless of whether or not that insurance requirement is listed in this section.

Vendor must maintain:

☐ **X Commercial General Liability Insurance** in at least an amount of:
 $1,000,000.00 _____ per occurrence.

☐ **Automobile Liability Insurance** in at least an amount of: _____ per occurrence.

☐ **Professional/Malpractice/Errors and Omission Insurance** in at least an amount of: _____ per occurrence. Notwithstanding the forgoing, Vendor's are not required to list the State as an additional insured for this type of policy.

☐ **Commercial Crime and Third Party Fidelity Insurance** in an amount of: _____ per occurrence.

☐ **Cyber Liability Insurance** in an amount of: _____ per occurrence.

☐ **Builders Risk Insurance** in an amount equal to 100% of the amount of the Contract.

☐ **Pollution Insurance** in an amount of: _____ per occurrence.

☐ **Aircraft Liability** in an amount of: _____ per occurrence.

☐

☐

☐

☐

8. WORKERS' COMPENSATION INSURANCE: The apparent successful Vendor shall comply with laws relating to workers compensation, shall maintain workers' compensation insurance when required, and shall furnish proof of workers' compensation insurance upon request.

9. ~~**RESERVED**~~**LIQUIDATED DAMAGES:** ~~This clause shall in no way be considered exclusive and shall not limit the State or Agency's right to pursue any other available remedy. Vendor shall pay liquidated damages in the amount specified below or as described in the specifications:~~

☐ ~~_____ for _____~~

☐ ~~Liquidated Damages Contained in the Specifications~~

10.   ACCEPTANCE: Vendor's signature on its bid, or on the certification and signature page, constitutes an offer to the State that cannot be unilaterally withdrawn, signifies that the product or service proposed by vendor meets the mandatory requirements contained in the Solicitation for that product or service, unless otherwise indicated, and signifies acceptance of the terms and conditions contained in the Solicitation unless otherwise indicated.

11.   PRICING: The pricing set forth herein is firm for the life of the Contract, unless specified elsewhere within this Solicitation/Contract by the State. A Vendor's inclusion of price adjustment provisions in its bid, without an express authorization from the State in the Solicitation to do so, may result in bid disqualification. Notwithstanding the foregoing, Vendor must extend any publicly advertised sale price to the State and invoice at the lower of the contract price or the publicly advertised sale price.

12.   PAYMENT IN ARREARS: Payment in advance is prohibited under this Contract. Payment may only be made after the delivery and acceptance of goods or services. The Vendor shall submit invoices, in arrears.

13.   PAYMENT METHODS: Vendor must accept payment by electronic funds transfer or P-Card. (The State of West Virginia's Purchasing Card program, administered under contract by a banking institution, processes payment for goods and services through state designated credit cards.)

14.   ADDITIONAL FEES: Vendor is not permitted to charge additional fees or assess additional charges that were not either expressly provided for in the solicitation published by the State of West Virginia or included in the unit price or lump sum bid amount that Vendor is required by the solicitation to provide. Including such fees or charges as notes to the solicitation may result in rejection of vendor's bid. Requesting such fees or charges be paid after the contract has been awarded may result in cancellation of the contract.

15.   TAXES: The Vendor shall pay any applicable sales, use, personal property or any other taxes arising out of this Contract and the transactions contemplated thereby. The State of West Virginia is exempt from federal and state taxes and will not pay or reimburse such taxes.

16.   FUNDING: This Contract shall continue for the term stated herein, contingent upon funds being appropriated by the Legislature or otherwise being made available. In the event funds are not appropriated or otherwise made available, this Contract becomes void and of no effect beginning on July 1 of the fiscal year for which funding has not been appropriated or otherwise made available.

17.   CANCELLATION: The Agency reserves the right to cancel this Contract immediately upon written notice to the Vendor if the materials or workmanship supplied do not conform to the specifications contained in the Contract. The Agency may also cancel any purchase or Contract upon 30 days written notice to the Vendor provided shipment has not been made on such purchase.

18.   TIME: Time is of the essence with regard to all matters of time and performance in this Contract.

19.   APPLICABLE LAW: This Contract is governed by and interpreted under West Virginia law without giving effect to its choice of law principles. Any information provided in specification manuals, or any other source, verbal or written, which contradicts or violates the West Virginia Constitution, West Virginia Code or West Virginia Code of State Rules is void and of no effect.

20.   COMPLIANCE WITH LAWS: Vendor shall comply with all applicable federal, state, and local laws, regulations and ordinances. By submitting a bid, Vendor acknowledges that it has reviewed, understands, and will comply with all applicable laws, regulations, and ordinances. Vendor shall notify all subcontractors providing commodities or services related to this Contract that as subcontractors, they too are required to comply with all applicable laws, regulations, and ordinances.

21.   ARBITRATION: Any references made to arbitration contained in this Contract, Vendor's bid, or in any American Institute of Architects documents pertaining to this Contract are hereby deleted, void, and of no effect.

22.   MODIFICATIONS: This writing is the parties' final expression of intent. Notwithstanding anything contained in this Contract to the contrary, no modification of this Contract shall be binding without mutual written consent of the Agency, and the Vendor.

23.   WAIVER: The failure of either party to insist upon a strict performance of any of the terms or provision of this Contract, or to exercise any option, right, or remedy herein contained, shall not be construed as a waiver or a relinquishment for the future of such term, provision, option, right, or remedy, but the same shall continue in full force and effect. Any waiver must be expressly stated in writing and signed by the waiving party.

24.   SUBSEQUENT FORMS: The terms and conditions contained in this Contract shall supersede any and all subsequent terms and conditions which may appear on any form documents submitted by Vendor to the Agency such as price lists, order forms, invoices, sales agreements, or maintenance agreements, and includes internet websites or other electronic documents. Acceptance or use of Vendor's forms does not constitute acceptance of the terms and conditions contained thereon.

25.   ASSIGNMENT: Neither this Contract nor any monies due, or to become due hereunder, may be assigned by the Vendor without the express written consent of the Agency and any other government agency or office that may be required to approve such assignments.

26.   WARRANTY: The Vendor expressly warrants that the goods and/or services covered by this Contract will: (a) conform to the specifications, drawings, samples, or other description furnished or specified by the Agency; (b) be merchantable and fit for the purpose intended; and (c) be free from defect in material and workmanship.

27.   STATE EMPLOYEES: State employees are not permitted to utilize this Contract for personal use and the Vendor is prohibited from permitting or facilitating the same.

28.   PRIVACY, SECURITY, AND CONFIDENTIALITY: The Vendor agrees that it will not disclose to anyone, directly or indirectly, any such personally identifiable information or other confidential information gained from the Agency, unless the individual who is the subject of the information consents to the disclosure in writing or the disclosure is made pursuant to the Agency's policies, procedures, and rules. Vendor further agrees to comply with the Confidentiality Policies and Information Security Accountability Requirements, set forth in http://www.state.wv.us/admin/purchase/privacy/default.html

29.   YOUR SUBMISSION IS A PUBLIC DOCUMENT: Vendor's entire response to the Solicitation and the resulting Contract are public documents. As public documents, they will be disclosed to the public following the bid/proposal opening or award of the contract, as required by the competitive bidding laws of the State of West Virginia and the Freedom of Information Act West Virginia Code §§ 29B-1-1 et seq.

DO NOT SUBMIT MATERIAL YOU CONSIDER TO BE CONFIDENTIAL, A TRADE SECRET, OR OTHERWISE NOT SUBJECT TO PUBLIC DISCLOSURE.

Submission of any bid, proposal, or other document to the Agency constitutes your explicit consent to the subsequent public disclosure of the bid, proposal, or document. The Agency will disclose any document labeled "confidential," "proprietary," "trade secret," "private," or labeled with any other claim against public disclosure of the documents, to include any "trade secrets" as defined by West Virginia Code § 47-22-1 et seq. All submissions are subject to public disclosure without notice.

30.   LICENSING: In accordance with applicable law, Vendor must be licensed and in good standing in accordance with any and all state and local laws and requirements by any state or local agency of West Virginia, including, but not limited to, the West Virginia Secretary of State's Office, the West Virginia Tax Department, West Virginia Insurance Commission, or any other state agency or political subdivision. Obligations related to political subdivisions may include, but are not limited to, business licensing, business and occupation taxes, inspection compliance, permitting, etc. Upon request, the Vendor must provide all necessary releases to obtain information to enable the Agency to verify that the Vendor is licensed and in good standing with the above entities. Vendor shall notify all subcontractors providing commodities or services related to this Contract that as subcontractors, they too are required to be licensed, in good standing, and up-to-date on all state and local obligations as described in this section.

31.   ANTITRUST: In submitting a bid to, signing a contract with, or accepting an Award Document from any agency of the State of West Virginia, the Vendor agrees to convey, sell, assign, or transfer to the State of West Virginia all rights, title, and interest in and to all causes of action it may now or hereafter acquire under the antitrust laws of the United States and the State of West Virginia for price fixing and/or unreasonable restraints of trade relating to the particular commodities or services purchased or acquired by the State of West Virginia. Such assignment shall be made and become effective at the time the purchasing agency tenders the initial payment to Vendor.

32.   VENDOR CERTIFICATIONS: By signing its bid or entering into this Contract, Vendor certifies (1) that its bid or offer was made without prior understanding, agreement, or connection with any corporation, firm, limited liability company, partnership, person or entity submitting a bid or offer for the same material, supplies, equipment or services; (2) that its bid or offer is in all respects fair and without collusion or fraud; (3) that this Contract is accepted or entered into without any prior understanding, agreement, or connection to any other entity that could be considered a violation of law; and (4) that it has reviewed this Solicitation in its entirety; understands the requirements, terms and conditions, and other information contained herein. Vendor's signature on its bid or offer also affirms that neither it nor its representatives have any interest, nor shall acquire any interest, direct or indirect, which would compromise the performance of its services hereunder. Any such interests shall be promptly presented in detail to the Agency. The individual signing this bid or offer on behalf of Vendor certifies that he or she is authorized by the Vendor to execute this bid or offer or any documents related thereto on

Vendor's behalf; that he or she is authorized to bind the Vendor in a contractual relationship; and that, to the best of his or her knowledge, the Vendor has properly registered with any State agency that may require registration.

33.   VENDOR RELATIONSHIP: The relationship of the Vendor to the State shall be that of an independent contractor and no principal-agent relationship or employer-employee relationship is contemplated or created by this Contract. The Vendor as an independent contractor is solely liable for the acts and omissions of its employees and agents. Vendor shall be responsible for selecting, supervising, and compensating any and all individuals employed pursuant to the terms of this Solicitation and resulting contract. Neither the Vendor, nor any employees or subcontractors of the Vendor, shall be deemed to be employees of the State for any purpose whatsoever. Vendor shall be exclusively responsible for payment of employees and contractors for all wages and salaries, taxes, withholding payments, penalties, fees, fringe benefits, professional liability insurance premiums, contributions to insurance and pension, or other deferred compensation plans, including but not limited to, Workers' Compensation and Social Security obligations, licensing fees, etc. and the filing of all necessary documents, forms, and returns pertinent to all of the foregoing. Vendor shall hold harmless the State, and shall provide the State and Agency with a defense against any and all claims including, but not limited to, the foregoing payments, withholdings, contributions, taxes, Social Security taxes, and employer income tax returns.

34.   INDEMNIFICATION: The Vendor agrees to indemnify, defend, and hold harmless the State and the Agency, their officers, and employees from and against: (1) Any claims or losses for services rendered by any subcontractor, person, or firm performing or supplying services, materials, or supplies in connection with the performance of the Contract; (2) Any claims or losses resulting to an y person or entity injured or damaged by the Vendor, its officers, employees, or subcontractors by the publication, translation, reproduction, delivery, performance, use, or disposition of any data used under the Contract in a manner not authorized by the Contract, or by Federal or State statutes or regulations; and (3) Any failure of the Vendor, its officers, employees, or subcontractors to observe State and Federal laws including, but not limited to, labor and wage and hour laws.

35.   PURCHASING AFFIDAVIT: In accordance with West Virginia Code, the State is prohibited from awarding a contract to any bidder that owes a debt to the State or a political subdivision of the State, Vendors are required to sign, notarize, and submit the Purchasing Affidavit to the Agency affirming under oath that it is not in default on any monetary obligation owed to the state or a political subdivision of the state.

36.   CONFLICT OF INTEREST: Vendor, its officers or members or employees, shall not presently have or acquire an interest, direct or indirect, which would conflict with or compromise the performance of its obligations hereunder. Vendor shall periodically inquire of its officers, members and employees to ensure that a conflict of interest does not arise. Any conflict of interest discovered shall be promptly presented in detail to the Agency.

37.   REPORTS: Vendor shall provide the Agency with the following reports identified by a checked box below:

☐   Such reports as the Agency may request. Requested reports may include, but are not limited to, quantities purchased, agencies utilizing the contract, total contract expenditures by agency, etc.

☐   Quarterly reports detailing the total quantity of purchases in units and dollars, along with a listing of purchases by agency. Quarterly reports should be delivered to the Agency.

38.   BACKGROUND CHECK: In accordance with W. Va. Code § 15-2D-3, the Director of the Division of Protective Services shall require any service provider whose employees are regularly employed on the grounds or in the buildings of the Capitol complex or who have access to sensitive or critical information to submit to a fingerprint-based state and federal background inquiry through the state repository. The service provider is responsible for any costs associated with the fingerprint-based state and federal background inquiry. After the contract for such services has been approved, but before any such employees are permitted to be on the grounds or in the buildings of the Capitol complex or have access to sensitive or critical information, the service provider shall submit a list of all persons who will be physically present and working at the Capitol complex to the Director of the Division of Protective Services for purposes of verifying compliance with this provision. The State reserves the right to prohibit a service provider's employees from accessing sensitive or critical information or to be present at the Capitol complex based upon results addressed from a criminal background check.

Service providers should contact the West Virginia Division of Protective Services by phone at (304) 558-9911 for more information.

39.   LIMITATION OF LIABILITY:
39.1   Limitations. IN NO EVENT SHALL VIAVI HAVE ANY LIABILITY FOR ANY INCIDENTAL, SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS, REVENUE, OR DATA, INSTALLATION OR REMOVAL COSTS, OR COST OF COVER. THE LIABILITY OF VIAVI FOR ANY CLAIM ARISING OUT OF OR IN CONNECTION WITH ANY GOODS OR SERVICES SHALL NOT EXCEED A TOTAL AMOUNT EQUAL TO THE PURCHASE PRICE PAID OR PAYABLE BY CUSTOMER FOR THE GOODS OR SERVICES PRINCIPALLY RESPONSIBLE FOR SUCH DAMAGES WITHIN THE LAST 12 MONTHS PRECEDING THE CLAIM UNDER THIS AGREEMENT.

39.2   Scope. THE LIMITATIONS OF LIABILITY IN SECTION 39.1 (LIMITATIONS) SHALL APPLY TO ANY DAMAGES, HOWEVER CAUSED AND REGARDLESS OF THE THEORY OF LIABILITY, WHETHER DERIVED FROM CONTRACT, TORT (INCLUDING, BUT NOT LIMITED TO, NEGLIGENCE), OR ANY OTHER LEGAL THEORY, EVEN IF VIAVI HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES AND REGARDLESS OF WHETHER THE LIMITED REMEDIES AVAILABLE UNDER THESE GENERAL TERMS OR ANY OFFERING-SPECIFIC TERMS FAIL OF THEIR ESSENTIAL PURPOSE.

DESIGNATED CONTACT: Vendor appoints the individual identified in this Section as the Contract Administrator and the initial point of contact for matters relating to this Contract.

_____
(Name, Title)

_____
(Printed Name and Title)

_____
(Address)

_____
(Phone Number) / (Fax Number)

_____
(E-mail address)

CERTIFICATION AND SIGNATURE: By signing below, or submitting documentation through wvOASIS, I certify that I have reviewed this Solicitation in its entirety; that I understand the requirements, terms and conditions, and other information contained herein; that this bid, offer or proposal constitutes an offer to the State that cannot be unilaterally withdrawn; that the product or service proposed meets the mandatory requirements contained in the Solicitation for that product or service, unless otherwise stated herein; that the Vendor accepts the terms and conditions contained in the Solicitation, unless otherwise stated herein; that I am submitting this bid, offer or proposal for review and consideration; that I am authorized by the vendor to execute and submit this bid, offer, or proposal, or any documents related thereto on vendor's behalf; that I am authorized to bind the vendor in a contractual relationship; and that to the best of my knowledge, the vendor has properly registered with any State agency that may require registration.

_____
(Company)

_____
(Authorized Signature) (Representative Name, Title)

_____
(Printed Name and Title of Authorized Representative) (Date)

_____
(Phone Number) (Fax Number)

ADDENDUM ACKNOWLEDGEMENT FORM

SOLICITATION NO.:

Instructions: Please acknowledge receipt of all addenda issued with this solicitation by completing this addendum acknowledgment form. Check the box next to each addendum received and sign below. Failure to acknowledge addenda may result in bid disqualification. Acknowledgment: I hereby acknowledge receipt of the following addenda and have made the necessary revisions to my proposal, plans and/or specification, etc.

Addendum Numbers Received:
(Check the box next to each addendum received)

[x]	Addendum No. 1	[ ] Addendum No. 6
[ ]	Addendum No. 2	[ ] Addendum No. 7
		Addendum No. 8
[ ]	Addendum No. 3	Addendum No. 9
[ ]	Addendum No. 4	[ ]
		[ ]
[ ]	Addendum No. 5	[ ] Addendum No. 10

I understand that failure to confirm the receipt of addenda may be cause for rejection of this bid. I further understand that any verbal representation made or assumed to be made during any oral discussion held between Vendor's representatives and any state personnel is not binding. Only the information issued in writing and added to the specifications by an official addendum is binding.

VIAVI Solutions Inc.
Company

M. Todd Taylor   *M.T. Taylor*

Authorized   Signature

August 9, 2023

Date

NOTE: This addendum acknowledgement should be submitted with the bid to expedite document processing.

7/9/2021 - WVEMD

VIAVI

VIAVI Solutions

Brochure

VIAVI
8800SX
Digital Radio Test Set

With its hybrid portable design, the industry's largest color touch-screen display, ruggedness, internal battery, power accuracy, advanced automated test and alignment, fast VSWR / Return Loss and Cable Fault measurements, the 8800SX offers RF professionals a superior experience in radio test

At A Glance

- Dimensions: 34.3 cm x 29.3 cm x 14.6 cm
- Display Size: 30.5 cm (12 inches), diagonal
- Weight: 17 lbs (Base Unit)
- Battery: Internal, 2.5+ Hours Operation
- Rugged: 30 G Shock
- Test Range: −140 dBm to 57 dBm
- Technologies: P25, P25 Phase 2, DMR, NXDN™, TETRA, dPMR™, ARIB T98, FM, AM, DMR Repeater, PTC
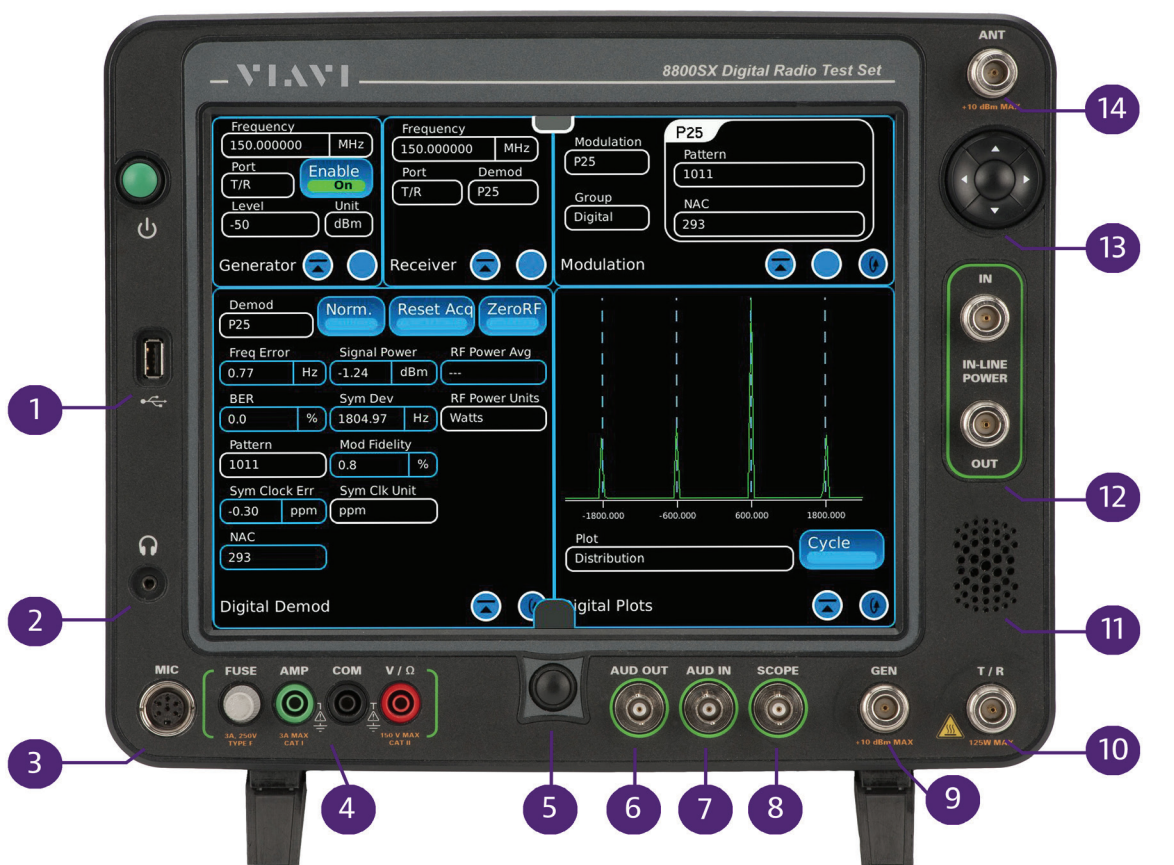
1. USB	6. Audio Out Port, BNC	11. Internal Loudspeaker
2. Headphone Jack	7. Audio In Port, BNC	12. Wideband Power Sensor (Included with Part Number 139942)
3. Microphone Jack	8. Oscilloscope Port, BNC	13. Arrow Controls
4. Digital Multi-Meter	9. RF GEN Port, Type N	14. Antenna Port, Type N
5. Home Key Control	10. T/R Duplex Port, Type N	

Hybrid Portable Design

The 8800SX combines the performance and features of a bench-level test set with the portability and ruggedness of a field-level instrument. Weighing only 17 lbs (7.71 kg), an internal battery with 2.5+ hours of operation, and rugged 30 G shock rating, test professionals will no longer compromise portability for critical test features. Advanced features ranging from automated test and alignment to digital modulation analysis plots to an internal 500 W (4% accuracy) in-line power meter are all available in a one-box solution.

Unprecedented Display Size and Easy to Use Interface

The 8800SX is designed for maximum test efficiency. With the industry's largest display, ultra-fast store and recall "Presets", and its unique "Fast-Stack" user interface that allows test tiles to be stacked on one another and quickly accessed, test professionals can set up analog and digital tests in seconds and have instant access to more displayed meters and test functions.

Exclusive "Fast Stack" Feature
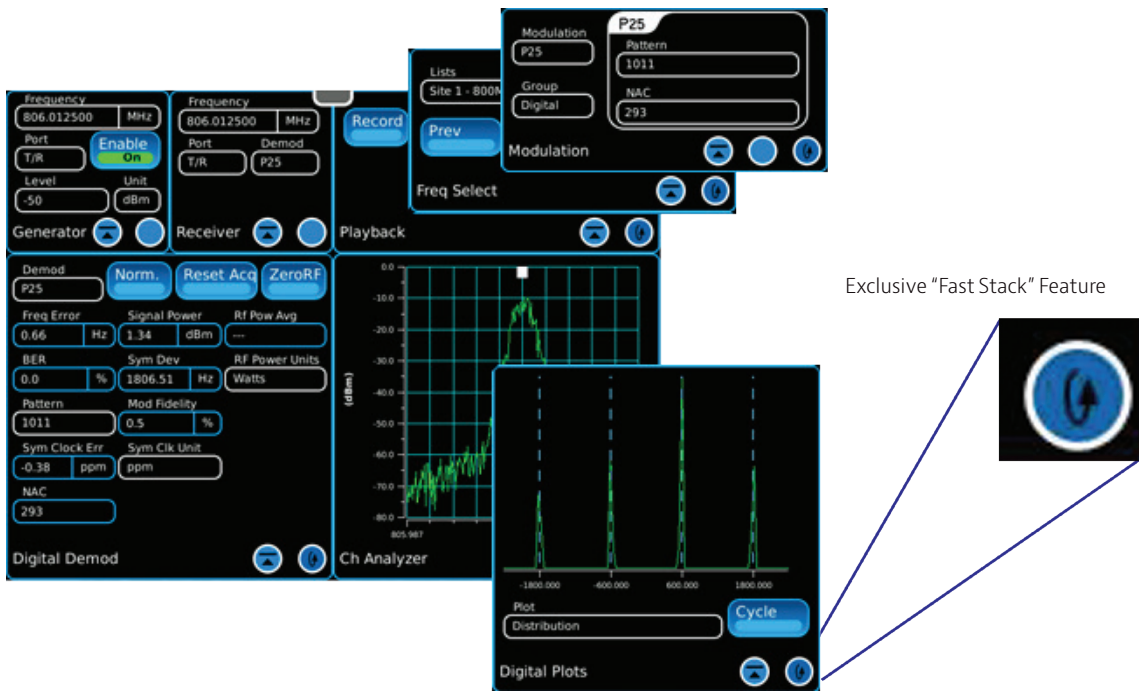
The 8800SX User Interface with "Fast Stack" Tile Access

Complete Digital and Analog Test Suite

The global land mobile radio (LMR) market is rapidly transitioning from analog to digital. Therefore, test instrumentation must test both legacy analog systems as well as new emerging digital standards. The 8800SX is designed with advanced frequency, power, and modulation analysis instruments for both analog and digital systems.

The 8800SX Technologies

- P25
- P25 Phase 2
- DMR
- NXDN
- TETRA
- dPMR
- AM
- FM
- ARIB T98
- Positive Train Control

Analog Test Features:

- Audio Oscilloscope
- Channel Analyzer
- Dual Modulation Source
- Audio Function Generator
- Tone Remote/Two-Tone/Tone Sequential
- Meters
    - RF Error
    - Frequency
    - Distortion
    - Audio Level
    - SNR
    - RF Power
    - SINAD
    - Audio Frequency
    - DMM
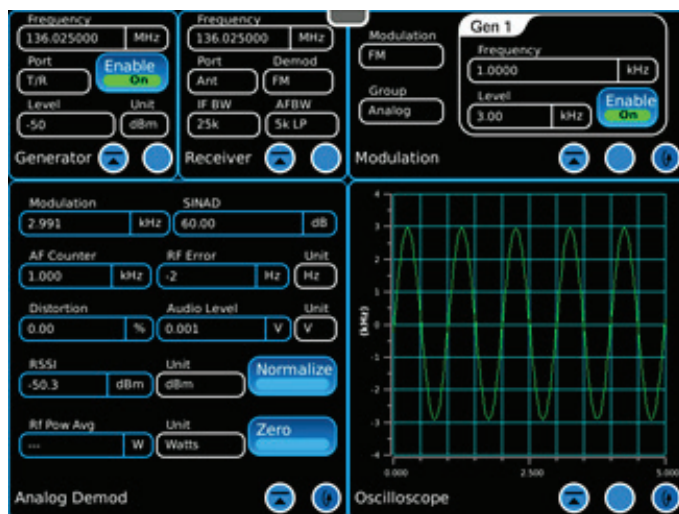
Example Analog Test Setup

Expanded Channel Analyzer with Markers

The channel analyzer offers a unique expanded display mode, which dedicates the entire screen to the analyzer. Combining the expanded mode with the industry's largest color display provides test professionals with an easy-to-see spectrum display; regardless of the test distance.

The channel analyzer now sweeps approximate four times per second and offers up to six color markers for identifying signals and interference. An on-screen marker table provides users with instant frequency, level, and delta information on monitored signals.
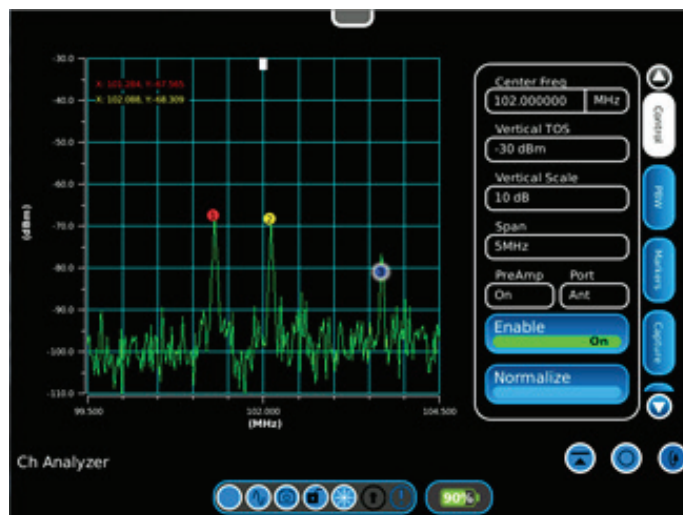
Channel Analyzer with Markers

Digital Test Features

• Digital Test Patterns

• Distribution, Constellation, Eye Diagram Plots

• TDMA Burst Profile with Mask for DMR and P25 Phase 2

• Digital Voice Quality Verification

• Meters

  – Signal Power – Slot Power

  – FSK Error – Symbol Deviation

  – Magnitude – Symbol Clock Error
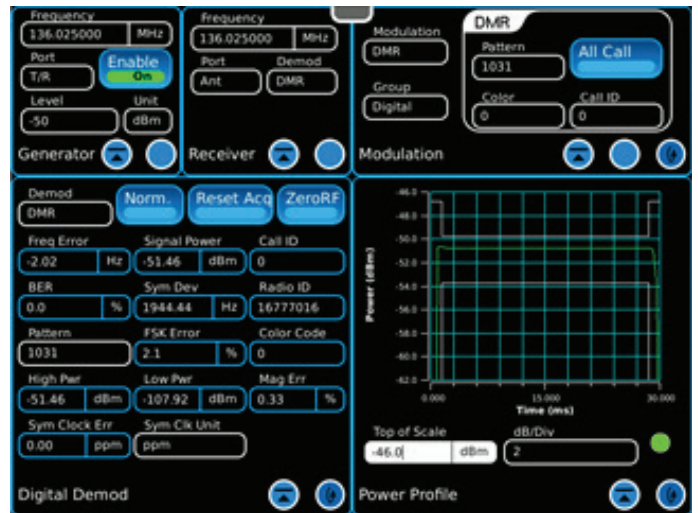
Example Digital Test Setup
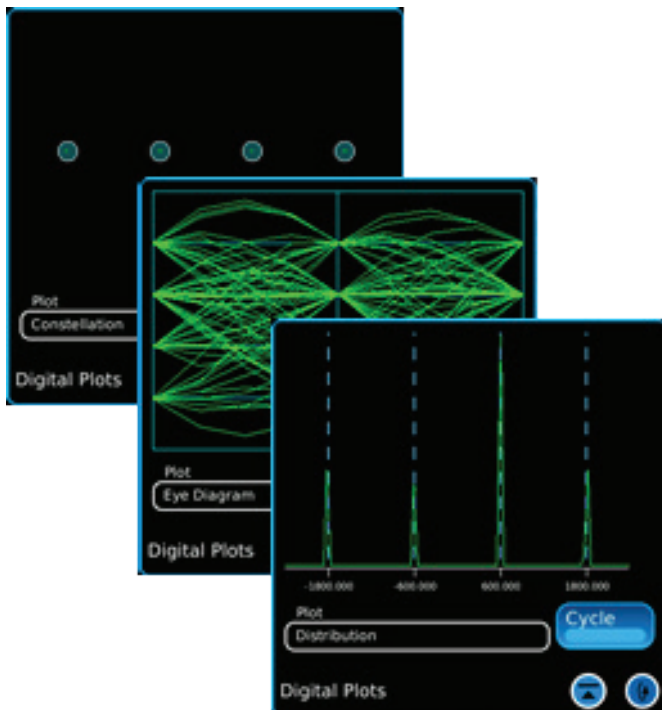
Modulation Analysis Plots

Digital Modulation Plots

Proper analysis of a radio's modulator requires digital modulation analysis plots, such as Distribution, Eye Diagram, and Constellation. These plots provide visual diagnostics of issues, such as deviation and symbol clock errors, to catch failing radios before they are deployed. The 8800SX provides these plots as well as an exclusive "cycle" feature, which allows ultra-fast toggling between the digital plots; ensuring full analysis in minimal time.

DMR Burst Profile Plot with Mask

DMR Burst Power Profile Plot

DMR is an ETSI standard with specific pass and fail parameters defined for the TDMA burst power in a slot. The Burst Power Profile plot on the 8800SX captures and displays the power profile of the burst in the active slot. Additionally, the 8800SX offers an exclusive pass and fail mask, defined with the ETSI standard's burst profile parameters, to visually indicate incorrect burst power. Proper bursts will display in green while burst errors will display in red.

Advanced Digital

DMR Repeater Testing

The DMR Repeater test mode automatically keys up DMR repeaters and transmits synchronously to the downlink signal. This greatly simplifies the task of testing the transmitter and receiver of a DMR repeater.

P25 Phase 2 Analysis

P25 Phase 2, as part of the TIA/EIA-102 Technical Standard, provides analysis of the TDMA burst profile as well as tests specific to P25 Phase 2 modulation. The 8800SX provides analysis of the HDQPSK downlink and HCPM uplink modulation formats used in the Phase 2 standard.
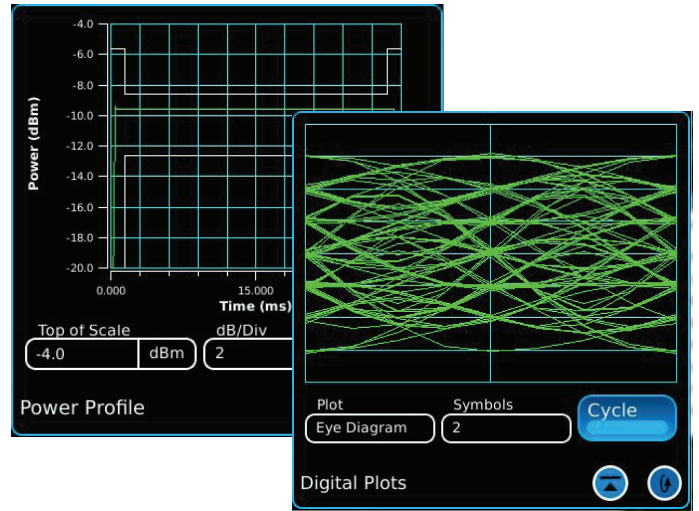
P25 Phase 2 Screen Shots

TETRA Base Station Analysis

The 8800SX includes a cost effective way to measure the critical parameters for field-testing of TETRA base stations.

The transmitter testing for TETRA base stations includes RMS EVM (Error Vector Magnitude), Peak EVM, Residual Carrier, Frequency Error, and Signal Power.

Field-testing for TETRA receivers is also a feature of the TETRA Base Station Test. The ETSI TETRA standard defines the method for generating the TETRA BS T1 test signal, and by use of this signal, the user can measure the sensitivity of the TETRA base station receiver.
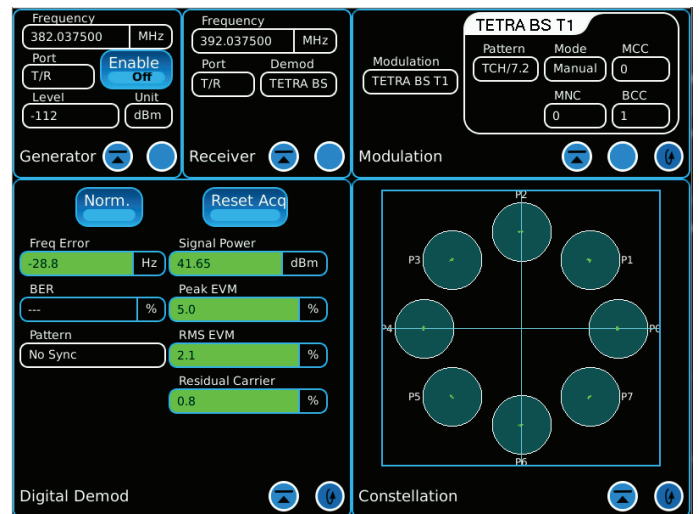
TETRA Base Station Test

Positive Train Control Analysis

Recently enacted laws require that railroads provide remote monitoring and control of trains to ensure that the US railroad system provides the highest level of safety available. The 8800SX provides a Positive Train Control (PTC) option that allows Class 1 railroad operators the ability to test their radio control systems in the field or in the lab to ensure that the radio meets stringent PTC RF parameters.
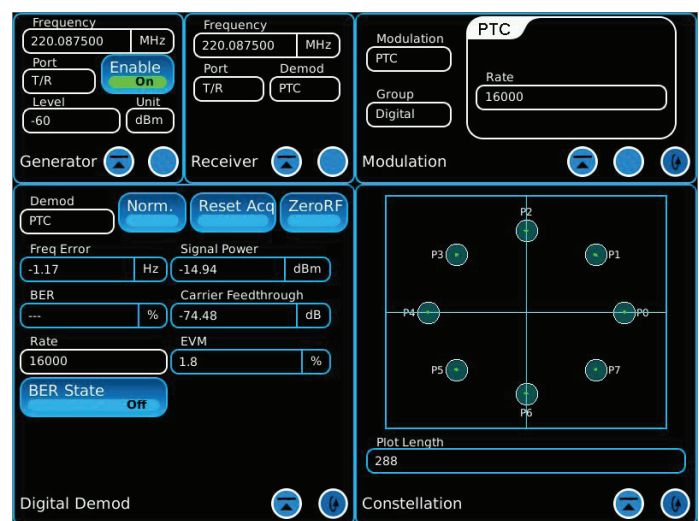
Positive Train Control Test (PTC)

Color Meters

The 8800SX features color-coded meters for quick indication of pass and fail test results. Using the configuration tile, upper and lower limits for each meter can be set and saved by the user. Measurements that exceed the set limits will display "red" for values above the limit and "blue" for values below the limit. Now test professionals can perform fast "Go / No-Go" measurements simply by monitoring meter color indications.

Meters with Color Pass/Fail Indicators

Frequency List

Land mobile radios are often tested at multiple frequencies, which requires the various transmit and receive frequencies to be set on the test instrument, which can be time consuming. The 8800SX frequency list feature provides a quick and easy way to test multiple frequencies. Frequency lists can be created using a configuration tool that allows users to:

• Create, Edit, and Store Frequency Lists

• Set 8800SX Generator and Receiver Frequencies and Generator Level

• Add CTCSS, DCS codes for Analog Testing

• Add NAC, Color Code, or RAN Code for Digital Testing
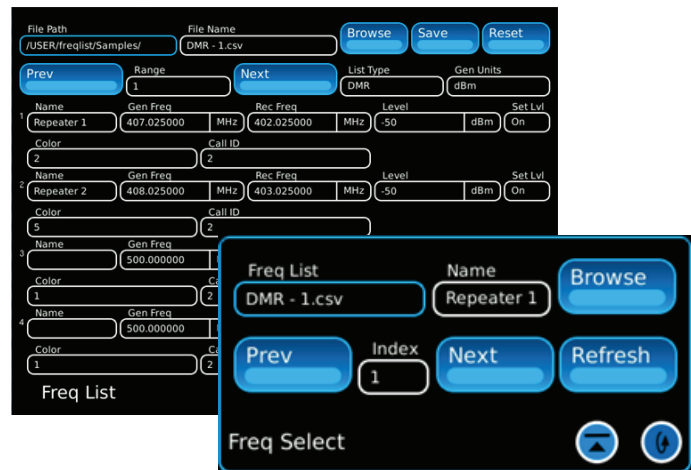
Frequency Select Control and Configuration Tiles

Digital Voice Tests

The 8800SX provides digital voice quality testing with its unique Record & Playback feature for P25, DMR, dPMR, NXDN, and ARIB T98 radio systems. Users can record live voice from a radio under test, regardless of vocoder type, and play back the recording to the radio for audio quality verification. An "ideal" audio recording can be saved for each digital modulation type (P25, DMR, etc) allowing for fast play back and audio quality verification of the radio under test.
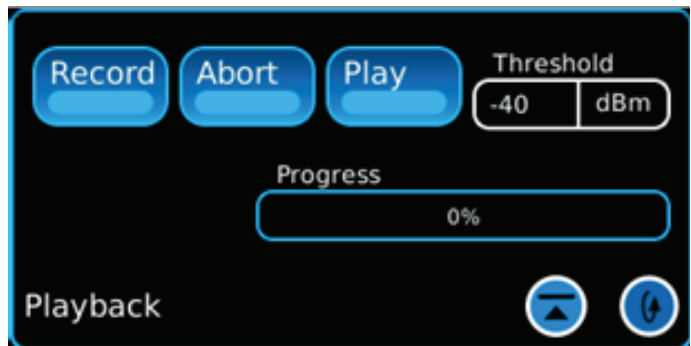
Record & Playback Tile for Voice Quality Testing

Quick Presets

The Presets feature allows for common analog and digital tests to be set up in seconds on the 8800SX. Three default presets and seven user-defined presets are included. A Preset saves open tiles, tile locations, modulation type, audio routing, and filter settings.
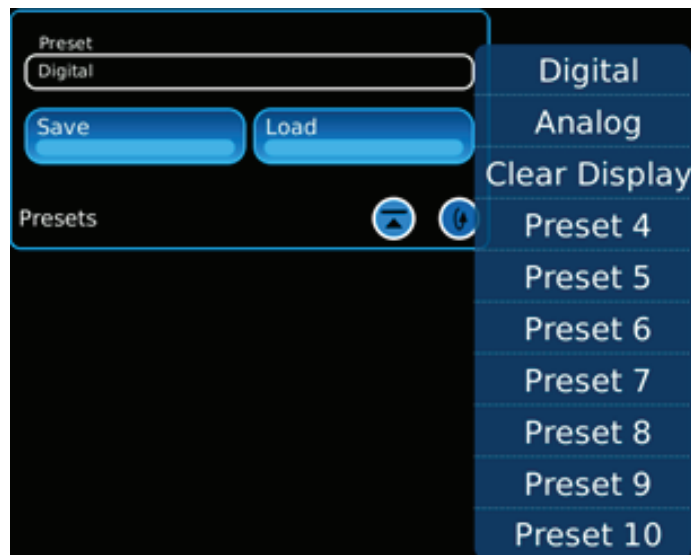
Presets Manager

Wideband Power Sensor

While the 8800SX features a power meter that will measure up to 125 Watts, a wideband power sensor is an especially useful test tool at remote repeater sites with high-power transmitters and cable antenna networks. Test professionals can measure true average and peak power, including VSWR and return loss.

The base configuration of the 8800SX (Part Number 142820) supports the use of an external wideband power sensor with 8800OPT13.

An alternate configuration of the 8800SX (Part Number 139942) comes with the wideband power sensor built-in so this valuable tool will not be forgotten.

In-Line Power Meter Tile

Wideband Analyzer

In addition to the full suite of field-level test instrumentation, the 8800SX features a 50 MHz Wideband Analyzer with six color markers. This powerful feature allows desired signals, interferes, and other spectrum anomalies to be viewed. Screen hold and capture features provide instant storage of screen images to be saved and exported to a PC for later analysis and documentation.
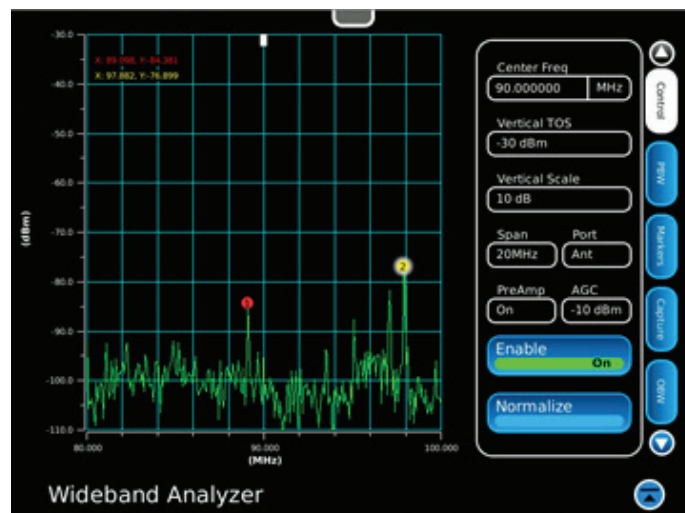
Wideband Analyzer with Color Markers

Tracking Generator

RF professionals maintain antenna transmission networks and tune duplexers, in addition to radio tests. With the optional tracking generator (88XXOPT10) and Precision VSWR/DTF Kit (114348), the 8800SX provides a simple, fast tool for VSWR, Return Loss, Insertion Loss, and Distance to Fault measurements.

The 8800SX soft case permits complete operation of the test set while inside the case. It is also specifically designed with compartments for the return loss bridge and power divider, which allows for VSWR, Return Loss, and Distance-to-Fault measurements to be performed *in the case*. This exclusive feature test set up ensures that these important accessories are not forgotten.
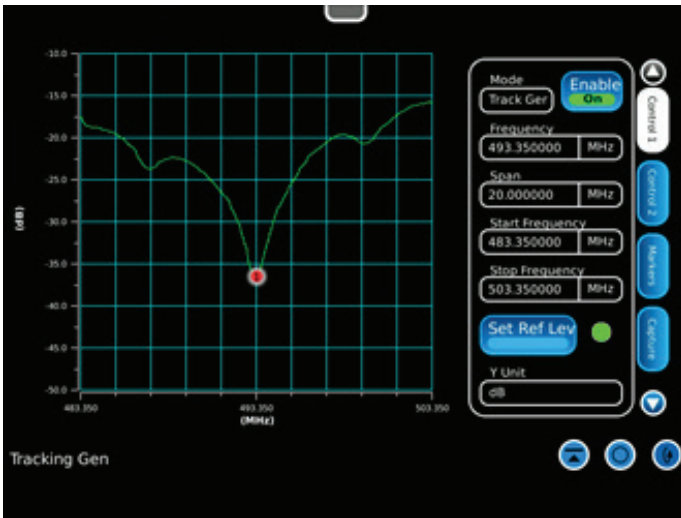
Tracking Generator with VSWR Measurement

The 8800SX in Soft Case with Return Loss Bridge Connected

NEON® Signal Mapper Package

VIAVI Solutions and TRX Systems are providing a joint solution that integrates TRX's NEON Signal Mapper Application with the VIAVI 8800SX. NEON Signal Mapper automates the geo-referencing cloud storage, and 3D visualization of LMR test data for technicians who use VIAVI test equipment to record and analyze two-way radio signals inside buildings and outdoors.

The NEON Signal Mapper includes the following:

- TRX Systems Tracking Unit with Belt Clip (1 Year Warranty)

- USB Cable and Wall Adapter for Charging

- 1 Year, 2 Year, 3 Year, and 5 Year Signal Mapper Software License with NEON Cloud Access

- Portable Wireless Router/Access Point
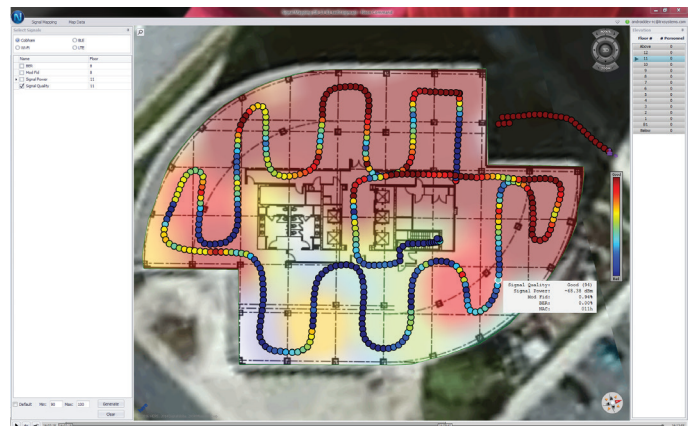
Auto-Test

The 8800SX is designed for complete automated radio test and alignment for analog and digital radios. Using the accurate instrumentation and high-speed remote command architecture, the 8800SX optimizes radio performance in minutes; with minimal human interaction.

Automated test and alignment applications are available for various radio manufacturers, including BK Technologies, EF Johnson Technologies, Hytera, JVCKENWOOD, L3Harris Technologies, Motorola Solutions, and Tait Communications. The complete list of supported radio families is provided in the options section.

The 8800SX Auto-Test Setup

The 8800SX Auto-Test Summary Setup

Multiple automated test and alignment options can be installed on the 8800SX. Operators are only required to know the radio type, such as Motorola MOTOTRBO; not radio model number. The unique "Read Radio" feature queries the radio to gather the specific model number, and applies the specific test and alignment parameters for that model number as determined by the manufacturers. Specific tests and alignments can be selected and configured. Pressing "Run" enables the program and executes the selected tests.

The 8800SX also provides the required DMM with an optional Current Shunt for doing critical PA bias mobile radio power alignments.

The 8800SX provides a unique test result for each radio tested. The test result includes Date/Time, Radio Model Number, Serial Number, Firmware Version, and other information uniquely identifying the radio under test. It also includes the specific results of each test and alignment performed.

Test results are automatically stored and can be exported through USB to an external PC for printing and for documentation purposes.

Test Results Summary

Select 8800SX Accessories Overview

Item	Part Number	Description	Image
Soft Case	114478	The soft case allows full operation of the 8800SX while inside the case. The laptop style design is lightweight and provides extra protection during field operation. Storage pockets provide extra space for spare batteries, test cables, etc.	
Hard Transit Case	114477	The hard transit case features form-fitted slots for the 8800SX, protective cover, precision VSWR/DTF Kit, power supply, 150 W attenuators, spare battery, and more.	
Precision DTF/ VSWR Accessory Kit	114348	This accessory kit provides all items for accurate VSWR, Return Loss, and Distance-to-Fault measurement. The kit includes a case, return loss bridge, power divider, 50 Ω calibrator, and two N-type test cables specifically designed for the 8800SX.	
Bird 5017D Wideband RF Power Sensor	92793	The 8800SX also supports the Bird 5017D Wideband Power Sensor as an external power meter for users that already have the 5017D. This capability requires 8800OPT13 and provides simultaneous forward and reverse power measurements up to 500 W and VSWR measurements that are displayed on the 8800SX screen. Only compatible with units that do not have the internal wideband power sensor.	

Ordering Information

Versions and Options

Order Number	Description
142820	8800SX Radio Test Set
	Standard Accessories
	Fuse, 5 A, 32 V, Mini Blade
	Power Supply
	AC Power Cord
	AC Power Cord - China
	AC Power Cord - Europe
	AC Power Cord - UK
	Adapter, N(m) to BNC(f), Qty 3
	Front Cover
	Internal Battery
139942	8800SX Radio Test Set with Internal Wideband Power Sensor
	Standard Accessories
	Internal Bird 5017D Wideband Power Sensor
	Fuse, 5 A, 32 V, Mini Blade
	Power Supply
	AC Power Cord
	AC Power Cord - China
	AC Power Cord - Europe
	AC Power Cord - UK
	Adapter, N(m) to BNC(f), Qty 3
	Front Cover
	Internal Battery

Options

113334	8800OPT01 DMR
140215	8800OPT06 DMR Repeater Test (Requires Opt01)
113335	8800OPT02 dPMR
113336	8800OPT03 NXDN
113337	8800OPT04 P25 Conventional
138895	8800OPT05 P25 Phase II (Requires Opt04)
113338	8800OPT09 ARIB T98
142131	8800OPT162 TETRA Base Station
113339	8800OPT10 Tracking Generator
113340	8800OPT11 Occupied Bandwidth

113342	8800OPT13 External Bird 5017D Wideband Power Sensor Support (Requires Power Sensor)
113343	8800OPT14 PTC
113344	8800OPT15 AAR Channel Plan
139836	8800OPT20 R&S Power Sensor Support (NRT-Z14)
139837	8800OPT21 SINAD Selectable Notch Filters
139838	8800OPT22 SNR Meter
143910	8800OPT23 SX Function Access
142370	8800OPT30 Mission Test Package (Motorola)

Auto-Test and Alignments

DMR Radios

138528	8800OPT104 Motorola MOTOTRBO Radio Series Auto-Test and Alignment Software (Requires Opt01)
139314	8800OPT108 Hytera DMR Series Auto-Test and Alignment Software (Requires Opt01 and Opt22)
139313	8800OPT109 Hytera DMR Repeater Auto-Test (Requires Opt01 and Opt108)
141179	8800OPT113 Tait DMR Series Auto-Test ONLY (Requires Opt01)

NXDN Radios

138525	8800OPT101 Kenwood NEXEDGE Series Auto-Test and Alignment Software (Requires Opt03)

P25 Radios

139319	8800OPT114 BK Technologies KNG Series Auto-Test and Alignment Software (Requires Opt04)
139320	8800OPT115 EFJohnson Viking Series Auto-Test and Alignment Software (Requires Opt04)
139317	8800OPT111 L3Harris P25 Series Auto-Test and Alignment Software (Requires Opt04)
141180	8800OPT117 L3Harris XL Series Auto-Test and Alignment Software (Requires Opt04)

138526	8800OPT102 Kenwood 5x20 Series Auto-Test and Alignment Software (Requires Opt04)
140913	8800OPT118 Kenwood Viking 5/6/7000 Series Auto-Test and Alignment Software (Requires Opt04)
138527	8800OPT103 Motorola APX Series Auto-Test and Alignment Software (Requires Opt04)
140868	8800OPT128 Motorola APX 8000 Series Auto-Test and Alignment Software (Requires Opt04 and Opt103)
140900	8800OPT129 Motorola APX "B" Series Auto-Test and Alignment Software (Requires Opt04 and Opt103)
139315	8800OPT105 Motorola ASTRO® 25 XTS® / XTL™ Auto-Test and Alignment Software (Requires Opt04)
8800OPT130	8800OPT130 Motorola APX NEXT™ Series Auto-Test and Alignment Software (Requires Opt04 and Opt103)
139318	8800OPT112 Tait P25 Series Auto-Test ONLY (Requires Opt04)

Multi-Protocol Radios

141178	8800OPT107 Kenwood NX-3000 / 5000 Series Auto-Test and Alignment Software (Requires Opt01, Opt03, or Opt04 depending on radio digital technology selected)

Languages

113356	8800OPT306 Arabic
113350	8800OPT300 Chinese (Simplified)
113351	8800OPT301 Chinese (Traditional)
113361	8800OPT311 French
113360	8800OPT310 German
139625	8800OPT312 Italian
113359	8800OPT309 Japanese
113355	8800OPT305 Korean
113354	8800OPT304 Malay / Indonesian
113357	8800OPT307 Polish
113358	8800OPT308 Russian
113352	8800OPT302 Spanish

Optional Accessories

114477	Case, Hard Transit
114478	Case, Soft-Sided Carrying
82556	Attenuator (6 dB / 150 W), 1.5 GHz
140227	Attenuator (40 dB / 2 W), 18 GHz Type N
67076	Battery, Spare, Internal
114479	8800 External Battery Charger
114348	8800 Precision DTF / VSWR Accessory Kit (Requires Opt10)
92793	External Bird 5017D Wideband Power Sensor (Requires Opt13)
114312	8800 Rackmount Kit
112861	8800 Microphone
114475	8800 Antenna Kit
62404	8800 DC Power Cord / Cigarette Adapter
63936	AC24009 DMM Test Leads
112277	10 Amp Current Shunt, 0.01 Ohm
67411	Scope Probe Kit
141707	8800 Balanced to Unbalanced Audio Adapter
63351	RF Cable for AutoAlignment (COAX ASSY, RG223,36.0,BNC,M,ST / BNC,M,ST)
140742	NEON Tracking Unit w/belt clip
140747	NEON Signal Mapper Package - Tracking Unit, Software, and 1 Year License
140748	NEON Signal Mapper Package - Tracking Unit, Software, and 2 Year License
140749	NEON Signal Mapper Package - Tracking Unit, Software, and 3 Year License
141586	NEON Signal Mapper Package - Tracking Unit, Software, and 5 Year License
63927	Survey Technologies Inc (STI) Site Survey Package (Software & GPS Antenna)

Care Plans

8800-5	5 Yr Total HW Warranty + Standard Calibrations - SILVER-5
8800-3	3 Yr Total HW Warranty + Standard Calibrations - SILVER-3
8800-HWO	1 Yr Extended HW Warranty only BRONZE-2

Calibration Certificates

138313	8800 Calibration Certificate (ISO 9001)

Data Sheet

VIAVI
8800SX
Digital Radio Test Set

General Specifications

User Interface

Dimensions	13.50 in (W) x 11.54 in (L) x 5.75 in (D)
	34.3 cm (W) x 29.3 cm (L) x 14.6 cm (D)
Display Size	30.5 cm (12 in)
Weight	7.71 kg (17 lbs) Base Unit
Internal Battery	2.5+ Hour at Full Backlight
Rugged	30 G Shock, MIL-STD 28800F Class 3
Direct Input Power	50 W Continuous, 125 W Cyclical
Internal Wideband RF Power Sensor **(Part Number 139442 Only)**	500 W, 4% Accuracy
Record & Playback	Digital Audio Quality
Quick Presets	Ultra-Fast Test Setup
Frequency Lists	Tx Frequency, Tx Level; Rx Frequency
"Fast Stack"	Instant Access to Multiple Meters
Tracking Generator	VSWR, Return Loss, Distance-to-Fault, Tuning Duplexers

LMR System Support

P25	P25 Phase II	DMR	NXDN™
dPMR	ARIB T98	AM/FM	PTC

Analog Duplex Operation

1 GHz RF Generator (AM / FM)	1 GHz Receiver (AM / FM)
Channel Analyzer	Oscilloscope
DMM	Audio Level Meter
Distortion Meter	SINAD Meter
RF Power Meter	Audio Frequency Counter
DTMF Encode / Decode	DCS Encode / Decode
RF Frequency Error Meter	In-band Power Meter (RSSI)

RF Generator

Port Input Protection

GEN Port	+20 dBm (Input Power Alarm Typical)
T/R Port	+52 dBm CW (Input Power Alarm Typical)
T/R Port	>+90°C (Temperature Alarm Typical)

Frequency

Range	2 MHz to 1000 MHz <2 MHz to 100 kHz Usable Range

RF Generator (continued)

Accuracy	Same as timebase
Resolution	1 Hz

Output Level

Range	T/R Port: –50 to –125 dBm ANT Port: –30 to –90 dBm GEN Port: –5 to -65 dBm
Accuracy	±2 dB; ±1.5 dB (Typ)
Resolution	1 dB 0.1 dB (0 to -6 relative to selected level with 0.1 dB Step On)

Port VSWR

ANT Port	<1.5:1 Typical
GEN Port	<1.5:1 Typical
T/R Port	<1.2:1
SSB Phase Noise	–90 dBc/Hz at 20 kHz offset
	–95 dBc/Hz at 1 GHz at 20 kHz offset, Typical
Spurious	Harmonics: –30 dBc, –42 dBc Typical
	Non-Harmonics: -40dBc, -50 dBc Typical (±20 kHz offset from carrier; 0 to 1 GHz)
Residual FM	<20 Hz rms in 300 Hz to 3 kHz BW
	<4 Hz rms, Typical <100 MHz
	<6 Hz rms, Typical <800 MHz
	<11 Hz rms, Typical >800 MHz
Residual AM	<0.5% rms in 300 Hz to 3 kHz BW

RF Generator Modulation

RF Generator Modulation Type

Analog	FM and AM
Digital	P25 (C4FM, H-CPM, H-DQPSK), DMR, dPMR, ARIB T98, NXDN, PTC
DTMF	FM and AM
DCS	FM and AM
Two-Tone Sequential	FM and AM
Tone Remote	FM and AM
Tone Sequential	FM and AM
CTCSS	FM, and AM using modulation generators

RF Generator Modulation (continued)

FM Modulation - Internal (GEN 1, GEN 2)

Modulation Frequency Range

Range:	0 Hz to 20 kHz
Resolution:	0.1 Hz
Accuracy:	Timebase ±2 Hz
FM Deviation Range:	Off 0 Hz to 100 kHz (GEN 1 and GEN 2 Selectable)
Total Harmonic Distortion:	3% (1000 Hz rate, >2 kHz Deviation, 300 Hz - 3 kHz BP filter)
Resolution:	1 Hz
Accuracy:	±5% at 1 kHz rate; 2 kHz to 50 kHz deviation (±1% typical) ±10% at 150 Hz to 3 kHz rate; 2 kHz to 50 kHz deviation

FM Modulation - External (MIC, AUDIO IN)

Microphone In

Alternate MIC Configurations	MIC Connector Pins
Range 1: 2-15 mVrms (8 mVrmw Typical)	Pin 2-OPEN, Pin 6-GND
Range 2: 35-350 mVrms (100 mVrms Typical)	Pine 2-GND, Pin 6-OPEN (Range 2 enables a nominal 3 Vdc Bias Voltage)
Range 3: 2-32 mVrms (20 mVrms Typical)	Pin 2-OPEN, Pin 6-OPEN
MIC Frequency Range	300 Hz to 3 kHz
MIC Level	Off, 0 Hz to 80 kHz
MIC Modulation Accuracy	±20% (300 Hz to 1.2 kHz) ±30% (>1.2 kHz)
MIC Slope	Positive voltage yields positive deviation

Audio In

AUD IN Input	Range: 30 V, 3V
AUD IN Switchable Loads	3 V Range: 150 ohms, 600 ohms, 1K ohms, High Z 30 V Range: High Z
AUD IN Input Levels	3 V Range: 0.05 to 3.2 Vrms 30 V Range: 3 Vrms - 30 Vrms
AUD IN	300 Hz to 5 kHz
AUD IN	3 V Range: 1 kHz/35 mVrms Typical 30 V Range: 1 kHz/350 mVrms Typical
AUD IN	Positive voltage yields positive deviation

AM Modulation - Internal (GEN 1, GEN 2)

Modulation Frequency Range

Range	0 Hz to 20 kHz
Resolution	0.1 Hz
Accuracy	Timebase ±2 Hz
Range	Off, 0 to 100% (GEN1 and GEN2 Selectable)
Resolution	0.1%
Total Harmonics Distortion	3% (20% to 90% mod, 1000 Hz rate, 300 Hz to 3 kHz BP filter)
Modulation Accuracy	±5% setting @ 1 kHz rate ±10% setting @ 150 Hz to 5 kHz rate 10% to 90% modulation

AM Modulation - External (MIC, AUDIO IN)

Microphone In

Alternate MIC Configurations	MIC Connector Pins
Range 1: 2-15 mVrms (8 mVrms Typical)	Pin 2-OPEN, Pin 6-GND
Range 2: 35-350 mVrms (100 mVrms Typical)	Pin 2-GND, Pin 6-OPEN (Range 2 enables a nominal 3 Vdc bias voltage)
Range 3: 2-32 mVrms (20 mVrms Typical)	Pin 2-OPEN, Pin 6-GND
MIC Frequency Range	300 Hz to 3 kHz
MIC Modulation	0% to 80%
MIC Modulation Accuracy	±20% (300 Hz to 1.2 kHz) ±30% (>1.2 kHz)

Audio In

AUD IN Input	Range: 30 V, 3 V
AUD IN Switchable Loads	3 V Range: 150 ohm, 600 ohms, 1 K ohms, High Z 30V Range: High Z
AUD IN Input Levels	3 V Range: 0.05 to 3.2 Vrms
	30 V Range: 3 Vrms - 30 Vrms
AUD IN AM Frequency Range	300 Hz to 5 kHz
AUD IN Level Sensitivity	3 V Range: 1% / 35 mVrms Typical (High Z Load)
	30 V Range: 1% / 350 Vrms Typical (High Z Load)

AFGEN 1 and AFGEN 2

Frequency

Range	0.0 Hz to 20.0 kHz
Resolution	0.1 Hz
Accuracy	Timebase ±2 Hz

Output Level

Audio Out Port Impedance	<1 ohm
Audio Level Out	0 Vrms to 1.57 Vrms
Resolution	0.001 Vrms
Accuracy	±10%; >100 mVrms, 30 Hz to 3 kHz
Distortion	<3% (1 kHz rate, sine 300 Hz to 3 kHz)

RF Receiver

Port Input Protection

ANT Port	+20 dBm (Input Power Alarm Typical)
T/R Port	+52 dBm CW
T/R Port	>+90°C (Temperature Alarm Typical)

Frequency

Range	2 MHz to 1000 MHz <2 MHz to 100 kHz Usable Range
Accuracy	Same as Timebase
Resolution	1 Hz

RF Receiver (continued)

Input Amplitude

Sensitivity	ANT: -80 dBm, typical 10 dB SINAD (-110 dBm with preamp) T/R: -40 dBm, typical, 10 dB SINAD
Minimum Level Receiver Measurements	ANT: -60 dBm Preamp off, -80 dBm Preamp On, RF Error Meter T/R: -20 dBm Preamp Off, -40 dBm Preamp ON, RF Error Meter
DEMOD Meters	ANT: Distortion, SINAD, Modulation, AF Counter T/R: Modulation, Distortion, SINAD, AF Counter
Maximum Input Level Receiver Measurements	ANT: +10 dBm (Auto, Preamp off) T/R: +47 dBm CW, FM +41 dBm AM

Receiver Demodulation Types

AM, FM, DMR, dPMR, ARIB T98, NXDN, P25 (C4FM, H-CPM, H-DQPSK), PTC

AM Modulation - External (MIC, AUDIO IN)

IF Bandwidth	FM: 5 kHz, 6.25 kHz, 8.33 kHz, 10 kHz, 12.5 kHz, 25 kHz, 30 kHz, 100 kHz, 300 kHz
	AM: 5 kHz, 6.25 kHz, 8.33 kHz, 10 kHz, 12.5 kHz, 25 kHz, 30 kHz
Audio Filters Bandwidth	FM: C-WT BP, CCITT BP, NONE, 15 kHz LP, 300 Hz LP, 300 Hz HP, 5 kHz LP, 300 Hz to 5 kHz BP, 300 Hz to 3 kHz BP, 300 Hz to 20 kHz BP, 3 kHz LP
	AM: C-WT BP, CCITT BP, NONE, 15 kHz LP, 0.3 kHz LP, 0.3 kHz HP, 5 kHz LP, 300 Hz to 5 kHz BP, 300 Hz to 3 kHz BP, 0.3 kHz to 20 kHz BP, 3 kHz LP
Audio Output, Level Sensitivity	FM: 3 Vrms/kHz Dev/IF BW (kHz, ±15%) AM: 7 mVrms/% AM, ±15%
LO EMISSIONS	<-50 dBc

RF Frequency Error Meter

Units	Hz, PPM
Range	±200 kHz, ±1000 PPM
Resolution	1 Hz
Accuracy	Timebase ±1 Hz

RSSI (Receive Signal Strength Indicator) RF Power Within Receiver IF Bandwidth

Units	dBm, Watts, microWatts
Range	-120 dBm to +60 dBm
RF Level Range	T/R Port (preamp off): -50 dBm to +47 dBm ANT Port (preamp off): -90 dBm to +10 dBm ANT Port (preamp on): -110 dBm to -10 dBm
Resolution	0.01 dBm
Accuracy	±3 dB; (1.5 Typical) Normalized
Ext Attenuation	-50 to +50 dB, 0.01 dB resolution

RF Power Meter (Broadband RF Power Into T/R Port)

Maximum Input Level	50 Watts continuous, +25°C, ±10°C
	125 Watts Cyclical (Max "ON" of 30 sec and Min "OFF" for 90 sec) for power levels >50 Watts
Alarms	+49 dBm (Input RF Power Alarm) >+90°C (+194°F) (Temperature Alarm)
Meter Range	+20 to +53 dBm
Meter Floor	0.10 W/+20 dBm
Measurement Modes	Average, Maximum, Minimum, Peak
Averaging Range	1 to 99
Display Units	Watts, dBm
Resolution	0.01 W, 0.1 dBm
Accuracy	10% of reading, (6% Typical)
Ext Attenuation	-50 to +50 dB, 0.01 dB resolution

FM Deviation Meter

Range	500 Hz to ±100 kHz
Meter Type	Peak+, Peak-, (Peak-Peak)/2, RMS
Resolution	0.1 Hz
Accuracy	±10% of reading, 500 Hz to 100 kHz Deviation ±5% of reading, 1 kHz to 10 kHz Deviation (150 Hz to 1 kHz rate) ±3% of reading, 1 kHz to 10 kHz Deviation (1 kHz to 1.5 kHz rate)

AM Percent Meter

Range	5% to 100%
Modes	Peak+, Peak-, (Peak-Peak)/2, RMS
Resolution	0.001%
Accuracy	±5% of reading, 1 kHz rate 30% to 90% modulation, 3 kHz LPF

SINAD Meter

Measurement Sources	AUD IN, Demod
DEMOD	FM: >2 kHz Deviation (IF BW set appropriately for received modulation BW) AM: >25% Modulation (IF BW set appropriately for received modulation BW)

AUDIO IN Port

Frequency Range	300 Hz to 10 kHz
Input Level	3 V (Audio Config setup): 0.9 Vp-p to 9 Vp-p 30 V (Audio Config setup): 9 Vp-p to 90 Vp-p
Audio Frequency Notch	1 kHz
Reading Range	0 dB to 60 dB
Resolution	0.001 dB
Accuracy	±1.5 dB, reading >8 dB, <40 dB

Distortion Meter

Measurement Sources	AUD IN, Demod
DEMOD	FM: >2 kHz Deviation (IF BW set appropriately for received modulation BW)
	AM: >25% Modulation (IF BW set appropriately for received modulation BW)

AUDIO IN Port

Frequency Range	300 Hz to 10 kHz
Input Level	3 V (Audio Config setup): 0.9 Vp-p to 9 Vp-p 30 V (Audio Config setup): 9 Vp-p to 90 Vp-p
Audio Frequency Notch	1 kHz
Reading Range	0% to 100%
Resolution	0.001%
Accuracy	±10% of reading +0.1% Distortion, >1% to <20%

Audio Frequency Counter

Measurement Sources	AUD IN, Demod
DEMOD	FM: 15 Hz to 20 kHz Rate (IF BW set appropriately for received modulation BW)
	AM: 100 Hz to 10 kHz Rate (IF BW set appropriately for received modulation BW)

AUDIO IN Port

Frequency Range	300 Hz to 20 kHz
Input Level	3 V (Audio Config setup): 28 mVp-p to 9 Vp-p
	30 V (Audio Config setup): 280 mVp-p to 90 Vp-p
Frequency Range	15 Hz to 20 kHz
Resolution	0.1 Hz
Accuracy	±1 Hz

Audio Frequency Level Meter

Measurement Sources	AUD IN, SCOPE

Input Range

AUD IN Range	3 V, 30 V
Scope Range	2 VDC, 40 VDC
Frequency Range	200 Hz to <5 kHz

Load Selection

Scope	High Z
AUD IN	3 V Input Range: High Z, 150 ohms, 600 ohms, 1 K ohms 30 V Input Range: 10 K

Input Level

AUD IN Port	3 V Range: 10 mV rms to 3.2 V rms 30 V Range: 1 V rms to 30 V rms
Scope Port	2.0 VDC Range: 10 mV rms to 1 V rms 40 VDC Range: 1 V rms to 28.28 V rms
Display Unit Resolution	Volts: 0.001 V mV: 0.001 mV dBuV: 0.001 dBuV dBm: 0.001 dBm Watts: 0.001 W
Accuracy	±5% AUD IN Port

P25 Measurements

Modulation Fidelity

Range	0 to 10%
Resolution	0.1%
Accuracy	<5.0% of reading (2.5 to 10%)

Symbol Deviation

Range	1620 to 1980 Hz
Resolution	0.1 Hz
Accuracy	±10 Hz (1620 to 1980 Hz)

Symbol Clock Error

Range	±12 ppm
Resolution	0.01 ppm
Accuracy	1 ppm (±0.0048 Hz)

DMR Measurements

FSK Error

Range	0 to 10%
Resolution	0.1%
Accuracy	<5.0% of reading (2.5 to 10%)

Symbol Deviation

Range	1745 to 2140 Hz
Resolution	0.1 Hz
Accuracy	±10 Hz

Symbol Clock Error

Range	±12 ppm
Resolution	0.01 ppm
Accuracy	±1 ppm (±0.0048 Hz)

Oscilloscope

Source	SCOPE, AUD IN, Demod
Bandwidth	5 kHz

Input Impedance

Scope Input	2.0 V Range: 53 K ohm 40 V Range: 1 M ohm
Audio I/O Input	3 V Range: 150 ohm, 600 ohm, 1 k ohm, High Z 30 V Range: 10 k ohm
Coupling	Scope: AC, DC and GND Audio In: AC only FM Internal Demod: DC AM Internal Demod: AC

Oscilloscope (continued)

Vertical Range

Scope, Audio In	10 mV to 10 V-div in a 1, 2, 5 sequence
FM Internal Demodulation	0.1 kHz to 50 kHz/div in a 1, 2, 5 sequence
AM Internal Demodulation	5, 10, 20, 50%/div
Vertical Accuracy	10% of full scale (DC to 5 kHz)
Horizontal Sweep	0.5 ms/div to 0.1 sec/div
Horizontal Accuracy	3% of full scale
Trigger Type	Internal (Auto, Normal)
Trigger Level	Variable on vertical scale
Markers	Two markers Displays vertical measurement (Voltage, kHz, % modulation) Displays Delta in time between markers

Channel Analyzer

Range	2 MHz to 1 GHz
Span	10 kHz to 5 MHz (1, 2, 5 steps)
Windows	Hanning, Flat Top, Rectangle
Vertical Scale	2, 5, 10, 15, 20 dB/div
Marker Bandwidth	1 kHz to 5 MHz (1, 2, 5 steps)
Marker Offset	±1 kHz to ±1/2 Span (1, 2, 5 steps)
Power Band Width (PdB) Accuracy	±3 dB typical (30 dB signal to noise)
Noise Floor	–123 dBm (preamp off) –140 dBm (preamp on) (span 100 kHz), typical
Wide Analyzer	10 kHz to 50 MHz in 1, 2, 5 sequence

Digital Multimeter (DMM)

AC/DC Voltmeter

Range	200 mV, 2 V, 20 V, 200 V, 2000 V, Auto (150 VAC RMS to VDC MAX input, Category II)
Resolution	3.5 digits (2000 counts)
Accuracy	DC: ±1% FS ±1 count AC: ±5% FS ±1 count +25 mV

AC/DC Ammeter

Range	200 mA, 2 A, 20 A, Auto (20 A range uses optional shunt connected to Voltmeter)
Maximum Open Circuit Input Voltage	30 V RMS referenced to COMMON or EARTH GROUND, Cateogry I
Resolution	3.5 digits (2000 counts)
Accuracy	DC: ±5% FS ±1 count AC: ±5% FS ±1 count
AC Volts Frequency Range	50 Hz to 10 kHz

Ohmeter

Range	200 ohms, 2 k ohms, 20 k ohms, 200 k ohms, 2 M ohms, 20 M ohms, Auto
Resolution	3.5 digits (2000 counts)
Accuracy	±5% FS ±1 count

In-Line Power Meter

RF Measurement Type	Average Power, Peak, Burst, Crest, CCDF
Frequency Range	25 MHz to 1 GHz
Power Range	500 mW to 500 W Average 13.3 W to 1300 W Peak
Insertion VSWR	<1.05
Insertion Loss	<0.05 dB
Directivity	29 dB up to 50 MHz 30 dB from 51 to 1000 MHz

Average Power

Average Forward Power Range	500 mV to 200 W Average
Peak/Average Ratio, Max	12 dB
Accuracy, Average Forward Power	±4% of reading +166 mW Maximum accuracy performance at 25°C (±10°C) (77°F ±50°F)
Return Loss	0 to 23 dB
VSWR	1.15 to 99.9

Burst Average Power

Burst Average Power Range	13.5 W to 500 W Average
Burst Width	**1 µs to 5 ms**
Repetitions Rate Min	200 Hz
Duty Cycle (D)	0.001 to 1.0 (D=Burst Width/Period)
Accuracy, Burst Average Power	±6% of reading +0.116/D mW

Peak Envelope Power

Peak Envelope Power Range	13.3 to 1300 W
Peak Envelope Power Accuracy	Burst width >200 µs: ±7% of reading, +0.70 W 1 µs <burst width <200 µs: ±10% of reading, +1.40 W 0.5 µs <burst width <1 µs: ±15% of reading, +1.40 W Burst width <0.5 µs: ±20% of reading, +1.40 W

Crest Factor

Measurement Range	500 mW to 300 W, 13.3 W Minimum Peak
Accuracy, Crest Factor	Linear Sum of Peak and Average Power Accuracies

Complementary Cumulative Distribution Function (CCDF)

Measurement Range	0.1 to 100%
Threshold Measurement Range	13.5 to 500 W
Measurement Uncertainty	±0.2%
Level Set Accuracy	As Peak Envelope, Power Accuracy +2.0%

Speaker Output

Speaker	On or Off
Output	75 dBa min at 0.5 m, 600 to 1800 Hz, max volume Speaker disconnects when headphones installed.

Volume Control	
Level Range	Scale 0 to 100

Timebase	
Temperature Stability	±0.15 ppm at -20° C to 70° C (-4°F to 158°F)
Aging	0.5 ppm/First Year 0.3 ppm/After First Year

External 10 MHz Reference Input	
External Input Frequency Range	10 MHz ±150 Hz
External Input Level	-10 dBm to +10 dBm
Max Input	+15 dBm

Freq-Flex (Externally Referenced Timebase Calibration)	
Input Frequency Range	2 MHz to 1000 MHz
Reference Input Port	T/R: >-20 dBm Antenna: >-40 dBm
Freq-Flex Accuracy	<0.5 Hz from external source applied + Stability + Aging

Example: 10 MHz External Input, after Freq-Flex = ±0.5Hz to external input. 10 MHz ±0.5 Hz = 0.05 ppm + Stability + Aging

I/O Connections
T/R Connector Type: N-Type Female
ANT Connector Type: N-Type Female
GEN Connector Type: N-Type Female
Scope Connector Type: BNC Female
AUD IN Connector Type: BNC Female
AUD OUT Connector Type: BNC Female
Headphone Jack: 3.5 mm Jack
USB Connectors (Qty 3) Type: USB Type A
External 10 MHz Reference Input: BNC Female
Ethernet Connector Type: RJ45
DC Power in Connector: 2-position 2.5 mm Jack
GND Connector: Banana
DMM (Qty 3): Banana (Optional)
IN (In-Line Power Meter): N-Type Female (Optional)
OUT (In-Line Power Meter): N-Type Female (Optional)

Front Panel Indicators	
SYS Indicator	Green: 88XX Power On/Awake Mode
	Blue: 88XX Sleep Mode
	Red: 88XX Shutting Down
	Green/Red Flashing: Battery Temperature >60°C (>140°F)
	Green Flashing: Battery Life <5%
BAT Indicator	Green: Battery at full charge
	Amber: Battery is charging

Microphone Connector	

6 PIN MIC CONNECTOR

Pin Number	Name		Characteristic
1	GROUND		
2	SPEAKER+	Output	75 dBa min at 0.5 m, 600 to 1800 Hz, max volume
3	PTT	Input	GND, open (with internal pullup)
4	Mic/Audio	Input	0 to 30 mVrms, voiced tone (whistle), 300 Hz to 3 kHz
5	MICSEL 1	GND, open with pullup	GND = 3 V DC bias (active Mic) and Mic audio gain of 2 Open = 0 V DC bias and Mic audio gain of 3
6	MICSEL 2	GND, open with pullup	

Environmental/Physical

Overall Dimensions	34.3 cm (W) x 29.3 cm (L) x 14.6 cm (D) 13.5 in (W), 11.54 in (L) x 5.75 in (D)
Weight	17 lbs (No hardware options installed)
Temperature	Storage: -40°C to +71°C (-40°F to +159.8°F), MIL-PRF-28800F, Class 3
	Note: Battery must not be subjected to temperatures below -20° C, nor above +60° C

8800SX Operation

DC Operation	-20°C to +50°C (-4°F to 122°F)
AC/DC Power Supply	See AC Input Power Section
Battery Operation	-20°C to approximately +50°C [1, 2] (-4°F to approximately +122°F)

Relative Humidity

Operation	5 to 95%, tested in accordance with MIL-PRF-28800F, Class 3

Altitude

Battery Only Operation	4,600 m (MIL-PRF-28800F, Class 3)
AC Power Supply Operation	3,048 m (MIL-PRF-28800F, Class 3)

Shock, Functional

Operation	30 G Shock (Functional Shock), tested in accordance with MIL-PRF-28800F, Class 3

Vibration

Operation	5 to 500 Hz random vibrations, tested in accordance with MIL-PRF-28800F, Class 3

Bench Handling

Operation	Tested in accordance with MIL-PRF-28800F, Class 3

1: Battery operation over temperature based on actual temperature rise of battery and instrument usage

2: Battery must not be subjected to temperature below -20° C nor above +60° C

Environmental/Physical (continued)

Compliance	
EMC	
Emissions and Immunity	MIL-PRF-28800F, Class 3 EN61326-1, Class A EN61000-3-2 EN61000-3-3
Safety	UL 61018-1 EN61010-1 CSA C22.2 No 61010-1
Reliability	20,000 hours at 25°C (77°F)
AC Input Power (AC to DC Converter/Charger Unit)	
AC Input Voltage Range	100 to 250 VAC, 3 A max., 47 Hz - 63 Hz
AC Input Voltage Fluctuation	Less than 10% of the nominal input voltage
Transient Overvoltage	According to Installation Category II
Usage Environment	Indoor use, Maximum Relative Humidity 80% for temperatures up to 31°C (87.8°F) decreasing linearly to 50% RH at +40°C (104°F), Installation Category II, Pollution degree 2
Operating Temperature	0°C to +40°C (32°F to 104°F)
Storage Temperature	-20°C to +85°C (-4°F to +185°F)
EMI	EN55022 Class B, EN61000-3-2, Class D
Safety	UL 1950, CSA 22.2 No 234 and No 950, IEC 950/EN 60950
DC Input Power	
Voltage Range	11 to 24 VDC
Maximum Power	55 W, 65 W charging Optional Battery
Typical Power	30 W
Fused	5 A, 32 VDC, Type F
Supplemental Items	
Battery Type	Lithium Ion (Li Ion) battery pack Note: Battery must not be subjected to temperatures below -20°C, nor above +60°C
Battery Operation Time	
100% Backlight	2 1/2 hours typical
Minimum Backlight (still viewable)	3 hours typical
Battery Charge Time	4 hours Unit Power Off Typical
	4 hours Unit Powered On Typical Note: Battery to be charged at temperatures between 0°C and +45°C (32°F and +113°F)
	Charge dead battery (<10% capacity) for 20 minutes before operation on external DC power

Ordering Information

Versions and Options

Order Number	Description
142820	8800SX Radio Test Set
	Standard Accessories
	Fuse, 5 A, 32 V, Mini Blade
	Power Supply
	AC Power Cord
	AC Power Cord - China
	AC Power Cord - Europe
	AC Power Cord - UK
	Adapter, N(m) to BNC(f), Qty 3
	Front Cover
	Internal Battery
139942	8800SX Radio Test Set with Internal Wideband Power Sensor
	Standard Accessories
	Internal Bird 5017D Wideband Power Sensor
	Fuse, 5 A, 32 V, Mini Blade
	Power Supply
	AC Power Cord
	AC Power Cord - China
	AC Power Cord - Europe
	AC Power Cord - UK
	Adapter, N(m) to BNC(f), Qty 3
	Front Cover
	Internal Battery

Options	
113334	8800OPT01 DMR
140215	8800OPT06 DMR Repeater Test (Requires Opt01)
113335	8800OPT02 dPMR
113336	8800OPT03 NXDN
113337	8800OPT04 P25 Conventional
138895	8800OPT05 P25 Phase II (Requires Opt04)
113338	8800OPT09 ARIB T98
142131	8800OPT162 TETRA Base Station
113339	8800OPT10 Tracking Generator
113340	8800OPT11 Occupied Bandwidth
113342	8800OPT13 External Bird 5017D Wideband Power Sensor Support (Requires Power Sensor)
113343	8800OPT14 PTC
113344	8800OPT15 AAR Channel Plan
139836	8800OPT20 R&S Power Sensor Support (NRT-Z14)
139837	8800OPT21 SINAD Selectable Notch Filters
139838	8800OPT22 SNR Meter
143910	8800OPT23 SX Function Access

Auto-Test and Alignments

DMR Radios

138528	8800OPT104 Motorola MOTOTRBO Series Auto-Test and Alignment Software (Requires Opt01)
139314	8800OPT108 Hytera DMR Series Auto-Test and Alignment Software (Requires Opt01 and Opt22)
139313	8800OPT109 Hytera DMR Repeater Auto-Test and Alignment Software (Requires Opt01 and Opt108)
141179	8800OPT113 Tait DMR Series Auto-Test ONLY (Requires OPT01)

NXDN Radios

138525	8800OPT101 Kenwood NEXEDGE Series Auto-Test and Alignment Software (Requires Opt03)

P25 Radios

139319	8800OPT114 BK Technologies KNG Series Auto-Test and Alignment Software (Requires Opt04)
139320	8800OPT115 EF Johnson Viking Series Auto-Test and Alignment Software (Requires Opt04)
139317	8800OPT111 L3Harris P25 Series Auto-Test and Alignment Software (Requires Opt04)
141180	8800OPT117 L3Harris XL Series Auto-Test and Alignment Software (Requires Opt04)
138526	8800OPT102 Kenwood 5x20 Series Auto-Test and Alignment Software (Requires Opt04)
140913	8800OPT118 Kenwood Viking 5/6/7000 Series Auto-Test and Alignment Software (Requires Opt04)
138527	8800OPT103 Motorola APX Series Auto-Test and Alignment Software (Requires Opt04)
140868	8800OPT128 Motorola APX 8000 Auto-Test and Alignment Software (Requires Opt04 and Opt103)
140900	8800OPT129 Motorola APX "B" Auto-Test and Alignment Software (Requires Opt04 and Opt103)
139315	8800OPT105 Motorola ASTRO® 25 XTS® / XTL™ Auto-Test and Alignment Software (Requires Opt04)
8800OPT130	8800OPT130 Motorola APX NEXT™ Series Auto-Test and Alignment Software (Requires Opt04 and Opt103)
139318	8800OPT112 Tait P25 Series Auto-Test ONLY (Requires OPT04)

Multi-Protocol Radios

141178	8800OPT107 Kenwood NX-3000 / 5000 Series Auto-Test and Alignment Software (Requires Opt01, Opt03, or Opt04 depending on radio digital technology selected)

Languages

113356	8800OPT306 Arabic
113350	8800OPT300 Chinese (Simplified)
113351	8800OPT301 Chinese (Traditional)
113361	8800OPT311 French
113360	8800OPT310 German
139625	8800OPT312 Italian
113359	8800OPT309 Japanese
113355	8800OPT305 Korean
113354	8800OPT304 Malay / Indonesian
113357	8800OPT307 Polish
113358	8800OPT308 Russian
113352	8800OPT302 Spanish

Optional Accessories

114477	Case, Hard Transit
114478	Case, Soft-Sided Carrying
82556	Attenuator (6 dB / 150 W), 1.5 GHz
140227	Attenuator (40 dB / 2 W), 18 GHz Type N
67076	Battery, Spare, Internal
114479	8800 External Battery Charger
114348	8800 Precision DTF / VSWR Accessory Kit (Requires Opt10)
92793	External Bird 5017D Wideband Power Sensor (Requires Opt13)
114312	8800 Rackmount Kit
112861	8800 Microphone
114475	8800 Antenna Kit
62404	8800 DC Power Cord / Cigarette Adapter
63936	AC24009 DMM Test Leads
112277	10 Amp Current Shunt, 0.01 Ohm
67411	Scope Probe Kit
141707	8800 Balanced to Unbalanced Audio Adapter
63351	RF Cable for AutoAlignment (COAX ASSY, RG223,36.0,BNC,M,ST / BNC,M,ST)
140742	NEON Tracking Unit w/belt clip
140747	NEON Signal Mapper Package - Tracking Unit, Software, and 1 Year License
140748	NEON Signal Mapper Package - Tracking Unit, Software, and 2 Year License
140749	NEON Signal Mapper Package - Tracking Unit, Software, and 3 Year License
141586	NEON Signal Mapper Package - Tracking Unit, Software, and 5 Year License
63927	Survey Technologies Inc (STI) Site Survey Package (Software & GPS Antenna)

Care Plans

8800-5	5 Yr Total HW Warranty + Standard Calibrations - SILVER-5
8800-3	3 Yr Total HW Warranty + Standard Calibrations - SILVER-3
8800-HWO	1 Yr Extended HW Warranty only BRONZE-2

Calibration Certificates

138313	8800 Calibration Certificate (ISO 9001)

Exhibit A - Pricing Page
ARFQ 0606 HSE2400000001
Viavi 8800SX Digital Radio Test Set (Service Monitor) or Equal

Contract Item #	Description	Unit of Measure	Estimated Quantity*	Unit Price	Total Cost
3.1.1	Viavi 8800SX Digital Radio Test Set (Service Monitor) or Equal	Ea	1	$72,690.35	$72,690.35
3.1.53.1.1	Fuse, 5A, 32V, Mini Blade	Ea	50	$2.00	$100.00
3.1.53.1.2	AC Power Cord	Ea	50	$25.00	$1,250.00
3.1.53.1.3	Adapter, N (male) to BNC (female), Qty - 3 pack	Ea	50	$40.85	$2,042.50
3.1.53.1.4	Internal Battery	Ea	50	$350.00	$17,500.00
3.1.53.1.5	Power Supply	Ea	50	$285.00	$14,250.00
3.1.53.1.6	Front Cover	Ea	50	$31.00	$1,550.00
3.1.54	Extended Warranty	Ea	1	$630.00	$630.00
					$110,012.85

Vendor must complete the Price Page in full as failure to complete the Pricing Page in its entirety will result in

Vendor's bid being disqualified. A no bid will result in Vendor's bid being disqualified.

*Estimated Quantities are for bidding purposes only.

Bidder/Vendor Information:

Name: VIAVI Solutions Inc.

Address: 1445 South Spectrum Blvd; Suite 102; Chandler, AZ 85286

Phone No.:   408 404 3600

Fax No.: 408 404 4500

Email Address: todd.taylor@viavisolutions.com

Authorized Signature

Contract Item #	Description	Unit of Measure	Estimated Quantity*	Unit Price	Total Cost
	Item 3.1.1 is comprised of the following features:				
	Includes following:				
	8800OPT01 DMR				
	8800OPT02 dPMR				
	8800OPT03 NXDN				
	8800OPT04 P25 Conventional				
	8800OPT09 ARIB-T98				
	8800OPT10 Tracking Generator				
	8800OPT14 PTC				
	8800OPT102 Kenwood P25 Series Auto-Test and Align; Requires Opt04				
	8800OPT103 Motorola APX Series Auto-Test and Align; Requires Opt04				
	8800OPT05 P25 Phase II; Requires Opt04				
	8800OPT105 Motorola ASTRO 25 Series Auto-Test and Align; Requires Opt04				
	8800OPT111 Harris P25 Series Auto-Test and Align; Requires Opt04				
	8800OPT112 Tait P25 Series Auto-Test; Requires Opt04				
	8800OPT114 BK KNG Series Auto-Test and Align; Requires Opt04				
	8800OPT115 EF Johnson Viking Series Auto-Test and Align; Requires Opt04				
	8800OPT128 Motorola APX8000 Auto-Test and Align; Requires Opt103				
	8800OPT129 Motorola APX B Series Auto-Test and Align; Requires Opt103				
	8800OPT130;Motorola APX Next Series Auto-Test and Alignment; Requires OPT 103				
	8800OPT107 Kenwood NX-3000 / 5000 Series Auto-Test and Align				
	8800OPT117 Harris XL Series Auto-Test and Align; Requires Opt04				
	8800 Precision DTF / VSWR Accessory Kit; Requires Opt10				

NOTES:

* Quantities are estimated for bid evaluation purposes only.

SOLICITATION NUMBER:
Addendum Number:

The purpose of this addendum is to modify the solicitation identified as ("Solicitation") to reflect the change(s) identified and described below.

Applicable Addendum Category:

[   ]   Modify bid opening date and time

[   ]   Modify specifications of product or service being sought

[   ]   Attachment of vendor questions and responses

[   ]   Attachment of pre-bid sign-in sheet

[   ]   Correction of error

[   ]   Other

Description of Modification to Solicitation:

Additional Documentation: Documentation related to this Addendum (if any) has been included herewith as Attachment A and is specifically incorporated herein by reference.

Terms and Conditions:

1. All provisions of the Solicitation and other addenda not modified herein shall remain in full force and effect.

2. Vendor should acknowledge receipt of all addenda issued for this Solicitation by completing an Addendum Acknowledgment, a copy of which is included herewith. Failure to acknowledge addenda may result in bid disqualification. The addendum acknowledgement should be submitted with the bid to expedite document processing.

ATTACHMENT A

ADDENDUM ACKNOWLEDGEMENT FORM
SOLICITATION NO.: _____

Instructions: Please acknowledge receipt of all addenda issued with this solicitation by completing this addendum acknowledgment form. Check the box next to each addendum received and sign below. Failure to acknowledge addenda may result in bid disqualification.

Acknowledgment: I hereby acknowledge receipt of the following addenda and have made the necessary revisions to my proposal, plans and/or specification, etc.

Addendum Numbers Received:
(Check the box next to each addendum received)

      [X]   Addendum No. 1   [   ]   Addendum No. 6

      [   ]   Addendum No. 2   [   ]   Addendum No. 7

      [   ]   Addendum No. 3   [   ]   Addendum No. 8

      [   ]   Addendum No. 4   [   ]   Addendum No. 9

      [   ]   Addendum No. 5   [   ]   Addendum No. 10

I understand that failure to confirm the receipt of addenda may be cause for rejection of this bid. I further understand that any verbal representation made or assumed to be made during any oral discussion held between Vendor's representatives and any state personnel is not binding. Only the information issued in writing and added to the specifications by an official addendum is binding.

               _____VIAVI Solutions Inc._____
               Company

               _____ _____ _____
               Authorized Signature

               _____August 9, 2023_____
               Date

NOTE: This addendum acknowledgement should be submitted with the bid to expedite document processing.
Revised 6/8/2012

Addendum 1
ARFQ 0606 HSE2400000001
Viavi 8800SX Digital Radio Test Set or Equal

Vendor Questions and Agency Responses:

1. Comments: The 8800SX is a Digital Radio Test Set where many of the function offered are either "standard" (provided in the base instrument as a standard feature) or "options" where specific functions are enabled with software options that are separate from the base instrument feature set. Options are added to configure the instrument to perform specific functions at an additional cost to the base instrument.   Some of the options require other options as a prerequisite to allow that feature to be enabled.

    In addition, the 8800SX also has hardware accessories included with the base instrument, but also accessories that are not part of the base instrument, but provide additional functionality when purchased separately.   For example, the 8800 Precision DTF / VSWR Accessory Kit part number 114348 provides an RF Bridge and Splitter to allows for precision Distance to Fault (DTF) and Vertical Standing Wave Ratio measurements to be performed.

    While the instrument in and of itself has the capability to perform a specific function, only when the option is enabled would that specific function be available for use (applies only to functions that are not part of the standard features). In addition, specific accessories add further functionality to the base instrument when used with corresponding standard or optional functions.

    Section 3.1 contains reference to both standard capabilities and optional capabilities.   We would request further clarification as to what options would be required to meet the requirements of this RFQ. Below is a review of each section where clarification is requested.

    Section 3.1.1 sub items contain references to both standard and optional functions.

    Sections 3.1.1.1 to 3.1.1.6 are standard functions provided with the base instrument.

    Section 3.1.1.7 "Shall have a Tracking Generator" requires the option 113339 - 8800OPT10 Tracking Generator. **Please confirm that option 113339 is required.**

    A. **Option 113339 is Required**

    Section 3.1.1.8 "Test Set shall be capable of performing RF cable fault location". The instrument can perform cable fault location with just the Tracking Generator mentioned above, however precision RF cable fault location requires the accessory "114348 - 8800 Precision DTF / VSWR Accessory Kit". **Please confirm that accessory 114348 - 8800 Precision DTF / VSWR Accessory Kit is required.**

    A. **Accessory 114348 – 8800 Precision DTF / VSWR Accessory Kit is required.**

    Sections 3.1.1.9 to 3.1.1.17 are standard functions provided with the base instrument.

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Sections 3.1.1.18 and subsequent subsections require options to meet these requirements. These options are for automated testing and alignment of specific OEM radios or radio families. Per the Viavi price list, the options required would be as follows:

- 113337 - 8800OPT04 P25 Conventional
- 138895 - 8800OPT05 P25 Phase II; Requires 8800OPT04 P25 Conventional as a prerequisite
- 139315 - 8800OPT105 Motorola ASTRO 25 Series Auto-Test and Align; Requires 8800OPT04 P25 Conventional as a prerequisite
- 138527 - 8800OPT103 Motorola APX Series Auto-Test and Align; Requires 8800OPT04 P25 Conventional as a prerequisite
- 140868 - 8800OPT128 Motorola APX8000 Auto-Test and Align; Requires 8800OPT103 Motorola APX Series Auto-Test and Align as a prerequisite
- 140900 - 8800OPT129 Motorola APX B Series Auto-Test and Align; Requires 8800OPT103 Motorola APX Series Auto-Test and Align as a prerequisite
- 8800OPT130 - Motorola APX NEXT Series Auto-Test and Align; Requires 8800OPT103 Motorola APX Series Auto-Test and Align as a prerequisite
- 138526 - 8800OPT102 Kenwood P25 Series Auto-Test and Align; Requires 8800OPT04 P25 Conventional as a prerequisite
- 141178 - 8800OPT107 Kenwood NX-3000 / 5000 Series Auto-Test and Align; Requires 8800OPT04 P25 Conventional as a prerequisite
- 139320 - 8800OPT115 EF Johnson Viking Series Auto-Test and Align; Requires 8800OPT04 P25 Conventional as a prerequisite
- 139317 - 8800OPT111 Harris P25 Series Auto-Test and Align; Requires 8800OPT04 P25 Conventional as a prerequisite
- 141180 - 8800OPT117 Harris XL Series Auto-Test and Align; Requires 8800OPT04 P25 Conventional as a prerequisite
- 139319 - 8800OPT114 BK KNG Series Auto-Test and Align; Requires 8800OPT04 P25 Conventional as a prerequisite
- 139318 - 8800OPT112 Tait P25 Series Auto-Test; Requires 8800OPT04 P25 Conventional as a prerequisite

These capabilities refer to OEM radios that specifically related to the P25 Phase 1 and Phase 2 technical standard. **Please confirm if all the above options are required or if only some of the above are required.**

A. **All of the above options are required.**

Sections 3.1.2 to 3.1.13 are standard functions provided with the base instrument.

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Viavi 8800SX Digital Radio Test Set or Equal

Section 3.1.14 "RF Generator Modulation" sub items contain references to both standard and optional functions.

Sections 3.1.14.1.1 is a standard function provided with the base instrument.

Section 3.1.14.1.2 references multiple digital radios technologies that include P25 Phase 1 and Phase 2 (C4FM, H-CPM, H- DQPSK), as required in section 3.1.1.18, but also requires non-P25 technology options specifically:

- 113334 - 8800OPT01 DMR
- 113335 - 8800OPT02 dPMR
- 113338 - 8800OPT09 ARIB-T98 (a Japanese technical standard)
- 113336 - 8800OPT03 NXDN
- 113343 - 8800OPT14 PTC (a technical standard used by the railroads called Positive Train Control – or PTC)

Please confirm if any of these options are required.

A. **All of these Options are required.**

Sections 3.1.14.1.3 to 3.1.14.1.8 are standard functions provided with the base instrument.

Sections 3.1.15 to 3.1.25 are standard functions provided with the base instrument.

Section 3.1.26 "Receiver Demodulation Types" sub items contain references to both standard and optional functions.

Section 3.1.26.1 references multiple digital radios technologies that include P25 Phase 1 and Phase 2 (C4FM, H-CPM, H- DQPSK), as required in section 3.1.1.18, but also requires non-P25 technology options specifically:

- 113334 - 8800OPT01 DMR
- 113335 - 8800OPT02 dPMR
- 113338 - 8800OPT09 ARIB-T98 (a Japanese technical standard)
- 113336 - 8800OPT03 NXDN
- 113343 - 8800OPT14 PTC (a technical standard used by the railroads called Positive Train Control – or PTC)

Please confirm if any of these options are required.

A. **All of these options are required.**

- Note that AM and FM are standard functions provided with the base instrument.

Sections 3.1.27 to 3.1.36 are standard functions provided with the base instrument.

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Section 3.1.37 "P25 Measurements" sub items contain references to optional functions, specifically:

- 113337 - 8800OPT04 P25 Conventional
- 138895 - 8800OPT05 P25 Phase II; Requires 8800OPT04 P25 Conventional as a prerequisite

As stated in section 3.1.1.18 above, please confirm if any of these options are required.

A. All options are required.

Section 3.1.38 "DMR Measurements" sub items contain references to optional functions, specifically:

- 113334 - 8800OPT01 DMR

As stated in section 3.1.14 above, please confirm if this option is required.

A. This option is required.

Sections 3.1.39 to 3.1.52 are standard functions provided with the base instrument.

Section 3.1.53 "Viavi 8800SX Options and Accessories or Equal" sub items contain references to both standard and optional functions/accessories.

Section 3.1.53.1 are standard hardware accessories provided with the base instrument.

Sections 3.1.53.2 and sub section 3.1.53.2.1 reference "Options shall include at a minimum" and "All available and developed options to include warranty options", where many of the available and developed options (49 in total) would dramatically increase the cost of the instrument if all available and developed options were included as part of our response to this RFQ. Clarification of the above questions would narrow the requirement to just those needed by the State of West Virginia.

In reference to the document "Final_ARFQ_0606_HSE2400000001_1_WV_ARFQ_FORM.PDF"

Line items 2 to 7 reference a quantity of 50 each per line item. We understand this to be an estimated usage quantity, not the actual RFQ quantity at award. **Please confirm if this understanding is correct.**

A. A quantity of 50 is for bidding purposes only and not a guaranteed purchase quantity.

STATE OF WEST VIRGINIA

PURCHASING AFFIDAVIT

CONSTRUCTION CONTRACTS: Under W. Va. Code § 5-22-1(i), the contracting public entity shall not award a construction contract to any bidder that is known to be in default on any monetary obligation owed to the state or a political subdivision of the state, including, but not limited to, obligations related to payroll taxes, property taxes, sales and use taxes, fire service fees, or other fines or fees.

ALL CONTRACTS: No contract or renewal of any contract may be awarded by the state or any of its political subdivisions to any vendor or prospective vendor when the vendor or prospective vendor or a related party to the vendor or prospective vendor is a debtor and: (1) the debt owed is an amount greater than one thousand dollars in the aggregate; or (2) the debtor is in employer default.

> **EXCEPTION:** The prohibition listed above does not apply where a vendor has contested any tax administered pursuant to chapter eleven of the W. Va. Code, workers' compensation premium, permit fee or environmental fee or assessment and the matter has not become final or where the vendor has entered into a payment plan or agreement and the vendor is not in default of any of the provisions of such plan or agreement.

> **DEFINITIONS:**

> **"Debt"** means any assessment, premium, penalty, fine, tax or other amount of money owed to the state or any of its political subdivisions because of a judgment, fine, permit violation, license assessment, defaulted workers' compensation premium, penalty or other assessment presently delinquent or due and required to be paid to the state or any of its political subdivisions, including any interest or additional penalties accrued thereon.

> **"Employer default"** means having an outstanding balance or liability to the old fund or to the uninsured employers' fund or being in policy default, as defined in W. Va. Code § 23-2c-2, failure to maintain mandatory workers' compensation coverage, or failure to fully meet its obligations as a workers' compensation self-insured employer. An employer is not in employer default if it has entered into a repayment agreement with the Insurance Commissioner and remains in compliance with the obligations under the repayment agreement.

> **"Related party"** means a party, whether an individual, corporation, partnership, association, limited liability company or any other form or business association or other entity whatsoever, related to any vendor by blood, marriage, ownership or contract through which the party has a relationship of ownership or other interest with the vendor so that the party will actually or by effect receive or control a portion of the benefit, profit or other consideration from performance of a vendor contract with the party receiving an amount that meets or exceed five percent of the total contract amount.

AFFIRMATION: By signing this form, the vendor's authorized signer affirms and acknowledges under penalty of law for false swearing (*W. Va. Code* §61-5-3) that: (1) for construction contracts, the vendor is **not** in default on any monetary obligation owed to the state or a political subdivision of the state, and (2) for all other contracts, that neither vendor nor any related party owe a debt as defined above and that neither vendor nor any related party are in employer default as defined above, unless the debt or employer default is permitted under the exception above.

WITNESS THE FOLLOWING SIGNATURE:

Vendor's Name: _VIAVI Solutions Inc._

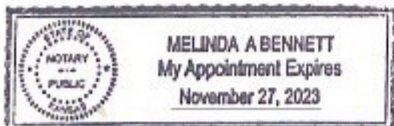Authorized Signature: _M.V. Taylor_   Date: _08/09/2023_

State of _Kansas_

County of _Sedgwick_, to-wit:

Taken, subscribed, and sworn to before me this _9th_ day of _August_, 20 _23_

My Commission expires _November 27th_, 20 _23_

AFFIX SEAL HERE   NOTARY PUBLIC _Melinda A. Bennett_

Purchasing Affidavit (07/09/2021)

MELINDA A BENNETT
My Appointment Expires
November 27, 2023

![VIAVI Solutions logo]

Viavi Solutions Inc.
20250 Century Blvd
Germantown, MD 20874
United States
240-404-2112
844-468-4284 (Tollfree)

ger.neworders@viavisolutions.com

QUOTE

Sales Representative	Customer	
Joseph Gomez Phone: 1-301-219-3900 Email: Joe.Gomez@ViaviSolutions.com	State of West Virginia - Division of Emergency Management 1124 Smith Street Suite 2100 Charleston, West Virginia United States, 25301	

Quote Number	294115646-1
Expiration Date	02-SEP-2023
Customer Contact	Herbert M. Skeens

Send Order To:
VIAVI Germantown by fax on 240 404 1299 or email: ger.neworders@viavisolutions.com - PLEASE REFERENCE QUOTE NUMBER ON ALL ORDERS

Currency	Payment Terms	Freight Terms	Delivery Date	Revision No	EID	Account No
USD	Under Review	FCA ORIGIN FACTORY	Delivery will be confirmed upon receipt of order	1		

Line	Product	Description	Qty	Units	Unit Price	Line Total
1	8800SX-FAMILY	8800SX-FAMILY;8800SX Family Configurator	1	EA		
	139942	139942;8800SX Radio Test Set with Internal Precision Power Meter	1	EA	20,956.05	20,956.05
	8800-HWO	8800-HWO;1 Yr Extended HW Warranty only - BRONZE-2 Duration: 1 YRS	1		630.00	630.00
	113334	113334;8800OPT01 DMR	1	EA	2,446.25	2,446.25
	113335	113335;8800OPT02 dPMR	1	EA	2,446.25	2,446.25
	113336	113336;8800OPT03 NXDN	1	EA	2,446.25	2,446.25
	113337	113337;8800OPT04 P25 Conventional	1	EA	2,446.25	2,446.25
	113338	113338;8800OPT09 ARIB-T98	1	EA	2,446.25	2,446.25
	113339	113339;8800OPT10 Tracking Generator	1	EA	1,220.75	1,220.75
	113343	113343;8800OPT14 PTC	1	EA	4,222.75	4,222.75
	138526	138526;8800OPT102 Kenwood P25 Series Auto-Test and Align; Requires Opt04	1	EA	2,773.05	2,773.05
	138527	138527;8800OPT103 Motorola APX Series Auto-Test and Align; Requires Opt04	1	EA	2,773.05	2,773.05
	138895	138895;8800OPT05 P25 Phase II; Requires Opt04	1	EA	2,446.25	2,446.25
	139315	139315;8800OPT105 Motorola ASTRO 25 Series	1	EA	2,883.25	2,883.25

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QUOTE

Quote#: 294115646-1

Date:03-AUG-2023   Page **2** OF **4**

Line	Product	Description	Qty	Units	Unit Price	Line Total
		Auto-Test and Align; Requires Opt04				
	139317	139317;8800OPT111 Harris P25 Series Auto-Test and Align; Requires Opt04	1	EA	2,773.05	2,773.05
	139318	139318;8800OPT112 Tait P25 Series Auto-Test; Requires Opt04	1	EA	2,773.05	2,773.05
	139319	139319;8800OPT114 BK KNG Series Auto-Test and Align; Requires Opt04	1	EA	2,773.05	2,773.05
	139320	139320;8800OPT115 EF Johnson Viking Series Auto-Test and Align; Requires Opt04	1	EA	2,773.05	2,773.05
	140868	140868;8800OPT128 Motorola APX8000 Auto-Test and Align; Requires Opt103	1	EA	740.05	740.05
	140900	140900;8800OPT129 Motorola APX B Series Auto-Test and Align; Requires Opt103	1	EA	740.05	740.05
	8800OPT130	8800OPT130;Motorola APX Next Series Auto-Test and Alignment; Requires OPT 103	1	EA	1,756.55	1,756.55
	141178	141178;8800OPT107 Kenwood NX-3000 / 5000 Series Auto-Test and Align; See note	1	EA	2,773.05	2,773.05
	141180	141180;8800OPT117 Harris XL Series Auto-Test and Align; Requires Opt04	1	EA	2,773.05	2,773.05
	114348	114348;8800 Precision DTF / VSWR Accessory Kit; Requires Opt10	1	EA	3,309.00	3,309.00
2	56080	Fuse;Norm;FUSE;5A;32V;MINI BLADE	50	EA	2.00	100.00
3	27478	Cable;Cord Power;16AWG;Male TP-11; RA Female TC-06; Black;125V;13A;2600mm;AC Power Cord	50	EA	25.00	1,250.00
4	20327	Conn;Adapter;50 Ohm; N Plug to BNC Jack; Straight;	50	EA	40.85	2,042.50
5	BATTERY-FAMILY	BATTERY-FAMILY;Battery Family Configurator	1	EA		
	67076	67076;AC27005 Battery; Spare; Internal	50	EA	350.00	17,500.00
6	67374	67374;PURCH ASSY;Pwr Supply	50	EA	285.00	14,250.00
7	141125	141125;8800 Series Front Cover	50	EA	31.00	1,550.00

Subtotal	110,012.85
Taxes as applicable	0.00
Total (USD)	110,012.85

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Additional Explanation

Standard Terms and Conditions
http://www.viavisolutions.com/terms

Warranty for VIAVI Hardware, Software, Services
www.viavisolutions.com/warranty

If an executed sales agreement or channel partner agreement exists between the Customer and VIAVI covering the products, services or solutions identified in this quotation, then it shall govern any purchase order received from the Customer relating to such products, services or solutions. In the absence of a sales agreement or channel partner agreement, by placing a purchase order with VIAVI, the Customer hereby accepts the applicability of VIAVI's quotation and standard terms and conditions (except for those specific terms included in this quotation which shall supersede any conflicting standard terms and conditions), which are attached to this quotation and are available at www.viavisolutions.com/terms. This quotation supersedes any previous communications, quotations, representations or agreements between the parties, whether oral or written, regarding transactions hereunder. VIAVI does not accept, expressly or impliedly, and VIAVI hereby rejects, any additional or different terms or conditions that the Customer presents, including, but not limited to, any terms or conditions contained or referenced in any purchase order, acceptance, acknowledgment, or other document, or established by trade usage or prior course of dealing, unless VIAVI expressly and unambiguously agrees to such terms and conditions in a duly signed writing. The application of the VIAVI terms and conditions shall be deemed effective unless the Customer has expressly notified VIAVI to the contrary prior to the earlier of three (3) business days after the issuance of VIAVI's order acknowledgment or any shipment or other performance of this order by VIAVI.
 Please note that if certain products in this quotation are subject to Export Control, any stated delivery shall be subject to receipt of the relevant export license. To minimize delays, Customer should provide an End-User Undertaking when placing its purchase order.

This is VIAVI//Restricted Information

For questions or concerns regarding your order, please contact Customer Care at 1 844 GO VIAVI (1-844-468-4284),option 2 or email NAM.CustomerCare@viavisolutions.com.

QUOTE

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Quote#: 294115646-1

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Included Items

Product	Item Number	Description	Qty
139942	22143971	139942;8800SX Radio Test Set with Internal Precision Power Meter	1
	139942	139942-TS;8800SX Radio Test Set with Internal Precision Power Meter	1