TrellisWare® Product Catalog

TSM Shadow® Radios
- TW-135 TSM Shadow® High Power Radio (HPR)
- TW-950 TSM Shadow® Radio
- TW-900 TSM Shadow® Radio
- TW-650 TSM Shadow® Module

TSM Ghost™ Radios
- TW-875 TSM Ghost™ Radio
- TW-870 TSM Ghost™ Radio

TSM Spirit™ Radios
- TW-860 TSM Spirit™ Radio
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About TrellisWare

TrellisWare was founded by four innovators in the areas of signal processing and advanced communications. In the year 2000, the co-founders decided to pursue terrestrial applications of technology that combined foundations in signal processing innovation, with the ability to productize these ideas for the real-world in the commercial sector. We are now a worldwide leader in highly advanced algorithms, waveforms, and communications systems that range from small form factor radio products to fully integrated solutions.

Today, TrellisWare’s technology is a critical component of modern tactical networks. Our TSM™ waveform is incorporated into a wide range of systems, including TrellisWare radios, trusted industry partner radios, and multiple government and commercial solutions. Our highly adaptable network facilitates mission critical voice and data delivery in the most severe conditions.

TrellisWare is leading innovative development programs covering a wide range of technologies that aim to meet emerging customer mission requirements. These include High Frequency (HF) radio, Troposcatter, Interference Mitigation, Dynamic Spectrum Allocation (DSA), and Free Space Optics (FSO), to name a few.

TrellisWare® is a registered trademark of TrellisWare Technologies, Inc.
PHOTOS BY: SPC. ISAIAH MATTHEWS (HUMVEE) AND U.S. AIR FORCE MASTER SGT. BARRY LOO (FAST ATTACK BOAT)
The TrellisWare TSM™ Waveform is the leading Mobile Ad-hoc Networking (MANET) solution to support uninterrupted communications in real dynamic environments. TrellisWare’s proprietary technology, known as Barrage Relay™, eliminates routing, minimizes network overhead, and provides unrivaled scalability. TSM supports 400+ nodes in a single channel, enabling a truly flat network.

The TSM waveform provides mission critical voice, situational awareness, and data sharing without depending on infrastructure or pre-deploying equipment. As a true Software Defined Radio (SDR) waveform, the TSM waveform can be implemented on many different SDRs.

The TSM waveform is also available in low SWaP SDRs that are embeddable into platforms ranging from commercial micro unmanned aerial systems to tactical radios. The result is an ecosystem that forms the most powerful network, enabling interoperability between partner platforms, sensors, and systems.
Each radio in the Trellisware® family of TSM products runs with the robust TSM-6 waveform. The TSM Shadow® radios are available as full-featured handhelds or in vehicular configurations, while the TSM Ghost™ radios are small form factor and simplified. Both product lines are Software Defined Radios (SDR) that support a wide frequency range. TSM products interoperate with each other over the TSM network and are easy to integrate into larger systems for complete coverage, security, and service.
TSM Shadow® Product Line

TW-135 TSM Shadow® HPR

TW-900 TSM Shadow® Radio

TW-650 TSM Shadow® Module

TSM Ghost™ Product Line

TW-870 TSM Ghost™ Radio

TW-875 TSM Ghost™ Radio

TSM Spirit™ Product

TW-860 TSM Spirit™ Radio
TW-135 TSM SHADOW® HIGH POWER RADIO (HPR)

**Specifications**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Size</strong></td>
<td>3.4 H x 5.25 W x 7.26 D in (8.64 x 13.34 x 18.44 cm)</td>
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<tr>
<td><strong>Weight (R/T only)</strong></td>
<td>6.4 lbs (2.90 kg)</td>
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<tr>
<td><strong>Frequency Range</strong></td>
<td>L-UHF 225-450 MHz</td>
</tr>
<tr>
<td></td>
<td>U-UHF 698-970 MHz</td>
</tr>
<tr>
<td></td>
<td>L/S Bands 1250–2600 MHz</td>
</tr>
<tr>
<td><strong>Configurable Bandwidth</strong></td>
<td>1.2, 3.6, 10, 20, 40 MHz</td>
</tr>
<tr>
<td><strong>Transmit Power</strong></td>
<td>100mW, 2W, 5W, 10W, 20W</td>
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<tr>
<td><strong>Operating Temperature</strong></td>
<td>-20°C to +55°C (-4°F to +131°F)</td>
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<tr>
<td><strong>Environmental</strong></td>
<td>MIL-STD-810G</td>
</tr>
<tr>
<td><strong>Water Resistant</strong></td>
<td>IP67</td>
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<tr>
<td><strong>Connectors</strong></td>
<td>ODU Data/Audio, TNC RF, SMA GPS, 36-Pin MFC Side Connector, 6-Pin Audio</td>
</tr>
<tr>
<td><strong>IP Support</strong></td>
<td>IPv4, IPv6; Unicast, Multicast, Broadcast; TCP, UDP</td>
</tr>
<tr>
<td><strong>Audio Encoding</strong></td>
<td>AMR 5.9, MELPe, AAC Audio</td>
</tr>
<tr>
<td><strong>Video Encoding</strong></td>
<td>SD and HD H.264</td>
</tr>
<tr>
<td><strong>Waveform</strong></td>
<td>TSM Release 6</td>
</tr>
</tbody>
</table>

**Highlights**

- Amplified power for vehicular or aerial networks
- Up to 200+ miles with Long Range Mode enabled
- Expand TSM 6 Network range

Photos by: CPL. Scott Jenkins (Humvee), The U.S. Air Force (C-17) and Tommie Horton (Mobile Unit)
TW-950 TSM SHADOW® RADIO

**Highlights**
- Up to 16 Mbps and 32 talk groups
- SD and HD H.264 video encoding
- UHF, L-band, S-band in a single radio
- Transflective LCD display for controlled visibility
- 2 Talk Group- simultaneous capable

**SPECIFICATIONS**

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<th>Specification</th>
<th>Details</th>
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<tr>
<td><strong>Size</strong></td>
<td>4.54 H x 2.76 W x 0.90 D in (11.53 x 7.01 x 2.29 cm)</td>
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<td><strong>Weight (R/T only)</strong></td>
<td>11.3 oz (0.32 kg)</td>
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<tr>
<td><strong>Frequency Range</strong></td>
<td>L-UHF: 225–450 MHz</td>
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<tr>
<td></td>
<td>U-UHF: 698–970 MHz</td>
</tr>
<tr>
<td></td>
<td>L/S-bands: 1250–2600 MHz</td>
</tr>
<tr>
<td><strong>Configurable Bandwidth</strong></td>
<td>1.2, 3.6, 10, 20, 40 MHz</td>
</tr>
<tr>
<td><strong>Transmit Power</strong></td>
<td>100mW, 250mW, 500mW, 1W, 2W</td>
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<tr>
<td><strong>Battery Life</strong></td>
<td>8 Hours with 32 Wh Rechargeable Battery</td>
</tr>
<tr>
<td><strong>Environmental</strong></td>
<td>MIL-STD-810G</td>
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<tr>
<td><strong>Operating Temperature</strong></td>
<td>-20°C to +55°C (-4°F to +131°F)</td>
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<tr>
<td><strong>Water Resistant</strong></td>
<td>IP68</td>
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<tr>
<td><strong>Connectors</strong></td>
<td>ODU Data/Audio, TNC RF, SMA GPS, 36-Pin Side Connector</td>
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<tr>
<td><strong>Data Rate</strong></td>
<td>Pt. to Pt., up to 16 Mbps (1-hop)</td>
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<tr>
<td><strong>IP Support</strong></td>
<td>IPv4, IPv6; Unicast, Multicast, Broadcast; TCP, UDP</td>
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<tr>
<td><strong>Audio Encoding</strong></td>
<td>AMR 5.9, MELPe, AAC Audio</td>
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<td><strong>Video Encoding</strong></td>
<td>SD and HD H.264</td>
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<tr>
<td><strong>Waveform</strong></td>
<td>TSM Release 6</td>
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</table>
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Audio/Data Adapters

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## TW-900 TSM SHADOW® RADIO

### SPECIFICATIONS

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<th>Specification</th>
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<td>Size</td>
<td>4.54 H x 2.76 W x 0.90 D in (11.53 x 7.01 x 2.29 cm)</td>
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<tr>
<td>Weight (R/T only)</td>
<td>11.3 oz (0.32 kg)</td>
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<tr>
<td>Configurable Bandwidth</td>
<td>1.2, 3.6, 10, 20, 40 MHz</td>
</tr>
<tr>
<td>Transmit Power</td>
<td>100mW, 250mW, 500mW, 1W, 2W</td>
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<tr>
<td>Battery Life</td>
<td>8 Hours with 32 Wh Rechargeable Battery</td>
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<tr>
<td>Environmental</td>
<td>MIL-STD-810G</td>
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<tr>
<td>Operating Temperature</td>
<td>-20°C to +55°C (-4°F to +131°F)</td>
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<tr>
<td>Water Resistant</td>
<td>IP68</td>
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<tr>
<td>Connectors</td>
<td>ODU Data/Audio, TNC RF, SMA GPS, 36-Pin Side Connector</td>
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<tr>
<td>Data Rate</td>
<td>Pt. to Pt., up to 16 Mbps (1-hop)</td>
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<tr>
<td>IP Support</td>
<td>IPv4, IPv6; Unicast, Multicast, Broadcast; TCP, UDP</td>
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<td>Audio Encoding</td>
<td>AMR 5.9, MELPe, AAC Audio</td>
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<td>Video Encoding</td>
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<td>Net Entry Time</td>
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<td>Waveform</td>
<td>TSM Release 6</td>
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### Highlights
- Up to 16 Mbps and 32 talk groups
- SD and HD H.264 video encoding
- UHF, L-Band, S-Band in a single radio

*Note: Product model TW-900 provides TSM Shadow capabilities without the front panel screen or keypad.*
**TW-900 TSM Shadow® Radio**

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- **TW-1255**
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TW-650 TSM SHADOW® CORE BOARD MODULE

SPECIFICATIONS

<table>
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<th>Specifications</th>
<th>Details</th>
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<tr>
<td>Size</td>
<td>2.92 H x 2.0 W x 0.108 D in (7.42 x 5.08 x 0.27 cm)</td>
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<td>Weight</td>
<td>1.12 oz (0.03 kg) (core board with shielding)</td>
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<td>Frequency Range</td>
<td>L-UHF 225-450 MHz, U-UHF 698-970 MHz, L/S Bands 1250–2600 MHz</td>
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<td>Configurable Bandwidth</td>
<td>1.2, 3.6, 10, 20, 40 MHz</td>
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<td>Transmit Power</td>
<td>0.1–2W</td>
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<td>Input Power</td>
<td>3.0–4.0 VDC, 9.8 W max</td>
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<td>Security</td>
<td>Built-in AES-256 COMSEC and TRANSEC</td>
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<td>Connectors</td>
<td>Board Mount, Power and Control, PTT Audio, USB 2.0 Ports (USB-OTG, USB-H1), Serial UARTs, I2C, RF Antenna (SMP Jack), GPS</td>
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<tr>
<td>Data Rate</td>
<td>Pt. to Pt., Up to 16 Mbps (1-hop)</td>
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<td>IP Support</td>
<td>IPv4, IPv6; Unicast, Multicast, Broadcast; TCP, UDP</td>
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<td>Audio Encoding</td>
<td>AMR 5.9, MELPe</td>
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<tr>
<td>Video Encoding</td>
<td>H.264, HDMI, NTSC, PAL, MJPEG</td>
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<tr>
<td>Waveform</td>
<td>TSM Release 6</td>
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</table>

Highlights

• Embeddable single board module
• Low Size, Weight, and Power (SWaP)
• Module for end user integration and interoperability
TW-650 TSM Shadow® Module

RF Antenna Connector

Power Input Connector

Interface I/O
TW-875 TSM GHOST™ RADIO

Specifications

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<tr>
<th>Size</th>
<th>4.06 H x 2.50 W x 1.46 D in (10.31 x 6.35 x 3.71 cm)</th>
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<tr>
<td>Weight (R/T only)</td>
<td>16 oz (0.45 kg)</td>
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<tr>
<td>Frequency Range</td>
<td>L-UHF 225-450 MHz</td>
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<tr>
<td></td>
<td>U-UHF 698-970 MHz</td>
</tr>
<tr>
<td></td>
<td>L/S Bands 1250–2600 MHz</td>
</tr>
<tr>
<td>Configurable Bandwidth</td>
<td>1.2, 3.6, 10, 20, 40 MHz</td>
</tr>
<tr>
<td>Transmit Power</td>
<td>100mW, 250mW, 500mW, 1W, 2W</td>
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<tr>
<td>Input Power</td>
<td>5 V to 20 V</td>
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<td>Environmental</td>
<td>MIL-STD-810G</td>
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<tr>
<td>Water Resistance</td>
<td>IP68</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>-20°C to +55°C (-4°F to +131°F)</td>
</tr>
<tr>
<td>Connectors</td>
<td>USB On-the-Go, RF TNC, GPS SMA</td>
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<tr>
<td>Data Rate</td>
<td>Pt. to Pt., up to 16 Mbps (1-hop)</td>
</tr>
<tr>
<td>Waveform</td>
<td>TSM Release 6</td>
</tr>
</tbody>
</table>

Highlights

- Small Form Factor Network Relay
- Rechargeable internal battery
- Leave behind as unattended relay device
**Antennas**

- **TW-1110**
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- **TW-1140**
  1800/2200 RF Antenna pg. 27
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- **TW-1670**
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TW-870 TSM GHOST™ RADIO

Highlights

- Easy to embed, ideal for unmanned systems
- Fully capable TSM 6 data radio
- Low SWAP for integration solutions

SPECIFICATIONS

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
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<tbody>
<tr>
<td>Size</td>
<td>4.06 H x 2.25 W x 0.62 D in (10.31 x 5.72 x 1.57 cm)</td>
</tr>
<tr>
<td>Weight (R/T only)</td>
<td>8.8 oz (0.24 kg)</td>
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<tr>
<td>Frequency Range</td>
<td>L-UHF 225-450 MHz</td>
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<tr>
<td></td>
<td>U-UHF 698-970 MHz</td>
</tr>
<tr>
<td></td>
<td>L/S Bands 1250–2600 MHz</td>
</tr>
<tr>
<td>Configurable Bandwidth</td>
<td>1.2, 3.6, 10, 20, 40 MHz</td>
</tr>
<tr>
<td>Transmit Power</td>
<td>100mW, 250mW, 500mW, 1W, 2W</td>
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<tr>
<td>Input Power</td>
<td>8 V to 20 V, 21 W peak, 3A max</td>
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<tr>
<td>Environmental</td>
<td>MIL-STD-810G</td>
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<tr>
<td>Water Resistance</td>
<td>IP68</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>-20°C to +55°C (-4°F to +131°F)</td>
</tr>
<tr>
<td>Connectors</td>
<td>USB On-the-Go, RF SMA, GPS SMA, 4-Pin ODU Power</td>
</tr>
<tr>
<td>Data Rate</td>
<td>Pt. to Pt., up to 16 Mbps (1-hop)</td>
</tr>
<tr>
<td>Waveform</td>
<td>TSM Release 6</td>
</tr>
</tbody>
</table>

PHOTO BY: U.S. AIR FORCE· STAFF SGT. JOSHUA KLEINHOLZ(DRONE)
**Antennas**

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TW-860 TSM SPIRIT™ RADIO

Highlights

• Global Frequency Coverage
• Interoperable with all TSM-enabled radios
• World-class scalability and spectrum efficiency
• Designed for next-generation soldier systems, public safety, and first responder requirements

SPECIFICATIONS

<table>
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<tr>
<th>Specification</th>
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<tbody>
<tr>
<td>Size</td>
<td>4.70 H x 2.50 W x 0.74 D in (11.93 x 6.35 x 1.88 cm)</td>
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<tr>
<td>Weight (R/T only)</td>
<td>7.5 oz (0.21 kg)</td>
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<tr>
<td>Frequency Range</td>
<td>L-UHF 225-450 MHz, U-UHF: 698–970 MHz, L/S Bands: 1250–2600 MHz</td>
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<tr>
<td>Configurable Bandwidth</td>
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<td>Transmit Power</td>
<td>100mW, 250mW, 500mW, 1W, 2W</td>
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<td>Operating Temperature</td>
<td>-20°C to +55°C (-4°F to +131°F)</td>
</tr>
<tr>
<td>Environmental</td>
<td>MIL-STD-810H</td>
</tr>
<tr>
<td>Water Resistant</td>
<td>IP67</td>
</tr>
<tr>
<td>RF Connector</td>
<td>TNC</td>
</tr>
<tr>
<td>GPS Connector</td>
<td>SMA</td>
</tr>
<tr>
<td>Audio Connector</td>
<td>9-Pin Connector – Supports Dual Push-To-Talk (PTT) and Two Simultaneous Talkgroups</td>
</tr>
<tr>
<td>Power/Data Connector</td>
<td>12-Pin ODU Connector – Supports USB-C Power Delivery and Data</td>
</tr>
<tr>
<td>Expansion Connector</td>
<td>USB-A Connector – Supports Data, Programming, and Accessories</td>
</tr>
<tr>
<td>Power Input</td>
<td>5 V to 20 V, 3A max</td>
</tr>
<tr>
<td>Data Rate</td>
<td>Pt. to Pt., up to 16 Mbps (1-hop)</td>
</tr>
<tr>
<td>Waveform</td>
<td>TSM Release 6</td>
</tr>
</tbody>
</table>
TW-860 TSM Spirit™ Radio

- Headset Audio Port
- SMA GPS Antenna Port
- On/Off
- Up/Right
- Mode/Select
- Down/Left
- Daylight Readable LCD
- Full Menu: Status, Preset Change
- RF Antenna Port Rugged TNC
- 2-Ch Audio PTT1, PTT2, MIC, SPKR1, SPKR2
- USB Data Port for Optional WiFi/BT Accessories
- IP-67 Waterproof
- IP-68 Cap Available
- 12-Pin Rugged Power/Data USB Data
- 5-20V USB-C Power Delivery
- Aux Data, Commercial USB A
Accessories

Customize TSM radios to meet the needs of the network and mission with hardware accessories.
<table>
<thead>
<tr>
<th>Accessory</th>
<th>Catalog Number/Name</th>
<th>Description</th>
<th>Specifications</th>
<th>Compatible Radio</th>
</tr>
</thead>
</table>
| TW-1110 GPS Stub Antenna | | • GPS Stub antenna with a low profile immersion sealed design for GPS reception in disadvantaged areas  
• Designed for operation with an unpowered SMA port | **Weight:** 0.5 oz  
**Size:** 1.24" x 0.59"  
**Connector:** SMA  
**GPS L1 Band:** 1575.42 MHz | TW-135 TSM Shadow HPR  
TW-900/950 TSM Shadow  
TW-870/875 TSM Ghost  
TW-860 TSM Spirit |
| TW-1115 GPS Patch Antenna | | • GPS Patch antenna with 10’ cable and a magnetic back, allowing for remote use of a GPS receiver where the GPS signal may be stronger  
• Designed for operation with a powered SMA port | **Weight:** 2.7 oz  
**Size:** 1.44” x 0.5” x 0.177”  
**Cable Length:** 10’  
**Connector:** SMA | TW-135 TSM Shadow HPR  
TW-900/950 TSM Shadow  
TW-870/875 TSM Ghost  
TW-860 TSM Spirit |
| TW-1135 1800/2200 Dual Band RF Antenna | | • Includes a +2 dBi gain and is terminated in SMA  
• Gooseneck base can bend up to 90° | **Weight:** 1 oz  
**Size:** 8.5" x 1.13" x 0.5"  
**Connector:** SMA  
**Band:** 1755 - 1815 MHz, 2200 - 2270 MHz | TW-870 TSM Ghost |
| TW-1136 1800/2200 Dual Band RF Body Worn Antenna | | • Rugged and covert antenna especially designed to reduce the signature when worn remotely on the operator’s body  
• Operates in 1800, 2200 MHz frequency bands  
• Ships with SMA cable | **Weight:** 0.8 oz  
**Size:** 5.5” x 1.13”  
**Connector:** SMA  
**Band:** 1755 - 1815 MHz, 2200 - 2270 MHz | TW-870 TSM Ghost |
<table>
<thead>
<tr>
<th>Accessory</th>
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<tbody>
<tr>
<td><strong>Antennas</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>TW-1137 Dual Band</td>
<td>TW-1137</td>
<td>Ruggedized antenna for the TW-225 CheetahNet® Mini radio</td>
<td>Weight: 1.25 oz</td>
<td>TW-870 TSM Ghost</td>
</tr>
<tr>
<td>1400 1800 RF Antenna</td>
<td></td>
<td>Operates in the 1400 MHz and 1800 MHz frequency bands</td>
<td>Size: 9.0” x 1.5”</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Has a +2 dBi gain and is terminated in SMA</td>
<td>Connector: SMA</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gooseneck base can bend up to 90°</td>
<td>Band: 1410 - 1460 MHz, 1755 - 1815 MHz</td>
<td></td>
</tr>
<tr>
<td>TW-1138 SMA +4 dBi Antenna</td>
<td>TW-1138</td>
<td>Rugged antenna operating in 1800 and 2200 MHz frequency bands</td>
<td>Weight: 1.4 oz</td>
<td>TW-870 TSM Ghost</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Includes a +4 dBi gain +/- .5</td>
<td>Size: 11.25”</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Gooseneck base can bend up to 90°</td>
<td>Connector: SMA</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>Band: 1755 - 1815 MHz, 2200 - 2270 MHz</td>
<td></td>
</tr>
<tr>
<td>TW-1140 1800/2200 RF Antenna</td>
<td>TW-1140</td>
<td>Rugged antenna operating in 1800 and 2200 MHz frequency bands</td>
<td>Weight: 4.6 oz</td>
<td>TW-135 TSM Shadow HPR</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Includes a +2 dBi gain</td>
<td>Size: 10.0” x 0.9” x 0.6”</td>
<td>TW-900/950 TSM Shadow</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Includes a TNC connector to connect to TW-1141 Magnetic Mount</td>
<td>Connector: TNC</td>
<td>TW-875 TSM Ghost</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gooseneck base can bend up to 90°, and is rigid enough to support long-term operation in bent position</td>
<td>Band: 1755 - 1815 MHz, 2200 - 2270 MHz</td>
<td>TW-860 TSM Spirit</td>
</tr>
<tr>
<td>TW-1141 Magnetic Antenna Mount</td>
<td>TW-1141</td>
<td>Magnetic antenna mount to hold antennas in a secure location</td>
<td>Weight: 4.6 or 9.2 oz (depending on cable length)</td>
<td>TW-135 TSM Shadow HPR</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Includes 3 meters of cable terminated with a male TNC connector</td>
<td>Size: 3 Meters or 12’</td>
<td>TW-900/950 TSM Shadow</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>Connector: TNC</td>
<td>TW-875 TSM Ghost</td>
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<td></td>
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<td></td>
<td>TW-860 TSM Spirit</td>
</tr>
<tr>
<td>Accessory</td>
<td>Catalog Number/Name</td>
<td>Description</td>
<td>Specifications</td>
<td>Compatible Radio</td>
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</tr>
<tr>
<td>TW-1143 TNC +4dBi Antenna</td>
<td>TW-1143 TNC +4dBi Antenna</td>
<td>Rugged antenna operating in 1800 and 2200 MHz frequency bands • Includes a +4 dBi gain +/- .5 • Gooseneck base can bend up to 90°</td>
<td>Weight: 1.4 oz Size: 12” Connector: TNC Band: 1755 - 1815 MHz, 2200 - 2270 MHz</td>
<td>TW-135 TSM Shadow HPR TW-900/950 TSM Shadow TW-875 TSM Ghost TW-860 TSM Spirit</td>
</tr>
<tr>
<td>TW-1144 Narrow Band Antenna</td>
<td>TW-1144 Narrow Band Antenna</td>
<td>Housed in a thick UV stable radome and constructed from corrosion-resistant material for reliability in the harshest environments, this gooseneck antenna has consistent gain across the band</td>
<td>Weight: 4.5 oz Size: 15.9” Connector: TNC-N Band: 1250 - 1450 MHz</td>
<td>TW-875 TSM Ghost TW-900/950 TSM Shadow TW-860 TSM Spirit</td>
</tr>
<tr>
<td>TW-1145 Narrow Band Antenna</td>
<td>TW-1145 Narrow Band Antenna</td>
<td>Housed in a thick UV stable radome and constructed from corrosion-resistant material for reliability in the harshest environments, this gooseneck antenna has consistent gain across the band.</td>
<td>Weight: 4.0 oz Size: 13-1/8” Connector: TNC-M Band: 1750 - 1850 MHz</td>
<td>TW-875 TSM Ghost TW-900/950 TSM Shadow TW-860 TSM Spirit</td>
</tr>
<tr>
<td>TW-1146 Narrow Band Antenna</td>
<td>TW-1146 Narrow Band Antenna</td>
<td>Housed in a thick UV stable radome and constructed from corrosion-resistant material for reliability in the harshest environments, this gooseneck antenna has consistent gain across the band.</td>
<td>Weight: 3.7 oz Size: 12” Connector: TNC-M Band: 2200 - 2350 MHz</td>
<td>TW-875 TSM Ghost TW-900/950 TSM Shadow TW-860 TSM Spirit</td>
</tr>
<tr>
<td>TW-1150 L-UHF Antenna</td>
<td>TW-1150 L-UHF Antenna</td>
<td>Rugged antenna for UHF operations • Operates between 225 - 450 MHz frequency bands • TNC connector to connect to the TW-1141 Magnetic Mount</td>
<td>Weight: 3 oz Size: 10” Connector: TNC Band: 225 - 450 MHz</td>
<td>TW-875 TSM Ghost TW-900/950 TSM Shadow TW-860 TSM Spirit</td>
</tr>
<tr>
<td>Accessory</td>
<td>Catalog Number/Name</td>
<td>Description</td>
<td>Specifications</td>
<td>Compatible Radio</td>
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<td>Antennas</td>
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<tr>
<td>Antennas</td>
<td>TW-1151 L-UHF Antenna</td>
<td>• This rugged whip antenna achieves consistent gain across the L-UHF band in a compact form.</td>
<td>Weight: 2 oz</td>
<td>TW-900/950 TSM Shadow</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Size: 10.25”</td>
<td>TW-875 TSM Ghost</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Connector: TNC Female</td>
<td>TW-860 TSM Spirit</td>
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<td></td>
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<td></td>
<td>Band: 225 - 450 MHz</td>
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</tbody>
</table>
| TW-1152 UHF Manpack Dipple Antenna | TW-1152 UHF Manpack Dipple Antenna | • UHF 225 - 450 MHz  
• Dipole design  
• Designed for man-portable radios  
• Rugged high quality antenna with a durable construction | Weight: 9.52 oz               | TW-135 TSM Shadow HPR                               |
|                         |                     |                                                                              | Size: 22”                          | TW-900/950 TSM Shadow                                |
|                         |                     |                                                                              | Connector: TNC Female               | TW-875 TSM Ghost                                      |
|                         |                     |                                                                              | Band: 225 - 450 MHz                | TW-860 TSM Spirit                                     |
| TW-1160 L/S Band Antenna | TW-1160 L/S Band Antenna | • Broadband dipole antenna designed for military manpack or commercial mounted applications  
• Operates: 698 - 2600 MHz, U-UHF, and L/S bands  
• 4.5” gooseneck base bends up to 90° | Weight: 0.29 lb               | TW-135 TSM Shadow HPR                               |
|                         |                     |                                                                              | Size: 11.37”                       | TW-900/950 TSM Shadow                                |
|                         |                     |                                                                              | Connector: TNC                      | TW-875 TSM Ghost                                      |
|                         |                     |                                                                              |                                    | TW-860 TSM Spirit                                     |
| TW-1161 Body Worn Antenna | TW-1161 Body Worn Antenna | • Broadband dipole antenna with 36” cable, designed for body worn applications  
• Operates in 698 - 2600 MHz, upper UHF, and L/S bands | Weight: 0.29 lb               | TW-135 TSM Shadow HPR                               |
<p>|                         |                     |                                                                              | Size: 6”                           | TW-900/950 TSM Shadow                                |
|                         |                     |                                                                              | Connector: TNC                      | TW-875 TSM Ghost                                      |
|                         |                     |                                                                              |                                    | TW-860 TSM Spirit                                     |</p>
<table>
<thead>
<tr>
<th>Accessory</th>
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<td><strong>Antennas</strong></td>
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</tbody>
</table>
| | TW-1162 L/S Band Antenna | • Broadband dipole antenna designed for military manpack or commercial mounted applications  
  • Operates: 698 - 2600 MHz, U-UHF, and L/S bands  
  • 4.5” gooseneck base bends up to 90° | Weight: 0.29 lb  
Size: 10.5”  
Connector: SMA | TW-870 TSM Ghost |
| | TW-1163 Body Worn Antenna | • Broadband dipole antenna with 36” cable, designed for body worn applications  
  • Operates in 698 - 2600 MHz, upper UHF, and L/S bands | Weight: 0.29 lb  
Size: 6”  
Connector: SMA | TW-870 TSM Ghost |
| | TW-1165 225-450/1300-2600 MHz Antenna | • -3.0 ~ +1.0 dBi TNC Tri-Band antenna  
  • Operates: 225 - 450 MHz, 1300 - 2600 MHz band | Weight: 4.5 oz.  
Size: 11”  
Connector: TNC | TW-875 TSM Ghost  
TW-900/950 TSM Shadow  
TW-860 TSM Spirit |
| | TW-1170 L-UHF Vehicular Antenna | • Rugged vehicular antenna for ground-based communications | Size: 32”  
Weight: 4.9 lbs.  
Connector: Type N Female  
Band: 225 - 450 MHz | TW-135 TSM Shadow HPR |
<table>
<thead>
<tr>
<th>Accessory</th>
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</tbody>
</table>
| TW-1175 698-2600 MHz Vehicular Antenna | • Rugged vehicular antenna for ground-based communications                                                                                 | **Size:** 28.5”  
**Weight:** 5.0 lbs.  
**Connector:** Type N Female  
**Band:** 225 - 450 MHz | TW-135 TSM Shadow HPR  
TW-900/950 TSM Shadow  
TW-870/875 TSM Ghost  
TW-860 TSM Spirit |
| TW-1190 Dual Band Vehicular Antenna | • Rugged vehicular antenna for ground-based communications  
• Fully “oak beam” compliant  
• Has a +2 dBi gain and is terminated in TNC | **Weight:** 5 lbs  
**Size:** 39.00”  
**Connector:** TNC  
**Band:** 1775 - 1815 MHz, 2200 - 2250 MHz | TW-135 TSM Shadow HPR  
TW-900/950 TSM Shadow  
TW-870/875 TSM Ghost  
TW-860 TSM Spirit |
| **Dongles**        |                                      |                                                                                                                                             |                                                     |                                           |
| TW-1212 Ethernet Pigtail Dongle | • Immersible, rugged dongle that provides 100BaseT Ethernet data connectivity  
• Connects to the radio’s multi-functional side connector and provides a 1 meter pigtail cable that terminates in an RJ-45 connector | **Weight:** 2.4 oz  
**Cable Length:** 1 M  
100 Mbps transfer rates  
Ethernet Patch Cable | TW-135 TSM Shadow HPR  
TW-900/950 TSM Shadow |
| TW-1230 USB Host Dongle | • Simultaneously charge a USB device and connect to the TSM network  
• Dongle supplies up to 500 mA to USB charging compliant devices | **Weight:** 1.2 oz  
**Size:** 2.48” x .90" x 0.62”  
**Connector:** USB Type-A | TW-135 TSM Shadow HPR  
TW-900/950 TSM Shadow |
<table>
<thead>
<tr>
<th>Accessory</th>
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<th>Specifications</th>
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<td><strong>Dongles</strong></td>
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</tbody>
</table>
| TW-1250 Multi-Sensor Dongle     |                     | • Multi-Sensor dongle that provides a 100BaseT Ethernet, sensor connections, and control ports  
• Hosts two 2.5 mm Trigger In ports to connect directly to sensors, a 2.5 mm Trigger Out port, a 2.5 mm Power Out port, and BNC for analog video input | Weight: 1.7 oz  
Size: 3.69” x 0.86” x 0.88” | TW-135 TSM Shadow HPR  
TW-900/950 TSM Shadow |
| TW-1255 Ethernet Video Dongle   |                     | • Provides Nett Warrior Ethernet connection and BNC analog video input  
• Glenair Ethernet connector provides 500 mA @ 5 V  
• 2 M immersible with BNC cover and mating connector attached | Weight: 3.4 oz  
Size: 3.34” x 1.12” x 1.13”  
Connector: Nett Warrior Ethernet | TW-135 TSM Shadow HPR  
TW-900/950 TSM Shadow |
| TW-1260 Wi-Fi Dongle            |                     | • Acts as a Wi-Fi access point for a connection between the TSM network and other devices, such as smart phones and PDAs  
• Supports up to 16 clients simultaneously while delivering full network connectivity, including: IP data and full motion video, Web apps, Cursor on Target and JSON streams | Weight: 1.7 oz  
Size: 3.4” x 0.9” x 0.8” | TW-135 TSM Shadow HPR  
TW-900/950 TSM Shadow |
<table>
<thead>
<tr>
<th>Accessory</th>
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<tr>
<td><strong>Dongles</strong></td>
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</tr>
</tbody>
</table>
| **TW-1265 USB 6-Pin Pigtail Dongle** | TW-1265 USB 6-Pin Pigtail Dongle | • Immersible pigtail dongle that provides USB 2.0 connectivity  
• 6-Pin Glenair connector compatible with rugged military equipment  
• 1 M cable connects to the radio's multi-functional side connector  
• Radio acts as host and proves 500mA charging current to compliant devices | **Weight:** 1.9 oz  
**Length:** 1 M  
USB 2.0 Compatible  
6-Pin USB Connector | TW-135 TSM Shadow HPR  
TW-900/950 TSM Shadow |
| **TW-1725 HD Video Dongle** | TW-1725 HD Video Dongle | • Provides a means to High Definition video  
• Supports analog video input and all trigger functions (same as TW-1250 Multi-Sensor Dongle)  
• ODU connector exposes necessary signals for analog video input and all trigger I/O functions | **Weight:** 1.7 oz  
**Size:** 3.00” x 0.90” x 0.79”  
TW-1726 breakout cable  
HDMI | TW-135 TSM Shadow HPR  
TW-900/950 TSM Shadow |
| **TW-1726 HD Video Dongle** | TW-1726 HD Video Dongle | • Intended for use with the TW-1725 HD Video Dongle  
• The ODU plug on the cable mates with the ODU receptacle on the TW-1725 HD Video Dongle | **Weight:** 0.2 lbs  
**Size:** 21” Length | TW-1725 |
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Power/Mount Adapters</td>
<td></td>
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</tr>
</tbody>
</table>
| TW-1390 Power Adapter | TW-1390 | Enables connection to external AC power | Weight: 0.75 lbs  
Voltage: 12 V DC, 30 W max output  
Cable Length: 77" | TW-900/950 TSM Shadow |
| TW-1400 6–18 V Power Adapter | TW-1400 | Enables connection from handheld radios to external DC power for customizable power solutions | Weight: 1.8 oz  
Input Voltage: 6–18 V DC  
Cable Length: 16.21" | TW-900/950 TSM Shadow |
| TW-1401 Power Pigtail | TW-1401 | Supplies power from a remote power source | Weight: 2 oz  
Input Voltage: 6–18 V DC  
Cable Length: 2 M | TW-900/950 TSM Shadow |
| TW-1402 High Capacity Battery Adapter | TW-1402 | Provides interface to high capacity Thales MBITR and Harris batteries | Weight: 3.4 oz  
Size: 2.60" x 1.50" x 1.09"  
Input Voltage: 6–18 V DC  
Battery Life: Up to 20 hours | TW-900/950 TSM Shadow |
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<td><strong>Power/Mount Adapters</strong></td>
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<td></td>
</tr>
<tr>
<td>TW-1406 Power Cable</td>
<td>TW-1406</td>
<td>• Binder to BA-5590 Adapter</td>
<td><strong>Weight:</strong> 0.2 lbs</td>
<td>TW-900/950 TSM Shadow</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Enables connection to external power</td>
<td><strong>Extension Length:</strong> 78.74&quot;</td>
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<td></td>
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<td>• Use with accessory TW-1400</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TW-1407 Power Cable</td>
<td>TW-1407</td>
<td>• Binder to tajimi</td>
<td><strong>Weight:</strong> 2.4 oz</td>
<td>TW-900/950 TSM Shadow</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Enables connection to external power</td>
<td><strong>Input Voltage:</strong> 6–18 V DC</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Cable Length:</strong> 78.74&quot;</td>
<td></td>
</tr>
<tr>
<td>TW-1408 Glenair Binder Power Cable</td>
<td>TW-1408 Glenair Binder Power Cable</td>
<td>• Binder to Glenair adapter</td>
<td><strong>Weight:</strong> 0.05 lb (0.02 kg)</td>
<td>TW-900/950 TSM Shadow</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Enables connection from radio to a conformal battery</td>
<td><strong>Input Voltage:</strong> 6–18 V DC</td>
<td></td>
</tr>
<tr>
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<td></td>
<td></td>
<td><strong>Cable Length:</strong> 10&quot;</td>
<td></td>
</tr>
<tr>
<td>TW-1440 Remote Power Relay</td>
<td>TW-1440</td>
<td>• Controls power to auxiliary devices from radio</td>
<td><strong>Weight:</strong> 1.4 oz</td>
<td>TW-900/950 TSM Shadow</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• The relay is the connection between the auxiliary device and its power source</td>
<td><strong>Size:</strong> 1.54&quot; x 1.29&quot; x 0.8&quot;</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Use with the Power Out port on the TW-1250 Multi-Sensor Dongle for remote power</td>
<td><strong>Input Voltage:</strong> 30–220 V DC @ 60 W, 0–30 V DC @ 2 AMPs</td>
<td></td>
</tr>
<tr>
<td>TW-1450 32 Wh Rechargeable Battery</td>
<td>TW-1450</td>
<td>• Includes bayonet connector to connect to the radio</td>
<td><strong>Weight:</strong> 6.6 oz</td>
<td>TW-900/950 TSM Shadow</td>
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<td></td>
<td>• Connector locks into position with a latch</td>
<td><strong>Size:</strong> 3.20&quot; x 2.55&quot; x 0.95&quot;</td>
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<td></td>
<td></td>
<td>• Compatible with the TW-1460 Single Battery Charger and TW-1465 6-bay Battery Charger</td>
<td><strong>Battery:</strong> Lithium Ion</td>
<td></td>
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<tr>
<td>Accessory</td>
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<td>Description</td>
<td>Specifications</td>
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<tr>
<td>Power/Mount Adapters</td>
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</tbody>
</table>
| TW-1451 Battery, BB-2590 | TW-1451 Battery, BB-2590 | • Rugged, military tough case construction  
• SmartCircuit® Technology - Implements SMBus v1.1 smart battery technology  
• Flexible output voltage  
• State-of-Charge display  
• High energy density  
• Higher capacity version of UBI-2590 SMBus (UBBL13) | Weight: 3.1 lbs  
Size: 4.4" x 2.4" x 5.0"  
Battery: Lithium Ion | TW-135 TSM Shadow HPR |
| TW-1460 Single Battery Charger | TW-1460 Single Battery Charger | • Compact portable charger w/ DC power adapter for charging the TW-1450 32 Wh Rechargeable Battery  
• Low profile, easy to store, and charges a battery to full charge within 4 hours | Weight: 1.6 oz  
Size: 3.5" x 1.5" x 0.82" | TW-900/950 TSM Shadow |
| TW-1465 6-Bay Battery Charger | TW-1465 6-Bay Battery Charger | • Designed as a desktop style battery charger for charging TW-1450 32 Wh Rechargeable Batteries  
• Low profile, easy to store and operate, and charges a set of 6 batteries to full charge under 4 hours  
• Includes a DC power adapter | Weight: 31.6 oz  
Size: 16" x 4.88" x 3.25" | TW-900/950 TSM Shadow |
| TW-1491 UK Power Cord | TW-1491 UK Power Cord | • The UK Power Cord is used to plug the charger into the wall for charging the TW-1450 32 Wh Rechargeable Battery | Length: 2.5 Mt  
Plug Type: UK BS 1363A Connector  
Type: C13 | TW-400 CUB  
TW-900/950 TSM Shadow |
<table>
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|           | **TW-1800 Power Cable with Binder** | • 4-Pin mates to TSM Ghost power connector  
• Allows TSM Ghost radios to mate to adapters: TW-1390, TW-1406, TW-1407, TW-1408 | **Weight**: 1.5 oz  
**Length**: 12”  
**Connectors**: ODU and Binder | TW-870/875 TSM Ghost |
|           | **TW-1801 Power Pigtail** | • 4-Pin mates to TSM Ghost power connector  
• Custom terminate cable to interface of choice  
• Allows radio to be powered from lab bench supply | **Weight**: 1.5 oz  
**Length**: 40”  
**Connectors**: ODU | TW-870/875 TSM Ghost |
|           | **TW-1805 Power Cable w/ USB A Connector** | • TSM Ghost power cable with USB A connector  
• TSM Ghost radio can be powered by commercially available USB chargers | **Weight**: 1.5 oz  
**Length**: 18”  
**Connectors**: 4-Pin ODU and USB-A | TW-870/875 TSM Ghost |
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| TW-2220 Battery Canister | TW-2220 | Rugged aluminum canister creates a manpack system when used with the TW-135 Shadow High Power Radio | Weight: 1.5 oz  
Length: 3” x 6.199” x 5.2”  
Battery: Compatible with BA-5590 and BB-2590 batteries  
Water Resistant: IP-67 | TW-135 TSM Shadow HPR |
| TW-2225 Sincgars Adapter Shock Mount | TW-2225 | A Shock/Vibration Rack/Vehicle Mount for the TW-135 Shadow HPR  
Can be used with the TW-135 radio alone or with the TW-2226 12VDC Adapter installed  
Can be installed on a SINCGARs shelf | Weight: 6 lbs.  
Length: 12.54” x 6.90" x 5.43” | TW-135 TSM Shadow HPR |
| TW-2400 Secure Wi-Fi Adapter | TW-2400 | Wi-Fi access point that provides an L2TP/IPSec VPN over the Wi-Fi connection between your radio and EUD. Can also be operated with VPN disabled to act like a standard Wi-Fi access point. | Weight: 1.5 oz  
Length: 0.5” x 3.5” x 1.63”  
Water Resistant: IP-68 | TW-135 TSM Shadow HPR  
TW-900/950 TSM Shadow  
TW-870/875 TSM Ghost |
| TW-2401 Programming Cable, Secure WiFi | TW-2401 | Allows users to connect TW-2400 Secure Wi-Fi Adapter to their PC for configuration | Weight: 1.2 oz  
Size: 12”  
Connector: 6-Pin GlenAir USB to USB Type-A | TW-135 TSM Shadow HPR  
TW-900/950 TSM Shadow  
TW-870/875 TSM Ghost |
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<tr>
<td><strong>Audio &amp; Data</strong></td>
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<tr>
<td>TW-1430 LEMO-to-3.5 mm 3-Wire Headset Cable</td>
<td></td>
<td>• Covert solution for PTT comms with the TW-225 or TW-400 radios • Delivers crystal clear audio with a high-gain lapel mic • Uses a 3.5 mm audio connector to use with any standard 3.5 mm headset</td>
<td><strong>Weight:</strong> 1.2 oz  <strong>Size:</strong> 40 +/- 1”  <strong>Connector:</strong> FGN.0F.305.CLC (LEMO) 3.5 mm AUDIO JACK</td>
<td>TW-135 TSM Shadow HPR  TW-900/950 TSM Shadow</td>
</tr>
<tr>
<td>TW-1431</td>
<td></td>
<td>• Covert solution for PTT comms with the TW-225, TW-400 or TW-900, TW-950 radios • Delivers crystal clear audio with a high-gain lapel mic • Uses a LEMO connector to use with any standard headset</td>
<td><strong>Weight:</strong> 0.1 oz  <strong>Length:</strong> 48”  <strong>Connectors:</strong> FGN.0F.305.CLC (LEMO)</td>
<td>TW-135 TSM Shadow HPR  TW-900/950 TSM Shadow</td>
</tr>
<tr>
<td>TW-1435 H250 Handset</td>
<td></td>
<td>• Single Ch, single PTT</td>
<td><strong>Weight:</strong> 6.1 oz  <strong>Length:</strong> 8.3” x 5.9” x 2.7”  <strong>Connectors:</strong> 6-Pin</td>
<td>TW-135 TSM Shadow HPR</td>
</tr>
<tr>
<td>TW-1605 V Cable 6-Pin Audio and USB</td>
<td></td>
<td>• Connects to top of radio for audio and USB • Other capabilities include secure Wi-Fi and programming • No side dongles are needed</td>
<td><strong>Weight:</strong> 3.5 oz  <strong>Length:</strong> 8”  <strong>Connectors:</strong> 6-Pin</td>
<td>TW-135 TSM Shadow HPR  TW-900/950 TSM Shadow</td>
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<tr>
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<tr>
<td><strong>Audio/Data Adapters</strong></td>
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</table>
| TW-1610         | V Cable 10-Pin Audio and USB | • Connects to top of radio for audio and USB  
• Other capabilities include secure Wi-Fi and programming  
• No side dongles are needed                      | Weight: 3.5 oz  
Length: 8”  
Connectors: 10-Pin                                | TW-135 TSM Shadow HPR  
TW-900/950 TSM Shadow |
| TW-1615         | 6-Pin Audio Adapter   | • ODU to 6-Pin audio connector                                              | Weight: 3.3 oz  
Length: 11”  
Connectors: 6-Pin                                | TW-135 TSM Shadow HPR  
TW-900/950 TSM Shadow |
| TW-1620         | 10-Pin Audio Adapter  | • ODU to 10-Pin audio connector                                             | Weight: 3.2 oz  
Length: 11”  
Connectors: 10-Pin                                | TW-135 TSM Shadow HPR  
TW-900/950 TSM Shadow |
| TW-1635         | Audio Adapter         | • ODU 12-Pin to LEMO 5-Pin connector  
• Audio adapter allowing compatibility of audio accessories with TSM Shadow | Weight: .97 oz  
Length: 5.625”  
Connectors: ODU and LEMO (PHN.OF.305. XLM)        | TW-135 TSM Shadow HPR  
TW-900/950 TSM Shadow |
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</table>
| **TW-1650 ADP to Ethernet Connector** | TW-1650             | • Provides 100 BaseT Ethernet data connectivity  
• Connects to the Audio Data Port (ADP) on the radio and provides a female RJ 45 jack | Weight: 2.4 oz  
Length: 18”  
Connectors: Ethernet Adapter | TW-135 TSM Shadow HPR  
TW-900/950 TSM Shadow  
TW-870/875 TSM Ghost |
| **TW-1665 Glenair Adapter**           | TW-1665             | • Data only cable  
• Allows operation of the OTG USB with Glenair USB connection  
• Enables use of EUD | Weight: 1.6 oz  
Length: 24”  
Connectors: Glenair USB | TW-135 TSM Shadow HPR  
TW-900/950 TSM Shadow  
TW-870/875 TSM Ghost |
| **TW-1667 USB Glenair Host Mode Cable** | TW-1667            | • Data only cable  
• Enables use of EUD  
• Sets the radio as the USB host | Weight: 3.0 oz  
Length: 6-24”  
Connectors: Glenair | TW-135 TSM Shadow HPR  
TW-900/950 TSM Shadow  
TW-870/875 TSM Ghost |
| **TW-1670 USB Type-A Adapter**        | TW-1670             | • Connects to top of radio for USB, data, and programming  
• ODU to USB-A Connector | Weight: 3.0 oz  
Length: 10”  
Connectors: USB-A | TW-135 TSM Shadow HPR  
TW-900/950 TSM Shadow  
TW-870/875 TSM Ghost |

Contact sales@trellisware.com to place an order.
For a complete set of documents, tips, tricks and helpful hints, visit the TrellisWare Customer Support Center at: support.trellisware.com