Support Equipment
For MIDS LVT(1), LVT(2) and LVT(11) Terminals

MIDS LVT(1) and MIDS LVT(2) Terminals provide secure communications and positive friendly ID.

Supported Platforms
ViaSat’s Multifunctional Information Distribution System (MIDS) Low Volume Terminal (LVT) was developed to meet the Link 16 requirements of all U.S. Forces and Coalition partners. We are under contract with the MIDS IPO to produce a substantial number of LVT(1) terminals. MIDS LVT(1) is designed for installation in fighter aircraft, including F-16s, F/A-18s, and the Eurofighter 2000.

For customers who are using this terminal in a lab environment or ground station, we offer a range of support equipment to meet your needs for power, cooling, control, and cabling.

In addition to producing MIDS LVT(1) terminals, we are the major producer of MIDS LVT(2) and MIDS LVT(11) terminals. MIDS LVT(2) is designed to simplify installation in ground stations. This terminal is self-contained and integrates power, cooling and control. All cables are included except the fill cable and host cable. We have a selection of these in stock as well as a mounting shelf for installation in a mobile rack or vehicle.

This brochure describes our commercial, off-the-shelf "after market" products for all MIDS Terminals.
ViaSat’s MIDS LVT(1) Integrated Control Unit is designed to provide basic control and interface functions for the MIDS LVT(1) terminal in a rackmount configuration.

The following functions are supported:
- Off/On/Standby
- Long Term Transmit Inhibit
- Zeroize
- I/O Identification
- IFF Emergency

Indicators are provided for the Fail Decode discretes and for the transmit/receive indicators of the embedded AUI transceivers required by the terminal’s Ethernet and Support Port interfaces. The 1553 bus coupler required for the 1553 interface is also embedded and the stubs brought out.

Switches are provided for the I/O identification allowing the unit to be used with all platform types. The RT address is preset to 1.

Connections on the rear panel include:
- 12V power for the AUI Transceivers (included)
- J3 Connector for MIDS Host Interface Cable (included)
- J7 Connector for MIDS Control Cable (included)
- Support Port
- Ethernet Port
- ETR Input, 50 Ohm
- Additional 1553 Bus A and Bus B jacks
- TACAN Beacon audio output signal
- Voice Push-to-Talk output (compatible with ViaSat’s Voice Control Unit)

The MIDS Host Interface Unit provides access to the 1553, Ethernet, and Support Port interfaces. The AUI transceivers required to convert to the Ethernet RJ45 connector are embedded within the unit. An external 1553 bus coupler is required. The Platform Type is selectable; the RT Address is preconfigured to 1. The host cable connects to J3 of the MIDS terminal and is detachable. Power required by the AUI is provided through a USB cable or a 12V Power Supply, one of which is provided. The unit and all cables are delivered in a padded case. A reference card for the I/O Configuration switch settings is included.
**MIDS LVT(1) Power Unit**

The MIDS Power Unit (MPU) is a totally self-contained DC prime power source. This small unit is installed in a metal enclosure that is 10 7/8 in. W x 18 1/2 in. L x 8 3/4 in. H and weighs just 33 lbs. Its 1200 watt power rating will supply the DC power of 280 VDC differential (+/− 140 VDC) necessary to power two ViaSat MIDS LVT(1) terminals. The internal fans provide forced convection cooling. Separate DC Disconnect switches are provided for each terminal’s Remote Power Supply (RPS).

The MPU comes with all necessary cables. The AC input is supplied by an IEC type power cord. No user setup is required for the specified input voltage ranges. The MPU-to-MIDS RPS interconnecting cable provides connections for powering two terminals.

The MPU contains two Elgar-Sorrensen programmable DC power supplies that have been set to provide the correct output voltage and current. There is no danger of inadvertent voltage or current settings as this is preset and locked internally. The user simply connects the DC output cable to the MIDS RPS power supply, plugs the MPU into a standard U.S. or Universal voltage source, turns on the main power switch, and then turns on the corresponding DC Output switch. It couldn’t be simpler! Transport case is available separately.

**MIDS LVT(1) POWER UNIT**

<table>
<thead>
<tr>
<th>SPECIFICATIONS</th>
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<tbody>
<tr>
<td>Height</td>
<td>8.75 in.</td>
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<tr>
<td>Width</td>
<td>10.875 in.</td>
</tr>
<tr>
<td>Depth</td>
<td>18.5 in.</td>
</tr>
<tr>
<td>Approximate Weight</td>
<td>33 lbs.</td>
</tr>
<tr>
<td>Electrical Input Power</td>
<td>90 – 132 VAC, 47-63 Hz or Autoranging</td>
</tr>
<tr>
<td>Transport Case</td>
<td>PN 1037544</td>
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**MIDS LVT(1) Control Plug, J7**

Do you need to control a terminal in the field without a lot of bulky equipment? Do you need to determine the condition of a terminal when the host has failed or is not connected? The LVT(1) Control Plug connects directly to the MIDS LVT(1) J7 connector, providing switches for Power on/off and Standby on/off. Zeroize is accomplished simply by removing the connector. No longer than 5 inches in length, the device fits in your pocket!

The MIDS LVT(1) Fail Decode LEDs on the end plate provide valuable terminal status information. These include the three most probable LRU's and/or SRU's responsible for a failure detected by the terminal during Startup Built in Test (SBIT), TDMA IBIT, or simultaneous TACAN/TDMA IBIT – even when no host is connected.

For easy reference, the Control Plug comes with a pocket card containing the Fail Decode Matrix.

**MIDS LVT(1) CONTROL PLUG, J7**

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Diameter</td>
<td>1.38 in.</td>
</tr>
<tr>
<td>Length</td>
<td>4.78 in.</td>
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<tr>
<td>Weight</td>
<td>3.3 oz.</td>
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</table>
MIDS LVT(1) Cooling Tray

PN: 1027226 (115VAC)
PN: 1027984 (230VAC)
PN: 1037542 (Transport Case)

The MIDS LVT(1) Cooling Tray is a self-contained cooling and mounting device for one MIDS LVT(1) and its corresponding Remote Power Supply (RPS).

Made of lightweight, sturdy aluminum, the MIDS Cooling Tray provides the necessary 45 CFM of ambient cooling air to the MIDS terminal and RPS. The rear-mounted blower motor is totally enclosed within the air plenum to minimize noise. Guide channels are provided for both the MIDS LVT(1) and the RPS along with three aircraft hold down devices. Positioning pins are mounted on the plenum wall to ensure proper airflow port alignment.

A stainless steel interlock switch activates the blower whenever a terminal is inserted. There is no danger of operating the terminal with no airflow, as the blower automatically starts as soon as the terminal is inserted.

The cooling tray is designed to provide access to the side panel of the terminal, making it easy to access to SRUs for testing and repair.

There are two versions of the MIDS Cooling Tray, one for U.S. power (115 VAC 60 Hz) and one for European/Asian power (230 VAC 50 Hz). Specify Part Number 1027226 for the U.S. power option or Part Number 1027984 for the Euro/Asian power option.

The unit is rack mountable in a standard 19 in. wide rack configuration (requires a user- supplied shelf). A standard power cord with MIL D38999 connector is supplied and a mounting template is available upon request.

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<tr>
<td>Height</td>
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<tr>
<td>Width</td>
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<tr>
<td>Depth</td>
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<tr>
<td>Weight (Approximate)</td>
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<table>
<thead>
<tr>
<th>Electrical Input Power</th>
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<tbody>
<tr>
<td>PN 1027226: 100 – 130 VAC, 47-63 Hz, Single Phase, 200 watts</td>
</tr>
<tr>
<td>PN 1027984: 200 – 250 VAC, 47-63 Hz, Single Phase, 200 watts</td>
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<table>
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<tr>
<th>Cooling</th>
<th>None required</th>
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<tr>
<td>Noise Level</td>
<td>68 dBA at 3 feet</td>
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</table>
ViaSat’s MIDS LVT(1) Control Panel is designed to provide control and host interfacing to the MIDS LVT(1) terminal variants. Intended for lab or ground station installations, the MIDS LVT(1) Control Panel provides access to various discrete signals, control lines, and host interfaces. It is easily connected to the MIDS LVT(1) via supplied W-3 and W-7 connector cables. It is delivered with the following components:

- Chassis
- One (1) AUI Module and Crossover Cable
- W-3 Interconnect Cable
- W-7 Interconnect Cable
- J-7A PTT Jumper Plug
- Main Power Cord
- User’s Guide

Front panel LEDs provide a complete range of visual BIT and status indications. Isolated BNC connectors provide 8 discrete signals to the front panel area. Two of these differential discrete signals are converted to TTL format via an internal dual-channel differential-to-TTL converter.

A switch on the rear panel allows the user to set the ETR impedance to either 50 Ohms or 10K Ohms. Electrical noise mitigation is provided by an internal EMI filter and robust mil spec M27500 internal shielded wiring.

The two PTT switches can be operated locally on the front panel or can be directed to a remote location by use of the rear panel PTT Jumper Plug. This provides easy access to these signals for a remote voice console such as ViaSat’s Voice Control Unit.
ViaSat’s MIDS LVT(1) Voice Control Unit with Microphone is designed to provide basic control and interface functions for the MIDS LVT(1) voice capability. The following functions are supported:

- Speakers for Voice 1 and Voice 2
- Shure Push-to-Talk Microphone
- Transmit Channel Select
- Power On/Off Switch and Indicator
- Volume Control
- Headset Jack

PN 1048346 for LVT(1), or PN 1060167 for LVT(11), employs the hand held Shure Push-to-Talk Microphone and contains a headset jack. Use of the headset jack disables the speaker.

The Voice Control Unit for MIDS LVT(1) includes a User Guide, 12 VDC power supply, an 8 ft VCU to Main Terminal interface cable. The PTT end of this cable is compatible with ViaSat’s MIDS LVT(1) Integrated Control Unit.

The Voice Control Unit for MIDS LVT(11) includes a User Guide, 12 VDC power supply, and a MIDS LVT(11) cable harness replacing the H-250 compatible harness delivered with the terminal.

### MIDS LVT(1) / LVT (11) VOICE CONTROL UNIT

<table>
<thead>
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<tbody>
<tr>
<td>Height</td>
<td>3.5 in.</td>
</tr>
<tr>
<td>Front Panel Width</td>
<td>19 in.</td>
</tr>
<tr>
<td>Depth</td>
<td>5 in.</td>
</tr>
<tr>
<td>Weight (Approximate)</td>
<td>7.5 lbs.</td>
</tr>
<tr>
<td>Input Power</td>
<td>100 – 240V 50/60 Hz, 12 VDC External Power PAC</td>
</tr>
<tr>
<td>Audio Output Power</td>
<td>24 Watts RMS</td>
</tr>
</tbody>
</table>

ViaSat’s MIDS LVT(1) or LVT(11) Voice Control Unit with Headset is designed to provide basic control and interface functions for the MIDS LVT(1) or LVT(11) voice capability. The following functions are supported:

- Speakers for Voice 1 and Voice 2
- David Clark Headset
- Transmit Channel Select
- Power On/Off Switch and Indicator
- Volume Control

PN 1078843 for MIDS LVT(1), or PN 1078822 for MIDS LVT(11), employs the David Clark H10 series headset which features an inline Push-to-Talk switch, volume control knobs, gel ear seals, and 23 dB of noise reduction. A front panel switch selects between headset and speakers.

The Voice Control Unit for MIDS LVT(1) includes a User Guide, 12 VDC power supply, an 8 ft VCU to Main Terminal interface cable. The PTT end of this cable is compatible with ViaSat’s MIDS LVT(1) Integrated Control Unit.

The Voice Control Unit for MIDS LVT(11) includes a User Guide, 12 VDC power supply, and a MIDS LVT(11) cable harness replacing the H-250 compatible harness delivered with the terminal.

### MIDS LVT(1) / LVT (11) VOICE CONTROL UNIT

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The ViaSat Support Port Interceptor (SPI) Kit provides access to the Support Port of the MIDS LVT(1) and LVT(2) terminals. It is designed for use in operational settings where production cables do not provide access to this interface.

All of the J3 connections pass through the SPI except for those of the Support Port, which are brought out to the front panel. An Ethernet RJ45 connector permits connection by a PC system such as LEGS and a D38999 connector permits connection with a ViaSat MIDS Flight Recorder. A switch determines which data path is active.

A rechargeable NI-MH battery contained within the unit provides power for the embedded AUI or for the Flight Recorder. The SPI will operate on the Ethernet for 18 hours between charges. A battery gauge is provided to indicate the battery charge status. The Flight Recorder will operate approximately 4 hours on one charge.

The kit is delivered in a ruggedized Hardigg Storm Case with all required cables and a Universal Smart Charger. The SPI can be purchased individually, or bundled with ViaSat’s PC-based Support Port recording application (PN 1058388 bundled).
Link 16 terminals, including MIDS LVT(1)s, MIDS LVT(2)s, and FDLs, are used by the military for tactical communications. A Support Port on these terminals provides a means of obtaining detailed information about the data exchanged. The MIDS Flight Recorder connects to the terminal support port to automatically record data, including terminal performance data not available on the normal host interface. The additional data is invaluable for flight test verification. A simple GUI is provided with the Recorder that eliminates the requirement to perform HEX editing of recording parameters!

The MIDS Flight Recorder mounts to a bulkhead using four #10 fasteners in the corners. ViaSat recommends that NAS 1101 fasteners be used. Although the Recorder is a commercial product, it is suitable for use in fighter aircraft and meets many of the same environmental requirements imposed on MIDS terminals.

**Interfaces**
The Recorder employs D38999 connectors. It receives power from the aircraft’s 28V DC power supply and communicates with the MIDS Terminal via an AUI or Ethernet interface. A Compact Flash memory card socket interface provides for removable bulk storage and is used for recording of flight test data.

**Operation**
Once power is applied, the recorder automatically establishes a connection with the terminal and enables the recording function. A control file specifying which Functional Input Messages (FIMs), Functional Output Messages (FOMs), Data Transfer Blocks (DTBs), Internal Data Blocks (IDBs), and Status Words are to be recorded is prepared in advance and stored on the memory card by the Test Analyst. This allows the test director to obtain information not available on the 1553 interface without impacting the mission computer. The memory card may also hold the recording software, making it easy to upgrade to new software versions.

A new file is automatically started every time the terminal is restarted using a sequential naming convention. Even if every time slot contains Fixed Format messages at Packed-4, the 1 GB removable Compact Flash memory will hold over 10 hours of recorded data. That’s a time slot duty factor of 172%. If only half of the slots are used at Packed-2, it will hold over 20 hours of recorded data.

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**ENHANCED FLIGHT RECORDER**

**HIGHLIGHTS**
- Supports AUI or Ethernet 10 Base T
- Provides discrete indicator of recording-in-progress status
- Automatically connects to terminal and logs history of terminal status and state changes
- Measures and records fractional time delta between network time and GPS time
- Records over 20 hours of data at 50% TSDF on the removable 1 GB compact flash
- Includes software control and analysis utilities

**SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
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<tbody>
<tr>
<td>Size (excludes connectors and fasteners (WHD))</td>
<td>6.375 (w) x 4.906 (h) x 1.906 (d) in.</td>
</tr>
<tr>
<td>Weight</td>
<td>~3 lbs.</td>
</tr>
<tr>
<td>Power</td>
<td>12 to 28 VDC, MIL-STD-704F</td>
</tr>
</tbody>
</table>

**Analysis**
The recorded data is written in the “.raw” format and may be analyzed using the ViaSat Analysis Support Tool (VAST) provided with the unit, or with other data link analysis systems such as MANDRIL, available from Lockheed Martin STASYS Ltd.

**Time Reconciliation**
To facilitate the reconciliation of recorded data (which carries a Link 16 time stamp) with TSPI data (which carries a GPS UTC time stamp), the MIDS Recorder accepts as input two 1 PPS signals. The fractional time difference between these two signals is measured with millisecond accuracy and periodically written to a unique file on the CF card.
The RF Network Unit permits multiple RF devices to be hubbed together in a network. It is intended for lab usage and operates over a frequency range of 0 to 2 GHz. There are 6 Type N female RF low level (1 watt) connectors on the chassis and a variable step attenuator that ranges between 0 and 110 dB in 1-dB steps. The RF Network has an approximate 14 dB insertion loss between ports, and is perfect for bench top or field use. Included with the unit are four 50-ohm terminations for use on unused RF ports. The RF Network is available in a 19-inch rackmount model and a portable model measuring just 7 in. x 7 in. x 2 in; small enough to fit in a field service kit.

An L-Band antenna is required to transmit over the air. ViaSat recommends the high gain omni antenna made by European Antennas. This antenna covers the Link 16 band, 960 to 1215 MHz, and has a 7dBi gain, nearly doubling the range of a system. Receive sensitivity—usually the limiting factor for communications with distant airborne platforms—is increased significantly. The antenna is lightweight (1.7 kg) and has a base mount for standard 1-inch pole mount clamps. Mounting pole and guy wires are not included.

Be prepared! Armed with the 5-pound ViaSat Portable Antenna, a field service engineer, training instructor, or test engineer can conduct limited ground-to-air tests in the field. This L-band blade antenna is delivered with a 52-inch tripod and features a quick-connect mounting shoe that holds the antenna plate. It can be used in testing related to all L-band applications and is packaged in an expandable, zippered nylon bag.
Support Equipment for MIDS LVT Terminals

MIDS LVT(2) / LVT(11) Rack Mount Slide Shelf
PN: 1076004

The MIDS LVT(2) / LVT(11) Rack Mountable Slide Shelf provides a sturdy and versatile design for mounting your MIDS LVT(2) or LVT(11) in a 19” rack. The heavy duty slide mounts are fabricated with 1/4 inch aluminum. It has a baked-on powder-coated finish, and the hardware is stainless steel — all of which makes it suitable for rugged environments. The side rails are removable allowing the unit to be converted to a flat mount unit for hardmounting.

MIDS LVT(2) / LVT(11) Rack Mount Slide Shelf

**HIGHLIGHTS**
- **Rugged:** Heavy duty slide mounts with 1/4 inch aluminum construction makes this mount suitable for the most rugged environments.
- **Convenient:** Fits your standard 19-inch rack mount environment with a 2U rack mount configuration.
- **Flexible:** Can be used in multiple configurations both rack and hard mounted.
- **Easy:** Comes fully assembled ready for installation.

**SPECIFICATIONS**
- **Weight Capacity:** 100 lbs. / 45.36 kg
- **Form Factor:** Standard 2U footprint
- **Width:** 16.60 in. / 72.2 mm
- **Height:** 3.00 in. / 72.2 mm
- **Length:** 20.3 in. / 515.62 mm
- **Weight:** 10.14 lbs. / 4.6 kg
- **Coating Finish:** Gray Powder Coat

OTHER MIDS ACCESSORIES

**MIDS LVT(2) AND LVT(11) CABLES**

- 1060695 MIDS LVT(2) Spare Set of Cables Delivered with Terminal
- 1028898 MIDS LVT(2) / LVT(11) Spare Voice / ETR Cable
- 1027657 MIDS LVT(2) / LVT(11) Fill Cable, W4
- 1032880 MIDS LVT(11) Voice Cable
- 1076130 MIDS LVT(11) Remote Voice Cable

**MIDS LVT(2) / LVT(11) HOST CABLE VARIANTS**

- 1045956 ... with Ethernet and Support Port
- 1045957 ... with Support Port
- 1045958 ... with Ethernet
- 1057830 ... with Eicon X.25
- 1057831 ... with Eicon X.25 and Ethernet
- 1057832 ... with Eicon X.25 and Support Port
- 1057828 ... with Eicon X.25, Ethernet and Support Port
- 1045959 ... with WanWare X.25, Ethernet and Support Port
- 1060695 ... with WanWare X.25

**MIDS LVT(2) / LVT(11) Cables**

The MIDS LVT(2) is provided with the interconnect cables and both a DC and AC power cable. Cables that are not included with the terminal are the Fill Cable and Host Cable. Host cables are available to support all combinations of interfaces.

The MIDS LVT(11) implements the voice capability and the cable set includes a voice cable that is compatible with the H-250 Handset.

MIDS LVT(2) / LVT(11) Voice Cable
(H250 Handset not included)
ViaSat offers customized MIDS cables, transport cases, and other specialty items for the MIDS integrator and field service engineer. Items manufactured by other vendors such as RF terminators, attenuators, low pass filters, GPS receivers, and L-band antennas may also be purchased through ViaSat.

We carry many of these items in inventory and can shorten the lead time significantly by shortening your schedule and reducing costs.

The MIDS LVT(1) is delivered without any cables. The terminal integrator will need to provide both the interconnect cables and the external cables including those for connecting to the main power, a tactical host and a fill device.
Link 16 Environment Gateway Stimulator (LEGS) is an essential MIDS support tool. Prime developers use this software in the integration of MIDS terminals, and ground facilities and Field Service Engineers rely on the LEGS application for terminal troubleshooting and maintenance. The tool is also used by test facilities for Link 16 system performance measurement and evaluation, and by instructors for MIDS training.

A low-cost version (LEGS-Lite) that does not include the scenario generation or situation display capabilities is also available. The J LEGS version of the application implements the JTRS Platform A interface.

ViaSat’s Link 16 Flight-line Tool (LiFT) software is designed to support “go/no-go” testing and troubleshooting of Multifunctional Information Distribution System Low Volume Terminals (MIDS LVT) in a field environment. The LiFT application is available installed on a Tablet PC or as a software package for customers who want to install the LiFT application on their own equipment, such as the GoBook 3.

This software is intended for use by technicians and allows the user to read, reconfigure, update, and monitor terminal parameters. Data is provided in dynamic graphical displays.

Software update subscriptions and site licenses are available.

**VIASAT TECHNICAL SUPPORT AND TRAINING**

**Link 16, MIDS, and LEGS Training Courses**

- **VSAT 101** MIDS Familiarization (Short Course)
  1-day training course on MIDS LVT
- **VSAT 102** LEGS Familiarization (Short Course)
  2-day training course on ViaSat’s LEGS host
- **VSAT 103** Link 16 Familiarization (Short Course)
  2-day training on the introduction to Link 16
- **VSAT 104** MIDS and LEGS Familiarization
  3-day training course covering the use of LEGS and MIDS operation
- **VSAT 105** MIDS Specifications and Documentation (Short Course)
  1-day training course on MIDS ICDs and SSS
- **VSAT 201** Introduction to MIDS/Link 16 for Beginners
  5-day training course introducing Link 16 and MIDS (priced individually for entire week)
- **VSAT 202** MIDS/LEGS: Introduction to Operations and Maintenance
  5-day training course on MIDS LVT, LEGS and the maintenance of the MIDS LVT
- **VSAT 203** MIDS/LEGS: Operations and Maintenance for the Advanced User
  5-day training course focusing on the advanced maintenance concepts of MIDS LVT and Recording processes
- **VSAT 204** MIDS/LEGS: Operations and Maintenance for the Field Service Engineer (Available to U.S. Citizens)
  5-day training course focusing on the field level maintenance of the MIDS LVT to include SKU removal.

These courses are conducted at ViaSat and may be customized to meet your specific requirements. Contact us for individual pricing information.