

VSAT Systems and Protocols Essentials Course

8 – 12 November 2026
Amman (Jordan)

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VSAT Systems and Protocols Essentials Course

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VSAT systems and protocols are the very small aperture terminals, hub stations and communication rules that carry data, voice and video over satellite links to sites that terrestrial networks do not reach. This 1-week course is for telecom technicians, network engineers and field staff, and its final deliverable is a site plan for one VSAT terminal with a simple link budget, a pointing record and a maintenance checklist.

Introduction

The course rests on three references. DVB-S2, the second-generation Digital Video Broadcasting standard for satellite, defines the modulation and coding used by most current VSAT carriers. The link budget is the calculation of gains and losses between transmitter and receiver that shows whether a link closes with margin. TCP/IP, the internet protocol suite, explains how data behaves over the long delay of a geostationary path. The level is practitioner essentials and assumes basic telecom knowledge. Teaching combines worked calculations, equipment walkthroughs and installation and fault-finding exercises.

Course Objectives

- Define a VSAT network and distinguish star from mesh topologies by cost, delay and use
- Compare TDMA, FDMA and SCPC access schemes and select one for a given traffic pattern
- Interpret a simple link budget, including rain fade in C, Ku and Ka bands, to judge whether a link has margin
- Apply dish pointing, polarisation and footprint checks to commission a remote terminal
- Distinguish the needs of accelerated TCP, VoIP and video on a satellite path and select settings that suit each
- Apply troubleshooting and preventive maintenance routines that keep a VSAT site in service

Target Audience

- Telecom technicians installing remote terminals, who must decide how to point, peak and commission each dish
- Network engineers adding satellite links to corporate networks, who must judge which access scheme and topology fit their sites
- Operations and network monitoring staff, who must determine whether a fault lies in the terminal, the link or the hub
- IT managers at organisations with dispersed sites, who must select between VSAT options for data, voice and video
- Technical support staff new to satellite, who must interpret equipment readings when advising users

A graphic featuring the text 'UK Training' in a small, black sans-serif font above the word 'PARTNER' in a large, bold, black sans-serif font. The text is positioned over a background of concentric circles and a chessboard pattern.

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Course Outline

Day 1: Satellite Basics and What a VSAT Is

- GEO vs LEO Satellites: Orbit Height, Delay and Coverage Compared
- Satellite Communication Fundamentals: Uplink, Downlink, Transponders and Frequency Bands
- VSAT Definition and Components: Terminal, Outdoor Unit, Indoor Unit and Hub
- How Satellites Communicate: Signal Path from Remote Terminal to Earth Station
- VSAT Applications: Private Networks for Dispersed Sites and Remote Broadband Access

Day 2: Networks, Equipment, Access and Modulation

- Star vs Mesh Topology: Hub-Routed Traffic Compared with Direct Site-to-Site Links
- VSAT Equipment: BUC, LNB, Modem and Feed Assembly Functions Explained
- Access Schemes: TDMA, FDMA, MF-TDMA and SCPC for Sharing Capacity
- Modulation and Coding: QPSK, 8PSK and DVB-S2 Adaptive Coding Explained
- Services and Features: Data, Voice, Video and Remote Management Options

Day 3: Propagation, Earth Stations and Link Budgets

- C-Band vs Ku-Band vs Ka-Band: Rain Sensitivity, Antenna Size and Capacity
- RF and Microwave Basics for VSAT: Frequency, Wavelength and Free-Space Loss
- Propagation Effects: Rain Fade, Atmospheric Absorption and Interference on Satellite Signals
- Earth Stations and Terminals: Hub Roles, Remote Terminal Setup and Integration
- Link Budget Calculation: EIRP, G/T, Losses and Link Margin Worked Example

Day 4: Antennas, Pointing, Polarisation and IP Traffic

- Linear vs Circular Polarisation: Alignment Needs and Cross-Polar Interference Compared
- VSAT Antennas: Dish Types, Sizes and Gain for Different Sites
- Dish Pointing: Azimuth, Elevation and Signal Peaking Procedure Step by Step
- Satellite Footprints: Coverage Contours and Their Effect on Terminal Sizing
- TCP/IP, VoIP and Video over VSAT: Delay Effects, Acceleration and Quality Settings

Day 5: Installation and Maintenance Practice

- Corrective vs Preventive Maintenance: Fixing Faults Compared with Scheduled Checks
- Installation and Operation: Site Survey, Mounting, Cabling and Grounding Steps
- Commissioning a Terminal: Applying Pointing, Polarisation and Link Budget Checks
- Troubleshooting Exercise: Isolating Terminal, Link and Hub Faults from Readings
- VSAT Site Plan: Completing the Link Budget, Pointing Record and Maintenance Checklist

Skills You Will Gain

- Link Budget Calculation
- Access Scheme Selection
- Dish Pointing and Peaking
- Polarisation Alignment
- Rain Fade Assessment
- VSAT Fault Isolation
- Preventive Maintenance Planning

Why Attend This Course

- From treating satellite links as a black box to reading where gains and losses arise in a link budget
- From trial-and-error dish alignment to a repeatable pointing, peaking and polarisation routine
- From guessing whether a fault is local or remote to isolating terminal, link and hub problems from readings
- From ad hoc site visits to a site plan with a link budget, pointing record and maintenance checklist

Conclusion

A VSAT network is a satellite-based private network in which small terminals exchange traffic through a hub or with each other, chosen where cables and radio towers cannot reach. The course makes three distinctions clear: star against mesh topology, C against Ku and Ka bands, and corrective against preventive maintenance. In one week it suits technicians, engineers and operations staff who need a working command of the essentials rather than the extended design practice of a longer VSAT course.

Course FAQs

What are VSAT systems and protocols?

VSAT systems are small satellite terminals, usually under three metres across, linked through a satellite to a hub or to each other. Their protocols set how capacity is shared, how signals are modulated and coded, and how IP traffic crosses the satellite path.

What is the difference between star and mesh VSAT networks?

In a star network every remote terminal talks through a central hub, which simplifies management but adds a second satellite hop between remotes. In a mesh network terminals link directly, cutting delay between sites but needing larger terminals.

Which standards does the VSAT systems and protocols essentials course follow?

The course follows DVB-S2 for modulation and coding, uses the link budget method to test link margin, and applies TCP/IP to explain how data, voice and video behave over satellite delay.

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Is the VSAT systems and protocols essentials course right for a field technician?

Yes. Field technicians practise site surveys, dish pointing, polarisation alignment, commissioning checks and fault isolation, the tasks they carry out when installing and maintaining remote terminals.

What do delegates produce in the VSAT systems and protocols essentials course?

Delegates produce a site plan for one VSAT terminal, with a simple link budget, a pointing and polarisation record and a preventive maintenance checklist that can be reused on later installations.

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