



# Tekwill

## Satellite Engineering Curriculum

Version 2.1

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## Introduction

This document is the first curriculum draft for preparation the course of satellite engineering.

## Concept

Course is splitter between Moldova and Israel office.  
Duration 6 weeks (30 business days)

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## Wireless Communications (Day 1)

**Locations:** Moldova office

**Discussion/course Overview:**

- Brief overview of wireless
- Radio Frequency (RF) fundamentals (RF Principles)
- Radio Frequency (RF) Math (Frequency, Wavelength Simple Math, dBs and Watts)
- Antenna Fundamentals
- How does a Satellite Antenna work?

## Basic Satellite (Day 2)

**Locations:** Moldova office

**Discussion/course Overview:**

- How do satellites work?
- Understanding Spectrum!
- Understanding concept of Bandwidth, Symbol Rate and Roll Off Factor.
- Understanding modulation and FEC (Coding)
- Understanding Standards DVB-S2 and DVB-S2X
- Access scheme: TDMA and MF-TDMA
- Spectral efficiency

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## SEII-C X-ARCHITECTURE BASIC HUB OPERATIONS (Day 3 to 7)

**Course Name:** SkyEdge II-c X-Architecture Hub Operations

**Course Code:** PSTRSEIIcX01, PSTRSEIIcX02

**Prerequisites:** NET 101 or previous networking experience

**Duration:** Five (5) days

**Enrollment:** Ten (10), maximum

**Locations:** Gilat Customer Educational Centers in Petach Tikva, Israel

### Course Overview:

The Gilat SkyEdge II-c X-Architecture Hub Operations course is aimed at Tier-1 and Tier-2 Hub operators who will be operating and maintaining the SkyEdge II-c X-Architecture Hub and remote VSATs. This course introduces the theoretical, operational, and practical aspects of the SkyEdge II-c X-Architecture system. It includes hands-on workshops and exercises, enabling participants to practice basic configuration of the Gilat system/equipment and to perform basic troubleshooting.

### Course Objectives:

Upon completing the course, participants will be able to:

- Describe system components and associated functions
- Describe system Data Flow
- Identify Hub components
- Install, configure and troubleshoot a VSAT
- Describe TotalNMS architecture and the functions
- Add/delete/modify/manage VSAT Groups and VSATs
- Create/copy/modify component configurations
- Analyze TotalNMS alarms and events
- Backup and restore TotalNMS database parameters
- Perform daily and periodic Hub maintenance procedures
- Describe and perform basic configurations of common features4 :
  - NMS Basic Usage
  - MG & VSAT creation
  - SLA Profiles
  - Classification Profiles
  - Users management
  - Monitoring

## Ground System Hub Operations Agenda

<i>Time</i> <i>Day/Date</i>	<i>Day 3</i>	<i>Day 4</i>	<i>Day 5</i>	<i>Day 6</i>	<i>Day 7</i>
09:00 – 09:30	Course Opening E-learning	Daily Recap	Daily Recap	Daily Recap	Daily Recap
09:30 – 10:15	System Introduction	HUB Components LAN Architecture	Mgmt. system Overview	Total Control Theory	Ground Modem Troubleshooting
10:15 – 11:00	System Introduction	HUB Components LAN Architecture	Mgmt. system Overview	Total Control Theory	Ground Modem Troubleshooting
11:00 – 11:15	<b>Break</b>	<b>Break</b>	<b>Break</b>	<b>Break</b>	<b>Break</b>
11:15 – 12:00	Data Flow	Ground Modem Platforms	Mgmt. system Overview	Total Control Theory	Hub Maintenance
12:00 – 12:45	Data Flow	Ground Modem service Activation	Mgmt. system Overview	Total Control Theory	Final Tips
12:45 – 13:45	<b>Lunch</b>	<b>Lunch</b>	<b>Lunch</b>	<b>Lunch</b>	<b>Lunch</b>
13:45 – 14:30	Outbound Overview	Ground Modem Installation Mgmt. System	Mgmt. system Practice	Total Control Practice	Practice Quiz
14:30 – 15:15	Outbound Overview	Ground Modem Installation Modem Manager	Mgmt. system Practice	Total Control Practice	Practice Quiz
15:15 – 15:30	<b>Break</b>	<b>Break</b>	<b>Break</b>	<b>Break</b>	<b>Break</b>
15:30 – 16:15	Inbound Overview	Ground Modem Installation Practice	Mgmt. system Practice	Total Control Practice	Feedback
16:15 – 17:00	Inbound Overview	Ground Modem Installation Practice	Mgmt. system Practice	Total Control Practice	Closure

\* Schedule may be subject to changes.

## Frequency calculations (Day 8)

**Locations:** Moldova office

- Theory and practice of FWD and RTN calculations.

## Satellite Frequency Migration (Day 9)

**Locations:** Moldova office

- RTN frequency migration
- FWD frequency migration
- HUB practice on FWD and RTN migration

## Recap and catch up (Day 10)

**Locations:** Moldova office

## SKYEDGE II-C ADVANCED CUSTOMIZED COURSE (Day 11 to 19)

**Course Name:** SkyEdge II-c Customized Course – Available both for cHub and xHub

**Course Code:** PSTRSEIIC14, PSTRSEIIC15

**Prerequisites:**

- Participants must have completed the Hub Operations Course
- At least six months' working experience with SkyEdge II-c system
- Strong background in basic networking, RF, and satellite communications fundamentals is an advantage

**Duration:** 8 days

**Enrollment:** Ten (10), maximum

**Locations:** Gilat Customer Educational Centers in Petach Tikva, Israel

## Course Overview:

This course is aimed at field service engineers and Hub operators who will be providing Tier-2 and Tier-3 system support and who wish to be trained on the specific topics related to SkyEdge II-c system. Course participants will receive extensive background information on SkyEdge II-c supported technologies. The course includes daily, hands-on workshops, enabling participants to practice system/equipment configurations. This course is customized, enabling participants to select topics of interest from the training modules presented below, and to determine the length of the course.

## Training Modules

Training Module	Description	Duration (Days)	Notes
TotalControl	Extend your knowledge in various Bandwidth Management mechanisms and QoS.	1	The hands-on is performed on noncommercial hub only
VoIP	Understand VoIP technology and Gilat's implementation of this feature. Configure Gilat's VoIP solution.	1	The hands-on is a subject to the availability of the VoIP equipment.
Cellular Backhauling	Understand Gilat's Backhauling implementation. Practice the configuration of this feature.	1	The hands-on is performed on noncommercial hub only
Layer 2	Understand Gilat's implementation of Layer 2 feature. Practice the configuration of this feature.	1	The hands-on is performed on noncommercial hub only
Mobility	Understand the Mobility mechanism and its implementation in the system. Practice the configuration of this feature.	2	The hands-on is performed on noncommercial hub only
IP Features	Learn about the implementation of enhanced IP features, such as DHCP, NAT, Dual IPSec, Static and Dynamic Routing, Multicast in SkyEdge II-c system. Practice the configuration of these features.	1 1/2	The hands-on is performed on noncommercial hub only

NBI Operation	Learn about the operation of TotalNMS NBI for access of OSS/BSS	1	
RF Measurements	Become familiar with SkyEdge II-c RF measurements procedure and perform the RF measurement according to it.	1	The hands-on is a subject to the availability of the RF measuring equipment.

## Recap and catch up (Day 20)

**Locations:** Moldova office

## SEIc System Upgrade (Day 21)

**Locations:** Moldova office

- HUP presentation
- Theory and practice

## PRACTICE and MORE THEORY (Day 22 to Day 30)

**Locations:** Moldova office

- Practice will include hand-on in the lab