



Microwave Networks 2011 Training Programs

Catalog of Course Descriptions





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Introduction

Ericsson has developed a comprehensive Training Programs service to satisfy the competence needs of our customers, from exploring new business opportunities to expertise required for operating a network. The Training Programs service is delineated into packages that have been developed to offer clearly defined, yet flexible training to target system and technology areas. Each package is divided into flows, to target specific functional areas within your organization for optimal benefits.

Service delivery is supported using various delivery methods including:

Icon	Delivery Method
	Instructor Led Training (ILT)
	Virtual Classroom Training (VCT)
	eLearning (WBL)
	Workshop (WS)
	Short Article (SA)
	Structured Knowledge Transfer (SKT)
	mLearning
	Job duty analysis (JDA)
	Competence GAP Analysis (CGA)

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Microwave Networks Overview



LZU 108 8322 R1A

Description

Telecom networks of today employ a variety of technologies and products which at first can be difficult to get an overview of.

This course will help you to understand what a Microwave Transport network is and how the Ericsson Microwave Network product families can be used to realize such networks in an efficient way. Main features and benefits of the products will be explained.

This course will on its own give an overall understanding of the products and techniques and the knowledge provided by it is a prerequisite for deeper studies in the subject.

Learning objectives

On completion of this course the participants will be able to:

- 1 Give typical applications for Ericsson Microwave Network products
- 2 Describe the main functions of each product family

Target audience

The target audience for this course is:

Fundamentals

Prerequisites

Successful completion of the following courses:

The participants should be familiar with basic telecommunication and have basic data communication knowledge.

Duration and class size

The length of the course is 70 minutes.



**Learning situation**

Web based learning

Time schedule

The time required always depends on the knowledge of the attending participants and the hours stated below can be used as estimate.

Day	Topics in the course	Estimated Time (hours)
1	What is Microwave Transmission Why deploy Microwave Transmission Ericsson Microwave Portfolio Product Descriptions Deployment Scenarios Technologies and Solutions Element/Network Management	

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Microwave Networks System Survey



LZU 108 7348 R4A

Description

Are you interested in getting a basic knowledge about Ericsson Microwave Networks and its main features? This course will provide you with an understanding of the key features and benefits of the products forming the Ericsson Microwave Networks portfolio. After the course you will understand what equipment to use to meet different demands put on the transmission network.

Learning objectives

On completion of this course the participants will be able to:

- 1 Describe basic microwave and digital transmission theory
 - 1.1 Describe PDH, SDH, IP/Ethernet and ATM
 - 1.2 Describe Microwave propagation
- 2 Describe the system features of the Ericsson microwave products
 - 2.1 List MINI-LINK TN equipment
 - 2.2 List MINI-LINK CN Products
 - 2.3 List MINI-LINK SP Products
 - 2.4 List MINI-LINK PT Products
 - 2.5 List MINI-LINK E equipment
 - 2.6 List Marconi LH/MINI-LINK LH equipment
- 3 Describe the system features of ServiceOn
- 4 From given data for the transmission network and with the help from customer documentation configure system hardware for microwave terminals

Target audience

The target audience for this course is:

Fundamentals



Prerequisites

Successful completion of the following courses:

Basic Data and Telecom knowledge

Duration and class size

The length of the course is 2 days and the maximum number of participants is 16.

Learning situation

This course is based on theoretical instructor-led lessons given in a classroom environment

Time schedule

The time required always depends on the knowledge of the attending participants and the hours stated below can be used as estimate.

Day	Topics in the course	Estimated Time (hours)
1	Course introduction	0,5 hour
	Technical introduction to transmission techniques and microwave propagation	1,5 hours
	Microwave Networks	1 hour
	MINI-LINK E system features	0,5 hour
	MINI-LINK TN system features	2,5 hours
2	MINI-LINK CN Products	0,5 hour
	MINI-LINK SP and PT Products	0,5 hour
	Short haul radio parts	0,5 hour
	Marconi LH/MINI-LINK LH system features	1 hour
	Microwave Networks Management	1 hour
	System design exercise	2 hours
	Summing up of the course	0,5 hour

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MINI-LINK PT Fundamentals



LZU 108 8553 R1A

Description

Are you about to implement all outdoor microwave equipment for Ethernet transport into your network and need to know how this is done in the best way? Or perhaps for the moment you are only interested in what possibilities this new microwave transport technology can offer in capacity and operational cost reduction? If the answer is yes to any of these questions this web based course which describes the MINI-LINK PT 2010 and the MINI-LINK PT 6010 will give the answers. The attendee will learn the properties of the systems and how they can efficiently be implemented and managed in the network.

To get practical experience in how to commission and maintain the systems the course is recommended to be followed by an instructor lead workshop where the participants will get hands-on training on the equipment.

Learning objectives

On completion of this course the participants will be able to:

- 1 Define the different parts of a MINI-LINK PT 2010 and PT 6010 terminals
 - 1.1 Available interfaces
 - 1.2 Installation accessories.
 - 1.3 Main differences between PT 2010 and PT 6010
- 2 Describe the main traffic functionalities of MINI-LINK PT.
 - 2.1 Ethernet functionality
 - 2.2 Traffic compatibility between MINI-LINK PT and MINI-LINK TN and CN.
 - 2.3 Adaptive modulation
 - 2.4 Licenses
- 3 Describe how MINI-LINK PT can be included into a management DCN
 - 3.1 Local management
 - 3.2 Remote management
- 4 Describe configuration and fault finding steps in MINI-LINK PT Craft tool
 - 4.1 Commissioning
 - 4.2 Maintenance

**Target audience**

The target audience for this course is:

Network Deployment Engineers, System Engineers, Field Technicians

Prerequisites

Successful completion of the following courses:

The participants shall have completed or in other way gained the knowledge of the following courses:

Microwave Networks Overview, LZU 108 8322

Ethernet Fundamentals, LZU 108 7591

IP Networking and Internetworking, LZU 108 5942

Microwave Technology Basic Knowledge

Duration and class size

The length of the course is 3 hours.

Learning situation

This course is a self study web-based course.

Time schedule

The time required always depends on the knowledge of the attending participants and the hours stated below can be used as estimate.

Day	Topics in the course	Estimated Time (hours)
1	System Architecture	1 hour
	System Key Concepts	1 hour
	System Configuration and Management	1 hour

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MINI-LINK E Operation and Maintenance



LZU 113 48 R6D

Description

Do you have the right knowledge in MINI-LINK E to work with operation and maintenance in the field in the most efficient way? If not, this course is the one to help you to do that. With the help of theoretical lectures and exercises a good knowledge in the MINI-LINK E product will be provided. During practical exercises under the guidance from experienced instructor a good knowledge in field installation, commissioning and maintenance of MINI-LINK E will be gained

Learning objectives

On completion of this course the participants will be able to:

- 1 With the help of MINI-LINK customer documentation and SID on their own perform commissioning of a MINI-LINK E site
 - 1.1 Identify relevant set-up inputs
- 2 With the help of MINI-LINK customer documentation and SID on their own perform on site maintenance and fault correction
 - 2.1 Fault analyze process
 - 2.2 Unit replacement
 - 2.3 Identify possible fault correction actions
- 3 On their own and with help from customer documentation handle MINI-LINK E specific tools
 - 3.1 Working with MSM
 - 3.2 Proper use of MINI-LINK E HW tools
- 4 Identify possible MINI-LINK E configurations to perform a given transmission task.
 - 4.1 Indoor and outdoor HW
 - 4.2 Management network

Target audience

The target audience for this course is:

System Technicians, Service Technicians, System Engineers, Service Engineers and Field Technicians.



Prerequisites

The participants should be familiar with:

The MINI-LINK concept in general, telecommunication and microwave transmission in general, working with Windows operating system and have an understanding of what it means to work in a field maintenance organization

Duration and class size

The length of the course is 4 days and the maximum number of participants is 8.

Learning situation

This course is based on theoretical and practical instructor-led lessons given in both classroom and in a technical environment using equipment and tools

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Time schedule

The time required always depends on the knowledge of the attending participants and the hours stated below can be used as estimate.

Day	Topics in the course	Estimated Time (hours)
1	Course introduction	0.75
	MINI-LINK microwave transmission network	0.75
	MINI-LINK E radio network	2.25
	MINI-LINK E traffic network	0.75
	MINI-LINK E site configuration exercise	1.5
2	MINI-LINK E site configuration exercise, continued	1.5
	MINI-LINK E management network	1.5
	Demonstration of products and accessories	1
	MINI-LINK E installation	1
	MSM demonstrations and exercises	1
3	MSM demonstrations and exercises, continued	6
4	MSM demonstrations and exercises, continued	2
	Functional test	1
	Fault finding with MSM	2
	Summing up	1

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MINI-LINK TN R4 Operation and Maintenance



LZU 108 7243 R1A

Description

Do you have the right knowledge to work with operation and maintenance in a MINI-LINK TN R4 network? If not, this is the course for you.

With the help of the theoretical lessons the attendees will get a good knowledge about the MINI-LINK TN R4 products and functions. During the practical exercises and with guidance from the instructors the attendees will learn the most efficient ways of performing operation and maintenance of a MINI-LINK TN R4 network. This course is updated to meet the MINI-LINK TN release 4.4.

Learning objectives

On completion of this course the participants will be able to:

- 1 Understand Transmission fundamentals.
- 2 Define the different parts in a MINI-LINK TN network element.
 - 2.1 Name the indoor and outdoor parts.
 - 2.2 Name the traffic interfaces.
 - 2.3 Recognize the MINI-LINK TN accessories.
 - 2.4 Work with the MINI-LINK Craft used for operation and maintenance.
- 3 Be able to list needed equipment by using defined parameters for a site.
- 4 Understand the functionalities of the MINI-LINK TN concept.
 - 4.1 Define Traffic Routing.
 - 4.2 Define protection.
 - 4.3 Describe licenses.
 - 4.4 Configure a MINI-LINK TN network element.
 - 4.5 Configure Traffic Routing and ring protection on an E1/DS1 level.
 - 4.6 Describe Adaptive modulation.
- 5 Understand basic IP and DCN parts of a MINI-LINK TN network.
 - 5.1 Name different DCN interfaces.
 - 5.2 Describe static routing and OSPF.
 - 5.3 Configure the DCN settings and make the DCN up and running.
- 6 Understand the SDH/SONET functionalities in the MINI-LINK TN.
 - 6.1 Configure the SDH/SONET radio terminal.
 - 6.2 Configure the SDH Cross Connect.
- 7 Understand the ATM Aggregation functionalities in the MINI-LINK TN



- 7.1 Configure the ATM Aggregation.
- 7.2 Configure synchronization of a MINI-LINK TN network.
- 8 Understand the Ethernet functionalities in the MINI-LINK TN
 - 8.1 Configure Layer 1 & 2 Ethernet traffic over PDH and SDH.
 - 8.2 Configure Native Ethernet Radio links.
- 9 Perform maintenance of a MINI-LINK TN network element.
 - 9.1 Define alarms and remove them with help of fault finding.
 - 9.2 Perform Configuration backups.
 - 9.3 Perform a Software upgrade.
 - 9.4 Exchange Plug-In Units.
 - 9.5 Perform E1 fault finding by using the inbuilt BERT.
 - 9.6 Create license request.

Target audience

The target audience for this course is:

Network Deployment Engineer, System Engineer, Field Technician

Prerequisites

Successful completion of the following courses:

Microwave Networks Overview LZU 108 8322 and be familiar with digital transmission and IP/Ethernet fundamentals

Duration and class size

The length of the course is 5 days and the maximum number of participants is 8.

Learning situation

This course is based on theoretical and practical instructor-led lessons given in both classroom and in technical environment using equipment and tools.

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Time schedule

The time required always depends on the knowledge of the attending participants and the hours stated below can be used as estimate.

Day	Topics in the course	Estimated Time (hours)
1	Introduction	0,5 hour
	Basic PDH Node	2 hours
	Radio Terminal	1 hour
	Basic Features	0,5 hour
	DCN and Management	1 hour
	Site Configuration Exercise	1 hour
2	Practical Exercises	6 hours
3	SDH/SONET Traffic Handling	1 hour
	SDH/SONET Configuration Exercise	0,5 hour
	Practical Exercises	1,5 hour
	ATM Traffic Handling	1 hour
	ATM Aggregation Configuration Exercise	0,5 hour
	Practical Exercises	1,5 hour
4	Ethernet Traffic Handling	2 hours
	Ethernet Configuration Exercise	1 hour
	Practical Exercises	3 hours
5	Radio Propagation Theory	1 hour
	Maintenance Theory	1 hour
	Practical Exercises	3.5 hours
	Summing up	0,5 hour

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MINI-LINK TN Advanced Ethernet Operations



LZU 108 7996 R2A

Description

Are you deploying Ethernet as your main transmission carrier in a MINI-LINK TN R4 network and are you going to use all the functionalities that come with Ethernet? Or do you just want to know the more advanced Ethernet settings you can make in the MINI-LINK TN R4? If so, this is the course for you.

With the help of the theoretical lessons the attendees will get a good knowledge about the Ethernet functionalities in the MINI-LINK TN R4 products. During the practical exercises and with guidance from the instructors the attendees will learn how to set up all the different Ethernet possibilities that you have in a MINI-LINK TN R4 network. This course is updated to meet the MINI-LINK TN release 4.4.

Learning objectives

On completion of this course the participants will be able to:

- 1 Understand the different Ethernet functionalities
 - 1.1 Define User Priority, Network Priority and Traffic Classes
 - 1.2 Describe Provider Bridge switching
 - 1.3 Describe Policing, Coloring and Aging
 - 1.4 Describe WRED
 - 1.5 Describe Strict Priority Queuing and WFQ
 - 1.6 Describe STP/RSTP/MSTP
- 2 Be able to configure all Ethernet functionalities mentioned above (Provider Bridge after 4.4FP)

Target audience

The target audience for this course is:

Network Deployment Engineer, System Engineer, Field Technician

Prerequisites

Successful completion of the following courses:

The participants have to have participated in the MINI-LINK TN R4 Operation and Maintenance course (LZU 108 7243)





Duration and class size

The length of the course is 2 days and the maximum number of participants is 8.

Learning situation

This course is based on Instructor Led Training.

This course is based on theoretical and practical instructor-led lessons given in both classroom and in a technical environment using equipment.

Time schedule

The time required always depends on the knowledge of the attending participants and the hours stated below can be used as estimate.

Day	Topics in the course	Estimated Time (hours)
1	Introduction	0,5
	Ethernet Networks	1
	Ethernet Functionalities	3,5
	Site Configuration Exercise	1
2	Practical Exercises	5,5
	Summing up	0,5

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MINI-LINK TN Troubleshooting



LZU 108 7997 R1A

Description

Are you working with MINI-LINK TN but find it hard to understand the system in detail and to do troubleshooting. If so, this is the course for you.

With the help of the theoretical lessons the attendees will get a deeper knowledge about the MINI-LINK TN R4 products and functions that will help doing troubleshooting. During the practical exercises and with guidance from the instructors the attendees will learn how to think and perform to realize the most common errors there are in a MINI-LINK TN R4 network.

Learning objectives

On completion of this course the participants will be able to:

- 1 Understand how the MINI-LINK TN is built up in a more detailed way
 - 1.1 Understand when unable to protect occurs
- 2 Know how to use the CLI for trouble shooting
- 3 Know how to use the alarm and error logs
- 4 Know what problems occur from HW and SW incompatibility
- 5 Know how to read out the results of the BERT and loops
- 6 Know how to find out faulty HW
 - 6.1 Backplane pin shortcuts
 - 6.2 Cables and connectors
- 7 Know how to read out the RF performance data

Target audience

The target audience for this course is:

Network Deployment Engineer, System Engineer, Field Technician



Prerequisites

Successful completion of the following courses:

The participants have to have participated in the MINI-LINK TN Operation & Maintenance course (LZU 1087243). Moreover, they must be experienced in working with a PC and the Windows operating system.

Duration and class size

The length of the course is 2 days and the maximum number of participants is 8.

Learning situation

This course is based on Instructor Led Training.

This course is based on theoretical and practical instructor-led lessons given in both classroom and in technical environment using equipment and tools.

Time schedule

The time required always depends on the knowledge of the attending participants and the hours stated below can be used as estimate.

Day	Topics in the course	Estimated Time (hours)
1	Introduction	0,5 hour
	Detailed description of the MINI-LINK TN	2 hours
	CLI	2 hours
	Alarm and error logs	1,5 hours
2	Reading out the results	2 hours
	HW fault finding	2 hours
	Interference problems and test	1,5 hours
	Summing up	0,5 hour

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MINI-LINK CN 210 R1 Operation and Maintenance



LZU 108 7990 R1A

Description

Do you have the right knowledge to work with operation and maintenance of a MINI-LINK CN 210? If not, this is the course for you.

With the help of the theoretical lessons the attendees will get a good knowledge about the MINI-LINK CN 210 products and its functions. During the practical exercises and with guidance from the instructors the attendees will learn the most efficient ways of performing operation and maintenance of a MINI-LINK CN 210.

Learning objectives

On completion of this course the participants will be able to:

- 1 Understand transmission fundamentals
- 2 Understand the functionalities of the MINI-LINK CN 210
 - 2.1 Name the indoor and outdoor parts
 - 2.2 Name the traffic interfaces
 - 2.3 Describe Adaptive modulation
 - 2.4 Configure a MINI-LINK CN 210 network element with the MINI-LINK Craft
- 3 Understand the DCN parts of a MINI-LINK CN 210
 - 3.1 Name different DCN interfaces
 - 3.2 Configure the DCN settings and make the DCN up and running
- 4 Understand the Ethernet functionalities of the MINI-LINK CN 210
 - 4.1 Configure Ethernet Radio links
- 5 Perform maintenance of a MINI-LINK CN 210 network element
 - 5.1 Define alarms and remove them with help of fault finding
 - 5.2 Perform Configuration backups
 - 5.3 Perform a Software upgrade

Target audience

The target audience for this course is:

Network Deployment Engineer, System Engineer, Field Technician





Prerequisites

Successful completion of the following courses:

The participants should be familiar with digital transmission fundamentals and the subjects/contents of Microwave Networks Overview (LZU 1086109 R2A) or similar knowledge. Moreover, they must be experienced in working with a PC and the Windows operating system.

Duration and class size

The length of the course is 1 day and the maximum number of participants is 8.

Learning situation

This course is based on theoretical and practical instructor-led lessons given in both classroom and in technical environment using equipment and tools.

Time schedule

The time required always depends on the knowledge of the attending participants and the hours stated below can be used as estimate.

Day	Topics in the course	Estimated Time (hours)
1	Introduction	0.5
	Radio Terminal	1.0
	MINI-LINK 210	0,5
	Ethernet	1.0
	DCN and Initial setup	1.0
	Maintenance	0.5
	Practical Exercises	1.5

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MINI-LINK CN 210/510 R1 Operation and Maintenance



LZU 108 7959 R1A

Description

Do you have the right knowledge to work with operation and maintenance of a MINI-LINK CN 210/510? If not, this is the course for you.

With the help of the theoretical lessons the attendees will get a good knowledge about the MINI-LINK CN 210/510 products and its functions. During the practical exercises and with guidance from the instructors the attendees will learn the most efficient ways of performing operation and maintenance of a MINI-LINK CN 210/510.

Learning objectives

On completion of this course the participants will be able to:

- 1 Understand transmission fundamentals
- 2 Understand the functionalities of the MINI-LINK CN 210 and CN510
 - 2.1 Name the indoor and outdoor parts
 - 2.2 Name the traffic interfaces
 - 2.3 Describe Adaptive modulation
 - 2.4 Configure a MINI-LINK CN 210 & 510 network element with the MINI-LINK Craft
- 3 Understand Transmission fundamentals
- 4 Understand the functionalities of the MINI-LINK CN 210 & 510
 - 4.1 Name the indoor and outdoor parts
 - 4.2 Name the traffic interfaces
 - 4.3 Describe Adaptive modulation
 - 4.4 Configure a MINI-LINK CN 210 & 510 network element with the MINI-LINK Craft
- 5 Understand the DCN parts of a MINI-LINK CN 210/510
 - 5.1 Name different DCN interfaces
 - 5.2 Configure the DCN settings and make the DCN up and running
- 6 Understand the Ethernet functionalities of the MINI-LINK CN 210/510
 - 6.1 Configure Ethernet Radio links
- 7 Perform maintenance of a MINI-LINK CN 210/510 network element
 - 7.1 Define alarms and remove them with help of fault finding
 - 7.2 Perform Configuration backups
 - 7.3 Perform a Software upgrade



Target audience

The target audience for this course is:

Network Deployment Engineer, System Engineer, Field Technician

Prerequisites

Successful completion of the following courses:

The participants should be familiar with digital transmission fundamentals and the subjects/contents of Microwave Networks Overview (LZU 1086109 R2A) or similar knowledge. Moreover, they must be experienced in working with a PC and the Windows operating system.

Duration and class size

The length of the course is 2 days and the maximum number of participants is 8.

Learning situation

This course is based on theoretical and practical instructor-led lessons given in both classroom and in technical environment using equipment and tools.

Time schedule

The time required always depends on the knowledge of the attending participants and the hours stated below can be used as estimate.

Day	Topics in the course	Estimated Time (hours)
1	Introduction	30 min.
	Radio Terminal	1 hour
	MINI-LINK CN	1.5 hours
	MINI-LINK 210	1 hour
	MINI-LINK 510	1 hour
	Ethernet	1 hour
2	DCN	1 hour
	Radio Theory	1 hour
	Maintenance	1 hour
	Practical Exercises	3 hours

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MINI-LINK CN 500 R1 Operation and Maintenance



LZU 108 7929 R1A

Description

Do you have the right knowledge to work with operation and maintenance of a MINI-LINK CN 500? If not, this is the course for you.

With the help of the theoretical lessons the attendees will get a good knowledge about the MINI-LINK CN 500 product and its functions. During the practical exercises and with guidance from the instructors the attendees will learn the most efficient ways of performing operation and maintenance of a MINI-LINK CN 500.

If you have participated in the MINI-LINK TN R4 Operation & Maintenance course (LZU 108 7243) you have acquired enough knowledge to be able to work with the MINI-LINK CN 500.

Learning objectives

On completion of this course the participants will be able to:

- 1 Understand Transmission fundamentals.
- 2 Understand the functionalities of the MINI-LINK CN 500.
 - 2.1 Name the indoor and outdoor parts.
 - 2.2 Name the traffic interfaces.
 - 2.3 Describe Adaptive modulation.
 - 2.4 Configure a MINI-LINK CN 500 network element with the MINI-LINK Craft.
- 3 Understand the DCN parts of a MINI-LINK CN 500.
 - 3.1 Name different DCN interfaces.
 - 3.2 Configure the DCN settings and make the DCN up and running.
- 4 Understand the Ethernet functionalities of the MINI-LINK CN 500.
- 5 Configure Ethernet Radio links.
- 6 Perform maintenance of a MINI-LINK CN 500 network element.
 - 6.1 Define alarms and remove them with help of fault finding.
 - 6.2 Perform Configuration backups.
 - 6.3 Perform a Software upgrade

Target audience

The target audience for this course is:

Network Deployment Engineer, System Engineer, Field Technician





Prerequisites

Successful completion of the following courses:

Microwave Networks Overview LZU 108 8322

Duration and class size

The length of the course is 1 days and the maximum number of participants is 8.

Learning situation

This course is based on theoretical and practical instructor-led lessons given in both classroom and in a technical environment using equipment and tools

Time schedule

The time required always depends on the knowledge of the attending participants and the hours stated below can be used as estimate.

Day	Topics in the course	Estimated Time (hours)
1	Introduction	0,5 hour
	MINI-LINK CN 500 theory	1,5 hours
	Ethernet functionalities	0,5 hour
	Maintenance Theory	1 hour
	Practical Exercises	2,5 hours

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MINI-LINK SP 110 R1 Operation and Maintenance



LZU1088444 R1A

Description

Do you have the right knowledge to work with operation and maintenance of a MINI-LINK SP 110? If not, this is the course for you.

With the help of the theoretical lessons the attendees will get a good knowledge about the MINI-LINK SP 110 product and its functions. During the practical exercises and with guidance from the instructors the attendees will learn the most efficient ways of performing operation and maintenance of a MINI-LINK SP 110.

Learning objectives

On completion of this course the participants will be able to:

- 1 Know the functionalities of the MINI-LINK SP 110
 - 1.1 Configure a MINI-LINK SP 110 network element with the Local Craft Terminal
- 2 Describe how the DCN works for a MINI-LINK SP 110
 - 2.1 Configure the DCN parameters and make the DCN up and running
- 3 Know the Ethernet functionalities of the MINI-LINK SP 110
 - 3.1 Configure the different Ethernet functionalities
- 4 Perform maintenance of a MINI-LINK SP 110 network element
 - 4.1 Define alarms and remove them with help of fault finding
 - 4.2 Perform Configuration backups
 - 4.3 Perform a Software upgrade

Target audience

The target audience for this course is:

Network Deployment Engineer, System Engineer, Field Technician



Prerequisites

Successful completion of the following courses:

The participants should be familiar with digital transmission fundamentals and the subjects/contents of Microwave Networks Overview (LZU 1086109 R2A) or similar knowledge. Moreover, they must be experienced in working with a PC and the Windows operating system.

Duration and class size

The length of the course is 1 day and the maximum number of participants is 8.

Learning situation

This course is based on Instructor Led Training.

This course is based on theoretical and practical instructor-led lessons given in both classroom and in technical environment using equipment and tools.

Time schedule

The time required always depends on the knowledge of the attending participants and the hours stated below can be used as estimate.

Day	Topics in the course	Estimated Time (hours)
1	Introduction	0,5 hour
	MINI-LINK SP 110 Features	0,25 hour
	DCN and Management	0,75 hour
	Ethernet functionalities	1,5 hours
	Configuration Exercises	2,5 hours
	Summing up	0,5 hour

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MINI-LINK SP 210/310 R1 Operation and Maintenance



LZU1088330 R2A

Description

Operation and maintenance of equipment could be a complex and resource-consuming task if your personnel do not have the appropriate skills and knowledge. This course will provide to your operators the full information about the MINI-LINK SP 210/310 family structure and features. Furthermore you will learn how to operate and maintain the MINI-LINK SP 210/310 family in the most efficient way using the training documentation.

Learning objectives

On completion of this course the participants will be able to:

- 1 Describe the MINI-LINK SP 210/310 family and features.
 - 1.1 Illustrate the use of the equipment in the network.
 - 1.2 Demonstrate the main features the MINI-LINK SP 210/310 offers.
 - 1.3 Explain the equipment composition.
 - 1.4 Identify the front panel devices.
- 2 Explain the main system architectures.
 - 2.1 Discuss the system architecture
- 3 Explain the protection schemes that the equipment supports.
 - 3.1 Describe the equipment protections.
 - 3.2 Describe the Ethernet traffic protections.
- 4 Use the MINI-LINK SP 210/310 Local Terminal interface.
 - 4.1 Connect to the equipment.
 - 4.2 Navigate the Command Line Interface.
 - 4.3 Navigate the GUI.
 - 4.4 Interacting with MINI-LINK PT.
- 5 Operate the initial system set-up.
 - 5.1 Configure and analyze the communication parameters.
 - 5.2 Configure the unit's parameters.
 - 5.3 Configure the ports' parameters.
 - 5.4 Configure synchronization parameters
- 6 Configure Ethernet traffic and protection schemes.
 - 6.1 Operate the provisioning of Ethernet services.
 - 6.2 Operate the provisioning of Circuit Emulation Services.
 - 6.3 Operate the provisioning of IGMP Snooping and DHCP Relay.



- 6.4 Set-up and manage the protections mechanisms.
- 7 Analyze the performance data.
 - 7.1 Configure OAM features.
 - 7.2 Set-up the performance data collection.
 - 7.3 Analyze the performance data and the optical measurement.
- 8 Manage fault reporting.
 - 8.1 Manage the alarm attributes.
 - 8.2 Recognize the fault condition and find the alarm cause.
- 9 Manage the equipment database and software.
 - 9.1 Perform the backup and restore of the equipment database.
 - 9.2 Describe the software download principles.
- 10 Operate main maintenance procedures.
 - 10.1 Use common tools for troubleshooting.
 - 10.2 Perform the card replacement.
 - 10.3 Manage some emergency conditions.

Target audience

The target audience for this course is:

Network Deployment Engineers, System Technicians, Service Technicians, System Engineers, Service Engineers, Field Technicians.

Prerequisites

Successful completion of the following courses:

Optical Networks System Survey (LZU 108 6951).

The participants should be familiar with the Ethernet, MPLS and SDH principles.

Duration and class size

The length of the course is 3 days and the maximum number of participants is 8.

Learning situation

This course is based on theoretical and practical instructor-led lessons given in both classroom and in technical environment using equipment and tools which can be optionally accessed remotely. This course can be conducted at the Customer premises.

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Time schedule

The time required always depends on the knowledge of the attending participants and the hours stated below can be used as estimate.

Day	Topics in the course	Estimated Time (hours)
1	Description of the MINI-LINK SP 210/310 family and equipment features	1 hour
	Description of the equipment composition	1 hour
	Description of the main system architectures	1 hour
	Starting the MINI-LINK SP 210/310 Local Terminal interface	1 hour
	Initial system set-up	2 hours
2	Configuration of the traffic and protection schemes	6 hours
3	Configuration of the performance data collection	2 hours
	Management of the fault reporting	2 hours
	Management of the equipment database and software	1 hour
	Operate main maintenance procedures	1 hour

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Exercises for MINI-LINK PT 2010 R1



LZU 108 8269 R1A

Description

Are you about to implement MINI-LINK PT 2010 into your transmission network and need to know how to manage it in the most efficient way in the field? If so then this is the right course for you. It covers how to work with the local Craft Tool and hands-on training of configuration, management and fault finding tasks on MINI-LINK PT 2010.

Theory to hands-on ratio of this course is 5/95

This course is designed based on Work-Shop concept. Remote or local Lab access is required to perform the exercises.

Learning objectives

On completion of this course the participants will be able to:

- 1 Connect the local Craft Tool to a MINI-LINK PT 2010 terminal
- 2 Make an initial set-up:
 - 2.1 Radio settings
 - 2.2 Capacity setting
 - 2.3 Ethernet traffic settings
 - 2.4 Remote Management Network settings
- 3 Save and restore a configuration
- 4 Make a functional test.
- 5 Manage feature licenses
- 6 Check alarms and do fault finding.
- 7 Collect link performance data
- 8 Make a software upgrade.

**Target audience**

The target audience for this course is:

Network Design Engineers, Solution Architects, Network Deployment Engineers, System Engineers and Service Engineers.

Prerequisites

Successful completion of the following courses:

Microwave Networks Overview, LZU 108 8322

MINI-LINK PT Fundamentals, LZU 108 8553

Ethernet Standards, LZU 108 5942

IP Networking and Internetworking, LZU 108 5942

Duration and class size

The length of the course is 1 days and the maximum number of participants is 8.

Learning situation

Instructor Led Work-Shop training.

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Time schedule

The time required always depends on the knowledge of the attending participants and the hours stated below can be used as estimate.

Day	Topics in the course	Estimated Time (minutes)
1	Introduction to local Craft tool	30 min
	Local management connection	30 min
	Initial setup	60 min
	Functional test	30 min
	Alarm logging	30 min
	Performance logging	30 min
	Fault finding	30 min
	Software upgrade	30 min
	Assessment	60 min
	Summary	30 min

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Exercises for MINI-LINK PT 6010 R1



LZU 108 8270 R1A

Description

Are you about to implement MINI-LINK PT 6010 into your transmission network and need to know how to manage it in the most efficient way in the field? If so then this is the right course for you. It covers how to work with the local Craft Tool and hands-on training of configuration, management and fault finding tasks on MINI-LINK PT 6010.

Theory to hands-on ratio of this course is 5/95

This course is designed based on Work-Shop concept. Remote or local Lab access is required to perform the exercises.

Learning objectives

On completion of this course the participants will be able to:

- 1 Connect the local Craft Tool to a MINI-LINK PT 6010 terminal
- 2 Make an initial set-up:
 - 2.1 Radio settings
 - 2.2 Capacity setting
 - 2.3 Ethernet traffic settings
 - 2.4 Remote Management Network settings
- 3 Save and restore a configuration
- 4 Make a functional test.
- 5 Check alarms and do fault finding.
- 6 Collect link performance data
- 7 Make a software upgrade.



Target audience

The target audience for this course is:

Network Design Engineers, Solution Architects, Network Deployment Engineers, System Engineers and Service Engineers.

Prerequisites

Successful completion of the following courses:

Microwave Networks Overview, LZU 108 8322

MINI-LINK PT Fundamentals, LZU 108 8553

Ethernet Standards, LZU 108 5942

IP Networking and Internetworking, LZU 108 5942

Duration and class size

The length of the course is 1 days and the maximum number of participants is 8.

Learning situation

Instructor Led Work-Shop training.



Time schedule

The time required always depends on the knowledge of the attending participants and the hours stated below can be used as estimate.

Day	Topics in the course	Estimated Time (minutes)
1	Introduction to local Craft tool	30 min
	Local management connection	30 min
	Initial setup	60 min
	Functional test	30 min
	Alarm logging	30 min
	Performance logging	30 min
	Fault finding	30 min
	Software upgrade	30 min
	Assessment	60 min
	Summary	30 min



MINI-LINK LH R1 Operation and Maintenance



LZU 108 7992 R1A

Description

Do you have the right knowledge to work with operation and maintenance of the MINI-LINK LH? If not, this is the course for you.

With the help of the theoretical lessons the attendees will get a good knowledge about the MINI-LINK LH and its functions. During the practical exercises and with guidance from the instructors the attendees will learn the most efficient ways of performing operation and maintenance of the MINI-LINK LH

Learning objectives

On completion of this course the participants will be able to:

- 1 Understand transmission fundamentals
- 2 Define the different parts in a MINI-LINK LH network element
 - 2.1 Name the indoor and outdoor parts
 - 2.2 Name the traffic interfaces
 - 2.3 Describe Adaptive modulation
 - 2.4 Configure a MINI-LINK LH network element with the MINI-LINK Craft
- 3 Be able to list needed equipment by using defined parameters for a site
- 4 Understand the functionalities of the MINI-LINK LH concept
 - 4.1 Define protection
 - 4.2 Describe licenses
 - 4.3 Describe adaptive modulation
- 5 Understand the Ethernet functionalities in the MINI-LINK LH
 - 5.1 Configure Ethernet Radio links
- 6 Understand the DCN parts of a MINI-LINK LH network
 - 6.1 Name different DCN interfaces
 - 6.2 Configure the DCN settings and make the DCN up and running
- 7 Perform maintenance of a MINI-LINK LH network element
 - 7.1 Define alarms and remove them with help of fault finding.
 - 7.2 Perform Configuration backups.
 - 7.3 Perform a Software upgrade.
 - 7.4 Exchange Plug-In Units.
 - 7.5 Create license request



Target audience

The target audience for this course is:

Network Deployment Engineer, System Engineer, Field Technician

Prerequisites

Successful completion of the following courses:

The participants should be familiar with digital transmission fundamentals and the subjects/contents of the Microwave Networks Overview (LZU1086109 R2A) or Microwave Networks System Survey (LZU 1087348 R4A). Moreover, they must be experienced in working with a PC and the Windows operating system

Duration and class size

The length of the course is 3 days and the maximum number of participants is 8.

Learning situation

This course is based on theoretical and practical instructor-led lessons given in both classroom and in technical environment using equipment and tools.

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Time schedule

The time required always depends on the knowledge of the attending participants and the hours stated below can be used as estimate.

Day	Topics in the course	Estimated Time (hours)
1	Introduction	0,5
	Basic Node and CBN	2
	Radio Terminal	1
	Site Configuration Exercise	1
	Basic Features	0,5
	DCN and Management	1
2	Practical Exercises	3
	Ethernet Traffic Handling	2
	Practical Exercises	1
3	Practical Exercises	2
	Maintenance Theory	1
	Practical Exercises	2,5
	Summing Up	0,5

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Marconi LH R2 Operation and Maintenance



LZU 108 6712 R2B

Description

Will the SDH Long Haul Microwave Radio System Marconi LH be part of your transport and transmission network? Do you have this system in your sphere of responsibility, but you are not able to operate or configure it reliably within the network? Each network element has specific procedures and special features and functions.

With the help of the training documentation provided in this course and the guidance of the instructors, the attendees will learn the most efficient ways of system operation, maintenance, commissioning, configuration and troubleshooting, hence saving time and money.

Learning objectives

On completion of this course the participants will be able to:

- 1 Describe the basic concepts of SDH microwave radio technologies
 - 1.1 Explain the benefits and characteristics of XPIC operation
- 2 Define the benefits and performance of the Marconi LH equipment
 - 2.1 Clarify the difference to SDH microwave radio systems MDRS155E
 - 2.2 Describe the channel branching network
 - 2.3 Explain the waveguide and dehydrator technology
 - 2.4 Discuss service channels supported
 - 2.5 Understand all line and radio protection concepts
 - 2.6 Explain the delta between release 2.5.3 and 2.5.4
 - 2.7 Illustrate the upgrade of MDRS155E with Marconi LH
- 3 Operate the Marconi LH Local Craft Terminal
 - 3.1 Connect the Local Craft Terminal to the equipment
 - 3.2 Practice basic functions like data backup and software
- 4 Describe the Marconi LH DCN solution
 - 4.1 Explain the basic concept of the SISA and SNMP technology
 - 4.2 Describe and specify the benefits of all DCN operating
- 5 Configure the system
 - 5.1 Practice all system configurations
 - 5.2 Explain all equipment parameters
 - 5.3 Manage line and radio protection switching solutions
- 6 Commissioning of the system



- 6.1 Practice the commissioning wizard
- 7 Operate and maintain the system
 - 7.1 Back up and restore the equipment database
 - 7.2 Monitor performance data and measuring values
 - 7.3 Monitor alarms
 - 7.4 Execute basic troubleshooting procedures

Target audience

The target audience for this course is:
Network Deployment Engineer, Field Technician

Prerequisites

Successful completion of the following courses:
Microwave Networks Overview LZU 108 8322

Duration and class size

The length of the course is 5 days and the maximum number of participants is 8.

Learning situation

This course is based on Instructor Led Training. It includes instructor-led lessons using power point presentations, hardware and software demonstrations and practical exercises on the hardware and local craft terminal in a classroom with complete Marconi LH equipment setup.

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Time schedule

The time required always depends on the knowledge of the attending participants and the hours stated below can be used as estimate.

Day	Topics in the course	Estimated Time (hours)
1	Introduction to SDH microwave radio technology	2 hours
	Marconi LH System Performance	0.75 hours
	Marconi LH Application Examples	1.25 hours
	Channel Branching Network	2 hours
2	Baseband Unit – Functional View	1 hour
	Baseband Unit – Hardware Components	2 hours
	Baseband Unit – Service Channel Applications	0.5 hour
	Baseband Unit – Protection Switching	0.5 hour
	Transceiver – Functional View and Interfaces	1 hour
	LMT – Local Maintenance Terminal Introduction	1 hour
3	Introduction to the SISA Technology	1.5 hours
	Network management connection – Operating Modes	2.5 hours
	LMT – Local Maintenance Terminal – Basic Functions	2 hours
4	System Configuration	2 hours
	Measuring Values and Performance Data	1.5 hours
	Alarm Displays and Troubleshooting	1 hour
	Commissioning Instructions	1.5 hours
5	Introduction to IP and Routing Technology	0.5 hours
	IP and Routing Configuration	1.5 hours
	System Configuration	1 hour
	Troubleshooting and Replacement Instructions	3 hours

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Short-Haul Microwave Radio Design



LZU 108 6842 R2A

Description

To correctly design a microwave radio network is a task with the utmost importance to the functionality of a microwave transmission network. Often diverting demands from different legal administrations, needed transmission capacity, required Quality and Availability and equipment properties must be weighted together with atmospheric and geographical properties to find the optimum solution.

Even with the help from modern prediction tools it is in the end the Planner who has to judge if the solution is acceptable or if some of the parameters has to be changed.

This is a delicate but interesting task!

This course gives the participants a good understanding of what planning objectives are applied in a microwave radio network and what parameters influence the performances. By lectures, classroom discussions, and exercises the participants get a solid ground in how to design the microwave radio network to meet stated transmission quality and availability objectives.

Several reference documents for the student's own further studies are included in the course book

Learning objectives

On completion of this course the participants will be able to:

- 1 Describe the workflow of a generic microwave radio design project
 - 1.1 Transmission target network model
 - 1.2 Nominal planning.
 - 1.3 Site acquisition
 - 1.4 Detailed planning
- 2 Describe what impact the inputs in prediction tools for equipment, topography and climate properties will have to the path performance.
 - 2.1 Hardware performance
 - 2.2 Free space loss and link budget
 - 2.3 Ground clearance
 - 2.4 Fading from rain and multi-path propagation.
 - 2.5 Ground reflections.
- 3 Describe the principles for frequency planning.
 - 3.1 Frequency allocation
 - 3.2 Obstacle loss





- 3.3 Threshold degradation
- 3.4 Cross polarization discrimination
- 3.5 Automatic Transmit Power Control
- 4 Give examples of network topologies and judge where from a microwave radio design point of view a certain topology is suitable.
- 5 Allocate quality and availability objectives according to applicable ITU-T and ITU-R recommendations.
 - 5.1 ITU-T recommendations G.821, G.826, G.827, G.828
 - 5.2 ITU-R recommendations F.696, F.1668, F.1703.
- 6 By the help from user documentation use Ericsson microwave prediction tools MLPERF and TEMS LinkPlanner for designing small microwave networks.

Target audience

The target audience for this course is:

Network Design Engineers

Prerequisites

Successful completion of the following courses:

Microwave Networks Overview LZU 108 8322

Duration and class size

The length of the course is 3 days and 0 hours and the maximum number of participants is 8.

Learning situation

This course is based on theoretical and practical instructor-led lessons given in both classroom and in technical environment using equipment and tools.

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Time schedule

The time required always depends on the knowledge of the attending participants and the hours stated below can be used as estimate.

Day	Topics in the course	Estimated Time (hours)
1	Course introduction	1 hour
	Microwave networks topologies	0,5 hour
	MINI-LINK radio terminal hardware	1.5 hours
	Quality and Availability objectives	1.5 hour
	Microwave propagation in fading free conditions	1 hour
	Exercise, Ground clearance	0.5 hour
2	Fading mechanisms in microwave networks	1 hour
	Ground reflections	1 hour
	Frequency planning and Interference calculation	2 hour
	Microwave planning with ATPC	0.5 hour
	Designing passive repeaters	1.0 hour
3	Introduction to MLPERF	0.5 hour
	Exercise, Path prediction with MLPERF	2.25 hours
	Introduction to TEMS LinkPlanner	0.5 hour

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Exercise, Network design with TEMS LinkPlanner	2.25 hours
Summing up	0.5 hour



Microwave Networks DCN Design



LZU 108 6146 R4A

Description

To design a microwave radio transmission network is a delicate task. Besides design for traffic handling and microwave radio propagation the Planner must be familiar with how to design the management network.

To in a proper way design the management network is of great importance as network availability is becoming an increasingly important issue, both from customer demand and from economical reality. Furthermore the complexity of modern networks adds on to the Planner's challenge in finding the optimal solution.

By lectures, classroom discussions, and exercises this course will give the participants a solid ground in how to design the Management Data Communication Network for the Ericsson Microwave Networks product range.

Basics about functionality, connectivity and dimensioning of the management tool ServiceOn Microwave is included in this course. For detailed knowledge in how to administrate and operate this please refer to respectively training course.

Learning objectives

On completion of this course the participants will be able to:

- 1 By help from customer documentation identify main Management properties and describe configuration possibilities for MINI-LINK TN, E, and Marconi LH R2.
- 2 Give examples of management DCN topologies and to judge where a certain topology is suitable.
- 3 Understand and describe how a management DCN for the above products can be designed

Target audience

The target audience for this course is:

Network Design Engineers





Prerequisites

Successful completion of the following courses:

Microwave Networks Overview LZU108 8322

Duration and class size

The length of the course is 3 days and the maximum number of participants is 16.

Learning situation

This course is based on theoretical instructor-led lessons given in a classroom environment



Time schedule

The time required always depends on the knowledge of the attending participants and the hours stated below can be used as estimate.

Day	Topics in the course	Estimated Time (hours)
1	Course Introduction	0.5 hour
	DCN introduction	0.5 hour
	DCN bearers	1 hour
	Generic protocols; Ethernet, IP and OSI	2 hours
	OSPF routing, fundamentals and design guidelines	1 hour
	DCN capacity dimensioning guidelines	1 hour
	MINI-LINK E DCN specifics	1.5 hours
2	MINI-LINK TN R4 DCN specifics	2.5 hours
	Marconi LH R2 DCN specifics	2 hours
	Interoperability with external equipment; Ericsson Marconi OMS 8xx, 12xx, 16xx and verified third party routers.	1 hour
3	ServiceOn Microwave functionality and dimensioning.	1 hour
	DCN design exercises spread over all days	3 hours
	Summing up	1 hour

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Marconi LH R2 System Planning



LZU 108 6713 R3A

Description

Will the SDH Long Haul Microwave Radio System Marconi LH be part of your transport and transmission network? Would you like to ensure the optimum use of this system? Each network element has specific procedures and special features and functions.

With the help of the training documentation provided in this course and the guidance of the instructors, the attendees will learn the most efficient ways of system and station planning, hence saving time and money. Moreover, they will know how to ensure the optimum use of these systems.

The radio hop planning process is not part of this training course

Learning objectives

On completion of this course the participants will be able to:

- 1 Describe the Marconi LH equipment
 - 1.1 Define the benefits and performance of the Marconi LH
 - 1.2 Illustrate the Marconi LH system application
- 2 Describe the microwave radio technologies
 - 2.1 Explain the ATPC, Diversity and XPIC operation
- 3 Plan the connection between Transceiver and antenna
 - 3.1 Describe the channel branching network
 - 3.2 Explain the waveguide and dehydrator technology
- 4 Plan the Marconi LH subracks
 - 4.1 Describe the hardware components
 - 4.2 Understand all line and radio protection concepts
 - 4.3 Explain the delta between release 2.5.3 and 2.5.4
 - 4.4 Discuss service channels supported
- 5 Design the Marconi LH DCN solution
 - 5.1 Explain the basic concept of the SISA and SNMP technology
 - 5.2 Describe and specify the benefits of all DCN operating



Target audience

The target audience for this course is:

Network Design Engineer

Prerequisites

Successful completion of the following courses:

Microwave Networks Overview LZU 108 8322

Duration and class size

The length of the course is 2 days and the maximum number of participants is 16.

Learning situation

This course utilizes Instructor Led Training.

It includes instructor-led lessons using power point presentations, hardware demonstrations and planning exercises



Time schedule

The time required always depends on the knowledge of the attending participants and the hours stated below can be used as estimate.

Day	Topics in the course	Estimated Time (hours)
1	Marconi LH System Performance	1 hour
	Marconi LH Planning Examples	1 hour
	Microwave radio technology (Diversity, XPIC, ATPC)	1.5 hour
	Channel Branching Network	2 hours
	Waveguide, Dehydrator and Antenna	1.5 hours
2	Rack configuration and Power supply	0.5 hour
	Baseband Unit – Hardware Components	2 hours
	Baseband Unit – Service Channel Application	0.5 hour
	Baseband Unit – Protection Concept	0.5 hour
	Introduction to the SISA and SNMP Technology	1.5 hour
	Network management connection – QD2, OSI , IP	1 hour

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MINI-LINK System Planning



LZU 108 8064 R1A

Description

A transmission network of today employs a variety of techniques, for example traditional PDH and SDH, ATM and Ethernet. With all offered possibilities it can be a challenging task to configure the transmission equipment in a complex transport network.

By lectures, classroom discussions, and configuration exercises this course will help the planner in how to configure MINI-LINK systems to meet different transmission challenges.

This course focuses on System configuration for different traffic cases of;

PDH and Super PDH traffic,

SDH traffic including ADM functionality,

Ethernet traffic directly over radio (Native Ethernet) and over PDH and SDH

Ethernet traffic handling in the embedded Layer 2 Switch, VLAN and priority functionality

ATM cross connect and transport of ATM over PDH.

Synchronization issues.

Traffic dimensioning and network topology examples are taken from GSM and WCDMA

Radio Access Networks.

This course covers and concentrates on functionality for MINI-LINK TN up to release 4.4. To a minor extent it also covers MINI-LINK CN products and MINI-LINK E.

For detailed knowledge in Management Network Design please refer to the training course: Microwave Networks DCN Design, LZU 108 6146.

For detailed knowledge in designing the microwave radio network please refer to the training course: Short-haul Microwave Radio Network Design, LZU 108 6842.

Learning objectives

On completion of this course the participants will be able to:

- 1 Understand and describe how MINI-LINK TN R4.4 can be used for transport of PDH, SDH, ATM and Ethernet
 - 1.1 ETSI and ANSI PDH transport and Traffic Routing
 - 1.2 SDH regenerator, Add-drop multiplexer, Cross-connector
 - 1.3 ATM over E1 and ATM Cross-connect.
 - 1.4 Ethernet over radio, PDH and SDH, Ethernet switching.
- 2 From given network topology, traffic capacities and traffic types describe configuration possibilities and requirements for MINI-LINK TN and E equipment
 - 2.1 Traffic related indoor equipment and configurations
 - 2.2 Feature licenses.
 - 2.3 DC power requirement



- 3 Understand how to estimate needed transmission capacity in cellular radio access networks.
 - 3.1 GSM RAN built on TDM technology
 - 3.2 WCDMA RAN over ATM
 - 3.3 WCDMA RAN over Ethernet
- 4 Give examples of network topologies and be able to judge where a certain topology is suitable from a traffic point of view
- 5 Describe how to estimate needed number of spare units

Target audience

The target audience for this course is:

Network Design Engineers, Network Deployment Engineers

Prerequisites

Successful completion of the following courses:

Microwave Network Overview LZU 108 8322

Duration and class size

The length of the course is 3 days and the maximum number of participants is 16.

Learning situation

This course is based on theoretical instructor-led lessons given in a classroom environment. It holds network and equipment configuration exercises on paper to let the students practice knowledge gained from the theoretical lessons.

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Time schedule

The time required always depends on the knowledge of the attending participants and the hours stated below can be used as estimate.

Day	Topics in the course	Estimated Time (hours)
1	Course introduction	1 hour
	Access Transport Network, GSM and WCDMA	1 hour
	Access Transport Network Design exercise	2 hour
	MINI-LINK TN R4 Basic Node	0.5 hour
	MINI-LINK TN R4 Radio Terminals	0.5 hour
	MINI-LINK TN R4 TDM Traffic Handling	1 hour
2	MINI-LINK TN R4 ATM Traffic Handling	0.5 hour
	MINI-LINK TN R4 SDH Traffic Handling	1 hour
	MINI-LINK TN R4 Ethernet Traffic Handling	2 hour
	MINI-LINK TN R4 system configuration exercise	2.5 hours
3	MINI-LINK TN R4 Synchronization Network, lecture and exercise	1 hour
	MINI-LINK TN R4 Feature Licenses, lecture and exercise	0.5 hour
	MINI-LINK E System Description, lecture and exercise	1.5 hours
	MINI-LINK CN Product Descriptions	0.5 hour

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MINI-LINK Outdoor Units	0.75 hour
MINI-LINK Power Consumption	0.75 hour
MINI-LINK Spare Part Dimensioning	0.5 hour
Summing up	0.5 hour



MINI-LINK TN R4 Operation and Maintenance Delta



LZU 108 7245 R5A

Description

Do you have the right knowledge to work with operation and maintenance in a MINI-LINK TN R4 network? If you already have the competence for MINI-LINK TN R3 but need to know the latest updates, this might be the right course for you.

With the help of the theoretical lessons the attendees will get a good knowledge about the O&M delta between MINI-LINK TN release 3 to release 4.4. During the practical exercises and with guidance from the instructors the attendees will learn the most efficient ways of performing MINI-LINK TN R4 specific operation and maintenance tasks

Learning objectives

On completion of this course the participants will be able to:

- 1 Define new MINI-LINK TN products
 - 1.1 Indoor parts: AMM's and plug-in units
 - 1.2 Outdoor parts: Radio and antennas
 - 1.3 Traffic interfaces
- 2 Define the new functionalities in the MINI-LINK TN concept
 - 2.1 Enhanced Ethernet (Ethernet switching, Ethernet over PDH or Packet Link, LAG, WRED, WFQ, Policing, Coloring etc.)
 - 2.2 Enhanced SDH (integrated ADM, EoSDH and enhanced protection scheme)
- 3 Define new DCN feature in MINI-LINK TN
 - 3.1 Multivendor DCN
- 4 Handle the new MINI-LINK Craft used for operation and maintenance
- 5 Configure and Maintain the new MINI-LINK TN R4.4 specific features/functions

Target audience

The target audience for this course is:

System Engineer, Field Technician



Prerequisites

Successful completion of the following courses:

MINI-LINK TN R3 Operation and Maintenance

Duration and class size

The length of the course is 2 days and the maximum number of participants is 8.

Learning situation

This course utilizes Instructor Led Training.

The course consists of instructor-led lessons using power point presentations and practical exercises in classroom and in lab environment using live MINI-LINK TN R4 equipment



Time schedule

The time required always depends on the knowledge of the attending participants and the hours stated below can be used as estimate.

Day	Topics in the course	Estimated Time (hours)
1	Introduction	0,5 hour
	Basic Node	1 hour
	Radio Terminal	0,5 hour
	DCN and Management	0,5 hour
	SDH Traffic handling	0,5 hour
	Ethernet Traffic handling	2 hours
	Site Configuration Exercise	1 hour
2	Practical Exercises	5,5 hours
	Summing up	0,5 hour

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