

# Product Training 2012

Courses and Schedules





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## Hello

The excitement, tension and anticipation in the sporting world is set to move up a gear, as 2012 – Olympic Year – dawns upon the world. For the athletes countless hours of discussions and planning with coaches, together with extensive training regimes will come to an end – as they take to their chosen stage to perform and compete with excellence, and dream of medal glory.

Performing with excellence is the aspiration of KEYMILE. The high quality feature-rich products you are investing in for your network are the result of considerable planning, discussion, design and a little inspiration. So we want to partner with you to achieve excellence in the way your KEYMILE equipment functions, so we can offer the best possible experience for all customers and end-users.

Like the Olympic athletes, a key element in achieving excellence in a KEYMILE network is good training. So it makes sense this year to look again at where you and your colleagues might benefit from joining one of our training courses.

Please take a few minutes to browse through the pages of this program – you should find all you need to know. The handy Course Finder helps you decide which courses will cover the plug-in units you have in your network.

We continue to offer our well-established Open Course program at our European training centres, with new and updated course content reflecting the continually expanding functionality of our product lines.

If you require a special course – we will be delighted to work with you to develop the content that is most suitable for your needs. Speak to your KEYMILE Sales contact, or directly to one of the Training Team. Contact details are below.

On the internet you can always find us at: <http://training.keymile.com>

I wish you an excellent 2012 - enjoy the Olympics - and we look forward to seeing you soon on a training course at KEYMILE.

A handwritten signature in blue ink, appearing to read "John Collinson".

John Collinson  
Director of Training

### Contact KEYMILE Training

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## Overview

We offer a full range of standard courses across the MileGate, UMUX, UNEM and XMP1/SOX platforms, many of which are available on our Open Course Program. We are pleased to offer by request courses on the LineRunner, HYTAS and PacketBand product lines.

If none of the Standard courses are suitable we will work with you to design a special course for your particular requirements. Get in touch with us using one of the contact details below to arrange a discussion.

English continues to be used as the standard language in our courses. Our team of instructors regularly train students from many different countries, and we are usually able to deliver courses in the preferred language of the customer. Please make clear which language you would like the instructor to use for your dedicated course.

It's always a pleasure to welcome students to one of our custom-built European training centres in Germany, Switzerland and the UK. As an alternative we will be pleased to look at delivering a course at your own premises.

### Contact KEYMILE Training

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## Course Index

### UMUX Courses

Course Title	Days	Reference	Page
UMUX Fundamentals	3	A28A1725	31
UMUX SDH Applications	2	A28A1757	32
UMUX Ethernet Applications	2	A29A9680	33
UMUX TDM Data Applications	1	A32A9313	34
UMUX TDM Voice Applications	1	A28A1758	35
UMUX NGN VoIP Applications	1	A29A9679	36
UMUX Ethernet over DSL	1	A31A1784	37
UMUX Legacy Units	1	37548212	39
UMUX Network Management Communications	1	A28A1730	40
UMUX Project Planning	1	37548204	38
UMUX Specific Applications and Design	1	37548220	41
UMUX Release Update	1	37548239	42

### MileGate Courses

Course Title	Days	Reference	Page
MileGate Fundamentals	2	A31A1785	22
MileGate Ethernet over DSL or Fibre	2	A32A2551	24
MileGate TDM Applications	3	A32A9312	25
MileGate VoIP Applications	1	A32A2548	26
MileGate Circuit Emulation Services	1	37948008	28
MileGate Multicast Applications	½	37948032	29
MileGate CLI and Scripting	1	37948016	27
MileGate Security Management	1	37948024	23
MileGate Release Update	1	37948040	30

### UNEM Courses

Course Title	Days	Reference	Page
UNEM Basic Package (BP) Operations	2	A28A1733	45
UNEM Administration	1	A29A9675	46
UNEM Networking Package	1	A28A1752	47



## XMP1 Courses

Course Title	Days	Reference	Page
XMP1-LCC PDH Hardware under NMS SOX	2	37016067	48
XMP1-LCC PDH and SDH Hardware under NMS SOX	4	37016075	49
XMP1 PDH Hardware and NMS SOX	5	37016008	50
XMP1 PDH Hardware and NMS SOX/MSP under SOA	5	37016016	51
XMP1 SDH Hardware under NMS SOX	4	37016024	52
XMP1 SDH Hardware under NMS SOX/MSP (SOA)	4	37016032	53
XMP1 SOX NMS (without Hardware)	3	37016040	54
XQI-SL	3	37016059	55

## PacketBand Courses

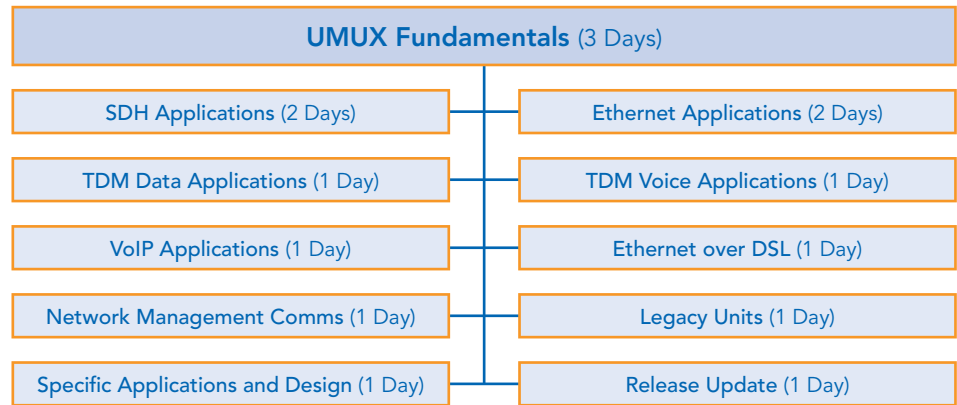
Course Title	Days	Reference	Page
PacketBand Circuit Emulation Services	2	37848003	43
PacketBand Ethernet and VLAN Services	1	37848011	44



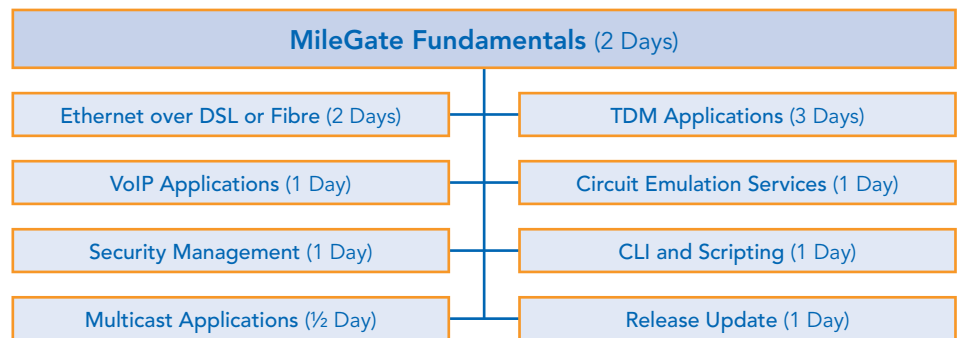
## Courses At A Glance

The following diagrams show which courses should be attended before others. Please consider this when deciding on which courses to attend.

### UMUX Courses



### MileGate Courses



### UNEM Courses





### XMP1 Courses



### PacketBand Courses



## Course Finder

Use this chart to identify the appropriate course for all current MileGate plug-in units.

Plug-in Unit	MileGate Course	Function	Page
CEOP1	Circuit Emulation Services	Circuit Emulation 8 port + Transport 8 x E1	28
COGE1	MileGate Fundamentals	Control, 1 GbE	22
COGE3	MileGate Fundamentals	Control, 10 GbE	22
COGE5	MileGate Fundamentals	Control, 10 GbE, PDH ECC, Synchronous Ethernet	22
ETAG1	TDM Applications	TDM 4 port 10/100 Ethernet	25
IPSM2	VoIP Applications	MEGACO Gateway	26
IPSS2	VoIP Applications	SIP Gateway	26
IPSM3	VoIP Applications	MEGACO Gateway (high capacity)	26
IPSS3	VoIP Applications	SIP Gateway (high capacity)	26
LOMI8	TDM Applications	Transport 8 x E1	25
PCOM1	TDM Applications	V5.2 Gateway	25
PCOM2	TDM Applications	V5.2 Gateway (high capacity)	25
PCOM2	TDM Applications	V5.1 Gateway	25
STIM1	TDM Applications	Transport 8 x SHDSL	25
SUAD1/3/5	MileGate Fundamentals	32/48/64 port ADSL2plus over POTS	22
SUAD2/4	MileGate Fundamentals	32/48 port ADSL2plus over ISDN	22
SUAM6	MileGate Fundamentals	64 port ADSL2plus over ISDN with MELT	22
SUE18	Ethernet over DSL or Fibre	24 port 10/100/1000 Electrical Ethernet, 10 GbE	24
SUE12	Ethernet over DSL or Fibre	12 port 100/1000 SFP Optical/Electrical Ethernet, 10 GbE	24
SUE16	Ethernet over DSL or Fibre	24 port 100/1000 cSFP Optical Ethernet, 10 GbE	24
SUEN1	Ethernet over DSL or Fibre	6 port FE SFP + 2 port GbE SFP Optical/Electrical Ethernet	24
SUEN3	Ethernet over DSL or Fibre	24 port Optical Ethernet with Cable TV Overlay	24
SUEN4	Ethernet over DSL or Fibre	24 port Optical Ethernet	24
SUEP1	Ethernet over DSL or Fibre	8 port 10/100 Ethernet, 6 ports with PoE	24
SUIQ1	VoIP Applications	16 port ISDN (2B1Q)	25
SUIT1	VoIP Applications	16 port ISDN (4B3T)	25
SUPM1/3/4/5	VoIP Applications	16/32/48/64 port PSTN	25
SUPC3/4/5	VoIP Applications	32/48/64 port PSTN with integrated Splitter	25
SUSD1	Ethernet over DSL or Fibre	32 port SHDSL.bis (ATM)	24
SUSE1	Ethernet over DSL or Fibre	32 port SHDSL.bis (EFM)	24
SUV11	Ethernet over DSL or Fibre	48 port VDSL2 over POTS, 10 GbE	24
SUVD1/3	Ethernet over DSL or Fibre	20/32 port VDSL2 over POTS	24



Plug-in Unit	MileGate Course	Function	Page
SUVD2	Ethernet over DSL or Fibre	20 port VDSL2 over ISDN	24
SUVM4	Ethernet over DSL or Fibre	32 port VDSL2 over ISDN with MELT	24
SUVM6	Ethernet over DSL or Fibre	48 port VDSL2 over ISDN with MELT	24
SYN4M	TDM Applications	Transport 4 x STM-1/4	25
TUDA1	TDM Applications	TDM 4 port Data + 1 Ethernet	25
TUEM1	TDM Applications	TDM 4 port E&M	25
TUXA1	TDM Applications	12 port FXO	25

Use this chart to identify the appropriate course for all current UMUX plug-in units.

Plug-in Unit	UMUX Course	Function	Page
ALCAR	Legacy Units	External Digital Alarm (24)/Control (4)	39
COBUX	UMUX Fundamentals	Control	31
DATA*	TDM Data Applications	4 x Serial Data, 1 x Ethernet	34
ETER1	TDM Data Applications	4 x Bridging and Switching	34
EXLAN	TDM Voice Applications	12 x 2-wire exchange side, FXO	35
EXLIC	TDM Voice Applications	8 x ISDN-BRI exchange side	35
GECOD	Legacy Units	8 x G.703 64 kbps co-directional timing	39
IPLM1/2/4/6	Ethernet over DSL	24 x Ethernet over ADSL	37
ISBUQ/T	TDM Voice Applications	8 x ISDN over V5	35
LAWA4	Ethernet Applications	Ethernet over PDH (4 Mbps)	33
LEMU6	Ethernet Applications	6 x Ethernet over MSDSL	33
LOMIF/4	UMUX Fundamentals	8 x G.703, 2 Mbps Transport	31
MAGI8	TDM Data Applications	8 x Magneto signalling	34
NEBRO/A/E	Ethernet Applications	6 x Switched Ethernet, Ethernet over SDH, VLANs	33
NEMSG	TDM Data Applications	4 x E&M VF interfaces with hotline conference	34
PCON2	TDM Voice Applications	High capacity V5.x gateway	35
PHOV5	TDM Voice Applications	Standard capacity V5.x gateway	35
POSUM	UMUX Fundamentals	Voltage converter	31
STIC1/2	TDM Data Applications	2 x TDM over DSL without/with remote power	34
SUBH1/3	UMUX Fundamentals	10/30 POTS, FXS	31
SULIS	TDM Voice Applications	ISDN-BRI	35
SWITE	Ethernet Applications	Power over Ethernet	33
SYN4E	SDH Applications	4 x STM-4, STM-1 transport + 4 x Ethernet	32
SYNAC	SDH Applications	8 x P12, VC12	32
SYNAM/D	SDH Applications	8/16 x E1, VC12	32
SYNUF	SDH Applications	1 x STM-1 transport	32



Plug-in Unit	UMUX Course	Function	Page
SYNVA	SDH Applications	32 x VC12 over DSL	32
TUPON	TDM Data Applications	32 x VC12 over DSL	34

Use this chart to identify the appropriate course for all current UMUX and MileGate CPEs.

Plug-in Unit	UMUX/MileGate Course	Function	Page
LineRunner DTM	TDM Data Applications/ TDM Applications	UMUX/MileGate CPE for E1 and modular X.21, V.xx	34/25
LineRunner DTR	Ethernet over DSL or Fibre	MileGate CPE for 4 x SHDSL.bis	24
LineRunner DTU	TDM Data Applications/ TDM Applications	UMUX/MileGate CPE for E1 and X.21, V.xx	34/25



## Booking on an Open Course

### Procedure

If you wish to make an enquiry or book one or more places on a course on our Open Program please follow the steps below:

1. Check this Program or the on-line schedule to find the course, dates and venue you require. Contact the Training Administrator if you need more information at this stage.
2. Print out a copy of the Course Booking Form, which can be found at the end of this document. The form can also be downloaded from the website.
3. Complete the form with your requested course places.
4. Fax or Scan and e-mail the completed form to the Training Administrator. See the contact details below.
5. The Training Administrator will e-mail you with a response. This will advise you that course places have been reserved, what the costs are, and all the details you will need for the Purchase Order.
6. Fax or e-mail the Purchase Order to the location advised by the Training Administrator.
7. Your booking will then be confirmed, and you will be invoiced for the course fees.
8. Joining Instructions will be sent out approximately 10 to 15 working days before the course starts. Let us know if you require the information earlier than this, for example, for booking accommodation or travel. Please provide us with the e-mail addresses you wish to receive this information.

### Contact KEYMILE Training

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## Dedicated and Customised Courses

If the Standard Open courses are not entirely suitable for your needs, we offer Dedicated and Customised Courses.

Dedicated courses are just for your company. You decide where the course takes place, what the course content is, and how many participants will attend. You can even specify if there is to be an end-of-course test, or any other special arrangements.

### Customised Course Content

If you would like to specify or customise the content of your dedicated course, we will discuss with you how we can best modify the Standard course content in order to suit your particular needs.

### Location

Courses can be delivered either at a KEYMILE Training Centre, or your own premises. KEYMILE Training Centres are located in Berne (Switzerland), Hanover, Backnang (Germany), and Hertford (UK).

### Language

The standard language of the spoken word used by our instructors is English. Slides and Course Notes are also prepared in English. However, for Dedicated courses, if you have a requirement for the spoken word to be in another language, please contact us for options. Furthermore for an agreed cost we will consider translating the courseware into another language.

### Making an Enquiry

For all dedicated and customised courses enquiries:

Firstly, contact your own KEYMILE Account Team with your requirements. If you are unsure who to speak with, contact us and we will put you in touch with a member of your sales account team.

After discussions, we will put together a course proposal, based on your specific requirements. This will include details of the course content, pricing and dates.

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## Open Course Schedule 2012

Open Courses take place at one of our international Training Centres. The following table shows provisional dates which can be used for planning purposes. Unless otherwise specified, courses are delivered in English.

Remember to check the on-line schedule for up-to-date information on the availability of places on these Open Courses, and information on new courses – including those from other product families – that may be added to the Open program.

Visit: <http://training.keymile.com>

Course Title	Start Date	Duration	Location
UMUX Fundamentals	13 Feb 2012	3 days	Berne
UMUX SDH Applications	16 Feb 2012	2 days	Berne
UMUX Ethernet Applications	20 Feb 2012	2 days	Berne
UMUX TDM Data Applications	22 Feb 2012	1 day	Berne
UNEM Basic Package	23 Feb 2012	2 days	Berne
MileGate Fundamentals	27 Feb 2012	2 days	Berne
MileGate Ethernet over DSL or Fibre	29 Feb 2012	2 days	Berne
MileGate VoIP Applications	2 Mar 2012	1 day	Berne
MileGate TDM Applications	5 Mar 2012	3 days	Berne
UNEM Basic Package	8 Mar 2012	2 days	Berne
XMP1 PDH Hardware and SOX O&M	16 Jan 2012	5 days	Backnang
XMP1 SDH Hardware under SOX O&M	23 Jan 2012	4 days	Backnang
XMP1 PDH Hardware and SOX O&M (German)	6 Feb 2012	5 days	Backnang
XMP1 SDH Hardware under SOX O&M (German)	13 Feb 2012	4 days	Backnang
XMP1-LCC PDH, SDH Hardware under SOX O&M	5 Mar 2012	4 days	Backnang
XMP1-LCC PDH, SDH Hardware under SOX O&M (German)	12 Mar 2012	4 days	Backnang
XMP1 PDH Hardware under SOA (SOX/MSP) O&M	16 Apr 2012	5 days	Backnang
XMP1 SDH Hardware under SOA (SOX/MSP) O&M	23 Apr 2012	4 days	Backnang
XMP1-LCC PDH Hardware under SOX O&M	7 May 2012	2 days	Backnang
XMP1-LCC PDH Hardware under SOX O&M (German)	10 May 2012	2 days	Backnang
XMP1 PDH Hardware under SOA (SOX/MSP) O&M (German)	21 May 2012	5 days	Backnang
UMUX Fundamentals	4 Jun 2012	3 days	Hanover
UMUX SDH Applications	7 Jun 2012	2 days	Hanover
UMUX Ethernet Applications	11 Jun 2012	2 days	Hanover
UMUX TDM Data Applications	13 Jun 2012	1 day	Hanover
UNEM Basic Package	14 Jun 2012	2 days	Hanover



Course Title	Start Date	Duration	Location
MileGate Fundamentals	18 Jun 2012	2 days	Hanover
MileGate Ethernet over DSL or Fibre	20 Jun 2012	2 days	Hanover
MileGate VoIP Applications	22 Jun 2012	1 day	Hanover
MileGate TDM Applications	25 Jun 2012	3 days	Hanover
UNEM Basic Package	28 Jun 2012	2 days	Hanover
XMP1 SDH Hardware under SOA (SOX/MSP) O&M (German)	11 Jun 2012	4 days	Backnang
XQI-SL O&M (German)	19 Jun 2012	3 days	Backnang
UMUX Fundamentals	6 Aug 2012	3 days	Berne
UMUX SDH Applications	9 Aug 2012	2 days	Berne
UMUX Ethernet Applications	13 Aug 2012	2 days	Berne
UMUX TDM Data Applications	15 Aug 2012	1 day	Berne
UNEM Basic Package	16 Aug 2012	2 days	Berne
MileGate Fundamentals	20 Aug 2012	2 days	Berne
MileGate Ethernet over DSL or Fibre	22 Aug 2012	2 days	Berne
MileGate VoIP Applications	24 Aug 2012	1 day	Berne
MileGate TDM Applications	27 Aug 2012	3 days	Berne
UNEM Basic Package	30 Aug 2012	2 days	Berne
XMP1-LCC PDH & SDH Hardware under SOX O&M	27 Aug 2012	4 days	Backnang
XMP1-LCC PDH & SDH Hardware under SOX O&M (German)	3 Sep 2012	4 days	Backnang
XMP1 SOX NMS (no Hardware)	17 Sep 2012	3 days	Backnang
XMP1 SOX NMS (no Hardware) (German)	24 Sep 2012	3 days	Backnang
XMP1 PDH Hardware and SOX O&M (German)	29 Oct 2012	5 days	Backnang
XMP1 SDH Hardware under SOX O&M (German)	5 Nov 2012	4 days	Backnang
UMUX Fundamentals	5 Nov 2012	3 days	Hanover
UMUX SDH Applications	8 Nov 2012	2 days	Hanover
UMUX Ethernet Applications	12 Nov 2012	2 days	Hanover
UMUX TDM Data Applications	14 Nov 2012	1 day	Hanover
UNEM Basic Package	15 Nov 2012	2 days	Hanover
MileGate Fundamentals	19 Nov 2012	2 days	Hanover
MileGate Ethernet over DSL or Fibre	21 Nov 2012	2 days	Hanover
MileGate VoIP Applications	23 Nov 2012	1 day	Hanover
MileGate TDM Applications	26 Nov 2012	3 days	Hanover
UNEM Basic Package	29 Nov 2012	2 days	Hanover
XMP1 PDH Hardware and SOX O&M	26 Nov 2012	5 days	Backnang
XMP1 SDH Hardware under SOX O&M	3 Dec 2012	4 days	Backnang



## Course Structure by Training Centre

KEYMILE Training Centre, Berne, Switzerland

Scheduled Session: 13th February - 9th March, 6th - 31st August 2012

Course Title	Week 7					Week 8				
	13.02.	14.02.	15.02.	16.02.	17.02.	20.02.	21.02.	22.02.	23.02.	24.02.
UMUX Fundamentals	■	■	■							
UMUX SDH Applications				■	■					
UMUX Ethernet Applications						■	■			
UMUX TDM Data Applications								■		
UNEM Basic Package									■	■

Course Title	Week 9					Week 10				
	27.02.	28.02.	29.02.	1.03.	2.03.	5.03.	6.03.	7.03.	8.03.	9.03.
MileGate Fundamentals	■	■								
MileGate Ethernet over DSL or Fibre			■	■						
MileGate VoIP Applications					■					
MileGate TDM Applications						■	■	■		
UNEM Basic Package									■	■

Course Title	Week 32					Week 33				
	6.08.	7.08.	8.08.	9.08.	10.08.	13.08.	14.08.	15.08.	16.08.	17.08.
UMUX Fundamentals	■	■	■							
UMUX SDH Applications				■	■					
UMUX Ethernet Applications						■	■			
UMUX TDM Data Applications								■		
UNEM Basic Package									■	■

Course Title	Week 34					Week 35				
	20.08.	21.08.	22.08.	23.08.	24.08.	27.08.	28.08.	29.08.	30.08.	31.08.
MileGate Fundamentals	■	■								
MileGate Ethernet over DSL or Fibre			■	■						
MileGate VoIP Applications					■					
MileGate TDM Applications						■	■	■		
UNEM Basic Package									■	■



## KEYMILE Training Centre, Hanover, Germany

Scheduled Session: 4th - 29th June and 5th - 30th November 2012

Course Title	Week 23					Week 24				
	4.6.	5.6.	6.6.	7.6.	8.6.	11.6.	12.6.	13.6.	14.6.	15.6.
UMUX Fundamentals	■	■	■							
UMUX SDH Applications				■	■					
UMUX Ethernet Applications						■	■			
UMUX TDM Data Applications								■		
UNEM Basic Package									■	■

Course Title	Week 25					Week 26				
	18.6.	19.6.	20.6.	21.6.	22.6.	25.6.	26.6.	27.6.	28.6.	29.6.
MileGate Fundamentals	■	■								
MileGate Ethernet over DSL or Fibre			■	■						
MileGate VoIP Applications					■					
MileGate TDM Applications						■	■	■		
UNEM Basic Package									■	■

Course Title	Week 45					Week 46				
	5.11.	6.11.	7.11.	8.11.	9.11.	12.11.	13.11.	14.11.	15.11.	16.11.
UMUX Fundamentals	■	■	■							
UMUX SDH Applications				■	■					
UMUX Ethernet Applications						■	■			
UMUX TDM Data Applications								■		
UNEM Basic Package									■	■

Course Title	Week 47					Week 48				
	19.11.	20.11.	21.11.	22.11.	23.11.	26.11.	27.11.	28.11.	29.11.	30.11.
MileGate Fundamentals	■	■								
MileGate Ethernet over DSL or Fibre			■	■						
MileGate VoIP Applications					■					
MileGate TDM Applications						■	■	■		
UNEM Basic Package									■	■

## Course Descriptions

Detailed Course Descriptions now follow for all available courses in the following product families:

- UMUX
- MileGate
- UNEM
- PacketBand
- XMP1/SOX

Please note carefully the specific pre-requisites for students intending to participate in the course. Also note the general comments regarding pre-requisites below.

### Pre-requisites for Participants

It is important that all those attending a KEYMILE course make the most of their time with us. Most courses are intensive and without suitable preparation a participant may find it difficult to obtain the maximum benefit from the training.

Sensible preparation for course attendance would include reading articles (both printed and on-line) that discuss the technologies used in the products to be studied on the course. Contact the Training Administrator if you need advice on suggested reading.

Some courses define a pre-requisite as successful attendance on another product course. Where possible this should be adhered to. However, this would not be required for a participant who has recent extensive working experience of the product.

The course descriptions above have detailed specific pre-requisites for attendance. However, the following points give a general indication of what is expected. Participants who come without the required knowledge and experience will NOT be refused admission to the course. However, in such a case KEYMILE will not respond to claims that a participant received inadequate benefit from course attendance.

- Basic telecommunication knowledge in the Telecommunications Access area.
- Experienced with using PCs and Microsoft Windows 2000/XP/Vista/7.  
Note: Should participants wish to bring with them and use their own Laptop-PCs during the course, where the use and the installation of configuration software plays an important role, this is welcomed.
- Conversational and Technical competence in the language in which the course is to be taught, both spoken and written.
- In some cases, the successful completion of another KEYMILE course.

See individual course descriptions for details.



## MileGate Fundamentals

Duration: 2 days

Training ID: A31A1785

### Overview

The MileGate 2500 platform is a Multi-Service Access Node (MSAN) with extensive application options including DSLAM functionality (Digital Subscriber Line Access Multiplexer). It is therefore essential to gain the knowledge of its features, functions and capabilities, and learn the skills required to carry out commissioning and in-service maintenance in order to successfully implement into a live network.

This course provides all the necessary information and practical training required by commissioning and maintenance teams in order that they can most effectively support the MileGate platform.

It covers aspects of installation, power, redundancy, shelf and backplane traffic capacities. Protocols and technologies are introduced and explained in connection to their relevance to the operation of the platform, including Layer 2 protocols such as VLANs and CoS.

Specific units covered on this course are the Control/Network traffic Gigabit Ethernet unit, COGE1; and the ADSL2plus unit, SUADx

After completing the course participants will have the knowledge and confidence to install, commission, maintain and fault-find the MileGate in a managed network.

### KEY Topics

- NGN Network Architecture – Tech Overview
- MileGate 2500 Subrack – Hardware and Features
- Overview of Interface Units and Applications
- Basics of Network Element Management using the MCST local craft terminal (MSCT)
- Configuration Principles
- Platform Commissioning
- COGE1 Unit Features (Control and GbE Network)
- COGE1 Configuration, Monitoring and Testing
- SUADx Unit Features (ADSL2plus, G.992)
- SUADx Configuration, Monitoring and Testing
- VLAN Services – Options and Configuration
- Practical Work
- Fault-finding
- Product User Guides

### Pre-requisites

- Basic Windows knowledge/PC skills
- Basic knowledge of Telephony and Data and IP communications
- Some knowledge of NGN technology would be an advantage



## MileGate Security Management

Duration: 1 day

Training ID: 37948024

### Overview

This advanced level course is designed to provide the participant with a greater depth of instruction in the various methodologies available for secure access and management of the MileGate platform.

Specific topics covered in this course are IPSec and RADIUS.

The course is designed for experienced network engineers who require in-depth knowledge and practical instruction in configuring the security protocols for accessing the MileGate platform.

### KEY Topics

- General introduction to Management Security – the layered concept
- Introduction to the IPSec Protocol
- Authentication Header (AH) and Encapsulating Security Payload (ESP) Protocols
- Digital Signatures, Encryption Standards, Hash Standards, Key Exchange Standards
- Configuring IPSec on the MileGate
- Configuring IPSec on Windows XP
- CLI Management using SSH and SFTP
- User Authentication Concepts in MileGate
- Local Authentication
- RADIUS Server Authentication
- Setting up a RADIUS Server
- Practical Work

### Pre-requisites

- Successful completion of MileGate Fundamentals course
- Some background knowledge or experience with IP security would be an advantage
- It is expected that participants will usually come to the course with some understanding of the approach being taken to the security management of their own network



## MileGate Ethernet over DSL or Fibre

Duration: 2 days

Training ID: A32A2551

### Overview

This course continues on from the MileGate Fundamentals course, and focuses on the platform's additional capabilities in delivering Ethernet to the customer.

The course covers an introduction to the technologies, then looks at the features of the relevant plug-in units, and how to carry out configuration, monitoring and testing functions.

Topics covered in detail include VDSL2, G.SHDSL and Optical Ethernet.

The course is designed for engineers and planners who have an interest in the scope and capabilities of the MileGate platform in carrying Ethernet services to the customer over various copper and optical technologies, and wish to gain the skills to successfully carry out commissioning and maintenance.

### KEY Topics

- Introduction to VDSL2
- SUVx Unit Features (VDSL2)
- SUVx Configuration, Monitoring and Testing
- Introduction to G.SHDSL
- SUSE1 Unit Features (G.SHDSL)
- SUSE1 Configuration, Monitoring and Testing
- LineRunner DTR CPE Unit Features (G.SHDSL)
- LineRunner DTR Configuration, Monitoring and Testing
- Introduction to Optical Ethernet
- SUENx Unit Features (Optical Ethernet with TV Overlay)
- SUENx Configuration, Monitoring and Testing
- Practical Work
- Fault-finding

### Pre-requisites

- Successful completion of MileGate Fundamentals course



## MileGate TDM Applications

Duration: 3 days

Training ID: A32A9312

### Overview

This extended course begins with a look at the TDM-based functionality and plug-units of the MileGate platform. The course begins with an introduction to TDM, CAS and V5.x followed by the MileGate units which support these technologies, LOMI8, SUPxx and PCOMx units. The STM-4/1 unit, SYN4M, is explained together with a refresher of SDH principles.

The course continues with an introduction to a number of TDM-based units. There will be practical work available to carry out on some of these units: STIM1, SUIx1, TUDA1, TUEM1, and TUXA1.

The final part of the course includes a comprehensive introduction to the ETAG1, a versatile L2/L3 networking unit supporting Ethernet over PDH, multiple bridge instances, inter-VLAN routing and IP routing. Students will be provided with an explanation of the key Ethernet protocols such as RSTP and VLANs, and how they are practically implemented, together with IP protocols such as OSPF, RIP and VRRP.

This course will provide students with a comprehensive practical introduction to working with these units - including areas of commissioning, monitoring, testing and fault-finding. It is designed for all those who require a technical knowledge of MileGate TDM applications. This includes Installation and Commissioning engineers, Operations and Maintenance staff, Support engineers and Planners.

### KEY Topics

- Introduction to Time Division Multiplexing (TDM) and Channel Associated Signalling (CAS)
- LOMI8 Unit (2 Mbps, G.703/G.704)
- Introduction to Pulse Code Modulation (G.711)
- SUPxx Unit (POTS, PCM G.711)
- Introduction to the V5.x protocol
- PCOMx Unit (V5.x)
- Introduction to TDM SHDSL
- STIM1 Unit (SHDSL, G.991.2)
- SUIx1 Unit (ISDN Basic Rate, ETSI TS 102 080)
- SYN4M (STM-4/1)
- TUDA1 (Serial Data), TUEM1 (E&M), TUXA1 (Exchange side POTS) Units
- Introduction to Ethernet, VLAN switching, IP routing
- ETAG1 Unit (L2/L3 Switching and Networking)
- Practical Work
- Fault-finding

### Pre-requisites

- Successful completion of 'MileGate Fundamentals' course
- Some knowledge of TDM principles would be an advantage



## MileGate VoIP Applications

Duration: 1 day

Training ID: A32A2548

### Overview

This course builds on the topics covered during the MileGate Fundamentals Course. It focuses on the packet voice functionality and NGN (Next Generation Networks) applications supported on the platform.

The common signalling protocols of MEGACO (also known as H.248) and SIP are introduced together with the VoIP-based network architectures.

The Milegate units supporting these protocols are introduced: IPSMx and IPSSx, together with an overview of the associated subscriber interface units.

The course is designed for planners and engineers and has a high element of practical work.

### KEY Topics

- Revision of PSTN principles; migrating PSTN to Telephony NGN
- H.248/MEGACO and SIP Protocols
- MileGate in Telephony NGN (using MEGACO)
- MileGate in Multimedia NGN (using SIP)
- Overview of SUPxx (POTS)
- Overview of SUlx1 (ISDN-BA)
- IPSSx Unit Features (SIP)
- IPSSx Configuration, Monitoring and Testing
- IPSMx Unit Features (MEGACO)
- IPSMx Configuration, Monitoring and Testing
- Practical Work
- Fault-finding

### Pre-requisites

- Successful completion of MileGate Fundamentals course
- Successful completion of MileGate TDM Applications course would be an advantage
- Some knowledge of NGN principles would be an advantage



## MileGate CLI and Scripting

Duration: 1 day

Training ID: 37948016

### Overview

This advanced level course is designed to provide the participant with an introduction to managing and monitoring the Milegate platform using CLI commands.

The course also introduces the area of scripting, by which a series of linked CLI commands and responses can be written into one or more files. These enable the operator to carry out rapid commissioning of the network element.

This course is designed for experienced engineers who require the knowledge and skills to use MileGate CLI commands and syntax, and additionally the skills to use scripting tools and techniques.

### KEY Topics

- General introduction to Command Line Interface concepts
- MCLI and CLI overview
- Preparing the CLI environment
- Command and Notation Syntax
- Error handling
- Log-in procedures
- Common Commands
- File System overview and File Transfer
- MCLI-specific and CLI-specific commands
- Introduction to Scripting
- Scripting options and languages
- Basic scripts
- Advanced scripts
- Practical Work

### Pre-requisites

- Successful completion of MileGate Fundamentals course
- Some background knowledge or experience with CLI and/or scripting would be an advantage



## MileGate Circuit Emulation Services

Duration: 1 day

Training ID: 37948008

### Overview

This course focuses on the increasingly popular technology of Circuit Emulation Services over Packet (CESoP), and its implementation on the MileGate platform.

The course provides a comprehensive introduction to the protocols, standards and vital considerations in designing a CES network.

The MileGate unit which supports this technology, CEOP1, is introduced, Students will be given practical and comprehensive instruction on working with this unit – including all areas of commissioning, monitoring, testing and fault-finding.

This course is designed for engineers and planners who have an interest in the scope and capabilities of the CES function of the MileGate platform, and wish to gain the skills to successfully commission and maintain it.

### KEY Topics

- Introduction to CESoP
- The Challenges of Packet Loss, Latency and Jitter
- Synchronisation over a PSN using Adaptive Clock Recovery
- CESoP Applications
- CEOP1 Unit features (CESoP)
- CEOP1 Configuration
- Initial Setup
- Pseudo-wire commissioning
- Monitoring and Maintenance
- Practical Work

### Pre-requisites

- Successful completion of MileGate Fundamentals and MileGate TDM Applications courses
- Some background knowledge or experience with CES would be an advantage



## MileGate Multicast Applications

Duration: 0.5 day

Training ID: 37948032

### Overview

This short course focuses on the specific Milegate application of TV/Video Multicast Streaming.

The course begins by providing a comprehensive introduction to the Multicast protocols, standards and vital design considerations.

Students will then be introduced to the implementation of Multicast applications supported on the MileGate platform. They will learn the configuration stages required in order to implement a successful design.

There will be an opportunity for practical work, in which students will be able to design, build and test a multicast video streaming network in the classroom.

The contents of the course can be included as part of a longer customer-specific course on the MileGate platform.

This course is designed for engineers who require the knowledge and skills required to implement a successful video streaming multicast element in their network.

### KEY Topics

- Introduction to Multicast protocols and standards, including IGMP
- Overview of using multicast in a network
- Design considerations and constraints
- Stages to implement multicast on the MileGate platform
- Building and testing the configuration using MCST
- Practical Work

### Pre-requisites

- Successful completion of MileGate Fundamentals course
- Successful completion of the appropriate course for the Service Units to be used for delivery of the TV/video service eg. 'MileGate Ethernet over DSL or Fibre'



## MileGate Release Update

Duration: 1 day

Training ID: 37948040

### Overview

This course is designed to provide an overview of the changes between any two releases of the MileGate platform.

The course will include a summary of the new features and functions relevant to the customer that have been added to the product since the old release.

In addition, students will learn about relevant upgrade procedures, and upgrade scripts, where applicable.

This course is designed for engineers, planners and managers who require the knowledge to plan and work with the MileGate platform during and after an upgrade in their network.

### KEY Topics

- Review of customer's current use of product and functions of old release
- New NE features and functions
- Changes to management interface GUI
- Detail of new key features and functions
- Practical work on implementing new key features and functions
- Upgrade procedures
- Upgrade scripts (where applicable)

### Pre-requisites

- Successful completion of MileGate Fundamentals course
- Successful completion of other MileGate courses relevant to the Service Units deployed in the customer's network



## UMUX Fundamentals

Duration: 3 days

Training ID: A28A1725

### Overview

The UMUX 1500 family is a multi-protocol Access Node with extensive application options including SDH and PDH multiplexer functionality. It is therefore essential to gain the knowledge of its features, functions and capabilities, and learn the skills required to carry out commissioning and in-service maintenance in order to successfully implement into a live network.

This course provides all the necessary information and practical training required by commissioning and maintenance teams in order that they can most effectively support the UMUX platform.

It covers aspects of installation, power, redundancy, shelf and bus capacities, traffic consolidation, synchronisation and management telemetry.

Specific units covered on this course are the Control Unit COBUX, 2 Mbps Unit LOMIF, POTS Unit SUBH3 and Data Unit DATAS.

After completing the course students will have the knowledge and confidence to install, commission, maintain and fault-find the UMUX platform in a complex managed network.

### KEY Topics

- Introduction to UMUX Product Family
- UMUX Hardware and Features, including installation, power and heat considerations
- FANU5 (Fans and Alarms) and DUPI4 (Dual Power) auxiliary units
- COBUX Unit Features (Control and Telemetry)
- UCST Configuration Software Tool installation
- UCST navigation
- Unit Embedded Software (ESW)
- LOMIF Unit (2 Mbps, G.703) – Features and Configuration
- SUBH3 Unit (POTS, G.711) – Features and Configuration
- Cross-connections
- Synchronisation
- Diagnostic Tools
- Embedded Control Channels
- DATAS Unit (V.24, X.21, Ethernet, etc.) – Features and Configuration
- Product User Guides
- Practical Exercises

### Pre-requisites

- Basic Windows knowledge
- Basic knowledge of digital telephony, PDH and IP technology



## UMUX SDH Applications

**Duration:** 2 days

**Training ID:** A28A1757

### Overview

This course builds on the topics covered during the UMUX Fundamentals course. It focuses on the platform's SDH functionality and supported applications.

The course starts with a short revision of SDH theory and principles. Students are reminded of the design of the UMUX SDH backplane. A range of SDH aggregate and tributary are then introduced in detail, with a short overview of the other SDH units available.

Specific units covered on this course are the STM-4/1 aggregate unit, SYN4E; the STM-1 aggregate unit, SYNUF; the E1 tributary unit, SYNAD; the E1-VC12 mapping unit, SYNAC.

Students will be provided with a good knowledge of how these units would be used in a typical network, and instruction is given on how to prepare critical areas such as synchronisation and protection mechanisms.

This course is designed for engineers and planners, and has a high element of practical work.

### KEY Topics

- Revision of SDH principles
- Multiplexing/Mapping procedures of PDH signals into STM frames
- Section/Path Overhead Information and role of pointers
- SDH network elements types (Regenerator, TM, ADM, DXC ...)
- Applications and options using the UMUX SDH units
- SYN4E Unit Features (STM-4/1 and EoS aggregate)
- SYN4E Configuration, Monitoring and Testing
- SYNUF Unit Features (STM-1 aggregate)
- SYNUF Configuration, Monitoring and Testing
- SYNAC Unit Features (E12-VC12 mapping)
- SYNAC Configuration, Monitoring and Testing
- SYNAD Unit Features (E12 tributary)
- SYNAD Configuration, Monitoring and Testing
- SDH Alarms – interpreting anomalies and defects
- SDH Synchronisation principles and configuration
- SDH Protection schemes and their application
- Practical exercises

### Pre-requisites

- Successful completion of UMUX Fundamentals Course
- Some knowledge of SDH principles would be an advantage
- Some knowledge of IP technology would be an advantage

## UMUX Ethernet Applications

**Duration:** 2 days

**Training ID:** A29A9680

### Overview

The UMUX family, although designed around a TDM core, includes extensive Ethernet capability both for transport (Ethernet over SDH or PDH) and for VLAN based switching.

This course focuses on the Ethernet capability of the UMUX platform. Starting with the theory and principles of Ethernet and Ethernet transport, the course introduces the functionality and capabilities of the Ethernet units.

Specific units covered on this course are the Ethernet over SDH and Ethernet Switching units, NEBRO and NEBRA; the Ethernet Switching unit NEBRE; and the Ethernet over PDH unit, ETER1. It should be noted that ETER1 is now a versatile L2/L3 networking unit supporting Ethernet over PDH, multiple bridge instances, inter-VLAN routing and IP routing.

Students will also look at key Ethernet protocols such as RSTP and VLANs, and how they are practically implemented, together with IP protocols such as OSPF, RIP and VRRP.

This course is designed for engineers and planners, and has a high element of practical work.

### KEY Topics

- Ethernet in SDH and PDH networks
- EoS principles and standards
- Protection schemes: SNCP, LCAS, MSP, etc.
- Working with VLANs
- Delivering Quality of Service traffic
- NEBRO, NEBRA Units Features (EoS, VLAN Switching)
- NEBRO, NEBRA Configuration, Monitoring and Testing
- NEBRE Unit Features (VLAN Switching)
- NEBRE Configuration, Monitoring and Testing
- ETER1 Unit Features (L2/L3 Switching and Networking)
- ETER1 Configuration, Monitoring and Testing
- Practical exercises

### Pre-requisites

- Successful completion of UMUX Fundamentals Course
- Successful completion of the UMUX SDH Applications (UMUX) course is highly recommended
- Some knowledge of Ethernet switching and IP routing would be an advantage



## UMUX TDM Data Applications

Duration: 1 day

Training ID: A32A9313

### Overview

The UMUX family supports a wide range of TDM data interfaces. This course firstly provides an overview of the Data Units available, their functionalities and applications. Following on, the instructor will provide an in-depth instruction on some of these units.

Specific units covered on this course are the Serial and Ethernet Data units, DATAx; the TDM DSL unit, STICx/LineRunner DTM; the E&M signalling and conferencing unit, NEMSG; the Magneto signalling unit, MAGI8; the 4 x E1/Optical 8Mbps unit, TUPON/ TUNOR.

In order to maximise the value of this course the emphasis on certain units can be modified to suit the particular requirements of the students.

This course is designed for engineers and planners and all those who require the knowledge and skills to be able to successfully work with the TDM Data functionality of the UMUX platform. There is a significant element of practical work.

### KEY Topics

- Overview of the TDM Data units
- DATAx Unit (Serial and Ethernet data) – Features and Configuration
- STICx Unit (TDM over DSL) – Features and Configuration
- LineRunner DTM CPE (TDM over DSL) – Features and Configuration
- NEMSG Unit (E&M signalling + Conferencing) – Features and Configuration
- MAGI8 Unit (Magneto Signalling) – Features and Configuration
- TUPON Unit (Optical 8 Mbps/4 x E1) – Features and Configuration
- TUNOR CPE (Optical 8 Mbps/4 x E1) – Features and Configuration
- Practical Work on a subset of these units
- Fault-finding

### Pre-requisites

- Successful completion of UMUX Fundamentals Course
- Basic knowledge of serial data interfaces would be an advantage



## UMUX TDM Voice Applications

**Duration:** 1 day

**Training ID:** A28A1758

### Overview

The UMUX platform provides a comprehensive range of Voice interfaces, ideally suited for Public operator or Private enterprise alike. This course provides a good introduction to the wide range of UMUX TDM voice systems and interfaces.

Starting with a brief revision of the technologies and signalling protocols used in delivering voice, the course continues by exploring each of the relevant units, their functionalities and configurable options. Units already covered in the UMUX Fundamentals course will be revised (LOMIF, SUBH3).

Specific units covered on this course are the V5 signalling unit, PCON2; the ISDN Basic Rate unit, ISBUQ; the 2-wire FXO unit, EXLAN. Other units will be covered in overview.

This course is designed for engineers and planners and all those who require the knowledge and skills to be able to successfully work with the TDM Voice functionality of the UMUX platform. There is a significant element of practical work.

### KEY Topics

- Revision of TDM Voice Transmission and Signalling Systems including PCM, V5 and CAS
- Revision of SUBHx Unit (POTS) - Features and Configuration
- Revision of LOMIF Unit (2 Mbps G.704) - Features and Configuration
- PCON2 Unit (V5 signalling) – Features
- PCON2 Configuration, Monitoring and Testing
- ISBUx Unit (ISDN-BRA over V5) – Features
- ISBUx Configuration, Monitoring and Testing
- EXLAN Unit (2-wire FXO) – Features
- EXLAN Configuration, Monitoring and Testing
- Overview of SULIS and EXLIC Units (ISDN 2-wire)
- Practical Work

### Pre-requisites

- Successful completion of UMUX Fundamentals Course



## UMUX NGN VoIP Applications

Duration: 1 day

Training ID: A29A9679

### Overview

The UMUX platform support for Voice includes an integrated solution for Next Generation Networks telephony. This provides the opportunity for the Operator to migrate seamlessly from a TDM voice configuration to NGN Voice over IP (VoIP).

This course provides a good introduction to NGN telephony on the UMUX. Students are first introduced to the popular H.248/MEGACO signalling protocol together with the VoIP-based network architecture.

The course continues with an introduction to the UMUX unit supporting H.248/MEGACO, IPSMG. In addition an overview of the associated subscriber interface units is provided.

There is a significant element of practical work in this course, which is suitable for both planners and engineers, and all those who require the knowledge and skills to be able to successfully work with the NGN VoIP functionality on the UMUX.

### KEY Topics

- Revision of PSTN principles; migrating PSTN to Telephony NGN
- H.248/MEGACO and RTP Protocols
- MileGate in Telephony NGN (using H.248/MEGACO)
- Revision of SUBH3 (POTS)
- Revision of ISBUx (ISDN-BA)
- IPSMG Unit Features (H.248/MEGACO)
- IPSMG Configuration, Monitoring and Testing
- Practical Work
- Fault-finding

### Pre-requisites

- Successful completion of UMUX Fundamentals Course
- Some knowledge of NGN principles would be an advantage



## UMUX Ethernet over DSL

Duration: 1 day

Training ID: A31A1784

### Overview

In order to support high-speed internet applications, the UMUX platform is designed to host a family of high-capacity ADSL2plus linecards with integrated Network facing GbE interfaces.

This course covers an introduction to the technologies and typical applications. Students are then introduced to the features of the relevant plug-in units, and instructed in how to carry out configuration, monitoring and testing functions using the CLI configuration interface.

Specific Units covered on this course are : Members of the IPLMx family.

The course is designed for engineers and planners who have an interest in the scope and capabilities of the UMUX platform in carrying Ethernet services to the customer over copper, and wish to gain the skills to successfully carry out commissioning and maintenance.

### KEY Topics

- IP DSLAM functionality of UMUX
- Principles of Traffic management
- Security features
- Multicast technology
- IPLMx Unit (ADSL2plus, GbE) – Features
- Typical Applications
- Principles of using the CLI configuration interface
- IPLMx Configuration, Monitoring and Testing
- Fault finding
- Practical Work

### Pre-requisites

- Successful completion of UMUX Fundamentals Course
- Some knowledge of DSL and Ethernet/VLAN technology would be an advantage



## UMUX Project Planning

**Duration:** 1 day

**Training ID:** 37548204

### Overview

This course is designed to provide the participant with an overview of the functionality of the UMUX platform. The course includes key information regarding capacities and limitations to enable the participant to design and plan with confidence.

In addition the participants will be given practical tuition on using the local management software (UCST) as a planning tool.

The customer's own network requirements can be discussed, in order to help plan for the most effective implementation of the UMUX platform.

This course is designed for planners and managers who require an introduction to the UMUX platform, in regard to functionality, dimensioning and constraints.

### KEY Topics

- UMUX in the Access Network
- UMUX Platform – general design
- Options for installations, powering and handling heat
- Backplane Buses
- Overview of all Interface Units
- Use of UCST as a Planning Tool
- Cross-connections, telemetry and synchronisation options
- Customer's Network requirements – discussion

### Pre-requisites

- Basic understanding of Telecommunications terms and principles
- Some experience in Access Network planning or design



## UMUX Legacy Units

**Duration:** 1 day

**Training ID:** 37548212

### Overview

A number of interface units used in the UMUX platform are no longer on the market, and do not feature in the standard training courses on offer. However, the customer may have a requirement for engineers to be trained or re-trained on these "legacy" units.

We offer the opportunity for the customer to discuss their requirements, and a suitable course will be designed to cover the commissioning and maintenance of almost any of these older units. The course will be designed at the level determined by the customer, with both theoretical and practical elements included where required.

This course is designed for engineers and planners who require a first or refresher training course on "legacy" units in their network.

### KEY Topics

- Overview of use of legacy units in the customer's network
- Description of functionality and design of each unit
- Configuration options of each unit using local manager, UCST
- In-service maintenance of each unit
- Typical alarms associated with each unit, and overview of common fault causes
- Discussions
- Practical work

### Pre-requisites

- Successful completion of UMUX Fundamentals course



## UMUX Network Management Communications

**Duration:** 1 day

**Training ID:** A28A1730

### Overview

In order to most effectively manage a large network of UMUX platforms, careful consideration must be given to design of the management communications telemetry. UMUX offers a number of options that should be considered by those planning the network

This course introduces the options available to the network planner, with an explanation of which options are most appropriate for the customer's network.

Specific areas that are covered include: UMUX's routing function, OSI tunnelling, Embedded Control Channels (ECC), and Engineering limitations of Data Comms Networks (DCNs)

The course is designed for engineers who are involved in planning, extending or modifying the Management approach to their UMUX network, and wish to gain the skills to successfully implement changes and improvements.

### KEY Topics

- UMUX networking principles
- Management interfaces and protocol stacks
- Practical set-up of the UMUX
- Overview of the Management Communications network
- OSI-tunnelling through SDH networks
- Interoperability with L2 OSI routers
- Embedded Control Channels (ECC)
- WAN Interfaces
- Planning an MCN for a new network
- Topologies and Protocols
- Engineering limits
- UNEM considerations

### Pre-requisites

- Successful completion of UMUX Fundamentals course



## UMUX Specific Applications and Design Workshop

Duration: 1 day

Training ID: 37548220

### Overview

This workshop is offered to customers in order to provide their design team with an opportunity to discuss their specific requirements with KEYMILE in a helpful environment, and receive some training on the platform.

Discussions will take the direction determined by the customer, but may include traffic, synchronisation and network management considerations.

The workshop will usually take place in the Training School where participants can have access to the hardware and configuration software. Short ad hoc training sessions can be undertaken as part of the discussions.

This course is designed for members of the customer's design team.

### KEY Topics

- Overview of customer's network design
- Review of use of UMUX in the design
- Discussions on detail of complex traffic routing, protection schemes, synchronisation plan and network management telemetry
- Short training sessions as required

### Pre-requisites

- Successful completion of UMUX Fundamentals course, or
- Successful completion of UMUX Project Planning Course



## UMUX Release Update

Duration: 1 day

Training ID: 37548239

### Overview

This course is designed to provide an overview of the changes between any 2 releases of the UMUX platform.

The course will include a summary of the new features and functions relevant to the customer that have been added to the product since the old release.

In addition, students will learn about relevant upgrade procedures, and upgrade scripts, where applicable.

This course is designed for engineers, planners and managers who require the knowledge to plan and work with the UMUX platform during and after an upgrade in their network.

### KEY Topics

- Review of customer's current use of product and functions of old release
- New NE features and functions
- Changes to management interface GUI
- Detail of new key features and functions
- Practical work on implementing new key features and functions
- Upgrade procedures
- Upgrade scripts (where applicable)

### Pre-requisites

- Successful completion of UMUX Fundamentals course
- Successful completion of other UMUX courses relevant to the Service Units deployed in the customer's network



## PacketBand Circuit Emulation Services

Duration: 2 days

Training ID: 37848003

### Overview

The technology behind Circuit Emulation Services enables TDM circuits to be carried over an IP/Ethernet network with high quality preservation of network synchronisation. This course provides a comprehensive introduction to Circuit Emulation Services (CES) and its implementation using PacketBand units.

The course begins with a general introduction to the concept of TDM over Packet, and the relevant standards and protocols, particularly in relation to the vital area of synchronisation. The students are introduced to the PacketBand Units and the local management software, DbManager.

Configuration procedures and techniques are introduced, and students are provided with opportunities to carry out practical work to confirm the theory. The concept of logical links (pseudo-wires) is introduced, and instruction is given on the skills to build resilient error-free CES circuits. Finally, advice is provided with regard to how to analyse typical faults.

This course is designed for engineers and planners who require the knowledge to design, commission and maintain the CES Applications using the PacketBand platform.

### KEY Topics

- Introduction to CESoP
- Next Generation Networks and Packet Switched Network issues
- Synchronisation considerations
- PacketBand System Overview
- Applications
- Unit types and interfaces
- PacketBand Management
- DbManager Overview and Architecture
- Software installation
- Modes and Functions
- PacketBand Configuration
- Connecting to the Units
- Defining Clock Sources
- Defining Logical Links
- Multicast timing
- Fault finding

### Pre-requisites

- Some understanding of telecommunications principles, particularly in the area of CES would be an advantage



## PacketBand Ethernet and VLAN Services

**Duration:** 1 day

**Training ID:** 37848011

### Overview

This course builds on the knowledge gained on the PacketBand Circuit Emulation Services course.

This course begins with a general introduction to the concept of VLANs in the Ethernet environment. The standards and protocols are discussed and general applications are reviewed.

The functionality of VLAN handling using the PacketBand CPE and Aggregation units is described. Students are given the opportunity to use the DbManager software to implement configuration of the PacketBand units for VLANs. Maintenance and Performance monitoring options are introduced with further opportunities given for practical work to confirm the theory.

This course is designed for engineers and planners who require the knowledge to design, commission and maintain the PacketBand for use with VLAN handling.

### KEY Topics

- Virtual LANs: Applications, Standards and Design
- Review of PacketBand design and operation
- Implementing VLANs on the PacketBand
- Use of DbManager GUIs to configure VLANs
- Monitoring, Alarms and Performance Monitoring of VLANs with DbMgr
- Practical Work

### Pre-requisites

- Successful Completion of the PacketBand Circuit Emulation Services course
- Some understanding of VLANs would be an advantage



## UNEM Basic Package Operations

Duration: 2 days

Training ID: A28A1733

### Overview

UNEM is the Network Management System for the UMUX and MileGate nodes, together with other 3rd party devices. UNEM has a sophisticated architecture with multiple topology and application options. It is therefore essential to gain the knowledge of its features, functions and capabilities, and learn the skills required to commission and use it for ongoing management of a large live network.

This course provides all the necessary information required by the Operators in the Network Management team in order that they can most effectively manage the network using the UNEM NMS.

It covers aspects of building a database of NEs through creation and discovery, configuration of NEs, and performance management. The course covers all areas of fault detection and fault resolution techniques. Construction of the hierarchical network map design (Network Browser) is covered including the use of sections and foreign objects.

After completing the course students will have an understanding of the UNEM architecture and the interaction of its various components, and a working knowledge of the UNEM NMS applications.

### KEY Topics

- UNEM Architecture and Components
- Distributed Management Concept
- Windows Client operation
- NEM Desktop
- NEM Configurator layout
- Element Agents and Polling
- NE Discovery and Creation
- NEM Brower and Map creation
- Symbols and Section Management
- Synchronisation Maps
- Fault Management
- Configuration Management
- Performance Management
- ESW and other Network Tasks
- Inventory Reports

### Pre-requisites

- Successful completion of either MileGate Fundamentals Course or UMUX Fundamentals Course
- Experience of NMS systems is an advantage



## UNEM Administration

Duration: 1 day

Training ID: A29A9675

### Overview

KEYMILE's Network Management System, UNEM, has a sophisticated architecture and a good understanding of its underlying processes and functions is vital to the smooth operation of this management platform.

This course provides the knowledge required by a system administrator of both the LINUX operating system, and the UNEM application software. Students will be introduced to a number of script files and other process-checking techniques that can be used for many "behind the scenes" tasks supporting the UNEM operational environment. They will be taught how to add new users, check Log files and perform other maintenance tasks. They will learn how to maintain the UNEM database, how to backup the database, and then how to restore the database.

This course is suitable for system administrators, engineers and all those who are involved in supporting the UNEM platform on behalf of the UNEM Operators.

### KEY Topics

- Hardware installation, set-up and upgrade procedures
- Operating System Software installation and set-up
- NEM Administration Tool
- UNIX/LINUX commands required for administrative tasks for UNEM
- UNEM commands
- UNEM Software installation and set-up
- Creation of new user accounts
- Definitions of UNEM User and Privileges
- Log and Trace files
- Database Backup and Restore procedures
- Running reports
- Viewing historical records

### Pre-requisites

- Experience of general System Administration is essential
- Successful completion of the UNEM Operators course would be an advantage



## UNEM Networking Package

Duration: 1 day

Training ID: A28A1752

### Overview

The Basic Package function of KEYMILE's Network Management System, UNEM, is to provide a high quality Element Management System. However, it also incorporates a Network-wide function for creating End-to-End circuits. This licensed function is known as Networking Package, and is the subject of this course.

This course is suitable for system administrators, engineers and all those who are involved in supporting the UNEM platform on behalf of the UNEM Operators.

### KEY Topics

- Review of standards and the TMN pyramid
- Transport Entities (Trails, Sub Network Connections, Circuits) inside NP Applications
- Using the graphical user interface
- Semi-automatic provisioning of Transport Entities
- Auto-generation of Transport Entities as a consequence of NP or BP events
- Associating specific information (customer's data) with each circuit to enable creation of reports according to specified criteria
- Practical Work

### Pre-requisites

- Successful completion of the UNEM Basic Package course



## XMP1-LCC PDH Hardware under NMS SOX

**Duration:** 2 days

**Training ID:** 37016067

### Overview

XMP1-LCC is a modular, flexible and high capacity cross-connect system with extensive application options including high capacity SDH and PDH multiplexer functionality. It is therefore essential to gain the knowledge of its features, functions and capabilities, and learn the skills required to carry out commissioning and in-service maintenance in order to successfully implement into a live network.

This course provides all the necessary information and practical training in order to enable students to most effectively operate, maintain, monitor, configure and troubleshoot the XMP1-LCC platform.

Specific units covered on this course include the PDH components managed under the network management system, SOX

This course is suitable for Network Deployment Engineers, System Technicians, Service Technicians, and Field Technicians.

### KEY Topics

- Introduction. Short general system overview XMP1 system
- Short introduction to NMS SOX, Operation and handling
- PDH fundamentals (short part).
- Clock synchronization, alarm messages
- Basics of the LCC PDH, Distribution of the communication channel
- Hardware: Description and settings of the separate LCC components
- View at the element editor
- Commissioning procedure and settings LCC with Local Craft Terminal and SOX
- Connectivity management (trunk settings and connections) using the SOX Network Management
- Protection configurations
- Performance management
- Practical exercises: Commissioning of the PDH training network, node settings, Troubleshooting
- Practical exercises: Connectivity management (trunk settings and connections) using the SOX Network Management, Troubleshooting.

### Pre-requisites

- Successful completion of either of these courses: XMP1 PDH Hardware and SOX, or XMP1 SOX NMS
- Basic Windows knowledge
- Basic knowledge of digital telephony, PDH and IP technology



## XMP1-LCC PDH and SDH Hardware under NMS SOX

**Duration:** 4 days

**Training ID:** 37016075

### Overview

XMP1-LCC is a modular, flexible and high capacity cross-connect system with extensive application options including high capacity SDH and PDH multiplexer functionality. It is therefore essential to gain the knowledge of its features, functions and capabilities, and learn the skills required to carry out commissioning and in-service maintenance in order to successfully implement into a live network.

This course provides all the necessary information and practical training in order to enable students to most effectively operate, maintain, monitor, configure and troubleshoot the XMP1-LCC platform.

Specific units covered on this course include the PDH and SDH components managed under the network management system, SOX

This course is suitable for Network Deployment Engineers, System Technicians, Service Technicians, and Field Technicians.

### KEY Topics

- Introduction: Short general system overview XMP1
- Short introduction to NMS SOX, Operation and handling
- SDH and PDH fundamentals (short part)
- Mapping, clock synchronization, alarm messages
- Basics of the LCC SDH, Distribution of the communication channel
- Hardware: Description and settings of LCC components
- View at the element editor
- Commissioning procedure and settings LCC with Local Craft Terminal and SOX
- Clock settings, management channel DCCr, DCCm or HDLC and ECC8.
- Connectivity management (trunk settings and connections) using the SOX Network Management
- Protection configurations, SNCP, MSP
- Performance management
- Practical exercises: Commissioning of the SDH training network, node settings, Troubleshooting
- Practical exercises: Connectivity management (trunk settings and connections) using the SOX Network Management, Troubleshooting.

### Pre-requisites

- Successful completion of either of these courses: XMP1 PDH Hardware and SOX, or XMP1 SOX NMS
- Basic Windows knowledge
- Basic knowledge of digital telephony, PDH, SDH and IP technology



## XMP1 PDH Hardware and NMS SOX

Duration: 5 days

Training ID: 37016008

### Overview

XMP1 is a modular, flexible and highly integrated cross-connect system with extensive application options including SDH and PDH multiplexer functionality. It is therefore essential to gain the knowledge of its features, functions and capabilities, and learn the skills required to carry out commissioning and in-service maintenance in order to successfully implement into a live network.

This course provides all the necessary information and practical training in order to enable students to most effectively operate, maintain, monitor, configure and troubleshoot the XMP1 platform.

Specific units covered on this course include the PDH components, and the network management system, SOX

This course is suitable for Network Deployment Engineers, System Technicians, Service Technicians, and Field Technicians.

### KEY Topics

- Introduction
- Basic functions, features of XMP1
- Central modules (racks, central unit, power feeding)
- Port modules (basic settings of E1)
- Port Modules (G703, optical E1, SDSL, LAN, Video, E3, V11/V35)
- Data modules (V11, WT, V24, V35, G703 64k)
- Analogue modules (4 wire, subscriber, exchange, local battery)
- ISDN modules (S0, Uk0)
- Signal collector module
- Tools for troubleshooting (display and control module, WinLSP)
- NMS SOX (basic functions, single and multiuser version)
- Using of the database SQL on SOX
- First step to create a NMS configuration, practical part
- NMS SOX working with basic masks, synchronization concept
- NMS SOX online functions, trouble shooting tools
- SOX performance management
- SOX connectivity, alarm – rerouting
- Exercises on the test network (Installation, settings, traffic)
- Installation of SOX single user version on PC
- Exercises on the test network, complete configuration
- (Commissioning, operating, trouble shooting, monitoring, routing)

### Pre-requisites

- Basic Windows knowledge
- Basic knowledge of digital telephony, PDH and IP technology



## XMP1 PDH Hardware and NMS SOX/MSP under SOA

Duration: 5 days

Training ID: 37016016

### Overview

XMP1 is a modular, flexible and highly integrated cross-connect system with extensive application options including SDH and PDH multiplexer functionality. It is therefore essential to gain the knowledge of its features, functions and capabilities, and learn the skills required to carry out commissioning and in-service maintenance in order to successfully implement into a live complex managed network.

This course provides all the necessary information and practical training in order to enable students to most effectively operate, maintain, monitor, configure and troubleshoot the XMP1 platform.

Specific units covered on this course include the PDH components, and the Modular Service PC (MSP) which is used under the network management system applications Service On Access (SOA).

This course is suitable for Network Deployment Engineers, System Technicians, Service Technicians, and Field Technicians.

### KEY Topics

- Basic functions and features of XMP1
- Central modules (racks, central unit, power feeding)
- Port modules (basic settings of E1)
- Port Modules (G703, optical E1, SDSL, LAN, Video, E3, V11/V35)
- Data modules (V11, WT, V24, V35, G703 64k)
- Analogue modules (4 wire, subscriber, exchange, local battery)
- ISDN modules (S0, Uk0)
- Signal collector module
- Tools for troubleshooting (display and control module, WinLSP)
- Introduction to the SISA supervisory system: General system info, types of a SISA network, management channels
- Connection to SOA (64k, ECC8, ECC 64).
- Introduction to the LMT software (offline, online status)
- Introduction to the SOX/MSP application SOX/MSP online functions, trouble shooting tools
- Creating cross connections
- Installation of LMT and SOX/MSP on PC
- Exercises on the test network, complete configuration (first commissioning, operating, trouble shooting, monitoring, routing activities)

### Pre-requisites

- Basic Windows knowledge
- Basic knowledge of digital telephony, PDH and IP technology



## XMP1 SDH Hardware under NMS SOX

Duration: 4 days

Training ID: 37016024

### Overview

XMP1 is a modular, flexible and highly integrated cross-connect system with extensive application options including SDH and PDH multiplexer functionality. It is therefore essential to gain the knowledge of its features, functions and capabilities, and learn the skills required to carry out commissioning and in-service maintenance in order to successfully implement into a live network.

This course provides all the necessary information and practical training in order to enable students to most effectively operate, maintain, monitor, configure and troubleshoot the XMP1 platform.

Specific units covered on this course include the SDH components, managed by the network management system, SOX

This course is suitable for Network Deployment Engineers, System Technicians, Service Technicians, and Field Technicians.

### KEY Topics

- Short introduction to SOX , operation and handling
- SDH fundamentals: Mapping, clock synchronization, alarm messages
- Basics of the XMP1 SDH
- Functions and settings of SDH components
- Module SCU, E1 and STM interfaces, hardware settings, view at element editor
- Module EoSCU, E1, Ethernet and STM interfaces, hardware settings, view at element editor
- Commissioning procedure and settings of SDH components
- Clock settings, management channel DCCr, DCCm or HDLC installation
- Connectivity management (trunk settings and connections) using the SOX Network Management
- Protection configurations, SNCP, MSP
- Performance management
- Practical exercises: Commissioning of the SDH training network, node settings
- Practical exercises: Connectivity management (trunk settings and connections) using the SOX Network Management
- Troubleshooting

### Pre-requisites

- Successful completion of either of these courses: XMP1 PDH Hardware and SOX, or XMP1 SOX NMS
- Basic Windows knowledge
- Basic knowledge of digital telephony, SDH and IP technology



## XMP1 SDH Hardware under NMS SOX/MSP (SOA)

**Duration:** 4 days

**Training ID:** 37016032

### Overview

XMP1 is a modular, flexible and highly integrated cross-connect system with extensive application options including SDH and PDH multiplexer functionality. It is therefore essential to gain the knowledge of its features, functions and capabilities, and learn the skills required to carry out commissioning and in-service maintenance in order to successfully implement into a live network.

This course provides all the necessary information and practical training in order to enable students to most effectively operate, maintain, monitor, configure and troubleshoot the XMP1 platform.

Specific units covered on this course include the SDH components, and the , SOX Modular Service PC (MSP) which is used under the network management system application of Service On Access (SOA).

This course is suitable for Network Deployment Engineers, System Technicians, Service Technicians, and Field Technicians.

### KEY Topics

- Short introduction to SOX/MSP , operation and handling
- SDH fundamentals: Mapping, clock synchronization, alarm messages
- Basics of the XMP1 SDH
- Functions and settings of SDH components
- Module SCU, E1 and STM interfaces, hardware settings, view at element editor
- Module EoSCU, E1, Ethernet and STM interfaces, hardware settings
- Commissioning procedure and settings of SDH components
- Clock settings, management channel DCCr, DCCm or HDLC installation
- Creating of cross connections using the service PC SOX/MSP
- Protection configurations, SNCP, MSP
- Performance management
- Practical exercises: Commissioning of the SDH training network, node settings
- Practical exercises: Connectivity management (trunk settings and connections) using the service PC SOX/MSP.
- Troubleshooting

### Pre-requisites

- Successful completion of the course: XMP1 PDH Hardware and SOX/MSP
- Basic Windows knowledge
- Basic knowledge of digital telephony, SDH and IP technology



## XMP1 SOX NMS (without Hardware)

Duration: 3 days

Training ID: 37016040

### Overview

Service On XMP1 (SOX) is the Network Management System for the XMP1 family of nodes. SOX has a sophisticated architecture with multiple topology and application options. It is therefore essential to gain the knowledge of its features, functions and capabilities, and learn the skills required to commission and use it for ongoing management of a large live network.

This course provides all the necessary information required by Operators in a network management team in order that they can most effectively manage the network using the SOX NMS.

Note : this course does not cover the hardware aspects of XMP1 either relating to PDH or SDH components.

This course is suitable for Network Operations staff and all those who require a working knowledge of the SOX NMS, such as Deployment Engineers, System Technicians, Service Technicians, and Field Technicians.

### KEY Topics

- Basic information regarding XMP1 hardware and network structure
- Tool for troubleshooting (display and control module, WinLSP)
- NMS SOX (basic functions, single and multiuser version)
- Using of the database SQL at SOX
- View and settings of the modules at SOX
- NMS SOX online functions, trouble shooting tools
- NMS SOX working with basic masks, synchronization concept
- First step to create a NMS configuration, practical part
- NMS SOX online functions, trouble shooting tools
- SOX performance management
- SOX connectivity, creating trunks and circuits
- Manual and automatic alarm rerouting
- Installation of SOX single user version on PC
- Exercises on the test network, complete configuration
- (Commissioning, operating, trouble shooting, monitoring, routing)

### Pre-requisites

- Basic Windows knowledge
- Basic knowledge of PDH and IP technology



## XQI-SL

Duration: 3 days

Training ID: XQISL-TR

### Overview

XQI-SL is a flexible network element, which is used to build highly complex management networks. These networks are used to connect the NMS ServiceOn Access QD2 protocol to different network element types. Furthermore the XQI-SL provides input and output interfaces. These are used to monitor and control power supply, door contacts, climate systems and more.

It is therefore essential to gain the knowledge of its features, functions and capabilities and learn the skills required to commission and use it for ongoing management of a large live network.

This course provides all the necessary information and practical training in order to enable students to most effectively operate, maintain, monitor, configure and troubleshoot the XQI-SL.

This course is suitable for Network Deployment Engineers, System Technicians, Service Technicians, and Field Technicians.

### Key Topics

- SISA basics: system architecture, addressing, device management, types of SISA networks.
- XQI-SL: organization, structure, assembly, function, representation in SOA
- XQI-SL, Applications in SISA networks.
- Local Management Terminal LMT
- Device management
- Function as SISA Gateway
- Signal collector function
- Commissioning
- Hardware settings
- Software settings
- Including a multiplexer XMP1 at the network
- MIB Upload/Download
- Troubleshooting
- Practical part: Commissioning of various networks SISA
- Practical part: Troubleshooting

### Pre-requisites

- Basic Windows
- Basic PDH Technology
- Basic IP Technology

## Payment

### Course Fees

The Training Administrator will advise you of the standard schedule of course fees. These apply to places on Open Schedule courses.

The costs of Dedicated courses are determined by your KEYMILE Account Team. As described above costed proposals will be provided on request.

Standard Fees are reviewed on an annual basis. However, KEYMILE reserve the right to make amendments more frequently. Existing customers will be advised in advance of any impending changes in rates. Course fees will not be subject to change once a booking has been confirmed with a Purchase Order.

### Payment Terms

Payment should be received by KEYMILE no later than 10 working days before the start of the course.

### Cancellations

Cancellation of course places can be made up to 15 working days before the course starts, without penalty.

For late cancellations, KEYMILE reserves the right to invoice the following:

- 50% of fee: Where the booking is cancelled between 1 and 2 weeks from the start date of the course
- 100% of fee: Where the booking is cancelled less than 1 week from the start date of the course

KEYMILE reserves the right to cancel any training with a full refund of the training fee.

- Up to 3 weeks before the scheduled start of the training (without any obligation to give reasons)

## Training Documentation

Printed documentation is supplied for each course. It comprises a copy of the slides used by the trainer, together with some additional notes.

A sample of the user manual on CD-ROM is provided where appropriate.

Note: Student's Courseware and Product Documentation are usually available in English only.

The contents of any particular course may vary from the course description contained in this Program and on the website. At the discretion of the trainer and on special request and agreement of the participants it may be possible to vary the balance of topics and activities from the standard plan.

## About Instructors and Training Centres

### Instructors

Courses are prepared and delivered by KEYMILE's own experienced engineers and training specialists.

They come with excellent background knowledge of the KEYMILE products as well as field experience in installation, commissioning and maintenance.

### Training Centres

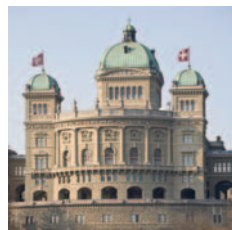
All of our Training Centres are purpose-built. The classrooms are designed to be an ideal environment for learning, with the layout suitable for class discussions. Target equipment for practical work is housed in the classroom, together with workstations for participants to use for configuration activities.

The instructors use high quality visuals to present concepts and product information to the class.

Comfortable break-out areas are provided for participants to relax and enjoy a drink during break times. Lunch is provided for participants at no extra charge.

Our Training Centres are located in four very different locations, all of which have a unique attraction.

The following short pen-pictures may help you decide where you would like to visit for your KEYMILE training.



#### Berne, Switzerland

Our Swiss Training Centre is located at the KEYMILE Offices in the capital city of Bern.

After a day of learning, why not explore something of the magic of Bern. The old city, nestling in the loop of the River Aare, provides a delightful setting for discovering a little of its history and culture, and why it has been

designated a UNESCO Cultural World Heritage Site.

You can join other visitors and locals as you wander around the decorated arcades taking in the charm and gentle ambience, deciding which of the many wonderful restaurants you will eat in later.

Surrounded by the breathtaking Bernese Alps, Berne is a truly special place to visit!



#### Hertford, United Kingdom

Our UK Training Centre is located at the KEYMILE Offices in the historic county town of Hertford.

As you leave the classroom, there is a mouth-watering menu of possibilities for your evening ahead. The un-paralleled cosmopolitan capital of London is a short train ride away. In less than 40 minutes you will find

yourself in a pulsating mix of cultures, where all your senses come alive. From the casual street art of Covent Garden to the latest blockbuster West End musicals, a myriad of possibilities waits for you.

Back in Hertford, there is more to explore at this meeting place of four rivers, a traditional English market town steeped in history. A Royal Borough for more than 1,000 years, it was here that the last witch in England was condemned to death in 1751. Today, as you stroll through the ancient streets you will happen



upon hidden jewels of fascinating architecture, unusual shops, wonderful cafes and restaurants to suit every taste.

A visit to Hertford will leave you with memories that beckon you to return one day soon!



### Hanover, Germany

Our German Training Centre is located at the KEYMILE Offices in the vibrant provincial capital city of Hanover.

Leaving KEYMILE behind for the day, you can take a short tram journey into the heart of this surprising modern city set amongst reminders of its glorious past. Statues and fountains vie for attention with the street icecream

vendors. The Opera and the Music Hall invite you to an evening of pure entertainment.

Take time to walk along the wide streets and discover what makes this metropolis, at the heart of Lower Saxony, an exciting and alluring magnet for visitors, before settling down in one of the city's fine restaurants to an evening of unrivalled German hospitality.

Hanover – a city of warmth, welcome and a few surprises. One visit will not be enough!



### Backnang, Germany

Our southern German Training Centre is located at the KEYMILE Offices in Backnang.

After the training day the town and surrounding area invites you to enjoy something of their rural flair and urban chic. Locally you will find waiting for you the famous "gemuetlich" wine and beer houses where you can also

enjoy typical national dishes, in addition to many restaurants serving international food.

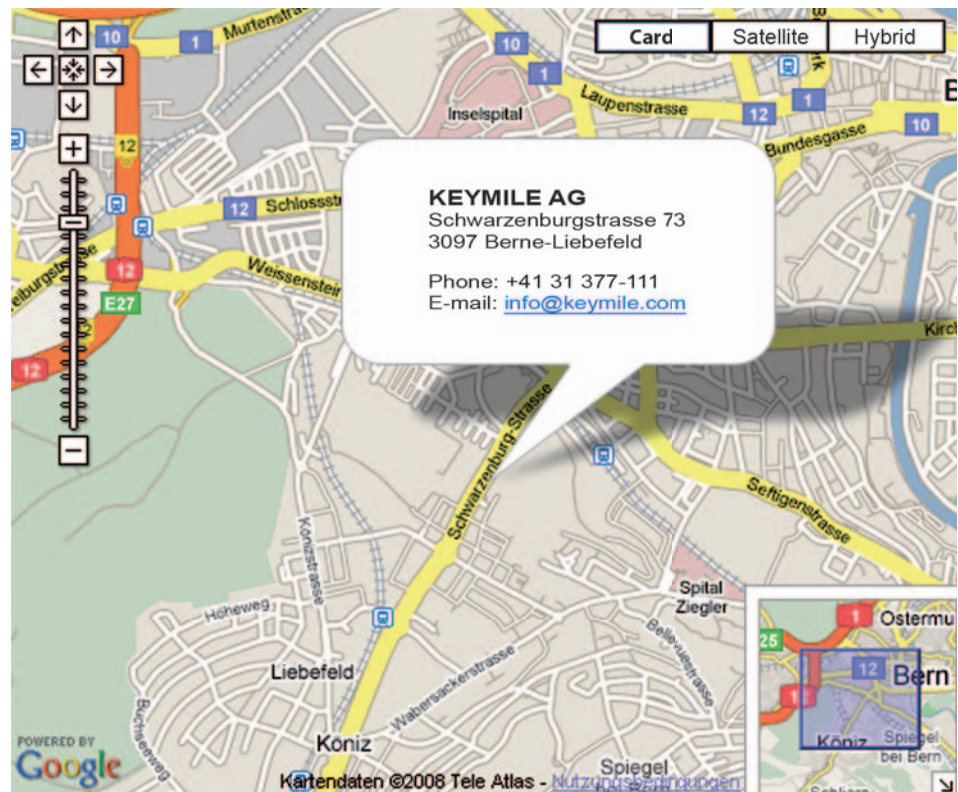
Further afield, the romantic region of Swabia (Schwaben) invites you to explore medieval castles, ancient villages and scenic walks along the Neckar river or through the nature reserves of the Swabian-Franconian Forest.

Using the S-Bahn you will be in the city of Stuttgart in 30 minutes. Here you will find an extensive cultural life, including some great museums. Comprehensive information material is available from the Training Centre, and your trainer will provide you with anything else you need to make sure your stay in Backnang is truly memorable.



## Route Descriptions

### Berne, Switzerland



#### By tram/bus, starting at the central station

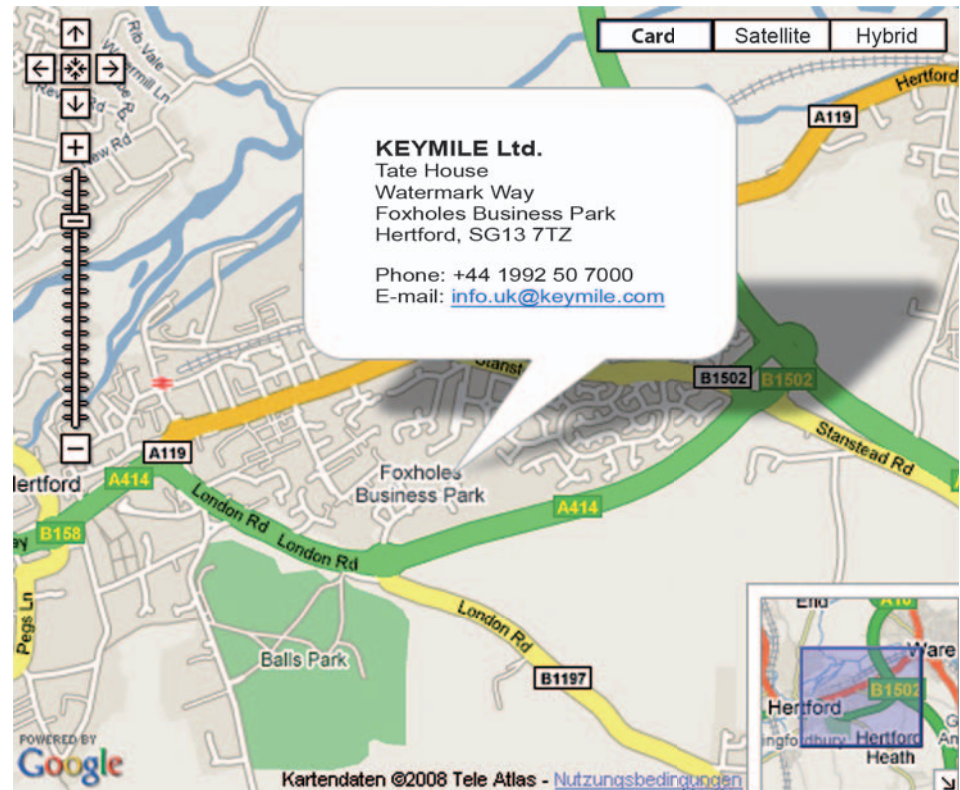
- Please take bus no. 10 "Köniz/Schliern":  
The main station stop is next to the "Loeb" shopping-center.
- Ride to stop "Dübystrasse". This is the 4th stop.
- Continue in the direction of the bus. After 150 meters you will find the yellow KEYMILE building on the left side.

#### By car

- Take the motorway direction Zurich/Lucerne ⇌ Berne ⇌ Fribourg
- Or take the motorway direction Geneva ⇌ Lausanne ⇌ Berne
- Or take the motorway direction Yverdon ⇌ Fribourg ⇌ Berne
- Leave the motorway at the exit Berne/Bümpliz ⇌ Direction: Köniz
- Follow the main street to Köniz, through the forest, until you reach the roundabout
- Turn right at the roundabout, straight on, until you reach the traffic lights
- Turn left at the traffic light, straight on, over the train crossing, straight on, until you reach the next roundabout
- Turn left at the roundabout, straight on
- After about 150 m you will see the yellow KEYMILE building on the right hand side



## Hertford, UK



### From M25

Leave M25 at junction 25 following signs for A10 to Hertford.

Exit A10 at Hertford taking the second exit at the roundabout to Hertford (A414). At the next roundabout turn right into Foxholes Business Park, past the Mercedes garage on your left. Continue into the business park going straight across the two mini roundabouts. KEYMILE is directly in front of you.

### From A1M

Exit A1M at junction 4 following signs for Hertford (A414). Travelling into Hertford continue straight across all roundabouts until you see a multi-storey car park on your left and a large church on your right. At the next roundabout turn right up the hill, still on the A414. Turn left at the next roundabout past the Mercedes garage into Foxholes Business Park. Continue into the business park going straight across the two mini roundabouts. KEYMILE is directly in front of you.

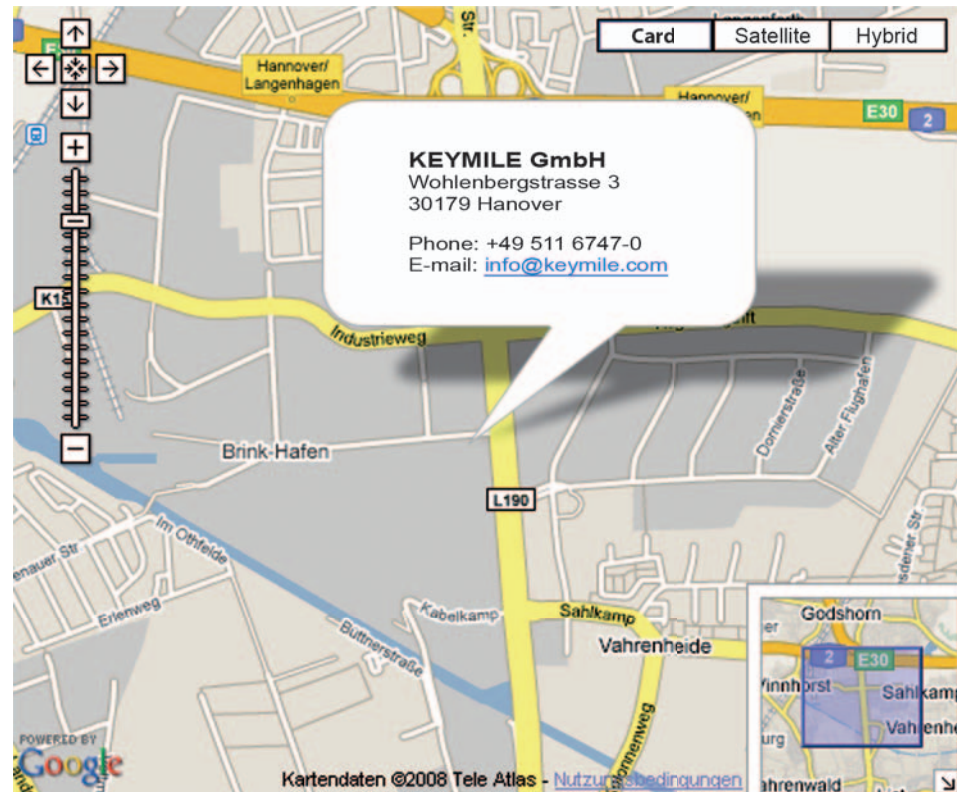
### By Rail

From London, Liverpool Street to Hertford East, approximately 50 minutes, with trains running every half hour. From London Moorgate, via Finsbury Park to Hertford North, approximately 40 minutes, with trains running every half hour.

KEYMILE is a short taxi journey from either of Hertford's two Railway Stations.



## Hanover, Germany



### Travel by car

Coming from Hamburg on motorway A7: At interchange "Hannover Nord" leave A7 and follow motorway A352 in direction of Dortmund. Leave A352 at exit "Hannover-Flughafen" (Airport) and follow B522 toward "Hannover-Zentrum" (city). After app. 3 km turn right into "Wohlenbergstraße".

Coming from Berlin or Dortmund on motorway A2: Leave the motorway at exit "Hannover/Langenhagen" in the direction of "Hannover-Zentrum" (city). After app. 800 m turn right into "Wohlenbergstraße".

Coming from Kassel on motorway A7: At motorway intersection "Hannover-Ost" follow A2 towards Dortmund. Leave the motorway at exit "Hannover/Langenhagen" in the direction of "Hannover-Zentrum" (city). After app. 800 m turn right into "Wohlenbergstraße".

After app. 150 m turn left for the KEYMILE premises.

### Travel by plane

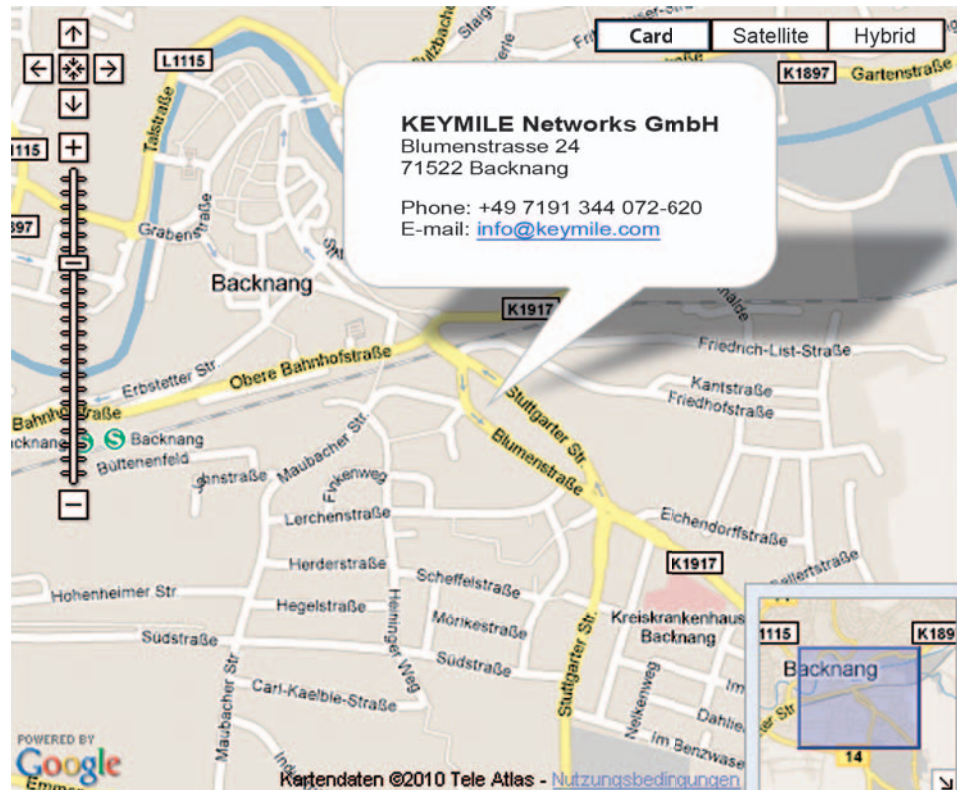
Take a taxi at Langenhagen airport (distance app. 7 km). Or take the S-Bahn to Hanover Central Station, then take the tram line 1, direction "Langenhagen", stop "Alter Flughafen".

### Travel by tram

Take line 1 and exit at tram stop "Alter Flughafen".



## Backnang, Germany



### Travel by car

Travelling by car, your choice of Autobahn (BAB) route should be the A81 to the Mundelsheim exit. As an alternative, you can use Federal Route B14 via Nürnberg-Stuttgart. The B14 skirts the southwestern suburbs of Backnang.

Note: Parking places for visitors are available free of charge. These are marked parking places at the rear side of the building.

### Travel by train

If you travel by train, you will reach Backnang via the Nürnberg-Stuttgart rail link. Backnang station is a stop for both regional commuter rail and regular main line trains. From Stuttgart main station, the S-Bahn (Line S3) commuter rail takes you to Backnang in 30 minutes. Trains travel in 30-minute intervals.

KEYMILE office is located a short distance from the Backnang railway station. If you want to walk go at the front from the station right, pass under the big railway bridge and follow the Blumenstrasse until number 24.

### Travel by plane

You will be arriving at the airport at Stuttgart-Echterdingen. From there, the S-Bahn line S3, takes you to Backnang in about an hour. It is a direct commuter rail connection. Take a ticket at the ticket machine with 6 areas.

## Course Booking Form

Please complete the form below with as much information as possible. You will be advised by e-mail that course places have been provisionally reserved, and informed of the information to be put on your Purchase Order, and where to send it. Only after receipt of your official Purchase Order will we be able to confirm your reservation.

**Important:** If you wish us to reserve places on multiple courses for more than one person, please use one Form per course.

Additional Registration Order Forms in PDF format can be downloaded from <http://training.keymile.com>.

Course Title	Start Date	Location	Ref. No. (where known)

Family Name	First Name	E-mail

### Contact Details

Company Name \_\_\_\_\_  
 Address \_\_\_\_\_  
 Contact Person \_\_\_\_\_  
 Phone \_\_\_\_\_  
 Fax/e-mail \_\_\_\_\_

### Hotel Accommodation (Please tick as required)

Please be aware that your chosen Training Centre may only be able to advise you of possible accommodation.

Not necessary  From \_\_\_\_\_ until \_\_\_\_\_

Special requirements \_\_\_\_\_

(Please use a separate page to supply more detailed information)

### To be returned to

KEYMILE Training Administration

E-mail: [training@keymile.com](mailto:training@keymile.com)

Fax: +44 1992 581-513, Phone: +44 1992 507-080

Fax: +49 511 6747-141, Phone: +49 511 6747-171

If we do not receive an official purchase order 30 days before the start of the course, we cannot guarantee the availability of free places. Payment should be received by KEYMILE at least two working weeks prior to the start of the course.

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