



FAST TRACK TO SKILLS.

AVL North America Open Enrollment Trainings 2022

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FAST TRACK TO
COMPREHENSIVE
SKILLS.



TRAINING – AVL Approach

High-quality, professional training classes at customer site or at AVL Training Centers provide first-class knowledge for competent, safe and reliable operation and the best utilization of test systems. AVL training courses are carried out by our specially qualified, professional trainers.

Instructor-led Training

Training classes are conducted either at the customer site or at one of the global AVL Training Centers. AVL Training Facilities provide the perfect environment for fast and efficient learning. Modern classrooms equipped with the latest technologies for presentation and communication - as well as a wide range of simulators and test equipment for practical exercises - enable the delivery of high quality AVL training classes.

Didactically and professionally skilled trainers impart the necessary knowledge to perform the testing tasks.



Available training classes:

Product Training courses allow staff to develop knowledge to understand and utilize AVL test systems for engine / battery/ eMotor /powertrain testing.

Open-Enrollment Training for staff to develop knowledge to understand and utilize AVL test systems for engine / battery/ eMotor /powertrain testing. Regularly scheduled throughout the year. Subject to cancellation if minimum enrollment levers are not reached.

Benefits

- Cost-effective and professional learning process
- Increases the qualification and competence of staff members
- Ensures safe and reliable operation of test systems
- High quality of test results from the beginning
- Supports in developing specific test procedures

Financial Aspects

Return on this effective training investment is immediate. E.g. avoiding the additional costs associated with a 2-week time delay in a development project would already pay for the education of a small team of operators and testing engineers

References

- > 1600 training days per year for products and technologies at customer sites or AVL Training Centers
- > 500 trainees per year from almost all engine and powertrain companies

Customer statements

- Expectations met to 100%
- Professional trainers - excellent expertise and know-how of trainers
- Interesting discussions and mutual exchange of experiences
- Well-structured and consistent training content

www.avl.com/training



HOW TO READ THIS CATALOG

Different job titles require different skill sets (“User Level”). Taking this into account, you’ll find the relevant “User Level” information in each course description based upon the following common tasks and roles:

- Operation (Test Operator)
- Parameterization (Test Engineer)
- Data Evaluation (Post Processing Personnel)
- Maintenance & Service (Calibration / Maintenance / Service Personnel)
- Administration (Test Field Administrator)

TRAINING PARTICLE COUNTER

TT05DA010A.01

User Level

Operation (Test Operator), Maintenance & Service (Calibration / Maintenance / Service Personnel)

Goal

The participant is able to operate the Particle Counter to perform measurements and carry out simple maintenance work.

Content

- Basic knowledge of emissions measurement & legislation
- Overview of System set-up (mechanical, pneumatically and electrical installation)
- Explanation of the installation of both Sampling Probe and Sampling Line
- Operation
 - Measurement principle and different measurement procedures
 - Operating States and Functions
 - Operation PUMA system or PC
 - Explanation of important parameters
 - Functionality of implemented options
- Maintenance
 - Cleaning
 - Venturi Pump (Particle Counter Advanced)
 - High Pressure Option
 - Changing the Filter element
 - Replacing Filter mats
 - Function check
 - Leak check
 - Response Check
 - Flow Check
 - Refill Butanol

If there are different job titles / tasks available in your organization and you need assistance in setting up a curriculum / education package for your organization, please get in touch with either your local representative or the AVL Skills Center North America (mailto: bruce.digna@avl.com).

GENERAL CANCELLATION POLICY

Cancellation or rescheduling of confirmed training dates are subject to following cancellation policy and fees:

Business days prior to the scheduled training start date	Handling fee	Charges incurred of contracted fee
35 to more than 30	\$50	
30 to more than 20	\$150	30%
20 to more than 5	\$250	50%
5 or less	\$300	100%

OPEN-ENROLLMENT TRAINING

OPERATION & BASIC PARAMETERIZATION OF PUMA 2 ENGINE TESTBED

TNASKTR531.01 - TRAINING PUMA 2 ENGINE TESTBED

This training refers to PUMA version 2 – for a training dealing with older versions, please contact your local representative.

User Level

Operation (Test Operator), Maintenance & Service (Calibration / Maintenance / Service Personnel)

Goal

The participant is able to operate the PUMA 2 Engine testbed automation system. The trainee is able to define and execute manual measurements, run pre-defined engine test runs and modify basic testbed parameters.

Content

- Starting the system and PUMA application programs
- Manual and automatic operation
- Limit monitoring and operating states
- Definition and execution of manual measurements
- Operation of a pre-defined recorder
- Values and results display
- Overview of PUMA parameter sets (System-, Test Facility-, Unit Under Test- and Test Parameters)
- Selection of testbed parameters, results and results series
- Modification and activation of existing testbed parameters
- Using the message window and the help functions

Notes

- Training class is conducted in English
- Session will be held if minimum headcount (4) is reached two weeks before the training start date
- Training Price is for ONE participant
- Venue at AVL, remote attendance option also available
- General Cancellation Policy applies to this training, see page 6 of this catalog.

Prerequisites

- Basic knowledge of the operation of a unit under test
- Knowledge of PC's and Windows

Scope of Services

Each consisting of:

- 4 days instructor led training with hands-on practical exercise sessions
- Training Materials.
- AVL Certificate for participants

DEVELOPMENT OF AUTOMATIC TESTRUNS IN PUMA 2

TNASKTR524.01 - TRAINING PUMA 2 TESTRUN PREP.

This training refers to PUMA version 2 – for a training dealing with older versions, please contact your local representative.

User Level

Parameterization (Test Engineer)

Goal

The participant is able to parameterize automatic test runs according to complex test requirements and display the results.

Content

- Writing complex automatic test runs (SSQ/BSQ)
- Parameter setup of data storage tables, measurement requests and automatic measurements
- Usage of implemented Toolbox objects
- Test workspace
- Library concept
- Setup of Exception routines and subprograms
- Editing test specific formulas
- Setup of test run limits and engine specific limits
- Data post processing (check of results)
- Import and export of testrun parameters using AVL Navigator

Notes

- Training class is conducted in English
- Session will be held if minimum headcount (4) is reached two weeks before the training start date
- Training Price is for ONE participant
- Venue at AVL, remote attendance option also available
- General Cancellation Policy applies to this training, see page 6 of this catalog.

Prerequisites

- Experience in operation and parameterization of the PUMA 2 System

Scope of Services

Each consisting of:

- 3 days instructor led training with hands-on practical exercise sessions
- Training Materials on USB memory stick
- AVL Certificate for participants

OPERATION OF AND MODEL INTEGRATION WITH Testbed.CONNECT™

TNASKTR599.01 - TRAINING AVL TESTBED.CONNECT

This training refers to version 1R1 – It's contains only the integration of realtime models. For the usage of non realtime models within Model.CONNECT™, please contact your local representative.

User Level

Parameterization (Test Engineer)

Goal

The participant is able to integrate a model at a PUMA 2 or Testbed.CONNECT™ workstation.

Information: The functions are explained using already existing model examples. The integration of customer models is not part of the training – if there is a need for it an application support can be ordered at AVL.

Content

- Usage of interface functions of the PUMA 2 automation system (system channels, messages))
- Model Parameter Editor (MPE), Testbed.CONNECT™ Explorer
- Deployment at PUMA Open systems (if available) or Testbed.CONNECT™ Workstation
- Development of a simple application by the trainee
- Usage of the Model.CONNECT™ configurator to link several models

Notes

- Training class is conducted in English
- Session will be held if minimum headcount (4) is reached two weeks before the training start date
- Training Price is for ONE participant
- Venue at AVL, remote attendance option also available
- General Cancellation Policy applies to this training, see page 6 of this catalog.

Prerequisites

- Experience in operation and parameterization of the PUMA 2 System

Scope of Services

Each consisting of:

- 2 days instructor led training with hands-on practical exercise sessions
- Training Materials on USB memory stick
- AVL Certificate for participants

DEVELOPMENT OF VB SCRIPTS IN PUMA 2

TNASKTR343.01 - TRAINING SCRIPTING IN PUMA OPEN

This training refers to PUMA 2 – for a training dealing with older versions, please contact your local representative.

User Level

Parameterization (Test Engineer)

Goal

The participant understands the basic usage of scripting in PUMA 2 (Activation Objects, Scripting, Extensibility Scripts, State Machine and BSQ/SSQ). He/she is able to create, modify scripts and to test the scripts in the PUMA 2 system.

Content

- Introduction into the VB programming language
- VB script syntax and best practices
- VB concepts: variables, constants and control structures
- VB concepts: functions, subroutines, data arrays
- Basic introduction into scripting in PUMA 2
- Creation and modification of script contexts
- Definition of hand-over parameters (Systemchannels / script parameters)
- Integration of scripts into the automatic testrun (BSQ/SSQ)
- Execution of scripts from other PUMA components
- Practical exercises using extensibility scripts
- Debugging and problem analysis

Notes

- Training class is conducted in English
- Session will be held if minimum headcount (4) is reached two weeks before the training start date
- Training Price is for ONE participant
- Max. participants: 6 persons
- Venue at AVL, remote attendance option also available
- General Cancellation Policy applies to this training, see page 6 of this catalog.

Prerequisites

- It is necessary to have basic knowledge in programming languages e.g. C++, VBA, VBS and to understand the fundamental concepts of those, e.g. functions/subroutines, hand-over of parameters by reference and by value, indexed data types
- Experience in operation and parameterization of the PUMA 2 System
- Knowledge of drawing up automatic test runs with BSQ / SSQ
- If the training class is conducted on site the client has to provide sufficiently installed and commissioned equipment running properly for practical exercises

Scope of Services

Each consisting of:

- 4 days instructor led training with hands-on practical exercise sessions
- Training Materials on USB memory stick
- AVL Certificate for participants

FROM DATASOURCE TO REPORT WITH CONCERTO

TNASKTR527.01 – TRAINING CONCERTO EVALUATION

This training refers to version 5 – for a training dealing with older versions, please contact your local representative.

User Level

Operation (Test Operator), Data Evaluation (Post Processing Personnel)

Goal

The participant is able to handle the complete workflow of post-processing with AVL CONCERTO from data import to visualization and evaluation

Content

- Overview of the data structure and data management
- Import of test result data from a wide variety of sources (AVL PUMA, ETAS INCA, AVL iFiles, CSV, etc.)
- Creation of diagrams, tables and reports
- Evaluation and interpretation of measurement data
- Data comparison (of test results from the same data source)
- Export and merging of data
- Management of layouts and data sources in work environments and libraries
- Hands-on exercises with application examples for above topics

Notes

- Training class is conducted in English
- Session will be held if minimum headcount (4) is reached two weeks before the training start date
- Training Price is for ONE participant
- Venue at AVL, remote attendance option also available
- General Cancellation Policy applies to this training, see page 6 of this catalog.

Prerequisites

- Knowledge of PC's and Windows
- If the training class is conducted on site the client has to provide sufficient workplaces / notebooks with installed & running AVL CONCERTO software for practical exercises.

Scope of Services

Each consisting of:

- 2 days instructor led training with hands-on practical exercise sessions
- Training Materials.
- AVL Certificate for participants

AUTOMATIC DATA PROCESSING WITH CONCERTO

TNASKTR529.01 – TRAINING CONCERTO ADVANCED

This training refers to version 5 – for a training dealing with older versions, please contact your local representative.

User Level

Data evaluation (post processing personnel with basic CONCERTO experience)

Goal

The participant is able to design and implement advanced post-processing applications using AVL CONCERTO. This includes development of formulae/macros/scripts to extend the basic CONCERTO functionality and to automate large post processing tasks and create a GUI to guide operators through complex evaluation processes

Content

- Creation of CONCERTO formulae, macros and scripts
- Resource management
 - Organization of CONCERTO components in multi user environments
 - Library concept
 - Advanced data source configuration
- Application development
 - Data handling (resampling, extracting, filtering, etc.)
 - Creation of GUI
 - Automation of work flows
 - Data export
- Hands-on exercises with application examples for above topics

Notes

- Training class is conducted in English
- Session will be held if minimum headcount (4) is reached two weeks before the training start date
- Training Price is for ONE participant
- Venue at AVL, remote attendance option also available
- General Cancellation Policy applies to this training, see page 6 of this catalog.

Prerequisites

- TRAINING CONCERTO Evaluation
- If the training class is conducted on site, the client has to provide sufficient workplaces / notebooks with installed & running AVL CONCERTO software for practical exercises.

Scope of Services

Each consisting of:

- 2 days instructor led training with hands-on practical exercise sessions
- Training Materials.
- AVL Certificate for participants

TRAINING PYTHON IN AVL CONCERTO

TNASKTR308.01 TRAINING: PYTHON WITH AVL CONCERTO

This training refers to all AVL CONCERTO 5 R3 releases and newer.

User Level

Group Data Evaluation Engineers with knowledge in Python. Experienced CONCERTO App Developer.

Goal

The participants understand how Python functions can be embedded in CONCERTO post processing applications. Practical examples should highlight the advantages of Python over CONCERTO scripting language.

Content

- Introduction / Overview of the Python implementation
- Data transfer between CONCERTO / Python
- Data structures in Python
- Calculations / Automation with Python
- Comparison to existing CONCERTO scripting functionality
- Hands-on exercises with application examples for above topics

Notes

- Training class is conducted in English
- Session will be held if minimum headcount (4) is reached two weeks before the training start date
- Training Price is for ONE participant
- Venue at AVL, remote attendance option also available
- General Cancellation Policy applies to this training, see page 6 of this catalog

Prerequisites

- Training CONCERTO Advanced (TNASKTR529.01) or equivalent knowledge
- Basic skills with Python are mandatory, this is NOT a training for Python coding
- If the training class is conducted at customer site sufficient workplaces / notebooks with installed and running AVL CONCERTO software for practical exercises must be provided by the customer. CONCERTO licenses can be provided by AVL for the duration of the training on prior notice

Scope of Services

Each consisting of:

- 2 days instructor led training with hands-on practical exercise sessions
- Training Materials.
- AVL Certificate for participants

BOBCAT OPERATION & PARAMETERIZATION

TNASKTR522.01 - TRAINING OPERATING BOBCAT OP-ENROLL

User Level

Operation (Test Operator), Maintenance & Service (Calibration / Maintenance / Service Personnel)

Goal

The participant is able to operate the bobcat automation system. He is able to define and execute manual measurements, run pre-defined test runs and modify basic parameters.

Content

- Starting the system
- Manual and automatic operation
- Limit monitoring and operating states
- Definition and execution of manual measurements
- Operation of a pre-defined recorder
- Use pre-defined values and results displays
- Overview of bobcat parameter sets (Testcell, Engine, and Test parameters)
- Selection of test bed parameters
- Using the message window
- Using the help functions
- Reviewing data with the Data Browser
- Overview of bobcat hardware architecture
- Contents of testcell, engine, and test parameters
- Setting up Input/Output channels
- Writing automatic test runs, startup and shutdown routines
- Sequence Library and subroutines
- Creating and use Datasheets
- Setup of Exception routine
- Creating and editing formulas
- Setting up of testcell limits and engine limit groups

Notes

- Training class is conducted in English
- Session will be held if minimum headcount (4) is reached two weeks before the training start date
- Training Price is for ONE participant
- Venue at AVL, remote attendance option also available
- General Cancellation Policy applies to this training, see page 6 of this catalog.

Prerequisites

- Basic knowledge of the operation of a unit under test
- Knowledge of PC's and Windows

Scope of Services

Each consisting of:

- 4 days instructor led training with hands-on practical exercise sessions
- Training Materials on USB memory stick - printed training manuals may be ordered optionally.
- AVL Certificate for participants

LYNX BATTERY TESTING OPERATION & PARAMETERIZATION

TNASKTR337.01 - TRAINING LYNX BATT. TEST. OPER. OP-ENR.

This training refers to version 2 – for a training dealing with older versions, please contact your local representative.

User Level

Operation (Test Operator), Parameterization (Test Engineer)

Goal

The participant is able to operate the Lynx Automation System. He/She is able to define and execute manual measurements, run pre-defined test runs and modify basic parameters. He/She is able to set up channels, connect input/output devices, and parameterize automatic test runs.

Content

- Starting the system
- Manual and automatic operation
- Limit monitoring and operating states
- Definition and execution of manual measurements
- Operation of a pre-defined recorder
- Use pre-defined values and results displays
- Overview of automation parameter sets (Testcell, Stand, Battery, and Test)
- Selection of test bed parameters
- Using the message window and help functions
- Reviewing data with the Data Browser
- Writing automatic test runs, startup and shutdown routines
- Sequence Library and subroutines
- Creating and use Data sheets
- Setup of Exception routines
- Creating and editing formulas
- Setting up of testcell limits
- Importing and exporting of testrun parameters

Notes

- Training class is conducted in English
- Session will be held if minimum headcount (4) is reached two weeks before the training start date
- Training Price is for ONE participant
- Venue at AVL, remote attendance option also available
- General Cancellation Policy applies to this training, see page 6 of this catalog.

Scope of Services

Each consisting of:

- 4 days instructor led training with hands-on practical exercise sessions
- Training Materials on USB memory stick - printed training manuals may be ordered optionally.
- AVL Certificate for participants

INDICATING SETUP & OPERATION

TNASKTR519.01 - TRAINING INDICATING OPEN - ENROLLMENT

User Level

Operation (Test Operator), Parameterization (Test Engineer)

Goal

The participant is able to perform measurements and evaluations and to manage combustion data with an AVL indicating system. He understands the setup of an AVL indicating system and is able to parameterize it to perform measurements. In addition, he is familiar with the calibration of the system the diagnoses of failures and the indicating data management.

Content

- Basic knowledge in engine indicating and the indicating measurement chain
- Signal conditioning
- Operating Interface
- Execution of crank angle- and/or time based measurements
- Data presentation
- Management of measured data
- Calculation of results by means of Calcgraf
- Data comparison
- Data Import / Export
- Plausibility check and diagnosis of failures based on the measured data
- Setup of the AVL indicating system and connected pressure transducers, crank angle encoder and amplifier
- Parameterization, signal conditioning and TDC-determination
- Management of indicating data
- Remote control and interface to a test bed automation system
- Set up of single measurement, durability measurement, monitoring and automatic mode
- Calibration
- Plausibility check and diagnosis of failures regarding the parameterization
- Data evaluation (e.g. Calcgraf) and data presentation using different display methods
- Numerous hands-on exercises based on simulated combustion sensor signals

Notes

- Training class is conducted in English
- Session will be held if minimum headcount (4) is reached two weeks before the training start date
- Training Price is for ONE participant
- Venue at AVL, remote attendance option also available
- General Cancellation Policy applies to this training, see page 6 of this catalog.

Prerequisites

- Skills for indicating data

Scope of Services

Each consisting of:

- 4 days instructor led training with hands-on practical exercise sessions
- Training Materials on USB memory stick
- AVL Certificate for participants

AMA i60 OPERATING

TNASKTR559.01 - EXH. GAS ANALYZER AMA i60, OPEN-ENROLL.

This training refers to both AMA i60 generation series I and II.

User Level

Operation (Test Operator)

Goal

The participant understands the principles of analyzers and the layout of AMA i60. He is able to operate the main functions and to do the basic maintenance task. The participant obtains a basic understanding of the foundations of emissions measurement.

Content

- Basics of emissions measurement and legislation
- Overview of the customer specific system configuration
- HSS-Prefilter
- Measurement principles of the analyzers
- Pneumatic layout of the customer specific analyzers
- Physical and pneumatic layout of AMA i60
- Electric components and control layout
- iGEM AMA software operation
- Operation of AMA i60
- Parameterization on operator level
- Basic maintenance tasks

Notes

- Training class is conducted in English
- Session will be held if minimum headcount (4) is reached two weeks before the training start date
- Training Price is for ONE participant
- Venue at AVL, remote attendance option also available
- The daily, weekly and monthly maintenance measures have to be performed by local staff in time because otherwise the measuring quality is no longer guaranteed (loss of accuracy). To qualify the maintenance staff the adequate training class "TRAINING L2: AMA i60 MAINTENANCE" has to be ordered in addition
- General Cancellation Policy applies to this training, see page 6 of this catalog.

Prerequisites

- Technical, electrical/electronic and physical background
- General knowledge of engine or vehicle testing

Scope of Services

Each consisting of:

- 4 days instructor led training with hands-on practical exercise sessions
- Training Materials on USB memory stick - printed training manuals may be ordered optionally.
- AVL Certificate for participants



OPEN-ENROLLMENT TRAINING SCHEDULE

Open-enrollment trainings are offered on a regularly scheduled basis. This provides a cost-effective option when a dedicated training session is not feasible. These sessions will be held if minimum headcount (4) is reached two weeks before the training start date. Training Price is for ONE participant.

Cancelation and Rescheduling

Cancelation or rescheduling of confirmed training dates are subject to following cancelation policy and fees:

Business days prior to the scheduled training start date	Handling fee	Charges incurred of contracted fee
35 to more than 30	\$50	
30 to more than 20	\$150	30%
20 to more than 5	\$250	50%
5 or less	\$300	100%

OPERATION & BASIC PARAMETERIZATION OF PUMA 2 ENGINE TESTBED

- ~~April 5 – 8~~
- August 16 – 19
- November 29 – December 2

DEVELOPMENT OF AUTOMATIC TESTRUNS IN PUMA 2

- ~~April 11 – 13~~
- August 24 – 26
- December 5 – 7

FROM DATASOURCE TO REPORT WITH CONCERTO

- April 19 – 20
- August 1 – 2
- December 5 – 7

AUTOMATIC DATA PROCESSING WITH CONCERTO

- April 21 – 22
- August 3 – 4
- December 19 – 20

IMPLEMENTATION OF PYTHON CODE WITH CONCERTO

- Please Inquire

DEVELOPMENT OF VB SCRIPTS IN PUMA 2

- January 11 – 14
- September 6 – 9

BOBCAT OPERATION & PARAMETERIZATION

- Please Inquire

INDICATING SETUP & OPERATION

- Please Inquire

LYNX BATTERY TESTING OPERATION & PARAMETERIZATION

- April 26 – 29
- August 29 – September 1
- December 13 – 16

AMA i60 OPERATING

- April 5 - 8
- August 2 – 5
- December 6 – 9

OPERATION OF AND MODEL INTEGRATION WITH Testbed.CONNECT™

- Please Inquire