the power to control

bachmann.

Training

Modular training concept.

energy.industry.maritime.

Overview

Basic Training	User Training
Basic knowledge of automation required	Basic training and specific knowledge recommended

Basic Training
- Bachmann automation
- Grid measurement and monitoring
- Safety technology
- Service technician

User Training
- PLC programming
- Visualization M1 webMI pro
- atvise® scada
- Motion Control
- Condition Monitoring BINDT-certified training
- Industry-specific training
  - Wind Turbine Template (WTT)
  - forsiteSCADA
  - M1 ServiceCenter
- Safety technology (Safety Developer)

| Industry-specific training |
| Redundancy |
| bluecom (Ethernet real-time protocol) |

Training Roadmap

Overview

Solid know-how combined with first-class products is the key to perfect automation. We provide both.

Take advantage of our extensive training program, which we will gladly adapt to your individual needs. In seminar rooms equipped with the latest technology, our experienced trainers will provide you with everything you need to know about the Bachmann automation system.

The training sessions are held either in our branch offices or, if needed, directly at your company. Following each training course, participants receive a personalized certificate.

Individual modules can also be offered as webinars on request (2-3 hrs duration).

Workshops

Our modular concept enables a training pro-gramme to be created specifically for the needs of your company.

Our training offer ranges from proven standard training seminars to workshops tailored to your individual requirements. The training is centered around intensive knowledge transfer and hands-on work on special problem solving tasks. Bachmann specialists provide all the knowledge required.

| C/C++ Developer |
| Application development with M-Target for Simulink® |
| Model-based development with MATLAB® / Simulink® |
| Customer-specific workshops |

Bachmann Automation

Fundamentals / Basic Training

This training provides you with a quick and comprehensive introduction to the world of Bachmann automation.

The focus here is the SolutionCenter as the all-in-one engineering tool and as a convenient environment for the project design, commissioning, configuration and diagnostics of all Bachmann automation devices.

There is also an introduction to programming and visualization. (see advanced training course "PLC programming").

Target Group

- Commissioning engineers
- Application engineers
- Project managers

Prerequisites

- Basic knowledge in automation
- Basic knowledge in IEC 61131-3 programming is helpful

Content

- Controller hardware
- Commissioning
- Controller software
- Visualization
- PLC Programming
- Introduction to fieldbus configuration

DURATION
3 days

NUMBER OF PARTICIPANTS
Min. 4 / Max. 8

ORDER NUMBER
00016065-01

Service Technicians

Fundamentals / Basic Training

Service technicians are confronted with complex automated systems during commissioning and service tasks in the field.

In this seminar, the content of the "Bachmann Automation" basic training is presented with regard to diagnostics and troubleshooting of the Bachmann controller.

The SolutionCenter provides you with the perfect tools for this.

Target Group

- Service technicians

Prerequisites

- Basic knowledge in automation

Content

- Controller hardware
- Commissioning, diagnostics, troubleshooting, maintenance
- Controller software
- Optional:
  – Fieldbus diagnostics
  – PLC programming
  – Visualization

DURATION
2 days

NUMBER OF PARTICIPANTS
Min. 4 / Max. 8

ORDER NUMBER
00016065-02

Grid Measurement and Monitoring

Energy Management

Project Design / Basic Training

The safety and efficiency of the electrical energy supply are placing increasing demands on the generator units, transmission systems and consumers.

Bachmann grid modules supply the latest state-of-the-art technologies as a fully integrated solution in the automation units of the Bachmann controller system.

This training seminar provides the knowledge required to use Bachmann grid measurement, monitoring and synchronization modules in the SolutionCenter.

Target Group

- Commissioning engineers
- Application engineers

Prerequisites

- Basic training "Bachmann Automation"
- Knowledge of energy technology an advantage

Content

- Comparison and use of GM, GMP, GSP modules
- Module configuration in the SolutionCenter
- Use of the module functions by means of practical examples
- Examples with the module scope and simulation mode
- PLC programming example

DURATION
½ day

NUMBER OF PARTICIPANTS
Min. 4 / Max. 8

ORDER NUMBER
00024605-00

Safety Technology

Fundamentals / Basic Training

This seminar offers a concise and rapid entry into the field of functional safety technology. Knowledge of the Bachmann automation solution is not a prerequisite.

The advanced training course "User Training Safety Technology" can be found on page 11.

Target Group

- Service technicians
- Commissioning engineers
- Application engineers
- Design engineers
- Project managers
- Safety specialists

Prerequisites

- Basic knowledge in automation

Content

- Introduction to the Bachmann controller system
- Fundamentals of configuring and programming the safety modules
- Overview and interconnections of the Machinery Directive, ISO 13849 and IEC 62061

DURATION
1 day

NUMBER OF PARTICIPANTS
Min. 4 / Max. 8

ORDER NUMBER
00016065-03

Safety Technology

Project Design / User Training

This seminar offers a concise and rapid entry into the field of functional safety technology.

You are shown how to program safety applications based on the Bachmann safety products in hardware and software.

Target Group

- Commissioning engineers
- Application engineers
- Safety specialists

Prerequisites

- Basic training "Bachmann Automation"
- Knowledge of programming to IEC 61131-3
- Knowledge of the relevant standards

Content

- Safety hardware and configuration
- Programming with Function Block Diagram, Compounds
- PLCopen safety function blocks
- Diagnostics, communication with the PLC (SVI)
- Project design with the Safety Developer based on examples

DURATION
1 day

NUMBER OF PARTICIPANTS
Min. 4 / Max. 8

ORDER NUMBER
00016065-04

M1 WebMI pro

Project Design / User Training

The M1 webMI pro web server runs as an elegant and highperformance software directly on the controller.

Any device with a browser thus becomes the user interface for the machine. The viewing of a visualization page immediately demonstrates the extraordinary benefits of HTML5 and SVG (scalable vector graphics), the basis for all graphic objects: Zooming without a loss in quality as well as color gradients and transparency!

Furthermore, JavaScript allows the virtually limitless implementation of special requirements. At the end of this training seminar each participant will have created an extensive sample project.

Target Group

- Commissioning engineers
- Application engineers

Prerequisitesen

- Basic training "Bachmann Automation"
- Knowledge of JavaScript an advantage

Content

- Installing and configuring the web server
- Project design with atvise® builder
- Screen design and navigation
- Animations
- Creating user-defined graphic objects
- Alarms, trending, archiving
- Basic client-side scripting

[i] Scripting & advanced features offered as a separate user training seminar. Further information on request.

DURATION	NUMBER OF PARTICIPANTS	ORDER NUMBER
2 days	*Min. 4 / Max. 8*	*00016065-20*

atvise® scada

Project Design / User Training

The latest generation of Supervisory Control and Data Acquisition solutions puts the Internet in service to the automation world through the use of pure web technology.

The consistent use of industrial and communication standards (such as OPC UA) reduces the effort required for engineering down to a minimum. Furthermore, JavaScript allows the virtually limitless implementation of special requirements.

At the end of this training seminar each participant will have created an extensive sample project.

Target Group

- Application engineers
- Software developers

Prerequisitesen

- Basic knowledge of web technology and OPC an advantage
- Knowledge of JavaScript an advantage

Content

- Installation and engineering
- Project design with atvise® builder
- Screen design and navigation
- Animations
- Creating user-defined graphic objects
- Alarms, trending, archiving
- Basic client-side scripting

DURATION
2 days

NUMBER OF PARTICIPANTS
Min. 4 / Max. 6

ORDER NUMBER
00016065-19

bluecom Communication

Project Design / User Training

The bluecom protocol is based on standard Ethernet technology and provides a convenient and easy to implement communication solution for fast and reliable information exchange in real time, such as for energy grids.

This training course provides a rapid introduction to configuring and using the bluecom protocol with the Bachmann controller as the system platform.

Target Group

- Application engineers
- Software developers

Prerequisites

- Basic training "Bachmann Automation"
- Knowledge of programming in Structured Text or C
- Knowledge of Ethernet network technology is an advantage

Content

- Introduction to the functions of bluecom
- Notes on implementations on other platforms
- Possible configurations using examples
- Examples from the bluecom user library
- Commissioning
- Diagnostics

DURATION
1 day

NUMBER OF PARTICIPANTS
Min. 4 / Max. 8

ORDER NUMBER
00020266-00

Redundancy

Project Design / User Training

Redundancy in various implementations is the preferred technology for increasing availability sustainably up to achieving virtually total freedom from failure.

The Bachmann automation system can be tailored exactly to the requirements of your particular application.

This training course provides a rapid introduction to configuring and creating redundant applications.

Target Group

- Application engineers
- Software developers

Prerequisites

- Basic training "Bachmann Automation"
- Knowledge of programming in Structured Text
- Knowledge of Ethernet network technology is an advantage

Content

- Introduction to network, warm and hot standby redundancy
- Software components in a redundancy project
- Configuration of redundant control systems using examples
- Programming of redundant applications
- Diagnostics

DURATION
2 days

NUMBER OF PARTICIPANTS
Min. 4 / Max. 8

ORDER NUMBER
00020267-00

Wind Turbine Template (WTT)

Project Design / User Training

WTT is a software package for the wind sector. It contains the basic functions required to implement the operational control of a wind turbine in accordance with IEC 61400-25. It also features an interface for making the data prepared according to the wind energy standard available to the outside (SCADA system interface).

The WTT software package also features an additional user and access management function in compliance with the latest standards.

The training firstly consists of a brief look at the IEC 61400-25 wind energy standard in order to illustrate the benefits of the template. The operational control template and its use within the PLC programming are then illustrated. Participants are then shown how to configure the interface as well as how to use the access management function. The individual elements of the package are explained with practical examples.

Target Group

- Application developers for wind turbines

Prerequisites

- Basic training "Bachmann Automation"
- Knowledge of PLC programming according to IEC 61131-3 and C/C++
- Basic knowledge of IEC 61400-25 (advantageous)

Content

- Presentation of WTT
- Exploration of IEC 61400-25
- Structure and use of WTT operational control template
- Interface configuration according to IEC 61400-25
- Configuration and use of user and access management

DURATION
2 days

NUMBER OF PARTICIPANTS
Min. 4 / Max. 6

ORDER NUMBER
00031240-00

forsiteSCADA

Project Design / User Training

"forsiteSCADA" is a sector specific SCADA system that is fully tailored to the needs of plant manufacturers and operators. This is based on our proven atvise® scada product, which enables the user to make customized adaptions and extensions. WPS is connected to the controllers via the communication interface (OPC UA) and brings the user all the benefits via the standard interface in accordance with IEC 61400-25.

The training seminar uses examples to show participants how to create turbine objects according to IEC 61400-25 and how to implement expansions.

Target Group

• Visualization users for wind turbines

Prerequisites

• Basic training in atvise® scada
• Basic knowledge of Bachmann controller system and OPC UA (advantageous)
• Basic knowledge of IEC 61400-25 (desirable)

Content

• Introduction to WPS and installation
• Exploration of IEC 61400-25
• Structure and use of WPS
• Communication according to IEC 61400-25
• Design and instantiation of object types
• Server/client scripting
• Creation of examples for further use

DURATION
2 days

NUMBER OF PARTICIPANTS
Min. 4 / Max. 6

ORDER NUMBER
00031241-00

M1 ServiceCenter

Project Design / User Training

Service tasks, such as the backup of existing software and software updates, hardware exchange and data logging are indispensable tasks on any machine or plant.

The M1 ServiceCenter makes it possible to plan and carry out these and other activities automatically for one or several plants. Users can create their own service plan in the program from a large portfolio of recurring processes and assign them to the service personnel. Execution is then carried out at the click of a button.

The training covers the creation of process routines in the program and also shows how this can be used simply for an Bachmann controller.

Target Group

- Application engineers/ control technicians
- Service personnel

Prerequisites

- Basic knowledge of the Bachmann controller system (advantageous)

Content

- Presentation of the M1 ServiceCenter and installation
- Overview of the process catalog
- Engineering
- Creation of a process routine using an example
- Execution of the program
- Other settings and possibilities

DURATION
1 day

NUMBER OF PARTICIPANTS
Min. 4 / Max. 8

ORDER NUMBER
00031243-00

Motion Control

Project Design / User Training

This training seminar provides what you need to know to design single and multi-axis motion applications, use them irrespective of the relevant drive and parameterize software controllers.

Target Group

- Commissioning engineers
- Application engineers

Prerequisites

- Basic training "Bachmann Automation"
- Basic knowledge of drive and closed-loop control technology

Content

- Software Motion Controller (M-SMC, Drive Middleware)
- Virtual shaft controller (M-SHAFT, Drive Middleware)
- M-CNC on request (option, + ½ day)

DURATION
2 days

NUMBER OF PARTICIPANTS
Min. 4 / Max. 6

ORDER NUMBER
00016065-09

Additional Technologies

Project Design / User Training

These can be included to a limited degree within a basic training seminar on request.

Examples:

– OPC UA/DA

– MMS (IEC 61850 / IEC 61400-25)

– IEC 60870-5-101/-103/-104 Server

– Fieldbus configuration (CANopen,
  Profibus, Profinet, Modbus, EtherCAT)

PLC Programming

Programming / User Training

This training offers you a rapid introduction to programming the Bachmann controller system under the M-PLC environment based on CoDeSys. The emphasis is on the most powerful IEC language: Structured Text (ST).

Target Group

- Commissioning engineers
- Application engineers

Prerequisites

- Basic training "Bachmann Automation"
- Basic knowledge of CoDeSys and structured programming an advantage

Content

- Introduction to programming to IEC 61131-3
- Programming in ST
- Overview of FBD, LD, IL, SFC
- Programming the Bachmann controller
- Controller and task configuration
- User libraries

DURATION	NUMBER OF PARTICIPANTS	ORDER NUMBER
2 days	*Min. 4 / Max. 8*	*00016065-11*

C/C++ Developer

Programming / User Training

This training provides a rapid introduction to C/C++ programming with the Developer for Bachmann hardware. The emphasis is on the use of the Bachmann development tools under the C programming language.

Target Group

- Application engineers
- Software developers

Prerequisites

- Basic training "Bachmann Automation"
- Knowledge of C/C++

Content

- Modular software design and system services
- Communication between programs
- Hardware access
- Event handling
- Debugger
- Working with the Developer based on examples
- Developing function blocks for IEC 61131-3

DURATION
3 days

NUMBER OF PARTICIPANTS
Min. 4 / Max. 8

ORDER NUMBER
00016065-12

Application Development

M-Target for Simulink®

Programming / User Training

The MATLAB® program package from The MathWorks Inc. is considered around the world to be the standard for modeling dynamic systems in technologically demanding processes.

"M-Target for Simulink®" enables the Bachmann controller to be used as a target system. Based on examples, this training course explains how the models are implemented in the controller.

Target Group

- Development engineers

Prerequisites

- Basic training "Bachmann Automation"
- Advanced knowledge of MATLAB® and Simulink®
- Knowledge of model-based development processes
- Knowledge of C programming
- PCs with all the required software licenses are provided

Content

- Basics of code generation from MATLAB®/Simulink®
- Content and structure of the Bachmann Simulink® libraries
- Data exchange between Simulink® modules and C or IEC 61131 modules
- User-specific programming of S functions for the Bachmann controller system
- Applications with several controllers
- Implementation of HiL (Hardware in the Loop) systems with Simulink® and the Bachmann controller system

DURATION	**NUMBER OF PARTICIPANTS**	**ORDER NUMBER**
1 day	*Min. 4 / Max. 8*	*00016065-13*

Model-based Development

MATLAB®/ Simulink® and Bachmann controller system

Programming / User Training

The MATLAB® program package from MathWorks offers an extensive tool landscape for the model-based development of controller applications.

With M-Target for Simulink® the user can integrate seamlessly in this development process within the Bachmann controller environment.

The training offers an entry into the subject of model-based application development for the Bachmann controller system.

Target Group

- Development engineers

Prerequisites

- Basic training "Bachmann Automation"
- Basic knowledge of mathematics and dynamic systems
- Basic knowledge of C programming
- PCs with all the required software licenses are provided

Content

- MATLAB® fundamentals
- Simulink® for modeling algorithms and systems
- Basics of code generation with MATLAB® coder and Simulink® coder
- Content and structure of the Bachmann Simulink® libraries
- Data exchange between Simulink® modules and C or IEC 61131 modules
- User-specific programming of S functions for the Bachmann controller system
- Applications with several controllers Implementation of HiL (Hardware in the Loop) systems with Simulink® and the Bachmann controller system

DURATION	NUMBER OF PARTICIPANTS	ORDER NUMBER
3 days	*Min. 4 / Max. 8*	*00016065-22*

Condition Monitoring System

Condition Monitoring involves the continuous or regular monitoring of the state of a machine through the measuring or analysis of meaningful physical variables (e.g. vibrations, temperatures, condition of lubricant etc.). The comparison with reference measurements provides information for drawing conclusions about the actual condition of gears, generators, bearings, and other elements.

These training courses cover the basics of Condition Monitoring as well as providing a detailed knowledge of relevant hardware and software. We also now offer approved training in the field of Vibration Analysis for Condition Monitoring, according to ISO 18436-2

Basic Vibration Training

----- *Training Package 1*

This training session provides a basic explanation of the principles of vibration, and how these can be used to detect machinery faults.

The course is aimed at participants without previous experience or knowledge of vibration analysis and provides an introduction to the concept of Condition Monitoring and diagnostics, and how vibration can be used for that purpose.

Target Group

- Plant Operators
- O&M Service Teams
- O&M Schedulers/Planners

Prerequisites

- Background in Operations and Maintenance

Content

- Condition Monitoring
- Vibration Definitions
- Signal Analysis
- Fault Detection
- Fault Diagnosis
- Bearing Faults
- Gear Faults

DURATION
1 day

NUMBER OF PARTICIPANTS
Min. 4 / Max. 10

ORDER NUMBER
00024885-00

WebLog Customer Portal

Training Package 2

This course gives an overview of the WebLog Customer Portal tool, explaining how to use its different features, including the ticket system.

At the end of the course you will have an improved understanding of the messages you receive from the ticket system. You will be able to navigate through the WebLog customer portal to review data and gain confidence delivering relevant information to the Bachman Monitoring team.

Target Group

- Operations Staff
- O&M Staff
- Asset Managers

Prerequisites

- Category 1 Vibration Analysis preferred, but attendance of Training Package 1 will suffice

Content

- Introduction to WebLog
- Ticket System
  – Log on and Server usage
  – E-mails to and from the ticket system
  – Report contents
  – Meaning of specific fields
  – Responding to a ticket
- Access to raw data (V-Tool)
- Workflow

DURATION
1 day

NUMBER OF PARTICIPANTS
Min. 4 / Max. 10

ORDER NUMBER
00024890-00

Vibration Analysis and WebLog Expert®

Training Package 3 – Advanced

This course is based on the WebLog Expert® software and goes into greater detail on the subject of vibration analysis. As well as the basics of vibration, we cover specific signal processing techniques used to enhance signals and provide numerous supporting case studies.

In addition, the training explains how to configure systems in the optimum way for machine monitoring, both from a theoretical standpoint and through practical demonstrations in WebLog Expert®.

For this training participants are expected to have knowledge equivalent to VA Category II qualified analysts.

Target Group

- Vibration Analysts
- O&M Engineers with Condition Monitoring experience
- Condition Monitoring Team Leaders

Prerequisites

- Vibration Analysis Category 2

Content

- Basics of Vibration Analysis
- Bachmann CMS Hardware
- WebLog Expert®
  – Installation
  – Preferences
  – Views
- Characteristic Values
- Severity Classes
- Ticket System
- Categories/Filters
- Analysis with WebLog Expert®
- Workflow

DURATION
2 days

NUMBER OF PARTICIPANTS
Min. 4 / Max. 10

ORDER NUMBER
00024891-00

Customer Specific CMS Topics

Training Package 4

With this training package, customers receive a bespoke, tailor-made Condition Monitoring course. Content is based on the needs of the customer team and their typical machine issues.

This course will generally be drawn from elements of training packages 1, 2 and 3, but may also go into deeper discussions of topics of specific interest, such as maintenance optimisation.

Target Group

- Condition Monitoring Teams
- Vibration Analysts
- O&M Engineers with Condition Monitoring experience
- Condition Monitoring Team Leaders
- O&M teams

Prerequisites

- Usually requires a minimum of Vibration Analysis Category 2

Content

- Content developed bespoke to the customer
- Case studies taken from customers own data and tickets
- Hardware examples based on hardware set up in customers fleet
- Troubleshooting examples relevant to customers experience
- Software used mirrors set up used by or for the customer

DURATION
2-5 days

NUMBER OF PARTICIPANTS
Min. 2 / Max. 10

ORDER NUMBER
00027108-00

WebLog Expert® Functionality, Operation and Analysis

Training Package 5

This course is designed to enable customers to start their own monitoring and teaches the required capabilities for daily monitoring. Teams using our pre-screening service typically need to complete this training before starting to work.

By the end of the week, participants will have gained a complete understanding of alarm screening procedure, filtering options for effective alarm management, and message categorisation.

The training includes familiarisation with all the visualisation tools within WebLog Expert® for alarm investigation, as well as methods for creating a ticket to report findings.

Target Group

- Customers who intend to perform their own monitoring
- Vibration Analysts
- O&M Engineers with Condition Monitoring experience
- Condition Monitoring Team Leaders

Prerequisites

- Vibration analysis Category 2 and previous attendance of TP3

Content

- Introduction and Philosophy
- WebLog Expert®
  – Installation
  – Preferences and Views
- Alarmlist
  – Concept
  – Examples
- Pre-Screening
- Diagnosis
  – Theory
  – Case Studies
- O&M Workflow
- Reporting
- Ticket System
  – Ticket Case Studies
- Kinematics and Spectral Data

DURATION
5 days

NUMBER OF PARTICIPANTS
Min. 1 / Max. 4

ORDER NUMBER
00024914-00

WebLog Expert® Administration

Training Package 6

This course is for customers who wish to take over the monitoring and hosting of their own data.

The administrative tools within WebLog are extensive and relate to user rights for a variety of different purposes, including access to the WebLog Customer Portal, receipt of E-Mails, rights to change configurations or templates, accept alarms, set deadbands and a variety of other functions. These are transparent to customers for whom we provide the service but need careful consideration when customers take over their own data hosting.

This course also includes guidance on selecting roles for different user groups.

Target Group

Customers intending to carry out their own monitoring:
- Vibration Analysts or IT administrators in Customer Organizations, who will be defining access rights
- Condition Monitoring Team Leaders

Prerequisites

- Knowledge of MySQL permissions and company infrastructure

Content

- Connecting to WebLog
- WebLog Architecture
- Adding New Systems
- Working with Categories
- WebLog Portal
  – Customer rights
  – E-Mail contacts
- WebLog Access rights
- User Set up
  – Set up from Template
  – Assign to group
  – Assign system to user
- Group Set up
- Location Set up
- Shared rights
- Read/Write Access
- V-Tool Access
- Threshold Configuration
- Template configuration
- Admin Rights
- Using the logs

DURATION
5 days

NUMBER OF PARTICIPANTS
Max. 2

ORDER NUMBER
00024915-00

Installation Training

Installation & Commissioning

Our experienced technicians explain the complete installation process, including software tools, precautions on site, and the tools and materials required for a successful installation.

A member of our Remote Monitoring team will then guide you through the process of commissioning, describing data requirements, and the philosophy behind threshold setting and evaluation.

Content may vary, depending upon the scope of work.

Target Group

- New customers seeking to install or maintain Bachmann Systems
- Contractors working on installations
- Condition Monitoring Engineers
- Project Engineers

Prerequisites

- Appropriate Safety Certifications for working on Wind Turbines
- Background and experience in C&I installation

Content

- About the Bachmann System
- Hardware
  - Cabinet fixing
  - Mains Connection
  - Communication Connections
- Sensor Installation
  - Mounting requirements – BAM Stud mounting
  - Mounting requirements – µ-bridge
  - Cable Runs
  - Earthing
- General Safety
  - COSHH – glues
  - Surface Preparation
    - Dust
    - Use of hand-held electrical tools
  - Housekeeping
- Quality Assurance
  - Cable colours
  - Setting codes
  - Installation assistant app / photos
  - Installation Reporting
- On-Site Commissioning
  - Connecting to System
  - Webpages
  - M1 ServiceCenter
  - Configuration (including communications)
  - Minor troubleshooting
- Off-Site Commissioning. Bachmann Monitoring Team tasks

DURATION
*1-2 days;
2-3 additional days
for practical training*

NUMBER OF PARTICIPANTS
Min. 3 / Max. 8

ORDER NUMBER
00025099-00

Approved Training with Bachmann Monitoring
Verified Quality

Bachmann's Condition Monitoring training program in Rudolstadt has been approved by the British Institute of Non-Destructive Testing (BINDT). Training is carried out in full accordance with ISO 18436, the International Standard for the qualification of Condition Monitoring practitioners, and allows participants to seek certification as Vibration Analysts. Approval from BINDT independently verifies the high quality of training delivered by Bachmann and validates its training center to globally-recognized standards.

Vibration Analysis

As per ISO 18436-2, Category 1

The curriculum is intended to provide sufficient theoretical knowledge to support a range of pre-defined, simple vibration measurement tasks. There will be practical content to support this learning and to help to apply it to real-world situations.

The training includes many case studies and examples of typical machines on which this might be applied.

This course supports certification as a category 1 Vibration Analyst through the BINDT PCN scheme.

Target Group

- Technicians tasked with collecting vibration data for the purposes of Condition Monitoring. This is basic training for initial entry to the field of Condition Monitoring

Prerequisites

- Minimum 6 months experience

Content

- Introduction to Condition Monitoring
- Principles of Vibration
- Data Acquisition – Instrumentation
- Data Acquisition – Measurement
- Recognising Poor Data
- Equipment Knowledge
- Vibration Signal analysis
- Fault Finding
  – Fault Condition Recognition
  – General Fault Recognition
  – Basic Maintenance Action
  – Test Procedure
- Introduction to Resonance
- Corrective Action and acceptance testing
- BINDT Vibration Analysis Category 1 Examination

DURATION
30 hours

NUMBER OF PARTICIPANTS
Min. 5 / Max. 10

ORDER NUMBER
00037383-00

Vibration Analysis

As per ISO18436-2, Category 2

The curriculum is intended to provide sufficient theoretical knowledge to extend the knowledge of someone who has already reached Category 1.

In addition to the simple vibration tasks outlined above, the theory will support phase measurements, simple signal processing and basic fault analysis.

There will be practical content to support this learning and to help to apply it to real-world situations. Examples and Case Studies will be taken from various machine types relevant to this level.

This course supports certification as a category 2 Vibration Analyst through the BINDT PCN scheme.

Target Group

- Technicians working with vibration data for the purpose of machine Condition Monitoring. This course is aimed at technicians with knowledge equivalent to Category 1 and at least 18 months experience in the field, who routinely carry out diagnosis and reporting as well as basic measurement screening

Prerequisites

- Minimum 18 months experience

Content

- Introduction to Condition Monitoring
- Principles of Vibration
- Introduction to Resonance
  – Phase
  – Natural Frequency
  – Resonance and Critical Speeds
- Data Acquisition – Instrumentation
- Data Acquisition – Measurement
- Recognising Poor Data
- Monitoring Programme Definition
  – Equipment Knowledge
  – Reporting and Documentation
- Vibration Signal analysis
- Fault Finding and fault analysis
- Corrective Action and acceptance testing
- BINDT Vibration Analysis Category 2 Examination

DURATION
38 hours

NUMBER OF PARTICIPANTS
Min. 5 / Max. 10

ORDER NUMBER
00037384-00

Vibration Analysis

As per ISO18436-2, Category 3

The curriculum is intended to provide sufficient theoretical knowledge to extend the knowledge of someone who has already reached Category 2. In addition to the standard vibration tasks outlined above, the theory will support the design of Condition Monitoring programmes including alarm and frequency band configuration.

The training includes guidance on fault finding and root cause analysis, as well as the application of alternative techniques to complement or confirm results from Vibration Analysis. There will be practical content to support this learning and to help to apply it to real-world situations. Examples and Case Studies will be taken from various machine types relevant to this level.

This course supports certification as a category 3 Vibration Analyst through the BINDT PCN scheme.

Target Group

- Technicians and Engineers working in Condition Monitoring, who are involved with project definition and vibration investigations, as well as day to day monitoring and diagnostics

Prerequisites

- Category 2 and minimum 36 months experience

Content

- Introduction to Condition Monitoring
- Principles of Vibration
- Force/Response
- Data Acquisition
- Signal Processing
- Monitoring Programme Definition
  – Condition Monitoring
  – Equipment Knowledge
- Fault Finding
  – Fault Analysis
  – Equipment Knowledge
  – Fault Severity Determination
- Advanced Diagnostics
  – Equipment testing and diagnostics
- Use of Alternative Technologies
  – Alternative Condition Monitoring technologies
  – Equipment Knowledge
- Corrective Action
  – Corrective Action (Balance and Alignment)
  – Equipment Knowledge
  – Fault Severity Determination
- Acceptance Testing
  – Corrective Action (Balance and Alignment)
  – Acceptance Testing
  – Fault Severity Determination
- BINDT Vibration Analysis Category 3 Examination

DURATION	**NUMBER OF PARTICIPANTS**	**ORDER NUMBER**
38 hours	*Min. 5 / Max. 10*	*00037385-00*

Training Offer

Fundamentals / Basic Training	Date	Location	Order number
Bachmann Automation	on request	Feldkirch	00016065-01
Grid Measurement and Monitoring	on request	Feldkirch	00024605-00
Service Technicians	on request	Feldkirch	00016065-02
Safety Technology	on request	Feldkirch	00016065-03

Project Design / User Training	Date	Location	Order number
Safety Technology (Safety Developer)	on request	Feldkirch	00016065-04
M1 webMI pro	on request	Feldkirch	00016065-20
atvise® scada	on request	Feldkirch	00016065-19
bluecom Communication	on request	Feldkirch	00020266-00
Redundancy	on request	Feldkirch	00020267-00
Wind Turbine Templates (WTT)	on request	Feldkirch	00031240-00
forsiteSCADA	on request	Feldkirch	00031241-00
M1 ServiceCenter	on request	Feldkirch	00031243-00
Motion Control	on request	Feldkirch	00016065-09

Programming / User Workshop	Date	Location	Order number
PLC Programming	on request	Feldkirch	00016065-11
Programming with C/C++ Developer	on request	Feldkirch	00016065-12
Application development with M-Target for Simulink®	on request	Feldkirch	00016065-13
Model-based development with MATLAB®/Simulink® and the Bachmann controller system	on request	Feldkirch	00016065-22

Condition Monitoring Training	Date	Location	Order number
Basic Vibration Training	On request	Rudolstadt	00024885-00
WebLog Customer Portal	On request	Rudolstadt	00024890-00
Advanced Vibration Analysis and WebLog Expert®	On request	Rudolstadt	00024891-00
Customer Specific CMS Topics	On request	Rudolstadt	00027108-00
WebLog Expert® Functionality, Operation and Analysis	On request	Rudolstadt	00024914-00
WebLog Expert® Administration	On request	Rudolstadt	00024915-00
Installation Training	On request	Rudolstadt	00025099-00

BINDT approved training	Date	Location	Order number
Vibration Analysis as per ISO18436-2, Category 1	on request	Rudolstadt	00037383-00
Vibration Analysis as per ISO18436-2, Category 2	on request	Rudolstadt	00037384-00
Vibration Analysis as per ISO18436-2, Category 3	on request	Rudolstadt	00037385-00

Registration

E-Mail: training@bachmann.info
Online registration: www.bachmann.info/en/campus/knowledge/training

Prices, dates, other languages and prices for individual training or on-site training on request.

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