Training Offerings for Inpho

Offered training formats
- Individual Classroom Training
- Open Classroom Group Training
- Individual Online Training

Quick Overview of the Inpho Training Offering

Inpho Software Modules
- ApplicationsMaster
- MATCH-AT (Inpho Aerial Triangulation)
- MATCH-3DX/MATCH-T DSM (Surface Modelling, True-Orthophoto Generation)
- DTMaster (DEM Editing & Viewing)
- OrthoMaster (Orthophoto generation)
- OrthoVista (Orthophoto mosaicking)
- UASMaster (UAS data processing)

Inpho Software Module combinations
- Inpho Aerial Suite
- Inpho True Orthomosaic & Mesh Generation
- Inpho Surface Modelling & Editing
- OrthoBox (Inpho Orthophoto & Mosaic Production)
- General Training Prerequisites
- Further information

Appendix - Training Course Content Description
- Individual Online Training
- Individual Classroom training
  - MATCH-AT’s aerial triangulation processing workflow
  - Match-3DX
  - Match-T DSM
  - DTMaster
  - OrthoMaster
  - OrthoVista
  - UASMaster

Offered training formats

**Individual Classroom Training**
These are customer-centric training events. The training event is conducted at the company location or at a Trimble site. The training follows an agenda provided by Trimble.

**Open Classroom Group Training**
We offer training events for attendees with diverse professional backgrounds. We conduct these events at various Trimble locations worldwide. They have a fixed agenda and the content is designed to teach users the fundamental principles. We are announcing Open Classroom Group Training Events, its costs and content well before training is conducted and is therefore not specifically mentioned in this document further on.

**Individual Online Training**
Our online training course is available in a self-paced format and concluded with an instructor-led session to wrap up the learning experience. The customer can order an increased number of hours in advance for Q&A online sessions with a certified Trimble trainer.

It is the perfect opportunity for high quality training on reasonably low costs at the time you wish to have the training done with the following advantages:

- Web-based course material is available 24/7
- Course is split into sections to allow learners to select the session they need
- Individual learning pace
- Q&A online sessions with certified Trimble trainer
- No travel expenses are involved
- Training can start right away after ordering the training

The training can be ordered by contacting your local sales representative or by sending a quote request to imaging_support@trimble.com. More information on how to order the training and how to Enroll for the course and course material is available on https://learn.trimble.com. You find the course after you logged in or registered on https://learn.trimble.com by entering the link “https://learn.trimble.com/pages/227/office-software” where you find the Inpho online courses.
Quick Overview of the Inpho Training Offering

[Diagram showing various training modules and combinations]
Inpho Software Modules

Below you find the modules for which we offer training. Please contact imaging_support@trimble.com if you would like to order a different training. For the Inpho modules, we recommend a certain number of training days. For those who would like to have more time to practice or need more guidance we offer an extended number of training days.

ApplicationsMaster

ApplicationsMaster is the basis of all Inpho Software Modules and is part of all training units explained below (besides UASMaster which comes with a different own setup functionality). It allows setup projects, preparing images, coordinate systems and to import and export different kinds of data.

MATCH-AT (Inpho Aerial Triangulation)

Full automatic aerial triangulation including complete camera calibration, robust bundle block adjustment and thorough quality assessment for imagery blocks of huge number of images, variable overlap and geometry. The training is based on a data set provided by Trimble and is designed for beginners and advanced users. Depending on the number of ordered training days and the pre-knowledge of the trainees, a small data set provided by the customer could be included in the individual classroom training.

We offer the following training formats with the recommended and extended number of training days:

- Individual Classroom Training (recommended 2/extended 3 days of training)
- Individual Online Training accompanied with a 1-hour Q&A online session with a certified Trimble trainer.
- The MATCH-AT training is also included in the training offering of “Inpho Aerial Suite”

MATCH-3DX/MATCH-T DSM (Surface Modelling, True-Orthophoto Generation)

Dependent on the license the training will teach you:

- How dense point clouds from aerial image blocks are automatically derived and True-Orthos are generated.
- Or how digital terrain and surface models from aerial or satellite images are automatically created.
- You will be guided through the complete workflow; theory is explained and background information is provided.

We offer the following training formats with the recommended and extended number of training days:

- Individual Classroom Training (recommended 1/extended 1 day of training)
- The MATCH-3DX/MATCH-T training is also included in the training offerings of “Inpho Aerial Suite”, Inpho True Orthomosaic & Mesh Generation, Inpho Surface Modelling & Editing

DTMaster (DEM Editing & Viewing)

The training will teach you how to do quality control and editing of digital terrain models. The training covers lessons about data visualization, checking, editing and digitizing 3D vector data for terrain model generation.

We offer the following training formats with the recommended and extended number of training days:

- Individual Classroom Training (recommended 1/extended 1 day of training)
- Individual Online Training accompanied with a 1-hour Q&A online session with a certified Trimble trainer.

The MATCH-3DX/MATCH-T training is also included in the training offerings of “Inpho Aerial Suite”, Inpho True Orthomosaic & Mesh Generation, Inpho Surface Modelling & Editing

OrthoMaster (Orthophoto generation)
The training will teach you how to generate orthophotos. You will learn how to get prepared and how to set up automated processing.

We offer the following training formats with the recommended and extended number of training days:

- Individual Classroom Training (recommended half day/extended 1 day of training)
- The OrthoMaster training is also included in the training offerings of “Inpho Aerial Suite”, OrthoBox (Inpho Orthophoto & Mosaic Production)

OrthoVista (Orthophoto mosaicking)
The training explains the theory and methods and guides you through hands-on exercises to enable you to create orthophoto mosaics. You will also learn about the functionality of the Seam Editor and the Radiometrix Editor.

The training will teach you how to generate orthophotos. You will learn how to get prepared and how to set up automated processing.

We offer the following training formats with the recommended and minimum number of training days:

- Individual Classroom Training (recommended 2/min 2 days of training)
- The OrthoVista training is also included in the training offerings of “Inpho Aerial Suite”, OrthoBox (Inpho Orthophoto & Mosaic Production)

UASMaster (UAS data processing)
The training will teach you on how to set up projects and coordinate systems for imagery derived from UAS systems. It allows processing of UAS imagery, calibration of cameras and derives surface models and orthophotos very efficiently.

We offer the following training formats with the recommended and minimum number of training days:

- Individual Classroom Training (recommended 2/min 2 days of training)
- Regular free of charge web sessions to train the basics of UASMaster

Inpho Software Module combinations

Inpho Aerial Suite
The Inpho Aerial Suite consists of the modules ApplicationsMaster, MATCH-AT, MATCH-3DX/MATCH-T, DTMaster, OrthoMaster and OrthoVista.

We offer the following training formats with the recommended and extended number of training days:

- Individual Classroom Training (recommended 5/extended 8 days of training)
- Individual Online Training accompanied with 5-hours Q&A online sessions with a certified Trimble trainer
Inpho True Orthomosaic & Mesh Generation
This module combination trains you in the modules ApplicationsMaster, MATCH-3DX and DTMaster.
We offer the following training formats with the recommended and extended number of training days:
  ● Individual Classroom Training (recommended 2/extended 3 days of training)
  ● Individual Online Training accompanied with 2-hours Q&A online sessions with a certified Trimble trainer

Inpho Surface Modelling & Editing
This module combination trains you in the modules ApplicationsMaster, MATCH-T DSM and DTMaster.
We offer the following training formats with the recommended and extended number of training days:
  ● Individual Classroom Training (recommended 2/extended 3 days of training)
  ● Individual Online Training accompanied with 2-hours Q&A online sessions with a certified Trimble trainer

OrthoBox (Inpho Orthophoto & Mosaic Production)
This module combination trains you in the modules ApplicationsMaster, OrthoMaster and OrthoVista.
We offer the following training formats with the recommended and extended number of training days:
  ● Individual Classroom Training (recommended 2/extended 3 days of training)
  ● Individual Online Training accompanied with 2-hours Q&A online sessions with a certified Trimble trainer

General Training Prerequisites
Training attendees are responsible for providing computer hardware that meets the Inpho system requirements:
  ● 64-bit operating system
  ● Windows 10
  ● A minimum of 16GB RAM but we recommend 32GB or higher
  ● Enough free disk space to handle input and output data set including temporary files (dependent on size of project but min. 512 GB)

Further information
See the “Appendix - Training Course Content Description”.
Besides the mentioned training, we also offer individual advanced training and consultancy. It is possible to adjust the training agenda of standard training to your need if you inform us in advance of the training and if we can do it within the ordered number of training days and allows us to provide the needed training content. Should you be interested or should you have any questions then please contact us via email at imaging_support@trimble.com.
Appendix - Training Course Content Description

Individual Online Training

The online training is delivered with training material, data sets and is accompanied with Q&A online sessions with a certified Trimble trainer. The extensive training material covers all aspects on what is required to understand

- Understanding the Inpho workflow
- Loading and displaying data as well as the project
- Defining processing parameters
- Handling different data types
- Generating and exporting the results

You can request a limited number of sessions to get answers on questions you might have based on the training material. The total duration of all QA sessions is mentioned with the quick description in the former section. The trainer sessions allow you to be guided on how to process the demo data and to deepen learned training content. Additional trainer guided hours can be ordered when ordering the online training or anytime later when you have a need for it.

For ordering a Q&A trainer session a calendar is available to select a time slot when a trainer is available and you have time for it.

The self-paced part includes the training material which is split into sections to allow learning at any time you want and at the speed you like. It includes video material with theory and exercises. Depending on the background and experience of a learner, completion of the self-paced part on average takes as long as a classroom training would also take during which a learner will go through the videos and process the data.

The material is provided to your company and is not limited to a certain number of people or a period.

The training can be ordered by contacting your local sales representative or by sending a quote request to imaging_support@trimble.com. More information on how to order the training and how to Enroll for the course and course material is available on https://learn.trimble.com. You find the course after you logged in or registered on https://learn.trimble.com by entering the link “https://learn.trimble.com/pages/227/office-software” where you find the Inpho online courses.

Recommended prerequisites:

- Computer with min 16GB of RAM. Recommended is 32 GB of RAM
- Enough disk space to run the example data set. Min 512 GB
- Good internet connection for the Q&A online sessions with a trainer
- Headset with Microphone when one person has the Q&A online session with the trainer or a loudspeaker plus microphone when several people are attending the Q&A online session

Individual Classroom training

MATCH-AT’s aerial triangulation processing workflow

Overview
The training course teaches the complete workflow of how to set up and process the fully automated aerial triangulation with Match-AT, from the basics up to processing parameters, and post processing. You will work on sample data and, if available, use a smaller subset of your own data.

Recommended prerequisites: Photogrammetric background

Content
- Project setup
- Aerial triangulation theory
- Camera specification and calibration in detail
- Setting the correct parameters for automated aerial triangulation process
- Analyzing aerial triangulation results
- Error correction (post-processing)

How to proceed after training:
- Self-study: We recommend to learn more about cameras, GNSS/IMU and triangulation in general
- Customized Advanced Training day: After you have worked with MATCH AT for some time and especially before you are going to process larger projects, we recommend to add another day of customized training, please contact us to discuss possibilities

Match-3DX
Generating dense point clouds with Match-3DX

Overview
The training course teaches you how to automatically create dense point clouds from aerial image blocks. You are guided through the complete workflow and get theory and background information about dense point cloud generation with True-Ortho products.

Recommended prerequisites:
- Photogrammetric background
- Availability of oriented aerial images
- Know how to use DTMaster for QA

Content
- Introduction to MATCH-3DX workflow
- What is a DTM/DSM (theory)
- Theory on MATCH-3DX algorithms
- Setting parameters for processing
- Data post-processing of MATCH-3DX point cloud data
- How to do QA/QC? Using DTMaster
- Additional parameters (match.status, batch parameters)

How to proceed after training:

www.trimble.com
Customized Advanced Training day: Learn about special adjustments, if you are having special cases, like larger areas of desert or forest, or if working with very large data sets

Match-T DSM
Generating DTM/DSM with Match-T DSM

Overview
The training course teaches you how to automatically create digital terrain and surface models from aerial or satellite image blocks. You are guided through the complete workflow and get theory and background information about DTM/DSM generation.

Recommended prerequisites:
- Photogrammetric background
- Availability of oriented aerial images
- Know how to use DTMaster for QA

Content
- Introduction to MATCH-T DSM workflow
- What is a DTM/DSM (theory)
- Theory on MATCH-T DSM algorithms
- How to handle ‘Area Definitions’
- Setting parameters for processing
- Data post-processing of MATCH-T DSM point cloud data (DTMToolKit)
- How to do QA/QC? Using DTMaster
- Additional parameters (match.status, batch parameters)

How to proceed after training:
- Customized Advanced Training day: Learn about special adjustments, if you are having special cases, like larger areas of desert or forest, or if working with very large data sets

DTMaster
Efficient DTM quality control and editing with DTMaster

Overview
The training course teaches you how to do quality control and editing of digital terrain models. The training covers lessons about data visualization, checking, editing and digitizing 3D vector data of terrain models.

Recommended prerequisites:
- General knowledge about terrain models

Content
- Introduction to the DTMaster workflow
- Going through the complete workflow step by step
- Import and export of vector data
- Tools to create points and lines
- Data display and visualization with aerial images, orthophotos
- Working with files and layers
- Details on measurement and editing functionality

Quality Assurance and Quality Control

How to proceed after training:

- Processing final terrain model

OrthoMaster
Generating orthophotos with OrthoMaster

Overview

The training course teaches you how to process orthophotos with OrthoMaster. You will learn how to navigate and display data as well as details about processing parameters for automated processing.

Recommended prerequisites:

- Photogrammetric background

Content

- Introduction to OrthoMaster
- Get an overview of OrthoMaster
- Learn about orthophoto rectification
- Go through a basic exercise
- Data display and activation
  - Learn about zooming and navigation
  - Understand data display options in OrthoMaster
  - How to activate data for processing
- Orthophoto generation
  - Learn about Terrain Models
  - How to generate Ortho Areas
  - How to process Orthophotos

OrthoVista
Generating orthophoto mosaics with OrthoVista

Overview

The training course of OrthoVista explains the theory and methods of orthophoto mosaicking and guides you through hands-on exercises to be able to create orthophoto mosaics. You will also learn about the functionality of the Seam Editor and the Radiometrix Editor.

Prerequisites and recommendations:

- General photogrammetric knowledge
- Orthophotos should be available

Content

- Introduction OrthoVista
  - Navigation, Display & more
  - Learn how to use the display options
  - Learn about navigation options
- Project Handling
  - Get and introduction to OrthoVista project handling
  - Learn how to work with OrthoVista project files
  - Learn about file management

www.trimble.com
UASMaster

Processing UAS data with UASMaster

Overview
The training course introduces users to UAS theory and methods. Additionally, the course guides you through hands-on exercises to process UAS sample data from project setup to orthophoto mosaics.

Prerequisites and recommendations:
- Basic photogrammetric knowledge

Content
- Introduction to UASMaster
- UAS ApplicationsMaster
- Understand the differences between UAV and Photogrammetric Projects
- Get an introduction to UAS ApplicationsMaster
- Learn how to setup a project
- Georeferencing – Measure
  - Learn how the Tie Point Extraction works
  - Get an introduction to the UAS Measurement
  - Understand the Point Tab and the Photo Tab
- Georeferencing - Analysis
  - Learn about Camera Calibration
  - Understand the LOG File
  - Learn about the Preferences – Graphical Check Tools
  - Learn about the Statistics options
  - Get an introduction to the Stereo Quality Check functionality
- DSM generation and Editing
  - Learn about the DSM / DTM Generation
  - Learn about the Preferences and Display options
  - Get an introduction to the UAS Edit tool
  - Understand the Terrain Tab
  - Understand the Point and Line Tools
- Generation of orthophoto mosaics

How to proceed after training:

www.trimble.com
• Continue with a one-day advanced online training as instructor-led web-based course. The advanced course handles its own data and answers specific questions from the users.