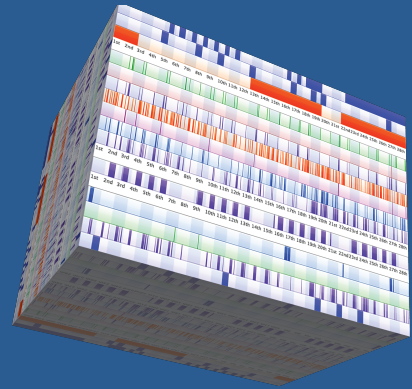


SkyFoundry

Training



Overview of SkyFoundry Training Programs



“Find What Matters”™

Overview of SkyFoundry Training Programs

SkyFoundry offers four training programs for SkySpark® software:

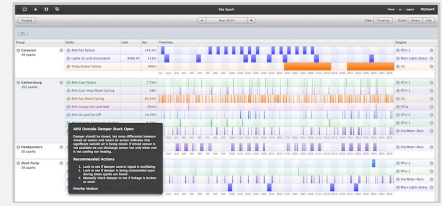
- SkySpark Essentials – In-Person, Classroom Training
- SkySpark Essentials – Remote Learning Version
- SkySpark Advanced Axon Techniques - In-Person Training
- SkySpark Developer Training – In-Person Training

This document provides a detailed overview of these programs

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SkySpark[®] Essentials



The “SkySpark Essentials” training program provides students with the essential information to start to use and implement SkySpark. The training program consists of 4 Modules, each of which builds on the knowledge acquired in the previous Module. This course is offered in two formats:

1. As an in-person, two-day session presented in a classroom setting.
2. As a remote learning course, utilizing resources including: live workshops presented via webcast, documentation, video presentations, and self directed exercises to reinforce learning

Module 1 Description: SkySpark Product Overview and Application Use

Module 1 focuses on initial introduction to the product and a thorough review of SkySpark’s user-oriented Apps, including: SiteSpark, KPI, Energy, Historian, Equip, Note and Report.

Goal: The goal of Module 1 is for the student to become comfortable and proficient in the use of all user-oriented SkySpark Apps outlined below. Students are expected to utilize the information presented in either the product demonstration provided as part of the Classroom session, or the training videos (for remote learning), and practice the use of the SkySpark applications. The goal is to achieve competence with the product as a “user” before moving on to additional training Modules which address set up of projects and implementation of analytic rules.

Module 1 makes extensive use of the SkySpark Demo database. The demo database, which is provided with all copies of SkySpark, includes a real world example of a 4-building portfolio with:

- A range HVAC equipment and energy meters
- Multiple years of sensor data that continues to automatically generate over time
- A range of Rules that automatically generate sparks on the system data and produce views in the various SkySpark Apps.

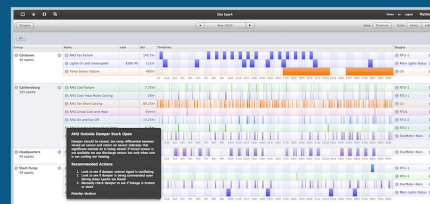
Completion of Module 1 provides an understanding of the capabilities, features and use of the product. This session is strongly recommended for salespeople, and is required for students that will participate in additional training modules 2, 3 and 4. It provides the essential understanding of the features and capabilities of SkySpark Apps needed to take advantage of the additional training sessions.

Requirements:

- Access to an instance of SkySpark
- For remote learning: a PC with Internet access to view training videos
- User account on SkyFoundry secure support site to access documentation and videos

SkySpark Essentials: Module 1

Learning the SkySpark Apps



Module 1: Additional Training Information

Remote Training: For students completing the course remotely, the following link provides access to the Training Videos. Note that students will need a user account on the SkyFoundry secure site.

<http://www.skyfoundry.com/doc/docTraining/index>

As part of Module 1 Students should review the following videos, which provide an overview the user-oriented SkySpark Apps.

Videos: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 17, 19

In addition, the student should complete the post session exercises described in:

<http://www.skyfoundry.com/file/64/Training-Module-1-Post-Session-Work-Exercises-for-v215.docx>

Important Note for Remote Learning: We strongly recommend that students start the remote learning process by attending a live demonstration of the product presented by SkyFoundry personnel referred to as the SkySpark Deep Dive Demonstration Webcast. Attendance provides an essential understanding to support ongoing learning.

Schedule for In-Person, Classroom SkySpark Essentials Training: Training begins at 9:00AM on Day 1 and runs until 5pm. The second day begins at 8:30AM and end at appx 4PM. Lunch and breaks are provided on both days.

SkySpark Essentials: Module 2

Creating a Project with the Builder App



The second module is targeted at the implementers/programmers, but is also recommended for auditing by sales engineers and others that will be responsible for scoping, quoting and managing projects. It focuses on use of the Builder App to create a sample project that includes a Site, Equipment, Points and imported historical data. Module 2 makes up the afternoon of the in-person Classroom version of the Essentials course.

The instructor leads the student through an exercise of building a Project database for a sample facility including a basic import of historical data, creation of an analytic rule, a KPI, a normalization formula, a custom energy baseline, and sample report queries. Module 2 follows a detailed workbook presented in Powerpoint format. This workbook is available for self-directed completion of Module 2 for students that wish to complete this session on their own. The Module 2 workbook is available at:

<http://www.skyfoundry.com/file/57/Training-Module-2-Workbook-Using-Builder-v215.pptx>

Goal: The goal of Module 2 is to gain familiarity with the end-to-end process of manually creating a project. Module 2 provides an essential understanding of how things get “wired up” in SkySpark and the use of the Builder App. This tool is useful for small to mid-size projects. For larger projects, SkySpark typically acquires data from external sources including “live” connectors such as Bacnet, oBix and haystack, or via import scripts that require programmer skills. These topics are covered in Modules 3 and 4 of the Essentials course and also in the Advanced Training program.

Requirements:

- For remote learning: To participate in live webcast presentations by the SkyFoundry instructor, two PC's with Internet access are required. The first PC is used to view the webcast presented by the SkyFoundry instructor. The second PC is used by the lead student and hosts a separate web meeting, which allows the SkyFoundry instructor to watch the progress of the lead student while they perform the exercises presented in the training. This student hosts a meeting to present their screen to the instructor. If multiple students are attending in the same location it is recommended that those students watch the lead student's screen on a projector.
- Access to an instance of SkySpark with Admin rights to the application and access to the SkySpark directory
- Previous completion of Module 1 training including all Post Session Exercises.

In addition to demonstrating the use of the Builder App, this session helps bring the big picture together for programmers that will be developing data import scripts for automatic generation of project databases.

Module 2 Post session work: The student is expected to utilize the information presented in live session, and practice the set up of a sample project by either doing the sample exercises again on their own, or preferably by attempting to build a their own sample project and importing their own data. The goal is to demonstrate competence with these tools before moving on to Module 3 of the training.

SkySpark Essentials: Modules 3 & 4

Introduction to the Axon Language



The third and fourth Modules of the SkySpark Essentials course take students into the Axon programming language. Axon is the language that underlies all of SkySpark. It is used to write Rules, database queries, custom reports and data import and transformation functions. Module 3 starts with a review of Axon concepts and tools and continues on to present a range of real-world oriented exercises to help students learn key concepts and begin to become proficient as an Axon programmer. Modules 3 & 4 make up the second day of the in-person Classroom version of the Essentials course.

Axon is a programming language so previous experience with programming is essential. Both Module 3 and 4 are targeted at students who will be involved in the development of Axon code to import data into SkySpark and to write Axon functions and analytic rules.

Remote Learning Version of Modules 3 and 4

For remote learning of Module 3 the student uses the training videos, the Module 3 & 4 training workbook, and SkySpark product manuals to gain familiarity with the Axon language and then continues on to the post session exercises and application notes to reinforce learning. Links are provided below. Module 3 & 4 Training Workbook: <http://www.skyfoundry.com/file/117/SkySpark-Essentials-Module-3--4-Workbook.pptx>

Module 3 Students should review and become comfortable with the materials presented in all of the videos in sections III and IV. These can be found here: <http://www.skyfoundry.com/doc/docTraining/index>

Preparation: It is expected that the attendees of Module 3 have accomplished the following in order to make Module 3 work as productive as possible:

- Completed Modules 1 and 2
- Have familiarized themselves with the product documentation including all videos.
- Invested time to pull together the necessary information for an initial sample or pilot project, e.g, identify data source, project characteristics and types of rules to be implemented
- Have programming experience with one of the following languages: Java, C#, VB, JavaScript, Python, Ruby, etc

Post session work: The student is expected to utilize the information presented in Session 3, to move forward towards implementation of their first sample or pilot project including development of data import scripts and creation of a few basic rules to generate Sparks. Students should complete the exercises shown in the Module 3 Post Session Work document as a minimum before moving on to Module 4. These are found here: <http://www.skyfoundry.com/file/49/Training-Module-3-Post-Session-Work-Exercises-v215.docx>

In addition to Post Session Exercises, the student should review all Application notes in detail. These notes show real world usage of SkySpark analytic functions. They can be found here in the Developer Resources section of the support site: <http://www.skyfoundry.com/doc/files/index>

SkySpark Essentials: Module 4

Axon Application Examples



Module 4 continues with exploration of Axon using exercises to develop the student's knowledge of the language.

Classroom Version: In the live Classroom setting, Module 4 builds on the introduction to Axon provided in Module 3 and focuses on demonstration of Axon concepts through review of selected application notes, and a range of real world examples addressing data import, and rule development.

Module 4 Remote Learning: When presented in a remote learning setting, Module 4 takes the form of a consultation session designed to allow students to have an open discussion with the SkyFoundry instructor regarding the programming steps and approaches used in implementing actual installations. Ideally the student will be working with their first pilot project and the instructor will provide guidance and address questions related to that specific project.

SkySpark Essentials Training Cost, Registration and Additional Notes

Registration Cost for the in-person version of "SkySpark Essentials" training is \$1100 per student (list price). SkyFoundry schedules classes on a regular basis. Typical classes have from 10-16 students. Classes are hosted in Richmond VA and other locations. Check the SkyFoundry Calendar latest schedule information: <http://www.skyfoundry.com/forum/calendar/>

or contact SkyFoundry or your SkyFoundry reseller.

Cost for the Remote version of training is also \$1100. This provides access to all materials, workbooks and videos and includes the two live webcast sessions to support the Modules 2 and 4. Each webcast session is approximately 2.5 hours in length. Multiple students may attend the webcast sessions at no additional charge. Direct one-on-one support is provided to a single "lead student" however, as described in the Module 2 description.

Note regarding fully self-directed learning: The "SkySpark Essentials" training materials are provided at no cost to SkyFoundry customers and can be used for fully self-directed learning.

On-Site Training. SkySpark Essentials training can be presented on-site for groups. Contact SkyFoundry to discuss pricing and scheduling.

SkySpark - Advanced Axon Techniques

Moving Deeper into Axon, Importing and Best Practices

The Advanced Axon Techniques training program is designed for users that are actively involved in development of Axon functions for analytics, data transformation, data importing and custom reporting. This course takes students into the use of more sophisticated analytic functions in the SkySpark extension libraries, importing and transforming data from a range of external sources including CSV, SQL Databases, and live Connectors.

All of the topics are presented through the use of comprehensive documentation and exercises.

This training course requires the student to have a copy of SkySpark running on their laptop. It is expected that the student has completed SkySpark Essentials and has implemented SkySpark on one or more projects and has command of basic Axon programming and performing common data transformations such as map, filter, and fold.

A detailed syllabus for the Advanced Axon techniques class can be found here:

<http://www.skyfoundry.com/file/145/SkySpark-Advanced-Axon-Techniques-Training-Syllabus.pdf>

Schedule: Training begins at 9:00AM on Day 1 and runs until 5pm. The second day begins at 8:30AM and end at appx 4PM. Lunch and breaks are provided on both days. In addition, a reception and dinner is provided on Day 1.

Prerequisites: The Intermediate class is not designed for beginners. Attendees are expected to meet the following prerequisites:

1. Have been to the SkySpark Essentials Training Class
2. Have a strong command of axon programming language
3. Have implemented a real project including: importing data with connectors and scripts
4. Have written successful rules using Axon.

Registration Cost for SkySpark Intermediate Training is \$1200 per student, list price. For information on dates check the SkyFoundry Calendar at: <http://www.skyfoundry.com/forum/calendar/>

For remote Training Essentials training contact SkyFoundry or your SkyFoundry reseller.

SkySpark Developer Training



Overview: The SkySpark Developer Training course is designed for software programmers that wish to exploit SkySpark API's, the SkySpark 3.0 DOMkit UI toolset and Fantom APIs for integration with external applications and development of custom visualizations and Apps. The Advanced Programming class is presented only as a 2-day, in-person class. It is targeted at software developers.

Prerequisites To Attend the Developer Training Class

- Experience implementing SkySpark on multiple projects
- Solid programming experience in Axon
- Solid programming experience in an object oriented language such as Java, C#, C++
- Review all of Fantom documentation in docIntro and docLang

This training course requires the student to have a copy of SkySpark running on your laptop. It is expected that the student is comfortable writing Axon functions and has solid command of common data transformations such as map, filter, and fold.

The student will be developing custom extensions and UI presentations during the course - your laptop environment must be setup to edit and compile Fantom programs using tools of your choice. Before coming to the class the student should be able to write a simple hello world program in Fantom (both script and pod) and run it successfully from the command line. Information on the Fantom programming language can be found here: <http://fantom.org/>

SkySpark Advanced Programming – Sample Agenda (Note: Agenda may be adjusted when class is announced)

- Folio architecture (model, internals, concurrency control, transient diffs)
- Historian architecture (storage model, internals, management)
- Spark engine architecture (storage model, internals, working with Debug tab)
- Data formats: Zinc, Trio, JSON, CSV
- Haystack REST API: integrating with other systems (client perspective, server perspective, nHaystack)
- History grids, transformations, interpolation, totalization
- Advanced charting (using grid meta to customize charts)
- Fantom introduction (tour of key concepts)
- Extension fundamentals (ExtStub, boiler plate components)
- Writing a custom connector
- Writing a custom Fresco app

Schedule: Training begins at 9:00AM on Day 1 and runs until 5pm. The second day begins at 9:00AM and end at appx 4PM. Lunch and breaks are provided on both days. In addition, a reception and dinner event is provided on Day 1.

Registration Cost for SkySpark Developer Training is \$1300 per student, list price. For information on dates check the SkyFoundry Calendar at: <http://www.skyfoundry.com/forum/calendar/>

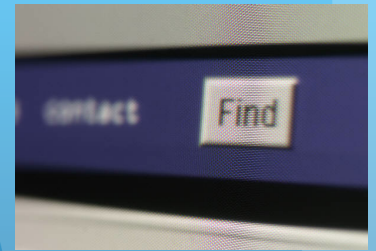
or contact SkyFoundry or your SkyFoundry reseller.

SkySpark® - Analytics for a World of Smart Devices

The past decade has seen dramatic advances in automation systems and smart devices. From IP connected systems to support for web services and xml data schemas, it is now possible to get the data produced by the wide range of systems and devices found in today's buildings and equipment systems.

Access to this data opens up new opportunities for the creation of value-added services to reduce energy consumption and cost, and to identify opportunities to enhance overall facility operations.

Access to the data is just the first step in that journey, however. The new challenge is how to manage and derive value from the exploding amount of data available from these smart and connected devices. *SkySpark directly addresses this challenge.*



The new frontier is to efficiently manage and analyze data to *find what matters.*

ABOUT SKYFOUNDRY

SkyFoundry's mission is to provide software solutions for the age of "the Internet of things". Areas of focus include:

- Building automation and facility management
- Energy management, utility data analytics
- Remote device and equipment monitoring
- Asset management

SkyFoundry products help customers derive value from their investments in smart systems. Contact us to learn more.

Contact us at:

info@skyfoundry.com

www.skyfoundry.com