

Overview of SkyFoundry Training Programs

SkyFoundry offers the following training programs
for SkySpark® software:

SkySpark Essentials 3 – Offered as In-Person Classroom Training,
Web-based Instructor-led Training, and Self Learning

SkySpark Advanced Axon Techniques – In-Person Training and
Self-Learning

SkySpark Developer Training – In-Person Training

This document provides a detailed overview of these programs



SkySpark Training Programs: The Quick Summary



The **SkySpark Essentials** training program provides students with the essential information to start to use and implement SkySpark. The training program consists of 5 Modules, each of which builds on the knowledge acquired in the previous Module. The Modules include:

- M1: Installing SkySpark and Working with the SkySpark User-Oriented Apps
- M2: Building a Project with SkySpark Builder Tools
- M3: On boarding data – Setting up Data Connectors and Importing data files
- M4: Creating Custom Visualizations with ViewBuilder
- M5: Introduction to Axon Programming

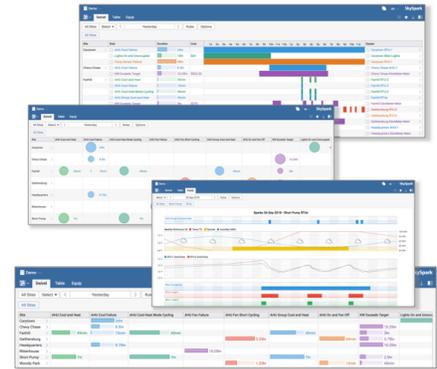
The **Advanced Axon Techniques** training program is designed for users that are actively involved in development of Axon functions for analytics, data transformation, data importing and custom reporting. This course takes students into the use of more sophisticated analytic functions in the SkySpark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

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 Connectors visualizations and Apps. Advanced Programming training is presented as a one-day session in conjunction with the annual SkyPosium User Conference and at other times is presented as a 2-day, in-person class at SkyFoundry facilities. It is targeted at software developers.

The remainder of this document provides details on those courses and different methods of delivery.

SkySpark Essentials – The Details

Module 1. A portion of Module 1 addresses the software installation process which may not be appropriate for all students. Once the software is installed, the remaining content of Module 1 is designed to provide an understanding of the capabilities, features and use of the product.



This session is strongly recommended for technical salespeople and is required for students that will participate in additional training modules 2, 3, 4 and 5. It provides the essential understanding of the features and capabilities of SkySpark Apps needed to take advantage of the additional training sessions. It is also the core material typical end users need to know to use SkySpark.

Module 2 leads the student through an exercise of building a Project database (Site, Equipment and Points) for a sample facility including a basic import of historical data, set up of an analytic rule, a KPI, a normalization formula, a custom energy baseline, and sample report queries. The materials is targeted at implementers/programmers but is also recommended for auditing by sales engineers and others that will be responsible for scoping, quoting and managing projects.

Module 3 focuses on the process for on-boarding data from external sources. It covers setting up connectors to external systems for data acquisition and on-boarding of data from files (CSV).

Module 4 provides a hands-on exploration of the SkySpark ViewBuilder tools, which enable users to go beyond the standard SkySpark Apps to build their own Apps, Views and Reports.

Module 5 takes students into the Axon programming language, which underlies all of SkySpark. It is used to write Rules, database queries, and data import and transformation functions. Module 5 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. Module 5 makes up the entire third day of the in-person classroom version of the Essentials course.

Note: Axon is a programming language so previous experience with programming is essential. Module 5 is targeted at students who will be involved in the development of Axon code to import data into SkySpark and write Axon functions and analytic rules.

Module 5 Preparation: It is expected that the attendees of Module 5 have accomplished the following:

- Completed Modules 1, 2, 3 and 4
- Familiarized themselves with the documentation including all videos in Sections IV, V, and VI
- Have programming experience with one of the following languages: Java, C#, VB, JavaScript, Python, Ruby, etc

SkySpark Essentials - Requirements and Recommended Preparation

SkySpark Essentials makes extensive use of the SkySpark Demo database, which is available with all copies of SkySpark. It 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 selection of Rules that automatically generate sparks and produce views in the various Apps.

Students will need:

- A laptop computer with Admin access rights, SkySpark software installed with enough capacity to run the Demo project (200 Points)
- A user account on the SkyFoundry secure site for access to documentation and videos.

Registration Cost for “SkySpark Essentials” in-person training is \$1400 per student (list price).

Typical classes have from 10-16 students. Classes are hosted in Richmond VA and other locations in the US and around the world. Check the SkyFoundry Calendar latest schedule information:

<http://www.skyfoundry.com/forum/calendar/>

Training typically begins at 9:00AM on day 1 and 8:30AM on day 2 and ends at appx 5PM each day. Lunch and breaks are provided on each day.

Web-Based SkySpark Essentials Training – The Details

The web-based Essentials training divides the 5 Modules of courseware into 8 sections presented in ~120-minute sessions over the course of 2 weeks, 4 days per week. Because this is live interactive training, **students registering for a class need to plan to attend all sessions in a single cycle**. It will not be possible to mix students from different cycles together. Registration cost for web-based Essentials is \$990. Schedules for web-based Essentials training are published on our web site at: <https://skyfoundry.com/calendar>

Web-based Training Requirements and Instructions

Here is a quick checklist/summary of what you need to do to be prepared to attend the training, but please review all of the detailed information below.

- Verify that you can attend all Web-based training for this cycle.
- Attend a SkySpark Demonstration webcast (or request access to a recorded version)
- Ensure you have an account on SkyFoundry.com
- Complete Module 1 "Installing SkySpark" and pre-session work (see full details below)

The following information provides a detailed review of requirements to attend a web-based training course. Please review to confirm that you can achieve the requirements in order to participate.

We want to make sure the training goes smoothly, and everyone gets maximum benefit from the session. To do that we need to make sure everyone is prepared **before the training sessions**, so please review and follow these instructions in advance.

Module 1 – SELF DIRECTED PREPARATION WORK - Review of SkySpark User Apps and Installation of SkySpark Software

The goal of Module 1 is for the student to have SkySpark installed on their own computer and to have familiarity with the use of all of user-oriented Apps (Spark, KPI, Energy and Historian). Follow the instructions below to accomplish that goal:

Requirement 1. Get Familiar with SkySpark. Attend a SkySpark Deep Dive Demonstration webcast to get a detailed overview of the Apps and core concepts. Contact us for access to a recorded version if it will not be possible to attend a live session (which is preferred). A schedule of our upcoming SkySpark Demonstration webcasts can be found here: <https://skyfoundry.com/calendar>

Students are expected to utilize the information presented in the live demonstration and the training videos shown below to practice the use of the various SkySpark Apps to achieve competence with the product as a "user" before attending the web-based training sessions. In addition to attending a

Demonstration webcast, students should review the selected training videos shown below. Note: You will need a user account on SkyFoundry.com to access these videos (see requirement 2 below).

Section III:

1. Spark Views <https://skyfoundry.com/doc/docTraining/SparkViews>
2. KPI Views <https://skyfoundry.com/doc/docTraining/KpiViews>
3. Energy Views <https://skyfoundry.com/doc/docTraining/EnergyViews>
4. Historian Views <https://skyfoundry.com/doc/docTraining/HisViews>

Section IV:

1. Settings App <https://skyfoundry.com/doc/docTraining/SettingsApp>
2. Rule Views <https://skyfoundry.com/doc/docTraining/RuleViews>

Requirement 2. All students need a user account on the SkyFoundry secure site here: <https://skyfoundry.com/user/login> Please let us know as soon as possible if you need an account or have any trouble accessing your existing account.

Requirement 3. Each student must have their own computer and be able to connect to a licensed copy of SkySpark (either installed on your computer or an accessible remote instance). The training is conducted with **the latest version of SkySpark**. All students should have the current version installed. The computer should be relatively modern with a current browser (IE 11, Firefox, Safari or Chrome). You must also have local admin rights on your computer to do some of the exercises. We also recommend that students have two monitors connected during the training sessions.

Requirement 4. Installing SkySpark - Please read and follow the instructions in the Module 1 document found at this link: <https://skyfoundry.com/file/386/Module-1-Getting-Started-SkySpark-Essentials.pptx>

This document includes instructions for installing SkySpark as well as some pre-session work which will accelerate your understanding of SkySpark and help you get the most out of the class. If you do not have SkySpark loaded on your computer or are not able to connect to a running copy of SkySpark that you will use for the training, please work with your internal SkySpark team or your SkySpark provider, or contact SkyFoundry to get the software loaded on your PC. We are not able to address software installation issues in the live sessions.

Modules 2 through 5 – Live, Instructor Lead Sessions Modules 2-5 are delivered as live webcast sessions. We recommend having the training materials on your computer ahead of time. The materials we will be using in the web-based instruction sessions can be found at this link:

<https://skyfoundry.com/doc/files/index#essentials>

On the Day of Training:

- Ensure you have access to a working copy of SkySpark
- Please arrive 10 minutes before your scheduled session so we can start on time.

If you have any questions, please contact us at training@skyfoundry.com We look forward to presenting these new training sessions!

SkySpark Essentials Certification

SkyFoundry offers a certification test in conjunction with SkySpark Essentials training to validate student skills. The online certification test is available to students that attend an in-person or web-based SkySpark Essentials class or have completed self-learning. The certification test is made up of two sections:

- General knowledge questions presented as true/false, multiple choice and fill in the blanks
- Exercises completed with a working SkySpark database downloaded from the SkyFoundry Secure site. You need to be able to use an up to date copy of SkySpark to complete the certification test.

Each user is given a link and a password to the online test, which can be accessed from a PC. Students have the ability to pause, save and resume as time allows. We expect most students will require appx 3 hours to complete the test. Upon successful completion a certificate will be generated ready for printing or downloading. In addition, an email with summary information is provided.

Essentials certification testing is provided at no cost within 60 days of attending a training course. After that time, and for students that self-learn, there is a \$100 administration fee.



SkySpark - Advanced Axon Techniques Training

Moving Deeper into Axon, Importing and Best Practices

The Advanced Axon Techniques training program is a 2-day class 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.

16. Axon Language

Overview

This chapter fully covers the syntax constructs of the Axon programming language. See [Axon](#) chapter for an overview of how Axon is used in the SkySpark.

Scalars

The following scalar literals are supported:

- Null: null keyword
- Bool: true or false keyword
- Number: 4, -91, 18.000, 9.23kg, 5.4e-45, 74.2°F, 5min
- Str: "hello" string literals
- Uri: "lo/sites.csv"
- Date: YYYY-MM-DD, 2018-01-27
- Time: [D]h:m[s], 3:45, 08:12:05 (always 24 hour)
- Range: 0..100, 2018-01-01..2018-01-31
- Date Range: YYYY-MM, 2008-02 is shortcut for 01-Feb-2008..29-Feb-2008

Numbers may be optionally annotated with a unit - see [Units](#).

There is no literal representation for DateTime, Coord, or XStr. Instead use an Axon function to construct:

- dateTime: dateTime(2012-10-19, 12:30)
- coord: coord(37.55, -77.55)
- xstr: xstr("Color", "red")

The Advanced Axon 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>

Prerequisites: The Advanced Axon Techniques class is not designed for beginners. Axon is a programming language so previous experience with programming is essential. Attendees are expected to meet the following prerequisites:

1. Have completed the SkySpark Essentials Training Class and passed the Certification test
2. Have implemented a real project including: importing data with connectors and scripts
3. Have written successful rules using Axon.
4. Have programming experience with one of the following languages: Java, C#, VB, JavaScript, Python, Ruby, etc

Registration Cost for Advanced Axon Techniques Training is \$1200 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 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 Connectors visualizations and Apps.



Advanced Programming training is presented as a one-day session in conjunction with the annual SkyPosium User Conference and at other times is presented as a 2-day, in-person class at SkyFoundry facilities. It is targeted at software developers. The program and topics will vary but typically include topics as shown below:

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 Developer Training – Sample Agenda

- Folio architecture (model, internals, concurrency control, transient diffs)
- Historian architecture (storage model, internals, management)
- Spark engine architecture (storage model, internals)
- Data formats: Zinc, Trio, JSON, CSV

- Haystack REST API: integrating with other systems (client perspective, server perspective, nHaystack)
- The “Viz” framework underlying the SkySpark UI
- The ViewBuilder tools - under the hood
- Fantom introduction (tour of key concepts)
- Extension fundamentals (ExtStub, boiler plate components)
- Writing a custom connector
- Writing a custom Fresco app

Note: Topics presented in the Developer Class are subject to change based on new product features.

Registration Cost for SkySpark Developer Training when offered as a stand-alone 2-day class is \$1300 per student, list price. When presented at the SkyPosium user conference, Developer Training is included in the event registration price.

For information on dates check the SkyFoundry Calendar at:

<http://www.skyfoundry.com/forum/calendar/> Or contact SkyFoundry or your SkyFoundry reseller.

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.

<https://skyfoundry.com/>

info@skyfoundry.com

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