Nighttime Imaging 'N' Astronomy

An astrophotography imaging suite

Table of contents

. Documentation	5
1.1 Introduction	5
1.1.1 About N.I.N.A.	5
1.1.2 About this Documentation	5
1.1.3 Getting Help or Helping Out	5
1.2 System Requirements and Device Support	7
1.2.1 Minimum System Requirements	7
1.2.2 Recommended and Optional support software	7
1.2.3 Supported Devices	8
1.3 Tabs	10
1.3.1 Overview	10
1.3.2 Equipment	0
1.3.3 Sky Atlas	0
1.3.4 Framing Assistant	0
1.3.5 Flat Wizard	0
1.3.6 Sequencer	0
1.3.7 Imaging	0
1.3.8 Options	0
1.3.9 Plugins	0
1.4 Sequencer	0
1.4.1 Overview	0
1.4.2 Legacy Sequencer	0
1.4.3 Advanced Sequencer	0
1.5 Advanced Topics	0
1.5.1 Auto-Focus	0
1.5.2 Automated Meridian Flip	0
1.5.3 Camera Simulator	0
1.5.4 Bulb Shutter Control	0
1.5.5 Dithering	0
1.5.6 Focuser Backlash Measurement	0
1.5.7 Framing Assistant	0
1.5.8 File Formats	0
1.5.9 Guiding	0
1.5.10 Plate Solving	0

1.6 Troubleshooting	0
1.6.1 General	0
1.6.2 iOptron Mount Setup	0
1.6.3 EQMOD Setup	0
1.6.4 Altair Dual Gain	0
1.6.5 Setting up planetarium software	0
1.6.6 QHY Driver	0
1.6.7 Display Issues	0
1.7 Glossary	0
1.8 Mozilla Public License Version 2.0	0
1.8.1 1. Definitions	0
1.8.2 2. License Grants and Conditions	0
1.8.3 3. Responsibilities	0
1.8.4 4. Inability to Comply Due to Statute or Regulation	0
1.8.5 5. Termination	0
1.8.6 8. Litigation	0
1.8.7 9. Miscellaneous	0
1.8.8 10. Versions of the License	0
1.8.9 Exhibit A - Source Code Form License Notice	0
1.8.10 Exhibit B - "Incompatible With Secondary Licenses" Notice	0
1.9 3rd-Party-Licenses	0
2. Quick Start	0
2.1 UI Overview	0
2.2 Connecting Your Equipment	0
2.3 Finalizing Settings	0
2.4 Focusing	0
2.5 Starting a Sequence	0
3. Contributing	0
3.1 Enhance documentation	0
3.1.1 Contributing	0
3.1.2 Prerequisites	0
3.1.3 Building the docs	0
3.1.4 Branching Model	0
3.1.5 Pull Requests	0
3.1.6 Updating the homepage	0
3.2 How to setup the development environment	0
3.2.1 Forking the repository	0
3.2.2 Cloning Repository	0

3.2.3 Navigation in Visual Studio	0
3.3 Localization	0
3.3.1 Quick Start	0
3.3.2 Integration into N.I.N.A.	0
3.4 Plugins	0
3.5 Ecosystem	0
3.5.1 Bitbucket Repositories	0
3.5.2 Crowdin	0
3.5.3 The Homepage	0

1. Documentation

1.1 Introduction



1.1.1 About N.I.N.A.

Welcome to N.I.N.A. - Nighttime Imaging 'N' Astronomy. If are reading this document, you have likely downloaded the software - congratulations!

N.I.N.A. is designed for automated DSO imaging using the sequencing model. Whether you are new to the world of DSO imaging or are a seasoned veteran, the goal of N.I.N.A. is to make your imaging sessions easier, faster, and comfortable. N.I.N.A. attempts to make complex concepts and operations easy to understand and effect so that more time is spent on imaging rather than minding equipment.

The N.I.N.A project is also a FOSS application that is licensed and distributed under the provisions of the Mozilla Public License Version 2.0 license. Its maintenance, maturation, and further development is realized by a team of dedicated volunteers from around the world. If you have an interest in helping the project or contributing to it, please join the project's Discord server (see below) and reading the contributor guidelines.

1.1.2 About this Documentation

This document aims to describe the functionality of N.I.N.A. so you can utilize it to its full potential. It is divided into three main chapters:

- 1. A Quick Start Guide to quickly get started.
- 2. Detailed explanation of the various Tabs and their purposes.
- 3. Advanced Topics which covers everything you need to know to effectively run the software.



Important notes will appear in boxes similar to this throughout the documentation. If you see one, do not skip over it!

1.1.3 Getting Help or Helping Out

The N.I.N.A.'s Discord chat server is a great way to chat with the creator Stefan Berg the N.I.N.A. contributors and fellow users. Ask questions, share your photos, make suggestions, and help other users. To research past questions, bug reports, or file your own bug report or question, please use the Issue Tracker.



Please note that images in this manual might not always reflect what you see as updates and additions to the manual may lag behind the code development process.

1.2 System Requirements and Device Support

1.2.1 Minimum System Requirements

The following represents the minimum system resources required to operate N.I.N.A.

- A dual-core x64 CPU
- 3GB of RAM
- Windows 10 (64 bit) or later
- 350MB of free disk space without the optional SkyAtlas image data or framing cache data (3GB with)
- .NET Framework 4.8 Runtime (included with Windows 10 May 2019 Update (build 1903) and later)



Some users have reported successful operation of N.I.N.A. on small, low-power embedded systems such as the Intel Compute Stick and similar platforms. As expected, experiences will vary in such resource-constrained environments. Technically, N.I.N.A. should be able to run on a single core, but this will certainly lead to a highly undesirable experience and is certainly not recommended. However, if forced to choose between the two, more RAM is desirable over CPU power.

1.2.2 Recommended and Optional support software

The functionality of N.I.N.A. shines through when paired with a supporting cast of other applications. Please consider the items in the following lists to access the full breadth of N.I.N.A.'s capabilities.

- ASCOM 6.5SP1 Platform (recommended)
- PHD2 Guiding
- Metaguide Guiding
- Any of several supported plate solving applications (recommended)
- ASTAP
- All Sky Plate Solver
- Local Astrometry.net (ansvr)
- PlateSolve2
- Any of several supported planetarium applications (optional)
- Cartes du Ciel
- HNSKY
- Stellarium
- TheSky X
- SkyAltas image data (optional at the bottom of the download section)

1.2.3 Supported Devices

Direct (native) camera support

N.I.N.A. can directly interface with a wide range of popular cameras without the need for an intermediate ASCOM driver. Direct camera control is recommended over accessing the camera through ASCOM for performance reasons and to access additional camera controls that cannot be manipulated through ASCOM.

- Altair
- Atik
- Canon
- Nikon
- FLI
- Omegon
- QHYCCD
- RisingCam
- ToupTek
- ZWO
- SVBony
- SBIG



Certain older Nikon DSLRs require a serial shutter cable for bulb exposures. Please consult your camera's documentation regarding its requirements for long exposure operation using a USB or other remote cable.

The list of supported cameras can change and expand as N.I.N.A. developers gain access to relevant hardware or support is contributed.

ASCOM Device Support

Astronomy-related equipment often has an ASCOM driver for it. N.I.N.A. supports accessing the following types of devices through their associated ASCOM drivers, as long as the drivers are fully compliant with the relevant ASCOM frameworks. Cameras that lack direct support in N.I.N.A. but do have an ASCOM driver may also be utilized this way. The following ASCOM device classes are supported:

- Cameras
- Mounts (aka "Telescopes")
- Filter Wheels
- Flat Panels (ASCOM Cover Calibrator)
- Focusers
- Rotators
- Weather data (ASCOM ObservingConditions)
- Domes
- Switches
- · Safety Devices



Be aware that ASCOM drivers that are provided by their vendor in a 32 bit-only form will **not** be accessible by a 64 bit N.I.N.A. or any other 64 bit ASCOM client application. If this is the case for you, then the 32 bit version of N.I.N.A. must be installed.

Anote to ASCOM driver developers

If it has not already been done, please consider making both 32 and 64 bit varieties of your driver(s) available to your users or customers, and ensure that the driver passes all ASCOM Conformance tests. Please refer to the relevant documentation on ASCOM's website for more information.

Guiding Applications

N.I.N.A. supports several guiding applications to guide, dither, and monitor tracking accuracy. Telemetry from these applications are also displayed inside of the Imaging tab. The guiding applications N.I.N.A. supports are:

- PHD2
- MetaGuide
- MGEN2
- MGEN3

1.3 Tabs

1.3.1 Overview

N.I.N.A. organizes different functional areas in its user interface into tabs. In some instances, a tab may be broken up into subtabs or sub-windows. An example of this is the Equipment tab, or in the Imaging tab.

The goal with tabs is to visually and functionally separate distinct areas of the application to avoid clutter. Descriptions of each tab and their constituent functions are in the following sections.





