SOFTWARE BISQUE

TheSky Fusion™ Specifications

$1,895

- Intelligently combines power, communication, and control of your entire digital imaging system.
- TheSky™ Imaging Edition, fully integrated.
- Wirelessly control devices with TheSky™ from your iPad, iPhone, Android, laptop, or other computer.
- Eight adaptable power output ports; three have configurable voltages and amperages to drive even the most complex setups.
- Four high-speed USB 3.0 ports.
- Integrated GPS, Wi-Fi, and Ethernet.
- Real-time status display of your imaging run.
- Dovetail adapter included for easy and flexible telescope mounting.

Introduction

TheSky Fusion™ marries the world's single-most capable object-acquisition and imaging software with exquisitely designed hardware to connect, power and integrate your imaging equipment.

TheSky™ Imaging Edition software controls more imaging devices across more platforms than any other software on the market. With TheSky Fusion™ you can connect your mount, camera, autoguider, focuser, filter wheel, rotator, and dew heater to control them from your tablet, smartphone, laptop, or desktop. Operate using any

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modern web browser through Wi-Fi or use a remote desktop application (remote web interface or VNC). An Ethernet port permits a hardwired connection for an optimal experience. Though an Internet connection is not required, TheSky Fusion™ takes full advantage of being on-line when connected to the Worldwide Web.

TheSky Fusion™ attaches to your mount and simplifies system setup, maintenance, and nightly tasks for maximum productivity. TheSky Fusion's™ flexible power-output ports can drive even the most complex hardware configurations. Four high-speed USB 3.0 ports and one legacy serial port can meet most communication needs. If not, configure a power port to supply 5V DC, and connect an external powered USB hub so that you can add additional USB ports as you need.

Hardware Specifications

Category	Feature/Specification	Details
External Housing	All aluminum housing	The external housing is red anodized 6061 aluminum. External dimensions (W x H x D): 19.7 cm x 7.6 cm x 13 cm (7.8 in. x 3 in. x 5.1 in.) Total weight: 1.9 kg/4.2 lb., including the dovetail mounting bracket.
Computer	64-bit Six-Core CPU at 1.8 GHz	Coupled with fast DDR4 RAM, and a discrete GPU, the fast CPU offers an ideal image acquisition experience. • Smooth Sky Chart updates. • Efficient live stacking. • Fast image archiving.
GPU	Discrete	GPU supports OpenGL graphics hardware acceleration for smooth panning and zooming.
Memory	• 4 GB of DDR4 SDRAM • 64 GB of high-speed eMMC storage • 256 GB of non-volatile flash memory (mass storage)	• *TheSky Imaging Edition* occupies about 5 GB of flash memory. • The complete Gaia stellar database occupies an additional 90 GB of mass storage. • 25 GB available high-speed memory and 165 GB of mass storage. Ample storage is available to store an entire night of full-frame images, even using a large-format camera: – About 6000 images at 30 MB each. – About 1900 images at 100 MB each.
Computer Power Requirements	ARM-based CPU	Here is the processor's approximate power footprint under varying operating conditions: • 2 Watts (processor idle). • 4 Watts (typical workload usage). • 8 Watts (maximum CPU draw). A laptop's power consumption can vary from 30W to 90W. Comparably, TheSky Fusion requires between one-tenth to one-fourth the power.
Wired Communication	Gigabit Ethernet	Allows for a high-speed wired connection giving the best possible responsiveness, data transfer rates and reliability.
Wireless Communication	802.11AC 2.4 or 5.0 GHz Wi-Fi	The fastest widely available Wi-Fi standard and allows for the best possible wireless experience. The built-in Wi-Fi antenna can be upgraded to a Reverse Polarity SMA Wi-Fi antenna.
GPS	Built-in	The GPS gets accurate time and position data. This simplifies nightly setup and eliminates common mistakes, for example, entering the location or time incorrectly or neglecting to update them.

Category	Feature/Specification	Details
		Real-time access to the site's precise position and time ensure optimal telescope pointing accuracy with TheSky Imaging's TPoint telescope modeling. The default antenna is mounted internally. An optional external antenna (sold separately) can be attached to the External GPS Antenna port.
External Power Ports	Eight Anderson power pole connectors	Anderson Power Products' Powerpole® connectors and cabling offer: • Availability of low cost, off-the-shelf cables. • A variety of amperages and wire gauges (15A/30A/45A contacts supporting 10–20 AWG wires). • Durability. • Easily assemble custom cables with an optional crimping tool (sold separately). The power output port specifications are described in the "External Components" section below.
USB Ports	Four USB 3.0 ports	Four USB 3.0 ports can drive CMOS high-speed cameras or other astronomical devices. USB 3.0 is essential for planetary imaging or anyone who enjoys fast image downloads. If more than four USB 3.0 ports is required, use one of the ports to connect a 4- or 8-port USB hub and power the hub using one of the power ports configured for 5V output.
Ethernet Port	RJ45 Ethernet port	1000/100/10 Base-T.
External Monitor Port	HDMI 2.0 connector	Video out that can be used to view TheSky on any HDMI-compatible monitor. Useful for outreach programs, controlling TheSky Fusion using a mouse and keyboard in an observatory or for troubleshooting. • Supports up to 4K @ 60Hz. • Supports audio out.
External LCD Display	Four line, 16-character wide OLED display.	TheSky-supplied status messages provide real-time feedback during startup, imaging runs, automated pointing calibration or debugging information if things go wrong.

Software Specifications

Category	Feature/Specification	Details
Operating System	Linux (Ubuntu 18 LTS) 	Linux offers an efficient, stable, reliable, and secure 64-bit operating system.
TheSky™ Imaging Edition	Includes ***TheSky™ Imaging Edition***—the world's most powerful observatory control software. Enjoy the benefits of increased productivity and ease of use, out of the box. All from a singular integrated application software package. ***TheSky™ Imaging Edition*** takes full advantage of the 64-bit operating system as well as hardware-accelerated graphics. Coupled with the Linux operating system, TheSky Fusion provides years of reliable, worry-free operation.	Crafted from 35 years of customer feedback, *TheSky Imaging Edition* has the tools you need to plan observing sessions, acquire astronomical images and so much more. • Operate your mount, camera, guider, focuser, filter wheel, rotator, etc. from a single application. • Provides power (on/off) switching to the integrated 5V/8V/12V power ports. • Offers graphics acceleration to produce smooth Sky Chart zooming and scrolling. • Includes the complete Gaia star catalog with 1.7 billion stars. • Includes millions of galaxies, clusters, nebulas and other non-stellar objects. • Includes *TheSky LTI™* interface for Paramount™ mount owners. • Displays comets, satellites, asteroids, planets, Sun, Moon, Saturn's and Jupiter's major moons. • Performs Image Link and All Sky Image Link astrometric solutions (a.k.a. "plate solving"). • TPoint™ telescope pointing analysis produces exceptional pointing accuracy. For Paramount™ mount users, TPoint with ProTrack produces exceptional tracking accuracy. • Automated telescope pointing calibration. • Advanced autoguiding with optional guide camera, with features like graphing guider logs, 3D star graphs, and so much more. • Automated focus using either @Focus2 or @Focus3. • Filter wheel support. • Rotator support. • Fully scriptable operation (bisque.com/scripting) using JavaScript or Python. • So much more (see TheSky's 800-page user guide for details).
$100 Optional Annual TheSky™ Imaging Edition Subscription Fee	Access to downloadable updates.	TheSky's annual subscription ensures your software is updated with the latest features, fixes, improvements, and device support. • The first year's subscription is included. • Downloadable access to newer software versions is permitted with a current subscription. • Subscription renewal is *optional* and *not required*. • If the subscription expires, TheSky continues operating normally and indefinitely.

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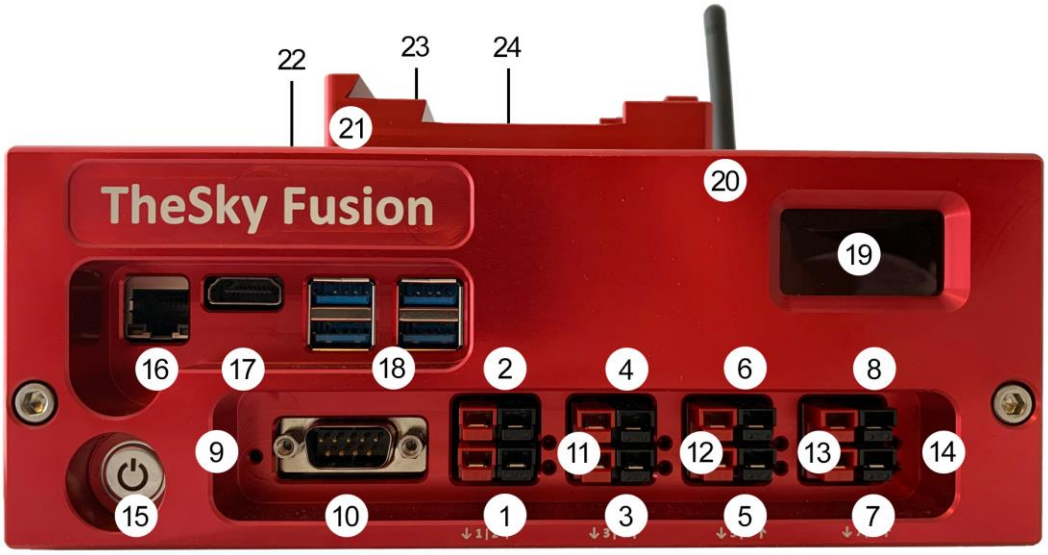
External Components



TheSky Fusion's numbered external components are described in the table below.

Number	Description	Number	Description
1	12V/3A DC or 5V/1.5A DC fused power out port (configurable).	15	System power button.
2	12V/3A DC or 5V/1.5A DC fused power out port (configurable).	16	RJ45 Ethernet port.
3	12V/3A DC fused power out port.	17	HDMI port.
4	12V/5A DC fused power out port.	18	Four USB 3.0 ports.
5	12V/5A DC fused power out port.	19	Four-line OLED status display.
6	12V/7A DC fused power out port (configurable PWM).	20	External Wi-Fi antennae.
7	12V/7A DC fused power out port (configurable PWM).	21	1/4-20, 60 mm-spaced dovetail mounting holes.
8	8V/3A DC or 5V/3A DC fused power out port (configurable).	22	GPS antenna (internal).
9	TheSky Fusion's GPS status LED.	23	Optional External GPS antenna port.
10	Male DB9 RS-232 serial port.	24	Power input port (12V DC up to 40A max.), specified below.
11-14	Power output port status LEDs.		

Note	Explanation
Power button	The power button does not operate like a traditional on/off switch. • When external power is initially supplied, the unit is turned on automatically, the power status LED is illuminated, and the system starts up. There is no need to flip a *power switch*. From there, the startup process takes about one minute before it is ready to use. • After the unit is powered on and initialized, pressing, and releasing the power button initiates the unit's shut down procedure and then turns the power off. Pressing and releasing the power button restarts the unit.
Power input port	• Standard 15/25/35A Powerpole connector.
Power output ports	• The power port numbering sequence shown in the diagram matches the order on TheSky's *Power Control* window (shown below). • Each output port is protected by self-resetting fuses and are numbered 1-8 as shown above. • Ports 6 and 7 can be configured to provide power using pulse-width modulation (PWM) for dew heaters.

TheSky Imaging Edition's Power Control window provides software-based power port control.

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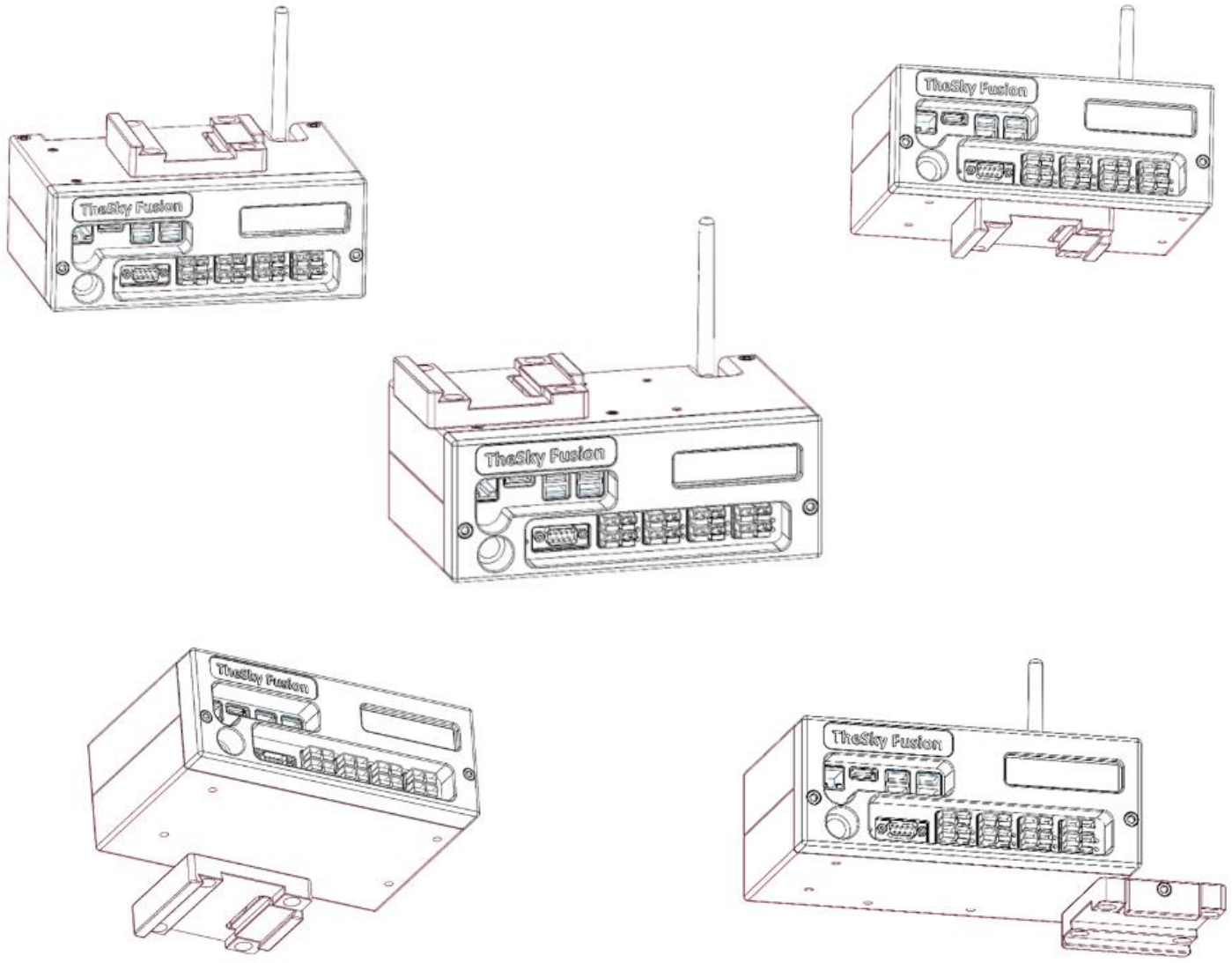
Mounting Specifications

Category	Feature/Specification	Details
Dovetail	Female Losmandy and Vixen Dovetail (D and V Series respectively) included	• 60 mm (2.36 in.) spaced 1/4-20-in. mounting holes. This spacing is used by many vendors including ADM dovetail hardware. • Mounting holes located on the top and bottom of the aluminum housing so that TheSky Fusion can be attached to a wide range of telescope configurations.

The figures below show several possible mounting positions.



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Supported Devices

Mounts	Cameras	Filter Wheels	Focusers	Rotators
• Astro-Physics • Celestron • iOptron • Losmandy/Gemini control system • Meade • Sky-Watcher • Software Bisque Paramount mounts • Takahashi	• ATIK • Canon DSLR • Finger Lakes Instruments • QSI • Mallincam • Morovian • QHYCCD • Starlight Xpress • ZWO	• Chuck Faranda's RDC Shutter • Finger Lakes Instruments • Morovian • QHYCCD • QSI • Starlight Xpress • Xagyl Communications • ZWO	• AAF2 • Arduino Focus • Astro-Physics† • Astromechanics Canon Lens Controller • Baader Planetarium • Finger Lakes Instruments • Gemini† • Lake Side • Meade† • MicroFocuser • MoonLite • Officina Stellare • Optec • Planewave EFA with Hendrick Focuser • Pegasus Astro • PrimaLuce • Rigel systems • Starizona • Starlight Instruments • Technical Innovations • ZWO	• MoonLite • Officina Stellare • Optec • Pegasus Astro • Software Bisque

†Pulse focuser motor control using the telescope mount's built-in focuser port.

The above list includes devices supported as of January 2021. If your hardware's manufacturer or model is not listed above, please let us know so that we can work with them to add support where possible.

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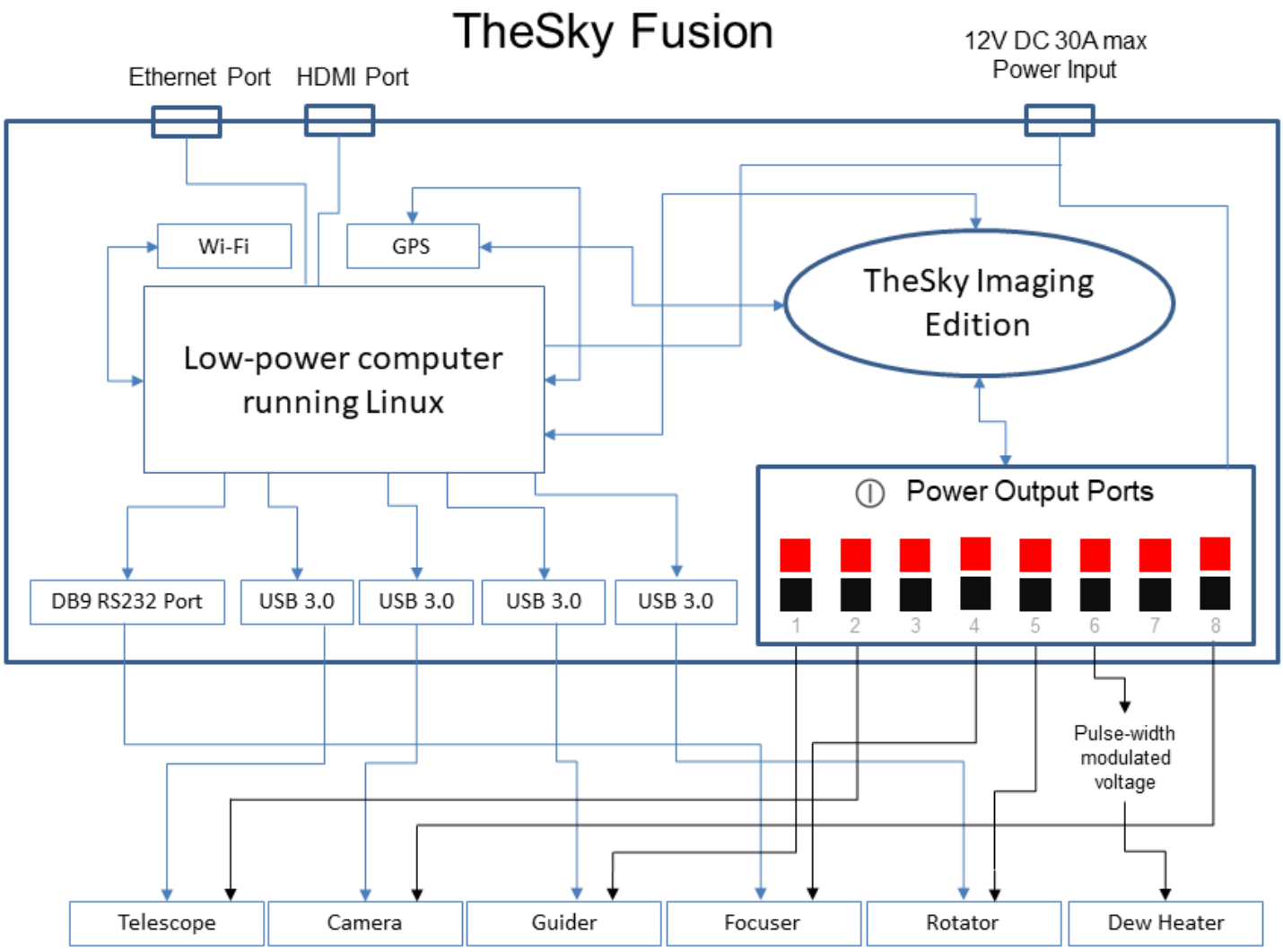

TheSky Fusion hardware and software block diagram showing one possible hardware configuration.

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Superior imaging solutions for discriminating astronomers.

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