

AstroHub[™]
Product Overview
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Product Overview

The Problem to be solved:

Astronomy telescope and camera set-ups are becoming increasingly complex in terms of hardware and software to operate all of the devices used. A typical astronomy configuration can be easily described as a "rats nest" of cables that take a significant amount of time to connect and disconnect and present continuing reliability and maintenance issues. The growing number of small control units for each device has become a problem as well.

The Solution:

The solution is a set of products to end these problems once and for all. A single cable is used from the PC to an "astronomy system control unit" and handles all signal, data, and, control information. The single cable connects the PC to a controller unit that connects directly to all peripherals in the set up. All of the small device control boxes previously used are no longer required as all of these functions are provided in a single product.

The product is fully compatible with all software and peripherals on the market and, while preserving the functionality and compatibility of all these products, provides extended functions controllable through a clear and concise software interface useable in an ASCOM or proprietary interconnection environment.

AstroHub Overview

An astro-controller or "hardware server" unit with a single USB2.0 connection from the controlling computer with all required functions built in. This unit resides close to the telescope/imaging system and has short, readily available, and peripheral specific compatible cables fanning out to all of the peripherals such as mount, focusers, cameras, guiders, etc. The controller is fully compatible with ASCOM and is provided with ASCOM software while able to be used in any configuration including that with proprietary software control. Normal USB distance specifications apply (i.e. 30m with intermediate hubs). Extended distance between the computer and the controller is achieved with the use of Category 5 cable based USB extenders allowing 100m+ distances.

The vision is that even the most complex systems would have a small unit "at the scope" with a single USB2.0 cable running from it to the PC!

The AstroHub Features

The product is available in a choice of configurations

Base AstroHub Unit:

- Universal Guider (based on Aquest's unique "Plug-n-Guide" (tm) technology, i.e. ability to plug in a Gemini or "ST-4 compatible" mount and it just works). Enhanced specific pulseguide command facility in addition to standard formats (RJ-11)
- Dedicated Mount Control serial port (DB9M) capable of auto mount power control and other functions
- 2 USB2 ports for dual camera control, data acquisition, and guiding (2 - USB-A)
- 1 Focuser Serial Port (with optionally shareable onboard PCFocus Lite) (DB9M plus RJ-11 plus mono audio connector for user supplied hand focus button box)
- Two "plug-in" sockets accepting any combination of plug-ins from the list below (including duplicates)
- Software: Configuration and monitoring program, "ActiveX" software automation object for Mount, Guider, Control Port, and Telescope Status (interfaces are fully scriptable and/or callable from application software), Enhanced function ASCOM Telescope hub software.

Available plug-ins:

- Control port (microprocessor based). The control port has 4 general-purpose inputs and 4 outputs as well as a set of relay contacts that can be used to control any peripherals. Outputs can be accurately pulsed. Also available are 192 bytes of user non-volatile memory. All functions are fully scriptable. (DB9F)
- RoboFocus port - microprocessor based stepper motor controller so no control box is needed, includes power (RoboFocus compatible DM9F plus mono audio jack for user supplied hand focus button box)
- Optec Focuser port - microprocessor based stepper controller so no control box is required, includes power (Optec compatible DM9F)
- FLI Filter Wheels and Focusers port - microprocessor based stepper controller so no control box is required (FLI compatible DB9F)
- True Tech CFW port - microprocessor based stepper motor controller so no control box is needed, includes power (True Tech DB9F plus mono audio jack for user supplied hand button box)
- SBIG/Optec/Homeyer Filter Wheel port (RJ-11/4) (no camera is required for operation)
- Aux Serial Port (DB9M) (used for SBIG/Optec/Homeyer Filter Wheel support)
- Aux USB2 Port (USB-A) (External USB 2, USB 1.1 hub(s), or any USB device can be connected)

The stepper plug-ins above can be configured with downloadable firmware to control anything that has a stepper motor in it. The plug-ins ship with the firmware installed for the above but can be easily reconfigured in the field by dealers or end-users. Plug-in firmware for other devices will be developed in the future as required.

Other features of any model include:

- Mount power switching for parking
- All firmware is dealer or end user field upgradeable using Flash memory technology
- Ability to power the controller unit from the same power input as the mount or by a separate 12V supply (e.g. 24V for a Tak Temma mount or 18V for a Gemini saving another cable). Allowable input voltage range is 10V to 28V
- PC level voltage monitoring of input and internal voltages
- Control Port plug-in: Controller level storage so as to store 32 long integers and 32 short integers in controller non-volatile memory. These storage locations fully accessible through the controller object interface and therefore available to scripts and application programs.

Note on cables: All connectors have been chosen to allow the use of standard/existing cables supplied with all the products that will be connected. "Cable packs" that would be the same as cables supplied with compatible products but in shorter lengths may be offered as a convenience to customers but they may use the cables they currently have or substitute widely available industry standard cables.