



Quad Serial data Combiner/Expander



Revision A
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GRTAvionics.com

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Revision History

Initial Release 3/31/17

Description

The quad serial data combiner module allows any compatible GRT EFIS to be expanded, by combining four serial ports on the module into a single serial port on the GRT EFIS. The module features minimum latency and allows baud rates up to 115,200 on each of the serial ports on the module.

Compatibility

The serial data combiner module is compatible with any GRT Mini, Sport SX, Horizon HX, Horizon HXr, Sport EX, or Horizon EX EFIS. The minimum software versions that support the module are:

EFIS	Minimum Software Version
All models of Mini EFIS	3.00
Sport EX/Horizon EX	1.06
Sport SX	13.00
HX	9.00
HXr	5.01

Use with Non-Compatible GRT and other systems

The serial data combiner is compatible only with GRT Avionics EFIS systems, and will not function with other manufacturers equipment.

Serial Data Combiner/Expander Function

The serial data combiner module includes 5 serial ports (input and output). One of these is dedicated for communication with the EFIS display unit. The other 4 serial ports are used to expand the number of serial ports available to your display unit.

Recommended Usage of Serial Combiner/Expander Serial Ports

The design of the serial port combiner minimizes data latency (delays), however, connecting the following devices is not recommended due to their potential sensitivity to the additional latency.

- GRT Autopilot Servos
- Data to 3rd party autopilots, such as Trutrak and Trio
- AHRS, especially when the system includes a connection to an autopilot

Devices that provide large amounts of data at high baud rates (38400+), such as ADS-B receivers or XM weather will function through the combiner, but could exceed the capacity of the combiner and reduce the available data that could be passed through the other serial ports. For this reason, it may be necessary to wire high data rate devices directly to the display unit to avoid data loss.

Installation

Mounting holes are provided in the four corners of the case for #6 flat head screws. Two screws are sufficient when located in opposite corners for most installations. The module can be mounted in any orientation. Typically the unit is mounted in the forward part of the airplane so it is near the GRT EFIS display units. The module should not be exposed to water, or in a location where it is likely to get wet, or where temperatures will exceed 180 deg F when in normal operation.

Wiring

The combiner provides 4 serial inputs and outputs to expand the number of serial ports available to your GRT EFIS. The serial data from these ports is combined into the one serial data stream and is transmitted to the EFIS via the Serial Control Out pin. Typical wiring is illustrated at the end of this manual.

Power and Ground

Power – Power must be provide to at least one of the three power inputs on pins 23,24,25. +9-32VDC is required at 0.2A maximum. These inputs are isolated, and multiple power inputs can be used for redundancy.

Ground - One ground connection is recommended, to any of the provided ground pins.

Serial Ports

Control Port In/Out - This serial port is dedicated to use with a GRT EFIS. This connection allows the EFIS to change the configuration of the module's serial ports, and send and receive data from them.

Serial Ports 1,2,3,4 – These serial ports can be configured to transmit or receive any data compatible with the GRT Avionics EFIS connected to it. These serial ports are configured on EFIS display unit.

Serial outputs. Serial outputs 1,2 and 3 include multiple pins to allow driving multiple devices without the need to “tee” into aircraft wiring.

Configuration

This configuration can be changed when the module is connected to a compatible GRT EFIS.

Configuration Settings

The EFIS display unit must be configured for this module when it is wired to one of its serial ports. Using the “Set Menu”, “General Setup”, configure the serial port on the EFIS that is wired to the “Serial Control Input/Output” as “Serial Port Combiner”, at 115,200 baud. After saving these settings, the General Setup menu will show additional settings associated with this module. They appear just after the serial port configuration settings.

Setting	Description
SPC Serial Port 1,2,3,4 Rate	Rate applies to input and output
SPC Serial Port 1,2,3,4 Input	Functions available are the same as the EFIS.
SPC Serial Port 1,2,3,4 Output	Functions available are the same as the EFIS.

Post-Installation Checkout Procedure

Data to and from serial ports used on the module combiner are verified by any means that validates serial communication. The technique will vary depending on the device. The “Status” page on the EFIS provides a convenient way to observe if the expected data is being received on a serial port.

Status Reporting

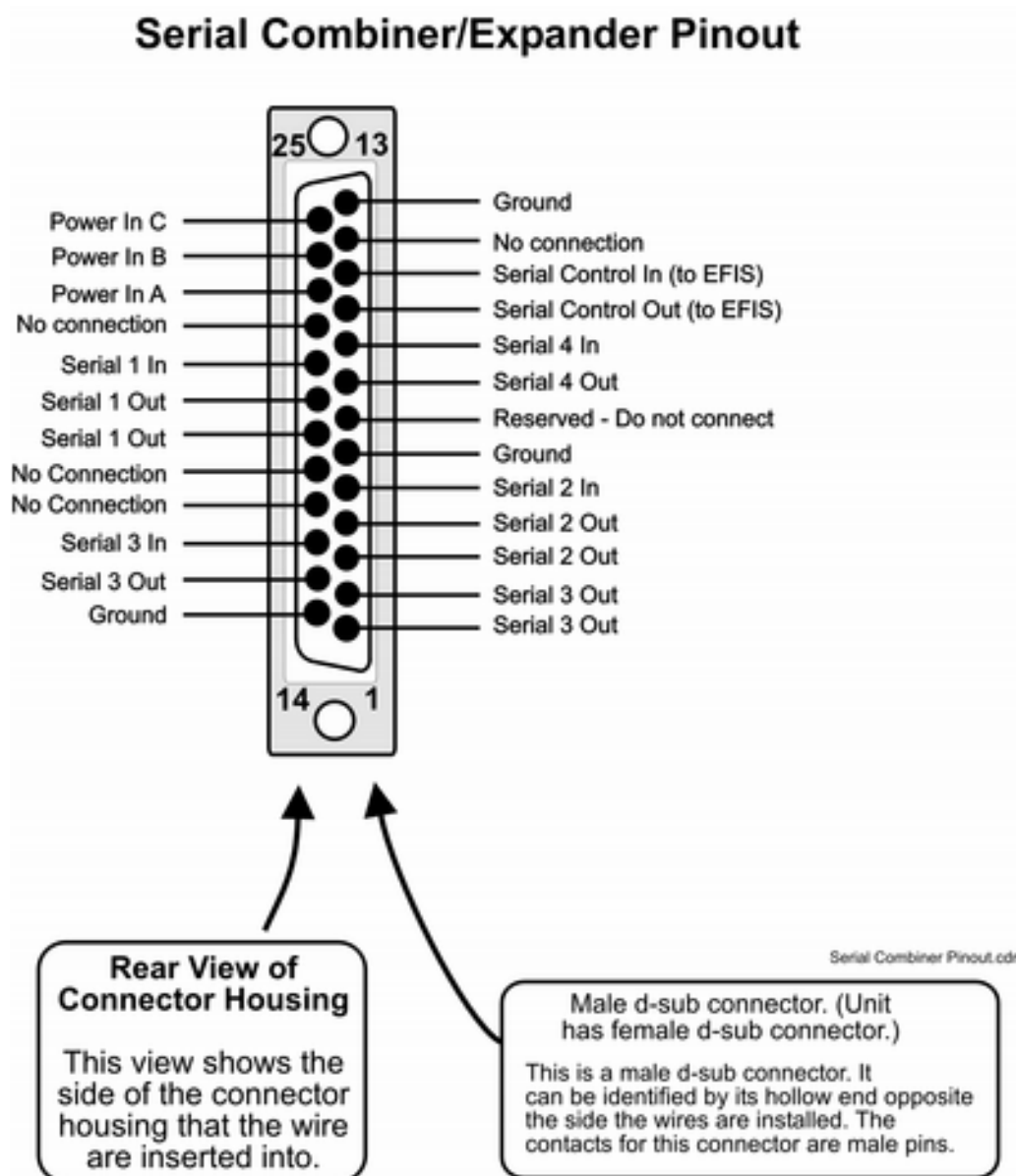
When a serial port has been configured for this module, the status of the module may be observed on the Set Menu, Display Unit Maintenance, “Serial Port Combiner”. In the Serial Port Combiner menu, the following data is provided:

Name	Description
Module Software Version	Software version of the module
Load Module Software	Select to update the software into the module from a GSPCUp*.dat file.
Power Input 1	Voltage present on this power input
Power Input 2	Voltage present on this power input
Power Input 3	Voltage present on this power input
Temperature	Internal temperature of processor

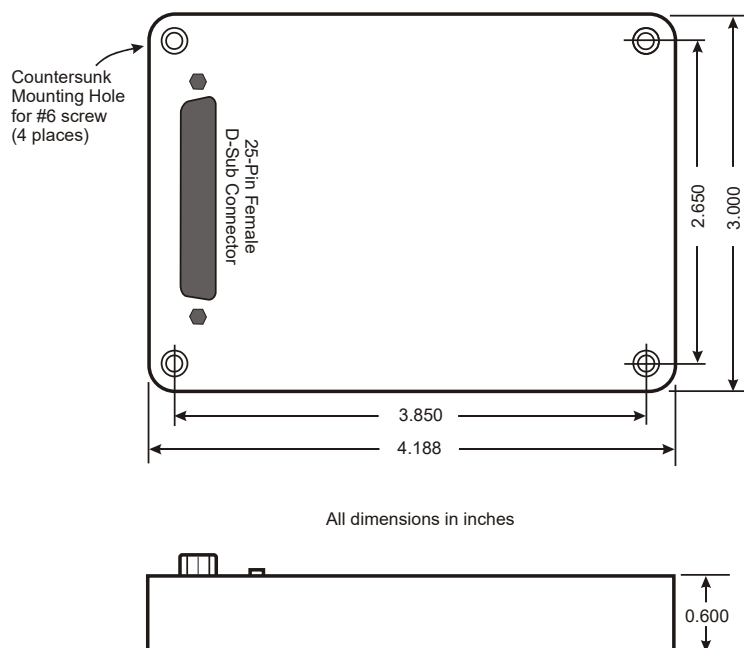
Specifications

- Power Requirements: 9-32Vdc, 0.2 Amp maximum
- Weight: 0.4 lbs
- Mounting Orientation: Any
- User configurable serial ports: 4
- Available baud rates: 110, 300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200
- Available Serial Port Functions: All serial port functions available on the display unit can be used through the combiner.

Connector Pinout



Dimensions



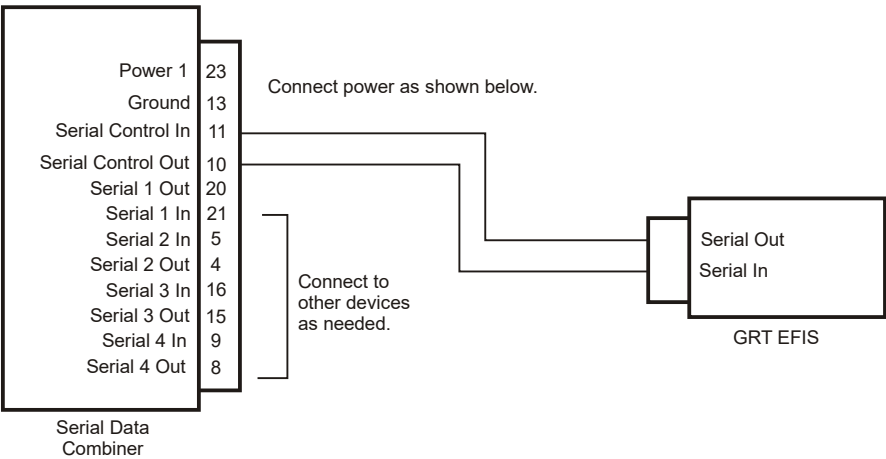
Notes:

1. Mount in a location to avoid exposure to water and excessive heat, such as from cabin heat ducts.
2. No cooling required.
3. Secure with 2 or more mounting screws in opposite corners.
4. See user manual for wiring.

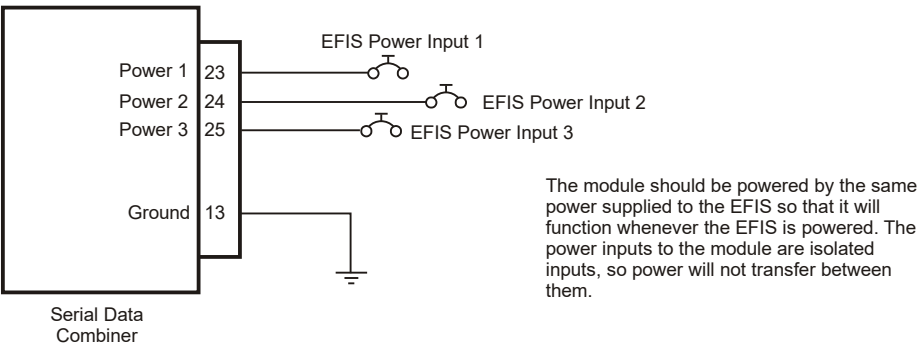
Serial Port Combiner/Expander



Typical Wiring



Typical Serial Port Wiring



Typical Power/Ground Wiring

Serial combiner wiring diagram.cdr

Included Cable Assembly

The cable assembly is provided with a 25-pin male d-sub connector, housing, backshell, and a variety of wires pre-pinned with male contacts ready for insertion into the d-sub housing. In addition, 10 d-sub male contacts are provided. All wires for the adapter are 4' long, but can be replaced with longer wires as needed. When inserting the wires into the housing, be sure to insert them into the correct holes, as removing them requires a pin extraction tool, and can be difficult.

Wire Color	Suggested Function
Red	Power 1
Black	Ground
White	Any
Blue	Any
Orange	Any
Yellow	Any
Green	Any
Violet	Any
White/Green	Serial Control In
White/Blue	Serial Control Out