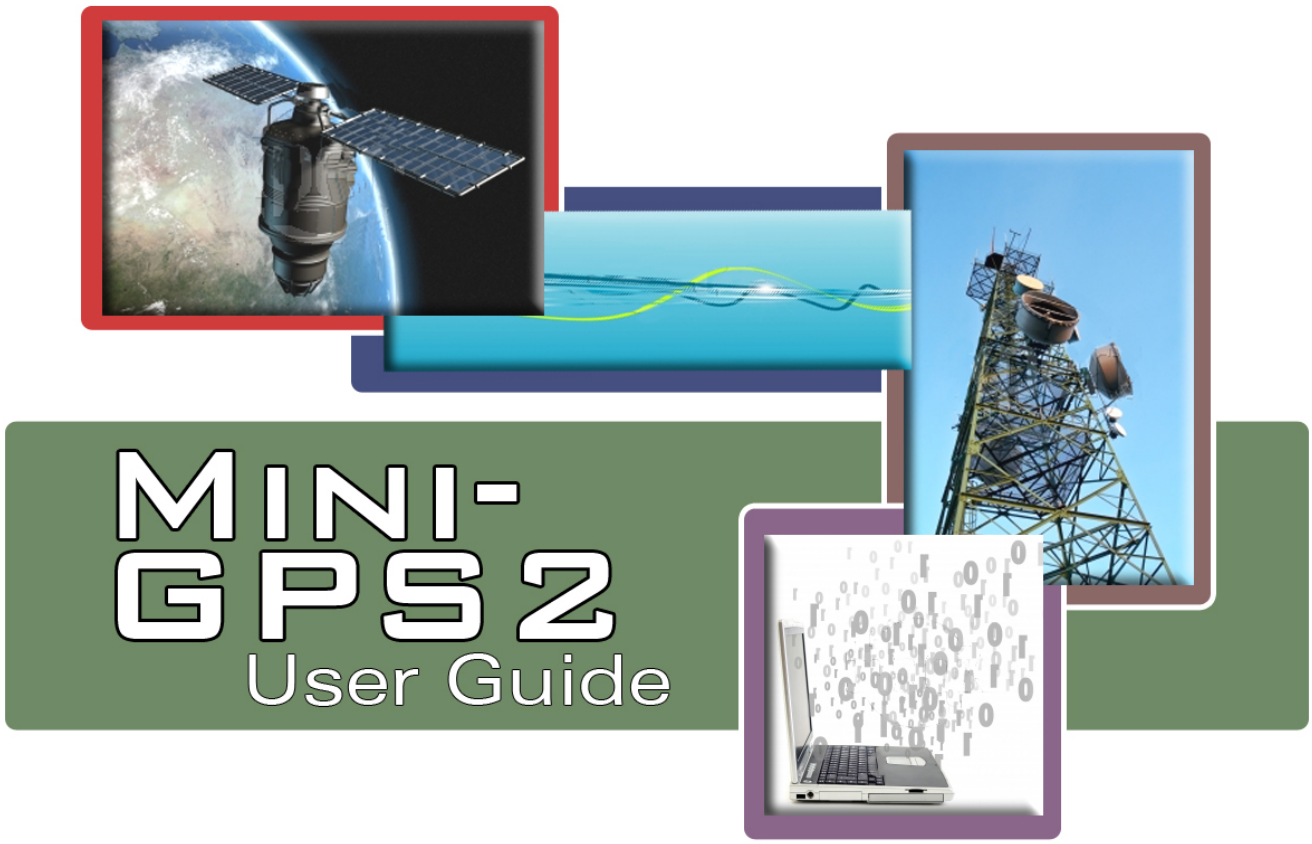

Mini-GPS2 User Guide

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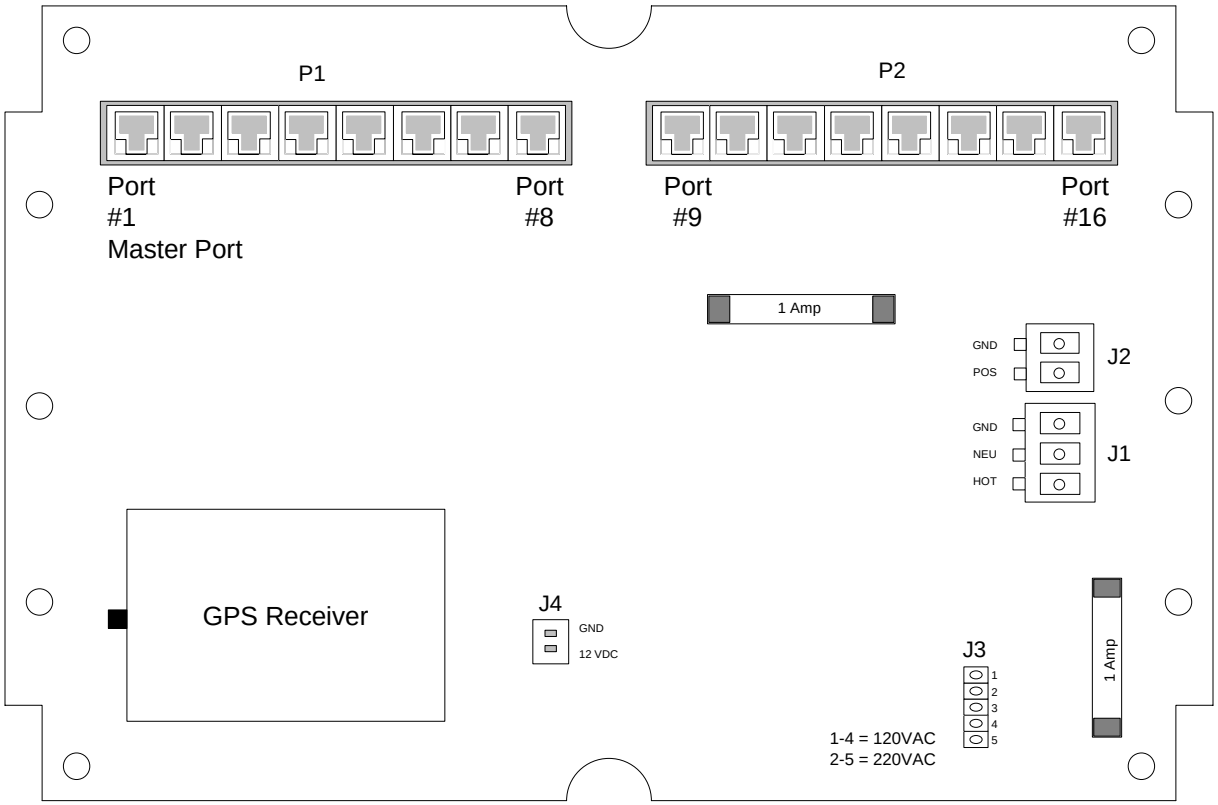
Mini-GPS2 Block Diagram



Port #1 is the master port for the Mini-GPS2. Always connect first radio into Port #1 for proper operation. Any port can be use after Port #1

P1 – Eight 6pin RJ-11 (RJ-14) timing ports
P2 – Eight 6pin RJ-11 (RJ-14) timing ports
J1 – 110 / 220 VAC power terminals
J2 – 12 to 32 VDC power terminals
J3 – AC jumper connection
Cover Pin 1 – Pin 4 for VAC
Cover Pin 2 – Pin 5 for VDC
J4 – 12 VDC output power for accessories

Warnings and Notices:

- Do **NOT** power the unit without a GPS antenna connected to the unit.
- Select between either the AC or DC terminals to supply power to the Mini-GPS2. Do not use both power terminals simultaneously or damage to the unit will occur!
- Always make sure that four pins of Jumper J3 are connected according to the pinout for the correct AC selection.
- Stranded tinned copper wire rated as 12 AWG or 14 AWG is recommended. Always make sure the local electric code has been satisfied.

Required Equipment

- DC Power supply or AC power cable
- A coax cable is required to attach the included GPS antenna to the bulkhead connection on the Mini-GPS2. This cable is not included due to the fact that length requirements change at each installation site.

Updates/Revisions

All Mini-GPS2 boards, as of July 1, 2006, require that a radio be plugged into Port #1. Port #1 is now the master port for the Mini-GPS2. This minor revision of the design eliminates a previous known problem that could occasionally cause the satellite information to display improperly. After Port #1 is used, any port in bay P1 or P2 can be used to connect additional radios to the Mini-GPS2. See the Block Diagram on Page 2 for the location of Port #1 and Bay P1 and Bay P2.

Product Description

GPS Sync Distribution

The Mini-GPS2 has been designed to provide GPS synchronization and information to a radio system that requires a one pulse per second (1PPS) timing pulse to coordinate transmission. Currently, this system is only supported on the Motorola Canopy© Wireless Broadband system. The unit provides timing and GPS satellite information for up to sixteen devices with a cable distance of over 300 feet.

Enclosure

A Mini-GPS2 comes in a NEMA4 certified weatherized enclosure. It can be mounted on a tower, rooftop, outside of a building, etc. The enclosure is smaller and lighter than the Mini-GPS1 enclosure. ***IMPORTANT*: The Mini-GPS2 is not designed to contain any power supply inside of the enclosure.**

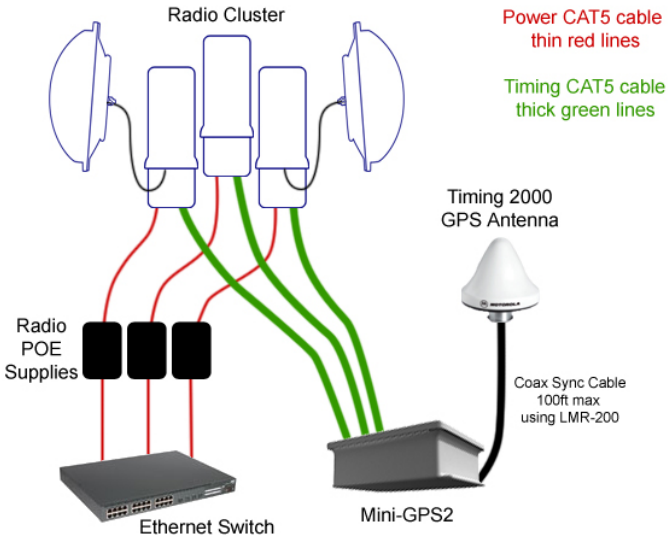
Power Setup

The Mini-GPS2 can be configured to run on 24VDC or on 110 / 220 VAC power. In addition there is an internal 12 VDC power source to power accessories such as a fan. ***The Mini-GPS2 is NOT a Power Over Ethernet (POE) device.*** A one pulse per second timing signal and GPS satellite information is transmitted using a specific pinout. Refer to the Timing Cable Construction section on Page 5 for the pinout of the timing cables. The Mini-GPS2 does not provide power to any radio device, nor does it contain a computer hub or switch.

Setup Information

System Layout

Category 5 cable should be used as timing cables that run from each radio to the Mini-GPS enclosure. The length of each timing cable must not exceed 100 meters (328 feet). The coax sync cable cannot be greater than 100 feet if the cable is made from LMR-200. LMR-200 cable is recommended.



GPS Antenna Location

The GPS antenna must be located so that it has an unobstructed view of the sky (20° off the horizon). It is not required to be particularly high at the site location. The Mini-GPS2 simply needs to be able to view satellites to receive synchronization. In addition, consider the exposure to lightning when placing it near other radio equipment. The GPS antenna needs to be connected before applying power.

Electrical Requirements and Setup

Warning: Applying the wrong type of power may permanently damage the board and the GPS receiver. Use caution when supplying power to the unit.

The unit is capable of being powered by 12-32 VDC or 110 / 220 VAC. ***IMPORTANT: Do NOT connect both AC and DC power at the same time.*** Always be sure to attach the correct polarity to the terminal or damage to the unit may result. Wiring should be of type 12 AWG or 14AWG, stranded tinned copper wire or as determined by your local electric code.

Although there is not a jumper to select between VDC and VAC, a jumper is required to select between 110VAC and 220VAC. The unit is shipped to be used with 110VAC or VDC. Make sure that the GPS antenna is attached before applying power to the Mini-GPS2 unit.

Using 110 / 220 VAC Power

The AC voltage selection is done by positioning J3. Please refer to the Mini-GPS2 Block Diagram on Page 2 for the location of the jumper. The jumper covers fours pins at a time. For 110VAC, Pin 1 through Pin 4 should be connected. For 220VAC, Pin 2 through Pin 5 should be connected. Four pins (either Pins 1-4 or Pins 2-5) must be covered for proper operation.

The power leads for AC operation are terminated at the terminal blocks labeled J1. See the Mini-GPS2 Block Diagram on Page 2 for the location of J1. Press down on the lever on the left side of the terminal

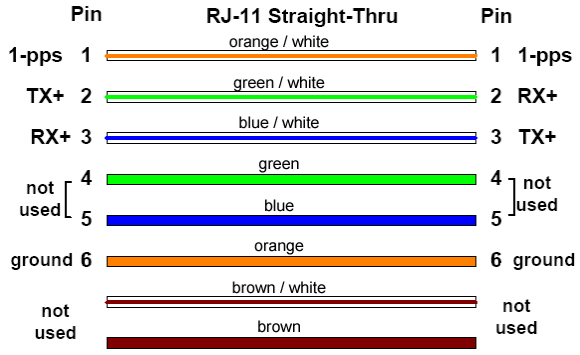
block and insert stripped wire into the terminal. Each connector is marked as E-GND (Earth Ground), NEU (Neutral), and Hot (Hot).

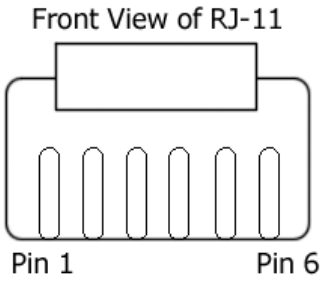
Using 24 VDC Power

To power the Mini-GPS2 from a DC power source use Terminal J2. The terminal is marked on the board and the block diagram. Place the wire into the terminal by holding down the lever on the left side of the terminal down. J3 is not relevant to running the Mini-GPS2 on VDC power. However, it is important to have the jumper on the board at all times.

Timing Cable Construction

Each radio that gets synchronization from the Mini-GPS2 will need an individual timing cable. The timing cable should be Category 5 (CAT5) outdoor rate cable. It is recommended to use shielded CAT5 cable for distances longer than 100 feet. A 6 Pin RJ-11 (RJ-14) is required to terminate the cable on either end. The pin out for each timing cable is listed below. It is important to correctly identify Pin 1 and Pin 6. If the pin out is incorrect, then the GPS satellite information will not be transmitted to the radio.





Installation Procedure

1. Mount the Minig-GPS2
   - The unit can be mounted to a wall or pole with enclosed mounting hardware or using the four corner holes. These mounting holes can only be accessed with the lid removed.
2. Mount the GPS antenna
   - Attach the antenna with enclosed mounting bracket to a nearby pole or wall.
3. Route and connect coax cable from GPS antenna to Mini-GPS N-connector
   - LMR-200 coax cable is recommended and is not to exceed 100ft in length
4. Apply 110VAC or 12-32VDC power to the Mini-GPS2
5. Route and connect the timing cables from the Mini-GPS to the Canopy radios
   - Always connect one radio to the master port, Port #1. After which any port in Bay P1, or Bay P2 can be used to provide GPS pulse.
6. Connect to each radio to confirm GPS status.