

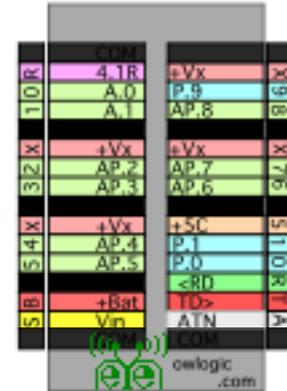
Owl topboard type 2, TB2-10 and TB2-15.

This top board is designed to make 12 multipurpose terminals available for sensors, along with an ample number of connection points for power supply and common. The connections are made to Phoenix screw-down terminals that clamp down on stripped and tinned cable ends. All nine analog inputs are brought out, along with 10 digital I/O and the power supplies.

- Terminals A.0 and A.1 are analog inputs only, from 0 to 4095 millivolts, connected to OWL analog inputs 0 and 1.

- Terminals P.0 P.1 and P.9 are Stamp direct i/o only, connected to the Stamp pins of the same designation.

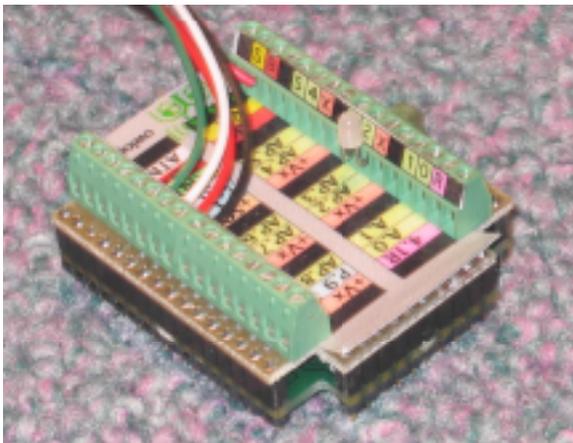
- Terminals AP.2 to AP.8 (seven i/o) are connected both to OWL analog inputs 2 to 8 and also to Stamp pins P2 to P8. These analog inputs are doubled up with the digital i/o so that each such connection point can serve either as an analog input or as a Stamp direct i/o or as both.



Note that when these terminals are used as analog inputs, the corresponding Stamp i/o must also be configured as an input. Otherwise the digital i/o will overwhelm the analog signal. When the analog input is not needed, it may be effective for lowest power consumption to make the stamp pin a low output to clamp the pin at a definite low level.

The top board also provides protection for the i/o terminals against lightning and mis-wiring. This is implemented by means of 200 ohm resistors in series with each signal lead as well as with a shunt circuit that directs potentially harmful currents to ground.

The board also provides buffering for the 4.096 volt reference, on the terminal labeled "4.096", It can supply up to 10 milliamps, and it is isolated from the analog to digital converter reference. This can supply reference grade power to ratiometric sensors such as wind vanes and resistance bridge circuits.



Input power comes in on the terminal "Vin", which is also connected to the terminal

breakout board TB2-10 is the same outline and size as the OWL2pe and plugs into the OWL2pe from the top. The label overlays are printed on laminated plastic film.

labeled "Bat". Connect a source of power from 5.5 to 15 volts DC to Vin. The operating current is up to 16 milliamps to operate the OWL itself, plus whatever current is required by external circuitry. In sleep mode, the current consumption drops to 60 microamps. The terminal labeled +Bat can supply power to devices that require direct battery power.

Switched power of 5.5 volts at up to 150 ma is available on the terminals labeled "+Vx". Constant power of 5 volts at up to 100 ma is available from the terminal labeled +5C.

This topboard layout is available in two sizes, with either terminals on either 0.1" spacing, or with 0.15" spacing.

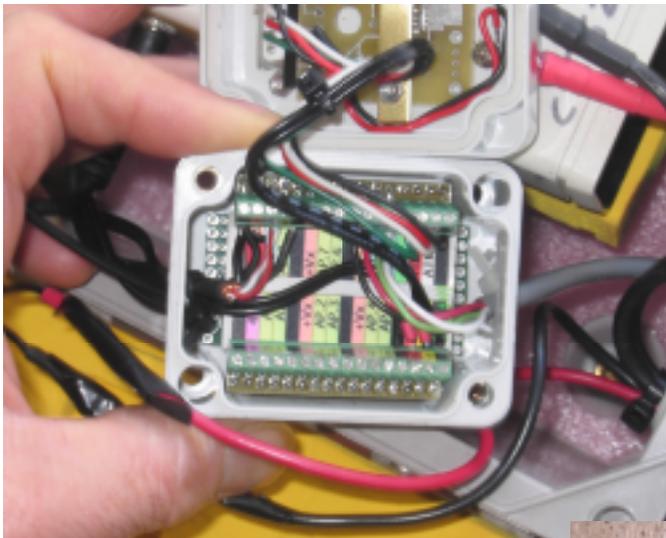
The serial port connections come into the 4 pins at the corner:

common

white ATN connects to PC DTR line, reset signal from PC to OWL./

red TXD connects to PC TXD line, data from PC to OWL

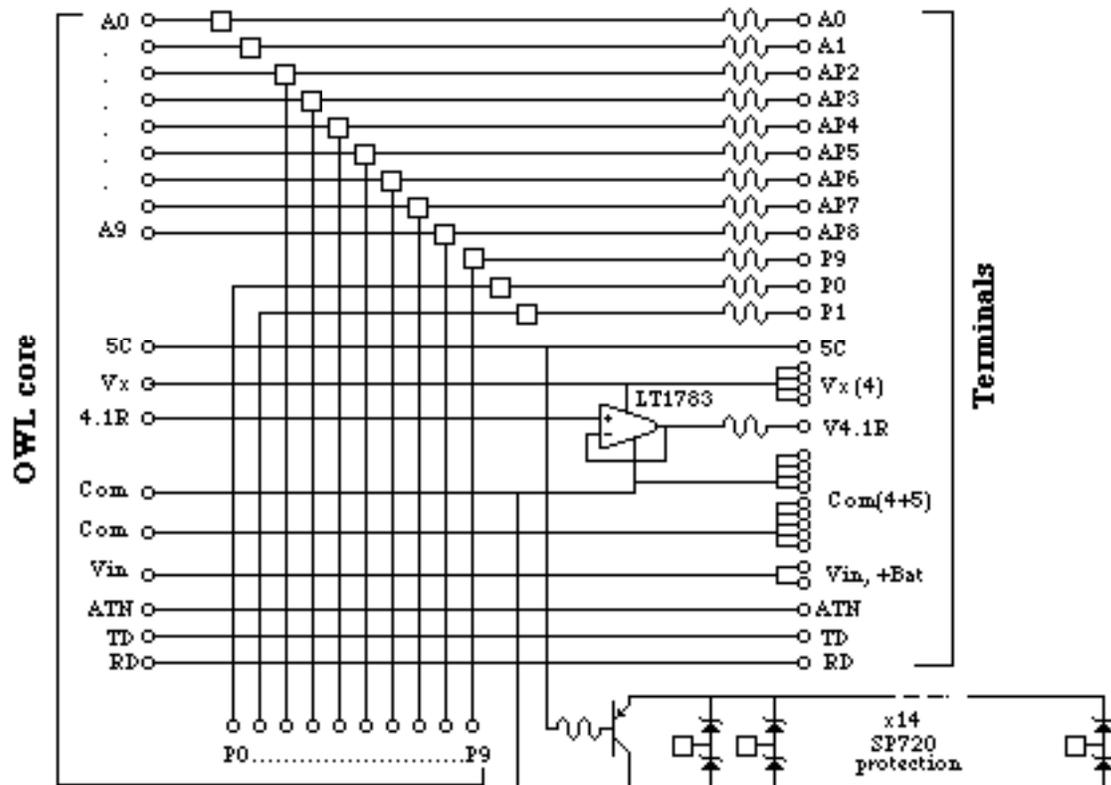
green RXD connects to PC RXD line, data from OWL to PC



An OWL2pe and the topboard TB2-10 mounted in a 50mm x 70mm x 40mm polycarbonate enclosure with other components and wiring.

An OWL2pe and the topboard TB2-10 mounted in a large fiberglass enclosure with other components and wiring.





Owl topboard type 2 schematic, TB2-10 and TB2-15.

Analog inputs 2 to 8 share terminals with Stamp i/o P2 to P8, while analog A0 and A1 and Stamp pins P0, P1 and P9 stand apart.

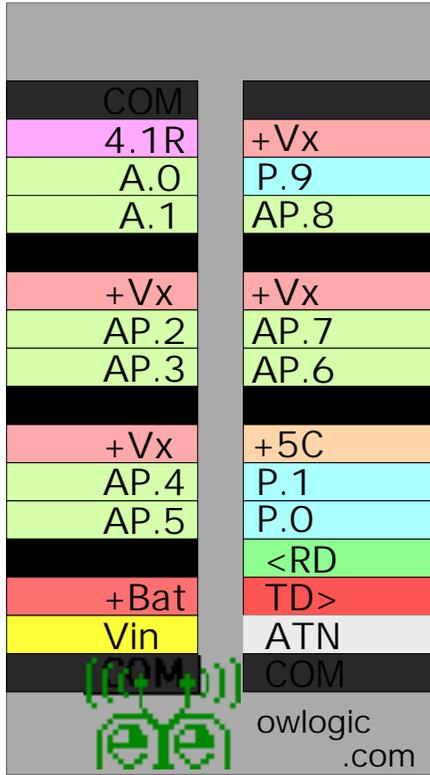
There are nine ground, common connections on the terminal board, for convenience in wiring. The four common terminals around the analog inputs and reference output are isolated from the 5 common terminals around the digital and power input connectors. The common connections are linked through the OWL2pe circuit board, an arrangement which minimizes noise pickup.

All the signal lines are protected with 200 ohm resistors that feed into a SP720 transient protection circuit. The connections shown as small squares on the signal lines, which corresponding to pins on the SP720. Overload currents on the negative side are shunted to common, while overload currents on the positive side are also shunted to ground via the PNP transistor that is referenced to the +5 volt supply.

The reference voltage of 4.096 volts is buffered by the LT1783 operational amplifier connected for unity gain. The available current is 10 milliamps. The amplifier is turned on along with the switched power supply.

There are 4 terminals that connect to the OWL switched 5.5 volts power supply, Vx, and one terminal that connects through to the 5 volt constant supply +5. There are 9 common ground terminals. The RS232 terminals connect directly to the corresponding OWL signal lines.

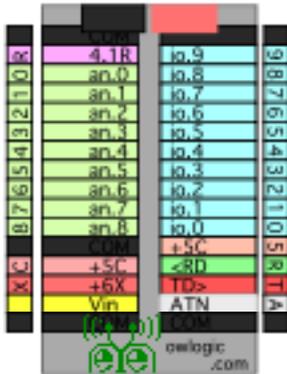
There are some signals on the OWL that are not available on the top board. These other signals can be found on the terminals at the two ends of the OWL board and arrangements can be made to bring them out via ad hoc wiring.



This sheet can help to plan and document sensor wiring to the top board TB2-10 or TB2-15

Owl topboard type 1, TB1-10

This top board is designed to bring out all nine analog inputs as well as 10 digital I/O and the power supplies. The analog inputs are not doubled up with the digital, so the total number of signals available is greater than is the case with the topboard type 2. The tradeoff is that there are fewer power supply and common terminals.



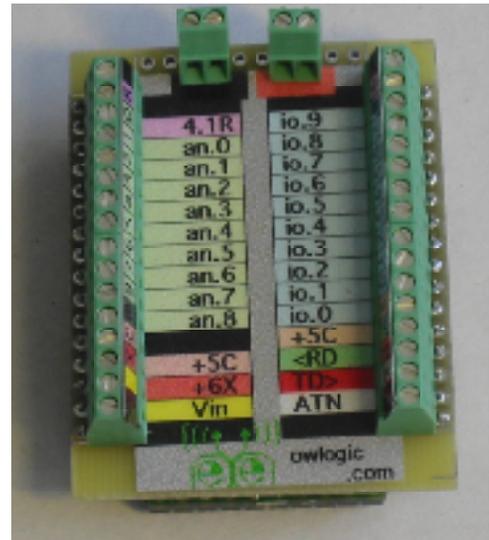
This was our first terminal board, as it does no more than provide a direct connection to the signals present on the 16 pin edges of the OWL2pe module. The circuit board under the label sheet provides an array of holes for the purpose of adding additional prototype circuitry to the system. This board does not provide additional i/o protection, although considerable i/o protection is provided by the OLW2pe module itself.

Input power from 5.5 to 15 volts DC comes in on the terminal "Vin". The operating current is up to 16 milliamps to operate the OWL itself, plus whatever current is required by external circuitry. In sleep mode, the current consumption drops to 60 microamps.

Switched power of 5.5 volts at up to 150 ma is available on the terminals labeled "+Vx". Constant power of 5 volts at up to 100 ma is available from the terminal labeled +5C.

The 4.096 volt reference is available on the terminal labeled "4.1R". This pin has an output resistance of 330 ohms, and a current maximum of 2 milliamps, and it can be switched on and off by the OWL2pe.

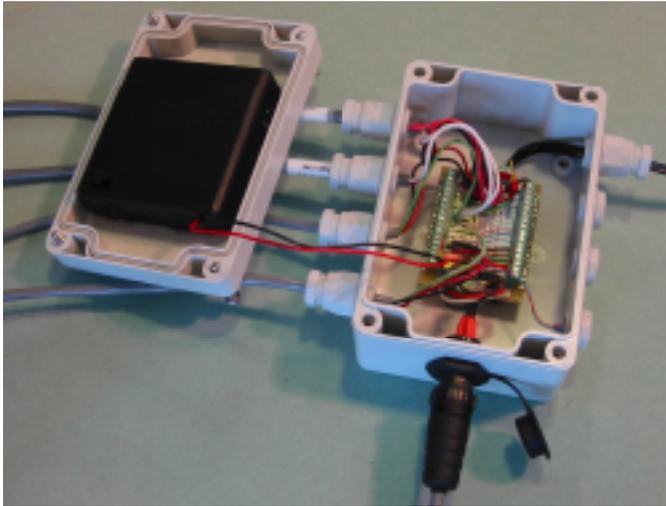
This topboard design has terminals on 0.1" spacing, and the circuit board will fit along with the OWL2pe in our standard small NEMA enclosure. The topboard also has mounting holes for #4-40 screws, aligned with the mounting holes in the OWL2pe module.



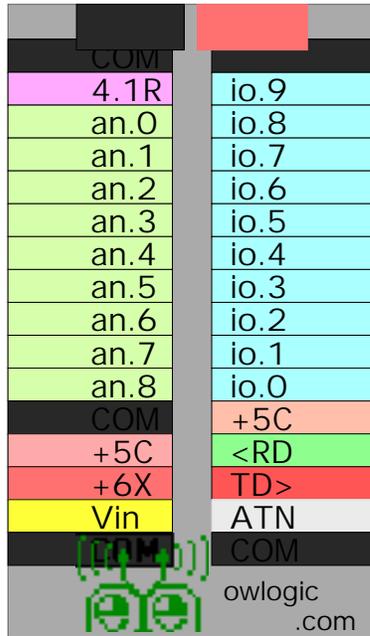
The serial port connections come into the 4 pins at the corner:

- common
- white ATN connects to PC DTR line, reset signal from PC to OWL./
- red TXD connects to PC TXD line, data from PC to OWL
- green RXD connects to PC RXD line, data from OWL to PC

In the future, we will probably come out with an expanded version of this type 1 board, that brings out many terminals but will also include more power and common connections and additional i/o protection.



An OWL2pe with a topboard TB1-10 mounted in a larger polycarbonate enclosure with a battery pack and with wiring through gland nuts to external sensors and with a waterproof data offload connector.



This sheet can help to plan and document sensor wiring to the top board TB1-10