SPECTRE Board

The technology developed using the simulation environment includes a suite of self-tuning autopilots and attitude control, and this has been incorporated into the SPECTRE Processor Board.

This board provides 10 serial I/O channels and multiple analogue and digital I/O channels and supports standard navigational instruments and sensors.

Autopilot controller algorithms, including

- Heading control
- Speed control
- Track following, including event management at waypoints
- Vehicle following
- Collision avoidance
- Attitude and depth control
- Hovering / Dynamic Positioning

Machinery and control surface interfaces

- Analogue, e.g. analogue input and output voltages
- Digital inputs and outputs, e.g. ON/OFF, ENABLE and DIRECTION signals, Pulse Width Modulation

- On board digital I/O can be expanded with Digital IO boards
- Power Management Modules and Power Generation Controllers (PMMs, PGCOs and PGCIs) can safely connect to PV cells and power external devices with programmable trip levels
- Additional interfaces may be provided upon request

Navigational instrument / sensor interfaces

- NMEA 0183 serial interface, standard NMEA uses 4800 baud, but each port may be individually configured to different baud rates
- Analogue and Digital input: e.g. voltage from a pressure sensor
- Analogue and digital IO can be expanded with GENIE cards, with up to 15 GENIE cards per serial port
- Digital outputs may be converted to Volt Free Contacts using relay boards
- Additional interfaces may be provided upon request

Communications interface protocol

- The propriety communications protocol is robust and efficient, and ideally suited for low bandwidth applications. This allows RS232, radio or acoustic communications between the remote control operator workstation and the SPECTRE module

Operator User Interface

- The standard Remote Control Workstation software runs on a PC, or laptop PC and provides:

  Route planning and upload/download

  Mission recording and replay

  Electronic chart input/output for vehicle activity, waypoints, routes

  Vehicle system status and control

  Payload system status and control

  Handheld remote control joystick for close-in manoeuvers such as docking

Specifications (SPECTRE 2)

Mechanical	PC104 format 90 x 96mm
Power supply	8 to 28V
Current	70 mA (no external load or outputs)
Serial I/O	10 Serial ports
Digital I/O	16 digital I/O channels. 3.3V logic, 5V tolerant inputs. 8 can be configured as PWM outputs
Analogue In	12 x 12 bit, -10V to 10V
Analogue out	4 x 12 bit, -5V to 5V
On board sensors	Gyro stabilised compass with roll and pitch rates