Dynautics

SPECTRE M5 Autopilot

The SPECTRE remote control autopilot for surface craft (RCAS) was the remote control system on the first boat approved for unmanned operation in UK coastal waters by the UK Maritime Coastguard Agency.

Based on the proven SPECTRE autopilot board, the SPECTRE M5 is available as a turnkey system suitable for a wide range of Uncrewed Surface Vehicles (USVs), typically in the range of 4 to 24 metres LOA. The SPECTRE M5 unit has interfaces for navigation sensors via NMEA0183 and NMEA2000, and CANbus engine and throttle controls. The system may be configured to control a craft with single or twin engines, props or waterjets, via a standard electronic throttle actuator and electrohydraulic steering pumps, and is designed to be easily reconfigurable to meet the needs of a variety of craft.

The SPECTRE autopilot board provides:

- Advanced self-tuning autopilot control modes, including heading, track and hover / dynamic positioning.
- Remote controlled operation.
- Fully autonomous operation.
- Support for Collision Avoidance.
- Autonomy with capability for operator intervention.
- Covert mode - zero command link transmissions.
- Proprietary secure communications protocol (available as DLL for third party control software) or NMEA type interface.
- Engine Monitoring.
- Ignition control (remote start/stop).
- Control of auxiliary systems (PTZ camera, transponders etc) including gyrostabilisation control for IR/visible camera systems.
- Up to 10 serial connections using RS232 or RS422.
- Support for digital inputs and outputs.
- Control for up to 4 engines, including single or twin waterjets.
- Support for bow thrusters.
- Docking Joystick - fine control of the boat via a remote handset, for bringing the boat into harbour and up to the dock.
- Support for control over satellite based communications links (eg Iridium, VSAT, Starlink).
- Integrated datalogger records at high rate from serial ports and CANbus connections.

Contact us to find out more about how our autopilots can help you achieve your mission:

info@dynautics.com www.dynautics.com 44 (0)23 9226 7607

Typical applications are vehicles up to 24 metres in length, at speeds ranging from less than 1 kt to over 50 kts.

Performance is limited primarily by the ability of the vehicle's own navigational sensors to operate correctly at high speeds, and the performance of the vehicle itself.

To facilitate the operation of unmanned vehicles, SPECTRE processor has the ability to communicate, using a remote control protocol, across a radio link or some other remote signalling system. The SPECTRE system provides the additional circuitry for controlling the hydraulic steering pumps and electronic throttle, as well as the navigational sensor suite and the ignition and starter circuitry. Remote control of additional channels, for example cameras, is provided. Safety cut-outs and fail-safe operation are included.

High speed operations:

SPECTRE is equipped with advanced sensor datafusion and adaptive autopilot algorithms which aid stability at high speed. Agile craft such as RHIBs can sometimes have a tendency to begin "snaking" when the autopilot is engaged at high speed, especially when following waypoints. SPECTRE's advanced adaptive algorithms are able to overcome these issues, resulting in a straight track with no significant oscillation.

Potential applications include:

- Surveillance: the autopilot controls the vessel to follow a pre-defined track within the survey area, while payload instruments are employed, for instance, side-scan sonar, visual / infrared imagery. The SPECTRE autopilot autonomously navigates the craft, while the command link is used to communicate with the payload sensors or the autopilot may be pre-programmed to switch on instruments at specific waypoints. The system provides command and control channels for remote control and monitoring the payload.
- Remote controlled mine-hunting: the SPECTRE autopilot is ideally suited to control the vessel at low speeds and in hover manoeuvres while payload instruments are deployed. A special mode can control the vehicle to stay on a fixed station relative to a host ship and can be used to scan the area ahead of a warship under way.
- Hydrographic survey: widely used for hydrographic surveys, SPECTRE systems support and facilitate integration with various industry standard survey software packages. The SPECTRE M5 can also support additional modules to facilitate integration with instruments such as towed sensors.

M5 Autopilot specifications

Power	Typically 24W at 12 or 24V
Dual Redundant Power	Yes
Boot up time	< 1 second
Weight	4.5kg
Serial channels	10
Serial interfaces	RS232, RS422
CANbus	Propulsion protocols
NMEA2K support	Yes

Control interface	Via binary protocol
NMEA commands (third party C2)	Supported
C2 datalink	Radio modem or IP
Steering	Electric / hydraulic
Waterjet control	Via interface modules
Bow thrusters	Fixed / azipod
Docking joystick	Supported
Datalogger	Integrated

Contact us to find out more about how our autopilots can help you achieve your mission:

info@dynautics.com www.dynautics.com +44 (0)23 9226 7607