Digital Controls

For Precision Positioners

2010 Data Sheet

The most important thing we build is trust

Cobham Sensor Systems manufactures a variety of control products from basic Servo Amplifier Units to standalone Servo Digital Controls and Operator's Workstations available in a variety of formats – VME, PC-104 or custom control cards. The controls are COTS and are common to all the positioner systems. The controls are available in a number of packages – EIA, NEMA housing, ATR or packaged within the gimbal, Controllers are also available in commercial, commercial ruggedized and full MIL environmental performance. Cobham has integrated the digital controls into the positioner package for special applications.

The Cobham Sensor Systems control systems are software based digital controls tailored to the application by software modifications via the communications interface. The controllers provide operational commands, servo compensation, gain modifications, and commands for peripheral sensors. Since the designs use PC-104 and VME formats, the controls reflect an open architecture that is upgradeable in order to prevent obsolescence. The architecture utilizes Industrial Pack (IP) modules to implement a wide variety of interfaces and features including A/D and D/A converters, R/D converters, digital and analog I/O interfaces, IRIG timing, auto video track and communications interfaces such as RS-422/232, RS-485, Ethernet, and other common communication formats. The controls form a common set for all Cobham positioners and can be adapted to other positioners as well to implement upgrades, overhauls and modernization.

Features

- Operation from 120 or 220 VAC, 1φ or 3φ and 28 VDC.
- Brushless 3φ, Sinusoidally Driven Servo Amps available in a variety of power levels.
- RT Linux Operating System.
- Tailored to a Software Interface Specification
- Uses high reliability components including VICOR Power Supplies.
- Provided with a variety of accessories – Joystick, Auto Video Trackers, VGA Monitors, Recording Media, Time Code Generators, Video Annotation, and Stabilization Components (Gyros).
- Includes EMI/EMC Suppression.
- Programmable modes of operation including BIT, payload control, calibration and set-up.
- Interfaces with a wide variety of data pick-offs; resolver, inductosyn, gyro's, optical encoders and resolvers.
- MIL capable custom Servo Control Board (MDC) for compact MIL requirements

Servo Digital Control (SDC) SPS-2722

Micro Digital Control (MDC) SPS-2840

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Adaptable Control Configuration

The SPS series of positioner controls are available in a building block organization to allow the positioners to be fielded in a variety of configurations from a basic rate/position loop closure with a customer provided control signal to systems level workstations with positioner, payload, manual and automatic control. The control functions, including servo compensation and complex filtering, are implemented through software using an RT Linux Operating System and C programming. A Host Interface Specification is used to tailor the control, communication and timing functions. The position controls options include:

- Basic Servo Amplifier Unit
- Servo Digital Control Unit
- Operator's Workstation Implemented with customer, VME and PC-104 Technology
- Custom Controls (Micro Digital Control – MDC)
- Accessories including joystick, video monitors, video autotrackers, recorders, TCG's, and Stabilization Devices
- Adapts to resolvers, inductosyns, encoders and RESR's
- Custom screen with GUI icons

Selectable control functions include manual and automatic control, stabilization, error correction, coordinate conversion, scan modes BIT and test programs, payload control and many other possibilities.

The following are descriptions of the various control units.

Servo Amplifier Unit (SAU) Model SPS-2702

The Servo Amplifier Unit (SAU) is used to provide power to the positioner without servo controls. It is used when the Customer wishes to provide their own workstation or when Cobham uses a VME System with servo controls incorporated at that level. It is available in EIA or NEMA housing and is tailored via selection of the appropriate amplifiers and power supplies. It is usually packaged in the same chassis as the SDC but without the control processors.

Servo Digital Control Unit (SDC) Model SPS-2722

The Servo Digital Control Unit (SDC) is a microprocessor-based, servo controller, providing both position and rate-loop control of the positioner. A firmware download that modifies digital compensation filters allows the position and rate servo-loops to be optimized for different payloads.

The SDC includes multiple RS-422/RS-232/RS-485 and Ethernet ports to allow control of, and access to, the signals generated by sensors and monitoring equipment associated with the payload. Cobham's brushless, low-torque-ripple motors and the Pulse-Width-Modulated (PWM) amplifiers within the SDC provide rapid and precise control of the pedestal.

The SDC monitors servo faults and provides a number of safety features, which include the ability to prevent remote operation of the positioner while maintenance personnel are working on the unit.

The SDC is available for mounting in either a 19-inch EIA rack, a NEMA weatherproof enclosure or it can be custom packaged. The SDC may be commanded by an external computer system, joystick, or autotracker.

Micro Digital Controller (MDC)

The MDC is a custom 2-axis servo control board suitable for military application. The DSP-based,single-board processor is supported by 128 KByte Flash and 64 Kbyte RAM memories plus a serial EEPROM and operates at 400 MFLOPS. The card has 4 channels of 16 bit ADC, 4 channels of 16 bit DAC, 32 bits of Digital I/O, and 4 channels of R/D conversion. Communications with the MDC is via 2 Hi-Speed serial RS-422 and 2 Standard serial RS-232/422/485 interfaces. The MDC is designed to add an Ethernet interface daughterboard for Hi-Speed communications.

The MDC is configured as an ATR or ½ ATR enclosure or it may be provided as a 5" square package suitable for mounting in the base of a gimbal. Small Micro Series PWM servo amplifiers can also be mounted in the gimbal for a complete turnkey gimbal/control solution whereby the customer need only supply power and communication inputs. Functionality of the MDC is completed with the software including loop closures, compensation filters, mode control, gain control, BITE, and communication protocol.

MDC Board

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The software is modular and reusable; programming is accomplished in C code. Software is used to tailor the positioner system to the user's mission.

The MDC will meet most MIL-STD-810 environments.

SDC Performance Specifications

Configuration

Power	120 / 208 VAC, 50/60 Hz or 28 VDC
19" EIA	4U or 5U by 24" Deep
NEMA	20" x 20" x 8"
Weight	40 to 65 lb.
Interfaces	Serial RS-232 / 422 / 485 and Ethernet

Environmental

Temperature	MIL: -30° to + 55°C
	Commercial: 0° to 50° C
Rain	Water Tight in NEMA Enclosure
Relative Humidity	98 %

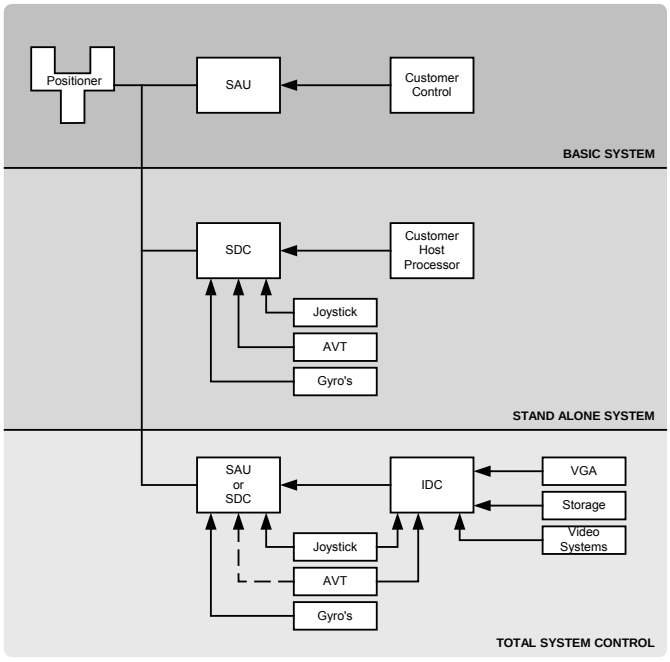
MDC Performance Specifications

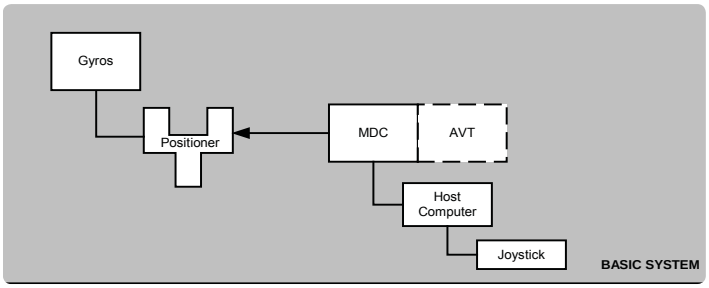
Configuration

Power	28 VDC
Enclosure	1/2 ATR Case
Weight	< 18 lb.
Interfaces	Serial RS-232 / 422

Environmental

Temperature	MIL: -55° to + 70°C (with heaters)
	-40° to 70° C (without heaters)
Shock	10 g (half sine 11 msec, 3 axis)
Vibration	4.3 grms (functional)
Relative Humidity	98 % Condensing





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