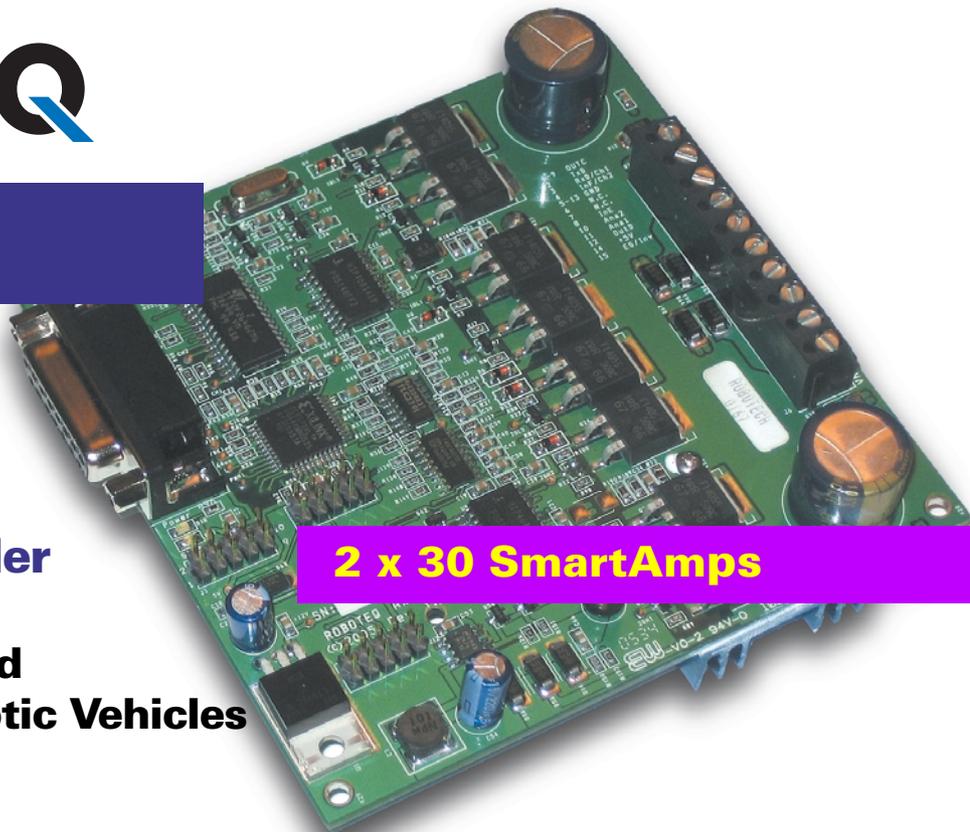# RoboteQ

AX1500

Dual Channel Forward/Reverse Digital Robot Controller

2 x 30 SmartAmps

for Computer Guided and Remote Controlled Robotic Vehicles

Roboteq's AX1500 controller is designed to convert commands received from a R/C radio, Analog Joystick, wireless modem, or microcomputer into high voltage and high current output for driving one or two DC motors. Designed for maximal ease-of-useby professionals and hobbyist alike, it is delivered with all necessary cables and hardware and is ready to use in minutes.

The controller's two channels can either be operated independently or mixed to set the direction and rotation of a vehicle by coordinating the motion on each side of the vehicle. The motors may be operated in open or closed loop speed mode. Using low-cost position sensors, they may also be set to operate as heavy-duty position servos.

The AX2850 version is equipped with quadrature optical encoders inputs for precision speed or position operation.

Numerous safety features are incorporated into the controller to ensure reliable and safe operation.

The controller can be reprogrammed in the field with the latest features by downloading new operating software from Roboteq.

Applications

- Light duty robots
- Terrestrial and Underwater Robotic Vehicles
- Automatic Guided Vehicles
- Electric vehicles
- Police and Military Robots
- Hazardous Material Handling Robots
- Telepresence Systems

Key Features	Benefits
Microprocessor digital design	Accurate, reliable, and fully programmable operation. Advanced algorithms
R/C mode support	Connects directly to simple, low cost R/C radios
RS232 Serial mode support	Connects directly to computers for autonomous operation or to wireless modem for two-way remote control
Analog mode support	Connects directly to analog joystick
Header for Optional Optical encoder	Stable speed regardless of load. Accurate measurement of travelled distance
Built-in power drivers for two motors	Supports all common robot drive methods
Up to 30A output per channel	Suitable for a wide range of motors
Programmable current limitation	Protects controller, motors, wiring and battery.
Open loop or closed loop speed control	Low cost or higher accuracy speed control
Closed loop position control	Create low cost, ultra-high torque jumbo servos
Data Logging Output	Capture operating parameters in PC for analysis
Built-in DC/DC converter	Operates from a single 12V-40V battery
Compact Board Level Design	Lightweight and easy to incorporate in most applications
Field upgradable software	Never obsolete. Add features via the internet

Technical Features

Microcomputer-based Digital Design

- Multiple operating modes
- Fully configurable using a connection to a PC
- Non-volatile storage of user configurable settings. No jumpers needed
- Simple operation
- Software upgradable with new features

Multiple Command Modes

- Serial port (RS-232) input
- Radio-Control Pulse-Width input
- 0-5V Analog Voltage input

Multiple Motor Control modes

- Independent channel operation
- Mixed control (sum and difference) for tank-like steering
- Open Loop or Closed Loop Speed mode
- Position control mode for building high power position servos
- Modes can be set independently for each channel

Optical Encoder Inputs (option)

- Two Quadrature Optical Encoders inputs
- 250kHz max. frequency per channel
- 32-bit up-down counters
- Inputs may be shared with four optional limit switches

Automatic Command Corrections

- Joystick min, max and center values
- Selectable deadband width
- Selectable exponentiation factors for each command inputs
- 3rd R/C channel input for accessory output activation

Special Function Inputs/Outputs

- 2 Analog inputs. Used as
  - Tachometer inputs for closed loop speed control
  - Potentiometer input for position (servo mode)

- External temperature sensor inputs
- User defined purpose (RS232 mode only)
- One Switch input configurable as
  - Emergency stop command
  - Reversing commands when running vehicle inverted
- Up to 2 general purpose outputs for accessories or weapon
  - One 24V, 2A output
  - One low-level digital output
- Up to 2 digital input signals

Built-in Sensors

- Voltage sensor for monitoring the main 12 to 40V battery
- Voltage monitoring of internal 12V
- Temperature sensors near each Power Transistor bridge

Advanced Data Logging Capabilities

- 12 internal parameters, including battery voltage, captured R/C command, temperature and Amps accessible via RS232 port
- Data may be logged in a PC or microcomputer
- Data Logging Software supplied for PC

Low Power Consumption

- On board DC/DC converter for single 12 to 40V battery system operation
- Optional 12V backup power input for powering safely the controller if the main motor batteries are discharged
- 100mA at 12V or 50mA at 24V idle current consumption
- Power Control input for turning On or Off the controller from external microcomputer or switch
- No consumption by output stage when motors stopped
- Regulated 5V output for powering R/C radio. Eliminates the need for separate R/C battery.

High Efficiency Motor Power Outputs

- Two independent power output stages
- Dual H bridge for full forward/reverse operation
- Ultra-efficient 5 mOhm ON resistance MOSFETs
- Four quadrant operation. Supports regeneration
- 12 to 40 V operation
- User programmable current limit up to 30A
- Standard Fast-on connectors for power supply and motors
- 16 kHz Pulse Width Modulation (PWM) output

Advanced Safety Features

- Safe power on mode
- Optical isolation on R/C control inputs
- Automatic Power stage off in case of electrically or software induced program failure
- Overvoltage and Undervoltage protection
- Watchdog for automatic motor shutdown in case of command loss (R/C and RS232 modes)
- Run/failure diagnostics on visible LEDs
- Programmable motors acceleration
- Built-in controller overheat sensors
- "Dead-man" switch input
- Emergency Stop input signal and button

Compact Design

- All-in-one board-level design.
- Efficient heat sinking. Operates without a fan in most applications.
- 4.25″ (108mm) L, 4.25″ W (108mm), 1″ (25mm) H
- -20o to +70o C operating environment
- 3oz (85g)

Ordering Information

Model	Description
AX1500	Dual Channel DC Motor controller up to 30 SmartAmps per channel

RoboteQ

www.roboteq.com