

# Sigmadrive

AC INDUCTION AND DC MOTOR CONTROLLERS



- 24-80V 175-650A power ratings
- AC and DC motor control
- Traction, pump and steering control
- Dual traction options
- Assured gradient control
- Elegant, low-profile package
- High power-to-size ratio
- Exceptional thermal performance
- High-efficiency, minimal switching losses
- Heatsinking of all internal components
- No internal cables or connections
- High reliability
- CANbus communications
- Field upgradeable software



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MI



M2

B-



A



B

POWER ● ● TRIP

Sigmadrive

## SUPERIOR CONTROL FOR INDUSTRIAL APPLICATIONS



The Sigmadrive family of AC and DC motor controllers have been developed for use in a wide range of electric vehicle applications, including Materials Handling, Airport Ground Support, Industrial, Utility and Mobile Work Platforms. The range spans power ratings of 24V /75A to 80V /650A in three package sizes, each intended to give optimal price and performance.

Because of the universal nature of the design, the same hardware can be easily configured to work as either a traction, pump or steering controller. Furthermore, in total, four different motor technologies - AC induction, DC series, DC separately excited and DC permanent magnet are supported.

Insulated Metal Substrate (IMS) technology is fully utilized to provide state-of-the-art thermal performance and exceptional reliability. The innovative design means there is no internal cabling or inter-board connections, as well as providing direct heatsinking for all components and terminals. This increases reliability and enables Sigmadrive to provide a higher power-to-size ratio than competitive controllers of the same rating.

Dual traction applications can be easily and effectively addressed by connecting two controllers in a master-slave configuration. The speed output of each is then determined by the steering angle of the vehicle. In this mode of operation, there is a great deal of flexibility offered by a number of specialist programmable parameters, thereby ensuring smooth comfortable control under all conditions. Assured gradient control comes via selectable Hill-hold and Restraint functions, which are designed to hold the vehicle steady even when no drive signal is present.

CANbus communication provides a safe and reliable electrical connection method to gauges and programmers, as well as between controllers themselves. Additionally, the CANbus can be used to load software updates into the Sigmadrive, meaning a vehicle can be upgraded to include new and improved functions.



- 7 x low impedance digital inputs
- 3 x analogue inputs
- 3 x 3A contactor outputs
- In-built coil suppression
- 12V, 20mA output pin
- Under and over-voltage protected
- Robust to external short-circuits
- Throttle wire-off detection
- Hill-hold and Restraint
- Proportional, direction or neutral braking
- Electromagnetic brake control
- 3 traction cutback speeds
- Belly-button function
- Programmable inching speed
- 6 pump speeds
- Pump inhibit input
- Power steer timer

Sigmadrive Controller Dimensions

Dimensions (mm)	Sigmadrive Frame Size		
	Small	Medium	Large
Length	177	225	320
Width	155	200	200
Height	41	49	51
Weight (kg)	1.2	4.1	6.1

## ACCESSORIES

### SIGMADRIVE LCD VEHICLE DISPLAY



The Sigmagauge LCD is a highly versatile vehicle display, which can be easily configured to meet the OEM's requirements. The backlit, dot-matrix display receives its information over the CANbus, and presents vehicle status and diagnostic information to the operator in clear, easy-to-read icons. The operator, via pushbuttons on the front panel, is also able to select which details are displayed on the screen.

- Large, dot-matrix display with backlight
- Operator selectable display
- Displays include BDI, speeds and timers
- CANbus communications
- Field upgradeable software

### SIGMADRIVE HAND-HELD PROGRAMMER



The Sigmadrive Hand-held Programmer (HHP) is a powerful tool that can be used to configure all Sigmadrive controllers, as well as the Sigmagauge display. In addition to multiple programming menus, there are status and test functions that provide vehicle designers and service engineers with powerful, real-time system information, making set-up or diagnosis particularly intuitive.

### SIGMADRIVE CANBUS I/O MODULE

This module expands the Sigmadrive's I/O count by allowing many extra connections to be put onto the CANbus, thus into the Sigmadrive itself. Full environmental protection is afforded via totally encapsulated electronics.

- 4x digital inputs
- 2x analogue inputs
- 4x contactor outputs
- 4x low-current outputs
- 3x analogue outputs

Sigmadrive AC Model	Voltage	Current rms/Time	Current rms (1 hour)	Size
Traction				
ACT865L	72-80V	460A/60s	240A	Large
ACT835M	72-80V	250A/60s	120A	Medium
ACT817S	72-80V	120A/20s	70A	Small
ACT465L	24-48V	460A/60s	260A	Large
ACT445M	24-48V	320A/60s	180A	Medium
ACT425S	24-48V	180A/20s	80A	Small
ACT225S	24V	180A/60s	80A	Small
Pump				
ACP865L	72-80V	460A/60s	240A	Large
ACP835M	72-80V	250A/60s	120A	Medium
ACP817S	72-80V	120A/20s	70A	Small
ACP465L	24-48V	460A/60s	260A	Large
ACP445M	24-48V	320A/60s	180A	Medium
ACP425S	24-48V	180A/20s	80A	Small

Sigmadrive SEM Model	Voltage	Current/Time	Current (1 hour)	Size
Traction				
SET865L	72-80V	650A/60s	240A	Large
SET835M	72-80V	350A/60s	120A	Medium
SET465L	24-48V	650A/60s	260A	Large
SET445M	24-48V	450A/60s	180A	Medium
SET425S	24-48V	250A/20s	80A	Small
SET225S	24V	250A/60s	80A	Small

Sigmadrive Series Model	Voltage	Current/Time	Current (1 hour)	Size
Traction				
SRT865L	72-80V	650A/60s	240A	Large
SRT850M	72-80V	500A/60s	180A	Medium
SRT465M	24-48V	650A/15s	260A	Medium
SRT445M	24-48V	450A/60s	180A	Medium
SRT425S	24-48V	250A/20s	80A	Small
Pump				
SRP865L	72-80V	650A/60s	240A	Large
SRP850M	72-80V	500A/60s	180A	Medium
SRP465M	24-48V	650A/15s	260A	Medium
SRP445M	24-48V	450A/60s	180A	Medium
SRP425S	24-48V	250A/20s	80A	Small
Pump and steering				
SRD865L	72-80V	650A/60s & 60A/60s	240A & 50A	Large
SRD445M	24-48V	450A/60s & 50A/60s	180A & 35A	Medium

Sigmadrive PM Model	Voltage	Current/Time	Current (1 hour)	Size
Traction				
PMT835M	72-80V	350A/60s	120A	Medium
PMT465L	24-48V	650A/60s	260A	Large
PMT445M	24-48V	450A/60s	180A	Medium
PMT425S	24-48V	250A/20s	80A	Small
Steering				
PME817S	72-80V	175A/20s	70A	Small
PME425S	24-48V	250A/20s	80A	Small

### Sigmadrive AC

Can be tuned to any AC motor. High resolution current measurement, combined with advanced flux control techniques, provides smooth control of torque and speed. This approach is particularly efficient with highly dynamic loads, such as those experienced on an electric vehicle. Easy to set-up and program, the Sigmadrive AC is available in traction, pump and steering configurations.

### Sigmadrive Separately Excited (SEM)

Offers the same advanced technology and design features of the Sigmadrive AC controllers, to provide a range of powerful and flexible traction units.

### Sigmadrive Series

Available in traction and pump versions, as well as an innovative, combined pump and steering configuration.

### Sigmadrive Permanent Magnet (PM)

Smooth and predictable control of a wide power range of permanent magnet motors.