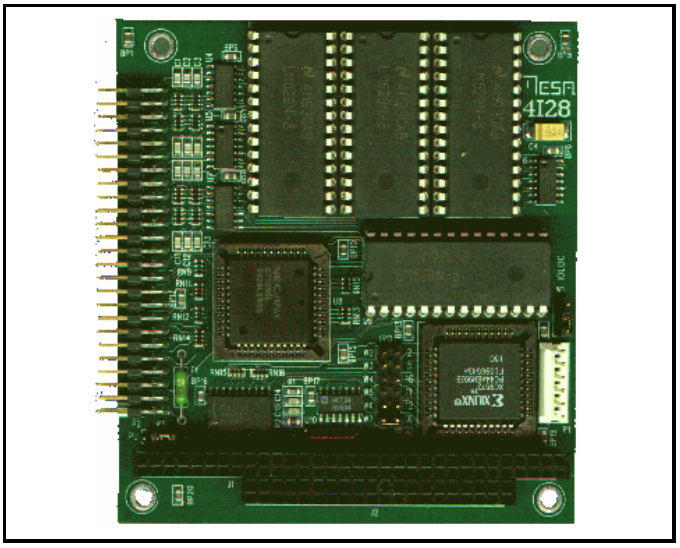
# MESA ELECTRONICS 4I28 MOTOR CONTROLLER

## FEATURES:

- **4 axis DC servo motor controller**
- **31 bit position range**
- **Programmable digital PID filter**
- **8 bit sign-magnitude PWM output**
- **Low Power (less than 1 watt)**
- **Position & velocity control modes**
- **4 axis H-bridge drivers available**
- **Small size**
- **2 year warranty**
- **Driver software included**




The 4I28 is a low cost, LM629 based 4 axis DC servo motor control system implemented on a stackable PC/104 bus card. The 4I28 is designed for high performance positioning systems using DC servo motors with quadrature shaft encoders. The per axis output of the 4I28 is an 8 bit sign-magnitude PWM signal that can drive H-bridge type servo amplifiers directly.

Quadrature encoder and index inputs are conditioned with RC filters and Schmitt triggers for noise immunity.

Sixteen general purpose I/O bits are available for any application use. The I/O bits are arranged as an eight bit I/O port and two four bit I/O ports port for flexibility

The LM629's used on the 4I28 are high performance digital processors specifically designed for motion control. The LM629 can execute a ramp-up, slew, and ramp-down sequence without processor intervention.

A digital PID filter is used to set loop feeback parameters for stability and optimum performance. Velocity, target position and filter parameters may be changed during motion

Host interrupts can be generated at end of motion, position breakpoints, index pulse, or in response to various error conditions. Interrupts are or'ed and maskable per channel on the 4I28 card, so that only one system interrupt is used. IRQs 5,9,10,11,12 line used can be used by the 4I28.

Demonstration software includes examples of 4 axis position mode operation, velocity mode operation, and a simple filter tuning program that allows dynamic filter coefficient modification while providing a graphic display of the servo system step response. Source code is provided for all demonstration software.

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**LM629 COMMAND SUMMARY:**

| | |
|---|---|
| Reset | Load Trajectory |
| Define Home | Start Motion |
| Set Index Position | Read Status Byte |
| Interrupt on Error | Read Signals Reg. |
| Stop on Error | Read Index Pos. |
| Set Breakpoint Absolute | Read Desired Pos. |
| Set Breakpoint Relative | Read Real Pos |
| Mask Interrupts | Read Desired Vel. |
| Reset Interrupts | Read Real Vel. |
| Load Filter Parameters | Read Integ. Sum. |
| Update Filter | |

(All commands may be executed during motion.)

**I/O CONNECTOR PINOUT:**

| PIN | FUNC | PIN | FUNC | PIN | FUNC |
|---|---|---|---|---|---|
| 1 | +5V | 18 | GND | 35 | IDX2 |
| 2 | BIT0 | 19 | A0 | 36 | ENA2 |
| 3 | BIT1 | 20 | B0 | 37 | PWM2 |
| 4 | BIT2 | 21 | IDX0 | 38 | DIR2 |
| 5 | BIT3 | 22 | ENA0 | 39 | GND |
| 6 | BIT4 | 23 | PWM0 | 40 | A3 |
| 7 | BIT5 | 24 | DIR0 | 41 | B3 |
| 8 | BIT6 | 25 | GND | 42 | IDX3 |
| 9 | BIT7 | 26 | A1 | 43 | ENA3 |
| 10 | BIT8 | 27 | B1 | 44 | PWM3 |
| 11 | BIT9 | 28 | IDX1 | 45 | DIR3 |
| 12 | BIT10 | 29 | ENA1 | 46 | GND |
| 13 | BIT11 | 30 | PWM1 | 47 | SEL0 |
| 14 | BIT12 | 31 | DIR1 | 48 | SEL1 |
| 15 | BIT13 | 32 | GND | 49 | SEL2 |
| 16 | BIT14 | 33 | A2 | 50 | SEL3 |
| 17 | BIT15 | 34 | B2 | | |

| **SPECIFICATIONS:** | **Min** | **Max** | **Units** | **Notes** |
|---|---|---|---|---|
| POWER REQUIREMENTS: | | | | |
| Supply voltage | 4.5 | 5.5 | V | |
| Supply current | ---- | 300 | mA | |
| I/O LOADING: (PWM,DIR,ENC,INDEX) | | | | |
| Input logic low | -.5 | .8 | V | |
| Input logic high | 2.0 | 5.5 | V | |
| Output low | ---- | .4 | V | 8 mA sink |
| Output high | 3.0 | ---- | V | 8 mA source |
| I/O LOADING: (82C55 I/O port) | | | | |
| Input logic low | -.5 | .8 | V | |
| Input logic high | 2.0 | 5.5 | V | |
| Output low | ---- | .4 | V | 2.5 mA sink |
| Output high | 3.0 | ---- | V | 2.5 mA source |
| ENVIRONMENTAL: | | | | |
| Temperature range -C version | -0 | +70 | °C | |
| Temperature range -I version | -40 | +85 | °C | |

ORDERING INFORMATION: MESA 4I28 Add -I for industrial temperature range

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