

Modicon Quantum automation platform

140 MSB 101 00 single-axis motion module for servomotors

Presentation

The 140 MSB 101 00 single-axis motion module is designed for applications with one axis requiring a strong integration with the sequential program of the machine. The analog output of this module can drive the speed reference of the Lexium MHDA servodrive, or any other servodrive with an analog interface. See characteristics on page 4/39.

The module, using encoder feedback input, receives a signal from an incremental encoder which represents the position of the machine axis. After calculation, this information, depending on the movement driven by the application program, delivers a speed reference of ± 10 V to the servodrive.

The 140 MSB 101 00 module is designed as follows:

- 8 digital inputs of 24 VDC, configurable in stops or in motion-specific functions. The inputs not used in the axis control application can be used as standard inputs for the application program.
- 3 outputs of 24 VDC and one ± 10 V analog output, which can be programmed as a real-time image of the internal parameters of the axis under control.

These inputs and outputs require an external 24 V power supply. The module includes a ± 10 V analog input.

The incremental encoder's multiplication of impulses is integrated in the 140 MSB 101 00 module, which accepts a second auxiliary encoder feedback signal as an image of the master axis.

The 690 MCB 000 00 breakout box allows connection between the 141 MSB 101 00 motion module and the Lexium MHDA servodrive, to simplify the system cabling.

Description

The 140 MSB 101 00 is comprised of:

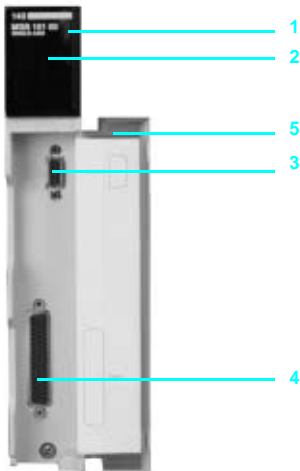
- 1 A rugged outer rugged shell ensures the following:
 - PCB card support.
 - closing and locking of module into position.
- 2 Module diagnostic LEDs, including a digital Modbus status indicator.
- 3 A SUB-D 9 connector for RS 232 Modbus link.
- 4 A SUB-D 50 port for connection to the servodrive.
- 5 A clear access door to hold the user label.

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| Operating characteristics | | | | |
|---------------------------|-------------------|---------------|---|------------------------------------|
| Axe | Type | | Automatic control of linear, rotary, or continuous axes Synchronization of master/slave speed and position | |
| | Number | | 1 real axis, 1 remote axis | |
| | Positioning range | Maximum | | 4 294 967 296 points (32 bits) |
| | | Units | | inches, mm or other units |
| | Speed | Range | | 1...4 294 967 296 points (32 bits) |
| | | Units | | counts/s, inches/s, mm/s, rpm... |
| | Update | Position loop | ms | 1 |
| Speed loop | | ms | 0.5 | |
| Motion | | | Homing, absolute, relative, or continuous movement 28 traversing programs 650 flash memory commands | |
| Controls | Environnement | | Encoder interface, position captures (stops) | |
| | Motion | | Logical stops, loop position control, point window | |
| Register words | | | 3 input words and 4 output words | |

| Electrical characteristics | | | | |
|---|----------------------------|-------------------------------|--|-----------------------------------|
| Encoder feedback (2 channels) | Incremental encoder | Type | Differential | |
| | | Voltage | V 5 ± 20 % | |
| | | Impedance | W > 500 at 5 V nominal | |
| | | Frequency x 1 | kHz 200 nominal, 500 maximum | |
| | | Frequency x 4 | kHz 2000 maximum (internal counting) | |
| | | Maximum system accuracy | | 0.5 arc/minute, encoder-dependent |
| Servo interface | Analogue outputs | Type | Bipolar | |
| | | Range | V + 10,24 | |
| | | Resolution | 11 bits + sign | |
| | Drive-enable output | Voltage | V 24 nominal, 30 maximum | |
| | | Current | mA 500 (resistive maximum under 30 V) | |
| Drive-fault input | | True high, 5 V TTL-compatible | | |
| I/O | Discrete inputs | Number | 7 | |
| | | Voltage | V 24 + 20 % | |
| | Discrete outputs | Number | 3 | |
| | | Voltage | V 24 + 20 % | |
| | | Current | mA 150 maximum | |
| | Analog inputs | Voltage | V ± 10.24 | |
| | | Resolution | 9 bits + sign | |
| | | Impedance | kΩ 30 | |
| | Analog outputs | Voltage | V ± 10.24 | |
| | | Maximum current | mA 3 | |
| | | Resolution | 11 bits + sign | |
| | High-speed input | Position capture time | ms 250 | |
| | | Pulse width | ms 25 | |
| | | Time between two captures | ms 20 minimum | |
| | OT inputs | | Dry contact | |
| | Communication ports | Serial ports | Type | RS 232 D |
| | | | Protocol | Modbus slave |
| Baud rate | | | Bits/s 300...9600, software selectable | |
| Power requirements | From the backplane | | V 5 V - 1000 mA | |
| | External (power process) | | V 24 V + 20 % at - 500 mA max (for auxiliary I/O) | |

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References

All types of Quantum CPUs support the 140 MSB 101 00 single-axis motion module. The module performs the same regardless of rack selected (primary, RI/O, or DI/O).



140 MSB 101 00

| Designation | For | Encoder inputs | Functions | Reference | Weight kg |
|--|---------------------------------|--------------------------------------|---|-----------------------|-----------|
| Motion module for one controlled axis | Servodrive via analog reference | 2 encoder inputs --- 5 V, 500 kHz | Closed-loop control of linear, rotary and continuous axes. Synchronization of master-slave axes. | 140 MSB 101 00 | 0.450 |

Connection accessories

| Designation | Use | No. (1) | Reference | Weight kg |
|-------------------------|---|----------|-----------------------|-----------|
| Breakout box (2) | Connection between the 141 MSB 101 00 module and the servodrive: speed reference, auxiliary I/O, and simulated encoder feedback | 3 | 690 MCB 000 00 | – |

Connector cables

| Designation | Use | No. (1) | Length | Reference | Weight kg |
|------------------------|---|----------|--------------|-----------------------|-----------|
| Supplied cables | Connection between the 140 MSB 101 00 module and the 690 MCB 000 00 breakout box. Cable comes with SUB-D 50 connectors on each end. | 4 | 0,3 m (1 ft) | 690 MCI 000 01 | – |
| | | | 0,9 m (3 ft) | 690 MCI 000 03 | – |
| | | | 1,8 m (6 ft) | 690 MCI 000 06 | – |
| | Connection between the breakout box 690 MCB 000 00 and Lexium MHDA servodrive (simulated encoder feedback). Cable comes with SUB-D 9 connector on one end | 5 | 6 m (20 ft) | 690 MCI 002 06 | – |

Configuration software

| Designation | Description | Reference | Weight kg |
|--|---|--------------------|-----------|
| MMDS configuration and programming software | Configuration and programming software for the 140 MSB 101 00 motion module Use with ProWORX 32 or Concept | SW MMDS 1DB | 0.525 |

(1) See page 4/41 for key.

(2) For **CE** conformity, you must order the breakout box field wiring kit (690 MCB 101 00).

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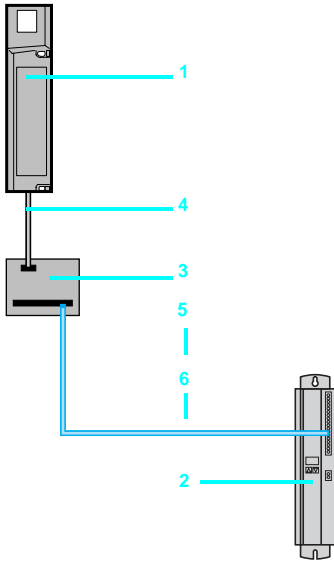
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Connections

- 1 140 MSB 101 00: single-axis motion module 140 MSB 101 00.
- 2 MHDA 1●●●N00/A00: Lexium servodrive for Lexium SER or BPH motor.
- 3 690 MCB 000 00: breakout box (speed reference, auxiliary I/O, and simulated encoder feedback).
- 4 690 MCI 000 0●: breakout box cable (0● indicates cable length).
- 5 690 MCI 002 06: cable with connector for simulated encoder feedback.
- 6 Cable (not included; flying lead cable with connections to terminal strips on each end).

