DSP7000 SERIES
PROGRAMMABLE CONTROLLER

FEATURES

▪ DSP7001 Single Channel: Low cost and easy to use
▪ DSP7002 Dual Channel: Enables the support of two testing instruments with independent or tandem configurations and two fully independent control loops
▪ Built-in Alarm System: For power, speed, torque, temperature, air flow, water flow, electrical overload and external inputs
▪ High Speed Data Acquisition: Up to 500 torque and speed points per second of both channels with time stamp
▪ High Quality, Easy-to-Read Vacuum Fluorescent Readout: Displays torque, speed, power, auxiliary and PID (proportional gain, integral and derivative) values
▪ Fast Full-Curve Data Acquisition: Free-run to locked rotor in seconds
▪ Speed & Torque Operating Modes: PID settings for exceptional dynamometer control
▪ Programmable Digital PID Values: Controlled and stored via M-Test Software or controlled manually
▪ Built-in Current-Regulated Supply: For use with Hysteresis Dynamometer or brakes up to 1amp
▪ Adjustable Torque Units: English, Metric and SI are standard
▪ Digital Filter: Removes undesired noise from torque signals
▪ Saving: Currently used configuration can be saved and recalled at power up
▪ Single or Multi-point Torque and Speed Stabilized Testing: Via M-TEST 7.0 Software
▪ Closed Box Calibration
▪ Rack Mounting: 19" (482.6 mm) with handles
▪ Backwards Compatible: Compatible with the DSP6001 (in DSP6001 mode)
▪ HD5 dynamometers: Supported
▪ USB: Standard
▪ Low RPM: calculation from angle (quadrature signal) and time designed to capture RPM’s as low as .001 RPM
▪ Position Measurement: Two quadrature decoders

OPTIONS

▪ Interfaces: RS-232 and IEEE-488
▪ I/O card accessible programmatically (LabVIEW™, Visual C)

DESCRIPTION

Magtrol’s Model DSP7000 High Speed Programmable Dynamometer Controller employs state-of-the-art Digital Signal Processing Technology to provide superior motor testing capabilities. Designed for use with any Magtrol Hysteresis, Eddy-Current or Powder Dynamometer, Magtrol In-Line Torque Transducer or auxiliary instrumentation, the DSP7000 can provide complete PC control via the USB or optional IEEE-488 or RS-232 interface. With up to 500 readings per second, the DSP7000 is ideally suited for both the test lab and the production line.

APPLICATIONS

In the laboratory, the DSP7000’s high sample rate provides superior resolution for data acquisition and curve plotting. This allows for capturing more usable motor test data during switching, breakdown and other transitional areas of the motor test curve. For production and incoming inspection, the DSP7000 displays torque, speed and power at all times, allowing the Controller to be used as a manual stand alone unit or as part of a complete PC system.
MOTOR TESTING SOFTWARE

Magtrol’s M-TEST 7 Software (sold separately) is a state-of-the-art motor testing program for Windows®-based data acquisition. Used with the Magtrol DSP7000 Controller, Magtrol M-TEST 7 Software provides the control of any Magtrol Dynamometer and runs test sequences in a manner best suited to the overall accuracy and efficiency of the Magtrol Motor Test System. The data that is generated by Magtrol’s Motor Testing Software can be stored, displayed and printed in tabular or graphic formats, and can be easily imported into a spreadsheet.

Written in LabVIEW™, M-TEST 7 has the flexibility to test a majority of motor types in a variety of ways. Because of LabVIEW’s versatility, obtaining data from other sources (e.g. thermocouples), controlling motor power and providing audio/visual indicators is relatively easy.

Magtrol’s M-TEST 7 Software is ideal for simulating loads, cycling the unit under test and motor ramping. Because it is easy to gather data and duplicate tests, the software is ideal for use in engineering labs, production testing and incoming/outgoing inspection.

SPECIFICATIONS

<table>
<thead>
<tr>
<th>MEASUREMENT CHARACTERISTICS</th>
<th>DIMENSIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Torque</td>
<td>99,999 units</td>
</tr>
<tr>
<td>Max. Speed</td>
<td>199,999 rpm</td>
</tr>
<tr>
<td>Accuracy</td>
<td>Speed: 0.01% of reading from 5 rpm to 200,000 rpm (used on all HD Series other than HD5 Series)</td>
</tr>
<tr>
<td></td>
<td>Torque: 2 volt range ± 0.05% of range (±1 mV) (used on all except HD Series)</td>
</tr>
<tr>
<td></td>
<td>10 volt range ± 0.05% of range (±5 mV) (used on all except HD Series)</td>
</tr>
<tr>
<td>MEASUREMENT CHARACTERISTICS</td>
<td>ELECTRICAL CHARACTERISTICS</td>
</tr>
<tr>
<td>Voltage Requirements</td>
<td>85-264 VAC 50/60 Hz</td>
</tr>
<tr>
<td>Power Requirements</td>
<td>210 VA</td>
</tr>
<tr>
<td>Fuses (5 × 20 mm)</td>
<td>Brake: IEC .25 A 250 V T</td>
</tr>
<tr>
<td></td>
<td>Main Power: IEC 2.5 A 250 V T</td>
</tr>
<tr>
<td>Max. Compliance Voltage</td>
<td>48 VDC, Brake Output</td>
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<tr>
<td>Max. Brake Output Current</td>
<td>1 Amp, Calibrated that 100% OL = 1 Amp</td>
</tr>
<tr>
<td>TSC1 and TSC2 User Power Supplies</td>
<td>24 Volt DC 450 mA (power supply fault protected)</td>
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<tr>
<td></td>
<td>5 Volt DC 200 mA (internal fuse at 500 mA)</td>
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<tr>
<td>ENVIRONMENT</td>
<td></td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>5 ºC to 40 ºC</td>
</tr>
<tr>
<td>Relative Humidity</td>
<td>&lt; 80%</td>
</tr>
<tr>
<td>Temperature Coefficient</td>
<td>0.004% of range/°C of 5 VDC for both channels</td>
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</table>

Optional equipment may be factory installed or purchased separately and user installed.
OPTIONAL EQUIPMENT

COMMUNICATIONS

RS-232 Interface
The RS-232 Interface provides backwards compatibility for older systems. 300, 600, 1200, 2400, 4800, 9600, 19200 and 115200 Baud rates are supported.

GPIB IEEE-488 Interface
The GPIB IEEE-488 Interface provides standard GPIB communications.

I/O CARD

- Torque/Speed Analog Outputs: For interface with a data acquisition system
- Analog Signal such as tachometer can be routed to PID loop
- External alarm input
- Alarm relay contacts
- 2 Relays
- 3 Digital inputs
- 2 Digital outputs
- 2 Analog inputs
- 2 Analog outputs
- 5 Volts available to user fused at 500 mA. Nominal 200 mA
- All I/O data can be accessed by LabVIEW™

FRONT PANEL

Displays Torque, Speed, Power and PID Values
Ready for Rack Mounting
Select Display Format
Setup Menu/Open Loop Mode
Set Desired Power Units/Brake on/off
Set Desired Torque Units/Set Point Torque
Speed Control/Set Point Speed
PID Scale/Adjustable PID (Proportional Gain, Integral and Derivative)
Tare
Reset Tare
REAR PANELS

For use with any Magtrol Dynamometer (Hysteresis, Eddy-Current, Powder Brake), Magtrol Torque Transducer

Optional I/O Card

Connector for Model DES Power Supplies (for WB/PB and HD 825 Dynamometers only)

USB (standard) and Optional GPIB/IEEE-488 Interface or RS-232 Interface for Connection to PC (GPIB Shown)

DSP7001 REAR PANEL

For use with any Magtrol Dynamometer (Hysteresis, Eddy-Current, Powder Brake), Magtrol Torque Transducer

Optional I/O Card 1 and I/O Card 2

Connectors for Models DES Power Supplies (for WB/PB and HD 825 Dynamometers only)

USB (standard) and Optional GPIB/IEEE-488 Interface or RS-232 Interface for Connection to PC (GPIB Shown)

DSP7002 REAR PANEL
SYSTEM CONFIGURATIONS

DSP7001 CONNECTED TO HYSTERESIS DYNAMOMETER

DSP7001 CONNECTED TO A HYSTERESIS OR EDDY-CURRENT/POWDER BRAKE WITH IN-LINE TORQUE TRANSDUCER

DSP7002 CONNECTED TO HYSTERESIS DYNAMOMETER WITH IN-LINE TORQUE TRANSDUCER
SYSTEM CONFIGURATIONS

DSP7002 CONNECTED TO HYSTERESIS DYNAMOMETER AND EDDY-CURRENT OR POWDER BRAKE DYNAMOMETER

DSP7002 CONNECTED TO EDDY-CURRENT OR POWDER BRAKE DYNAMOMETER (WB/PB) WITH IN-LINE TORQUE TRANSDUCER

DSP7002 CONNECTED TO 2 EDDY-CURRENT OR POWDER BRAKE DYNAMOMETERS (INDEPENDENT SETUP)
SYSTEM CONFIGURATIONS

DSP7002 CONNECTED TO 2 EDDY-CURRENT OR 2 POWDER BRAKE DYNAMOMETERS
(TANDEM SETUP)

DSP7002 CONNECTED TO EDDY-CURRENT AND POWDER BRAKE DYNAMOMETER
(TANDEM SETUP)

The USB Driver required for communication between the PC and DSP7000 is available for
download at Magtrol’s website:

www.magtrol.com/support/downloads.html
CUSTOM MOTOR TEST SYSTEM

HD Series Hysteresis Dynamometers can be incorporated into a Customized Motor Test System. These PC based, turn-key systems are custom designed and built to meet specific user requirements.
ORDERING INFORMATION

DSP7001  High-Speed Programmable Dynamometer Controller - single channel
DSP7002  High-Speed Programmable Dynamometer Controller - dual channel

MODEL NUMBER  DSP700_ - _ - _

Channel Type
1 : Single Channel
2 : Dual Channel

Communications Options
0 : none (standard USB)
1 : USB port and GPIB
2 : USB port and RS-232

I/O Options
0 : none (standard)
1 : I/O card in slot 1 (7001)
3 : I/O card in slot 1 and 2 (7002)

SYSTEM OPTIONS AND ACCESSORIES

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>DESCRIPTION</th>
<th>MODEL/PART #</th>
</tr>
</thead>
<tbody>
<tr>
<td>TESTING DEVICES</td>
<td>Hysteresis Dynamometers</td>
<td>HD Series</td>
</tr>
<tr>
<td></td>
<td>Eddy-Current Dynamometers</td>
<td>WB Series</td>
</tr>
<tr>
<td></td>
<td>Powder Brake Dynamometers</td>
<td>PB Series</td>
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<tr>
<td></td>
<td>In-Line Torque Transducers</td>
<td>TM Series</td>
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<tr>
<td>POWER ANALYZERS</td>
<td>High-Speed Single-Phase Power Analyzer</td>
<td>7510</td>
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<td>High-Speed Three-Phase Power Analyzer</td>
<td>7530</td>
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<tr>
<td>SOFTWARE</td>
<td>M-TEST 7 Motor Testing Software</td>
<td>M-TEST 7</td>
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<td>POWER SUPPLIES</td>
<td>Power Supply</td>
<td>5200</td>
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<td>Current-Regulated Power Supply</td>
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<td>Power Amplifier (required for HD-825 Dynamometer only)</td>
<td>5241</td>
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<td>Power Supply for WB &amp; PB Dynamometers</td>
<td>DES 410 &amp; DES 411</td>
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<tr>
<td>MISC.</td>
<td>Torque/Speed Conditioner (required for connecting WB/PB Series Dynamometers to DSP6001)</td>
<td>TSC 401</td>
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<td>Temperature Testing Hardware</td>
<td>HW-TTEST</td>
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<td>CARDS &amp; CABLES</td>
<td>GPIB Interface Card (PCI)</td>
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<tr>
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<td>GPIB Cable, 1 meter</td>
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<td>GPIB Cable, 2 meters</td>
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<td>Torque Transducer Connector Cable</td>
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<td>DSP7000 GPIB Card</td>
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<td>DSP7000 RS-232 Card</td>
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<td>DSP7000 I/O Card</td>
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