



MODEL 16MS MICROSCANNER

- Smallest Size Scanner
- Highest Scan Rate
- DTC Interface Compatible
- Conventional Compatible
- CAN Bus Compatible
- Ethernet Bus Compatible

Features

- Small Size
- High Scan Rate
- DTC Interface
- CAN Bus Compatibility
- Ethernet Compatibility

Applications

- Windtunnel Testing of Flaps and Slats
- Transient Data Acquisition
- High Accuracy, Excellent Temperature Compensation
- F1 and Automotive Testing
- Direct Data Bus Connection

The 16MS MicroScanner is the evolution of the Pressure Systems ESP Scanners to provide pressure scanning capability in previously inaccessible locations. Utilizing proprietary DTC Digital Temperature Compensation technology, each MicroScanner is factory calibrated to compensate for non-linearity and temperature errors. The result is a highly accurate measurement with minimal thermal errors. Optional dual range calibration provides two ranges of operation to increase measurement sensitivity, expand testing conditions, and reduce user inventory management.

The MicroScanner is automatically identified at power up and is compatible with factory data systems like Initium, Optimus, 8400, and FDS Flight Data System. Numerous third party integrators provide compatible data systems.

F1 and Automotive Testing

Direct Data Bus Connection

Theory of Operation

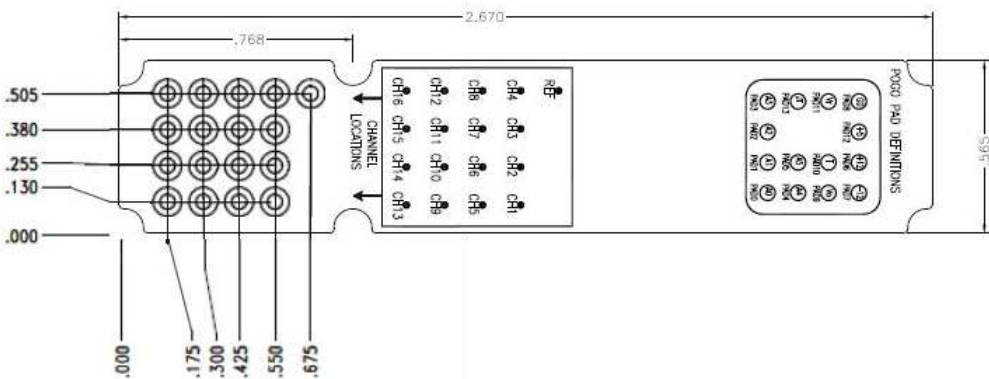
The MicroScanner is a pressure scanner with silicon pressure sensors that receive pneumatic pressure signals applied via direct connection to the test object or via flexible tubing into bulged tube connections on the associated Electric Manifold. The pressure signals are multiplexed and amplified to provide high level DC analog signal to an associated data system. The data system can be a Pressure Systems Optimus, Initium, FDS-Initium or 8400 System Processor. Alternatively third party integrators with DTC compatible data systems can also be used. The MicroScanner is compatible with CAN Bus or Ethernet digital data directly compatible data systems through capable third party integrator Electric Manifolds Interfaces.

Pressure System's Electric Run Manifold is attached to the MicroScanner with six screws incorporating O-rings to provide the pneumatic interface and spring loaded pogo-pins to provide the electrical interface. During normal operation the run manifold is used, providing 16 dedicated pressure input connections and one common reference connection. The reference connection can be left open to atmosphere for gauge pressure measurements or connected to a specific point for differential pressure measurements. The reference pressure connection can also be used to provide a verification pressure from an external pressure source to confirm proper operation before test. Measurement accuracy is maintained using the re-zero calibration, is required before test which is accomplished via software commands when the scanner is in a wind-off condition where zero differential pressure exists between the measurement ports and the common reference connection. At six month intervals a span calibration is required to maintain stated accuracy. For this purpose a calibration version of the Electric Manifold can be used. That unit has one pressure connection which reaches all sixteen measurement ports and one reference connection. Span calibration uses one or more pressures to update the single and unique span coefficient of each pressure sensor. The span calibration can be performed with atmospheric pressure on the reference port, or at an elevated reference pressure to simulate conditions within pressurized windtunnels.

The MicroScanner uses the unique Pressure Systems DTC Digital Temperature Compensation technology. DTC technology is widely employed within the ESP family of pressure scanners. Factory calibration over the full pressure and temperature operating range generates a 24 coefficient correction for each of the measurement ports. The coefficients are stored in non-volatile memory within the pressure scanner. Compatible data systems extract and utilize these coefficients to provide highly accurate data by automatically correcting for non-linearity and temperature sensitivity of each pressure sensor. For compatibility with older non-DTC data systems the MicroScanner can also be operated as a Conventional Scanner, the term for a scanner which does not have the DTC capability. There is a reduction in accuracy and the temperature compensation, so such operation should be restricted to thermally stable test conditions.

Dual Range Calibration is an optional feature that uses factory calibration and both normal range operation and sensitive range operation. For dual range operation the scanner is commanded to increase the gain of the amplifier and use separate calibration information to operate accurately at a reduce pressure range. This feature is often used for multiple test configurations during one windtunnel test without needing to change the pressure scanner and perform separate tests. Dual Range pressure scanners can also reduce inventory management by providing one scanner capable of performing all the testing at specific facilities.

Electrical and Pneumatic Connection



PAD	Function
POGO0	A0_IN
POGO1	A1_IN
POGO2	A2_IN
POGO3	A3_IN
POGO4	A4_IN
POGO5	A5_IN
POGO6	+12VIN
POGO7	-12VIN
POGO8	GNDBA
POGO9	VOUT
POGO10	TS_VTEMP
POGO11	Vref
POGO12	+5VIN
POGO13	JTAGEN_IN

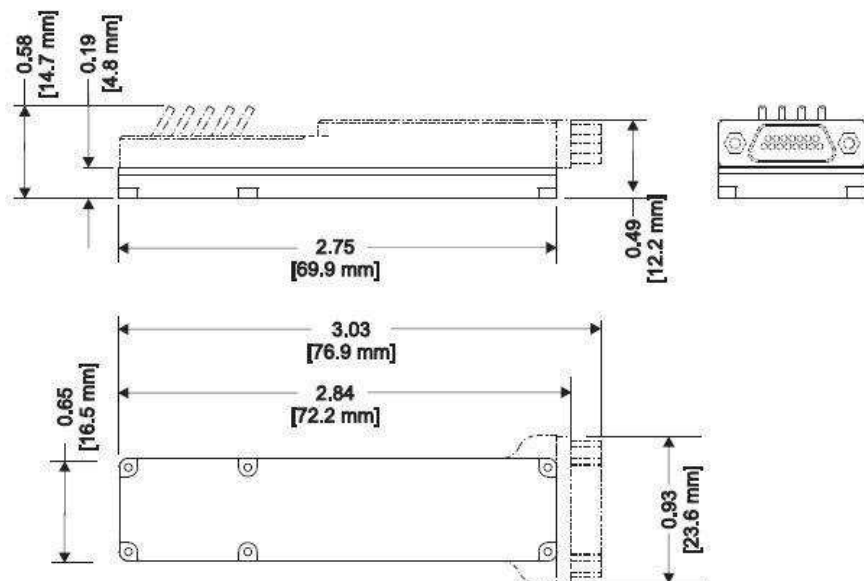
Performance Specifications

PERFORMANCE SPECIFICATIONS - MICRO SCANNER				
PARAMETER	MICROSCANNER 16 DTC OPERATION	MICROSCANNER 16 CONVENTIONAL OPERATION	UNITS	COMMENTS
Number of Pressure Inputs	16	16	Ports	
Throughput In Engineering Units	2000	2000	Hz	Per Port/ Single Point
Throughput In Binary	6250	6250	Hz	Per Port/ Single Point
Scan Rate	100,000	100,000	Hz	Port to Port
Resolution	0.003	0.003	% FS	Noise Floor Analysis
Static Accuracy at Full Range -12 to +15 psid	±0.05	±0.10	% FS	32 averages
Static Accuracy at 33% Range -5 to +5 psid	±0.10	N/A	% FS	32 averages
Thermal Stability Full Range	±0.002	±0.25	% FS	Per °C
Proof Pressure	60	60	psid	
Maximum Reference Pressure	50	50	psid	
Line Pressure Effect	±0.001	±0.001	% FS	Per psi
Media Pressure Port				Non Corrosive Gas up to 100% Humidity
Media Reference Port				Non Condensing
Pneumatic Connection				Non Corrosive Gas 0.040" bulged tubes ¹
Power	+12 VDC -12 VDC +5 VDC	+12 VDC -12 VDC +5 VDC		at 25 mA at 5 mA at 6 mA
Pressure Full Scale Output Standard Interface	±4	±4	VDC	Nominal
Pressure Full Scale Output CAN Bus or Ethernet Interface	±3	±3	VDC	Nominal
Electrical Connection				15 pin MDM Socket ¹
Compensated Temp Range	0-100	0-100	°C	
Operating Temp Range	-20 to +100	-20 to +100	°C	
Storage Temp Range	-25 to +100	-25 to +100	°C	
Vibration	10	10	g	15-2000 Hz
Weight	2	2	Ounces	Scanner and Manifold
Dimensions	2.75 x 0.645 x 0.150 3.03 x 0.930 x 0.580		In	L x W x H L x W x H ¹

Notes:

1. If used with Electric Run or Calibration Manifold

Drawings



Ordering Information

16MS-0702001100	MicroScanner, 16 ports, direct connect, pogo-pad interface, single range cal
16MS-0702001200	MicroScanner, 16 ports, direct connect, pogo-pad interface, dual range cal
16MS-EMR0020000	Electric Manifold, run manifold, 0.040" 60 degree tubes, 15 pin d-shell connector
16MS-EMC0020000	Electric Manifold, cal manifold, 0.040" 60 degree tubes, 15 pin d-shell connector

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