# ZMI 4004 Measurement Board

<table>
<thead>
<tr>
<th>P/N</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>8020-0102-11</td>
<td>4 axes, VME 6U board</td>
</tr>
</tbody>
</table>

## General
- **Maximum Number of Boards in a System**: 16 (64 axes); there may also be limits due to VME or P2 population
- **Reference Inputs**: ST fiber optic or HSSDC2 electrical
- **Reference Outputs (2 per board)**: HSSDC2 electrical
- **Measure Inputs (1 per axis)**: ST fiber optic
- **Signal Strength Test Points (1 per axis)**: RJ-11 connector
- **Status Indicators (LEDs)**: Green – meas present (1 per axis), ref present, User LED; Amber – meas error (1 per axis), ref error, Config.

## Power Requirements
- **Minimum Input Optical Power**: > 1.0 µW AC (per axis)
- **Maximum Input Optical Power**: ~76 µW AC (per axis)

## Cooling Requirements (Typical)
- **30°C**: 250 linear fpm
- **40°C**: 400 linear fpm
- **50°C**: 600 linear fpm

## Compliance
- **VME**: VMEbus specification ANSI/VITA 1-1994
- **Type**: VME64X
- **Addressing**: A24
- **Data Transfer**: D16 or D32
- **P1 and P2 Connectors**: 160-pin DIN
- **Other**: UL94V0, CE Mark (Emissions EN 55011A, Immunity EN 50082-1, Low Voltage Directive EN 61010-1, tested inside CE Mark compliant chassis)

## Performance
- **Position Resolution**: \( \frac{\lambda}{4096} \) (0.15 nm)
- **Position Range**: ± 10.6 m
- **Position Format**: 37 bit - 2's complement
- **Time Stamp Resolution**: 25 nanoseconds
- **Maximum Velocity**: 2.55 m/s
- **Maximum Acceleration**: 100 g (0.1 g max. during reset)
- **Data Age (P2 output)**: 1 µs typical
- **Data Age Uncertainty, Uncompensated**: ± 6 ns (axes on any one board) ± 30 ns (15 boards, any axis to axis)
- **Data Age, Uncertainty, Factory Compensated**: ± 0.2 ns (axes on any one board) ± 1.0 ns (any axes including maximum of 3 calibrated reference jumpers)
- **Accuracy**: \( \sigma \leq 1.0 \) LSB at 0 m/sec \( \sigma \leq 1.2 \) LSB at ± 1.27 m/sec \( \sigma \leq 1.4 \) LSB at ± 2.55 m/sec
- **Noise**: \( \sigma \leq 3 \) LSB (3σ)
- **Temperature Coefficient**: < 1 LSB per °C

## Environmental
- **Operating Temperature**: 10 to 50°C
- **Operating Humidity**: 0 to 90%, noncondensing
- **Operating Pressure**: Standard 1 atmosphere (700-800 mmHg), non-vacuum applications

(1) Based on double pass interferometer.
(2) 1.0 µW into measurement board receiver, specified at filter settings of Kp = -6, Kv = -15.