

# RPI20 parallel interface

This data sheet contains an overview and specification of the Renishaw RPI20 parallel interface.

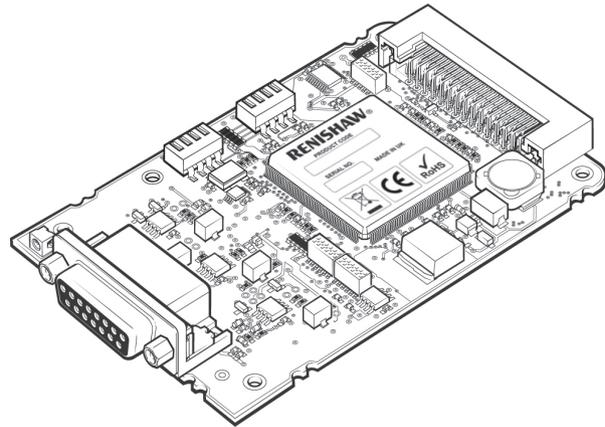
The RPI20 accepts differential analogue 1 Vpp sine/cosine signals, interpolates by 4096 and provides an output in parallel format with up to 36-bits of position data being available.

When used in combination with a double pass plane mirror interferometer system (PMI) (fundamental period of sinusoids is nominally 158 nm), this results in an LSB of 38.6 picometres at velocities of up to 1 m/sec.

The system architecture comprises a daughter board and 'industry standard' (VME) interface motherboards specifically designed to accommodate docking of either one or two (format dependent) daughter boards.

For multi-axis bus based architectures, the daughter board contains switches which allow each board to be assigned a unique address extending capability to up to seven axes. Additional switches enable selection of the LSB value and the direction sense to be changed.

Each daughter board contains four 36-bit wide addressable registers providing access to position, status and control information.



In the VME configuration, no connection is required to the P1 (VME interface) connector; all functions are accessed through the P2 connector.

Data timing is as shown in the timing diagram overleaf.

## Parallel interface performance

Resolution	38.6 pm (double pass plane mirror interferometer - PMI) 77.2 pm (single pass retroreflector interferometer - RRI)	
Maximum velocity	1 m/s (double pass plane mirror interferometer - PMI) 2 m/s (single pass retroreflector interferometer - RRI)	
Maximum update rate	4 MHz (single axis) 2.86 MHz (dual axis) 2.22 MHz (three axis) Each additional axis will require a further 100 ns to read, assuming each axis is read in turn	
Data age uncertainty	<±10 ns	
SDE contribution (PMI)	<±0.5 nm (low bandwidth, velocities <50 mm/sec) >70% <120% signal strength <±2 nm (full bandwidth, velocities <1 m/sec) >50% <120% signal strength	
User configurable features	Base address selection LSB value (available selections with double pass PMI 38.6, 77.2, 154.4, 308.8 pm) Direction sense	
Power supply required	5 V @ <500 mA for each parallel interface daughter board	
Connections	15-way D-type (interferometer/encoder input) (female on RPI20) 60-way JAE connector (36-bit parallel data) (male on RPI20)	
Operating environment		
Pressure	650 mbar to 1150 mbar	Normal atmospheric
Humidity	0% to 95% RH	Non-condensing
Temperature	10 °C to 40 °C	
Dimensions	110 mm x 72 mm (4.33 inches x 2.83 inches)	

