

Remote isolated analogue measurement system

The circuit shown provides a method of remotely measuring an analogue signal from a 3V logic controller using low cost and readily available parts. The analogue system is isolated from the digital processing circuit for two reasons, firstly to minimise EMI pick-up on the cable and secondly to prevent digital noise break through affecting the analogue measurement. Using a transformer isolator/translator at the logic control (1636) also provides a simple method of interfacing between 3V and 5V systems without any other voltage or signal translation necessary.

The analogue measurement system is based around the ZN509 8bit ADC, this is set to continuous conversion mode by tying the chip select line low (CS). The rate of conversion is set via the external 220pF capacitor, this value producing approximately 1MHz on-chip clock frequency. The converter sends a negative going status pulse after each conversion cycle, hence sequencing of the host controller can be done from this signal. In between each status signal are the 8 data bits, MSB first. The data signals could saturate the transformer isolator if a long sequence of '1' bits was present or a continuous 50percent duty cycle data stream, hence an edge detector circuit is used to transmit the data as a sequence of narrow (100nsec) pulses.

At the logic control side the interface is extremely simple, a D-type flip-flop is used to regenerate the edge triggered data signal and a simple inverter buffer is used to interface between the trans-

former isolator and the status line.

The system offers several advantages for remote analogue measurement, firstly the analogue converter is asynchronous to the controller, hence can be converting while the controller is performing other processing functions. The whole system can be easily switched off to conserve power via a transistor switch to the NME0312D DC-DC converter, hence measurements can be made occa-

sionally and power is only used when necessary to make a measurement. Using transformer isolators rather than opto-isolators also conserves power as negligible current is transmitted between systems over the signal lines, with an opto-isolated scheme a 20mA pulse is usually required for switching. The total system power consumption is under 750mW for the complete circuit when operating with a 1MHz on-chip clock. *Martin O'Hara, Milton Keynes*

