Task Example

Video Matrix Software for CCTV application

Phasor Design

Task Outline

Phasor Design were commissioned by a CCTV company to prepare the embedded software solution for their video crosspoint matrix. Together, with the client's hardware engineers, we were asked to arrive at a very compact solution in a very short timescale. The existing serial control protocols had to be adhered to, so that the new matrix would be fully backward compatible with the existing technology.

Background

A single chip solution to the requirement for a 16 x 16-video crosspoint matrix had recently become available in the form of the MAX4356 128 pin device. See the following link for details.

http://datasheets.maxim-ic.com/en/ds/MAX4356.pdf

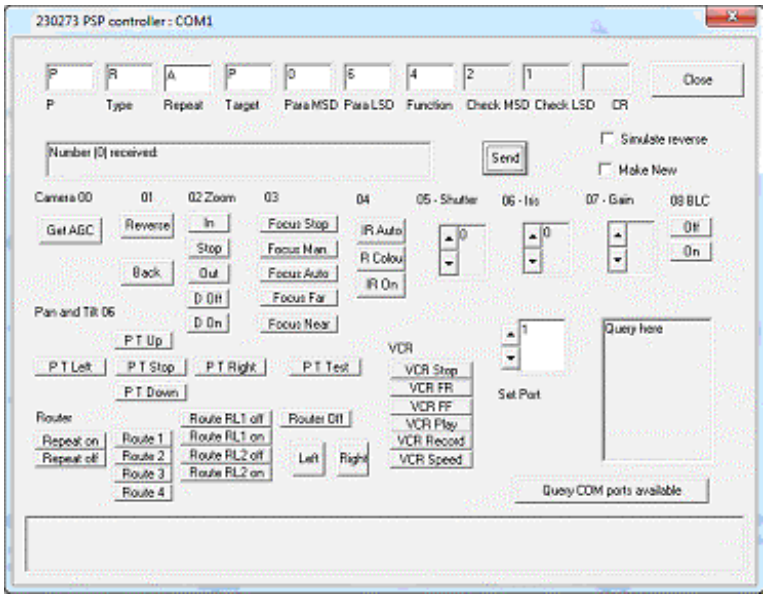
This device requires control via Serial Peripheral Interface Bus (SPI) with a sixteen-bit word in individual output address mode. In addition to control of the matrix, a total of ten serial ports were required plus an auxiliary diagnostic port.

The Solution

The very large amount of input and output ports required suggested the use of the 80-pin PIC24FJ128GA108 device. This is a sixteen-bit microcontroller with 44,032 words of flash memory. It is important to note that 128k bytes of memory (indicated by the part number) translates as 44,032 words (of three bytes each). 23% of the available memory was consumed by the completed and verified code, and 40% of data space was utilised. For details of this device follow the link:

http://ww1.microchip.com/downloads/en/DeviceDoc/39905e.pdf

C language code was compiled with the HiTech DSPICC C compiler and verified using a specially written PC application that emits serial messages in the format required. Pictured below.



Conclusions

Phasor Design very rapidly prepared C code to implement a solution to the requirement for a video crosspoint matrix based the MAX4356 device. The microcontroller operated a very large number of serial communications ports, and verification software for the PC was developed at the same time. This task was carried out as part of a team together with the engineers at the client company who performed hardware and mechanical design in a very short period.

Acknowledgements

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