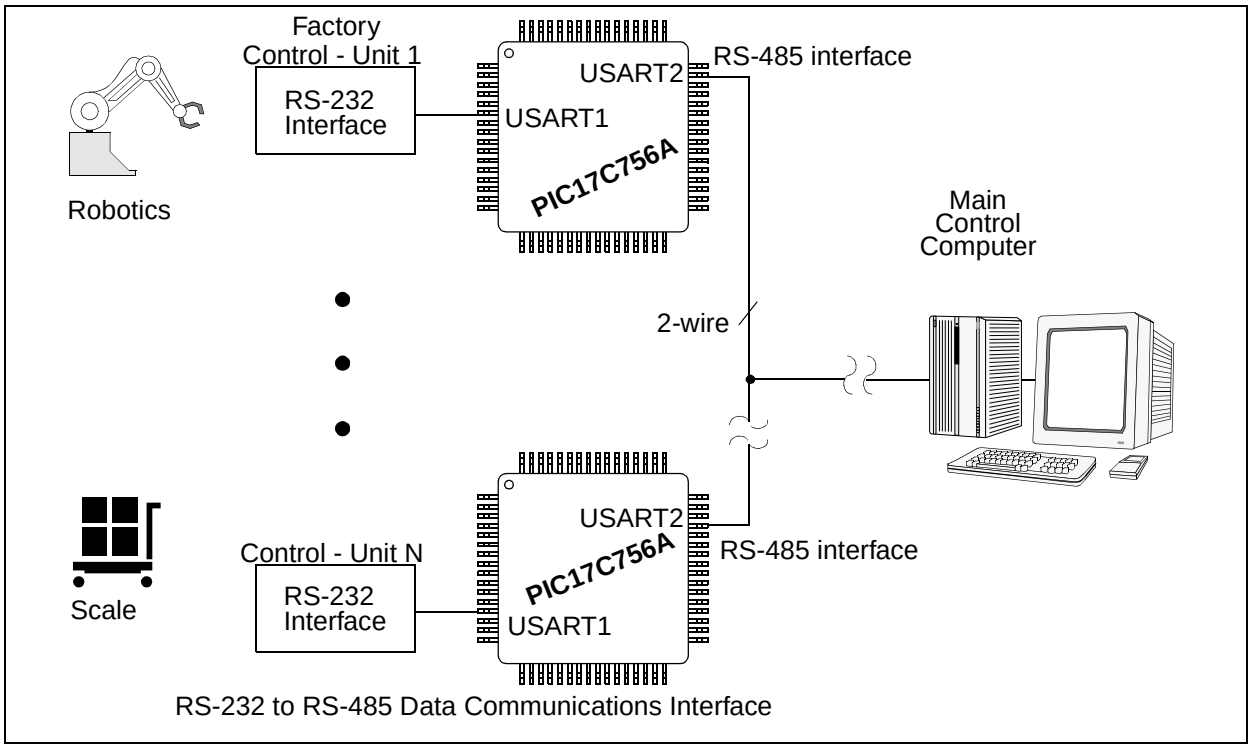
Multi-Node Serial Interface Application Brief



APPLICATION DESCRIPTION

RS-232 is an industrial standard serial interface link and almost all control systems in the industrial field are equipped with this interface. However, RS-232 has severe limitations on distance and speed throughput. Normally, at 9600 baud, the length of the link cannot be greater than 100 foot. Another problem is connecting multi-nodes to one computer system for central control. RS-232 was not designed for daisy-chaining, but the RS-485 was.

Each control unit is connected on the RS-232 side to the PIC17C756A's USART1. The second USART is connected via a RS-485 hardware interface to the a dual wire, multi-node communication interface. This is then linked to the central computer. The central computer acts as a single master requesting information from the multiple slave unit thus avoiding conflicts in the communications. The control information is also addressed in this similar manner.

The PIC17C756A's dual USART is a necessity for this application. Also the PIC17C756A's throughput is fast enough for it to handle the communication protocol which is required for the whole system to work properly. Lastly, the two PWM outputs can be used to provide the high voltage and negative voltage required for the RS-232 link to the control unit.

PIC17C756A Market: Industrial Automation/Process Control

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System Requirements

System Requirements	PICmicro™ MCU Applicability
Connect multiple RS-232 lines to one controller computer over a long (> 100 ft.) factory line	• Dual USART: One USART connected to control unit's RS-232 interface; second USART connected to a 2-wire RS-485 interface, which is also linked to the central computer
Fast communication protocol	• Throughput to handle software protocol for RS-485 interface
Need high voltage and negative voltage for RS-232 to control system link	• Two PWM outputs generate on-chip high voltage and negative voltage

Related Applications

- Centralized Monitoring of Security Systems
- Multi-Drop Data Acquisition Monitoring Systems

PIC17C756A Features

Performance	Peripherals	Power	Package
✔ DC - 33 MHz	4 Captures (16 bit)	BOR	DIE
✔ Program Memory: 16K internal, 64K external	✔ 3 PWM (10 bit)	< 1 μA Standby Current	✔ 64/68 pin
✔ Data Memory: 902 bytes	4 Timers	✔ Low Voltage Capability - see the PIC17C75X Data Sheet for details (DS30264A)	
✔ Single Cycle Instructions	✔ 2 USARTs		
✔ 8 x 8 Single Cycle Multiply in 121 ns	10-bit A/D (12 channel), < ± 1LSb error		
	SPI™		
	I^2C™ Master		
	Watchdog Timer		
✔ Key features utilized in this application.			

MICROCHIP

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