

The logo for GadgEon, with 'Gadg' in blue and 'Eon' in orange.

Engineering Smartness

INTEGRATED SOLUTION FOR A CELL PROCESSING SYSTEM

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Version 01



Integrated Solution for a Cell Processing System



A Medical technology company wanted to develop a system for cell processing to be used for cell and gene therapy research and manufacturing. The challenge was that, the peripheral components had different communication interfaces and protocols and design & component selection were complex in nature

Solution Description

- Develop a complete system involving multiple sub-units like Windows based panel PC, embedded controller unit and RF unit
- Develop a GUI Application in C# for Windows host system to run the cell processing steps
- An embedded firmware communicates with the peripherals using different interface and protocols like Modbus over UART, SPI, ADC
- PC application coordinates the communication between multiple units over Ethernet link to complete the process

Outcome and Benefits Delivered

- Completed the project within the customer budget (<80%)
- Interactive touch screen display provides a better customer experience than the existing normal display
- The solution enabled the real time monitoring and controlling of the peripheral devices
- Animated process diagrams and alert messages simplified user interface



The Solution / System Description

The Solution developed by Gadgeon has two key components:

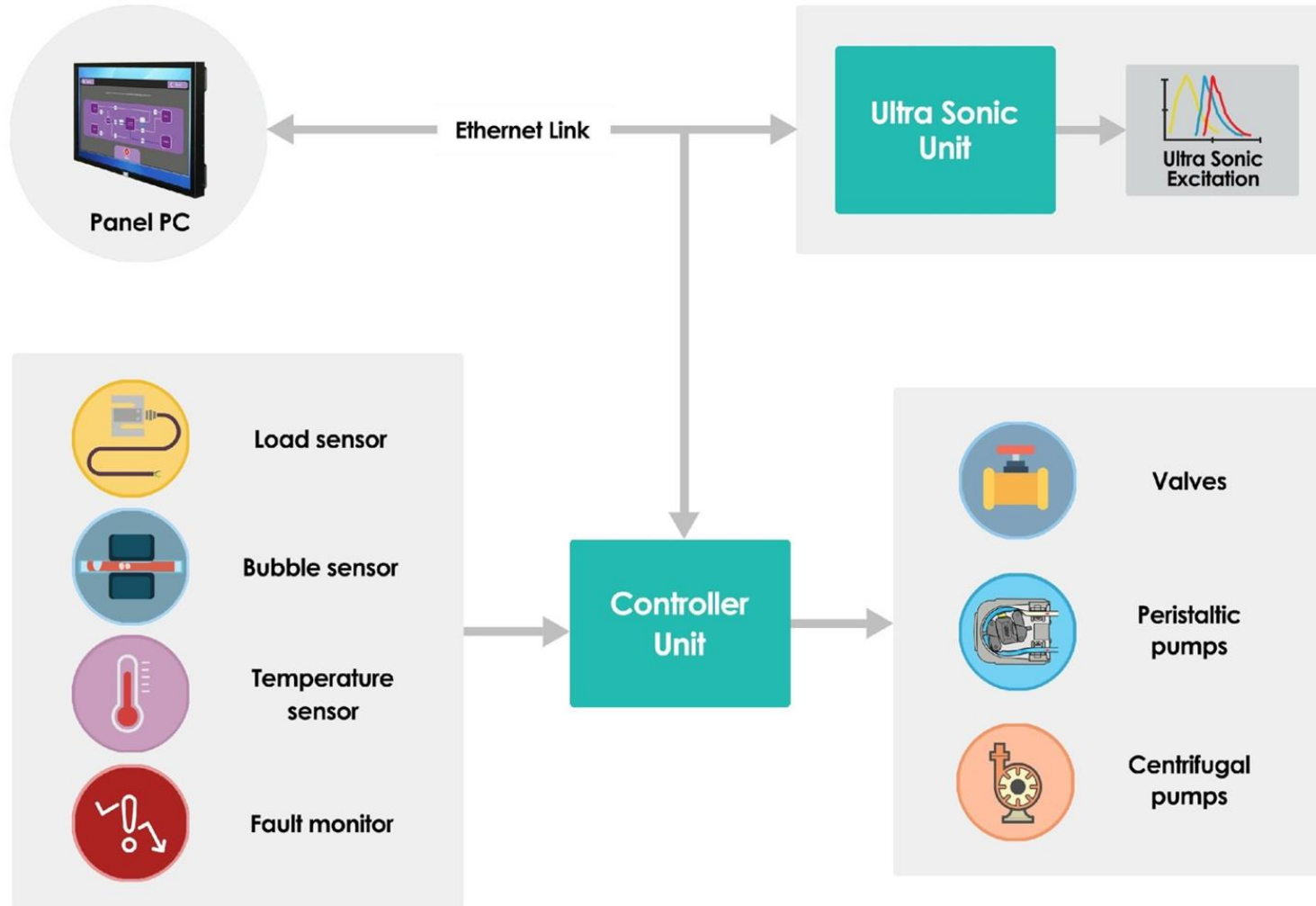
Windows Host Application

- The host application runs in a panel PC running Windows 10 IOT OS and allows different user privileges according to their roles through a touch screen enabled GUI
- The application provides live updates to the user with animated process diagrams and alert messages
- The panel PC application sends commands to the Embedded controller unit through TCP connection, to perform the actual cell processing steps
- Panel PC software coordinates the operation of the entire system involving the embedded control unit and Ultrasonic unit
- Key Technologies used: C# based on WPF, XAML, Windows 10 IoT OS

Embedded Control Unit

- The Embedded controller unit performs actions as per the commands received from the Host application
- The peripherals controlled by the controller unit are centrifugal and peristaltic pumps, solenoid valves, load sensors , flow sensors etc
- The embedded firmware communicates with the peripherals using different interface and protocols like Modbus over UART, SPI, ADC
- It also regulates the temperature of the process fluid within limits by actuating a temperature control unit
- Technologies used: uC/OS RTOS, ModBus over UART, Modbus over SPI

System / Architecture Description



- The system allows the user to initiate, manage and monitor a process from a touch screen enabled GUI
- The Control Unit communicates with the peripherals
- The cell processing system consists of various steps pumping the process fluid containing the cells in different speed and different paths while the ultrasonic excitation is done on the cells

THANK YOU



For More Details, Let's Connect



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