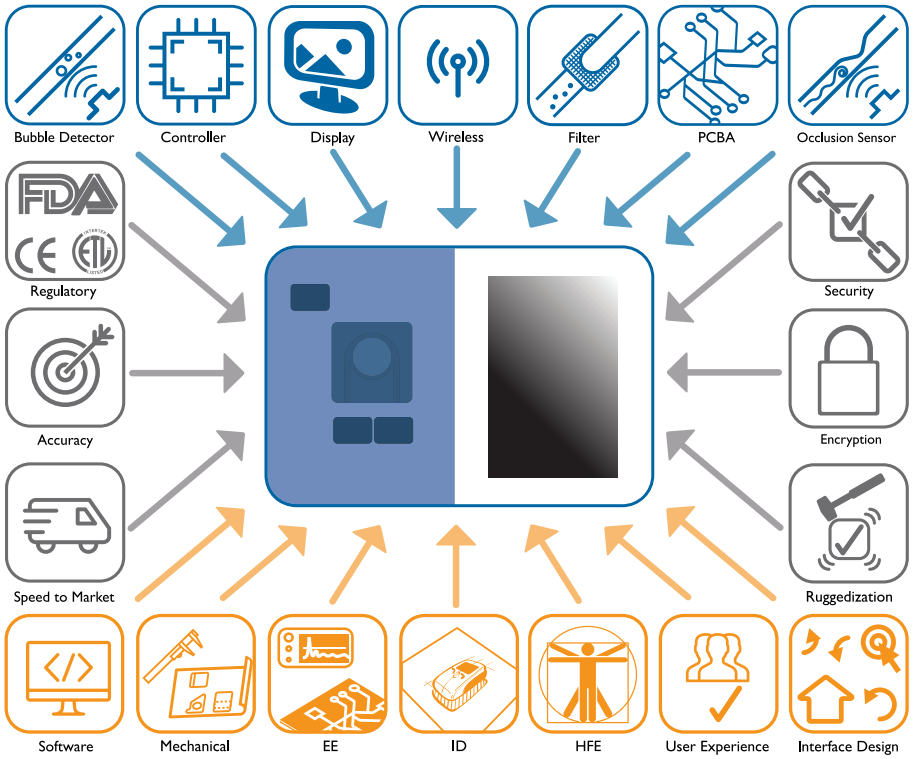
Technology Platform

Infusion System Demonstrator



Accurate fluid delivery

The infusion system provides quick and accurate fluid delivery with an intuitive interface that allows the user to quickly specify the flow, rate and volume by choosing two out of three options. Depending on the known values the user can deduce the final delivery outcomes.

Alarms

All alarms are compliant with ISO/IEC 60601-1-8. The alarms promptly and effectively notify the user if a bubble or occlusion has been detected. Three separate tones indicate urgency of the alarms:

- Low- Two pulses, falling pitch - For: running indication
- Medium- Four pulses, rising pitch, repeated at 30s intervals - For: Occlusion
- High- (through faster, louder, at higher pitch and with more rapid onset) with two additional 'attention' pulses appended, repeated at 15 s intervals- For Bubble detection

An alarm may be triggered due to one or more hazards, including, but not limited to:

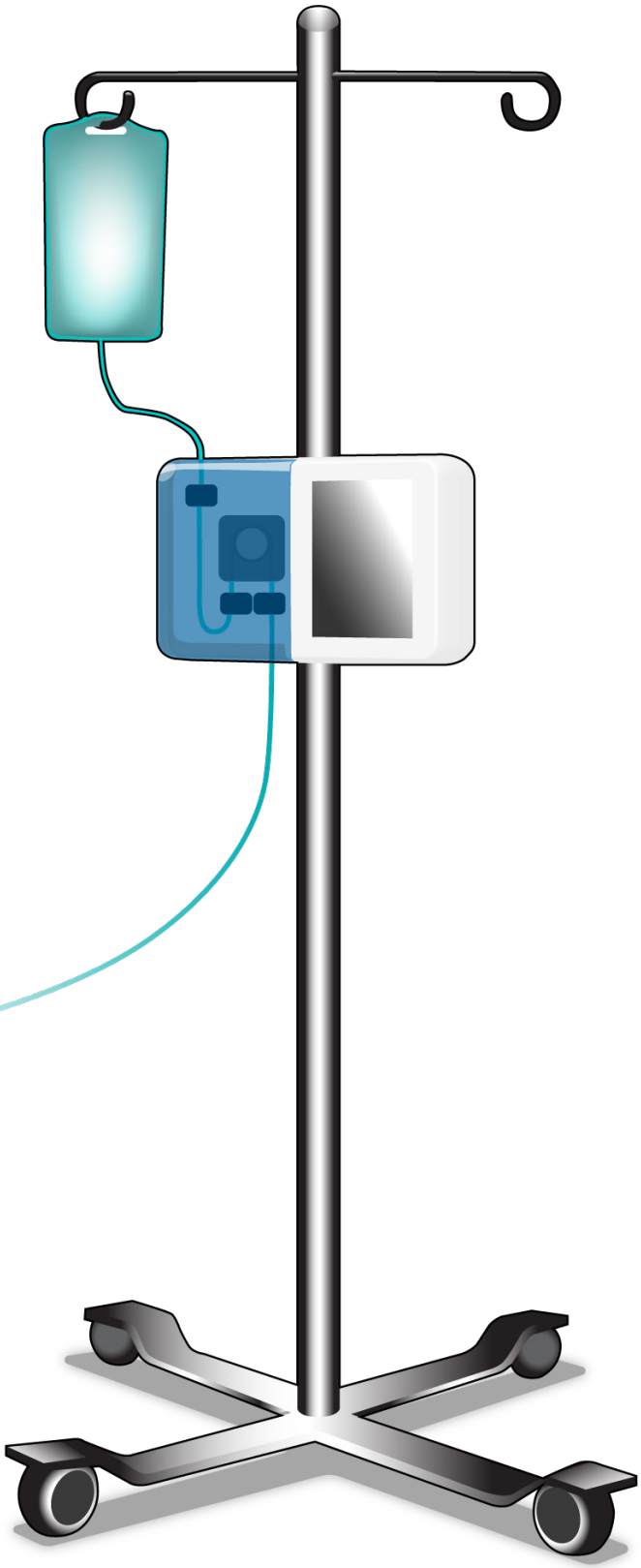
- Occlusion (supply side and patient side)
- Air-in-line
- Free flow / Improper flow of fluid
- Low or Empty reservoir
- No reservoir
- ROM / RAM CRC test failure
- Pump mechanism failure
- Watchdog alarm – issued when the watchdog timer expires
- Infusion set not loaded properly

Capabilities Overview

The Infusion System Demonstrator utilizes building block components that highlight Benchmark Electronics ability to integrate occlusion detectors, bubble detectors, peristaltic pump and a display into a cohesive infusion system. The system is intuitive for users that are accustomed to consumer electronics that have large touch displays. The infusion system provides quick and accurate fluid delivery with an intuitive interface that allows the user to quickly specify the flow, rate and volume by choosing two out of the three options. Alarms promptly and effectively notify the user if a bubble or occlusion has been detected in the infusion lines. These technology building blocks can be integrated into specific end product designs.

The following building block components were integrated within the infusion system following the 60601 Development process:

- User Interface design
- ISO Development Alarm System Compliance
- Pump Controller Integration
- Fluid and Bubble Sensor Integration
- Imbedded Control Software Programming
- Integration of OTS sensors and radios
- Occlusion Sensor Integration
- Process and Pump Control Software Design
- Infusion Application Integration



Security

Future expansions to this device include a LPSN technologies which restrict access to the device. Medical staff that is wearing a tag that corresponds to the sensor code within the device will be able to unlock the system and make appropriate modifications.

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