Precision Timing Solutions

Patient Monitors

Precision Timing in Patient Monitoring Systems

Advancement in technology and the resulting cost reductions have enabled a new breed of patient monitoring systems capable of monitoring multiple parameters such as ECG, oxygen saturation (SpO2), body temperature, respiration rate, blood pressure (BP) and other body functions all through a single system. These systems are ideal for both critical and non-critical care patients, allowing for real time monitoring and documentation of changes in patient conditions.

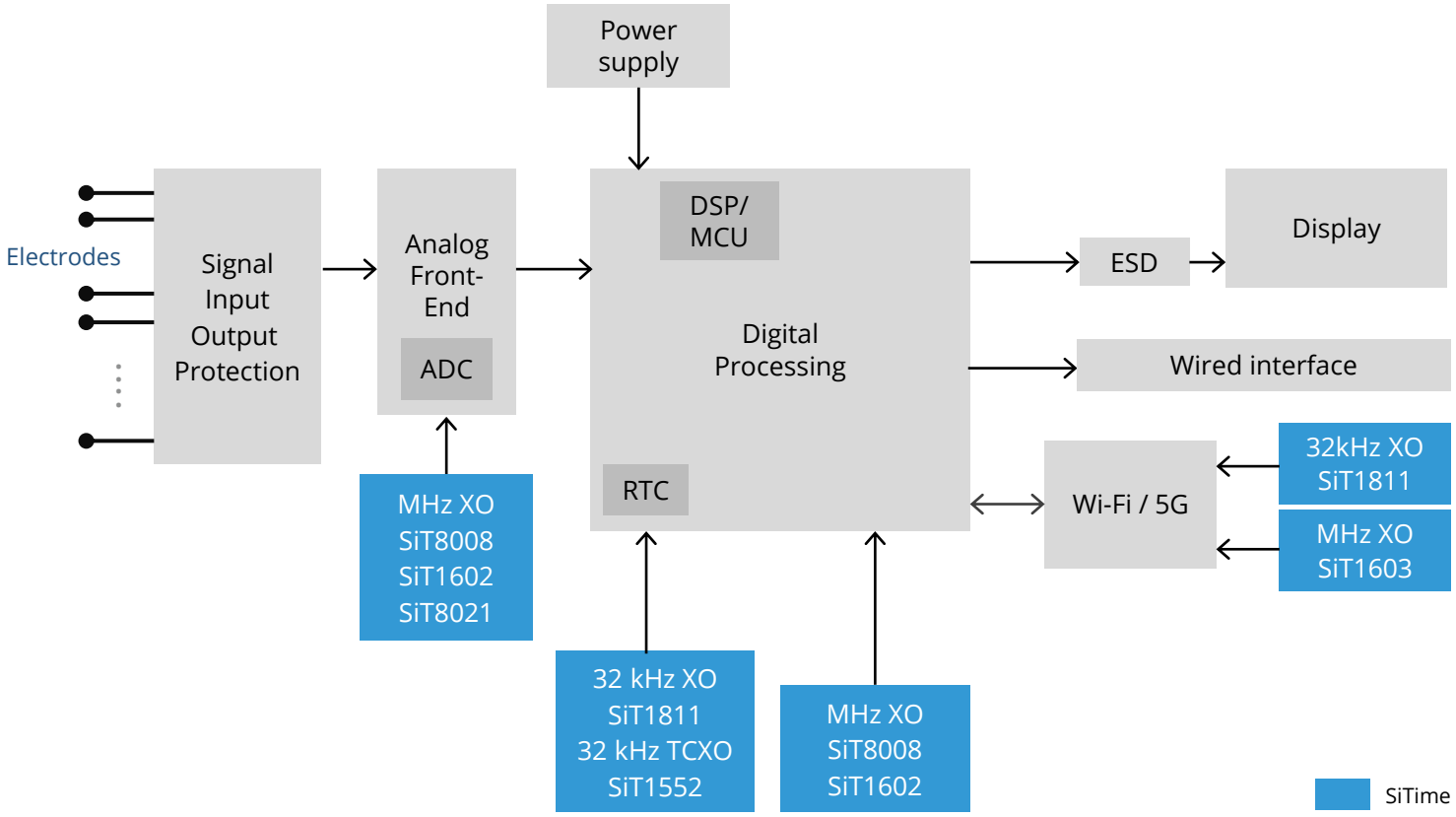
Key Considerations

- Reliable performance across environmental conditions
- EMI resilience
- Shock and vibration resistance
- Power-efficiency for portable systems

Multiparameter patient monitors can either be fixed or portable depending on where they are deployed. Fixed or non-portable monitors tend to be larger, come with more advanced features, and are primarily targeted for use in hospitals in ICUs and clinics. Portable units are ideal for use in ambulances, ambulatory surgical centers, and home use.

Multiple oscillators are required in multiparameter patient monitors. At a minimum, one for the ADC and two for the MCU/DSP control board and depending on the communication protocol being used additional oscillators are needed. Portable systems are wireless, and while most currently rely on Wi-Fi, it is expected that once 5G becomes pervasive they will convert to this faster and more reliable protocol.

Block Diagram for Patient Monitor



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SiTime advantages:

SiTime devices offer the following advantages over quartz, which are particularly important for medical:

- Factory programmable to any frequency (unless noted otherwise)
- Higher reliability than quartz
- Industry-leading small package sizes down to 1508 CSP

Featured products – please refer to SiTime.com or contact us for more options.

Type	Product	Frequency	Key Features	Key Values
MHz oscillator	SiT8008	1 to 110 MHz	• -40°C to +85°C • ±20 ppm stability • 5 std package sizes	• High reliability • Flexible frequency options • Excellent stability over temperature
	SiT1602	52 std freqs from 3.57 to 77.76 MHz		
	SiT8021	1 to 26 MHz	• -40°C to +85°C • ±50 ppm stability • 1.5 x 0.8 CSP package	• High reliability • Extended temperature range • Small footprint • Wide programmable freq range
	SiT1603[1]	8 to 76.8 MHz (various specific frequencies)	• -40°C to +85°C • ±25 ppm stability • 2 mA current consumption • 0.75 fs rms phase jitter	• High reliability • Low power • Various standard package options
32.768 kHz oscillator	SiT1811[1]	32.768 kHz	• ±20, ±50 ppm stability • 1.14 to 3.3 V supply • 490 nA current consumption • Up to -40°C to +105°C • 1.2 x 1.1 mm QFN	• Low power • Small footprint • Excellent stability
32.768 kHz TCXO	SiT1552	32.768 kHz	• ±5, ±10, ±20 ppm stability • 1 uA current consumption • Up to -40°C to +85°C • 1.5 x 0.8 CSP package	• Small footprint • Excellent stability

[1] Please contact SiTime for availability

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