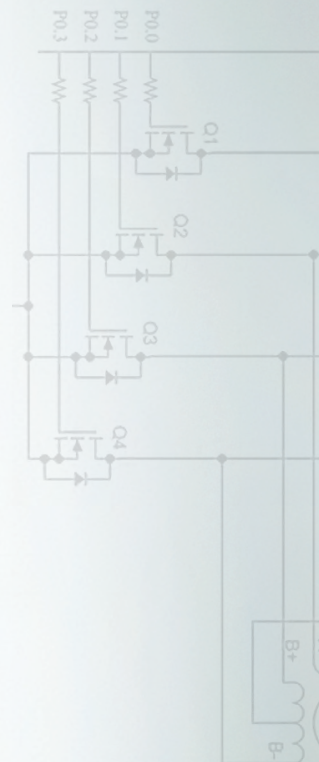




# INDUSTRIAL APPLICATIONS

SILICON LABS APPLICATION GUIDE 2011



Smart Energy / Security and Automation / Motor Control /  
Factory Automation  
[www.silabs.com/industrial](http://www.silabs.com/industrial)



Silicon Labs' mixed-signal solutions for industrial applications offer a compelling combination of reliability, small footprint and low power ideal for metering, automation, security and motor control products.

Our industrial portfolio leverages innovative mixed-signal IP to enable integration without compromise to performance. The result is less complexity, lower system cost and a suite of features that helps customers differentiate their products.

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SILICON LABS CAPABILITIES	REQUIREMENTS	SILICON LABS SOLUTIONS	
	<b>Core Processing</b> Low power operation Integrated peripherals Low system cost	C8051F5xx/9xx MCU	Extremely low power operation and single cell capable
BOM savings via integrated ADC, comparators, temp sensors, etc.			
<b>Wireless Connectivity</b> Ability to communicate over long distances Ability to communicate through walls and other barriers Increased battery life	Si4xxx Wireless	Devices capable of long-range communication via integrated power amplifier and high sensitivity receiver	Optimal performance and link quality with embedded antenna diversity
		Lower power operation via low sleep mode current and fast wake-up	
<b>Wireline Connectivity</b> Transmit and receive data Handle audio/sound Transmit and receive voice	Si24xx Modems	Fully-featured, globally compliant data/fax/voice modems	
	Si3000 Audio Codec	Highly integrated, low cost codec optimized for voice applications	
	Si305x/IA322x DAAs	Software programmable, globally compliant DAAs for voice and data	
<b>Human Interface (HMI)</b> Sophisticated user interfaces Touch and gesture recognition Simple configuration with QuickSense™ Studio	Si11xx Optical Sensors	High sensitivity, low power infrared and visible light sensors for best range	
	CP2501 USB Touch Screen Bridge	Touch screen HMI to Windows controllers via USB	
	C8051F7xx/8xx/99xMCU	Robust capacitive sensing	
<b>Other I/O Power and Peripheral Support</b> Interface to service ports Connect to Ethernet Remotely receive power	CP210x USB to UART	Single-chip, full speed (12 Mbps) USB-to-UART bridge	
	CP220x Ethernet	Small, high-performance, single-chip Ethernet controller	
	Si3402 Power over Ethernet	Fully integrated Power over Ethernet PD Controller	
<b>Digital Isolation</b> Voltage protection for equipment and humans in a small footprint Smaller, faster, more reliable and lower power than optocouplers	Si84xx Digital Isolators	Safety-certified, multi-channel, single package, reliable low power digital isolation with high-speed (DC-150 Mbps) operation over a wide temperature range	
	Si82xx Isolated Gate Drivers	Small size, single package gate driver solution with programmable dead time, latch-free level shifting	
<b>Precise Timing</b> Improve system performance Reduce BOM cost and minimize board space Simplify system design	Si535x Clock Generators	Low-jitter, high-performance custom clocks delivered in less than two weeks	

# Smart Energy

REQUEST SAMPLES AND DOWNLOAD DOCUMENTATION AT [www.silabs.com/metering](http://www.silabs.com/metering)



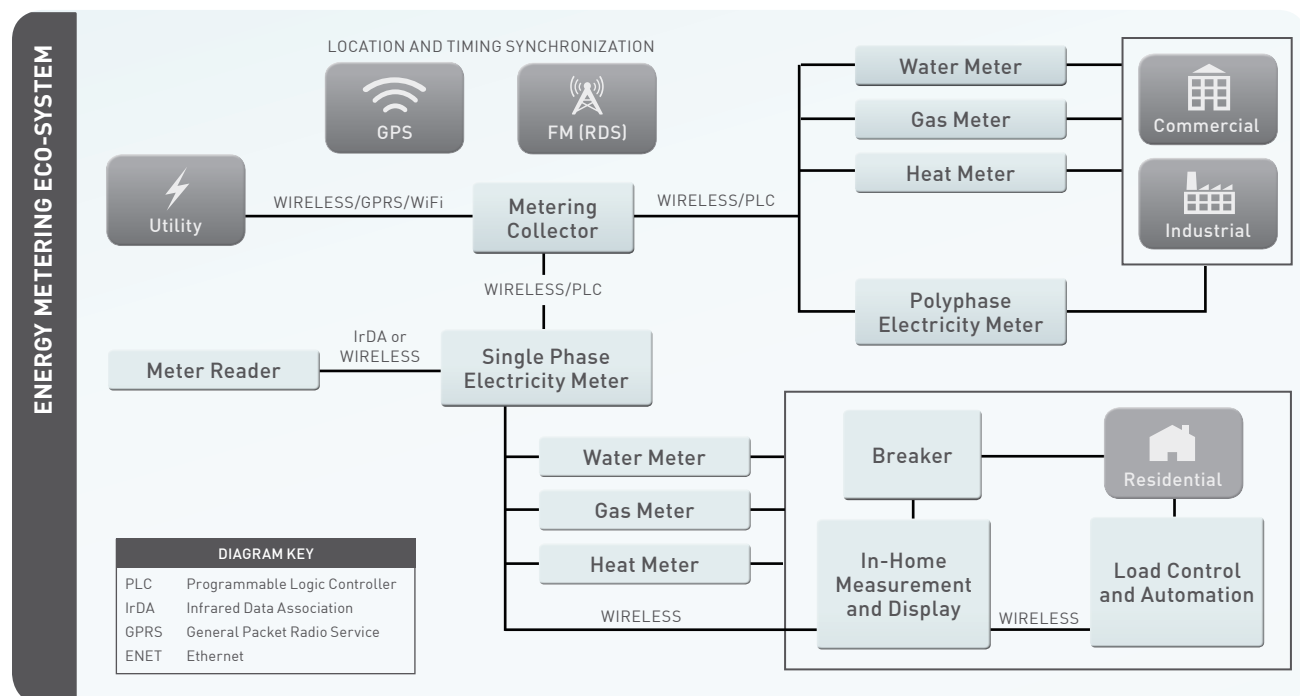
A global transition is underway to improve energy efficiency by adding intelligence to gas, water, electric and heat meters, for example. Whether retrofitting existing networks or building out new networks, customers will find that high-performance, low power mixed-signal technology is the enabler of this next generation of energy infrastructure.

Utilities are updating their infrastructure to enable two-way networks that allow operators and users to benefit from dynamic billing, better reliability and accuracy and, ultimately, better utilization of scarce energy resources.

- Improved reliability and ruggedness
- Improved accuracy
- Support of nonlinear and low-power factor loads
- Ease of calibration
- Automated meter reading
- Security
- Advanced billing options (e.g., time-of-use, prepay, etc.)

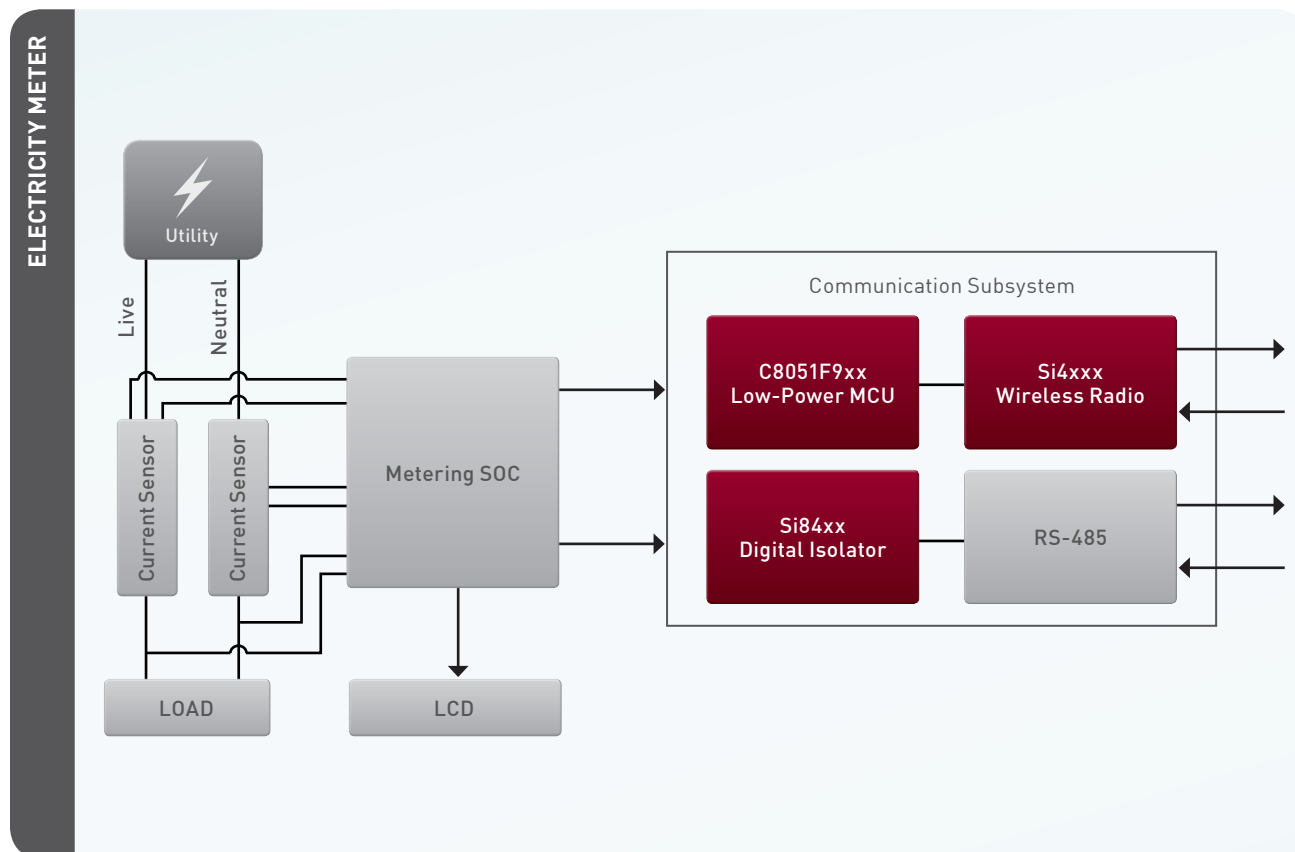
How it works: Smart meters capture and process usage data, which is sampled at regular intervals and aggregated by a common metering collector before being sent to the utility company. This automated process eliminates the need to hand check meters, making data collection more cost-efficient. These meters are complemented by intelligent in-home energy displays, thermostats and load controllers, enabling an improved level of power control. In this environment, accurate timekeeping and network synchronization are critical.

Whether it is smart metering or alternative energy like solar and wind power, Silicon Labs' complete solutions ensure customers can deliver high levels of accuracy at the lowest possible power consumption to fully realize the benefits of green technology.



## Electric Meters

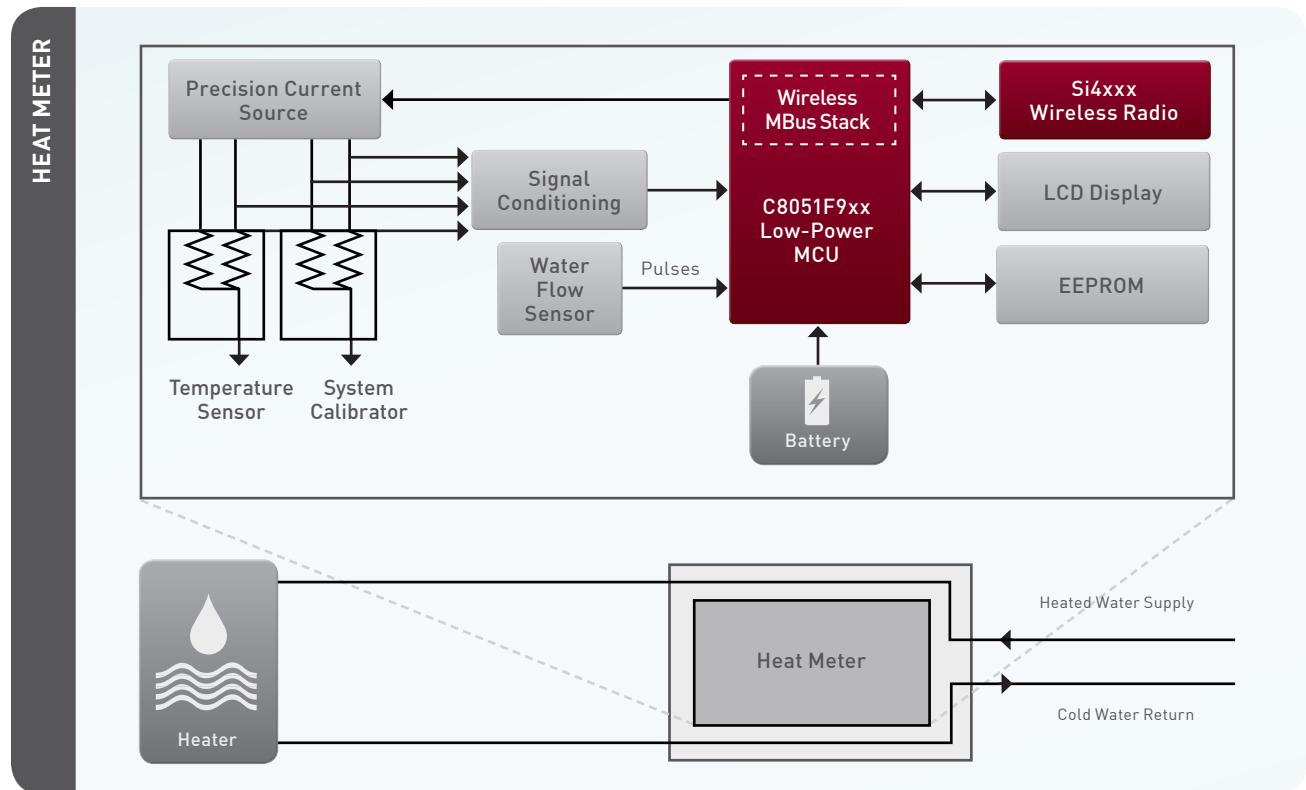
Electric meters measure kilowatt hours consumed, the power factor of the load and the time of the electricity consumption to support multi-rate metering. The communications system in these meters requires reliability and range, which Silicon Labs provides with its embedded wireless receivers, MCUs and digital isolators.



PRODUCT	DESCRIPTION	SILICON LABS SOLUTIONS	CUSTOMER BENEFITS
<b>WIRELESS RANGE AND ROBUSTNESS</b>			
Si4xxx	EZRadio®/ EZRadioPRO® Embedded Wireless Solutions	Continuous frequency coverage from 240 to 960 MHz, output power up to +20 dBm, built-in features like wake-up timer, low battery detector, transmit and receive data FIFOs, power-on reset circuit and general-purpose digital I/Os	Meters can transmit data that will be reliably read by the data collector over long distances
<b>LOW POWER OPERATION</b>			
C8051F9xx	Ultra Low-Power MCU	Capable of full-spec operation down to 0.9 V and up to 3.6 V, single-cell battery operation; Integrated dc-dc converter, fast wake-up time, low active-mode and ultra-low sleep mode current consumption	Extremely long battery life and fewer battery replacements; maintains accurate time over long time periods
<b>DIGITAL ISOLATION</b>			
Si84xx	Digital Isolator	Up to 6 isolation channels in a single package, high-speed operation (DC-150 Mbps) over a wide temperature operating range, up to 5 kVrms isolation and less than 10 ns propagation delay	Voltage protection for equipment and humans in a small footprint; based on standard CMOS processes, making it easy to integrate into the system

## Heat Meters

Heat meters enable utilities to bill by the number of BTUs or kilowatts measured by the flow of hot water and input and exit water temperatures. Silicon Labs provides heat meter customers with a complete communications and low power processing solution with its embedded wireless receivers and MCUs.

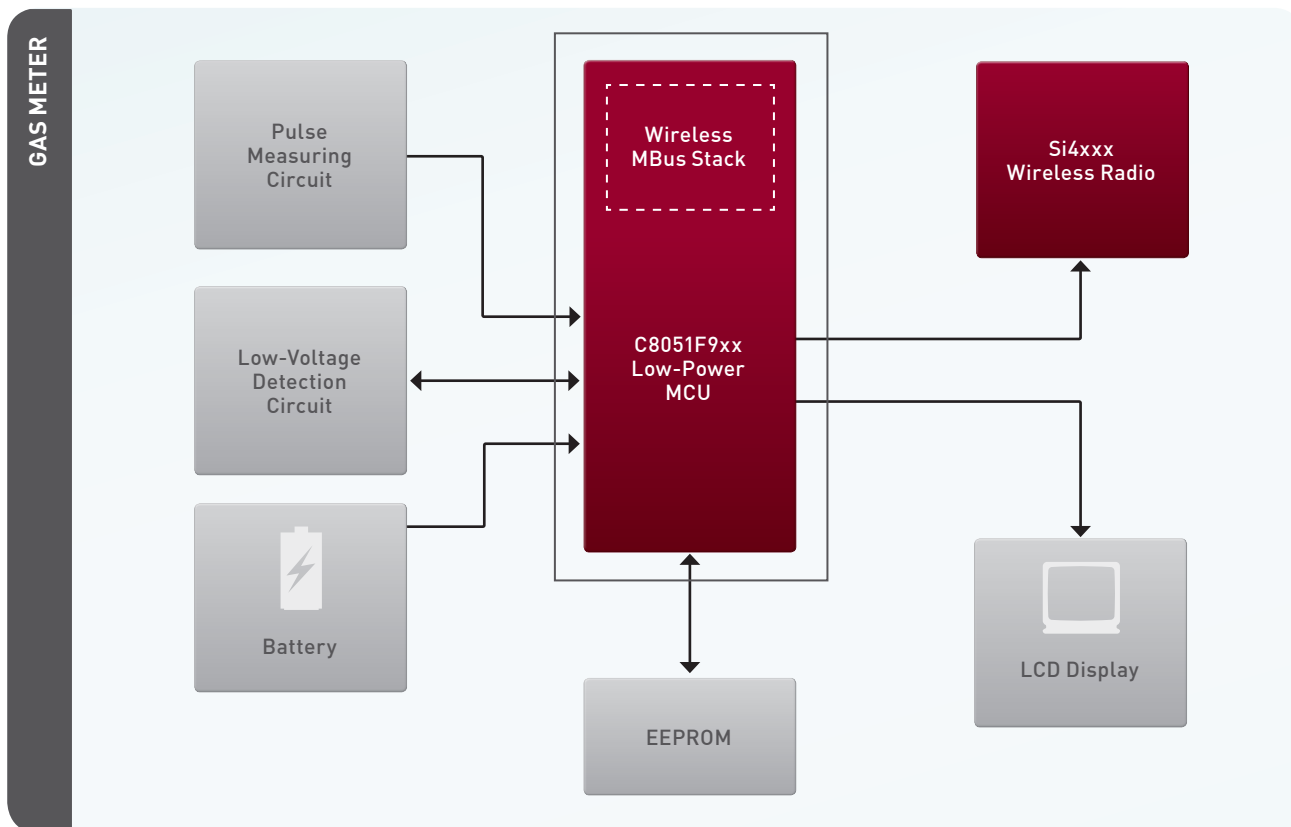


PRODUCT	DESCRIPTION	SILICON LABS SOLUTIONS	CUSTOMER BENEFITS
<b>WIRELESS RANGE AND ROBUSTNESS</b>			
Si4xxx	EZRadio®/ EZRadioPRO® Embedded Wireless Solutions	Continuous frequency coverage from 240 to 960 MHz, output power up to +20 dBm, built-in features like wake-up timer, low battery detector, transmit and receive data FIFOs, power-on reset circuit and general purpose digital I/Os	Meters can transmit data that will be reliably read by the data collector over long distances
<b>LOW POWER OPERATION</b>			
C8051F9xx	Ultra Low-Power MCU	Capable of full-spec operation down to 0.9 V and up to 3.6 V, single-cell battery operation; Integrated dc-dc converter, fast wake-up time, low active-mode and ultra-low sleep mode current consumption	Extremely long battery life and fewer battery replacements; maintains accurate time over long time periods
<b>METERING SOFTWARE</b>			
Wireless MBus Stack	Fully compliant wireless MBus(EN-13754) physical and link layer supports all device modes (S,T,R)	PHY layer optimized for lowest power operation	Rapid deployment of fully tested and compliant wireless MBus solutions



## Gas and Water Meters

Gas and water meters use positive displacement flow meters to measure the number of times a unit volume of the fluid moves through the meter. Low power is critical, as these meters are generally battery powered. Silicon Labs provides customers with a complete communications and low power processing solution with its embedded wireless receivers and MCUs.

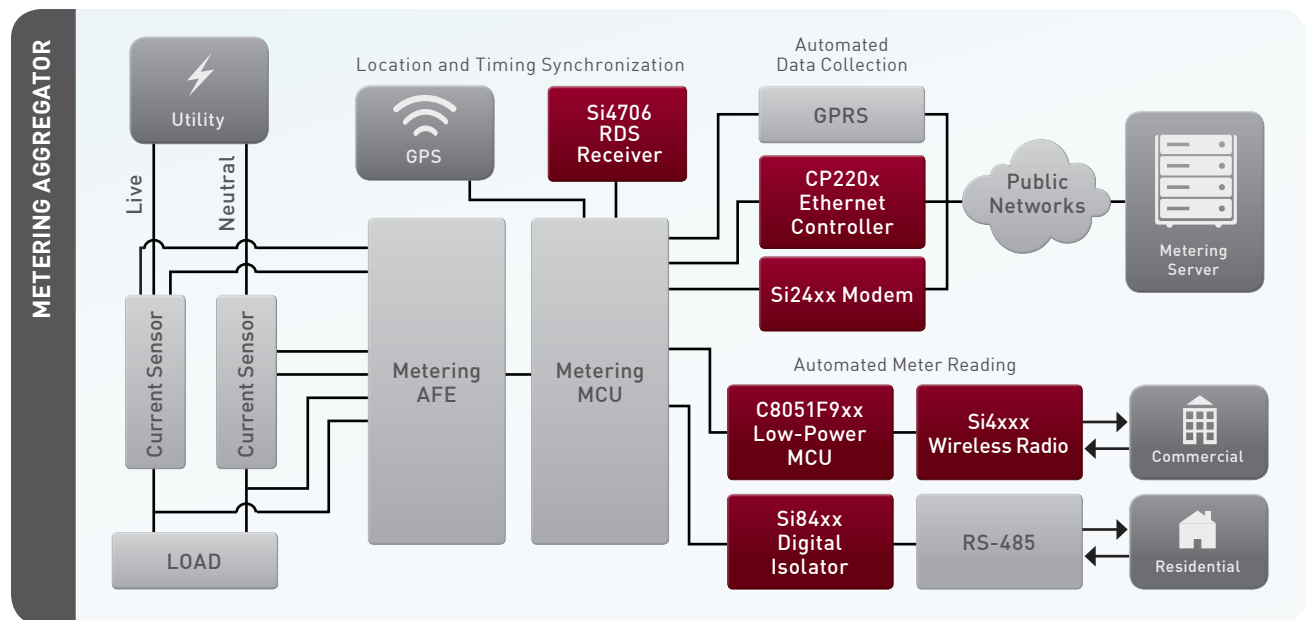


PRODUCT	DESCRIPTION	SILICON LABS SOLUTIONS	CUSTOMER BENEFITS
<b>WIRELESS RANGE AND ROBUSTNESS</b>			
Si4xxx	EZRadio®/ EZRadioPRO® Embedded Wireless Solutions	Continuous frequency coverage from 240 to 960 MHz, output power up to +20 dBm, built-in features like wake-up timer, low battery detector, transmit and receive data FIFOs, power-on reset circuit and general purpose digital I/Os	Meters can transmit data that will be reliably read by the data collector over long distances
<b>LOW POWER OPERATION</b>			
C8051F9xx	Ultra Low-Power MCU	Capable of full-spec operation down to 0.9 V and up to 3.6 V, single-cell battery operation; Integrated dc-dc converter, fast wake-up time, low active-mode and ultra-low sleep mode current consumption	Extremely long battery life and fewer battery replacements; maintains accurate time over long time periods
<b>METERING SOFTWARE</b>			
Wireless MBus Stack	Fully compliant wireless MBus (EN-13754) physical and link layer supports all device modes (S,T,R)	PHY layer optimized for lowest power operation	Rapid deployment of fully tested and compliant wireless MBus solutions



## Metering Aggregators

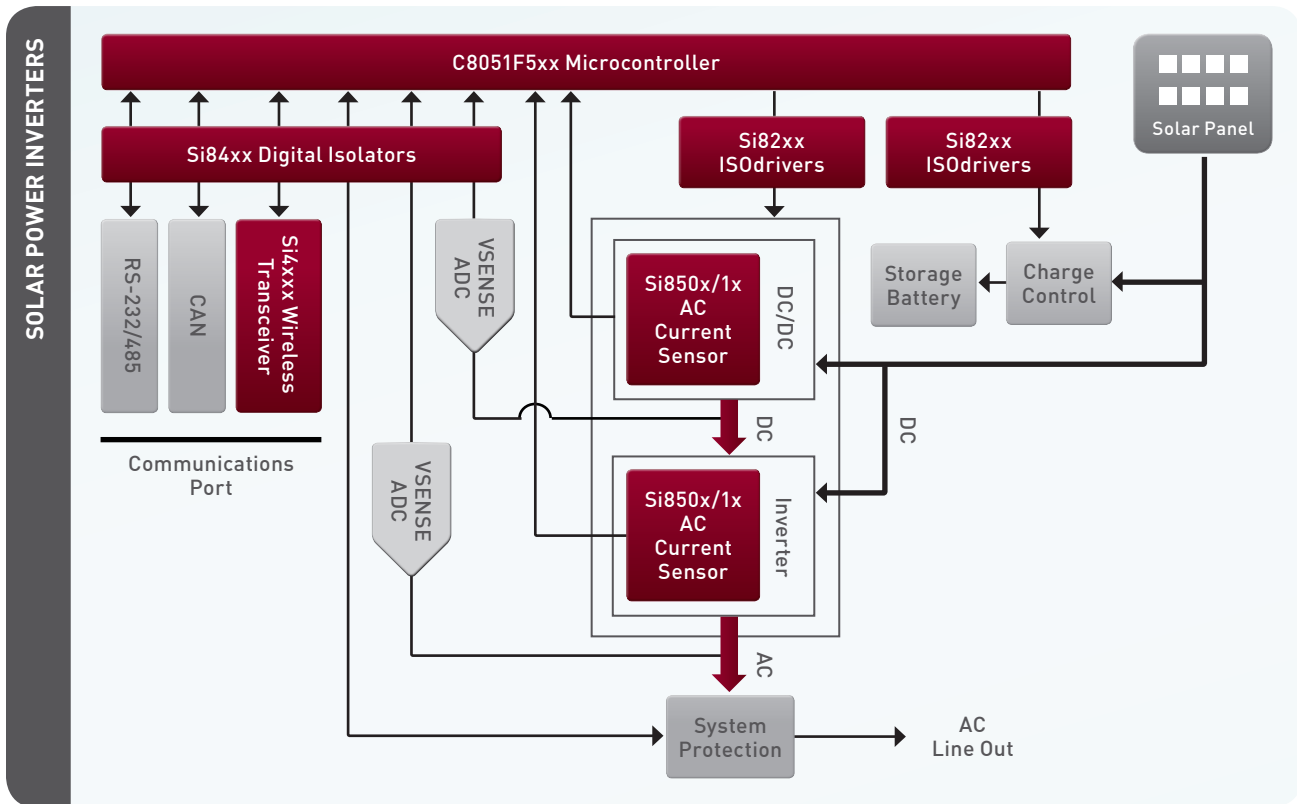
Metering aggregators act as a metering hub by centralizing usage data from a variety of meters. Silicon Labs provides customers with a complete communications and low power processing solution with its embedded wireless receivers, embedded modems, digital isolators and MCUs.



PRODUCT	DESCRIPTION	SILICON LABS SOLUTIONS	CUSTOMER BENEFITS
<b>WIRELESS RANGE AND ROBUSTNESS</b>			
Si4xxx	EZRadio®/EZRadioPRO® Embedded Wireless Solutions	Highest sensitivity, longest range, lowest system cost	Meters can transmit data that will be reliably read by the aggregator over long distances
<b>LOW POWER OPERATION</b>			
C8051F9xx	Ultra Low-Power MCU	Extremely low power operation and single cell capable, integrated flash, GPIO flexibility	Extremely long battery life; fewer battery replacements
<b>DIGITAL ISOLATION</b>			
Si84xx	Digital Isolator	Up to 6 isolation channels in a single package, high-speed operation (DC-150 Mbps) over a wide temperature operating range, up to 5 kVrms isolation and less than 10 ns propagation delay	Voltage protection for equipment and humans in a small footprint; based on standard CMOS processes, making it easy to integrate into the system
<b>COMMUNICATION – WIRED</b>			
Si24xx	ISOmodem® Data/Fax/Voice Modems	Ranging in speed from 2,400 bps to 56,000 bps, Silicon Labs' patented modem technology provides a programmable telephone line interface and small footprint with minimum external components required	Small size, low cost, low power and proven global compliance
CP220x	Ethernet Controller	Small, high performance, single-chip Ethernet controller; Ethernet stack available (royalty-free)	Reliable Ethernet communications
<b>TIMING SYNCHRONIZATION</b>			
Si4706	FM Receiver with RDS	Enhanced FM RDS/TMC radio receiver, no external antenna required	Synchronize timing in system and ensure reliable data transmission

## Solar Power Inverters

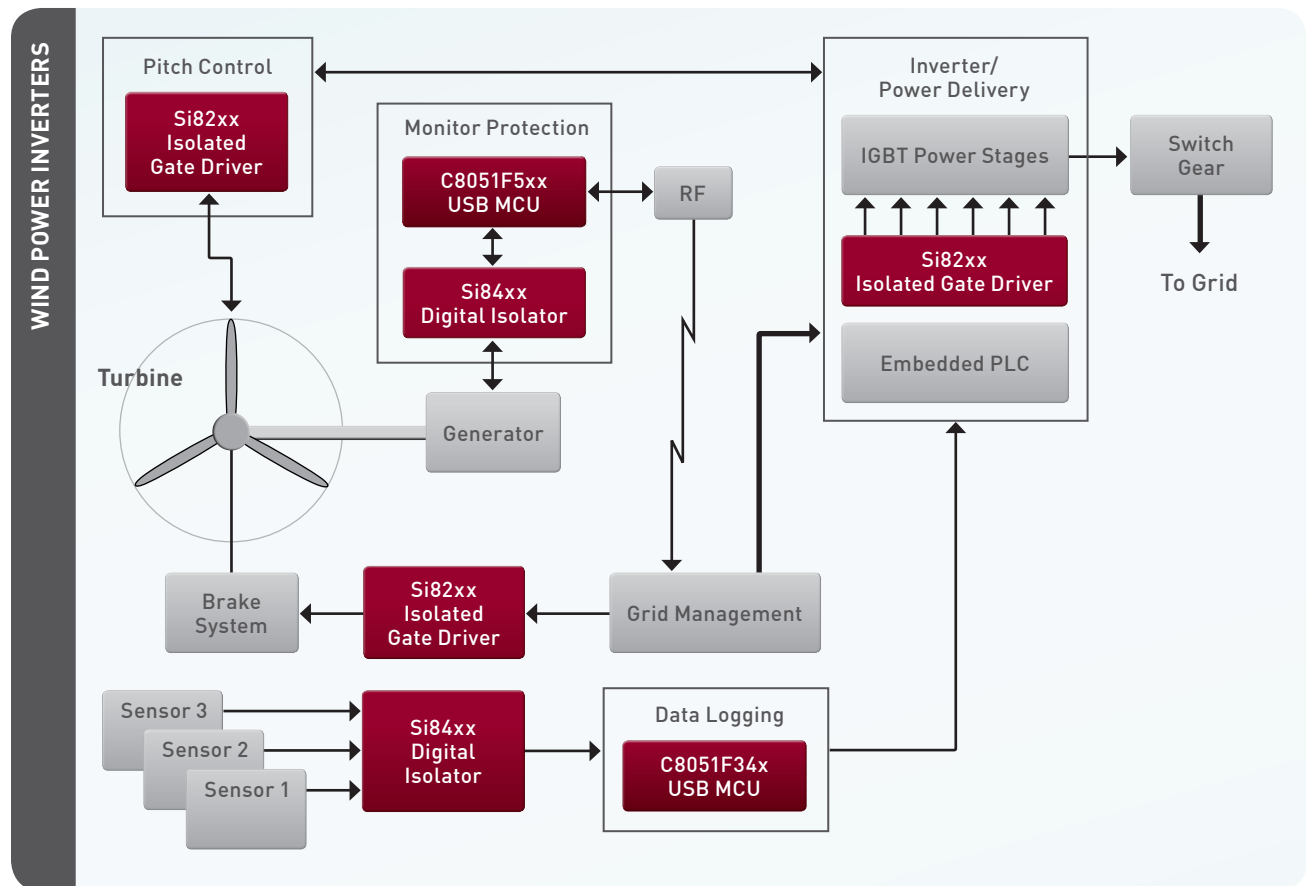
Solar micro-inverters are small devices installed on each solar panel that immediately convert dc current to ac. Power losses are minimized and efficiency is improved since each panel directly connects to the main ac grid; also, each panel does not affect the performance of the other panels. This approach makes system expansion easier since modular panel/inverter assemblies can easily be added to existing wiring and don't require sophisticated installation.



PRODUCT	DESCRIPTION	SILICON LABS SOLUTIONS	CUSTOMER BENEFITS
<b>RELIABLE, SAFE &amp; EFFECTIVE ISOLATION AND POWER</b>			
Si82xx	ISOdriver Isolated Gate Driver	Combines an isolator and two independent drivers into a single package with ultra-fast 50 ns propagation delays for better timing margins, safety certified to 5.0, 3.75 or 2.5 kVrms and withstand $\pm 1500$ VDC between outputs for dual drivers; CSA, VDE and UL certified	High integration, low propagation delay, small PCB footprint, flexibility, and cost-effectiveness ensure rock-solid operation over temperature and time, and unparalleled size and cost benefits
Si850x/1x	AC Current Sensor	Unidirectional ac current sensors that operate over the frequency range of 50 kHz to 1.2 MHz; available in full-scale ranges of 5, 10 and 20 A and isolation ratings up to 5 kV	Size, performance and cost advantages over current transformers, Hall effect devices, DCR circuits and other approaches
Si84xx	Digital Isolator	Industry's best mean time to failure rating, both 2.5 kV and 5.0 kV isolation ratings, best-in-class ESD and EMI performance, CSA, UL and VDE certification reports for global platform development	Safety certified components enable low-cost installation that meets regulatory standards, long-term reliable operation, limited external BOM components needs keep manufacturing costs low and allow for innovative designs
<b>PRECISION PROCESSING</b>			
C8051F5xx	Industrial Microcontroller	Mixed-signal system-on-a-chip MCU, on-board oscillator ( $\pm 0.5\%$ ) with clock multiplier, integrated flash, 12-bit analog, CAN 2.0B interface, 125° C operation	High reliability, few external components, wide temperature range and voltage operating range; up to 50 MIPS

## Wind Power Inverters

Wind power inverters are installed in the windmill turbine or in the control panels and convert dc current to ac. Isolation is needed for blade pitch control, communications interface and grid interface control. Power losses are minimized and efficiency is improved since each panel directly connects to the main ac grid. This approach makes system expansion easier since modular panel/inverter assemblies can easily be added to existing wiring and don't require sophisticated installation.











PRODUCT	DESCRIPTION	SILICON LABS SOLUTIONS	CUSTOMER BENEFITS
<b>RELIABLE, SAFE &amp; EFFECTIVE ISOLATION</b>			
Si82xx	ISOdriver Isolated Gate Driver	Combines an isolator and two independent drivers into a single package with ultra-fast 50 ns propagation delays for better timing margins, safety certified to 5.0, 3.75 or 2.5 kVrms and withstand ±1500 VDC between outputs for dual drivers; CSA, VDE and UL certified	High integration, low propagation delay, small PCB footprint, flexibility, and cost-effectiveness ensure rock-solid operation over temperature and time, and unparalleled size and cost benefits
Si84xx	Digital Isolator	Industry's best mean time to failure rating, both 2.5 kV and 5.0 kV isolation ratings, best-in-class ESD and EMI performance, CSA, UL and VDE certification reports for global platform development	Safety certified components enable low-cost installation that meets regulatory standards, long-term reliable operation, limited external BOM components needs keep manufacturing costs low and allow for innovative designs
<b>PRECISION PROCESSING</b>			
C8051F5xx	Industrial Microcontroller	Mixed-signal system-on-a-chip MCU, on-board oscillator (± 0.5%) with clock multiplier, integrated flash, 12-bit analog, CAN 2.0B interface, 125° C operation	High reliability, few external components, wide temperature range and voltage operating range; up to 50 MIPS

# Security and Automation

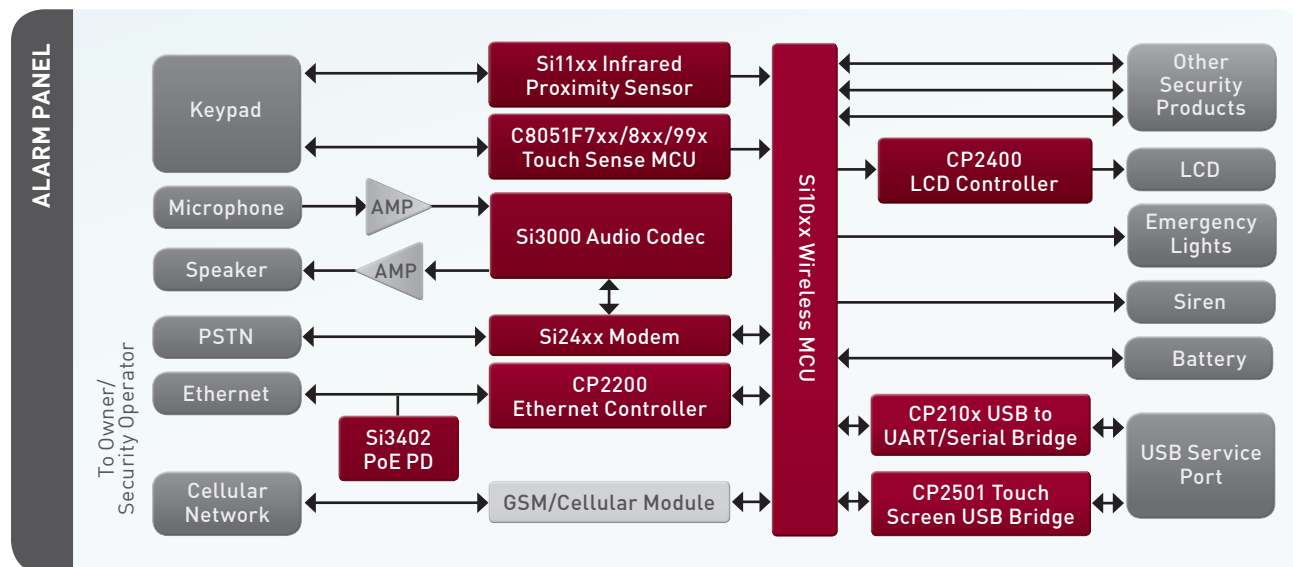
REQUEST SAMPLES AND DOWNLOAD DOCUMENTATION AT [www.silabs.com/security](http://www.silabs.com/security)

Security and Automation leverage innovations in sensing, connectivity and embedded computing, which are eliminating the need for professionally installed systems with reams of cables and a matrix of large and unsightly sensors. New IC technology is enabling smaller, more affordable, less power hungry and more easily installed security and automation systems. Complex wiring can be replaced by reliable, low-cost wireless technology, and efficient processing can enable low-cost and small footprint sensor technology.

<p><b>1</b> Personal Emergency Response System</p> 	<p><b>2</b> Motion Detector</p> 	<p><b>3</b> Flood/Water Detector</p> 
<p><b>4</b> Smoke/Gas Detector</p> 	<p><b>5</b> Alarm Panel &amp; Access Control</p> 	<p><b>6</b> Window/Glass Break Detector</p> 
<p><b>7</b> Thermostat</p> 	<p><b>8</b> Weather Station</p> 	<p><b>9</b> IP Camera</p> 

## Alarm Panels

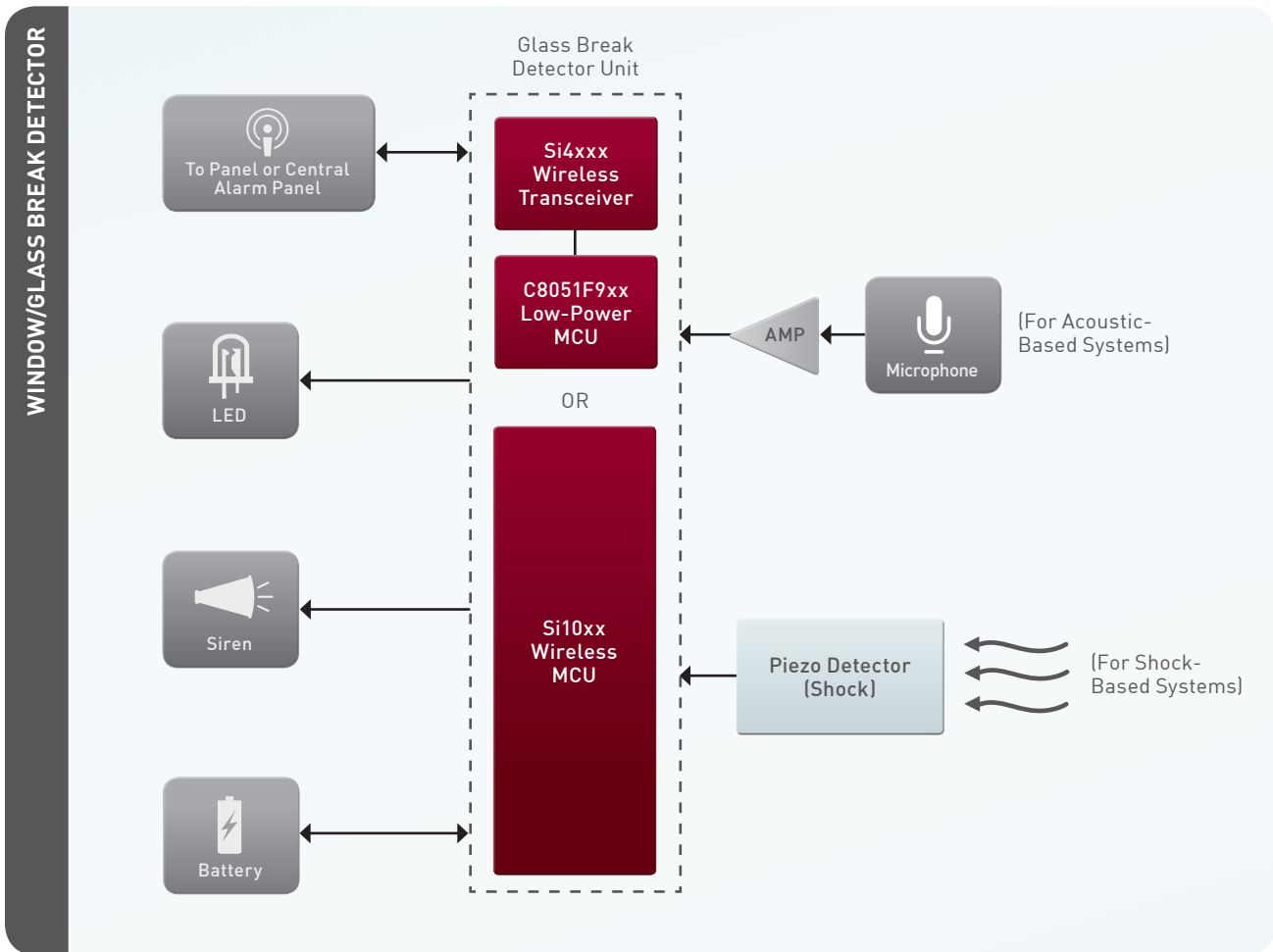
Alarm panels are increasingly becoming wirelessly networked to other security and automation products. The panel acts as a hub for incoming alerts and provides centralized management for home or office security systems.



PRODUCT	DESCRIPTION	SILICON LABS SOLUTIONS	CUSTOMER BENEFITS
<b>WIRELESS RANGE AND ROBUSTNESS</b>			
Si10xx	Low-Power Wireless MCU	Highest sensitivity, longest range, lowest system cost	Robustly and reliably communicate to/from sensor units
<b>LOW POWER OPERATION AND ROBUST FAILURE PROTECTION</b>			
C8051F9xx	Ultra Low-Power MCU	Extremely low power operation and single cell capable, integrated flash, GPIO flexibility	Robustly and reliably communicate with all security points throughout the house, long battery life, low system cost, scalable processor
Si11xx	QuickSense™ Proximity and Ambient Light Sensor	Low power proximity detection and ambient light sensing	Senses an individual's presence and can control power to LCD display backlights or RF inductive loops to ensure the lowest possible current consumption
<b>I/O AND COMMUNICATIONS SUPPORT</b>			
Si24xx	Data/Fax/Voice Modems	Fully-featured, globally compliant, low power, small size	Create a modular architecture that can be readily expanded and changed
Si305x/IA322x	DAA's	Software programmable, globally compliant DAA's with/without codecs to transmit and receive voice and data	
Si3000	Audio Codec	Highly integrated, voice codec; direct interface to Si24xx modems	
CP210x	USB to UART Bridge	Single-chip, full-speed (12 Mbps) USB-to-UART bridge to interface to service ports	
CP2501	USB Touch Screen Bridge	Windows® 7 touch compliant USB bridge	
CP220x	Ethernet Controller	Small, high performance, single-chip Ethernet controller; Ethernet stack available (royalty free)	
Si3402	Power over Ethernet (PoE) Controller	Fully integrated PoE PD controller to remotely receive power	
C8051F7xx/8xx/99x	Capacitive Sensing MCU	Fully integrated 8-bit microcontroller with capacitive touch sensing	

## Window/Glass Break Detectors

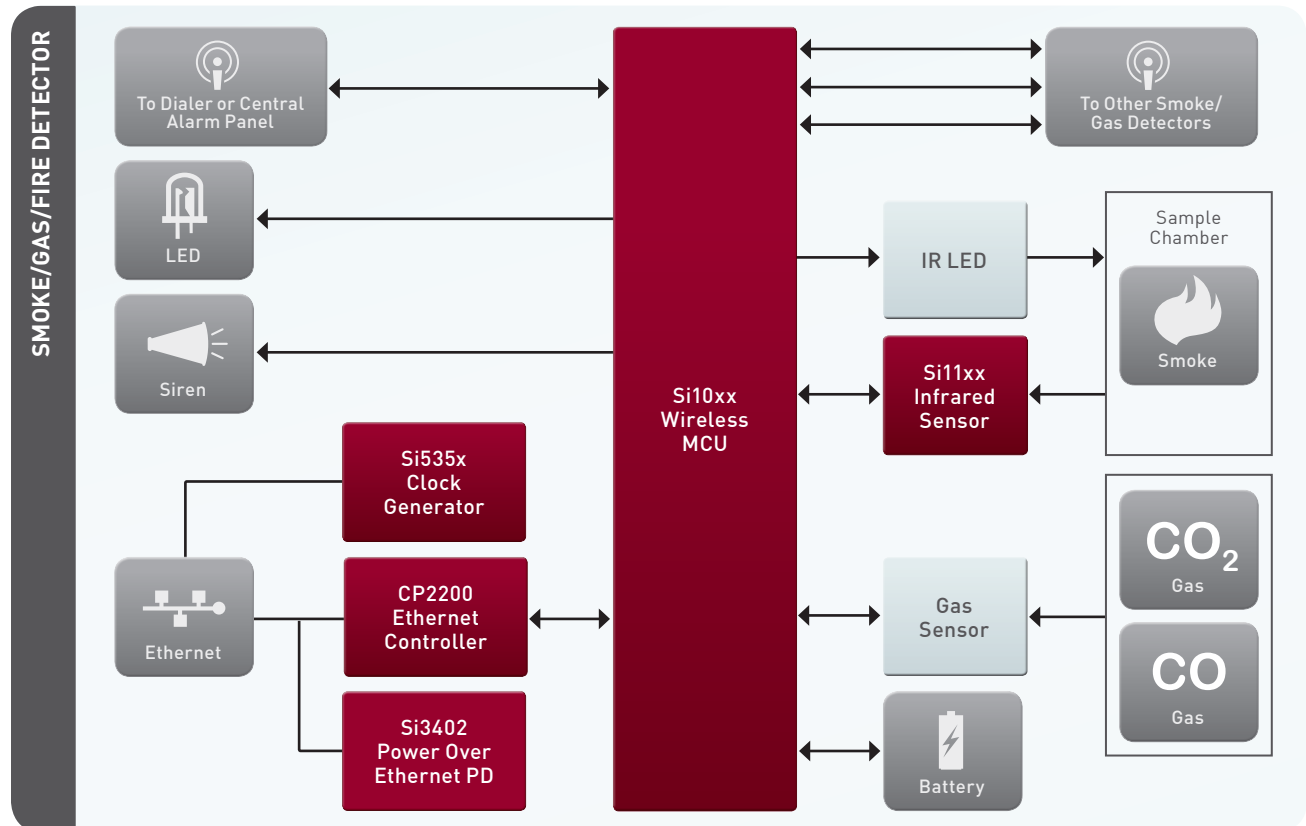
Window/glass break detectors trigger an alarm once they detect the sound or shockwave caused by glass breaking. Wirelessly-connected 'dual technology' devices eliminate false alarms through sophisticated sensor techniques and can be either acoustically-based or shock-based.



PRODUCT	DESCRIPTION	SILICON LABS SOLUTIONS	CUSTOMER BENEFITS
<b>INTEGRATED SUB-GHZ RF TRANSCEIVER MCU</b>			
Si10xx	Low-Power Wireless MCU	160 $\mu$ A per MHz operation, integrated ADCs and comparators; extremely low power operation with integrated flash, highest sensitivity, longest range, lowest system cost	Quickly analyze signal frequency, duration, and amplitude to detect events and eliminate false alarms; long battery life and reliable data protection in event of power loss, robustly and reliably communicate to/from multiple glass break detector units (or alarm panels)
<b>LOW POWER OPERATION AND WIRELESS RANGE</b>			
C8051F9xx	Ultra Low-Power MCU	Built-in power supply that can operate from a single 0.9 V cell battery and provide 0.9 to 3.3 V to its peripherals, up to a maximum of 65 mW	Extremely long battery life; fewer battery replacements
Si4xxx	EZRadioPRO® Embedded Wireless Solutions	Multiple sleep modes, reduced TX current consumption and reduce wasted current during fast startup	

## Smoke/Gas/Fire Detectors

Smoke/gas/fire detectors, heat detectors and fire alarms trigger warnings upon detection of a relevant event. These security devices are increasingly using wireless technology to communicate with other devices.

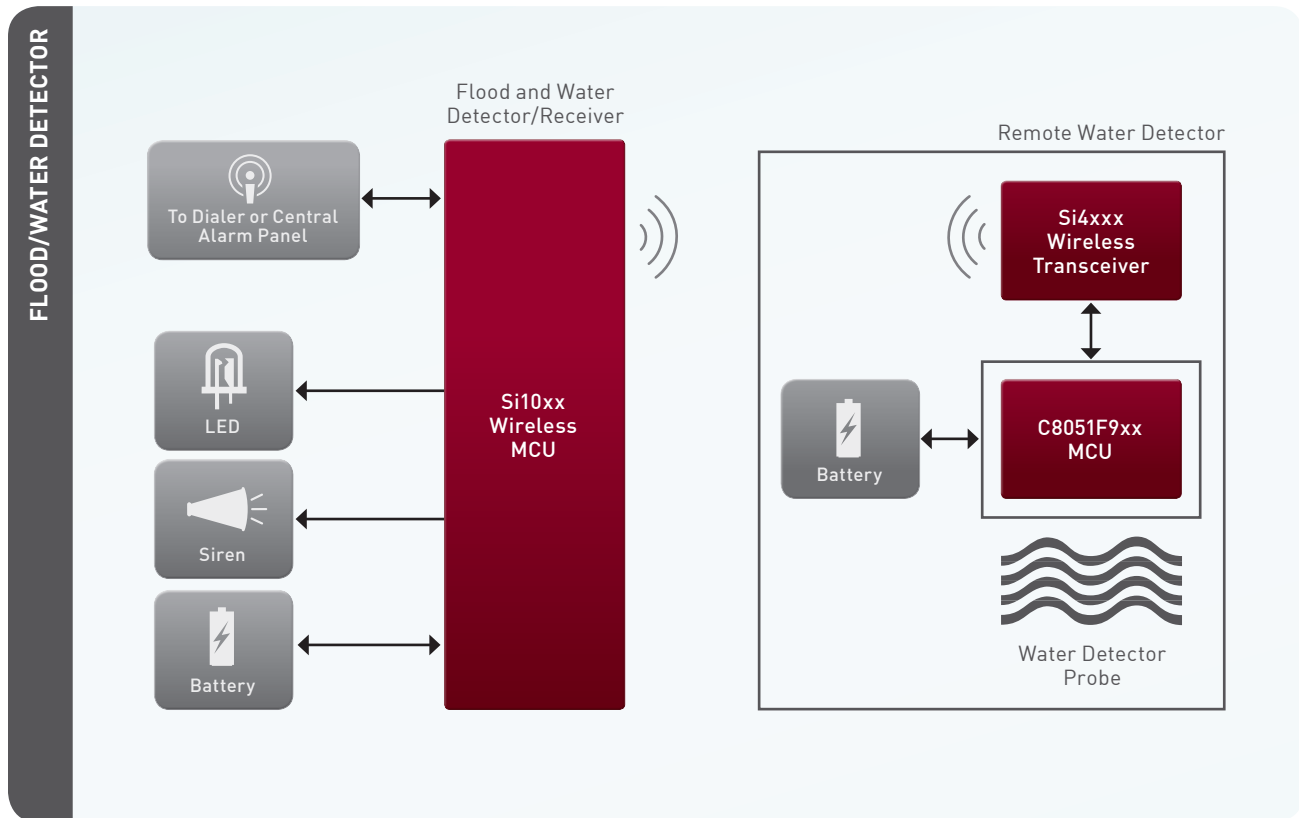


PRODUCT	DESCRIPTION	SILICON LABS SOLUTIONS	CUSTOMER BENEFITS
<b>FAST AND FLEXIBLE PROCESSING</b>			
Si10xx	Low-Power Wireless MCU	160 $\mu$ A per MHz operation, integrated ADCs and comparators; extremely low power operation with integrated flash	Quickly analyze signal frequency, duration, and amplitude to detect events and eliminate false alarms; long battery life and reliable data protection in event of power loss
<b>HUMAN-MACHINE INTERFACE</b>			
Si11xx	QuickSense™ Proximity and Ambient Light Sensor	Low power proximity detection and ambient light sensing	Senses particle density growth to accurately trigger a smoke detection event
<b>ETHERNET CONNECTIVITY AND POWER</b>			
Si3402	Power over Ethernet (PoE)	Complete power supply solution for Power over Ethernet (PoE) Powered Device (PD) applications; delivers 15 watts; IEEE 802.3af compliant	BOM savings with elimination of high-cost external components, maximum system reliability over industrial temperature range, operates seamlessly with standard PoE
CP220x	Ethernet Controller	Small, high performance, single-chip Ethernet controller; Ethernet stack available (royalty-free)	Reliable Ethernet communications
<b>TIMING FLEXIBILITY</b>			
Si535x	Any-Frequency Clock Generator	Superior flexibility, low power, low jitter, small size	Exact frequency synthesis (0 ppm) enables replacement of XOs, VCXOs and multiple clocks



## Flood/Water Detectors

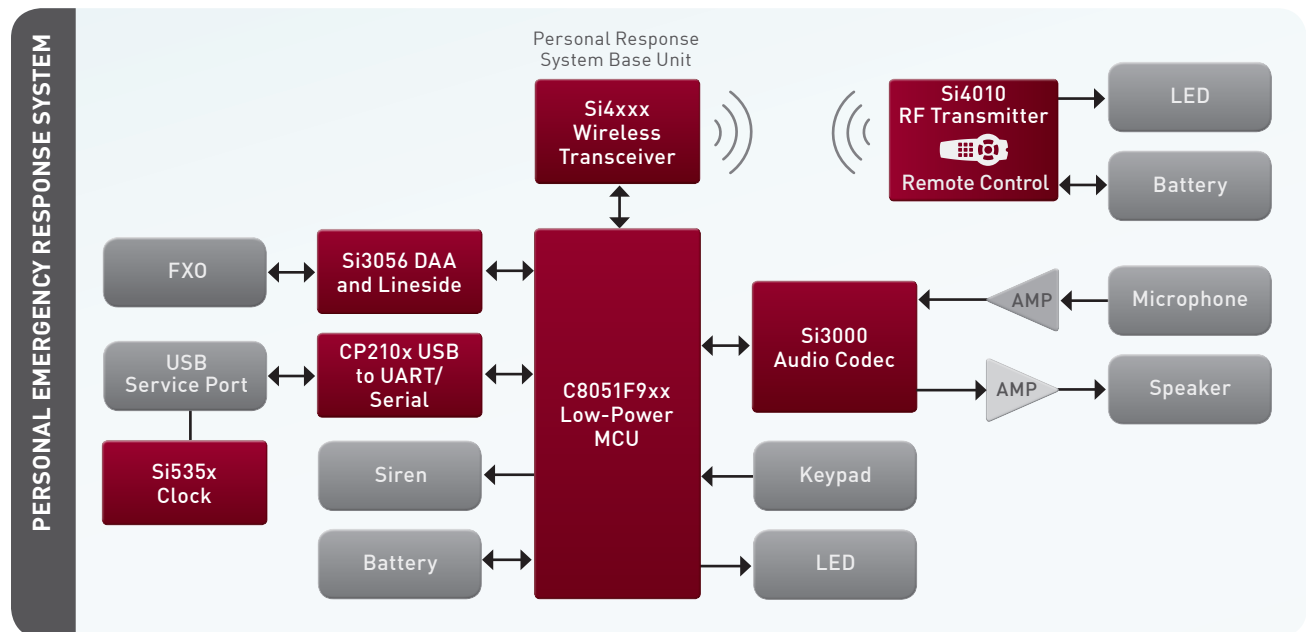
Flood/water detectors are remote sensors that are typically placed in floors and basements. Flood detectors use wireless technology to communicate to a receiver or with other security devices, such as centralized alarm systems/dialers. More advanced flood detectors include temperature sensing to identify possible freeze conditions.



PRODUCT	DESCRIPTION	SILICON LABS SOLUTIONS	CUSTOMER BENEFITS
<b>LOW POWER OPERATION</b>			
C8051F9xx	Ultra Low-Power MCU	Built-in power supply that can operate from a single 0.9 V cell battery and provide 0.9 to 3.3 V to its peripherals, up to a maximum of 65 mW	Extremely long battery life; fewer battery replacements
Si4xxx	EZRadioPRO® Embedded Wireless Solutions	Multiple sleep modes, reduced TX current consumption and reduce wasted current during fast startup	
<b>WIRELESS RANGE AND ROBUSTNESS</b>			
Si4xxx	EZRadioPRO® Embedded Wireless Solutions	Highest sensitivity, longest range, lowest system cost	Receiver can be placed in safe location far from remote probes while still reliably sending and receiving information
Si10xx	Low-Power Wireless MCU	Lowest power single chip MCU with integrated sub-GHz RF transceiver	Long battery life and exceptional range
<b>TEMPERATURE SENSING CAPABILITIES</b>			
C8051F9xx	Ultra Low-Power MCU	Integrated temp sensing as a standard feature	Customer can offer additional value-added features/options (e.g., freeze warnings)

## Personal Emergency Response System

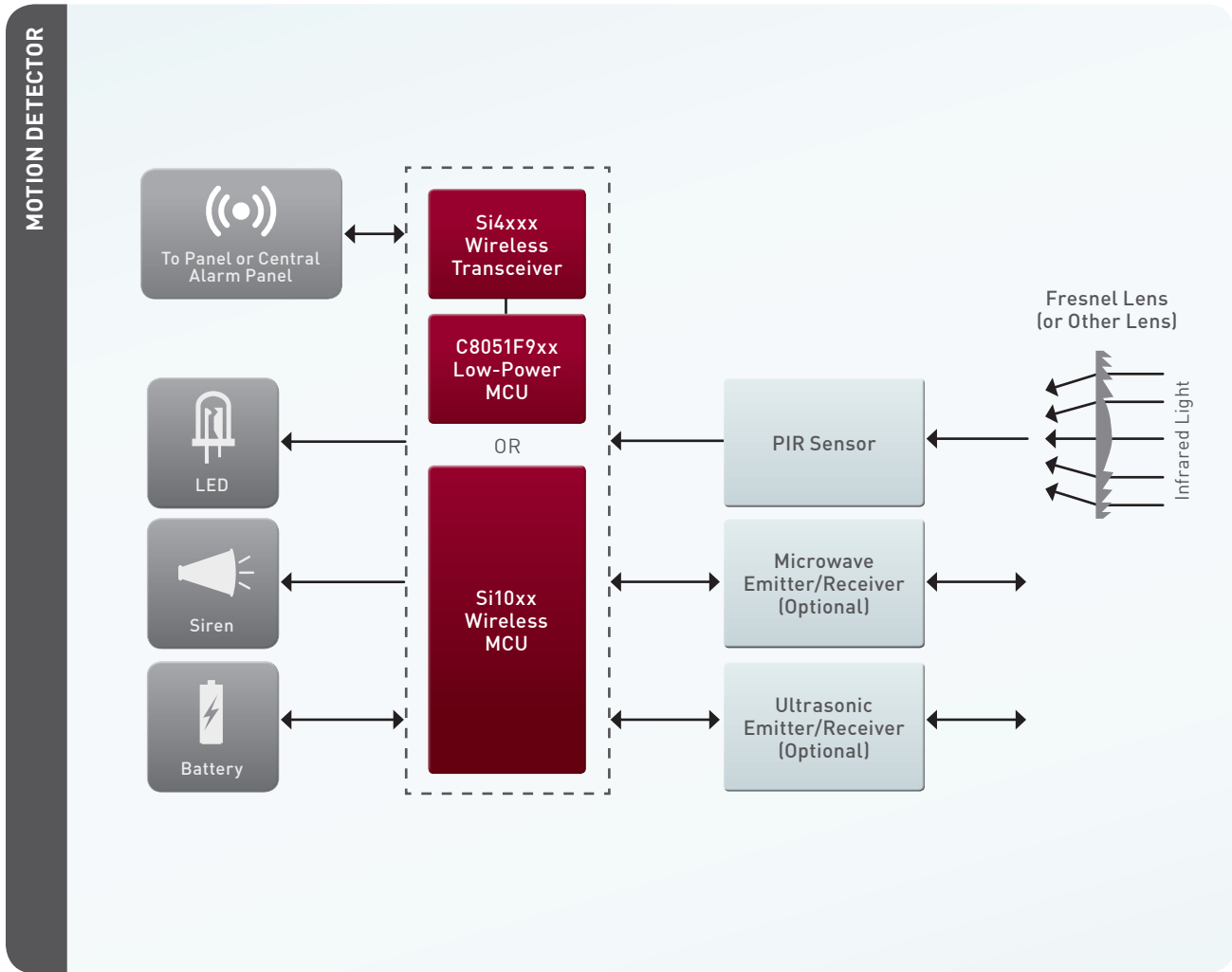
Personal emergency response systems are monitored alarm systems designed to signal a medical or personal emergency. In an emergency, individuals initiate a signal that is wirelessly transmitted to a base unit. Base units are typically centrally monitored, can automatically dial pre-set numbers, activate a siren and enable remote “listening” and “talking.”



PRODUCT	DESCRIPTION	SILICON LABS SOLUTIONS	CUSTOMER BENEFITS
<b>WIRELESS RANGE AND ROBUSTNESS</b>			
Si4xxx	EZRadioPRO® Embedded Wireless Solutions	Highest sensitivity, longest range, lowest system cost	Remote transmitters can trigger an alarm that will reliably be read at the base unit—even over long distances
Si4010	EZ Radio® RF Transmitter and MCU	Single chip remote control IC requiring only one external bypass capacitor	Simplified design, reduced BOM and space
<b>LOW POWER OPERATION</b>			
C8051F9xx	Ultra Low-Power MCU	Extremely low power operation and single cell capable, integrated flash, GPIO flexibility	Extremely long battery life; fewer battery replacements
<b>I/O AND COMMUNICATION SUPPORT</b>			
Si24xx	Data/Fax/Voice Modems	Fully-featured, globally compliant, low power, small size	Create a modular architecture that can be readily expanded and changed
Si3056	DAAs	Software programmable, globally compliant DAAs with/without codecs to transmit and receive voice and data	
Si3000	Audio Codec	Highly integrated, low-cost code optimized for voice/audio applications	
CP210x	USB to UART Bridge	Single-chip, full-speed (12 Mbps) USB-to-UART bridge to interface to service ports	
<b>TIMING FLEXIBILITY</b>			
Si535x	Any-Frequency Clock Generator	Superior flexibility, low power, low jitter, small size	Exact frequency synthesis (0 ppm) enables replacement of XO's, VCXO's and multiple clocks

## Motion Detectors

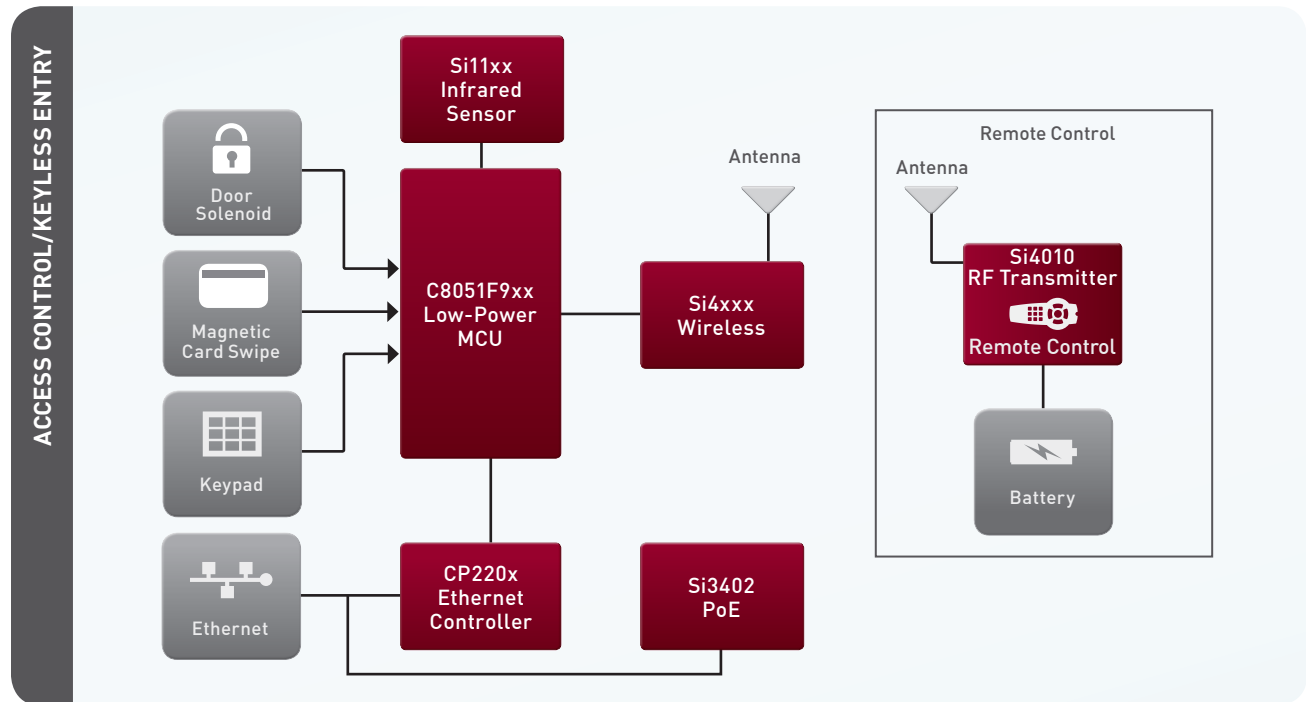
Motion detectors contain sensors that transform the detection of motion into an electrical signal that can be used to trigger alarm events. Modern motion detectors employ “dual-sensor” technology and embedded signal processing to reduce false alarms. They also use wireless technology to communicate with centralized alarm systems/dialers.



PRODUCT	DESCRIPTION	SILICON LABS SOLUTIONS	CUSTOMER BENEFITS
<b>INTEGRATED SUB-GHZ RF TRANSCEIVER MCU</b>			
Si10xx	Low-Power Wireless MCU	Highest-performing 160 $\mu$ A per MHz operation, highly-integrated MCU includes ADCs, comparators, real-time clock and temperature sensor, highest sensitivity, longest range, lowest system cost	Can implement sophisticated algorithms that will reduce false alarms, adapt to environmental disturbances, compensate for temperature changes, etc., dramatically simplifies motion detector design and reduces board space, reliably send alerts to alarm panel (or dialer)
<b>LOW POWER OPERATION AND WIRELESS RANGE</b>			
C8051F9xx	Ultra Low-Power MCU	Built-in power supply that can operate from a single 0.9 V cell battery and provide 0.9 to 3.3 V to its peripherals, up to a maximum of 65 mW	Extremely long battery life; fewer battery replacements
Si4xxx	EZRadioPRO® Embedded Wireless Solutions	Multiple sleep modes, reduced TX current consumption and reduce wasted current during fast startup	

## Access Control/Keyless Entry

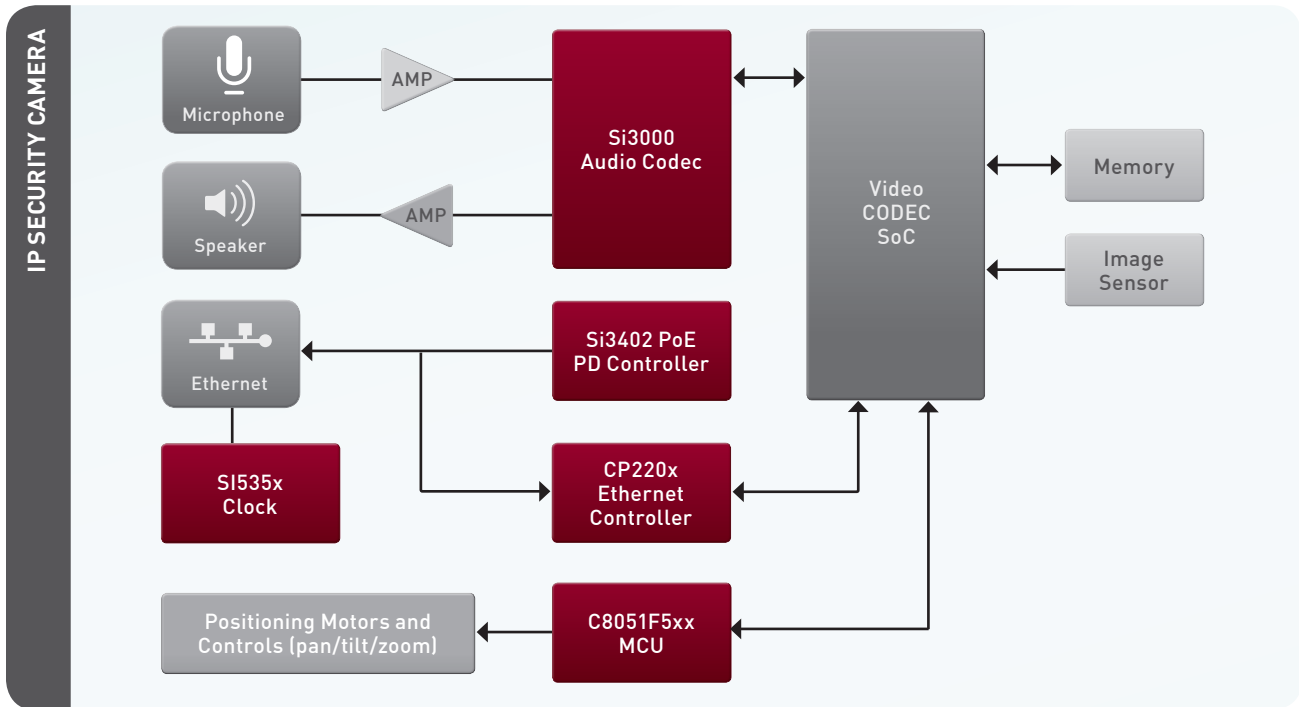
Electronic access control has become increasingly common in commercial, residential and automotive environments. The mechanical key is being replaced by a number of alternative solutions that allow for dynamic and personalized entry control. Silicon Labs provides many of the blocks required to implement cost-effective and extremely low power solutions.



PRODUCT	DESCRIPTION	SILICON LABS SOLUTIONS	CUSTOMER BENEFITS
<b>HUMAN-MACHINE INTERFACE</b>			
Si11xx	QuickSense™ Proximity and Ambient Light Sensor	Low power proximity detection and ambient light sensing	Senses an individual's presence and can control power to LCD display backlights or RF inductive loops to ensure the lowest possible current consumption
<b>WIRELESS RANGE &amp; ROBUSTNESS</b>			
Si4xxx	EZRadioPRO® RF Device	Wireless interface for individual and backhaul data in frequencies from 240 to 960 MHz	Extremely robust RF links that allow for both short range individual communication or long range back haul communication
Si4010	EZRadio® RF Device	Single chip RF transmitter design; can directly drive a loop antenna (removing the need to create complex RF matching networks), embeds an MCU and LC oscillator for true SoC transmitter	Lowest cost solution; reduces circuit design to only the RFIC and a capacitor
<b>PRECISION PROCESSING</b>			
C8051F9xx	Ultra Low-Power MCU	Industry's lowest active and sleep mode current consumption with operation down to 0.9 V and up to 3.6 V; integrated dc-dc controller can power external devices; capacitive sensing versions also available	Extremely long battery life and fewer battery replacements; maintains accurate time over long time periods
<b>ETHERNET CONNECTIVITY AND POWER</b>			
CP220x +Si3402	Ethernet Controller + Power Over Ethernet (PoE)	Small, high-performance Ethernet controller complete with royalty free Ethernet stack; used with the Si34xx PoE device, system power can be provided via standard Ethernet cabling	Lower system power usage using Ethernet

## IP Security Camera

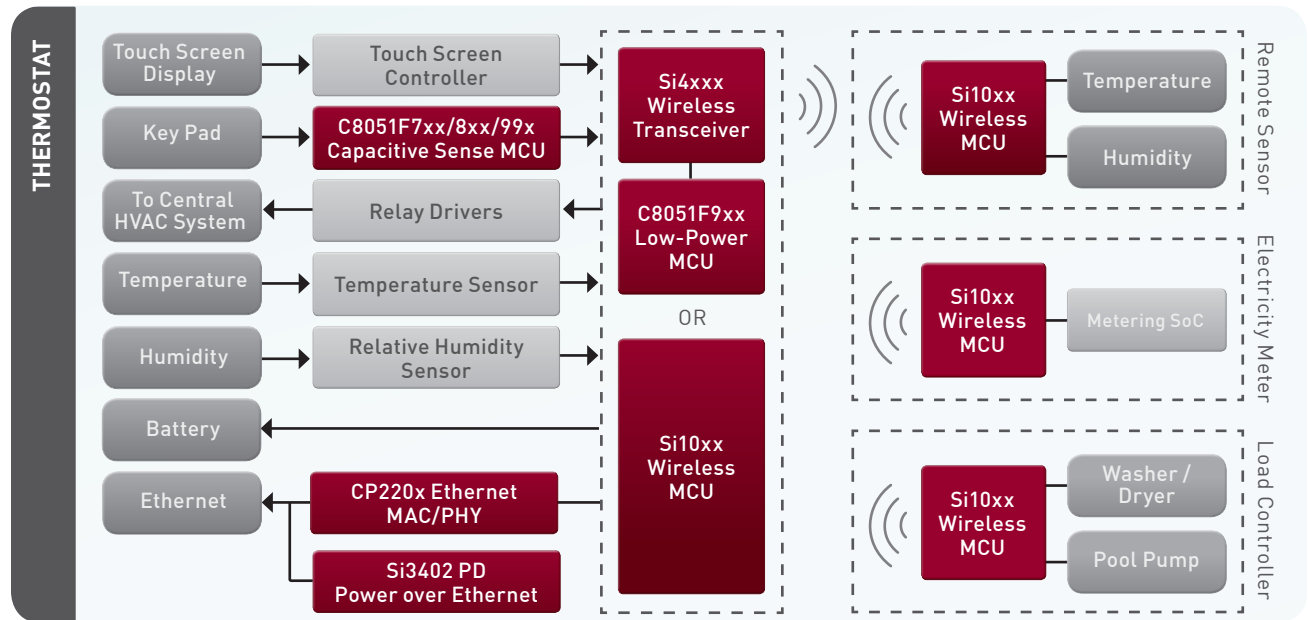
An IP Security Camera transmits remote images over a packet-switched network to a central router or switch over a transmission medium. This approach is superseding analog security and monitoring cameras due to enhanced quality of image delivery, as well as networking capabilities for the cameras. In some cases, the transmission medium is an Ethernet cable such as CAT5. In addition to data flow to and from the camera over the data transmission wires, dc power can also be injected, eliminating the need for additional power wiring or connection to a local power outlet using an ac/dc adapter.



PRODUCT	DESCRIPTION	SILICON LABS SOLUTIONS	CUSTOMER BENEFITS
<b>RELIABLE, SAFE AND EFFECTIVE ISOLATION AND POWER</b>			
Si3402	Power over Ethernet (PoE)	Complete power supply solution for Power over Ethernet (PoE) Powered Device (PD) applications; delivers 15 watts; IEEE 802.3af compliant	BOM savings with elimination of high-cost external components, maximum system reliability over industrial temperature range, operates seamlessly with standard PoE products
Si822x/3x	ISOdriver Isolated Gate Driver	Combines an isolator and two independent drivers into a single package with ultra-fast 50 ns propagation delays for better timing margins, safety certified to 5.0, 3.75 or 2.5 kVrms and withstand ±1500 VDC between outputs for dual drivers; CSA, VDE and UL certified	High integration, low propagation delay, small PCB footprint, flexibility, and cost-effectiveness ensure rock-solid operation over temperature and time, and unparalleled size and cost benefits
Si84xx	Digital Isolator	Industry's best mean time to failure rating, both 2.5 kV and 5.0 kV isolation ratings, best-in-class ESD and EMI performance, CSA, UL and VDE certification reports for global platform development	Safety certified components enable low-cost installation that meets regulatory standards, long-term reliable operation, limited external BOM components needs keep manufacturing costs low and allow for innovative designs
<b>PRECISION PROCESSING</b>			
C8051F5xx	Industrial Microcontroller	Mixed-signal system-on-a-chip MCU, on-board oscillator (± 0.5%) with clock multiplier, integrated flash, 12-bit analog, CAN 2.0B interface, 125° C operation	High reliability, few external components, wide temperature range and voltage operating range; up to 50 MIPS
<b>TIMING FLEXIBILITY</b>			
Si535x	Any-Frequency Clock Generator	Superior flexibility, low power, low jitter, small size	Exact frequency synthesis (0 ppm) enables replacement of XOs, VCXOs and multiple clocks

## Thermostat

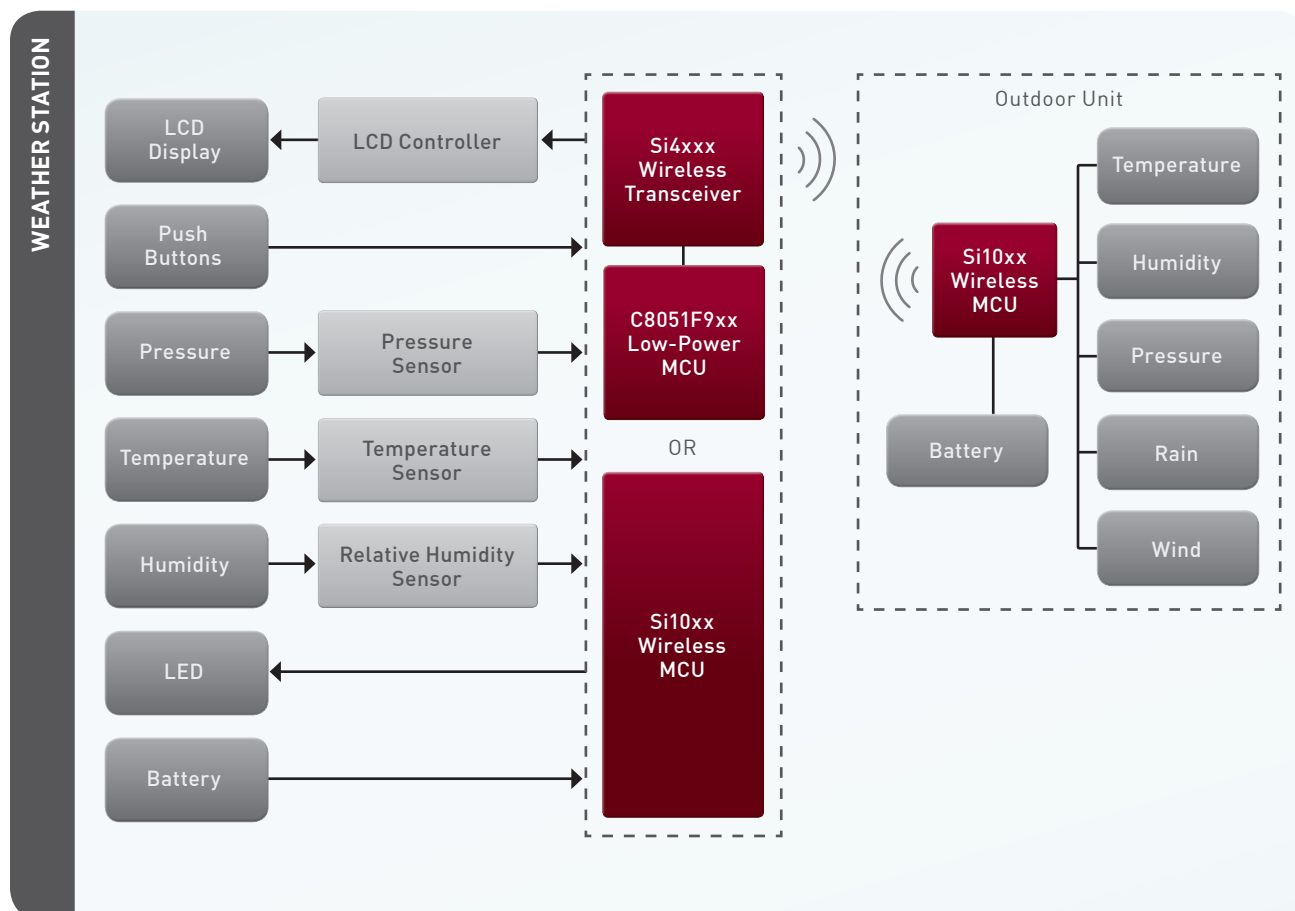
Thermostats regulate temperature and humidity in homes and commercial buildings. Newer models incorporate touch screens, 7-day programmability and wireless communication to remote sensors to simplify and improve heating and cooling. Thermostats may also support a Home Area Network (HAN) that provides access to time-of-day billing rates from public utilities and the ability to schedule the use high-load equipment at lower rates.



PRODUCT	DESCRIPTION	SILICON LABS SOLUTIONS	CUSTOMER BENEFITS
<b>WIRELESS RANGE AND ROBUSTNESS</b>			
Si4xxx	EZRadio®/ EZRadioPRO® Embedded Wireless Solutions	Continuous frequency coverage from 240 to 960 MHz, output power up to +20 dBm, built-in features like wake-up timer, low battery detector, transmit and receive data FIFOs, power-on reset circuit and general-purpose digital I/Os	Meters can transmit data that will be reliably read by the data collector over long distances
<b>LOW POWER OPERATION</b>			
C8051F9xx	Ultra Low-Power MCU	Capable of full-spec operation down to 0.9 V and up to 3.6 V, single-cell battery operation; integrated dc-dc converter, fast wake-up time, low active-mode and ultra-low sleep mode current consumption	Extremely long battery life and fewer battery replacements; maintains accurate time over long time periods
<b>INTEGRATED SUB-GHZ RF TRANSCEIVER MCU</b>			
Si10xx	Wireless Microcontroller	Industry's lowest power single-chip wireless MCU, lowest power consumption in all modes: active, sleep, and deep sleep	Extended range, higher bandwidth and lower overall power consumption
<b>HUMAN INTERFACE CAPABILITIES</b>			
C8051F7xx/ 8xx/99x	QuickSense™ Capacitive Sense MCU	Low power MCU with capacitive sensing, wake-on-touch, and LED lighting control	Enables stylish and differentiated user interface
<b>ETHERNET CONNECTIVITY AND POWER</b>			
CP220x	Ethernet Controller	Small, high-performance Ethernet controller complete with royalty free Ethernet stack; used with the Si34xx PoE device, system power can be provided via standard Ethernet cabling	Lower system power usage using Ethernet
Si3402	Power over Ethernet (PoE)	Complete power supply solution for Power over Ethernet (PoE) Powered Device (PD) applications; delivers 15 watts; IEEE 802.3af compliant	BOM savings with elimination of high-cost external components, maximum system reliability over industrial temperature range, operates seamlessly with standard PoE products

## Weather Station

Weather stations provide a unified display of interior and outdoor weather conditions including temperature, humidity and barometric pressure. Advanced systems also support the measurements of wind speed and rain levels. The indoor and outdoor units are typically battery-powered and benefit from extended wireless reach, making Silicon Labs' low-power wireless MCU products an ideal solution.

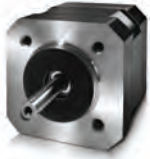


PRODUCT	DESCRIPTION	SILICON LABS SOLUTIONS	CUSTOMER BENEFITS
<b>WIRELESS RANGE AND ROBUSTNESS</b>			
Si4xxx	EZRadio®/ EZRadioPRO® Embedded Wireless Solutions	Continuous frequency coverage from 240 to 960 MHz, output power up to +20 dBm, built-in features like wake-up timer, low battery detector, transmit and receive data FIFOs, power-on reset circuit and general-purpose digital I/Os	Meters can transmit data that will be reliably read by the data collector—even over long distances
<b>LOW POWER OPERATION</b>			
C8051F9xx	Ultra Low-Power MCU	Capable of full-spec operation down to 0.9 V and up to 3.6 V, single-cell battery operation; integrated dc-dc converter, fast wake-up time, low active-mode and ultra-low sleep mode current consumption	Extremely long battery life and fewer battery replacements; maintains accurate time over long time periods costs low and allow for innovative designs
<b>INTEGRATED SUB-GHZ RF TRANSCEIVER MCU</b>			
Si10xx	Wireless Microcontroller	Industry's lowest power single-chip wireless MCU, lowest power consumption in all modes: active, sleep, and deep sleep	Extended range, higher bandwidth and lower overall power consumption



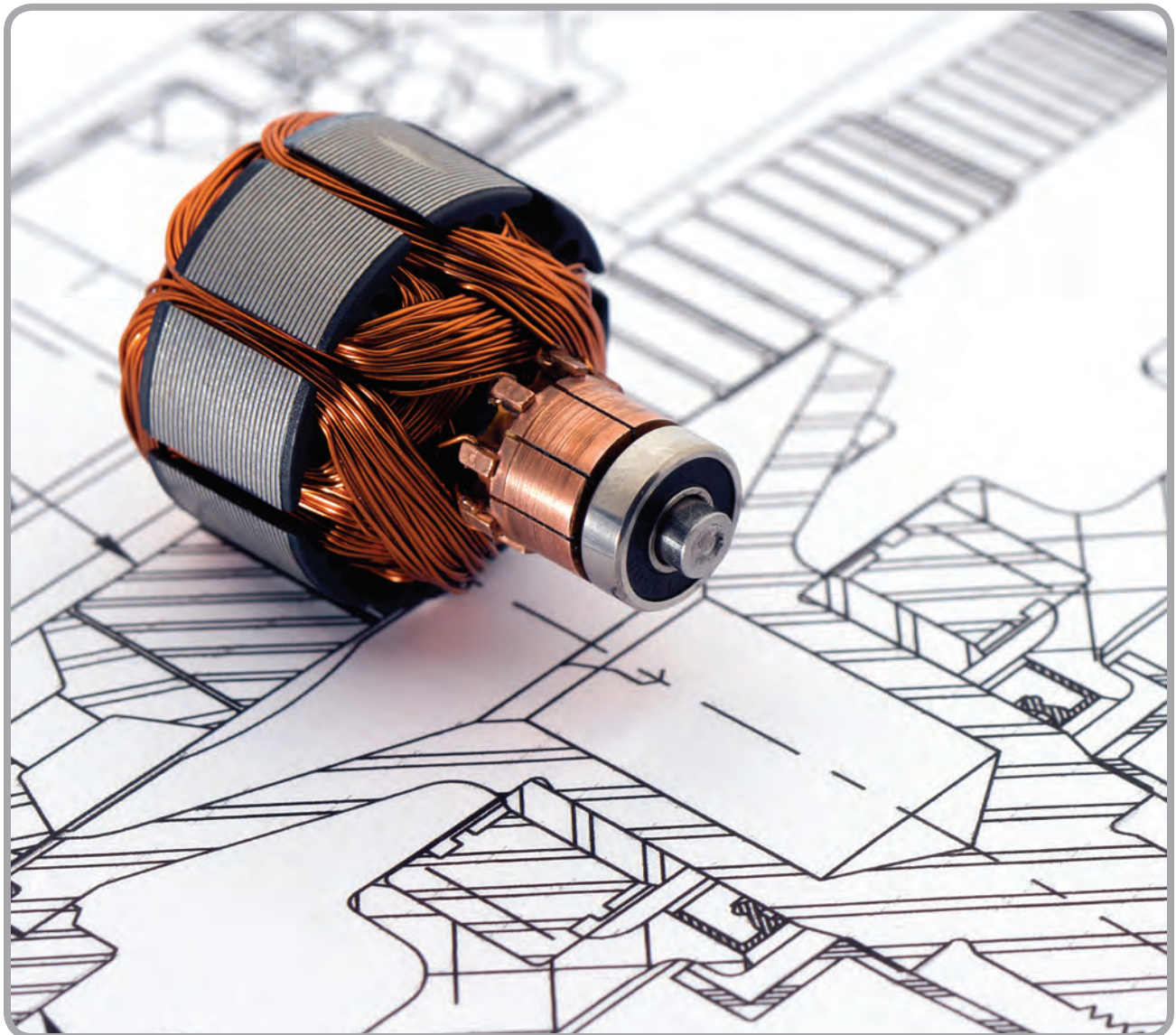
## Motor Control

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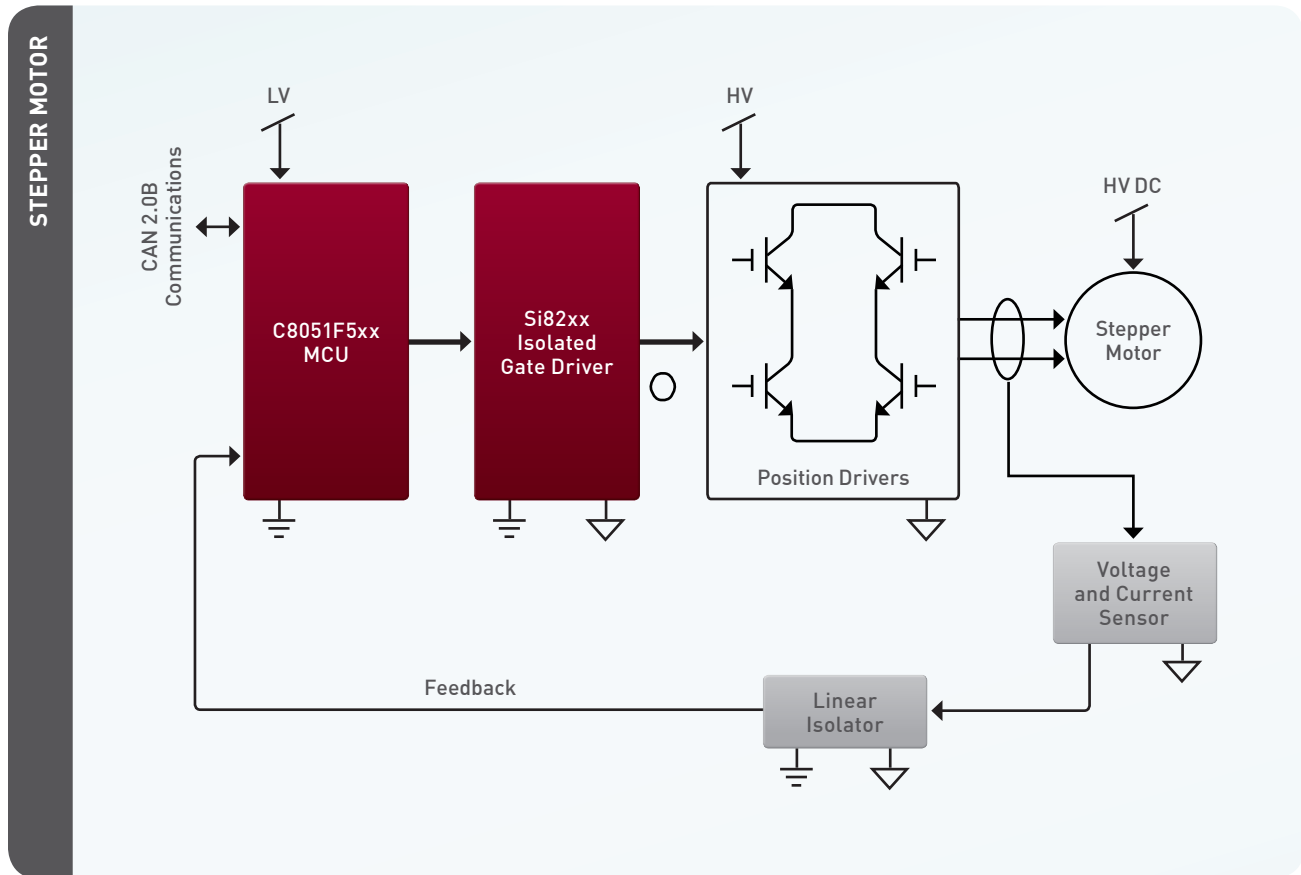
Small motors (less than 300 W) are found in a wide variety of industrial applications, including factory automation, test equipment, robotics and more. High-voltage applications, such as HVAC motors, industrial inverters and high-voltage brushless designs, require reliable isolation to protect both staff and equipment.

Silicon Labs' MCU and isolator products offer outstanding mixed-signal capabilities and integration, making them ideal for motor control applications. Silicon Labs' motor control reference designs provide complete system solutions for all of the popular small motor types (dc, brushless dc and stepper motors), speeding time to market and reducing development costs.



## Stepper Motor

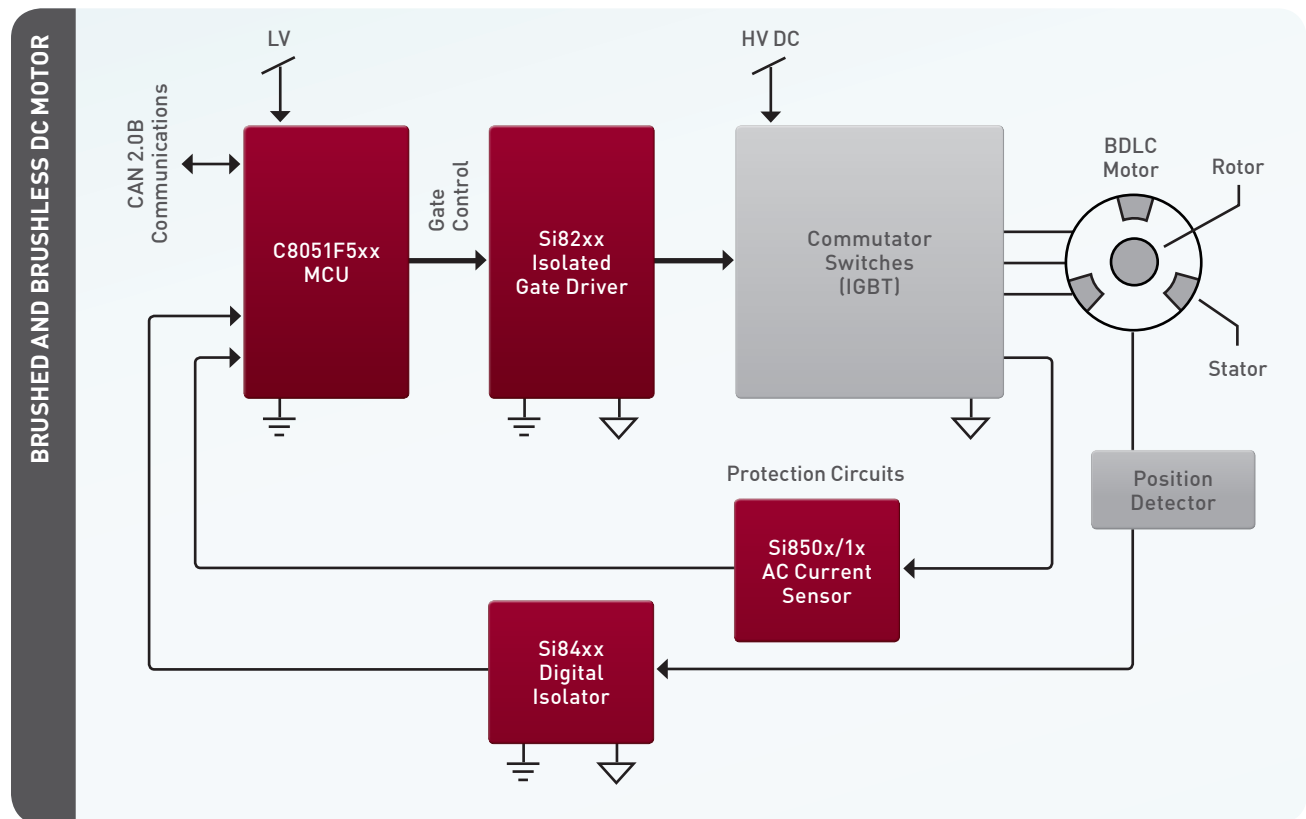
Stepper motors are used when accurate positioning is required. Controlling the position of a stepper motor is achieved by energizing stator windings that allow the stator to align with permanent magnets mounted on the rotor. The MCU controls the sequence of pulses that are applied to the windings to control speed and direction.



PRODUCT	DESCRIPTION	SILICON LABS SOLUTIONS	CUSTOMER BENEFITS
<b>PRECISION PROCESSING</b>			
C8051F5xx	Industrial Microcontroller	Mixed-signal system-on-a-chip MCU, on-board oscillator ( $\pm 0.5\%$ ) with clock multiplier, integrated flash, 12-bit analog, CAN 2.0B interface, 125° C operation	High reliability, few external components, wide temperature range and voltage operating range; up to 50 MIPS
<b>RELIABLE, SAFE AND EFFECTIVE ISOLATION</b>			
Si82xx	ISOdriver Isolated Gate Driver	Isolated gate drivers in 0.5 A and 4.0 A peak output current ratings. 2.5 and 5.0 kVrms isolation	Minimum space, single package gate driver solution. Programmable dead time, latch-free level shifting dc working voltages up to 1 kV, 60 nS prop time. More reliable than HVIC drivers
Si84xx	Digital Isolator	2.5 and 5.0 kVrms isolators with 10x higher reliability than optocouplers; data rates from dc to 150 Mbps	Safety certified, single package digital isolator (1-6 ch/pkg). Smaller, faster, more reliable and lower power than optocouplers

## Brushed and Brushless DC Motor

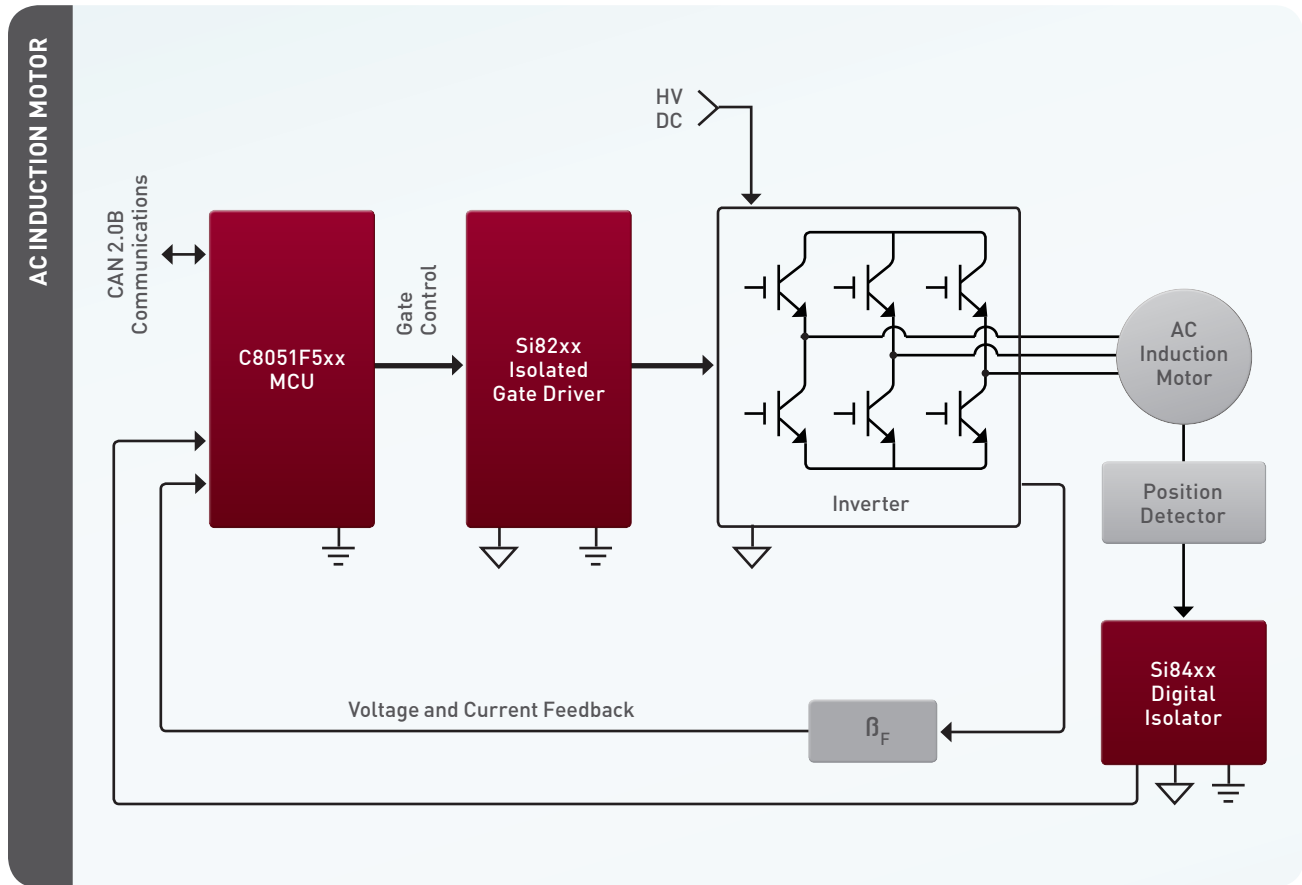
Brushless dc motors are popular as their current-to-torque and voltage-to-speed relationships are linear. They have the advantage of electronic commutation and do not require brush maintenance typical of mechanically commutated motors. The MCU generates gate drive signals and the on-chip analog-to-digital converter is used to measure feedback from voltage, current and position sensors.



PRODUCT	DESCRIPTION	SILICON LABS SOLUTIONS	CUSTOMER BENEFITS
<b>PRECISION PROCESSING</b>			
C8051F5xx	Industrial Microcontroller	Mixed-signal system-on-a-chip MCU, on-board oscillator ( $\pm 0.5\%$ ) with clock multiplier, integrated flash, 12-bit analog, CAN 2.0B interface, 125° C operation	High reliability, few external components, wide temperature range and voltage operating range; up to 50 MIPS
<b>RELIABLE, SAFE AND EFFECTIVE ISOLATION</b>			
Si82xx	ISOdriver Isolated Gate Driver	Isolated gate drivers in 0.5 A and 4.0 A peak output current ratings. 2.5 and 5.0 kVrms isolation	Minimum space, single package gate driver solution. Programmable dead time, latch-free level shifting DC working voltages up to 1 kV, 60 nS propagation time, more reliable than HVIC drivers
Si84xx	Digital Isolator	2.5 and 5.0 kVrms isolators with 10x higher reliability than optocouplers; data rates from dc to 150 Mbps	Safety certified, single package digital isolator (1-6 ch/pkg) smaller, faster, more reliable and lower power than optocouplers
Si850x/1x	AC Current Sensor	High frequency (50 kHz to 1 MHz) tiny CMOS replacement for current sense transformer	Single package CMOS ac current sensor with 2 V full-scale output, signal conditioning and 5% of measurement accuracy, 4 mm x 4 mm x 1 mm package

## AC Induction Motor

The ac induction motor is very popular in industrial and consumer applications because of its reliability and low cost. AC induction motors require three PWM signals with sine wave modulation. These signals are generated by the microcontroller. This example circuit uses a three-phase transistor bridge to drive an ac induction motor.



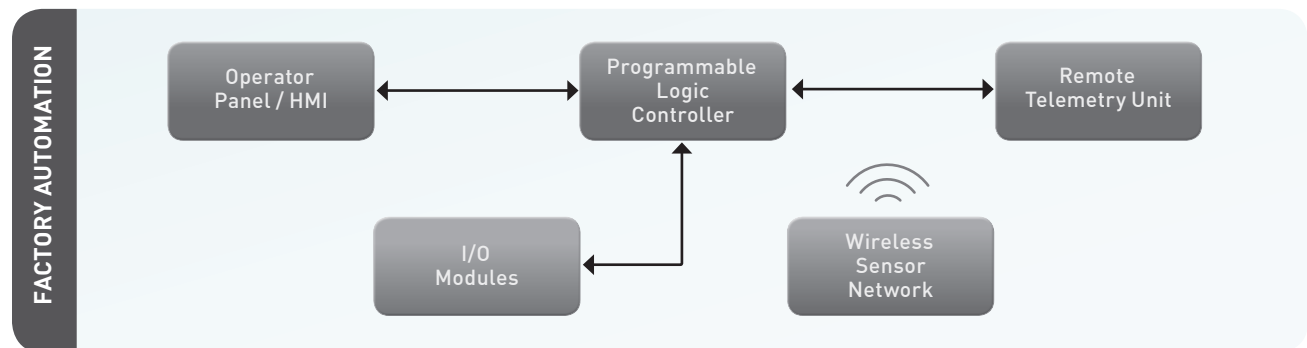
PRODUCT	DESCRIPTION	SILICON LABS SOLUTIONS	CUSTOMER BENEFITS
<b>PRECISION PROCESSING</b>			
C8051F5xx	Industrial Microcontroller	Mixed-signal system-on-a-chip MCU, on-board oscillator ( $\pm 0.5\%$ ) with clock multiplier, integrated flash, 12-bit analog, CAN 2.0B interface, 125° C operation	High reliability, few external components, wide temperature range and voltage operating range; up to 50 MIPS
<b>RELIABLE, SAFE AND EFFECTIVE ISOLATION AND POWER</b>			
Si822x	ISOdriver Isolated Gate Driver	Isolated gate drivers in 0.5 A and 4.0 A peak output current ratings; 2.5 and 5.0 kVrms isolation	Minimum space, single package gate driver solution; programmable dead time, latch-free level shifting dc working voltages up to 1 kV, 60 nS propagation time; more reliable than HVIC drivers
Si84xx	Digital Isolator	2.5 and 5.0 kVrms isolators with 10x higher reliability than optocouplers; data rates from dc to 150 Mbps	Safety certified, single package digital isolator (1-6 ch/pkg); smaller, faster, more reliable and lower power than optocouplers

## Factory Automation

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Factory and industrial automation applications involve monitoring temperature, strain, voltage, current, distance, pressure and flow and the equipment responsible for each process. These harsh operating environments contain varying ground potentials, hazardous voltages and electrical noise.

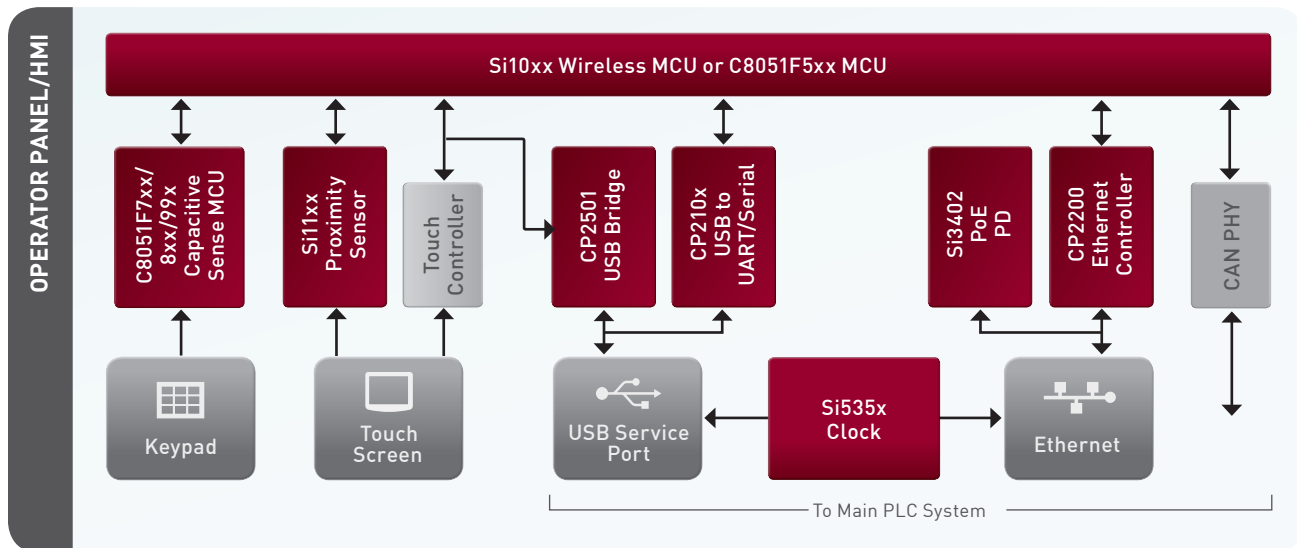
Silicon Labs' fully-integrated system-on-a-chip microcontrollers excel in these harsh environments. Silicon Labs' multi-channel isolators provide high-voltage isolation in a small form factor for high-channel count applications enabling precise measurement and control.





## Operator Panel/HMI

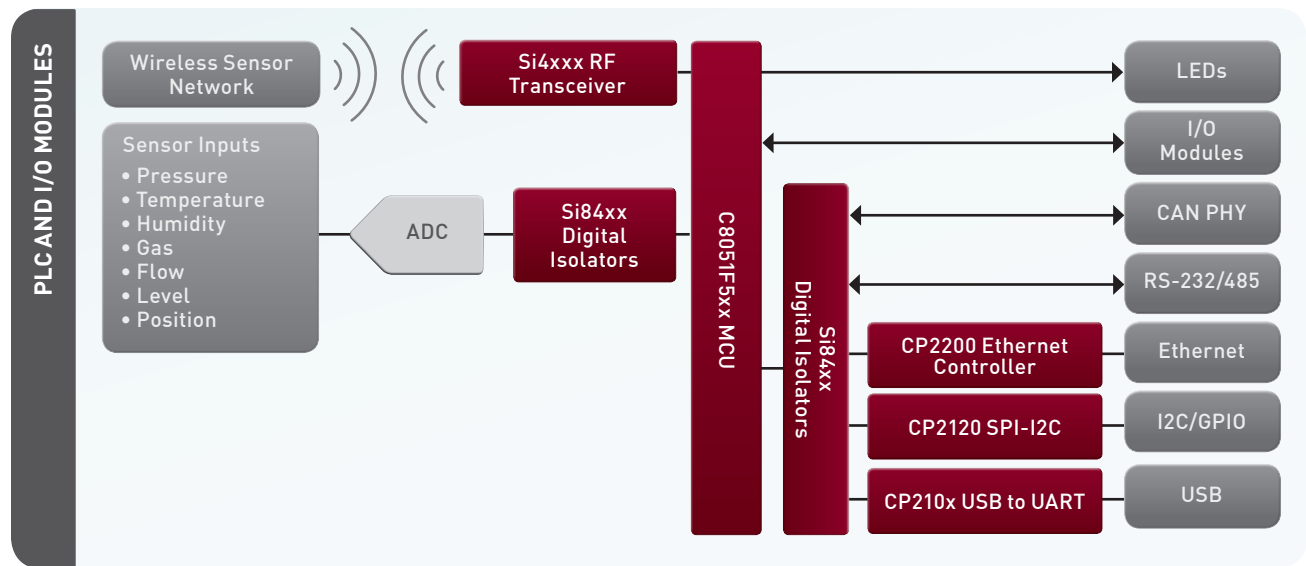
Operator Panels, also known as human machine interfaces (HMI), permit interaction between human operators and industrial control systems such as programmable logic controllers (PLC). Products range from text panels with keypads to highly customizable graphical displays with touch screens. The interface is designed to provide operators with the ability to monitor critical process variables and input commands to query or modify the behavior of the machinery under control. Industrial operator panels are ruggedized for use in harsh environments.



PRODUCT	DESCRIPTION	SILICON LABS SOLUTIONS	CUSTOMER BENEFITS
<b>PROCESSING AND WIRELESS CONNECTIVITY</b>			
Si10xx	Low-Power Wireless MCU	Industry-leading wireless solutions (highest sensitivity, longest range, lowest system cost)	Operators can reliably control a remote industrial control system without wires
C8051F5xx	8-bit MCU with CAN	High reliability 8-bit controller with CAN 2.0B interface	Fully integrated CAN bus solution for high reliability industrial communications
<b>ETHERNET CONNECTIVITY AND POWER</b>			
CP2200	Ethernet Controller	Smallest single-chip Ethernet controller containing an integrated Media Access Controller (MAC) and Physical Layer (PHY)	Enables higher levels of product integration with most efficient use of space
Si3402	Power over Ethernet Device	Complete power supply solution for Power over Ethernet (PoE) Powered Device (PD) applications	Provides isolated or non-isolated power to remote peripherals
<b>HUMAN-MACHINE INTERFACE</b>			
Si11xx	Optical Sensor	High sensitivity, low power infrared sensors	Allows the HMI panel to reduce energy consumption while the operator is away
C8051F7xx/8xx/99x	Capacitive Sensing MCU	Ultra-sensitive and robust capacitive sensing	Implement buttons, sliders, wheels for advanced UI control
<b>USB CONNECTIVITY</b>			
CP210x	USB to UART Bridge	Single-chip full-speed (12 Mbps) USB-to-UART bridge for systems communications	Simple and modular inter-system connectivity via USB
CP250x	Touch Screen USB Bridge	Single-chip full-speed (12 Mbps) USB to touch screen bridge	Adapt touch screen HMI to Windows controllers via USB
<b>TIMING FLEXIBILITY</b>			
Si535x	Any-Frequency Clock Generator	Superior flexibility, low power, low jitter, small size	Exact frequency synthesis (0 ppm) enables replacement of XO's, VCXO's and multiple clocks

## PLC and I/O Modules

Programmable Logic Controllers (PLCs) are computers designed to automate electromechanical processes. They are used in a wide range of applications including assembly lines, food processing, transportation, injection molding and water treatment. PLCs are typically designed for harsh environments and include multiple input/output (I/O) ports to monitor process variables and actuate external systems. These I/O ports may be built in the PLC or they may be housed externally in separate I/O modules.

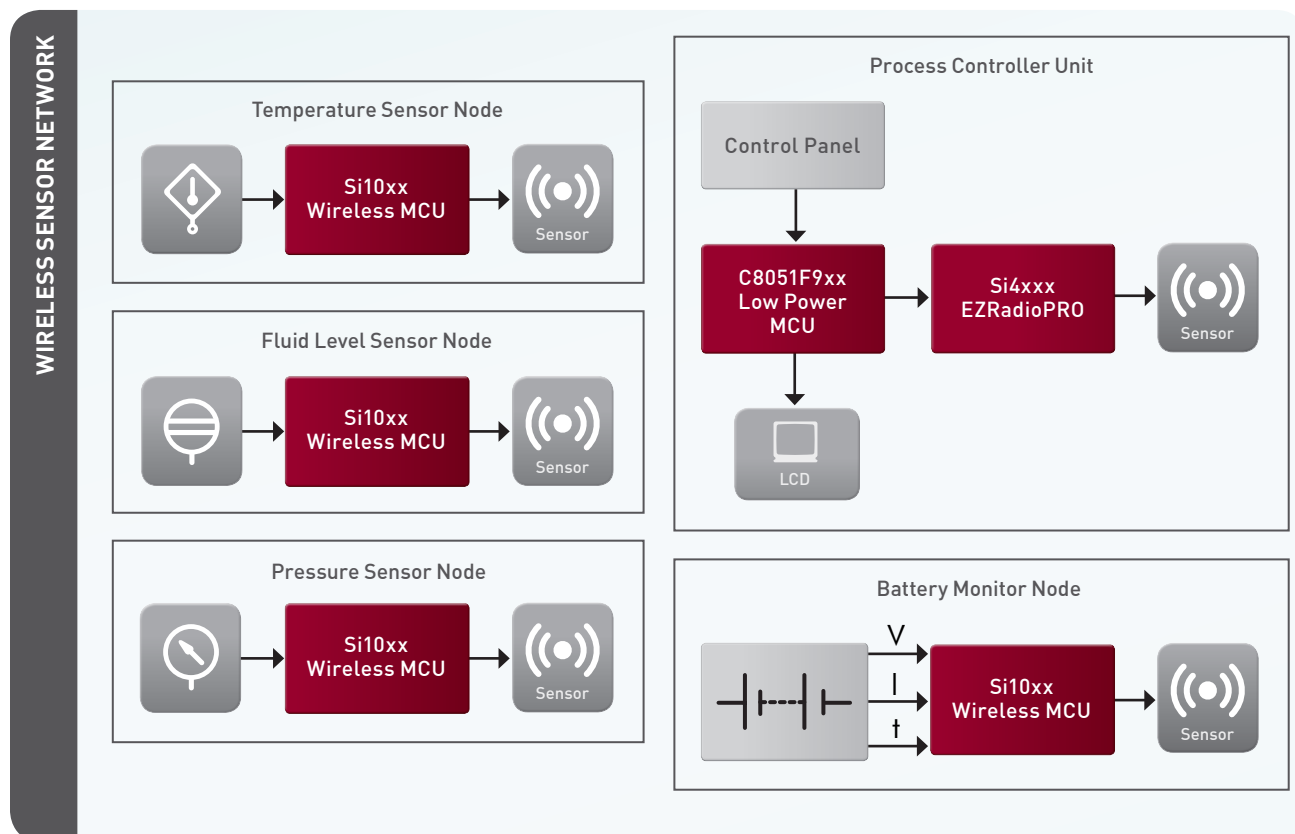


PRODUCT	DESCRIPTION	SILICON LABS SOLUTIONS	CUSTOMER BENEFITS
<b>PRECISION PROCESSING AND WIRELESS RANGE</b>			
C8051F5xx	Industrial Microcontroller	Mixed-signal system-on-a-chip MCU, on-board oscillator ( $\pm 0.5\%$ ) with clock multiplier, integrated flash, 12-bit analog, CAN 2.0B interface, 125° C operation	High reliability, few external components, wide temperature range and voltage operating range; up to 50 MIPS
Si4xxx	EZRadio®/ EZRadioPRO® Embedded Wireless Solutions	Continuous frequency coverage from 240 to 960 MHz, output power up to +20 dBm, built-in features like wake-up timer, low battery detector, transmit and receive data FIFOs, power-on reset circuit and general-purpose digital I/Os	Meters can transmit data that will be reliably read by the data collector over long distances
<b>RELIABLE, SAFE AND EFFECTIVE ISOLATION</b>			
Si84xx	Digital Isolator	Up to 6 isolation channels in a single package, high-speed operation (DC-150 Mbps) over a wide temperature operating range, up to 5 kV VRMS isolation and less than 10 ns propagation delay	Voltage protection for equipment and humans in a small footprint; based on standard CMOS processes, making it easy to integrate into the system
<b>I/O AND COMMUNICATION SUPPORT</b>			
CP210x	USB to UART Bridge	Single-chip, full-speed (12 Mbps) USB-to-UART bridge to interface to service ports	Create a modular architecture that can be readily expanded and changed
CP2120	SPI-I2C Bridge Device and GPIO Port Expander	Compact SPI-to-I2C bridge and general purpose port expander device that allows an SPI master to communicate as an I2C master device	Easily added to a system to solve interface compatibility problems and add more GPIO when required
CP2200	Ethernet Controller	Smallest single-chip Ethernet controller containing an integrated media access controller (MAC) and physical layer (PHY)	Enables higher levels of product integration with most efficient use of space



## Wireless Sensor Network

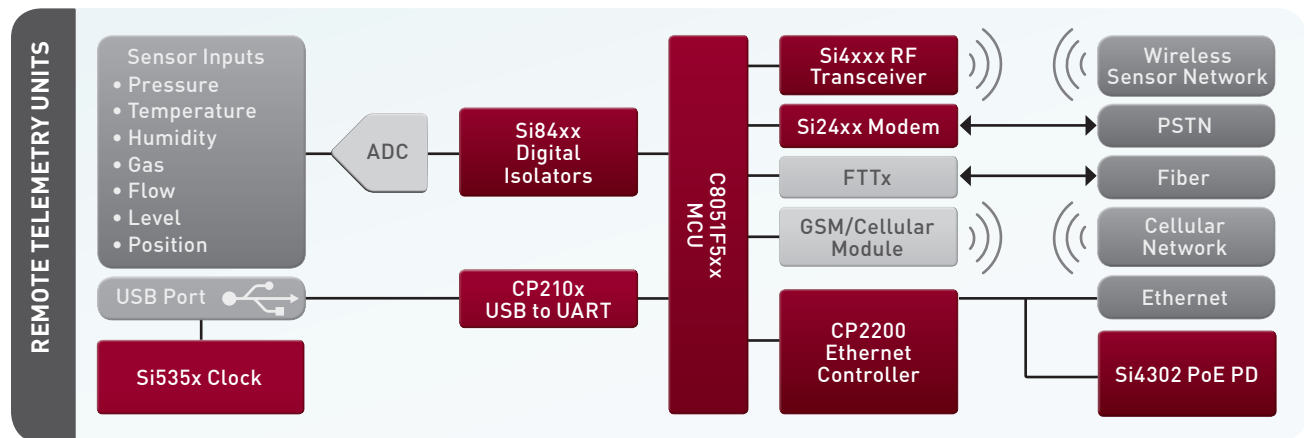
Wireless sensors networks are used when it is not possible or convenient to supply signaling or power supply wires to sensor nodes. These sensor nodes must be battery powered. This example illustrates typical sensor nodes that are used in an industrial process control system that has been implemented wirelessly.



PRODUCT	DESCRIPTION	SILICON LABS SOLUTIONS	CUSTOMER BENEFITS
<b>LOW POWER OPERATION</b>			
Si10xx	Low-Power Wireless MCU	Lowest power single chip MCU with integrated sub-GHz RF transceiver and on-chip temperature sensor	Long battery life, exceptional range, reduced BOM and space required
C8051F9xx	Ultra Low-Power MCU	Industry's lowest active and sleep mode current consumption with operation down to 0.9 V and up to 3.6 V; integrated dc-dc controller can power external devices; capacitive sensing versions also available	High integration, low propagation delay, small PCB footprint, flexibility, and cost-effectiveness ensure rock-solid operation over temperature and time, and unparalleled size and cost benefits
<b>WIRELESS RANGE AND ROBUSTNESS</b>			
Si4xxx	EZRadioPRO® Wireless Transceiver	Highest sensitivity, longest range, lowest system cost; low power consumption	Reliable communications in industrial environment, long battery life with low maintenance

## Remote Telemetry Units

Remote telemetry units (RTUs) are designed to control and monitor remote facilities from a centralized location. RTUs may be used in a distributed large scale wide area network or in point-to-point applications to monitor system status, control process variables and report alarms.



PRODUCT	DESCRIPTION	SILICON LABS SOLUTIONS	CUSTOMER BENEFITS
<b>RELIABLE, SAFE AND EFFECTIVE ISOLATION AND POWER</b>			
Si84xx	Digital Isolator	Industry's best mean time to failure rating, both 2.5 kV and 5.0 kV isolation ratings, best-in-class ESD and EMI performance, CSA, UL and VDE certification reports for global platform development	Safety certified components enable low-cost installation that meets regulatory standards, long-term reliable operation, limited external BOM components needs keep manufacturing costs low and allow for innovative designs
Si3402	Power over Ethernet (PoE)	Complete power supply solution for Power over Ethernet (PoE) Powered Device (PD) applications; delivers 15 watts; IEEE 802.3af compliant	BOM savings with elimination of high-cost external components, maximum system reliability over industrial temperature range, operates seamlessly with standard PoE
<b>TIMING FLEXIBILITY</b>			
Si535x	Any-Frequency Clock Generator	Superior flexibility, low power, low jitter, small size	Exact frequency synthesis (0 ppm) enables replacement of XOs, VCXOs and multiple clocks
<b>PRECISION PROCESSING AND WIRELESS RANGE</b>			
C8051F5xx	Industrial Microcontroller	Mixed-signal system-on-a-chip MCU, on-board oscillator ( $\pm 0.5\%$ ) with clock multiplier, integrated flash, 12-bit analog, CAN 2.0B interface, 125° C operation	High reliability, few external components, wide temperature range and voltage operating range; up to 50 MIPS
Si4xxx	EZRadio®/ EZRadioPRO® Embedded Wireless Solutions	Continuous frequency coverage from 240 to 960 MHz, output power up to +20 dBm, built-in features like wake-up timer, low battery detector, transmit and receive data FIFOs, power-on reset circuit and general-purpose digital I/Os	Meters can transmit data that will be reliably read by the data collector over long distances
<b>I/O AND COMMUNICATIONS SUPPORT</b>			
CP210x	USB to UART Bridge	Single-chip, full-speed (12 Mbps) USB-to-UART bridge to interface to service ports	Create a modular architecture that can be readily expanded and changed
CP2200	Ethernet Controller	Smallest single-chip Ethernet controller containing an integrated media access controller (MAC) and physical layer (PHY)	Enables higher levels of product integration with most efficient use of space
Si24xx	ISOmodem® Data/Fax/Voice Modems	Ranging in speed from 2,400 bps to 56,000 bps, Silicon Labs' patented modem technology provides a programmable telephone line interface and small footprint with minimum external components required	Small size, low cost, low power and proven global compliance

## Turnkey Support

Silicon Labs offers complete tools to help designers throughout the entire project cycle. The microcontroller, EZRadio wireless solutions, isolation, USB and infrared and capacitive sensing solutions offer hardware and software platforms to easily set up and configure, compile and debug a project.

Full documentation and application notes are available. Software stacks provide networking support for multi-node metering networks. Software simulation tools can estimate power consumption and determine expected battery life.

## Partner Program

The Partner Program utility is a searchable database that holds the profiles of third-party companies who provide design support services and offer customized solutions for Silicon Labs' products. [www.silabs.com/partnerprogram](http://www.silabs.com/partnerprogram)

### Easy Step-by-Step Development Support

- Software and hardware development tools
- Windows® GUI development utilities
- Target boards with in-system debug
- Fully integrated IDE for code development
- Documentation and software CD
- USB and audio cables
- External power supply
- AM/FM adapter card and antennas
- Battery life estimator based on user configuration and battery types



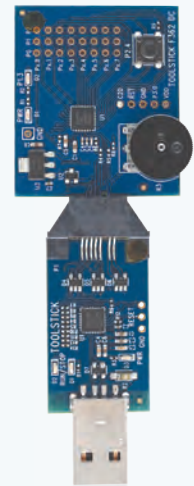
**EZRADIO® AND  
EZRADIOPRO® WIRELESS  
DEVELOPMENT KIT**



**TIMING TOOLSTICK**



**POWER OVER ETHERNET  
DEVELOPMENT KIT**



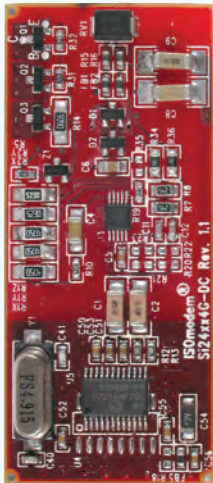
**MCU USB  
TOOLSTICK**

## QuickSense™ Studio Software

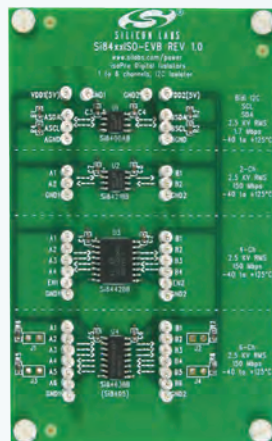
Silicon Labs' QuickSense touch and proximity sensing devices are all easily programmable through the QuickSense Studio development software. The Configuration Wizard simplifies the integration of human interface technologies in end products, allowing engineers to set up capacitive buttons, sliders and wheels by using an intuitive software GUI that generates all the C code required for the selected functions. The studio enables the configuration of infrared proximity and ambient light sensors through a comprehensive library of application programming interfaces (APIs). QuickSense Studio also provides a real-time monitoring and adjustment tool enabling developers to thoroughly test and optimize user interfaces.

### Studio Software Benefits

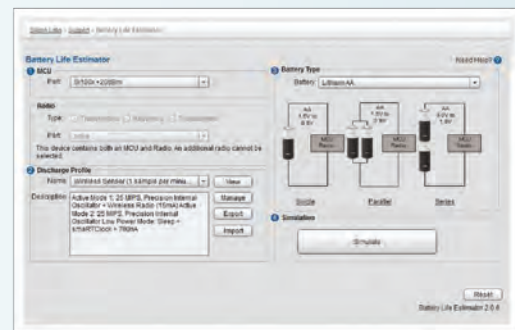
- Quickly add human interface technologies to end products
- Set up capacitive buttons, sliders and wheels with ease
- Support complex algorithms like gesture recognition
- Never type a single line of code with our intuitive software GUI
- Enable the configuration of infrared proximity and ambient light sensors through an API library
- Support provided for the following:
  - C8051F7xx MCU Family
  - C8051F8xx MCU Family
  - C8051F99x MCU Family
  - Si11xx Infrared Proximity and Ambient Light Sensor



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### Low-Power MCUs: [www.silabs.com/lowpower](http://www.silabs.com/lowpower)

PART NUMBER	FLASH MEMORY	MIPS (PEAK)	RAM (BYTES)	DIG. I/O	COMMUNICATIONS	TIMERS (16-BIT)	PWM/PCA	INTERNAL OSC	ADC	TEMP SENSOR	VREF	COMP.	OTHER	PACKAGE	DEV KIT
C8051F930	64 kB	25	4352	24	EMIF, I <sup>2</sup> C, 2 x SPI, UART	4	6	±2%	10-bit, 23-ch., 300 ksps	•	•	2	170 µA/MHz active 50 nA sleep, dc-dc	QFN32/ LQFP32	C8051F930DK
C8051F931	64 kB	25	4352	16	I <sup>2</sup> C, 2 x SPI, UART	4	6	±2%	10-bit, 15-ch., 300 ksps	•	•	2	170 µA/MHz active 50 nA sleep, dc-dc	QFN24	C8051F930DK
C8051F920	32 kB	25	4352	24	EMIF, I <sup>2</sup> C, 2 x SPI, UART	4	6	±2%	10-bit, 23-ch., 300 ksps	•	•	2	170 µA/MHz active 50 nA sleep, dc-dc	QFN32/ LQFP32	C8051F930DK
C8051F921	32 kB	25	4352	16	I <sup>2</sup> C, 2 x SPI, UART	4	6	±2%	10-bit, 15-ch., 300 ksps	•	•	2	170 µA/MHz active 50 nA sleep, dc-dc	QFN24	C8051F930DK
C8051F911	16 kB	25	768	16	I <sup>2</sup> C, 2 x SPI, UART	4	6	±2%	10-bit, 15-ch., 300 ksps	•	•	2	160 µA/MHz active 50 nA sleep, dc-dc	QFN24/ QSOP24	C8051F912DK
C8051F912	16 kB	25	768	16	I <sup>2</sup> C, 2 x SPI, UART	4	6	±2%	12-bit, 15-ch., 75 ksps	•	•	2	160 µA/MHz active 10 nA sleep, dc-dc	QFN24/ QSOP24	C8051F912DK
C8051F901	8 kB	25	768	16	I <sup>2</sup> C, 2 x SPI, UART	4	6	±2%	10-bit, 15-ch., 300 ksps	•	•	2	160 µA/MHz active 50 nA sleep, dc-dc	QFN24/ QSOP24	C8051F912DK
C8051F902	8 kB	25	768	16	I <sup>2</sup> C, 2 x SPI, UART	4	6	±2%	12-bit, 15-ch., 75 ksps	•	•	2	160 µA/MHz active 10 nA sleep, dc-dc	QFN24/ QSOP24	C8051F912DK
C8051F980	8 kB	25	512	16	I <sup>2</sup> C, SPI, UART	4	3	±2%	12-bit, 9-ch., 75 ksps	•	•	1	150 µA/MHz active 10 nA sleep	QFN20	C8051F996DK
C8051F981	8 kB	25	512	16	I <sup>2</sup> C, SPI, UART	4	3	±2%				1	150 µA/MHz active 10 nA sleep	QFN20	C8051F996DK
C8051F986	8 kB	25	512	17	I <sup>2</sup> C, SPI, UART	4	3	±2%	12-bit, 9-ch., 75 ksps	•	•	1	150 µA/MHz active 10 nA sleep	QFN24/ QSOP24	C8051F996DK
C8051F987	8 kB	25	512	17	I <sup>2</sup> C, SPI, UART	4	3	±2%				1	150 µA/MHz active 10 nA sleep	QFN24/ QSOP24	C8051F996DK
C8051F982	4 kB	25	512	16	I <sup>2</sup> C, SPI, UART	4	3	±2%	10-bit, 9-ch., 300 ksps	•	•	1	150 µA/MHz active 10 nA sleep	QFN20	C8051F996DK
C8051F983	4 kB	25	512	16	I <sup>2</sup> C, SPI, UART	4	3	±2%				1	150 µA/MHz active 10 nA sleep	QFN20	C8051F996DK
C8051F988	4 kB	25	512	17	I <sup>2</sup> C, SPI, UART	4	3	±2%	10-bit, 9-ch., 300 ksps	•	•	1	150 µA/MHz active 10 nA sleep	QFN24/ QSOP24	C8051F996DK
C8051F989	4 kB	25	512	17	I <sup>2</sup> C, SPI, UART	4	3	±2%				1	150 µA/MHz active 10 nA sleep	QFN24/ QSOP24	C8051F996DK
C8051F985	2 kB	25	512	16	I <sup>2</sup> C, SPI, UART	4	3	±2%				1	150 µA/MHz active 10 nA sleep	QFN20	C8051F996DK

### Industrial and Automotive Qualified MCUs: [www.silabs.com/automotivemcu](http://www.silabs.com/automotivemcu)

All products are AEC-Q100 qualified.

PART NUMBER	FLASH MEMORY	MIPS (PEAK)	RAM (BYTES)	DIG. I/O	COMMUNICATIONS	TIMERS (16-BIT)	PWM/PCA	INTERNAL OSC	ADC	TEMP SENSOR	VREF	COMP.	OTHER	PACKAGE	DEV KIT
C8051F580	128 kB	50	8448	40	CAN 2.0, I <sup>2</sup> C LIN 2.1, SPI, 2x UART	6	2x6	±0.5%	12-bit, 32-ch., 200 ksps	•	•	3	-40 to 125 °C, Volt. Reg.	QFP48/ QFN48	C8051F580DK
C8051F581	128 kB	50	8448	40	I <sup>2</sup> C, SPI, 2x UART	6	2x6	±0.5%	12-bit, 32-ch., 200 ksps	•	•	3	-40 to 125 °C, Volt. Reg.	QFP48/ QFN48	C8051F580DK
C8051F582	128 kB	50	8448	25	CAN 2.0, I <sup>2</sup> C LIN 2.1, SPI, 2x UART	6	2x6	±0.5%	12-bit, 25-ch., 200 ksps	•	•	3	-40 to 125 °C, Volt. Reg.	QFP32/ QFN32	C8051F580DK
C8051F583	128 kB	50	8448	25	I <sup>2</sup> C, SPI, 2x UART	6	2x6	±0.5%	12-bit, 25-ch., 200 ksps	•	•	3	-40 to 125 °C, Volt. Reg.	QFP32/ QFN32	C8051F580DK
C8051F588	128 kB	50	8448	33	CAN 2.0, I <sup>2</sup> C LIN 2.1, SPI, 2x UART	6	2x6	±0.5%	12-bit, 32-ch., 200 ksps	•	•	3	-40 to 125 °C, Volt. Reg.	QFN40	C8051F580DK
C8051F589	128 kB	50	8448	33	I <sup>2</sup> C, SPI, 2x UART	6	2x6	±0.5%	12-bit, 32-ch., 200 ksps	•	•	3	-40 to 125 °C, Volt. Reg.	QFN40	C8051F580DK
C8051F584	96 kB	50	8448	40	CAN 2.0, I <sup>2</sup> C LIN 2.1, SPI, 2x UART	6	2x6	±0.5%	12-bit, 32-ch., 200 ksps	•	•	3	-40 to 125 °C, Volt. Reg.	QFP48/ QFN48	C8051F580DK
C8051F585	96 kB	50	8448	40	I <sup>2</sup> C, SPI, 2x UART	6	2x6	±0.5%	12-bit, 32-ch., 200 ksps	•	•	3	-40 to 125 °C, Volt. Reg.	QFP48/ QFN48	C8051F580DK
C8051F586	96 kB	50	8448	25	CAN 2.0, I <sup>2</sup> C LIN 2.1, SPI, 2x UART	6	2x6	±0.5%	12-bit, 25-ch., 200 ksps	•	•	3	-40 to 125 °C, Volt. Reg.	QFP32/ QFN32	C8051F580DK

## Industrial and Automotive Qualified MCUs (cont.)

PART NUMBER	FLASH MEMORY	MIPS (PEAK)	RAM (BYTES)	DIG. I/O	COMMUNICATIONS	TIMERS (16-BIT)	PWM/PCA	INTERNAL OSC	ADC	TEMP SENSOR	VREF	COMP.	OTHER	PACKAGE	DEV KIT
C8051F587	96 kB	50	8448	25	I <sup>2</sup> C, SPI, 2x UART	6	2x6	±0.5%	12-bit, 25-ch., 200 ksps	•	•	3	-40 to 125 °C, Volt. Reg.	QFP32/QFN32	C8051F580DK
C8051F590	96 kB	50	8448	33	CAN 2.0, I <sup>2</sup> C, LIN 2.1, SPI, 2x UART	6	2x6	±0.5%	12-bit, 32-ch., 200 ksps	•	•	3	-40 to 125 °C, Volt. Reg.	QFN40	C8051F580DK
C8051F591	96 kB	50	8448	33	I <sup>2</sup> C, SPI, 2x UART	6	2x6	±0.5%	12-bit, 32-ch., 200 ksps	•	•	3	-40 to 125 °C, Volt. Reg.	QFN40	C8051F580DK
C8051F500	64 kB	50	4352	40	CAN 2.0, I <sup>2</sup> C, LIN 2.1, SPI, UART	4	6	±0.5%	12-bit, 32-ch., 200 ksps	•	•	2	-40 to 125 °C	QFP48/QFN48	C8051F500DK
C8051F501	64 kB	50	4352	40	I <sup>2</sup> C, SPI, UART	4	6	±0.5%	12-bit, 32-ch., 200 ksps	•	•	2	-40 to 125 °C	QFP48/QFN48	C8051F500DK
C8051F502	64 kB	50	4352	25	CAN 2.0, I <sup>2</sup> C, LIN 2.1, SPI, UART	4	6	±0.5%	12-bit, 25-ch., 200 ksps	•	•	2	-40 to 125 °C	QFP32/QFN32	C8051F500DK
C8051F503	64 kB	50	4352	25	I <sup>2</sup> C, SPI, UART	4	6	±0.5%	12-bit, 25-ch., 200 ksps	•	•	2	-40 to 125 °C	QFP32/QFN32	C8051F500DK
C8051F508	64 kB	50	4352	33	CAN 2.0, I <sup>2</sup> C, LIN 2.1, SPI, UART	4	6	±0.5%	12-bit, 32-ch., 200 ksps	•	•	2	-40 to 125 °C, Volt. Reg.	QFN40	C8051F500DK
C8051F509	64 kB	50	4352	33	I <sup>2</sup> C, SPI, UART	4	6	±0.5%	12-bit, 32-ch., 200 ksps	•	•	2	-40 to 125 °C, Volt. Reg.	QFN40	C8051F500DK
C8051F504	32 kB	50	4352	40	CAN 2.0, I <sup>2</sup> C, LIN 2.1, SPI, UART	4	6	±0.5%	12-bit, 32-ch., 200 ksps	•	•	2	-40 to 125 °C	QFP48/QFN48	C8051F500DK
C8051F505	32 kB	50	4352	40	I <sup>2</sup> C, SPI, UART	4	6	±0.5%	12-bit, 32-ch., 200 ksps	•	•	2	-40 to 125 °C	QFP48/QFN48	C8051F500DK
C8051F506	32 kB	50	4352	25	CAN 2.0, I <sup>2</sup> C, LIN 2.1, SPI, UART	4	6	±0.5%	12-bit, 25-ch., 200 ksps	•	•	2	-40 to 125 °C	QFP32/QFN32	C8051F500DK
C8051F507	32 kB	50	4352	40	I <sup>2</sup> C, SPI, UART	4	6	±0.5%	12-bit, 25-ch., 200 ksps	•	•	2	-40 to 125 °C	QFP32/QFN32	C8051F500DK
C8051F510	32 kB	50	4352	33	CAN 2.0, I <sup>2</sup> C, LIN 2.1, SPI, UART	4	6	±0.5%	12-bit, 32-ch., 200 ksps	•	•	2	-40 to 125 °C, Volt. Reg.	QFN40	C8051F500DK
C8051F511	32 kB	50	4352	33	I <sup>2</sup> C, SPI, UART	4	6	±0.5%	12-bit, 32-ch., 200 ksps	•	•	2	-40 to 125 °C, Volt. Reg.	QFN40	C8051F500DK
C8051F550	32 kB	50	2304	18	CAN 2.0, I <sup>2</sup> C, LIN 2.1, SPI, UART	4	6	±0.5%	12-bit, 18-ch., 200 ksps	•	•	2	-40 to 125 °C, Volt. Reg.	QFN24	C8051F560DK
C8051F551	32 kB	50	2304	18	CAN 2.0, I <sup>2</sup> C, SPI, UART	4	6	±0.5%	12-bit, 18-ch., 200 ksps	•	•	2	-40 to 125 °C, Volt. Reg.	QFN24	C8051F560DK
C8051F552	32 kB	50	2304	18	I <sup>2</sup> C, LIN 2.1, SPI, UART	4	6	±0.5%	12-bit, 18-ch., 200 ksps	•	•	2	-40 to 125 °C, Volt. Reg.	QFN24	C8051F560DK
C8051F553	32 kB	50	2304	18	I <sup>2</sup> C, SPI, UART	4	6	±0.5%	12-bit, 18-ch., 200 ksps	•	•	2	-40 to 125 °C, Volt. Reg.	QFN24	C8051F560DK
C8051F560	32 kB	50	2304	25	CAN 2.0, I <sup>2</sup> C, LIN 2.1, SPI, UART	4	6	±0.5%	12-bit, 25-ch., 200 ksps	•	•	2	-40 to 125 °C, Volt. Reg.	QFN32/QFP32	C8051F560DK
C8051F561	32 kB	50	2304	25	CAN 2.0, I <sup>2</sup> C, SPI, UART	4	6	±0.5%	12-bit, 25-ch., 200 ksps	•	•	2	-40 to 125 °C, Volt. Reg.	QFN32/QFP32	C8051F560DK
C8051F562	32 kB	50	2304	25	I <sup>2</sup> C, LIN 2.1, SPI, UART	4	6	±0.5%	12-bit, 25-ch., 200 ksps	•	•	2	-40 to 125 °C, Volt. Reg.	QFN32/QFP32	C8051F560DK
C8051F563	32 kB	50	2304	25	I <sup>2</sup> C, SPI, UART	4	6	±0.5%	12-bit, 25-ch., 200 ksps	•	•	2	-40 to 125 °C, Volt. Reg.	QFN32/QFP32	C8051F560DK
C8051F568	32 kB	50	2304	33	CAN 2.0, I <sup>2</sup> C, LIN 2.1, SPI, UART	4	6	±0.5%	12-bit, 32-ch., 200 ksps	•	•	2	-40 to 125 °C, Volt. Reg.	QFN40	C8051F560DK
C8051F569	32 kB	50	2304	33	CAN 2.0, I <sup>2</sup> C, SPI, UART	4	6	±0.5%	12-bit, 32-ch., 200 ksps	•	•	2	-40 to 125 °C, Volt. Reg.	QFN40	C8051F560DK
C8051F570	32 kB	50	2304	33	I <sup>2</sup> C, LIN 2.1, SPI, UART	4	6	±0.5%	12-bit, 32-ch., 200 ksps	•	•	2	-40 to 125 °C, Volt. Reg.	QFN40	C8051F560DK
C8051F571	32 kB	50	2304	33	I <sup>2</sup> C, SPI, UART	4	6	±0.5%	12-bit, 32-ch., 200 ksps	•	•	2	-40 to 125 °C, Volt. Reg.	QFN40	C8051F560DK
C8051F554	16 kB	50	2304	18	CAN 2.0, I <sup>2</sup> C, LIN 2.1, SPI, UART	4	6	±0.5%	12-bit, 18-ch., 200 ksps	•	•	2	-40 to 125 °C, Volt. Reg.	QFN24	C8051F560DK
C8051F555	16 kB	50	2304	18	CAN 2.0, I <sup>2</sup> C, SPI, UART	4	6	±0.5%	12-bit, 18-ch., 200 ksps	•	•	2	-40 to 125 °C, Volt. Reg.	QFN24	C8051F560DK
C8051F556	16 kB	50	2304	18	I <sup>2</sup> C, LIN 2.1, SPI, UART	4	6	±0.5%	12-bit, 18-ch., 200 ksps	•	•	2	-40 to 125 °C, Volt. Reg.	QFN24	C8051F560DK
C8051F557	16 kB	50	2304	18	I <sup>2</sup> C, SPI, UART	4	6	±0.5%	12-bit, 18-ch., 200 ksps	•	•	2	-40 to 125 °C, Volt. Reg.	QFN24	C8051F560DK
C8051F564	16 kB	50	2304	25	CAN 2.0, I <sup>2</sup> C, LIN 2.1, SPI, UART	4	6	±0.5%	12-bit, 25-ch., 200 ksps	•	•	2	-40 to 125 °C, Volt. Reg.	QFN32/QFP32	C8051F560DK
C8051F565	16 kB	50	2304	25	CAN 2.0, I <sup>2</sup> C, SPI, UART	4	6	±0.5%	12-bit, 25-ch., 200 ksps	•	•	2	-40 to 125 °C, Volt. Reg.	QFN32/QFP32	C8051F560DK
C8051F566	16 kB	50	2304	25	I <sup>2</sup> C, LIN 2.1, SPI, UART	4	6	±0.5%	12-bit, 25-ch., 200 ksps	•	•	2	-40 to 125 °C, Volt. Reg.	QFN24	C8051F560DK
C8051F567	16 kB	50	2304	25	I <sup>2</sup> C, SPI, UART	4	6	±0.5%	12-bit, 25-ch., 200 ksps	•	•	2	-40 to 125 °C, Volt. Reg.	QFN24	C8051F560DK
C8051F572	16 kB	50	2304	33	CAN 2.0, I <sup>2</sup> C, LIN 2.1, SPI, UART	4	6	±0.5%	12-bit, 32-ch., 200 ksps	•	•	2	-40 to 125 °C, Volt. Reg.	QFN40	C8051F560DK
C8051F573	16 kB	50	2304	33	CAN 2.0, I <sup>2</sup> C, SPI, UART	4	6	±0.5%	12-bit, 32-ch., 200 ksps	•	•	2	-40 to 125 °C, Volt. Reg.	QFN40	C8051F560DK
C8051F574	16 kB	50	2304	33	I <sup>2</sup> C, LIN 2.1, SPI, UART	4	6	±0.5%	12-bit, 32-ch., 200 ksps	•	•	2	-40 to 125 °C, Volt. Reg.	QFN40	C8051F560DK
C8051F575	16 kB	50	2304	33	I <sup>2</sup> C, SPI, UART	4	6	±0.5%	12-bit, 32-ch., 200 ksps	•	•	2	-40 to 125 °C, Volt. Reg.	QFN40	C8051F560DK
C8051F540	16 kB	50	1280	25	I <sup>2</sup> C, LIN 2.1, SPI, UART	4	6	±0.5%	12-bit, 25-ch., 200 ksps	•	•	2	-40 to 125 °C, Volt. Reg.	QFN32/QFP32	C8051F540DK
C8051F541	16 kB	50	1280	25	I <sup>2</sup> C, SPI, UART	4	6	±0.5%	12-bit, 25-ch., 200 ksps	•	•	2	-40 to 125 °C, Volt. Reg.	QFN32/QFP32	C8051F540DK



## Industrial and Automotive Qualified MCUs (cont.)

PART NUMBER	FLASH MEMORY	MIPS (PEAK)	RAM (BYTES)	DIG. I/O	COMMUNICATIONS	TIMERS (16-BIT)	PWM/PCA	INTERNAL OSC	ADC	TEMP SENSOR	VREF	COMP.	OTHER	PACKAGE	DEV KIT
C8051F542	16 kB	50	1280	18	I <sup>2</sup> C, LIN 2.1, SPI, UART	4	6	±0.5%	12-bit, 18-ch., 200 ksp/s	•	•	2	-40 to 125 °C, Volt. Reg.	QFN24	C8051F540DK
C8051F543	16 kB	50	1280	18	I <sup>2</sup> C, SPI, UART	4	6	±0.5%	12-bit, 18-ch., 200 ksp/s	•	•	2	-40 to 125 °C, Volt. Reg.	QFN24	C8051F540DK
C8051F544	8 kB	50	1280	25	I <sup>2</sup> C, LIN 2.1, SPI, UART	4	6	±0.5%	12-bit, 25-ch., 200 ksp/s	•	•	2	-40 to 125 °C, Volt. Reg.	QFN32/QFP32	C8051F540DK
C8051F545	8 kB	50	1280	25	I <sup>2</sup> C, SPI, UART	4	6	±0.5%	12-bit, 25-ch., 200 ksp/s	•	•	2	-40 to 125 °C, Volt. Reg.	QFN32/QFP32	C8051F540DK
C8051F546	8 kB	50	1280	18	I <sup>2</sup> C, LIN 2.1, SPI, UART	4	6	±0.5%	12-bit, 18-ch., 200 ksp/s	•	•	2	-40 to 125 °C, Volt. Reg.	QFN24	C8051F540DK
C8051F547	8 kB	50	1280	18	I <sup>2</sup> C, SPI, UART	4	6	±0.5%	12-bit, 18-ch., 200 ksp/s	•	•	2	-40 to 125 °C, Volt. Reg.	QFN24	C8051F540DK
C8051F520A	8 kB	25	256	6	LIN 2.1, SPI, UART	3	3	±0.5%	12-bit, 6-ch., 200 ksp/s	•	•	1	-40 to 125 °C	DFN10	C8051F530DK
C8051F521A	8 kB	25	256	6	SPI, UART	3	3	±0.5%	12-bit, 6-ch., 200 ksp/s	•	•	1	-40 to 125 °C	DFN10	C8051F530DK
C8051F530A	8 kB	25	256	16	LIN 2.1, SPI, UART	3	3	±0.5%	12-bit, 16-ch., 200 ksp/s	•	•	1	-40 to 125 °C	QFN20/TSSOP20	C8051F530DK
C8051F531A	8 kB	25	256	16	SPI, UART	3	3	±0.5%	12-bit, 16-ch., 200 ksp/s	•	•	1	-40 to 125 °C	QFN20/TSSOP20	C8051F530DK
C8051F523A	4 kB	25	256	6	LIN 2.1, SPI, UART	3	3	±0.5%	12-bit, 6-ch., 200 ksp/s	•	•	1	-40 to 125 °C	DFN10	C8051F530DK
C8051F524A	4 kB	25	256	6	SPI, UART	3	3	±0.5%	12-bit, 6-ch., 200 ksp/s	•	•	1	-40 to 125 °C	DFN10	C8051F530DK
C8051F533A	4 kB	25	256	16	LIN 2.1, SPI, UART	3	3	±0.5%	12-bit, 16-ch., 200 ksp/s	•	•	1	-40 to 125 °C	QFN20/TSSOP20	C8051F530DK
C8051F534A	4 kB	25	256	16	SPI, UART	3	3	±0.5%	12-bit, 16-ch., 200 ksp/s	•	•	1	-40 to 125 °C	QFN20/TSSOP20	C8051F530DK
C8051F526A	2 kB	25	256	6	LIN 2.1, SPI, UART	3	3	±0.5%	12-bit, 6-ch., 200 ksp/s	•	•	1	-40 to 125 °C	DFN10	C8051F530DK
C8051F527A	2 kB	25	256	6	SPI, UART	3	3	±0.5%	12-bit, 6-ch., 200 ksp/s	•	•	1	-40 to 125 °C	DFN10	C8051F530DK
C8051F536A	2 kB	25	256	16	LIN 2.1, SPI, UART	3	3	±0.5%	12-bit, 16-ch., 200 ksp/s	•	•	1	-40 to 125 °C	QFN20/TSSOP20	C8051F530DK
C8051F537A	2 kB	25	256	16	SPI, UART	3	3	±0.5%	12-bit, 16-ch., 200 ksp/s	•	•	1	-40 to 125 °C	QFN20/TSSOP20	C8051F530DK

USB MCUs: [www.silabs.com/usb](http://www.silabs.com/usb)

PART NUMBER	FLASH MEMORY	MIPS (PEAK)	RAM (BYTES)	EXT MEM I/F	DIG. I/O	COMMUNICATIONS	TIMERS (16-BIT)	PWM/PCA	INTERNAL OSC	ADC1	TEMP SENSOR	VREF	COMP.	OTHER	PACKAGE	DEV KIT
C8051F340	64 kB	48	4352	•	40	I <sup>2</sup> C, SPI, 2x UART, USB 2.0	4	5	±1.5%	10-bit, 17-ch., 200 ksp/s	•	•	2		TQFP48	C8051F340DK
C8051F342	64 kB	48	4352		25	I <sup>2</sup> C, SPI, UART, USB 2.0	4	5	±1.5%	10-bit, 17-ch., 200 ksp/s	•	•	2		LQFP32/QFN32	C8051F340DK
C8051F34A	64 kB	48	4352		25	I <sup>2</sup> C, SPI, 2x UART, USB 2.0	4	5	±1.5%	10-bit, 17-ch., 200 ksp/s	•	•	2		LQFP32/QFN32	C8051F340DK
C8051F34C	64 kB	48	4352	•	40	I <sup>2</sup> C, SPI, 2x UART, USB 2.0	4	5	±1.5%				2		TQFP48	C8051F340DK
C8051F34D	64 kB	48	4352		25	I <sup>2</sup> C, SPI, UART, USB 2.0	4	5	±1.5%				2		LQFP32	C8051F340DK
C8051F344	64 kB	25	4352	•	40	I <sup>2</sup> C, SPI, 2x UART, USB 2.0	4	5	±1.5%	10-bit, 17-ch., 200 ksp/s	•	•	2		TQFP48	C8051F340DK
C8051F346	64 kB	25	4352		25	I <sup>2</sup> C, SPI, UART, USB 2.0	4	5	±1.5%	10-bit, 17-ch., 200 ksp/s	•	•	2		LQFP32/QFN32	C8051F340DK
C8051F341	32 kB	48	2304	•	40	I <sup>2</sup> C, SPI, 2x UART, USB 2.0	4	5	±1.5%	10-bit, 17-ch., 200 ksp/s	•	•	2		TQFP48	C8051F340DK
C8051F343	32 kB	48	2304		25	I <sup>2</sup> C, SPI, UART, USB 2.0	4	5	±1.5%	10-bit, 17-ch., 200 ksp/s	•	•	2		LQFP32/QFN32	C8051F340DK
C8051F34B	32 kB	48	2304		25	I <sup>2</sup> C, SPI, 2x UART, USB 2.0	4	5	±1.5%	10-bit, 17-ch., 200 ksp/s	•	•	2		LQFP32/QFN32	C8051F340DK
C8051F345	32 kB	25	2304	•	40	I <sup>2</sup> C, SPI, 2x UART, USB 2.0	4	5	±1.5%	10-bit, 17-ch., 200 ksp/s	•	•	2		TQFP48	C8051F340DK
C8051F347	32 kB	25	2304		25	I <sup>2</sup> C, SPI, UART, USB 2.0	4	5	±1.5%	10-bit, 17-ch., 200 ksp/s	•	•	2		LQFP32/QFN32	C8051F340DK
C8051F348	32 kB	25	2304	•	40	I <sup>2</sup> C, SPI, 2x UART	4	5	±1.5%				2	EMIF	TQFP48	C8051F340DK
C8051F349	32 kB	25	2304		25	I <sup>2</sup> C, SPI, UART, USB 2.0	4	5	±1.5%				2		LQFP32/QFN32	C8051F340DK
C8051F320	16 kB	25	2304		25	I <sup>2</sup> C, SPI, UART, USB 2.0	4	5	±1.5%	10-bit, 17-ch., 200 ksp/s	•	•	2		LQFP32/QFN32	C8051F320DK
C8051F321	16 kB	25	2304		21	I <sup>2</sup> C, SPI, UART, USB 2.0	4	5	±1.5%	10-bit, 13-ch., 200 ksp/s	•	•	2		QFN28	C8051F320DK
C8051F326	16 kB	25	1536		15	UART, USB 2.0	2		±1.5%					Separate I/O Supply Pin	QFN28	C8051F326DK
C8051F327	16 kB	25	1536		15	UART, USB 2.0	2		±1.5%					Fixed I/O Supply	QFN28	C8051F326DK



## Smart Interface Devices: [www.silabs.com/interface](http://www.silabs.com/interface)

PART NUMBER	DESCRIPTION	LCD SEGMENTS	EEPROM (BYTES)	RAM (BYTES)	DIGITAL PORT I/O PINS	SERIAL BUSES	TIMERS (16-BIT)	INTERNAL OSC	TEMP. RANGE	OTHER	PACKAGE	EVAL KIT
CP2102	UART to USB Bridge	0	1024	1024		UART, USB 2.0	0	•	-40 to 85 °C	Volt Reg	QFN28	CP2102EK
CP2103	UART to USB Bridge	0	1024	1024	4	UART, USB 2.0	0	•	-40 to 85 °C	Volt Reg, RS-485, Split V <sub>DDIO</sub>	QFN28	CP2103EK
CP2104	UART to USB Bridge	0	1024	1152	4	UART, USB 2.0	0	•	-40 to 85 °C	Volt Reg, RS-485, Split V <sub>DDIO</sub>	QFN24	CP2104EK
CP2105	UART to Dual USB Bridge	0	296	608		UART, USB 2.0	0	•	-40 to 85 °C	Volt Reg, RS-485, Split V <sub>DDIO</sub>	QFN24	CP2105EK
CP2110	HID USB to UART Bridge	0	343	960	10	UART, USB 2.0	0	•	-40 to 85 °C	Volt Reg, RS-485, Split V <sub>DDIO</sub>	QFN24	CP2110EK
CP2112	USB to SMBus Bridge	0	194	512	8	USB 2.0, SMBus	0	•	-40 to 85 °C	Volt Reg	QFN24	CP2112EK
CP2120	SPI to I <sup>2</sup> C Bridge, GPIO Port Expander	0	0	512 [buffer RAM]		SPI to I <sup>2</sup> C	0	•	-40 to 85 °C	Voltage Monitor	QFN20	CP2120EB
CP2200	Ethernet Controller	0	8 K	2 kB TX buffer, 4 kB RX buffer	0	8-bit non-muxed Ext. Mem I/F	0		-40 to 85 °C	Integrated Ethernet Transceiver	TQFP48	ETHERNETDK
CP2201	Ethernet Controller	0	8 K	2 kB TX buffer, 4 kB RX buffer	0	8-bit muxed Ext. Mem I/F	0		-40 to 85 °C	Integrated Ethernet Transceiver	QFN28	ETHERNETDK
CP2400	LCD Driver	128	0	256	36	SPI	2	•	-40 to 85 °C	Ultra-low power mode	QFN48/TQFP48	CP2400DK
CP2401	LCD Driver	128	0	256	36	I <sup>2</sup> C	2	•	-40 to 85 °C	Ultra-low power mode	QFN48/TQFP48	CP2401DK
CP2402	LCD Driver	64	0	256	36	SPI	2	•	-40 to 85 °C	Ultra-low power mode	QFN32	CP2400DK
CP2403	LCD Driver	64	0	256	36	I <sup>2</sup> C	2	•	-40 to 85 °C	Ultra-low power mode	QFN32	CP2401DK
CP2501	Touch Screen USB Bridge	0	0	4352	25	I <sup>2</sup> C, SPI, UART, USB	4	1.5%	-40 to 85 °C	Windows-compatible USB HID touch screen interface	QFN32	CP2501EK

## QuickSense™ Touch Sense MCUs: [www.silabs.com/captouchsense](http://www.silabs.com/captouchsense)

PART NUMBER	FLASH (BYTES)	MIPS (PEAK)	RAM (BYTES)	DIG. I/O	COMMUNICATIONS	TIMERS (16-BIT)	PWM/PCA	INTERNAL OSC	ADC1	TOUCH CHANNELS	TEMP SENSOR	VREF	COMP.	PACKAGE	DEV KIT
C8051F702	16 kB	25	512	54	I <sup>2</sup> C, SPI, UART	4	3	±2%	10-bit	38	•	•	1	QFP64	C8051F700DK
C8051F703	16 kB	25	512	54	I <sup>2</sup> C, SPI, UART	4	3	±2%		38	•	•	1	QFP64	C8051F700DK
C8051F706	16 kB	25	512	39	I <sup>2</sup> C, SPI, UART	4	3	±2%	10-bit	27	•	•	1	QFN48/QFP48	C8051F700DK
C8051F707	16 kB	25	512	39	I <sup>2</sup> C, SPI, UART	4	3	±2%		27			1	QFN48/QFP48	C8051F700DK
C8051F716	16 kB	25	512	29	I <sup>2</sup> C, SPI, UART	4	3	±2%	10-bit	26	•	•		QFN32	C8051F700DK
C8051F717	16 kB	25	512	20	I <sup>2</sup> C, SPI, UART	4	3	±2%		18				QFN24	C8051F700DK
C8051F800	16 kB	25	512	17	I <sup>2</sup> C, SPI, UART	3	3	±2%	10-bit	16	•	•	1	QSOP24/QFP20	C8051F800DK
C8051F801	16 kB	25	512	17	I <sup>2</sup> C, SPI, UART	3	3	±2%	10-bit	8	•	•	1	QSOP24/QFP20	C8051F800DK
C8051F802	16 kB	25	512	17	I <sup>2</sup> C, SPI, UART	3	3	±2%	10-bit		•	•	1	QSOP24/ QFP20	C8051F800DK
C8051F803	16 kB	25	512	13	I <sup>2</sup> C, SPI, UART	3	3	±2%	10-bit	12	•	•	1	SOIC16	C8051F800DK
C8051F804	16 kB	25	512	13	I <sup>2</sup> C, SPI, UART	3	3	±2%	10-bit	8	•	•	1	SOIC16	C8051F800DK
C8051F805	16 kB	25	512	13	I <sup>2</sup> C, SPI, UART	3	3	±2%	10-bit		•	•	1	SOIC16	C8051F800DK
C8051F806	16 kB	25	512	17	I <sup>2</sup> C, SPI, UART	3	3	±2%		16			1	QSOP24/QFP20	C8051F800DK
C8051F807	16 kB	25	512	17	I <sup>2</sup> C, SPI, UART	3	3	±2%		8			1	QSOP24/QFP20	C8051F800DK
C8051F808	16 kB	25	512	17	I <sup>2</sup> C, SPI, UART	3	3	±2%					1	QSOP24/QFP20	C8051F800DK
C8051F809	16 kB	25	512	13	I <sup>2</sup> C, SPI, UART	3	3	±2%		12			1	SOIC16	C8051F800DK
C8051F810	16 kB	25	512	13	I <sup>2</sup> C, SPI, UART	3	3	±2%		8			1	SOIC16	C8051F800DK
C8051F811	16 kB	25	512	13	I <sup>2</sup> C, SPI, UART	3	3	±2%					1	SOIC16	C8051F800DK
C8051F815	16 kB	25	512	13	I <sup>2</sup> C, SPI, UART	3	3	±2%	10-bit	12	•	•	1	SOIC16	C8051F800DK
C8051F816	16 kB	25	512	13	I <sup>2</sup> C, SPI, UART	3	3	±2%	10-bit	8	•	•	1	SOIC16	C8051F800DK
C8051F817	16 kB	25	512	13	I <sup>2</sup> C, SPI, UART	3	3	±2%	10-bit		•	•	1	SOIC16	C8051F800DK
C8051F818	16 kB	25	512	17	I <sup>2</sup> C, SPI, UART	3	3	±2%		16			1	QSOP24/QFP20	C8051F800DK
C8051F819	16 kB	25	512	17	I <sup>2</sup> C, SPI, UART	3	3	±2%		8			1	QSOP24/QFP20	C8051F800DK
C8051F820	16 kB	25	512	17	I <sup>2</sup> C, SPI, UART	3	3	±2%					1	QSOP24/QFP20	C8051F800DK
C8051F821	16 kB	25	512	13	I <sup>2</sup> C, SPI, UART	3	3	±2%		12			1	SOIC16	C8051F800DK
C8051F822	16 kB	25	512	13	I <sup>2</sup> C, SPI, UART	3	3	±2%		8			1	SOIC16	C8051F800DK

## QuickSense Touch Sense MCUs (cont.)

PART NUMBER	FLASH (BYTES)	MIPS (PEAK)	RAM (BYTES)	DIG. I/O	COMMUNICATIONS	TIMERS (16-BIT)	PWM/ PCA	INTERNAL OSC	ADC1	TOUCH CHANNELS	TEMP SENSOR	VREF	COMP.	PACKAGE	DEV KIT
C8051F823	16 kB	25	512	13	I <sup>2</sup> C, SPI, UART	3	3	±2%					1	SOIC16	C8051F800DK
C8051F700	15 kB	25	512	54	I <sup>2</sup> C, SPI, UART	4	3	±2%	10-bit	38	•	•	1	QFP64	C8051F700DK
C8051F701	15 kB	25	512	54	I <sup>2</sup> C, SPI, UART	4	3	±2%		38			1	QFP64	C8051F700DK
C8051F704	15 kB	25	512	39	I <sup>2</sup> C, SPI, UART	4	3	±2%	10-bit	27	•	•	1	QFN48/QFP48	C8051F700DK
C8051F705	15 kB	25	512	39	I <sup>2</sup> C, SPI, UART	4	3	±2%		27			1	QFN48/QFP48	C8051F700DK
C8051F708	8 kB	25	512	54	I <sup>2</sup> C, SPI, UART	4	3	±2%	10-bit	38	•	•	1	QFP64	C8051F700DK
C8051F709	8 kB	25	512	54	I <sup>2</sup> C, SPI, UART	4	3	±2%		38			1	QFP64	C8051F700DK
C8051F710	8 kB	25	512	54	I <sup>2</sup> C, SPI, UART	4	3	±2%	10-bit	38	•	•	1	QFP64	C8051F700DK
C8051F711	8 kB	25	512	54	I <sup>2</sup> C, SPI, UART	4	3	±2%		38			1	QFP64	C8051F700DK
C8051F712	8 kB	25	512	39	I <sup>2</sup> C, SPI, UART	4	3	±2%	10-bit	27	•	•	1	QFN48/QFP48	C8051F700DK
C8051F713	8 kB	25	512	39	I <sup>2</sup> C, SPI, UART	4	3	±2%		27			1	QFN48/QFP48	C8051F700DK
C8051F714	8 kB	25	512	39	I <sup>2</sup> C, SPI, UART	4	3	±2%	10-bit	27	•	•	1	QFN48/QFP48	C8051F700DK
C8051F715	8 kB	25	512	39	I <sup>2</sup> C, SPI, UART	4	3	±2%		27			1	QFN48/QFP48	C8051F700DK
C8051F812	8 kB	25	512	17	I <sup>2</sup> C, SPI, UART	3	3	±2%	10-bit	16	•	•	1	QSOP24/QFP20	C8051F800DK
C8051F813	8 kB	25	512	17	I <sup>2</sup> C, SPI, UART	3	3	±2%	10-bit	8	•	•	1	QSOP24/QFP20	C8051F800DK
C8051F814	8 kB	25	512	17	I <sup>2</sup> C, SPI, UART	3	3	±2%	10-bit	—	•	•	1	QSOP24/QFP20	C8051F800DK
C8051F824	8 kB	25	512	13	I <sup>2</sup> C, SPI, UART	3	3	±2%	10-bit	12	•	•	1	SOIC16	C8051F800DK
C8051F825	8 kB	25	512	13	I <sup>2</sup> C, SPI, UART	3	3	±2%	10-bit	8	•	•	1	SOIC16	C8051F800DK
C8051F826	8 kB	25	512	13	I <sup>2</sup> C, SPI, UART	3	3	±2%	10-bit	—	•	•	1	SOIC16	C8051F800DK
C8051F827	8 kB	25	512	13	I <sup>2</sup> C, SPI, UART	3	3	±2%	—	12			1	SOIC16	C8051F800DK
C8051F828	8 kB	25	512	13	I <sup>2</sup> C, SPI, UART	3	3	±2%	—	8			1	SOIC16	C8051F800DK
C8051F829	8 kB	25	512	13	I <sup>2</sup> C, SPI, UART	3	3	±2%	—	—			1	SOIC16	C8051F800DK
C8051F830	8 kB	25	512	13	I <sup>2</sup> C, SPI, UART	3	3	±2%	10-bit	12	•	•	1	SOIC16	C8051F800DK
C8051F830	8 kB	25	512	13	I <sup>2</sup> C, SPI, UART	3	3	±2%	10-bit	12	•	•	1	SOIC16	C8051F800DK
C8051F990	8 kB	25	512	16	I <sup>2</sup> C, SPI, UART	4	3	±2%	—	14	•	•	1	QFN20	C8051F996DK
C8051F991	8 kB	25	512	16	I <sup>2</sup> C, SPI, UART	4	3	±2%	—	14	•	•	1	QFN20	C8051F996DK
C8051F996	8 kB	25	512	17	I <sup>2</sup> C, SPI, UART	4	3	±2%	—	14	•	•	1	QFN20	C8051F996DK
C8051F997	8 kB	25	512	17	I <sup>2</sup> C, SPI, UART	4	3	±2%	—	14	•	•	1	QSOP24/QFP24	C8051F996DK
C8051F831	4 kB	25	512	13	I <sup>2</sup> C, SPI, UART	3	3	±2%	10-bit	8	•	•	1	SOIC16	C8051F800DK
C8051F832	4 kB	25	512	13	I <sup>2</sup> C, SPI, UART	3	3	±2%	10-bit	—	•	•	1	SOIC16	C8051F800DK
C8051F833	4 kB	25	512	13	I <sup>2</sup> C, SPI, UART	3	3	±2%	—	12			1	SOIC16	C8051F800DK
C8051F834	4 kB	25	512	13	I <sup>2</sup> C, SPI, UART	3	3	±2%	—	8			1	SOIC16	C8051F800DK
C8051F835	4 kB	25	512	13	I <sup>2</sup> C, SPI, UART	3	3	±2%	—	—			1	SOIC16	C8051F800DK

## Sensors

REQUEST SAMPLES AND DOWNLOAD DOCUMENTATION AT [www.silabs.com/QuickSense](http://www.silabs.com/QuickSense)

### QuickSense™ Infrared Sensors

PART NUMBER	DESCRIPTION	TEMP. RANGE	PACKAGE
Si1120	PWM Proximity Sensor with Ambient Light Sensor	-40 to 85 °C	3 mm x 3 mm ODFN8
Si1102	Proximity Sensor	-40 to 85 °C	3 mm x 3 mm ODFN8
Si1141	I <sup>2</sup> C Proximity and Ambient Light Sensor with 1 LED Driver	-40 to 85 °C	2 mm x 2 mm QFN10
Si1142	I <sup>2</sup> C Proximity and Ambient Light Sensor with 2 LED Driver	-40 to 85 °C	2 mm x 2 mm QFN10
Si1143	I <sup>2</sup> C Proximity and Ambient Light Sensor with 3 LED Driver	-40 to 85 °C	2 mm x 2 mm QFN10

## Wireless

REQUEST SAMPLES AND DOWNLOAD DOCUMENTATION AT [www.silabs.com/wireless](http://www.silabs.com/wireless)

### EZRadio® Universal ISM-Band RF ICs

PART NUMBER	TYPE	MODULATION SCHEME (MAX KBPS)		FREQUENCY BANDS (MHz)				OUTPUT POWER MAX (dBm)		SUPPLY VOLTAGE (V)	SENSITIVITY (dBm)	PACKAGE
		FSK	OOK	315	434	868	915	868 MHz BAND	434 MHz BAND			
Si4010	MCU +TX	100	50					10		1.8-3.6		MSOP10/SOIC14
Si4012	TX	100	50					10		1.8-3.6		MSOP10/SOIC14
Si4021	TX	115	512		•	•	•	6	8	2.2-5.4		TSSOP16
Si4022	TX	115				•	•	6	8	2.2-3.8		TSSOP16
Si4311	RX	10		•	•					2.7-3.6	-104	QFN20
Si4312	RX		10	•	•					2.7-3.6	-110	QFN20
Si4313	RX	256	40	•	•	•	•			1.8-3.6	-118/-107	QFN20
Si4322	RX	256				•	•			2.2-3.8	-104	TSSOP16

### EZRadioPRO® ISM-Band Radio with Enhanced Features

PART NUMBER	TYPE	MODULATION SCHEME (MAX KBPS)		FREQUENCY RANGE (MHz)	OUTPUT POWER RANGE (dBm)	SENSITIVITY (dBm)		RX CURRENT (mA)	TX CURRENT (dBm)			PACKAGE	
		FSK	OOK			[2.0 KBPS] (FSK)	[4.8 KBPS] (OOK)		0	+11	+13		20
Si4030	TX	256	40	900-960	-8 to +13				18		30		QFN20
Si4031	TX	256	40	240-930	-8 to +13				18		30		QFN20
Si4032	TX	256	40	240-930	+1 to +20					35		85	QFN20
Si4330	RX	256	40	240-960		-121	-110	18.5 mA					QFN20
Si4430	TRX	256	40	900-960	-8 to +13	-12	-110	18.5 mA	18		30		QFN20
Si4431	TRX	256	40	240-930	-8 to +13	-121	-110	18.5 mA	18		30		QFN20
Si4432	TRX	256	40	240-930	+1 to +20	-121	-110	18.5 mA		35		85	QFN20

### Wireless MCUs: [www.silabs.com/wirelessmcu](http://www.silabs.com/wirelessmcu)

PART NUMBER	FLASH MEMORY	MIPS (PEAK)	RAM (BYTES)	DIG. I/O	COMMS.	FSK/FSK (KBPS)	OOK (KBPS)	OUTPUT POWER (DBM)	2/4.8 KBPS SENSITIVITY	TX CURRENT (dBm) (mA)	TIMERS (16-BIT)	PWM/ PCA	INT. OSC	ADC	COMP.	OTHER	PACKAGE	DEV KIT		
Si1000	64 kB	25	4352	22	I <sup>2</sup> C, SPI, UART	256	40	+1 to +20	-121/-110	35		85	4	6	±2%	10-bit, 18-ch., 300 ksps	2	Temp Sensor, RTC, CRC, VREF	QFN42	Si1000DK
Si1002	64 kB	25	4352	22	I <sup>2</sup> C, SPI, UART	256	40	-8 to +13	-121/-110	30			4	6	±2%	10-bit, 18-ch., 300 ksps	2	Temp Sensor, RTC, CRC, VREF	QFN42	Si1000DK
Si1004	64 kB	25	4352	19	I <sup>2</sup> C, SPI, UART	256	40	-8 to +13	-121/-110	30			4	6	±2%	10-bit, 15-ch., 300 ksps	2	Temp Sensor, VREF, RTC, CRC, DC-DC	QFN42	Si1000DK
Si1001	32 kB	25	4352	22	I <sup>2</sup> C, SPI, UART	256	40	+1 to +20	-121/-110	35		85	4	6	±2%	10-bit, 18-ch., 300 ksps	2	Temp Sensor, RTC, CRC, VREF	QFN42	Si1000DK
Si1003	32 kB	25	4352	22	I <sup>2</sup> C, SPI, UART	256	40	-8 to +13	-121/-110	30			4	6	±2%	10-bit, 18-ch., 300 ksps	2	Temp Sensor, RTC, CRC, VREF	QFN42	Si1000DK
Si1005	32 kB	25	4352	19	I <sup>2</sup> C, SPI, UART	256	40	-8 to +13	-121/-110	30			4	6	±2%	10-bit, 15-ch., 300 ksps	2	Temp Sensor, VREF, RTC, CRC, DC-DC	QFN42	Si1000DK
Si1010	16 kB	25	768	15	I <sup>2</sup> C, SPI, UART	256	40	+1 to +20	-121/-110	35		85	4	6	±2%	12-bit, 11-ch., 75 ksps	2	Temp Sensor, RTC, CRC, VREF	QFN42	Si1010DK
Si1012	16 kB	25	768	15	I <sup>2</sup> C, SPI, UART	256	40	-8 to +13	-121/-110	30			4	6	±2%	12-bit, 11-ch., 75 ksps	2	Temp Sensor, RTC, CRC, VREF	QFN42	Si1010DK
Si1014	16 kB	25	768	15	I <sup>2</sup> C, SPI, UART	256	40	-8 to +13	-121/-110	30			4	6	±2%	12-bit, 11-ch., 75 ksps	2	Temp Sensor, VREF, RTC, CRC, DC-DC	QFN42	Si1010DK
Si1011	8 kB	25	768	15	I <sup>2</sup> C, SPI, UART	256	40	+1 to +20	-121/-110	35		85	4	6	±2%	12-bit, 11-ch., 75 ksps	2	Temp Sensor, RTC, CRC, VREF	QFN42	Si1010DK
Si1013	8 kB	25	768	15	I <sup>2</sup> C, SPI, UART	256	40	-8 to +13	-121/-110	30			4	6	±2%	12-bit, 11-ch., 75 ksps	2	Temp Sensor, RTC, CRC, VREF	QFN42	Si1010DK
Si1015	8 kB	25	768	15	I <sup>2</sup> C, SPI, UART	256	40	-8 to +13	-121/-110	30			4	6	±2%	12-bit, 11-ch., 75 ksps	2	Temp Sensor, VREF, RTC, CRC, DC-DC	QFN42	Si1010DK

## Isolation and Power

REQUEST SAMPLES AND DOWNLOAD DOCUMENTATION AT [www.silabs.com/isolation](http://www.silabs.com/isolation)

### Multi-Channel Unidirectional Digital Isolators (1.0 kVrms)

PART NUMBER	FORWARD CHANNELS	REVERSE CHANNELS	MAXIMUM DATA RATE (MBPS)	ENABLE OUTPUT	ISOLATION RATING	VOLTAGE RANGE (V)	TEMPERATURE RANGE	PACKAGE
								NB SOIC16
Si8440AA-D-IS1	4	0	1	•	1.0 kVrms	2.7 - 5.5	-40 to +125 °C	•
Si8440BA-D-IS1	4	0	150	•				•
Si8441AA-D-IS1	3	1	1	•				•
Si8441BA-D-IS1	3	1	150	•				•
Si8442AA-D-IS1	2	2	1	•				•
Si8442BA-D-IS1	2	2	150	•				•
Si8445BA-D-IS1	4	0	150	•	1.0 kVrms	2.7 - 5.5	-40 to +125 °C	•
Si8450AA-B-IS1	5	0	1	•				•
Si8450BA-B-IS1	5	0	150	•				•
Si8451AA-B-IS1	4	1	1	•				•
Si8451BA-B-IS1	4	1	150	•				•
Si8452AA-B-IS1	3	2	1	•				•
Si8452BA-B-IS1	3	2	150	•	1.0 kVrms	2.7 - 5.5	-40 to +125 °C	•
Si8455BA-B-IS1	5	0	150	•				•
Si8460AA-B-IS1	6	0	1	•				•
Si8460BA-B-IS1	6	0	150	•				•
Si8461AA-B-IS1	5	1	1	•				•
Si8461BA-B-IS1	5	1	150	•				•
Si8462AA-B-IS1	4	2	1	•	1.0 kVrms	2.7 - 5.5	-40 to +125 °C	•
Si8462BA-B-IS1	4	2	150	•				•
Si8463AA-B-IS1	3	3	1	•				•
Si8463BA-B-IS1	3	3	150	•				•

\*NB = Narrow-Body, WB = Wide Body

### Multi-Channel Unidirectional Digital Isolators (2.5 kVrms)

PART NUMBER	FORWARD CHANNELS	REVERSE CHANNELS	MAXIMUM DATA RATE (MBPS)	ENABLE OUTPUT	ISOLATION RATING	VOLTAGE RANGE (V)	TEMPERATURE RANGE	PACKAGE(S)					
								NB SOIC8	WB SOIC16	NB SOIC16			
Si8410AB-D-IS	1	0	1		2.5 kVrms	2.7 - 5.5	-40 to +125 °C	•					
Si8410BB-D-IS	1	0	150					•					
Si8420AB-D-IS	2	0	1		2.5 kVrms	2.7 - 5.5	-40 to +125 °C	•					
Si8420BB-D-IS	2	0	150					•					
Si8421AB-D-IS	1	1	1		2.5 kVrms	2.7 - 5.5	-40 to +125 °C	•					
Si8421BB-D-IS	1	1	150					•					
Si8422AB-B-IS	1	1	1		2.5 kVrms	2.7 - 5.5	-40 to +125 °C	•					
Si8422BB-B-IS	1	1	150					•					
Si8423AB-B-IS	2	0	1					•					
Si8423BB-B-IS	2	0	150					•					
Si8430AB-D-IS(1)	3	0	1	•	2.5 kVrms	2.7 - 5.5	-40 to +125 °C		•	•			
Si8430BB-D-IS(1)	3	0	150	•							•	•	
Si8431AB-D-IS(1)	2	1	1	•							•	•	
Si8431BB-D-IS(1)	2	1	150	•	2.5 kVrms	2.7 - 5.5	-40 to +125 °C		•	•			
Si8435BB-D-IS(1)	3	0	150								•	•	
Si8440AB-D-IS(1)	4	0	1	•				2.5 kVrms	2.7 - 5.5	-40 to +125 °C		•	•
Si8440BB-D-IS(1)	4	0	150	•							•	•	
Si8441AB-D-IS(1)	3	1	1	•							•	•	
Si8441BB-D-IS(1)	3	1	150	•							•	•	
Si8442AB-D-IS(1)	2	2	1	•							•	•	
Si8442BB-D-IS(1)	2	2	150	•							•	•	
Si8445BB-D-IS(1)	4	0	150		2.5 kVrms	2.7 - 5.5	-40 to +125 °C		•	•			
Si8450AB-B-IS1	5	0	1	•								•	•
Si8450BB-B-IS1	5	0	150	•								•	•

## Multi-Channel Unidirectional Digital Isolators (2.5 kVrms) (cont.)

PART NUMBER	FORWARD CHANNELS	REVERSE CHANNELS	MAXIMUM DATA RATE (MBPS)	ENABLE OUTPUT	ISOLATION RATING	VOLTAGE RANGE (V)	TEMPERATURE RANGE	PACKAGE(S)		
								NB SOIC8	WB SOIC16	NB SOIC16
Si8451AB-B-IS1	4	1	1	•	2.5 kVrms	2.7 - 5.5	-40 to +125 °C			•
Si8451BB-B-IS1	4	1	150	•						•
Si8452AB-B-IS1	3	2	1	•						•
Si8452BB-B-IS1	3	2	150	•						•
Si8455BB-B-IS1	5	0	150	•						•
Si8460AB-B-IS1	6	0	1	•	2.5 kVrms	2.7 - 5.5	-40 to +125 °C			•
Si8460BB-B-IS1	6	0	150	•						•
Si8461AB-B-IS1	5	1	1	•						•
Si8461BB-B-IS1	5	1	150	•						•
Si8462AB-B-IS1	4	2	1	•						•
Si8462BB-B-IS1	4	2	150	•						•
Si8463AB-B-IS1	3	3	1	•						•
Si8463BB-B-IS1	3	3	150	•						•

## Multi-Channel Unidirectional Digital Isolators (5 kVrms)

PART NUMBER	FORWARD CHANNELS	REVERSE CHANNELS	MAXIMUM DATA RATE (MBPS)	ENABLE OUTPUT	ISOLATION RATING	VOLTAGE RANGE (V)	TEMPERATURE RANGE	PACKAGE(S)		
								NB SOIC8	WB SOIC16	NB SOIC16
Si8410AD-A-IS [2]	1	0	1		5 kVrms	2.7 - 5.5	-40 to +125 °C			•
Si8410BD-A-IS [2]	1	0	150							•
Si8420AD-A-IS [2]	2	0	1							•
Si8420BD-A-IS [2]	2	0	150							•
Si8421AD-B-IS [2]	1	1	1							•
Si8421BD-B-IS [2]	1	1	150							•
Si8422AD-B-IS	1	1	1							•
Si8422BD-B-IS	1	1	150							•
Si8423AD-B-IS	2	0	1							•
Si8423BD-B-IS	2	0	150							•

## Bidirectional Digital Isolators (2.5 kV and 1.0 kV)

PART NUMBER	SERIAL DATA	SERIAL CLOCK	UNIDIRECTIONAL CHANNELS	MAX. I <sup>2</sup> C CLOCK RATE	ISOLATION RATING	PACKAGE(S)	
						NB SOIC8	NB SOIC16
Si8400AA-B-IS	•	•	0	1.7 MHz	1.0 kVrms	•	
Si8400AB-B-IS	•	•	0	1.7 MHz	2.5 kVrms	•	
Si8401AA-B-IS	•		Clock	1.7 MHz	1.0 kVrms	•	
Si8401AA-B-IS	•		Clock	1.7 MHz	2.5 kVrms	•	
Si8405AB-B-IS1	•	•	1 forward and 1 reverse	1.7 MHz	1.0 kVrms		•
Si8405AB-B-IS1	•	•	1 forward and 1 reverse	1.7 MHz	2.5 kVrms		•

## Isolated Gate Drivers

PART NUMBER	INPUTS	CONFIGURATION	OVERLAP PROTECTION	PROGRAMMABLE DEAD TIME	PK IOU <sub>T</sub>	PACKAGE(S)			
						SOIC8	NB SOIC16	WB SOIC16	LGA14
Si8220	Opto (Passive)	Single Driver			2.5 A	SOIC16		•	
Si8221	Opto (Passive)	Single Driver			0.5 A	•		•	
Si8230	VIA/ VIB	High-Side/Low-Side	•	•	0.5 A		•	•	
Si8231	PWM	High-Side/Low-Side	•	•	0.5 A		•	•	
Si8232	VIA/ VIB	Dual Channel Driver			0.5 A		•	•	
Si8233	VIA/ VIB	High-Side/Low-Side	•	•	4.0 A		•	•	•
Si8234	PWM	High-Side/Low-Side	•	•	4.0 A		•	•	•
Si8235	VIA/ VIB	Dual Channel Driver			4.0 A		•	•	•
Si8236	VIA/ VIB	Dual Channel Driver with Thermal Pad			4.0 A				•

## Power over Ethernet Controllers

PART NUMBER	PART DESCRIPTION	TEMPERATURE RANGE	MAX. OUTPUT POWER	PACKAGE(S)
Si3402	Powered device I/F with PWM controller and low-EMI	-40 to 85 °C	17 W	5 x 5 mm 20-pin QFN

## Voice Codec

REQUEST SAMPLES AND DOWNLOAD DOCUMENTATION AT: [www.silabs.com/voice](http://www.silabs.com/voice)

PART NUMBER	MICROPHONE AMPLIFIER	INPUT MIXER	SPEAKER DRIVER	PROGRAMMABLE GAIN	PACKAGE
Si3000	•	•	•	•	SOIC16

## Modems

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### ISOmodem® Embedded Modems

PART NUMBER	DATA	VOICE	FAX	V.42 + V.42bis	CALLER ID	SMS	SECURITY PROTOCOLS	INTERFACE OPTIONS	INDUSTRIAL TEMPERATURE	PACKAGE
Si2401	≤ 2.4 k				•		•	UART		SOIC16 + SOIC16
Si2415	≤ 14.4 k			•	•	•		UART or parallel	•	TSSOP24 + SOIC16
Si2418	≤ 14.4 k	•	≤ 14.4 k	•	•	•	•	UART	•	TSSOP24 + SOIC16
Si2434	≤ 33.6 k			•	•	•		UART or parallel	•	TSSOP24 + SOIC16
Si2438	≤ 33.6 k	•	≤ 33.6 k	•	•	•	•	UART	•	TSSOP24 + SOIC16
Si2457	≤ 56 k			•	•	•		UART or parallel	•	TSSOP24 + SOIC16

## Silicon DAAs

PART NUMBER	REGION	DIGITAL INTERFACE	LINE VOLTAGE MONITOR	AC TERMINATION SETTINGS	CODEC	PACKAGE
Si3050	Global	PCM/SPI or GCI	•	4/16	•	TSSOP20 + SOIC8 or SOIC16
Si3052	Global	PCI	•	4	•	TQFP64 + SOIC8 or SOIC16
Si3054	Global	HD Audio/AC-Link	•	4	•	SOIC16 + SOIC8 or SOIC16
Si3056	Global	SSI	•	4/16	•	SOIC16 + SOIC8 or SOIC16
IA3223	Global	GPIOs + Analog Audio	•	4		QSOP16 + SOIC8 or MSOP10

## Clocks and Oscillators

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**Clock Generation:** [www.silabs.com/clocks](http://www.silabs.com/clocks)

PART NUMBER	DESCRIPTION	CONTROL	INPUT FREQ. (MHz)	OUTPUT FREQ. (MHz)	FORMAT	JITTER	PACKAGE
Si5350	1:8 clock generator; 1:3 clock generator; 1:8 clock generator + VCXO; 1:3 clock generator + VCXO	Pin	25/27 crystal or 10-100 MHz clock	8 kHz-125 MHz	CMOS	< 100 ps pp period jitter	QFN20 or QSOP24 or MSOP10
Si5351	1:8 clock generator; 1:3 clock generator; 1:8 clock generator + VCXO; 1:3 clock generator + VCXO	I <sup>2</sup> C					

## FM Radio Data System (RDS)

REQUEST SAMPLES AND DOWNLOAD DOCUMENTATION AT: [www.silabs.com/audio](http://www.silabs.com/audio)

PART NUMBER	DESCRIPTION	RDS SUPPORT	DIG I/O
Si4706	Enhanced FM RDS/TMC radio receiver, no external antenna required	•	•

Silicon Labs' products are designed and manufactured to ISO 9001, ISO 14001 and ISO/TS 16949 standards.



**ISO 9001**

Quality Management System  
Design and Manufacture of Integrated Circuits  
Certificate Registration  
No: 951 08 4762



**ISO 14001**

Environmental Management System  
Design and Manufacture of Integrated Circuits  
Certificate Registration  
No: 951 09 4998



**ISO/TS 16949**

Quality Management System for  
Manufacture of Integrated Circuits  
and Related Products for Automotive Applications  
Certificate Registration No.: 12 111 33114 TMS  
IATF Certificate No.: 0080212



Silicon Labs audio products are CE certified; Certificate No: EN55020



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