

Healthcare, Wellness and Fitness Patient Monitoring

IoT Designer
Guide 2024

A patient monitoring system is a set of systems and/or processes that enable medical professionals to monitor a patient's health. With the addition of various new sensor and wireless connectivity technologies, healthcare professionals can rely on intelligent analytics of the patient monitoring equipment based on the real time data collected from various sensors to understand patient conditions more accurately and make better informed decisions, no matter where

they are located. This guide provides a curated selection of what we can offer. Download the IoT Designer Guide to get access to the complete guide.

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Wireless Products Antennas

Manufacturer	Part Number/Series	Description	Development Kit	Note
Abracon	AFB4714A-0190S	Tri-band Wi-Fi 6E flex PCB antenna	NA	Flex PCB antenna
	ACAG0201-2450-T	Low-profile 2.4GHz BLE/Wi-Fi/Zigbee chip antenna with small PCB cut-out	ACAG0201-2450-EVB	Internal chip antenna

Bluetooth

Manufacturer	Part Number/Series	Description	Development Kit	Note
Renesas	RYZ012	Bluetooth 5.0 LE module	RTKYZ012A1B0000BE Pmod expansion board	Global RF certification for FCC/ISED, CE, MIC (Japan) Bluetooth certification, Declaration ID: D054228, QDIDs: 136037/160268
	RX23W	Bluetooth® 5.0 Module with long-range and mesh networking support	RTK5RX23W0C-00000BJ target board RTK5523W8AS-00000BJ starter kit	Trusted Secure IP Lite (AES/TRNG) Radio Law (Japan), FCC/ISED (North America), and CE (Europe) certifications
	DA14531 Module	Ultra low-power Bluetooth® 5.1 module	DA14531MOD-00DEVKT-P pro development kit	Worldwide certified BLE module for asset tracking, beacons, connected health, disposables, RCU

Cellular

Manufacturer	Part Number/Series	Description	Development Kit	Note
Renesas	RYZ014A	LTE Cat-M1 cellular IoT module	RTKYZ014ABb00000BE Pmod expansion board RYZ014A-EVK evaluation kit CK-RAGM5 Cellular to Cloud kit with RAGM5 MCU CK-RX65N Cellular to Cloud kit with RX65N MCU	Meets multiple regional regulatory certification requirements including FCC, CE, ISED, UKCA and Japan radio/terminal equipment construction type

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Wireless Products Multi Protocol Combo

Manufacturer	Part Number/Series	Description	Development Kit	Note
Renesas	DA16600MOD	Ultra low-power Wi-Fi + Bluetooth® low energy combo modules	DA16600MOD-DEVKT , DA16600MOD-DEVKT-P	N/A

Positioning

Manufacturer	Part Number/Series	Description	Development Kit	Note
u-blox	MAX-M10 series	Ultra low-power GNSS receiver for high-performance asset-tracking devices	EVK-M101	

UWB

Manufacturer	Part Number/Series	Description	Development Kit	Note
Murata	LBUA0VG2BP-741	UWB module with NXP SR150	LBUA0VG2BP-EVK-P	N/A
	LBUA50J2AB-828	UWB module with Qorvo UWB IC and Bluetooth LE SoC	LBUA50J2AB-828EVB	
	LBUA2ZZ2DK	UWB + Bluetooth® LE combo module with NXP SR040 and NXP QN9090 Bluetooth Low Energy chipset	LBUA2ZZ2DK-EVK	

Wi-Fi

Manufacturer	Part Number/Series	Description	Development Kit	Note
Renesas	DA16200MOD	Ultra low-power Wi-Fi Module	DA16200MOD-DEVKT-P	

Wireless MCU

Manufacturer	Part Number/Series	Description	Development Kit	Note
Renesas	RA4W1	48MHz Bluetooth® 5.0 low energy single chip MCU	EK-RA4W1 evaluation kit	Secure crypto engine (AES128/256, GHASH, TRNG)
	RX23W	32-bit MCUs and module with Bluetooth® 5.0	RTK5RX23WOC00000BJ target board RTK5523W8AS00000BJ starter kit	Trusted Secure IP Lite (AES/TRNG) Radio Law (Japan), FCC/ISED (North America), and CE (Europe) certifications

Sensor Products Air Quality/VOC

Manufacturer	Part Number/Series	Description	Development Kit	Note
Renesas	ZMOD4410	Firmware configurable indoor air quality sensor targeting VOCs	ZMOD4410-EVK	N/A
	ZMOD4510	Firmware configurable outdoor air quality with selective NOx & O3 detection	ZMOD4510-EVK	

Bio/Vital Sign Sensor

Manufacturer	Part Number/Series	Description	Development Kit	Note
ams OSRAM	AS7050	Bio-signal Sensor Analog Frontend	AS7050_EVALKIT_BT	N/A

CO₂ Sensor

Manufacturer	Part Number/Series	Description	Development Kit	Note
Infineon	PASC02V01BUMA1	PASC02V01 XENSIV™ PAS CO ₂ sensor	EVAL_PASC02_MINIBOARD EVAL_PASC02_SENSOR2GO	PASC02V0

Dust/PM Sensor

Manufacturer	Part Number/Series	Description	Development Kit	Note
Panasonic	SN-GCJA5	PM2.5 sensor for HVAC and air quality applications	N/A	N/A
	SN-GCJA5L		N/A	With cable

Gas Sensor

Manufacturer	Part Number/Series	Description	Development Kit	Note
Renesas	ZMOD4410	Firmware configurable indoor air quality sensor targeting VOCs	ZMOD4410-EVK	N/A
	ZMOD4510	Firmware configurable outdoor air quality with selective NOx & O3 detection	ZMOD4510-EVK	

Sensor Products

Flow Sensors

Manufacturer	Part Number/Series	Description	Development Kit	Note
Renesas	FS1015	Air velocity sensor module	N/A	N/A

Humidity Sensors

Manufacturer	Part Number/Series	Description	Development Kit	Note
Renesas	HS4001	Miniature size and ultra low-power relative humidity and temperature sensor	HS4000-EVK	N/A
	HS3001	Relative humidity and temperature sensor, analog output, $\pm 1.5\%$ RH	HS3000-EVK	

Temperature Sensors

Manufacturer	Part Number/Series	Description	Development Kit	Note
ams OSRAM	AS6221	$\pm 0.09^{\circ}\text{C}$ (20°C to 42°C) very accurate digital temp sensor	AS6221 eval kit , AS6221 demo kit	Household robot, industrial robot, appliance, agriculture, drones, home & building automation (HaBA), disinfection, health & diagnostic devices, light vehicle, 2 wheeler, Phone, media devices & tablets, accessories, display, computer, wearables, media, TV, home assist, personal assist, other transportation, medical imaging,
	AS6212	$\pm 0.2^{\circ}\text{C}$ deg accuracy - digital temperature sensor	AS621x eval kit, AS621x demo kit	
Melexis	MLX90632	Infrared temperature sensor. $\pm 0.2^{\circ}\text{C}$ in the human body temperature range. QFN package	EVK90632	N/A

Pressure Sensors

Manufacturer	Part Number/Series	Description	Development Kit	Note
Bosch Sensortec	BMP384	Sensor has a gel-filled cavity that allows higher robustness against water, liquids and other chemicals	SHUTTLE BOARD 3.0 BMP384	N/A
	BMP390	Very small, low-power and low-noise 24-bit absolute barometric pressure sensor	SHUTTLE BOARD 3.0 BMP390	
	BMP581	Barometric pressure sensor that impresses with its enormous accuracy	SHUTTLE BOARD 3.0 BMP581	

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Sensor Products Accelerometer

Manufacturer	Part Number/Series	Description	Development Kit	Note
Bosch Sensortec	BMA456	Ultra small, triaxial, low-g high performance acceleration sensor with digital interfaces	SHUTTLE BOARD 3.0 BMA456	N/A
	BMA400	Triaxial sensor with real ultra low-power acceleration	SHUTTLE BOARD 3.0 BMA400	

Inertial Combo

Manufacturer	Part Number/Series	Description	Development Kit	Note
Bosch Sensortec	BMI270	IMU optimized for wearables providing precise acceleration, angular rate measurement and intelligent on-chip motion-triggered interrupt features	SHUTTLE BOARD 3.0 BMI270	N/A
	BMI088	High-performance 6-axis inertial sensor that allows for highly accurate measurement of orientation and detection of motion along three orthogonal axes	0440.SB2.365-101	
	BMI323	General purpose, low-power IMU that combines precise acceleration and angular rate (gyroscopic) measurement with intelligent on-chip motion-triggered interrupt features.	SHUTTLE BOARD 3.0 BMI323	

Magnetometer

Manufacturer	Part Number/Series	Description	Development Kit	Note
Bosch Sensortec	BMM350	Small, high performance, low current 16 bit, 3-axis magnetometer	SHUTTLE BOARD 3.0 BMM350	N/A

MEMS Microphone

Manufacturer	Part Number/Series	Description	Development Kit	Note
Infineon	IM69D130V01XTSA1	XENSIV™ MEMS microphone with 105dB dynamic range and high output linearity up to 130dB SPL	EVAL_IM69D130_FLEXKIT S2G0 MEMSMIC IM69D	N/A
	IM69D127V11XTMA1	High performance XENSIV™ MEMS microphone in a small 3.6 x 2.5mm package	KIT_IM69D127V11_FLEX	
	IM72D128V01XTMA1	Ultra high performance XENSIV™ MEMS microphone with very high dynamic range	KITIM69D128SV01FLEX-T0B01	

Inductive Position Sensor

Manufacturer	Part Number/Series	Description	Development Kit	Note
Renesas	ZMID4200	Inductive position sensor IC	ZMID4200STKIT	N/A

Sensor Products

ALS

Manufacturer	Part Number/Series	Description	Development Kit	Note
ams OSRAM	TSL2540	Ambient light sensor: light-to-digital converter with Vdd I ² C interface	TSL2591EvalKit	Display backlight control, keyboard illumination control, solid state and general lighting control, printer paper detection

Capacitive Touch Sensor

Manufacturer	Part Number/Series	Description	Development Kit	Note
ams OSRAM	AS9579	Accurate 10-channel capacitive presence sensor	AS9579 eval kit	Autonomous driving applications e.g.: hands on steering wheel detection, detection of any human presence exterior of vehicles e.g.: automatic trunk opener (trunk opens automatically and touchless by detection of human foot near the sensor only), fluid level measurement

Time-of-Flight Sensor

Manufacturer	Part Number/Series	Description	Development Kit	Note
ams OSRAM	TMF8821	Configurable multi-zone 4 x 4 time-of-flight sensor with 940nm integrated IR VCSEL in a 2.0mm x 4.6mm x 1.4mm module	TMF882X eval kit TMF882x MCU shield EVM	Laser Detect Auto-Focus (LDAF), presence detection, industrial ranging, people counting, object and collision avoidance, fast ranging navigation detection, inventory control, optical switch, low-power system buffering of 3D cameras
	TMF8828	Configurable multi-zone 8 x 8 time-of-flight sensor with 940nm integrated IR VCSEL in a 2.0mm x 4.6mm x 1.4mm module		

IR Reflective Sensor

Manufacturer	Part Number/Series	Description	Development Kit	Note
ams OSRAM	TCS3707	Color and proximity sensor: TCS3707 color, proximity, 50/60Hz ambient light flicker detection sensor	Evaluation kit for TCS3707	Display management, camera, ambient light, proximity detection, color temperature sensing
	TMD2620	Proximity detection module: 2-in-1 small aperture proximity detection module	TMD2620EvalKit	Mobile phone touchscreen disable

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Sensor Products

Compact Camera Module

Manufacturer	Part Number/Series	Description	Development Kit	Note
ams OSRAM	NanEyeC	Integrated camera module: complete digital camera module (320 x 320 pixels), footprint of 1mm ² with 4 contact pads	NanoBerry Eval Kit	Capsule endoscopy, dental scanning, HABA/smart home: home robots, occupancy detection, eye tracking (VR/AR headsets), IoT sensor hubs
	NanEyeM		NanEye_FOB_2.0	

IR Thermal Sensor Array

Manufacturer	Part Number/Series	Description	Development Kit	Note
Melexis	MLX90640	Far infrared thermal sensor array (32 x 24 RES)	EVB90640-41	N/A
	MLX90641	Far infrared thermal sensor array (16 x 12 RES)		
Panasonic	GRID-EYE	Infrared array sensors array	N/A	N/A

PIR Sensor

Manufacturer	Part Number/Series	Description	Development Kit	Note
Panasonic	EKMB1391111K	Slight motion detection PIR motion sensor (white, 6uA, digital type)	N/A	Additionally available in black and pearl white colors
	EKMC1691111	Slight motion detection PIR motion sensor (white, 170uA, digital type)		
	EKMC2691111K	Slight motion detection PIR motion sensor (white, 170uA, analog type)		

Radar Sensor

Manufacturer	Part Number/Series	Description	Development Kit	Note
Infineon	BGT60TRI3CE6327XUMA1	MMIC is a XENSIV™ 60GHz radar sensor for advanced sensing	N/A	N/A
	BGT60LTR11AIP6327XUMA2	First completely autonomous 60GHz radar sensor	DEMO BGT60LTR11AIP SHIELD_AUTONOM_BGT60	
	BGT60UTR11AIP	Smallest 60 GHz sensor with antennas in package and 5.5 GHz ultra-wide bandwidth for precise FMCW radar operations	TBD	Available Q3 '23

Sensor Products Image Sensor

Manufacturer	Part Number/Series	Description	Development Kit	Note
AMS Osram	Mira-xxx NIR image sensor	CMOS image sensor with NIR-enhanced performance (0.3 & 1.3 Mpixel)	Mira130 NVIDIA Jetson Nano EvalKit	Machine vision, 3D imaging, motion capture, bar and 2D code scanning, intelligent traffic systems, video and broadcast, biometrics 3D structured light, 3D active stereo systems, 2D NIR imaging, machine vision, barcode scanners, motion monitoring
onsemi	AR0830	CMOS image sensor, 8 MP, 1/3" at 60 fps	TBD	Available Q4 '23

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