Thundercomm

Joint Venture of Qualcomm & ThunderSoft

TURBOX

Smart IoT

PRODUCT & SOLUTION CATALOG

SOM • DEV KIT • EDGE STATION • CLOUD SERVICE

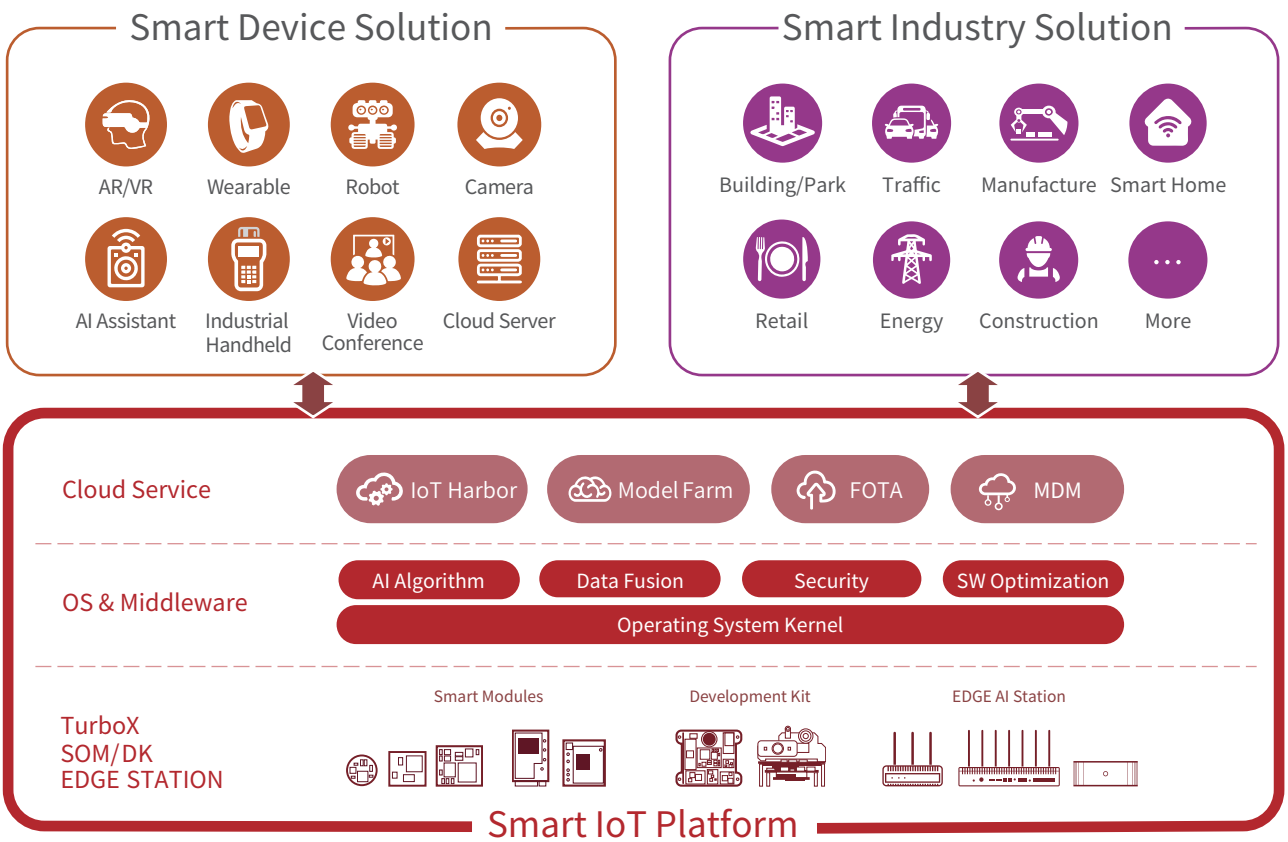
CONSUMER PRODUCT • INDUSTRY SOLUTION

Company Overview

Thundercomm is a world leading IoT product and solution provider. Founded in 2016 as a joint venture between ThunderSoft and Qualcomm Technologies, headquartered in San Diego. Leveraging Qualcomm's world-leading SoC technology and ThunderSoft's proven expertise in operating system, Thundercomm is now focusing on combing emerging, disruptive technologies, like AI, 5G, IoT and cloud computing to provide comprehensive end-to-end solutions from smart modules to end product for OEM/ODM, enterprises and developers. Based on optimized operating system, embedded with mature AI algorithms and FOTA, Thundercomm empowers smart camera, video conference device, robotics, AR/VR glasses, wearable and industrial handhelds with small RAM, fastboot and low power features to lower the smart product development cost and speed up the product development process from prototype to mass production.

In edge computing, Thundercomm provides device-edge-cloud integrated solutions in manufacturing, traffic, building, retail utilizing edge AI stations, IoT Harbor device management platform and ModelFarm zero-code AI development platform, to accelerate digital transformation of the enterprises.

With more than 1200 employees spreading in 20+ R&D centers and offices across the United States, Canada, Japan, South Korea, Germany and China, Thundercomm is committed to empowering global clients to develop competitive and innovative IoT products in an efficient and professional way.



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Product

TurboX SOM
(System on Module)

Model	C8750	C8550	C865C
Picture			
Dimension	39 x 33 x 2.75mm	39 x 33 x 2.75mm	36.5 x 52 x 4.55mm
Platform	Qualcomm® CQ8750S Qualcomm® Kryo™ CPU Qualcomm® Adreno™ GPU 8-series, Adreno VPU 8-series, Adreno DPU 8-series Qualcomm® Hexagon™ Tensor Processor (HTP) with Hexagon Vector eXtensions (HVX) and Hexagon Matrix eXtensions (HMX) Qualcomm Spectra™ Image Signal Processor (ISP) 8-series	Qualcomm® QCS8550 Qualcomm® Kryo™ 780 Qualcomm® Adreno™ 740 GPU, Adreno VPU 8550, Adreno 1295 DPU Qualcomm® Hexagon™ Tensor Processor (HTP) with Hexagon Vector eXtensions (HVX) and Hexagon Matrix eXtensions (HMX) Qualcomm Spectra™ 680 Image Signal	Qualcomm® QCS8250 Qualcomm® Kryo™ 585 Qualcomm® Adreno™ 650 GPU, Adreno 665 VPU, Adreno 995 DPU Qualcomm® Hexagon™ DSP with quad HVX Qualcomm Spectra™ 480 image processing
AI Capability	80 TOPS	55 TOPS	15 TOPS
Memory	16GB LPDDR5x + 128GB UFS3.1	12GB LPDDR5x (POP) + 128GB UFS	8GB LPDDRx (POP) + 128G UFS3.1
Connectivity	External	External	2x2 MIMO, 802.11 a/b/g/n/ac/ax BT5.1
Decode	4K240/8K60 (H.264/H.265/VP9/AV1)	4K240/8K60 (H.265 Main 10, H.265 Main, H.264 High, and VP9 profile 2) AV1 Decode	8K60 (H.264/H.265/VP8/VP9)
Encode	4K120/8K30 (H.264/H.265)	4K120/8K30 (H.265 Main 10, H.265 Main, H.264 high formats)	8K30 (H.264/H.265/VP8)
Camera Interface	4 x CSI D-PHY-1.2 4-lane 2 x CSI C-PHY-2.0 3-trio compatible with D-PHY 4-lane 5 x concurrent (3 IFEs + 2 IFE-lites)	3 x 36 MP@30fps ISPs 4 x CSI D-PHY-1.2 4-lane + 2 x CSI D-PHY-1.2 2-lane 2 x CSI C-PHY-2.0 3-trio 5 x concurrent (3 IFEs + 2 IFE-lites) HW sHDR; AON	4x MIPI-CSI D-PHY, 4-lane, 2.5 Gbps per lane; Up to 25 MP sensor; 1x MIPI-CSI C-PHY, 3-lane, 10.26 Gbps/trio on three trios per port; Up to 64MP sensor;
Display Interface	2 x CSI D-PHY-1.2 4-lane Internal panel resolution up to 3840 × 2560 at 144 Hz. Higher resolutions and refresh rates can also be supported. External panel support: DisplayPort v1.4 with MST (up to 8K60)	2 x DSI 4 lane; support up to 4K@120Hz 1 x DP V1.4	2x MIPI-DSI 4-lane; 5040X2160@60fps 4K60 display support over DisplayPort
Other Interface	1 x USB 3.1 Gen 2 (support Type-C with DP v1.4); 1 x 2-lane Gen3 2X SDC 2 x WSA SoundWire interfaces to support up to 4x WSA 6 x I2S with 2 x data lanes to support full duplex stereo, or up to 4-channel Tx/Rx application 1 X I2S supports 4x data lanes for up to eight channels Tx/Rx application 4 X DMIC ports to support up to 8 DMICs GPIOs, QUPs, SSC QUPs, IIC HUBs	1 x USB 3.1 Gen 2 (support Type-C with DP v1.4); 1 x 2-lane Gen4 PCIe 1 x 2-lane Gen3 PCIe GPIOs, UARTs	2x RF connector for WiFi/BT 2 x USB 3.1 2 x SSC I/F for sensor 1 x PCIe 1 lane 1 x PCIe 2 lane 1 x SDC for SD card 3 x DMIC interfaces GPIOs, UARTs
OS Support	Android 15, Linux (Planning)	Android 13, Linux, Ubuntu	Android 10/13
Software Features	Hypervisor ASE Camera SNPE	SNPE, Tensorflow Lite. FastCV, OpenCV, Open CL, OpenGL Support 5G Support UAC/UVC Support HDMI Out Support Dual-display,Triple-display Support FOTA	SNPE, Tensorflow Lite. FastCV, OpenCV, Open CL, OpenGL Support 5G Support UAC/UVC Support HDMI Out (4k@60fps) Support Dual-display,Triple-display Support FOTA
Applications	Smart Camera Video Conference Automated Manufacturing Robots Autonomous Mobile Robots (AMRS) Collaborative Robots Delivery Robots Urban Air Mobility (UAM) Transportation Edge Computing	Smart Camera Video Conference Automated Manufacturing Robots Autonomous Mobile Robots(AMRs) Collaborative Robots Delivery Robots Urban Air Mobility (UAM) Transportation Edge Computing	Smart Camera VR/AR Digital Signage Vending Machine Robotics Edge Device
Form Factor	LGA	LGA	LCC
Certifications	RoHS*/REACH*/WEEE*/TSCA*	RoHS, REACH	CE, FCC, RoHS, REACH

* In planning.

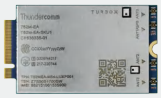
Model	C6490	C6490P	C5430
Picture			
Dimension	43 x 58 x 3mm	39 x 33 x 4mm	42.5 x 35.5 x 2.85mm
Platform	Qualcomm® QCS6490 Qualcomm® Kryo™ CPU 670 Qualcomm® Adreno™ GPU 643, Adreno 633 VPU, Adreno DPU 1075 Qualcomm® Compute Hexagon™ DSP with dual HVX, Hexagon Co-processor 2.0 and Hexagon Tensor Accelerator Qualcomm® Spectra™ 570L image processing	Qualcomm® QCS6490 Qualcomm® Kryo™ CPU 670 Qualcomm® Adreno™ GPU 643, Adreno 633 VPU, Adreno DPU 1075 Qualcomm® Compute Hexagon™ DSP with dual HVX, Hexagon Co-processor 2.0 and Hexagon Tensor Accelerator Qualcomm® Spectra™ 570L image processing	Qualcomm® QCS5430 Qualcomm® Kryo™ CPU 670 (2xA78@2.1GHz, 4xA55@1.8GHz) Qualcomm® Adreno™ GPU 642L, Adreno 633 VPU, Adreno DPU 1075 Qualcomm® Compute Hexagon™ DSP with dual HVX, Hexagon Co-processor 2.0 and Hexagon Tensor Accelerator Qualcomm® Spectra™ 570L image processing
AI Capability	12.5 TOPS	12 TOPS	3.5 TOPS
Memory	4GB LPDDR4x + 64GB UFS2.1 ; UMCP	8GB LPDDR4x + 128GB UFS2.x	8GB LPDDR4x + 128 GB UFS2.1 ; UMCP
Connectivity	802.11 ax over PCIe with DBS, 2x2 MIMO (Wi-Fi 6E), BT 5.2	External	802.11 ax over PCIe, 2x2 MIMO (Wi-Fi 6E), BT 5.2
Decode	4K60 (H.264/H.265/VP9)	4K60 (H.264/H.265/VP9)	4K60 (H.264/H.265/VP9)
Encode	4K30 (H.264/H.265)	4K30 (H.264/H.265)	4K30 (H.264/H.265)
Camera Interface	5 x 4-lane MIPI CSI D-PHY (2 of them compatible to support 3-lane MIPI CSI C-PHY) five concurrent MIPI CSI configurable	5 x 4-lane MIPI CSI D-PHY (2 of them compatible to support 3-lane MIPI CSI C-PHY) five concurrent MIPI CSI configurable	4 x 4-lane MIPI CSI D-PHY (2 of them compatible with 3 -trio MIPI CSI C -PHY up to 48M camera) Qualcomm Spectra 570L: 22 + 22 MP at 30 fps ZSL Two IFE + two IFE lite, four concurrent MIPI CSI configurable
Display Interface	1x MIPI-DSI 4-lane; FHD+ (1080x2520) 4K144 fps 4K60 display support over DisplayPort	1x MIPI-DSI 4-lane; FHD+ (1080x2520) 8L @144 fps 4K60 display support over DisplayPort	1x MIPI-DSI 4-lane; FHD+ (1080x2520) 8L @120 fps 4K60 display support over Display Port
Other Interface	1 x USB 3.1 with DP 1 x USB2.0 1 x PCIE Gen3 2-lane 2 x Sound Wire 1 x SDC for SD card 3 x DMIC Interfaces GPIOs, UARTs	1 x USB 3.1 with DP 1 x USB2.0 2x PCIe Gen 3 (1-lane, 2-lane) 1 x Sound Wire 2 x SDC (4-bit) 3 x DMIC Interfaces GPIOs, UARTs	1 x USB 3.1 with DP 1 x USB2.0 2 x Sound Wire 1 x SDC for SD card 3 x DMIC Interfaces GPIOs UARTs
OS Support	Android 13, Ubuntu	Android 13, Ubuntu	Android 13, Ubuntu
Software Features	Support Dual-display 5 cameras concurrency Support OTA AI algorithms	Support Dual-display 5 cameras concurrency Support OTA AI algorithms	Support Dual-display 4 cameras concurrency Support OTA AI algorithms
Applications	Industrial Handheld Digital Signage Service Robot Industrial Robot	Industrial Handheld Digital Signage Service Robot Industrial Robot	Rugged Handheld Rugged Tablet Service Robot Industrial Robot Edge Box
Form Factor	LGA	LGA	LGA
Certifications	CE, FCC, RoHS, REACH	RoHS*/REACH*	CE, FCC, RoHS, REACH

* In planning.

Model	C610	C6125	C6115
Picture			
Dimension	38 x 38 x 2.6mm	35 x 34 x 2.9mm	34 x 35 x 2.9mm
Platform	Qualcomm® QCS610 2x K4G (Enyo) 2.2 GHz + 6x K4S (A55) 1.8 GHz, 1MB L3 cache Qualcomm Adreno™ 608 GPU Qualcomm Hexagon™ with dual Hexagon Vector eXtensions (HVX),1.1 GHz	Qualcomm® QCM6125 Qualcomm Kryo™ 260 4xGold @ 2.0GHz + 4xSilver @ 1.8GHz Qualcomm Adreno™ 610 GPU, Adreno DPU 851 Qualcomm Hexagon™ Hexagon Vector eXtensions (dual-HVX512), Audio DSP	Qualcomm® SM6115 Qualcomm Kryo™ 260 CPU,4 x Gold @ 2.0GHz + 4 x Silver @ 1.8GHz Qualcomm Adreno™ 610 GPU @950MHz Qualcomm Hexagon™ 683 2 x HVX @556MHz
Memory	2GB LPDDR4x + 16GB eMMC 4GB LPDDR4x + 64GB eMMC	2GB/3GB LPDDR4x + 32GB eMMC 4GB LPDDR4x + 64GB eMMC	4GB LPDDR4x + 64GB eMMC
Connectivity	WLAN 1 × 1 802.11a/b/g/n/ac and Bluetooth 5.0	Wi-Fi 1 × 1 802.11a/b/g/n/ac, Bluetooth 5.0	Wi-Fi 1x1, 802.11a/b/g/n/ac; Bluetooth 5.0
Decode	4K30 (H.264/HEVC)	4K30/1080P20 (H.265/H.264/VP8/VP9)	1080P60 (H.264/H.265/VP9)
Encode	4K30 (H.264/HEVC/VP9)	4K30/1080P120 (H.265/H.264/VP8)	1080P60 (H.264/H.265)
Camera Interface	2x ISP support, 3 x 4-lane CSIs (4/4/4 or 4/4/2/1) D-PHY 2.1Gbps/lane, C-PHY 5.7Gbps/lane	2x ISP 14 bit: 16 + 16 MP, and 25 MP @30 fps ZSL D-PHY 1.2 /C-PHY 1.0 configurable in 4/4/4 or 4/4/2/1	3x MIPI-CSI, 4-lane, D-PHY
Display Interface	1 x MIPI-DSI 4-lane, 2520 × 1080p@60fps 1 x DisplayPort, 1920 × 1200@60fps	1 x 4-lane; DSI D-PHY 1.2, Split link supported, Up to FHD+ (1080 × 2520)@60fps; 1 x DisplayPort 1.4 over USB-C (external)	1x MIPI-DSI 4-lane FHD+(1080*2520)@60FPS
Other Interface	1 x Slimbus 1 x USB 3.1 1 x USB 2.0 1 x SDIO 4 x I2S 14 x QUPs 1 x RGMII 120 x GPIOs	1 x Slimbus 1 x Soundwire 1 x USB 3.0 with DP 1 x USB 2.0 1 x SD Card 5 x I2S 10 x QUP GPIOs	1 x SoundWire 1 x USB 3.1 1 x SD Card 3 x I2S 8 x QUP GPIOs
OS Support	Linux, Android 12	Android 10	Android 14, Linux
Software Features	Graphics Engine: Open CV, SNPE CV Algorithms: LDC, ePTZ, UAV/UVC, EIS, Stitching, sHDR AI Algorithms: Face Recognition, Face Detection Hardware Decoding: Multi-channel decoding (6 CH FHD)	Support Dual-display Support sHDR UVC 1.5/1.2, UAC 1.0 Applicable for IMX415, OV08A10 Support multiple AI algorithms(face recognition, face detection, object recognition)	Hexagon 683 DSP with dual-HVX512 for AI computing Support up to 3 cameras 1080P@60FPS video record and play FHD+(1080*2520) display@60FPS WLAN 802.11a/b/n/ac and GNSS 8 Cores Kryo™ 260 CPU: 4 x A73@ 2.0GHz + 4 x A53@ 1.8GHz
Applications	AI Camera Surveillance Camera Dash Camera Video Conference Edge Device	AI Camera Digital Signage Vending Machine Handheld	Smart Retail Smart Camera Industrial Robot Smart Home Rugged Handheld
Form Factor	LGA	LGA	LGA
Certifications	FCC,CE, JATE, TELEC, RoHS, REAC	CE, FCC, KC, JATE, TELEC, ROHS	CE*、FCC*

* In planning.

Model	CM2290-EA
Picture	
Dimension	35 x 51 x 2.9 mm
Platform	Qualcomm® QCM2290 Quad-core Arm Cortex-A53, 64-bit, 2.0GHz; Qualcomm Adreno™ 702 GPU; Qualcomm Hexagon™ QDSP6 v66
AI Capability	0.5 TOPS
Memory	2GB LPDDR4x + 32GB eMMC
Connectivity	Wi-Fi 802.11a/b/g/n/ac Bluetooth 5.0
Decode	1080P30 (H.265/H.264/VP9)
Encode	1080P30 (H.265/H.264)
Camera Interface	2x ISP (13 MP + 13 MP or 25 MP) at 30 fps ZSL Real-time sensor input resolution: 25 MP or 13 MP + 13 MP 25 MP 30 ZSL with a dual ISP 48 MP resolution in nZSL mode 13 MP 30 ZSL with a single ISP
Display Interface	1x MIPI-DSI 4-lane, supporting HD+(1680 × 720)@60fps
Other Interface	1 x USB 3.1 Type-C 9 x QUP 1 x SD Card 2 x UIM 1x I2S 2x DMIC (up to 4 x DMIC) GPIOs
OS Support	Android 13
Software Features	Support dual cameras Support FOTA Support GNSS Support LTE
Applications	Industrial Handheld Handheld POS Dash Camera Video Doorbell Household Cleaning Robotics
Form Factor	LGA
Certifications	CE, RoHS, REACH, WEEE, HF, JATE, TELEC, KC

Model	T62G-EA	T62M-EA	T75G(M)-EA
Picture			
Dimension	52 x 30 x 2.3mm	52 x 30 x 2.3mm	42*30*2.3mm
Regions	Asia, Europe	Asia, Europe	Korea, Japan, Europe
Platform	Arm Cortex-A7 up to 1.8 GHz Qualcomm® Hexagon™ DSP processor at up to 1.5 GHz	Arm Cortex-A7 up to 1.5 GHz Qualcomm® Hexagon™ DSP processor at up to 1.5 GHz	Cortex-A7 up to 1.28 GHz with 256 KB L2 cache Qualcomm® Hexagon™ DSP 6 with dual HVX-512 designed for 1 GHz Turbo
Memory	4Gb DDR4 + 4Gb NAND	4Gb DDR4 + 4Gb NAND	256MB LPDDR2 + 512MB NAND
Air Interface	**5G NR:** Sub-6GHz: n1,n3,n5,n7,n8,n20,n28,n38,n40,n41, n77, n78, n79 **LTE:** B1/B3/B5/B7/B8/B18/B19/B20/B26/B28A/B28B/B29/B32/B38/B40/B41/B42/B43 **WCDMA:** B1/B5/B6/B8/B9/B19 **GNSS:** GPS/Beidou/GLONASS/Galile-o/QZSS, L1/L5 bands supported	**5G NR:** Sub-6GHz: n1,n3,n5,n7,n8,n20,n28,n38,n40,n41, n77, n78, n79 **LTE:** B1/B3/B5/B7/B8/B18/B19/B20/B26/B28A/B28B/B32/B38/B40/B41/B42/B43 **WCDMA:** B1/B5/B6/B8/B19	**Sub-6:** n1/n3/n5/n7/n8/n20/n26/n28/n38/n40/n41/n48/n75/n76/n77/n78/n79/n91/n92/n93/n94 **mmWave:** n257/n258/n259/n260/n261 **LTE (Cat18 UL/Cat 20 DL):** B1/B3/B5/B7/B8/B18/B19/B20/B26/B28A/B28B/B32/B38/B40/B41/B42/B43/B48/B68 WCDMA: B1/B5/B6/B8/B19 **GNSS:** GPS/Beidou/GLONASS/Galileo/QZSS, L1/L2/L5 bands supported (optional)
Other Interface	1x USIM + 1x eSIM (Optional) 1x Gen3 1-lane (2-lane is optional) 1x USB 3.1 SS/USB2.0 HS 1x I2S/PCM 4x sub-6GHz (1 multiplexed with GNSS) antenna connector	4x BLSP supporting UART/SPI/I2C 2x USIM 1x PCIe Gen3 2-lane 2x I2S/PCM 1x USB 3.1	9 x BLSP supporting UART, SPI, and I2C 2 x USIM 1 x Gen4 1-lane + 1 Gen3 2-lane + 1 Gen3 1-lane PCIe 2x I2S/PCM 1x USB 2.0/1x USB 3.1 Gen 2 2x USXGMII 10G
OS Support	Linux	Linux	Linux
Software Features	Adopt the most advanced 4nm process technology Supports 3GPP R16 features of high bandwidth and low latency Well fit for laptop/Robotics/XR applications Commercialized FOTA program support The Linux operating system interconnects with Ubuntu, Android, and Windows Series of security features for Windows PC	Adopt the most advanced 4nm process technology Supports 3GPP R16 features of high bandwidth and low latency Cost-effective 5G CPE/MIFI/Routers solution preferred Commercialized FOTA program support The Linux operating system interconnects with Ubuntu, Android, and Windows Support Open CPU and provide rich SDK	Plug and play option with stable 4G performance Well fit for Laptop/Robotics/CPE applications The Linux operating system interconnects with Ubuntu, Android, and Windows OS Series of security features for Windows PC
Applications	CPE/Router/MiFi Industrial Control Robotics Webcast VR/AR	Laptop CPE/Router Handheld Robotics Industrial Drone	Laptop CPE/Router Tablet
Form Factor	LGA	M.2	M.2 Key-B
Certifications	CCC/SRRC/KC/JATE/TELEC/CE/GCF/LGU+/KT/SKT/NTT DOCOMO/Softbank/KDDI	CCC/SRRC/KC/JATE/TELEC/CE/GCF/LGU+/KT/SKT/NTT DOCOMO/Softbank/KDDI	JATE/TELEC/NCC/GCF*/KDDI*/Soft-bank*/NTT DOCOMO*

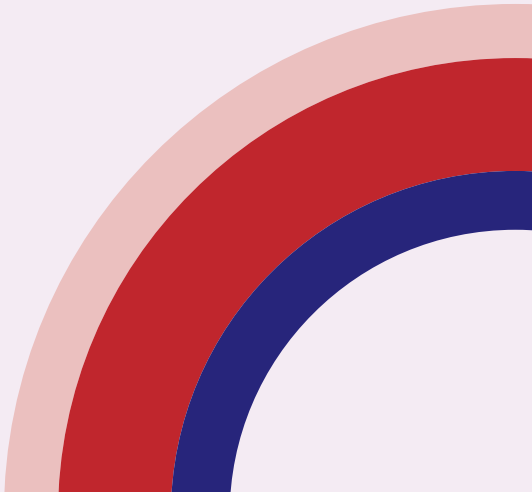
* In planning.

Model	M12M-JP
Picture	
Dimension	42*30*2.3mm
Regions	Asia, Europe
Platform	Cortex-A7 up to 1.28 GHz with 256 KB L2 cache Qualcomm® Hexagon™ DSP 6 with dual HVX-512 designed for 1 GHz Turbo
Memory	256MB LPDDR2 + 512MB NAND
Connectivity	**LTE** (Cat13 UL/DL): B1/B3/B8/B18/B19/B21/B39/B41 WCDMA: B1/B6/B8/B19 **GNSS:** GPS/GLONASS/Galileo/Bei-Dou/QZSS L1
Other Interface	4 x BLSP, 4 bits each; multiplexed serial interface functions, support I2C/SPI/UART (optional, multiplexed with UIM2) eSIM x 1 (MFF-XS optional) + UIM x 1 external or UIM x 2 external 1 x PCIe Gen2 (RC only; optional) I2S/PCM 1 x USB 3.0 /USB 2.0
OS Support	Linux
Software Features	Plug and play option with stable 4G performance Well fit for Laptop/Robotics/CPE applications The Linux operating system interconnects with Ubuntu, Android, and Windows OS Series of security features for Windows PC
Applications	Laptop CPE/Router Tablet
Form Factor	M.2 Key-B
Certifications	JATE/TELEC/NCC/GCF/KDDI/Softbank/NTT DOCOMO

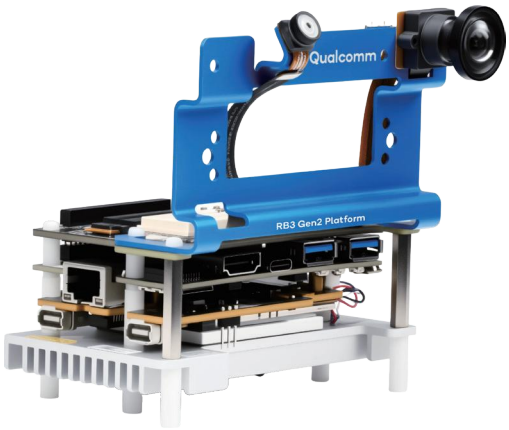
Model	I615
Picture	
Dimension	45 x 45mm
Platform	Qualcomm® QCS615 Qualcomm® Kryo™ CPU 460 Qualcomm® Adreno™ GPU 612,Adreno VPU 443,Adreno DPU 871 Qualcomm® Hexagon™ DSP with Dual hexagon Vector eXtensions (HVX) processor. Hexagon V66 DSP for low power audio subsystem
AI Capability	1.1 TOPS
Memory	4GB LPDDR4x + 64GB eMMC
Connectivity	External
Decode	4K60 (H.265 main 10/H.265 main/H.264 high/VP9 profile 2/VP8/MPEG-2)
Encode	4K30 (H.265 main/H.264 high/VP8)
Camera Interface	3x 4-lane MIPI CSI D-PHY v1.2
Display Interface	1x 4-lane MIPI DSI: D-PHY v1.2: 2.1 Gbps/lane on 4 lanes per port, up to 8.4 Gbps/port DisplayPort v1.4 a at 5.4 Gbps/lane, 21.6 Gbps/port with support for multi stream transport (MST) Up to a maximum of 5 MP; example configurations: 2x (1920 × 1080) + 1x (1280 × 720)
Other Interface	1x USB 3.1 Gen1 (HS+SS) 1x USB 2.0 (HS) 1x 1-lane PCIe Gen2 RC / EP 1x RGMII 1x 4-bit SD 3.0 1x eMMC 5.1 interface 1x QSPI interface 1x lane UFS2.1 Gear3 interface 2x high speed I2S GPIOs, QUPs, SSC QUPs
OS Support	Linux, Ubuntu (planning)
Software Features	Graphics Engine: Open CV, SNPE CV Algorithms: LDC, ePTZ, UAV/UVC, EIS, Stitching, sHDR AI Algorithms: Face Recognition, Face Detection Hardware Decoding: Multi-channel decoding (6 CH FHD)
Applications	AI Camera Surveillance Camera Dash Camera Video Conference Edge Device
Form Factor	OSM-L v1.2
Certifications	RoHs(Planning), REACH(Planning)

Product

Development Kit



Qualcomm® RB3 Gen 2 Development Kit



The Qualcomm® RB3 Gen 2 is based on the Qualcomm Dragonwing™ QCS6490 processor. Offering developers considerably increased AI processing capabilities compared to previous generations, higher inferences per second, improved power efficiency, and the ability to run more networks simultaneously. On-device machine learning combined with edge computing allows for near real-time processing for massive amounts of data.The Qualcomm RB3 Gen 2 development kit provides a valuable combination of strong performance and advanced features, including powerful AI processing and computer vision, to easily create a broad range of IoT solutions across use cases including enterprise, robotics, industrial, and automation.

Applications

- Face Detection and Recognition
- Path Planning and 3D Map Formation
- Deep Learning
- vSLAM (Visual Localization and Mapping)
- Inventory Management
- Driver Management Systems
- Surveillance and Security
- Object Detection and Avoidance

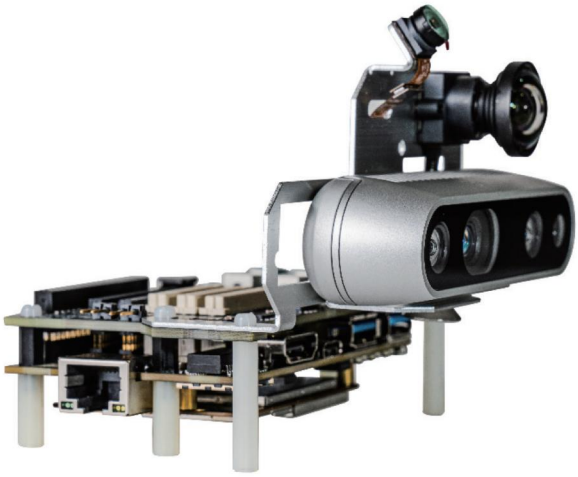
Key Features

- Advanced ISPs for single or multiple concurrent camera experience with superior image and video capture.
- AI-accelerated workplace security and visibility.
- Blazing-fast wireless connectivity and low latency thanks to multi-gigabit Wi-Fi 6E: Up to 3.6 Gbps, 160MHz, 4K QAM, DBS with MU-MIMO and OFDMA, and WPA3-P & E.
- Superior Bluetooth® 5.2 and LE audio with crystal-clear sound, low latency, and reliability with an extended range.
- Low-speed expansion for GPIOs, I2C, SPI, UART, and/or audio.
- High-speed expansion for PCIe, USB, MIPI CSI/DSI, and/or SDIO, designed for 96Boards mezzanines.

Specifications

Category	Core Kit	Vision Kit
Chipset	Qualcomm® Dragonwing™ QCS6490	
CPU	Octa-core CPU	
Memory (RAM)	uMCP package (6 GB LPDDR4x)	
Camera	2xC-PHY/D-PHY30-pin expansion ports on interposer board	1x IMX577D-PHY12MP, 1x OV9282 D-PHY 1 MP with bracket,plus additional D-PHY and GMSL-capable expansion ports
GPU	Adreno 643 GPU	
Video	Adreno 633 VPU: 4K60 fps decode / 4K30 fps encode	
Display	Up to two displays supported concurrently: Full-size HDMIconnector, USB Type-C supporting DP alt mode, mini-DP connector, DSI expansion	
AI	12 TOPS	
Expansion interfaces	HS1:1 x 60 pin high-speed connector (1 x QSPI, 1 x 4L MIPI DSI, 1 x USB 2.0, CCI I2C x2, 2L+4L-MIPI CSI) HS2:1 x 60 pin high-speed connector (4L-MIPI CSI x 2, SPI x 1, PCIe 3.0 gen3 1L, USB 3.0 x1, GPIO x 8 for RB5 Gen 2 Core Kit) HS3:1 x 60 pin high-speed connector (4L-MIPI CSI x 2, 4L-MIPI CSI x1(plus 2L CSI in HS1), RF CLK x 2, 2L-PCIe 3.0 x 1, 2L-PCIe 3.0 x 1(plus PCIe 1L in HS2), 4L-MIPI DSI x 1) LS1:1 x 40 pin low-speed connector (UART x 1, SPI, I2S/PCM x 1, I2C x 2, GPIO x 12 for RB5 Gen 2 Core Kit, DC powers) LS2:1 x 46 pin low-speed connector (Speaker x 2, DMIC I/F x 3, CAN, I2S, GPIO x 12 for RB5 Gen 2 Core Kit, PWM x 2, ADC x 2, CCI-I2C x 2, DC powers) LS3:1 x 46 pin low-Speed connector (SPI x 2, SNS I2C x 1, sensor interrupt x 5, GPIO x 19 for RB5 Gen 2 Core Kit, RTC clock, DC powers)	
WLAN/Bluetooth	802.11ax with DBS, Bluetooth 5.2, two onboard printed antennas, RF expansion connectors for optional external antennas	
Storage (onboard)	uMCP package (128 GB UFS Flash)	
Storage (external)	1x MicroSD Card Slot, PCIe expansion for NVMe	
PCIe	1x PCIe Gen 3 2-lane to expansion connector, optional 1x PCIe Gen 3 1-lane to expansion connector	
USB	1x USB 3.0 Type-C, 1xUSB 2.0 w/OTG, 2x USB 3.0 Type-A, 1xUSB 3.0 on high-speed expansion	
Audio	1x DMIC, 2x digital audio amplifiers,I2S/Soundwire/DMIC expansion on low-speed connectors	4x DMIC, 2x digital audio amplifiers,I2S/Soundwire/DMIC expansion on low-speed connectors
Sensor	IMU onboard (ICM-42688), additional expansion	IMU (ICM-42688), Pressure sensor (ICP-10111), Mag sensor/compass(AK09915), additional expansion

Qualcomm® Robotics RB5 Platform



The Qualcomm® Robotics RB5 Platform is the most innovative platform bringing together Qualcomm's broad expertise in 5G and AI. The Qualcomm® Dragonwing TM QRB5165 platform contains a robotics-focused development board, based on the Qualcomm QRB5165 Robotics SoC and compliant with the 96Boards open hardware specification to support a broad range of mezzanine-board expansions for rapid prototyping. The Qualcomm Robotics RB5 Platform supports the development of smart, power-efficient and cost-effective robots by combining high-performance heterogeneous computing, Qualcomm® Artificial Intelligence (AI) Engine for on-device machine learning, computer vision, vault-like security, multimedia and Wi-Fi and cellular connectivity.

Applications

Service Robot | Industrial Robot | Industrial Control | Automated Guided Vehicle | Self-driving Vehicle for Logistics | Consumption /Entertainment Robot | Industrial Drone

Key Features

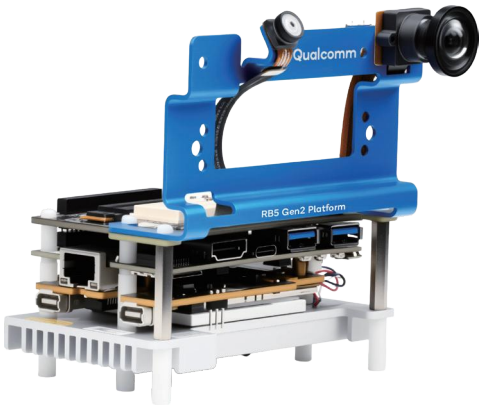
- On-device AI intelligence featuring our 5th generation Qualcomm AI Engine for complex AI and deep learning at the edge along with support for popular AI frameworks.
- Image capture with support for up to seven concurrent cameras as well as up to 8K video capture and time-of-flight camera.
- With eight Qualcomm Kryo CPUs and optimized GPU, your IoT solution can feature powerful heterogeneous computing with integrated audio, sensors, ISP, and AI subsystems.
- Support for 4G/5G (including 5G mmWave and sub-6 GHz) as well as Bluetooth, Wi-Fi 6 (802.11ax), 802.11ac Wave 2, and 802.11a/b/g/n.
- Sensors and drivers for camera and motor control functions are pre-integrated in the dev kit and customized for robotics.

Specifications

Category	Description
SOM Platform	Qualcomm® Dragonwing ™ QRB5165 Qualcomm® Kryo™ 585 Qualcomm® Adreno™ 650 GPU, Adreno 665 VPU, Adreno 995 DPU Qualcomm® Hexagon™ DSP with quad HVX Qualcomm® Spectra™ 480 image processing
RAM	8GB, LPDDR5 (POP)
Storage	128 GB UFS3.0 onboard storage；1x MicroSD card slot
Ethernet	1x 1GbE Ethernet
Wireless	WLAN 802.11a/b/g/n/ac 2.4/5GHz 2No2 MIMO
USB	1x USB 2.0 Micro B (Debug only) 1x USB 3.0 Type C (OTG mode) 2x USB 3.0 Type A (Host mode only)
Display	1 x HDMI 1.4 (Type A - full) on board connector
Audio	2x Class-D on board speaker amplifier, WSA8810 1x on board PDM MIC on Mainboard 4 x on board PDM MIC on NAV MEZZ
Sensor	Accelerometer + Gyro Sensor (TDK ICM-42688/ ICM-42688-P) Barometric Pressure
Camera	IMX577 I * GMSL I * OV9282 I * Panasonic (ToF) – Sensor[MN34906] * Intel Realsense (D435i)
Expansion interfaces	HS1:1 x 60 pin high-speed connector (SDC I/F, 1 x 4L MIPI DSI, USB 2.0, CCI I2C x2, 2L+4L-MIPI CSI) HS2:1 x 60 pin high-speed connector (4L-MIPI CSI x 2, SPI x 1, PCIe 3.0 gen3 1L, USB 3.0 x1, GPIO x 8) HS3:1 x 60 pin high-speed connector (4L-MIPI CSI x 2, 4L-MIPI CSI x1(plus 2L CSI in HS1), RF CLK x 2, 2L-PCIe 3.0 x 1, 2L-PCIe 3.0 x 1(plus PCIe 1L in HS2), 4L-MIPI DSI x 1) LS1:1 x 40 pin low-speed connector (UART x 2, SPI, I2S/PCM, I2C x 2, GPIO x 12, DC powers) ☒ LS2:1 x 46 pin low-speed connector (Speaker x 2, DMIC I/F x 3, CAN, I2S, GPIOs, PWM, ADC, I2C, DC powers) LS3:1 x 46 pin low-Speed connector (SPI x 2, SSC I2C, sensor interrupt x 5, GPIOs, RTC clock, DC powers)
LED	7 LED indicators 4 - User controllable 2 - For radios (WLAN activity) 1 - Power indicator
Buttons	Power Volume Up/Down Force USB Boot Dip Switch x 2 (6pin+4pin)
Power source	12 V @2.5A adapter with a DC plug Plug specification is inner diameter 1.75mm and outer diameter 4.75mm
Size	85 mm x 54 mm meeting 96boards Consumer Edition Standard form dimensions specifications

Note: * Only support in Qualcomm® Robotics RB5 Vision Kit.

Qualcomm® RB5 Gen 2 Development Kit



The Qualcomm® RB5 Gen 2 development kit provides a valuable combination of strong performance and advanced features, including powerful AI processing and computer vision, to easily create a broad range of IoT solutions across use cases including enterprise, robotics, industrial, and automation.

Utilizing the Qualcomm® Dragonwing™ QCS8550, the Qualcomm® RB5 Gen 2 development kits offer developers considerably increased AI processing capabilities compared to previous generations, higher inferences per second, improved power efficiency, and the ability to run more networks simultaneously. On-device machine learning combined with edge computing allows for near real-time processing for massive amounts of data.

Applications

Service Robot

Deep Learning

Face Detection and Recognition

Driver Management Systems

Surveillance and Security

Object Detection and Avoidance

Key Features

- Advanced ISPs for single or multiple concurrent camera experience with superior image and video capture.
- Blazing-fast wireless connectivity and low latency thanks to multi-gigabit Wi-Fi 7.
- Superior Bluetooth® 5.3 with crystal-clear sound, low latency, and reliability with an extended range.
- Low-speed expansion for GPIOs, I2C, SPI, UART, and/or audio.
- High-speed expansion for PCIe, USB, MIPI CSI/DSI, and/or SDIO, designed for 96Boards mezzanines.

Specifications

Category	Description
SOM Platform	Qualcomm Dragonwing™ QCS8550 Qualcomm® Kryo™ CPU built on Arm Cortex technology Qualcomm® Adreno™ GPU 740 for the highest in graphics performance and power efficiency Qualcomm Spectra™ Image Signal Processor Adreno VPU 8550 for high-quality, ultra HD video encode and decode Adreno DPU 1295 for on-device and external ultra HD display support
Storage	128 GB UFS3.1 Onboard Storage；1 x MicroSD Card Slot
Ethernet	1 x 1GbE Ethernet； 1 x 2.5GbE Ethernet；1 x 10GbE Ethernet
Wireless	Tri-band 2x2 MIMO DBS/HBS Wi-Fi 7 + Bluetooth 5.4 supports simultaneous Wi-Fi operation on 2.4 GHz + 5 GHz, 2.4 GHz + 6 GHz and 5 GHz + 6 GHz On-Board WLAN/BT/GNSS Antennas
USB	1 x USB 2.0 Micro B (Debug only) 1 x USB 3.0 Type C (ADB Mode, support DP out) 2 x USB 3.0 Type A (Host Mode Only)
Display	1 x HDMI 1.4 (Type A - full) on Board Connector 1 x DP 1.4 (Type C - full) on Board Connector
Audio	2 x Class-D on Board Speaker Amplifier, WSA8845 2 x speaker connector on Board 1 x on Board PDM MIC on Mainboard 4 x on Board PDM MIC on NAV MEZZ
Sensor	Accelerometer + Gyro Sensor (TDK ICM-42688/ ICM-42688-P) Barometric Pressure
Camera	IMX577 & OV9282 (Only available on Vision kit)
Expansion interfaces	HS1:1 x 60 pin high-speed connector (1 x QSPI, 1 x 4L MIPI DSI, 1 x USB 2.0, CCI I2C x2, 2L+4L-MIPI CSI) HS2:1 x 60 pin high-speed connector (4L-MIPI CSI x 2, SPI x 1, PCIe 3.0 gen3 1L, USB 3.0 x1, GPIO x 8 for RB5 Gen 2 Core Kit) HS3:1 x 60 pin high-speed connector (4L-MIPI CSI x 2, 4L-MIPI CSI x1(plus 2L CSI in HS1), RF CLK x 2, 2L-PCIe 3.0 x 1, 2L-PCIe 3.0 x 1(plus PCIe 1L in HS2), 4L-MIPI DSI x 1) LS1:1 x 40 pin low-speed connector (UART x 1, SPI, I2S/PCM x 1, I2C x 2, GPIO x 12 for RB5 Gen 2 Core Kit, DC powers) LS2:1 x 46 pin low-speed connector (Speaker x 2, DMIC I/F x 3, CAN, I2S, GPIO x 12 for RB5 Gen 2 Core Kit, PWM x 2, ADC x 2, CCI-I2C x 2, DC powers) LS3:1 x 46 pin low-Speed connector (SPI x 2, SNS I2C x 1, sensor interrupt x 5, GPIO x 19 for RB5 Gen 2 Core Kit, RTC clock, DC powers)
LED	7 x LED Indicators 4 x User Controllable 2 x For radios (WLAN activity) 1 x Power indicator
Buttons	Power Volume Up/Down Force USB Boot Dip Switch x 3 (6pin x 1+4pin x 2) (only support in Qualcomm® Robotics RB5 Gen 2 Core Kit.) Dip Switch x 5 (6pin x 3+4pin x 2) (only support in Qualcomm® Robotics RB5 Gen 2 Vision Kit.)
Power source	12 V @2.5A adapter with a DC plug inner diameter 1.75mm and outer diameter 4.75mm

Product

Edge AI Station

TURBOX

EB2 Edge AI Station

EB2 Edge AI Station is a cost-effective edge computing device with 1.7 TOPS AI performance, up to 6 channels FHD video decoding. It can flexibly adapt to different network access requirements during deployment, including Gbits Ethernet, 4G and Wi-Fi. With the compact and industrial design, EB2 featuring rich interfaces and stable performance. Embedded with OSware.Edge, supports edge-cloud synergy, remote AI algorithm and application deployment, FOTA, which makes it widely applied to the fields of applications like digital signage, smart retail, smart building, etc.

Applications

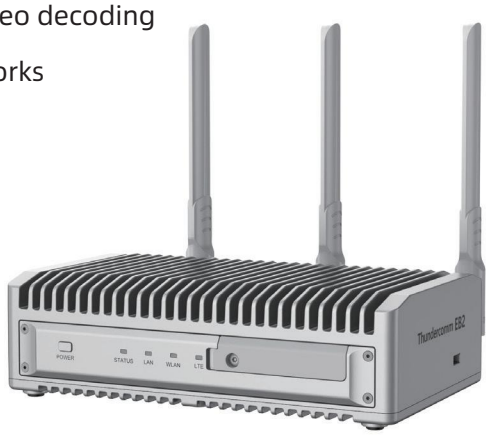
Smart Building

Digital Signage

Smart Retail

Key Features

- Support 1.7 TOPS AI performance, up to 6 channels FHD video decoding
- Rich interfaces, support Gbits ethernet, 4G, and Wi-Fi networks
- Fanless design, support indoor/outdoor deployment
- Support Linux or Android operating system
- End-to-end security mechanism to ensure device security
- Device-edge-cloud synergy



Specification

Platform	OS	Linux，Android 10
	SoC	CPU: 64-bit ARM V-8 compliant applications processor, Dual high-performance cores 2.2 GHz, Hexa low-power cores 1.8 GHz. Artificial Intelligence (AI) Engine 1.7TOPS.
		Video Processor Multi-format codec up to 4K30 video encode. Multi-stream codec(4K30 (HEVC) + 720p30 (YUV) + 480p30 (VA -YUV))
Memory	RAM	6GB LPDDR4x
Storage	ROM	64GB USF 2.1
	External memory	1x MicroSD card
I/O interface	USB	2x USB3.1 Type-A
	Video out	1x HDMI out Type-A, 1080p@60FPS
	MicroSD	1x MicroSD card Slot
	Ethernet	1x RJ45 support Gigabit LAN
	SIM	1x nano SIM card slot
Wireless Connectivity	LTE	Cat4 up to 150Mbps (DL)/ 50Mbps (UL)
	Wi-Fi	1x 802.11a/b/g/n/ac 2.4G/5GHz
External ANT	LTE	1x Main ANT and 1x diversity ANT
	Wi-Fi ANT	1x ANT 2.4G/5Ghz
Power	Power type	DC 12V
Mechanical	Dimension	169mm X 110mm X 50mm
	Mount	Wall Mount, Desktop
Environment	Operation Temperature	-20°C~+60°C
	Storage Temperature	-40°C~+70°C
	Waterproof	IP40
	Storage Humidity	10%~90%, non-condensing
Certification		CE, FCC, JATE/TELEC, CCC/SRRC, RoHS/Reach/WEEE

TURBOX

EB3Gen2
Edge AI Station

EB3Gen2 Edge AI Station is a high-performance AI edge computing device. It adopts an industrial-grade fanless design. Embedded with the built-in edge software OSware.Edge, it provides customers with device management, video management, AI algorithm configuration, application upgrades, edge-cloud collaboration, customization, and multi-cloud connectivity. EB3Gen2 delivers superior 14 TOPS of AI performance and up to 8 channels full HD video processing, which can be widely used in smart retail, smart building, smart factory, smart transportation, and many other edge AI application scenarios.

Applications

Smart City

Smart Transportation

Smart Retail

Smart Factory

Smart Grid

Smart Building

Key Features

- Premium performance with high AI computing power and multiple channel decoding
- Rich interfaces, multiple type of network for Edge computing scenarios
- Industrial design for harsh conditions
- Deeply optimized streaming media AI analysis service
- Visual configuration of AI algorithms and applications
- Edge cloud collaboration, large-scale deployment, one-stop management

Specifications

PlatForm	OS	Linux / Android / Windows
	SoC	Qualcomm® Dragonwing™ QCS6490
	Qualcomm® Artificial Intelligence (AI) Engine: 14 TOPS	CPU: 1Gold+ (2.7 GHz); Gold (3x 2.4 GHz); Silver (4x 1.9 GHz)
		GPU: Adreno 643
	Video Processor	Adreno VPU 633 Video decode up to 4K60 for H.264/H.265/VP9 Video encode: Up to 4K30 for H.264/H.265 Video concurrency: 1080p60 decode and 1080p60 encode/ 4K30 decode + 1080p30 encode
System Memory	RAM	8GB LPDDR4X
Display	HDMI	1x HDMI out, 1x HDMI in
Storage	Flash	128GB UFS2.2
	Expansion	SD Card, M.2 2280 SSD NVMe
I/O interface	USB	3x USB 3.0 Type A , 1x USB 2.0 Type A , 1x USB3.1 Type C(OTG)
	Ethernet	2 x RJ45 Gigabit ethernet(10/100M/1000M)
	COM Port	2x RS485, 2x RS232
	DI/DO	4x DI, 2x DO
	SIM	1x NanoSIM card slot
Wireless Connectivity	Wi- Fi	Support WiFi extension
	5G/4G	M.2 connector for 5G module, support PICIe/USB3.0 multimode support: 2G/3G/4G//5G NR sub-6
	Antenna	5 x Antenna connector, 1x for WiFi, 4 x for 5G(optional)
Audio	Audio	1 x MIC, 1 x Earphone, 1 x buzzer
Input&Indicators	Buttons	Power key, Reset key
	Leds	Power status, WiFi status, 5G Status
Others	RTC Battery	CR2032 RTC Battery
Power	DC Input	Input DC range support from 12V to 24V
Environment	Operation Temperature	-20℃ ~ 60℃
	Storage Temperature	-20℃ ~ 70℃
	Storage Humidity	10%~90%, non-condensing

TURBOX

EB5Gen2 Edge AI Station

EB5Gen2 Edge AI Station is a high-performance AI edge computing device. It adopts an industrial-grade fanless design. Embedded with the built-in edge software Edge OS, it provides customers with device management, video management, AI algorithm configuration, application upgrades, edge-cloud collaboration, customization, and multi-cloud connectivity. EB5Gen2 delivers superior 48 INT TOPS / 12 FP16 TOPS of AI performance and up to 24 channels full HD video processing, which can be widely used in smart retail, smart building, smart factory, smart transportation, and many other edge AI application scenarios.

Applications

Smart City

Smart Transportation

Smart Retail

Smart Factory

Smart Grid

Smart Building

Key Features

- Premium performance with high AI computing power and multiple channel decoding
- Rich interfaces, multiple type of network for Edge computing scenarios
- Industrial design for harsh conditions
- Deeply optimized streaming media AI analysis service
- Visual configuration of AI algorithms and applications
- Edge cloud collaboration, large-scale deployment, one-stop management

Specifications

PlatForm	OS	Linux / Android
	SoC	Qualcomm® Dragonwing™ QCS8550
	CPU	1 GoldPlus 3.2GHz + (2+2) Gold 2.8GHz + 3 Sliver 2.0GHz
	GPU	Adreno A740
	NPU	Dual eNPU V3, 4 x HVX, HMX, 48 INT8 TOPS, 12 FP16 TOPS
	Video Processor	4k240/8K60 dec, 4K120/8K30 enc, AV1 decoder
System Memory	RAM	12GB LPDDR5X
Display	HDMI	2x HDMI out, 1x HDMI in
Storage	Flash	128GB UFS3.1
	Expansion	SD Card, M.2 2280 SSD NVMe
I/O interface	USB	3x USB 3.0 Type A, 1x USB3.1 Type C(Suport Video)
	Ethernet	2x RJ45 Gigabit ethernet(10/100M/1000M)
	COM Port	2x RS485, 2x RS232, phoenix connector
	DI/DO	4x DI, 2x DO, phoenix connector
	SIM	1x NanoSIM card slot
Wireless Connectivity	Wi-Fi	Support WiFi extension
	5G/4G	M.2 connector for 3042 4G moduel, 3052 5Gmodule, support PICIe/USB3.0☒multimode support: 2G/3G/4G//5G NR sub-6
	Antenna	5x Antenna connector, 1x for WIFI, 4x for 5G(optional)T
Audio	Audio	1x MIC, 1x Earphone, 1x buzzer
Input&Indicators	Buttons	Power key, Reset key
	Leds	Power status, WIFI status, 5G Status
Others	RTC Battery	CR2032 RTC Battery
Power	DC Input	Input DC range support from 12V to 24V
Environment	Operation Temperature	-20~60°C
	Storage Temperature	-20~70°C
	Storage Humidity	10%~90%, non-condensing

TURBOX

EB5 Edge AI Station

EB5 Edge AI Station features advanced AI and codec capabilities, supports 5G and Wi-Fi6 connectivity, bringing massive high quality video for real time AI analysis and inferencing at the edge, and upload the structured data to the cloud, to extend the boundaries of cloud computing, enable an intelligent transformation of existing infrastructure. Embedded with rich OSware.edge, supports edge-cloud synergy, remote AI algorithm and application deployment, FOTA, which make it widely applied to the fields of applications like smart building, smart retail, smart manufacturing, smart healthcare, smart traffic, smart city, etc.

Applications

Smart Industry

- Flat panel defects inspection
- Wafer cell anomaly inspection
- PCB defects inspection
- Switch panel defects inspection
- Staff on duty detection
- Electrical tower defects inspection

Smart Building

- Face recognition
- Mask detection
- Smoking detection
- Emotion prediction
- Age/Gender prediction
- People counting
- Intrusion detection

Smart Traffic

- Drowsiness & fatigue detection
- Distraction monitoring
- Calling detection
- Smoking detection
- Gaze tracking
- Lane departure warning
- License plate recognition

Smart Worksite

- Face recognition
- Safety helmet detection
- Safety uniform detection
- Intrusion detection
- Trailing detection
- Boundary detection
- Violence detection

Key Features

Advanced Connectivity:
Support 5G and Wi-Fi-6

Powerful Codec Capability:
Support 24 channels FHD video decode

Plentiful Interfaces:
Compatible with multiple industrial communication interfaces, support RS232, RS485, CAN, USB3.0, DIDO multi-mode access interfaces

Embedded Edge OSware:
Provide TurboX Device ware for device connectivity, TurboX Cloud ware for multiple cloud access, TurboX Stream ware for multimedia processing and AI analysis

Edge-Cloud Synergy :
Support FOTA, DM and remote application deployment

Compact Design:
Industrial design with fanless design, can be used in a wide operating temperature

Specifications

Platform	OS	Linux/Android 10
	SoC	CPU: 8 cores CPU, CPU clock speed up to 2.84GHz. Artificial Intelligence (AI) Engine 15TOPS.
		Video Processor: video decoding 8k@60FPS, video encoding 8k@30FPS
System Memory	RAM	8GB, LPDDR5
Display	Output	2 x HDMI out, 1080p@60fps
Storage	Flash	128GB UFS3.0 on board
	Expansion	SD Card, M.2 M-key CON for SSD support
I/O interface	USB	4 x USB 3.0 Type A , 1x USB3.1 Type C(OTG)
	Micro SD	1 x Micro SD slot
	SIM	1 x NanoSIM card slot
	Ethernet	2 x Gigabit ethernet(10/100M/1000M)
	COM Port	2 x RS232, 2x RS485
	CAN	2 x CAN bus
	DI/DO	8 DI/DO(4 DI, 4 DO)
Wireless Connectivity	Wi-Fi	802.11a/b/g/n/ac/ax, 2x2 MIMO
	5G	M.2 B-key CONN for 5G module support, 5G module is optional configuration based on customer order
	Antenna	6 x Antenna connector, 2x for Wi-Fi, 4x for 5G(optional)
Audio	Audio	1 x MIC, 1x Earphone
Debug	Debug Port	1 x Micro USB(for debug)
Input&Indicators	Buttons	Power key, Reset key
	Leds	Power status, Wi-Fi status, 5G Status
Others	RTC Battery	CR2032 RTC Battery
Power	DC Input	Input DC range support from 12V to 24V
Mechanical	Dimension	200mm x 235.5mm x 44mm
	Weight	2200g
	Mount	Wall Mount
Environment	Operation Temperature	-10~50°C
	Storage Temperature	-20~70°C
	Storage Humidity	10%~90%, non-condensing
	Anti-Vibration	0.5Grms @ 5 ~ 500 Hz, random
Certification		CE NB, FCC, JATE/Telec, RoHS/Reach/WEEE

Solution

Smart Device Solution

Video Conference Solution

Thundercomm All-in-One Video Conference Device One-stop Solution based on Qualcomm /QCS6490/QCS610/QCS8250/SDA845 platforms. The solution includes SOMs, operating system customization, audio quality optimization, video processing, algorithms, UC APP integration and certification, testing and cloud services. With the world's leading audio and video technologies and first-class R&D resources, Blink can meet the requirements of smart video conference customers in different scenarios to help OEM customers develop competitive products in an efficient way.

Key Features

Product design

From industrial design to device architecture, UI/UE and DFX

Hardware base

SOM, PCBA and mechanical custom

Software OS base

Android, Linux, customization and restructure

Image/Audio

Camera system and audio system design

UC platform

API integration and complete test & certification process

Intelligence

Neural network AI algorithm LLM on device

Cloud

FOTA, device management Public/private cloud deployment

Applications

All-in-One Teams room device

360° panoramic camera

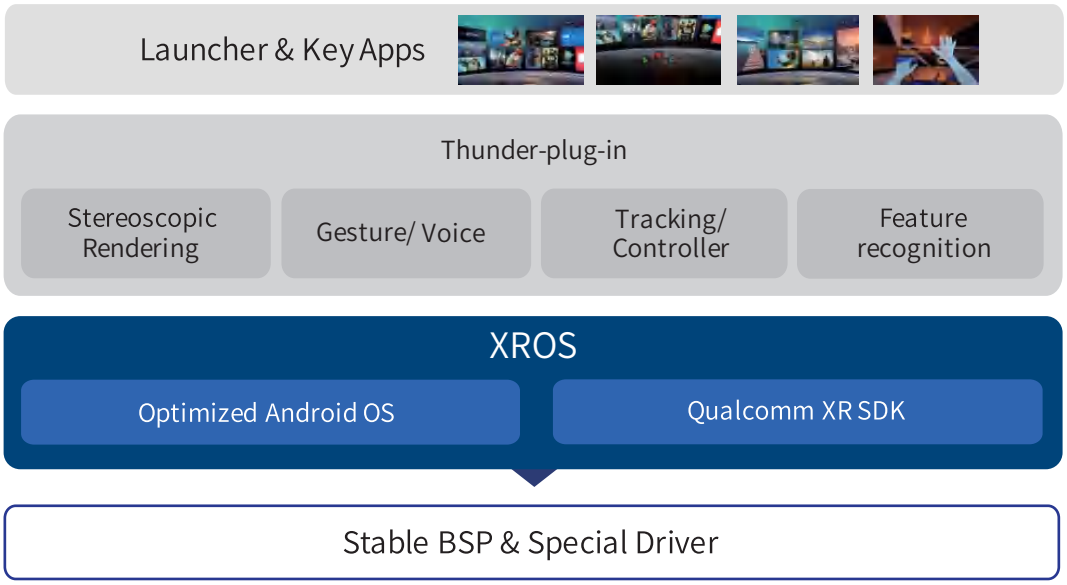
Bring your own device video bar

Touch console

Smart display

XR Solution

Thundercomm is a world leading end-to-end XR solution provider based on Qualcomm® Snapdragon ™ 4100/5100/XR1/XR2 platform. Our services include hardware/mechanical design, software development, testing and manufacturing. Our solution features high performance, high resolution, low latency, low distortion rate, and customized Android OS for VR/AR headset. With a powerful VR SDK which can support SLAM/6DOF and various interactive modes for VR/AR devices.



Key Features

- 6DOF Head tracking, drifting< 0.1%
- Tailor & Optimized Android OS
- Low latency rendering
- Launcher & key apps and Fast Boot
- Noise Cancellation
- Low latency Camera See-through
- Qualcomm XR SDK support
- Optical tuning/IPD tuning, Distortion < 3%
- Gesture and voice CMD

Applications


All-in-one VR

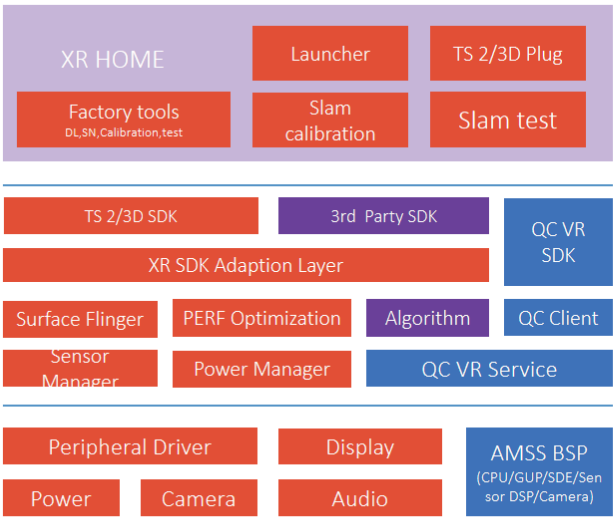

Enterprise AR Glass


All-in-one AR Glass


Tethered AR Box


Light Weight AR Glass

XR OS



- 3D container
  - Support 2D app render in 3D
  - Support multi-windows
- Slam calibration
- Slam performance test
- Support 3rd controller
- Support 3rd algorithm

Reference Product

Computing

SoC	Qualcomm AR1
Memory/Storage	2GB/4GB LPDDR4X, 32GB eMMC ePoP

Sensor

RGB Camera	12M RGB Camera
IMU	Accelerometer, Gyroscope
Proximity Sensor	Wearing Detection

Audio

Microphone	5 x Digital Microphone（+1 bone conduction）
Speaker	Stereo Speakers

Connectivity

Wi-Fi	WiFi7
Bluetooth	BT5.3
Charge	Pogo-Pin for Charging

Interaction

Key	Power Key, Snapshot Key
Touch	Volume +/-, Confirm

Fit

Size/Weight	Frame width 147mm, Frame height 47mm, Arm length 139mm, Weight < 50g, battery 150mAh

Computing

SoC	Qualcomm 5100 + BES2700
Memory/Storage	2GB/4GB LPDDR4X, 32GB eMMC ePoP

Sensor

RGB Camera	12M RGB Camera
IMU	Accelerometer, Gyroscope
Proximity Sensor	Wearing Detection

Audio

Microphone	5 x Digital Microphone
Speaker	Stereo Speakers

Connectivity

Wi-Fi	WiFi 2.4/5G
Bluetooth	BT5.3
Charge	Pogo-Pin for Charging

Interaction

Key	Power Key, Snapshot Key
Touch	Volume +/-, Confirm

Fit

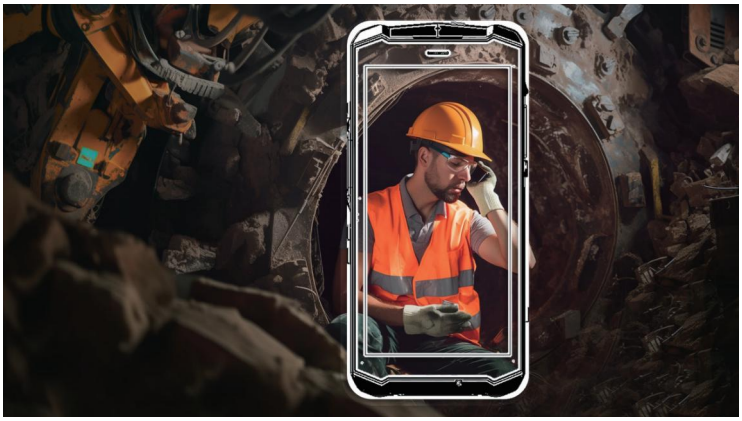
Size/Weight	Frame width 150mm, Frame height 46mm, Arm length 150mm, Weight < 40g, battery 180mAh

Algorithm

LLDHR, MFNR, LDC, Motion detection, EIS, AI MIC noise cancellation, Echo cancellation, Far/near field recognition

Handheld Solution

Thundercomm Handheld solutions is the world leading IOT soultion. From product definition to mass production, we provide a one-stop handheld solution,including Concept Design, software, hardware development, manufacturing and delivery.Our major product includes Rugged terminal, Pos terminal, Enterprise Tablet, Game Console.



Key Features

IHH / Rugged Devices

- 5G world band
- Explosion proof
- High performance Camera and Barcode reader
- Carrier certification

Game handheld console

- High system performance
- Full range Qualcomm chipset solution
- Complete device design
- Low latency network

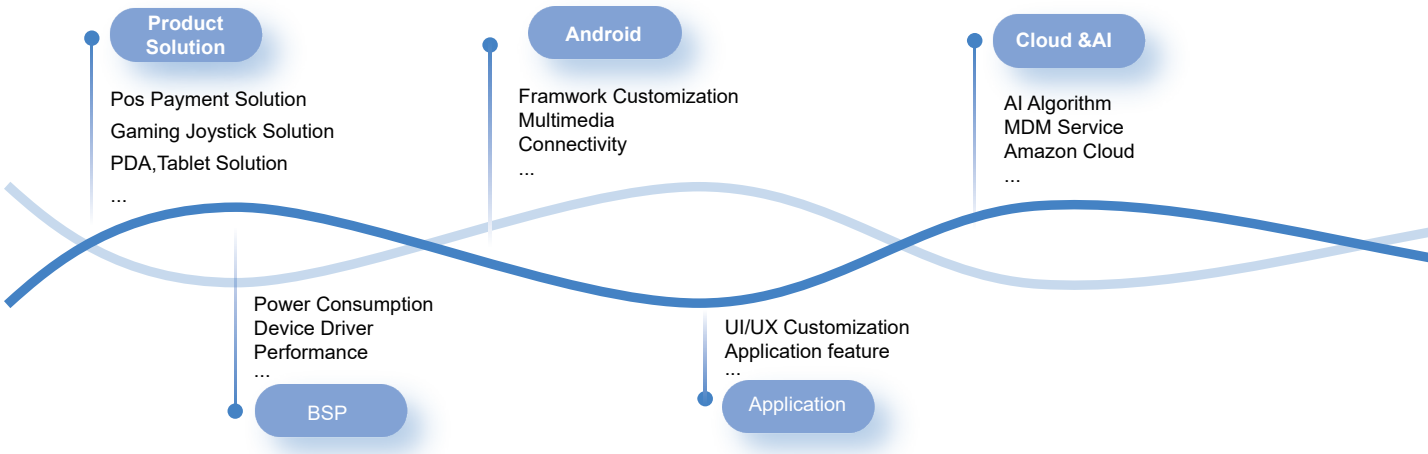
Payment / POS

- Dual display, dual content
- Multi-format Barcode Scanner
- EMV kernel design
- SP & Anti-Temper design

AI Vending Machine/ Self-service Terminal

- AI Automatic Recognition
- Support for Local/Cloud Computing
- AI Training Platform Model Farm

Software Customization Offering



Applications

POS | Cashier | Self-service Terminal | PDA | Game handheld Console | Boyfriend machine | Live streaming machine

POS Solution

The Payment terminals integrates the latest intelligent technology and professional certification. Adopting mainstream intelligent technology solutions.

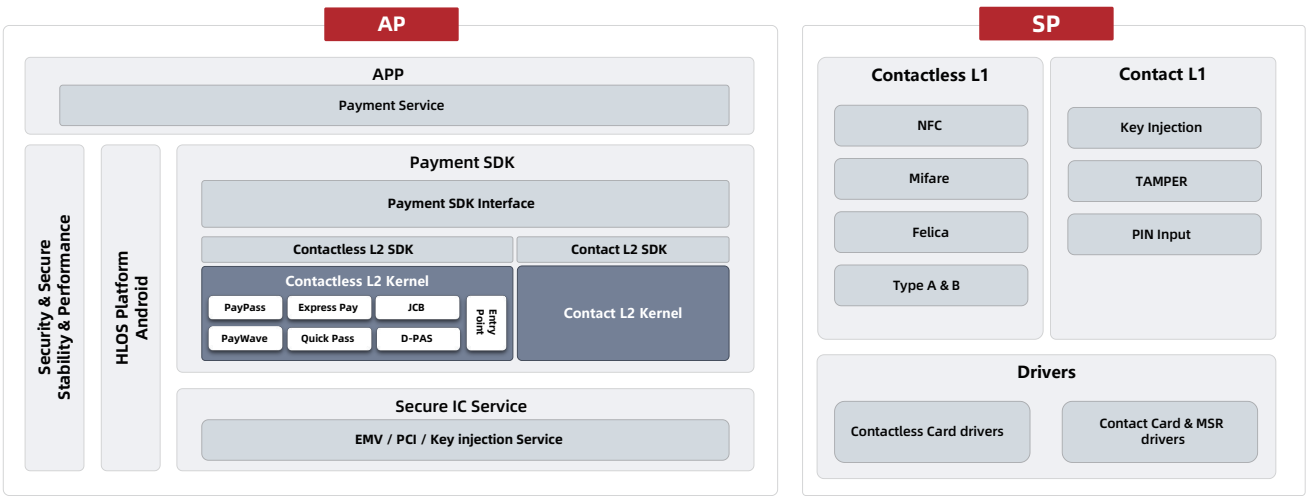
Key Features

- The latest Android version
- Multiple communication methods such as 4G/Wifi/BT/Ethernet etc.,
- Meets the latest PCI requirements, security standard PCI 7.X, EMV L1/L2.

Financial Product Kernel Design

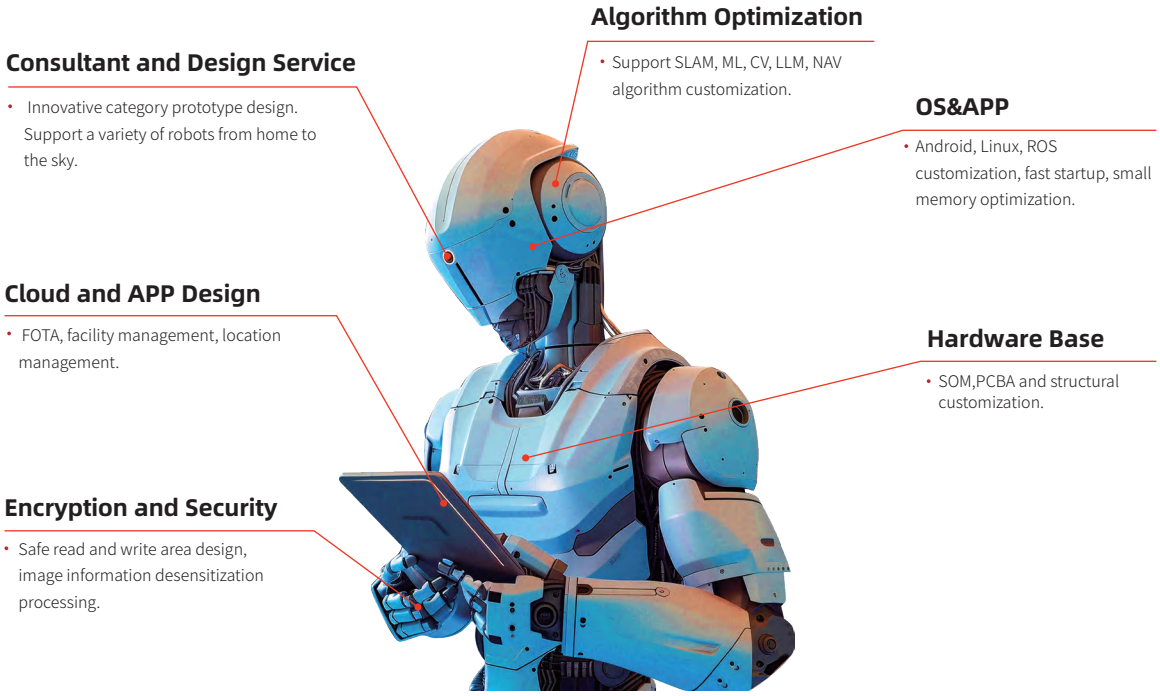
Security Design(S/W)

- AP+SP , Dual CPU Design
- EMV L2 kernel logic implementation and Development
- Security services customization ,Certified kernel : EMV, VISA, AMEX, DPAS, and PAYPASS…



Smart Robotics Solution

The Smart Robotics Solution combines a variety of high, medium and low computing power SOM/Dev Kit based on Qualcomm® QCS405/SDA845/QRB5165 platform and robot brain solution. It can meet the needs of different types of robot products including industry, service, home, logistics and cleaning robots. Through fully verified solutions and market integration capabilities in vertical fields, customers can lower development costs and technical barriers, and realize the rapid listing of innovative robot products.



Key Features

Intelligent Perception Solution

- Camera pipeline customization & camera tuning
- 8-camera concurrent processing
- Multi-sensor fusion filtering
- High frame rate object detection and segmentation

Intelligent Interaction Solution

- ID design
- Voice localization
- Motion planning
- Local LLM optimization

Applications

Drone

Service Robot

AMR

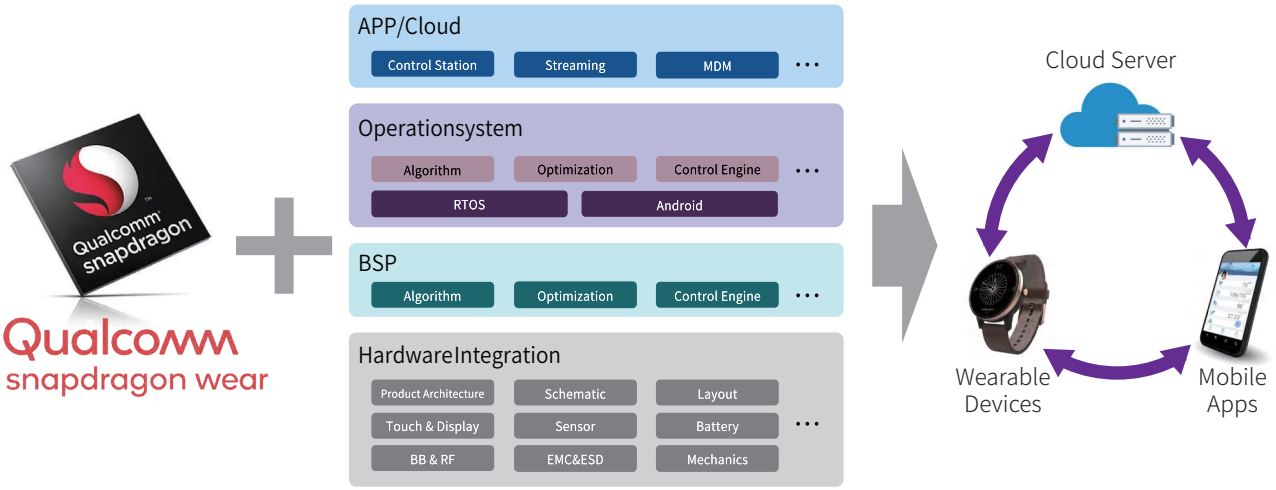
Companion Robot

Humanoid Robot

Smart Wearable Solution

Thundercomm provides a one-stop wearable solution based on Qualcomm® Snapdragon™ Wear 2500/4100/5100+ platforms from software customization to hardware design and mass production support. Including BSP/driver development, UI/UX design, APP development, operating system optimization, carrier certification support.

In addition, Thundercomm also provides software SDK with enhanced connectivity and security capabilities for various types of smart watches. Customers can easily and quickly develop applications based on the SDK.



Applications

Smart Watch

Kids Watch

Sports Watch

Wearable Player

Wearable Cam

Smart Camera Solution

Thundercomm provides end-to-end camera solution based on Qualcomm QCS8250/ QCS615/ QCS610/ QCS4290 /QCS2290 platforms for OEM customers. Our services range from hardware design and production, software design and operating system optimization, BSP/driver development, algorithm development and integration, optical imaging system design, IQ tuning, supply chain management and manufacturing. With years of experience in audio, image processing and full-stack software development, Thundercomm can help OEM customers in building innovative smart camera products for various using scenarios with lower cost and shortened development cycle.

Key Features

Edge Computing

- Video Analyze on Devices
- People Count / Face Recognition / People/-Object Tracking / Defect Recognition
- Computing on Devices

Variant Functions

- 360° On-Device Stitching
- Surround View / Depth Camera
- 4K / 8K
- HDR, WDR, EIS
- 3A customization
- UC App Integration & Certification Support

Advantages

Rich development experience on Qualcomm platform

Promote variety and customized cloud services for telematics

High image quality and camera tuning

Deep customized Android OS with low power consumption and fastboot

Advanced artificial intelligence algorithm

- Face Recognition
- Object Detection

One-stop service, fast TTM and low development cost

Applications

Video collaboration devices

Smart dash camera

Consumer Vlog camera

Industrial Body camera

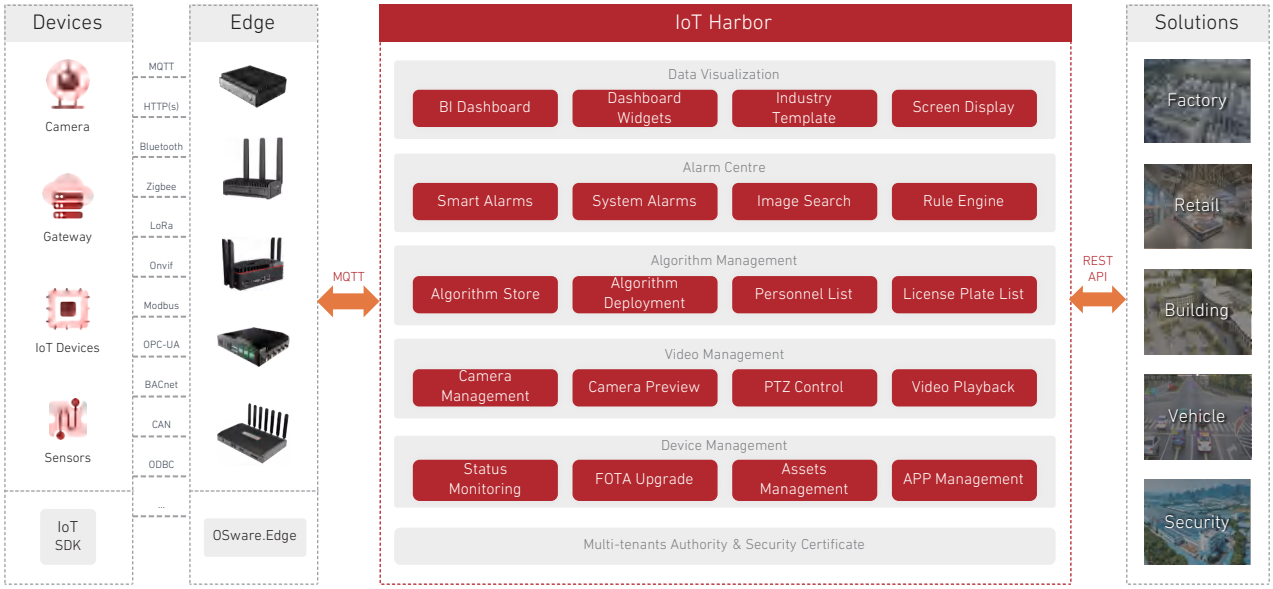
Cloud Service

TURBOX

IoT Harbor

IoT Harbor is an intelligent edge management platform that integrates device management, application upgrades, rule engine, data visualization and other capabilities. Harbor supports intelligent video services, remote deployment of algorithm applications and edge-cloud synergy services, helping enterprises and developers to shorten the industry application development cycle.

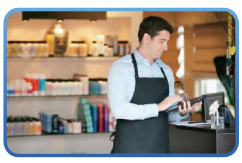
Tech Structure



Applications

Smart Building

Smart Campus



Smart Retail

Smart Factory

Smart Security

Key Features

Device Access
Support popular IoT and video protocols with fast cloud connection

Security
Support for provisioning and management of devices with credentials management

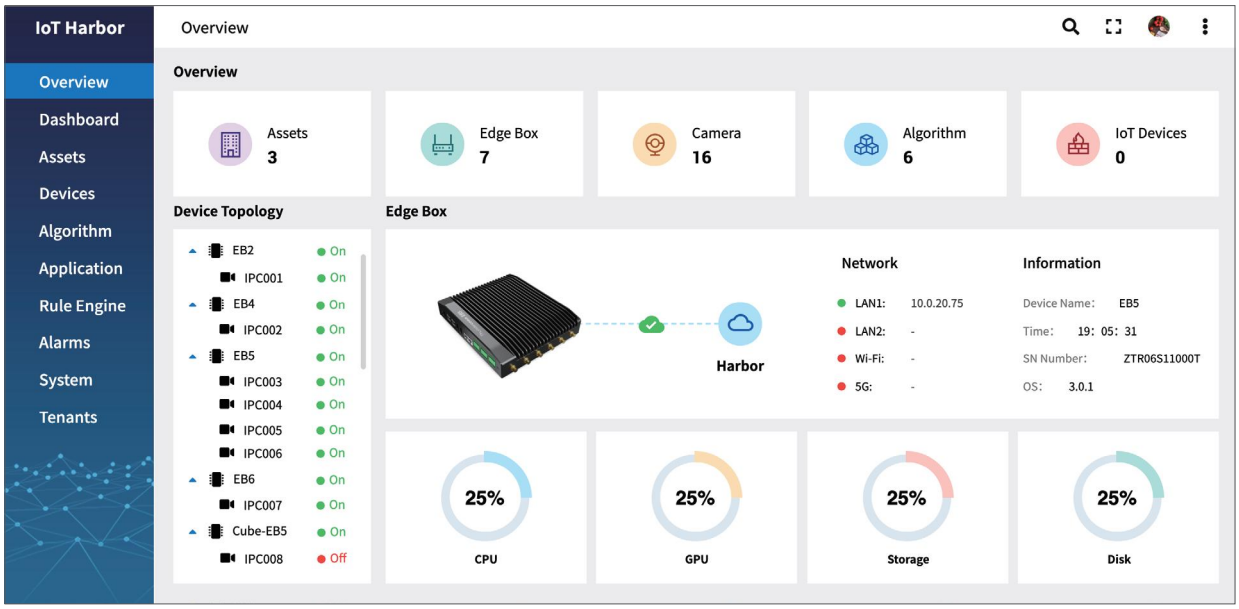
Device Management
Status monitoring, FOTA upgrade, APP management, and 100+ dashboard widgets

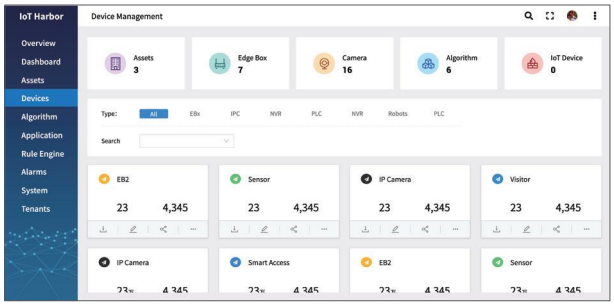
Intelligent Video Services
Provide services such as video management, smart alarms and algorithm management

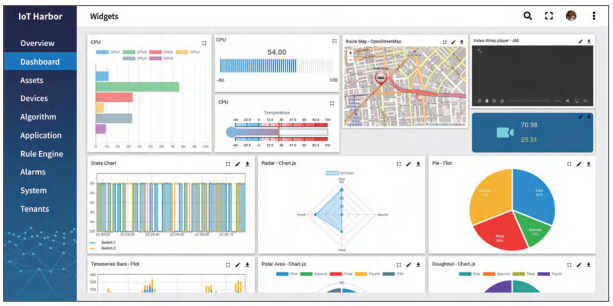
Scalability
Flexible deployment, rich Restful APIs, and support connecting to public cloud platforms

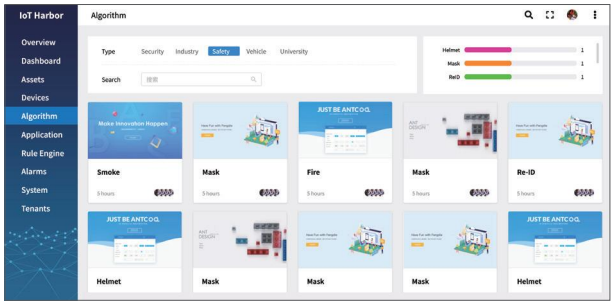
Rule Engine
Customized rule chains to control other devices, or generate notifications and alarms

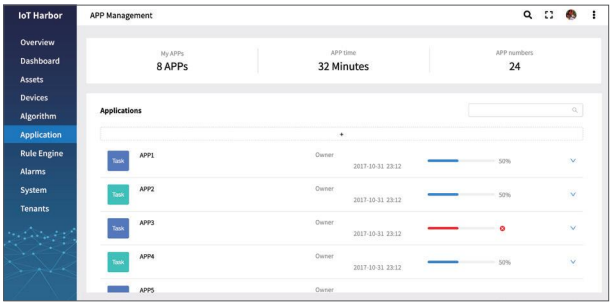
Web Portal







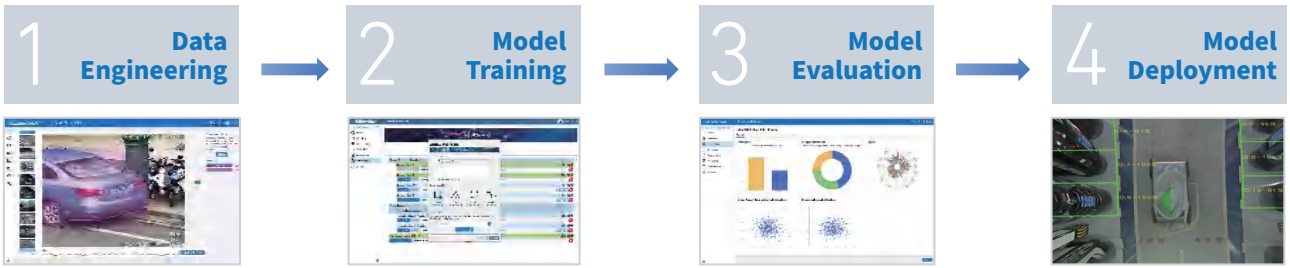




TURBOX

Model Farm

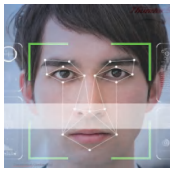
Model Farm is an automated machine learning platform for the field of artificial intelligence, providing the whole process of AI development services from data engineering to model training and evaluation. Through the automatic machine learning algorithm that support dynamic model structure design, it provides a platform for customers to quickly develop high-quality algorithm model and realize AI application. Model Farm also provides data management to ensure data security in data annotation, quality inspection, training, etc. The platform supports a variety of industry insensitive AI algorithms, including detection, classification, segmentation, key point detection, and supports online transformation of models for various types of IoT device deployments, it also can be accessed through the web to perform online inference and performance verification of the trained model. With the support of whole process of AI algorithm development, Model Farm can effectively satisfy the requirements of rapid algorithm customization development in a wide range of scenarios such as smart buildings, smart security, defect detection, autonomous driving, etc.



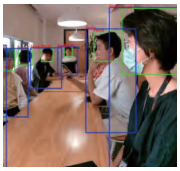
Key Features

- **Whole process:** covers the whole process of artificial intelligence model training
- **Low threshold:** Training models do not require model design skills
- **Support multiple algorithms:** Support multiple industry insensitive algorithms and apply to a wide range of scenarios
- **Support multiple inference platforms:** Support multiple types of model transformation for deployment on multiple IoT devices

Pre Trained Model

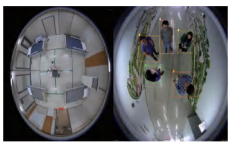

Facial Recognition


Face Detection

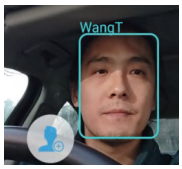

Video Conference Auto Framing


People Counting


ReID

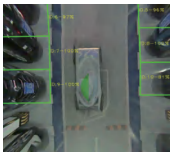

Multi Object Tracking

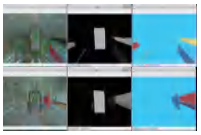

License Plate Recognition



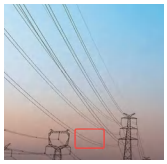
DMS

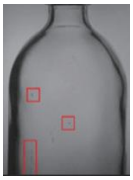

Sight Tracking


Parking Space Detection


Parking Obstacle Detection

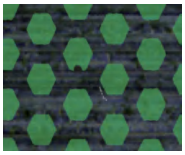

Door Defect Detection


Wire Defect Detection


Surface Defect Detection of Transparent Bottle

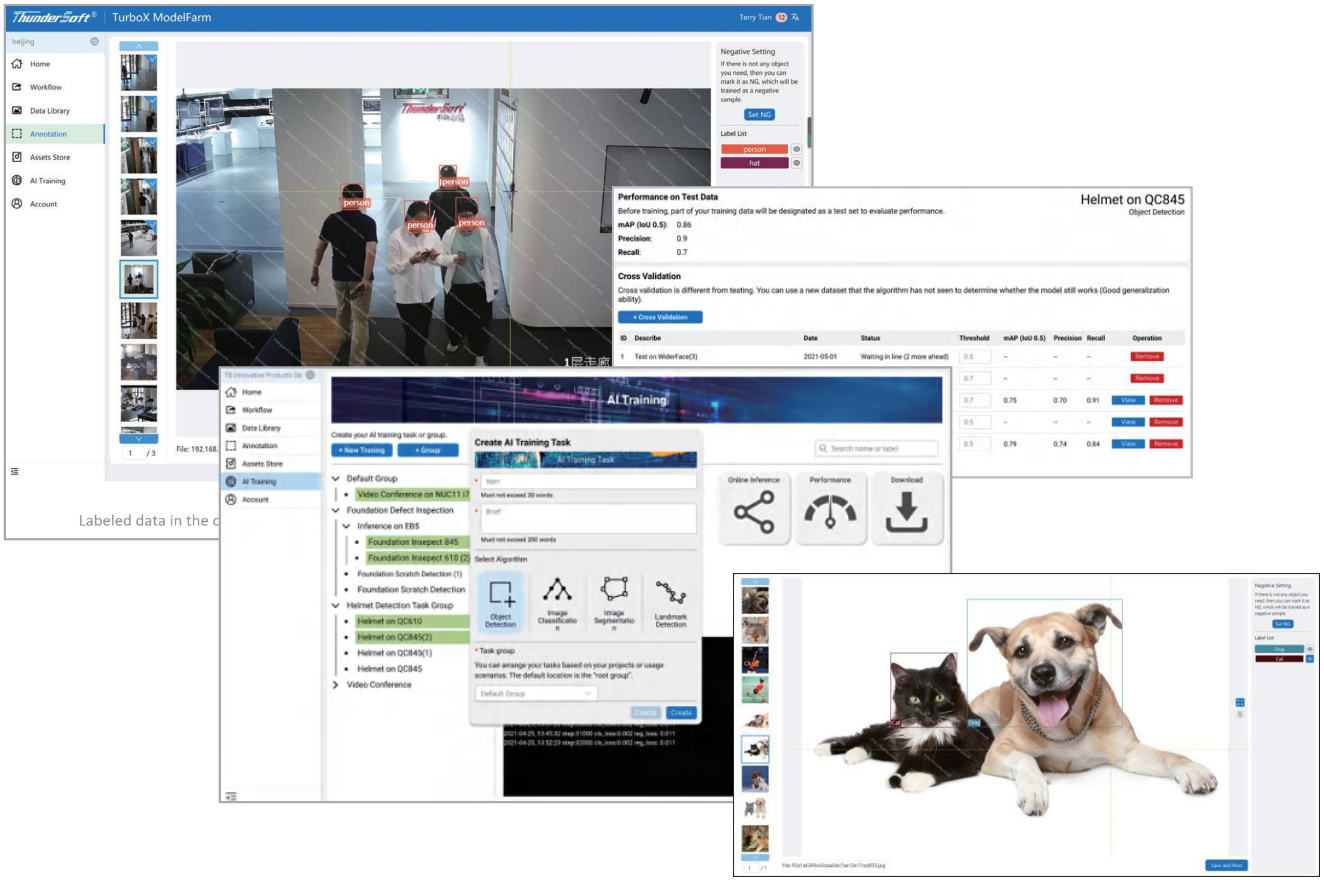

Compression Mold Defect Detection


Metal Corrosion Segmentation


Panel Defect Detection


Lesion Segmentation

Web Portal



FOTA Product

Thundercomm FOTA (Firmware Over-the-Air) Product provides one-stop customizable remote upgrade and management capabilities for different types of smart devices on both device and cloud. It can quickly repair and optimize the system over-the-air, helping OEM manufacturers enhance product value, and ensure a good end-user experience.

This platform Product has been widely applied to sectors such as home appliances, security, automobiles, manufacturing, healthcare, and wearables and has been successfully deployed in several Fortune Global 500 companies.

Key Features

Compliant local services
Supports global deployment

Powerful architecture
Unlimited number of devices and dynamic expansion

Small differential packages
Sizes only 20-50% of conventional differential packages

Stable download speed
Automatically select among global nodes to accelerate download

Simple integration solution
Both fota saas and paas are available

Deep customization service
Deep customization based on the client's business

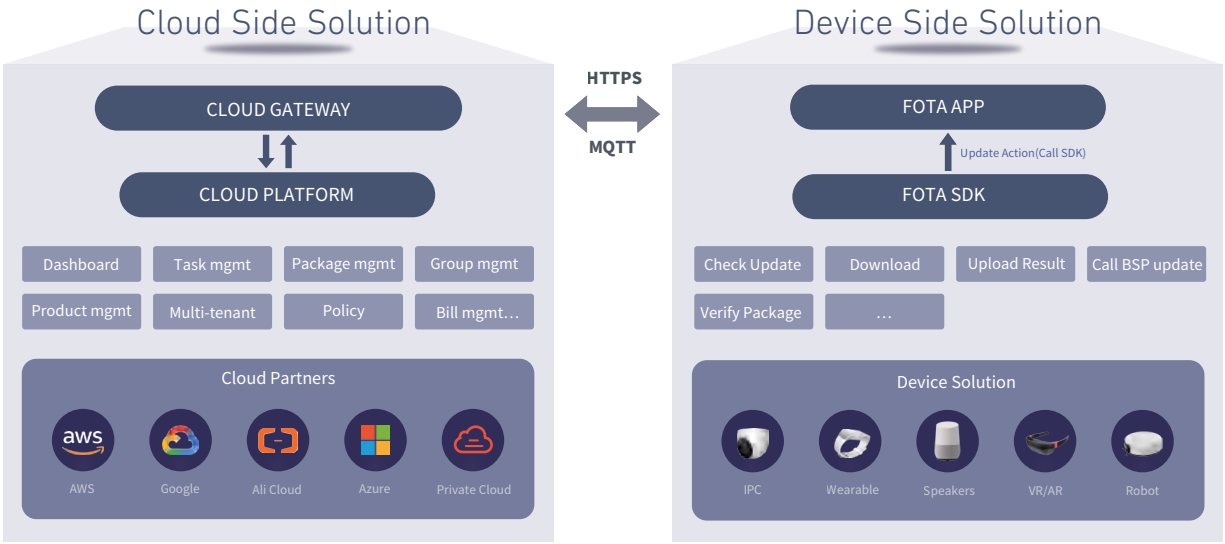
Various upgrade strategies
Customize groups based on the client's business needs such that each group can upgrade separately

Comprehensive functions
Firmware Management; Task Management; Product Management; Group Management; User Management; Bill Management,etc

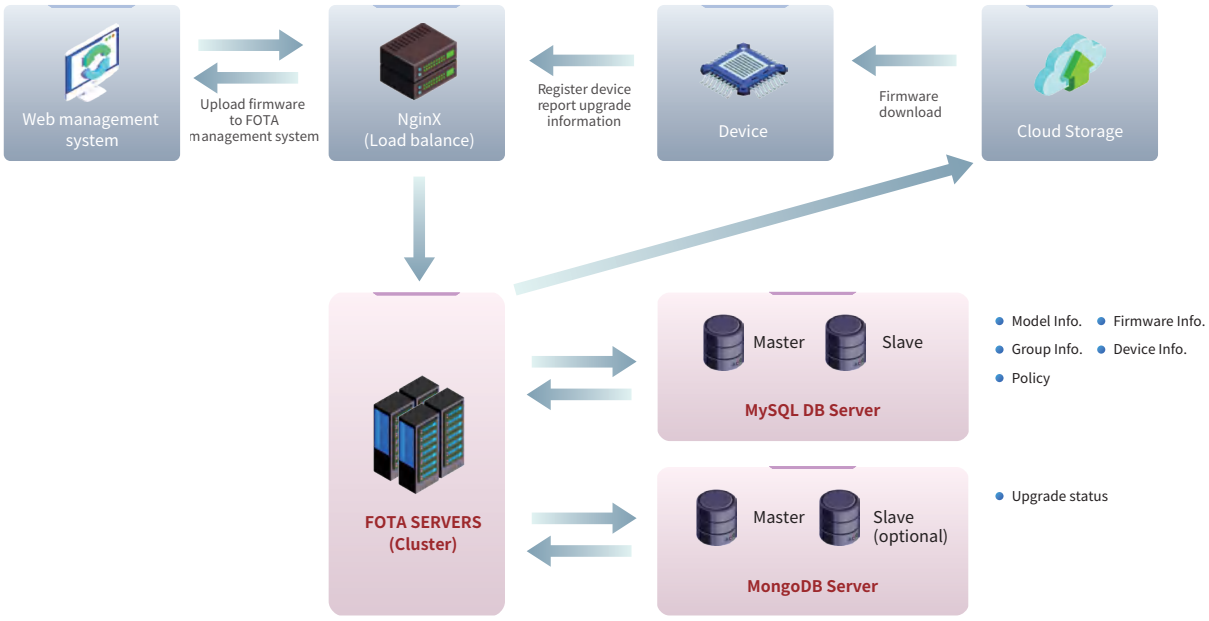
Architecture

FOTA is based on different cloud platforms, two FOTA products solutions are management, group offered: SaaS and Private deployment services.

The access layer provides multi-lingual and fast integrated device SDKs for customers to access different cloud platforms. The cloud provides services to connected devices such as device management, firmware upgrade, application management, operation and maintenance.



Deployment



Applications

Smart Devices
mobile phones, tablets, webcams, audio, cameras, game consoles

Smart Vehicles
vehicle upgrade, smart cockpit, intelligent rearview mirror, dashcam

Industrial IoT
sensors, collectors, controllers

Smart Home
smart robots, smart appliances

Smart Security
video monitoring, smoke detectors, smart lock

Smart Wearables
smart watches, smart rings, smart glasses

Other Applications
excavators...

MDM Product

MDM Product provides customizable one-stop, end-to-end smart device management. The Product is very powerful and easy to use. It can handle the latest device types and OS, including Android, iOS, macOS, and Linux, to help global enterprises to manage their devices, apps, policies, and users in their mobile application systems.

The MDM Product helps enterprises protect apps, content, and data for any device and manage and authenticate user access and identity to ensure that employees can access related data accurately and securely on these devices. The platform enables enterprises to manage many devices using a unified standard throughout their life cycle to ensure higher security and simplify the process, making solutions more cost-effective.

Key Features

Efficient and unified management: unified backend management of the devices, apps, and content

Secure access mechanisms: Multifactor Authentication (MFA)

Simple integration: SDK supports fast integration into apps

Secure data: supports data isolation and management system isolation among multiple members

Powerful architecture: unlimited number of devices with dynamic expansion

Compliant local services: supports global deployment

Deep customization service: deep customization based on the client's business

Intuitive management interface: deep customization based on the client's business

Functions

Device management: remote control, remote locking, remote reset, data reporting, locating devices, status monitoring.

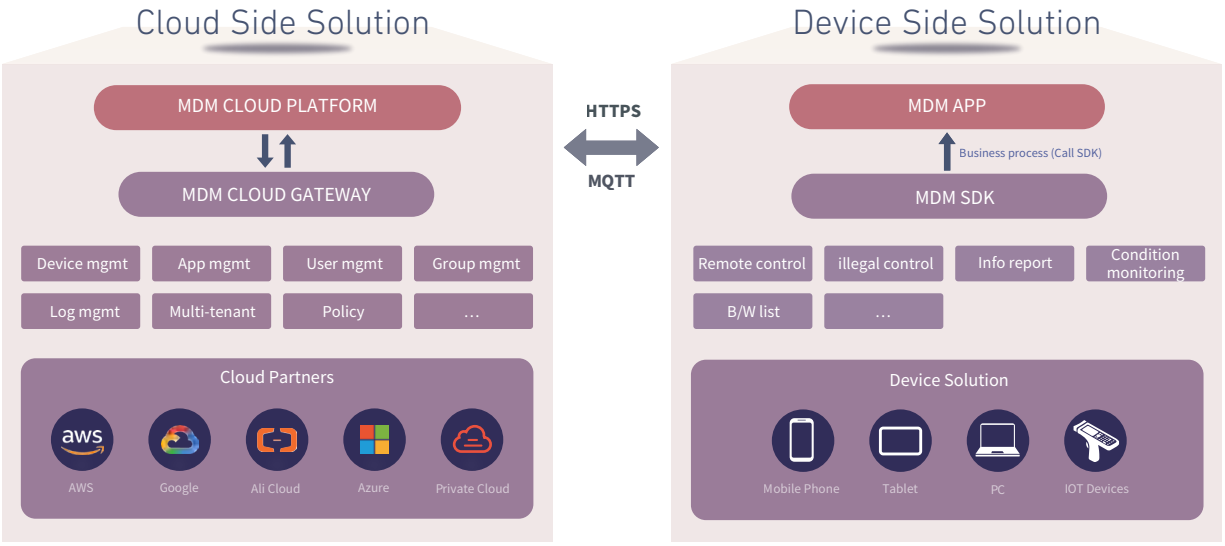
Policy management: device data collection, irregularity monitor and control, WLAN/E-mail configuration.

App management: silent installation/uninstall, blacklist/whitelist, version management.

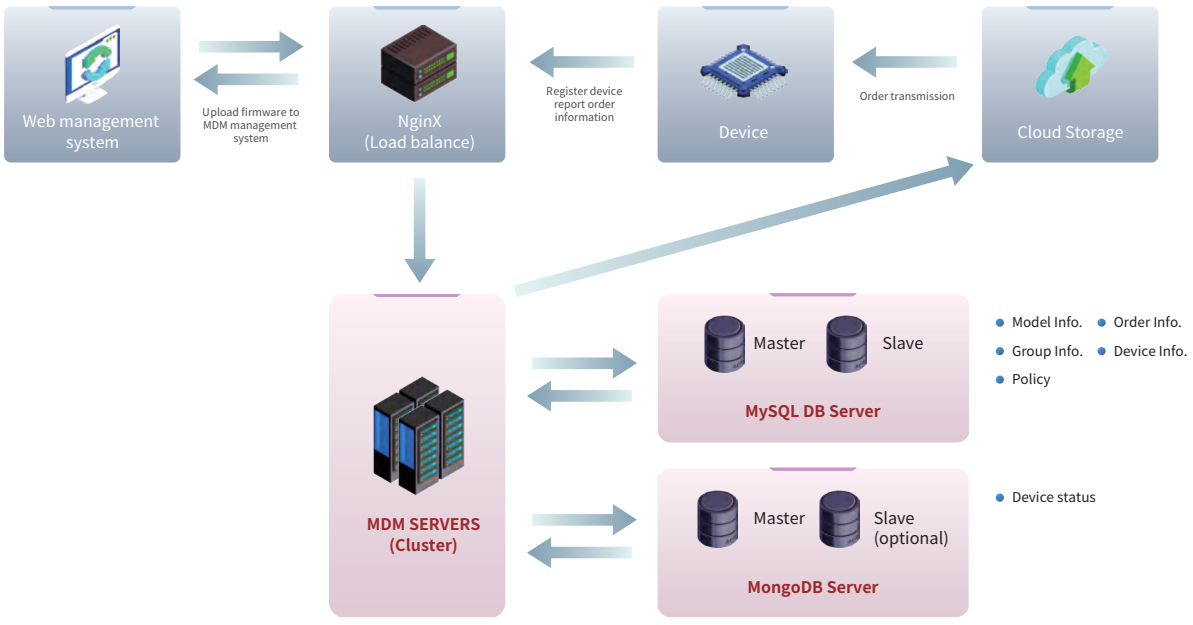
User management: user data management, single sign-on, authentication, app rights assignment, log auditing.

Architecture

The SpringCloud micro-service architecture for MDM is mature, stable, and based on a distributed system, with high availability and concurrency.



Deployment



Thundercomm

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Product features, specifications and appearance may change due to product software and hardware version updates without prior notice.

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