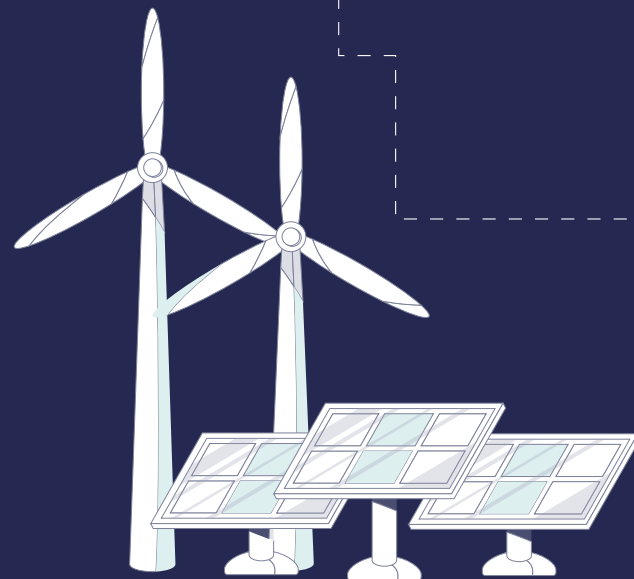
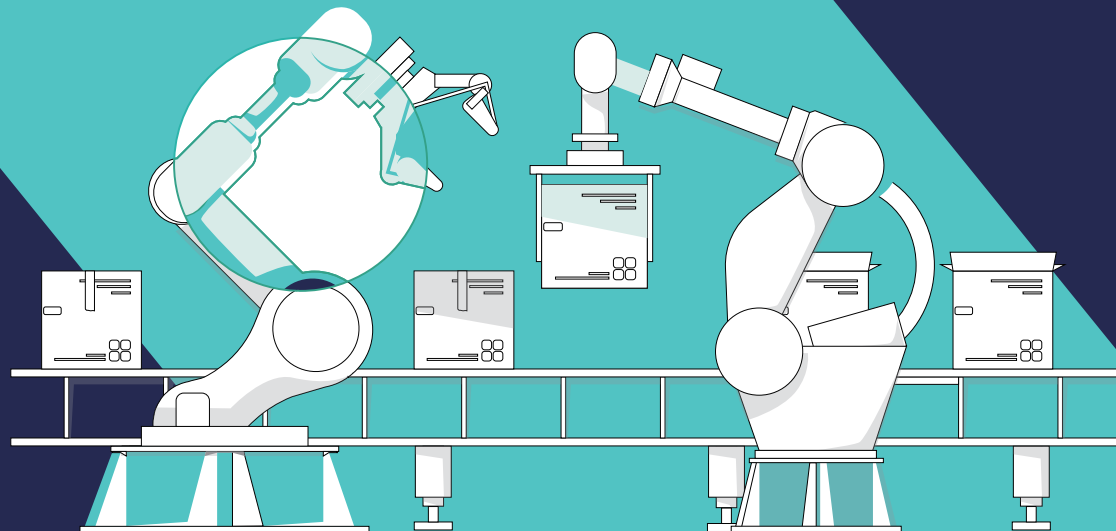


**TECHNOLOGY  
INSPIRED.**

**Geehy**  
SEMICONDUCTOR

# 32-Bit Industrial Grade MCU High-End Industrial Soc-Ese Chip and Application



## GEEHY SEMICONDUCTOR COMPANY

www.apexsemi-usa.com contact@geehy.com

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# CATALOGUE



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# Company Profile

## Design enterprise of IoT chip and self-controlled security master SoC

Geehy Semiconductor Co.,Ltd. is a wholly-owned subsidiary of Apex Microelectronics, formerly known as the R&D department for Apex's IoT chip, whose headquarters is Ninestar Corporation (Chinese top 500 companies, Stock code: 002180). With 20 years of experience in IC chip design, Geehy is a professional supplier of products and solutions for the 32-bit industrial-grade general purpose MCU, low-power BLE 5.1 SoC, and IIoT SoC-eSE security master SoC. Geehy is committed to providing higher quality products and services in industrial control, consumer electronics, medical equipment, smart home, and automobile application.

Geehy always adheres to Market Demand-Oriented, Technological Innovations as the Core, focusing on providing users with higher quality chips, solutions and differentiated services, and endeavors to build an intelligent and secure new ecosystem for the development of Internet of things.

20 years

Top 500

450 million

500 people

4 offices

4 chip R &D centers

Leading chip design technology

IC chip design experience

Head office Ninestar  
(Chinese Listed Company)

Annual chip shipment

R&D design team

Zhuhai / Shanghai / Shenzhen / Guangzhou

Zhuhai / Shanghai  
Hangzhou / North Carolina

CPU core  
Multi-core heterogeneous chip  
Hybrid architecture chip  
Secure encryption eSE chip

# Application Field



In 2019, Geehy chip covered consumer electronics, industrial control, medical equipment, and other fields.



In 2020, Geehy will officially layout automotive electronics, intelligent transportation, and intelligent energy.



# Industrial Reliability Assurance Platform

The high reliability and high stability quality assurance platform for industrial applications focus on customers' core needs, provides full life cycle quality management, and enables domestic industrial chips.



# High-level laboratory: through the national CNAS laboratory certification

- Covering over 2100m² area, inspection, and testing instruments is nearly 100 million yuan
- Five functional laboratories: testing, failure analysis, reliability, electricity, application
- Perfect chip test and verification process, support complete reliability project test, and customize reliability test solution according to customer requirements



Lifecycle management	Reliability test	Security certificate
Security mechanism	Security encryption	Support customization

# High-security certification: functional security and information security certification

- APM32F1 series products have obtained IEC61508 safety integrity level (SIL2/3), providing security manual and security mechanism to help security system developers build their security-related systems
- Dachuan GS series chips meet the state security algorithm level II, and support international cryptographic standards and Chinese commercial encryption algorithm



GS300 State Security Algorithm Certificate level II

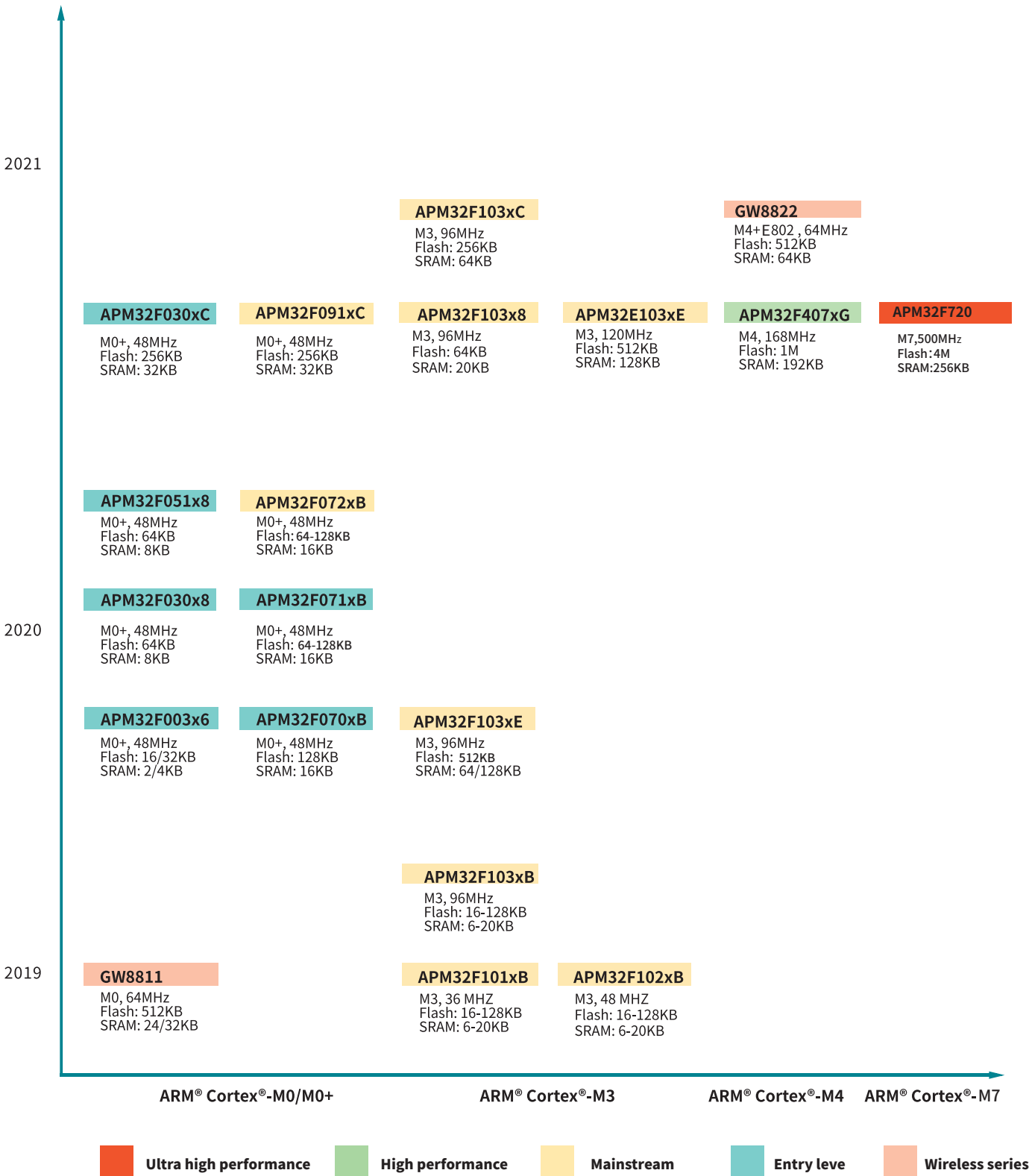


APM32F1 Series - 61508 SIL3 Certificate

# High-quality ecology: first-class development partner and supply chain



# Chip Roadmap of APM32 MCU



# Ultra-high Performance APM32F720

Based on new advanced ARM® Cortex®-M7 core meets the requirements of high computing power and high real-time performance, with a working frequency of up to 500MHz, abundant memory space on-chip supporting 4MB Flash and 16MB SDRAM. Enhanced DSP processing capability and more innovative peripherals help customers meet the needs of high-performance embedded applications at a low cost.

New products coming soon



# Large Capacity APM32F103xDxE

Based on ARM® Cortex®-M3 core, equipped with enhanced external memory controller eMMC, parallel LCD compatible with 8080 / 6800 mode, it has passed IEC61508 SIL2 and USB-IF certification, working temperature is -40°C~+105°C, in line with industrial high-reliability standards and has the characteristics of low-power, large capacity, and good portability.



## System

- ARM® Cortex®-M7
- Working frequency up to 500MHz
- Up to 256KB TCM
- Support full function FPU

## Memory

- Flash:4MB
- SRAM:256KB
- SDRAM: 16MB (optional)
- Support Emmc4.5 /SD3.0

## Power Consumption

- Integrated complete PMIC (DCDC/LDO)
- Temperature sensor (Programmable triggering signal)
- Hardware power management controller

## PWM and Timer

- 16-bit PWM timer: 2
- Quadrature encoder/Decoder: 2
- 16-bit advanced timer: 2
- 32-bit universal timer: 2
- 32-bit basic timer: 4
- Watchdog timer: 4

## Security

- Support security encryption startup
- Support true random number generator
- Support symmetric encryption and decryption accelerator AES128
- Support hashlib module Hash – SHA

## Package

- LQFP100/144

## Analog Peripherals

- 12-bit ADC: 3, External channel: 19
- Analog comparator: 4

## Debug Mode

- SWD
- JTAG

## peripheral

- UART : 8
- I2C : 4
- SPI : 4
- USB OTG : 1
- CAN: 2
- SAI/I2S:3
- SPDIF: 1
- Ethernet: 1
- eMMC 4.5/SD 3.0 : 2

## System

- ARM® Cortex® -M3
- Working frequency 96MHz
- support FPU
- Built-in 12 channels DMA

## Memory

- Flash: 512KB
- SRAM: 64/128KB

## Timer

- 16-bit universal timer: 4
- 16-bit advanced timer: 2
- 16-bit basic timer: 2
- Watchdog timer: 2
- 24-bit system timer: 1

## Security

- 96-bit unique device ID (UID)
- CRC cells

## Package

- LQFP64/100/144

## Analog Peripherals

- 12-bit ADC: 3, External channel: 21
- 12-bit DAC: 2
- ADC voltage conversion range: 0~V<sub>DA</sub>
- Internal temperature sensor:1
- Support dual sampling and holding function

## Debug Mode

- SWD
- JTAG

## Power Consumption

- Supply voltage 2.0V~3.6V
- Support PVD
- Support sleep, stop, and standby modes
- V<sub>BAT</sub> power supply can support RTC and backup register

## I/O

- 51/80/112 I/O
- Map to 16 external interrupt vectors

## Communication Peripherals

- U(S)ART : 5
- I2C : 2
- SPI : 3
- I2S : 2
- USB2 : 1
- CAN 2.0B: 1
- SDIO: 1
- Support SDRAM
- Support USB2 and CAN work independently at the same time



Industrial Gateway



HMI



Industrial Robot



Scanning Gun



Handheld Tripod Head



Electronic Balance



Password Keyboard



Encoder



Power meter



Alarm



# Mainstream APM32F103x4x6x8xB

Based on ARM® Cortex®-M3 core, with strong operation efficiency and excellent power consumption efficiency, has abundant enhanced peripheral functions, supports the independent work of USBD and CAN at the same time, has passed IEC61508 SIL3 and USB-IF certification, and the working temperature is -40°C~+105°C, which meets the high-reliability standard of the industrial level.



# Enhanced APM32F103xC

Based on ARM® Cortex®-M3 core, built-in two CAN interfaces, compatible with 2.0A and 2.0B (active) specifications, communication speed up to 1Mbit/s, can ensure the reliability and real-time of communication at the same time, help to expand industrial and automotive application scenarios.

New Product



## System

- ARM® Cortex® -M3
- Working frequency 96MHz
- support FPU
- Built-in 7 channels DMA

## Timer

- 16-bit universal timer: 3
- 16-bit advanced timer: 1
- Watchdog timer: 2
- 24-bit system timer: 1

## Security

- 96-bit unique device ID (UID)
- CRC cells

## Package

- LQFP48/64/100
- QFN36

## Memory

- Flash: 16-128KB
- SRAM: 6-20KB

## Analog Peripherals

- 12-bit ADC: 3, External channel: 16
- ADC voltage conversion range: 0~V<sub>DAA</sub>
- Internal temperature sensor: 1
- Support dual sampling and holding function

## Debug Mode

- SWD
- JTAG

## Power Consumption

- Supply voltage 2.0V~3.6V
- Support PVD
- Support sleep, stop, and standby modes
- V<sub>BAT</sub> power supply can support RTC and backup register

## I/O

- 26/37/51/80↑I/O
- Map to 16 external interrupt vectors

## Communication Peripherals

- USART : 3
- I2C : 2
- SPI : 2
- USB D : 1
- CAN 2.0B: 1
- QSPI: 1
- Support USB D and CAN work independently at the same time

## System

- ARM® Cortex® -M3
- Working frequency 96MHz
- Built-in RTC
- Built-in 5/7 channels DMA

## Timer

- 16-bit universal timer: 4
- 16-bit advanced timer: 2
- 16-bit basic timer: 2
- Watchdog timer: 2
- 24-bit system timer: 1

## Timer

- 96-bit unique device ID (UID)
- CRC cells

## Package

- LQFP48/64/100

## Memory

- Flash: 256KB
- SRAM: 64KB

## Analog Peripherals

- 12-bit ADC: 3,External channel:16
- 12-bit DAC: 2

## Debug Mode

- SWD
- JTAG

## Power Consumption

- Supply voltage 2.0V~3.6V
- Support PVD
- Support sleep, stop, and standby modes

## I/O

- Up to 80 I/O
- Map to external interrupt vectors
- Up to 60 I/O with 5V input

## Peripheral

- U(S)ART : 5
- I2C : 2
- SPI : 3
- USB D : 1
- CAN: 2

Support USB D and CAN work independently at the same time



Two-way Radio



Electric Bicycle



Sweeping Machine



Fan



Pulse Oximeter



Card Reader



Motor Control



Motormeters



Air Conditioner System



Access Control



Intelligent Lighting



Micro Printer



# Enhanced APM32F091xBxC

Based on ARM® Cortex®-M0+, it supports up to 256KB on-chip flash memory, provides multiple communication interfaces, 8 USART to enhances communication function, and has built-in HDMI CEC and TSC capacitive touch function. It supports CAN protocol communication and is suitable for expanding the application scenarios of intelligent household appliances, industrial equipment, and automotive electronics.

New Product



## System

- ARM® Cortex® -M0+
- Working frequency 48MHz
- Built-in RTC
- Built-in 5/7 channels DMA

## Memory

- Flash:128~256KB
- SRAM:32KB

## Power Consumption

- Supply voltage 2.0V~3.6V
- Support PVD
- Support sleep, stop, and standby modes

## System

- 16/32-bit universal timer: 5/1
- 16-bit advanced timer: 1
- 16-bit basic timer: 2
- Watchdog timer: 2
- 24-bit system timer: 1

## Analog Peripherals

- 12-bit ADC: 1, External channel: 16
- 12-bit DAC: 1, Channel: 2
- Programmable analog comparator: 2
- Capacitance sensing channel: 24

## I/O

- Up to 88 I/O
- Map to external interrupt vectors
- Up to 69 I/O with 5V input

## Security

- 96-bit unique device ID (UID)
- CRC cells

## Debug Mode

- SWD

## Peripheral

- USART : 8
- I2C : 2
- SPI :2
- I2S: 2
- CAN: 1
- HDMI CEC

## Package

- LQFP48/64/100
- QFN48



Frying Machine



Car GPS



Car Audio



Tablet PC



Digital Camera Controller



Power Management and Control



E-Cigarette



Virtual Reality Glasses



Intelligent Robot



BMS



Computer External Device



Industrial Handheld Terminal

# Extended APM32F072x8/xB

Based on ARM® Cortex®-M0+ core, full speed USB2.0 interface, no external crystal vibration, support BCD and LPM, up to 24 capacitance sensing channels for proximity, touch key, linear or rotary sensors. It supports the HDMI CEC function, which can meet the advanced control requirements of audio and video intelligent terminal equipment, and has passed USB-IF certification.



## System

- ARM® Cortex® -M0+
- Working frequency 48MHz
- Built-in RTC
- Built-in 7 channels DMA

## Memory

- Flash: 64-128KB
- SRAM: 16KB

## Power Consumption

- Supply voltage 2.0V~3.6V
- Support PVD
- Support sleep, stop, and standby modes
- VBAT power supply can support RTC and backup register

## Timer

- 16/32-bit universal timer: 5/1
- 16-bit advanced timer: 1
- 16-bit basic timer: 2
- Watchdog timer: 2
- System timer: 1

## Analog Peripherals

- 12-bit ADC: 1, External channel: 16
- 12-bit DAC: 1, Dual-channel: 1
- Programmable analog comparator: 2
- Capacitance sensing channel: 24

## I/O

- Up to 87 I/O
- Map to external interrupt vectors
- Up to 68 I/O with 5V input

## Security

- 96-bit unique device ID (UID)
- CRC cells

## Debug Mode

- SWD

## Communication Peripherals

- USART : 4
- I2C : 2
- SPI : 2
- I2S: 2
- USB2.0 : 1 , No external crystal oscillator
- CAN: 1
- HDMI CEC

## Package

- LQFP48/64/100
- QFN48





# Enhanced APM32F051x6/x8

Based on ARM® Cortex®-M0+ core and the performance of APM32F030x6/x8, it has the characteristics of high integration, good portability, wide compatibility, and strong extended control function. The new capacitive touch function TSC can accurately identify the touch input in complex working conditions, built-in HDMI CEC to meet the advanced control application requirements of intelligent terminal.

### System

- ARM® Cortex® -M0+
- Working frequency 48MHz
- Built-in RTC
- Built-in 5 channels DMA

### Timer

- 16/32-bit universal timer: 5/1
- 16-bit advanced timer: 1
- 16-bit basic timer: 1
- Watchdog timer: 2
- System timer: 1

### Security

- 96-bit unique device ID (UID)
- CRC cells

### Package

- LQFP32/48/64
- QFN32/48

### Memory

- Flash: 32-64KB
- SRAM: 8KB

### Analog Peripherals

- 12-bit ADC: 1, External channel: 16
- 12-bit DAC: 1
- Programmable analog comparator: 2
- Capacitance sensing channel: 18

### Debug Mode

- SWD

### Power Consumption

- Supply voltage 2.0V~3.6V
- Support PVD
- Support sleep, stop, and standby modes
- V<sub>BAT</sub> power supply can support RTC and backup register

### I/O

- Up to 55 I/O
- Map to external interrupt vectors
- Up to 35 I/O with 5V input

### Communication Peripherals

- USART : 2
- I2C : 2
- SPI : 2
- I2S:1
- HDMI CEC



# Upgrad APM32F030xC

Based on ARM® Cortex®-M0+ core and the performance of APM32F030x6x8, it has been comprehensively optimized and upgraded. It improves the capacity of FLASH and SRAM, increases UART interfaces, and widely upgrades peripherals and I/O to help customers expand innovative applications such as industrial control and smart home at a more economical cost.

New Product



### System

- ARM® Cortex® -M0+
- Working frequency 48MHz
- Built-in RTC
- Built-in 5 channels DMA

### Timer

- 16-bit universal timer: 5
- 16-bit advanced timer: 1
- 16-bit basic timer: 2
- Watchdog timer: 2
- 24-bit system timer: 1

### Security

- 96-bit unique device ID (UID)
- CRC cells

### Package

- LQFP48/64

### Memory

- Flash: 256KB
- SRAM: 32KB

### Analog Peripherals

- 12-bit ADC: 1
- External channel: 16

### Debug Mode

- SWD

### Power Consumption

- Supply voltage 2.0V~3.6V
- Support sleep, stop, and standby modes
- Support power on / power off reset

### I/O

- Up to 51 I/O
- Map to external interrupt vectors
- Up to 29 I/O with 5V input

### Communication Peripherals

- U(S)ART : 6
- I2C : 2
- SPI : 2



Intelligent Fingerprint Lock



Refrigerator Controller



POS



Computer Peripherals



Remote Control



Car T-BOX



Portable Vacuum Cleaner



Bluetooth Printer



Temperature Controller



Smart Speaker



Electronic Monitor



Drive Recorder



# General Purpose APM32F030x6/x8

Based on ARM® Cortex®-M0+ core, it fully upgrades in terms of reliability, stability, and power. The integration of enhanced real-time control capability and abundant peripherals can help customers obtain more complex and innovative product functions at a more economical cost.



# Extra Value APM32F003x4/x6

Based on ARM® Cortex®-M0+ core, with the characteristics of wide temperature range, high precision and low-temperature drift, ESD level up to 8KV, strong anti-interference, and anti-static ability. It integrates a high-speed internal oscillator with a full range accuracy of ±3% and can reach ±1% after user calibration. It supports TSSOP20, SOP20, and highly compact 3x3mm miniaturized package QFN20, which is conducive to improving system integration and reducing BOM material costs.



## System

- ARM® Cortex® -M0+
- Working frequency 48MHz
- Built-in RTC
- Built-in 5 channels DMA

## Timer

- 16-bit universal timer: 5
- 16-bit advanced timer: 1
- 16-bit basic timer: 1
- Watchdog timer: 2
- System timer: 1

## Security

- 96-bit unique device ID (UID)
- CRC cells

## Package

- LQFP32/48/64
- QFN32

## Memory

- Flash: 32-64KB
- SRAM: 4-8KB

## Analog Peripherals

- 12-bit ADC: 1
- External channel: 10/16

## Debug Mode

- SWD

## Power Consumption

- Supply voltage 2.0V~3.6V
- Support programmable supply voltage detector
- Support sleep, stop, and standby modes
- VBAT power supply can support RTC and backup register

## I/O

- Up to 55 I/O
- Map to external interrupt vectors
- Almost all I/O compatible 5V input

## Communication Peripherals

- USART : 2
- I2C : 2
- SPI : 2

## System

- ARM® Cortex® -M0+
- Working frequency 48MHz

## Timer

- 16-bit universal timer: 1
- 16-bit advanced timer: 2
- 16-bit basic timer: 1
- Watchdog timer: 2
- System timer: 1

## ESD Level

- HBM: 8KV
- CDM: 2KV
- MM: 550V
- LU: 200mA

## Security

- 96-bit unique device ID (UID)

## Memory

- Flash:16/32KB
- SRAM: 2/4KB

## Analog Peripherals

- 12-bit ADC: 1
- External channel: 8
- Support differential input

## Debug Mode

- SWD

## Package

- QFN20, TSSOP20, SOP20

## Power Consumption

- Supply voltage 2.0V~5.5V
- Support sleep, stop, and standby modes
- Support power on / power off reset

## I/O

- Up to 16 I/O
- Map to external interrupt vectors

## Communication Peripherals

- USART:3
- I2C : 1
- SPI : 1



Smoke Alarm



Mouse



Microwave Oven



Set-Top Box



Forehead Thermometer



Medical Equipment



Wireless Charger



Motor Control



Electronic Toys



Small Household Appliance



Smart Locks



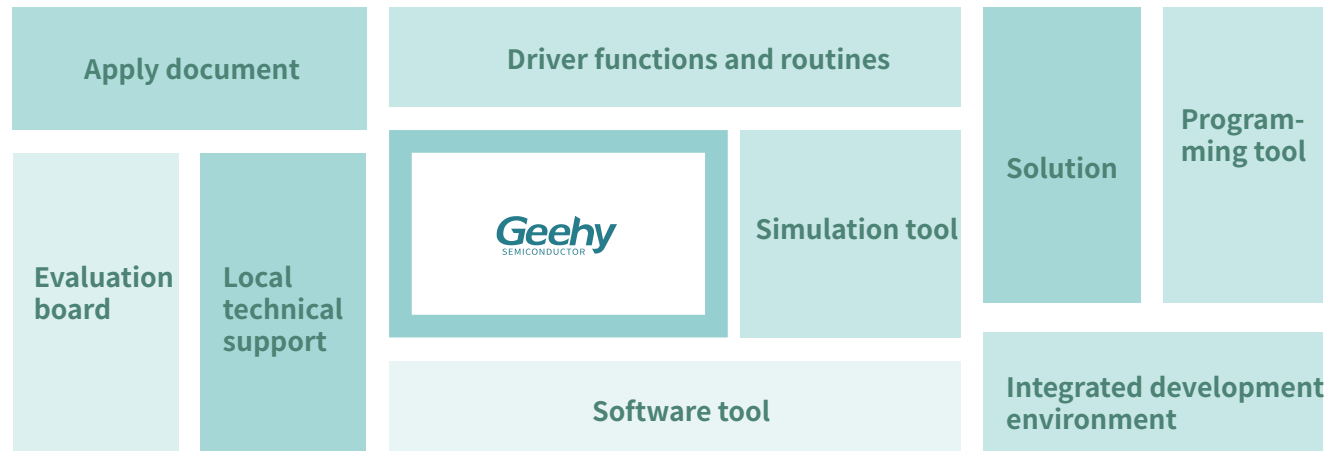
Temperature Transducer



# APM32 Development Tool

Abundant software and hardware development tools, flexible and convenient, easy to use, help engineers accelerate product development

APM32 is a high-quality 32-bit industrial-grade general-purpose MCU based on ARM® Cortex®-M0+/M3/M4/M7 with low-power, high performance, high integration, and fast transplantation. Excellent system performance, abundant co-processing function, and flexible user experience, help customers shorten product design time, reduce development costs and realize performance optimization. At present, it can widely use in industrial control, medical equipment, automotive electronics, smart home, and other fields.



## Simulator(GEEHY-LINK)

- Support WIN7/8/10 drive free
- Support SWD and JTAG programming
- Control button can support the power supply of the target board

## Programmer(APM32 PROG)

- Support offline and online programming functions
- Support JTAG and SWD programming
- Support WIN7/8/10 drive free

## APM32F103VC MINI Development Board

- USB:1 (TypeB)
- JTAG interface:1
- LED:2
- KEY:2
- RESET KEY:1
- GPIO:76
- USART:1 (USART1 or USART2 can be selected by wire jumper)

## APM32F103VB MINI Development Board

- USB:1 (TypeB)
- JTAG/SWD interface: 1
- KEY: 2
- LED: 3
- RESET KEY: 1
- GPIO: 76
- USART: 1 (USART1 or USART2 can be selected by wire jumper)



## APM32F091VC MINI Development Board

- USB: 1 (power supply)
- SWD interface: 1
- LED: 2
- KEY: 2
- RESET KEY: 1
- GPIO: 81
- USART: 1 (USART1 or USART2 can be selected by wire jumper)

## APM32F072VB MINI Development Board

- USB: 1
- SWD interface: 1
- KEY: 2
- LED: 2
- RESET KEY: 1
- GPIO: 81
- USART: 1 (USART1 or USART2 can be selected by wire jumper)

## APM32F051R8 MINI Development Board

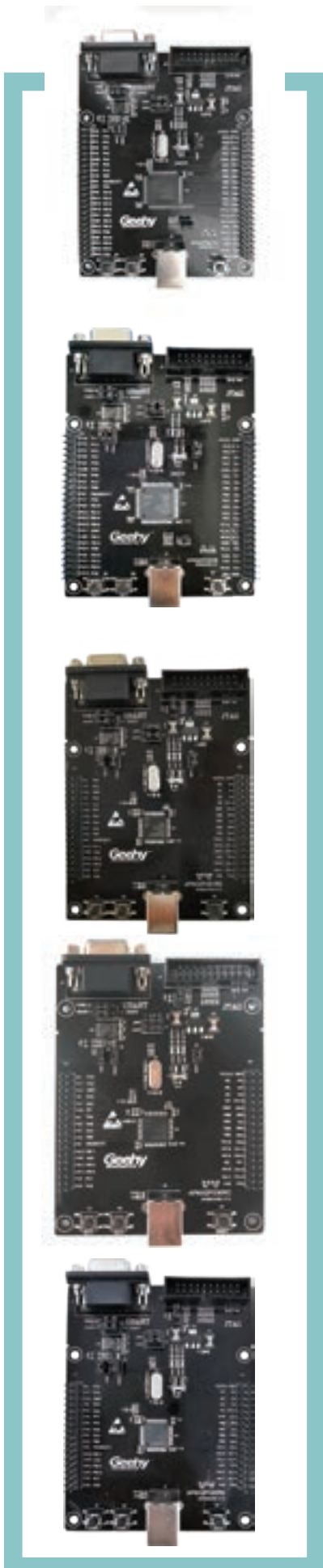
- USB: 1 (power supply)
- SWD interface: 1
- KEY: 2
- LED: 2
- RESET KEY: 1
- GPIO: 51
- USART: 1 (USART1 or USART2 can be selected by wire jumper)

## APM32F030RC MINI Development Board

- USB: 1 (power supply)
- SWD interface: 1
- LED: 2
- KEY: 2
- RESET KEY: 1
- GPIO: 47
- USART: 1 (USART1 or USART2 can be selected by wire jumper)

## APM32F030R8 MINI Development Board

- USB: 1 (power supply)
- SWD interface: 1
- LED: 2
- KEY: 2
- RESET KEY: 1
- GPIO: 51
- USART: 1 (USART1 or USART2 can be selected by wire jumper)





APM32F003F6 MINI Development Board

- USB: 1 (power supply)
- SWD interface: 1
- KEY: 1
- LED: 2
- RESET KEY: 1
- GPIO: 12

GW8811 MINI Development Board

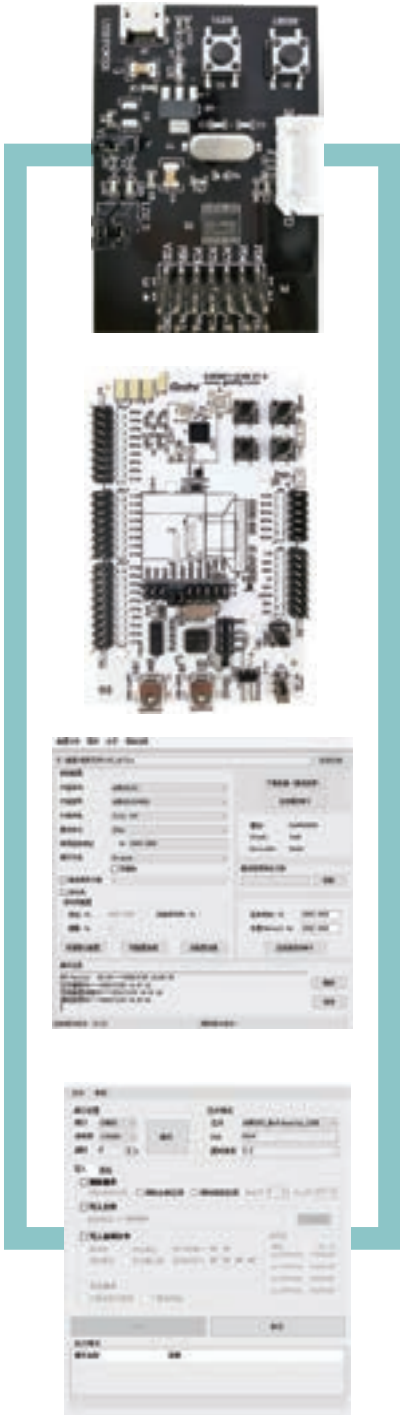
- UART: 2
- I2C: 2
- SPI: 2
- SWD interface: 1
- KEY: 4
- RESET KEY: 1
- GPIO: 32
- User LED: 4
- OLED12864 interface: 1

APM32 PROG PC

- Supports .hex/.bin file format
- Supports batch programming configuration
- Support offline and online programming
- Supports APM32 PROG firmware upgrade
- Supports saving and loading of configuration information

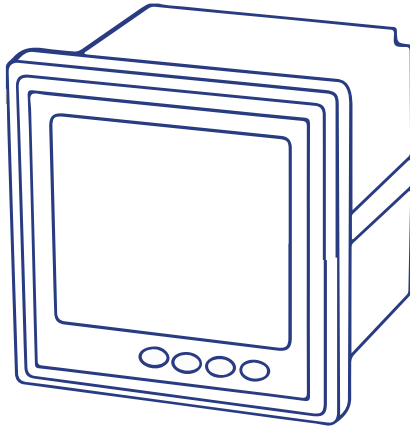
ISP

- Supports .hex/.bin file format
- Support option byte configuration
- Support serial port to read and write Flash data of GEEHY MCU



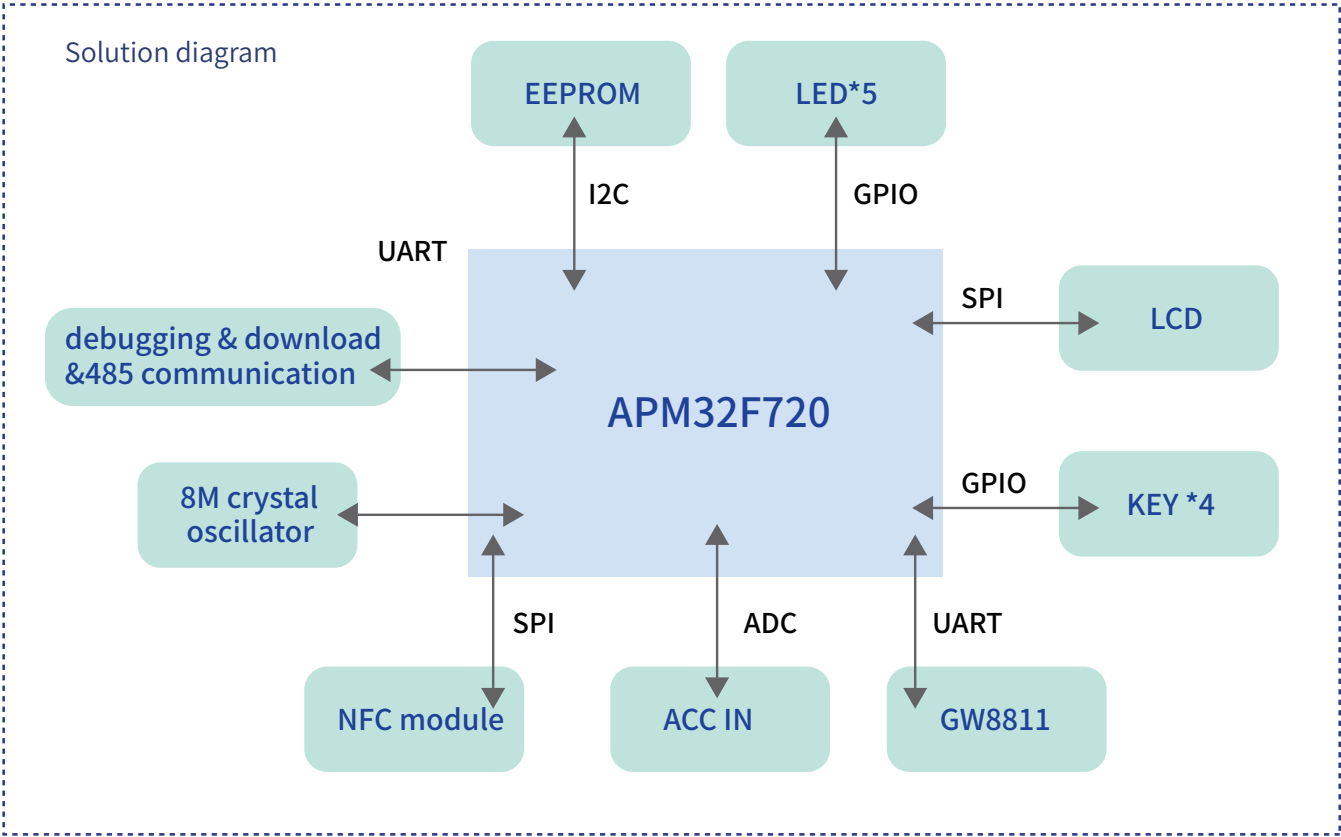
APM32 MCU HMI Solution

The HMI human-machine interface is a medium for interaction and information exchange between system and users. It consists of hardware and software. The hardware part includes processor, display unit, input unit, communication interface, data memory unit, etc. APM32F720 has good reliability and extended control function, can meet HMI Bluetooth communication, power adjustment, and diverse communication.



Solution Characteristic

APM32F720 series MCU	Input CRC cells	Real-Time clock RTC
Input SPI and DMA channel	Abundant peripheral	UART support Bluetooth module interface
UART support Debug interface		

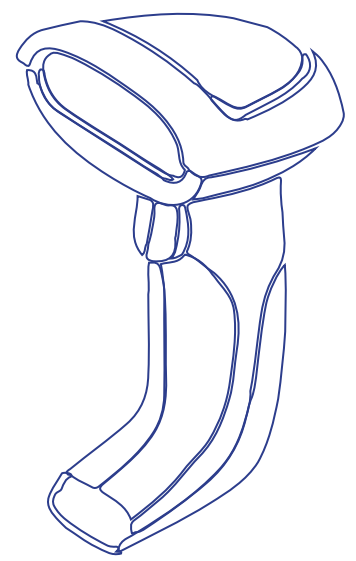


Part No.	Frequency	FLASH	SRAM	SDRAM	ADC	Peripherals
APM32F720	500MHz	4MB	256KB	16MB(Optional)	12位ADC:3 External channel :19	UART : 8 I2C : 4 SPI : 4 SAI/I2S:3 USB OTG : 1 CAN: 2 SPDIF: 1 Ethernet: 1 eMMC4.5\SD3.0 : 2



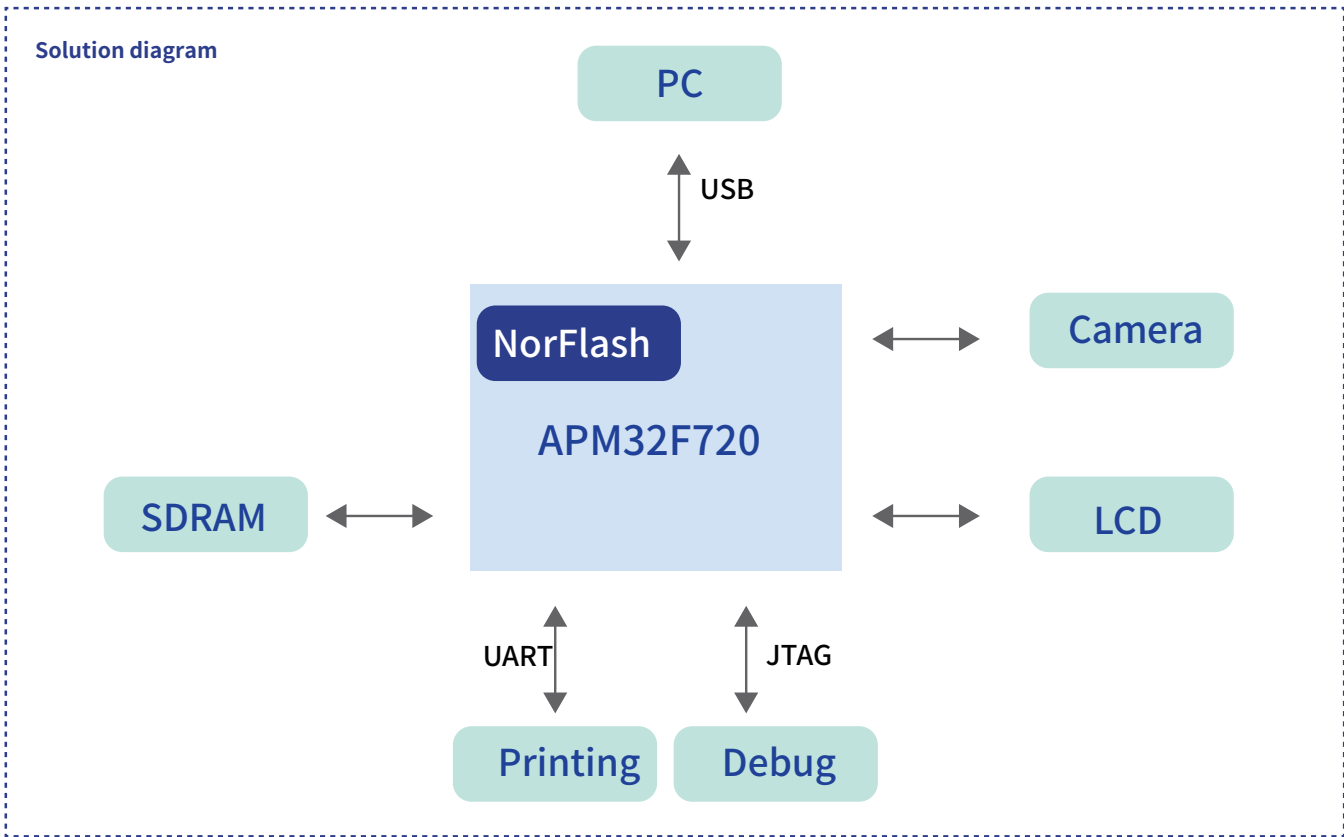
# APM32 MCU Scanning Gun Solution

The scanning gun can scan and analyze all kinds of bar codes and two-dimensional codes, send them to different processing hosts through wired or wireless transmission. APM32F720 has a built-in high-speed communication interface, connecting the high-pixel camera to obtain bar code information accurately. With an operating frequency of up to 500MHz, it can quickly analyze and process the obtained information, greatly reduce the hysteresis of code scanning gun, and improve the real-time performance of the system.



### Solution Characteristic

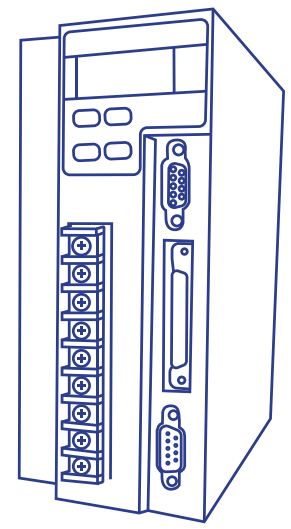
APM32F720 series MCU	Working frequency up to 500MHz	Support full function FPU
16 KB L1 instruction cache	16 KB L1 data cache	Up to 256KB TCM
Rapid processing	Powerful performance	Low delay



Part No.	Frequency	FLASH	SRAM	SDRAM	ADC	Peripherals
APM32F720	500MHz	4MB	256KB	16MB(Optional)	12位ADC:3 External channel:19	UART:8 I2C:4 SPI:4 SAI/I2S:3 USB OTG:1 CAN:2 SPDIF:1 Ethernet:1 eMMC4.5\SD3.0:2

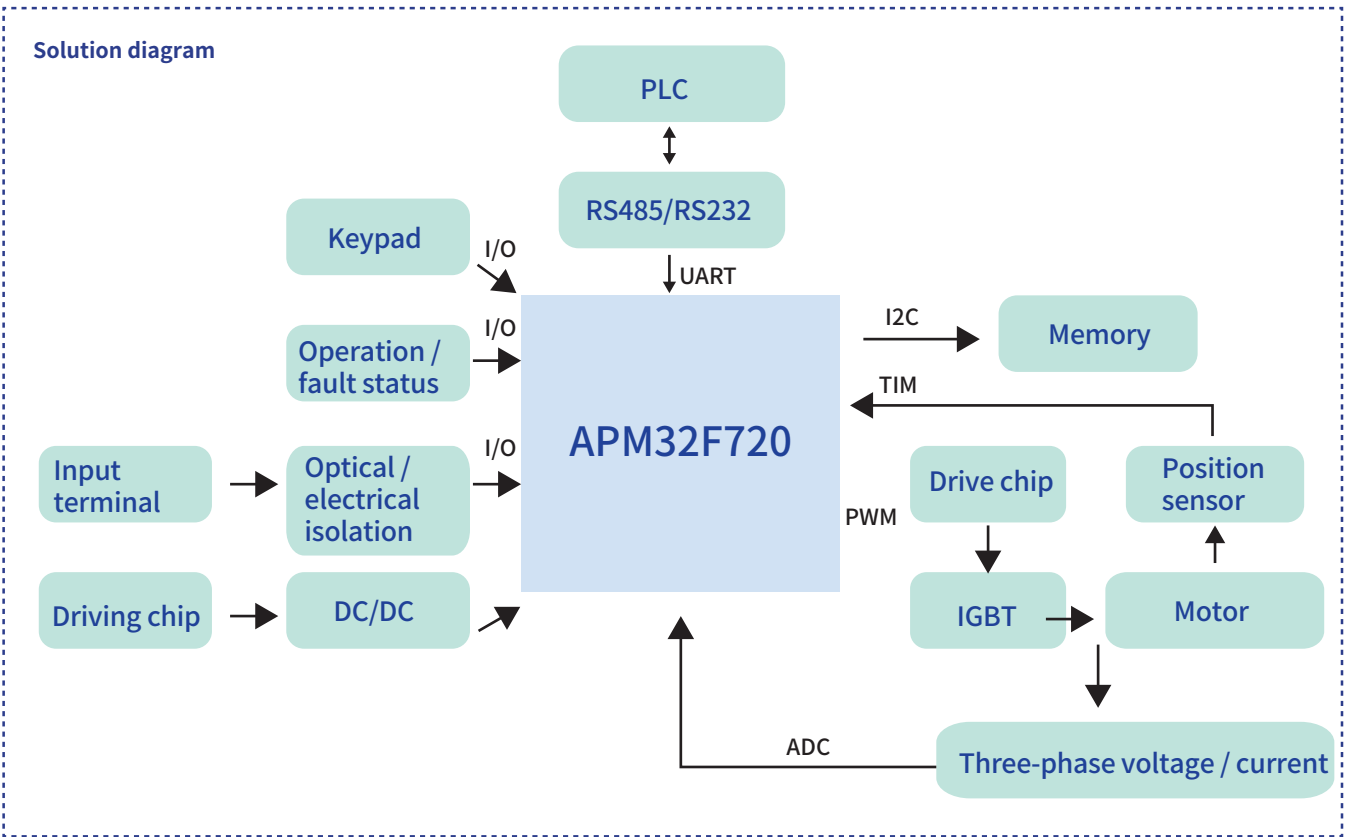
# APM32 MCU Servo Drives Solution

The servo drives is the core component of servo system. It can control the servo motor by position, speed, and torque to achieve high-precision positioning. It widely uses in industrial robots, NCPC numerically controlled production centers, and other automation equipment. APM32F720 has high-efficiency operation processing function and excellent power consumption performance, conducive to rapid response, high-precision control, and stable operation of the servo controller.



### Solution Characteristic

APM32F720 series MCU	For Brushless DC motor	Quick response, no overshoot
Low-speed and high-torque	Strong overload capacity	

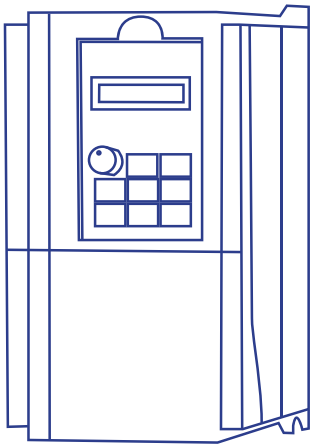


Part No.	Frequency	FLASH	SRAM	SDRAM	ADC	Peripherals
APM32F720	500MHz	4MB	256KB	16MB(Optional)	12位ADC:3 External channel:19	UART:8 I2C:4 SPI:4 SAI/I2S:3 USB OTG:1 CAN:2 SPDIF:1 Ethernet:1 eMMC4.5\SD3.0:2



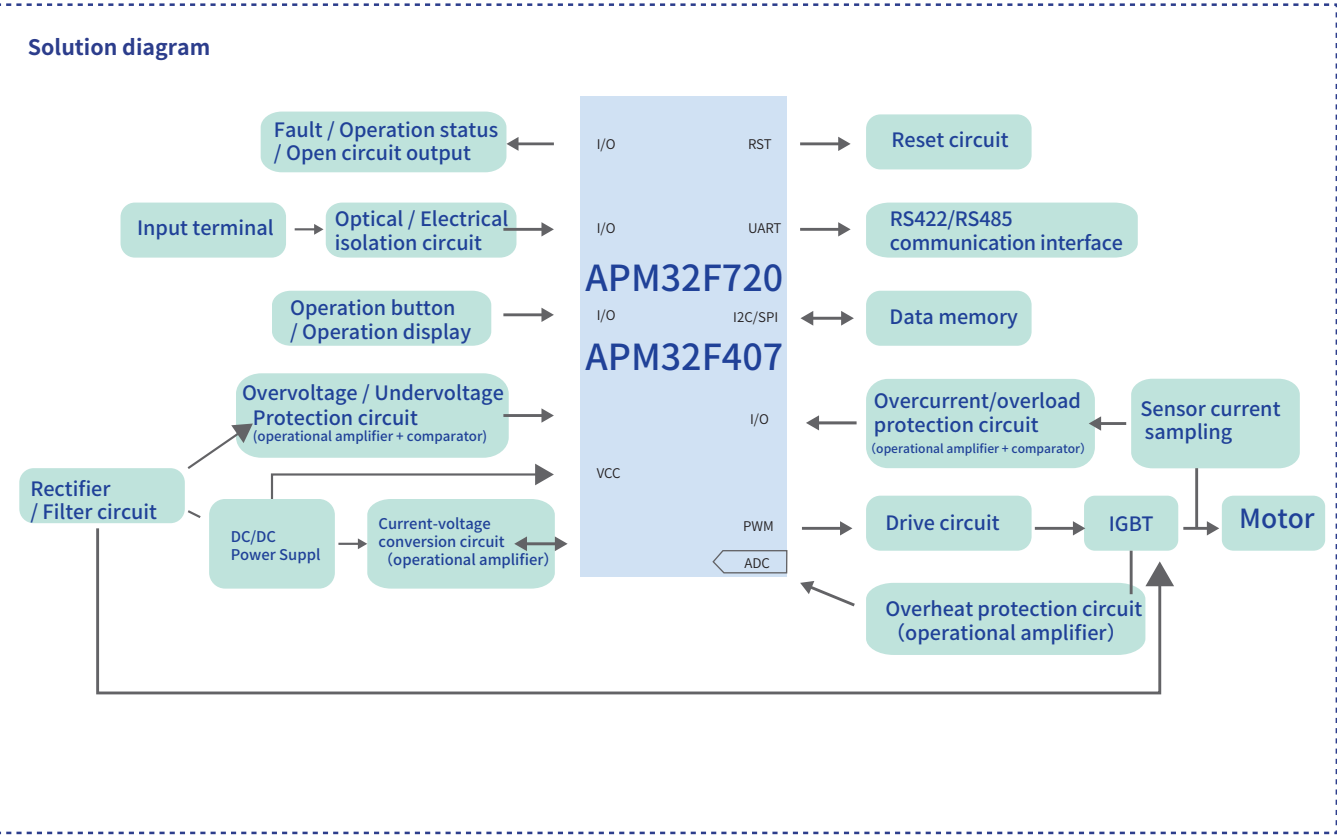
# APM32 MCU Inverter Solution

The inverter is an electrical control device that controls AC motor by changing the frequency of motor power supply by applying frequency conversion technology and microelectronics technology. According to the actual needs of the motor, it can provide the required power supply voltage to achieve the purpose of energy-saving and speed control.



Solution Characteristic

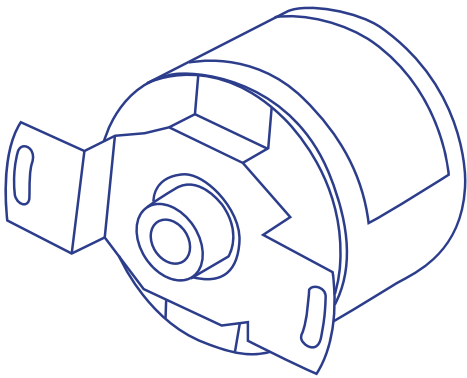
APM32F720 series MCU	Work frequency up to 500MHz	Support PWM output
Support for dead-zone protection	Multichannel 12-bit ADC	support vector and V/F control



Part No.	Frequency	FLASH	SRAM	SDRAM	ADC	Peripherals
APM32F720	500MHz	4MB	256KB	16MB(Optional)	12位ADC:3 External channel:19	UART : 8 I2C : 4 SPI : 4 SAI/I2S:3 USB OTG : 1 CAN: 2 SPDIF: 1 Ethernet: 1 eMMC4.5\SD3.0 : 2

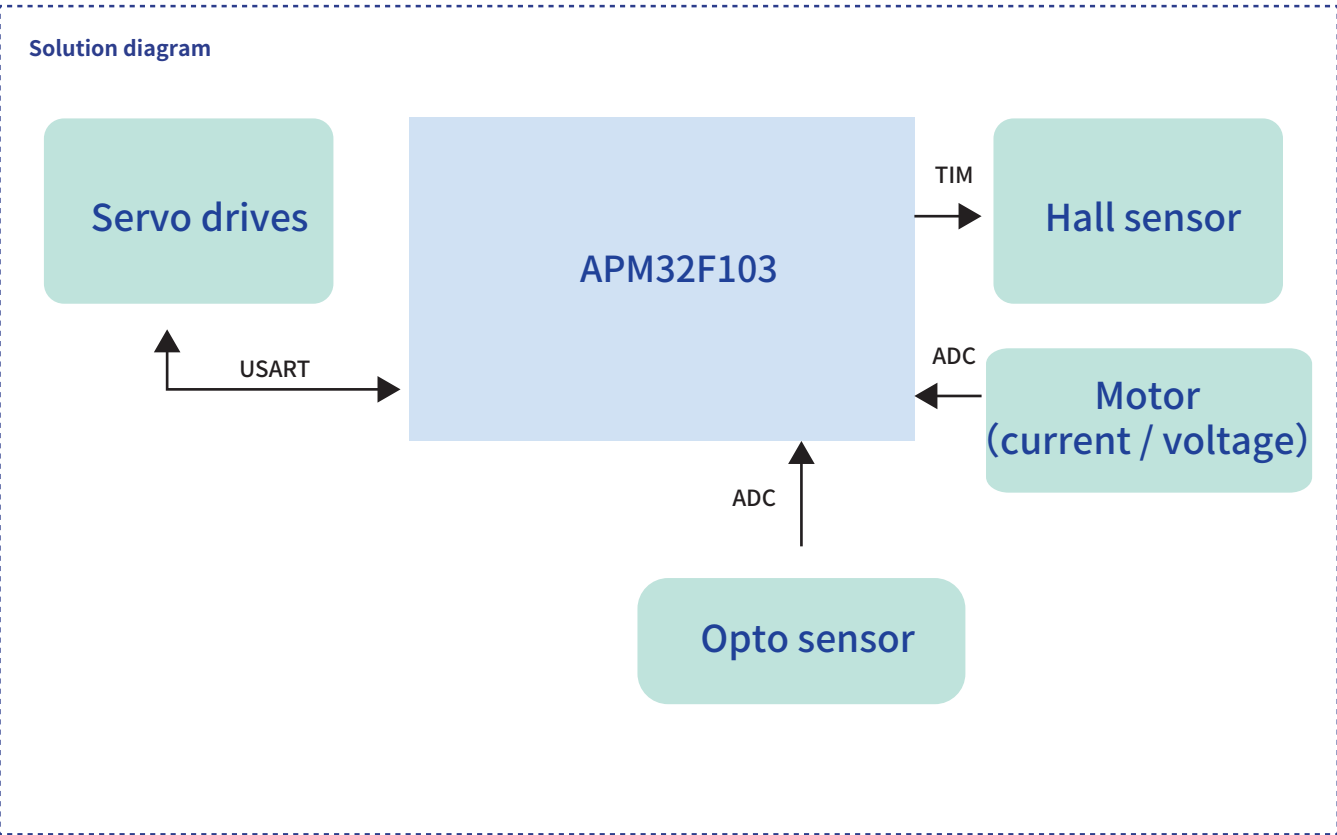
# APM32 MCU Encoder Solution

The encoder is a kind of equipment that can convert signal or data into a signal form for communication, transmission, and storage. In motor control applications, the encoder can feedback motor rotor position and speed signal. APM32F103 has built-in high-precision ADC, which can amplify the signal through the high-speed operational amplifier, dynamically and real-time sampling to determine the waveform phase, and improve encoder signal acquisition and processing accuracy. It has passed IEC61508 functional safety certification and USB-IF test certification, meeting the industrial high-reliability standard.



Solution Characteristic

Based on APM32F103 series MCU	Using flux open-loop vector	Using V/F control mode
Automatic torque compensation	Automatic slip compensation function	Suitable for various automation equipment

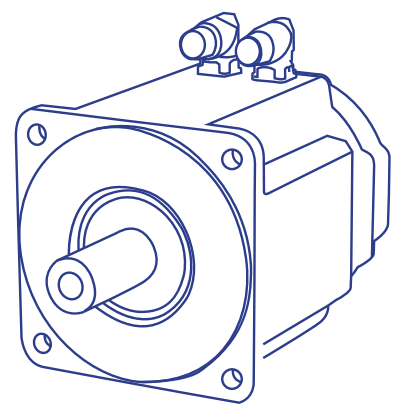


Part No.	Frequency	FLASH	SRAM	FPU	ADC	I/O	Peripherals
APM32F103	96MHz	16-512KB	6-128KB	Support	12位ADC:2/3 External channel: 16/21	26/37/51/80/112个I/O	U(S)ART :3/5 I2C : 2 SPI : 2/3 USBD : 1 CAN: 1/2 Support USB2 and CAN work independently at the same time



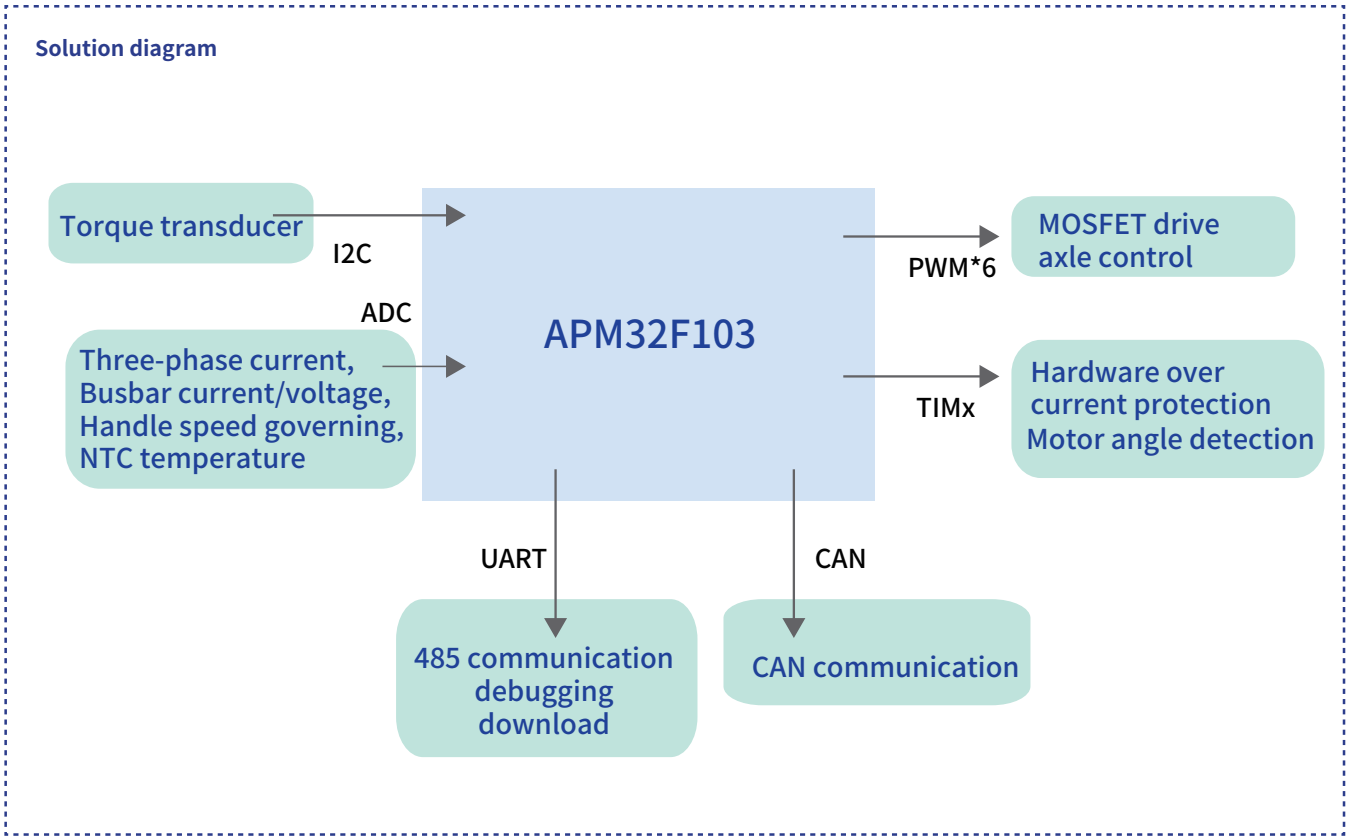
# APM32 MCU Motor Control Solution

The motor controls the starting, accelerating, running, decelerating, and stopping of the motor. It achieves fast starting, fast response, high efficiency, high torque output, and high overload capacity of the motor. APM32F103 equip with the enhanced external memory controller eMMC, which has strong signal processing ability and fast operation speed. It helps to obtain the motor operation status efficiently, control the three-phase output power supply, and effectively guarantee the continuous operation of the motor.



Solution Characteristic

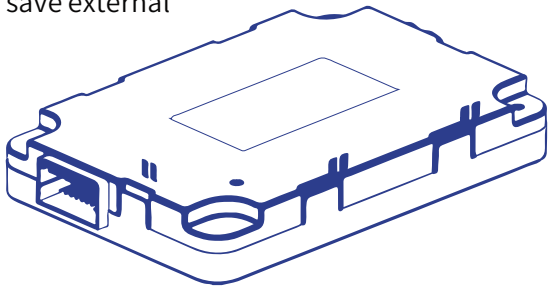
APM32F103 series MCU	Support mainstream FOC algorithm library	Support Hall sensor
Support floating-point trigonometric function arithmetic	FOC sine wave control	Input FPU



Part No.	Frequency	FLASH	SRAM	FPU	ADC	I/O	Peripherals
APM32F103	96MHz	16-512KB	6-128KB	支持	12位ADC:2/3 External channel: 16/21	26/37/51/80/112个I/O	U(S)ART :3/5 I2C : 2 SPI : 2/3  USBD : 1 CAN: 1/2 Support USB and CAN work independently at the same time

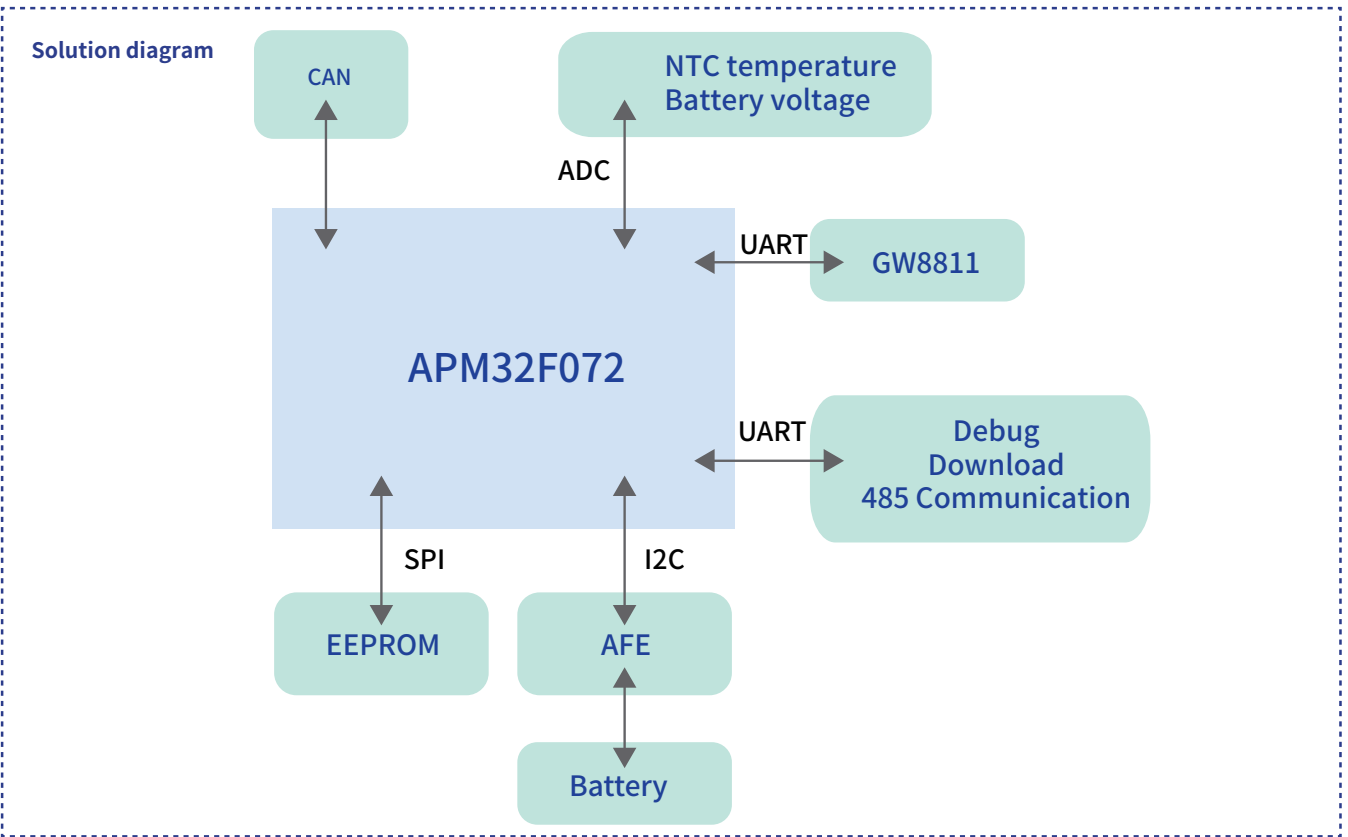
# APM32 MCU BMS Solution

The BMS is an important link between vehicle power battery and electric vehicle. It supports real-time monitoring of physical battery parameters, battery state estimation, online diagnosis and early warning, charge/discharge, and precharge control. APM32F072 has the characteristics of low-power, high reliability, and high security. It can achieve ultra-low power consumption and faster Flash erasure speed. It supports the full-speed USB2.0 and CAN interface at the same time. It supports high cost-effective USB solution without the external crystal oscillator, which helps to simplify the design and save external circuits.



Solution Characteristic

Based on APM32F072 series MCU	Low-power module	Charging / Discharging / Power off protection
Wide range voltage charger	Support remote control	Full USB-IF certification



Part No.	Frequency	FLASH	SRAM	ADC	I/O	Peripherals
APM32F072	48MHz	64-128KB	16KB	12位ADC:1 External channel: 16	37/51/87个I/O	USART :4 I2C : 2 SPI : 2 I2S: 2  USB:1 CAN: 1 HDMI CEC

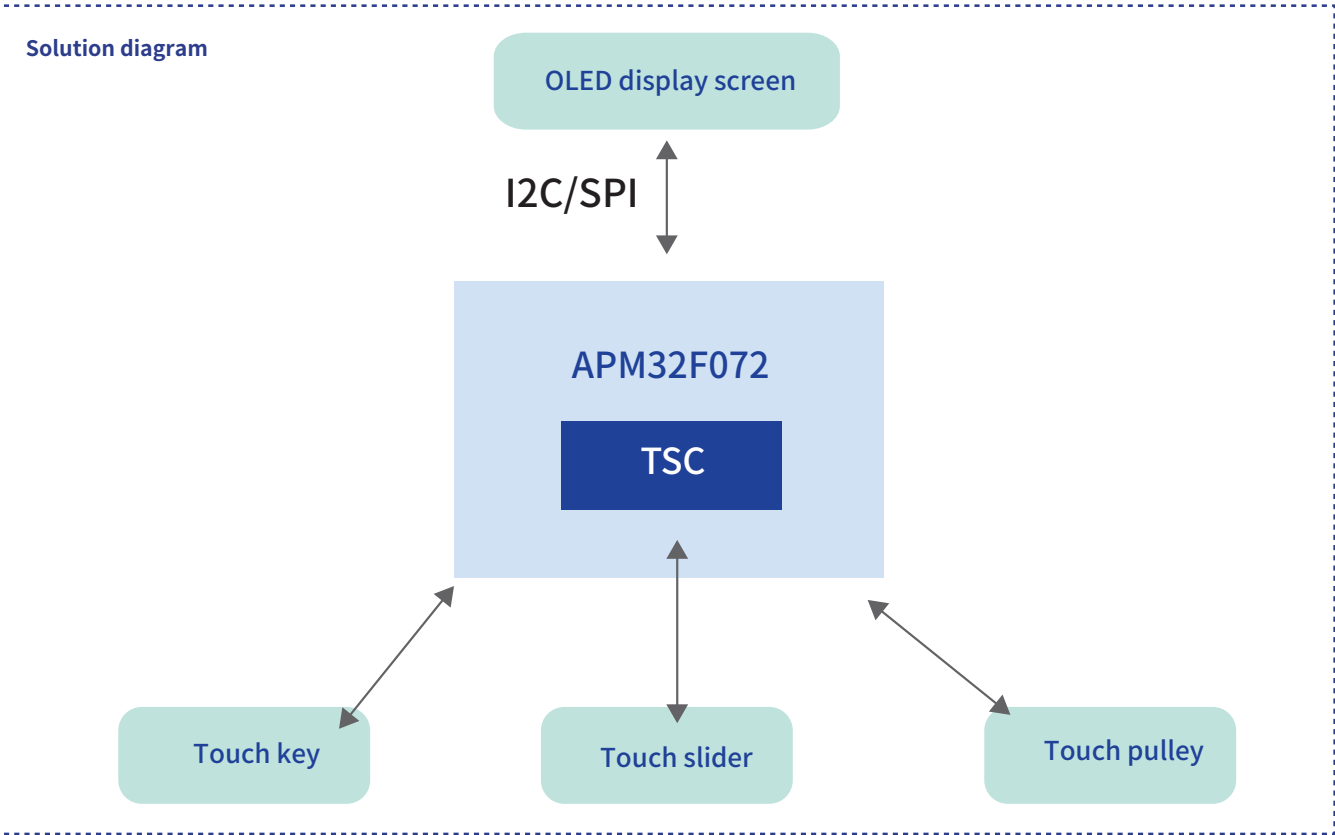
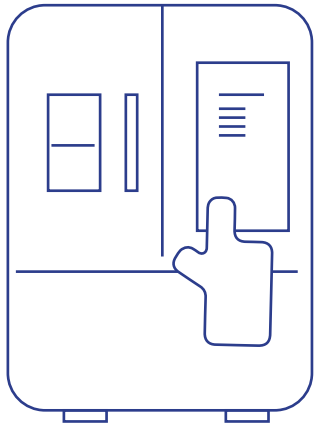


# APM32 MCU Household Electric Touch Panel Solution

The capacitive touch panel solution is a resistance-capacitance network composed of resistance and capacitance CX of induction electrodes. Through its charging / discharging time, it can detect the changes brought by human touch to the sensor to identify the operation action and carry out corresponding response processing. At present, it can support touch modes such as pressing keys, sliding bars, and pulleys.

Solution Characteristic

APM32F072 series MCU	Support key/slider/pulley touch	Quick response
Waterproof and anti-noise	Support remote control	



Part No.	Frequency	FLASH	SRAM	ADC	I/O	Peripherals
APM32F072	48MHz	64-128KB	16KB	12位ADC:1 External channel: 16	37/51/87个I/O	USART :4 I2C :2 SPI :2 I2S: 2 USB:1 CAN: 1 HDMI CEC

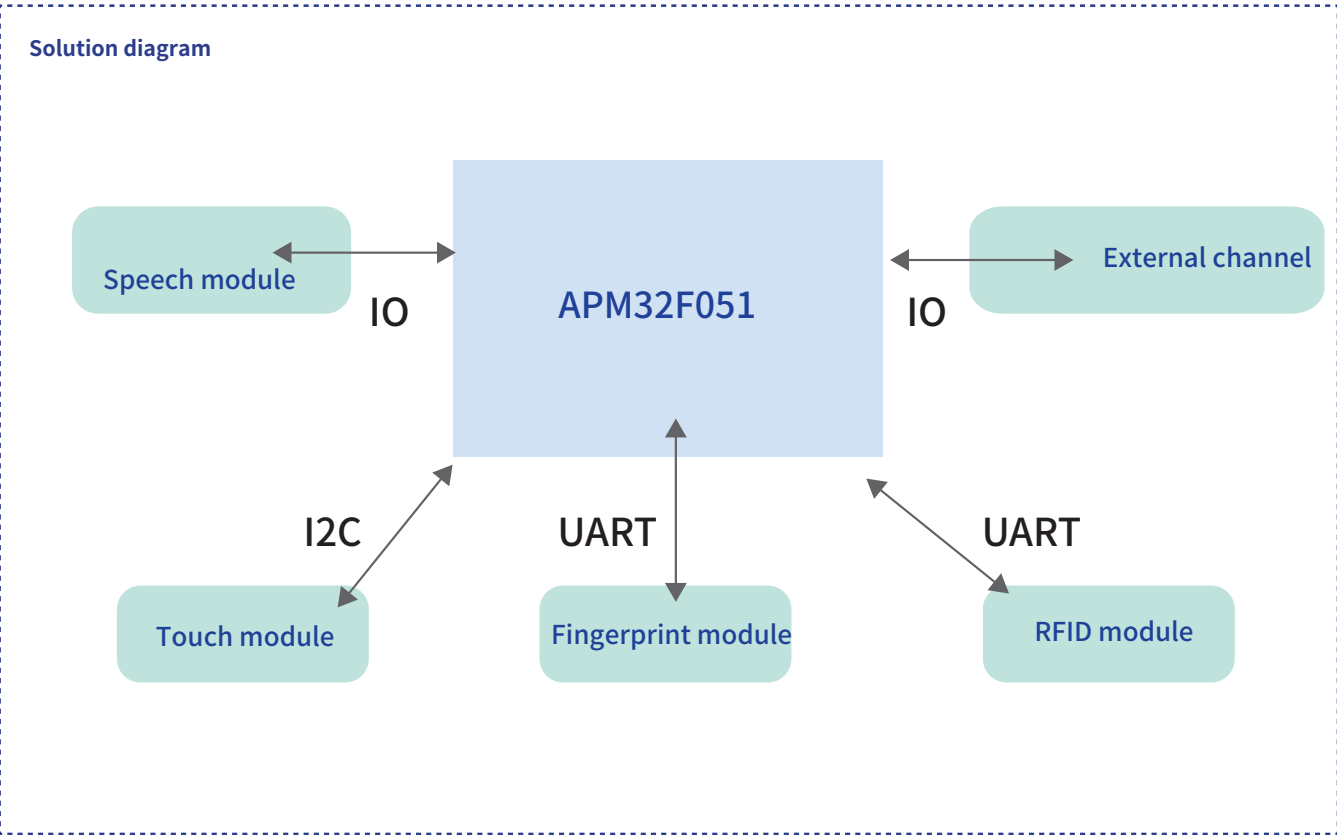
# APM32 MCU Intelligent Fingerprint Lock Solution

The fingerprint lock is an intelligent lock body that uses fingerprint identification to unlock and integrate passwords, RFID cards, keys, and other unlocking methods. It can collect, store, and identify fingerprints through the fingerprint identification sensor to identify the unlocking person accurately. At the same time, it can store the unlocking secret and RFID card information on the main control chip, identify the identity through password input and card swiping, and drive the clutch to unlock.



Solution Characteristic

APM32F051 series MCU	Function modularization	Abundant peripheral
Support external NFC / Bluetooth	Multiple unlocking methods	

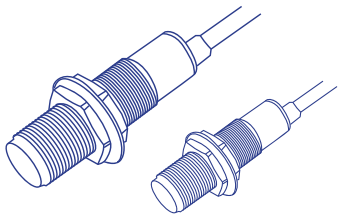


Part No.	Frequency	FLASH	SRAM	ADC	I/O	Peripherals
APM32F051	48MHz	32-64KB	8KB	12位ADC:1 External channel: 16	55个I/O	UART : 2 I2C : 2 SPI : 2 I2S : 1 HDMI CEC



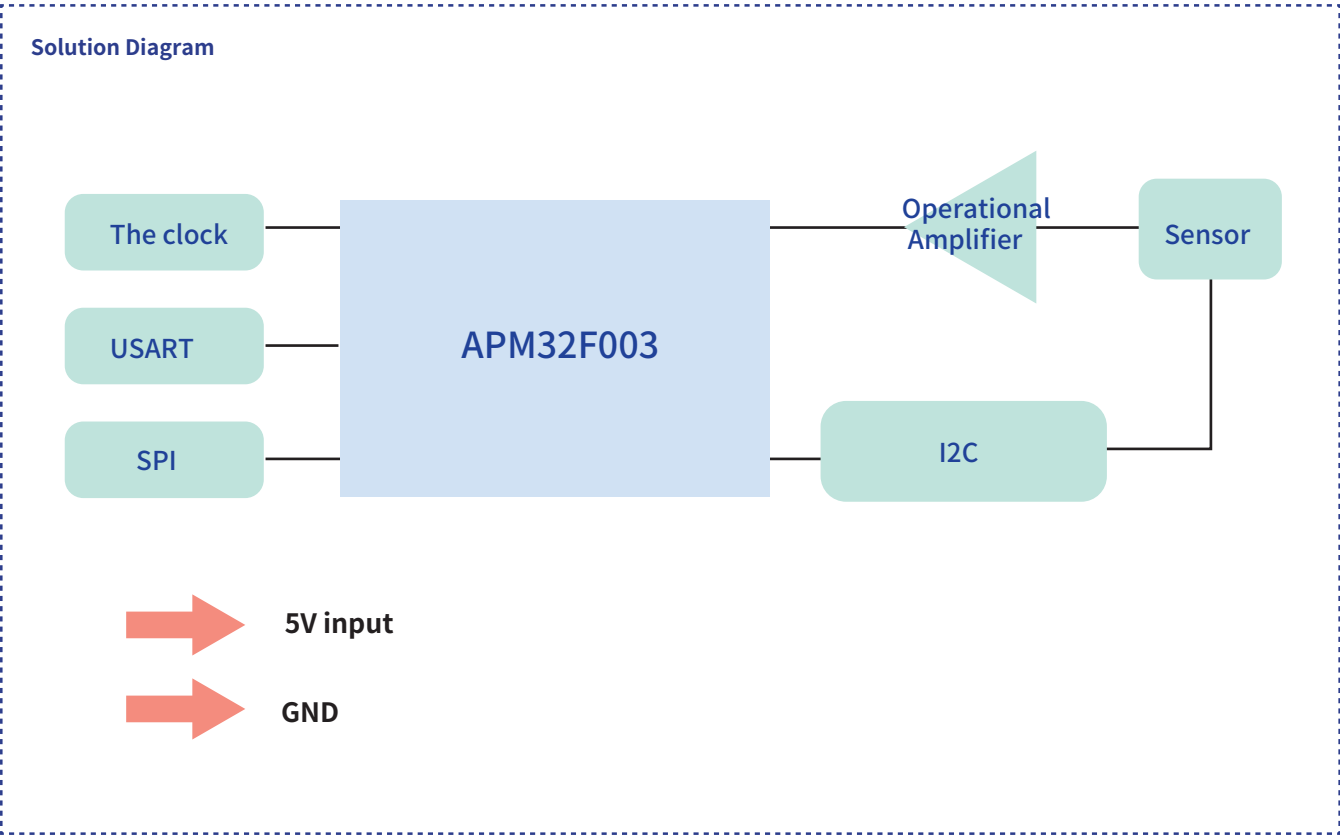
# APM32 MCU Sensor Solution

The sensor is a kind of detection device that can capture the measured information and transform it into an electrical signal or other output forms according to certain rules. It can meet the requirements of information transmission, memory, display, recording, and control. APM32 series MCU has high frequency, large capacity, wide temperature range, and high precision, which can meet the application requirements of sensor miniaturization, systematization, digitization, and intellectualization. Through the modular development of the MCU+ sensor, a large number of parameters can be monitored, collected, and processed efficiently.



### Solution Characteristic

APM32F003 series MCU	ESD level 8KV	Support LIN and one-way communication
12-bit high-precision ADC	HSI internal high-speed oscillator	



Part No.	Frequency	FLASH	SRAM	ADC	I/O	Peripherals
APM32F003	48MHz	16/32KB	2/4KB	12位ADC:1 External channel: 8	16个I/O	USART :3 I2C :1 SPI :1