

Your Trusted Partner for Device Networking & Computing



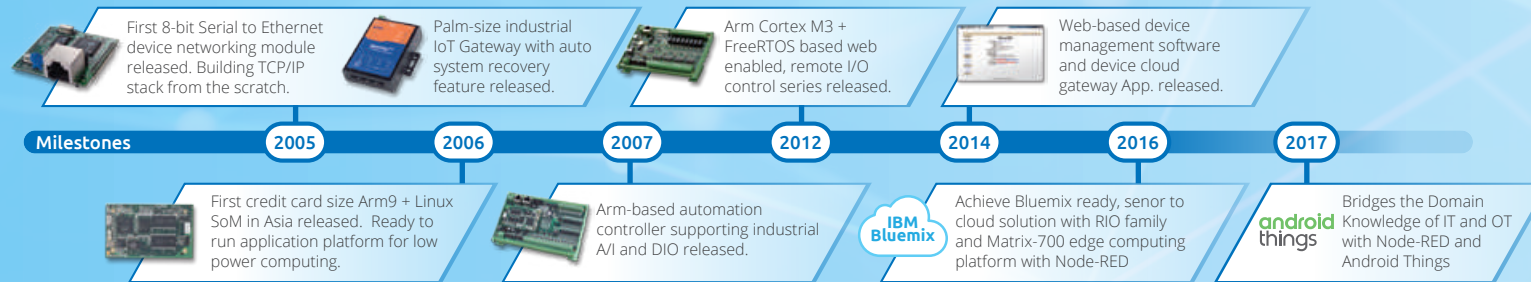
Artila

- Intelligent IoT Gateway
- IoT Device Platform
- Programmable Automation Controller
- Remote I/O
- Industrial Communication Gateway
- HMI

About Artila

Your Trusted Partner for Device Networking & Computing

Founded in 2004, Artila provides trusted innovative industrial computing products. Artila offers comprehensive system integration, hardware, software, and customer-centric design services; including the intelligent IoT gateway, programmable automation controller, IoT device platform, and remote I/O. We cooperate closely with our partners to help providing complete solutions for a wide array of applications across a diverse range of industries, such as energy management, lighting control and environmental monitoring. Artila has always been an innovator in the development and manufacturing of high-quality, high-performance computing products, and our mission is to empower these innovations by offering trustworthy automation products and services.



The Full Range of IoT Products

Intelligent IoT Gateway

Matrix Arm-based IoT Gateway is a Linux-ready industrial computing platform designed for data concentration and device gateway. Built rugged, its extra low-power RISC architecture realizes fanless computing. For real-time and small footprint applications such as protocol conversion and real-time control, the compact and easy-to-use FreeRTOS is the Artila's choice of software operation platform. Artila Intelligent IoT Gateway allows customers to integrate in their systems efficiently and painlessly.



IoT Device Platform

Artila M-series Arm+Linux-ready System on Module (SoM) is an application-ready platform for designers to reduce cost and time in hardware and software design. The M-series SoM, including Arm SoC, memory and flash, and pre-installed Linux OS, are in a compact size module with pin header or SO-DIMM form factor. The pre-loaded file system includes busybox utility collection, web server and USB device drivers. Artila M-series accelerate the adoption of IoT and facilitate innovation in the digital enterprise.



Programmable Automation Controller

PAC series is a Linux-based, C/C++ programmable automation controller. Network-enabled and web-ready PAC features rich analog and digital I/O for real-world I/O control. Based on M-series SoM, PAC is a true Linux computing platform with file system support. With failure prevention and the design of redundant start-up, Artila PAC series are ideal for many mission-critical applications.



Modbus Gateway

The Aport series come with Arm cortex M series controller plus FreeRTOS and programmer friendly APIs make your life easy. For budget limitation project, the low power Arm CORTEX-M plus the high efficient FreeRTOS make Aport Series an ideal light weight computing platform for device networking and remote monitoring.



Remote I/O

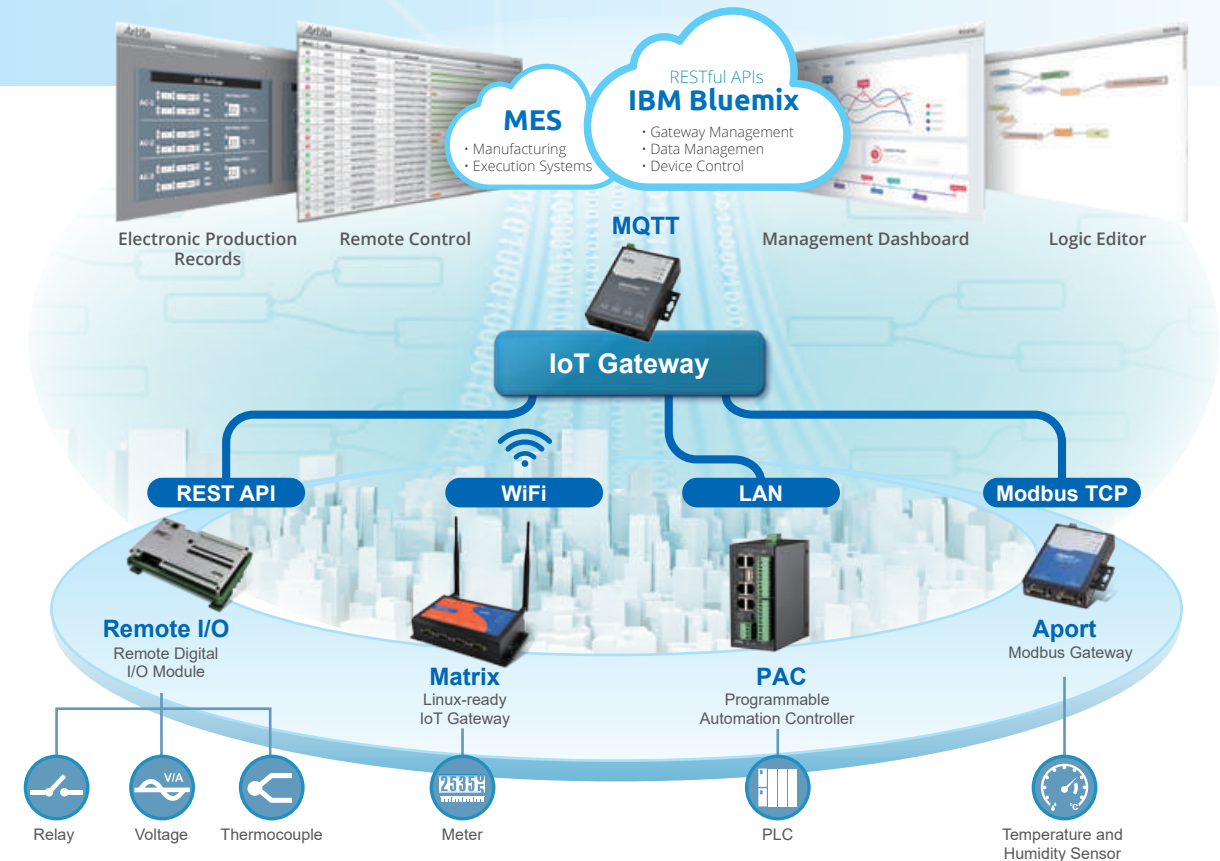
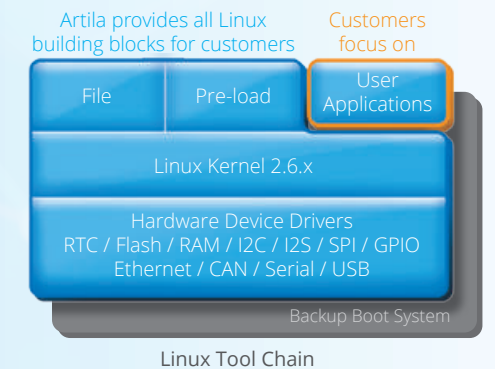
The RIO family, a web-ready, analog and digital I/O product lines, allows users to access and monitor the real-world data by using web interface or Modbus TCP / RTU protocols. Windows and Linux API library are also included in the RIO family. Thus, users can access the RIO products easily to cope with the fast-pace and ever-changing trend of the industrial computing industry.



Looking for A Reliable and Tiny Solution? Arm + Linux is What You Need.

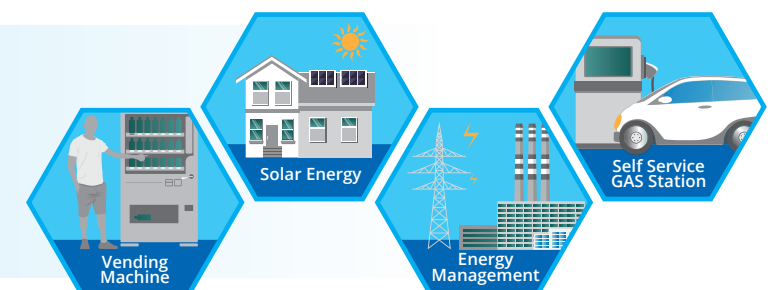


- Low power consumption RISC
- Highly integrated SoC
- Mature and mass market technology
- Market proven open technology
- Complete application building blocks
- Life cycle is under your control + Linux is What You Need



Application Proven

With worldwide experience in product integration, Artila's products are widely used in power management, light control, access control system, parking facilities, solar energy system integration, RFID, environmental monitoring, and more.



Intelligent IoT Gateway

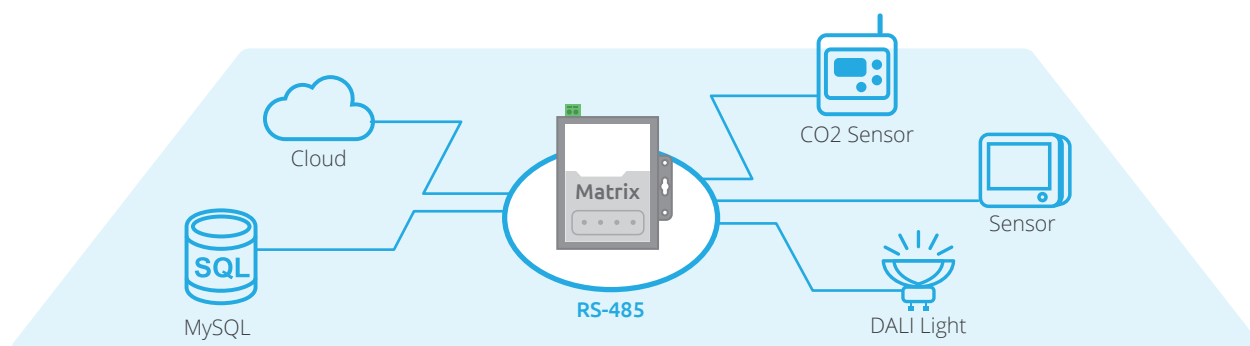
- Low Power Arm SoC for Wide Temperature Operating
- Linux and C / C++ toolchain Ready Computer Platform
- Easy to Expand Wireless module via miniPCle interface
- WEB / FTP / DHCP / SNMP / PHP / MySQL
- Palm Size, Wall Mount and DIN RAIL Mount



Matrix Series Linux Arm Industrial IoT Gateway

Arm-based Linux-ready industrial IoT Gateway with multiple Ethernet ports, RS-232/422/485 ports, USB ports and digital I/Os. Truly industrial design, fanless, no cable and no moving parts inside.

CPU AT91SAM9G20 AT91SAM9G45 ATSAMA5D35 i.MX6ULL



Data Acquisition, Buffering and Storage

Matrix Series Comparison Table



Model	Matrix-752	Matrix-704	Matrix-702	Matrix-700	Matrix-710	Matrix-713	Matrix-500	Matrix-504	Matrix-516B	Matrix-513
CPU	NXP i.MX6ULL Cortex-A7 800MHz	Atmel ATSAMA5D35 Arm Cortex-A5 536MHz				Atmel AT91RM9200 Arm9 180MHz		Atmel AT91SAM9G20 Arm926 400MHz		Atmel AT91SAM9G45 Arm926 400MHz
RAM	512MB SDRAM	512MB DDR2 SDRAM				64MB SDRAM		128MB DDR2 SDRAM		
Flash	16GB eMMC	16GB eMMC / 8MB Data Flash				16MB		256MB		
Micro-SD Card socket	1	1 (Support boot from SD card)				1				
Ethernet	10/100 Mbps x 2	GLAN x1 10/100 Mbps x 1				10/100Mbps x 1		10/100 Mbps x 1	10/100 Mbps x 2	10/100 Mbps x 2
RF Capability (Optional)	YES	YES	YES	N/A	YES	YES	N/A			YES
Micro-SIM card socket	1	1	1	N/A	1	2	N/A			1
GNSS	N/A				GPS + Glonass		N/A			
IMU (Inertial Measurement unit)	N/A				Gyro + G-sensor + E-Compass		N/A			
No. of Serial Port (Total)	2	4	N/A	4	8	4	4	4	8	4
. RS-232/422/485	X	X	X	X	X	X	1	1	X	4
. RS-232/485	1	X	X	4	1	X	X	3	X	4
. RS-232	1	X				1 isolated		X		X
. RS-422/485	X		X		7 (4 isolated)		3 isolated	X	X	8 isolated
. RS-485	X	4 (Surge Protected)	X	X	7 (4 isolated)	3 isolated	X	X	8 isolated	X
CAN Bus (Isolation)	1	N/A	N/A	N/A	2	2	N/A	N/A		N/A
USB 2.0	1 x USB OTG	1	N/A	2 x HOST	4 x HOST	2 x HOST	2 x HOST, 1 x Client			
GPIO	N/A	N/A	N/A	N/A		N/A	N/A	N/A	21-pin	N/A
Isolated DIO Channels (Total)	Dlx2, DOx2	N/A	N/A	0	0	Dlx2, DOx2	0	0		Dlx2
Audio	N/A				YES		N/A			
miniPCle slot	1	1	1	N/A	1	2	N/A	N/A		2
Linux Kernel	5.4.X				2.6.14		2.6.29		2.6.38	
Dimensions (W x H x D) mm	89 x 112 x 30	140x119.5x35	89x109.6x30	78 x 108 x 24	166 x 103 x 35	160 x 118 x 35	78 x 108 x 24	78 x 108 x 24	160 x 104 x 32	175 x 103 x 43
Power Input	+9 ~ +48VDC							+9 ~ +60VDC		+9 ~ +48VDC

Matrix-752



Features

- NXP i.MX6ULL Cortex-A7 CPU, Up to 800MHz
- Linux Kernel 5.10.x (or up) with Boot Loader & File System
- Toolchain: gcc 9.3.0 + glibc 2.31
- 512MB LvDDR3 SDRAM, 16GB eMMC
- 2 x 10/100Mbps Ethernet Interface
- 1 x USB OTG Port
- 1 x RS-485 / RS-232 Serial Port, and 1 x RS-232 Serial Port
- 1 x CAN Port
- 2 x Digital Input, 2 x Relay Out
- 1 x Full Size miniPCIe Socket Inside
- 1 x Micro-SIM Slot Reserved, Two Antenna Holes Reserved
- 1 x Micro-SD Slot Reserved
- Ultra-Low Power Consumption

■ H/W Specifications

CPU / Memory

- CPU: NXP i.MX6ULL Cortex-A7 MPCore, Up to 800MHz
- SDRAM: 512MB, LvDDR3
- Flash: 16GB, eMMC

Network Interface

- Type: 2 x 10/100Mbps Ethernet
- Connector Type: RJ45 (with LED indicator)

USB Interface

- 1 x USB OTG Port
- microUSB connector

TTY (Serial) Port

- Two Serial port
- Port 1: 1 x RS-485 or RS-232
- Port 2: 1 x RS-232
- Connector: Terminal block
- RS-485 Signal: Data+, Data-
- Direction Control: Auto, by software
- RS-232 Signal: TX1, RX1 and TX2, RX2

CAN Bus Ports

- Type: 1 x CAN bus 2.0 A/B compliant ports
- Speed: Up to 1Mbps
- Isolation: 2500Vrms

Console / Debug Ports

- Serial console port (inside the box)

Digital Input

- 2 x Digital Input channels
- Isolation Protection: 5000Vrms (Photo-Coupler)
- Logical High: 5~24VDC
- Logical Low: 0~1.5VDC

Relay Output

- 2 x Digital Output channels (Solid state Relay)
- Solid State Relay, Normal Open (NO) Type
- Contact Rating: 80VDC@1.5A

SD Slot

- 1 x Micro-SD socket
- SD 2.0 Compliant, support SDHC
- Storage capacity: support up to 128G

Expansion

- 1 x miniPCIe Full-size socket
- 1 x micro-SIM card socket, USB interface reserved
- 2 x SMA-type Antenna hole reserved

General

- Watchdog: Yes
- Real-Time Clock (RTC): Yes, backup by super capacitor
- Power Input Voltage: +9~+48VDC (terminal block)
- Typical Consumption: 12VDC@250mA
- Dimensions (W x L x H): 89 x 112 x 30mm (3.5 x 4.4 x 1.18in)
- Net Weight: 350g (0.77lb)
- Operating Temperature: 0~70°C (32~158°F)
- Typical Consumption: 12VDC@250mA
- Regulation: CE Class A, FCC Class A
- Installation: Wall mounting, DIN-rail mounting (with optional kit)

■ S/W Specifications

Operation System

- Linux kernel 5.10.x (or up)
- Supports bootup from eMMC or SD card
- Supports backup from SD card or USB device
- Boot Loader : BareBox
- File System : EXT4

Software Development

- Toolchain: gcc 9.3.0 + glibc 2.31
- Supports in-place C/C++ code compilation

Package Management

- Package repository: Artila self-maintained repository
- Command: Using standard apt-get command

Popular Packages

- Web server: Apache/Nginx/Lighttpd
- Database: MySQL/SQLite3/PostgreSQL
- Script Language: PHP/Python/Perl/NodeJS
- Text editor: vim/nano/sed
- Administration: Webmin

■ Ordering Information

Matrix-752 / Matrix-752U

- Linux / Ubuntu-ready Cortex-A7 800MHz Industrial IoT Gateway with 512MB SDRAM, 16G eMMC

CB-PHDF9-050 (91-PHDF9-050)

- Console Cable (Wafer Box to DB9 Female, 50cm)

DK-35A (36-DK35A-000)

- DIN RAIL Mounting Kit

PWR-12V-1A

- 100~240VAC to 12VDC 1A Power Adapter

Matrix-702



Features

- ATMELOX Cortex-A5 ATSA5D35 536MHz CPU, 512MB LPDDR2 SDRAM, 16GB eMMC
- Linux kernel 5.10.x or up with boot loader & file system, Toolchain: gcc 9.3.0 + glibc 2.31
- 1 x Gigabit Ethernet and 1 x 10/100Mbps Ethernet
- 1 x full size miniPCIe socket inside, 1 x Micro-SIM slot inside
- 2 x Antenna through SMA connector holes reserved
- 1 x microSD socket, support up to 128G storage capacity
- 1 x Serial console port (inside the box)
- Input Voltage: +9V~+48Vdc (terminal block)
- Real-time clock(RTC): Yes
- Watchdog: Yes
- Dimensions (W x H x D): 89 x 109.6 x 30mm (3.5 x 4.3 x 1.18in)
- Operating Temperature: 0~70°C (32~158°F)
- Regulation: CE Class A, FCC Class A

■ Ordering Information

Matrix-702

- Linux-ready Cortex-A5 536MHz Industrial IoT Gateway with 512MB SDRAM, 16GB eMMC Flash

Matrix-704



Features

- ATMELOX Cortex-A5 ATSA5D35 536MHz CPU
- Linux kernel 5.10.x or up with file system
- Toolchain gcc 9.30 + glibc 2.31
- 512MB LPDDR2 SDRAM, 16GB eMMC Flash
- Input Voltage: +9V~+48Vdc (terminal block)
- 1 x Gigabit Ethernet and 1 x 10/100Mbps Ethernet
- 1 x full size miniPCIe socket inside, 1 x Micro-SIM slot inside
- 2 x Antenna through SMA connector holes reserved
- 1 x Micro-SD card inside for data backup
- 4 x RS-485 serial ports with Surge protection
- Optional RS-485 with Isolation and Surge protection
- Real-time clock(RTC): Yes
- Watchdog: Yes
- Dimensions (W x H x D): 140 x 119.5 x 35.2mm (5.5 x 4.7 x 1.38in)

■ H/W Specifications

CPU / Memory

- CPU: ATMELOX ATSA5D35 536MHz w/MMU
- SDRAM: 512MB, LPDDR2
- Flash: 16GB, eMMC

Network Interface

- Type: 1 x Gigabit and 1 x 10/100Mbps Ethernet
- Protection: 1.5kV magnetic isolation
- Connector Type: RJ45

USB 2.0 Host Interface

- Host Ports: 1
- Supports 480Mbps hi-speed mode

Console / Debug Ports

- Support microUSB console port
- Serial console port (inside the box)

TTY (Serial) Port

- 4 x Surge-protected RS-485 (No isolation)
- Optional: 4 x Isolated / Surge-protected RS-485 (2500Vrms isolation)

- Direction Control: Auto, by hardware
- Connector: Terminal block

TTY (Serial) Port ParametersParameters

- Baud Rate: Up to 921.6Kbps
- Parity: None, Even, Odd, Mark, Space
- Data Bits: 5, 6, 7, 8
- Stop Bits: 1, 1.5, 2
- Flow Control: RTS / CTS, XON / XOFF, None

■ Ordering Information

Matrix-704

- Linux-ready Cortex-A5 536 MHz Surge-protected Industrial IoT Gateway with four Surge-protected RS-485 serial ports

Matrix-704i

- Linux-ready Cortex-A5 536 MHz Industrial IoT Gateway with four Isolated / Surge-protected RS-485 serial ports

Linux-ready Cortex-A5 Industrial IoT Gateway

Matrix-700



Features

- ATMEL ATSAMA5D35 536MHz Cortex-A5 CPU
- Linux kernel 5.10.x or up with file system
- Toolchain gcc 9.3.x + glibc 2.31
- 512MB LPDDR2 SDRAM
- 16GB eMMC Flash and 8MB DataFlash for system backup
- 1 x USB 2.0, 1 x MicroSD card slot (Inside)
- 1 x Gigabit Ethernet and 1 x 10/100Mbps Ethernet
- 4 x RS-232 / 485 serial ports
- Ultra-low power consumption, less than 3 Watts

Linux-ready Cortex-A5 Industrial IoT Gateway

Matrix-710



Features

- ATMEL ATSAMA5D35 536MHz Cortex-A5 CPU
- Linux kernel 5.10.x or up with file system
- 512MB LPDDR2 SDRAM
- 16GB eMMC Flash and 8MB DataFlash for system backup
- Toolchain: gcc 9.3.0 + glibc 2.31
- 1 x Gigabit Ethernet and 1 x 10/100Mbps Ethernet
- 4 x USB host ports
- 4 x isolation RS-485 serial ports and 4 x RS-485 serial ports
- 2 x CAN ports
- 1 x full size miniPCIe socket inside
- Ultra-low power consumption

H/W Specifications

CPU / Memory

- CPU: ATMEL ATSAMA5D35 536MHz w/MMU
- SDRAM: 512MB, LPDDR2
- Flash: 16GB, eMMC
- DataFlash: 8MB, for system backup

Network Interface

- Type: 1 x Gigabit and 1 x 10/100Mbps Ethernet
- Connector Type: RJ45

TTY (Serial) Ports

- RS-232 or RS-485, software select
- RS-232 Signals: TX, RX, RTC, CTS
- RS-485 Signals: Data+, Data-
- RS-485 Automatic Flow Control: Yes

TTY (Serial) Port Parameters

- Baud Rate: up to 921.6Kbps
- Parity: None, Even, Odd, Mark, Space
- Data Bits: 5, 6, 7, 8
- Stop Bits: 1, 1.5, 2
- Flow Control: RTS / CTS, XON / XOFF, None

Console / Debug Ports

- Support microUSB console port
- Serial console port (inside the box)

USB 2.0 Host Interface

- Supports 480Mbps hi-speed mode
- Host Ports: 2

SD Slot

- 1 x Micro-SD socket
- SD 2.0 Compliant, support SDHC
- Storage capacity: support up to 128G

General

- Watchdog: Yes
- Real-Time Clock (RTC): YES
- Buzzer: Yes
- Supports microUSB power source
- Power Input: +9V~+48Vdc (terminal block)
- Typical Consumption: 12VDC@200mA
- Dimensions (W x H x D): 78 x 108 x 24mm (3.0x4.25x0.94in)
- Operating Temperature: 0~70°C (32~158°F)
- Regulation: CE Class A, FCC Class A

S/W Specifications

Operation System

- Linux kernel 5.10.x or up
- Supports bootup from eMMC or SD card
- Supports backup from SD card or USB device
- Boot Loader : BareBox
- File System : EXT4/ETX3/ETX2, VFAT/FAT, NFS

Software Development

- Toolchain: gcc 9.3.0 + glibc 2.31
- Supports in-place C/C++ code compilation

Package Management

- Package repository: Artila self-maintained repository
- Command: Using standard apt-get command

Popular Packages

- Web server: Apache/Nginx/Lighttpd
- Database: MySQL/SQLite3/PostgreSQL
- Script Language: PHP/Python/Perl/NodeJS
- Text editor: vim/nano/sed
- Administration: Webmin

Ordering Information

Matrix-700

- Linux-ready Cortex-A5 536MHz Industrial IoT Gateway with 512MB SDRAM, 16GB eMMC Flash

CB-PHDF9-050 (91-PHDF9-050)

- Console Cable (Wafer Box to DB9 Female, 50cm)

DK-35A (36-DK35A-000)

- DIN RAIL Mounting Kit

PWR-12V-1A

- 100~240VAC to 12VDC 1A Power Adapter

H/W Specifications

CPU / Memory

- CPU: ATMEL ATSAMA5D35 536MHz w/MMU
- SDRAM: 512MB, LPDDR2
- Flash: 16GB, eMMC
- DataFlash: 8MB, for system backup

Network Interface

- Type: 1 x Gigabit and 1 x 10/100Mbps Ethernet
- Connector Type: RJ45

TTY (Serial) Ports

- Port 1, 2, 3, 4: Isolated RS-485 (2500Vrms isolation)
- Port 5, 6, 7, 8: RS-485
- Direction Control: Auto, by hardware
- Connector: Terminal block

TTY (Serial) Port Parameters

- Baud Rate: Up to 921.6Kbps
- Parity: None, Even, Odd, Mark, Space
- Data Bits: 5, 6, 7, 8
- Stop Bits: 1, 1.5, 2
- Flow Control: RTS / CTS, XON / XOFF, None

CAN Bus Ports

- Type: 2 x CAN bus 2.0 A/B compliant ports
- Speed: Up to 1Mbps
- Isolation: 2500Vrms
- CAN 1: 1~2 pin, CAN 2: 3~4 pin, GND: 5 pin

Console / Debug Ports

- Support microUSB console port
- Serial console port (inside the box)

USB 2.0 Host Interface

- Host Ports: 4
- Supports 480Mbps hi-speed mode

SD Slot

- 1 x Micro-SD socket
- SD 2.0 Compliant, support SDHC
- Storage capacity: support up to 128G

Expansion Slot

- 1 x miniPCIe socket
- Supports Full-size / half-size

General

- Watchdog: Yes
- Real-Time Clock (RTC): Yes, backup by super capacitor
- Buzzer: Yes
- Power Input Voltage: +9~+48VDC (terminal block)
- Typical Consumption: 12VDC@500mA
- Dimensions (W x L x H): 166 x 103 x 35mm (6.5 x 4.0 x 1.37in)
- Operating Temperature: 0~70°C (32~158°F)
- Regulation: CE Class A, FCC Class A
- Installation: Wall mounting, DIN-rail mounting (with optional kit)

S/W Specifications

Operation System

- Linux kernel 5.10.x or up
- Supports bootup from eMMC or SD card
- Supports backup from SD card or USB device
- Boot Loader : Barebox
- File System : EXT4/ETX3/ETX2, VFAT/FAT, NFS

Software Development

- Toolchain: gcc 9.3.x + glibc 2.31
- Supports in-place C/C++ code compilation

Package Management

- Package repository: Artila self-maintained repository
- Command: Using standard apt-get command

Popular Packages

- Web server: Apache/Nginx/Lighttpd
- Database: MySQL/SQLite3/PostgreSQL
- Script Language: PHP/Python/Perl/NodeJS
- Text editor: vim/nano/sed
- Administration: Webmin

Ordering Information

Matrix-710

- Linux-ready Cortex-A5 536MHz Industrial IoT Gateway with 512MB SDRAM, 16GB eMMC Flash

DK-35A (36-DK35A-000)

- DIN RAIL Mounting Kit

PWR-12V-1A

- 100~240VAC to 12VDC 1A Power Adapter

Linux-ready Cortex-A5 Industrial IoT Gateway

Matrix-713



Features

- Rugged Design, Wide-range Temperature operating
- ATMEL ATSAMA5D35 536MHz Cortex-A5 CPU
- Linux kernel 5.10.x or up with file system
- Support Node-Red , the browser-based flow editor
- 512MB LPDDR2 SDRAM
- 16GB eMMC Flash and 8MB DataFlash for system backup
- Toolchain: gcc 9.3.0 + glibc 2.31
- 2 x USB, 1 x Micro-SD socket, 1 x Line-out
- 1 x Gigabit Ethernet and 1 x 10/100Mbps Ethernet
- Rich I/Os: 4xisolated RS-485, 2xCAN, 2xUSB,2xDI, 2xDO
- Support GNSS (GPS&Glonass), Gyro, G-Sensor, e-Compass
- 2xminiPCIe slot & 2xmicro-SIM card socket reserved

Key Features

High Ability IoT Gateway

- Support versatile communication interface
- Support Plug & play networking protocol upnp & mDNS
- Location smart, support GNSS / 9-Axis Gyro,G-sensor, e-Compass

Information Smart

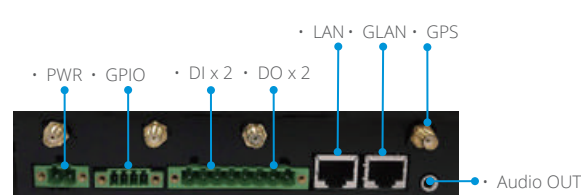
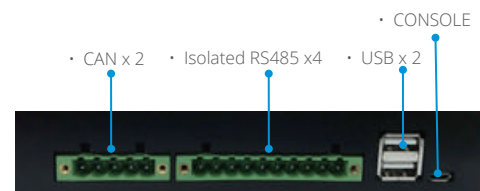
- Sensor / Data acquisition
- Database Management
- Rich I/Os fulfill different applications
- Support Node-Red visual writing tool for IoT

Flexibility

- Highly Integrated SoC, easy installation / maintenance
- Market proven open technology
- Completely application building blocks

Rugged Reliable Device

- Wide-range Temperature operating
- Low-Power consumption, Saving power / Money
- Dual SIM slots to support cross-zone communication / seamless integration



GNSS/IMU/Cellular Specifications

GNSS (Global Navigation Satellite System)

- 72-channel u-blox M8 e GNSS engine
- Support Dual Satellite: GPS & GLONASS
- -146dBm Tracking and Navigation Sensitivity
- Support AssistNow Online/Offline/Autonomous, OMA SUPL & 3GPP Compliant
- Max nav. update rate: Single channel/up to 18MHz, 2 Concurrent GNSS /up to 10MHz
- Accuracy (Position):2.5m CEP
- 1 x Active Antenna

IMU (Inertial Measurement Unit)

- 1 x 3-Axis digital output Gyroscope
- Gyroscope has a programmable full-scale range of ±250, ±500, ±1000, and ±2000 degrees/sec and very low rate noise at 0.01dps/Hz. Gyroscope operating current: 3.2mA
- 1 x 3-Axis Accelerometer (G-Sensor) ±2/±4/±8/±16 g user-programmable accelerometer full-scale range 16-bit data output
- 1 x 3-Axis Magnetometer (E-Compass) Build-in A to D converter for magnetometer data out 16 bit data each 3-Axis magnetic component (Sensitivity 0.15uT/LSB-typ.)

Cellular Module Parameters

- **For Europe/Asia /LATAM**
 - LTE(4G) support B1(2100)/B3(1800)/ B7(2600)/ B8(900)/ B20(800DD)/ B38(TDD2600)/B40(TDD2300), data rate at 50Mbps(UL)/100Mbps(DL)
 - UMTS(3G) support B1(2100)/B8(900), Data rate at 5.76Mbps(UL)/ 42Mbps(DL)
 - 2G support 900/1800MHz
 - Certification: CE
- **For North America**
 - LTE(4G) support B2(1900)/B4(1700 AWS)/B5(850)/B17(700bc), data rate at 50Mbps(UL)/100Mbps(DL)
 - HSPA(3G) support B2(1900)/B5(850), Data rate at 5.76Mbps(UL)/ 42Mbps(DL)
 - Carrier License: AT&T , Certification: FCC
- **For China**
 - LTE(4G) support B1(2100)/B3(1800)/B8(900)/B38(TDD2600)/B39 (TDD1900)/B40(TDD2300)/B41(TDD2500), data rate at 50Mbps(UL) /100Mbps(DL)
 - HSPA(3G) support B1(2100)/B8(900), Data rate at 5.76Mbps(UL)/ 42Mbps(DL)
 - 2G support 900/1800MHz,
 - Certification: CCC

Linux-ready Cortex-A5 Industrial IoT Gateway

Matrix-713

H/W Specifications

CPU / Memory

- CPU: ATMEL ATSAMA5D35 536MHz w/MMU
- SDRAM: 512MB, LPDDR2
- Flash: 16GB, eMMC
- DataFlash: 8MB, for system backup

Network Interface

- Type: 1 x Gigabit and 1 x 10/100Mbps Ethernet
- Protection: 1.5KV magnetic isolation
- Connector Type: RJ45

TTY (Serial) Ports

- 4 x Isolated RS-485 (1500Vrms isolation)
- Port 4 support RS422 / RS-485 (selectable)
- Direction Control: Auto, by hardware
- Connector: Terminal block
- RS485 Signal: Data+, Data-
- LED Indicator: YES

CAN Bus Ports

- 2 x CAN bus 2.0 A/B compliant ports
- Speed: Up to 1Mbps

Console / Debug Ports

- 1 x microUSB console port
- Serial console port (inside the box)

USB 2.0 Host Interface

- 2 x USB Host Port

Audio Out

- 1 x Line-out R/L port, optional Earphone R/L
- Connector: Earphone-Jack
- Support MP3 and WAV format

Digital Input

- 2 x Digital Input channels
- Isolation Protection: 5000Vrms (Photo-Coupler)
- Logical High: 5~24VDC
- Logical Low: 0~1.5VDC

Relay Output

- 2 x Digital Output Channels (Solid state Relay)
- Solid State Relay, Normal Open (NO) Type
- Contact Rating: 80VDC@1.5A
- LED Indicator: YES

Power Requirement

- Power Input: +9~+60VDC (terminal block)
- Typical Consumption : 12VDC@230mA

Dual Power Source

- Support external Battery bank
- Via Micro-USB port (5Vdc@1A)

SD Slot

- 1 x Micro-SD socket
- SD 2.0 compliant, supports SDHC
- Storage capacity: Support Up to 128G

Expansion

- 2 x miniPCIe Full-size socket
- 2 x micro-SIM card socket , USB interface reserved
- 3 x SMA-type Antenna hole reserved

General

- Watchdog: Yes
- Real-Time Clock (RTC): Yes, backup by super capacitor
- Buzzer: Yes
- Power Input: +9~+60VDC (terminal block)
- Typical Consumption: 12VDC@600mA
- Indicator: PWR, READY, LAN, UART, CAN, Status(user define)
- Dimensions (W x L x H): 160 x 118 x 35mm (6.3 x 4.64 x 1.37in)
- Operating Temperature: 0~70°C (32~158°F)
- Regulation: CE Class A, FCC Class A
- Installation: Wall mounting, DIN-rail mounting (with optional kit)

S/W Specifications

Operation System

- Linux kernel 5.10.x or up
- Supports bootup from eMMC or SD card
- Supports backup from SD card or USB device
- Boot Loader : Barebox
- File System : EXT4/EXT3/EXT2, VFAT/FAT, NFS

Software Development

- Toolchain: gcc 9.3.x+ glibc 2.31
- Supports in-place C/C++ code compilation

Package Management

- Package repository: Artila self-maintained repository
- Command: Using standard apt-get command

Popular Packages

- Web server: Apache/Nginx/Lighttpd
- Database: MySQL/SQLite3/PostgreSQL
- Script Language: PHP/Python/Perl/NodeJS
- Text editor: vim/nano/sed
- Administration: Webmin

Ordering Information

Matrix-713

- Linux-ready Cortex-A5 536MHz Industrial IoT Gateway with 512MB SDRAM, 16GB eMMC Flash, with GPS/Gyro/G-sensor/E-compass

Matrix-713-EA (for Europe, ASIA, LATAM)

- Linux-ready Cortex-A5 536MHz Industrial IoT Gateway with 512MB SDRAM, 16GB eMMC Flash, with GPS/GLONASS, with 4G/LTE miniPCIe Module with antenna

Matrix-713-NA (for North America)

- Linux-ready Cortex-A5 536MHz Industrial IoT Gateway with 512MB SDRAM, 16GB eMMC Flash, with GPS/GLONASS, with 4G/LTE miniPCIe Module with antenna

Matrix-713-C (for China)

- Linux-ready Cortex-A5 536MHz Industrial IoT Gateway with 512MB SDRAM, 16GB eMMC Flash, with GPS/GLONASS, with 4G/LTE miniPCIe Module with antenna

DK-35A (36-DK35A-000)

- DIN RAIL Mounting Kit

PWR-12V-1A

- 100~240VAC to 12VDC 1A Power Adapter

Linux-ready Arm9 Industrial IoT Gateway

Matrix-500



Features

- Linux 2.6.14 compatible computing platform
- 64MB SDRAM and 16MB NOR Flash
- Ultra-low power consumption, less than 3 Watts
- 1 x 10/100Mbps Ethernet port
- 4 x 921.6Kbps high speed TTY (serial) ports
- 2 x USB 2.0 host ports for add-on functionality expansion
- 1 x SD memory card slot inside for storage expansion
- GNU C / C++ toolchain for Linux / Windows environment
- Extremely compact design, 78 x 108 x 24mm

Linux-ready Arm9 Industrial IoT Gateway

Matrix-512



Features

- Linux 2.6.14 compatible computing platform
- 64MB SDRAM and 16MB NOR Flash
- 2 x 10/100Mbps Ethernet ports
- 4 x 921.6Kbps RS-232 / 422 / 485 TTY ports
- 2 x USB 2.0 host ports for add-on functionality expansion
- 1 x SD memory card slot inside for storage expansion
- 21 x CMOS / TTL-level digital I/Os (GPIO)
- GNU C / C++ toolchain for Linux / Windows environment
- Ultra-low power consumption, less than 3 Watts

H/W Specifications

CPU / Memory

- CPU: ATMEL AT91RM9200 180MHz (Arm9, w/ MMU)
- Memory: 64MB SDRAM, 16MB NOR Flash

Network Interface

- Type: 1 x 10/100BaseT, RJ45 connector
- Protection: 1.5KV magnetic isolation

TTY (Serial) Ports

- Port 1: Can be set as RS-232, RS-422 or RS-485
- Port 2, 3, 4: Can be set as RS-232 or RS-485
- Connector: RJ45 connector

TTY (Serial) Port Parameters

- Baud Rate: Up to 921.6Kbps
- Parity: None, Even, Odd, Mark, Space
- Data Bits: 5, 6, 7, 8
- Stop Bits: 1, 1.5, 2
- Flow Control: RTS / CTS, XON / XOFF, None
- RS-485 Direction Control: Auto, by hardware

USB Host Ports

- No. of Ports: 2
- Speed: USB 2.0 compliant, supports low-speed (1.5Mbps) and full-speed (12Mbps) data rate

Mass Storage

- 1 x SD 1.0 compliant socket inside

General

- Watchdog Timer: Yes, for kernel use
- Real-Time Clock (RTC): Yes
- Buzzer: Yes
- Power Input: +9~+48VDC
- Power Consumption: 12VDC@220mA
- Dimensions (W x H x D): 78 x 108 x 24mm (3.0 x 4.25 x 0.94in)
- Operating Temperature: 0~70°C (32~158°F)
- Regulation: CE Class A, FCC Class A

S/W Specifications

General

- OS: Linux, kernel 2.6.14
- Boot Loader: U-Boot
- File Systems: JFFS2, ETX2 / ETX3, VFAT / FAT, NFS

Protocol Stacks

- IPv4, ICMP, ARP, DHCP, NTP, TCP, UDP, FTP, TELNET, HTTP, PPP, PPPoE, CHAP, PAP, SMTP, SNMP V1 / V2, SSL, SSH 1.0 / 2.0

Pre-installed Utilities

- bash: shell command
- tinylogin: login and user manager utility
- telnet: telnet client program
- busybox: Linux utility collection
- ftp: ftp client program

Daemons

- pppd: dial in / out over serial port and PPPoE
- snmpd: SNMP agent program
- telnetd: telnet server program
- inetd: TCP server program
- ftpd: ftp server program
- boa: web server program
- sshd: secured shell server
- iptables: firewall service manager
- amgrd: Artila manager daemon

Toolchain for Linux

- GCC: C / C++ PC cross compiler
- GLIBC: POSIX Library

Device Drivers

- SD / MMC, UART, Real Time Clock, Buzzer, Digital I/O, Ethernet, Watchdog Timer

USB Host Drivers (Could Be Customized)

- Flash disk, WiFi (IEEE-802.11), and RS-232 adapters

Ordering Information

Matrix-500

- Linux-ready Arm9 Industrial IoT Gateway with 16MB on-board Flash

CB-RJ45F9-150 (91-R45F9-150)

- Serial Cable (RJ45 to DB9 Female, 150cm)

CB-RJ2CON-100 (91-RJCON-100)

- Console Cable (RJ45 to DB9 Female, 100cm)

DK-35A (36-DK35A-000)

- DIN RAIL Mounting Kit

PWR-12V-1A

- 100~240VAC to 12VDC 1A Power Adapter

H/W Specifications

CPU / Memory

- CPU: ATMEL AT91RM9200 180MHz (Arm9, w/ MMU)
- Memory: 64MB SDRAM, 16MB NOR Flash

Network Interface

- Type: 2 x 10/100BaseT, RJ45 connector
- Protection: 1.5KV magnetic isolation

TTY (Serial) Ports

- 4 x RS-232 / 422 / 485 ports, software select
- Port 2: Supports full modem signals
- Connector: DB9 male connector

TTY (Serial) Port Parameters

- Baud Rate: Up to 921.6Kbps
- Parity: None, Even, Odd, Mark, Space
- Data Bits: 5, 6, 7, 8
- Stop Bits: 1, 1.5, 2
- Flow Control: RTS / CTS, XON / XOFF, None

USB Host Ports

- No. of Ports: 2
- Speed: USB 2.0 compliant, supports low-speed (1.5Mbps) and full-speed (12Mbps) data rate

Digital I/Os (GPIO)

- No. of Pins: 21
- Signal Level: CMOS / TTL compatible
- Each pin can be programmed as input or output

Mass Storage

- 1 x SD 1.0 compliant socket inside

General

- Watchdog Timer: Yes, for kernel use
- Real-Time Clock (RTC): Yes
- Buzzer: Yes
- Power Input: +9~+40VDC
- Power Consumption: 12VDC@300mA
- Dimensions (W x H x D): 160 x 104 x 32mm (6.3 x 4.0 x 1.26in)
- Operating Temperature: 0~70°C (32~158°F)
- Regulation: CE Class A, FCC Class A

S/W Specifications

General

- OS: Linux, kernel 2.6.14
- Boot Loader: U-Boot
- File Systems: JFFS2, ETX2 / ETX3, VFAT / FAT, NFS

Protocol Stacks

- IPv4, ICMP, ARP, DHCP, NTP, TCP, UDP, FTP, TELNET, HTTP, PPP, PPPoE, CHAP, PAP, SMTP, SNMP V1 / V2, SSL, SSH 1.0 / 2.0

Pre-installed Utilities

- bash: shell command
- tinylogin: login and user manager utility
- telnet: telnet client program
- busybox: Linux utility collection
- ftp: ftp client program

Daemons

- pppd: dial in / out over serial port and PPPoE
- snmpd: SNMP agent program
- telnetd: telnet server program
- inetd: TCP server program
- ftpd: ftp server program
- boa: web server program
- sshd: secured shell server
- iptables: firewall service manager
- amgrd: Artila manager daemon

Toolchain for Linux

- GCC: C / C++ PC cross compiler for Linux, Cygwin
- GLIBC: POSIX Library

Device Drivers

- SD / MMC, UART, Real Time Clock, Buzzer, Digital I/O, Ethernet, Watchdog Timer

USB Host Drivers (Could Be Customized)

- Flash disk
- WiFi (IEEE-802.11b/g)
- RS-232 adapters

Ordering Information

Matrix-512

- Linux-ready Arm9 Industrial IoT Gateway with 16MB on-board Flash

CB-DB2CON-100 (91-DBCON-100)

- Console Cable (DB9 Female to DB9 Female, 100cm)

DK-35A (36-DK35A-000)

- DIN RAIL Mounting Kit

Linux-ready Arm9 Industrial IoT Gateway

Matrix-504



Features

- Linux 2.6.29 compatible computing platform
- 64MB SDRAM and 256MB NAND Flash
- Ultra-low power consumption, less than 3 Watts
- 1 x 10/100Mbps Ethernet port
- 4 x 921.6Kbps high speed TTY (serial) ports
- 2 x USB 2.0 host ports, 12Mbps
- 1 x microSD socket inside
- GNU C / C++ toolchain for Linux / Windows environment
- Extremely compact design, 78 x 108 x 24mm

Linux-ready Arm9 Industrial IoT Gateway

Matrix-516



Features

- ATMELE AT91SAM9G20 400MHz CPU
- Linux kernel 2.6.29 with file system
- 64MB SDRAM and 256MB NAND Flash
- 1 x microSD socket inside
- 2 x 10/100Mbps Ethernet ports
- 8 x isolated RS-485 serial ports
- 2 x USB hosts, 21 x GPIOs
- Ultra-low power consumption, less than 3 Watts

H/W Specifications

CPU / Memory

- CPU: ATMELE AT91SAM9G20 400MHz (Arm9, w/ MMU)
- Memory: 64MB SDRAM, 256MB NAND Flash
- DataFlash@: 2MB, for system backup

Network Interface

- Type: 1 x Gigabit and 1 x 10/100Mbps Ethernet
- Connector Type: RJ45

TTY (Serial) Ports

- Port 1, 2, 3, 4: Isolated RS-485 (2500Vrms isolation)
- Port 5, 6, 7, 8: RS-485
- Direction Control: Auto, by hardware
- Connector: Terminal block

TTY (Serial) Port Parameters

- Baud Rate: Up to 921.6Kbps
- Parity: None, Even, Odd, Mark, Space
- Data Bits: 5, 6, 7, 8
- Stop Bits: 1, 1.5, 2
- Flow Control: RTS / CTS, XON / XOFF, None
- RS-485 Direction Control: Auto, by hardware

USB Ports

- Host Ports: 2
- Client Port: 1, reserved
- Speed: USB 2.0 compliant, supports low-speed (1.5Mbps) and full-speed (12Mbps) data rate

General

- Watchdog Timer: Yes, for kernel use
- Real-Time Clock (RTC): Yes
- Buzzer: Yes
- microSD Socket: Yes
- Power Input: +9V~+48VDC
- Power Consumption: 12VDC@250mA
- Dimensions (W x H x D): 78 x 108 x 24mm (3.0 x 4.25 x 0.94in)
- Operating Temperature: 0~70°C (32~158°F)
- Regulation: CE Class A, FCC Class A

S/W Specifications

General

- OS: Linux, kernel 2.6.29
- Boot Loader: U-Boot
- File Systems: UBI, JFFS2, ETX2 / ETX3, VFAT / FAT, NFS

Pre-installed Utilities

- bash, busybox, sysvinit, wget, ipkg, procps (for webmin), psmics, apache2, vsftpd, iptables, ppp, ssh, wireless_tools, util-linux-mount / umount, usbutils, Artila utility

Daemons Started by Default

- ssh (secured shell) with sftp
- syslog / klogd (system and kernel log)
- telnet server (disable root permission in /etc/securityty)
- ftp server (vsftp)
- web server (lighttpd)
- amgrd (Artila broadcast search daemon)

Package Management & System Administration

- Supports ipkg to manage the package installation, upgrade and removal
- Supports webmin (use 'ipkg install webmin' to install) for web-based system administration

Toolchain for Linux

- GCC: C / C++ PC cross compiler
- GLIBC: POSIX Library

Ordering Information

Matrix-504

- Linux-ready Arm9 Industrial IoT Gateway with 256MB on-board Flash and microSD Socket Inside

Matrix-504T

- Wide-temperature (-20~80°C) Version of the Matrix-504

CB-RJ45F9-150 (91-R45F9-150)

- Serial Cable (RJ45 to DB9 Female, 150cm)

CB-RJ2CON-100 (91-RJCON-100)

- Console Cable (RJ45 to DB9 Female, 100cm)

DK-35A (36-DK35A-000)

- DIN RAIL Mounting Kit

PWR-12V-1A

- 100~240VAC to 12VDC 1A Power Adapter

H/W Specifications

CPU / Memory

- CPU: ATMELE AT91SAM9G20 400MHz w/ MMU
- Memory: 64MB SDRAM, 256MB NAND Flash
- DataFlash@: 2MB, for system backup

Network Interface

- Type: 2 x 10/100BaseT, RJ45 connector
- Protection: 1.5KV magnetic isolation

TTY (Serial) Ports

- 8 x Isolated RS-485 (1500Vrms isolation)
- Direction Control: Auto, by hardware
- Connector: Terminal block
- Baud Rate: Up to 921.6Kbps
- Parity: None, Even, Odd, Mark, Space
- Data Bits: 5, 6, 7, 8
- Stop Bits: 1, 1.5, 2

USB Ports

- Host Ports: 2
- Client Port: 1, reserved
- Speed: USB 2.0 compliant, supports low-speed (1.5Mbps) and full-speed (12Mbps) data rate

SD Socket (Secure Digital Card)

- Type: microSD
- No. of Sockets: 1
- Storage Capacity: Up to 32GB
- Compatibility: SD memory specification 1.0

Digital I/Os (GPIO)

- No. of Pins: 21
- Signal Level: CMOS / TTL compatible
- Each pin can be programmed as input or output

General

- Watchdog Timer: Yes
- Real-Time Clock (RTC): Yes
- Buzzer: Yes
- Power Input: +9V~+60VDC
- Power Consumption: 12VDC@190mA
- Dimensions (W x H x D): 160 x 104 x 32mm (6.3 x 4.0 x 1.26in)
- Operating Temperature: 0~70°C (32~158°F)
- Regulation: CE Class A, FCC Class A

S/W Specifications

General

- OS: Linux, kernel 2.6.29
- Boot Loader: U-Boot
- File Systems: UBI, JFFS2, ETX2 / ETX3, VFAT / FAT, NFS

Pre-installed Utilities

- bash, busybox, sysvinit, wget, ipkg, procps (for webmin), psmics, lighttpd, vsftpd, iptables, ppp, ssh, wireless_tools, util-linux-mount / umount, usbutils, Artila utility, and more

Daemons Started by Default

- ssh (secured shell) with sftp
- syslog / klogd (system and kernel log)
- telnet server (disable root permission in /etc/securityty)
- ftp server (vsftp)
- web server (lighttpd)
- amgrd (Artila broadcast search daemon)

Package Management & System Administration

- Supports ipkg to manage the package installation, upgrade and removal
- Supports webmin (use 'ipkg install webmin' to install) for web-based system administration

Toolchain for Linux

- GCC: C / C++ PC cross compiler
- GLIBC: POSIX Library

Ordering Information

Matrix-516B

- Linux-ready Arm9 Industrial IoT Gateway

CB-F10M9-20 (91-0P9M9-001)

- Console Cable (10Pin Header to DB9 Male, 20cm)

DK-35A (36-DK35A-000)

- DIN RAIL Mounting Kit

Linux-ready Arm9 Industrial IoT Gateway

Matrix-518



Features

- ATMEL AT91SAM9G20 400MHz CPU
- Linux kernel 2.6.29 with file system
- 64MB SDRAM and 256MB NAND Flash
- 1 x microSD socket inside
- 2 x 10/100Mbps Ethernet ports
- 8 x RS-232 / 422 / 485 serial ports
- USB / GPIO / Audio out
- Ultra-low power consumption, less than 3 Watts

Linux-ready Arm9 Industrial IoT Gateway

Matrix-522



Features

- ATMEL AT91SAM9G20 400MHz CPU
- Linux kernel 2.6.29 with file system
- 64MB SDRAM and 256MB NAND Flash
- 1 x microSD socket inside, up to 32GB capacity
- 2 x CAN bus ports support SocketCAN / CANOpen
- 2 x 10/100Mbps Ethernet ports
- 2 x RS-232 / 422 / 485 serial ports
- 2 x USB hosts, 21 x GPIOs
- Ultra-low power consumption, less than 3 Watts

■ H/W Specifications

CPU / Memory

- CPU: ATMEL AT91SAM9G20 400MHz w/ MMU
- Memory: 64MB SDRAM, 256MB NAND Flash
- DataFlash@: 2MB, for system backup

Network Interface

- Type: 2 x 10/100BaseT, RJ45 connector
- Protection: 1.5KV magnetic isolation

TTY (Serial) Ports

- 8 x RS-232 / 422 / 485
- Connector: RJ45 connector

TTY (Serial) Port Parameters

- Baud Rate: Up to 921.6Kbps
- Parity: None, Even, Odd, Mark, Space
- Data Bits: 5, 6, 7, 8
- Stop Bits: 1, 1.5, 2
- Flow Control: RTS / CTS, XON / XOFF, None
- RS-485 Direction Control: Auto, by hardware

USB Ports

- Host Ports: 2
- Client Port: 1, reserved
- Speed: USB 2.0 compliant, supports low-speed (1.5Mbps) and full-speed (12Mbps) data rate

SD Socket (Secure Digital Card)

- Type: microSD
- No. of Sockets: 1
- Storage Capacity: Up to 32GB
- Compatibility: SD memory specification 1.0

Digital I/Os (GPIO)

- No. of Pins: 21
- Signal Level: CMOS / TTL compatible
- Each pin can be programmed as input or output

Audio Output

- MP3 and WAV format are supported

General

- Watchdog Timer: Yes
- Real-Time Clock (RTC): Yes
- Buzzer: Yes
- Power Input: +9~+40VDC
- Power Consumption: 12VDC@190mA
- Dimensions (W x H x D): 160 x 104 x 32mm (6.3 x 4.0 x 1.26in)
- Operating Temperature: 0~70°C (32~158°F)

■ S/W Specifications

General

- OS: Linux, kernel 2.6.29
- Boot Loader: U-Boot
- File Systems: UBI, JFFS2, ETX2 / ETX3, VFAT / FAT, NFS

Pre-installed Utilities

- bash, busybox, sysvinit, wget, ipkg, procps (for webmin), psmics, lighttpd, vsftpd, iptables, ppp, ssh, wireless_tools, util-linux-mount / umount, usbutils, Artila utility, and more

Daemons Started by Default

- ssh (secured shell) with sftp
- syslog / klogd (system and kernel log)
- telnet server (disable root permission in /etc/securetty)
- ftp server (vsftpd)
- web server (lighttpd)
- amgrd (Artila broadcast search daemon)

Package Management & System Administration

- Supports ipkg to manage the package installation, upgrade and removal
- Supports webmin (use 'ipkg install webmin' to install) for web-based system administration

Toolchain for Linux

- GCC: C / C++ PC cross compiler
- GLIBC: POSIX Library

■ Ordering Information

Matrix-518

- Linux-ready Arm9 Industrial IoT Gateway

CB-RJ45F9-150 (91-R45F9-150)

- Serial Cable (RJ45 to DB9 Female, 150cm)

CB-F10M9-20 (91-0P9M9-001)

- Console Cable (10Pin Header to DB9 Male, 20cm)

DK-35A (36-DK35A-000)

- DIN RAIL Mounting Kit

■ H/W Specifications

CPU / Memory

- CPU: ATMEL AT91SAM9G20 400MHz w/ MMU
- Memory: 64MB SDRAM, 256MB NAND Flash
- DataFlash@: 2MB, for system backup

Network Interface

- Type: 2 x 10/100BaseT, RJ45 connector
- Protection: 1.5KV magnetic isolation

TTY (Serial) Ports

- 2 x RS-232 / 422 / 485
- Connector: DB9 male connector

TTY (Serial) Port Parameters

- Baud Rate: Up to 921.6Kbps
- Parity: None, Even, Odd, Mark, Space
- Data Bits: 5, 6, 7, 8
- Stop Bits: 1, 1.5, 2
- Flow Control: RTS / CTS, XON / XOFF, None
- RS-485 Direction Control: Auto, by hardware

USB Ports

- Host Ports: 2
- Client Port: 1, reserved
- Speed: USB 2.0 compliant, supports low-speed (1.5Mbps) and full-speed (12Mbps) data rate

Digital I/Os (GPIO)

- No. of Pins: 21
- Signal Level: CMOS / TTL compatible
- Each pin can be programmed as input or output

CAN Bus Ports

- Type: 2 x CAN bus 2.0A/B compliant ports
- Speed: Up to 1Mbps
- Isolation: 2500Vrms
- Connector: DB9 male connector

General

- Watchdog Timer: Yes
- Real-Time Clock (RTC): Yes
- Buzzer: Yes
- Power Input: +9V~+40VDC
- Power Consumption: 12VDC@190mA
- Dimensions (W x H x D): 160 x 104 x 32mm (6.3 x 4.0 x 1.26in)

■ S/W Specifications

General

- OS: Linux, kernel 2.6.29
- Boot Loader: U-Boot
- File Systems: UBI, JFFS2, ETX2 / ETX3, VFAT / FAT, NFS

Pre-installed Utilities

- bash, busybox, sysvinit, wget, ipkg, procps (for webmin), psmics, lighttpd, vsftpd, iptables, ppp, ssh, wireless_tools, util-linux-mount / umount, usbutils, Artila utility, and more

Daemons Started by Default

- ssh (secured shell) with sftp
- syslog / klogd (system and kernel log)
- telnet server (disable root permission in /etc/securetty)
- ftp server (vsftpd)
- web server (lighttpd)
- amgrd (Artila broadcast search daemon)

Package Management & System Administration

- Supports ipkg to manage the package installation, upgrade and removal
- Supports webmin (use 'ipkg install webmin' to install) for web-based system administration

Toolchain for Linux

- GCC: C / C++ PC cross compiler
- GLIBC: POSIX Library

■ Ordering Information

Matrix-522

- Linux-ready Arm9 Industrial CAN Bus Box Computer

CB-F10M9-20 (91-0P9M9-001)

- Console Cable (10Pin Header to DB9 Male, 20cm)

DK-35A (36-DK35A-000)

- DIN RAIL Mounting Kit

Linux-ready Arm9 Industrial IoT Gateway

Matrix-505



Features

- Linux 2.6.38 compatible computing platform
- 128MB DDR2 SDRAM and 256MB NAND Flash
- System backup Data Flash: 2MB
- 2 x 10/100Mbps Ethernet ports
- 1 x RS-232 / 422 / 485, 3 x RS-232 / 485 TTY ports
- 2 x USB 2.0 host ports, up to 480Mbps
- 1 x microSD socket inside
- Extremely compact design, 78 x 108 x 24mm
- Ultra-low power consumption, less than 3 Watts

H/W Specifications

CPU / Memory

- CPU: ATMEL AT91SAM9G45 400MHz (Arm9, w/ MMU)
- Memory: 128MB DDR2 SDRAM, 256MB NAND Flash
- DataFlash@: 2MB, for system backup

Network Interface

- No. of Ports: 2, independent
- Type: 10/100BaseT, RJ45 connector
- Protection: 1.5KV magnetic isolation

TTY (Serial) Ports

- Port 1: Can be set as RS-232 / 422 / 485
- Port 2, 3, 4: Can be set as RS-232 / 485
- Connector: RJ45 connector

TTY (Serial) Port Parameters

- Baud Rate: Up to 921.6Kbps
- Parity: None, Even, Odd, Mark, Space
- Data Bits: 5, 6, 7, 8
- Stop Bits: 1, 1.5, 2
- Flow Control: RTS / CTS, XON / XOFF, None
- RS-485 Direction Control: Auto, by hardware

USB Ports

- Host Ports: 2
- Client Port: 1, reserved
- Speed: USB 2.0 compliant, supports high-speed (480Mbps) mode

General

- Watchdog Timer: Yes, for kernel use
- Real-Time Clock (RTC): Yes
- Buzzer: Yes
- microSD Socket: Inside the box
- Power Input: +9V~+48VDC
- Power Consumption: 12VDC@200mA
- Dimensions (W x H x D): 78 x 108 x 24mm (3.0 x 4.25 x 0.94in)
- Operating Temperature: 0~70°C (32~158°F)
- Regulation: CE Class A, FCC Class A

S/W Specifications

General

- OS: Linux, kernel 2.6.38
- Boot Loader: U-Boot
- File Systems: UBI, JFFS2, ETX2 / ETX3, VFAT / FAT, NFS

Pre-installed Utilities

- bash, busybox, sysvinit, wget, ipkg, procps (for webmin), psimcs, lighttpd, vsftpd, iptables, ppp, ssh, wireless_tools, util-linux-mount / umount, usbutils, Artila utility, and more

Daemons Started by Default

- ssh (secured shell) with sftp
- syslog / klogd (system and kernel log)
- telnet server (disable root permission in /etc/securetty)
- ftp server (vsftp)
- web server (lighttpd)
- amgrd (Artila broadcast search daemon)

Package Management & System Administration

- Supports ipkg to manage the package installation, upgrade and removal
- Supports webmin (use 'ipkg install webmin' to install) for web-based system administration

Toolchain for Linux

- GCC: C / C++ PC cross compiler
- GLIBC: POSIX Library

USB Host Drivers

- Generic Flash drive
- RS-232 adapters
- WiFi dongles

Ordering Information

Matrix-505

- Linux-ready Arm9 Industrial IoT Gateway with 256MB on-board Flash

CB-RJ45F9-150 (91-R45F9-150)

- Serial Cable (RJ45 to DB9 Female, 150cm)

CB-PHDF9-050 (91-PHDF9-050)

- Console Cable (Wafer Box to DB9 Female, 50cm)

DK-35A (36-DK35A-000)

- DIN RAIL Mounting Kit

PWR-12V-1A

- 100~240VAC to 12VDC 1A Power Adapter

Linux-ready Arm9 Industrial IoT Gateway

Matrix-513



Features

- ATMEL 400MHz Arm9 AT91SAM9G45 CPU
- 128MB DDR2 SDRAM and 256MB NAND Flash
- 2 x 10/100Mbps Ethernet ports
- 2 x high-speed USB hosts, up to 480Mbps
- 1 x full size miniPCIe socket inside (USB signal)
- 1 x half size miniPCIe socket inside (USB signal)
- 4 x RS-232 / 422 / 485 serial ports

H/W Specifications

CPU / Memory

- CPU: ATMEL AT91SAM9G45 400MHz w/ MMU
- Memory: 128MB DDR2 SDRAM, 256MB NAND Flash
- DataFlash@: 2MB, for system backup

Network Interface

- Type: 2 x 10/100BaseT, RJ45 connector
- Protection: 1.5KV magnetic isolation

TTY (Serial) Ports

- Type: RS-232 / 422 / 485, software select
- Connector: DB9 male
- Port 1, 3, 4: TX, RX, RTS, CTS, GND
- Port 2: TX, RX, RTS, CTS, DCD, DTR, DSR, GND

USB Ports

- Speed: Supports 480Mbps high-speed mode
- Host Ports: 2
- Client Port: 1

Digital I/Os (GPIO)

- Inputs: 2 x 5000Vrms opto-isolation
- Output: 1 x relay output (30VDC@1A), supports form A or B (by jumper)

SD Socket (Secure Digital Card)

- Type: microSD
- No. of Sockets: 1

General

- Watchdog Timer: Yes, for kernel use
- Real-Time Clock (RTC): YES
- Buzzer: YES
- Power Input: +9V~+48VDC
- Typical Consumption: 12VDC@500mA
- Dimensions (W x H x D): 175 x 103 x 43mm (6.9 x 4.05 x 1.69in)
- Operating Temperature: 0~70°C
- Regulations: CE Class A, FCC Class A

S/W Specifications

General

- OS: Linux, kernel 2.6.38
- Boot Loader: U-Boot
- File Systems: UBI, JFFS2, ETX2 / ETX3, VFAT / FAT, NFS, NTFS

Toolchain for Linux

- GCC: C / C++ PC cross compiler
- GLIBC: POSIX Library

Package Management & System Administration

- Supports ipkg to manage the package installation, upgrade and removal
- Supports webmin (use 'ipkg install webmin' to install) for web-based system administration

Platform Features

- Web server (lighttpd) with PHP 5, Python 2.6
- MySQL 5, server and client
- SQLite 3
- SNMP V1 / V2 / V3
- Java

USB miniPCIe Supports

- Interface: Supports USB signals only
- Full-size Socket: 1, suitable for 2G / 3G card
- Half-size Socket: 1, suitable for WiFi card
- Antenna Mounting Holes: 3, suitable for mounting SMA connectors

Ordering Information

Matrix-513

- Linux-ready Arm9 Industrial IoT Gateway (Note: miniPCIe card, antenna and pigtail antenna cable are ****NOT**** included)

CB-F10M9-20 (91-0P9M9-001)

- Console Cable (10Pin Header to DB9 Male, 20cm)

DK-35A (36-DK35A-000)

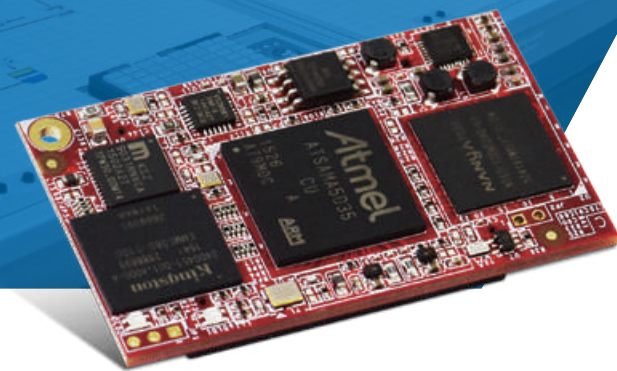
- DIN RAIL Mounting Kit

PWR-12V-1A

- 100~240VAC to 12VDC 1A Power Adapter

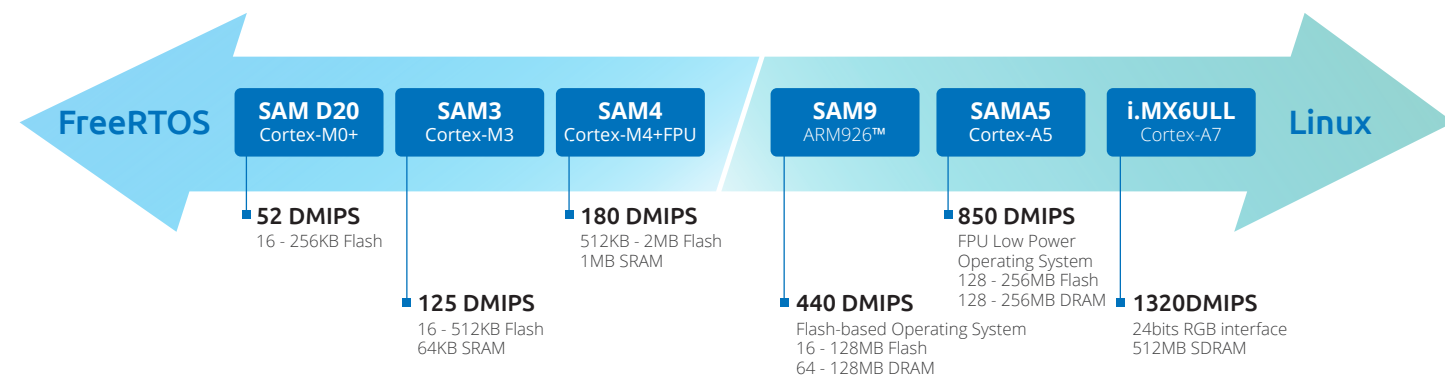
IoT Device Platform

- Ultra Low Power 32-bit Arm Processor
- Built-in Linux OS with GNU C / C++ Compiler
- Complete Device driver and Utility Support
- Production-ready and Designed-to-cost, Save Time and Resources
- Longevity Support the SoM Solution



Long-Term Partnership with Arm

A solid foundation for 32-bit Arm® processor-based MCUs



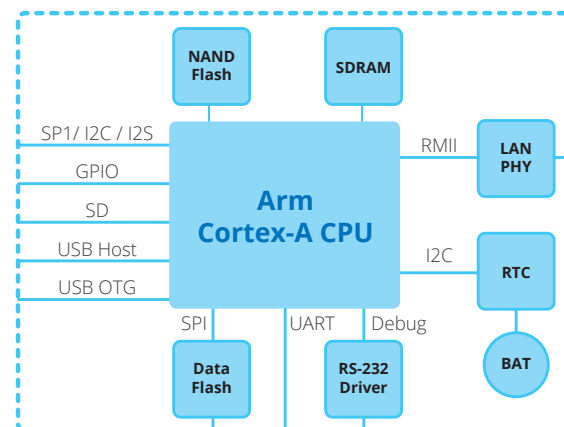
Linux Arm System On Module

Credit card size, Arm-based Linux-ready System-On-Modules with Ethernet ports, RS-232/422/485 ports, USB ports, SPI, I2S and digital inputs/outputs.

- Market-lead Low Power Consumption
- Arm Cortex-A CPU
- Miniature Size
- Variety of Interfaces

Linux Arm Single Board Computer

Arm-based Linux-ready single board computers with Ethernet ports, RS-232/422/485 ports, USB ports and digital inputs/outputs.



Comparison Table



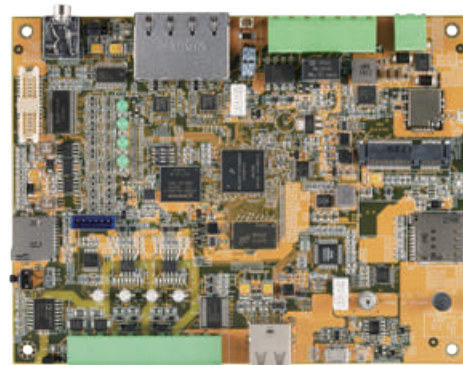
Model	SBC-7530	M-X6ULL	M-X6ULL-B	M-A5D35	M-501	M-502	M-503
CPU	NXP i.MX6ULL Cortex-A7 800MHz	NXP i.MX6ULL Cortex-A7 800MHz	NXP i.MX6ULL Cortex-A7 800MHz	Atmel ATSAM5D35 Cortex-A5 536MHz	Atmel AT91RM9200 Arm9 180MHz	Atmel AT91SAM9G20 Arm926 400MHz	Atmel AT91SAM9G20 Arm926 400MHz
Floating Point Unit	YES			N/A			
RAM	512MB SDRAM			64MB SDRAM		128MB DDR2 RAM	
Flash/eMMC	16GB eMMC	4GB/16GB eMMC	16GB eMMC	16GB eMMC	16MB NOR Flash	256MB NAND Flash	
SD / MMC	1						
Display	24-bits LVDS	24-bits RGB	24-bits RGB	N/A			
Ethernet	10/100Mbps x 2	10/100Mbps x 2	10/100Mbps x 2	GLAN x1, 10/100Mbps x 1	10/100Mbps x 1		
UART	2x RS485, 1x RS232	4-wire x2, 3-wire x2, 2-wire x1	4-wire x3, Full x1	full x 4	4-wire x3, full x 1		
CAN Bus	2	1	1	2	N/A		
Console	serial console x1	serial console x1					
USB 2.0	OTG x1, Host x2	OTG x2	HOST x1, Client x1	HOST x2, Client x1		HOST x1, Client x1	
Touch	YES	YES	YES	N/A			
I2C	0	2	1				
I2S	Audio Out	1					
SPI	0	0	1	4	1		
GPIO	Digital Input x2, Relay out x1	8-pin	15-pin	21-pin	32-pin 3.3V CMOS		
Linux Kernel	5.4.X				2.6.14	2.6.29	2.6.38
. Boot loader	BareBox				U-Boot		
. File system	EXT4/EXT3/EXT2, VFAT/FAT, NFS				JFFS2, EXT2/EXT3, VFAT/FAT, NFS		UBI, JFFS2, EXT2/3, VFAT/FAT, NFS, NTFS
Software Development	Tool Chain: gcc+glibc						
Package management	Standard apt-get command, Package repository	Standard apt-get command, Package repository			support ipkg & webmin		
Node-Red, browser-based editor	YES				N/A		
Dimensions (WxHxD) mm	150 x 115mm	43 x 68 mm	50 x 80 mm	30 x 50 mm	50 x 80 mm		
Power-Input	+9 - +48VDC	5VDC	3.3VDC	5VDC	3.3VDC	3.3VDC	3.3VDC
RTC, Watchdog Timer	YES						

Linux-ready Cortex-A7 Single Board Computer

SBC-7530

Linux-ready Cortex-A7 System on Module

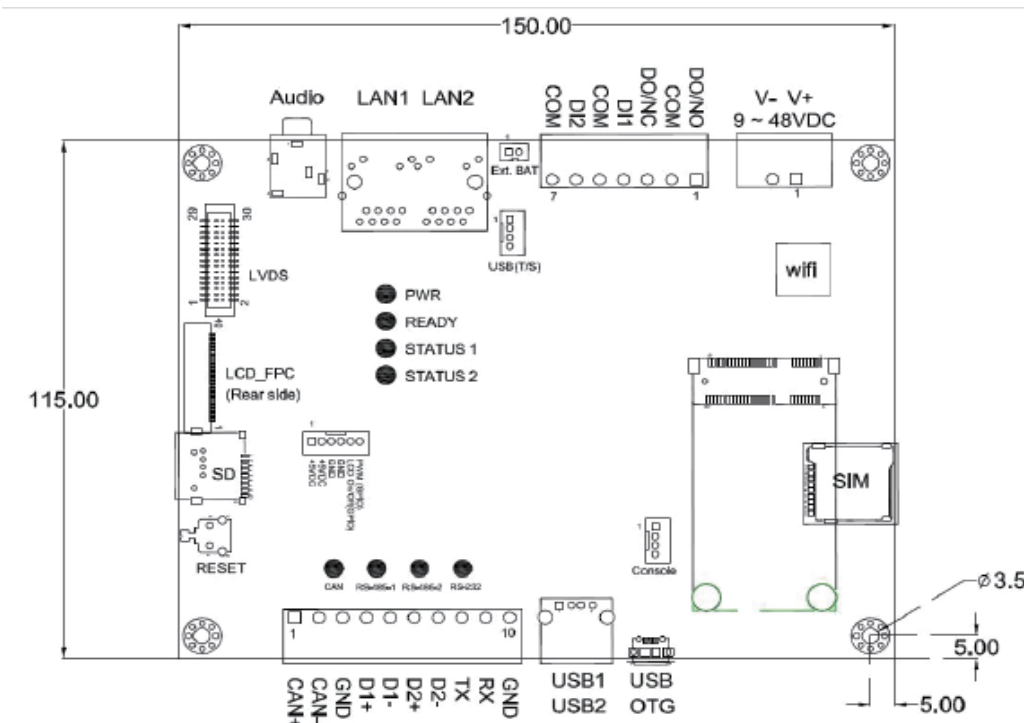
SBC-7530



Features

- NXP i.MX6ULL Cortex-A7 CPU, Up to 800MHz
- Linux kernel 5.4.x with boot loader & file system
- Toolchain: gcc 9.3.x + glibc 2.31
- 512MB DDR3/LvDDR3 SDRAM & 16GB eMMC
- Dual 10/100Mbps Ethernet Ports
- 1x CAN, 1x OTG USB, 2x HOST USB, 2x Digital Input, 1x Relay out, 2x RS-485, 1x RS-232
- 24bits LVDS display interface
- Reserved 1 x Touch sensor interface
- X11 Desktop environment
- 1 x miniPCIe slot & 1 x Miro-SIM socket & 1 x Micro-SD socket
- 1 x Temperature Sensor on board
- 1 x WLAN, 2.4G Single band WiFi support 802.11b/g/n
- Compact Size: 150mm x 115mm
- +9~48VDC Power Input

I/O Location



S/W Specifications

Operation System

- Linux kernel 5.4.x
- Support bootup from eMMC or SD card
- Supports backup from SD card or USB device
- Boot Loader : Barebox
- File System : EXT4/EXT3/EXT2, VFAT/FAT, NFS

Desktop Environment

- Matchbox (X11 Desktop Environment)
- Built-in Firefox / Chromium browser + virtual keyboard

Software Development

- Toolchain: gcc 9.3.0 + glibc 2.31
- Supports in-place C/C++ code compilation

Package Management

- Package repository: Artila self-maintained repository
- Command: Using standard apt-get command

Popular Packages

- Web server: Apache/Nginx/Lighttpd
- Database: MySQL/SQLite3/PostgreSQL
- Script Language: PHP/Python/Perl/NodeJS
- Text editor: vim/nano/sed
- Administration: Webmin

Ordering Information

SBC-7530

- Linux-ready Cortex-A7 800MHz Single Board Computer, with 512MB SDRAM&16G eMMC, LAN /USB/UART/I2C/CAN, Digital I/O, Relay out, mPCIe slot, Display Interface, Audio

CB-RJ45F9-150 (91-R45F9-150)

- Serial Cable (RJ45 to DB9 Female, 150cm)

PWR-12V-1A

- 100~240VAC to 12VDC 1A Power Adapter

Starter Kit

SBC-7530 starter Kit

- SBC-7530 single board computer with 7" Touch LCD module



H/W Specifications

CPU/Memory

- CPU: NXP i.MX6ULL Cortex-A7 MPCore, Up to 800MHz
- SDRAM: 512MB, DDR3/LvDDR3
- eMMC: 16GB

Network Interface

- 2x10/100Mbps Ethernet (RJ45)
- Protection: 1.5KV magnetic isolation

TTY (Serial) Ports

- 2 x Isolated RS-485 (1500Vrms isolation), Signal: Data+, Data-
- 1 x RS-232 (TX/RX/GND)
- Connector: Terminal block

CAN Bus Ports

- 1 x CAN bus 2.0 A/B compliant ports
- Speed: Up to 1Mbps
- Connector: Terminal block

Console / Debug Ports

- 1 x Serial console port (inside the box)

USB 2.0 Host Interface

- 1 x USB OTG Port (microUSB connector)
- 2 x USB Host Port (USB Type-A connector)

Audio Out

- 1 x Line-out R/L port, optional Earphone R/L
- Connector: Earphone-Jack

Digital Input

- 2 x Digital Input channels
- Isolation Protection: 2500Vrms (Photo-Coupler)
- Logical High: 5~24VDC
- Power Requirement

Relay Output

- 1 x Relay out channel
- Contact Rating: 30VDC@1A or 125VAC@0.5A

Display Interface

- One LVDS 24bits digital Display interface
- Support max. 85 MHz display clock and up to WXGA (1366 x 768) at 60 Hz
- Support PWM(Pulse Width Modulation) for LCD brightness control

Touch Sensor Interface

- Support 4-wire resistive touch panel (USB interface)

Expansion

- 1 x miniPCIe Full-size sock (Full Size)
- 1 x micro-SIM card socket reserve

Temperature Sensor

- 1 x Temperature Sensor on board (I2C)

WLAN Interface

- 1 x WiFi Interface
- Frequency Band: 2.4G Single band
- IEEE standard support: 802.11b/g/n
- Antenna: 1T1R IIPEX connector on board)

SD Slot

- 1 x microSD socket
- SD 2.0 compliant, supports SDHC

General

- Power Input: +9~48VDC
- Watch-Dog Timer: YES
- Real-Time Clock (RTC): YES
- Dimensions (W x L): 150mm x 115mm (5.9in x 4.5in)
- Mounting Hole x4 reserved , 3.0mm (M3) in diameter
- Consumption: 2.16Watts (NO expansion module / LCD)
- 1 x Reset Switch
- LEDIndicators: Power LED, Ready LED, Status LED (User define) x2

Linux-ready Cortex-A7 System on Module M-X6ULL



Features

- NXP i.MX6ULL Cortex-A7 CPU, Up to 800MHz
- Linux kernel 5.10.x or up with boot loader & file system
- Toolchain: gcc 9.3.0 + glibc 2.31
- 512MB DDR3/LvDDR3 SDRAM, 4GB eMMC
- 2x 10/100MHz Ethernet interface
- 1x CAN, 2x OTG/HOST USB, 4x UART & I2C / I2S/GPIO
- SD interface, Serial console
- 24bits RGB display interface, 4-wired resistive touch interface
- SODIMM 200 form factor, Compact size, 68 x 43mm
- Single 5VDC operation

H/W Specifications

CPU / Memory

- CPU: NXP i.MX6ULL Cortex-A7 MPCore, Up to 800MHz
- SDRAM: 512MB, DDR3/LvDDR3
- eMMC: 4GB

Network Interface

- Type: 2 x 10/100Mbps Ethernet
- RMII interface

CAN Interface

- 2 x Flexible Controller Area Network (FlexCAN)
- CAN1~2: TX/RX, compliant to CAN 2.0 partA/B

UART Interface

- UART1: TX, RX
- UART2: TX, RX, RTS, CTS
- UART5-6: TX, RX, CTS
- Signal Level: 3.3V

Common UART Parameters

- Baud Rate: up to 921.6Kbps
- Parity: None, Even, Odd, Mark, Space
- Data Bits: 5, 6, 7, 8
- Stop Bits: 1, 1.5, 2
- Flow Control: RTS / CTS, XON / XOFF, None

USB 2.0 Interface

- Supports 480Mbps high-speed mode
- Two high-speed OTG 2.0 modules with integrated HS USB PHYs

I2S Interface

- Transmit Signals: TX, Sync, CLK
- Receive Signals: RX, Sync, CLK

I2C Interface

- Signals: ata(SDA), clock(SCL)

GPIO (General-purpose I/Os)

- No. of Pins: 8

Console / Debug Ports

- Serial console port (TX / RX / GND)

Display Interface

- One 24bits RGB digital parallel display interface
- Support max 85MHz display clock, Up to WXGA (1366x768) at 60Hz

Touch Sensor Interface

- With touch controller to support 4-wire/5-wire resistive touch panel

SD nterface

- Signal: cmd, clock, data0~3, card detect
- SDHC compatible

General

- Power Input: +5VDC, Consumption: 0.75Watts (Typical)
- SODIMM 200P Form Factor
- Watch-Dog Timer: YES
- Real-Time Clock (RTC): YES
- Dimensions (W x L): 68 x 43 mm

S/W Specifications

Operation System

- Linux kernel 5.10.x or up
- Support bootup from eMMC or SD card
- Boot Loader: Barebox
- File System: EXT4/EXT3/EXT2, VFAT/FAT, NFS
- GUI Engine: X11

Desktop Environment

- Matchbox (X11 Desktop Environment)
- Built-in Firefox / Chromium browser + virtual keyboard

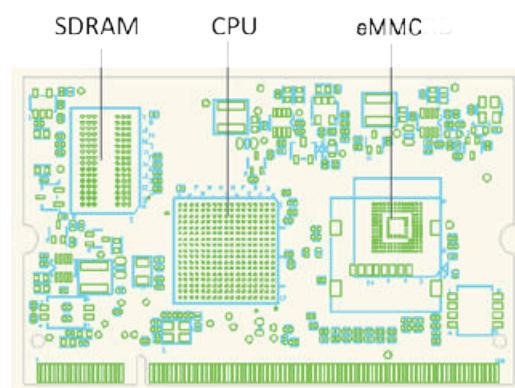
Software Development

- Toolchain: gcc 9.3.0 + glibc 2.31
- Supports in-place C/C++ code compilation

Package Management

- Package repository: Artila self-maintained repository
- Command: Using standard apt-get command

Front View

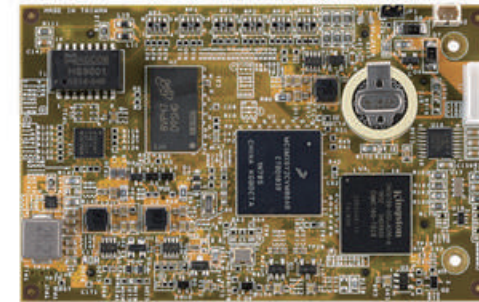


Ordering Information

M-X6ULL

- Linux-ready Cortex-A7 800MHz System on Module with 512MB SDRAM (SODIMM type)

Linux-ready Cortex-A7 System on Module M-X6ULL-B



Features

- NXP i.MX6ULL Cortex-A7 CPU, Up to 800MHz
- Linux kernel 5.10.x or up with boot loader & file system
- Toolchain: gcc 9.3.x + glibc 2.31
- 512MB DDR3/LvDDR3 SDRAM, 16GB eMMC
- 1x 10/100MHz Ethernet interface
- 4x UART, 2x USB & I2C / I2S / SPI / GPIO/RMII interface
- SD interface, Serial console
- 24bits RGB display interface, 4-wired resistive touch interface
- Compact size, 50 x 80mm
- Single 3.3VDC Power-in

H/W Specifications

CPU / Memory

- CPU: NXP i.MX6ULL Cortex-A7 MPCore, Up to 800MHz
- SDRAM: 512MB, DDR3/LvDDR3
- eMMC: 16GB

Micro-SD 2.0 Interface

- Signals: cmd, clock, data0~3, card_detect
- SDHC Compatible

Network Interface

- Type: 1 x 10/100Mbps Ethernet with PHY
- Signal: EXT+, EXT-, ERX+, ERX
- Protection: 1.5KV Magnetic isolation

UART Interface

- UART1~4: TX, RX, RTS, CTS, GND
- Signal Level: 3.3V

Common UART Parameters

- Baud Rate: up to 921.6Kbps
- Parity: None, Even, Odd, Mark, Space
- Data Bits: 5, 6, 7, 8
- Stop Bits: 1, 1.5, 2
- Flow Control: RTS / CTS, XON / XOFF, None

USB 2.0 Interface

- Supports 480Mbps high-speed mode
- 1x Host USB 2.0 Port, 1x USB Client Port

I2S (Inter-Integrated Circuit Sound) Interface

- Transmit Signals: TX, Sync, CLK
- Receive Signals: RX

I2C (Inter-Integrated Circuit) Interface

- Signals: data(SDA), clock (SCL)

SPI (Serial Peripheral Interface)

- Data Signal: MISO, MOSI, SCLK
- Chip Select: CS1

GPIO (General-purpose I/Os) & RMII Interface

- Total No. of Pins: 15

Console / Debug Ports

- Serial console port (TX / RX / GND)

Display Interface

- One 24bits RGB digital parallel display interface
- Support max 85 MHz display clock, Up to WXGA (1366x768) at 60Hz

Touch Sensor Interface

- Support 4-wire resistive touch pane

SD nterface

- Signal: cmd, clock, data0~3, card detect
- SDHC compatible

General

- Power Input: +3.3VDC, Consumption: 0.75Watts (Typical)
- Watch-Dog Timer: YES
- Real-Time Clock (RTC): YES
- Dimensions (W x L): 50 x 80mm
- Mounting Hole x 2 reserved , 2.0mm (M2) in diameter
- Pins: Total 128pins, 2.0mm pitch, CN1(28pin)/CN2(50pin)/CN3(50pin)

S/W Specifications

Operation System

- Linux kernel 5.10.x or up
- Support bootup from eMMC or SD card
- Boot Loader: Barebox
- File System: EXT4/EXT3/EXT2, VFAT/FAT, NFS
- GUI Engine: X11

Desktop Environment

- Matchbox (X11 Desktop Environment)
- Built-in Firefox / Chromium browser + virtual keyboard

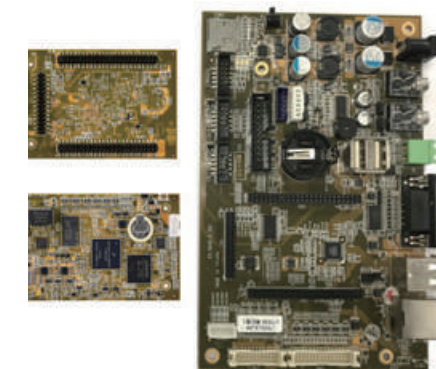
Software Development

- Toolchain: gcc 9.3.0 + glibc 2.31
- Supports in-place C/C++ code compilation

Package Management

- Package repository: Artila self-maintained repository
- Command: Using standard apt-get command

SOM + EVK board



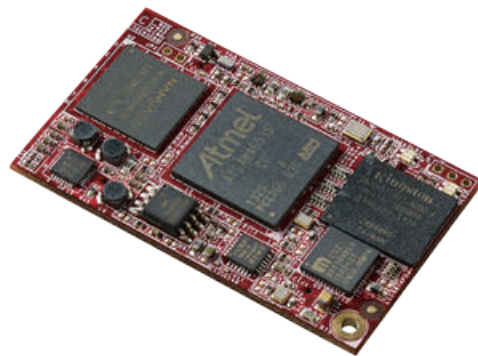
Ordering Information

M-X6ULL-B

- Linux-ready Cortex-A7 800MHz System on Module with 512MB SDRAM 16GB eMMC, (PIN-Header type)

Linux-ready Cortex-A5 System on Module M-A5D35

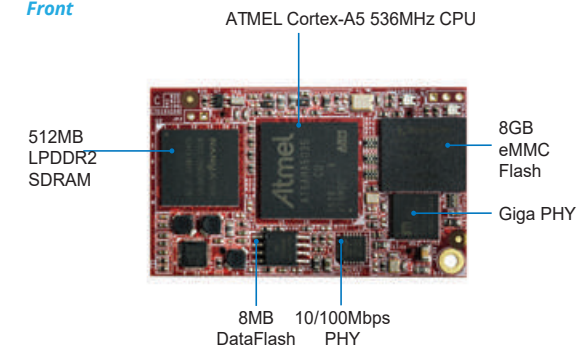
Linux-ready Cortex-A5 System on Module M-A5D35



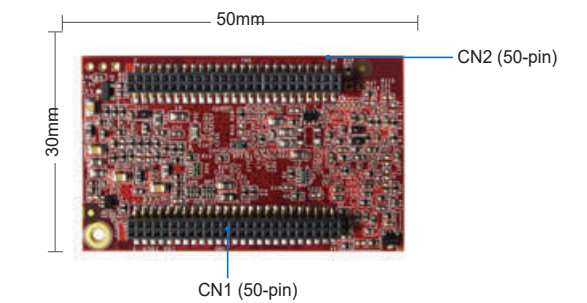
Features

- ATMEl Arm Cortex-A5 ATSAMA5D35 536MHz CPU
- Linux kernel 5.4.x with file system
- Toolchain gcc 9.3.0 + glibc 2.31
- 512MB LPDDR2 SDRAM
- 16GB eMMC Flash and 8MB DataFlash for system backup
- Dual Ethernet interface, 1 x Gigabit and 1 x 10/100Mbps, with on-board PHY
- SPI / I2C / I2S / UART / USB / GPIO / CAN / SD
- Miniature size, 50 x 30 mm only
- Single 5VDC operation, less than 1.0W

Front



Rear



H/W Specifications

CPU / Memory

- CPU: ATMEl Cortex-A5 ATSAMA5D35 536MHz w/ MMU
- SDRAM: 512MB, LPDDR2
- Flash: 16GB, eMMC
- DataFlash: 8MB, for system backup

Network Interface

- Type: 1 x Gigabit and 1 x 10/100Mbps Ethernet
- PHY: Micrel KSZ8081RNAIA (10/100Mbps)
- PHY: Micrel KSZ9031RNXCA (Gigabit)

UART Interface

- UART1: TX, RX, RTS, CTS (shared w/ CAN1 TX)
- UART2~4: TX, RX, RTS, CTS
- Signal Level: 3.3V

Common UART Parameters

- Baud Rate: up to 921.6Kbps
- Parity: None, Even, Odd, Mark, Space
- Data Bits: 5, 6, 7, 8
- Stop Bits: 1, 1.5, 2
- Flow Control: RTS / CTS, XON / XOFF, None

CAN Interface

- CAN1: TX (shared w/ UART1 CTS), RX
- CAN2: TX, RX

Console / Debug Ports

- Serial console port (UART interface)
- USB console port

USB 2.0 Host Interface

- Supports 480Mbps hi-speed mode
- Host ports: 2

SPI Interface

- Signals: MISO, MOSI, clock
- Chip Selects: 4, CS0-CS3

I2C Interface

- Signals: data, clock

I2S Interface

- Transmit Signals: data, clock, sync
- Receive Signals: data, clock, sync

SD 2.0 Interface

- Signals: cmd, clock, data0~3, card_detect
- SDHC Compatible

Watchdog Interface

- 1 x external watchdog timer input
- 1 x watchdog timer output

GPIO (General-purpose I/Os)

- No. of Pins: 21

Power Requirement

- Power Input: +5VDC
- Power Consumption: 0.75 Watts (typical)

General

- Dimensions (W x L): 50 x 30mm
- Pins: Total 50x2 pins, 1.27mm pitch Female header
- Mounting Hole: x 1, 2.0mm (M2) in diameter

S/W Specifications

Operation System

- Linux kernel 5.4.x with file system
- Supports bootup from eMMC or SD card
- Boot Loader : Barebox
- File System: EXT4/ETX3/ETX2, VFAT/FAT, NFS

Software Development

- Toolchain: gcc 9.3.0 + glibc 2.31
- Supports in-place C/C++ code compilation

Package Management

- Package repository: Artila self-maintained repository
- Command: Using standard apt-get command

Popular Packages

- Web server: Apache/Nginx/Lighttpd
- Database: MySQL/SQLite3/PostgreSQL
- Script Language: PHP/Python/Perl/NodeJS
- Text editor: vim/nano/sed
- Administration: Webmin

Ordering Information

M-A5D35

- Linux-ready Cortex-A5 536MHz System on Module with 512MB SDRAM, 16GB eMMC Flash

M-A5D35 Starterkit

- Includes one M-A5D35 SoM and one carrier board with power circuitry, Ethernet, Serial port/USB and SD socket

Pin Assignment

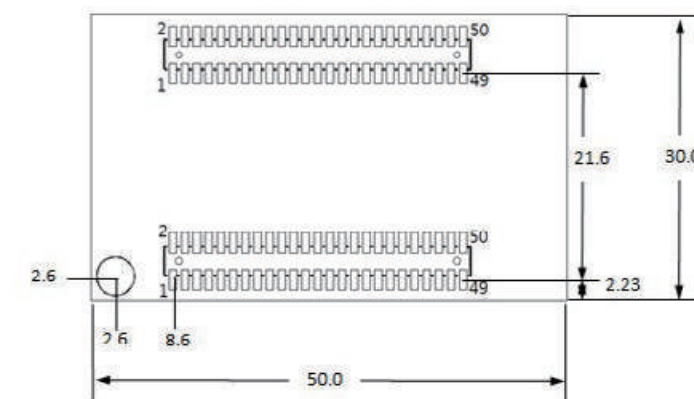
CN1	
GLAN_RX2-	1
GLAN_TX2+	3
GLAN_RX1-	5
GLAN_TX1+	7
GLAN_GND	9
LAN_TX+	11
LAN_TX-	13
LAN_RX+	15
LAN_RX-	17
Ready_LED	PD5
USB Device Data-	21
USB Host_1 Data+	23
USB Host_1 Data-	25
Buzzer	PD6
Wakeup	N/A
H/W Reset	RST#1
CLK	PD18
	GND
	+5V

CN2	
BAT_In	1
GND	3
PD14 or CAN0_RXD	5
PD15 or CAN0_TXD	7
PD16 or COM1_RTS	9
PD17 or COM1_RXD	11
PD18 or COM1_TXD	13
PE23 or COM3_CTS	15
PE24 or COM3_RTS	17
PE25 or COM3_RXD	19
PE26 or COM3_TXD	21
PA18 or I2C_Data	23
PA19 or I2C_Clk	25
PD0 or SD_CMD	27
PD1 or SD_Data0	29
PD2 or SD_Data1	31
PD3 or SD_Data2	33
PD4 or SD_Data3	35
PD9 or SD_CLK	37
PA27 or SD_CD	39
PA28	41
PA21	43
PA22	45
PA23	47
RST#2	49
+5V	50

CN2	
BAT_In	1
GND	3
PD14 or CAN0_RXD	5
PD15 or CAN0_TXD	7
PD16 or COM1_RTS	9
PD17 or COM1_RXD	11
PD18 or COM1_TXD	13
PE23 or COM3_CTS	15
PE24 or COM3_RTS	17
PE25 or COM3_RXD	19
PE26 or COM3_TXD	21
PA18 or I2C_Data	23
PA19 or I2C_Clk	25
PD0 or SD_CMD	27
PD1 or SD_Data0	29
PD2 or SD_Data1	31
PD3 or SD_Data2	33
PD4 or SD_Data3	35
PD9 or SD_CLK	37
PA27 or SD_CD	39
PA28	41
PA21	43
PA22	45
PA23	47
RST#2	49
+5V	50

Note: pin 7 also can be used as COM1_CTS

Dimension



Linux-ready Arm9 System on Module M-501

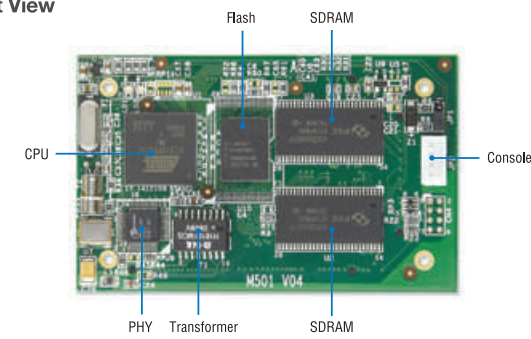
Linux-ready Arm9 System on Module M-501



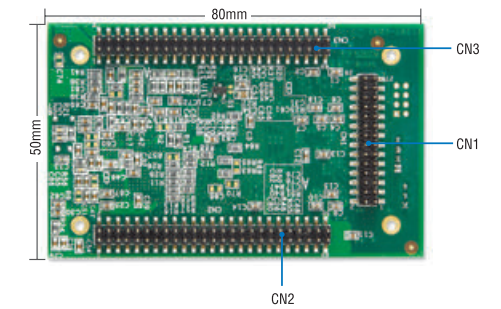
Features

- ATMEL 180MHz AT91RM9200 CPU w/ MMU
- Linux kernel 2.6.14 with file system
- 64MB SDRAM and 16MB NOR Flash
- 1 x 10/100Mbps Ethernet
- 2 x USB 2.0 hosts supporting full speed of 12Mbps
- 1 x SD (secure digital) interface
- 4 x 921.6Kbps UARTs w/ hardware flow control
- External bus (A0-A7, D0-D7, RD, WR), with 4 x chip select
- Ultra-low power consumption, less than 2.5 Watts
- GNU C / C++ toolchain is included

Front View



Rear View



H/W Specifications

CPU / Memory

- CPU: ATMEL 180MHz AT91RM9200 w/ MMU
- Memory: 64MB SDRAM, 16MB NOR Flash

Network Interface

- Type: 1 x 10/100Mbps Ethernet
- PHY: DAVIDCOM DM9161
- Protection: 1.5KV magnetic isolation

UART Interface

- Port 0: TXD0, RXD0, RTS0, CTS0, GND
- Port 1: TXD1, RXD1, RTS1, CTS1, DCD1, DTR1, DSR1, GND
- Port 2: TXD2, RXD2, RTS2, CTS2, GND
- Port 3: TXD3, RXD3, RTS3, CTS3, GND
- Signal Level: CMOS / 3.3V compatible

Common UART Parameters

- Baud Rate: Up to 921.6Kbps
- Parity: None, Even, Odd, Mark, Space
- Data Bits: 5, 6, 7, 8
- Stop Bits: 1, 1.5, 2
- Flow Control: RTS / CTS, XON / XOFF, None

UART Advanced Feature (When Used as RS-485)

- Supports 9-bit Multi-drop mode
- Supports hardware auto direction control

USB Ports

- Host Ports: 2, USB 2.0 compliant
- Host Signals: UdataA+, UdataA-, UdataB+, UdataB

I2C(Inter-IC Bus)

- Signals: TWD, TWCK
- Supported Devices: Driver has been built-in

I2S (Inter-IC Sound)

- Transmitter Signals: TSCK, TWS, TSD
- Receiver Signals: RSCK, RWS, RSD

SPI (Serial Peripheral Interface)

- Signals: MISO, MOSI, SPCK, CS1, CS2

SD (Secure Digital Card Interface)

- Signals: MCCA, MCCK, MCDA0-MCDA3
- Compatible with SD memory card specification 1.0

Watchdog Timer

- CPU built-in internal watchdog timer, used by Linux kernel

GPIO (General-purpose I/Os)

- 32 x GPIOs can be programmed as digital input or output
- Supports interrupt function when GPIOs are set as digital input
- Signal Level: CMOS / 3.3V compatible

Pre-defined Pins

- Reset Button (CN2, pin#35), input
- Buzzer (CN2, pin#37), output
- 2-pin DIP SW (CN2, pin#12, #13), input
- System ready LED (CN2, pin#38), output
- LAN activity LED (CN3, pin#11), output

Undefined Digital I/O Pins (Reserved)

- CN1: pin#23, #24, #25, #26
- CN3: pin#23, #24

Debug Ports

- Console Port: Tx / Rx serial console (share RTS2, CTS2)

Local Bus

- Data Bus: 8-bit (D0-D7)
- Address Bus: 8-bit (A0-A7)
- Chip Select: x 4 (CS3, CS4, CS5, CS6)
- Control Bus: RD, WR
- Signal Level: CMOS / 3.3V compatible

Power Requirement

- Power Input: +3.3VDC (Typical)
- Power Consumption: 2W

General

- Board Dimensions (W x L): 80 x 50mm
- 2.0mm Pitch Connectors
- CN1: 28 pins; CN2: 50 pins; CN3: 50 pins
- Mounting Holes: x 4, 2.0mm (M2) in diameter
- Operating Temperature:
 - M-501: 0~70°C (32~158°F)
 - M-501T: -20~80°C (-4~176°F)

S/W Specifications

General

- OS: Linux, kernel 2.6.14
- Boot Loader: U-Boot
- File Systems: JFFS2, ETX2, VFAT / FAT, NFS

Pre-installed Utilities

- bash, busybox, wget, boa, iptables, ppp, ssh, wireless_tools, Artila utility

Daemons Started by Default

- ssh (secured shell)
- syslog / klogd (system and kernel log)
- telnet server (disable root permission in /etc/security)
- ftp server (vsftpd)
- web server (lighttpd)
- amgrd (Artila broadcast search daemon)

Common UART Parameters

- Baud Rate: Up to 921.6Kbps
- Parity: None, Even, Odd, Mark, Space
- Data Bits: 5, 6, 7, 8
- Stop Bits: 1, 1.5, 2
- Flow Control: RTS / CTS, XON / XOFF, None

Toolchain for Linux

- GCC: C / C++ PC cross compiler
- GLIBC: POSIX Library

Standard Device Drivers

- SD / MMC, UART, Ethernet, GPIO, Buzzer
- Real-Time Clock (RTC): Supports Ricoh RS5C372
- EEPROM: Supports ATMEL AT24C16 and its compatibles

Pre-load USB Host Drivers (Could Be Customized)

- Generic Flash drive
- IEEE-802.11 WiFi adapter
- 10/100Mbps Fast Ethernet adapter
- RS-232 adapter
- ADSL modem
- ISDN modem (CDC / ACM compatible)

Ordering Information

M-501

- AT91RM9200 + Linux 2.6.14 System on Module with 64MB SDRAM, 16MB NOR Flash

M-501T

- AT91RM9200 + Linux 2.6.14 System on Module with 64MB SDRAM, 16MB NOR Flash, Wide-temp. Version

M-501 Starter Kit

- Includes one M-501 SoM and one carrier board with power circuitry, 3 x RS-232 ports, 1 x RS-232 / 422 / 485 port, 1 x Ethernet port, 2 x USB hosts, 1 x SD socket (at rear side), 2 x GPIO connectors, Real Time Clock, EEPROM, and local bus connector

Linux-ready Arm9 System on Module M-502

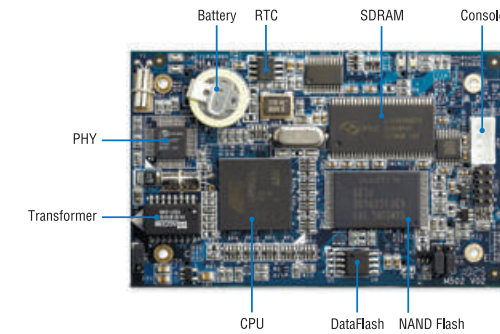
Linux-ready Arm9 System on Module M-502



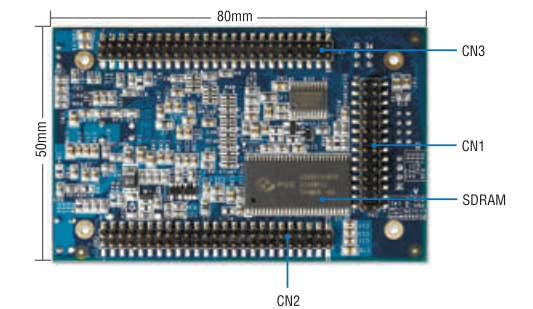
Features

- ATMEL 400MHz AT91SAM9G20 CPU w/ MMU
- Linux kernel 2.6.29 with file system
- 64MB SDRAM and 256MB NAND Flash
- 1 x 10/100Mbps Ethernet
- 2 x USB 2.0 hosts supporting full speed of 12Mbps
- 1 x SD (secure digital) interface
- 4 x 921.6Kbps UARTs w/ hardware flow control
- 32 x GPIOs, CMOS / 3.3V compatible
- Compact size, 50 x 80mm only
- Ultra-low power consumption, less than 2.5 Watts
- GNU C / C++ toolchain is included

Front View



Rear View



H/W Specifications

CPU / Memory

- CPU: ATMEL 400MHz AT91SAM9G20 w/ MMU
- Memory: 64MB SDRAM, 256MB NAND Flash
- DataFlash@: 2MB, for system backup

Network Interface

- Type: 1 x 10/100Mbps Ethernet
- PHY: DAVIDOM DM9161
- Protection: 1.5KV magnetic isolation

UART

- Port 0: TXD0, RXD0, RTS0, CTS0, GND
- Port 1: TXD1, RXD1, RTS1, CTS1, DCD1, DTR1, DSR1, GND
- Port 2: TXD2, RXD2, RTS2, CTS2, GND
- Port 3: TXD3, RXD3, RTS3, CTS3, GND
- Signal Level: CMOS / 3.3V compatible

Common UART Parameters

- Baud Rate: Up to 921.6Kbps
- Parity: None, Even, Odd, Mark, Space
- Data Bits: 5, 6, 7, 8
- Stop Bits: 1, 1.5, 2
- Flow Control: RTS / CTS, XON / XOFF, None

UART Advanced Feature (When Used as RS-485)

- Supports 9-bit Multi-drop mode
- Supports hardware auto direction control

USB Ports

- Host Ports: 2, USB 2.0 compliant
- Host Signals: UdataA+, UdataA-, UdataB+, UdataB-
- Device (Client): 1, USB 2.0 compliant
- Device (Client) Signals: Uddata+, Uddata-, Udio

I2C(Inter-IC Bus)

- Signals: TWD, TWCK
- Supported Devices: Driver has been built-in

I2S (Inter-IC Sound)

- Transmitter Signals: TSCK, TWS, TSD
- Receiver Signals: RSCK, RWS, RSD

SPI (Serial Peripheral Interface)

- Signals: MISO, MOSI, SPCK, CS1, CS2

SD (Secure Digital Card Interface)

- Signals: MCCDA, MCCK, MCDA0-MCDA3
- Compatible with SD memory card specification 1.0

Watchdog Timer

- CPU built-in internal watchdog timer, used by Linux kernel
- Additional watchdog timer is available for users' applications

GPIO (General-purpose I/Os)

- 32 x GPIOs can be programmed as digital input or output
- Signal Level: CMOS / 3.3V compatible

Pre-defined Pins

- Reset Button (CN2, pin#35), input
- Buzzer (CN2, pin#37), output
- 2-pin DIP SW (CN2, pin#12, #13), input
- System ready LED (CN2, pin#38), output
- LAN activity LED (CN3, pin#11), output

Real Time Clock

- Chip: ST M41T81
- Backup Battery: Lithium, 48mAh

Debug Ports

- JTAG Port: for low level debug
- Console Port: RS-232 (Tx / Rx) serial console

Local Bus

- Data Bus: 8-bit (D0-D7)
- Address Bus: 8-bit (A0-A7)
- Chip Select: x 3 (CS0, CS5, CS6)
- Control Bus: RD, WR
- Signal Level: CMOS / 3.3V compatible

Power Requirement

- Power Input: +3.3VDC (Typical)
- Power Consumption: 2W

General

- Board Dimensions (W x L): 80 x 50mm
- 2.0mm Pitch Connectors
- CN1: 28 pins; CN2: 50 pins; CN3: 50 pins
- Mounting Holes: x 4, 2.0mm (M2) in diameter
- Operating Temperature: 0~70°C (32~158°F)

S/W Specifications

General

- OS: Linux, kernel 2.6.29
- Boot Loader: U-Boot
- File Systems: UBI, JFFS2, ETX2 / ETX3, VFAT / FAT, NFS

Pre-installed Utilities

- bash, busybox, sysvinit, wget, ipkg, procps (for webmin), psmics, lighttpd, vsftpd, iptables, ppp, ssh, wireless_tools, util-linux-mount / umount, usbtutils, Artila utility

Daemons Started by Default

- ssh (secured shell) with sftp
- syslog / klogd (system and kernel log)
- telnet server (disable root permission in /etc/security)
- ftp server (vsftpd)
- web server (lighttpd)
- amgrd (Artila broadcast search daemon)

Package Management & System Administration

- Supports ipkg to manage the package installation, upgrade and removal
- Supports webmin (use 'ipkg install webmin' to install) for web-based system administration

Toolchain for Linux

- GCC: C / C++ PC cross compiler
- GLIBC: POSIX Library

Standard Device Drivers

- Real Time Clock, SD / MMC, UART, Ethernet, GPIO, Buzzer
- EEPROM: Supports ATMEL AT24C16 and its compatibles

Pre-load USB Host Drivers (Could Be Customized)

- Generic Flash drive
- IEEE-802.11 WiFi adapter
- 10/100Mbps Fast Ethernet adapter
- RS-232 adapter
- ADSL modem
- ISDN modem (CDC / ACM compatible)

Ordering Information

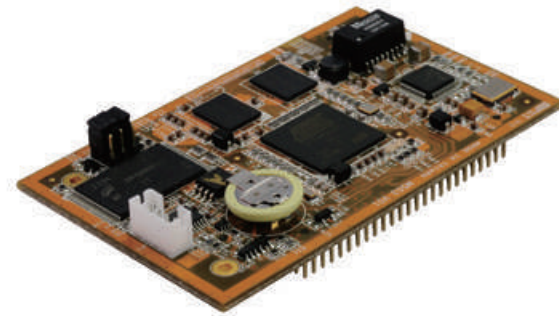
M-502

- ATMEL9G20 + Linux 2.6.29 System on Module with 256MB NAND Flash, 64MB SDRAM

M-502 Starter Kit

- Includes one M-502 SoM and one carrier board with power circuitry, 3 x RS-232 ports, 1 x RS-232 / 422 / 485 port, 1 x Ethernet port, 2 x USB hosts, 1 x SD socket (at rear side), 2 x GPIO connectors, Real Time Clock, EEPROM, and local bus connector

Linux-ready Arm9 System on Module M-503

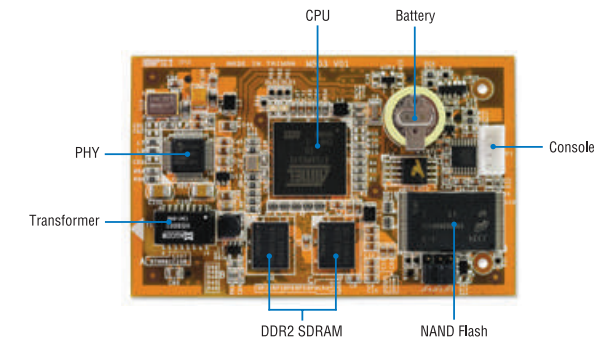


Features

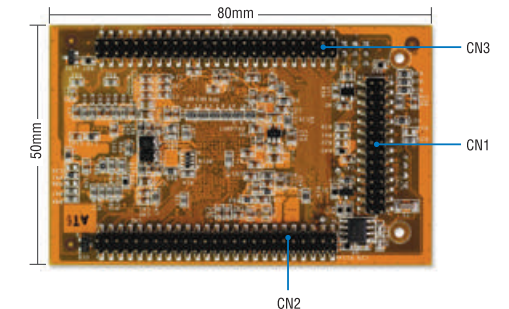
- ATMEL 400MHz AT91SAM9G45 CPU w/ MMU
- Linux kernel 2.6.38 with file system
- 128MB DDR2 SDRAM and 256MB NAND Flash
- GNU C / C++ toolchain is included
- 1 x 10/100Mbps Ethernet interface, with PHY and transformer on board
- 4 x 921.6Kbps UARTs w/ hardware flow control
- 1 x USB 2.0 host supporting high speed of 480Mbps
- 1 x SD (secure digital) interface, 1 x I2C interface, 1 x I2S interface, 1 x transmitter and 1 x receiver
- 1 x SPI interface with two chip selects

Linux-ready Arm9 System on Module M-503

Front View



Rear View



H/W Specifications

CPU / Memory

- CPU: ATMEL 400MHz AT91SAM9G45 w/ MMU
- Memory: 128MB DDR2 SDRAM, 256MB NAND Flash
- DataFlash@: 2MB, for system backup

Network Interface

- Type: 1 x 10/100Mbps Ethernet
- Signals: ETX+, ETX-, ERX+, ERX-
- PHY: DAVIDCOM DM9161, on-board
- Protection: 1.5KV magnetic isolation

UART

- UART 1: TX, RX, RTS, CTS, GND
- UART 2: TX, RX, RTS, CTS, DCD, DTR, DSR, GND
- UART 3: TX, RX, RTS, CTS, GND
- UART 4: TX, RX, RTS, CTS, GND
- Signal Level: CMOS / 3.3V compatible

Common UART Parameters

- Baud Rate: Up to 921.6Kbps
- Parity: None, Even, Odd, Mark, Space
- Data Bits: 5, 6, 7, 8
- Stop Bits: 1, 1.5, 2
- Flow Control: RTS / CTS, XON / XOFF, None

USB Ports

- Speed: Supports 480Mbps high-speed mode
- Host Port: 1, USB 2.0 compliant
- Host Signals: USBA+, USBA-
- Device (Client): 1, USB 2.0 compliant
- Device (Client) Signals: Uddata+, Uddata-, Udio

I2C(Inter-IC Bus)

- Signals: TWD, TWCK
- Supported Devices: EEPROM, Real Time Clock

I2S (Inter-IC Sound)

- Transmitter Signals: TSCK, TWS, TSD
- Receiver Signals: RSCK, RWS, RSD

SPI (Serial Peripheral Interface)

- Data Signals: MISO, MOSI, SPCK
- Chip Selects: CS1, CS2

SD (Secure Digital Card Interface)

- Data Signals: MCCDA, MCKK, MCDA0~MCDA3
- Aux. Signals: CD (Card Detection), WP (Write Protect)
- Compatibility: SD memory card specification 2.0

Watchdog Timer

- CPU built-in watchdog timer, used by Linux kernel
- Additional watchdog timer is available for users' applications

GPIO (General-purpose I/Os)

- No. of Pins: 32, PIO0~PIO32, for input / output
- IRQ Support: PIO32 only
- Signal Level: CMOS / 3.3V compatible

Pre-defined I/O Pins

- Reset Button (CN2, pin#35), input
- System Reset (CN2, pin#34), input / output
- Buzzer (CN2, pin#37), output
- System Ready LED (CN2, pin#38), output
- LAN activity LED (CN3, pin#11), output

Real Time Clock

- Chip: ST M41T81
- Backup Battery: Lithium, 48mAh, on-board
- External Battery Input: on CN1 pin#5

Debug Ports

- Type: RS-232 serial console
- Signals: Tx, Rx, GND

Power Requirement

- Power Input: +3.3VDC (Typical)
- Power Consumption: 2Watts (Typical)

General

- Board Dimensions (W x L): 80 x 50mm
- Pins: Total 128 pins, 2.0mm pitch
- CN1: 28 pins; CN2: 50 pins; CN3: 50 pins
- Mounting Holes: x 2, 2.0mm (M2) in diameter

S/W Specifications

General

- OS: Linux, kernel 2.6.38
- Boot Loader: U-Boot

File Systems

- UBI, JFFS2, ETX2 / ETX3, VFAT / FAT, NFS, NTFS

Pre-installed Utilities

- bash, busybox, gtk+, x11, gpe, alsa, madplayer, psplash, sysvinit, wget, ipkg, procps (for webmin), psmics, lighttpd, vsftpd, iptables, ppp, openssh, wireless_tools, util-linux-mount / umount, usbutils, python, jamvm, php, mysql, perl, qt4-embedded, sqlite3, snmp, Artila utility and more

Daemons Started by Default

- ssh (secured shell) with sftp
- syslog / klogd (system and kernel log)
- telnet server (disable root permission in /etc/security)
- ftp server (vsftp)
- web server (lighttpd)
- amgrd (Artila broadcast search daemon)

Toolchain for Linux

- GCC: C / C++ cross compiler
- GLIBC: POSIX Library

IPKG Package Management

- Supports ipkg to manage the package installation, upgrade and removal

Webmin System Administration

- Supports webmin for web-based system administration

Standard Device Drivers

- Real Time Clock, SD / MMC, UART, Ethernet, GPIO, Buzzer, EEPROM (ATMEL AT24C16 and compatibles), Audio out

Pre-load USB Device Drivers (Could Be Customized)

- Generic Flash drive
- IEEE-802.11 WiFi adapter
- 10/100Mbps Fast Ethernet adapter
- RS-232 adapter
- Webcam
- Keyboard / Mouse
- 3G modem
- ISDN modem (CDC / ACM compatible)
- Bluetooth

Ordering Information

M-503

- AT91SAM9G45 + Linux 2.6.38 System on Module with 256MB NAND Flash, 128MB DDR2 SDRAM

M-503 Starter Kit

- Includes one M-503 SoM and one carrier board with power circuitry, 3 x RS-232 ports, 1 x RS-232 / 422 / 485 port, 1 x Ethernet port, 2 x USB hosts, 1 x SD socket (at rear side), 2 x GPIO connectors, Real Time Clock, EEPROM, and local bus connector

Programmable Automation Controller

- Arm-based, Linux-ready Industrial-grade Programmable Controller
- Industrial Isolated I/O
- Dual Ethernet and Isolated RS-485
- DIN RAIL Mounting



PAC Series Linux Arm Programmable Automation Controllers

Arm-based Linux-ready PAC (programmable automation controller) supporting analog inputs, isolated digital inputs and high-drive digital outputs. PAC series featuring a modular, Arm-based system, expansable the I/Os with lineup of discrete, analog and specialty I/O modules to solve advanced control problems in rugged, industrial environments.



Redundant Network



Efficient Performance



Advanced Security



Easy Management



500mA High-Drive Digital Output



16-bit A/D Converter
Diff. input, mV, V, 0~20mA



2500Vrms Opto-isolation Digital Input

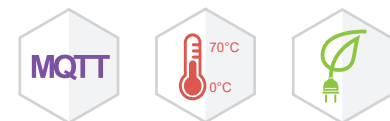


2500Vrms Isolation

Remote IO-PG Series FreeRTOS Programmable Remote I/O Module

The device manager utility featuring device discovery, network configuration, user's web page and firmware upload is also included. An example program which demonstrates how to push sensor data to IBM Bluemix using MQTT is also included for quick sensor to cloud application development. Low power consumption of Arm cortex M4 plus high efficiency of FreeRTOS make RIO-2014PG an ideal light weight computing platform for device networking and remote monitoring.

- Stand Alone Operation Without a Host PC
- Control Algorithm is Programmable by C Language
- FreeRTOS Real Time I/O



PAC Series Comparison Table



Model	PAC-4000	PAC-4010	PAC-4070
CPU	Atmel AT91SAM9G20 Arm926 400MHz		
RAM	64MB SDRAM		
Flash	256 NAND		
SD Card socket	Micro-SD x 1		
Ethernet	10/100Mbps x2		
No. of Serial Port	RS-232 x2, RS-232/485 isolation x2		
USB Host	2		
USB Client	1		
Digital I/O Channels	N/A	16	8
. Digital Input (Isolated))	--	8	4
. Relay Out	--	8	4
. High Drive Output (500mA)	--	--	--
Differential Analog Input	N/A	N/A	4
miniPCIe slot	N/A		
Linux Kernel	2.6.29		
. Boot loader	U-Boot		
. File system	JFFS2, EXT2/EXT3, VFAT/FAT, NFS		
Software Development	Tool Chain: gcc + glibc		
Package management	support ipkg & webmin		
Dimensions (W x H x D) mm	45x130x102.5	65x130x102.5	
Power Input	+9 ~ +48VDC		



Model	PAC-5010	PAC-5070
CPU	Atmel AT91RM9200 Arm920 180MHz	
RAM	64MB SDRAM	
Flash	16MB NOR	
SD Card socket	SD x 1	
Ethernet	10/100Mbps x2	
No. of Serial Port	RS-232 x1, RS-485 x1	
USB Host	2	
USB Client	1	
Digital I/O Channels	24	16
. Digital Input (Isolated))	16	8
. Relay Out	--	--
. High Drive Output (500mA)	8	8
Differential Analog Input	N/A	4
miniPCIe slot	N/A	
Linux Kernel	2.6.19	
. Boot loader	U-Boot	
. File system		
Software Development		
Package management		
Dimensions (W x H x D) mm	160x104x32	
Power Input	+9 ~ +40VDC	

Linux-based Arm9 Programmable Automation Controller PAC-4000



Features

- ATMEL AT91SAM9G20 400MHz CPU w/ MMU
- Linux kernel 2.6.29 with file system
- 64MB SDRAM and 256MB NAND Flash
- 2MB DataFlash for system recovery
- On-board real-time clock
- 2 x 10/100Mbps Ethernet ports
- 4 x RS-232 ports, 921.6Kbps max.
- 2 x 1500Vrms isolated RS-485 ports, with auto direction control
- 2 x USB 2.0 Hosts supporting full speed of 12Mbps
- Small form factor (W x H x D): 45 x 130 x 102.5mm

Linux-based Arm9 Programmable Automation Controller PAC-4010



Features

- ATMEL AT91SAM9G20 400MHz CPU w/ MMU
- Linux kernel 2.6.29 with file system
- 64MB SDRAM and 256MB NAND Flash
- 2MB DataFlash for system recovery
- 2 x 10/100Mbps Ethernet ports
- Up to 4 x RS-232 ports, 921.6Kbps max.
- 2 x 1500Vrms isolated RS-485 ports, with auto direction control
- 2 x USB 2.0 Hosts supporting full speed of 12Mbps
- 8 x 5000Vrms opto-isolated digital inputs
- 8 x 500mA max. High-Drive digital outputs
- Small form factor (W x H x D): 65 x 130 x 102.5mm

H/W Specifications

CPU / Memory

- CPU: ATMEL AT91SAM9G20 400MHz w/ MMU
- Memory: 64MB SDRAM, 256MB NAND Flash
- DataFlash@: 2MB, for system backup

Network Interface

- No. of Ports: 2
- Type: 10/100Mbps Ethernet, RJ45 connector
- Protection: 1.5KV magnetic isolation

Serial Ports

- 2 x RS-485 or RS-232 (Port 1 and Port 2)
- 2 x RS-232 (Port 3 and Port 4)
- Protection: 15KV ESD for RS-232; 1500Vrms isolation and 15KV ESD for RS-485
- Connector: RJ45 for RS-232; Terminal Block for RS-485

Serial Port Parameters

- Baud Rate: Up to 921.6Kbps
- Parity: None, Even, Odd, Mark, Space
- Data Bits: 5, 6, 7, 8
- Stop Bits: 1, 1.5, 2
- Flow Control: RTS / CTS, XON / XOFF, None
- RS-485 Direction Control: Auto, by hardware

USB Ports

- Host Ports: 2, USB 2.0 compliant
- Client Port: 1, reserved
- Speed: Supports low-speed (1.5Mbps) and full-speed (12Mbps)

SD Socket (Secure Digital Card)

- 1 x Micro-SD socket (at bottom side)
- SD 2.0 Compliant, support SDHC

General

- Watchdog Timer: Yes
- Real-Time Clock (RTC): Yes, with backup battery
- Buzzer: Yes
- Power Input: +9V~+48VDC
- Power Consumption: 12VDC@300mA
- Dimensions (W x H x D): 45 x 130 x 102.5mm (1.77x5.12x4.03in)
- Operating Temperature: 0~70°C (32~158°F)
- Regulation: CE Class A, FCC Class A

S/W Specifications

General

- OS: Linux, kernel 2.6.29
- Boot Loader: U-Boot
- File Systems: UBI, JFFS2, ETX2 / ETX3, VFAT / FAT, NFS
- Internet Protocol: TCP, UDP, IPv4, SNMP V1 / V2 / V3, ICMP, ARP, HTTP, CHAP, PAP, DHCP, NTP, NFS, SMTP, TELNET, FTP, TFTP, PPP, PPPoE
- Internet Security: OpenVPN, iptables

Pre-installed Utilities

- bash, busybox, sysvinit, wget, ipkg, procs (for webmin), psmics, lighttpd, vsftpd, iptables, ppp, ssh, wireless_tools, util-linux-mount / umount, usbtutils, Artila utility and more

Daemons Started by Default

- ssh (secured shell) with sftp
- syslog / klogd (system and kernel log)
- telnet server (disable root permission in /etc/securetty)
- ftp server (vsftpd)
- web server (lighttpd)
- amgrd (Artila broadcast search daemon)

Package Management & System Administration

- Supports ipkg to manage the package installation, upgrade and removal
- Supports webmin for web-based system administration

Toolchain for Linux

- GCC: C / C++ PC cross compiler
- GLIBC: POSIX Library

USB Host Drivers (Could Be Customized)

- Generic Flash drive
- RS-232 adapters
- WiFi dongles

Ordering Information

PAC-4000

- Linux-based Arm9 Programmable Automation Controller

CB-RJ45F9-150 (91-R45F9-150)

- Serial Cable (RJ45 to DB9 Female, 150cm)

CB-PHDF9-050 (91-PHDF9-050)

- Console Cable (Wafer Box to DB9 Female, 50cm)

PWR-12V-1A

- 100~240VAC to 12VDC 1A Power Adapter

H/W Specifications

CPU / Memory

- CPU: ATMEL AT91SAM9G20 400MHz w/ MMU
- Memory: 64MB SDRAM, 256MB NAND Flash
- DataFlash@: 2MB, for system backup

Network Interface

- Type: 2 x 10/100Mbps Ethernet, RJ45 connector
- Protection: 1.5KV magnetic isolation

Serial Ports

- 2 x RS-485 or RS-232 (Port 1 and Port 2)
- 2 x RS-232 (Port 3 and Port 4)
- Protection: 15KV ESD for RS-232; 1500Vrms isolation and 15KV ESD for RS-485
- Connector: RJ45 for RS-232; Terminal Block for RS-485

Serial Port Parameters

- Baud Rate: Up to 921.6Kbps
- Parity: None, Even, Odd, Mark, Space
- Data Bits: 5, 6, 7, 8
- Stop Bits: 1, 1.5, 2
- Flow Control: RTS / CTS, XON / XOFF, None
- RS-485 Direction Control: Auto, by hardware

USB Ports

- Host Ports: 2, USB 2.0 compliant
- Client Port: 1, reserved
- Speed: Supports low-speed (1.5Mbps) and full-speed (12Mbps)

SD Socket (Secure Digital Card)

- 1 x Micro-SD socket (at bottom side)
- SD 2.0 Compliant, support SDHC

Isolated Digital Input

- No. of Channels: 8
- Logical High: 5~24VDC; Logical Low: 0~1.5VDC
- Response Time:
- Opto-isolation: 5000Vrms

High-Drive Digital Output

- No. of Channels: 8
- Source Driver: UDN2981A (Allegro MicroSystems)
- Source Voltage (VDD): 5~50VDC
- Output Current: 500mA max.
- Isolation: 2500Vrms

General

- Watchdog Timer: Yes
- Real-Time Clock (RTC): Yes, with backup battery
- Buzzer: Yes

- Power Input: +9V~+48VDC
- Power Consumption: 12VDC@300mA
- Dimensions (W x H x D): 65 x 130 x 102.5mm (2.56x5.12x4.03in)
- Operating Temperature: 0~70°C (32~158°F)
- Regulation: CE Class A, FCC Class A

S/W Specifications

General

- OS: Linux, kernel 2.6.29
- Boot Loader: U-Boot
- File Systems: UBI, JFFS2, ETX2 / ETX3, VFAT / FAT, NFS
- Internet Protocol: TCP, UDP, IPv4, SNMP V1 / V2 / V3, ICMP, ARP, HTTP, CHAP, PAP, DHCP, NTP, NFS, SMTP, TELNET, FTP, TFTP, PPP, PPPoE
- Internet Security: OpenVPN, iptables

Pre-installed Utilities

- bash, busybox, sysvinit, wget, ipkg, procs (for webmin), psmics, lighttpd, vsftpd, iptables, ppp, ssh, wireless_tools, util-linux-mount / umount, usbtutils, Artila utility and more

Daemons Started by Default

- ssh (secured shell) with sftp
- syslog / klogd (system and kernel log)
- telnet server (disable root permission in /etc/securetty)
- ftp server (vsftpd)
- web server (lighttpd)
- amgrd (Artila broadcast search daemon)

Package Management & System Administration

- Supports ipkg to manage the package installation, upgrade and removal
- Supports webmin for web-based system administration

Toolchain for Linux

- GCC: C / C++ PC cross compiler
- GLIBC: POSIX Library

USB Host Drivers (Could Be Customized)

- Generic Flash drive
- RS-232 adapters
- WiFi dongles

Ordering Information

PAC-4010

- Linux-based Arm9 Programmable Automation Controller

CB-RJ45F9-150 (91-R45F9-150)

- Serial Cable (RJ45 to DB9 Female, 150cm)

CB-PHDF9-050 (91-PHDF9-050)

- Console Cable (Wafer Box to DB9 Female, 50cm)

PWR-12V-1A

- 100~240VAC to 12VDC 1A Power Adapter

Linux-based Arm9 Programmable Automation Controller PAC-4070



Features

- ATMEL AT91SAM9G20 400MHz CPU w/ MMU
- Linux kernel 2.6.29 with file system
- 64MB SDRAM and 256MB NAND Flash
- GNU C / C++ toolchain is included
- 4 x 16-bit multiplexed differential analog inputs
- 4 x 2500Vrms 500mA High-Drive digital outputs
- 4 x 5000Vrms Opto-isolated bipolar digital inputs
- 2 x 10/100Mbps Ethernet ports
- Up to 4 x RS-232 ports, 921.6Kbps max.
- 2 x 1500Vrms isolated RS-485 ports, with auto direction control

Linux-based Arm9 Programmable Automation Controller PAC-5010



Features

- Linux kernel 2.6.14 OS with file system
- 64MB SDRAM and 16MB NOR Flash
- 16 x opto-isolated digital inputs
- 8 x Darlington-pair digital outputs to drive external relays
- 2 x 10/100Mbps Ethernet ports
- 1 x RS-232 port, 1 x RS-485 port
- 2 x USB 2.0 host ports for add-on functionality expansion
- 1 x SD memory card slot included for storage expansion
- GNU C / C++ toolchain for Linux / Windows environment
- 9~40VDC input range

H/W Specifications

CPU / Memory

- CPU: ATMEL AT91SAM9G20 400MHz w/ MMU
- Memory: 64MB SDRAM, 256MB NAND Flash
- DataFlash@: 2MB, for system backup

Network Interface

- No. of Ports: 2
- Type: 10/100Mbps Ethernet, RJ45 connector
- Protection: 1.5KV magnetic isolation

TTY (Serial) Ports

- Port 1: Can be set as RS-232 or RS-485, software selectable
RS-232: TX, RX, RTS, CTS, GND
RS-485: D+, D- (must wiring to terminal block)
- Port 2: Can be set as RS-232 or RS-485, software selectable
RS-232: TX, RX, RTS, CTS, DSR, DTR, DCD, GND
RS-485: D+, D- (must wiring to terminal block)
- Port 3, 4: RS-232 only
RS-232: TX, RX, RTS, CTS, GND

Common UART Parameters

- Baud Rate: Up to 921.6Kbps
- Parity: None, Even, Odd, Mark, Space
- Data Bits: 5, 6, 7, 8
- Stop Bits: 1, 1.5, 2
- Flow Control: RTS / CTS, XON / XOFF, None

USB Ports

- Host Ports: 2, USB 2.0 compliant
- Client Port: 1, USB 2.0 compliant
- Speed: Supports 12Mbps full-speed mode

SD Socket (Secure Digital Card)

- 1 x Micro-SD socket (at bottom side)
- SD 2.0 Compliant, support SDHC

Real Time Clock

- Chip: ST M41T81
- Backup Battery: Lithium, 48mAh, on-board

Watchdog Timer

- CPU built-in watchdog timer, used by Linux kernel

Debug Port

- Type: RS-232 serial console, inside the box
- Signals: Tx, Rx, GND

High-precision Analog Input

- A/D Converter: AD7712 (Analog Devices)
- No. of Channels: 4, multiplexed, differential
- Sampling Speed: 10 readings per second
- Input Range (selected by software):
0~150mV, 0~500mV, +/-150mV, +/-500mV
0~1V, 0~5V, 0~10V, +/-1V, +/-5V, +/-10V
0~20mA
- Resolution: 16-bit
- Accuracy: +/-0.1%
- Voltage Input Mode: Differential, 100db CMR
- Voltage Input Impedance: 20M Ohms
- Current Input Impedance: 120 Ohms
- Isolation Protection: 1500VDC

Isolated Digital Input

- No. of Channels: 4, supporting bipolar input
- Opto-isolation: 5000Vrms
- Logical High: 5~24VDC
- Logical Low: 0~1.5VDC
- Response Time: 20µs

High-Drive Digital Output

- No. of Channels: 4
- Source Driver: UDN2981A (Allegro MicroSystems)
- Source Voltage (VDD): 5~50VDC
- Output Current: 500mA max.
- Isolation: 2500Vrms

General

- Power Input Range: +9V~+48VDC
- Power Consumption: 12VDC@500mA, 6 Watts max.
- Operating Temperature: 0~70°C (32~158°F)
- EMC Regulation: CE Class A, FCC Class A
- Dimensions (W x H x D): 65 x 130 x 102.5mm (2.56x5.12x4.03in)
- Mounting: DIN RAIL mountable

Ordering Information

PAC-4070

- Linux-based Arm9 Programmable Automation Controller

CB-RJ45F9-150 (91-R45F9-150)

- Serial Cable (RJ45 to DB9 Female, 150cm)

CB-PHDF9-050 (91-PHDF9-050)

- Console Cable (Wafer Box to DB9 Female, 50cm)

PWR-12V-1A (31-62100-000)

- 110~240VAC to 12VDC 1A Power Adapter

H/W Specifications

CPU / Memory

- CPU: ATMEL Arm9 AT91RM9200 180MHz w/MMU
- Memory: 64MB SDRAM, 16MB NOR Flash

Network Interface

- Type: 2 x 10/100BaseT, RJ45 connector

TTY (Serial) Ports

- RS-485: One port, with screw-fixed wiring terminal
Signals: Data+, Data-, GND
- RS-232: One port, with 10-pin header
Signals: Tx, Rx, RTS, CTS, DSR, DTR, DCD, GND
- Console: One port, with 10-pin header
Signals: Tx, Rx, GND

TTY (Serial) Port Parameters

- Baud Rate: Up to 921.6Kbps
- Parity: None, Even, Odd, Mark, Space
- Data Bits: 5, 6, 7, 8
- Stop Bits: 1, 1.5, 2
- Flow Control: RTS / CTS, XON / XOFF, None

USB Ports

- Host Ports: 2, USB 2.0 compliant, with 10-pin header
- Data Rate: Up to 12Mbps

Mass Storage

- 1 x Micro-SD socket (at bottom side)
- SD 2.0 Compliant, support SDHC

Isolated Digital Input

- No. of Channels: 16
- Logical High: 5~24VDC
- Logical Low: 0~1.5VDC
- Input Resistance: 1.2K ohms@0.5W
- Response Time: 20µs
- Opto-isolation: 5000Vrms

Digital Output

- No. of Channels: 8
- Source Driver: UDN2981A (Allegro MicroSystems)
- Source Voltage (VDD): 5~50VDC
- Output Current: 500mA max.

General

- Watchdog Timer: Yes, for kernel use
- Real-Time Clock (RTC): Yes
- Buzzer: Yes
- Power Input: +9~+40VDC
- Power Consumption: 12VDC@800mA
- Dimensions (W x H x D): 160 x 104 x 32mm (6.3x4.13x1.26in)
- Operating Temperature: 0~70°C (32~158°F)
- Regulation: CE Class A, FCC Class A

S/W Specifications

General

- OS: Linux, kernel 2.6.14
- Boot Loader: U-Boot
- File Systems: JFFS2, ETX2 / ETX3, VFAT / FAT, NFS

Protocol Stacks

- IPv4, ICMP, ARP, DHCP, NTP, TCP, UDP, FTP, TELNET, HTTP, PPP, PPPoE, CHAP, PAP, SMTP, SNMP V1 / V2, SSL, SSH 1.0 / 2.0

Pre-installed Utilities

- bash: shell command
- tinylogin: login and user manager utility
- telnet: telnet client program
- busybox: Linux utility collection
- ftp: ftp client program

Daemons

- pppd: dial in / out over serial port and PPPoE
- snmpd: SNMP agent program
- telnetd: telnet server program
- inetd: TCP server program
- ftpd: ftp server program
- boa: web server program
- sshd: secured shell server
- iptables: firewall service manager
- amgrd: Artila manager daemon

Toolchain for Linux

- GCC: C / C++ PC cross compiler for Linux, Cygwin
- GLIBC: POSIX Library

Device Drivers

- SD / MMC, UART, Real Time Clock, Buzzer, Digital I/O, Ethernet, Watchdog Timer

USB Host Drivers (Could Be Customized)

- Flash disk
- WiFi (IEEE-802.11)
- RS-232 adapters

Ordering Information

PAC-5010

- Linux-based Arm9 Programmable Automation Controller

CB-F10M9-20 (91-0P9M9-001)

- Console Cable (10Pin Header to DB9 Male, 20cm)

Linux-based Arm9 Programmable Automation Controller PAC-5070

Linux-based Arm9 Programmable Automation Controller PAC-5070



Features

- Linux kernel 2.6.14 OS with file system
- 64MB SDRAM and 16MB NOR Flash
- 4 x 16-bit high-precision multiplexed analog inputs
- 8 x 5000Vrms opto-isolated digital inputs
- 8 x 500mA High-Drive digital outputs
- 2 x 10/100Mbps Ethernet ports
- 1 x RS-232 port, 1 x RS-485 port
- 2 x USB 2.0 host ports for add-on functionality expansion
- 1 x SD memory card slot included for storage expansion
- GNU C / C++ toolchain for Linux / Windows environment
- 9~40VDC input range

H/W Specifications

CPU / Memory

- CPU: ATMEL Arm9 AT91RM9200 180MHz w/MMU
- Memory: 64MB SDRAM, 16MB NOR Flash

Network Interface

- Type: 2 x 10/100BaseT, RJ45 connector

USB Ports

- Host Ports: 2, USB 2.0 compliant, with 10-pin header
- Data Rate: Up to 12Mbps

Mass Storage

- 1 x Micro-SD socket (at bottom side)
- SD 2.0 Compliant, support SDHC

TTY (Serial) Ports

- RS-485: One port, with screw-fixed wiring terminal
- Signals: Data+, Data-, GND
- RS-232: One port, with 10-pin header
- Signals: Tx, Rx, RTS, CTS, DSR, DTR, DCD, GND
- Console: One port, with 10-pin header
- Signals: Tx, Rx, GND

TTY (Serial) Port Parameters

- Parity: None, Even, Odd, Mark, Space
- Data Bits: 5, 6, 7, 8
- Stop Bits: 1, 1.5, 2
- Flow Control: RTS / CTS, XON / XOFF, None

High Drive Digital Output

- No. of Channels: 8
- Source Driver: UDN2981A (Allegro MicroSystems)
- Source Voltage (VDD): 5~50VDC
- Output Current: 500mA max.

General

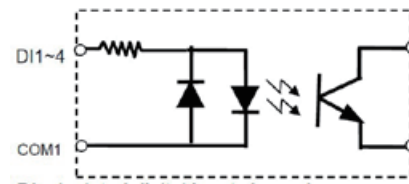
- Watchdog Timer: Yes, for kernel use
- Real-Time Clock (RTC): Yes
- Buzzer: Yes
- Power Input: +9V~+40VDC
- Power Consumption: 12VDC@800mA
- Dimensions (W x H x D): 160 x 104 x 32mm (6.3x4.13x1.26in)
- Operating Temperature: 0~70°C (32~158°F)
- Regulation: CE Class A, FCC Class A

High-precision Analog Input

- A/D Converter: AD7712 (Analog Devices)
- No. of Channels: 4, multiplexed, differential
- Sampling Speed: 10 readings per second
- Input Range (selected by software):
0~150mV, 0~500mV, +/-150mV, +/-500mV
0~1V, 0~5V, 0~10V, +/-1V, +/-5V, +/-10V
0~20mA
- Resolution: 16-bit
- Accuracy: +/-0.1%
- Voltage Input Mode: Differential, 100db CMR
- Voltage Input Impedance: 20M Ohms
- Current Input Impedance: 120 Ohms
- Isolation Protection: 1500VDC

Isolated Digital Input

- No. of Channels: 8
- Logical High: 5~24VDC
- Logical Low: 0~1.5VDC
- Input Resistance: 1.2K ohms@0.5W
- Response Time: 20µs
- Opto-isolation: 5000Vrms



DIx: Isolated digital input channels

S/W Specifications

General

- OS: Linux, kernel 2.6.14
- Boot Loader: U-Boot
- File Systems: JFFS2, ETX2 / ETX3, VFAT / FAT, NFS

Protocol Stacks

- IPv4, ICMP, ARP, DHCP, NTP, TCP, UDP, FTP, TELNET, HTTP, PPP, PPPoE, CHAP, PAP, SMTP, SNMP V1 / V2, SSL, SSH 1.0 / 2.0

Pre-installed Utilities

- bash: shell command
- tinylogin: login and user manager utility
- telnet: telnet client program
- busybox: Linux utility collection
- ftp: ftp client program

Daemons

- pppd: dial in / out over serial port and PPPoE
- snmpd: SNMP agent program
- telnetd: telnet server program
- inetd: TCP server program
- ftpd: ftp server program
- boa: web server program
- sshd: secured shell server
- iptables: firewall service manager
- amgrd: Artila manager daemon

Toolchain for Linux

- GCC: C / C++ PC cross compiler for Linux, Cygwin
- GLIBC: POSIX Library

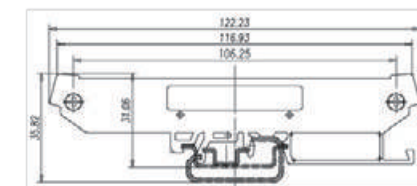
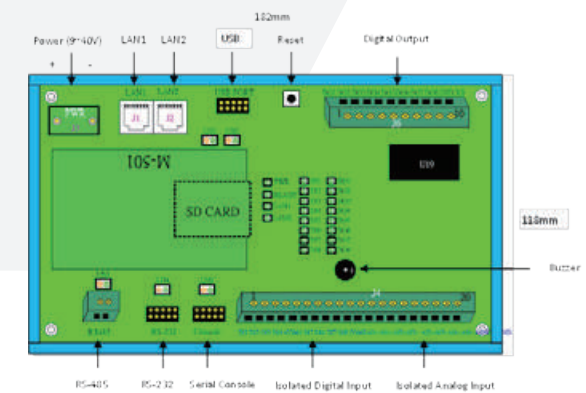
Device Drivers

- SD / MMC, UART, Real Time Clock, Buzzer, Digital I/O, Ethernet, Watchdog Timer

USB Host Drivers (Could Be Customized)

- Flash disk
- WiFi (IEEE-802.11)
- RS-232 adapters

Layout



Ordering Information

PAC-5070

- Linux-based Arm9 Programmable Automation Controller
- **CB-F10M9-20 (91-0P9M9-001)**
- Console Cable (10Pin Header to DB9 Male, 20cm)

Modbus / TCP Remote Digital I/O Module

RIO-2010

Remote I/O

Easy-to-use DIN-rail mountable Web-ready Modbus/TCP IO modules, supporting analog inputs, isolated digital inputs and relay outputs.



Features

- Web based remote I/O monitoring and control
- Web server and web interface ready
- Modbus, AJAX, MQTT
- Stand-alone alarm relay control and email alert
- Periodically data and event publishing to server (broker) via MQTT
- 8x Relay Out Form A or form B relay with contact rating 30VDC@1A or 125VAC@0.5A
- 16 x isolated digital input and 3x Maxim 1-wire temperature measurement
- 1x 10/100Mbps Ethernet Port

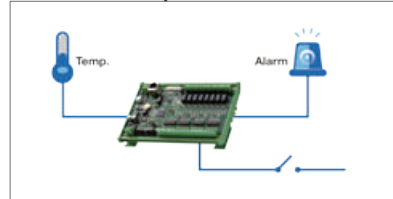
RIO Series

- Modbus TCP
- Stand alone control (event trigger I/O)

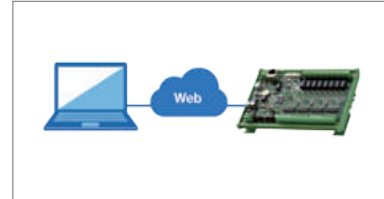


RIO is designed with FreeRTOS+lwIP (lightweight version of TCP/IP), which can automatically connect to Bluemix with verified instructions and push sensor data to cloud with Transport Layer Security (TLS) and MQTT Protocol. Applying on a Watson IoT platform, users can easily create a web-based application to monitor and analyze data. RIO supports Node-RED, a powerful visual wiring tool for the Internet of Things which is easy to wire together events and devices for the Internet of Things. With it, customers can take their IoT innovation to market faster and create new business value.

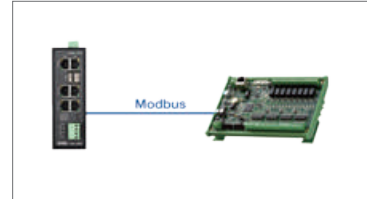
Stand-alone Operation



Web Control



Modbus Control



Remote I/O Comparison Table



Remote I/O	RIO-2010	RIO-2017	RIO-2018
CPU	NXP LPC1768 Arm Cortex-M3 100MHz		
RAM	64KB SRAM		
Flash	512KB		
Micro-SD card socket	N/A	1	
10/100Mbps Ethernet	10/100Mbps x 1		
No. of Serial Port	1	N/A	N/A
. RS-485	1 isolated	--	--
Digital I/O Channels	24	1	1
. Digital Input (Isolated)	16	N/A	N/A
. Relay Output	8	1	1
Maxim 1-Wire Interface	3	N/A	N/A
Isolated Analog Input	N/A	8	8
Thermocouple Input	N/A	N/A	J / K type
RealTime OS	FreeRTOS		
Windows Utility / Web Server Support	YES		
Node-Red, browser-based editor	N/A		
Dimensions (W x H x D) mm	182x118x36	78 x 108 x 24	78 x 108 x 24
Operating Temperature	0~70°C (32~158°F)		
Power	+9 ~ +48VDC		
RTC, Watchdog Timer / Buzzer, LED Indicators	Yes		
Battery	Li 48mAh		
DIN Rail Kit	Plastic	YES	

H/W Specifications

CPU / Memory

- CPU: NXP Arm Cortex-M3 LPC1768 100MHz
- Memory: 512KB on-chip Flash, 64KB SRAM

Network Interface

- Type: 1 x 10/100Mbps, RJ45 connector
- Protection: 1.5kVrms magnetic isolation

RS-485 Interface

- Isolation Protection: 2500Vrms
- Direction Control: Auto, by hardware
- Connector: Terminal block
- Baud Rate: 1.2~460.8Kbps
- Parity: None, Even, Odd, Mark, Space
- Data Bits: 5, 6, 7, 8
- Stop Bits: 1, 1.5, 2

Digital Input

- No. of Channels: 16
- Photo Isolation (AC in): 5000Vrms
- Logical High: 5~24VDC
- Logical Low: 0~1.5VDC
- LED Indicators: Yes

Relay Output

- No. of Channels: 8
- Contact Rating: 30VDC@1A or 125VAC@0.5A
- LED Indicators: Yes

Maxim 1-Wire Interface

- No. of Channels: 3
- Connector: 3-pin header (VDD, DQ, GND)

General

- Temperature Sensor: Maxim DS18B20 (optional accessory 91-6DS18-001)
- Temperature Range: -55°C~125°C
- Accuracy: +/-0.5°C
- Real-Time Clock (RTC): Manual or NTP (Network Time Protocol) setup and sync.
- Power Input: +9~+48VDC
- Power Consumption: 12VDC@220mA(max.), 12VDC@55mA(min)
- Dimensions (W x H x D): 182 x 118 x 36mm (7.16x4.64x1.42in)
- Operating Temperature: 0~70°C (32~158°F)

Access Control Guidelines

Default Access Ports

- Modbus / TCP Port: 502
- Telnet Console Port: 5001
- HTTP Port: 5003

Access Through Modbus Protocols

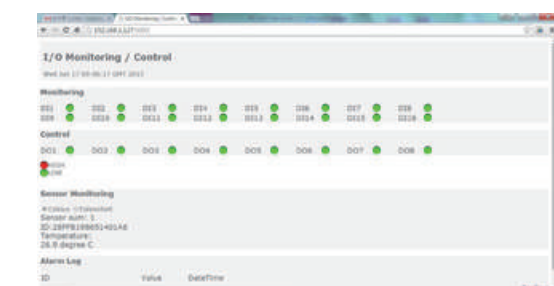
- Modbus / TCP via LAN interface
- Modbus / ASCII, Modbus / RTU via RS-485 interface

Access Through HTTP GET / POST Protocols

- AJAX-enabled demo page for up-and-running web-based monitoring and controls

Operation Mode

- Modbus TCP / RTU slave
- Web direct I/O control
- MQTT auto data and event publish and log
- Stand-alone alarm relay control and email alert
- C / C++ programmable controller (RIO-2010PG)



Ordering Information

RIO-2010

- Modbus / TCP Remote Digital I/O Module

CB-F10M9-20 (91-0P9M9-001)

- Console Cable (10Pin Header to DB9 Male, 20cm)

DS18B20 (91-6DS18-001)

- Programmable Resolution 1-wire Digital Thermometer

PWR-12V-1A

- 100~240VAC to 12VDC 1A Power Adapter

Analog Input Remote I/O Module RIO-2017



Features

- Remote analog input module with web access AJAX and Modbus TCP
- One 10/100Mbps Ethernet port
- 8x 16bit A/D, isolation up to 2500Vrms
- 1 x relay output
- Form A or Form B relay with contact rating 30VDC@1A or 125VAC@0.5A
- Support web-based I/O control
- Optional DIN RAIL mounting kit (DK-35A)
- Windows configuration utility included

Modbus / TCP Remote Digital I/O Module RIO-2018



Features

- Remote thermocouple input module with web access AJAX and Modbus / TCP
- 1 x 10/100Mbps Ethernet port
- 3 channels J or K type thermocouple input with cold junction compensation
- 2 x 5000Vrms isolated digital input (bipolar input photocoupler)
- 1 x Form C relay with contact rating 30VDC@1A or 125VAC@0.5A
- Support web-based temperature monitoring and DIO control
- Optional DIN RAIL mounting kit (DK-35A)
- Windows configuration utility included

H/W Specifications

CPU / Memory

- CPU: NXP Arm Cortex-M3 LPC1768 100MHz
- Memory: 512KB on-chip Flash, 64KB SRAM

Network Interface

- Type: 1 x 10/100Mbps, RJ45 connector
- Protection: 1.5KV Magnetic isolation
- Protocol: Modbus / TCP, UDP, HTTP, DHCP

Isolation Analog Input

- No. of Channels: 8
- Input Type: Differential input
- Input Mode: Voltage / Current
- Resolution: 16-bit
- Input Range:
 - Unipolar: 0~150mV, 0~500mV, 0~1V, 0~5V, 0~10V
 - Bipolar: +/-150mV, +/-500mV, +/-1V, +/- 5V, +/-10V
- Current: 0~20mA
- Input Impedance: 20M Ohm (voltage), 120 Ohm (current)
- Accuracy: +/-0.1% FSR
- Isolation: 2500Vrms

Relay Output

- No. of Channels: 1
- Contact Rating: 30VDC@1A or 125VAC@0.5A

General

- Power Input: +9~+48VDC (Terminal block)
- Protection: Auto polarity and surge protect
- Dimensions (W x H x D): 78 x 108 x 24mm (3.0x4.25x0.94in)

Front View



Access Control Guidelines

Default Access Ports

- Modbus / TCP Port: 502
- Telnet Console Port: 5001
- HTTP Port: 5003

Access Through Modbus Protocols

- Modbus / TCP via LAN interface

Access Through HTTP GET / POST Protocols

- AJAX-enabled demo page for up-and-running web-based monitoring and controls



Windows Utility Functionalities

- Broadcast search
- Configuration
- User web page conversion

Ordering Information

RIO-2017

- Analog Input Remote I/O Module

DK-35A (36-DK35A-000)

- DIN RAIL Mounting Kit

PWR-12V-1A

- 100~240VAC to 12VDC 1A Power Adapter

H/W Specifications

CPU / Memory

- CPU: NXP Arm Cortex-M3 LPC1768 100MHz
- Memory: 512KB on-chip Flash, 64KB SRAM

Network Interface

- Type: 1 x 10/100Mbps Ethernet, RJ45 connector
- Protection: 1.5KV magnetic isolation
- Protocol: Modbus / TCP, UDP, HTTP, DHCP

Thermocouple Input

- J type: Maxim MAX31855J converter with CJC Range: -210°C~+1200°C
- K type: Maxim MAX31855K converter with CJC Range: -200°C~+1350°C
- Resolution: 14-bit, 0.25°C
- Connector: OMEGA PCC-SMP Thermocouple connector
- Thermocouple fault detection

Relay Output

- No. of Channels: 1 x Form C
- Contact Rating: 30VDC@1A or 125VAC@0.5A

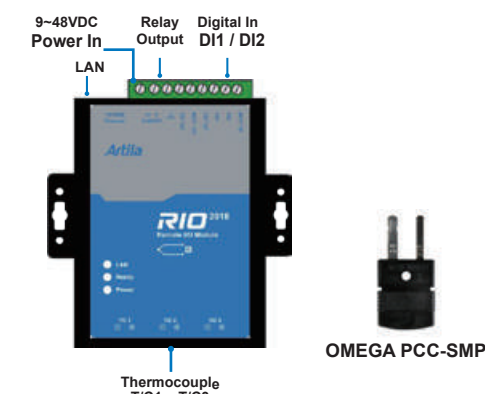
Isolated Digital Input

- No. of Channels: 2
- Logic High: 5~24VDC
- Logic Low: 0~1.5VDC
- Opto-Isolation: 5000Vrms
- Response Time: 20µs

General

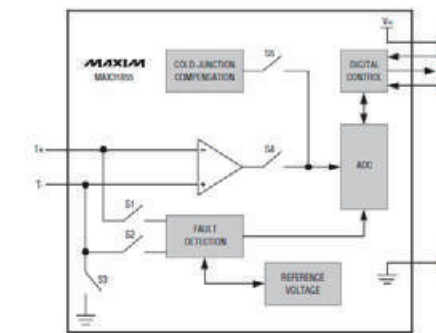
- Power Input: +9~+48VDC (Terminal Block)
- Protection: Auto polarity and surge protect
- Dimensions (W x H x D): 78 x 108 x 24mm (3. (3.0x4.25x0.94in))

Front View

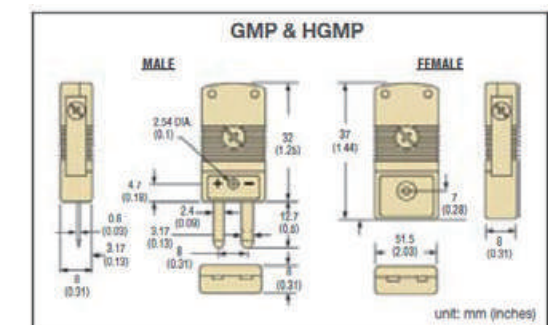


Thermocouple Input

- The thermocouple input is connected to MAX31855 Cold Junction Compensated Thermocouple to Digital Converter. The connector is OMEGA PCC-SMP. Please make sure the type of thermocouple matches the model of RIO-2018. Please refer to datasheet of MAX31855 for the technical specification of thermocouple measurement.



Thermocouple



The following two items are available from www.omega.com.

- J type Thermocouple: 5SRTC-GG-J-24-36
- K type Thermocouple: 5SRTC-GG-K-24-36

Ordering Information

RIO-2018J

- Analog Input Remote I/O Module with J type Thermocouple input channel

RIO-2018K

- Analog Input Remote I/O Module with K type Thermocouple input channel

DK-35A (36-DK35A-000)

- DIN RAIL Mounting Kit

PWR-12V-1A

- 100~240VAC to 12VDC 1A Power Adapter

Industrial Communication Gateway

Easy-to-use serial-to-Ethernet gateways allowing users access RS-232/422/485 devices via LAN or Internet. Virtual COM driver or Fixed-TTY driver is included for free.



■ Aport Series Industrial Communication Gateway

Allow nearly any device with serial ports to connect and share a WLAN network

Artila's communication gateway is the ideal choice that provides connectivity for your serial devices, such as meters and sensors to 802.11 wireless local area networks (WLANs). Eliminating the need for the development of a wireless LAN driver and security supplicant, it is ideal for minimizing upfront engineering investment and reducing time to market.



Configure via Web Browser & Windows Manager Utility

Simple to configure Aport-213 by using any devices like Smart phone, Notebook or PC via web browser without any software installation. Windows Manager Utility is a software provided by Artila that is used to configure and test devices through network.



■ Industrial Communication Gateway Comparison Table



Model	Aport-212	Aport-211S
Core Module	X	SE-100M
CPU	NXP Arm Cortex-M3 LPC1768 100MHz	SoC
10/100Mbps Ethernet	1	1
RF Capability	N/A	N/A
No. of Serial Port	2	1
. RS-232/422/485	1	1
. RS-232/485	1	N/A
Serial Console	1	1
RealTime OS	FreeRTOS	
Windows Utility	YES	
Web Server Support	YES	
Dimensions (W x H x D) mm	78 x 108 x 24	
Operating Temperature	0~70°C (32~158°F)	
Power	+9 ~ +40VDC	
Buzzer, LED indicators	YES	
DIN Rail Kit	YES	

Dual-port Modbus Gateway Aport-212



Features

- Gateway of Modbus / TCP to Modbus RTU / ASCII
- 2 x configurable serial ports
- Supports up to 16 x Modbus / TCP masters or 32 x Modbus / TCP slaves
- Supports transparent serial to Ethernet conversion
- 1 x 10/100Mbps Ethernet port
- Supports telnet, web and serial console configuration
- Support command line interface configuration
- Windows configuration utility included
- Firmware upgradable by Ethernet / Internet

H/W Specifications

CPU / Memory

- CPU: NXP Arm Cortex-M3 LPC1768 100MHz
- Memory: 512KB on-chip Flash, 64KB SRAM

Network Interface

- Type: 1 x 10/100Mbps Ethernet, RJ45 connector
- Protection: 1500Vrms magnetic isolation

Serial Ports

- Port 1: RS-232 / 422 / 485
- Port 2: RS-232

Serial Port Parameters

- Baud Rate: 1.2~921.6Kbps
- Data Bits: 5, 6, 7, 8
- Stop Bits: 1, 2
- Flow Control: None / Hardware / XON_XOFF
- Protection: 1500Vrms ESD

Serial Console Port

- RS-232: 115.2Kbps baud rate, no flow control, 8 bits data, 1 stop bit

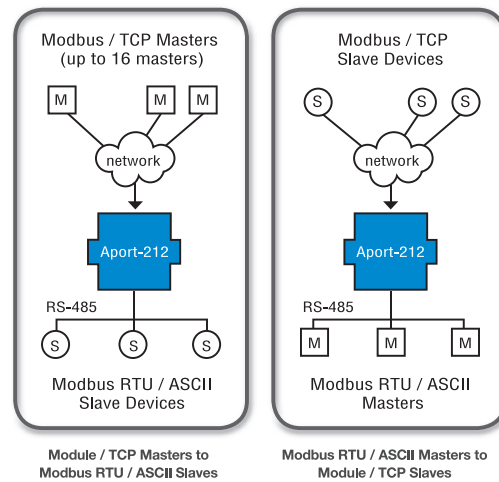
Operation Mode

- Modbus Gateway: Slave RTU, Slave ASCII, Master RTU, Master ASCII
- S2E Gateway: TCP server, TCP client

General

- Power Input: +9~+40VDC power jack and terminal block
- Dimensions (W x H x D): 78 x 108 x 24mm (3.0x4.25x0.94in)
- Operating Temperature: 0~60°C

Block Diagram



Ordering Information

Aport-212

- Modbus Gateway with 2 x Serial Ports, and 1 x Ethernet Port

CB-RJ2CON-100 (91-RJCON-100)

- Console Cable (RJ45 to DB9 Female, 100cm)

DK-35A (36-DK35A-000)

- DIN RAIL Mounting Kit

PWR-12V-1A

- 100~240VAC to 12VDC 1A Power Adapter

Single-port Serial-to-Ethernet Gateway Aport-211S



Features

- Connect RS-232 / 422 / 485 devices to TCP/IP network
- 8 x programmable digital I/Os
- 1 x 10/100Mbps Port
- Supports TCP / Server mode and TCP / Client mode
- Web / Telnet / Serial consoles for device configuration
- Windows utility for device configuration and management
- Firmware upgradable

H/W Specifications

Network Interface

- Type: 1 x 10/100Mbps Ethernet, RJ45 connector
- Protocols: TCP, UDP, HTTP, TELNET, IP, ICMP, ARP
- IP addressing: DHCP, Static IP

Operation Modes

- TCP / Server and TCP / Client

Serial Interface

- Type: RS-232 / 422 / 485, switch selectable
- Connector: DB9, male
- Signals: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
- Baud Rate: 1.2~38.4Kbps
- Parity: None, Even, Odd
- Data Bits: 7, 8
- Stop Bits: 1, 2
- Flow Control: None, RTS / CTS, XON / OFF

Programmable Digital I/Os

- PIO0~PIO5: TTL level compatible
- PIO6~PIO7: CMOS level compatible
- Connector: DB9, male

Configuration Methods

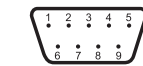
- Web console, Telnet Console and Serial Console

General

- Power Input: +9~+40VDC
- Power Consumption: 12VDC@70mA
- Operating Temperature: 0~70°C, 5~95% RH
- Dimensions (W x H x D): 78 x 108 x 24mm (3.0x4.25x0.94in)
- Regulation: CE / FCC compliant

PIN Assignment

PIN	GPIO	PIN	RS-232	RS-422	RS-485
1	PIO 0	1	DCD	Tx-	---
2	PIO 1	2	Rx	Tx+	---
3	PIO 2	3	Tx	Rx+	Data+
4	PIO 3	4	DTR	Rx-	Data-
5	PIO 4	5	GND	GND	GND
6	PIO 5	6	DSR	---	---
7	PIO 6	7	RTS	---	---
8	PIO 7	8	CTS	---	---
9	GND	9	---	---	---



Dimensions



Ordering Information

Aport-211S

- Single-port Serial-to-Ethernet Gateway

DK-35A (36-DK35A-000)

- DIN RAIL Mounting Kit

PWR-12V-1A

- 100~240VAC to 12VDC 1A Power Adapter

Arm-based Linux-ready HMI Computing

- Fanless, Rugged Design for harsh environment.
- Arm-based, Linux-ready HMI computing
- TFT LCD Display / LED Backlight with Capacity Touch
- QT5 library, support 2D / 3D graphics accelerator and LXDE desktop environment
- Easily Panel-mounting, no screw hole needed



Rugged, High-Performance, All-in-One industrial HMI Computing

The Artila HMI Computing suits for visualization tasks directly on the machine or in the plant. The all-in-one Panel PC devices integrate an Arm-based Linux-ready computing and an capacity touch panel. It convinces through its robustness, performance, and a brilliant display. Various device families fulfill a wide range of requirements in manufacturing and process automation.



HMI Series Comparison Table



Model	HC-3120	HC-3080
CPU	TI AM3354 Cortex A8 800MHz	TI AM3354 Cortex A8 800MHz
RAM	256MB DDR3	256M DDR3
eMMC	512MB	512MB
Micro-SD Card socket	YES	YES
Graphic	SGX530 3D Graphic Engine	SGX530 3D Graphic Engine
Display	12" TFT LCD, 16.2M color	8" TFT LCD, 262K color
Backlight	LED	LED
Resolution	800 x 600	800 x 600
Viewing Angle (H/V°)	89° / 89°	70° / 50°
Luminance (cd/m2)	600	250
Contract	1500:1	500:1
Touch	Projective Capacity Touch	Projective Capacity Touch
Ethernet	2 x Gigabit LAN	2 x Gigabit LAN
CAN Bus (Isolation)	2 isolated (2nd is optional)	2 isolated (2nd is optional)
USB 2.0	2 x HOST	2 x HOST
Linux Kernel	4.9.X	4.9.X
File system	EXT4	EXT4
Tool Chain	gcc 6.2.0 + glibc 2.24	gcc 6.2.0 + glibc 2.24
2D / 3D graphics accelerator	QT5	QT5
Desktop Environment	LXDE (Lightweight X11)	LXDE (Lightweight X11)
Build-in Browser	Chrome / Firefox	Chrome / Firefox
Node-Red, browser-based editor	YES	YES
Dimensions (W x H x D) mm	339 x 270 x 53	260 x 210 x 50
Operating Temperature	0~50°C (32~122°F)	0~50°C (32~122°F)
Power Input	+24VDC (18~30VDC)	+24VDC (18~30VDC)
RTC, Watchdog Timer	YES	YES
Buzzer, Reset button, LEDs	YES	YES
Wall-Mounting Kit	YES (no screw hole needed)	YES (no screw hole needed)

Linux-ready Arm-based 8" HMI Computing HC-3080



Features

- Fanless / Rugged Design HMI Computing
- 8" TFT LED backlight LCD display
- TI AM3354 Sitara Arm Cortex-A8 32-Bit RISC Processor
- Onboard 256MB DDR3 SDRAM
- Onboard storage eMMC 512MB NAND Flash
- IP65 compliant front panel, resistant to water and dust
- Rich I/O with RS-232, USB, CAN bus and Gigabit LAN
- Easily panel-mounting, no screw hole needed
- Low power consumption, +18~+30Vdc wide range input

H/W Specifications

CPU / Memory

- CPU: TI AM3354 Sitara Arm Cortex-A8 32-Bit RISC Processor
- Frequency: 800MHz, up to 1GHz
- SDRAM: 256MB DDR3, up to 512MB
- microSD Card Slot reserved (inside the enclosure)

Graphic

- SGX530 3D Graphics Engine
- Industry Standard API Support of Direct3D Mobile, OGL-ES 1.1 / 2.0, OpenVG 1.0, and OpenMax

LCD Display

- Display Size: 8" TFT LCD, 262K colors
- Resolution: 800 x 600
- Viewing Angle (H/V°): 70°/50°
- Luminance (cd/m2): 250
- Contrast Ratio: 500:1
- Backlight: LED
- Life: 20000hrs

Touchscreen (Optional)

- Touch Type: Projective Capacity Touch
- Controller: USB

External I/O Ports

- 2 x USB 2.0, Type A
- 1 x CAN bus
- 1 x CAN bus (Optional)

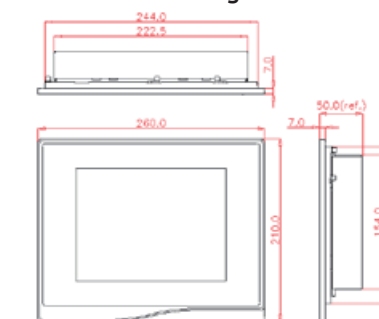
Network

- 2 x Gigabit Ethernet (10/100/1000Mbps), RJ45

SD Slot

- 1x MicroSD socket
- SD 2.0 compliant, supports SDHC

Dimension Drawing



Power Requirement

- 1 x phoenix male 2-pin terminal block
- Power Input: +24VDC typical (+18~+30VDC)
- Cable Length Suggestion: 3m (Typical), 12m (Max.)
- Power Consumption: 8W (+24V/320mA)

General

- Material: Die-casting aluminum (Front bezel), Metal (Case)
- Dimensions (W x H x D): 260 x 210 x 50mm (10.24x8.26x1.97in)
- Net Weight: 1.82kg (4lb)
- Installation: Panel mount, VESA mount
- Operating Temperature: 0~50°C (32~122°F)
- Operating Humidity: 25~85% @ 40°C, non-condensing
- Front Panel Protection: IP65 compliant

S/W Specifications

Operation System Support

- Linux kernel 4.9.x
- Supports bootup from eMMC or SD card
- File System : EXT4
- GUI Engine: X11
- Support QT Library

Desktop Environment

- Matchbox (X11) w/ virtual keyboard
- Built-in Firefox / Chromium browser

Software Development

- Toolchain: gcc 6.2.x + glibc 2.24
- Supports in-place C/C++ code compilation

Package Management

- Package repository: Artila self-maintained repository
- Command: Using standard apt-get command
- Support Node-Red
- Support Mono for running Windows .NET app

Ordering Information

HC-3080

- Linux-ready Arm-based 8" HMI Computing

Linux-ready Arm-based 12" HMI Computing HC-3120



Features

- Fanless / Rugged Design HMI Computing
- 12" TFT LED backlight LCD display with Projective Capacity Touch
- TI AM3354 Sitara Arm Cortex-A8 32-Bit RISC Processor
- Onboard 256MB DDR3 SDRAM
- Onboard storage eMMC 512MB NAND Flash
- IP65 compliant front panel, resistant to water and dust
- Rich I/O with RS-232, USB, CAN bus and Gigabit LAN
- Easily Panel-mounting, no screw hole needed
- Low power consumption, +18~+30Vdc wide range input

H/W Specifications

CPU / Memory

- CPU: TI AM3354 Sitara Arm Cortex-A8 32-Bit RISC Processor
- Frequency: 800MHz, up to 1GHz
- SDRAM: 256MB DDR3, up to 512MB
- Onboard eMMC 512MB NAND Flash

Graphic

- SGX530 3D Graphics Engine
- Industry Standard API Support of Direct3D Mobile, OGL-ES 1.1 / 2.0, OpenVG 1.0, and OpenMax

LCD Display

- Display Size: 12" TFT LCD, 16.2M colors
- Resolution: 800 x 600
- Viewing Angle (H/V°): 89°/89°
- Luminance (cd/m2): 600
- Contrast Ratio: 1500:1
- Backlight: LED
- Life: 50000hrs

Touchscreen

- Touch Type: Projective Capacity Touch
- Light Transparency: >85% at 550nm wavelength
- Controller: USB
- Explosion-proof

CAN Bus Ports

- Type: 1 x CAN bus 2.0 A/B compliant ports (second is option)
- Speed: Up to 1Mbps

USB 2.0 Host Interface

- Host Ports: 2
- Supports 480Mbps hi-speed mode
- Type A USB connector

SD Slot

- 1 x microSD socket
- SD 2.0 compliant, supports SDHC

Network

- 2 x Gigabit Ethernet (10/100/1000Mbps)
- Connector: RJ45

Power Requirement

- 1 x phoenix male 2-pin terminal block
- Power Input: +24VDC typical (+18~+30VDC)
- Cable Length Suggestion: 3m (Typical), 12m (Max.)
- Power Consumption: 14.4W (+24V/600mA)

General

- Material: Die-casting aluminum (Front bezel), Metal (Case)
- Dimensions (W x H x D): 339 x 270 x 53mm (13.35x10.63x2.09in)
- Net Weight: 2.92kg (6.4lb)
- Installation: Panel mount, VESA mount
- Operating Temperature: 0~50°C (32~122°F)
- Operating Humidity: 25~85% @ 40°C, non-condensing

Linux-ready Arm-based 12" HMI Computing HC-3120

S/W Specifications

Operation System Support

- Linux kernel 4.9.x
- Supports bootup from eMMC or SD card
- File System: EXT4
- GUI Engine: X11
- Support QT Library

Desktop Environment

- Matchbox (X11) w/ virtual keyboard
- Built-in Firefox / Chromium browser

Software Development

- Toolchain: gcc 6.2.x + glibc 2.24
- Supports in-place C/C++ code compilation

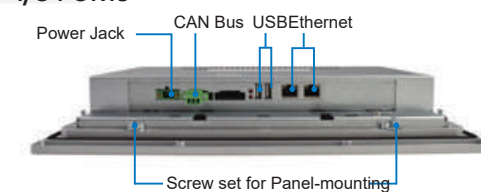
Package Management

- Package repository: Artila self-maintained repository
- Command: Using standard apt-get command
- Support Node-Red
- Support Mono for running Windows .NET app

Popular Packages

- Web server: Apache/Nginx/Lighttpd
- Database: MySQL/SQLite3/PostgreSQL
- Script Language: PHP/Python/Perl/NodeJS
- Text editor: vim/nano/sed
- Administration: Webmin

I/O PORTS

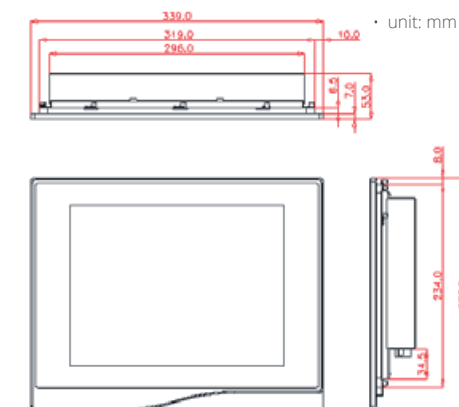


Ordering Information

HC-3120

- Linux-ready Arm-based 12" HMI Computing

Dimension Drawing



Application

Power and Energy

Remote Monitoring and Management System Allows the Control of Solar Power Plants to Exceed Efficiency

Developers of industrial applications expect reinforced isolation products to provide fail-safe protection from secondary lightning strikes, especially in applications where equipment is installed outdoors and where exposed cables or wires are vulnerable to lightning.

The Matrix-704, a robust industrial gateway was eventually selected as the data concentrator for the aforementioned solar power monitoring system capable of gathering and analyzing data from sensors and meters deployed at the remote site. The Matrix-704 is responsible for the electricity monitoring system. Since Matrix-704 embedded industrial IoT Gateway with Linux-ready Cortex-A5, system designers can have the hardware platform featuring high performance, high stability and rich resources. Multiple RS-485 serial ports provide ample interfaces to facilitate system integration with peripherals. lights and volume control for telephone conferences.



Environmental Monitoring & Facility Management

Ensures Stable Operation of Electronic Payment Terminal at Self-service Gas Station

A System Integrator of electronic payment terminal was implementing self-service gas stations, in order to meet the economic benefits, the oil pump island usually needs to install multiple fuel dispensers. In the case where the remaining space on the island is quite narrow, the System Integrator has to specifically design a pillar-type and compact-size electronic payment terminal for this project. Plus, gas station is part of the harsh environments and outdoor applications, so the company hoped to choose a compact and durable computing platform to execute its system developed for the self-service gas station.

The M-A5D35 is an embedded computing platform which features ultra-small appearance and wide temperature range, and is able to meet the needs of System Integrator. The designers can easily integrate this palm-sized SoM into the electronic payment terminal. Rich IOs enable the designers to establish intranet and internet for the system at the same time, so that preventing enterprise data loss or website hacking by setting the access authority.



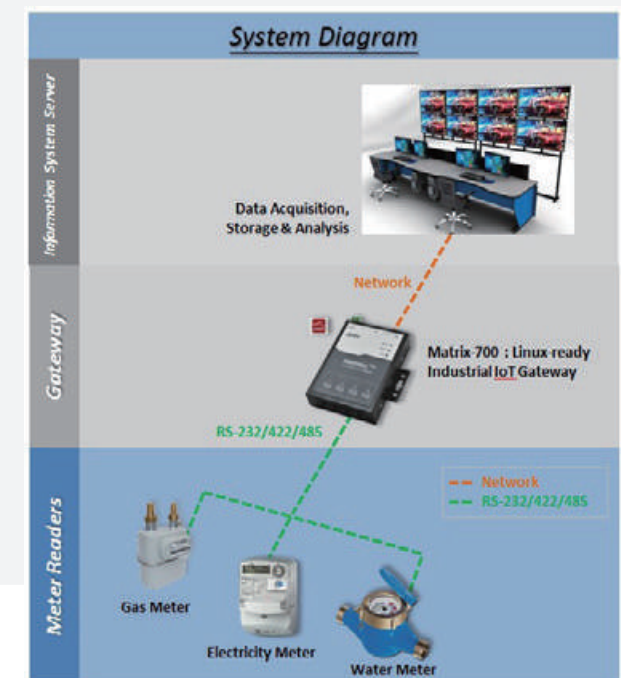
Environment and Facility Monitoring System

Automatic Meter Reading Application with Real-time Monitoring and Remote Management

As we all know that smart meter is a short-range communication device. For demanding communication range, the company wants to select an embedded Linux-based computer that provides adequate computing performance and connection interfaces as a data concentrator control core.

The Matrix-700 is based on the arm9 processor and Linux kernel. The system developer of this project is familiar with such development environment, so its designers can easily and quickly complete the product development. The high-speed arm processor and large memory also provide sufficient computing performance to execute the heavy tasks of the data concentrator.

Supporting multiple interface ports allows designers to develop the required functions according to the actual application needs such as: connecting a switch or router with an Ethernet port, connecting a smart meter or sensor with a high-speed serial port, using USB 2.0 port to set up the wireless network, and utilizing the micro-SD slot to insert the external memory card for storage capacity expansion.



Intelligent Transportation System

Parking Lot Monitoring System

The electric bus charging company has also developed a charging station management system to facilitate operators to manage charging stations. During the development process, the company found that the configuration of only one serial server to manage hundreds of parking spaces and handling hundreds of meters of data would place the system at high risk of instability. Therefore, it decided to implement the appropriate industrial-grade embedded IoT Gateway for parking management system and electricity monitoring system separately.

Artila's Matrix IoT Gateway could install easily in the monitoring system for its serial ports. With the low power consumption, fanless design and compact internal structure, Matrix series are small-sized IoT Gateway. They are not only convenient for installation and maintenance, but also are not easy to inhale the dust particles so that the system can run more stable.



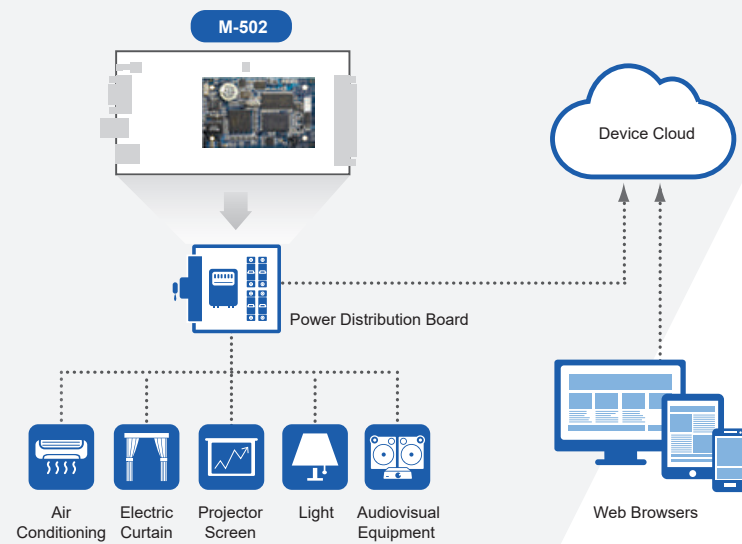
Application

Building Automation

Intelligent Conference Room Situational Control Solution

In such application structure, by placing the M-502 into the company's power distribution board and with the multi-functional GPIO interface of M-502, an intelligent control can be realized after conversation to achieve the function of auto-turning off meeting room facilities to ultimately realize the purpose of energy management such as the turning on/off of projectors, lighting control, electric curtains, intelligent air-conditioning, video systems, etc.

Also, the one-to-many instant monitoring and control function can be integrated for a relational situational control for multiple objects at the same time, for example, during a meeting, the instant data monitoring can be done for the speaker's movement, interior temperature and humidity, light, sound, etc., and the instant control can be done for projector screen up/down, air-conditioning, lights and volume control for telephone conferences.

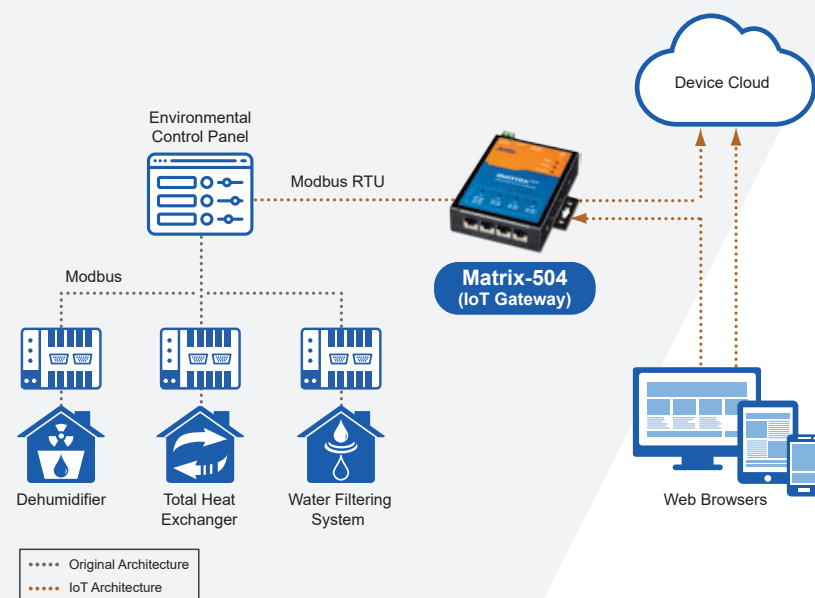


Environment and Facility Monitoring System

Intelligent Household Environment Control Solution

Most of traditional household appliances cannot connect to internet directly, while it takes a long time for the change and evolution from design aspect. However, as the development trend of IoT is rapidly spreading into the household market, a stable and reliable gateway is expected to be developed for reading traditional control signals at one end and connecting to cloud platforms at the other end.

In such application structure, Matrix-504 enables developers to connect traditional household appliances to a cloud server in the simplest and fastest way, by which to immediately upgrade them into intelligent appliances that can be controlled and monitored by remote units for the intelligent adjustment and control function of household environmental conditions, and to effectively attain the purpose of energy saving.



Optional Accessory

Console Cable



CB-RJ2CON-100

Console Cable (RJ45 to DB9 Female, 100cm)
Model No.
 • Matrix-500, Matrix-504, Matrix-510, Matrix-514
 • Aport-212



CB-F10M9-20

Console Cable (10Pin Header to DB9 Male, 20cm)
Model No.
 • Matrix-513, Matrix-516, Matrix-518, Matrix-522
 • PAC-5010, PAC-5070
 • RIO-2010, RIO-2014, RIO-2015



CB-DBCON-100

Console Cable (DB9 Female to DB9 Female, 100cm)
Model No.
 • Matrix-512



CB-PHDF9-050

Console Cable (Wafer Box to DB9 Female, 50cm)
Model No.
 • Matrix-752 / 700 / 702 / 704 / 710 / 713, Matrix-505
 • M-502, M-503, M-X6ULL-B, M-A5D35 / SBC-7530
 • PAC-4000, PAC-4010, PAC-4070, PAC-6070

DIN RAIL Mounting Kit



DK-35A

DIN RAIL Mounting Kit
Model No.
 • Matrix-500 / 504 / 505 / 510, Matrix-512 / 513 / 514 / 516, Matrix-518 / 522 / 604 / 605, Matrix-700 / 702 / 704 / 710 / 713 / 752
 • Aport-211S, Aport-211W, Aport-212
 • RIO-2017, RIO-2018

Serial Cable



CB-RJ45F9-150

Serial Cable (RJ45 to DB9 Female, 150cm)
Model No.
 • Matrix Series, PAC Series

Sensor



DS18B20

Programmable Resolution 1-Wire Digital Thermometer
Model No.
 • RIO-2010



5SRTC-GG-K-24-36

Subminiature Connector, K Thermocouple, Glass Braid Insulation, 24 AWG, 36 inch Length
Model No.
 • RIO-2018
 • Note: Artila generally suggests our customers to purchase this item from the original manufacturer directly.



5SRTC-GG-J-24-36

Standard Size Connector, J Thermocouple, Glass Braid Insulation, 24 AWG, 36 inch Length
Model No.
 • RIO-2018
 • Note: Artila generally suggests our customers to purchase this item from the original manufacturer directly.

Power Adaptor



PWR-12V-1A

100~240VAC to 12VDC 1A Power Adaptor
Model No.
 • All Artila Products



**Your Trusted Partner for
Device Networking & Computing**

Founded in 2004, Artila provides trusted innovative industrial computing products. Artila offers comprehensive system integration, hardware, software, and customer-centric design services; including the intelligent IoT gateway, programmable automation controller, IoT device platform, and remote I/O. We cooperate closely with our partners to help provide complete solutions for a wide array of applications across a diverse range of industries, such as energy management, lighting control and environmental monitoring. Artila has always been an innovator in the development and manufacturing of high-quality, high-performance computing products, and our mission is to empower these innovations by offering trustworthy automation products and services.



Artila www.artila.com

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