

## EBox-AIO-001 Mega Multi-I/O control Computer

- ✓ ATMEL 400Mhz ARM9 32-bit RISC low power consumption core
- ✓ Built-in embedded Linux Operating System
- ✓ Standard TCP/IP network interface
- ✓ 4-Channel RS-232 / RS-485 remote equipment data transmission communication
- ✓ 8-Channel optically isolated digital input control interface (DI)
- ✓ 8-Channel optically isolated relay output control (Relay DO)
- ✓ 8-Channel optically isolated Analog input control interface (AI)
- ✓ 8-Channel optically isolated Analog Output control interface (AO)
- ✓ USB / SD expandable interface
- ✓ Easy LCM & Keypad User Interface
- ✓ Built-in Web Server / MySQL Database
- ✓ Linux and Windows specific softward Development Kit

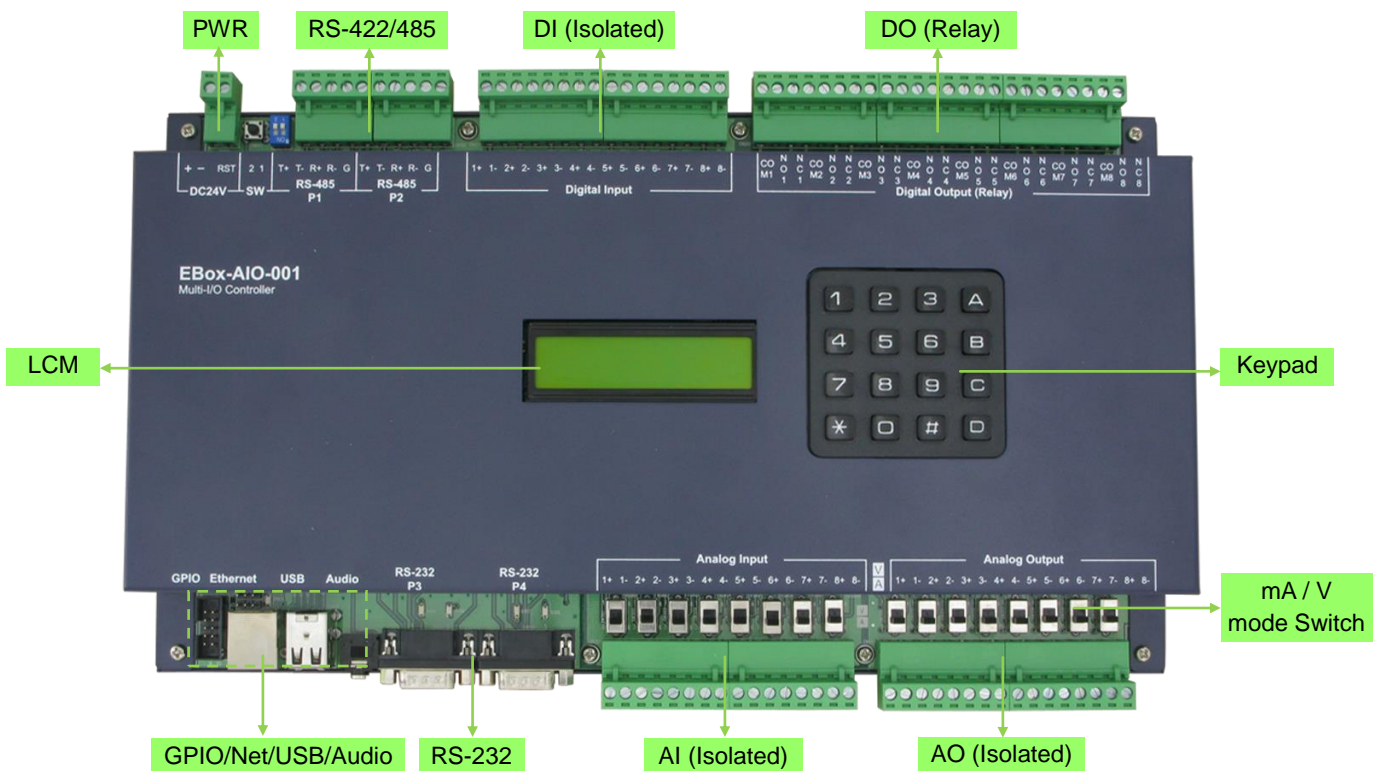


### Product Introduction

The EBox-AIO-001, which is designed for remote monitoring application of field device, meter or paired with SQL database to be a front-end controller to perform industrial tasks, such as data acquisition through TCP/IP, is based on the ATMEL ARM9 industrial processor, and features 8 digital input channels, and 8 relay output channels to do the switch control or status monitoring.

In addition, the EBox-AIO-001 has 8 analog input/output, making it the ideal solution for a variety of industrial applications. The industrial-grade design of the EBox-AIO-001 provides a robust, reliable computer. Meters, sensors, and other devices can all connect easily to 4 RS-232/485 serial ports, LCM and keypad also fit any industrial environment, and the open source Linux platform gives programmers a convenient tool for developing software at a lower cost.

### Exterior Description





## Product features

### ❑ ARM9 RISC low power consumption architecture, high stability

EBox-AIO-001 adopts ATMEL AT9G20 400MHz ARM9 RISC processor, with 64MB SDRAM and 128 MB Flash, as system core. With built-in 2.6.29 embedded Linux operating system, it is suitable for low power consumption and high communication performance requirements for industrial automation applications.

### ❑ UBI file system and Failover mechanism

Aiming at EBox-AIO-001 NAND Flash, it is equipped with UBI file system to access files efficiently and has more secure and reliable data protection function than JFFS2.

The extra 2MB data protection function allows reboot from this block when NAND Flash system fails and the repair of NAND Flash data block by users. Such a Failover mechanism allows EBox-AIO-001 to use minimal space for system repair and to improve system operation efficiency.

### ❑ Standard system development environment

Through open GNU software development tools, built-in C/C++ Compiler and Library allow developers to conduct system development and obtain related technical support at no cost.

### ❑ Suitable for database and webpage monitoring applications

EBox-AIO-001 has built-in MySQL Database for users to set up, record and exchange status message via database framework, It can also work with common PHP/Java Script to easily accomplish remote monitoring system development.

### ❑ Industrial Mechanistic Design

Iron casing and wall hanging design can satisfy the needs for field installation and environmental protection. 24VDC working voltage input range and the design for various standard signal connecting terminal blocks/ bases facilitates wiring and construction for

## Product specifications

### Software

#### Core

- ▶ OS: Linux kernel 2.6.29
- ▶ Boot Loader: U-Boot 1.1.2
- ▶ File Systems: JFFS2, ETX2/ETX3, VFAT/FAT, NFS

#### Pre-installed Utilities

- ▶ bash, busybox, sysvinit, wget, ipkg, procps, psmics, lighttpd, vsftpd, iptable, ppp, ssh, wireless\_tools, util-linux-mount/umount, usbutils, Artila utility, IP Search

#### Protocol stack

- ▶ IPv4, IPv6, ICMP, ARP, DHCP, NTP, TCP, UDP, FTP, Telnet, HTTP, PPPoE, CHAP, PAP, SMTP, SSL, SSH

#### Daemons

- ▶ ssh, syslog/klogd, telnet server, ftp server, MySQL, PHP, Web server(lighttpd), amgrd(IP broadcast search)

### ❑ Common analog acquisition and control interface (Analog I/O)

EBox-AIO-001 has multi-channel common 4~20 mA or 0~10 VDC analog input (AI) interface, suitable for data acquisition for various kinds of temperature or pressure sensors. And to provide a corresponding analog output (AO) interface, you can adjust the pressure valve control applications and other common variables. With AI and AO function, EBox-AIO-001 can easily meet the application requirements for environmental monitoring or building automation.

### ❑ Complete digital signal control interface (Digital I/O)

EBox-AIO-001 has 3 kinds of digital control signal interface. Optically isolated digital control signal can connect to various kinds of switches, press buttons and sensors for real time monitoring; besides general switch control, relay output control can have direct switch control over equipment or instrumentation. General-purpose digital signal (GPIO) can allow users to define their own input or output control, reinforcing inadequate control from the original optically isolated inputs and relay outputs.

### ❑ Multifunctional communication function

EBox-AIO-001 has one Ethernet interface and 802.11 Wi-Fi or 3G wireless network interface expandable via USB interface to make network communication seamless.

EBox-AIO-001 has 4 sets of 921.6Kbps high-speed serial ports, with RS-232 or RS-485 interface allowing EBox-AIO-001 to easily connect all kinds of monitoring equipment.

### ❑ Simple and easy human machine interface

EBox-AIO-001 provides a set of simple human interface devices in the field can be applied as a status display and setting parameters or control etc. instant operation. Through a set of 144x32 dots LCM, do English information display; a 4x4 Keypad can do input, the overall capacity of the system to improve the peacekeeping operation in the field running.

## Application

### Software Development Tool (Tool Chain)

- ▶ Linux/Windows Operating System
- ▶ GCC: C/C++ PC cross compiler for Linux
- ▶ GLIBC: POSIX Library
- ▶ Examples
- ▶ Integrated Developing Environment (IDE) for Windows

### Device Drivers

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

### USB expansion interface support driver

- ▶ Flash thumb disk
- ▶ IEEE-802.11b/g/n WiFi adapter
- ▶ Web CAM
- ▶ 3G adapter



## Hardware

### System Core

- ▶ CPU : ATMEL AT9G20 32-bit ARM9 RISC @400MHz
- ▶ Memory : 64MB SDRAM, 128MB NAND FLASH

### Network Interface

- ▶ Quantity : 1 set
- ▶ Type : 10/100BaseT Ethernet
- ▶ Connector : RJ45
- ▶ Protection : 1.5KV built-in Magnetic Isolation protection

### RS-232Serial Port Interface

- ▶ Quantity : 2 sets
- ▶ P2 Signal : TxD, RxD, RTS, CTS, GND
- ▶ P3 Signal : TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
- ▶ Connector : DB9 Male

### RS-422/485Serial Port Interface

- ▶ Quantity : 2 sets
- ▶ RS-422 Signal : Tx+, Tx-, Rx+, Rx-, GND
- ▶ RS-485 Signal : Data+, Data-, GND  
(support Auto Data Direction Control)
- ▶ RS-422/RS-485 selected by S/W
- ▶ Built-in Terminal Resistor : 120Ω, set up by Jumper
- ▶ Protection : 2 KV isolation protection, 2KV ESD static protection, 400W surge protection
- ▶ Connector : 5.00mm Pluggable terminal block

### Serial Port Communication Parameters

- ▶ Baud Rate : 300 ~ 921,600 bps
- ▶ Parity : None, Even, Odd, Mark, Space
- ▶ Data Bits : 5, 6, 7, 8
- ▶ Stop Bit : 1, 1.5, 2 bits
- ▶ Flow Control (RS-232 only) : RTS/CTS, XON/XOFF, None

### USB Interface

- ▶ Quantity : 2 Sets
- ▶ Connector : USB2.0 Compatible, Type A

### SD Expansion Interface

- ▶ Quantity : 1 set (need to open the case)
- ▶ Connector : SD Slot

### User Interface

- ▶ LCM : 1 Set 144x32 dot (18 x 4 char. X line)
- ▶ keypad : 4x4 pad

### Console Port

- ▶ Quantity/Signal : 1 set/ RS-232 (TxD, RxD, GND)
- ▶ Terminal type : 115,200 bps, VT-100
- ▶ Connector : 2.54 mm PIN block

### DIP Switch (Digital Input)

- ▶ Quantity : 1 set 2 points (Reserved for S/W development)

### Audio output

- ▶ Quantity : 1
- ▶ Format : mp3, wav
- ▶ Connector : 3.5Φ stereo port
- ▶ Output power : 1/8W

### Analog Output

- ▶ Quantity : 8 sets
- ▶ Signal Type : 4~20mA or 0-10VDC (by switch)
- ▶ Resolution : 12-bit
- ▶ Frequency : 10Hz
- ▶ Protection : 2000Vrms optically isolated protection
- ▶ Connector : 5.00mm Pluggable terminal block

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### Relay Output

- ▶ Quantity : 8 sets
- ▶ Signal type : SPDT relay, N.O./ N.C./ COM
- ▶ Input voltage : 120 VAC@2A / 24VDC@2A
- ▶ Protection : 2000 Vrms optically isolated protection
- ▶ Connector : 5.0 mm pluggable terminal block

### Digital Input

- ▶ Quantity : 8 Sets
- ▶ Input Voltage : 5~24VDC
- ▶ Signal Type : Dry Contact/Wet Contact Selected (by jumper)
- ▶ Protection : 2000 Vrms optically isolated protection
- ▶ Connector : 5.0mm pluggable terminal block

### General Purpose Input / Output (GPIO)

- ▶ Quantity : 8 sets · set output or input control via software
- ▶ Signal type : 3.3VDC CMOS
- ▶ Connector : 2.54 mm simple box header

### Mechanism

- ▶ Dimensions : 350 x 203 x 44mm  
(including pluggable terminal block)
- ▶ Material : galvanized steel sheet
- ▶ Weight : 1.8Kg
- ▶ Mounting : Wall, Din-Rail

### Power

- ▶ Working voltage : DC 24VDC
- ▶ Power Connector : 5.00mm pluggable terminal block
- ▶ Power Consumption : <24W (not include USB device)

### Others

- ▶ Real Time Clock : 1 set
- ▶ Buzzer : 1 set
- ▶ LED indicator : power, network, serial port, control signal
- ▶ Storage temperature : -20~60°C
- ▶ Applicable temperature : 0~50°C
- ▶ Applicable humidity : 20%~80% RHG
- ▶ Certification : CE, FCC

## Purchase information

- ☒ **EBox-AIO-001** Mega Multi-signal control Computer