

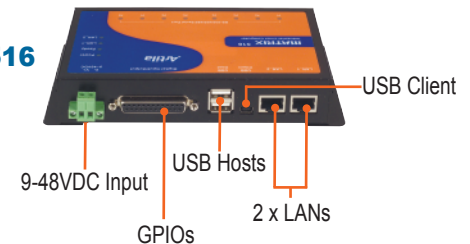
Matrix-516 Industrial ARM9 Linux-ready Box Computer



8x Isolated RS-485 (2500Vrms Isolation)

- ▶ ATMEL 400MHz ARM9 AT91SAM9G20 processor
- ▶ Linux kernel 2.6.29 with file system
- ▶ 64MB SDRAM, 128MB NAND Flash
- ▶ One micro SD socket inside, upto 32GB capacity
- ▶ Two 10/100M Ethernet ports
- ▶ Eight Isolated RS-485 serial ports
- ▶ Two USB hosts, 21x GPIOs
- ▶ Less than 3W power consumption

Rear View of Matrix-516



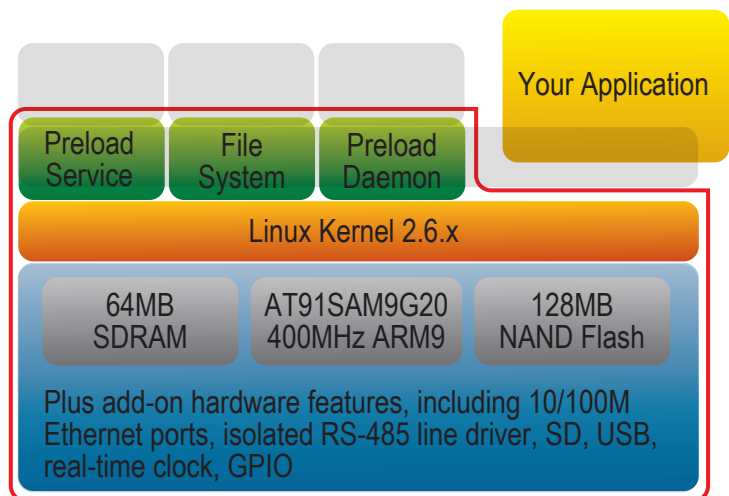
Overview

Artila's Matrix-516 industrial box computer is a small form-factor, low power consumption, and Linux-ready computing platform. With a 400MHz ARM9 CPU, 64MB SDRAM, and 128MB NAND Flash inside, Matrix-516 ensures system high performance. Matrix-516 is equipped with multiple I/O interfaces, including 2 LANs, 8 x isolated RS-485 serial ports, 2 x USB hosts, 1x micro-SD and 21 x GPIOs. It is easy to develop pure C/C++ programs or Web-based applications (ex: SQLite+ PHP) to run on top of the Matrix-516.

Matrix-516 is a reliable embedded computer to be used as a unattended controller 24/7 non-stop. It is ideal for all kinds of industrial applications, including intelligent transportation system (ITS), building automation, energy-saving system, scenario control systems, and factory automation.

Matrix-516 also provides a useful fail-proof design for system backup and recovery. Normally, Matrix-516 boots up from its NAND Flash. However, the Data Flash in Matrix-516 includes a backup Linux file system as well, which will automatically boot up Matrix-516 in case the primary NAND Flash fails. If the Matrix-516 boots up from the Data Flash, a menu-driven program will appear to help users restore NAND Flash images from a USB pen drive or an SD card. Also, this program can help users make a custom image of the current file system to a USB pen drive or an SD card, so that users can easily recover the file system, or duplicate it to other Matrix-516s. Please refer to the user guide for more detailed information.

System Architecture



With pre-installed Linux OS, users can easily operate Matrix-516 via Telnet, or transfer files using FTP.

Matrix-516 comes with a free GNU tool chain for users to develop C/C++ programs. Comprehensive examples are also available in Matrix-518 product CD to demonstrate how to access I/O interface and hardware features.

Matrix-516's Linux environment is highly scalable and configurable. A variety of driver modules and software utilities are included in the product CD. Advanced customization service is also available upon request.

Hardware Specifications

CPU/Memory

CPU: ATMEL 400MHz AT91SAM9G20 w/MMU
Memory: 64MB SDRAM, 128MB NAND Flash
DataFlash@: 2MB, for system backup

Network Interface

Type: 2 x 10/100BaseT, RJ-45 connector
Protection: 1.5KV magnetic isolation

TTY(Serial) Ports

8 x isolated RS-485 (2500Vrms 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 Bit: 1, 1.5, 2

USB Ports

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

SD Socket (Secure Digital Card)

Type: micro SD
No. of sockets: one
Storage capacity: 32GB max.
Compatibility: SD memory specification 1.0

Digital I/Os (GPIO)

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

General

WatchDog Timer: Yes
Real Time Clock: Yes
Buzzer: Yes
Power Input: 9 to 48VDC
Power Consumption: 190mA@12VDC
Dimensions: 160 x 104 x 32mm
Operating Temperature: 0 to 70°C (32 to 158°F)
Regulation: CE Class A, FCC Class A

Software Specifications

General

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

Pre-installed Utilities

bash, busybox, sysvinit, wget, ipkg, procps (for webmin), psmics, lighttpd, vsftpd, iptable, 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 with/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.

Tool Chain for Linux

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

USB Host Drivers

Generic Flash drive
RS-232 adaptors (for Prolific PL-2303 compatibles)
WiFi dongles (for Ralink RT73 compatibles)

Ordering Information

Matrix-516	Industrial Linux-ready ARM9 Box Computer
DK-35A	DIN RAIL Mounting Kit