

Matrix-604 WinCE-ready ARM9 Embedded Computer

- ✓ Windows CE 6.0 compatible computing platform
- ✓ ATMEL AT91SAM9G20 400MHz CPU
- ✓ 64MB SDRAM and 128MB NAND Flash
- ✓ Failover mechanism against system crash
- ✓ One 10/100Mbps Ethernet port
- ✓ Four 921.6Kbps high speed RS-232/422/485 ports
- ✓ Two USB 2.0 host ports, 12Mbps
- ✓ C/C++ Libraries and Run-times included
- ✓ Supports Microsoft .NET Compact Frameworks 2.0
- ✓ Extremely compact design, 78 x 108 x 24mm
- ✓ Ultra-low power consumption, less than 3 Watts



Introduction

Artila's Matrix-604 is an ARM9-based WinCE 6.0 computing platform designed for unmanned 24/7/365 continuously running industrial applications. It comes equipped with a 400MHz ARM9 CPU, 128MB NAND Flash, 64MB SDRAM, 1x 10/100M Ethernet port, 4x serial ports, 2x USB 2.0 host ports and 1x real-time clock.

✕ NAND-based Storage and Failover Mechanism

The Matrix-604 uses NAND Flash for its file system. NAND Flash provides reliable bad sector management over NOR Flash. A brand new Matrix-604 provides more than 90MB storage space for user files.

If the NAND Flash file system does crash for certain reason, the Matrix-604 will automatically boot up from its on-board 2MB Data Flash (read only). This failover mechanism provides a convenient way for system recovery.

✕ Ideal for Network-centric Application

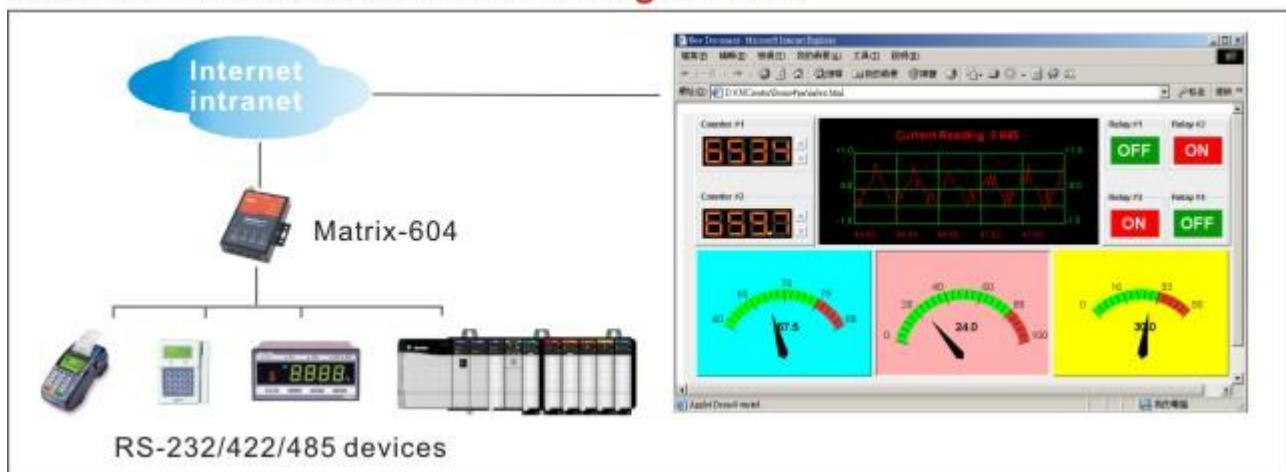
The Matrix-604 provides ready-to-use Web server, Telnet server and FTP server. Its comprehensive network capabilities make the Matrix-604 an ideal platform for developing remote device monitoring/control application.

Also, the Matrix-604 supports the Microsoft's Remote Display Control for WinCE utility, which allow users to operate/config the Matrix-604 in an UI-based environment.

✕ Application Development

Users can develop the Matrix-604's application using VB.Net, C# or C/C++. It is recommended to use Microsoft's Visual Studio 2005 IDE for application development. The Matrix-604 provides its own SDK for C/C++ programming language.

Browser-based device monitoring/control



H/W Specifications

CPU/Memory

- ▶ CPU: ATMEL 400MHz AT91SAM9G20 (ARM9, w/MMU)
- ▶ Memory: 64MB SDRAM, 128MB Flash (NAND)
- ▶ DataFlash®: 2MB, for system recovery

Network Interface

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

COM Ports (RJ45 connector)

- ▶ COM1: can be set as RS-232, RS-422, or RS-485
- ▶ COM2,3,4: can be set RS-232 or RS-485

COM Port Parameters

- ▶ Baud Rate: up to 921.6 Kbps
- ▶ Parity: None, Even, Odd, Mark, Space
- ▶ Data Bits: 5,6,7,8
- ▶ Stop Bit: 1, 1.5, 2 bits
- ▶ Flow Control: RTS/CTS, XON/XOFF, None
- ▶ RS-485 direction control: auto, by hardware

Console & GPIO (RJ45 connector)

- ▶ Console: Tx/Rx/GND, 115,200,N81
- ▶ GPIO: 5x, CMOS level

USB Ports

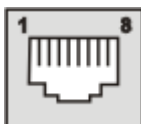
- ▶ Host ports: two
- ▶ Client port: one, for ActiveSync
- ▶ Speed: USB 2.0 compliant, supports low-speed (1.5Mbps) and full-speed (12Mbps) data rate

General

- ▶ WatchDog Timer: yes, for kernel use
- ▶ Real Time Clock: yes
- ▶ Buzzer: yes
- ▶ Power input: 9~48VDC
- ▶ Power consumption: 300mA@12VDC
- ▶ Dimension: 78 x 108 x 24mm
- ▶ Operation Temperature: 0 to 70C(32 to 158F)
- ▶ Regulation: CE Class A, FCC Class A

Pin Assignments

PIN	Console	PIN	RS-232	RS-422	RS-485
1	GPIO1	1	DSR	---	---
2	Tx	2	RTS	Tx+	Data+
3	GND	3	GND	GND	GND
4	GPIO2	4	Tx	Tx-	Data-
5	GPIO3	5	Rx	Rx+	---
6	GPIO4	6	DCD	Rx-	---
7	Rx	7	CTS	---	---
8	GPIO5	8	DTR	---	---



- * only COM1 supports RS-422
- * Console port contains 5x GPIO pins

S/W Specifications

General

- ▶ OS: WinCE 6.0 core version
- ▶ RAM-based File System: >30MB free space available
- ▶ NAND-based File System: >90MB free space available

Ready-to-use Network Services

- ▶ Web Server, including ASP support (users can specify the default directory of web pages)
- ▶ Telnet Server
- ▶ FTP Server
- ▶ Remote Display Control (Artila-built Windows's client utility is included)

Artila Enhanced Command Mode Utility

(utilities below are provided by Artila, not Microsoft)

- ▶ **ifconfig**: to modify the network interface settings
- ▶ **usrmgr**: to create and manage user accounts
- ▶ **update**: to update the kernel image and file system
- ▶ **init**: to organize the application programs which runs automatically after system boot-up.
- ▶ **gpioctrl**: to control the Matrix-604's GPIOs

System Failover Mechanism

- ▶ Normally, the Matrix-604 boots up from its NAND Flash.
- ▶ If the NAND Flash were crashed, the Matrix-604 can still boot up from its Data Flash. A menu-driven utility will be activated to help users to recover its NAND Flash.

Application Development & Deployment

- ▶ It is recommended to use Microsoft Visual Studio 2005 for application development. The Matrix-604 comes with its own SDK for C/C++ programming language.
- ▶ The application program can be transferred to the Matrix-604 either by ActiveSync or USB pen drive locally or by FTP remotely.

Ordering Information

☒ Matrix-604

ARM9-based WinCE Box Computer with 128MB on-board Flash

☒ CB-RJCON-100

Console cable, RJ45-to-DB9F, 100cm

☒ CB-RJ45F9-150

COM port connection cable, RJ45-to-DB9F, 150cm