

ATMC-3100 Summary Specification

Tracan Electronics Corporation



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Model ATMC-3100 Specification Summary

Description:


The Model ATMC-3100 is an expandable, flexible, microprocessor based traffic controller, which will run application software developed for x86 compatible microprocessors. The unit ships with QNX 6.3 support but can also run Linux, Microsoft WindowsCE, Windows XP or embedded XP. The ATMC-3100 is based on the currently deployed ATMC-3000 design with the added requirements of OSS_00270597.

This controller implements the following technology implemented on a Tracan designed PCB using a SOM (System on Module) processor:

- AMD Geode LX800 CPU at 433MHz, 256 KB cache, 256MB DRAM
- Two RS-232 Serial Ports With Hardware Flow Control (16550 Compatible)
- Four USB 2.0 Ports
- 10/100BaseT Ethernet
- Real Time Clock (Battery Backed)
- VGA Video (QNX Standard VGA Driver Support)
- 48 Lines TTL Digital Inputs Optically Isolated to 3000V RMS
- 24 Lines Open Collector Outputs 60V Optically Isolated to 3000V RMS
- Camera Control Interface Pan, Tilt, Zoom, Focus Isolated to 5000V RMS
- Camera Control Feedback, Four 12-bit A/D Inputs +- 10V Isolated to 5000V RMS + 2500 on the Analog Front End
- QNX Version 6.3 Real Time Operating System

CPU

CM-iGLX System On Module from Compulab is a complete single board computer utilizing the AMD Geode LX800 CPU x86 compatible processor. The CM-iGLX is connected to the Tracan designed PCB called a baseboard. The baseboard routes signals from the CM-iGLX to application specific circuitry and connectors. The system configuration parameters are stored in both battery backed RAM and non-volatile flash, allowing the OS to self-boot regardless of the CMOS battery

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being present or any particular voltage level the battery is at. The features and signals exposed from the CM-iGLX to the baseboard are as follows:

- PCI Bus – Used for PC/104+ Expansion Interface
- LPC Bus – Low Pin Count Bus (33 MHz) Used To Connect to FPGA I/O Subsystem
- 4 USB 2.0 Ports
- 2 Serial Ports (Level Converted On Baseboard)
- IDE (CompactFlash)
- Keyboard & Mouse Ports
- CRT (VGA)

This module is available from Compulab as Industrial Temperature Range: -40°C to +85°C operating. A heatsink extrusion will be used to thermally connect the CPU to the chassis for proper conduction cooling.

This CPU runs Windows XP/ CE. Linux, VxWorks, QNX and DOS.


The CPU has a built in RTC and watchdog timer.

CompactFlash

A compact flash port will be implemented on the baseboard which will be accessible through the front panel with a hinged door. The CompactFlash is connected to the CM-iGLX through the standard IDE interface. The standard IDE mode driver from QNX will support this mode transparently.

Ethernet

A IEEE 802.3 compliant 10/100BaseT Ethernet port will be routed and cabled to the rear panel. All isolation magnetics will be implemented on the baseboard. QNX 6.3 is supported.

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Serial Ports

Two serial ports are routed from the CM-iGLX module. The first port will be the console port by default. This port will be routed to the front panel utilizing a PCB mounted connector. All BIOS settings can be accessed through this port if desired. VGA, keyboard and mouse are not required. This port is level converted to RS-232.

The second serial port level converted to RS-232 will be routed to the rear panel via a standard 9-pin cable.

USB

Four USB 2.0 ports are available from the CM-iGLX module. 2 Ports will be routed to the front panel utilizing a stacked USB connector. All power limiting and EMI reduction circuitry will be implemented on the base board.


The spare two USB ports will be cabled to the rear panel.

VGA

The analog VGA port from the CM-iGLX will be routed to the front panel utilizing a PCB mounted HD-15 connector.

Digital Inputs

44 Lines of optically isolated digital inputs will be provided. All input lines will be pulled up to 5V through a 4k7 resistor. The opto-isolator used will provide 3000V RMS isolation. These input lines will be routed to a Xilinx FPGA. The FPGA will be the I/O subsystem for the ATMC-3100. The FPGA will be connected to the CM-iGLX via the LPC bus. This bus runs at 33MHz and is I/O and memory space decoded. All I/O offsets will be honored based on MTO-20-05-631 tender specification (compliant with OSS_00270597). Digital Inputs will be terminated to the C1 connector located at the rear panel

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Digital Outputs

16 Lines of optically isolated digital outputs will be provided. All output lines will utilize a NPN open collector output capable of driving 60VDC with 300 mA sink capability. The opto-isolator used will provide 3000V RMS isolation. These output lines will be routed to a Xilinx FPGA. The FPGA will be the I/O subsystem for the ATMC-3100. The FPGA will be connected to the CM-iGLX via the LPC bus. This bus runs at 33MHz and is I/O and memory space decoded. All I/O offsets will be honored based on MTO-20-05-631 tender specification (compliant with OSS_00270597).

Outputs will be open circuit on power up.


Digital Outputs will be terminated to the C1 connector located at the rear panel

Closed Circuit Camera I/O

The ATMC-3100 will provide four 120VAC switched outputs isolated to 5000 V RMS. These signals will be driven by the FPGA subsystem. Each pair of outputs will be fused to 7A. The FPGA will operate each pair of outputs as mutually exclusive (Pan Left & Pan Right, Tilt Up & Tilt Down).

Four $\pm 12V$ signals will be driven from the FPGA for Zoom In/Out and Focus In/Out. These signals will be optically isolated to 5000V RMS. Each pair of outputs will operate as mutually exclusive. The 12 V source will be a isolated power supply from the main power supply with the -12V being generated on board. Each output will be capable of delivering 100mA concurrently. Two additional 500mA $\pm 12V$ supply points will be routed to the rear panel as required.

Four channels of analog inputs optically isolated to 5000V RMS will be provided. These will be 12-bit channels bipolar ($\pm 10V$). The analog channels will be driven by the FPGA through an isolated SPI interface port. A front end isolation amplifier (2500V RMS) will be used to better protect the system and the A/D converter.

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Closed Circuit Camera I/O will terminate on the C3 or barrier strip terminal block as defined in the MTO Tender Specification MTO 20-05-631 (compliant with OSS_00270597).

Identity Registers

The FPGA will also provide model name, vendor name, serial number, and signature register set in accordance with section 2.5.7.17 in tender OSS_00270597.


Power Supply

The power supply will be implemented by utilizing a Vicor FARM (Filter/Autoranging Rectifier Module). This module will accept 90Vac to 132Vac inputs and is 92% efficient. This combined with two isolated Vicor DC/DC Converters will provide power to the system. One DC/DC converter will be a 5V unit providing main power. The second 12V DC/DC converter will supply power to the Camera control portion of the baseboard fully isolated from the system side. All power supply modules "T suffix" are rated for the full extended temperature range.

Power Entry will be from the rear of the chassis connected to the front panel power switch. This line will be fused to 10A. The AC line will be connected to the internal power supply frame and connector.

The power supply module itself will be a front panel removable module making for quick field replacement without having to open the main chassis. This module will slide into the power supply frame and mating connector.


This power supply is the same proven supply as used in the ATMC-2500 and ATMC-3000, of which over three hundred units have been deployed over 5 years with zero power supply failures to date.

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Custom Enclosure

The custom enclosure will be a 2U high (3.5") sealed aluminum enclosure designed for the EIA 19-inch rack standard utilizing open end mounting slots. Depth of the chassis will be 12". No internal or external vents are required. All cooling will be conducted through the chassis itself. Please refer to provided front and rear panel drawings.

The custom baseboard will provide a PC/104+ expansion site for future use. Two PC/104+ cards may be utilized for expansion..

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