



PROCESS AUTOMATION AND DATA COMMUNICATION - SIMPLIFIED

ACE1000 REMOTE TERMINAL UNIT

Whether there is a leaking pipe or a damaged power grid breaker miles away from your control center, you need to know about it as soon as possible. The sooner you get the information, the faster you can fix the problem and avoid negative consequences.

The Industrial Internet of Things (IIoT) offers new opportunities to enhance your operations across manufacturing, energy, agriculture, transportation, water utilities and other critical infrastructure sectors of the economy. It can improve the way you collect, analyze and share real-time information to help your organization make better decisions. It also enables machines and equipment to realize and correct for potential failures before they become a catastrophe. And, it allows objects to operate autonomously while being monitored by personnel from remote locations. You can't be in multiple places at once, with with an easy to deploy IIoT solution you can monitor and control your system as if you were.

The versatile ACE1000 will deliver the data communication and processing you need for a diverse set of applications, without having to completely replace your current operational technologies. The compact and versatile ACE1000 Remote Terminal Unit (RTU) will facilitate higher productivity and safety quickly and easily. Additionally you can leverage the web-based ACELogic tool to quickly and easily build data driven logical applications with a smooth and intuitive user interface.

KEY BENEFITS:

- Easy to configure, install and maintain with simplified web-based management tool
- Interoperability across a variety of communication media and systems
- Linux OS for greater application flexibility
- Large capacity memory for long-term data storage
- Green performance low-power and sleep modes
- ACELogic is a rule based logic tool that allows you to easily program local automated operations of the ACE1000 RTU and its connected devices

INTELLIGENCE SIMPLIFIED

Complicated control processes can be time consuming and difficult to keep track of. The ACE1000 allows you to easily automate processes such as multiple high speed control loops, event capture, and data storage, so you don't need to spend time doing it yourself.

The ACE1000's Linux OS allows for simplified programming, so your system can be adapted to existing applications or you can build from the ground up - quickly and easily - without the typical complexity of SCADA systems. Connect to operational technologies seamlessly and transmit information efficiently with the ACE1000's extensive common data protocol support combined with our enhanced MDLC protocol.

ACCELERATE APPLICATION DEVELOPMENT

The ACELogic tool provides a user-friendly interface that allows you to quickly and easily design, create and deploy customized logic applications for automated operations across all of your connected devices including sensors and actuators that are managed by the ACE1000 RTU. Using the ACELogic tool you significantly speed up the development process and accelerate time to market while freeing up resources typically allocated towards application development. The intuitive interface enables anyone to create applications following various, "when this happens, do this" logic. For example, when a tank has reached 100% capacity, close the supply valve. This level of automation will streamline your operation and provide you with greater control with fewer resources.

COMMUNICATE EFFORTLESSLY

The ACE1000's unique communication capabilities allow your system to transmit your valuable data over a variety of media including analog/digital two-way radio, dial-up modem, point-

to-point microwave, 3G/4G public or private, and Ethernet - simultaneously. The expandable memory also provides the ability to store data locally for back-up purposes.

The ACE1000 allows RTU-central and RTU-RTU communications, along with advanced networking abilities, which can be used to pass data between RTUs in the system so you don't have to purchase additional repeaters or expensive antennas. Its communication flexibility gives you the freedom to customize your system that's easy on your budget.

SEAMLESS CONFIGURATION

The ACE1000 is easy to install within existing, multi-vendor networks or as a brand new system. Its user-friendly configuration tools allow you to set up your whole system, rather than each unit individually, for quick deployment with less time, manpower and money. Your sites can also be supported remotely through a single gateway, reducing the amount of site visits you have to make.

RUGGED AND READY FOR THE FIELD

Not only will your data be safe and secure, but your equipment will too. The ACE1000 RTU is designed to withstand harsh conditions, unlike the average programmable logic controller (PLC), which is built for the factory floor. Temperature, altitude, and humidity are no match for the ACE1000, which meets rugged specifications. Whether it's installed at an offshore drilling platform or an Arctic power station, the environment won't affect the performance of your system. The ACE1000 even offers a low power and sleep mode option for when you're operating on solar power in remote locations.

Process automation improves efficiency and plant safety and you can be sure the important tasks are being completed at the right time. This will free up your employees to do other tasks and as a result, streamline your facility's operations.

KEY FEATURES:

- Motorola Radio Support (ASTRO 25 Digital, MOTOTRBO Digital, Dimetra)
- ACELogic Tool (via WEB Browser)
- RTC Back-up Battery
- 256 MB of FLASH Memory
- IECEx/ ATEX - EXnA IIC T4 (Cat 3/Zone 2)*
- 256 MB of RAM Memory
- 9-30 VDC Input Voltage Range
- Sleep/Low-power Mode
- 3rd Party Modem Support

*w/o radio, in ATEX approved enclosure

OPTIONAL FEATURES:

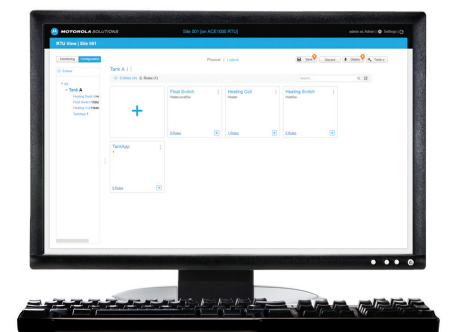
- Din Wall Mounting Bar



ACE1000 Remote Terminal Unit without cover



ACE1000 Remote Terminal Unit with covers



ACELogic Tool

GENERAL SPECIFICATIONS

Operating Temperature	-40 ° C to + 70 ° C (excluding radios)
Storage Temperature	-55 °C to + 85 °C (excluding radios)
Operating Humidity	5% to 95% RH @ 50 °C
Operating Altitude	-400 meters to +4000 meters
Dimensions	2.95 in. (w) x 6.3 in. (h) x 4.4 in. (d)
Weight	450 grams (without expansions)
Wall Mount Option	Yes (using DIN rail)
Construction	Modular
Power Consumption:	
Typical Runtime	~170mA at 12v
Power Saving Mode	65mA at 12v
Sleep Mode	~5.5mA at 12v
RTC Back-up Battery:	
Type	Coin Rechargeable Battery (30 days)
Temperature	- 40 °C to + 70 °C
AUX Power Connector:	
1 AUX Power Output Port	5v, 7.5v, 9.5v, 12v, V-IN (on plug-in) V-AUX > V-IN
SDIO Card	Up to 32 GB
UART	Yes
USB HOST	Yes
USB OTG	Yes
USB Device	Shared with USB OTG
LAN Port (10/100Mbps)	Yes
INPUTS/OUTPUTS (I/Os)	
I/Os:	
CPU I/Os	3DI + 1DO
Two I/O Expansion Types	12DI + 8AI (isolated) 8DO + 2AO (isolated)
Performances:	
DI Fast Counter	2Khz For All Inputs
DI Time Tagging	No
DI Event Capture	~ 100 msec
DO Control	~ 100 msec (w/out relay delay)

CPU

Processor	Sitara CPU (Cortex-A8)
Clock	300 MHz
OS	Linux
Memory:	
Flash	256 MB, 32 MB for User
RAM	256 MB, 16 MB for User
RTC	YES
Ports:	
RS232/RS485	Up to 1 port on CPU board (shared with RS485) (<115.2Kbps) Non-Isolated
RS232 Only	2 ports on plug-in board (<115.2Kbps) Isolated
Ethernet	1 port on CPU board 10/100MB
POWER MANAGEMENT	
Modes	Disabled Run Mode Idle Sleep Mode Low Power Sleep Mode (CPU is off)
Wake-Up Triggers	3 Assigned DIs (CPU Board) Manual Push-Button Real-Time Clock C App
Voltage Management	Power up occurs if the voltage is in range, or else a safe power down is performed automatically when voltage is too low. The unit returns to its previous mode (run or idle sleep) when input power returns to predefined value.
Power Voltage Reduced/Disabled ¹	Radio/Auxiliary Power Supply External I/Os Piggyback (All Components, or each serial port) Serial Main Board Ports USB HOST USB OTG Wire LAN Wireless LAN

¹ This is statically configured (not via C App) and cannot be changed without a reboot to the ACE1000

SOFTWARE

SW Tool: Mixed System	Configuration - STS Tools SW Download - Web Interface Diag/ErrorLogger/Partial Field View HW test - Yes
ACE1000 Only System	Configuration/Monitoring - Web Interface HW Test- Yes
MDLC Networking: Networking	Only in Mixed Systems Yes
Direct Link	Yes- Built in Application
Central to RTU	Yes- Built in Application
RTU Burst Reporting	Mixed System - Yes
RTU - RTU Communication	ACE1000 Only System- Via C App.
MDLC Store and Forward	Mixed System - Yes ACE1000 Only System - No
Broadcast Sending (RTU-RTU)	Mixed System - Yes ACE1000 Only System - Via C App.
Failsafe Mechanism	Yes
Error Logger	Yes
HW Test	Local (via CLI), not remote
HW Diag and Calibration	1) Digital Input Test Loop 2) CPU Battery Level 3) Enhanced Power Management Test
User Programming	1) Rule-based easy programming 2) C + Linux Functionality 3) IEC61131-3 with External Communication Interface
Security	MDLC password, Authentication Login, Firewall, HTTPS, SFTP, SSH
Protocols	MDLC, DNP3, MODBUS over RS232/RS485/IP
Time Synchronization	MDLC Time Sync (20 mS resolution with password)
Set Date/Time	Yes (with Time Zone and Daylight-Savings)
Table Monitoring Utility	Mixed System - No ACE1000 Only System - Yes
Network Configuration Utility	No
Services	DNS - Yes DHCP - Yes - Slave

² Motorola Data Link Communication (MDLC)

LED INDICATIONS

LEDS:	
Main CPU	4 General Function LEDs
Input/Output	4 General Function LEDs + 24 I/O LEDs
CPU	Power (physical indication) ERR (physical indication, detailed error can be seen in error logger) LOAD (UI Indication) CONF (UI Indication) APPL (UI Indication) MON (UI Indication) RST Process (Indication on the PWR Lead)
Ports	Tx/Rx on main RS232 (dedicated physical LED) Tx/Rx on Piggyback RS232 (UI Indication)
Main I/Os	Main DIs (represent on one of the 4 main board LEDS) Main DO (represent on one of the 4 main board LEDS)
Expansion I/Os Modules	DI DO Input Card: 12 DI/8AI Output Card: 8 DO/2AO AI: Range/Out of Range, Current/Voltage (UI Indication, Automatic) Calibrated (UI Indication) AO: On/Off (physical Indication), Current/Voltage (UI, Manual Calibration)
LEDs Tests	Yes
CPU Fail	Indication there is a fault on the fault LED
INFRASTRUCTURES	
MDLC ² via Ethernet	Yes
MDLC via Terminal Server (SLIP)	Yes
MDLC over ASTRO 25 7.XX (IV&D)	Yes
MDLC over Dimetra	Yes
MDLC over Null Modem	Yes
MDLC over GPRS	Yes
MDLC over Standard (line) Modem	Yes
MDLC over Digital MOTOTRBO	Yes
MDLC over IP Site Paging	Yes
MDLC over IP	Yes

For more information on the Industrial Internet of Things and products to help you drive greater productivity and safer operations visit us at motorolasolutions.com/industrialiot

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