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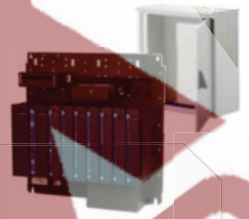
MOTOROLA ACE3600 INTRODUCTION PPT

support@ebipax.com

ACE3600 RTU - BUILDING BLOCKS

Power Supply

Housing & Chassis



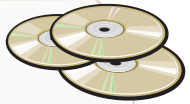
CPU

Frames

I/O Modules

Radios

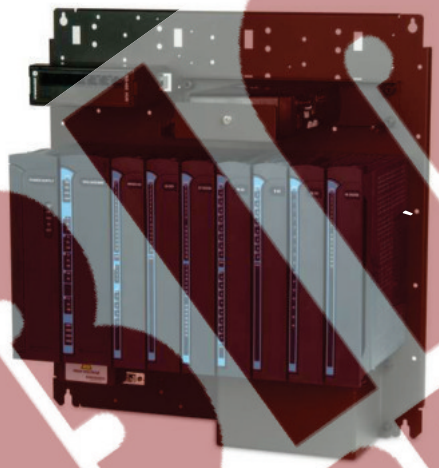
Software



STRUCTURE AND CONSTRUCTION

- The ACE3600 is available in various structures:

Frame only

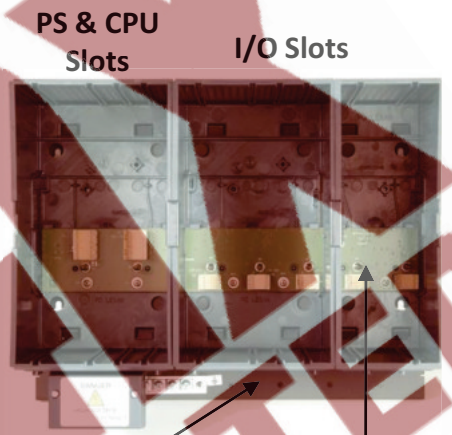


On Metal Chassis

In Housing

FRAMES

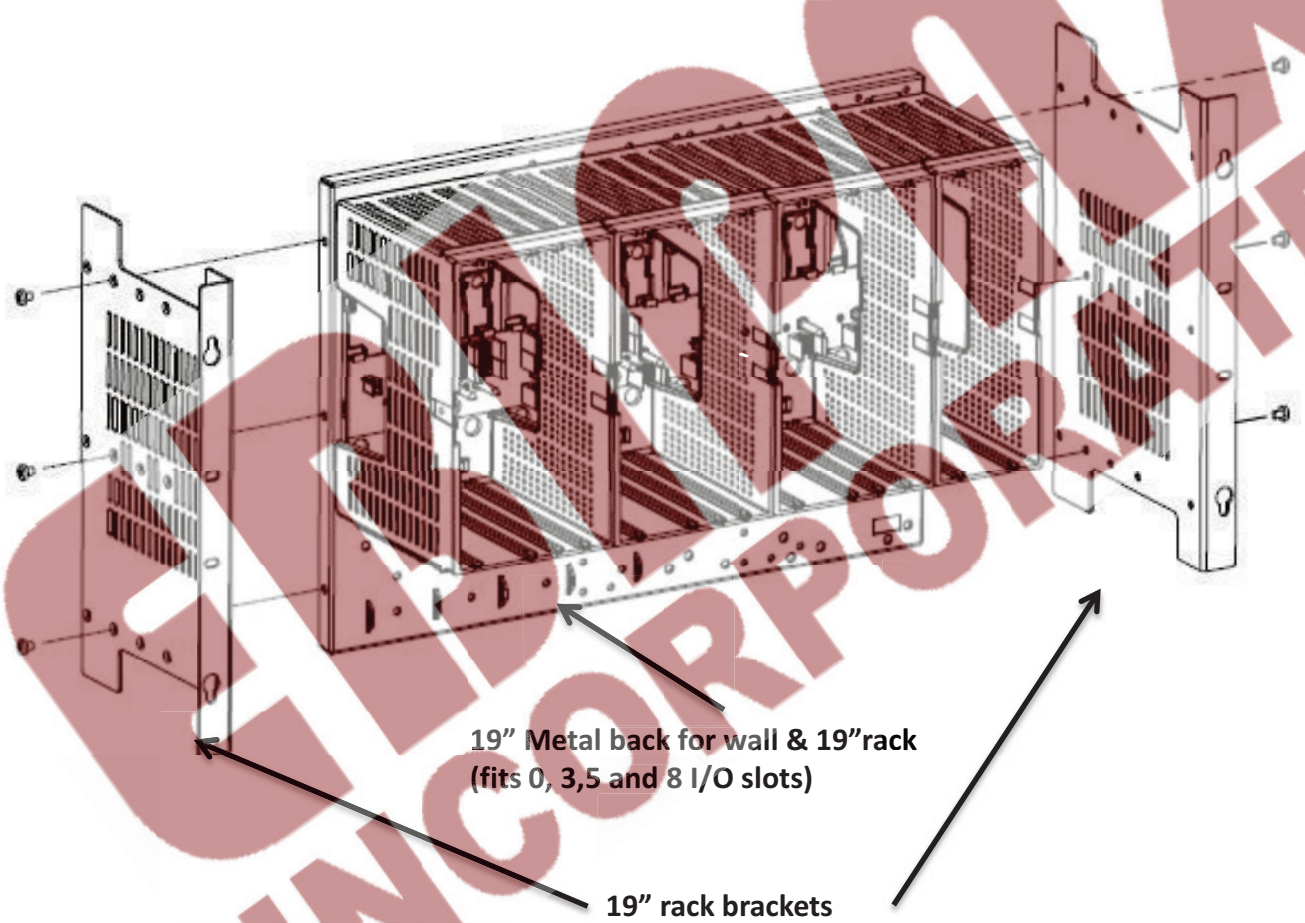
- The ACE3600 frames have the following tasks:
  - To hold the Power-Supply, CPU and I/O modules
  - To connect the modules with operating voltages
  - To connect the modules to the CP
- All frames can be installed on a wall
- The 8 I/O Frame can also be installed on a 19” rack
- The following frames sizes are available:



No I/O | 2 I/O | 3 I/O | 5 I/O | 7 I/O

8 I/O

8 I/O SLOTS FRAME - 19" RACK



METAL CHASSIS AND HOUSING

Small Chassis
0 or 2 I/O slots

Medium Chassis
0 or 3 I/O slots

Large Chassis
Up to 7 I/O slots

19” Chassis
for radio & accessories

Small Housing
Up to 3 I/O slots

Large Housing
Up to 7 I/O slots

ACE3600 CPU MODULE

- 2 types of CPU modules are available:
  - CPU 3640 and CPU 3680 (CPU 3610 – cancelled)
  - Wind River's VX-Works Real-time Operating System.
- Controls the I/O modules, processes the gathered data and communicates with the outside world.
- The module's processor is Power Quick II MPC8270, 32 bit, with extended communication capabilities, DMA and floating point calculation.
- Includes Field Programmable Gate Array (FPGA).

CPU MODULE DESCRIPTION

Pushbuttons

Status LEDs

2 USB Host Ports
(on CPU U3680 only - for MotoTrbo radios)

Communication Ports LEDs

Plug-In 1 Port (optional)

Serial 1 Port (RS-232/RS485)

Serial 2 Port (RS-232)

Ethernet 1 Port
(on CPU 3640 and CPU 3680)

USB Device Port (for Future use)

User LEDs

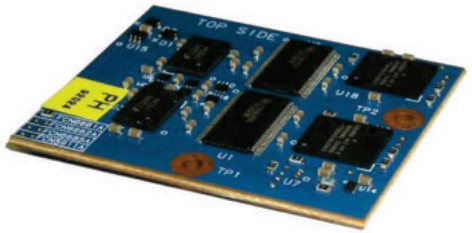
Plug-In 2 Port (optional)

CPU MEMORY

- The ACE3600 CPU includes

	CPU 3610	CPU3640	CPU3680
Flash memory	16 MB	16 MB	32 MB
SDRAM memory:	32 MB	32 MB	128 MB
User Flash:	3 MB	3 MB	19 MB
User SDRAM:	10 MB	10 MB	118 MB
SRAM Plug-In	4 MB	4 MB	4 MB

- FLASH
  - Stores the Firmware, configurations files, user program files, and the user data files.
- The SDRAM
  - Stores the Firmware run-time data and user program temporary data.
- Plug-in SRAM memory expansion
  - Option for logging user data.
  - Retained using by the on-board rechargeable lithium battery.

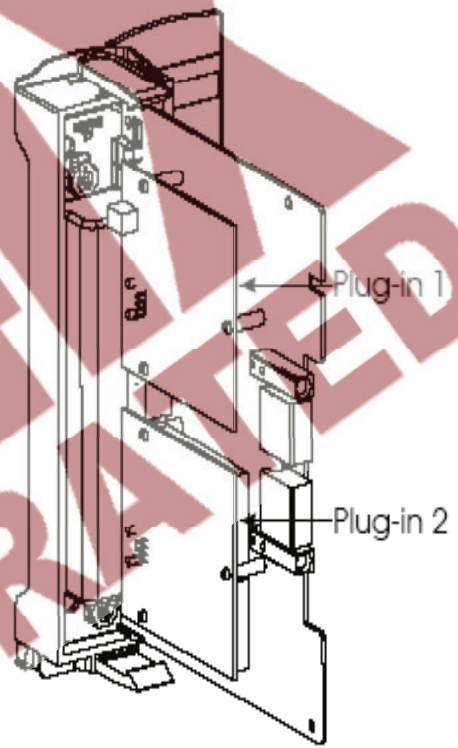


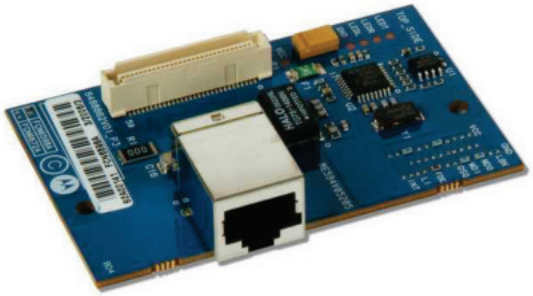
CPU COMMUNICATION PORTS

- Includes several communication ports:
  - On Board ports:
    - Serial 1 (SI1) – RS-232 / RS485 serial port (configurable)
    - Serial 2 (SI2) – RS-232 serial port
    - Ethernet1 (E1) - 10/100 Mbs Ethernet port
    - Internal Ethernet port (Int1) – Internal 100 Mbs Ethernet port (for CPU redundancy)
    - USB Host 1 (H1) – USB 2.0 host port (for MotoTrbo digital radio)
    - USB Host 2 (H1) – USB 2.0 host port (for MotoTrbo digital radio)
    - USB Device 1 (D1) – USB 1.1 device (HW for future SW release)
  - Plug-in Ports (options), for different types of ports:
    - Plug-in 1 (PI1) – fits RS-232, RS485, 10 MB Ethernet, 10/100 Mb Ethernet, or Radio Plug-in option
    - Plug-in 2 (PI2) – fits RS-232, RS485, 10 MB Ethernet, or Radio Plug-in port option.

CPU PLUG-IN PORT OPTIONS

- Serial Ports
  - RS232 up to 230 kb/s
  - RS485 up to 230 kb/s
- Configurable conventional/ Trunk radio modems:
  - DPSK 1.2 kb/s, FSK 2.4 kb/s , DFM 4.8 kb/s , Duo-Binary 9.6 kb/s
- Ethernet
  - 10/100 Mb/s (In Plug-in 1 only)
  - Ethernet 10 Mb/s





COMMUNICATION MEDIA OPTIONS

- Motorola Radio Support:
  - Mobile two-way radio - CM200, CM140, EM200, GM3188, CDM750
  - Portable two way radio - HT 750, GP320, GP328, PRO5150
  - Astro – XTL 5000 & XTL2500 (mobile digital and analog trunking), XTS 2500 (portable digital Trunking)
  - Dimetra – MTM700/800
  - MotoTrbo Digital - XPR4350, DM3400, XiR M8220, DGM4100
- 3rd party Radio / MODEM connectivity
  - 3rd party two way radios
  - Data radios (MDS, Data radio, etc.)
  - Dial-up modems
  - Cellular modems (dial mode & PD, GPRS,CDMA)
  - Broadband (WLAN, Canopy, iNet900,etc.)

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MDLC PROTOCOL

- MDLC is the ACE3600 native protocol.
- MDLC over serial ports
  - **RS-232 and RS-485 ports**
  - **Conventional and Analog Trunking radio ports (Plug-in 1 and 2)**
- MDLC Over IP
  - **On Ethernet Ports - UDP/IP, DHCP**
  - **On Serial Ports - PPP (for digital radios and wireless modems)**

3rd PARTY PROTOCOL DRIVERS

- Enable the application programmer to implement communication based on the following protocols
  - **ModBus RTU**
    - **Slave, RS-232 / RS-485 / IP**
    - **Master RS-232 / RS-485 / IP**
  - **DNP 3.0 Plus** (DNP 3.0 + MDLC on the same port)
    - **Master, RS-232 and IP ports**
    - **Slave, RS-232 and IP ports**
  - **Allan Bradley DF1** (compatible with PLC5 and SLC1-4)
    - **Master, RS-232**
  - **IEC 60870-5-101/104** www.enregro.eu
    - **Slave Driver for RS-232 ports**
  - **User Protocol Interface**
    - **Serial ports RS-232 and RS-485**
    - **Ethernet ports using TCP/IP**

32 other protocols - For more info please contact us at support@ebipax.com

IP FIREWALL

- ACE3600 has an optional firewall on IP. By default it is disabled.
- When enabled, it inhibits any reception of TCP/IP and UDP/IP.
- When enabled, only packets from specific addresses or range of IP addresses will have access to the RTU.
- For permitted addresses, ACE3600 accept specific non configurable:
  - UDP, TCP ports and ICMP.
  - MDLC, DNS, NTP, ping etc.

SECURITY & ENCRYPTION

- Integrated Option:
  - **For more info please contact us at support@ebipax.com**
- The Encryption Tool
  - **For more info please contact us at support@ebipax.com or www.ace3600.com**

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CPU BUZZER & PUSHBUTTONS

- The CPU module audio buzzer
  - Indicates task completion such as end of download/upload, restart etc.
  - can also be controlled by the user program.
- The CPU has two pushbuttons on the front panel
  - PB1 and PB2.
- These push buttons are used for:
  - activating and testing the modules LED,
  - resetting the unit,
  - erasing the user FLASH memory
  - activating memory test.
- The pushbuttons can also be monitored
  - by the user program (when running).

BACKUP BATTERY FOR SRAM AND RTC

- The CPU includes Real Time Clock
  - **For more info please contact us at support@ebipax.com**
  - Date and time are set using the ACE3600 STS.
  - Date and time can be synchronized from other RTUs, M-OPC or from IP Gateway.
- The CPU includes a rechargeable lithium battery
  - Provides backup power and data retention for the SRAM and RTC.
  - The lithium battery is capable of preserving the data stored in the SRAM and RTC for minimum 90 days
    - accumulated power off time.
  - Low battery warning flag is available to the user program

CPU TIME SYNCHRONIZATION

- CPU date & time synchronization methods:
  - MDLC legacy time sync. on serial ports and conventional radio ports
    - Compatible with MOSCAD and MOSCAD-L, ΔT ≤ 5 ms.
  - MDLC extended time sync. For more info please contact us at support@ebipax.com
- Network Time Protocol (NTP) time sync.
  - Time Sync. on IP ports (Ethernet, and serial), ΔT depends on the network.
- 3rd party GPS receiver supported
  - For more info please contact us at support@ebipax.com or www.ace3600.com
  - RTU with GPS can act as NTP server that synchronize other RTUs.
  - GPS time sync. - on Serial ports connected to local GPS receiver, ΔT ≤ 0.5 ms.
- Time sync. supports
  - Time zone and Daylight Save Time (not supported in the legacy time sync.)

CPU STATUS AND DIAGNOSTICS

- CPU warnings and errors are logged in the CPU memory.
  - To indicate issues or errors during startup
  - Restart, user program execution and other modes of CPU operation.
  - Indicated on the front panel LED.
- Detailed CPU status and diagnostics information
  - Can be retrieved using the CPU Hardware Test.
  - Existence of CPU warnings / errors are indicated in the ERR LED on the front panel of the module
  - Existence of CPU warnings / errors is available to the user program.
- Remote indications
  - Remote RTU status and diagnostics is possible via any port using the STS.

REMOTE DOWNLOAD AND UPLOAD

- Can be remotely downloaded to the RTU:
  - Site configuration IP configuration tables
  - Network configuration and Network configuration source
  - Phone book and MODEM setup files (STM files)
  - User programs (Ladder & C) and sources and User Data files
  - I/O modules FPGA files (for version updates)
  - Firmware updates (for version updates)
- Can be remotely uploaded from the CPU:
  - Site configuration
  - Network configuration source
  - IP configuration tables
  - User programs (Ladder & C) and sources and User Data files

POWER SUPPLY

- The ACE3600 power supply modules provide the CPU and I/O modules with their operating voltages via the motherboard bus.

- It also provides power to radios, modems and accessories.

- The available power supply models are:
  - AC Power Supply 90-264 V with Battery Charger
  - For more info please contact us at support@ebipax.com

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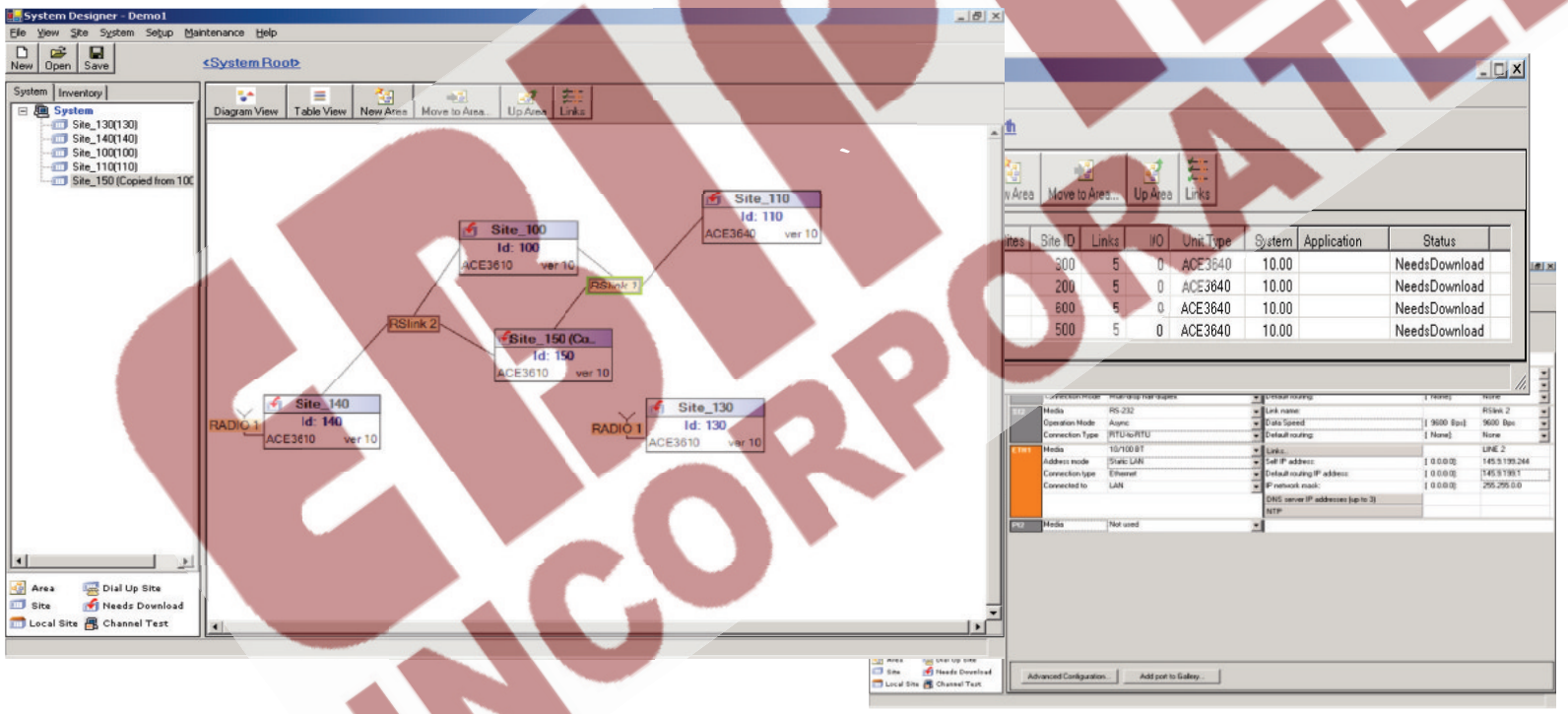
ACE3600 PROGRAMING TOOLS - STS

SYSTEM TOOL SUITE (STS)

The main benefits of the STS:

- Project oriented tool - handles multiple sites from a system design approach.
- Integrates all SCADA related functions in a single tool – Configuration, Setup, Programming, Debagging and maintenance.



ADVANCED FEATURES - ENHANCED PID

- The ACE3600 Enhanced PID is an add-on program that adds advanced PID control functionality to the user programs with minimum effort.
- The Enhanced PID supports up to 32 PID loops running simultaneously.
- Each PID loop can be monitored and tuned with a user friendly PID Monitor Tool built into the STS.
- Several PID loops can be monitored at the same time
- For more info please visit us at www.ace3600.com