



Building  
Automation  
Systems

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## EM Solutions™ 8/16/24/32-UD Direct Digital Controller

Model Numbers: SSS-08-UD-0-0, SSS-16-UD-0-0, SSS-24-UD-0-0, or SSS-32-UD-0-0



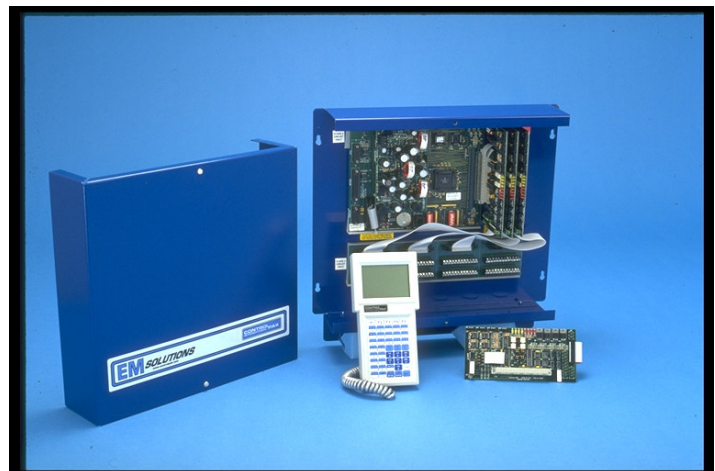
### Applications

The EM Solutions 8/16/24/32-UD is a micro-processor based energy management and direct digital controller. It is commonly used to monitor and control mechanical and electrical equipment in industrial and commercial heating, ventilating and air conditioning operations. Typical systems include boilers, chillers, single zone/multi-zone/variable air volume air handling units, circulation pumps, lighting, exhaust fans, clean rooms, and custom commercial and industrial control processes. Control Pak International's object oriented programming software uses powerful objects or building blocks to configure customized control sequences.

### Description

As an extremely reliable and flexible controller, the ability to program the unit while it is controlling is a key attribute of the EM Solutions 8/16/24/32-UD. The EM Solutions 8/16/24/32-UD is a compact and powerful unitary controller. It consists of a Central Processing Unit (CPU) board with real time clock, versatile Input/Output (I/O) boards with full surge protection, optional full peripheral communication interface board, and detachable I/O termination strips. The I/O functions are achieved via the use of up to four (4) I/O cards with four universal inputs and four digital outputs each to achieve up to 32 I/O points total. The universal inputs can be configured as either analog (AIs) or digital inputs (DIs).

The standard EM Turbo Local Area Network (LAN) communicates with up to 127 EM Solutions units via a two wire cable up to 4,000 feet at 9600 baud (115Kbaud\*). Complete user programmability can be achieved via either the optional hand held Portable Operator's Terminal, hand held or wall mount Remote Terminal Unit (RTU), LTU or host software system. All peripheral communication ports are available internally on the optional communication breakout board in the wall section to allow direct connection of CRT terminal, printer, remote terminal unit (RTU), and host PC via direct or modem connection to achieve a completely stand-alone or networked full-function Building Automation System. The optional ManagePak™ Engineering Workstation host software for Windows™ running on PCs in a TCP/IP Server/Client based Ethernet provides more addresses, faster communication, and enhanced user interface features.



# SPECIFICATIONS:

## Ambient Temperature Limits -

Operating: 32°F (0°C) to 113°F (45°C)  
Shipping & Storage: 0°F (-17.8°C) to 140°F (60°C)

## Ambient Humidity Limits -

Operating: 10 to 95 % RH, non-condensing.  
Shipping & Storage: 10 to 95 % RH, non-condensing.

## Power Requirements –

Input power 24VAC, 60HZ, single-phase, 25 Watts.

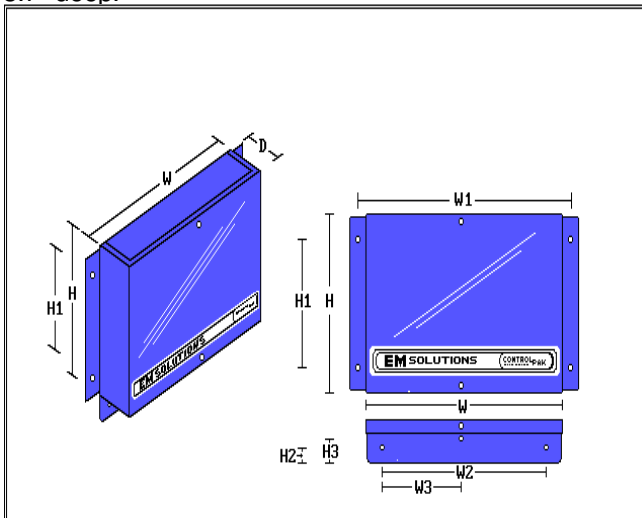
## Equipment Protection –

**Fuses:** 2 Amp circuit breaker on the AC input.

**Transient Suppression:** These devices protect the LAN and every input/output termination.

## Chassis -

A 1/16th inch formed aluminum enclosure with main box dimensions of 15" W x 14" H x 3.7" D. The unit is designed to mount on the installation bracket to allow early I/O termination via six (6) 1" diameter knockouts and the removable I/O termination cards. The mounting dimensions for the installation bracket are 13" W2 x 1" H2 and 6.5" W3 x 1.5" H3. The back plate mounts on the installation bracket and any surface with mounting dimensions of 15.8" W1 x 10" H1. The front cover has a slight press fit as it attaches to the back plate and is held in place with two machine screws. Therefore the enclosures total dimensions are 16.5" wide x 16" high x 3.7" deep.



## CPU Board -

**Memory:** There is 64K of Flash memory for self test and boot sequences, 256K of Flash memory for remote firmware enhancements\*, 192K of Flash memory for automatic (or manual) redundant RAM backup\*, and 128K (optional 512K\*) of RAM for application program, object value status, trend log storage, and operating system use.

**Battery Back-Up:** A CPU mounted, replaceable coin cell battery provides Ninety (90) days extended power back-up to maintain the RAM based Application Engineering and real time clock functions. Upon power recovery, the system will automatically return to real time control.

**Real Time Clock:** The RTC is battery backed and automatically adjusts for Leap Year and Daylight Savings Time. The LAN Address 01 unit synchronizes the time and date for all the units on the LAN

**English Language:** Fifteen (15) character alphanumeric labels can be assigned to all input/output points and relational decision making objects for display to LTU, RTU, SS-POT, computer terminal emulation or via ManagePak™ Engineering Workstation host software for Windows™.

## Communication Ports -

**Modem/Computer Direct Connect Port:** DB-25, RS-232 internal serial port to link an EM Solutions LAN to a directly connected or remote host computer running CPI's ManagePak™ Engineering Workstation host software for Windows™ or a generic terminal emulation communication software program at Baud rates up to 9600 (115 Kbaud\*). Modems call to remote Printers.

**Printer Port :** DB-25, RS-232 internal port for a serial printer for local trend and alarm log reports. Baud rates are up to 9600.

**CRT/SS-POT Ports:** RJ-11 internal port is for CRT with key board or SS-POT to communicate with the EM Solutions 13/29. Baud rates are up to 19200.

**Remote Terminal Unit (RTU) Port:** DB-9 internal port  
**Local Area Network (LAN) Port:** RS-485 internal serial port for LAN communication up to 4000 feet without optional repeaters at 9600 baud (115 Kbaud\*) using a single twisted pair of wires. Remote unit access and Network Objects values can be shared in real time. Up to 127 controllers on one network can monitor and control up to over 12,000 (24,000\*) I/O points total.

## Expansion Board -

**Universal Inputs :** Four to sixteen (4-16) points can be jumper configured as either analog inputs (AI's) or digital inputs (DI's). AI's can receive signals of 0-2.5 VDC, 0-20 mA or 500-5000 ohm resistance. AI resolution is twelve (12) bits. The input impedance selectable on each channel with 100 and 1000 ohms standard values.

The DI's are opto-isolated and they accept externally powered 10-24 VDC or VAC: DI types include instantaneous, latch any ON, latch any OFF, and count pulses (fractional). Minimum input pulse width is 29.4 ms HIGH or LOW.

**Digital Outputs :** Four to sixteen (4-16) points of digital outputs (DO's) can be used for enable/disable and floating point control. DO's are optically isolated triac outputs with a maximum rating of two (2) amps on state RMS current, 30 VAC. DO's can also perform pulse width modulation with one second resolution. A direct override hand/auto/off switch exists on the front of the I/O card for each DO.

# ORDERING INFORMATION:

## CONTROLLER OPTIONS:

**EM Solutions 8-UD:** M/N SSS-08-UD-0-0

Consists of four (4) universal inputs, four (4) digital outputs with a total of eight (8) I/O points.

**EM Solutions 8-UD with Communications Breakout Board:** M/N SSS-08-UD-B-0

Consists of above with Communications Breakout Board

**EM Solutions 16-UD:** M/N SSS-16-UD-0-0

Consists of two (2) I/O cards connected to the CPU board with eight (8) universal inputs and eight (8) digital outputs for a total of sixteen (16) I/O points.

**EM Solutions 16-UD with Communications Breakout Board:** M/N SSS-16-UD-B-0

Consists of above with Communications Breakout Board

**EM Solutions 24-UD:** M/N SSS-24-UD-0-0

Consists of three (3) I/O cards connected to the CPU board with twelve (12) universal inputs and twelve (12) digital outputs for a total of twenty-four (24) I/O points.

**EM Solutions 24-UD with Communications Breakout Board:** M/N SSS-24-UD-B-0

Consists of above with Communications Breakout Board

**EM Solutions 32-UD:** M/N SSS-32-UD-0-0

Consists of four (4) I/O cards connected to the CPU board with sixteen (16) universal inputs and sixteen (16) digital outputs for a total of thirty-two (32) I/O points.

**EM Solutions 32-UD with Communications Breakout Board:** M/N SSS-32-UD-B-0

Consists of above with Communications Breakout Board

## COMMUNICATION OPTIONS:

**EM Solutions™ Series Hand Held Portable Operator's Terminal Unit (POT):** P/N SS-POT

Full alphanumeric keys allow editing of all 15 character labels of objects to include I/O points and relationship decisions. Supertwist backlit LCD with 8 lines of 24 characters or 16 lines of 32 characters of U.S. ASCII Upper/Lower case, plus inverse character attribute. The LCD is 2" X 3" in size and it has programmable contrast. Enables user to set up to 99 unit specific user functions, each of which can execute up to 50 keystrokes via 3 or 4 keys. Also provides 15 SS-POT specific function keys to execute up to 200 total keystrokes via 1-2 keys.

**Remote Terminal Unit (RTU):** P/N 50.1049W

A wall-mount RTU with keypad for data entry. The RTU is made up of a sixteen (16) character alpha-numeric display and a sixteen (16) button keypad. The unit is powered with a 20 mA current loop and will communicate up to 4000 feet remotely with the standard power supply or up to 100 feet via Controller provided power. Multiple RTUs will work with the same Controller.

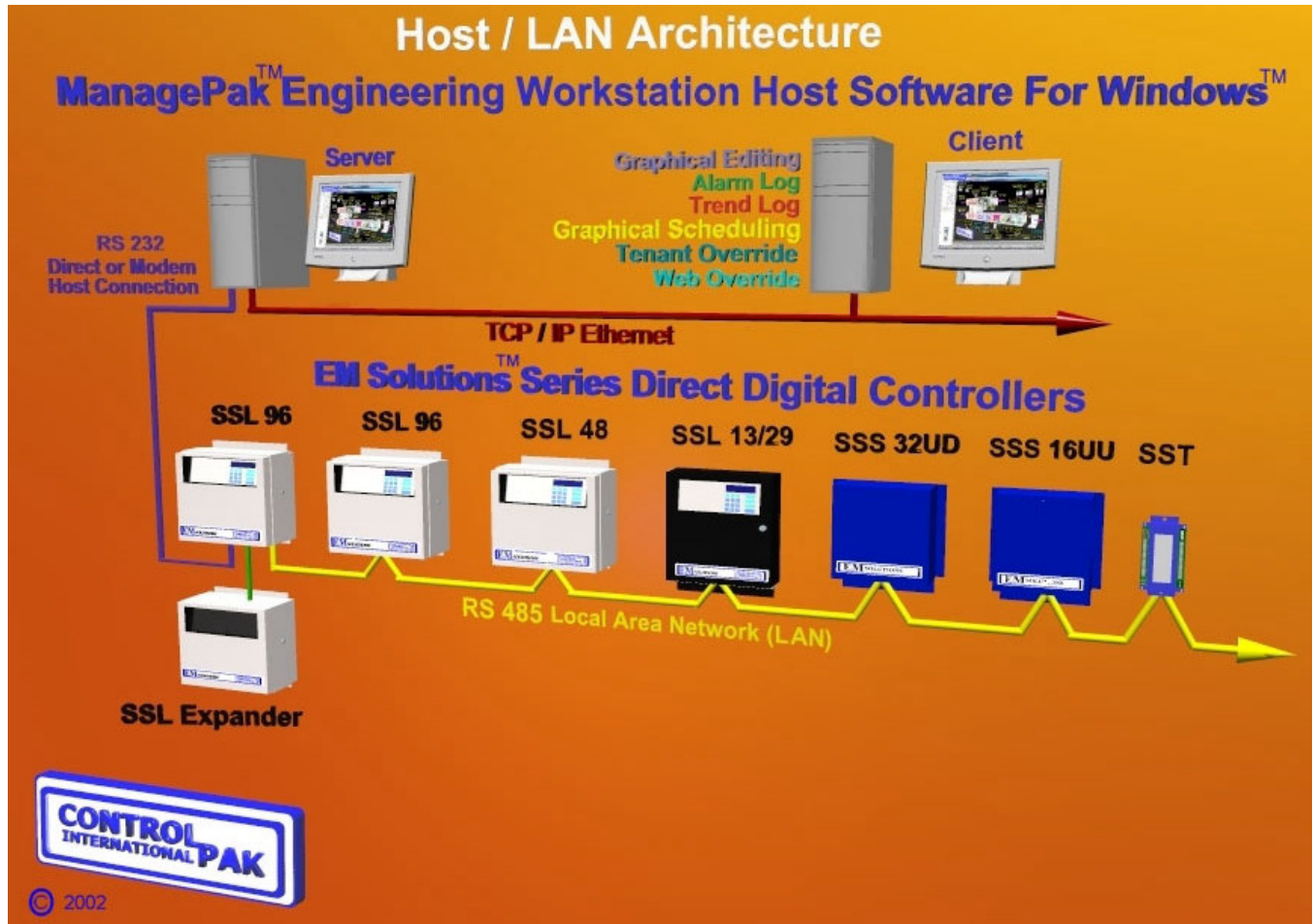
**Remote Terminal Unit (RTU):** P/N 50.1049H

A hand-held RTU with retractable cord for easy access to the RAM program, via the RTU port.

**Remote Annunciator Unit (RAU):** P/N 50.1065

A wall-mount RAU with twelve (12) point/object status. Annunciators are able to be mounted up to 4000 feet from the EM Solutions Controller. Up to four (4) RAU's will work with a unit

**TYPICAL SYSTEM ARCHITECTURE:**



Specifications and product offerings are subject to change without notice.

**Distributed by:**



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 \* = Future Feature in Firmware Evolution (present Hardware is capable)