

## EM Solutions™ 13/29 Direct Digital Controller

Model Numbers: SSL-13-BF-0-0, SSL-13-LT-0-0, or SSL-13-LA-0-0



### Applications

The EM Solutions 13/29 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 13/29. The compact and modular EM Solutions 13/29 consists of a multifunction input/output (I/O) board, a central processing unit (CPU), a transformer assembly and Power Supply board. The standard I/O points consist of four (4) universal inputs, four (4) digital output (DO), four (4) analog output (AO) points, and a high resolution Digital Input for accurate meter monitoring is standard for a total of thirteen (13) I/O's. The UI's can be configured as analog or digital input points.

The unit is expandable to a total of twenty eight (29) I/O points by adding up to four (4) optional four (4) channel I/O cards consisting of two (2) UI, one (1) DO, and one (1) AO card. All I/O points are hard-wired using removable termination strips for ease of installation and service. A mounting bracket is provided to allow removal of the unit for hardware service, thereby leaving the I/O wiring intact.

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 internally mounted 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 -

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 120 VAC, 60 HZ, single-phase, 150 Watt.

## Equipment Protection -

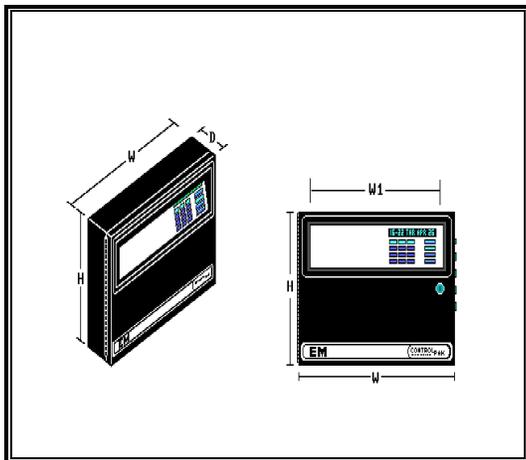
**Fuses:** Included are fuses for +5, -15, +15, and an unregulated +12 VDC. Power supply utilizes crowbar circuitry to prevent damage to the EM unit. All regulated voltages have indicator lights (LEDs) showing current status.

**Varistors:** Metal Oxide Varistors (MOV's) protect every input/output point on the Multi-function I/O Board. A MOV also protects the LAN port and the telephone line.

**RF Filter:** Filters RF signals on AC power line.

## Chassis -

Main box dimensions are 18 3/8" W x 17 7/8" H x 4 5/8" D. The main box material is 1/16th " aluminum with keylock and left-hinged door. The main box removes from the mounting bracket for installation or service. The mounting dimension is 16" (W1). The enclosure's interior and exterior are completely painted glossy black with white and black trim.



## 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.

## I/O Points -

**Universal Inputs:** Four (4) points can be configured as either analog inputs (AIs) or as digital inputs (DIs). The analog inputs will receive 0 - 2.4 VDC or 0 - 20 mA current voltage (C/V) or RTD in the range of 500 to 5000 ohms. AI resolution is 13 bits. The input impedance is 100 ohms. The digital inputs 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.

**Analog Outputs:** Four (4) analog outputs are factory set at 0 -12 VDC. Jumper selectable to 0 - 20 mA. AO resolution is eight (8) bits.

**Digital Outputs:** Four (4) isolated dry contact, N.O. or N.C. jumper selectable, with a maximum rating of three (3) amps, 30 VDC or VAC resistive.

# ORDERING INFORMATION:

## CONTROLLER OPTIONS:

**EM Solutions 13/29, Blank Front:** M/N SSL-13-BF-0-0  
EM Solutions 13/29 with Blank Front

**EM Solutions 13/29, W/ LTU:** M/N SSL-13-LT-0-0  
EM Solutions 13/29 with a Local Terminal Unit (LTU) factory installed. The LTU is comprised of a sixteen (16) button keypad and a sixteen (16) character alpha-numeric display. Primary functions include Set-up, Edit, Override and Monitor of all Control Pak International objects, User Functions, Trend Logs, Alarm Logs, and the Controller's System features.

## INPUT/OUTPUT BOARD OPTIONS

**Universal Input (UI) Expander Board:** P/N 50.1176  
Allows for four (4) additional Universal Inputs. A maximum of two (2) UI cards are allowed on a single EM Solutions 13/29. Jumper selectable AI or DI, internally or externally powered as specified under "I/O Points".

**Analog Output Expansion Board:** P/N 50.1178  
Allows for four (4) additional Analog Outputs. A maximum of one (1) AO card is allowed on a single EM Solutions 13/29. Jumper selectable current or voltage. Factory board setting is 0-12 VDC. Available upon request is 0-24 VDC or 0-20 mA. The AO boards resolution is 8 bits.

**Digital Output Board Expander Card:** P/N 50.1177  
Allows for four (4) additional Digital Outputs. A maximum of one (1) DO card is allowed on a single EM Solutions 13/29. Jumper selectable normally open (N.O.) or normally closed (N.C.). Isolated any contact output. Maximum rating is three (3) amps, 30 Vdc or VAC resistive.

## COMMUNICATION OPTIONS:

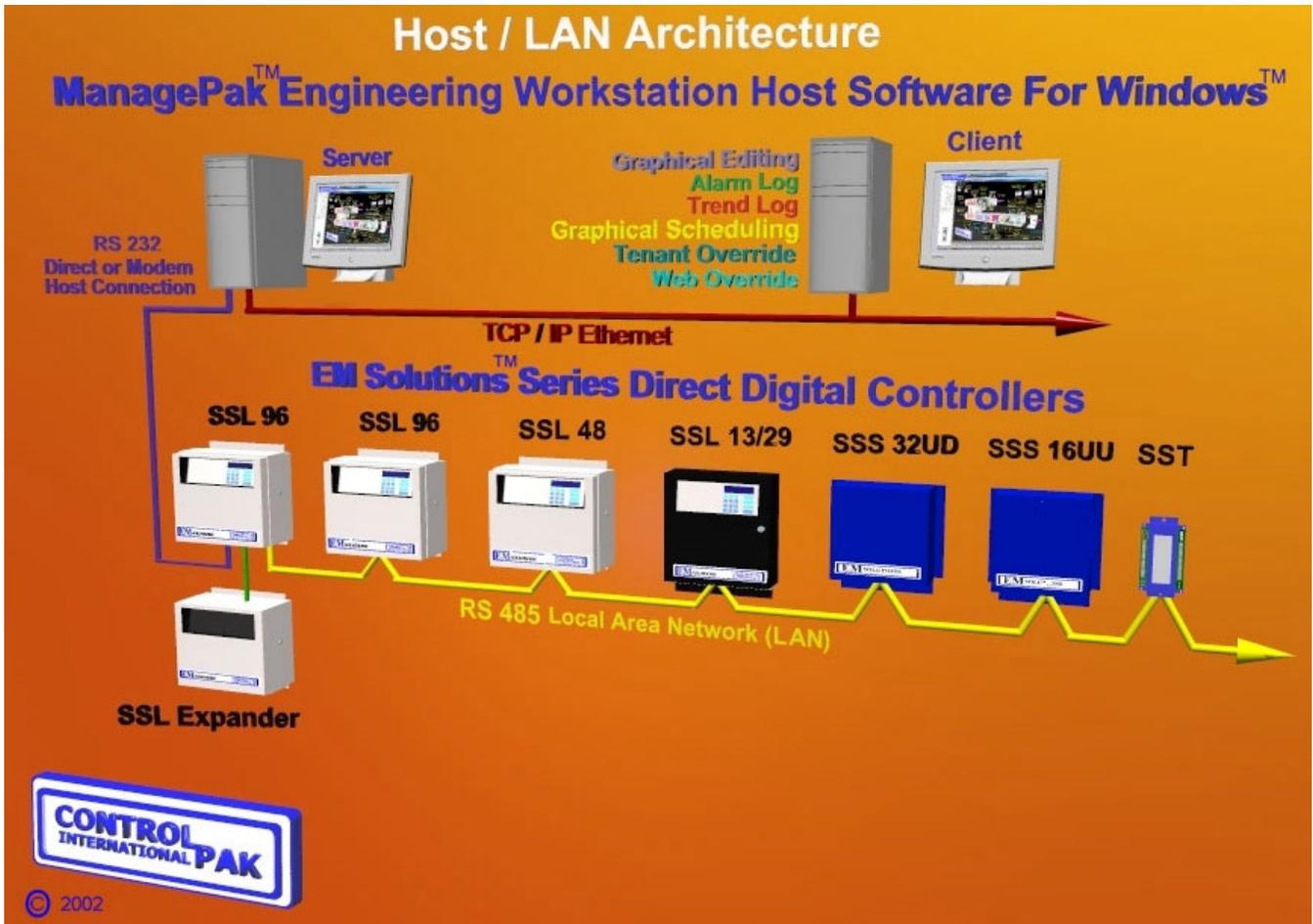
**EM Solutions™ Series Hand Held Portable Operator's Terminal Unit (POT):** P/N SS-POT  
Full alphanumeric keys allow editing of all 15 character labels of objects to include I/O points and relationship decisions. Supertwist backlit LCD with 8 lines of 24 characters or 16 lines of 32 characters of U.S. 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)