



Building
Automation
Systems

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EM Solutions™ 48/193

Direct Digital Controller

Model Numbers: SSL-48-BF-0-0, SSL-48-LT-0-0, or SSL-48-LA-0-0



Applications

The EM Solutions 48/193 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 48/193. The flexible Input/Output (I/O) architecture of the EM Solutions 48/193 results in a high volume of control points with tailored I/O point mixes as the three (3) available I/O card slots for sixteen (16) channel I/O cards enable one to choose virtually any combination of digital and analog points to achieve up to a total of forty eight (48) I/O points. A high resolution Digital Input for accurate meter monitoring is standard. A optional field upgrade kit expands the unit to become an EM Solutions 96/193 Controller. Further, the optional EM Solutions Expander Box (M/N 65.1023) adds another enclosure with a six (6) slot Motherboard, giving twelve (12) total card slots for a total of 193 I/O points.

I/O card types include analog input (AI), digital input (DI), analog output (AO), and digital output (DO) cards. AO cards have eight (8) channels with an eight (8) channel expander card. The door unit is removable from the wall unit for easy installation and/or service and it contains the CPU board, optional Local Terminal Unit (LTU), Break-Out board, and Power Supply. The wall unit contains the Motherboard, I/O card cage, cooling fan, and the I/O termination strips.



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 external on the door to allow direct connection of CRT terminal, printer, remote terminal unit (RTU), and telephone line (for optional internally mounted modem) 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.

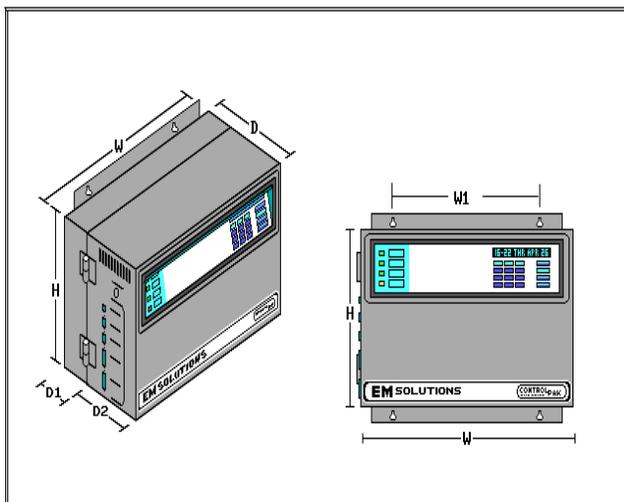
Varistors: Metal Oxide Varistors (MOV's) protect every input/output point on the Motherboard. A MOV also protects the LAN port and the telephone line.

RF Filter: Filters RF signals on AC power line.

Partial Voltage Loss: Fail Safe board removes the I/O signals should any voltage fail, thus preventing inappropriate partial I/O operations, thereby protecting mechanical and electrical equipment.

Chassis -

Main box dimensions are 20" W x 18" H x 12" D. The material is 16 gage welded steel. A removable, left-hinged door includes a key lock. The wall mount section's depth (D1) is 4", the door depth (D2) is 8", and the mounting dimension (W1) is 17". The enclosure's interior and exterior are completely painted glossy beige with white, blue 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™.

Motherboard –

Consists of 3 slots for plug-in I/O boards, an I/O wire trough, and 3 I/O termination strips, with screw terminal blocks.

Communication Ports -

Modem/Computer Direct Connect Port: DB-25, RS-232 external 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 external port for a serial printer for local trend and alarm log reports. Baud rates are up to 9600.

CRT/SS-POT Ports: DB-25, RS-232 external port and an RJ-11 internal port are for CRT with key board or SS-POT to communicate with the EM Solutions 96/193. Baud rates are up to 19200.

Remote Terminal Unit (RTU) Port: DB-9 external 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.

ORDERING INFORMATION:

CONTROLLER OPTIONS:

EM Solutions 48/193 W/ Blank Front: M/N SSL-48-BF-0-0
EM Solutions 48/193 with Blank Front.

EM Solutions 48/193 W/ LTU: M/N SSL-48-LT-0-0
EM Solutions 48/193 with Local Terminal Unit (LTU) factory installed. The LTU is made up 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 objects, User Functions, Trend Logs, Alarm Logs, Controller System features.

EM Solutions 48/193 W/ LTU and LAU: M/N SSL-48-LA-0-0
EM Solutions 48/193 with LTU and Local Annunciator Unit (LAU) factory installed. The LAU has twelve (12) point/object status to cause green, red, or flashing red annunciators to correspond with user defined status and color decisions. Each EM Solutions 48/193 can support up to a total of four (4) LAU's and RAU's combined to achieve up to forty eight (48) annunciation and forty eight (48) Flash objects.

INPUT/OUTPUT BOARD OPTIONS:

Analog Input Board: P/N 50.1007
Sixteen (16) points per board; accepted inputs include 0 - 20 mA or 0 - 2.4 VDC current voltage (C/V) or RTD in the range of 500 to 5000 ohms. Eighteen (18) gage, twisted, shielded wire is recommended. The input impedance of the AI board is 100 ohms. The AI board's resolution is 13 bits.

Analog Output Main Board: P/N 50.1009
Eight (8) point main board, with expansion plug for an additional 8 point expander board (P/N 50.1010) for "piggyback" mount to the main board. The factory board setting is 0 - 12 VDC. Available upon request is 0 - 24 VDC or 0 - 20 mA. The AO board's resolution is 8 bits.

Analog Output Expansion Board: P/N 50.1010
There are eight (8) points on this board that piggyback to the main AO board.

Digital Input Board: P/N 50.1011
Sixteen (16) points per board; opto-isolated; 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 Output Board: P/N 50.1074
Sixteen (16) points per board; isolated dry contact output; N.O. or N.C. jumper configurations; maximum rating 3 amps, 30 VDC or VAC resistive.

COMMUNICATION OPTIONS:

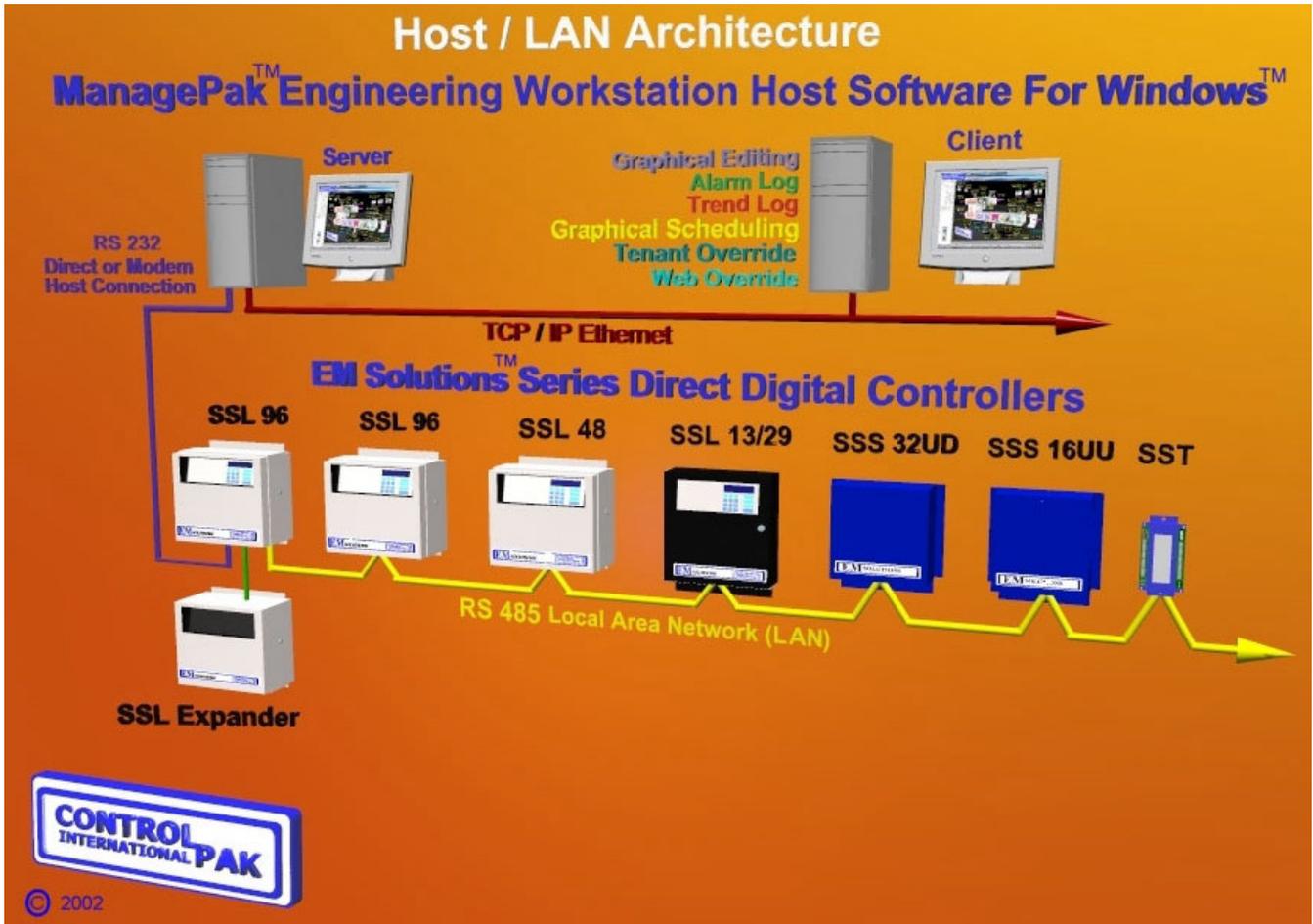
EM Solutions™ Series Hand Held Portable Operator's Terminal Unit (POT): P/N SS-POT
Full alphanumeric keys allow editing of all 15 character labels of objects to include I/O points and relationship decisions. Supertwist backlit LCD with 8 lines of 24 characters or 16 lines of 32 characters of U.S. ASCII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