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6.0 PRODUCT SPECIFICATIONS

- Product Specifications
- Application Information
- Mounting and Clearance Dimensions
- Electrical Connections

6.1 SERIES 4000 I/O STATIONS

Series 4000 I/O Stations provide a powerful, low cost, measurement and control system suitable for most industrial data acquisition and control applications. The Series 4000 I/O Station can communicate in either ASCII or binary format to any Host equipped with a standard RS-232C or RS-485 interface. Series 43xx/44xx units include support for RF and phone modem interface types. Each I/O Station can accommodate up to 16 analog I/O modules and provides 16 digital I/O lines for interfacing to an external panel of solid state relays. All user selectable options (address, baud rate, alarms, etc.) are configured with software comands via the communication port and are stored in nonvolatile EEPROM memory. All scaling, linearization, and calibration functions are performed digitally. Series 4000 I/O Stations can be supplied with or without a built-in AC input power supply. A wide range of hardware and software accessory items are available to meet the needs of most applications.

The I/O Station sub-system component parts consist of the following; analog I/O modules, digital I/O modules, microcomputer (CPU) board with digital I/O interface, communication port(s), backplane assembly, and power supply. Series 41xx and 43xx I/O Stations are available as an 8 or 16 channel analog I/O sub-system, while Series 42xx and 44xx I/O Stations are 16 channel sub-systems with 8 analog channels and 8 digital channels. All Series 4000 I/O Stations include a digital I/O port that can support an additional 16 digital I/O modules mounted on an external digital I/O panel. See the Simplified I/O Station Block Diagram, drawing 4500-865 (41xx/42xx I/O Stations) or 4501-004 (43xx/44xx I/O Stations), following this specification.

All Series 4000 I/O modules have field circuit isolation; this provides channel to channel isolation, isolation between the field environment and I/O Station control circuitry and the serial communication ports. AC powered units include power isolation. DC powered units are directly coupled (the power and I/O Station control circuits share the same common).

MODEL NUMBER FORMAT:

... Refer to Section 1.1.1 for the Series 4000 Model Number Format

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ANALOG AND DIGITAL I/O MODULES:

Module Capacity .....*(per I/O Station Model Number as follows)*
41xx/43xx-16: 16 analog + 16 digital Max
41xx/43xx-08: 8 analog + 16 digital Max
42xx/44xx-16: 8 analog + 24 digital Max

Analog I/O Modules .....May be installed in any mix (see Analog Input and Output Module Specifications).

Digital I/O Modules .....May be installed in any mix (see Digital Input and Output Module Specifications).

MICROCOMPUTER (CPU) BOARD:

Processor (CPU).....Motorola 68HC11, HCMOS, single-chip microcomputer, 2 MHz +/- 0.01%.

A/D Conversion.....A V/F (Voltage-to-Frequency) Converter is contained in each analog input Module. The microcomputer is used as a counter/timer to measure the period of the signal frequency. Measurement resolution is better than 1 part in 10,000.

D/A Conversion.....A Serial D/A (Digital-to-Analog) Converter is contained in each analog output module. Resolution: Approximately 12 bits (1 in 3840). Each module has overrange and underrange capability of 3 percent. All analog output modules are updated every 32.768ms. When power is first applied, all analog output modules are set to their respective reset values. For example: The default reset value is 0 volts for the 0 to 10 volt DC output module. Other reset values may be assigned with the Save Resets (SR) command.

Digital I/O Port.....The microcomputer can interface to a separate panel of up to 16 digital I/O modules through connector P2 (50 pins), and a 50-wire ribbon cable. Digital I/O modules can be arranged in any order. *Note:* The cable connecting the I/O Station to the digital I/O panel should be kept to a minimum length. When power is first applied, all digital output modules are set to their respective default reset states (or the state assigned with the Save Resets command).

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Analog Output Update Rate.....Analog output modules are updated every 32.768 ms.

Digital I/O Update Rate.....All digital I/O modules are updated every 32.768ms.

Analog Input Scan Rate.....A function of the number (n) of active analog input channels, excluding the temperature reference channels. The time between samples of each analog input channel is: (3 + n) x 32.768ms, where n refers to the number of analog input channels configured for a station. *Note:* For a maximum of 16 analog input channels, the time between samples is 622.6ms.

Firmware and Memory..... All required firmware and memory are standard. Some options include additional memory. The types of memory used include the following:
...PROM (Programmable Read Only Memory): used for storage of the operating system and constant data (firmware).
...RAM (Volatile Random Access R/W Memory): is used for working memory data storage and for acquired channel data.
...EEPROM (Electrically Erasable, Programmable Read-Only Memory): provides nonvolatile storage of channel configuration parameters, which eliminates the need to reconfigure at every system power up.
...NVRAM (NonVolatile RAM--Log Memory Option only, 41x5/42x5 models): provides the room to store at least 2000 data logging samples. The data retention time is typically 10 years (at +25 degrees C).
...NVRAM (NonVolatile RAM--Data Logging Memory Option only, 43x6/44x6 models): provides the room to store at least 9000 data logging samples. The data retention is typically 10 years (at +25 degrees C).

NVRAM Batteries .....*43x6/44x6 Models Only:* 2 lithium coin type batteries installed at the factory provide battery back-up for 64 K bytes of logging memory. Battery is 3 Volt, 300 maH, Ray-O-Vac BR2335 or equivalent. These batteries must be replaced periodically. See Section 7.2.1 for battery service instructions.

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Autocalibration.....*Analog Input Modules*: auto-zero and auto-span readings maintain calibration over time and temperature. Autocalibration is performed internally and is transparent to the user.

Channel Configuration.....The channel configuration remains in effect until modified by the channel configuration commands. The configuration information is stored in nonvolatile EEPROM and, therefore, does not need to be re-initialized after a power failure.

Personality Code.....Identifies the I/O module type and characteristic. Each I/O channel must be given a personality code to identify its hardware configuration. This code enables the firmware to select the correct conversion scheme for the desired I/O module.

Engineering Units.....Analog inputs and outputs are specified in engineering units per module type. Each personality code has default units and optional units. The Set Units command is used to select the units required.

Linearization.....For thermocouple and RTD input module types, linearization is done by the I/O Station's embedded firmware per the Personality Code.

Time Stamp Clock.....Used to time stamp events in relative terms. One clock per station; time is always specified and returned in ticks (16.384 milliseconds per tick). All stations on a network can be synchronized using the global station number (00).

Temperature Sensor.....The microcomputer has an A/D converter which is used to monitor temperature sensors at the isothermal bars (located next to the module terminal blocks). Used to provide terminal temperature data for thermocouple input modules.

Diagnostics.....A complete set of built-in diagnostics execute with each power-up or reset to ensure system integrity.

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Watchdog Timer.....Computer Operating Properly (COP) timer. During operation, the hardware watchdog timer reacts to hardware or software failures. A properly operating microcomputer will reset the watchdog timer before a time-out occurs, otherwise, a system reset will be generated. For safety reasons, a watchdog timer time-out also causes all outputs to be set to their respective output reset values. The watchdog timer has a timeout interval of 1.049 seconds.

Error Messages.....If the command message received by the I/O Station is in error, an error code message is sent to the Host. A list of the error codes can be found in Appendix B of the *Series 4000 ASCII Mode Programmer's Reference Manual (8500-228)*.

Initialization Delay.....On power-up or after a reset, the system will initialize for up to 15 seconds (this time varies with the model).

COMMUNICATION (Host Port):

Communication.....RS-232C or RS-485, both with full transient protection. All communication between the I/O Station and the Host is made over a three-wire cable (Transmit, Receive, and signal Common).

Signal Common.....For proper operation, a return path is required for the transmit and receive signals. A third wire should connect all the system signal grounds together. This conductor can be an integral part of the power system, but is most often an additional wire or shielded conductor (recommended). To limit ground currents to a safe value, a 100 ohm resistor is installed between the signal common and earth ground on each I/O Station.

Network.....RS-232C, only one station allowed. The RS-232C option is meant for limited channel I/O applications. RS-485 is used to communicate with more than one I/O Station; it has multidrop capability with up to 31 stations before a signal repeater must be used. With further expansion using signal repeaters, up to 253 I/O Stations can be handled (Half Duplex only).

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I/O Station Address.....User selectable: 1 to 253 decimal. Each I/O Station on an RS-485 network must be set up with its own unique address to avoid communication collisions.

Global Addressing.....Global addressing is a technique that allows multiple channels or stations to be addressed with a single command. Using global addressing, a single command can be sent to all of the channels in a station, all of the stations on a network, or all of the channels on a network.

Baud Rates.....75, 150, 300, 600, 1200 (Default), 2400, 4800, or 9600, user selectable by software command.

Communication Modes.....ASCII or Binary, as selected by software command (SM command).

Communication Watchdog Timer.....The user has the option of enabling a communication watchdog timer. This function will set the analog and digital output channels to their respective reset values and/or states, if no communication has been received from the Host over a time interval selected by the user.

Communication Protocol.....Command and Response.

Dumb Terminal.....A "dumb" ASCII terminal can be used to communicate with the I/O Station in the ASCII Mode. The terminal is connected in the same manner as when using a computer as the Host. To avoid double characters when typing commands, set the terminal to full-duplex mode or turn off the local echo.

Checksum.....A optional checksum can be added to commands in the ASCII Mode (recommended). Response will follow command format.

Communication Parameters.....All communication parameters (address, mode, baud rate, duplex, etc.) are stored in nonvolatile memory (EEPROM).

Default Parameters.....All Series 4000 I/O Stations provide a default connection on the unit. When this connection is made and the I/O Station is reset, the operator places an I/O Station into a known communication state. This allows communication with an I/O Station in a standard manner, regardless of how it was previously configured. Each I/O Station is shipped from the factory with the DEFault jumper installed.

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Communication Distance.....*RS-232C:* 50 feet maximum (per standard). *RS-485 :* 4000 feet, further when used with Repeaters. For very long distance communication a phone modem or short haul modem can be used to extend the distance between the I/O Station and the Host. An RF modem interface is also available. Refer to the *Series 4000 Interface User's Manual (8500-274)* for more information.

COMMUNICATION (Local Port):

Local Port.....Besides the main host port of the unit, an optional RS-232C Local Port can be ordered. See Chapter 4 for additional details.

Local Port Baud Rates.....75, 150, 300, 600, 1200 (default), 2400, 4800, or 9600, user selectable by software command.

BACKPLANE:

Analog I/O Channels (Series 41xx, 43xx, 42xx, and 44xx Backplanes):

Analog I/O Channel Capacity.....8 or 16, per model number.
Field Wiring Connections.....Each I/O module is connected to four barrier strip terminals, see individual module specifications for connection information.
Field Wiring Connectors.....Modular terminal blocks with screw clamps. Wire range 14 to 26 AWG, CSA approved.
Module Plug-in Connectors.....Bifurcated contacts, gold over nickel for industrial environment.

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Digital I/O Channels (Series 42xx and 44xx Backplanes Only):

Digital I/O Channels.....8 channels on backplane compatible with the following isolated modules:
...*Digital Input Modules*
IAC5, IAC5-A, IDC5, IDC5-B
...*Digital Output Modules*
OAC5, OAC5-A, ODC5, ODC5-A, ODC5R

Digital Status Indicators.....1 red LED per channel:
...*Input Module:* LED ON when there is an input signal to the module.
...*Output Module:* LED ON when there is a signal for the output to be ON.

Fuse.....5 Amp, Littlefuse part #255-005, one per channel, and one spare fuse. Each digital panel is supplied with an individual 5 Amp fuse for each position. The fuse is installed in a pair of sockets, and may be removed with needle-nose pliers. One extra fuse is also supplied and is mounted on the panel.

Field Wiring Connections.....Each I/O module is connected to two barrier strip terminals. When connecting DC loads or inputs, the LOWER NUMBERED position is always MORE POSITIVE.

Field Wiring Connectors.....Barrier-type terminal strip using No. 6 screws and clamp plates. Wire range 12 to 18 AWG.

Digital Module Sockets.....For repair or replacement, Select:
...*Large Socket:* Amp part #50871-8
...*Small Socket:* Amp part #50863-8
Digital I/O sockets on backplane are not gold plated (Series 42xx and 44xx).

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POWER SUPPLIES AND STATUS INDICATORS:

Backplane DC Power Supplies.....+15V DC and +5V DC. Both supplies have overcurrent and overvoltage (crowbar) protection. Overvoltage protection occurs at 6.5V, nominal, on the +5V DC supply and 18.3V, nominal, on the +15V DC supply. If either or both of these voltage limits is exceeded, fuse F2 will blow. This fuse disconnects both supplies from the microcomputer board and I/O modules.

Power Circuit Protection Fuses.....The various power supply circuits are fuse protected to reduce the possibility of a hazard should a failure occur.
F1 (AC power): 2A, 250V, 5mm x 20mm
F2 (+15V DC): 3A, 250V, 3AG Type
F3 (LP power): 0.75A, 250V, Buss PC Tron Type.

Status Indicators.....Tx LED (green) : Station Transmitting Data
Rx LED (green) : Station Receiving Data
PWR LED (red) : Power On/Off monitoring the +5V DC supply
... Series 43xx/44xx I/O Stations include:
DEFAULT LED (yellow): Default Mode On

PHYSICAL CHARACTERISTICS:

Shipping Weight.....*Series 41xx/43xx:* 8 pounds (3.6 kg) packed
Series 42xx/44xx: 8 pounds (3.6 kg) packed

Mounting.....For surface mounting, leave sufficient space around the I/O Station for wiring. Optional NEMA type enclosures and mounting panels are available.

Mounting Hardware.....The I/O Station is mounted on a baseplate.

Host Port Connections.....Host port connections use modular terminal blocks with screw clamps. Wire range 14 to 26 AWG, CSA approved.

Power Wiring Connections.....Barrier-type terminal strip using No. 6 screws and clamp plates. Wire range 12 to 18 AWG, CSA approved.

Local Port Connections.....Connector type DE-9S (female) which mates with a DE-9P (male--not supplied).

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Dimensions..... (mounting and clearance dimensions):
...*Series 41xx-16*, see Drawing 4500-868
...*Series 41xx-08*, see Drawing 4500-866
...*Series 42xx-16*, see Drawing 4500-870
...*Series 43xx-16*, see Drawing 4501-015
...*Series 43xx-08*, see Drawing 4501-014
...*Series 44xx-16*, see Drawing 4501-016

Electrical Connections..... (electrical connection schematic):
...*Series 41xx-16*, see Drawing 4500-904
...*Series 41xx-08*, see Drawing 4500-905
...*Series 42xx-16*, see Drawing 4500-906
...*Series 43xx-16*, see Drawing 4501-005
...*Series 43xx-08*, see Drawing 4501-006
...*Series 44xx-16*, see Drawing 4501-007

Enclosure.....Chassis and Cover are aluminum with a black anodized finish.

Printed Circuit Board.....0.094 inch thick Military grade FR-4 epoxy glass circuit board.

OPERATING CONDITIONS:

Operating Temperature.....*Series 43xx/44xx:* -25 to 60 degrees C,
-13 to 140 degrees F
Series 41xx/42xx: 0 to 70 degrees C,
32 to 158 degrees F
... With Local Port Terminal Attached:
Series 41xx/42xx: 0 to 60 degrees C
32 to 140 degrees F

Storage Temperature.....-25 to +85 degrees C (-13 to 185 deg. F)

Relative Humidity (RH).....10 to 95 percent Relative Humidity (non-condensing), up to 40 degrees C (104 degrees F).

Power.....*4xxx-xx-1:* 115V AC +/-10%, 50/60Hz, 0.5A
4xxx-xx-2: 230V AC +/-10%, 50/60Hz, 0.25A
4xxx-xx-6: +15V DC +/-10%, 2.5A DC max., reverse polarity protected
43xx-xx-7: ... *See below*
44xx-xx-7: +12V DC (8 to 16 V DC range), 3.6A @ 12V (6A DC Max @ 8V)

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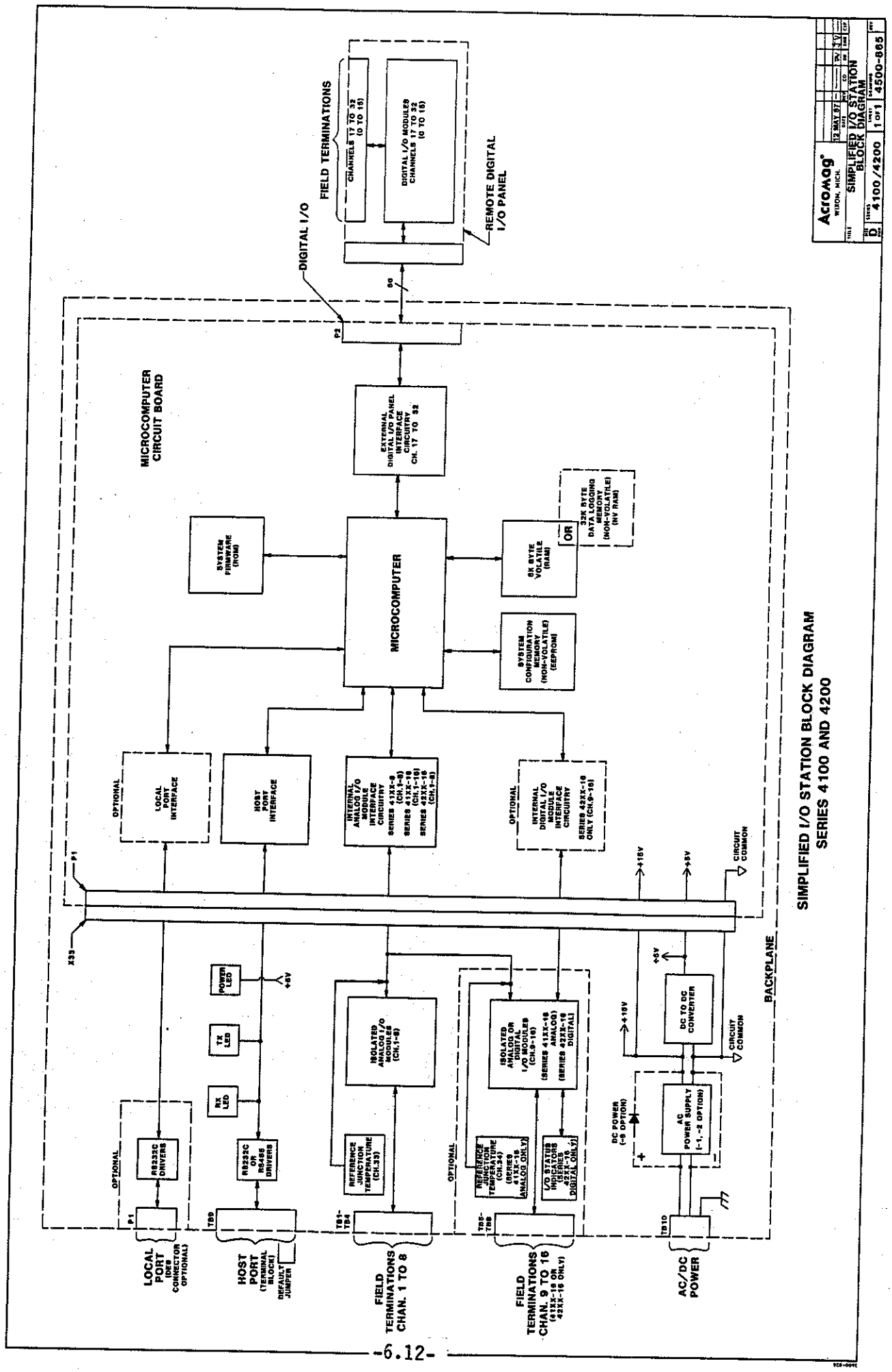
Power Isolation.....AC powered units(-1 and -2 models) have full power isolation and can sustain a 1000V AC isolation breakdown test between the power and secondary circuits, and between the power and chassis ground. This complies with test requirements outlined in ANSI C39.5-1974 for the voltage ratings specified. DC powered units (-6 and -7 models) are directly coupled; the power and I/O Station control circuits share the same common and are connected to chassis ground through a 100 ohm resistor.

GENERAL NOISE DATA:

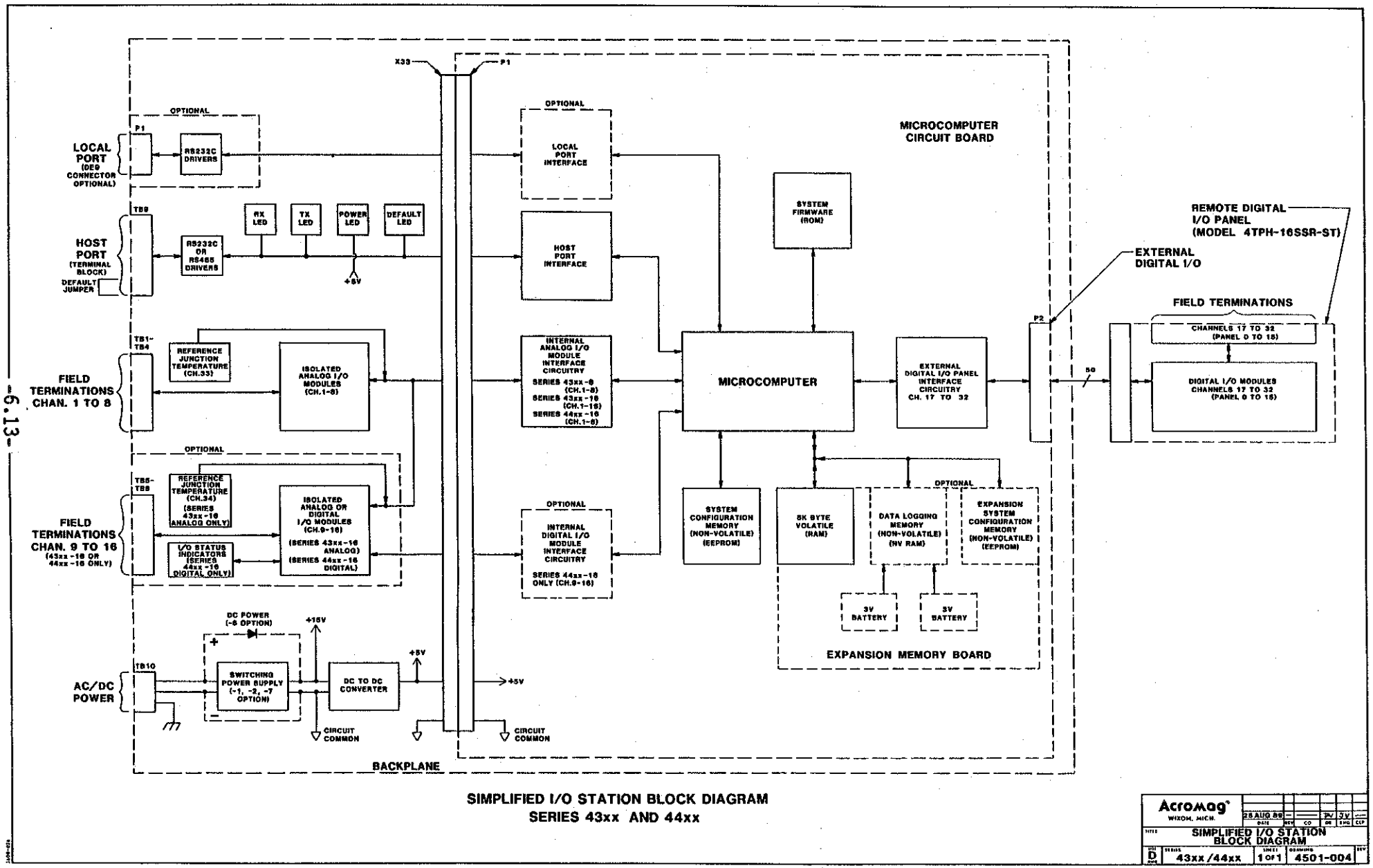
RFI (Radio Frequency Interference)..Capability of withstanding an RFI field strength of 10 volts per meter at 27 MHZ, 151 MHz, and 467 MHz with an analog effect of no greater than 0.5 percent and no digital effect, per SAMA PMC 33.1 test procedures.

Line Noise Effects.....Field, communication ports, and power line terminals are capable of withstanding ANSI/IEEE C37.90-1978 Surge Withstanding Capability (SWC) test with no component failures. Unit is tested to a standardized test waveform that is representative of surges (high frequency transient electrical interference) observed in actual installations.

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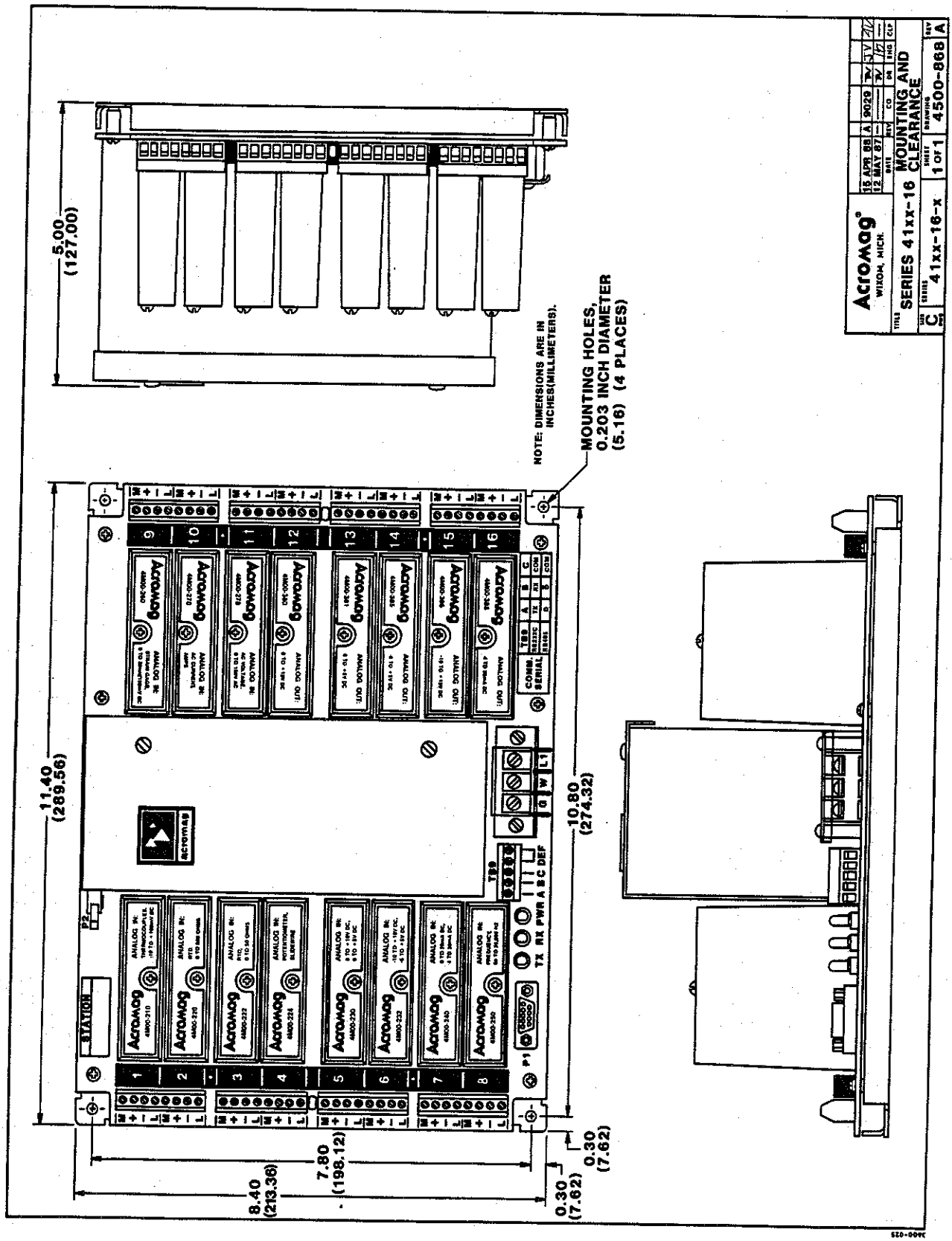
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SIMPLIFIED I/O STATION BLOCK DIAGRAM
SERIES 43xx AND 44xx

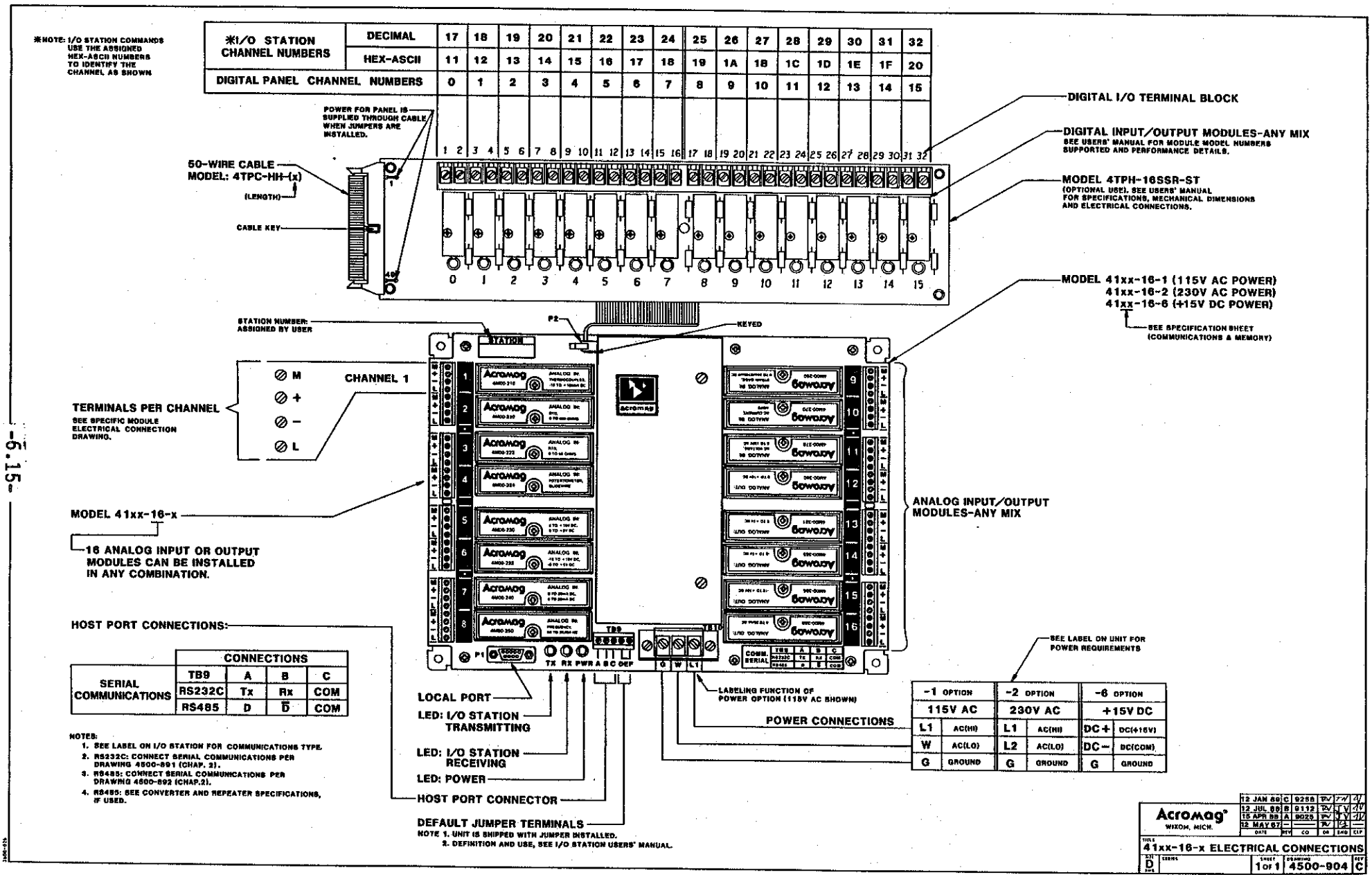
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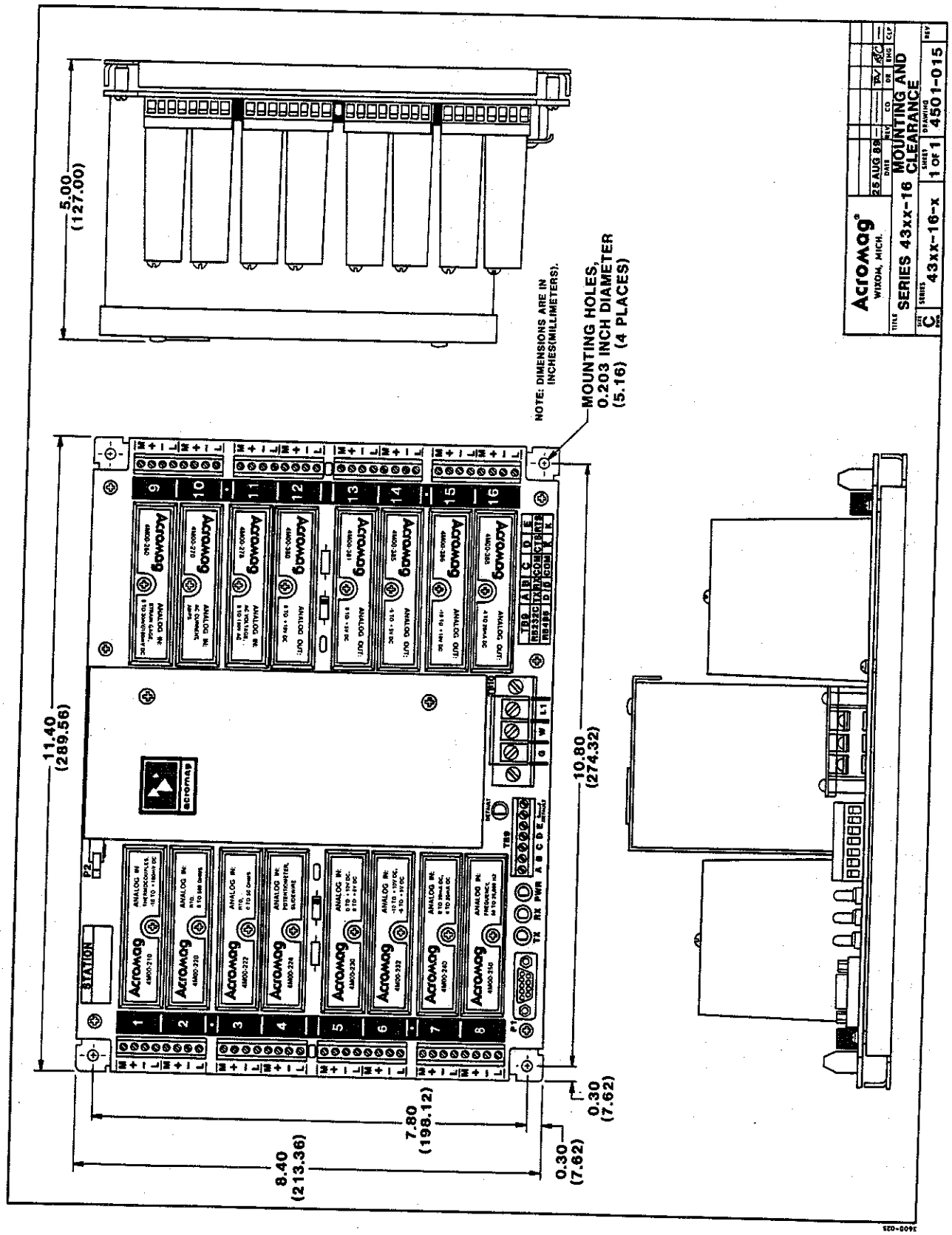
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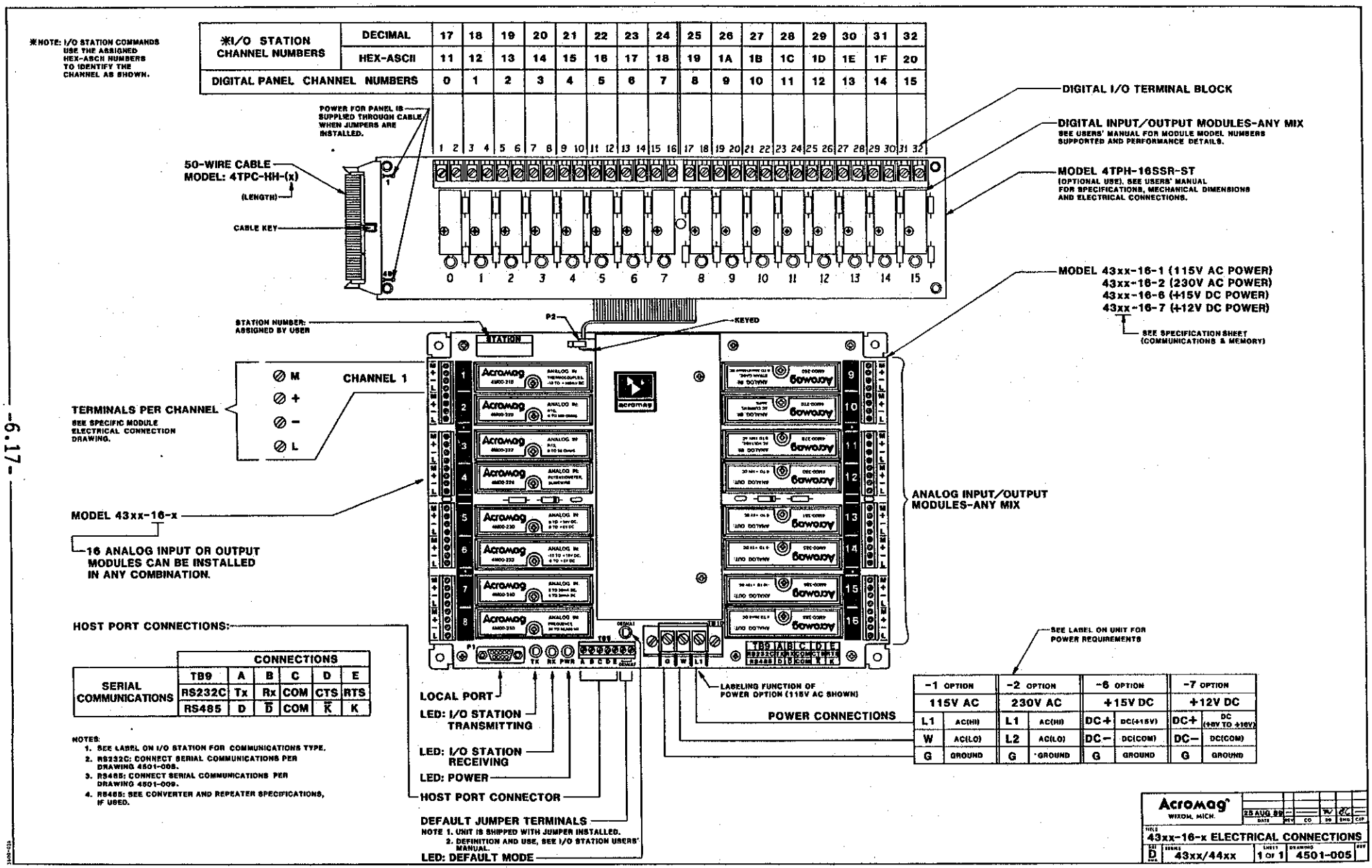
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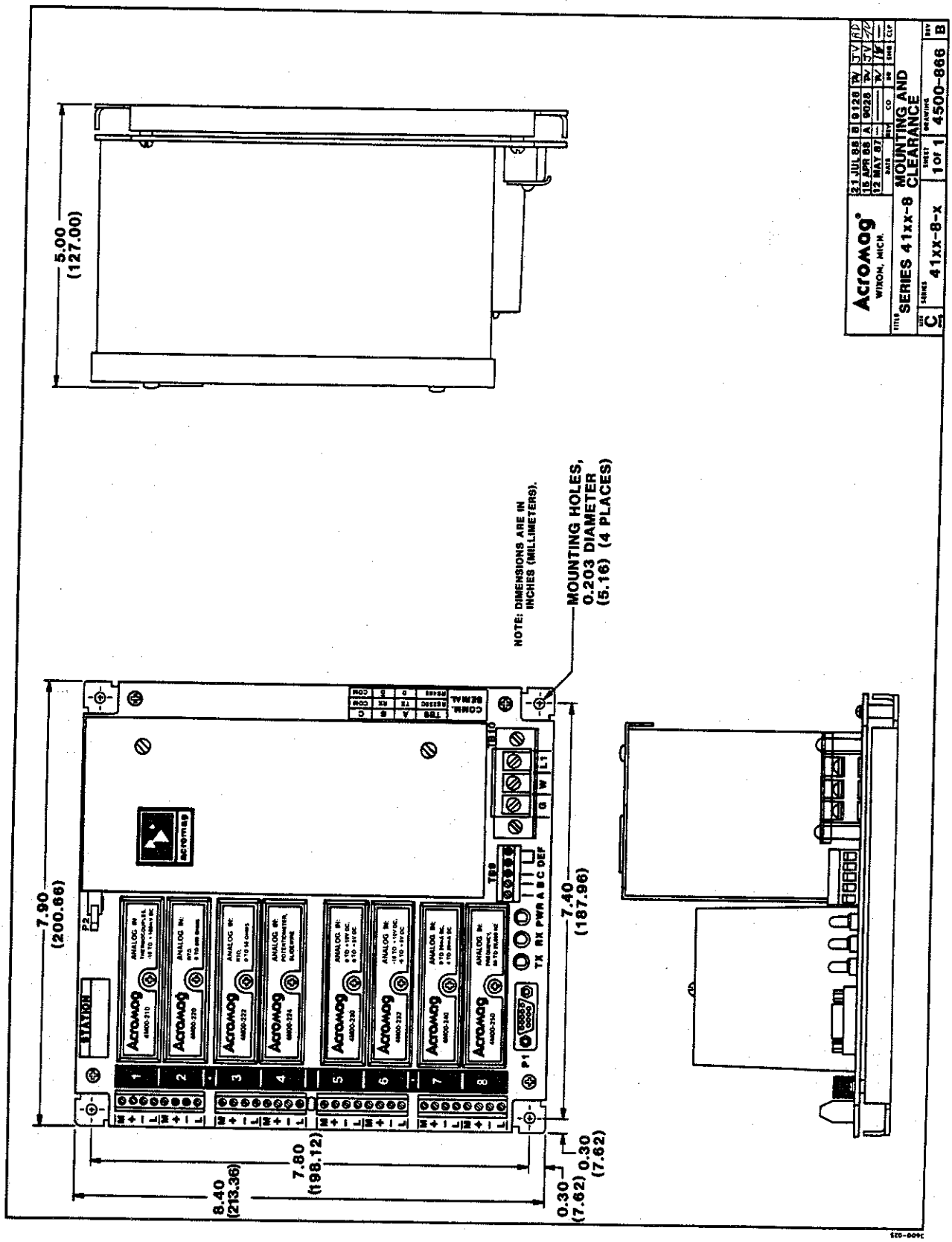




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*NOTE: I/O STATION COMMANDS USE THE ASSIGNED HEX-ASCII NUMBERS TO IDENTIFY THE CHANNEL AS SHOWN.

*I/O STATION CHANNEL NUMBERS	DECIMAL	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
	HEX-ASCII	11	12	13	14	15	16	17	18	19	1A	1B	1C	1D	1E	1F	20
DIGITAL PANEL CHANNEL NUMBERS		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

POWER FOR PANEL IS SUPPLIED THROUGH CABLE WHEN JUMPERS ARE INSTALLED.

50-WIRE CABLE
MODEL: 4TPC-HH-(x)
(LENGTH)

CABLE KEY

DIGITAL I/O TERMINAL BLOCK

DIGITAL INPUT/OUTPUT MODULES-ANY MIX
SEE USERS' MANUAL FOR MODULE MODEL NUMBERS SUPPORTED AND PERFORMANCE DETAILS.

MODEL 4TPH-16SSR-ST
(OPTIONAL USE). SEE USERS' MANUAL FOR SPECIFICATIONS, MECHANICAL DIMENSIONS AND ELECTRICAL CONNECTIONS.

MODEL 41xx-8-1 (115V AC POWER)
41xx-8-2 (230V AC POWER)
41xx-8-6 (+15V DC POWER)
SEE SPECIFICATION SHEET (COMMUNICATIONS & MEMORY)

STATION NUMBER: ASSIGNED BY USER

P2

KEYED

TERMINALS PER CHANNEL
SEE SPECIFIC MODULE ELECTRICAL CONNECTION DRAWING.

M
+
−
L

CHANNEL 1

MODEL 41xx-8-x

8 ANALOG INPUT OR OUTPUT MODULES CAN BE INSTALLED IN ANY COMBINATION.

HOST PORT CONNECTIONS:

SERIAL COMMUNICATIONS	CONNECTIONS			
	TB9	A	B	C
	RS232C	Tx	Rx	COM
	RS485	D	$\overline{D}$	COM

NOTES:
1. SEE LABEL ON I/O STATION FOR COMMUNICATIONS TYPE.
2. RS232C: CONNECT SERIAL COMMUNICATIONS PER DRAWING 4500-891 (CHAP. 2).
3. RS485: CONNECT SERIAL COMMUNICATIONS PER DRAWING 4500-892 (CHAP.2).
4. RS485: SEE CONVERTER AND REPEATER SPECIFICATIONS, IF USED.

LOCAL PORT

LED: I/O STATION TRANSMITTING

LED: I/O STATION RECEIVING

LED: POWER

HOST PORT CONNECTOR

DEFAULT JUMPER TERMINALS
NOTE 1. UNIT IS SHIPPED WITH JUMPER INSTALLED.
2. DEFINITION AND USE, SEE I/O STATION USERS' MANUAL.

SEE LABEL ON UNIT FOR POWER REQUIREMENTS

LABELING FUNCTION OF POWER OPTION (115V AC SHOWN)

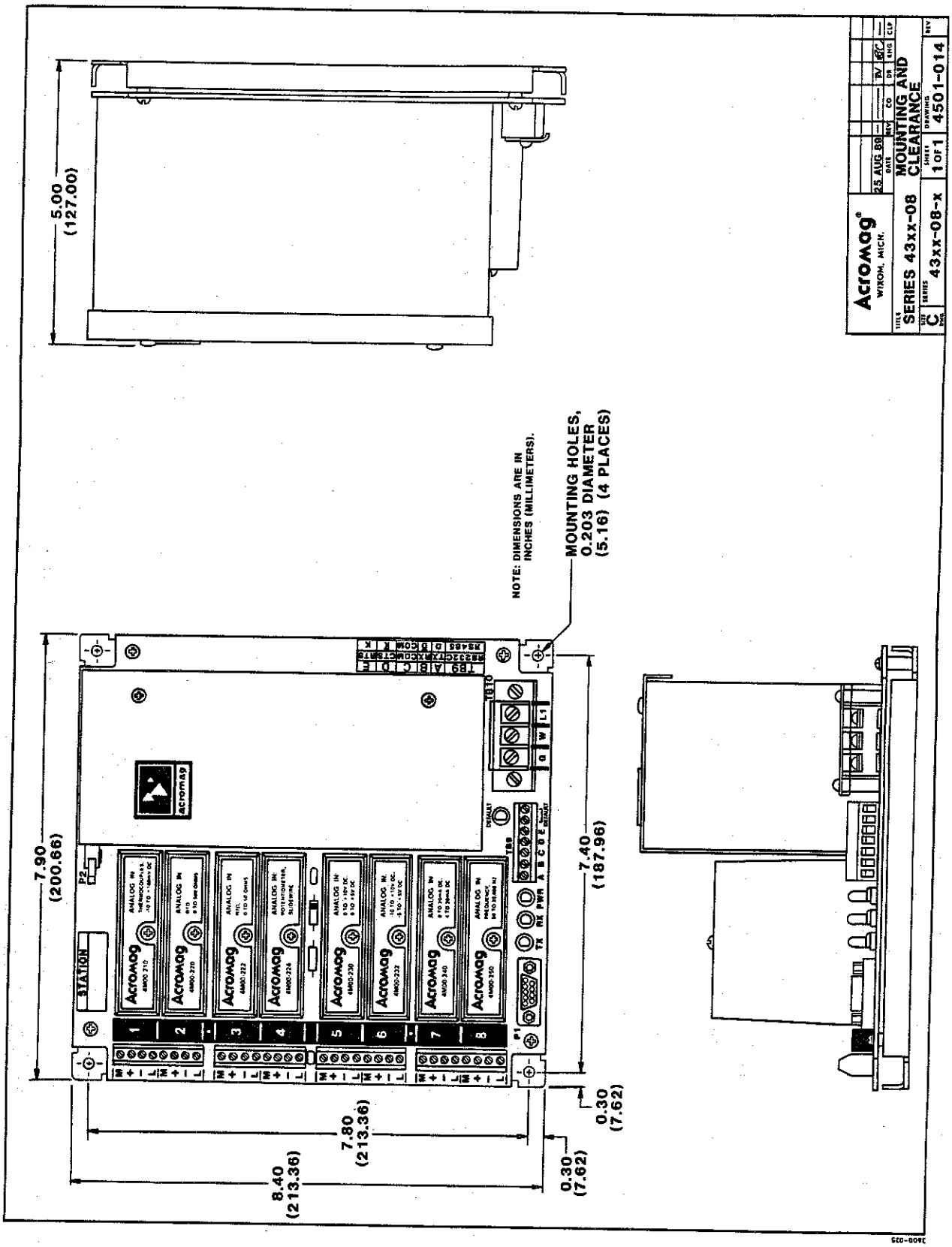
POWER CONNECTIONS

-1 OPTION 115V AC		-2 OPTION 230V AC		-6 OPTION +15V DC	
L1	AC(HI)	L1	AC(HI)	DC+	DC(+15V)
W	AC(LO)	L2	AC(LO)	DC−	DC(COM)
G	GROUND	G	GROUND	G	GROUND

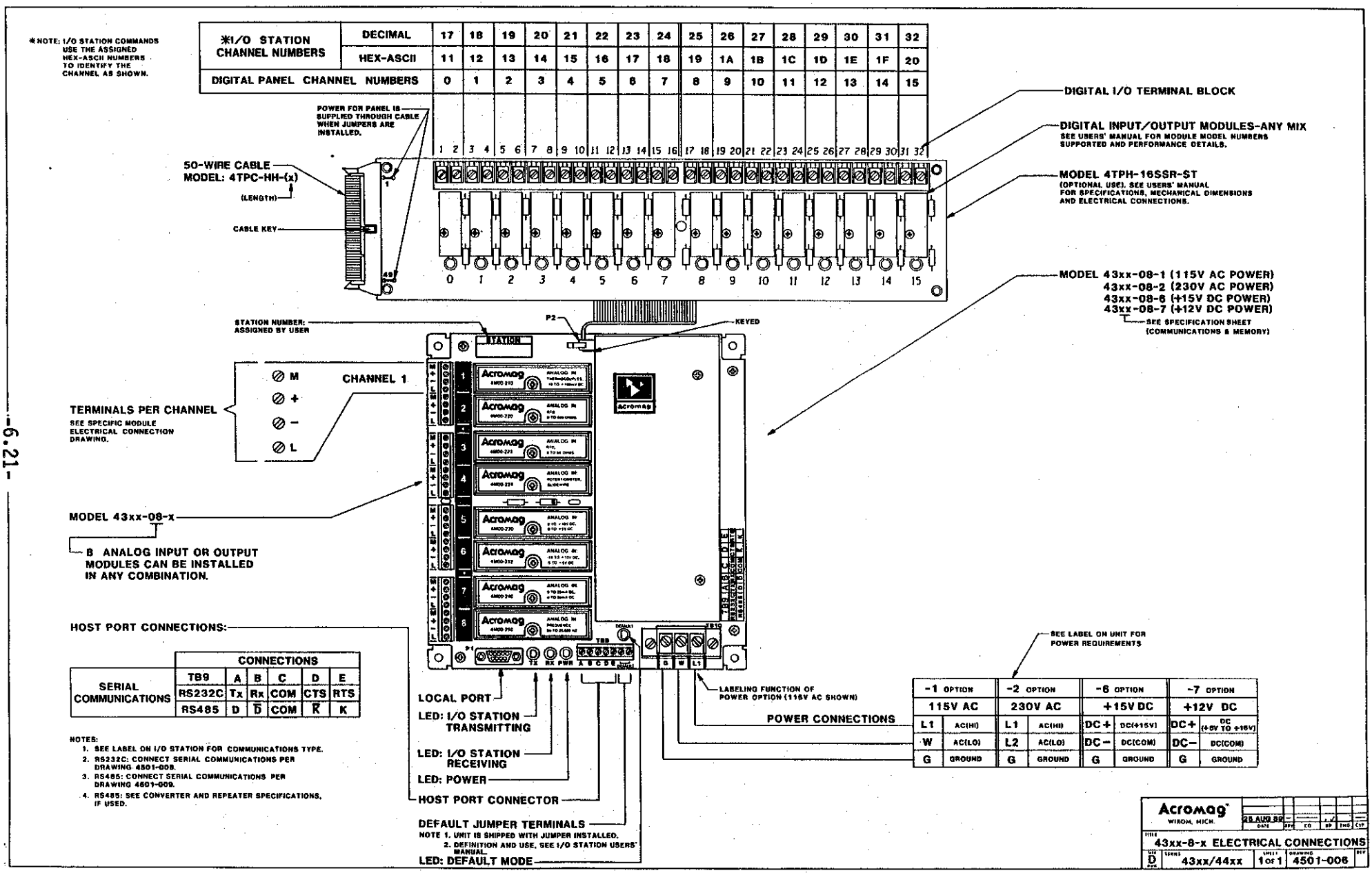
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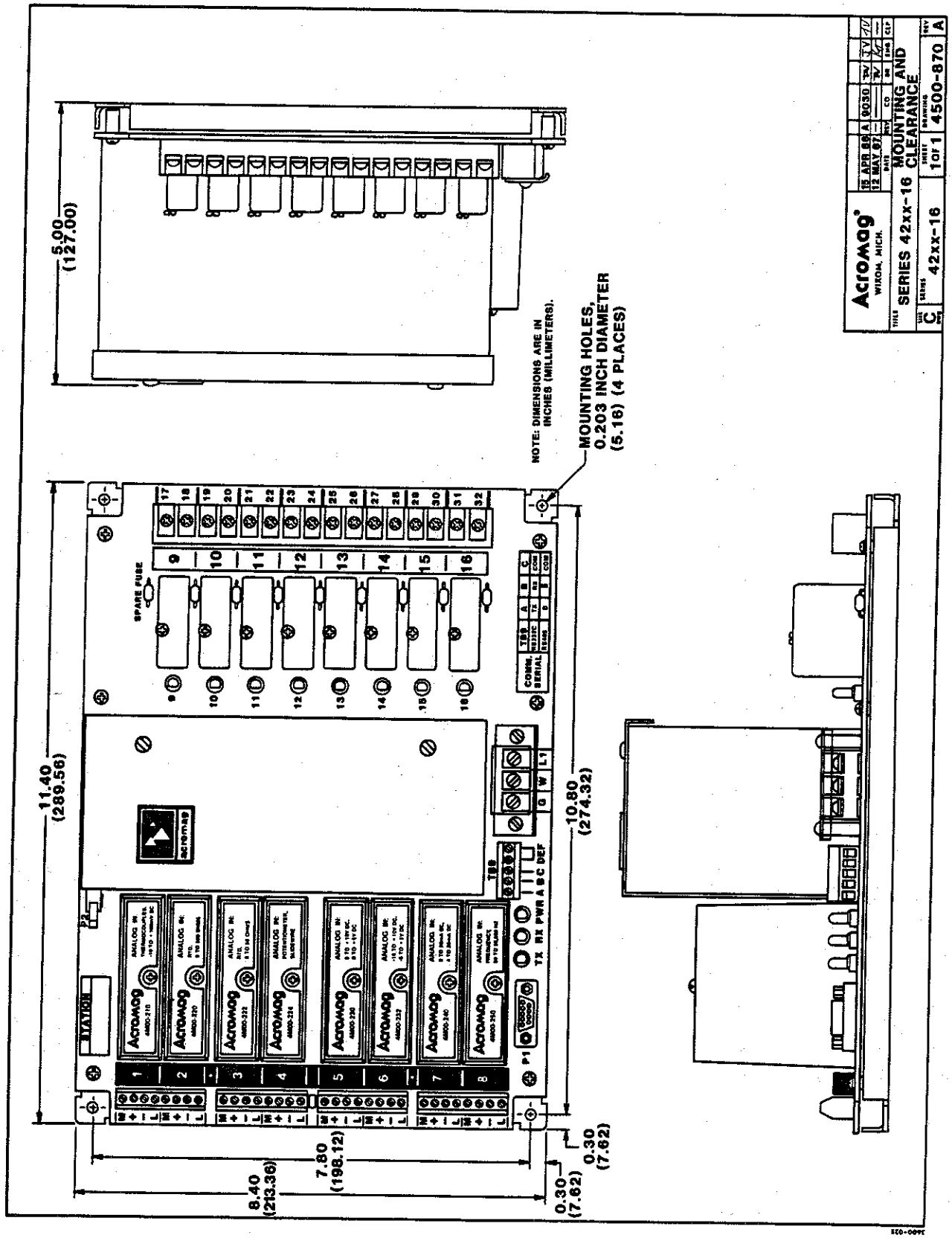
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*NOTE: I/O STATION COMMANDS USE THE ASSIGNED HEX-ASCII NUMBERS TO IDENTIFY THE CHANNEL AS SHOWN.

*I/O STATION CHANNEL NUMBERS	DECIMAL	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
	HEX-ASCII	11	12	13	14	15	16	17	18	19	1A	1B	1C	1D	1E	1F	20
DIGITAL PANEL CHANNEL NUMBERS		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

POWER FOR PANEL IS SUPPLIED THROUGH CABLE WHEN JUMPERS ARE INSTALLED.

50-WIRE CABLE
MODEL: 4TPC-HH-(x)
(LENGTH)
CABLE KEY

DIGITAL I/O TERMINAL BLOCK

DIGITAL INPUT/OUTPUT MODULES-ANY MIX
SEE USERS' MANUAL FOR MODULE MODEL NUMBERS SUPPORTED AND PERFORMANCE DETAILS.

MODEL 4TPH-16SSR-ST
(OPTIONAL USE). SEE USERS' MANUAL FOR SPECIFICATIONS, MECHANICAL DIMENSIONS AND ELECTRICAL CONNECTIONS.

MODEL 42xx-16-1 (115V AC POWER)
42xx-16-2 (230V AC POWER)
42xx-16-6 (+15V DC POWER)
SEE SPECIFICATION SHEET (COMMUNICATIONS & MEMORY)

STATION NUMBER: ASSIGNED BY USER

KEYED

TERMINALS PER CHANNEL
SEE SPECIFIC MODULE ELECTRICAL CONNECTION DRAWING.

M
+
−
L

CHANNEL 1

MODEL 42xx-16-x

16 CHANNELS; 8 ANALOG/ 8 DIGITAL. 8 ANALOG INPUT OR OUTPUT MODULES CAN BE INSTALLED IN any COMBINATION.

8 DIGITAL INPUT OR OUTPUT MODULES CAN BE INSTALLED IN ANY COMBINATION.

SPARE FUSE

HOST PORT CONNECTIONS:

	CONNECTIONS			
SERIAL COMMUNICATIONS	TB9	A	B	C
	RS232C	Tx	Rx	COM
	RS485	D	$\overline{D}$	COM

NOTES:
1. SEE LABEL ON I/O STATION FOR COMMUNICATIONS TYPE.
2. RS232C: CONNECT SERIAL COMMUNICATIONS PER DRAWING 4500-891 (CHAP. 2).
3. RS485: CONNECT SERIAL COMMUNICATIONS PER DRAWING 4500-892 (CHAP.2).
4. RS485: SEE CONVERTER AND REPEATER SPECIFICATIONS, IF USED.

LOCAL PORT
LED: I/O STATION TRANSMITTING
LED: I/O STATION RECEIVING
LED: POWER
HOST PORT CONNECTOR
DEFAULT JUMPER TERMINALS
NOTE 1. UNIT IS SHIPPED WITH JUMPER INSTALLED.
2. DEFINITION AND USE, SEE I/O STATION USERS' MANUAL.

LABELING FUNCTION OF POWER OPTION (115V AC SHOWN)

POWER CONNECTIONS

SEE LABEL ON UNIT FOR POWER REQUIREMENTS

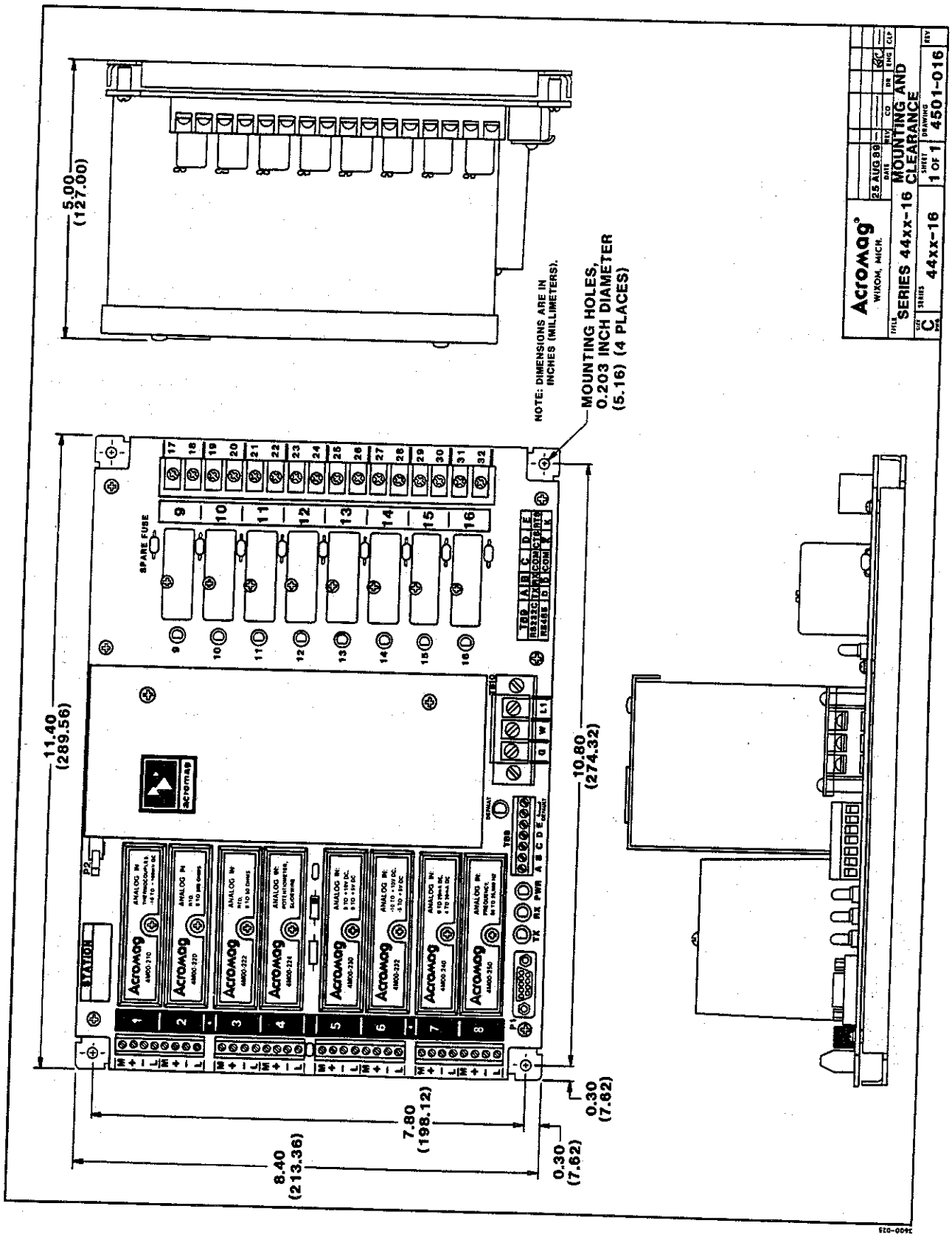
-1 OPTION		-2 OPTION		-6 OPTION	
115V AC		230V AC		+15V DC	
L1	AC(HI)	L1	AC(HI)	DC+	DC(+15V)
W	AC(LO)	L2	AC(LO)	DC−	DC(COM)
G	GROUND	G	GROUND	G	GROUND

4 MAY 92	D	9245	TW	TW	TD
12 JAN 89	C	9260	TW	TW	AV
12 JUL 88	B	9114	TW	AV	TW
15 APR 86	A	9027	TW	VV	TW
12 MAY 87	—	——	TW	VV	——
DATE	REV	CO	DR	SHC	CHK

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TITLE: 42xx-16-x ELECTRICAL CONNECTIONS

SIZE D | SERIES | SHEET 1 OF 1 | DRAWING 4500-906 | REV D



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*NOTE: I/O STATION COMMANDS USE THE ASSIGNED HEX-ASCII NUMBERS TO IDENTIFY THE CHANNEL AS SHOWN.

*I/O STATION CHANNEL NUMBERS	DECIMAL	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
	HEX-ASCII	11	12	13	14	15	16	17	18	19	1A	1B	1C	1D	1E	1F	20
DIGITAL PANEL CHANNEL NUMBERS		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

POWER FOR PANEL IS SUPPLIED THROUGH CABLE WHEN JUMPERS ARE INSTALLED.

50-WIRE CABLE
MODEL: 4TPC-HH-(x)
(LENGTH)

CABLE KEY

DIGITAL I/O TERMINAL BLOCK

DIGITAL INPUT/OUTPUT MODULES-ANY MIX
SEE USERS' MANUAL FOR MODULE MODEL NUMBERS SUPPORTED AND PERFORMANCE DETAILS.

MODEL 4TPH-16SSR-ST
(OPTIONAL USE). SEE USERS' MANUAL FOR SPECIFICATIONS, MECHANICAL DIMENSIONS AND ELECTRICAL CONNECTIONS.

MODEL 44xx-16-1 (115V AC POWER)
44xx-16-2 (230V AC POWER)
44xx-16-6 (+15V DC POWER)
44xx-16-7 (+12V DC POWER)
SEE SPECIFICATION SHEET (COMMUNICATIONS & MEMORY)

STATION NUMBER: ASSIGNED BY USER

P2

KEYED

TERMINALS PER CHANNEL
SEE SPECIFIC MODULE ELECTRICAL CONNECTION DRAWING.

M
+
−
L

CHANNEL 1

MODEL 44xx-16-x

16 CHANNELS; 8 ANALOG/ 8 DIGITAL. 8 ANALOG INPUT OR OUTPUT MODULES CAN BE INSTALLED IN ANY COMBINATION.

8 DIGITAL INPUT OR OUTPUT MODULES CAN BE INSTALLED IN ANY COMBINATION.

HOST PORT CONNECTIONS:

SERIAL COMMUNICATIONS	CONNECTIONS					
	TB9	A	B	C	D	E
	RS232C	Tx	Rx	COM	CTS	RTS
	RS485	D	$\overline{D}$	COM	$\overline{K}$	K

NOTES:
1. SEE LABEL ON I/O STATION FOR COMMUNICATIONS TYPE.
2. RS232C: CONNECT SERIAL COMMUNICATIONS PER DRAWING 4501-008.
3. RS485: CONNECT SERIAL COMMUNICATIONS PER DRAWING 4501-009.
4. RS485: SEE CONVERTER AND REPEATER SPECIFICATIONS, IF USED.

LOCAL PORT

LED: I/O STATION TRANSMITTING

LED: I/O STATION RECEIVING

LED: POWER

HOST PORT CONNECTOR

DEFAULT JUMPER TERMINALS
NOTE 1. UNIT IS SHIPPED WITH JUMPER INSTALLED.
2. DEFINITION AND USE, SEE I/O STATION USERS' MANUAL.

LED: DEFAULT MODE

SPARE FUSE

LABELING FUNCTION OF POWER OPTION (115V AC SHOWN)

POWER CONNECTIONS

SEE LABEL ON UNIT FOR POWER REQUIREMENTS

-1 OPTION		-2 OPTION		-6 OPTION		-7 OPTION	
115V AC		230V AC		+15V DC		+12V DC	
L1	AC(HI)	L1	AC(HI)	DC+	DC(+15V)	DC+	DC (+8V TO +15V)
W	AC(LO)	L2	AC(LO)	DC−	DC(COM)	DC−	DC(COM)
G	GROUND	G	GROUND	G	GROUND	G	GROUND

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TITLE: 44xx-16-x ELECTRICAL CONNECTIONS

SIZE D | SERIES 43xx/44xx | SHEET 1 OF 1 | DRAWING 4501-007 | REV

SPECIFICATIONS

6.2 ANALOG INPUT MODULES

6.2.1 General Specifications

The following specifications are applicable to all Analog Input Modules, see individual module specification sheets for module specific items.

Label Color Code	White designates input modules.
Operating Temperature Range	-25 to 70 degrees C (-13 to 158 F)
Ambient Temperature Effect	Less than +/-0.005% of maximum span per degree C (+/-0.003% per degree F), unless otherwise noted on individual specification sheet.
Storage Temperature Range	-25 to 85 degrees C (-13 to 185 F)
Terminals	Each channel has four terminals associated with it, labeled M, +, -, and L. See connection drawing for each module type.
DC Power Supplies	+15V DC +/-10%, +5V DC +/-5%; current varies per module type.
DC Power Supply Effect	Less than +/-0.01% of span.
Input Isolation	Each module's input circuit is independently isolated (transformer and opto-coupler). Rated 250 Volts RMS (354V DC) continuous. Will withstand a 1500V AC dielectric strength test for 1 minute without breakdown. Complies with test requirements outlined in ANSI C39.5-1974 for the voltage rating specified.
Engineering Units	All module output data is in engineering units applicable to module type.
Automatic Calibration	Automatically checks calibration against an internal reference and corrects zero and span every 30 seconds for all input modules, except the Frequency Input Module where it is not required.
Calibration Procedure	See Section 7.4 to verify performance or change calibration. Trim values will be stored in EEPROM, excluding the Frequency Input Module.
A/D Conversion	Voltage to Frequency (V/F), excluding the Frequency Input Module. Better than 1 part in 10,000 resolution for period measurement.

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Out of Range Indication.....If input signals significantly exceed the range of the module, overrange (30) and underrange (31) error codes will be received by the Host. Error code 40 will be received if the output of the module is not measurable, or if the module has been removed.

Scan Time.....A function of the number of active analog input modules of station. See I/O Station specifications for formula.

RFI Resistance.....Less than +/-0.5% of span change with field strengths of 10 volts per meter at frequencies of 27, 151 and 467 MHz per SAMA PMC 33.1 test procedures.

EMI Resistance.....Less than +/-0.25% of span change for switching solenoids and commutator motors.

SWC (Surge Withstand Capability)....Input terminals rated per ANSI/IEEE C37.90-1978. Unit is tested to a standardized test waveform that is representative of surges (high frequency transient electrical interference), observed in actual installations.

Mechanical Attributes.....*Size:* 0.75 x 2.90 x 3.0 inches (See Drawing 4500-848).
Case: Self-extinguishing Noryl(GE), UL94 V-0 rated, color black.
Connectors: 15 microinches Type 1 Gold over 50 microinches Nickel, Class 1, Type 5.
Printed Circuit Board: Military grade FR-4 epoxy glass circuit board. Conformal coated with a fungus resistant acrylic coating.

Mounting.....Each module, single captive screw mount.

Shipping Weight.....0.25 pound (0.11 Kg) packed.

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