



# Programmable Controllers

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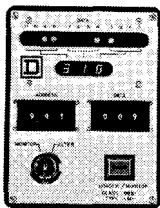
**SQUARE D COMPANY**

**LOADER/MONITOR**

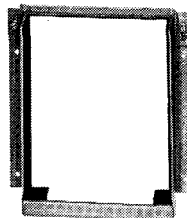
Two types of loader/monitors are available to load and monitor individual MLU data storage locations. A decimal loader/monitor (Type LM-1) is used to enter and monitor decimal coded three digit numbers. A hexadecimal loader/monitor (Type LM-2) is used to enter and monitor hexadecimal coded three digit numbers. The decimal loader/monitor allows access to the first 10 combinations of the 4 bits used to make a digit whereas the hexadecimal loader/monitor allows access to all 16 possible combinations for shift register and other bit manipulation applications. The loader/monitor provides an inexpensive method for data entry and data readouts eliminating the need for data entry and readout through external I/O's. The loader/monitor may be used for data entry and readout without the need of any additional programming equipment.

**LOADER/MONITOR — MOUNTING HARDWARE**

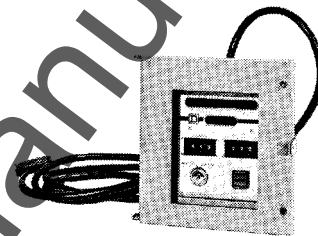
Two types of loader/monitor mounting hardware are available: 1) a holding bracket kit to mount the loader/monitor inside an enclosure or other assembly, and 2) a NEMA 12 lockable cover assembly with plexiglass window to mount the loader/monitor in an enclosure door. The plexiglass window allows viewing of the thumbwheel switch settings and readouts although the cover may be locked and sealed.



Type LM-1  
Loader/Monitor



Type H-1  
Holding  
Bracket Kit

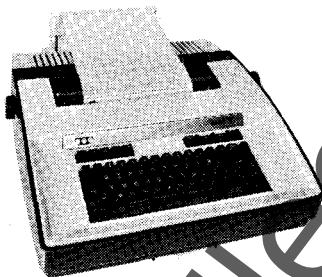


Type H-2  
NEMA 12 Cover  
(Shown with L/M Installed)

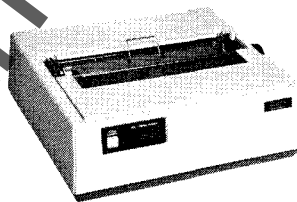
Description		Type	Price
Loader/Monitor	Decimal Loader/Monitor .....	LM-1	\$500.
	Hexadecimal Loader/Monitor .....	LM-2	550.
Mounting Hardware	Holding Bracket Kit for Loader/Monitor (to store or mount L/M inside enclosure) .....	H-1	40.
	NEMA-12 Lockable Cover Assembly with Plexi-Glass window for Loader/Monitor (includes H-1) .....	H-2	110.

**PRINTERS**

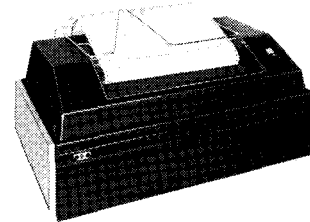
A printer terminal with 80 character wide format, operating at 300 BAUD as well as a high speed line printer with 132 character wide format, operating at up to 9600 BAUD may be added to the Class 8881 Programmable Controller. The printers are connected to the cassette/printer port of the PR-3 programmer and may be used to list processor programs (ladder or boolean algebra) with definitions as well as data logging reports such as inventory, maintenance, or production. Order cables from cable section.



Type PP-11  
Printer Terminal



Type PP-13  
Okidata Printer



Type PP-20  
High Speed  
Line Printer

Description		Class	Type	Price
Printers	OKIDATA Microline 82A Serial Dot Matrix Printer with 2K buffer (80 character lines, 120 cps, up to 9600 BAUD, RS-232C and current loop capability) .....	8010	PP-12	\$985.
	OKIDATA Microline 82A Serial Dot Matrix Printer (80 character lines, 120 cps, up to 1200 BAUD, RS-232C only) .....	8010	PP-13	690.
	Teletype Model 43 Printer with Keyboard (80 character lines, 300 BAUD 30 cps) .....	8010	PP-11	2,000.
	Teletype Model 40 Line Printer (132 character lines, up to 9600 BAUD, 300 lpm) .....	8010	PP-20	5,369.
Cables	30 Ft. RS-232C Cable (PP-11, 20 to PE-5 CRT) .....	8881	CC-20	100.
	25 Ft. RS-232C Cable (PP-12, 13 to SPR-200 CRT or PR-3) .....	8010	CC-152	100.
	25 Ft. RS-232C Cable (Teletype Model 43 to SPR-200 CRT or PR-3) .....	8010	CC-160	100.
	25 Ft. RS-232C Cable (Teletype Model 40 to SPR-200 CRT or PR-3) .....	8010	CC-170	100.

**ORDERING INFORMATION REQUIRED:** Class and type number



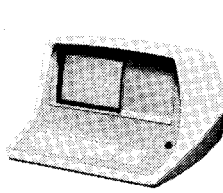
# PROGRAMMABLE CONTROLLERS

## ADDITIONAL PROGRAMMING EQUIPMENT — Cont'd

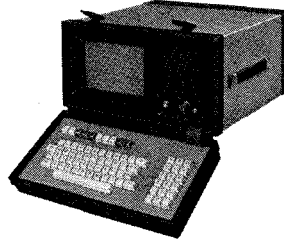
**CLASS**  
**8881**

### ADDITIONAL TERMINALS AND MONITORS

Additional CRT's and printers may be added to the programmable controller system to supplement the CRT used with the CRT programmer. The programmer's CRT port can accommodate the desk top CRT. The programmer's printer port can also accommodate CRT's as well as the printer and the color graphics CRT. Black and white as well as color graphics may easily be implemented using the inherent data logging capability of the CRT programmer.



Type PE-5  
CRT



Type SPR-200  
CRT



Type PP-11  
Printer  
Terminal

Description	Class	Type	Price
SY/MAX CRT (Requires CC-6 Cable and SPK-200 Key Kit) .....	8010	SPR-200	<b>\$2,200.</b>
CRT Programmer Key Modification Kit (Required with SPR-200) .....	8010	SPK-200	<b>15.</b>
CRT (Includes 30 Ft. CC-6 Cable) .....	8881	PE-5	<b>2,000.</b>
Printer Terminal, 80 character lines, 300 BAUD, 30 cps (order cable separately) .....	8010	PP-11	<b>2,000.</b>
Color CRT — Monitor or Terminal .....	8881	PE-11	Consult Factory

### MISCELLANEOUS EQUIPMENT

A general purpose interface is available to provide a parallel interface and a serial interface to both the processor and the Math/Logic Unit. The interface allows binary communication between a computer and the Class 8881 Programmable Controller to: 1) Read I/O status; 2) force outputs; 3) Read and Write Data Storage Locations; and 4) Read and Write individual words of processor core memory. Note: The PR-3 CRT programmer includes an ASCII coded computer interface as a standard feature. A modem may be added to allow remote communication of printers or CRT's via telephone lines. Order cables from cable section.



Type IB-4  
General Purpose  
Interface

Description	Type	Price
General Purpose Interface (requires CC-8 Power Cable and appropriate data cable — order separately) .....	IB-4	<b>\$1,512.</b>
Modem — used for long distance communications of CRT's, printers, and computer interfaces — originate/answer, full duplex, 0-1200 BAUD .....	PE-8	<b>1,000.</b>
CRT Contact Programmer Keyboard Modification Kit (used to update previously purchased CRT to make it visually compatible with the CRT Programmer) .....	PK-1	<b>15.</b>
Current Loop/RS-232C Interface (single channel) .....	LX-1	<b>475.</b>
IB-4 General Purpose Interface Test Plug (used for self test) .....	T1	<b>65.</b>

### CABLES

Description	Class	Type	Price	Description	Class	Type	Price
Interface Cable: .....	8881	CC-1	<b>\$122.</b>	8 Ft. 120 VAC Power Cable: .....	8881	CC-8	<b>\$ 20.</b>
Processor to PR-3 CRT Programmer .....				PR-3 CRT Programmer .....			
Processor to IB-4 General Purpose Interface .....				Math/Logic Unit (MLU) .....			
30 Ft. Serial Data Cable: .....	8881	CC-4	<b>90.</b>	IB-4 General Purpose Interface .....			
PE-11 Color CRT to PR-3 CRT Programmer Printer Port .....				10 Ft. Parallel Data Cable: .....	8881	CC-9	<b>156.</b>
PE-8 Modem to PR-3 CRT Programmer CRT Port or .....				PR-3 CRT Programmer to MLU .....			
Computer Port .....				30 Ft. Serial Data Cable: .....	8881	CC-20	<b>100.</b>
PE-8 Modem to PE-5 CRT Aux Port .....				PE-5 CRT to PP-11 Printer Terminal .....			
PCI (RS-232C) to IB-4 General Purpose Interface .....				PE-5 CRT to PP-20 High Speed Line Printer .....			
30 Ft. Serial Data Cable: .....	8881	CC-5	<b>90.</b>	25 Ft. RS-232C Cable (PP-12, 13 to SPR-200 CRT .....	8010	CC-152	<b>100.</b>
PE-8 Modem to IB-4 General Purpose Interface .....				or PR-3 .....	8010	CC-160	<b>100.</b>
PE-8 Modem to PCI (RS-232C) .....				25 Ft. Serial Data Cable: .....			
30 Ft. Serial Data Cable: .....	8881	CC-6	<b>90.</b>	PR-3 CRT Programmer Printer Port to PP-11 Printer .....			
PR-3 CRT Programmer to PE-5 Desk Top CRT .....				at 300 BAUD .....			
PR-3 CRT Programmer to PE-1 Cassette .....				PR-3 CRT Programmer Printer Port to PP-20 High .....			
PR-3 CRT Programmer Computer Port to PCI (RS-232C) .....				Speed Line Printer at 300 BAUD .....			
PE-5 CRT Aux Port to another PE-5 (EIA port) .....				PCI (RS-232C) to PP-11 Printer Terminal at 300 BAUD .....			
PE-5 CRT Aux Port to PE-1 Cassette .....				PCI (RS-232C) to PP-20 High Speed Line Printer .....			
PE-5 CRT Aux Port to PE-8 Modem .....				at 300 BAUD .....			
PE-1 Cassette to PE-8 Modem .....				25 Ft. Serial Data Cable: .....	8010	CC-170	<b>100.</b>
10 Ft. Parallel Data Cable: .....	8881	CC-7	<b>170.</b>	PR-3 CRT Programmer Printer Port to LP-2 High .....			
IB-4 General Purpose Interface to MLU .....				Speed Line Printer at up to 9600 BAUD .....			

**ORDERING INFORMATION REQUIRED: Class and type number**

**DISTRIBUTED CONTROL (EXTENDED DATA LOGGING)**

Extended data logging capability (similar to the data logging offered as standard in the PR-3 CRT Programmer) allows multiple programmable controllers to communicate with each other in a distributed control system. Extended data logging also allows display and printouts of complex messages with data dynamically obtained from any of the programmable controllers in the system. Black and white and color graphics displays may also be generated.

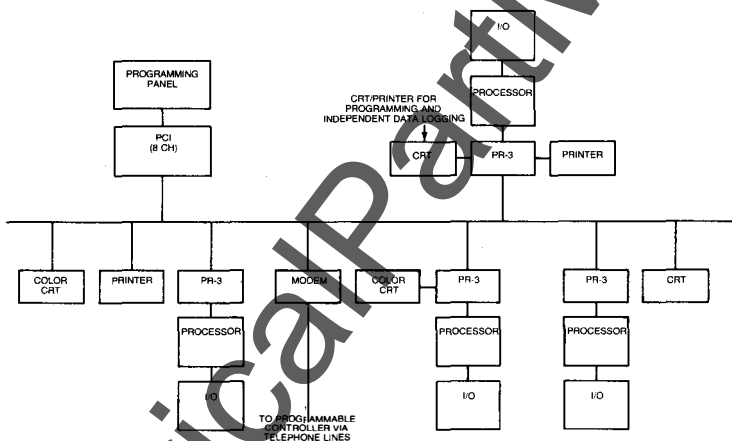
A peripheral controller interface (PCI) allows up to 64 channels of programmable controllers, CRT's, printers, and color CRT's to be attached. Either an ASCII coded interface (PR-3) CRT programmer — computer interface) or a binary coded interface (IB-4 General Purpose Interface) may be used for

communication to the processors. PCI communications is RS-232C. RS-232C to current loop interfaces are available for communication up to 2000 feet away. Modems are used for longer distances.

In addition to the CRT's and printers of the distributed control system, a CRT, color CRT, and/or printer may be controlled by an independent data logging program contained in and operating on a particular programmable controller. The local data logging program operates independent of the extended data logging program of the distributed control system.

Contact the factory for details.

**TYPICAL DISTRIBUTED CONTROL SYSTEM**



	Description	Type	Price
Current Loop Interface	Current Loop Output Interface — interfaces single RS-232C output channel to Current Loop Output. One required for each current loop output. Operates at any of the BAUD rates listed above. Note: Maximum cable length with current loop output is 1000' (9600 BAUD) and 2000' (1200 and 300 BAUD).	LX-1	\$475.

**ORDERING INFORMATION REQUIRED:** Class and type number with description



# PROGRAMMABLE CONTROLLERS SPARE PARTS

### RECOMMENDED SPARE PARTS STOCK

Various levels of spare parts stock are recommended for programmable controller applications, based on maximum allowable system down-time, down-time costs, and budgets. Three levels of stocking recommendations are listed below. For programmable controller systems that are not critical, minimum stock is recommended. For programmable controller systems that are involved in productive work and/or service, average stock is recommended. For critical programmable controller applications where system down-time may have serious consequences, complete back-up stock is recommended. For applications where system down-time has severe consequences, the use of a transfer module is recommended.

Description	Type	Stocking Level		
		Minimum	Recommended	Complete Backup
Processor with Memory, 8 Logic Cards, and Power Supply	CP-			1
8 Processor Logic Cards	B-		1	
Math/Logic Unit (MLU)	ML-1			1
I/O Cards	MD-, MRD-, SC-, SA-	1	See Below	See Below
Remote I/O Transceiver Cards	CH-1, CM-1	1	See Below	See Below
Transfer Module Cards	CO-, CB-1	1	1	1
I/O Power Supplies	PS-			1
Terminator	TB-1		1	1
Appropriate Fuse Kit(s)	FK	1	1	1

Number of I/O Cards and Remote I/O Transceiver Cards Used	Recommended Stocking Level of Each Type
1-10	1
11-30	2
31-60	3
60-up	4

### PROCESSOR

	Amount of Internal Relay Equivalents	Processor Memory Size							
		4K		8K		16K		32K	
		Type	Price	Type	Price	Type	Price	Type	Price
Processor	None	CP-4000	\$2,860.	CP-8000	\$5,370.	CP-16000	\$9,150.	CP-32000	\$10,750.
	255 Non-Retentive	CP-4000 Form WR-10	2,860.	CP-8000 Form WR-10	5,370.	CP-16000 Form WR-10	9,150.	CP-32000 Form WR-10	10,750.
	511 Non-Retentive	CP-4000 Form WR-20	2,970.	CP-8000 Form WR-20	5,480.	CP-16000 Form WR-20	9,260.	CP-32000 Form WR-20	10,860.
	767 Non-Retentive	CP-4000 Form WR-30	3,080.	CP-8000 Form WR-30	5,590.	CP-16000 Form WR-30	9,370.	CP-32000 Form WR-30	10,970.
	255 Non-Retentive and 256 Retentive	CP-4000 Form WR-11	3,026.	CP-8000 Form WR-11	5,536.	CP-16000 Form WR-11	9,316.	CP-32000 Form WR-11	10,916.
	511 Non-Retentive and 256 Retentive	CP-4000 Form WR-21	3,136.	CP-8000 Form WR-21	5,646.	CP-16000 Form WR-21	9,426.	CP-32000 Form WR-21	11,026.
	767 Non-Retentive and 256 Retentive	CP-4000 Form WR-31	3,246.	CP-8000 Form WR-31	5,756.	CP-16000 Form WR-31	9,536.	CP-32000 Form WR-31	11,136.
	Terminator	Description					Units of Load	Type	Price
	Terminator (one required per processor)					1000	TB-1	\$ 93.	

### PROCESSOR PARTS (FOR USE IN SERIES B OR LATER PROCESSORS)

Description	Type	Price
Complete Processor, Less Memory, 8 Logic Cards, Power Supply Module	CPF-20	\$1,356.
Processor Power Supply Module	PSM-1	660.
4K Processor Memory Plane (To upgrade processor memory size, see page 18)	RW-4000	2,400.
8K Processor Memory Plane (To upgrade processor memory size, see page 18)	RW-8000	4,910.
16K Processor Memory Plane (To upgrade processor memory size, see page 18)	RW-16000	8,690.
32K Processor Memory Plane (To upgrade processor memory size, see page 18)	RW-32000	10,290.
Processor Logic Card #1	B-10	\$212.
Processor Logic Card #2	B-22	195.
Processor Logic Card #3	B-34	180.
Processor Logic Card #4 with No Internal Relay Equivalents	B-42	445.
Processor Logic Card #4 with 255 Non-Retentive Internal Relay Equivalents	B-42 Form WR-10	445.
Processor Logic Card #4 with 511 Non-Retentive Internal Relay Equivalents	B-42 Form WR-20	555.
Processor Logic Card #4 with 767 Non-Retentive Internal Relay Equivalents	B-42 Form WR-30	665.
Processor Logic Card #4 with 255 Non-Retentive and 256 Retentive Internal Relay Equivalents	B-42 Form WR-11	611.
Processor Logic Card #4 with 511 Non-Retentive and 256 Retentive Internal Relay Equivalents	B-42 Form WR-21	721.
Processor Logic Card #4 with 767 Non-Retentive and 256 Retentive Internal Relay Equivalents	B-42 Form WR-31	831.
Processor Logic Card #5	B-53	200.
Processor Logic Card #6	B-60	218.
Processor Logic Card #7	B-73	209.
Processor Logic Card #8	B-80	209.
Replacement Battery Pack for Processor Internal Relay Equivalents	Part Number 30584-169-50	\$56.

**ORDERING INFORMATION REQUIRED:** Class, type, and form number or part number.

**PROCESSOR PARTS (FOR USE IN SERIES A PROCESSORS)**

Description	Type	Price
Processor Logic Card #1 .....	B-10	\$212
Processor Logic Card #2 .....	B-20	195.
Processor Logic Card #3 .....	B-30	180.
Processor Logic Card #4 with 255 Internal Relay Equivalents .....	B-41	445.
Processor Logic Card #4 with 511 Internal Relay Equivalents .....	B-41 Form WR-2	555.
Processor Logic Card #4 with 767 Internal Relay Equivalents .....	B-41 Form WR-3	665.
Processor Logic Card #4 with 1023 Internal Relay Equivalents .....	B-41 Form WR-4	775.
Processor Logic Card #4 without Internal Relay Equivalents .....	B-41 Form WR-5	445.
Processor Logic Card #5 .....	B-50	200.
Processor Logic Card #6 .....	B-60	218.
Processor Logic Card #7 or #8 .....	B-70	209.
Replacement Battery Pack for Processor Internal Relay Equivalents (Used Only if Processor is Form WB) .....	Part Number 30584-105-50	\$90.

**MATH/LOGIC UNIT (MLU)**

MLU	Options	Math/Logic Unit Data Storage Location Capacity							
		224		460		736		991	
		Type	Price	Type	Price	Type	Price	Type	Price
	None	ML1-224	\$700.	ML1-460	\$1,145.	ML1-736	\$1,590.	ML1-991	\$2,035.
	Fencing Capability	ML1-224 Form WF	790.	ML1-480 Form WF	1,235.	ML1-736 Form WF	1,680.	ML1-991 Form WF	2,125.
	50 Hz Capability	ML1-224 Form W50	700.	ML1-480 Form W50	1,145.	ML1-736 Form W50	1,590.	ML1-991 Form W50	2,035.
	Fencing and 50 Hz Capability	ML1-224 Forms WF, W50	790.	ML1-480 Forms WF, W50	1,235.	ML1-736 Forms WF, W50	1,680.	ML1-991 Forms WF, W50	2,125.
Replacement Battery	Replacement Battery for MLU .....							Part Number 29904-03370	\$88. List D-14A

**INPUT CARDS**

Description	Type	Price
120 VAC/VDC Input Card, 16 Inputs, Reed Relay Isolation .....	SC-1	\$260.
120 VAC/VDC Input Card, 16 Inputs, Optical Isolation .....	SC-2	275.
10-55 VDC Input Card, 16 Inputs, Normal Response .....	SC-3	240.
5-55 VDC Input Card, 16 Inputs, Fast Response .....	SC-4	240.
220-240 VAC Input Card, 16 Inputs, Optical Isolation .....	SC-5	210.
Analog: 0-10, 0-20, 4-20, 10-50 ma and 0-10, 1-5 VDC, 8 Differential Inputs .....	SC-6	1,080.
24 VAC Input Card, 16 Inputs, Optical Isolation .....	SC-9	300.

**OUTPUT CARDS**

Description	Type	Price
120 VAC Output Card, 16 Outputs, 2 AMP TRIAC Output, Reed Relay Isolation .....	SA-1	\$370.
120 VAC Output Card, 16 Outputs, 2 AMP TRIAC Output, Optical Isolation .....	SA-2	385.
0-120 VAC/VDC Output Card, 16 Outputs, Pilot Duty 35 VA (AC) or 15 Watts (DC) .....	SA-3	290.
100-240 VAC Output Card, 16 Outputs, 1 AMP TRIAC Output, Reed Relay Isolation .....	SA-5	390.
Analog: 4-20 ma, 0-10 VDC, 1-5 VDC, 4 Outputs .....	SA-6	1,008.
1-48 VDC Output Card, 16 Outputs, Open Collector (2 AMP max) .....	SA-7	350.
150 VDC Output Card, 16 Outputs, Optical Isolation 1 AMP max .....	SA-8	425.
120 VAC Output Card, 8 Outputs with individual commons, 2 AMP TRIAC Output, Reed Relay Isolation .....	SA-10	195.

**ORDERING INFORMATION REQUIRED:** Class, type, and form number or part number.



**PROGRAMMABLE CONTROLLERS  
SPARE PARTS — Cont'd**

**I/O STRUCTURES (NEW STYLE — WITHOUT ADDRESS CARDS)**

Description	Type	Price
4 Card I/O Frame .....	FRU-4	\$280.
8 Card I/O Frame .....	FRU-8	415.
Master Decoder Card .....	MD-3	220.
Cover Plate .....	MD-4	20.
8 Function Local Decoder Card .....	MD-8	130.
4 Function Remote Decoder Card .....	MRD-4	130.
8 Function Remote Decoder Card .....	MRD-8	130.

**I/O STRUCTURES (OLD STYLE — WITH ADDRESS CARDS)**

Description	Type	Price
Local I/O Frame .....	FRU-1	\$700.
Remote I/O Frame .....	FRU-2	700.
Local Master Decoder Card .....	MD-1	150.
Remote Master Decoder Card .....	MD-2	325.
Input Address Card .....	CA-1	150.
High Speed Input Address Card .....	CA-2	165.
Output Address Card .....	MA-1	170.

**REMOTE I/O TRANSCIVERS**

Description	Type	Price
Remote Transceiver Channel Card (one required per channel) .....	CH-1	\$120.
Remote Transceiver Frame .....	TF-1	450.
Remote Transceiver Logic Card .....	CM-1	255.
Terminator .....	TB-1	93.

**CABLES**

Description	Type	Price
Daisy Chain Cable — 5 Ft. ....	DCO-5	\$110.
Daisy Chain Cable — 10 Ft. ....	DCO-10	150.
Daisy Chain Cable — 15 Ft. ....	DCO-15	175.
Daisy Chain Cable — other lengths: 20, 25, 30, 35, 40, 45, 50, 60, 70, 80, 90, 100, 110, 120, 130, and 150 Ft. ....	DCO — Specify Length	100. plus \$5/Ft.
Power Supply Cable — 10 Ft. ....	FC-1	12.
8 Ft. Power Cable for use with MLU, PR-3, or IB-4 .....	CC-8	20.

**MISCELLANEOUS I/O CARDS**

Description	Type	Price
Monitor Light Card .....	SI-1	\$142.
RC Timer Card .....	TD-1	400.
Time Base Card .....	TC-1	260.
Retentive Memory Card .....	RM-1	410.

**TRANSFER MODULE**

Description	Type	Price
Transfer Module Frame .....	XF-1	\$800.
Transfer Module Common Card #1 .....	CO-1	490.
Transfer Module Common Card #2 .....	CO-2	490.
Transfer Module Channel Card .....	CB-1	225.
MLU Terminator Mounting Bracket .....	H-10	30.

**TRANSFER MODULE — INTERNAL RELAY EQUIVALENT CARD**

Description	Type	Form	Price
Card with 255 Non-Retentive Internal Relay Equivalents .....	IN-1	WB-10	\$650.
Card with 511 Non-Retentive Internal Relay Equivalents .....	IN-1	WR-20	760.
Card with 767 Non-Retentive Internal Relay Equivalents .....	IN-1	WR-30	870.
Card with 256 Non-Retentive and 256 Retentive Internal Relay Equivalents .....	IN-1	WR-11	816.
Card with 512 Non-Retentive and 256 Retentive Internal Relay Equivalents .....	IN-1	WR-21	926.
Card with 767 Non-Retentive and 256 Retentive Internal Relay Equivalents .....	IN-1	WR-31	1,036.
Replacement Battery for Transfer Module Internal Relay Equivalent Card (Used only with Retentive Internal Relay Equivalents) .....	Part Number 29904-03370		\$50. List D-14A

**ORDERING INFORMATION REQUIRED:** Class, type and form number or part number.

**DIODE ISOLATION KITS**

Description	Type	Price
Diode Isolation Kit for Use with Type PS-11 I/O Power Supplies	DK-1	\$125.
Diode Isolation Kit for Use with Type PS-12 I/O Power Supplies	DK-2	150.
Diode Isolation Kit for Use with Type PS-13 I/O Power Supplies	DK-3	200.

**POWER SUPPLIES**

Description	Type	Price
I/O Power Supply with 6,400 Units of Load Capacity	PS-11	\$425.
I/O Power Supply with 18,800 Units of Load Capacity	PS-12	1,100.
I/O Power Supply with 38,600 Units of Load Capacity	PS-13	2,100.
Analog Output Card Power Supply with Capacity to Drive 4 Analog Output Cards	PS-21	425.

**PROGRAMMING EQUIPMENT**

Description	Type	Price
CRT PROGRAMMER	PR-3	\$2,447.
General Purpose Interface	IB-4	1,280.
Decimal Loader/Monitor	LM-1	500.
Hexadecimal Loader/Monitor	LM-2	550.
PR-3 Logic Card #1	BI-70	440.
PR-3 Logic Card #2 (Use only with Series A, B, or C PR-3 — Note: BI-90 and BI-95 must be ordered as a set)	BI-90	440.
PR-3 Logic Card #3 (Use only with Series A, B, or C PR-3 — Note: BI-90 and BI-95 must be ordered as a set)	BI-95	440.
PR-3 Logic Card #4	BI-80	440.
PR-3 Logic Card #2 (Used only with Series D PR-3)	BI-100	888.
CRT Programmer Keyboard Modification Kit	PK-1	15.
IB-1 Logic Card	BI-10	356.
IB-4 Logic Card #1	BI-40	356.
IB-4 Logic Card #2	BI-50	378.
IB-4 Logic Card #3	BI-60	450.
IB-4 Test Plug	T1	65.
IB-4 Processor Interlock Plug	T2	58.
PR-3 CRT, Cassette/Printer, or Computer Port Test Plug	T3	35.
PR-3 MLU Port Test Plug	T4	35.
PR-3 Processor Port Test Plug	T5	70.

**PROGRAMMING EQUIPMENT CABLES**

Description	Type	Price
Interface Cable	CC-1	\$122.
30' IB-4 to Programming Panel Serial Cable	CC-4	90.
30' IB-4 to Modem Serial Cable	CC-5	90.
30' CRT, Cassette, Modem to Programming Panel Serial Cable or CRT, Cassette to Modem Cable	CC-6	90.
10' IB-4 to MLU Cable	CC-7	170.
8' Power Cable for use with PR-3, MLU or IB-4	CC-8	20.
10' MLU to PR-3 Cable	CC-9	156.
30' Printer Terminal or High Speed Line Printer to CRT Printer Port or Programming Panel	CC-20	100.
30' Printer Terminal or High Speed Line Printer to CRT Programmer (Printer Port) or PDI at 300 BAUD	CC-21	100.
30' High Speed Line Printer to CRT Programmer (Printer Port) at up to 9600 BAUD	CC-22	100.

**FUSE KITS**

Description	Type	Price
BASIC SYSTEM FUSE KIT — Includes 3 sets of fuses for Processor and MLU	FK-10	\$12.
CRT Programmer or General Purpose Interface Fuse Kit — Includes 5 fuses	FK-20	12.
Programming Box Fuse Kit — Includes 5 fuses	FK-30	12.
Programming Panel Fuse Kit — Includes 3 sets of fuses	FK-40	40.
Output Card Fuse Kit #1 — Includes 10 fuses for SA-1, 2, 5, 10 output cards	FK-51	12.
Output Card Fuse Kit #2 — Includes 10 fuses for SA-3 output cards	FK-52	12.

**ORDERING INFORMATION REQUIRED:** Class and type number.



# PROGRAMMABLE CONTROLLERS

**CLASS  
8881**

## RENTAL EQUIPMENT

Certain Class 8881 Programmable Controller Products are available on a monthly rental basis. Rental, rather than purchase, may be desirable for such temporary uses as programming, equipment start-up, or while equipment is being repaired.

## EQUIPMENT

Description	Type	Rental Price Per Month
CRT Programmer complete, consisting of: Programmer ..... CRT (with 30' CC-6 cable) ..... 120 VAC Power Cable ..... Interface Cable ..... 10' MLU to PR-3 Cable .....	PR-3 PE-5 CC-8 CC-1 CC-9	<b>\$400.</b>
Cassette Loader/Recorder (includes 6' cable and 1 PE-2 cassette cartridge) .....	PE-1	<b>180.</b>
Processor with 32K Memory and 255 Non-Retentive Internal Relay Equivalents .....	CP-32000 Form WR-10	<b>1,132.</b>

## TERMS

Minimum rental period is one month. Rental charges are billed in advance. Invoicing will be for one month intervals only and will be in advance for the next month's rental. Rental termination date is the date the returned equipment is received at Square D Company, Milwaukee Plant.

## PURCHASE OPTION

Credit toward the purchase of the rented or like equipment will be given upon receipt of a purchase order **prior** to termination of rental, with the following credits given for rental payments:

100% of 1st month	40% of 4th month
80% of 2nd month	20% of 5th month
60% of 3rd month	0% of 6th month and thereafter

## RENTAL EQUIPMENT REPAIR

Service of rental equipment in customer's plant is not included in rental charge. Rented equipment must be returned to the Square D Milwaukee Plant for repair, with shipping prepaid and absorbed by the customer. Replacement equipment will be shipped by Square D upon verbal notification of equipment needing repair, with shipping charges prepaid and absorbed by Square D. Replacement equipment will be invoiced at new equipment purchase price with full credit issued upon receipt of equipment requiring repair. If required repairs are the result of improper use or treatment, or should equipment returned upon termination of rental require repair, as determined by the Square D Company, the customer will be invoiced in full for all necessary repairs on the basis of repair cost.

**ORDERING INFORMATION REQUIRED:** Specify rental order including: Class, type and form number.

**PROGRAMMABLE CONTROLLERS  
PROCESSOR MEMORY SIZE UPGRADE  
(Only for Series B or Later Processors)**

Changing application needs may require additional processor memory capacity beyond that already purchased. For that reason Square D Company makes available a processor memory exchange. To increase processor memory size:

1. Purchase new larger size processor memory plane per the table below.
2. Return the used smaller size processor memory plane for credit per the table below. Contact your local Square D Company field office for return authorization.
3. The above procedure applies only to Series B or later Class 8881 processors. (See note)
4. Returned memory plane must be fully operational and resalable.

**NOTE:** When upgrading series B processor memory to 32K, processor logic cards 3, 5, and 7 must be upgraded to B-34, B-53, and B-73 respectively. No credit is given for old B-32, B-52, and B-72 cards.

**PROCESSOR MEMORY SIZE UPGRADE**

To Upgrade Processor Memory Size	Purchase New Larger Size Processor Memory Plane			Return for Credit Smaller Size Processor Memory Plane		
	Description	Type	List Price	Description	Type	List Price Credit*
From 4K to 8K	8K Memory Plane	RW-8000	\$4,910.	4K Memory Plane	RW-4000	\$1,800.
From 4K to 16K	16K Memory Plane	RW-16000	8,690.	4K Memory Plane	RW-4000	1,800.
From 4K to 32K	32K Memory Plane	RW-32000	10,290.	4K Memory Plane	RW-4000	1,800.
From 8K to 16K	16K Memory Plane	RW-16000	8,690.	8K Memory Plane	RW-8000	3,683.
From 8K to 32K	32K Memory Plane	RW-32000	10,290.	8K Memory Plane	RW-8000	3,683.
From 16K to 32K	32K Memory Plane	RW-32000	10,290.	16K Memory Plane	RW-16000	6,518.

\* Returned processor memory plane must be fully operational and resalable.

**PR-3 CRT PROGRAMMER SERIES UPDATE**

A. Previously purchased series A or B PR-3 CRT programmers may be updated to series C to obtain the additional feature of Boolean Algebra programming (in addition to ladder programming) now available with series C programmers. To update to Series C:

1. Purchase PR-3 logic cards #2 and #3 (BI-90 and BI-95) from the repair/exchange pool specifying "for update of PR-3 CRT programmer to series C". Note: both cards must be purchased.
2. Return existing PR-3 logic cards #2 and #3 per the repair/exchange policy. Contact your local Square D Company field office for return authorization.
3. Total price will be:  
 \$352. (\$176. Repair/Exchange price for each of the cards)  
 \$300. (\$150. Memory update charge for each of the cards).  
 \$652. LIST

B. Series B or C PR-3 can be updated to Series D. Update charge \$988. PR-3 must be returned to Square D.

**REPAIR/EXCHANGE PARTS  
GENERAL**

Inoperable Class 8881 Programmable Controller equipment, warranty. that is out of warranty, can be returned to Square D Company for either 1) repair or 2) exchange for equivalent rebuilt equipment (see list of available exchange items below). Inoperable equipment still under warranty is not covered by the Repair-Exchange Policy, but is covered under the terms of the original

The Repair-Exchange Policy provides the benefits of quick replacement (shipment within 48 hours after receipt of a purchase order) and replacement at a fixed price that is substantially discounted from new equipment prices.

**NOTE:** 48 HOUR SHIPMENT CANNOT BE GUARANTEED FOR MORE THAN 5 IDENTICAL I/O OR LOGIC CARDS.

**TERMS**

Equipment covered under the Repair-Exchange Policy will be furnished in exchange for repairable equipment of equivalent part number. The replacement equipment furnished will be

shipped from our bank of rebuilt, retested equipment and will be covered by our repair warranty.

**NON-REPAIRABLE EQUIPMENT**

If the exchanged equipment returned to Square D is deemed "not repairable," due to physical damage, an invoice will be issued in the amount of the catalog price for new equipment, less 10%, and a credit will be issued in the amount of the exchange invoice. The non-repairable equipment will be re-

turned to the customer, or discarded, at the customer's direction. If equipment for exchange is not received by Square D within 3 weeks after shipment of replacement equipment, it will be considered "not repairable" and invoiced accordingly.

**WARRANTY**

Square D warrants that equipment covered by our Repair-Exchange Policy to be free from defects in materials and workmanship for a period of 90 days from date of shipment by Square D. If within such period any such equipment shall be proved to Square D's satisfaction to be defective, such equipment shall be repaired or replaced at Square D's option. This warranty does not apply (a) to equipment not manufactured by All other terms are subject to Square D standard conditions of sale.

Square D, (b) to equipment which shall have been repaired or altered by others than Square D so as, in its judgement, to affect the same adversely or (c) to equipment which shall have been subjected to negligence, accident, or damage by circumstances beyond Square D's control, or to improper operation, maintenance or storage, or to other than normal use or service.

- NOTE:**
1. Repair reports will not be issued for equipment returned on a repair/exchange basis.
  2. Equipment returned for repair rather than exchange will be invoiced at a minimum of \$100.00 Net.

**ORDERING INFORMATION REQUIRED:** Specify: 1) processor memory upgrade order; 2) PR-3 CRT programmer series update order; or 3) repair/exchange order including class, type, and form number.

# PROGRAMMABLE CONTROLLERS REPAIR/EXCHANGE PARTS —Cont'd

### PROCESSOR LOGIC CARDS (FOR USE IN SERIES B OR LATER PROCESSORS)

Description	Type	Exchange Price
Processor Logic Card #1	B-10	\$85.
Processor Logic Card #2	B-22	78.
Processor Logic Card #3	B-34	72.
Processor Logic Card #4 with No Internal Relay Equivalents	B-42	178.
Processor Logic Card #4 with 255 Non-Retentive Internal Relay Equivalents	B-42 Form WR-10	178.
Processor Logic Card #4 with 511 Non-Retentive Internal Relay Equivalents	B-42 Form WR-20	222.
Processor Logic Card #4 with 767 Non-Retentive Internal Relay Equivalents	B-42 Form WR-30	266.
Processor Logic Card #4 with 255 Non-Retentive and 256 Retentive Internal Relay Equivalents	B-42 Form WR-11	244.
Processor Logic Card #4 with 511 Non-Retentive and 256 Retentive Internal Relay Equivalents	B-42 Form WR-21	288.
Processor Logic Card #4 with 767 Non-Retentive and 256 Retentive Internal Relay Equivalents	B-42 Form WR-31	332.
Processor Logic Card #5	B-53	80.
Processor Logic Card #6	B-60	87.
Processor Logic Card #7	B-73	84.
Processor Logic Card #8	B-80	84.

### PROCESSOR LOGIC CARDS (FOR USE IN SERIES A PROCESSORS)

Description	Type	Exchange Price
Processor Logic Card #1	B-10	\$85.
Processor Logic Card #2	B-20	78.
Processor Logic Card #3	B-30	72.
Processor Logic Card #4 with 255 Internal Relay Equivalents	B-41	178.
Processor Logic Card #4 with 511 Internal Relay Equivalents	B-41 Form WR-2	222.
Processor Logic Card #4 with 767 Internal Relay Equivalents	B-41 Form WR-3	266.
Processor Logic Card #4 with 1023 Internal Relay Equivalents	B-41 Form WR-4	310.
Processor Logic Card #4 without Internal Relay Equivalents	B-41 Form WR-5	178.
Processor Logic Card #5	B-50	80.
Processor Logic Card #6	B-60	87.
Processor Logic Card #7 or #8	B-70	84.

### MATH/LOGIC UNIT (MLU)

Description	Type	Exchange Price
MLU with 224 Data Storage Locations	ML1-224	\$280.
MLU with 480 Data Storage Locations	ML1-480	458.
MLU with 736 Data Storage Locations	ML1-736	636.
MLU with 991 Data Storage Locations	ML1-991	814.

### LOCAL AND REMOTE I/O STRUCTURES

Description	Type	Exchange Price
Master Decoder Card	MD-3	\$88.
8 Function Local Decoder Card	MD-8	52.
4 Function Remote Decoder Card	MRD-4	52.
8 Function Remote Decoder Card	MRD-8	52.
Local Master Decoder Card	MD-1	60.
Remote Master Decoder Card	MD-2	130.
Remote Transceiver Channel Card	CH-1	48.
Remote Transceiver Logic Card	CM-1	102.

### INPUT CARDS

Description	Type	Exchange Price
120 VAC/VDC Input Card, 16 Inputs, Reed Relay Isolation	SC-1	\$104.
120 VAC/VDC Input Card, 16 Inputs, Optical Isolation	SC-2	110.
10-55 VDC Input Card, 16 Inputs, Normal Response	SC-3	96.
5-55 VDC Input Card, 16 Inputs, Fast Response	SC-4	96.
220-240 VAC Input Card, 16 Inputs, Optical Isolation	SC-5	84.
Analog: 0-10, 0-20, 4-20, 10-50 mA and 0-10, 1-5 VDC, 8 Differential Inputs	SC-6	432.
24 VAC Input Card, 16 Inputs, Optical Isolation	SC-9	120.
Input Address Card	CA-1	60.
High Speed Input Address Card	CA-2	66.

**ORDERING INFORMATION REQUIRED:** Specify repair/exchange order including class, type, and form number.

**OUTPUT CARDS**

Description	Type	Exchange Price
120 VAC Output Card, 16 Outputs, 2 AMP TRIAC Output, Reed Relay Isolation	SA-1	\$148.
120 VAC Output Card, 16 Outputs, 2 AMP TRIAC Output, Optional Isolation	SA-2	154.
0-120 VAC/VDC Output Card, 16 Outputs, Pilot Duty 35 VA (AC) or 15 Watts (DC)	SA-3	116.
100-240 VAC Output Card, 16 Outputs, 1 AMP TRIAC Output, Reed Relay Isolation	SA-5	120.
Analog: 4-20 ma, 0-10 VDC, 1-5 VDC, 4 Outputs	SA-6	403.
1-48 VDC Output Card, 16 Outputs, Open Collector (2 AMP Max)	SA-7	140.
150 VDC Output Card, 16 Outputs, Optical Isolation, 1 AMP Max	SA-8	170.
120 VAC Output Card, 8 Outputs with individual commons, 2 AMP TRIAC Output, Reed Relay Isolation	SA-10	78.
Output Address Card	MA-1	68.

**MISCELLANEOUS I/O CARDS**

Description	Type	Exchange Price
Monitor Light Card	SL-1	\$57.
RC Timer Card	TD-1	160.
Time Base Card	TC-1	104.
Retentive Memory Card	RM-1	164.

**TRANSFER MODULE CARDS**

Description	Type	Exchange Price
Common Card #1	CO-1	\$196.
Common Card #2	CO-2	196.
Channel Card	CB-1	90.

**TRANSFER MODULE — INTERNAL RELAY EQUIVALENT CARD**

Description	Type	Form	Exchange Price
Card with 256 Non-Retentive Internal Relay Equivalents	IN-1	WR-10	\$260.
Card with 511 Non-Retentive Internal Relay Equivalents	IN-1	WR-20	304.
Card with 767 Non-Retentive Internal Relay Equivalents	IN-1	WR-30	348.
Card with 256 Non-Retentive and 256 Retentive Internal Relay Equivalents	IN-1	WR-11	326.
Card with 512 Non-Retentive and 256 Retentive Internal Relay Equivalents	IN-1	WR-21	370.
Card with 767 Non-Retentive and 256 Retentive Internal Relay Equivalents	IN-1	WR-31	414.

**POWER SUPPLIES**

Description	Type	Exchange Price
I/O Power Supply with 6,400 Units of Load Capacity	PS-11	\$170.
I/O Power Supply with 18,800 Units of Load Capacity	PS-12	440.
I/O Power Supply with 38,600 Units of Load Capacity	PS-13	840.
Analog Output Card Power Supply with Capacity to Drive 4 Analog Output Cards	PS-21	170.

**PROGRAMMING EQUIPMENT**

Description	Type	Exchange Price
Decimal Loader/Monitor	LM-1	\$200.
Hexadecimal Loader/Monitor	LM-2	220.
PR-3 Logic Card #1	BI-70	176.
PR-3 Logic Card #2 (use only with Series A, B, or C PR-3 — Note: BI-90 and BI-95 must be ordered as a set)	BI-90	176.
PR-3 Logic Card #3 (use only with Series A, B, or C PR-3 — Note: BI-90 and BI-95 must be ordered as a set)	BI-95	176.
PR-3 Logic Card #4	BI-80	176.
PR-3 Logic Card #2 (Use only with Series D PR-3)	BI-100	888.
IB-4 Logic Card #1	BI-40	142.
IB-4 Logic Card #2	BI-50	151.
IB-4 Logic Card #3	BI-60	180.

**ORDERING INFORMATION REQUIRED:** Specify repair/exchange order including class, type, and form number.



**SPECIFICATIONS**  
**TEMPERATURE AND HUMIDITY RATINGS**

All Class 8881 Equipment (With the Following Exceptions) Have Ratings of:

Operating Temperature	0 to 55°C (32 to 131°F)
Storage Temperature	-40 to 80°C (-40 to 176°F)
Humidity (Non-Condensing)	0 to 95%

Device	Operating Temperature	Storage Temperature	Humidity (Non-Condensed)
Type PE-1 Cassette Loader/Recorder	10 to 40°C (50 to 104°F)	-40 to 70°C (-40 to 158°F)	5 to 95%
Type PE-5 CRT	0 to 50°C (32 to 122°F)	0 to 85°C (32 to 185°F)	10 to 95%
Type PE-8 Telephone Coupler (Modern)	0 to 60°C (32 to 140°F)	-30 to 100°C (-22 to 212°F)	10 to 95%
Type PP-11 Printer Terminal	4 to 43°C (40 to 110°F)	-40 to 60°C (-40 to 140°F)	2 to 95%
Type PP-20 High Speed Line Printer	4 to 43°C (40 to 110°F)	-40 to 66°C (-40 to 150°F)	2 to 95%

**VOLTAGE AND VA REQUIREMENTS**

Device	Voltage	VA	Device	Voltage	VA
Type CP Processor	120 VAC ± 10% 50 or 60 Hz	250*	Type IB-4 General Purpose Interface	120 VAC ± 10% 50-60 Hz	80
Type ML1 Math/Logic Unit	120 VAC ± 10% 50 or 60 Hz	80	Type PE-1 Cassette Loader/Recorder	115 VAC ± 10% 50 or 60 Hz	90
Type RT Remote I/O Transceiver	120 VAC ± 10% 50-60 Hz	105	Type PE-5 CRT	110 VAC ± 10% 60 Hz	110†
Type PS-11 I/O Power Supply	120 VAC ± 10% 50-60 Hz	1800	Type PE-8 Telephone Coupler (Modern)	120 VAC ± 10% 60 Hz	15
Type PS-12 I/O Power Supply	120 VAC ± 10% 50-60 Hz	1800	Type PP-11 Printer Terminal	115 VAC ± 10% 50-60 Hz	105
Type PS-13 I/O Power Supply	120 VAC ± 10% 50-60 Hz	1800	Type PP-20 High Speed Line Printer	115 VAC ± 10% 50-60 Hz	230
Type PS-21 Analog Output Card Power Supply	120 VAC ± 10% 50-60 Hz	110	Type CX Peripheral Controller Interface (PCI)	120 VAC ± 10% 50-60 Hz	1200
Type PR-3 CRT Contact Programmer	120 VAC ± 10% 50-60 Hz	80†	Type SPR-200 SY/MAX CRT	120 VAC ± 10% 47-63 Hz	100
Type PR1-16 16K Programming Panel	120 VAC ± 10% 50-60 Hz	480†			
Type PR1-32 32K Programming Panel	120 VAC ± 10% 50-60 Hz	600†			

† These devices normally receive their 120 VAC power from the two convenience receptacles provided on the types PS-11, 12, and 13 I/O power supplies. For specific capacities of Types PS-11, 12, and 13 I/O power supplies, see Hardware Product Data #M-512.

\* Power is supplied from I/O power supply.

**APPROXIMATE WEIGHTS**

Device	Lb.	Kg.	Device	Lb.	Kg.
Type CP Processor	90	41	Type PR-3 CRT Programmer	17	8
Type ML1 Math/Logic Unit	21	10	Type PR-1 Programming Panel	70	32
Type FRU-4 I/O Frame	23	10	Type IB-4 General Purpose Interface	21	10
Type FRU-8 I/O Frame	32	15	Type PW-1 Cassette Loader/Recorder	20	9
Type RT Remote I/O Transceiver	38	17	Type PE-5 CRT	50	23
Type XM Transfer Module	35	16	Type PP-11 Printer Terminal	40	18
Type PS-11 I/O Power Supply	24	11	Type PP-20 High Speed Line Printer	56	25
Type PS-12 I/O Power Supply	42	19	Type LM Loader/Monitor	3	1
Type PS-13 I/O Power Supply	79	36	Type SPR-200 SY/MAX CRT	31	14
Type PS-21 Analog Output Card Power Supply	25	11			
Type SC Input Card	2	1			
Type SA Output Card	2	1			

**MINIMUM CLEARANCES**

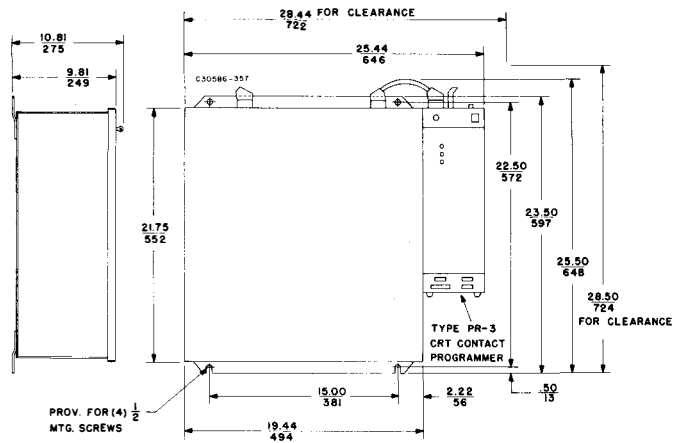
Device	Inches					Centimeters				
	Front	Top	Bottom	Left	Right	Front	Top	Bottom	Left	Right
Type CP Processor	2	5	4	4	9⊕	5	13	10	10	23⊕
*Type ML1 Math/Logic Unit	3	4	6	4	4	8	10	15	10	10
Type FRU- I/O Frame	—	4	4	4	4	—	10	10	10	10
*Type RT Remote I/O Transceiver	2	4	6	4	4	5	10	15	10	10
*Type XM Transfer Module	—	4	6	4	4	—	10	15	10	10
Type PS Power Supply	—	4	4	4	4	—	10	10	10	10
Type PR-3 CRT Programmer	3	5	5	‡	3	8	13	13	‡	8
*Type PR-1 Programming Panel	—	4	4	4	4	—	10	10	10	10
Type IB-4 General Purpose Interface	—	5	5	‡	3	—	13	13	‡	8

⊕ Includes clearance for PR-3 programmer or IB-4 interface. Proper clearance for processor alone is 4 inches (10 cm)

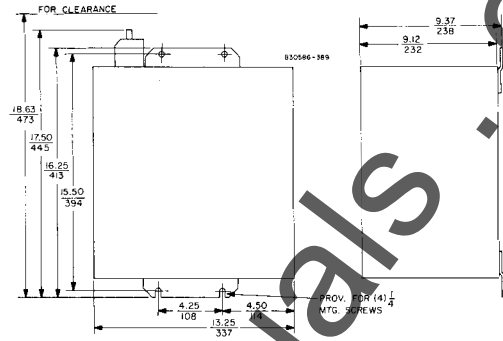
‡ Mounted against right side of processor

\* The Math/Logic Unit, Remote I/O Transceiver, Transfer Module, and Programming Panel should not be mounted above high heat devices such as I/O Structures or Power Supplies

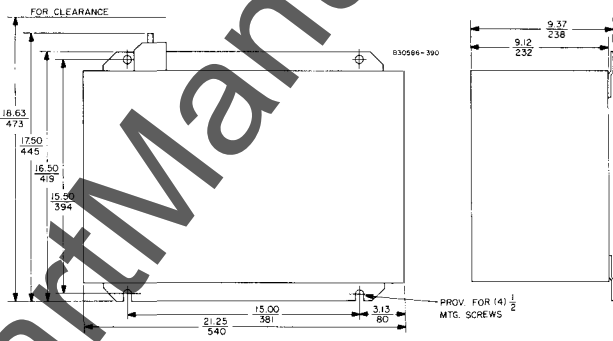
**APPROXIMATE DIMENSIONS**



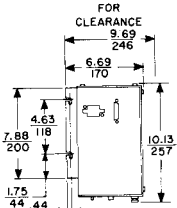
**Type CP Processor**  
(Shown with Type PR-3 CRT Programmer Attached)



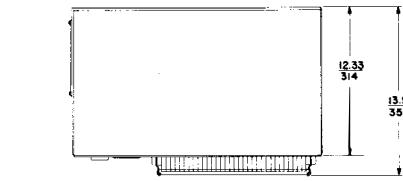
**Type FRU-4 I/O Frame**



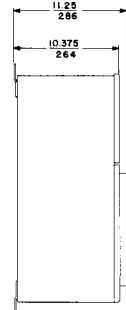
**Type FRU-8 I/O Frame**



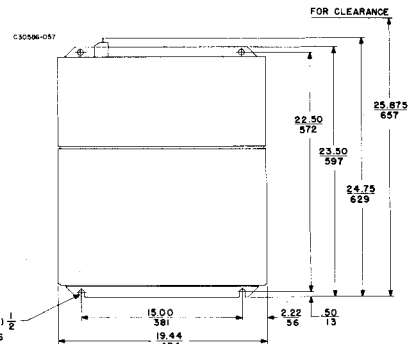
**Type IB-4 General Purpose Interface**



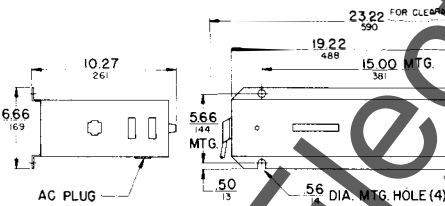
**Type PS-13 I/O Power Supply**



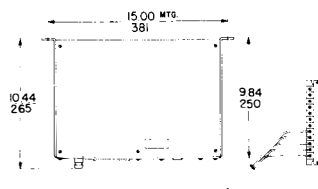
**Type ML1 Math/Logic Unit**



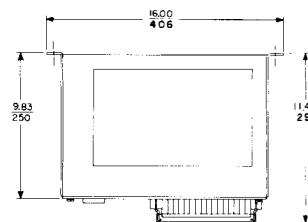
**Type FRU-1 I/O Frame**



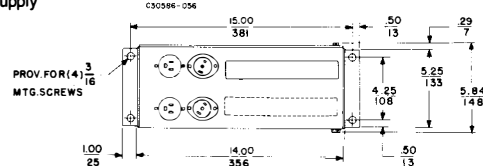
**Type MLI Math/Logic Unit**



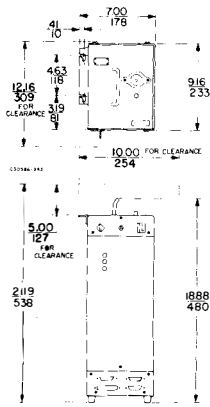
**Type PS-11, 12 I/O Power Supply**



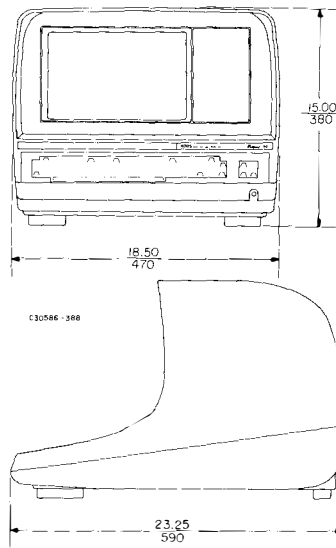
Dual Dimensions: **INCHES**  
Millimeters



DIMENSIONS — Cont'd

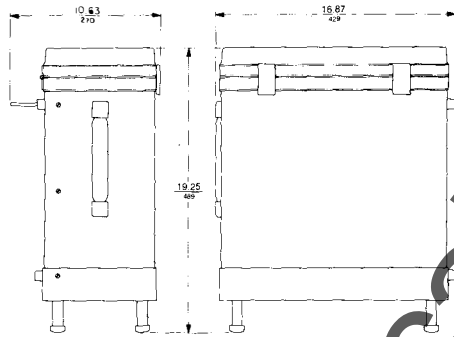


Type PR-3 CRT Programmer

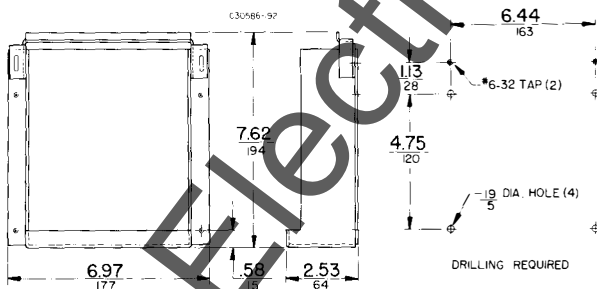


Type PE-5 CRT

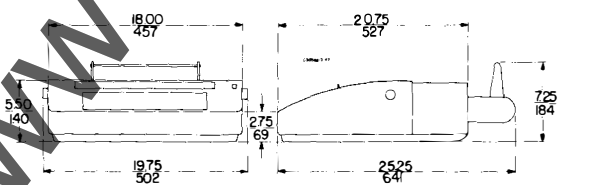
Dual Dimensions: INCHES / Millimeters



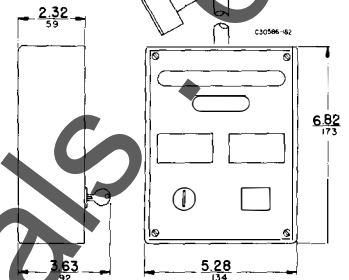
Type SPR-200 CRT



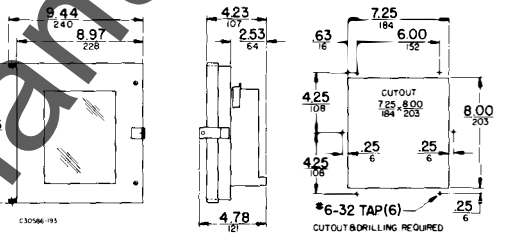
Type H1 Loader Monitor Holding Bracket Kit



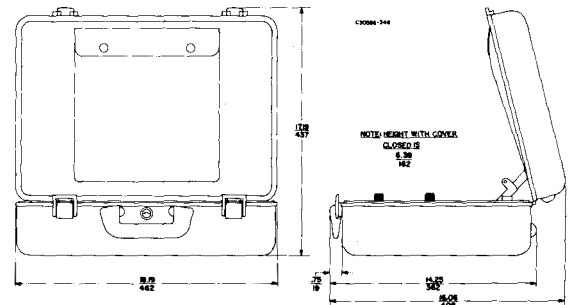
Type PP-11 Printer Terminal



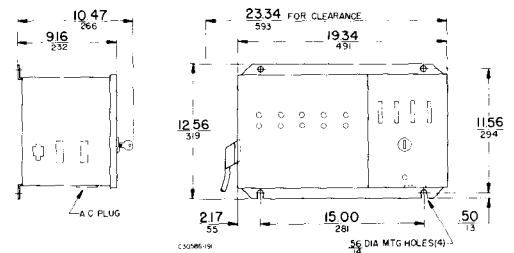
Type LM Loader Monitor



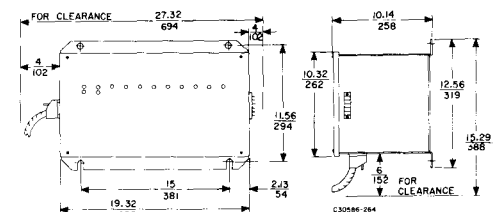
Type H-2 Loader Monitor NEMA 12 Lockable Cover Assembly



Type SLR100 Loader/Recorder



Type RT Remote I/O Transceiver



Type XM Transfer Module

**ALPHABETICAL LISTING OF TYPE NUMBERS WITH PRICES**

Type	Price	Type	Price	Type	Price	Type	Price
B-10	\$212.	CP-4000 Form WR-31	\$3,246.	DK-3	\$200.	PS-12	\$1,100.
B-20	195.	CP-8000	5,370.	FC-1	12.	PS-13	2,100.
B-22	195.	CP-8000 Form WR-10	5,370.	FK-10	12.	PS-21	425.
B-30	180.	CP-8000 Form WR-20	5,480.	FK-20	12.	PSM-1	660.
B-33	180.	CP-8000 Form WR-30	5,590.	FK-30	12.	R100	16.
B-41	445.	CP-8000 Form WR-11	5,536.	FK-40	40.	R250	16.
B-41 Form WR-2	555.	CP-8000 Form WR-21	5,646.	FK-51	12.	R500	16.
B-41 Form WR-3	665.	CP-8000 Form WR-31	5,756.	FK-52	12.	R1000	16.
B-41 Form WR-4	775.	CP-16000	9,150.	FRU-1	700.	RM-1	410.
B-41 Form WR-5	445.	CP-18000 Form WR-10	9,150.	FRU-2	700.	RP-1	18.
B-42	445.	CP-16000 Form WR-20	9,260.	FRU-4	280.	RW-4000	2,400.
B-42 Form WR-10	445.	CP-16000 Form WR-30	9,370.	FRU-8	415.	RW-8000	4,910.
B-42 Form WR-20	555.	CP-16000 Form WR-11	9,316.	H-1	40.	RW-16000	8,690.
B-42 Form WR-30	665.	CP-16000 Form WR-21	9,426.	H-2	110.	RW-32000	10,290.
B-42 Form WR-11	611.	CP-16000 Form WR-31	9,536.	H-10	30.	SA-1	370.
B-42 Form WR-21	721.	CP-32000	10,750.	IB-4	1,512.	SA-2	385.
B-42 Form WR-31	831.	CP-32000 Form WR-10	10,750.	IN-1 Form WR-10	650.	SA-3	290.
B-50	200.	CP-32000 Form WR-20	10,880.	IN-1 Form WR-20	780.	SA-5	390.
B-53	200.	CP-32000 Form WR-30	10,970.	IN-1 Form WR-30	870.	SA-6	1,008.
B-60	218.	CP-32000 Form WR-11	10,916.	IN-1 Form WR-11	816.	SA-7	350.
B-70	209.	CP-32000 Form WR-21	11,026.	IN-1 Form WR-21	926.	SA-8	425.
B-73	209.	CP-32000 Form WR-31	11,136.	IN-1 Form WR-31	1,036.	SA-10	195.
B-80	209.	CPF-20	1,356.	KP-1	5.	SC-1	260.
BI-10	356.	CX-2	Consult Factory	LM-1	500.	SC-2	275.
BI-40	356.	CX-4	Consult Factory	LM-2	550.	SC-3	240.
BI-50	378.	CX-6	Consult Factory	PP-20	5,370.	SC-4	240.
BI-60	450.	CX-8	Consult Factory	LX-1	475.	SC-5	210.
BI-70	440.	CX-10	Consult Factory	MA-1	170.	SC-6	1,080.
BI-80	440.	CX-12	Consult Factory	MD-1	150.	SC-9	300.
BI-90	440.	CX-14	Consult Factory	MD-2	325.	SI-1	142.
BI-95	440.	CX-16	Consult Factory	MD-3	220.	SPK-200	15.
BI-100	888.	CX-18	Consult Factory	MD-4	20.	SPR-200	2,200.
C-1	12.	CX-20	Consult Factory	MR-8	130.	T1	65.
CA-1	150.	CX-22	Consult Factory	ML-224	700.	T2	58.
CA-2	165.	CX-24	Consult Factory	ML-480	1,145.	T3	35.
CB-1	225.	DCO-5	110.	ML-736	1,590.	T4	35.
CC-1	122.	DCO-10	150.	ML-1-99	2,035.	T5	70.
CC-4	90.	DCO-15	175.	Form W50 (use with ML1)	NC	TB-1	93.
CC-5	90.	DCO-20	200.	Form W7F (use with ML1)	90.	TB-2	95.
CC-6	90.	DCO-25	225.	MRD-4	130.	TC-1	260.
CC-7	170.	DCO-30	250.	MRD-8	130.	TD-1	400.
CC-8	20.	DCO-35	275.	PE-1	1,980.	TF-1	450.
CC-9	156.	DCO-40	300.	PE-2	14.	XF-1	800.
CC-20	100.	DCO-45	325.	PE-5	2,000.		
CC-21	100.	DCO-50	350.	PE-8	1,000.		
CC-22	100.	DCO-60	400.	PE-11	Consult Factory		
CH-1	120.	DCO-70	450.	PK-1	15.		
CM-1	255.	DCO-80	500.	PP-11	2,000.		
CO-1	490.	DCO-90	550.	PP-12	985.	30584-105-50	\$90.
CO-2	490.	DCO-100	600.	PP-13	690.	30584-169-50	56.
CP-4000	2,860.	DCO-110	650.	PP-20	5,369.	29904-03370	\$50. LIST
CP-4000 Form WR-10	2,660.	DCO-120	700.	PR1-16	Consult Factory		D-14A
CP-4000 Form WR-20	2,970.	DCO-130	750.	PR1-32	Consult Factory		
CP-4000 Form WR-30	3,080.	DCO-150	850.	PR1-64	Consult Factory		
CP-4000 Form WR-11	3,026.	DK-1	125.	PR-3	2,447.		
CP-4000 Form WR-21	3,136.	DK-2	150.	PS-11	425.		

**ORDERING INFORMATION REQUIRED:** Class, type, and form number or part number.

