



APPLICATION		REVISIONS			
NEXT ASSY	USED ON	REV	DESCRIPTION	DATE	APPROVED
		A	PRODUCTION RELEASE/SEE E.O. 35686	12-11-00	B. LO
		B	SEE E.O. 36975	06-04-02	B. LO
		C	SEE E.O. 37181	08-26-02	<i>B. Lo</i>

MANUAL

- SHEET 0 - THIS SHEET
- SHEET 1 - FEATURES
- SHEET 2 - GENERAL SPECIFICATIONS
- SHEET 3 - EXPLODED ASSY VIEW & PARTS REFERENCE
- SHEET 4 & 5- ASSEMBLY INSTRUCTIONS, CASH DRAWER MOUNTING CONFIGURATIONS
- SHEET 6 - OPERATION
- SHEET 7 - USER DEFINED CHARACTER LOADING
- SHEET 8 & 9 - CHARACTER FONTS
- SHEET 10 - KIT NUMBERING SCHEME
- SHEET 11, 12 & 13 - COMMAND CODES AND FONTS FOR EMULATED EMAX AN101 MODE (AEDEX AND DUMB TERMINAL MODE)
- SHEET 14, 15 & 16 - COMMAND CODES AND FONTS FOR EMULATED LOGIC CONTROLS PD3000/ULTIMATE PD220XL
- SHEET 17 - COMMAND CODES FOR EMULATED AEDEX PSD 220G STAND ALONE CODE
- SHEET 18 Thru 31 - COMMAND CODES EPSON DM-101/102 NO PASS THRU MODE STAND ALONE CODE



REV STATUS OF SHEETS	REV	A	A	A	A	A	A	A	A	A	A	A	A	A				
	SHEET	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
REV STATUS OF SHEETS	REV	C	A	A	B	A	A	A	A	A	A	C	A	A	A	A	A	A
	SHEET	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE ARE : FRACTIONS DECIMALS ANGLES ± XXX± ±	CONTRACT NO.		 INDUSTRIAL ELECTRONIC ENGINEERS, INC VAN NUYS, CALIFORNIA
	APPROVALS	DATE	
DO NOT SCALE DRAWING	DRAWN J. WILLIAMS	12/04/00	TITLE MANUAL, PDK-229U-XXXXXX INSTALLATION & OPERATING INSTRUCTIONS
TREATMENT	CHECKED B. LO	12/11/00	SIZE CAGE CODE DWG NO. REV
FINISH	ISSUED B. LO	12/11/00	A 05464 PDK-229U-INOPML C
			SCALE - PROJ NO. 468 SHEET 0 OF 31





DISPLAYS
KEYBOARDS
INTEGRATED PANELS

INDUSTRIAL ELECTRONIC ENGINEERS, INC. 7740 Lemona Ave., Van Nuys, CA 91409-9234, U.S.A. • Tel 818-787-0311

PDK-229U-XXXXXX* VF POS Pole Display Kit

INSTALLATION and OPERATING INSTRUCTIONS

Key Features:

- Vacuum Fluorescent (VF) display - 2 line x 20 character 9mm 5x7 dot matrix - with contrast enhancing filter, EIA-232 interface, detachable DB-9F host interface/power supply cable and 24Vdc wall mount power supply.
- Five Selectable Software Personalities.
- IEE's extensive command and control set.
- Eight selectable character fonts, block cursor, dimming control and selective blinking.
- Display module housed in a compact, impact resistant enclosure with four-position tilt-recline and 330° swivel adjustment. Pole and mounting base kit are included.
- Display certified to the requirements of UL, CE, TUV and FCC Part 15, Class A.

(* Refer to Page 9 for exact configuration of your kit).

Table of Contents:

Page 2 provides General Specifications and an introduction to the Assembly and Installation of the pole display.
Page 3 provides an exploded view of your pole display assembly with part numbers, so you can identify and verify that you have all the parts ordered.

Pages 4 and 5 provide instructions for assembling the display and attaching it using one of many mounting configurations.

Pages 6, 7, 8 and 9 provide information on how to operate the display including provisions for self-test, software commands, character fonts and User Defined Character (UDC) loading.

Page 10 provides the kit numbering scheme that defines the exact contents as referenced by the number on the lid of the shipping box. **PDK-229u-XXX** defines the characteristics of the display head (i.e. display type, software functionality, pole position, housing color and filter color) and cannot be revised.

Page 11,12 and 13 provide command codes and fonts **Emulates EMAX AN101 mode.**(AEDEX command mode and DUMB TERMINAL MODE)

Page 14,15 and 16 Provides command codes and fonts for Emulated Logic Control PD3000/Ultimate PD220XL.

Page 17 Provides command codes and fonts for Emulated Aedex PSD 220G Stand Alone Mode.

Page 18 thru 31 Provides command codes and fonts for Emulated Epson DM-101/102 No Pass Thru Mode.

PRODUCT SUPPORT

For information not found in these Instructions, please contact IEE's Sales Application Engineering Department:

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Van Nuys, California 91409-9234 USA

Phone: (800) 422-0867 or (818) 787-0311
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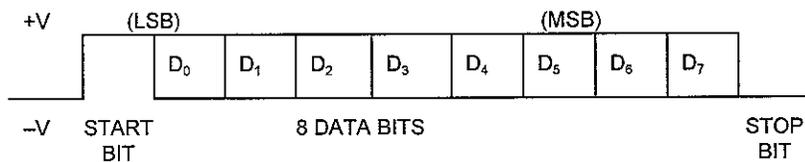
PDK-229U-INOPML
August 19, 2002

GENERAL SPECIFICATIONS

Interface:

• Power:	Supply voltage	11-29 Vdc	• Pin Assignments:		
	Supply current @24 Vdc	213 ma (max)	(Host)	DB-9F	
	Supply risetime	100 milliseconds (max)	COM	1	COM
• Caution:	Supply sequencing	Rapid ON/OFF sequencing is not recommended.	RXD	2	TXD
	Start cycle	The display is not ready to accept data until 1.2 seconds after application of power.	TXD	3	RXD
• Signal:	Serial EIA-232	9600 baud - 8 bits - no parity	DTR	4	DSR
	Serial input levels	+3V to +15V (space/logic 0)	SIG GND	5	SIG GND
		-3V to -15V (mark/ logic 1)	DSR	6	DTR
			N.A	7	N.C
			CTS	8	DTR
			N.A	9	N.C

Data Format



Environmental:

- **Operating Temperature:** 0 to +70 °C (+32 to +158 °F)
- **Storage Temperature:** -20 to +70 °C (-4 to +158 °F)
- **Relative Humidity:** 0 to 95% (non-condensing)

ASSEMBLY and INSTALLATION

Overview

To achieve the greatest mounting and cabling flexibility available in a POS pole display system this kit provides a cable break a few inches from the pod. The DIN8M on the module pigtail cable connects to the DIN8F on the Host/Power cable assembly after it has been installed and routed through the pole. This allows easy connect and disconnect of the display module.

The DIN8F should be routed through any holes, slots, etc. in the installation and mounting hardscape (organizers, hardware, mounting surfaces, mounting bases or kits) between the Host DB9 and Power Supply connections before it is routed through the pole, from the bottom (threaded end). The independent power supply cable provides additional flexibility in locating the wall mount power supply.

Pages 3, 4 and 5 provide information on the assembly and installation/attachment of the pole display. Details are provided for attaching the pole to a variety of bases, kits, surfaces and organizers.

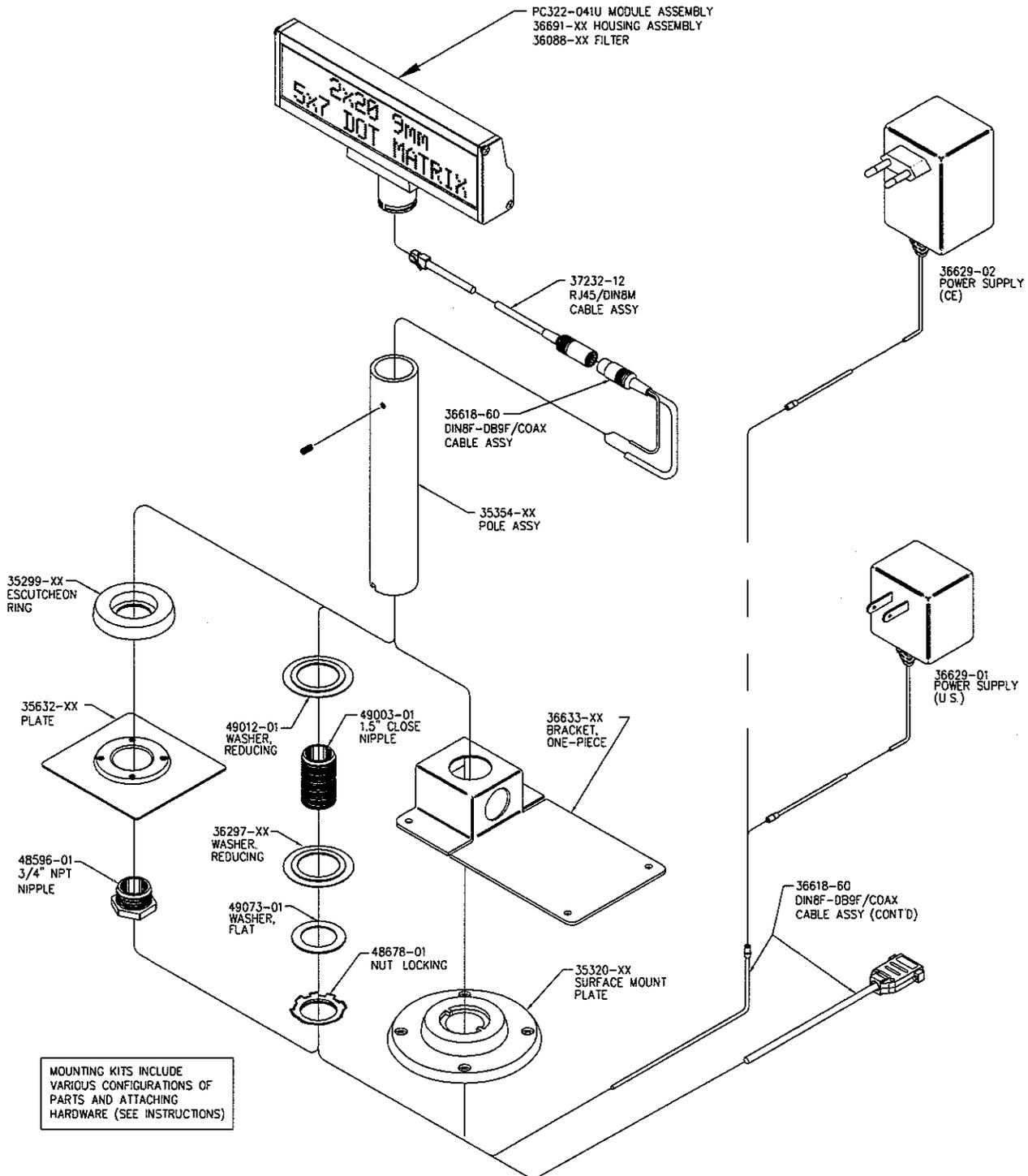
Installation Instructions:

Perform these electrical installation steps after, or as a part of the attachment instructions appropriate for the specific mechanical installation:

1. Connect the DB-9 (female) to the appropriate port on the host system.
2. Plug the wall mount power supply into an appropriate AC outlet.
3. A blinking cursor should appear in the left-most position on the top line. The POS display is now ready for operation using the commands and codes provided on pages 6, 7 and 8.

EXPLODED ASSEMBLY VIEW and PARTS REFERENCE

PDK-229U-XXXXXX POS POLE DISPLAY DISTRIBUTOR KIT TYPE 3C POD RS232 INTERFACE



ASSEMBLY INSTRUCTIONS

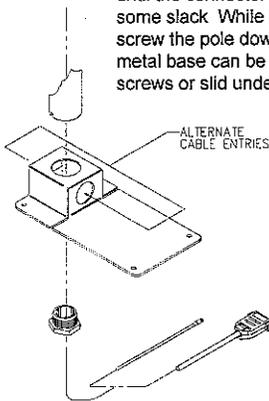
Mounting kits:

- **35360-0X SURFACE MOUNTING KIT (standard)**
 - (1) 35320-XX SURFACE MOUNT PLATE
 - (1) 48596-01 CONDUIT NIPPLE
- **35697-0X BASE KIT, HEAVY METAL**
 - (1) 35632-XX PLATE, MULTI-PURPOSE
 - (1) 35299-XX ESCUTCHEON RING
 - (1) 48596-01 CONDUIT NIPPLE
- **36231-0X ICD POLE KIT**
 - (1) 36297-XX WASHER, REDUCING
 - (1) 49003-01 CLOSE NIPPLE
 - (1) 49012-01 WASHER, REDUCING
 - (1) 48678-01 LOCKNUT
- **36634-0X MOUNTING KIT, SHEET METAL BASE**
 - (1) 36633-XX BASE, SHEET METAL
 - (1) 48596-01 CONDUIT NIPPLE
 - (4) 48765-10 #8-18 PAN HEAD SCREW, THD. FORMING
- **36631-99 APG BRACKET KIT**
 - (1) 36630-99 BRACKET, POLE
 - (1) 48596-01 CONDUIT NIPPLE
 - (2) 48989-02 #8-32 PAN HD. SCREW LOCKWASHER
 - (2) 43311-04 #8-32 NUT, HEX
- **36632-0X MS CASH KIT**
 - (1) 36297-XX WASHER, REDUCING
 - (1) 49073-01 WASHER, FLAT
 - (1) 48596-01 CONDUIT NIPPLE

Surface Mount and Freestanding Configurations:

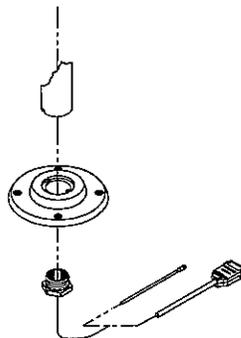
Mounting Kit, Sheet Metal

Thread the DIN8F connector through a hole in the mounting surface or one of the two side openings in the bracket and then through the conduit nipple. Thread the connector through the bracket top hole and into the threaded end of the pole, continue to feed the cables in until the connector emerges from the pole, and pull out some slack. While holding the conduit nipple in place, screw the pole down snugly onto the bracket. The sheet metal base can be freestanding, mounted with 48765-10 screws or slid under the cash register etc



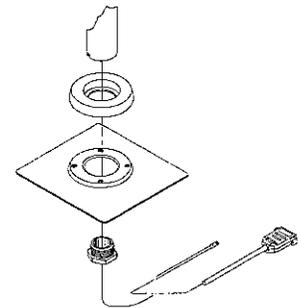
Surface Mount Plate

Thread the DIN8F connector through a hole in the mounting surface and conduit nipple, or breakout one of the tabs in the surface mount plate (use wide, square jaw pliers) and route the cable through the conduit nipple. Thread the cable through the surface mount plate and pole. Holding the pole in the plate, tighten the conduit nipple into the pole. Attach the mounting plate to the surface, being careful to route the cables through the breakout tab if applicable



Base Kit, Heavy Metal

Thread the DIN8F connector through a hole in the mounting surface and conduit nipple or just through the conduit nipple. Thread the cable through the base, escutcheon ring and pole. Pull some cable slack through, push the nipple into the recess in the base, put the pole in place in the escutcheon ring and tighten it onto the nipple threads until snug



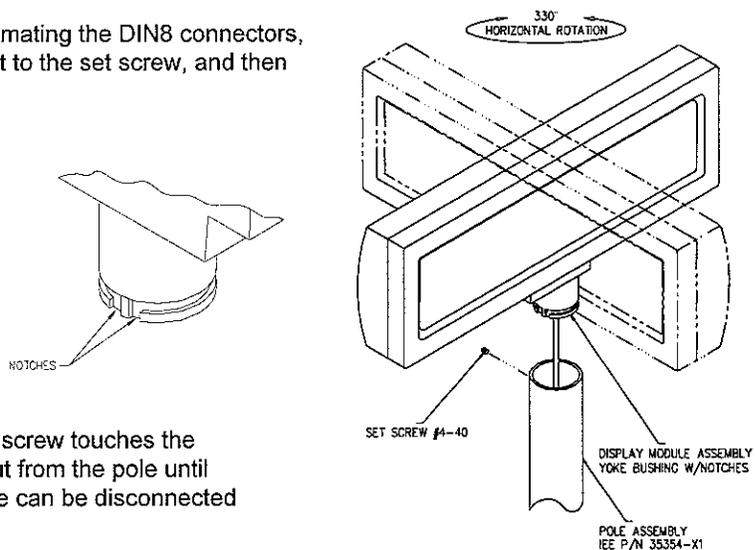
Display Module and Pole Assembly:

The display module is attached to the pole assembly by mating the DIN8 connectors, inserting the display yoke into the pole at the end closest to the set screw, and then rotating the display

1. Push the cable slack back into the pole.
2. Insert the display module partially into the pole and align the set screw with one of the two notches on the yoke bushing.
3. Push the yoke bushing completely into the pole, then rotate the module on the pole as desired

TO REMOVE THE MODULE:

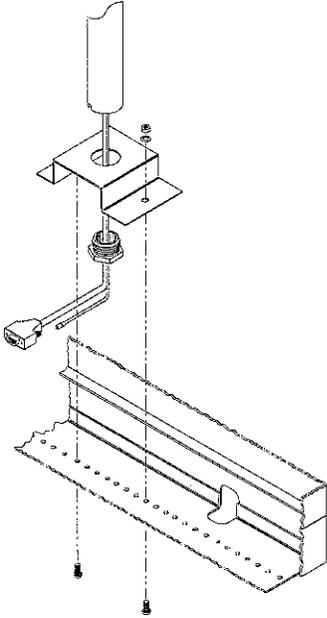
Rotate the module in either direction until the set screw touches the stop on the yoke, then pull the module straight out from the pole until the DIN8 connectors are exposed and the module can be disconnected



CASH DRAWER MOUNTING CONFIGURATIONS

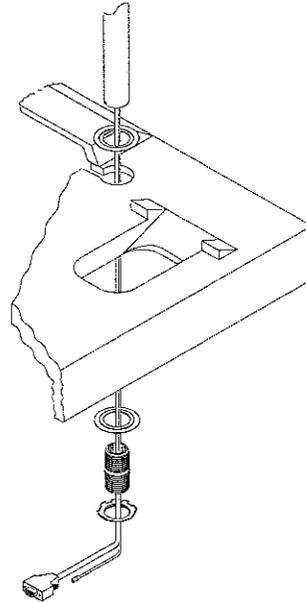
• APG CASH DRAWER

Thread the DIN8F connector through the conduit nipple, bracket and pole, pulling out some slack. Hold the nipple in place and tighten the pole down onto the bracket. Mount the assembly (through the partner) in the selected position along the row of mounting holes at the rear of the drawer using the hardware as shown.



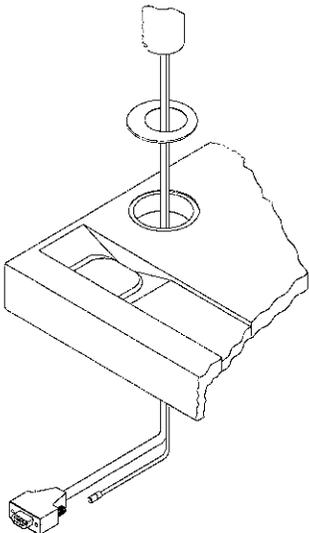
• INDIANA CASH DRAWER

Remove the mounting bracket on the underside of the shoe. Tighten the close nipple into the pole. Thread the DIN8F connector through the locknut, metal washer, shoe, painted washer and pole. Put the pole on the painted washer and tighten it in place with the locknut.



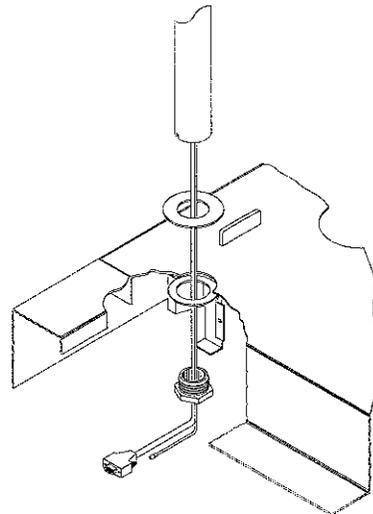
• MMF CASH DRAWER

Loosen the U-clamp nuts on the pole mounting bracket in the POS platform system. Thread the DIN8F connector through the POS platform, eccentric washer and pole. Seat the pole in the bracket to full depth and tighten the U-clamp nuts to secure the assembly in place.



• MS CASH DRAWER

Remove the clamp assembly from the mounting bracket on the underside of the POS deck. Thread the DIN8F connector through conduit nipple, small washer, POS deck, painted washer and pole, pulling out some slack. Slide the small washer under the edges of the spotwelded bracket at the underside surface of the POS deck. Hold the nipple in place through the washer and tighten the pole onto the nipple, over the painted washer, to secure the pole in place.



OPERATION

Numeric Order Control Codes:

6 selectable modes can be selected by pushing through the switch on the 37232-12 cable with DSR not active.

They are:

- mode 1: IEX (default)
- mode 2: Emulate EMAX AN101 (9600 Baud)
- mode 3: Emulate Logic Control PD3000 / Ultimate PD220XI (9600 Baud)
- mode 4: Emulate Logic Control PD3000 / Ultimate PD220XI (4800 Baud)
- mode 5: Emulate AEDEX PSD220G 9600 Baud (stand alone)
- mode 6: Emulate Epson DM-101/102 9600 Baud no pass thru

NOTE: CARE SHOULD BE TAKEN NOT TO SEND UNDEFINED CONTROL OR COMMAND CODES TO THE POS DISPLAY AS THIS MAY CAUSE A MALFUNCTION OF THE MODULE.

01h READ THE CHARACTER CAPACITY OF THE DISPLAY (Display responds sending 28h)

02h DISPLAY SOFTWARE CHECKSUM AND SOFTWARE NUMBER

03h READ CURSOR LOCATION VALUE (display responds with one byte)

01-14(h) for line1, 21-34(h) for line2

04h READ DATA AT CURRENT CURSOR LOCATION

06h BEGIN BLINK FIELD AT CURRENT CURSOR LOCATION

07h END BLINK FIELD AT CURRENT CURSOR LOCATION

08h BACKSPACE CURSOR LOCATION ONE POSITION (except at HOME position)

09h ADVANCE CURSOR LOCATION ONE POSITION (cursor wraps to HOME from bottom right position)

0Ah LINE FEED (vertical scroll from bottom line: cursor position does not change)

0Ch CLEAR THE DISPLAY (cursor does not move)

0Dh CARRIAGE RETURN (returns cursor to left-most position on the same line)

0Eh MAKE CURSOR INDICATOR (FLASHING BLOCK) INVISIBLE (cursor location counter continues to function)

0Fh + MAKE CURSOR INDICATOR (FLASHING BLOCK) VISIBLE

<10h> BOTTOM LINE DATA ENTRY WITH AUTOMATIC CARRIAGE RETURN AND LINE FEED (moves cursor to left-most position on bottom line, when line is filled a vertical scroll occurs and the cursor is moved back to the left-most position on the bottom line)

<11h> + NORMAL DATA ENTRY WITH AUTOMATIC CARRIAGE RETURN AND LINE FEED (data enters from current cursor position, when bottom line is filled a vertical scroll occurs and the cursor is re-positioned to the left-most position on the bottom line)

<12h> OVERWRITE OF RIGHT-MOST CHARACTER ON THE CURRENT LINE (automatic Carriage Return is set to OFF)

<13h> HORIZONTAL SCROLL MODE (characters move from right to left on bottom line only, after line has been filled)

14h RESET (sets display to DEFAULT configurations and clears User Defined Character locations)

15h + DISPLAY CLEAR (moves cursor to left-most position on bottom line in Mode 10h. and HOME in Modes 11h, 12h, 13h and 14h)

16h + CURSOR HOME (returns cursor to upper left most position)

19h SET BIT SEVEN HIGH FOR NEXT BYTE ONLY

<1Ah> WRAP AROUND DATA ENTRY (after the bottom right character is entered the cursor is moved to the HOME position)

+ Display automatically defaults to these conditions after Power-up or RESET.

< > These instructions are mutually exclusive.

1Bh INITIATES FOLLOWING SEQUENCES:

1B-05-49 IEE SPECIFIC RESPONSE CODE (the message is sent to the host without regard for flow control):

1B-26-01-M-N DOWNLOAD USER DEFINED CHARACTERS

M=Byte location to begin download (FB-FF)

N=Number of characters to be downloaded

Each character pattern is defined by 5 data bytes

1B-3D-N N=01 The display is not selected. All data from the host is not processed in the display

+ N=02 The display is selected All data from the host is processed in the display

1B-3F-N DELETE DOWNLOADED CHARACTER LOCATION N N=FB-FF

1B-40 TERMINATE SELF TEST (sets display to DEFAULT configurations and clears all USER DEFINED CHARACTER locations)

1B-74-N SELECT CHARACTER SET

- + N=01, ASCII and General European
- N=02, ASCII and Katakana
- N=03, ASCII and Cyrillic
- N=04, ASCII and Hebrew
- N=05, ASCII and ISO 8859-1
- N=06, ASCII and ISO 8859-2

N=07, ASCII and Greek

1D-05(h) EPSON SPECIFIC RESPONSE CODE (display sends 05 to host)

1Fh INITIATES FOLLOWING SEQUENCES:

1F-24-C-I MOVE CURSOR TO C Column 01-14(h) I, Line 01,02(h)

1F-40 EXECUTE SELF TEST (use 1B-40 to terminate self test)

1F-45-T SET ALL DISPLAY BLINK FIELDS TO AN INTRVAL= I X 50msec, range of I=00h(OFF)-3Fh. duty cycle=50%

1F-58-N SET BRIGHTNESS LEVEL, N=% of max brightness: + N=04(100%) N=03(60%), N=02(40%)

N=01(20%)

1F-72-N SELECT NORMAL/REVERSE DISPLAY MODE + N=00 (Normal) N=01 (Reverse)

User Defined Character Loading:

A maximum of eight characters may be created temporarily (until power-off or reset) by a user-defined downloaded character pattern. To do so, enter the following sequence of commands and data:

BYTE	DESCRIPTION	CHARACTER DOT DATA								CHARACTER MATRIX					
		BYTE #	7	6	5	4	3	2	1	0	1	2	3	4	5
1-3	Start load 1B-26-01 (HEX)	6	29	20	11	2	28	19	10	1	6	7	8	9	10
4	Location to begin download F8-FF	7	31	22	13	4	30	21	12	3	11	12	13	14	15
(HEX)		8	33	24	15	6	32	23	14	5	16	17	18	19	20
5	Number of characters to download	9	35	26	17	8	34	25	16	7	21	22	23	24	25
(01-08)		10	0	0	0	0	0	27	18	9	26	27	28	29	30
6-10	*Character dot data										31	32	33	34	35

* Repeat bytes 6-10 for number of characters to be downloaded

Example: To download a Greek letter Psi into character location F8

1Bh	BYTE 1. start load	○ ● ● ● ○
26h	BYTE 2. start load	○ ○ ● ○ ○
01h	BYTE 3. start load	● ○ ● ○ ●
F8h	BYTE 4. location to begin download	● ○ ● ○ ●
01h	BYTE 5. download 1 character	○ ● ● ● ○
78h	BYTE 6. dots 20 11. 2, 28 ON	○ ○ ● ○ ○
71h	BYTE 7. dots 22, 13, 4, 3, ON	○ ● ● ● ○
Ech	BYTE 8. dots 33. 24. 15, 32. 23 ON	
1Ah	BYTE 9. dots 8, 34. 16 ON	
02h	BYTE 10. dot 18 ON	

CHARACTER FONTS

The **ASCII CHARACTER SET** is located in standard ASCII locations from 20 (HEX) to 7F (HEX)
 The alternate character set is loaded into ASCII locations from 80 (HEX) to F7 (HEX).

ASCII CHARACTER SET - always available from non-volatile memory

EUROPEAN CHARACTER SET (Default setting) - loaded into RAM* at Power-up or Reset, can be re-loaded with command sequence 1B-74-01 (HEX)

KATAKANA CHARACTER SET - can be loaded into RAM* with command sequence 1B-74-02 (HEX)

CYRILLIC CHARACTER SET - can be loaded into RAM* with command sequence 1B-74-03 (HEX)

HEBREW CHARACTER SET - can be loaded into RAM* with command sequence 1B-74-04 (HEX)

ISO 8859-1 CHARACTER SET - can be loaded into RAM* with command sequence 1B-74-05 (HEX)

ISO 8859-2 CHARACTER SET - can be loaded into RAM* with command sequence 1B-74-06 (HEX)

GREEK CHARACTER SET - can be loaded into RAM* with command sequence 1B-74-07 (HEX)

* Pre-designated alterable character set location

N/A															
00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
N/A															
10	11	12	13	14	15	16	17	18	19	1A	1B	1C	1D	1E	1F
20	21	22	23	24	25	26	27	28	29	2A	2B	2C	2D	2E	2F
30	31	32	33	34	35	36	37	38	39	3A	3B	3C	3D	3E	3F
40	41	42	43	44	45	46	47	48	49	4A	4B	4C	4D	4E	4F
50	51	52	53	54	55	56	57	58	59	5A	5B	5C	5D	5E	5F
60	61	62	63	64	65	66	67	68	69	6A	6B	6C	6D	6E	6F
70	71	72	73	74	75	76	77	78	79	7A	7B	7C	7D	7E	7F

STANDARD ASCII CHARACTER SET

80	81	82	83	84	85	86	87	88	89	8A	8B	8C	8D	8E	8F
90	91	92	93	94	95	96	97	98	99	9A	9B	9C	9D	9E	9F
A0	A1	A2	A3	A4	A5	A6	A7	A8	A9	AA	AB	AC	AD	AE	AF
B0	B1	B2	B3	B4	B5	B6	B7	B8	B9	BA	BB	BC	BD	BE	BF
C0	C1	C2	C3	C4	C5	C6	C7	C8	C9	CA	CB	CC	CD	CE	CF
D0	D1	D2	D3	D4	D5	D6	D7	D8	D9	DA	DB	DC	DD	DE	DF
E0	E1	E2	E3	E4	E5	E6	E7	E8	E9	EA	EB	EC	ED	EE	EF
F0	F1	F2	F3	F4	F5	F6	F7	F8	F9	FA	FB	FC	FD	FE	FF

GENERAL EUROPEAN CHARACTER SET
(Default Setting)

80	81	82	83	84	85	86	87	88	89	8A	8B	8C	8D	8E	8F
90	91	92	93	94	95	96	97	98	99	9A	9B	9C	9D	9E	9F
A0	A1	A2	A3	A4	A5	A6	A7	A8	A9	AA	AB	AC	AD	AE	AF
B0	B1	B2	B3	B4	B5	B6	B7	B8	B9	BA	BB	BC	BD	BE	BF
C0	C1	C2	C3	C4	C5	C6	C7	C8	C9	CA	CB	CC	CD	CE	CF
D0	D1	D2	D3	D4	D5	D6	D7	D8	D9	DA	DB	DC	DD	DE	DF
E0	E1	E2	E3	E4	E5	E6	E7	E8	E9	EA	EB	EC	ED	EE	EF
F0	F1	F2	F3	F4	F5	F6	F7	F8	F9	FA	FB	FC	FD	FE	FF

KATAKANA CHARACTER SET

80	81	82	83	84	85	86	87	88	89	8A	8B	8C	8D	8E	8F
90	91	92	93	94	95	96	97	98	99	9A	9B	9C	9D	9E	9F
A0	A1	A2	A3	A4	A5	A6	A7	A8	A9	AA	AB	AC	AD	AE	AF
B0	B1	B2	B3	B4	B5	B6	B7	B8	B9	BA	BB	BC	BD	BE	BF
C0	C1	C2	C3	C4	C5	C6	C7	C8	C9	CA	CB	CC	CD	CE	CF
D0	D1	D2	D3	D4	D5	D6	D7	D8	D9	DA	DB	DC	DD	DE	DF
E0	E1	E2	E3	E4	E5	E6	E7	E8	E9	EA	EB	EC	ED	EE	EF
F0	F1	F2	F3	F4	F5	F6	F7	F8	F9	FA	FB	FC	FD	FE	FF

CYRILLIC CHARACTER SET

CHARACTER FONTS

#	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z		
80	81	82	83	84	85	86	87	88	89	8A	8B	8C	8D	8E	8F																							
90	91	92	93	94	95	96	97	98	99	9A	9B	9C	9D	9E	9F																							
A0	A1	A2	A3	A4	A5	A6	A7	A8	A9	AA	AB	AC	AD	AE	AF																							
B0	B1	B2	B3	B4	B5	B6	B7	B8	B9	BA	BB	BC	BD	BE	BF																							
N/A																																						
C0	C1	C2	C3	C4	C5	C6	C7	C8	C9	CA	CB	CC	CD	CE	CF																							
N/A																																						
D0	D1	D2	D3	D4	D5	D6	D7	D8	D9	DA	DB	DC	DD	DE	DF																							
E0	E1	E2	E3	E4	E5	E6	E7	E8	E9	EA	EB	EC	ED	EE	EF																							
F0	F1	F2	F3	F4	F5	F6	F7	F8	F9	FA	FB	FC	FD	FE	FF																							

HEBREW CHARACTER SET

#	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z		
80	81	82	83	84	85	86	87	88	89	8A	8B	8C	8D	8E	8F																							
90	91	92	93	94	95	96	97	98	99	9A	9B	9C	9D	9E	9F																							
A0	A1	A2	A3	A4	A5	A6	A7	A8	A9	AA	AB	AC	AD	AE	AF																							
B0	B1	B2	B3	B4	B5	B6	B7	B8	B9	BA	BB	BC	BD	BE	BF																							
C0	C1	C2	C3	C4	C5	C6	C7	C8	C9	CA	CB	CC	CD	CE	CF																							
D0	D1	D2	D3	D4	D5	D6	D7	D8	D9	DA	DB	DC	DD	DE	DF																							
E0	E1	E2	E3	E4	E5	E6	E7	E8	E9	EA	EB	EC	ED	EE	EF																							
F0	F1	F2	F3	F4	F5	F6	F7	F8	F9	FA	FB	FC	FD	FE	FF																							

ISO 8859-1 CHARACTER SET

#	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z		
80	81	82	83	84	85	86	87	88	89	8A	8B	8C	8D	8E	8F																							
90	91	92	93	94	95	96	97	98	99	9A	9B	9C	9D	9E	9F																							
A0	A1	A2	A3	A4	A5	A6	A7	A8	A9	AA	AB	AC	AD	AE	AF																							
B0	B1	B2	B3	B4	B5	B6	B7	B8	B9	BA	BB	BC	BD	BE	BF																							
C0	C1	C2	C3	C4	C5	C6	C7	C8	C9	CA	CB	CC	CD	CE	CF																							
D0	D1	D2	D3	D4	D5	D6	D7	D8	D9	DA	DB	DC	DD	DE	DF																							
E0	E1	E2	E3	E4	E5	E6	E7	E8	E9	EA	EB	EC	ED	EE	EF																							
F0	F1	F2	F3	F4	F5	F6	F7	F8	F9	FA	FB	FC	FD	FE	FF																							

ISO 8859-2 CHARACTER SET

#	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z			
80	81	82	83	84	85	86	87	88	89	8A	8B	8C	8D	8E	8F																								
90	91	92	93	94	95	96	97	98	99	9A	9B	9C	9D	9E	9F																								
A0	A1	A2	A3	A4	A5	A6	A7	A8	A9	AA	AB	AC	AD	AE	AF																								
B0	B1	B2	B3	B4	B5	B6	B7	B8	B9	BA	BB	BC	BD	BE	BF																								
C0	C1	C2	C3	C4	C5	C6	C7	C8	C9	CA	CB	CC	CD	CE	CF																								
D0	D1	D2	D3	D4	D5	D6	D7	D8	D9	DA	DB	DC	DD	DE	DF																								
E0	E1	E2	E3	E4	E5	E6	E7	E8	E9	EA	EB	EC	ED	EE	EF																								
F0	F1	F2	F3	F4	F5	F6	F7	F8	F9	FA	FB	FC	FD	FE	FF																								

GREEK CHARACTER SET

KIT NUMBERING SCHEME

PDK-[229U]- X₁ X₂ X₃ X₄ X₅ X₆

POLE POSITION

- 0 = CENTER/NO OPTION
- C = CENTER
- L = LEFT SIDE
- R = RIGHT SIDE

HOUSING COLOR

- W = WHITE (IEE IVORY GRAY)
- B = JET BLACK

FILTER COLOR

- A = AMBER
- B = BLUE
- G = GREEN
- N = NEUTRAL GRAY
(DISPLAY APPEARS AQUA)

POLE LENGTH

- 0 = NOT PROVIDED
- B = MINIMUM LENGTH (2 IN.)
- S = SHORT (8 IN.)
- D = MEDIUM SHORT (10 IN.)
- M = MEDIUM (12 IN.)
- L = LONG (18 IN.)
- X = EXTRA LONG (22 IN.)

MOUNTING KIT

- 0 = NOT SUPPLIED
- 1 = MNTG KIT, UNIVERSAL
- 2 = MNTG KIT, HARD
- 3 = MNTG KIT, SHEET METAL
- 4 = BASE KIT, PASS THRU
- 5 = BASE KIT, HEAVY METAL
- 6 = SURFACE MOUNT KIT
- A = MNTG KIT, APG BRACKET
- I = MNTG KIT, ICD POLE
- C = MNTG KIT, MS CASH

POWER SUPPLY

- 0 = NOT SUPPLIED
- 1 = 115VAC-24VDC/US-COAX
- 2 = 230VAC-24VDC/CE-COAX

NOTE: THE SUB-SET PDK -[229U] -X₁X₂X₃ DEFINES THE DISPLAY ASSEMBLY IN THIS PDK KIT

Emulate EMAX AN101 Mode (AEDEX COMMAND MODE AND DUMB TERMINAL MODE) Continued

0A	LINE FEED (clears the display and cursor position does not change in DUMB TERMINAL MODE; ignore in AEDEX MODE)
0D	CARRIAGE RETURN AND SELECT DUMB TERMINAL MODE (return cursor to home position in DUMB TERMINAL; display clear and cursor home position in AEDEX MODE)
04	Read display data (the display will send 40 on screen characters to the HOST)
!#1xxx xxxCR	* Select AEDEX mode and display a message "xxx .xxx" up to 20 characters on the top line. If the message has less than 20 characters spaces will be added automatically to make the total number of characters in the message equal to 20. If the message has more than 20 characters, then the message will be displayed in DUMB TERMINAL mode
!#2xxx xxxCR	* Select AEDEX mode and display a message "xxx .xxx" up to 20 characters on the bottom line. If the message has less than 20 characters, spaces will be added automatically to make the total number of characters in the message equal to 20. If the message has more than 20 characters then the message will be displayed in DUMB TERMINAL mode
!#4xxx xxxCR	* Select AEDEX mode and a message "xxx .xxx" up to 45 characters will be scrolled continuously on the top line. If the message has less than 45 characters, spaces will not be added to make the total number of characters equal to 45. If the message has less than 20 characters, only the message will be scrolling and the rest of the character positions will remain blank. If the message has more than 45 characters then the message will be displayed in DUMB TERMINAL mode
!#5hh:mmCR	* Select AEDEX mode and enable the display of the internal clock data and the changing of the internal clock contents. 'hh:mm' is the optional parameter. If it is included in the command, then the original clock data will be replaced by the new data hh:mm and will be displayed on the rightmost 5 character positions of the bottom line. If it is not include, then the original internal clock data will remain unchanged and it will be displayed on the rightmost 5 character position of the bottom line. A valid value of "hh" is from 00 to 23 and "mm" is from 00 to 59. If "hh:mm" is not a valid value (for example, 25:00 or 03:62), then invalid data will be ignored. The original internal clock data will remain unchanged and will be displayed. If the "hh:mm" is not in a correct format (for example, 1:19 05:9, or 11:33 then the original internal clock will remain unchanged and the display will ignore this command
!#6xxx .xxxCR	* Select AEDEX mode and a message "xxx .xxx" up to 45 characters will be scrolled once on the top line. If the message has less than 45 characters, spaces will not be added to make a total number of characters equals 45. If the message has less than 20 characters, only the message will be scrolled once and the rest of the characters positions will remain blank. If the message has more than 45 characters, then the message will be displayed in DUMB TERMINAL mode.
!#7CR	* Same as command 0D
!#8hex1hex2CR	* Select AEDEX mode and change the multi-byte code from !# to two other characters. Do this by sending down an !#8 followed by two hex characters. The display will substitute the two hex characters for !#, in all subsequent command strings. To set the attention code back to default, that is !#, is to send down the new attention code and the number 8 followed by '!#'
!#9xxx .xxxCR	* Select AEDEX mode and a message "xxx .xxx" up to 40 characters to be sent to the display in one lone string, The first 20 characters will be displayed on the top line and the next 20 characters will display on the second line. If the message is less than 40 characters, spaces will be added automatically to make the total number of characters in the message equals to 40. If the message is more than 40 characters, then the message will be displayed in DUMB TERMINAL mode

Emulate EMAX AN101 Mode (AEDEX COMMAND MODE AND DUMB TERMINAL MODE) Continued

N/A															
00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
N/A															
10	11	12	13	14	15	16	17	18	19	1A	1B	1C	1D	1E	1F
20	21	22	23	24	25	26	27	28	29	2A	2B	2C	2D	2E	2F
30	31	32	33	34	35	36	37	38	39	3A	3B	3C	3D	3E	3F
40	41	42	43	44	45	46	47	48	49	4A	4B	4C	4D	4E	4F
50	51	52	53	54	55	56	57	58	59	5A	5B	5C	5D	5E	5F
60	61	62	63	64	65	66	67	68	69	6A	6B	6C	6D	6E	6F
70	71	72	73	74	75	76	77	78	79	7A	7B	7C	7D	7E	7F

FIGURE 1 - ASCII CHARACTER SET

**Emulate EMAX AN101 Mode (AEDEX COMMAND MODE AND DUMB
 TERMINAL MODE) Continued**

80	81	82	83	84	85	86	87	88	89	8A	8B	8C	8D	8E	8F
90	91	92	93	94	95	96	97	98	99	9A	9B	9C	9D	9E	9F
AD	A1	A2	A3	A4	A5	A6	A7	A8	A9	AA	AB	AC	AD	AE	AF
B0	B1	B2	B3	B4	B5	B6	B7	B8	B9	BA	BB	BC	BD	BE	BF
C0	C1	C2	C3	C4	C5	C6	C7	C8	C9	CA	CB	CC	CD	CE	CF
D0	D1	D2	D3	D4	D5	D6	D7	D8	D9	DA	DB	DC	DD	DE	DF
E0	E1	E2	E3	E4	E5	E6	E7	E8	E9	EA	EB	EC	ED	EE	EF
F0	F1	F2	F3	F4	F5	F6	F7	F8	F9	FA	FB	FC	FD	FE	FF

FIGURE 2 - AEDEX CHARACTER SET

Note: N/A = Non-Applicable

Emulate Logic Control PD3000 / Ultimate PD220XL

Data is entered serially at 9600 Baud. (4800 Baud for Mode 4 selecting)

DATA (HEX)	DESCRIPTION
02	READ DATA AT PRESENT CURSOR LOCATION
03-X-F-F-F-F-F	DOWNLOAD FONT: X = Standard keyboard F = font bitmap (see 6.3)
04-N	BRIGHTNESS LEVEL: N-LEVEL 20=very dim, 40=dim, 60=bright, FF=maximum brightness
05	SCROLLS A CONTINUOUS MESSAGE OF UP TO 45 CHARACTERS (the message starts at "05" and terminated by "0D")
08	BACKSPACE CURSOR LOCATION ONE POSITION (cursor moves one digit to the left erasing previous character The cursor wraps around whether it is in vertical scroll mode or normal mode)
09	ADVANCE CURSOR LOCATION ONE POSITION (cursor moves one position to the right This function depends on whether it is in the vertical scroll mode or normal mode.)
0A	LINE FEED (During vertical scroll mode, cursor does a vertical scroll from bottom line; cursor position does not change. During normal mode it wraps around)
0D	CARRIAGE RETURN (returns cursor to left-most character position of the same line; does not clear display)
10-P	MOVE CURSOR POSITION 00 to 27 (HEX)
<11>	NORMAL DATA ENTRY MODE (After bottom right character is entered, cursor moves to home position)
<12>	+ VERTICAL SCROLL MODE (data enters beginning at the home position, vertical scroll from bottom line after line has been filled)
<13>	MAKE CURSOR INDICATOR VISIBLE
<14>	+ MAKE CURSOR INDICATOR INVISIBLE (the cursor location counter continues to function but there is no visible indicator of next character location)
1F	RESET (all characters are erased and settings are returned to power-on conditions
+<1F>	Display automatically defaults to these conditions after power-up or reset.
< >	These instructions are mutually exclusive

Emulate Logic Control PD3000 / Ultimate PD220XL Continued

Alternate Character Codes

A maximum of six characters may be created temporarily (until power-off or reset) by a user-defined down-loaded character pattern. To do so, enter the following sequence of commands and data:

BYTE	DESCRIPTION
1	Start load 03 (HEX)
2	Location to begin download (20-FF hex)
3-7	*Character dot data

*Repeat bytes 1-7 for the number of characters to be downloaded.

CHARACTER DOT DATA

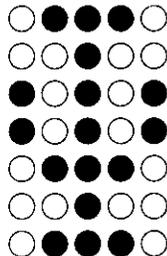
BYTE #	7	6	5	4	3	2	1	0
3	8	7	6	5	4	3	2	1
4	16	15	14	13	12	11	10	9
5	24	23	22	21	20	19	18	17
6	32	31	30	29	28	27	26	25
7	0	0	0	0	0	35	34	33

CHARACTER MATRIX

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20
21	22	23	24	25
26	27	28	29	30
31	32	33	34	35

Example: To download 1 Greek letter Psi for character 20H.

03	BYTE 1, start UDC load
20	BYTE 2, ASCII CODE
8E	BYTE 3, Dot 2, 3, 4, 8 ON
D4	BYTE 4, Dot 11, 13, 15, 16 ON
EA	BYTE 5, Dot 18, 20, 22, 23, 24 ON
88	BYTE 6, Dot 28, 32 ON
03	BYTE 7, Dots 33, 34 ON



Emulate Logic Control PD3000 / Ultimate PD220XContinued

Note: N/A = Non-Applicable



FIGURE 3 – LOGIC CONTROL PD3000/ULTIMATE PD220XL CHARACTER SET

Emulate AEDEX PSD 220G Stand Alone Mode

Data is entered serially at 9600 Baud

Instructions

DATA (HEX)	DESCRIPTION
02	READ DATA AT PRESENT CURSOR LOCATION
08	BACKSPACE CURSOR LOCATION ONE POSITION (cursor moves one digit to the left erasing previous character. The cursor wraps around whether it is in vertical scroll mode or normal mode)
09	ADVANCE CURSOR LOCATION ONE POSITION (cursor moves one position to the right. This function depends on whether it is in the vertical scroll mode or normal mode)
0A	LINE FEED (During vertical scroll mode, cursor does a vertical scroll from bottom line; cursor position does not change. During normal mode it wraps around.)
0D	CARRIAGE RETURN (returns cursor to left-most character position of the same line; does not clear display)
10-P	MOVE CURSOR POSITION 00 to 27 (HEX)
<11>	NORMAL DATA ENTRY MODE (After bottom right character is entered, cursor moves to home position)
<12>	+ VERTICAL SCROLL MODE (data enters beginning at the home position, vertical scroll from bottom line after line has been filled)
<13>	+ MAKE CURSOR INDICATOR VISIBLE
<14>	MAKE CURSOR INDICATOR INVISIBLE (the cursor location counter continues to function but there is no visible indicator of next character location)
1F	RESET (all characters are erased and settings are returned to power-on conditions)

Emulate Epson DM-101/102 No Pass Thru Mode

Data is entered serially at 9600 Baud

DATA (HEX)		DESCRIPTION
08	*	BACKSPACE CURSOR LOCATION ONE POSITION
		Wrap Around Mode When the cursor is at the top-left location, it is moved to the bottom right
		Vertical Scroll Mode When the cursor is at the top-left location, the characters on the top line are scrolled to the bottom line and the top line is cleared. The cursor is moved to the top-right location.
		Horizontal Scroll Mode When the cursor is at the left end of either line, all characters on that line are scrolled one character to the right. Cursor does not move.
09	*	ADVANCE CURSOR LOCATION ONE POSITION
		Wrap Around Mode When the cursor is at the bottom-right location, it is moved to the top-left
		Vertical Scroll Mode When the cursor is at the bottom-right location, the characters on the bottom line are scrolled to the top line and the bottom line is cleared. The cursor is moved to the bottom-left.
		Horizontal Scroll Mode When the cursor is at the right end of either line, all characters on that line are scrolled one character to the left. Cursor does not move.
0A	*	LINE FEED (cursor moves down one line in the same column)
		The following is true for each display mode when the cursor is on the lower line.
		Wrap Around Mode The cursor is moved to the top line on same column.
		Vertical Scroll Mode The characters on the bottom line are scrolled to the top line and the bottom line is cleared. Cursor does not move.
		Horizontal Scroll Mode Cursor does not move.

Emulate Epson DM-101/102 No Pass Thru Mode Continued

DATA (HEX)		DESCRIPTION
0B	*	CURSOR HOME (cursor moves to the upper left-most position)
0C	*+	DISPLAY CLEAR AND CURSOR HOME (when the cursor is in a defined window, only that window is cleared. Not the entire display.)
0D	*	CARRIAGE RETURN (cursor moves to the left-most position of the current line)
18	*	CLEAR CURSOR LINE AND CARRIAGE RETURN (when the cursor is in a defined window, only the line in window is cleared. Not the entire line)
1B	1B-25-N	SETS OR CANCELS THE USER DEFINED CHARACTER SET (characters already displayed are not affected) +N=00 The user defined character set is canceled. N=01 The user defined character set is selected.
	1B-26-01-M-N-C	DEFINES USER DEFINED CHARACTERS (Up to 4 chars – See 8.3) M=byte location to begin download (20 to 7E) N=byte location of final download (M to M+3) C=the number of dot columns (01 to 05) (When C<5, remaining column dots are padded with spaces.)
	1B-3D-N	SELECT PERIPHERAL DEVICE N=01 The printer is selected only, all the data from the host is not processed in the display. +N=02 The display is selected only, all the data from the host is processed in the display. N=03 The printer and display are both selected, all the data from the host is processed in the display
	1B-3F-N	DELETE USER DEFINED CHARACTER LOCATION N (N=20 to 7E)
	1B-40	RESET DISPLAY (sets all configuration to default setting, clears all user defined characters, clears display and sets cursor home)

Emulate Epson DM-101/102 No Pass Thru Mode Continued:

DATA (HEX)	DESCRIPTION
1B-52-N	SELECT ALTERNATE CHARACTER SET (See Fig 19) + N=00 : USA N=01 : France N=02 : Germany N=03 : U.K. N=04 : Denmark I N=05 : Sweden N=06 : Italy N=07 : Spain N=08 : Japan N=09 : Norway N=0A : Denmark II
1B-57-M-N-X1-Y1-X2-Y2	DEFINE OR CANCEL THE WINDOW RANGE. (up to 4 windows can be set and can not overlap each other) M = WINDOW NUMBER TO BE SET OR CANCELED (01 to 04) N = 01 select window, (X1-Y1-X2-Y2 input are required.) N = 00 cancel window, (X1-Y1-X2-Y2 input are not required.) X1 = the upper left column of the window (01 to 14h) Y1 = the upper left line of the window (01 to 02) X2 = the lower right column of the window (01 to 14h) Y2 = the lower right line of the window (01 to 02)
1B-74-N	SELECT CHARACTER PAGE N + N = 00, PAGE 0 CHARACTER SET N = 01, PAGE 1 CHARACTER SET N = 02, PAGE 2 CHARACTER SET N = 03, PAGE 3 CHARACTER SET N = 04, PAGE 4 CHARACTER SET N = 05, PAGE 5 CHARACTER SET
1F	
* 1F-01	+ WRAP AROUND MODE (After bottom-right character is entered, cursor moves to top-left location)
* 1F-02	VERTICAL SCROLL MODE (After bottom-right character is entered, bottom line is scrolled to the top line and bottom line is cleared. Cursor is moved to bottom left location)
* 1F-03	HORIZONTAL SCROLL MODE (After a character is entered at the right end of either line, all characters on that line are scrolled one character to the left. Cursor does not move.)

Emulate Epson DM-101/102 No Pass Thru Mode Continued

DATA (HEX)	DESCRIPTION
* 1F-0A	MOVE CURSOR UP (cursor moves up one line in the same column) The following is true for each display mode when the cursor is on the upper line Wrap Around Mode: The cursor is moved to the same column on the bottom line Vertical Scroll Mode: The characters on the top line are scrolled to the bottom line and the top line is cleared. Cursor does not move Horizontal Scroll Mode: Cursor does not move.
* 1F-0D	MOVE CURSOR TO THE END OF CURRENT LINE
1F-24-C-L	CURSOR POSITION C=Column (01 to 14h) L=Line (01 to 02)
1F-3A	SET BEGINNING OR ENDING OF MACRO DEFINITION. Up to 80 bytes can be defined in MACRO message Format: 1F-3A-M-1F-3A (M=control code or character data) To delete a MACRO definition, send 1F-3A-1F-3A
1F-40	EXECUTE SELF TEST A series of self-test messages are displayed. All set values are initialized except: 1 USER DEFINED CHARACTER 2 MACRO MESSAGE 3 TIMER VALUE

After self-test, the display is cleared and cursor home

Emulate Epson DM-101/102 No Pass Thru Mode Continued

DATA (HEX)	DESCRIPTION
* 1F-42	MOVE CURSOR TO BOTTOM RIGHT LOCATION
1F-43-00	CURSOR OFF
1F-43-01	CURSOR ON, FLASHING BLOCK
1F-45-T	SET BLINK DISPLAY SCREEN AT INTERVAL T T x 50 msec, 50% DUTY CYCLE T _{max} = FEh T=00, the display is kept on. (cursor remains blinking at interval T) T=FF, the display is turned off but the contents of the screen are maintained.
1F-54-H-M	SET AND DISPLAY TIMER. The display is cleared, cursor home and the time is displayed in 24-hour mode at the bottom-right location. The display timer clears if the cursor of character moves to the bottom line. However, the internal timer continues to be updated. H=hours (0 to 17h) M=minutes (0 to 3Bh)
1F-55	DISPLAY TIMER The display is cleared, cursor home and the timer is displayed at the bottom-right location. If the time has already been set using 1F-54-H-M command, the elapsed time is displayed in real time in the format (hours: minutes: seconds). If the time has not yet been set, the elapsed time from when the display was initialized is displayed in real time in the format (hours minutes: seconds)
1F-58-N	BRIGHTNESS LEVEL; N = LEVEL 01=20%, 02=40%, 03=60%, 04=100% (+)
1F-5E-M-N	EXECUTE AND REPEAT MACRO M=00 The time interval for displaying characters at CPU processing speed. M=01-FFh The time interval for displaying characters (M x 20 msec) N=00-FFh The time interval for start over MACRO message (N x 5 msec) The MACRO processing is terminated by receiving data from the host
1F-72-N	SELECT/CANCEL REVERSE DISPLAY MODE N=01 REVERSE; N=00 CANCEL (+) STATUS CONFIRMATION BY DTR SIGNAL

Emulate Epson DM-101/102 No Pass Thru Mode Continued

DATA (HEX)	DESCRIPTION	
1F-76-N	N=00	SET DTR from display to SPACE state (display is not busy) under following conditions: 1. The display receive buffer is not full. 2. Self-test is not processing.
	N=01	SET DTR from display to MARK state (display is busy)

- + Display automatically defaults to these conditions after power-up or reset
- * When the cursor is in a defined window, it is moved only within the window.

Emulate Epson DM-101/102 No Pass Thru Mode Continued

A maximum of four characters may be created temporarily (until power-off or reset) by a user-defined down-loaded character pattern. To do so, enter the following sequence of commands and data:

<u>BYTE</u>	<u>DESCRIPTION</u>
1-3	Start load 1B-26-01 (HEX)
4	Location to begin download (20-7E hex)
5	Location to end download
6	Number of dot columns (0 to 5)

*Repeat bytes 6-10 for the number of characters to be downloaded

CHARACTER DOT DATA

BYTE #	7	6	5	4	3	2	1	0
7	0	1	6	11	16	21	26	31
8	0	2	7	12	17	22	27	32
9	0	3	8	13	18	23	28	33
10	0	4	9	14	19	24	29	34
11	0	5	10	15	20	25	30	35

Example: To download 1 Greek letter Psi for character 2E

CHARACTER MATRIX

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20
21	22	23	24	25
26	27	28	29	30
31	32	33	34	35

Example: To download 1 Greek letter Psi for character 2E

1Bh	BYTE 1, start load
26h	BYTE 2, start load
01h	BYTE 3, start load
2Eh	BYTE 4, location to begin download
2Eh	BYTE 5, location to end download
05h	BYTE 6, number of dot columns
18h	BYTE 7, Dots 11, 16 ON
45h	BYTE 8, Dots 2, 22, 32 ON
7Fh	BYTE 9, Dots 3, 8, 13, 18, 23, 28, 33 ON
45h	BYTE 10, Dots 4, 24, 34 ON
18h	BYTE 11, Dots 15, 20 ON

Emulate Epson DM-101/102 No Pass Thru Mode Continued

00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
10	11	12	13	14	15	16	17	18	19	1A	1B	1C	1D	1E	1F
20	21	22	23	24	25	26	27	28	29	2A	2B	2C	2D	2E	2F
30	31	32	33	34	35	36	37	38	39	3A	3B	3C	3D	3E	3F
40	41	42	43	44	45	46	47	48	49	4A	4B	4C	4D	4E	4F
50	51	52	53	54	55	56	57	58	59	5A	5B	5C	5D	5E	5F
60	61	62	63	64	65	66	67	68	69	6A	6B	6C	6D	6E	6F
70	71	72	73	74	75	76	77	78	79	7A	7B	7C	7D	7E	7F
80	81	82	83	84	85	86	87	88	89	8A	8B	8C	8D	8E	8F
90	91	92	93	94	95	96	97	98	99	9A	9B	9C	9D	9E	9F
A0	A1	A2	A3	A4	A5	A6	A7	A8	A9	AA	AB	AC	AD	AE	AF
B0	B1	B2	B3	B4	B5	B6	B7	B8	B9	BA	BB	BC	BD	BE	BF
C0	C1	C2	C3	C4	C5	C6	C7	C8	C9	CA	CB	CC	CD	CE	CF
D0	D1	D2	D3	D4	D5	D6	D7	D8	D9	DA	DB	DC	DD	DE	DF
E0	E1	E2	E3	E4	E5	E6	E7	E8	E9	EA	EB	EC	ED	EE	EF
F0	F1	F2	F3	F4	F5	F6	F7	F8	F9	FA	FB	FC	FD	FE	FF

FIGURE 5 - PAGE 0 CHARACTER SET

Emulate Epson DM-202 II No Pass Thru Mode Continued

00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
10	11	12	13	14	15	16	17	18	19	1A	1B	1C	1D	1E	1F
20	21	22	23	24	25	26	27	28	29	2A	2B	2C	2D	2E	2F
30	31	32	33	34	35	36	37	38	39	3A	3B	3C	3D	3E	3F
40	41	42	43	44	45	46	47	48	49	4A	4B	4C	4D	4E	4F
50	51	52	53	54	55	56	57	58	59	5A	5B	5C	5D	5E	5F
60	61	62	63	64	65	66	67	68	69	6A	6B	6C	6D	6E	6F
70	71	72	73	74	75	76	77	78	79	7A	7B	7C	7D	7E	7F
80	81	82	83	84	85	86	87	88	89	8A	8B	8C	8D	8E	8F
90	91	92	93	94	95	96	97	98	99	9A	9B	9C	9D	9E	9F
A0	A1	A2	A3	A4	A5	A6	A7	A8	A9	AA	AB	AC	AD	AE	AF
B0	B1	B2	B3	B4	B5	B6	B7	B8	B9	BA	BB	BC	BD	BE	BF
C0	C1	C2	C3	C4	C5	C6	C7	C8	C9	CA	CB	CC	CD	CE	CF
D0	D1	D2	D3	D4	D5	D6	D7	D8	D9	DA	DB	DC	DD	DE	DF
E0	E1	E2	E3	E4	E5	E6	E7	E8	E9	EA	EB	EC	ED	EE	EF
F0	F1	F2	F3	F4	F5	F6	F7	F8	F9	FA	FB	FC	FD	FE	FF

FIGURE 6 - PAGE 1 CHARACTER SET

Emulate Epson DM-202 II No Pass Thru Mode Continued

00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
10	11	12	13	14	15	16	17	18	19	1A	1B	1C	1D	1E	1F
20	21	22	23	24	25	26	27	28	29	2A	2B	2C	2D	2E	2F
30	31	32	33	34	35	36	37	38	39	3A	3B	3C	3D	3E	3F
40	41	42	43	44	45	46	47	48	49	4A	4B	4C	4D	4E	4F
50	51	52	53	54	55	56	57	58	59	5A	5B	5C	5D	5E	5F
60	61	62	63	64	65	66	67	68	69	6A	6B	6C	6D	6E	6F
70	71	72	73	74	75	76	77	78	79	7A	7B	7C	7D	7E	7F
80	81	82	83	84	85	86	87	88	89	8A	8B	8C	8D	8E	8F
90	91	92	93	94	95	96	97	98	99	9A	9B	9C	9D	9E	9F
A0	A1	A2	A3	A4	A5	A6	A7	A8	A9	AA	AB	AC	AD	AE	AF
B0	B1	B2	B3	B4	B5	B6	B7	B8	B9	BA	BB	BC	BD	BE	BF
C0	C1	C2	C3	C4	C5	C6	C7	C8	C9	CA	CB	CC	CD	CE	CF
D0	D1	D2	D3	D4	D5	D6	D7	D8	D9	DA	DB	DC	DD	DE	DF
E0	E1	E2	E3	E4	E5	E6	E7	E8	E9	EA	EB	EC	ED	EE	EF
F0	F1	F2	F3	F4	F5	F6	F7	F8	F9	FA	FB	FC	FD	FE	FF

FIGURE 7 - PAGE 2 CHARACTER SET

Emulate Epson DM-202 II No Pass Thru Mode Continued

00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
10	11	12	13	14	15	16	17	18	19	1A	1B	1C	1D	1E	1F
20	21	22	23	24	25	26	27	28	29	2A	2B	2C	2D	2E	2F
30	31	32	33	34	35	36	37	38	39	3A	3B	3C	3D	3E	3F
40	41	42	43	44	45	46	47	48	49	4A	4B	4C	4D	4E	4F
50	51	52	53	54	55	56	57	58	59	5A	5B	5C	5D	5E	5F
60	61	62	63	64	65	66	67	68	69	6A	6B	6C	6D	6E	6F
70	71	72	73	74	75	76	77	78	79	7A	7B	7C	7D	7E	7F
80	81	82	83	84	85	86	87	88	89	8A	8B	8C	8D	8E	8F
90	91	92	93	94	95	96	97	98	99	9A	9B	9C	9D	9E	9F
A0	A1	A2	A3	A4	A5	A6	A7	A8	A9	AA	AB	AC	AD	AE	AF
B0	B1	B2	B3	B4	B5	B6	B7	B8	B9	BA	BB	BC	BD	BE	BF
C0	C1	C2	C3	C4	C5	C6	C7	C8	C9	CA	CB	CC	CD	CE	CF
D0	D1	D2	D3	D4	D5	D6	D7	D8	D9	DA	DB	DC	DD	DE	DF
E0	E1	E2	E3	E4	E5	E6	E7	E8	E9	EA	EB	EC	ED	EE	EF
F0	F1	F2	F3	F4	F5	F6	F7	F8	F9	FA	FB	FC	FD	FE	FF

FIGURE 8 - PAGE 3 CHARACTER SET

Emulate Epson DM-202 II No Pass Thru Mode Continued

00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
10	11	12	13	14	15	16	17	18	19	1A	1B	1C	1D	1E	1F
20	21	22	23	24	25	26	27	28	29	2A	2B	2C	2D	2E	2F
30	31	32	33	34	35	36	37	38	39	3A	3B	3C	3D	3E	3F
40	41	42	43	44	45	46	47	48	49	4A	4B	4C	4D	4E	4F
50	51	52	53	54	55	56	57	58	59	5A	5B	5C	5D	5E	5F
60	61	62	63	64	65	66	67	68	69	6A	6B	6C	6D	6E	6F
70	71	72	73	74	75	76	77	78	79	7A	7B	7C	7D	7E	7F
80	81	82	83	84	85	86	87	88	89	8A	8B	8C	8D	8E	8F
90	91	92	93	94	95	96	97	98	99	9A	9B	9C	9D	9E	9F
A0	A1	A2	A3	A4	A5	A6	A7	A8	A9	AA	AB	AC	AD	AE	AF
B0	B1	B2	B3	B4	B5	B6	B7	B8	B9	BA	BB	BC	BD	BE	BF
C0	C1	C2	C3	C4	C5	C6	C7	C8	C9	CA	CB	CC	CD	CE	CF
D0	D1	D2	D3	D4	D5	D6	D7	D8	D9	DA	DB	DC	DD	DE	DF
E0	E1	E2	E3	E4	E5	E6	E7	E8	E9	EA	EB	EC	ED	EE	EF
F0	F1	F2	F3	F4	F5	F6	F7	F8	F9	FA	FB	FC	FD	FE	FF

FIGURE 9 - PAGE 4 CHARACTER SET

Emulate Epson DM-202 II No Pass Thru Mode Continued

00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
10	11	12	13	14	15	16	17	18	19	1A	1B	1C	1D	1E	1F
20	21	22	23	24	25	26	27	28	29	2A	2B	2C	2D	2E	2F
30	31	32	33	34	35	36	37	38	39	3A	3B	3C	3D	3E	3F
40	41	42	43	44	45	46	47	48	49	4A	4B	4C	4D	4E	4F
50	51	52	53	54	55	56	57	58	59	5A	5B	5C	5D	5E	5F
60	61	62	63	64	65	66	67	68	69	6A	6B	6C	6D	6E	6F
70	71	72	73	74	75	76	77	78	79	7A	7B	7C	7D	7E	7F
80	81	82	83	84	85	86	87	88	89	8A	8B	8C	8D	8E	8F
90	91	92	93	94	95	96	97	98	99	9A	9B	9C	9D	9E	9F
A0	A1	A2	A3	A4	A5	A6	A7	A8	A9	AA	AB	AC	AD	AE	AF
B0	B1	B2	B3	B4	B5	B6	B7	B8	B9	BA	BB	BC	BD	BE	BF
C0	C1	C2	C3	C4	C5	C6	C7	C8	C9	CA	CB	CC	CD	CE	CF
D0	D1	D2	D3	D4	D5	D6	D7	D8	D9	DA	DB	DC	DD	DE	DF
E0	E1	E2	E3	E4	E5	E6	E7	E8	E9	EA	EB	EC	ED	EE	EF
F0	F1	F2	F3	F4	F5	F6	F7	F8	F9	FA	FB	FC	FD	FE	FF

FIGURE 10 - PAGE 5 CHARACTER SET

Emulate Epson DM-202 II No Pass Thru Mode Continued

SELECT CODES (HEX)	CHARACTER SET	23	24	40	5B	5C	5D	5E	60	7B	7C	7D	7E
0	*U S A												
1	France												
2	Germany												
3	U K												
4	Denmark I												
5	Sweden												
6	Italy												
7	Spain 1												
8	Japan												
9	Norway												
A	Denmark II												

* Set by default

FIGURE 11