| APPLICATION | | REVISIONS | | | | |
|---|---|---|---|---|---|---|
| NEXT ASSY | USED ON | REV | DESCRIPTION | | DATE | APPROVED |
| | | A | PRODUCTION RELEASE/SEE E.O. 37182 | | 09−03−02 | M. ENGLEHART |
| | | B | SEE E.O. 37429 | | 11−19−02 | |

<u>MANUAL</u>

SHEET 0 −   THIS SHEET
SHEET 1 −   FEATURES
SHEET 2 −   GENERAL SPECIFICATIONS & ASSEMBLY AND INSTALLATION
SHEET 3 −   EXPLODED ASSY VIEW & PARTS REFERENCE
SHEET 4 −   ASSY INSTRUCTIONS
SHEET 5 −   CASH DRAWER MOUNTING CONFIGURATIONS
SHEET 6 −   OPERATION
SHEET 7 −   CHARACTER FONTS
SHEET 8 −   CHARACTER FONTS
SHEET 9 −   KIT NUMBERING SCHEME

| REV STATUS OF SHEETS | REV | B | A | A | B | A | A | A | A | A | A | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | SHEET | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCE ARE :
FRACTIONS  DECIMALS  ANGLES
±           XX±        ±
            XXX±
DO NOT SCALE DRAWING

CONTRACT NO

TREATMENT

FINISH

| APPROVALS | | DATE |
|---|---|---|
| DRAWN | D. MCCOY | 08−21−02 |
| CHECKED | D. SUMMERS | 8−27−02 |
| ISSUED | M. ENGLEHART | 09−03−02 |

**(IEE)** INDUSTRIAL ELECTRONIC ENGINEERS, INC.
VAN NUYS, CALIFORNIA

TITLE   MANUAL,
PDK−404A−0XXXXX
INSTALLATION & OPERATING INSTRUCTIONS

| SIZE | CAGE CODE | DWG NO. | REV |
|---|---|---|---|
| A | 05464 | PDK−404A−INOPML | B |
| SCALE − | PROJ NO  468 | SHEET 0 OF 9 | |

IEE FILE: ASIZE1.DWG

# PDK-404A-0XXXXX*  VF POS Pole Display Kit
## INSTALLATION and OPERATING INSTRUCTIONS

### Key Features:

- **Vacuum Fluorescent (VF) display - 4 line x 20 character 5mm 5x7 dot matrix - with contrast enhancing filter, EIA-232 interface, detachable DB-9F host interface/power supply cable and 24Vdc wall mount power supply.**
- **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, 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 and 8** provide information on how to operate the display including provisions for self-test, software commands, character fonts and User Defined Character (UDC) loading.
**Page 9** provides the kit numbering scheme that defines the exact contents as referenced by the number on the lid of the shipping box. **PDK-404A-0XX** defines the characteristics of the display head (i e. display type, software functionality, pole position, housing color and filter color) and cannot be revised.

## PRODUCT SUPPORT

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

Industrial Electronic Engineers, Inc.
7740 Lemona Avenue
Van Nuys, California 91409-9234 USA

Phone:   (800) 422-0867 or (818) 787-0311
Fax:       (818) 901-9046
E-mail:   mail@ieeinc.com

# GENERAL SPECIFICATIONS

## Interface:

| | | | | | |
|---|---|---|---|---|---|
| • **Power:** | Supply voltage | 11-29 Vdc | | • **Pin Assignments:** | |
| | Supply current @24 Vdc | 230 ma (max) | | (Host) | DB-9F |
| | Supply risetime | 100 milliseconds (max) | | | |
| • **Caution:** | Supply sequencing | Rapid ON/OFF sequencing | COM | 1 | COM |
| | | is not recommended. | RXD | 2 | TXD |
| | Start cycle | The display is not ready to accept | TXD | 3 | RXD |
| | | data until 1.2 seconds after | DTR | 4 | DSR |
| | | application of power. | SIG GND | 5 | SIG GND |
| | | | DSR | 6 | DTR |
| • **Signal:** | Serial EIA-232 | 9600 baud - 8 bits - no parity | N.A. | 7 | N. C. |
| | Serial input levels | +3V to +15V (space/logic 0) | CTS | 8 | DTR |
| | | -3V to -15V (mark/ logic 1) | N.A. | 9 | N. C. |
| | Data Format | | | | |

```
+V      (LSB)                              (MSB)
     ┌──┬────┬────┬────┬────┬────┬────┬────┬────┐
     │  │ D₀ │ D₁ │ D₂ │ D₃ │ D₄ │ D₅ │ D₈ │ D₇ │
─────┘  └────┴────┴────┴────┴────┴────┴────┴────┘────

-V    START              8 DATA BITS           STOP
      BIT                                       BIT
```
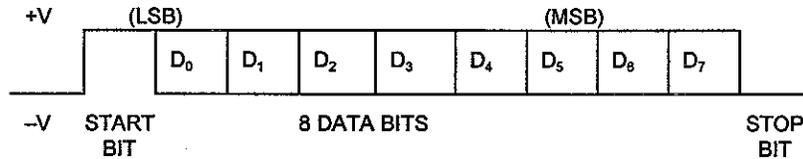
## Environmental:

• **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-404A-XXXXXX
POS POLE DISPLAY DISTRIBUTOR KIT
TYPE 4 POD RS232 INTERFACE

PM300-0415 MODULE ASSEMBLY
37622-XX REAR HOUSING ASSEMBLY
37620-XX BEZEL ASSY

5x7 4x20 5mm
DOT MATRIX

35753-10
RJ45/DIN8M
CABLE ASSY

36629-02
POWER SUPPLY
(CE)

36618-60
DIN8F-DB9F/COAX
CABLE ASSY

35354-XX
POLE ASSY

35299-XX
ESCUTCHEON
RING

35632-XX
PLATE

49012-01
WASHER,
REDUCING

49003-01
1.5" CLOSE
NIPPLE

36633-XX
BRACKET,
ONE-PIECE

36629-01
POWER SUPPLY
(U.S.)

48596-01
3/4" NPT
NIPPLE

36297-XX
WASHER,
REDUCING

49073-01
WASHER,
FLAT

36618-60
DIN8F-DB9F/COAX
CABLE ASSY (CONT'D)

48678-01
NUT LOCKING

35320-XX
SURFACE MOUNT
PLATE

MOUNTING KITS INCLUDE
VARIOUS CONFIGURATIONS OF
PARTS AND ATTACHING
HARDWARE (SEE INSTRUCTIONS)

# 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) 49003-02 CLOSE NIPPLE
  - (1) 49012-01 WASHER, REDUCING
  - (1) 48678-01 LOCKNUT

- **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
- **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

## 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. 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.

ALTERNATE CABLE ENTRIES
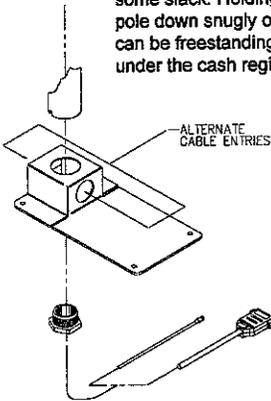
### Surface Mount Plate

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.
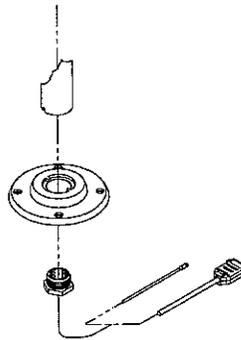
### Base Kit, Heavy Metal

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
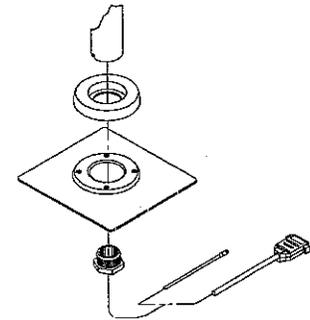
## Display Module and Pole Assembly:

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.

NOTCHES

330° HORIZONTAL ROTATION

Change picture to Type 4.

SET SCREW #4-40

DISPLAY MODULE ASSEMBLY
YOKE BUSHING W/NOTCHES

POLE ASSEMBLY
IEE P/N 35354-X1

4
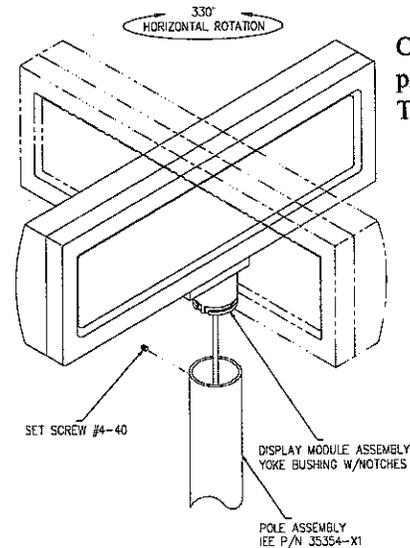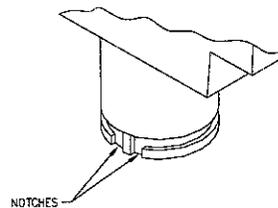
- **APG CASH DRAWER**

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.
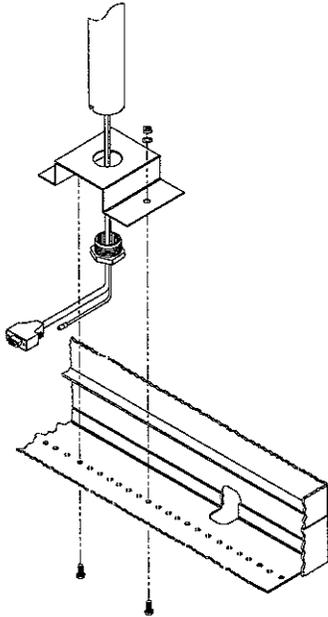
- **INDIANA CASH DRAWER**

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.
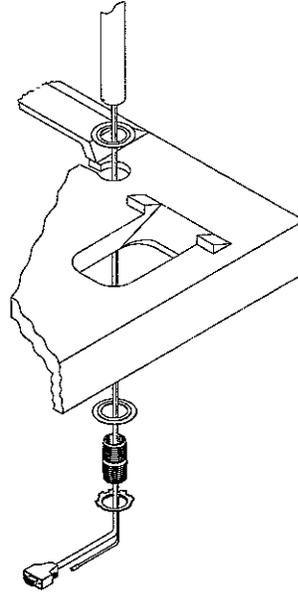
- **MMF CASH DRAWER**

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.
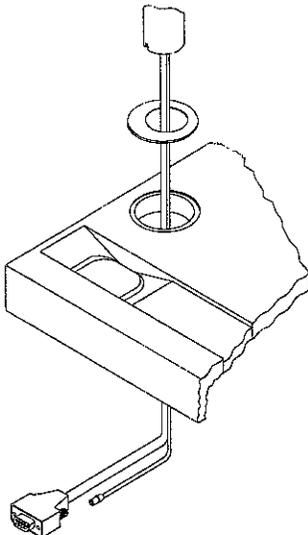
- **MS CASH DRAWER**

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.
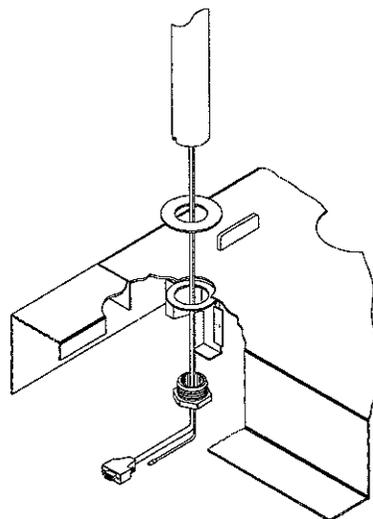
# OPERATION

## Numeric Order Control Codes:

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 50h) |
| 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  41-54(h) for line3,  61-74(h) for line4 |
| 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 1Ah) |
| 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 1B-05-49 | INITIATES FOLLOWING SEQUENCES: IEE SPECIFIC RESPONSE CODE (the following message is sent to the host without regard for flow control): D,2,IEE,36365,-01(CR)  (18 BYTES) |
| 1B-26-01-M-N | DOWNLOAD USER DEFINED CHARACTERS M=Byte location to begin download (F8-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=F8-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 1F-24-C-L | INITIATES FOLLOWING SEQUENCES: MOVE CURSOR TO C  Column 01-14(h) L, Line 01-04(h) |
| 1F-40 | EXECUTE SELF TEST (use 1B-40 to terminate self test) |
| 1F-45-T | SET ALL DISPLAY BLINK FIELDS TO AN INTERVAL=T X 50msec, range of T=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 |
| 1-3 | Start load 1B-26-01 (HEX) |
| 4 | Location to begin download F8-FF (HEX) |
| 5 | Number of characters to download (01-08) |
| 6-10 | ¨Character dot data |

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

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

| | | | | |
|---|---|---|---|---|
| 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 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.



**STANDARD ASCII CHARACTER SET**

**GENERAL EUROPEAN CHARACTER SET**
**(Default Setting)**

**KATAKANA CHARACTER SET**

**CYRILLIC CHARACTER SET**

7

# CHARACTER FONTS

HEBREW CHARACTER SET

ISO 8859-1 CHARACTER SET

ISO 8859-2 CHARACTER SET

GREEK CHARACTER SET

8

# KIT NUMBERING SCHEME

PDK-[404A]- $0_1$ $X_2$ $X_3$ $X_4$ $X_5$ $X_6$

## POLE POSITION
0 = CENTER/NO OPTION

## 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 (6 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 (2.1MM)
2 = 230VAC-24VDC/CE-COAX (2.1MM)

NOTE: THE SUB-SET **PDK -[404A] -$0_1X_2X_3$** DEFINES THE DISPLAY ASSEMBLY IN THIS PDK KIT.