# Zebra® KDU Plus™

## User's Manual

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**Part Number: 980548-001 Rev. A**

## FCC Compliance Statement

This device complies with Part 15 rules. Operation is subject to the following two conditions:

1. **This device may not cause harmful interference, and**
2. **This device must accept any interference received, including interference that may cause undesired operation.**

This equipment has been tested and found to comply with the limits for Class B Digital Devices, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the product manuals, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, the user is encouraged to do one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

The user is cautioned that any changes or modifications not expressly approved by Zebra Technologies could void the user's authority to operate the equipment. To ensure compliance, this printer must be used with fully shielded communication cables.

## Canadian DOC Compliance Statement

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

# Preface

This section provides you with contact information, document structure and organization, and additional reference documents.

## Contents

# Contacts

You can contact Zebra Technologies at the following:

## Web Site

http://www.zebra.com

Technical Support via the Internet is available 24 hours per day, 365 days per year. Go to http://www.zebra.com/support.

## The Americas

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| --- | --- | --- |
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# Document Conventions

The following conventions are used throughout this document to convey certain information:

**Alternate Color** (online only) Cross-references contain links to other sections in this guide. If you are viewing this guide online, click the blue text to jump to its location.

**Command Line Examples** All command line examples appear in `Courier New` font. For example, type the following to get to the Post-Install scripts in the `bin` directory:

    Ztools

**Files and Directories** All file names and directories appear in `Courier New` font. For example, the `<version number>.tar` file and the `/root` directory.

**Icons Used**

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**Caution •** Warns you of a potential electric shock situation.

---

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**Caution •** Advises you that failure to take or avoid a specific action could result in physical harm to you.

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**Important •** Advises you of information that is essential to complete a task.

**Note •** Indicates neutral or positive information that emphasizes or supplements important points of the main text.

# Environmental Management

Do not dispose of this product in unsorted municipal waste. This product is recyclable, and should be recycled according to your local standards.

For more information, please see our website at:

**Web address:** www.zebra.com/environment

# Related Documents

The following documents might be helpful references:

- *ZPL II® Programming Guide Volume I* and *Volume II*
- *EPL™ Programmer's Manual*

# Contents

# 1

# Introduction

Thank you for choosing the Zebra KDU Plus, a keyboard display unit. This manual guides you through setup and operation of the KDU Plus.

## Contents

# What's in the box?

Save the carton in case you need to ship or store the KDU Plus later. After unpacking, make sure you have all parts.
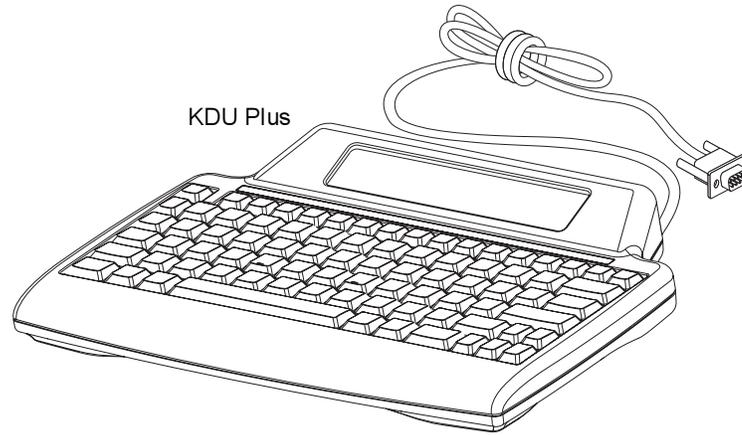
KDU Plus

Software and Documentation

Extended Language Character Overlays
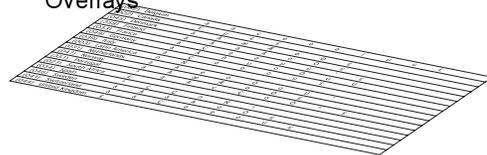
# KDU Plus Features

The following shows the main functional features found on your KDU Plus.

Display
(4 rows by 40 character wide)

QWERTY
Keypad

Auxiliary
Serial Port
(AUX 2)

Auxiliary
Serial Port
(AUX 1)

Printer Serial Port Cable with
"Phantom" DC Power

Auxiliary Keypad/Scan Port
6-Pin DIN
(PS/2 Scan Set 2 Compatible)
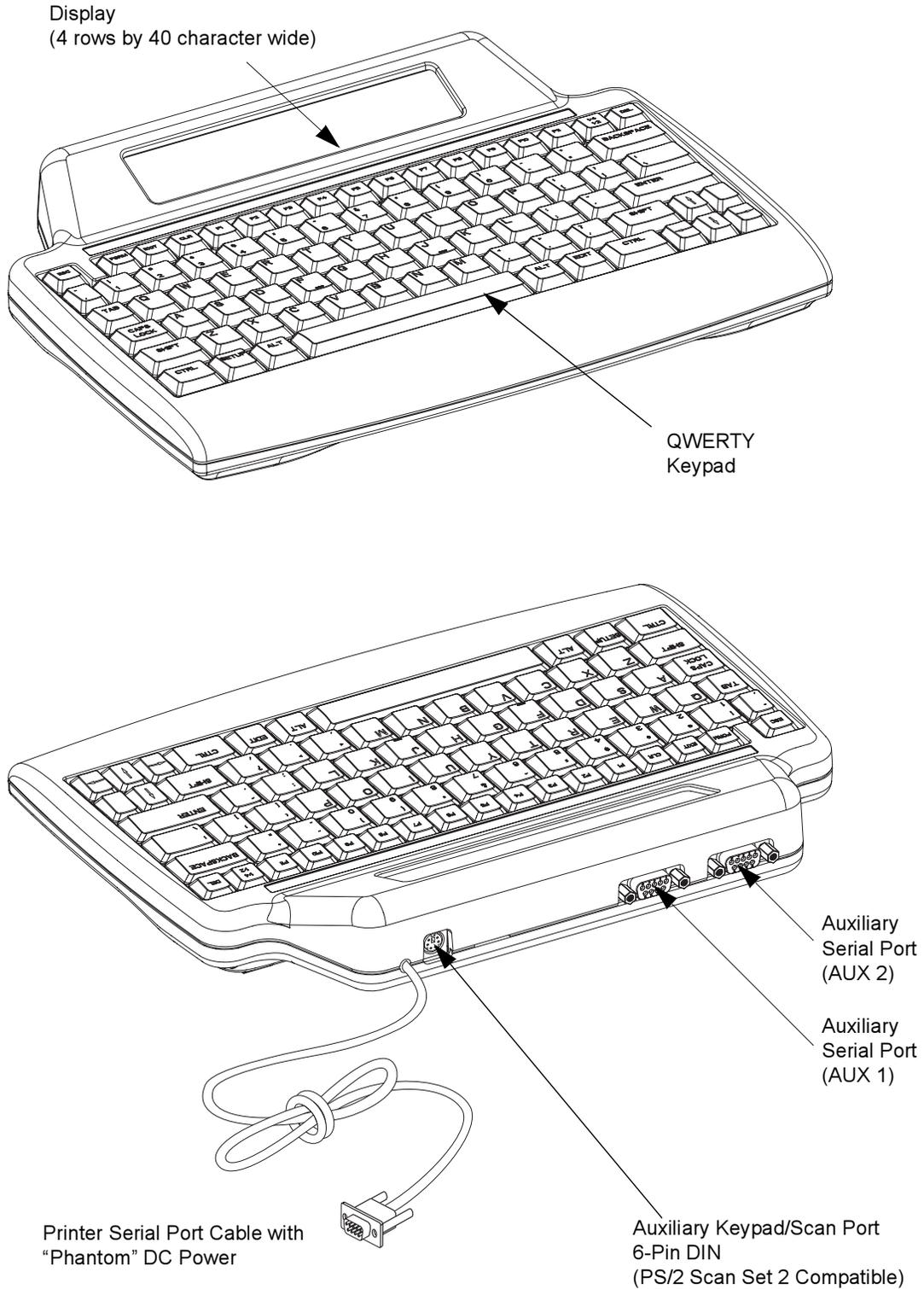
# Operational Modes

The KDU Plus is factory set to Auto-Detect the attached Zebra printer type. The KDU Plus automatically sets the interface and modes to match the attached printer. The two automatically detected modes that the KDU Plus defaults to are Forms and Terminal modes.

The KDU Plus has four basic modes of operation: Setup, Forms, Terminal, and File.

**SETUP -** After the printer has been attached to the KDU Plus, the KDU Plus can be reconfigured to support a variety of different interface parameters including operational modes, serial port settings, and data entry modes.

```
CHANGE KDU SETTINGS

   > OPERATIONAL MODE<
```

**FORMS MODE -** Designed to work with Zebra ZPL and EPL printer models. This mode emulates earlier KDU models and Zebra EPL printer operations. The KDU Plus has added support for ZPL printer operation. See the Forms Mode chapter for more details.

**Note •** Forms Mode is not designed to work with EPL Line Mode printer operations.

```
    F2 KEY - List Forms in Printer
  FORM KEY - Retrieve Form from Printer
 SETUP KEY - Change KDU Settings
CONNECTION - (Status Here)
```

**TERMINAL MODE -** Terminal Mode's primary use is to act as an debugging tool for printer command operations and communications to printers, PC's and external input devices, such as scanners.

The KDU Plus in Terminal Mode, immediately sends any data typed in on the KDU Plus to the attached printer. The data shown on the KDU Plus display is only to provide feedback and verification of data entered.

Terminal Mode will default to a display that has a single blinking square (the cursor) in the top left hand corner.

```
█
```
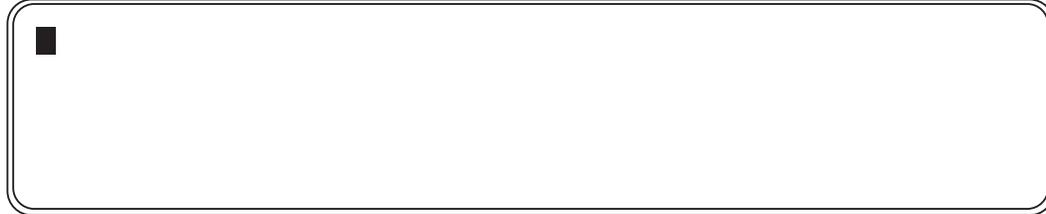
**FILE MODE -** File Mode provides a method to remotely manage and distribute files to one or more Zebra printers.

```
FILE MANAGEMENT

SELECT FILE OPERATION
   > DELETE FILE <
```
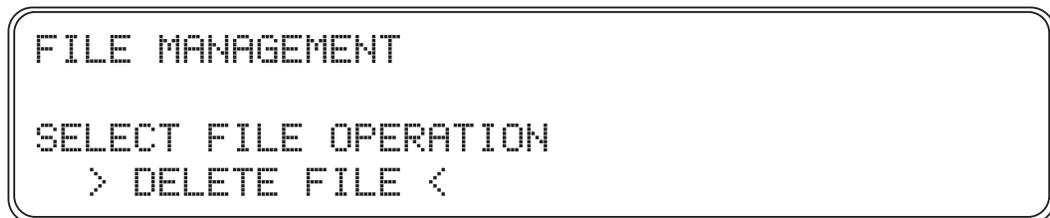
The KDU Plus will not by default, remain in the File Mode after turning off the power. See *Operational Mode Selection* on page 16 for more details.

# Controls

The KDU Plus has a QWERTY style keyboard that includes special function and navigation keys to configure the user and communication interfaces. The KDU Plus is designed to automatically detect your attached Zebra printer and configure the KDU Plus to default settings. To change and store modifications to the default settings, use the control buttons shown below.

Esc - Escape Key · Enter Key · Setup Button · Navigation "Arrow" Keys
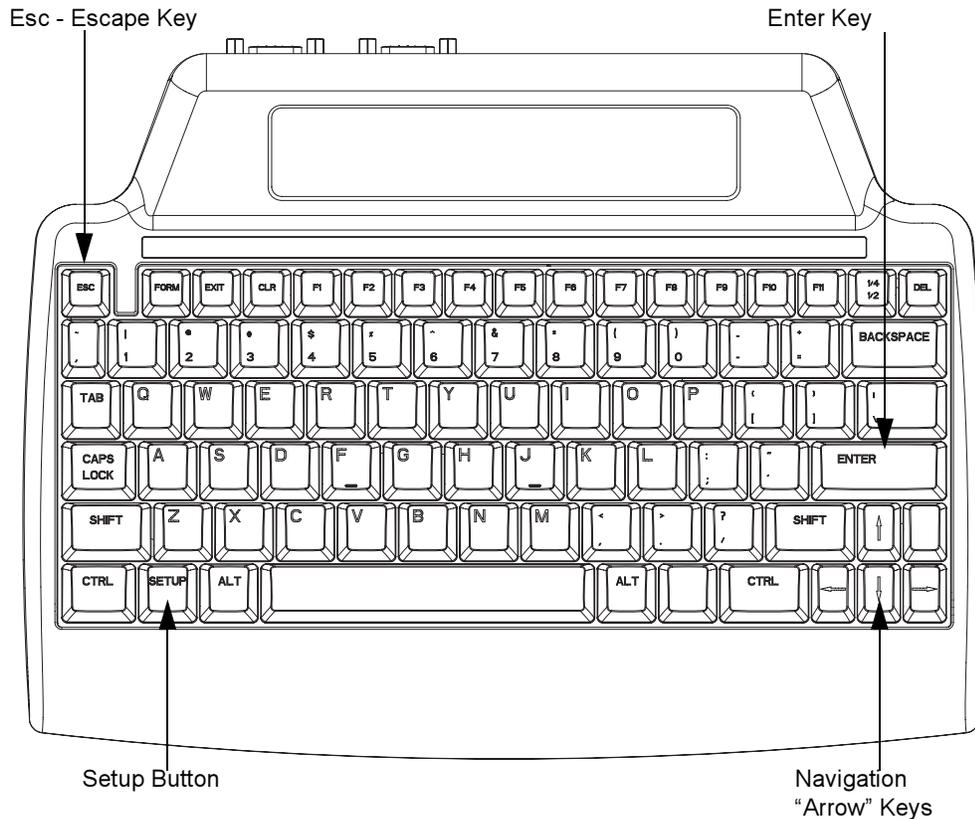
**Setup Key -** Press the Setup key to access the 'CHANGE KDU SETTING' menus. The setup options allow the user to change the configuration settings or operational modes. The Setup key is only active when the KDU Plus is in one of the other three operational modes: Forms, Terminal and File modes.

**Esc Key -** The Esc (Escape) key operation and function will vary depending upon the KDU Plus operational mode.

In the Setup Mode, press the Esc key to exit Setup Mode level. Pressing the Esc key, when at the top level 'CHANGE KDU SETTING' Setup mode, will cause the KDU Plus to exit the Setup Mode and return to the last configured operation mode set prior to entering the Setup Mode.

In File Mode, the KDU Plus will exit the file management operation selected or in process.

**Note •** The Esc key will not cause the KDU Plus exit to the File Management mode/screen. Press the Setup key to to enter the CHANGE KDU SETTING menu and then select 'OPERATIONAL MODE' to change to Forms or Terminal operating modes.

The Esc key in Terminal and Forms mode functions as the Esc key only, sending the appropriate Escape character for the attached device's or printer interface.

**Navigation Keys -** The Navigation 'Arrow' keys (UP, DOWN, LEFT and RIGHT) are used to change selection in Setup and File Modes. The UP and DOWN arrow keys scroll through the available options. The RIGHT and LEFT arrow keys change the selection group if more than one exists in the displayed Setup Mode.

In Terminal Mode, the 'Arrow' keys move the cursor location without altering text.

**Enter Key -** The Enter key (or Return key) is pressed to select displayed menu items in the Setup and File Modes.

**Notes** • _____

_____

_____

_____

_____

_____

_____

_____

_____

# 2

# Installation

This section provides basic installation and configuration instructions for using the KDU Plus.

Hardware interface communication and KDU Plus user preferences are configured with the Setup operational mode. See "Setup Mode" on page 13.

## Contents

The Zebra EPL and ZPL desktop printers have been designed to support the KDU Plus (or other external devices). The printer has a RS-232 <u>compatible</u> interface that includes a 5 Volt DC power circuit available for external devices such as scanners and the KDU Plus.

The Zebra ZPL industrial tabletop (work bench) class printer requires hardware reconfiguration to support the KDU Plus. The printer has a RS-232 <u>compliant</u> interface that by default does not have the 5 Volt DC necessary for external devices such as scanners or the KDU Plus. The ZPL tabletop printer must be ordered with this optional interface configuration or reconfigured by an authorized Zebra service representative.

**Electric Shock Caution •** Printer modifications must be performed by authorized Zebra service technician. Improper printer configuration or modification could result in damage to the printer, KDU Plus, or an attached device or may even cause electrical shock.

# Basic Hardware Installation

With the printer power OFF, attach the KDU Plus's printer serial port cable to the printer's serial port.



Power OFF

**COM/SER**
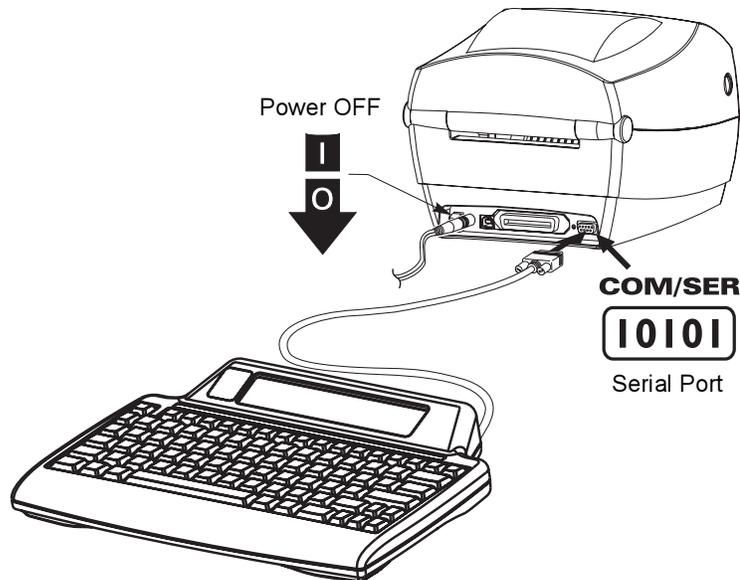
Serial Port

# KDU Plus Printer Interface Communication

**With the KDU Plus connected to the printer, turn the printer power on.**

The KDU Plus will now take up to a minute to detect the Serial port configuration (DTE or DTC), printer programming language (EPL or ZPL), operating mode (Form or Terminal) and establish communication between the KDU Plus and the printer.

**Important •** The printer must be loaded with media (labels), closed and ready to print. For best results manually calibrate the printer for the media installed in your printer.

The KDU Plus will not Auto-Detect an EPL printer if the printer is not ready to print!

# Operational Modes

The KDU Plus is factory set to Auto-Detect the attached printer cable type. The KDU Plus automatically sets the interface to match the attached Zebra printer. The serial port settings may need to be set for proper operation. See "Port Settings" on page 17. The KDU Plus defaults to auto detect EPL Forms Mode or ZPL Forms Mode.
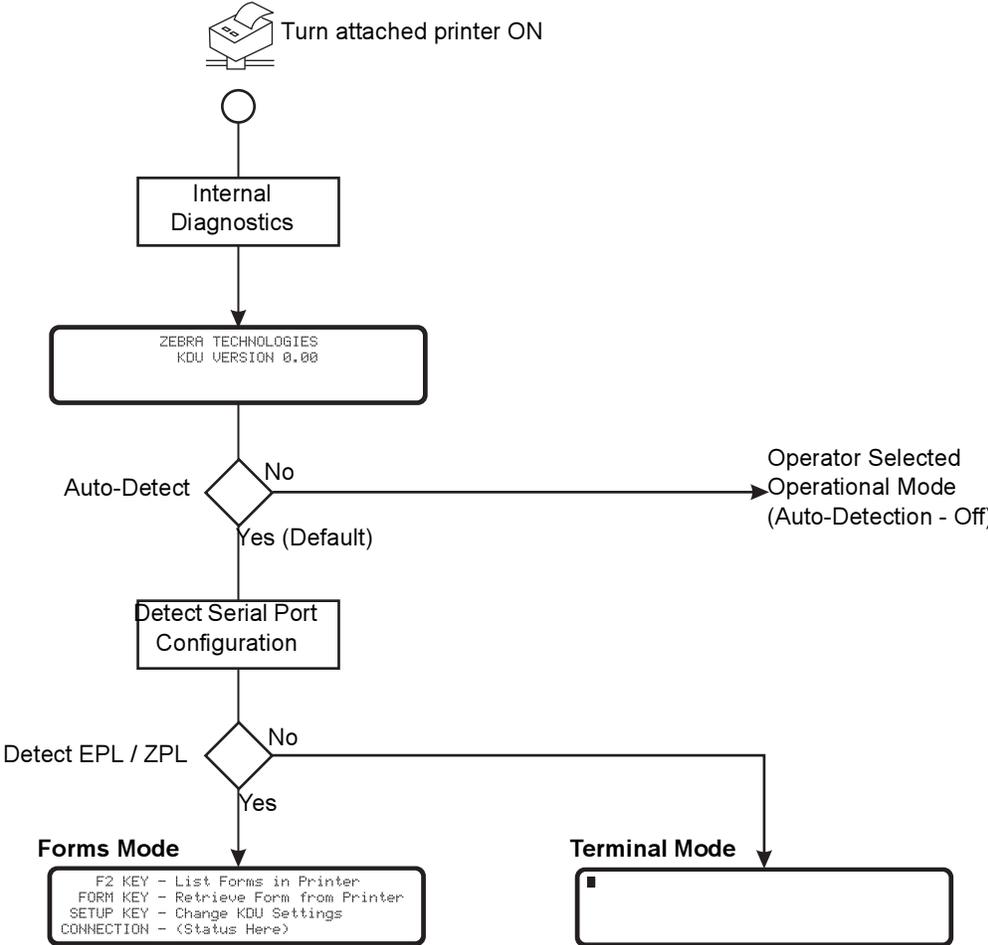
Turn attached printer ON

Internal
Diagnostics

```
ZEBRA TECHNOLOGIES
KDU VERSION 0.00
```

Auto-Detect — No → Operator Selected
Operational Mode
(Auto-Detection - Off)

Yes (Default)

Detect Serial Port
Configuration

Detect EPL / ZPL — No →

Yes

**Forms Mode**

```
   F2 KEY - List Forms in Printer
 FORM KEY - Retrieve Form from Printer
SETUP KEY - Change KDU Settings
CONNECTION - (Status Here)
```

**Terminal Mode**

**The KDU Plus has four basic modes of operation: Setup, Forms, Terminal, and File.**

**SETUP -** After the printer has been attached to the KDU Plus, the KDU Plus can be reconfigured to support a variety of different interface parameters including operational modes, serial port settings, and data entry modes. See the Setup Mode chapter for more details.

```
CHANGE KDU SETTINGS

  > OPERATIONAL MODE<
```

**FORMS MODE** - This is the KDU Plus default operating mode. When the Auto-Detect is enabled, the KDU Plus will try to establish EPL communication and then ZPL communication. The KDU Plus will count down 60 seconds while continuing to establish Forms mode operations before initiating Terminal Mode with the serial port set to DTE communication. If the KDU Plus fails to establish Form Mode operation, then the KDU Plus will default to Terminal mode.

The CONNECTION status line in the illustration of the Forms Mode screen will show the printer's language (EPL or ZPL) and the serial interface (DTE or DCE) or it can have a 'No response from printer' status. If the KDU Plus is forced to one of the Form Modes and Auto-Detect is turned off, the KDU Plus may report on the CONNECTION status line a 'No response from printer' status.

```
    F2 KEY - List Forms in Printer
  FORM KEY - Retrieve Form from Printer
 SETUP KEY - Change KDU Settings
CONNECTION - (Status Here)
```

**TERMINAL MODE** - This is the default mode when the KDU Plus can not communicate with the printer. Use the Setup mode to change the PRINTER/COM port to DCE communication for EPL printer communication and other serial port communication parameters. This mode is used primarily for debugging purposes.

```
█

```
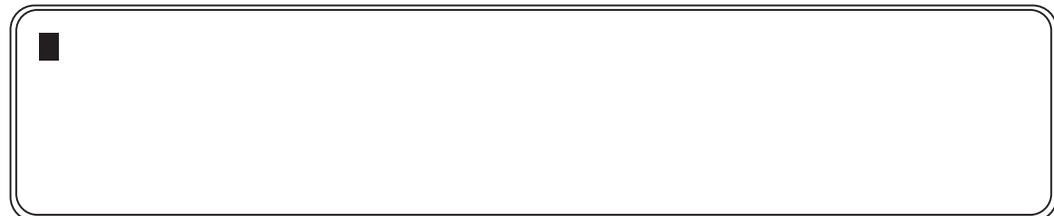
**FILE MODE** - File Mode must be selected using the Setup Mode. The KDU Plus can startup in File Mode by turning off Auto-Detect and setting the operational mode to File Mode. Files can be transferred (for processing by the printer) from a PC (host computer) to the KDU Plus and from the KDU Plus to a Zebra printer using serial port communications.

```
FILE MANAGEMENT

SELECT FILE OPERATION
   > DELETE FILE <
```

File Mode can be used to manage printers by sending files with commands for immediate processing or files that store Forms in the printer for later retrieval in Forms Mode.

# 3

# Setup Mode

This section provides detail the use of the Setup Mode to configure your KDU Plus.

KDU Plus Setup mode allows the operator to reconfigure the KDU Plus operation. The operator can change Operational Mode, Keyboard Settings, Port Settings, Terminal Settings, Auto-Detection, and Factory Defaults.

## Contents

Changes made in Setup mode are stored in non-volatile flash memory. These settings remain until the factory defaults are re-applied or they are changed again in Setup Mode. Turning off the power does not change stored configuration settings (or stored files).

## Entering Setup Mode

The operator can enter Setup mode immediately by pressing the Setup key when operating in any of the other operational modes: Forms, Terminal and File modes. The Setup key is only active in the initial screen in each of these modes. See *Operational Modes* on page 11 for a basic description of the modes.

```
CHANGE KDU SETTINGS

   > OPERATIONAL MODE<
```

From here the operator can change the setting shown between the angle brackets ( > < ). Use the up and down arrow keys to change your selection. Press the enter key to accept your selection. Use the Esc (Escape) key to exit that setting or exit the Setup Mode.

## Saving Setup Configuration Settings

You must completely exit the Setup Mode to save KDU Plus configuration changes. Do not power down in setup mode or all changed settings will be discarded. The KDU Plus only writes the changed settings to temporary memory prior to exiting Setup Mode. Writing changes only once during the to flash (non-volatile) memory conserves the memory life.

## Setup Mode Menu Structure

```
CHANGE KDU SETTINGS

 > OPERATIONAL MODE<
```

```
>KEYBOARD SETTINGS<
>  PORT SETTINGS  <
>TERMINAL SETTINGS<
> AUTO-DETECTION  <
>FACTORY DEFAULTS <
```

### Operational Mode

```
CHANGE KDU MODE

   >EPL FORMS MODE<
```

```
   >ZPL FORMS MODE<
   >TERMINAL MODE <
   >  FILE MODE   <
```

### Keyboard Settings

```
KEYBOARD SETTINGS

KEY BEEPS       EDIT MODE
 >ON <            OVER
```

```
 >OFF<           INSERT
```

### Port Settings

```
SELECT PORT TO CHANGE

 >COM/PRINTER<
```

```
 > AUX1 PORT <
 > AUX2 PORT <
```

```
COM/PRINTER PORT SETTINGS

  BAUD  PARITY DATA  STOP   FLOW   CABLE
 >9600<  NONE    7    1     NONE    DCE
```

```
AUX1 PORT SETTINGS

  BAUD  PARITY DATA  STOP   FLOW
 >2400<  NONE    7    1     NONE
```

```
AUX2 PORT SETTINGS

  BAUD  PARITY DATA  STOP   FLOW
 >2400<  NONE    7    1     NONE
```

Only AUX2 port can be used to download firmware.

### Terminal Settings

```
TERMINAL SETTINGS

LOCAL ECHO
    >ON <
```

```
    >OFF<
```

### Auto-Detection

```
AUTO-DETECT PRINTER AND MODE

    >ON <
```

```
    >OFF<
```

### Factory Defaults

```
RESTORE FACTORY DEFAULTS

    >NO <
```

```
    >YES<
```

## Operational Mode Selection

Selecting an Operational Mode will immediately enter the selected mode and store that setting into the KDU Plus's configuration memory. The KDU Plus has exited the Setup Mode.

Operational Modes interact with the Auto-Detect setting. If Auto-Detect is on (default configuration), then making these settings will not continue after a power cycle. See "Operational Modes" on page 11 for a diagram outlining Auto-Detect operation. We recommend that the Auto-Detect feature remain on, ready for normal use in Forms Mode.

The KDU Plus will look at the stored Operational Mode setting if the Auto-Detect is off when the printer and KDU Plus are first powered up. The KDU Plus will remain in this mode until manually changed by the operator or the Auto-Detect his re-enabled (on) and the power is cycled.

# Operational Mode

```
CHANGE KDU MODE

    >EPL FORMS MODE<
```

```
    >ZPL FORMS MODE<
    >TERMINAL MODE <
    >   FILE MODE    <
```

## Keyboard Settings

The operator can control the sound and text editing method used by the KDU Plus.

# Keyboard Settings

```
KEYBOARD SETTINGS

KEY BEEPS          EDIT MODE
  >OFF<                OVER
```

```
    >ON <              INSERT
```

**KEY BEEPS** - Turns off or on the beep (chirp) sounds for pressing on the keyboard keys. This does not control the two attention beeps the KDU Plus makes when it is powered up and going through a reset or when pressing the Esc (escape) key in Forms Mode.

**EDIT MODE** - Sets the data entry mode to over write (OVER) text at the displayed cursor location or to insert (INSERT) text in the following character location without overwriting the displayed data (text).

## Port Settings

Each of the KDU Plus's serial communication ports must be configured properly to communicate with your printer, PC or other input device (bar code scanner, scale, etc.). The KDU Plus and Zebra desktop printers are configured to work together (by default) when using the KDU Plus's factory default settings.

```
SELECT PORT TO CHANGE

  >COM/PRINTER<
```

```
> AUX1 PORT <
> AUX2 PORT <
```

```
COM/PRINTER PORT SETTINGS

  BAUD   PARITY DATA   STOP   FLOW    CABLE
 >9600<  NONE    8      1    HARDWARE  DCE
```

```
AUX1 PORT SETTINGS

  BAUD   PARITY DATA   STOP   FLOW
 >4800<   ODD    8      1    NONE
```

```
AUX2 PORT SETTINGS

  BAUD   PARITY DATA   STOP   FLOW
 >4800<   ODD    8      1    NONE
```
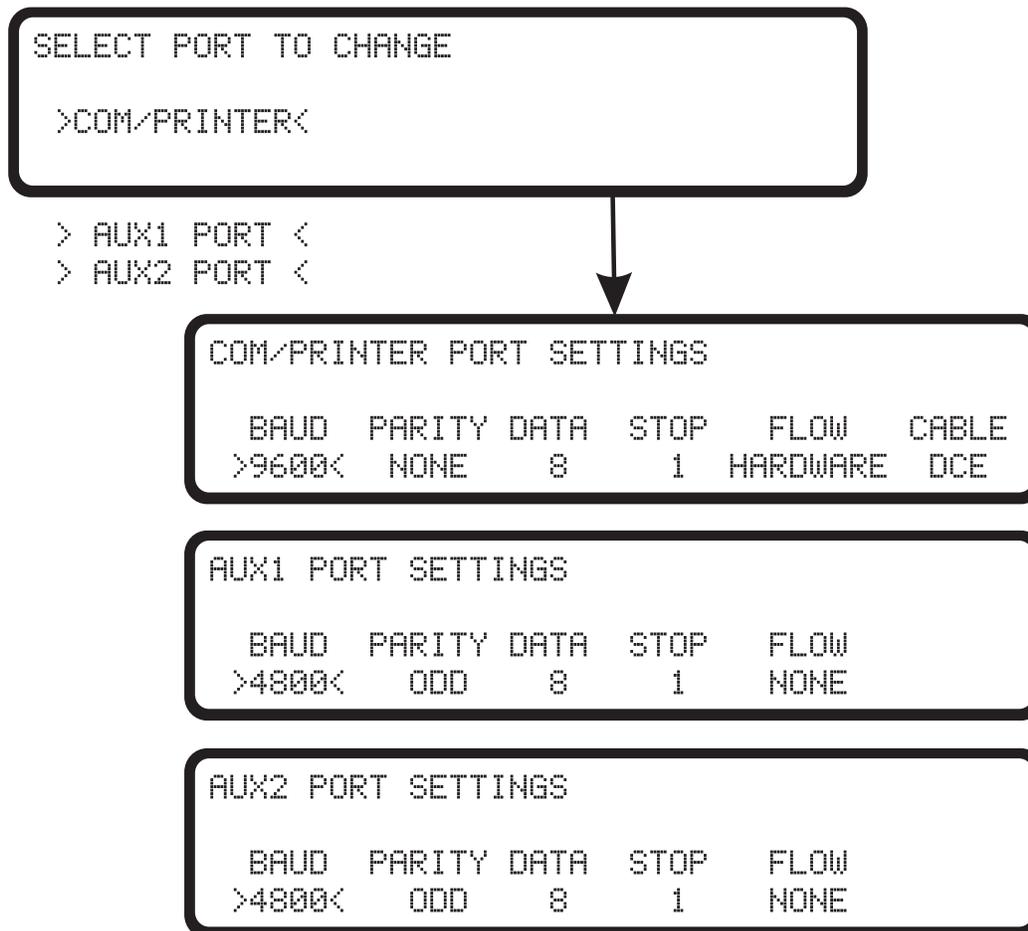
Only AUX2 port can be used to download firmware.

The printer's serial port communication settings can be verified by printing a status label. To print a status label with EPL printers, see media length sensing or AutoSense or with ZPL desktop printers, see Feed button modes. The KDU Plus's COM/PRINTER settings should match your printer's status label.

When transferring files from the PC to the KDU Plus, the AUX2 port should be the primary with the AUX1 as the secondary choice. The AUX2 port is the only port that can download firmware updates for your KDU Plus.

When using additional input devices, such as bar code scanners, use the KDU Plus's AUX1 port as the primary with the AUX2 as the secondary port. Fewer changes to your port configuration setting will be needed to maintain forms, input devices and the KDU Plus.

The EPL and ZPL printers have different internal default serial port communication settings and serial port connection configurations. The desktop printer's settings are only accessed via programming. Tabletop printers with displays can also have their serial port settings changed through the printer control menu.

The illustration below shows the COM/PRINTER port and the selections available in each category. The COM/PRINTER port has one extra category in addition to the setting categories available on the AUX1 and AUX2 ports, the CABLE category.

```
COM/PRINTER PORT SETTINGS

  BAUD   PARITY DATA   STOP    FLOW     CABLE
 >9600<   NONE    8      1    HARDWARE   DCE
```
```
 14400     ODD     7      2    XON/XOFF   DTE
 19200    EVEN                   NONE
  2400
  4800
```

**COM/PRINTER** - The port is used exclusively for communication between the printer and the KDU Plus. The factory default settings for the COM/PRINTER port are shown in the display window. These settings are the same as the early model KDU that exclusively supported EPL printer models.

**EPL** printers must have the flow control set to **HARDWARE** and the cable is DCE. The KDU Plus will not Auto-Detect an EPL printer if the printer is not ready to print!

**ZPL** printers must have the flow control set to **XON/XOFF** and the cable is DTE.

When using Auto-Detect to initiate printer communication, the KDU Plus will automatically detect the cable type. All other parameters must be synchronized to communicate properly.

**AUX1 and AUX2** - The auxiliary serial ports have two main functions: data entry and file transfer. The KDU Plus will work with a variety of input devices (scanners, scales, etc.). Both ports can transfer form and graphic (logo) files into the KDU Plus for distribution to remote printers.

Configure the auxiliary port to match the settings of your input device or PC interface to transfer data. The factory default settings are shown below.

```
AUX1 PORT SETTINGS

  BAUD   PARITY DATA   STOP    FLOW
> 4800<   ODD     8      1     NONE
```

When it is necessary connect the KDU Plus directly to a PC, then the communications between the PC and the KDU Plus must be synchronized to have reliable data transfers. The PC's settings must match the settings on the KDU Plus.

The PC's port setting can be found in the Windows™ operation system's Control Panel. Click in the *Start* button and select *Settings --> Control Panel.*

Open the *System* icon. Select the Hardware tab. Select the Device Manager menu button on the Hardware. Expand Ports in the Device Manager Menu and select your COM port.
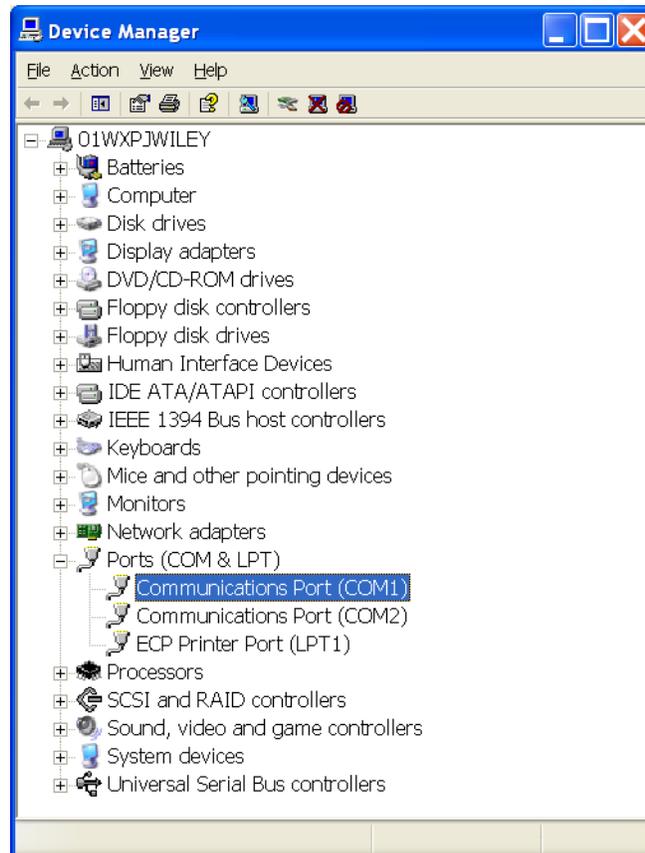
Change the Port Settings to match the settings shown below. (Double-click selection to access)
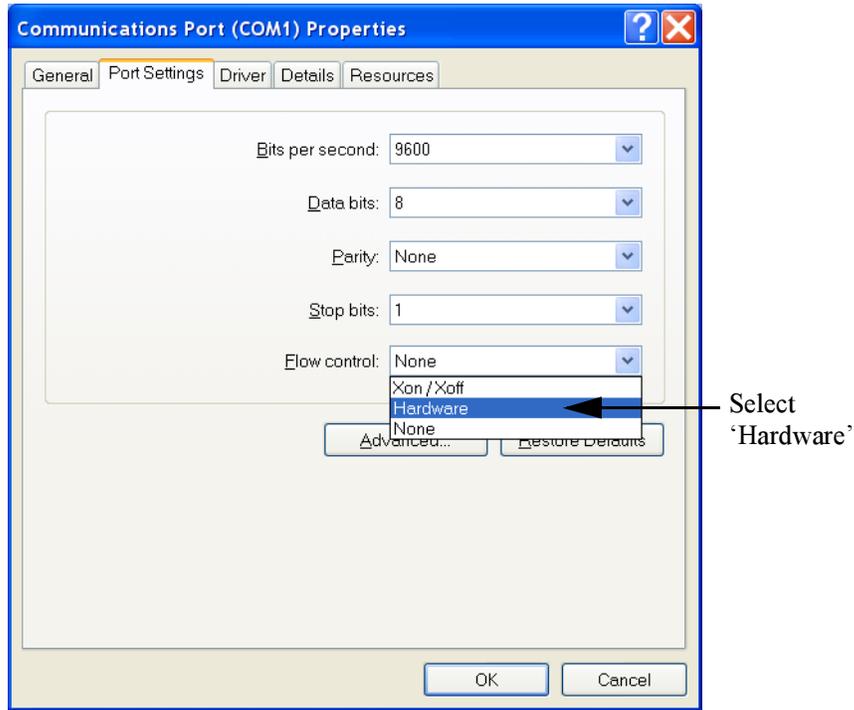


The AUX2 (or AUX1) should match the PC's settings.

## Terminal Settings

```
TERMINAL SETTINGS

LOCAL ECHO
     >ON <
```

```
     >OFF<
```

**LOCAL ECHO -** This setting when ON, will enable the KDU Plus to display characters as typed. With LOCAL ECHO turned OFF, the KDU Plus will only display information sent from the printer.

## Auto-Detection

Auto-Detection is designed to detect your Zebra printer and default to the KDU Plus's native operational mode, Forms Mode, at printer/KDU Plus power up. Disable Auto-Detection by setting this setting to OFF. The KDU Plus will now be in the last set operational mode during the next power-up cycle.

```
AUTO-DETECT PRINTER AND MODE

     >ON <
```

```
     >OFF<
```

# Factory Defaults

The factory default settings will be reset by selecting the YES option and pressing the Enter key.

```
RESTORE FACTORY DEFAULTS

   >NO <
```

```
>YES<
```

# Exiting Setup Mode

Setup Mode changes are not saved to flash memory until Setup Mode is exited properly by pressing the Esc (Escape) key until you go into the last selected operational mode or by selecting an operational mode which exits Setup Mode immediately. All Setup Mode setting changes are stored in temporary RAM memory. The KDU Plus will save all changes to permanent memory when properly exiting the Setup Mode. If you power down during Setup Mode, the KDU Plus will not store your settings.

# 4

# EPL Forms Mode

Forms Mode is the standard operational mode of the KDU Plus. Forms Mode allows the operator to print and recall forms (labels formats) stored in the printer. EPL Forms Mode closely emulates the most functional aspects of original KDU which was designed to work with EPL language printers.

Both of the ZPL and EPL Forms Modes allow the operator to do the following basic operations:

- Print a list of label forms stored in the printer
- Retrieve label forms stored in the printer
- Input variable data
- Print labels

## Contents

## Forms Mode Basics

```
        F2 KEY - List Forms in Printer
     FORM KEY - Retrieve Form from Printer
    SETUP KEY - Change KDU Settings
   CONNECTION - EPL Printer (DCE)
```

The three keys active in the Forms Mode main screen (shown above) are:

**F2 -** Press the F2 key to print a label that lists forms (label formats) stored and available in the printer.

**FORM -** Recalls a form for printing. A label may print immediately, wait for operator input by KDU Plus keyboard entry or via an attached input device, or operator input for the number of labels to print.

**SETUP -** The Setup key is only available during Forms Mode when the main screen is displayed.

## F2 - List Forms

Press the F2 function key on the KDU Plus. The printer will print a forms file listing. Form names printed on the list are in the exact form needed for retrieval. EPL printer form names are case sensitive.

## Form - Form Retrieval

The KDU Plus does not directly store label forms. The forms are stored in the printer. The KDU Plus sends the form retrieval commands directly to the printer to start a form.

Press the Form key to retrieve a form. Enter the form name exactly as it is shown in the List Forms printout.
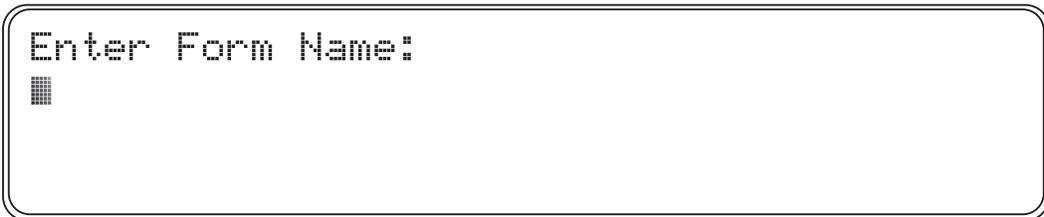
```
Enter Form Name:
▓
```

**Important •** The AUX1, AUX2 and the PS/2 style input ports are turned off during form retrieval. The input ports are active once a form is running and the KDU Plus prompts the operator for data input.

- Form names used by the KDU Plus can be up to 8 alpha-numeric characters long.
- EPL form names can also support any valid DOS and Windows file name characters as long as the name does not exceed 8 characters.
- The KDU Plus will not recognize a filename that includes the file extension. The printer has stripped the file extension from the form file during the storage process in the printer. Note the file name and form name do not have to match. EPL can even process multiple forms in a single file. See the EPL programmer's manual for more details.

The EPL form name of **AbC123zP** would be entered as:
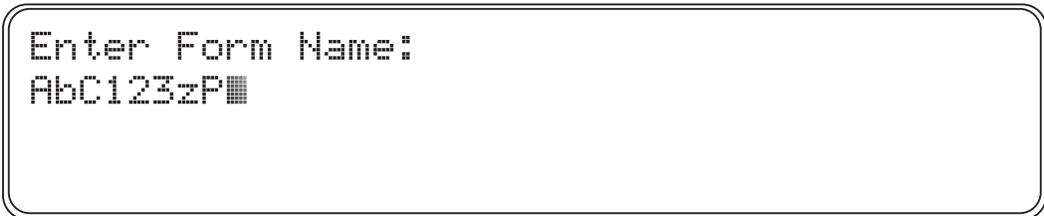
```
Enter Form Name:
AbC123zP▓
```

- Press the Enter key to finish retrieving your form. The printer and KDU Plus will now begin processing the form.
- Press the Clr key to clear the form name entry.
- The right and left arrow keys, Del key and the Backspace keys are active during Forms Mode.
- Press the Exit or Esc keys at any time to quit form retrieval or form data entry.

If a form name is entered incorrectly or does not exist the KDU Plus will report an error.
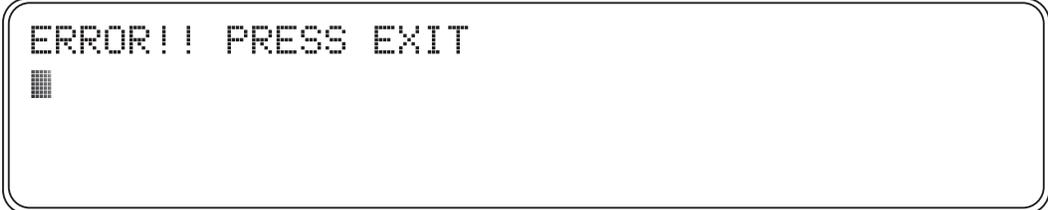
```
ERROR!! PRESS EXIT
▓
```

Pressing Exit or Esc will clear the error and return to the KDU Plus's Forms Mode display screen.

Pressing the Caps Lock key will toggle the KDU Plus between 'Capital letter mode' and 'Small letter mode' data entry mode when the KDU Plus in a form name or data entry modes. The display will change between the entry mode screen and to one of these screens for one second.

```
Small letter mode
```

```
Capital letter mode
```
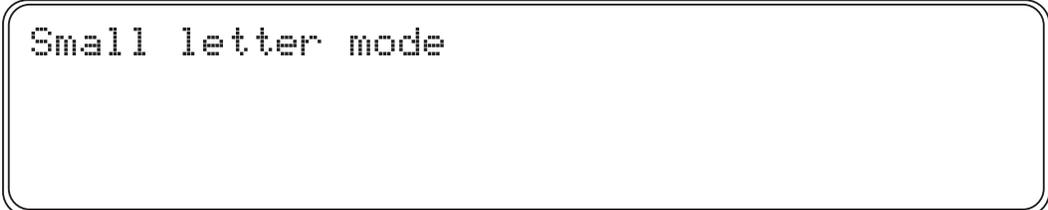
Use the Shift key and a letter key to alternate to the opposite state letter mode for entering individual letters. Use the Shift key to access the alternate character keys, for example press the Shift key and 2 key to display the @ character symbol.

## Printing Forms without Variables

**Forms without variables or counters and <u>do not include</u> the Print Automatic (PA) command** will cause the KDU Plus to prompt the operator to enter a quantity of label sets to print.

```
Number of labels sets
 1▓
```

The operator can change the quantity and press the Enter key. The printer will print the form sets.

- The operator can press the Enter key again to repeat the form print, change the quantity again and print, or press the Exit or Esc keys to exit form operations.
- Press the Clr key to clear the quantity entry shown.
- The right and left arrow keys, Del key and the Backspace keys are all active during Form Mode.
- Press the Exit or Esc keys at any time to quit form retrieval or form data entry.

**Forms without variables or counters and <u>includes</u> the Print Automatic (PA) command** will cause the printer to continuously print copies the form's label and the KDU Plus will display 'Auto printing'. The printer must be turned off to stop printing (or run out of labels).

```
Auto printing
```

## Printing Forms with Variables

**If the form contains variables or counters and <u>does not include</u> the Print Automatic command (PA)**, the display line will display the 1st variable's prompt.
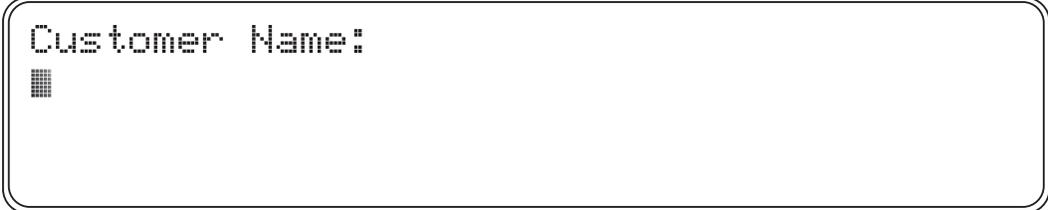
```
Customer Name:
▓
```

Type in the data followed by pressing the Enter key with the KDU Plus keyboard or with an input device attached to the AUX1, AUX2 or PS/2 style port. Input devices, like scanners, automatically provide the equivalent of pressing the Enter key, that, is a line feed character (and carriage return), which is hidden from the operator.

- Press the Clr key to clear the entry shown.
- The right and left arrow keys, Del key and the Backspace keys are active during Forms Mode.
- Press the Exit or Esc keys at any time to quit form retrieval or form data entry.

The KDU Plus will continue prompting the operator to enter data until the all form variables prompts have been entered. The KDU Plus will then begin prompting for counter variables to be entered.

**If a form has the number of print quantity specified from within the EPL form with the Print Automatic command (denoted by the PA) from within the form**, then the KDU Plus will display 'Auto printing' for two seconds and start printing.

```
Auto printing
```

When the form has finished printing, the KDU Plus will return to the main forms menu.

**If the form <u>Does Not Include</u> the Print Automatic specified with the Print Automatic command (PA) from within the form**, then the operator will be prompted to enter the 'Number of label sets' to print. The operator can change the quantity and press the Enter key. The number range is 1 to 9999.
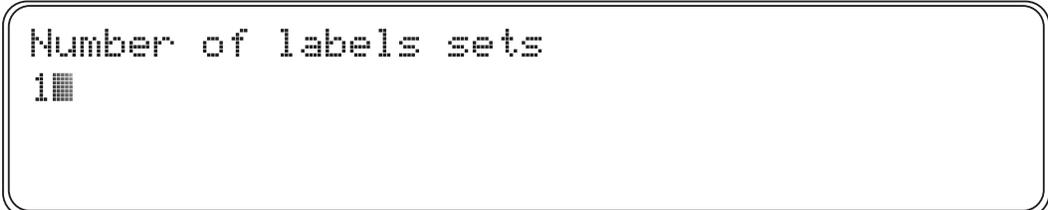
```
Number of labels sets
1▓
```

**If the form also contains at least one counter**, then the KDU Plus will display 'Copies of each label' before printing begins. For example, if an operator needed serial number labels for 100 widgets and a duplicate label for its shipping box, then the operator would enter 100 sets with 2 copies each for a total of 200 labels.

```
Copies of each label
1▓
```

- The operator can press the Enter key again at the first prompt to repeat the form print, change the prompt entries, set quantity or copies again and print, or press the Exit or Esc keys to exit form operations.
- Press the Clr key to clear the entry shown.
- The Arrow keys, Del key and the Backspace keys are active during Forms Mode.
- Press the Exit or Esc keys at any time to quit form retrieval or form data entry.

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# 5

# ZPL Forms Mode

Forms Mode is the standard operational mode of the KDU Plus. Forms Mode allows the operator to print and recall forms (labels formats) stored in the printer. ZPL Forms Mode emulates the basic functional aspects of original KDU which was designed to work with EPL language printers.

Both of the ZPL and EPL Forms Modes allow the operator to do the following basic operations:

- Print a list of label forms stored in printer
- Retrieve label forms stored in printer
- Input variable data
- Print labels

## Contents

## Forms Mode Basics

```
      F2 KEY - List Forms in Printer
    FORM KEY - Retrieve Form from Printer
   SETUP KEY - Change KDU Settings
 CONNECTION - ZPL Printer (DTE)
```

The three keys active in the Forms Mode main screen (shown above) are:

**F2 -** Press the F2 key to print a label that lists forms (label formats) stored and available in the printer.

**FORM -** Recalls a form for printing. A label may print immediately, wait for operator input by KDU Plus keyboard entry or via an attached input device, or operator input for the number of labels to print.

**SETUP -** The Setup key is only available during Forms Mode when the main screen is displayed.



Exit Forms Mode

Form Information:
X12345
YaBcDe
YAbCdE
Form memory left: 060.1K

```
DIRECTORY OF E:*.*

E:ABCFORM.ZPL        540
E:123FORM.ZPL        748
E:ZYXFORM.ZPL

E:ONBOARD FLASH
2536376 BYTES FREE
```

## F2 - List Forms

Press the F2 function key on the KDU Plus. The printer will print a forms file listing, see the example shown below.

- KDU Plus only lists and retrieves forms stored in the ZPL printer's E:ONBOARD FLASH memory area.
- The KDU Plus has an eight character limit on file names excluding the file extension (.zpl) and will not recognize a filename that includes the file extension.
- Forms must have a '**.ZPL**' file extension.

```
DIRECTORY OF E:*.*
E:ABCFORM.ZPL          540
E:123FORM.ZPL          748
E:ZYXFORM.ZPL
E:ONBOARD FLASH
2536376 BYTES FREE
```

## Form - Form Retrieval

The KDU Plus does not directly store label forms. The forms are stored within the printer. The KDU Plus sends form retrieval commands directly to the printer to start forms.

- Press the Form key to retrieve a form.
- Enter the form name as it is shown in the List Forms printout. Do not include the **E:** or the **.ZPL** form file name extension, i.e. the listed form (see above) **E:ABCFORM.ZPL** would be entered as **ABCFORM**.

```
Enter Form Name:
▓
```

**Important** • The AUX1, AUX2 and the PS/2 style input ports are turned off during form retrieval. The input ports are active once a form is running and prompts the KDU Plus for data input.

The ZPL form name of **E:1234ABCD.ZPL** would be entered as:

```
Enter Form Name:
1234ABCD▮
```

- Press the Enter key to finish retrieving your form. The printer and KDU Plus will now begin processing the form.
- Press the Clr key to clear the form name entry.
- The right and left arrow keys, Del key and the Backspace keys are active during Forms Mode.
- Press the Exit or Esc keys at any time to quit form retrieval or form data entry.

If a form name is entered incorrectly or does not exist the KDU Plus will report form not found.

```
FORM NOT FOUND:
NAME

PRESS <EXIT> OR <ESC>
```

Pressing the Caps Lock key will toggle the KDU Plus between 'Capital letter mode' and 'Small letter mode' data entry mode when the KDU Plus in a form name or data entry mode. The display will change between the entry mode screen and to one of these screens for one second.

```
Small letter mode
```

```
Capital letter mode
```

Use the Shift key and a letter key to alternate to the opposite state letter mode for entering individual letters. Use the Shift key to access the alternate character keys, for example press the Shift key and 2 key to display the @ character symbol.

## ZPL Forms Mode Memory and Programming Issues

The KDU Plus in ZPL Forms Mode utilizes printer and KDU memory very differently than the EPL Forms Mode operations. The EPL printer stores all variable data internally. The KDU Plus with the ZPL printer stores the variable data for the printer and passes it to the printer with each print form request.

When retrieving a form and the form's name is valid, then the printer will send the entire form format to the KDU Plus. The KDU Plus will parse the entire format and search for field numbers (denoted by ^FN) and serial number fields (denoted by ^SN). A message will be displayed on the KDU Plus to indicate to the user that the form is being processed.

A field number may have a prompt associated with it which will be embedded in quotes ("") immediately following the field number. As the format is parsed, the KDU Plus will construct a list of prompts. If no prompt is associated with a field number, then the field number including the FN prefix will be used as the prompt.

If a ^SN is detected during the parsing of the form, a flag is set that will cause the KDU to display the number of Copies of each serial number.

The KDU Plus has 576 bytes in which to store the prompts and the field data entered by the user. The amount of storage used for each variable can be determined as follows:

- 2 bytes for field number
- 2 bytes for field prompt pointer (pointer to text string)
- 2 bytes for field data pointer (pointer to text string)
- (m+1) bytes for prompt text (includes zero or NULL byte terminator)
- (n+1) bytes for data text (includes zero or NULL byte terminator)

If 576 bytes are exceeded during parsing of the format, the KDU Plus will display the error message "Insufficient memory". The KDU Plus will abort the form recall process and returning to the top level ZPL forms menu.

If 576 bytes are exceeded during data entry, the KDU Plus will clear the oldest previous value entered and continue the data entry process and store the new value. If the new value exceeds the storage limit, then the value will not be saved for the next iteration of the form.

The maximum number of characters that can be entered during a single data entry (prompt) is 99 characters.

Each form to be stored for retrieval by the KDU Plus must have the Download Format command (denoted by ^DF). An example would be ^DFE:FILENAME.ZPL^FS located near the beginning if the form (label) format.

## Printing Forms without Variables

Forms without variables (fields or serial numbers) will cause the KDU Plus to prompt the operator to enter a quantity of label to print.
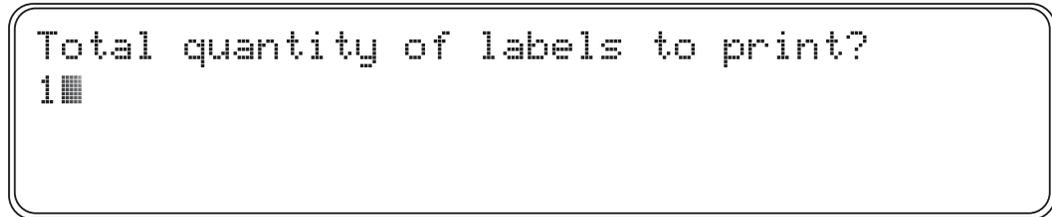
```
Total quantity of labels to print?
1█
```

The operator can change the quantity and press the Enter key. The printer will print the form.

- The operator can press the Enter key again to repeat the form print, change the quantity again and print, or press the Exit or Esc keys to exit form operations.
- Press the Clr key to clear the quantity entry shown.
- The right and left arrow keys, Del key and the Backspace keys are all active during Form Mode.
- Press the Exit or Esc keys at any time to quit form retrieval or form data entry.

## Printing Forms with Variables

If the form contains variables, the display line will display the 1st variable's prompt.
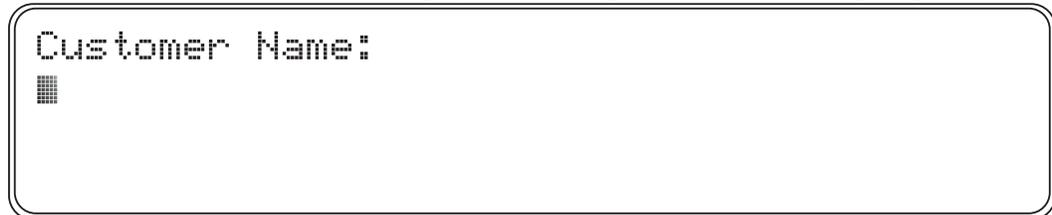
```
Customer Name:
█
```

Enter data followed by pressing the Enter key with the KDU Plus keyboard or with an input device attached to the AUX1, AUX2 or PS/2 style port.

- Input devices, like scanners, typically provide the equivalent of pressing the Enter key (a line feed character), which is hidden from the operator.
- Any unprintable characters will not be displayed by the KDU Plus.
- The maximum number of characters that can be entered during a single data entry (prompt) is 100 characters.
- The total amount of data stored for printing is limited and will overwrite the memory data stored. See "ZPL Forms Mode Memory and Programming Issues" on page 35.
- The KDU Plus will continue prompting the operator to enter data until the all of the form variables prompts have been entered.

The KDU Plus may display a 'Processing Form ..' when loading and parsing form commands.

```
PROCESSING FORM ...
```

If a form has the number of print quantity specified from within the ZPL form with the Print Quantity command (denoted by the ^PQ) from within the form, then the KDU Plus will display 'Auto printing' for two seconds and start printing.

```
Auto printing
```

When the form has finished printing, the KDU Plus will return to the main forms menu.

If the form does not have the print quantity specified with the Print Quantity command within the form, then the operator will be prompted to enter the 'Total quantity of labels to print'.

```
Total quantity of labels to print?
1▓
```

The operator can change the quantity and press the Enter key. The printer will print the form.

If the form also contains at least one Serial Number command (denoted by ^SN), then the KDU Plus will display 'Copies of each serial number?'.

```
Copies of each serial number?
1▓
```

- The operator can press the Enter key again to repeat the form print, change the quantity again and print, or press the Exit or Esc keys to exit form operations.
- Press the Clr key to clear the quantity entry shown.
- The right and left arrow keys, Del key and the Backspace keys are active during Forms Mode.
- Press the Exit or Esc keys at any time to quit form retrieval or form data entry.

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# Terminal Mode

Terminal Mode allows the operator to use a KDU Plus as a debugging tool and a custom applications printer control interface.

## Contents

# Overview

The operation of Terminal mode is similar to Windows™ Accessories software program Hyper Terminal and could be described as generic terminal.

- All data typed (and displayed if Echo mode is active) is sent immediately to the printer.
- Printer responses are immediately sent back to the KDU Plus and displayed (if printable).
- Every typed action by the operator is sent to the printer. Typing '123' and then following that with a backspace will display '12' with the '3' alternating with a blinking cursor. The printer received the ASCII characters for 1, 2, 3, and backspace.
- Custom Applications - Displayed data does not need to match data sent to the printer. The KDU Plus recognizes ANSI Escape sequences for display cursor control, see *External Terminal Control* on page 63.

# Debugging with Terminal Mode

The typical reason the KDU Plus is in Terminal Mode is that communication has not been properly established between the printer and KDU Plus. Common reasons for communication failure include:

- EPL printer does not have the cover closed with media (labels) properly installed. (Load media and print a status label using AutoSense to verify printer operation).
- The operator was running an AutoSense or a Feed Button mode process immediately upon printer/KDU Plus power up. (The printer is busy and can not respond).
- The Auto-Detect feature is turned off and the KDU Plus can not reconfigure the communications to match your printer's settings. See "Port Settings" on page 17.
- The KDU Plus's PRINTER/COM port or the printer's COM port communication settings have been changed from default.
- EPL - The printer may be running an AUTOFR form. See the EPL2 Page Mode Programmer's manual for details on the AUTOFR command (form).

## Troubleshooting - Basic Procedure

a. Disconnect the KDU Plus from the printer.

b. Load media in printer and verify printer operation by running a manual media label calibration or AutoSense.

c. Connect the KDU Plus to the printer and turn on the printer. Does the KDU Plus detect the printer?

d. Go into the Setup Mode and re-enable the Auto-Detect mode or Reset Factory Defaults. Cycle the printer power. Does the KDU Plus detect the printer?

e. Check the printer's status printout serial port settings (step a). Do they match the PRINTER/COM settings? No, change the COM/PRINTER port setting to match the printer. Note the cable type. Cycle the printer power. Does the KDU Plus detect the printer?

**EPL Default Port Settings**

```
COM/PRINTER PORT SETTINGS

   BAUD   PARITY DATA   STOP    FLOW      CABLE
> 9600<   NONE     8      1    HARDWARE    DCE
```

**ZPL Default Port Settings**

```
COM/PRINTER PORT SETTINGS

   BAUD   PARITY DATA   STOP    FLOW      CABLE
> 9600<   NONE     8      1    XON/XOFF    DTE
```

**f.** The following printer query commands can be sent directly via the KDU Plus in Terminal Mode to the printer.
*For EPL:*
**UI**
and press the Enter key.

```
UI
UI81,001
▓
```

*For ZPL printers:*
**~HS**

```
~HS014,0,0,1038,000,0,0,0,000,0,0,0
000,0,0,0,0,2,6,0,00000000,1,000
1234,0
▓
```

The printer will respond and update the KDU Plus display if it is now able to communicate.

Enter Setup Mode and select the Operational Modes. Change the mode to match the appropriate printer Forms Mode (EPL or ZPL). Check the Forms Mode 'Printer Status'. Press the F2 function key to test basic Forms Mode communication. Did it print?

**g.** If the printer is still not automatically detected by the KDU Plus and is not responding to Terminal Mode query commands (step f), then the printer serial port operation should be verified by sending the commands via Hyper terminal or command files directly to the printer. For information on setting the PC's serial port settings see *Port Settings on page 17* for more details. If the printer responds similarly to the Hyper Terminal command queries as shown above (step f), then the KDU is not communicating. Contact your Zebra sale representative or go to http://www.zebra.com for support and information.

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# File Mode

File Mode allows the operator to use a KDU Plus as a file management and transport vehicle between a PC and a remote printer or printers using serial port interfaces.

## Contents

## Overview

```
FILE MANAGEMENT

SELECT FILE OPERATION
   > DELETE FILE <
```

The File Management system uses storage catalog folders to hold files for transfer to the printer.

- The KDU Plus can store up to 32 files with a cumulative size less than or equal to 32K bytes of available storage memory.

- The maximum file size that can be stored on the KDU Plus is 32752 bytes (32768-16, total available memory less 16 bytes for the file folder header). Each file folder catalog name (header) requires 16 bytes of memory space.

- Files received that exceed the amount of available memory will not be stored. The KDU Plus will display an error message if this condition occurs and emit an overflow tone. Press escape to return to the previous screen.

- The size of the file stored on the KDU Plus can be calculated by taking the size of the file in bytes plus 16 bytes for the header, and then rounding that value up to the nearest multiple of 16 bytes. Example: A 49 byte file on a host would store as an 80 byte file on the KDU Plus (49+16=65, rounded up to the nearest multiple of 16 is 80).

## File Mode - OverView

```
FILE MANAGEMENT

SELECT FILE OPERATION
   > DELETE FILE <
```

**SETUP**

```
   > DELETE ALL  <
   >RECEIVE FILE <
   > SEND FILE   <
   >  SEND ALL   <
```

### Delete File

```
SELECT FILE TO DELETE:
   >NAME1   <     NAME2         NAME3
    NAME4
```

### Delete ALL Files

```
PRESS <ENTER> TO DELETE ALL FILES
PRESS <ESCAPE> TO RETURN
```

### Receive File

AUX1
AUX2

```
RECEIVE FILE FROM AUXILIARY PORT
KDU STORAGE AVAILABLE IN BYTES:     02845
ENTER NEW FILE NAME:
```

### Send File

```
SELECT FILE TO SEND:
   >NAME1   <     NAME2         NAME3
    NAME4
```

### Send ALL Files

```
PRESS <ENTER> TO SEND ALL FILES
PRESS <ESCAPE> TO RETURN
```

## Configuring File Mode Operations

Tips for making sure File Mode functions properly.

- Make sure the Forms Mode F2 function key causes the printer to print a Form List printout. If in Terminal mode instead of a Forms Mode, see *Troubleshooting - Basic Procedure* on page 41 with an emphasis on **step f** which can be used to verify printer serial port communication.
- All serial port communications between the PC and KDU Plus (including the printer) must be properly configured and synchronized. See *Port Settings* on page 17 for more information and tips on setting up serial port communication.
- File Mode can only be accessed via the Setup Modes Operational Mode setting command.
- File Mode is only a temporary setting if the KDU Plus's printer Auto-Detect setting is enabled (default).
- Disable Auto-Detect in Setup Mode to have the KDU Plus start up in File Mode.

## Transferring and Storing Files

The KDU Plus provides an interim holding area for files to be transferred to your printer or multiple printers. Files copied into the KDU Plus are held in a KDU Plus catalog folder.

- Each folder has a unique name.
- The folder name is 1 to 8 characters long.
- The folder's name has no special naming relation to the file itself.
- There is no naming requirement for files being stored in the KDU Plus catalog folder. The printer programming language has file naming requirements, see the appropriate printer programming manual for file naming details.

ABCFILE.TXT

COPY ABCFILE.TXT COM1 /b

New file: FILE4

FILE4

FILE3
FILE2
FILE1

KDU PLUS AUX1 or AUX2 Data Input to File Storage
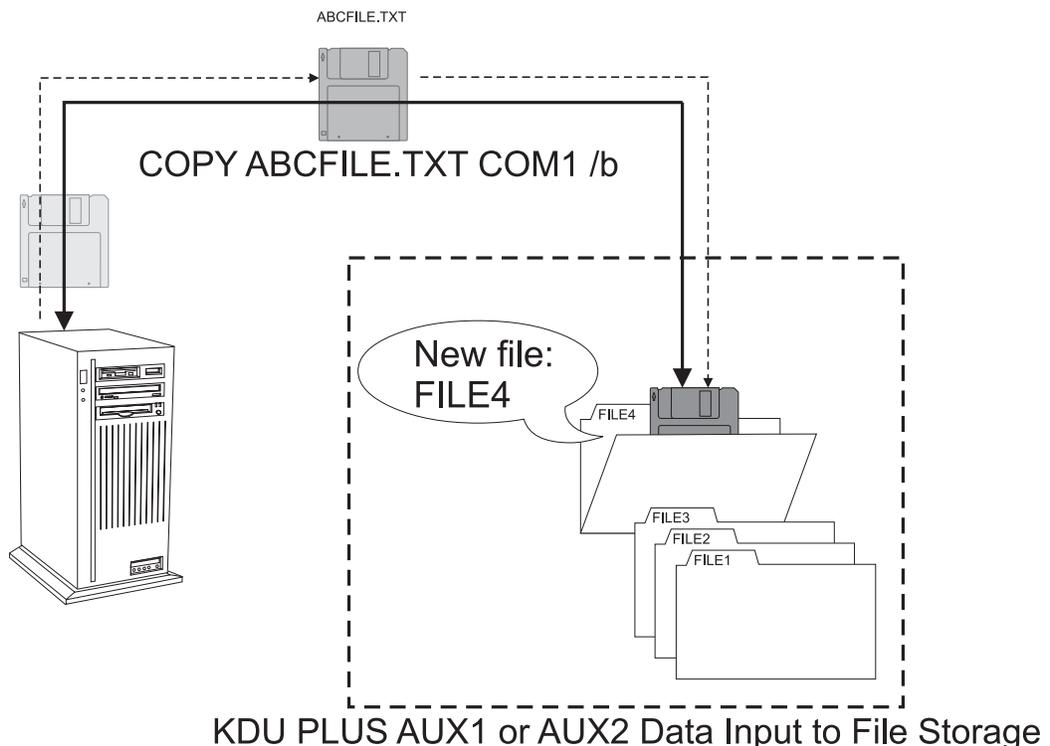
## KDU Plus - Receiving Files

To start the file transfer process in the KDU Plus, select the >RECEIVE FILE < from the File Management display screen. Use the Up and Down Arrow keys to change the selection. Use the Enter key to make your selection.

```
FILE MANAGEMENT


SELECT FILE OPERATION
   >RECEIVE FILE <
```

Upon entering the Receive File operation, the KDU Plus will display on the second line how much memory is available and the operator is prompted to enter a file name (i.e. a catalog folder name). In the example below, the file (folder) name entered is FILE4 at the prompt.

```
RECEIVE FILE FROM AUXILIARY PORT
KDU STORAGE AVAILABLE IN BYTES:    32640
ENTER NEW FILE NAME:
FILE4▓
```

Press the Enter key to accept the file folder name. If the file folder name in the catalog has already been used, the KDU Plus will report 'FILE NAME ALREADY EXISTS".

```
FILE NAME ALREADY EXISTS:          FILE1
PRESS <ESCAPE> TO RETURN
```

If the file catalog folder is available, then the Receive File screen will be displayed. The bytes received will be 0 (zero).

```
RECEIVE FILE FROM AUXILIARY PORT
WAITING FOR DATA FOR FILE:          FILE4
NUMBER OF BYTES RECEIVED:               0
PRESS <ENTER> WHEN DONE
```

You must now initiate the file transfer from the PC to the KDU Plus. Use one of many possible method or software tools, such as DOS command line or Windows HyperTerminal, to transfer files to the KDU Plus via the auxiliary (AUX1 or AUX2) serial communication ports. See for a basic file transfer method using the DOS COPY command.

The number of bytes will begin incrementing until the last byte has transferred. The file folder byte size displayed will be the files size as listed in the PC's Windows file properties plus one byte. Press Enter to complete file storage.

The KDU Plus will return to the main Receive File screen. You can continue to import files from the PC or press the Esc (Escape) key to exit the Receive File mode. The file import process can continue until there are no more files that need transferring or memory available in the KDU Plus will be exceeded.

If memory available is exceeded while transferring a file into the KDU Plus, then the KDU Plus will clear the buffer, remove the file catalog folder, and display the following screen:

```
PLEASE WAIT WHILE THE RECEIVE FILE
BUFFER AND AUX PORTS ARE EMPTIED
```

The KDU Plus will also display this screen if a file transfer has been prematurely interrupted. The KDU Plus will store the partially saved file in the file catalog folder.

This file folder with the corrupt file, should be deleted immediately to prevent it from being sent to the printer!

## Sending Files to the Printer

To start the file transfer process to the printer, select the > SEND FILE < from the File Management display screen. Use the Up and Down Arrow keys to change the selection. Use the Enter key to make your selection.

```
FILE MANAGEMENT


SELECT FILE OPERATION
   >  SEND FILE  <
```

Upon entering the Send File operation, the KDU Plus will display file catalog folders that hold the files stored in the KDU Plus. The first file folder name is bracketed with >FILENAME<. Use the Left, Right, Up and Down Arrow keys to change the selection.

```
┌─────────────────────────────────────────────────────┐
│  SELECT FILE TO SEND:                                │
│     >FILE1  <      FILE2          FILE3              │
│      FILE4                                           │
│                                                      │
│                                                      │
└─────────────────────────────────────────────────────┘
```

Make your file selection and press the Enter key. The KDU Plus will begin transferring the file out of the folder and into the printer. The printer should not be printing, calibrating or feeding media (labels) while a file transfer is in progress. The NUMBER OF BYTES REMAINING status will decrement until it reaches 0 (zero) and returns to the SELECT FILE TO SEND screen.

```
┌─────────────────────────────────────────────────────┐
│  SEND FILE TO COM/PRINTER PORT                       │
│  TRANSMITTING DATA FOR FILE:          FILE4          │
│  NUMBER OF BYTES REMAINING:             234          │
│                                                      │
│                                                      │
└─────────────────────────────────────────────────────┘
```

Repeat this process until all the individual files that you need have been transferred.

To exit SEND FILE mode, press the Esc (Escape) key.

**To transfer all the stored files in the printer at once as a single process,** use the SEND ALL File Management selection. To start sending all files stored in the KDU Plus to the printer, select the
> SEND ALL   < from the File Management display screen.

```
┌─────────────────────────────────────────────────────┐
│  PRESS <ENTER> TO SEND ALL FILES                     │
│  PRESS <ESCAPE> TO RETURN                            │
│                                                      │
│                                                      │
│                                                      │
└─────────────────────────────────────────────────────┘
```

When this screen is displayed, press the Enter key again to start the file transfers. The display will show the file transfer for each file until all files have transferred. Pressing the Esc (Escape) key at any time, will immediately terminate the file transfer in progress and any files that have not transferred yet.

## File Download Sequence

Zebra printers process files sent to the printers immediately. The printers act on data in the order that they receive the data. When using the SEND ALL file option to send file to the printer, files will sort by numerics and then alpha characters.

## Printer File Facts

- Files can contain programming to create a printer stored form, but do not have to include a form in the programing data.
- The form name and file names do not have to match.
- Graphic (or logos) can be downloaded by the KDU Plus to the printer (file size must be under 32Kbytes).
- Multiple forms, independent label commands, and printer configuration commands can all be sent to the printer as a single file. Multiple files can also be sent. Remember, sequence is important when sending commands to the printer.
- Files sent to the printer can disrupt KDU Plus to printer file transfers, such as soft reset, print status commands, configuration changes, etc.

## KDU Plus - File Deletion

The KDU Plus has two file catalog folder deletion methods to remove files stored in the KDU Plus: DELETE FILE and DELETE ALL. To start the file deletion in the KDU Plus, select the > DELETE FILE < to remove individual files or > DELETE ALL   < to clear all files from KDU Plus memory. Use the Up and Down Arrow keys to change the selection. Use the Enter key to make your selection.

**The KDU Plus will display the following screen to delete individual files**. Upon entering the Delete File operation, the KDU Plus will display file catalog folders that hold the files stored in the KDU Plus. The first file folder name is bracketed with >FILENAME<. Use the Left, Right, Up and Down Arrow keys to change the selection.

```
SELECT FILE TO DELETE:
   >FILE1   <     FILE2            FILE3
     FILE4
```

With the selection made, press the Enter key and the KDU Plus will ask you to verify the file you are permanently deleting from the KDU Plus. Press Esc (Escape) key to cancel. Press the Enter key to confirm file deletion.

```
PRESS <ENTER> TO DELETE FILE:        FILE4
PRESS <ESCAPE> TO RETURN
```

To delete all files in the KDU Plus, simply select DELETE ALL in the main File Management screen. The KDU Plus will display the file deletion confirmation screen where the KDU Plus asks you to verify that you want to permanently delete all files from the KDU Plus. Press Esc (Escape) key to cancel. Press the Enter key to confirm deleting all of the files from the KDU Plus catalog storage memory.

```
PRESS <ENTER> TO DELETE ALL FILES
PRESS <ESCAPE> TO RETURN
```

## File Catalog Error

The KDU Plus automatically tests the file catalog memory with a simple data integrity test to detect file storage memory corruption. If the KDU Plus detect a corrupt file during a send file or after power up, then it will display the File Error screen.

```
FILE SYSTEM CATALOG ERROR DETECTED
POSSIBLE EXTERNAL EEPROM FAILURE
PRESS <ENTER> TO DELETE:              XYZ01
PRESS <ESCAPE> TO RETURN
```

The corrupt file should be deleted. A corrupt file can not be processed properly.

You can also press Esc (Escape) to return to the last process, but this is not recommended. The KDU Plus can now be reset by power cycling the printer and KDU Plus. The KDU Plus will recheck the file integrity. The file may still be corrupted but no longer is detectable by the memory check. Use of the file may cause unpredictable result when transferred to the printer.

**Notes •** _____

_____

_____

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_____
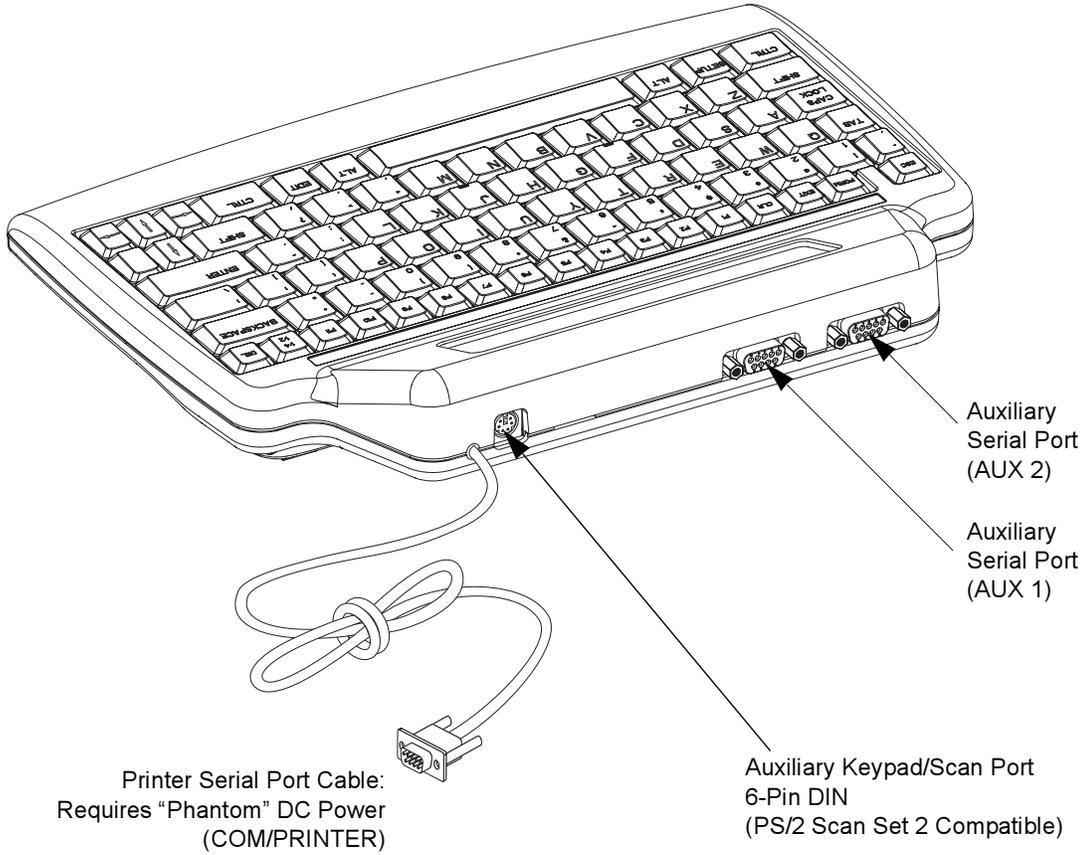
_____

_____

_____

_____

# 8

# Interfaces

The section covers the electrial connections and issues involved with connecting the KDU Plus to other devices and systems.

## Contents

# Overview



Auxiliary
Serial Port
(AUX 2)

Auxiliary
Serial Port
(AUX 1)

Auxiliary Keypad/Scan Port
6-Pin DIN
(PS/2 Scan Set 2 Compatible)

Printer Serial Port Cable:
Requires "Phantom" DC Power
(COM/PRINTER)

## COM/PRINTER Serial Port Configurations

| PIN | KDU Plus is DCE PRINTER is DTE (ZPL) | | KDU is DTE PRINTER is DCE (EPL) | |
|---|---|---|---|---|
| | **NAME** | **DIRECTION** | **NAME** | **DIRECTION** |
| 1 | NOT USED | NOT USED | +5V | +5V FROM PRINTER |
| 2 | TxD | TO PRINTER | RxD | FROM PRINTER |
| 3 | RxD | FROM PRINTER | TxD | TO PRINTER |
| 4 | DTR | FROM PRINTER | CTS | TO PRINTER |
| 5 | GND | GND | GND | GND |
| 6 | DSR | TO PRINTER | DTR | FROM PRINTER |
| 7 | RTS | FROM PRINTER | NOT USED | NOT USED |
| 8 | CTS | TO PRINTER | RTS | FROM PRINTER |
| 9 | +5V | +5V FROM PRINTER | NOT USED | NOT USED |

The +5 volts from the printers (pins 1 and 9) provide power for the KDU Plus and any additional input devices attached to the KDU Plus.

Maximum total current draw for printers with ZPL hardware architecture: **750mA**
Maximum total current draw for printers with EPL hardware architecture: **250mA**
The KDU Plus's current without external input devices attached is: **50mA**



**( 45mA + 120mA + 25mA )  +  50mA  <  Max. Current**
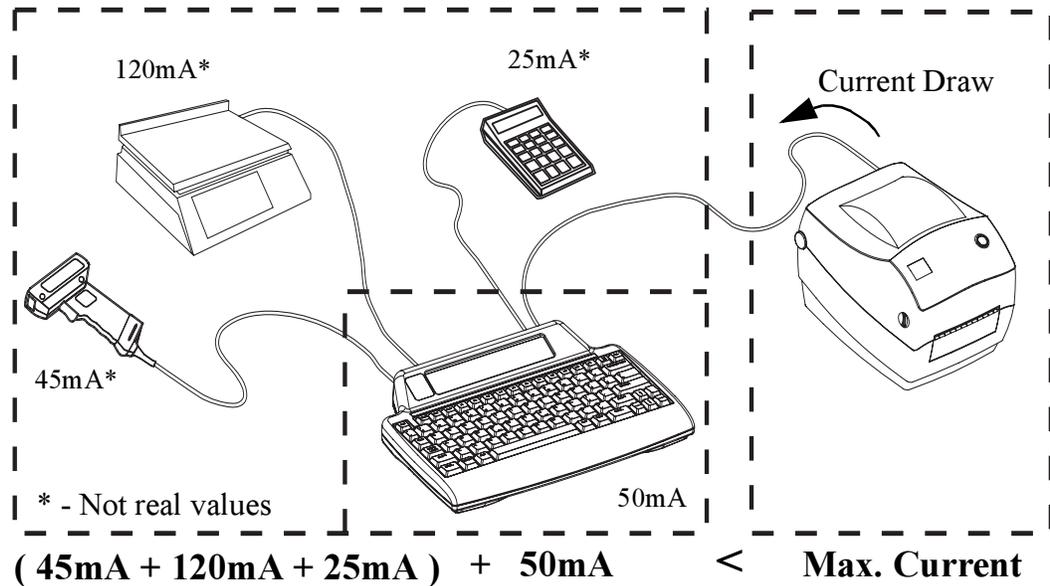
**Caution** • The KDU Plus's input ports (AUX1, AUX2, and PS/2 style) are not fused. Exceeding the total current draw available could damage the your input device, KDU Plus, or printer.

## AUX1 and AUX2 Serial Port Configuration

Interface signal meet standard RS-232 requirements.

| PIN | NAME | DIRECTION |
|-----|------|-----------|
| 1 | NOT USED | NOT USED |
| 2 | NOT USED | NOT USED |
| 3 | **RXD** | FROM AUX DEVICE |
| 4 | NOT USED | NOT USED |
| 5 | **GND** | GND |
| 6 | **DSR** | TO AUX DEVICE |
| 7 | NOT USED | NOT USED |
| 8 | **CTS** | TO AUX DEVICE |
| 9 | **+5V** | +5V TO AUX DEVICE |

The AUX1 and AUX2 port are active in Forms and Terminal modes.

## PS/2 Style Port (6-Pin DIN) Configuration

This port supports PS/2 Set 2 Scan Codes.

| Pin | Connection |
|-----|------------|
| 1 | Data |
| 2 | NOT USED |
| 3 | GND |
| 4 | +5V INPUT |
| 5 | CLK |
| 6 | NOT USED |

# 9

# EPL Language Support

EPL printers and the KDU Plus support a variety of country and language with special characters not supported by the KDU Plus's QWERTY style keyboard. The EPL printer programming language allows the operator or administrator to change both the printer's and the KDU Plus's supported language from United States English (code page 437) to one of the other printer supported codepages. This is an EPL feature only, ZPL printers do not support this method.

## Contents

## Language Support Crossreference (Language Strip)

The KDU Plus provides access to the addition characters by enabling the Function Keys (F1-F11) and Language Strip to identify the correct associated Function key.

| Country | KDU Country Code (p3) | Available Characters | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | F1 | F2 | F3 | F4 | F5 | F6 | F7 | F8 | F9 | F10 | F11 |
| Belgium | 032 | à | â | ç | é | è | ê | î | µ | ù | £ | |
| Canada | 002 | É | µ | ¢ | £ | | | | | | | |
| Denmark | 045 | å | Å | æ | Æ | ø | Ø | £ | | | | |
| Finland | 358 | å | Å | ä | Ä | ö | Ö | £ | | | | |
| France | 033 | à | Ç | é | è | µ | ù | ° | £ | | | |
| Germany | 049 | ä | Ä | ß | µ | ö | Ö | ü | Ü | | | |
| Italy | 039 | à | Ç | é | è | ò | ù | £ | | | | |
| Latin America | 003 | ñ | Ñ | | | | | | | | | |
| Netherlands | 031 | ä | Ä | ë | ö | Ö | ü | Ü | ° | | | |
| Norway | 047 | å | Å | æ | Æ | ø | Ø | £ | | | | |
| Portugal | 351 | ª | ã | Ã | ç | Ç | õ | Õ | º | £ | | |
| South Africa | 027 | £ | | | | | | | | | | |
| Spain | 034 | ª | ç | Ç | ñ | Ñ | º | | | | | |
| Sweden | 046 | å | Å | ä | Ä | ö | Ö | £ | | | | |
| Switzerland | 041 | à | ä | Ç | é | è | ö | ü | £ | | | |
| United Kingdom | 044 | £ | | | | | | | | | | |

# EPL Programming and Language Support

The EPL printer controls language with the EPL programming's **I** command. A shortened version of the **I** command is include below.

## I Command - Character Set Selection

### Description

Use this command to select the appropriate character set for printing (and KDU display).

### Syntax

**I p1, p2, p3**

### Parameters

**p1** = Number of data bits **-** 8 for 8 bit data (or for legacy support 7 for 7 bit data).

**p2** = Printer Code page/Language Support

| For 8 Bit Data - Only | | |
|---|---|---|
| **p2** | **Code Page** | **Description** |
| 0 | DOS 437 | English - US |
| 1 | DOS 850 | Latin 1 (Supported by language strips) |
| 2 | DOS 852 | Latin 2 (Cyrillic II/Slavic) |
| 3 | DOS 860 | Portuguese |
| 4 | DOS 863 | French Canadian |
| 5 | DOS 865 | Nordic |
| 6 | DOS 857 | Turkish |
| 7 | DOS 861 | Icelandic |
| 8 | DOS 862 | Hebrew |
| 9 | DOS 855 | Cyrillic |
| 10 | DOS 866 | Cyrillic CIS 1 |
| 11 | DOS 737 | Greek |
| 12 | DOS 851 | Greek 1 |
| 13 | DOS 869 | Greek 2 |

p2 parameters **A-F** that support Windows code page 1250 through 1255 are not supported by the KDU Plus.

**p3** = KDU Country Code.

| Code | Country | Code | Country | Code | Country |
|------|---------|------|---------|------|---------|
| **001** | USA | **033** | France | **046** | Sweeden |
| **002** | Canada | **034** | Spain | **047** | Norway |
| **003** | Latin America | **039** | Italy | **049** | Germany |
| **027** | South Africa | **041** | Switzerland | **351** | Portugal |
| **031** | Netherlands | **044** | United Kingdom | **358** | Finland |
| **032** | Belgium | **045** | Denmark | | |

## Installing the Language Strip

The Language Strip matches the table on the first page of this chapter of the manual. The Language Strip is made to fit tightly in the recessed area above the Function keys ((F1- F11). The Language Strip's adhesive backing is permanent. The strip should only be installed after the printers character set code page and KDU country codes have been set. They should be tested to verify that they meet your language and character display, data entry and print needs. The strip's adhesive completely sets in 24 hours.

| (032) | Belgium | à | â | ç | é | è | ê | î | µ | ù | £ |
|-------|---------|---|---|---|---|---|---|---|---|---|---|
| (002) | Canada | É | µ | ¢ | £ | | | | | | |
| (045) | Denmark | å | Å | æ | Æ | ø | Ø | £ | | | |
| (358) | Finland | å | Å | ä | Ä | ö | Ö | £ | | | |
| (033) | France | à | Ç | é | è | µ | ù | ° | £ | | |
| (049) | Germany | ä | Ä | ß | µ | ö | Ö | ü | Ü | | |
| (039) | Italy | à | Ç | é | è | ò | ù | £ | | | |
| (003) | Latin America | ñ | Ñ | | | | | | | | |
| (031) | Netherlands | ä | Ä | ë | ö | Ö | ü | Ü | ° | | |
| (047) | Norway | å | Å | æ | Æ | ø | Ø | £ | | | |
| (351) | Portugal | ª | ã | Ã | ç | Ç | õ | Õ | º | £ | |
| (027) | South Africa | £ | | | | | | | | | |
| (034) | Spain | ª | ç | Ç | ñ | Ñ | º | | | | |
| (046) | Sweden | å | Å | ä | Ä | ö | Ö | £ | | | |
| (041) | Switzerland | à | ä | Ç | é | è | ö | ü | £ | | |
| (044) | United Kingdom | £ | | | | | | | | | |

# 10
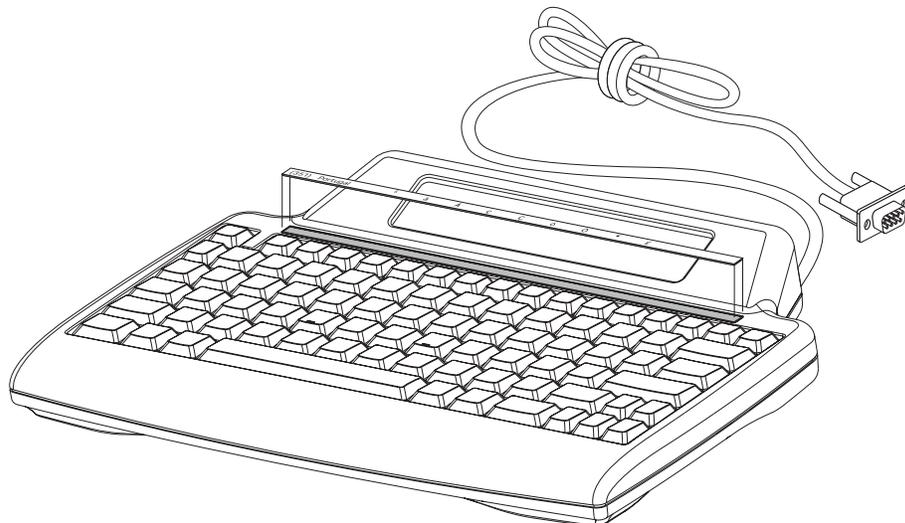
# External Terminal Control

This section documents the ANSI escape sequences and parameters that support communication between the printer and the KDU Plus. The following tables represent a subset of ANSI escape sequences for cursor control that are supported by the KDU Plus.

The abbreviation ESC represents the ASCII escape character 27 (1Bh), which appears at the beginning of each escape sequence.

**KDU Plus ANSI Escape Sequence Commands**

| Mnemonic | Sequence | Description |
|---|---|---|
| CPR | ESC[6n | Cursor Position Report: Returns the current row and column position of the cursor in the form **ESC[<row>;<col>R** |
| CUP | ESC[Pn;PnH | Cursor Position: Moves the cursor to the specified position (coordinates). If you do not specify a position, the cursor moves to the home position — the upper-left corner of the screen (line 1, column 1). |
| CUU | ESC[PnA | Cursor Up: Moves the cursor up by the specified number of lines without changing columns. If the cursor is already on the top line, this sequence is ignored. |
| CUD | ESC[PnB | Cursor Down: Moves the cursor down by the specified number of lines without changing columns. If the cursor is already on the bottom line, this sequence is ignored. |
| CUF | ESC[PnC | Cursor Forward: Moves the cursor forward by the specified number of columns without changing lines. If the cursor is already in the rightmost column, this sequence is ignored. |
| CUB | ESC[PnD | Cursor Backward: Moves the cursor back by the specified number of columns without changing lines. If the cursor is already in the leftmost column, this sequence is ignored. |
| ED | ESC[2J | Erase Display: Clears the screen and moves the cursor to the home position (line 1, column 1). |
| KVC | ESC[?25h | Cursor visible: Makes the cursor visible on the display. |
| KCI | ESC[?25I | Cursor invisible: Turns off the cursor so it cannot be seen on the display. |
| OSC | ESC] | Operating system command: Begin macro command sequence. (Non-ANSI command) |
| ST | ESC\ | String terminator: End macro command sequence. (Non-ANSI command) |

**KDU Plus ANSI Escape Command Parameter Definitions**

| Parameter | Description | Definition |
|---|---|---|
| Pn | Numeric parameter | Specifies a decimal number |
| Ps | Selective parameter | Specifies a decimal number that you use to select a function. You can specify more than one function by separating the parameters with semicolons. |
| Pl | Line | Specifies a decimal number that represents one of the lines on your display or on another device. |
| Pc | Column Parameter | Specifies a decimal number that represents one of the columns on your screen or on another device. |

# 11

# DOS File Transfer

Windows supports basic file transfer method utilizing the legacy Command mode screen that uses DOS commands. This is the most basic method that can be used to transfer files with fewest exceptions across operating system versions and printer language differences.

## Contents

## Windows Command Mode File Transfers

The following process describes using the DOS commands from within Windows XP or Windows 2000 operating systems. The process is needed every time a new **cmd.exe** (DOS Command) session is started in these operating systems. The steps are:

- Run **cmd.exe** (for Windows 95/98/ME, use the Command.com)
- Configure selected COM port on the PC to match the selected AUX port communication settings
- Change the drive and directory path to point to the transfer file's location
- use the COPY command to transfer the files

Go to the Windows mains screen and click on the Start button. Select and click on the highlighted 'Run' program command line window.
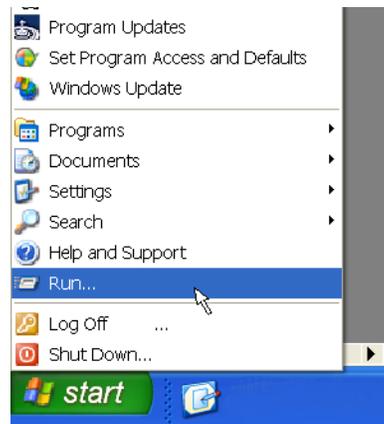


**Note •** The Help (and Support) menu item is immediately above the Run in the Start menu. Go to the Start menu and click on Help (and Support) to get help with DOS commands and methods. For Windows XP, enter a search query for 'display help for an MS-DOS command'. Look at 'New ways to do familiar tasks' and 'Display Help for an MS-DOS commands' for help using DOS commands. For Windows 2000, do and index search query on MS-DOS, command help.

Relevant commands include: **CD**, **CDDIR**, **MD**, **COPY and MODE**. To get Help on these DOS commands, type a **/?** following the command. Type the drive letter followed by a colon (**:**), for example, **C:**. to access drive C.

From the Run Program window, type **CMD** and click the OK button.
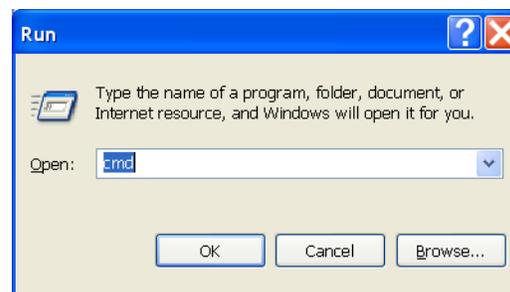


Windows will open a DOS command window.

By default, the KDU Plus AUX ports are set to operate at different communication setting that the DOS sessions in Windows XP or Windows 2000.

**AUX Port Default Settings**

```
AUX1 PORT SETTINGS

   BAUD   PARITY DATA   STOP    FLOW
> 4800<    ODD    8      1      NONE
```

Windows XP DOS Session - MODE Command Results Display Default Settings

```
C:\WINDOWS\system32\cmd.exe                        _ □ ✕

Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.

H:\>MODE

Status for device LPT1:
-----------------------
    Printer output is not being rerouted.


Status for device COM2:
-----------------------
    Baud:              1200
    Parity:            None
    Data Bits:         7
    Stop Bits:         1
    Timeout:           OFF
    XON/XOFF:          OFF
    CTS handshaking:   OFF
    DSR handshaking:   OFF
    DSR sensitivity:   OFF
    DTR circuit:       ON
    RTS circuit:       ON


Status for device COM1:
-----------------------
    Baud:              1200
    Parity:            None
    Data Bits:         7
    Stop Bits:         1
    Timeout:           OFF
    XON/XOFF:          OFF
    CTS handshaking:   OFF
    DSR handshaking:   OFF
    DSR sensitivity:   OFF
    DTR circuit:       ON
    RTS circuit:       ON


Status for device CON:
-----------------------
    Lines:             300
    Columns:           80
    Keyboard rate:     31
    Keyboard delay:    1
    Code page:         437


H:\>
H:\>
H:\>
```
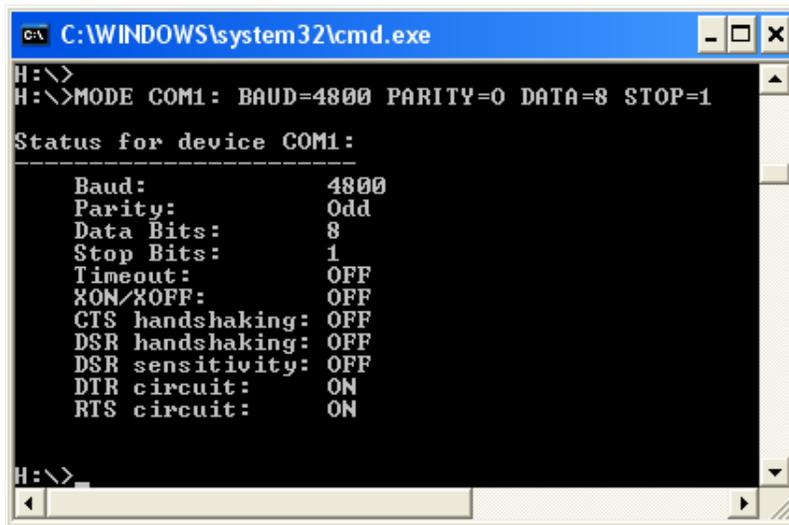
For Windows XP and Windows 2000, enter the following at the command prompt:

**MODE COMx: BAUD=4800 PARITY=o DATA=8 STOP=1**

```
C:\WINDOWS\system32\cmd.exe

H:\>
H:\>MODE COM1: BAUD=4800 PARITY=O DATA=8 STOP=1

Status for device COM1:
------------------------
    Baud:            4800
    Parity:          Odd
    Data Bits:       8
    Stop Bits:       1
    Timeout:         OFF
    XON/XOFF:        OFF
    CTS handshaking: OFF
    DSR handshaking: OFF
    DSR sensitivity: OFF
    DTR circuit:     ON
    RTS circuit:     ON

H:\>
```

The equivalent command for Windows 95/98/ME operating systems would be:

**MODE COMx:40,o,8,1**

After the communications have been synchronized, Type **C:** at the prompt. If the prompt window was pointing at any other drive than drive **C:\,** then it is now pointing at drive **C:\.** The window can be directed to any local drive or mapped network (letter) drive.
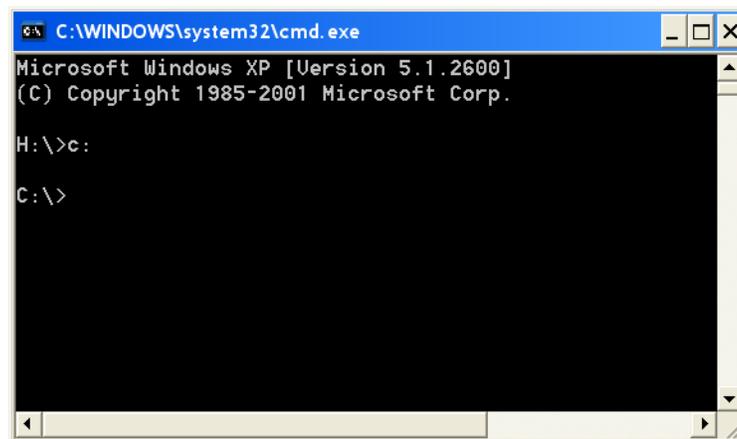
```
C:\WINDOWS\system32\cmd.exe

Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.

H:\>c:

C:\>
```

As an example, the **C:\>** drive has a FORMS directory with the label form files that need transferring to the KDU Plus. Type **CD** followed by the directory name (FORMS in the example shown below) at the prompt and press the Enter key.

The KDU Plus most be in the File Mode to receive files from the PC (or other host). See *KDU Plus - Receiving Files* on page 49 for more details on transferring files to the KDU Plus.

To initiate file transfer, type **COPY** followed by the file name (ABCFILE.TXT in the example shown above) and the serial communication port name (COM1 in this example). The entry is a **/b** to set binary data file transfer. Press the Enter key to send files to the KDU Plus.

**COPY ABCFILE.TXT COM1 /B**

```
C:\WINDOWS\system32\cmd.exe                         _ □ ×

Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.

H:\>c:

C:\>cd forms

C:\FORMS>copy abcfile.txt com1 /b
```

**Notes •** _____

_____

_____

_____

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