



Kodak

Versamark CS400

System Controller

Introduction

0114278-603



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FCC Compliance Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, 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 commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

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Versamark CS400 Introduction

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Scope

This manual introduces the KODAK VERSAMARK CS400 system controller, its capabilities, work flow, operation, configuration, and specifications. The information in this manual is intended for use by anyone who wants a general introduction to this print system controller.

CS400 operation is documented in the following publications:

- KODAK VERSAMARK CS400 System Controller *Introduction* (this manual)
- KODAK VERSAMARK CS400 System Controller *Help*
- KODAK VERSAMARK VX5000/5000e Printing Systems *Operator's Guide*
- KODAK VERSAMARK VT3000 Printing Systems *Operator's Guide*
- KODAK VERSAMARK VJ1000 Printing System *Operator's Guide*
- KODAK VERSAMARK DT9000 Series Print Stations *Operator's Guide*.

Note: Due to continuing improvement in the controller products, small differences between the actual hardware and software and the hardware and software depictions in this book may be seen.

Text Notations

This manual uses the following typographical conventions.

This style	Refers to
Ready	Text displayed by the software.
go	Anything you type, exactly as it appears, whether referenced in text or at a prompt.
ENTER	Special keys on the keyboard, such as enter, alt, and spacebar.
[NEXT]	Buttons and lights on the printer operator panel.
Save	Software command buttons and sections of dialog boxes, such as group boxes, text boxes, and text fields.
File → Open	A menu and a specific menu command.
ALT+F1	Pressing more than one key at the same time.
ALT, TAB	Pressing more than one key in sequence.
xx,yy	Variable in error messages and text.
jobfile.dat	File names.

Safety Notations

The following definitions indicate safety precautions to the operator.

Note: Information that needs to be brought to the reader's attention.

Caution: A situation where a mistake could result in the destruction of data or system-type damage.



WARNING

A potential hazard that could result in serious injury or death.



DANGER

An imminent hazard that will result in serious injury or death.

Service and Support

Technical equipment support is available 24 hours a day, 7 days a week.

Software and applications support is available 8:00 a.m. to 5:00 p.m. EST/EDT, Monday through Friday.

Call for telephone or on-site technical support; to order parts or supplies; to request documentation or product information.

	Phone	Fax
U.S.A., Canada, and worldwide	(+1-800-472-4839) +1-937-259-3739	+1-937-259-3808
Europe	+41-22-354-1400	+41-22-354-1480
Asia/Pacific Rim	+65-6744-6400	+65-6744-6700
Japan	+81-3-5621-2220	+81-3-5621-2221



Contents

Introduction

Capabilities and Features	2
Data Source Information	3
IJPDS Input	3
MPC Input	3
Modifying Setup Parameters	3
Fonts	4
Networking	4
Work Flow	5
Operation	6
Starting the System Software	6
Operating Modes	7
Common Screen Components	8
Function Bar	9
Application Button	9
Status Bar	10
Help Button	11
Subsystem Bar	12
Work Area	13
Configuration	14
Specifications	17

Glossary

Figures

Figure 1	KODAK VERSAMARK CS400 System Controller	1
Figure 2	Work flow with the KODAK VERSAMARK CS400 System Controller	5
Figure 3	Powering on the CS400	7
Figure 4	Application screen	8
Figure 5	Common screen components (Printhead Summary screen is displayed).....	9
Figure 6	Status bar	10
Figure 7	Help screen	11
Figure 8	CS400 computers.....	14
Figure 9	CS400 components and connections.....	16

Introduction

The KODAK VERSAMARK CS400 System Controller allows IJPDS (Inkjet Printer Data Stream) and MPC job files to be printed at extra-high speeds on KODAK VERSAMARK printing systems. This document provides an introduction to the capabilities and features, work flow, operation, configuration, and specifications of the CS400.

Figure 1 KODAK VERSAMARK CS400 System Controller



Capabilities and Features

The highly customizable CS400 is an integrated component of KODAK VERSAMARK printing systems. Modular and scalable, the CS400 provides extra-high performance for printing black, spot color, and full color jobs.

Fully compatible with the family of KODAK VERSAMARK products, the controller features:

- Support for the feature sets of earlier controller products, including those in the 200 series, thus providing an easy upgrade path
- Industry-leading performance in font downloads and processing speeds
- An easy-to-use central point of control through:
 - The MICROSOFT WINDOWS XP operating system
 - A highly graphical user interface with on-screen visual system representation
 - A touch screen monitor
- Support for up to 16 KODAK VERSAMARK printheads of any size
- Automated configuration definition and setup
- “Save-and-load” for multiple job setups for fast, efficient operation
- Auxiliary cue output for use with strobes or camera systems
- Document synchronization and registration regardless of the number of printheads
- Page correlation
- A fully integrated PSI (Print Station Interface) for systems with 9-inch (8.96-inch) printheads
- Support for a wide range of system configurations and finishing options
- Support for DS3600/DS3700 machine control features
- Remote connection for error isolation and troubleshooting.

System functions are performed at a single point of control through a user-friendly, enhanced graphical touch screen where the operator:

- Starts and stops printing
- Responds to messages
- Monitors status of the printing system.

Data Source Information

The data source provides data files, sometimes called job files, that contain information necessary for printing a job. A job file can include such information as font identification, font bitmaps, image positions, fixed data, and variable data. The CS400 can use any of the following data sources:

- CD/DVD drive
- Dedicated file server
- Any file system recognized by the MICROSOFT WINDOWS XP operating system.

Job files must have a filename extension of .IJP or .MPC, designating one of the two formats allowed for job files: IJPDS or MPC. The job format is independent of the data source connection.

IJPDS Input

IJPDS job files are generated by KODAK VERSAMARK Composer, DijiComp, or Begin software, or by user-supplied software. Fonts are included in IJPDS job files. IJPDS format requirements are described in the *IJPDS Formats Reference Guide*.

MPC Input

MPC job files are generated by the KODAK VERSAMARK MPC4 Data Prep software or by user-supplied software. Fonts to be used with MPC jobs are supplied separately. The MPC file format is described in the *File Formats* manual.

Modifying Setup Parameters

The setup parameters in IJPDS files cannot be edited or replaced, although the RIP (printer) assignments may be turned on or off, or they can be modified in the system software configuration. Software configuration changes must always be checked against the physical configuration of the printing system for compatibility.

Setup parameters in MPC files can be edited using the system software's MPC Job screen and the edited parameters can be stored in a file on the controller's drive for subsequent use. In fact, a different setup file can be substituted for the one in the MPC data file.

Fonts

Fonts for IJPDS jobs come embedded in the data file and cannot be changed or replaced in the system software. For MPC jobs, fonts required by the job must be placed in a single directory accessible to the system software. Although the CS400 comes with some standard fonts, it is recommended that you use the KODAK VERSAMARK Font Tools software to create the fonts required for your application. Font Tools creates high-quality fonts of the size and style you choose.

MPC job files require special files for fonts with different vertical and horizontal resolution (such as 300x600 dpi). Font Tools creates two fonts in a font file for this situation: one at 300x600 dpi and one at 600x300 dpi. Depending on the rotation required for the font in the image, the system software selects which of the two fonts to use.

The Font Tools software is factory installed on the controller PC, but it can also be installed and run on a separate WINDOWS PC along with the KODAK VERSAMARK IJPDS PC Proofer and the MPC4 Data Prep software. This second PC is generally connected through a LAN (Local Area Network) to the controller PC.

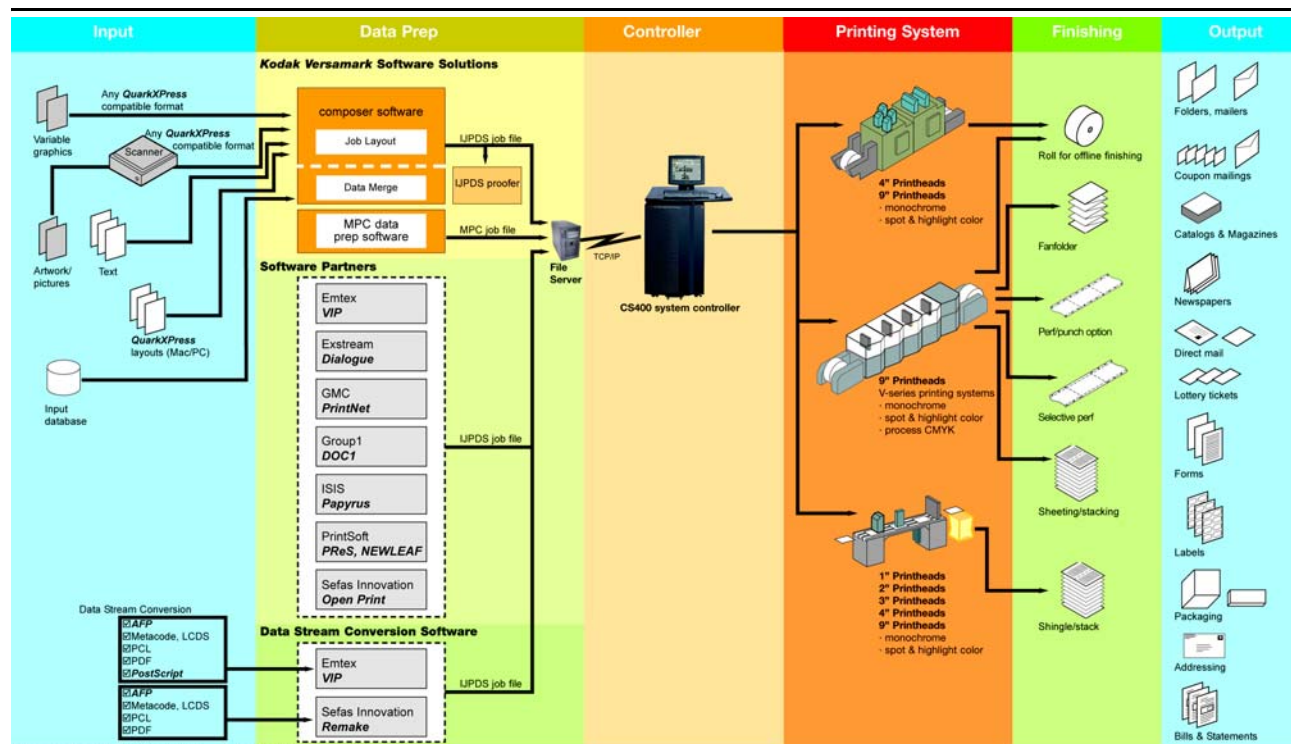
Networking

The CS400 comes with an Ethernet adapter card that has a connection for twisted pair cabling. The controller supports all networking protocols supported by WINDOWS XP.

Work Flow

Figure 2 illustrates the typical work flow with the CS400.

Figure 2 Work flow with the KODAK VERSAMARK CS400 System Controller



The CS400 operator starts the printing process by:

- Navigating to the location (typically a folder on a server) of the production IJPDS or MPC files
- Selecting and loading the job to be run
- Making any setup changes needed for that job
- Selecting the Start button on the user interface function bar (see Figure 5 and "Function Bar" on page 9).

Operation

The operator interface to the CS400 system software is designed primarily for use with a touch screen, although a mouse and keyboard can also be used. This custom interface occupies the entire area of the computer monitor screen.

This section:

- Explains how to start the system software
- Briefly explains the two operator modes
- Briefly describes the interface components that are common to all system software screens, and a few of the most commonly used screens and dialog boxes.

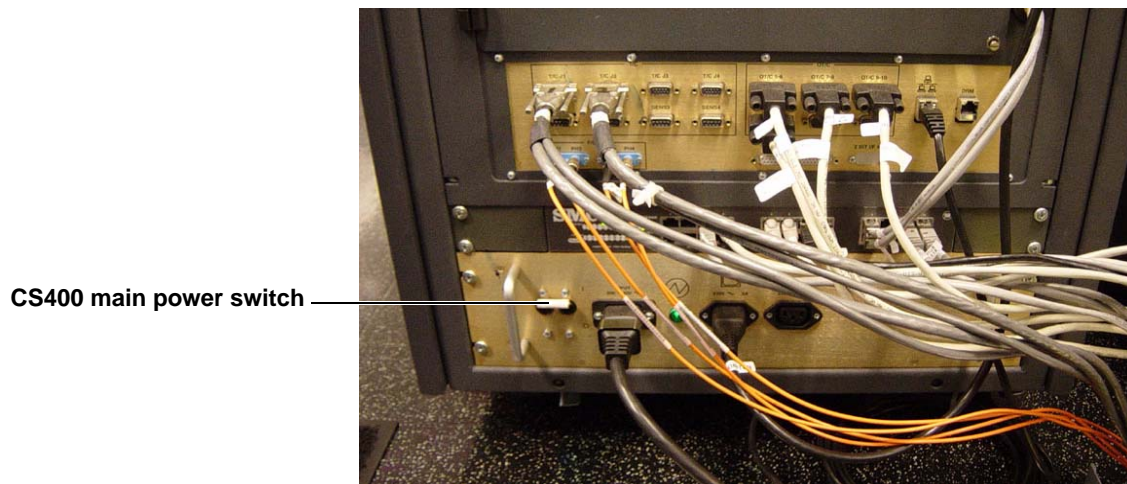
All operating procedures are described in detail in the CS400 online Help and in the Kodak Versamark printing system operator's guides.

Starting the System Software

To start the system software:

1. Flip the main power switch (see Figure 3), which is located near the bottom of the rear panel.
2. If necessary, power on the computer monitor.
3. Log on to WINDOWS.
4. In the WINDOWS Start menu, select **All Programs** → **Kodak Versamark, Inc** → **CS400 System Controller**.

Figure 3 Powering on the CS400

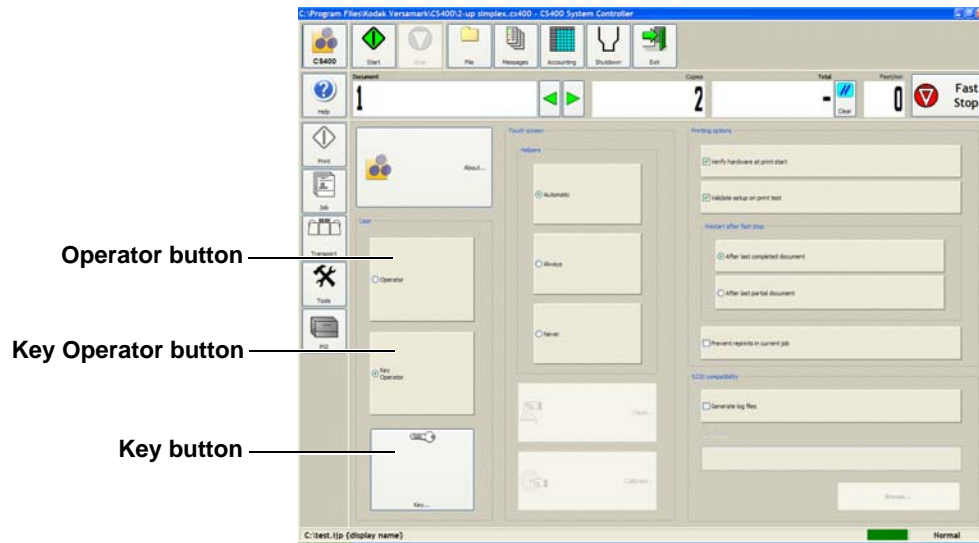


Operating Modes

The CS400 system software offers two modes of operation: operator mode and key operator mode. The system software starts in operator mode. The current operating mode is indicated by whether the Operator button or the Key Operator button is selected in the Application screen. In the following figure, key operator mode is active.

In operator mode, users have limited access to controller functions. In key operator mode, users have access to all controller functions. To enter key operator mode, a user must have access to a valid key operator password. The list of key operator functions can be customized to a customer's unique requirements.

Figure 4 Application screen

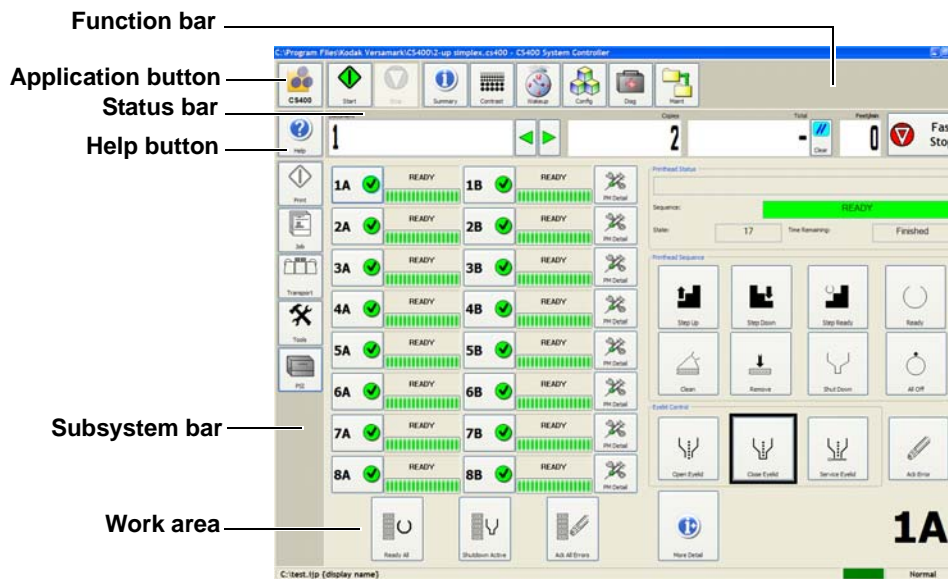


Common Screen Components

The system software comprises a number of screens, each of which has the following common components (see Figure 5):

- Function bar
- Application button
- Status bar
- Help button
- Subsystem bar
- Work area.

Figure 5 Common screen components
(Printhead Summary screen is displayed)

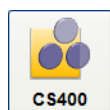


Function Bar

The function bar (see Figure 5) contains the buttons used to access various operator and key operator functions. The first two buttons, Start and Stop, always appear on the function bar.

Additional buttons appear to the right of the Stop button, depending on which of the subsystem bar buttons or the Application button is selected. Also, some buttons only appear in key operator mode.

Application Button



This button, which appears in the upper left corner of each system software screen, displays the Application screen (see Figure 4 on page 8), where you can:

- Get version and copyright information
- Enter or exit key operator mode, or enter or change a key operator password

- Enable or disable touch screen helpers
- Temporarily disable the “touch” mode so you can clean the touch screen
- Calibrate the touch screen
- Set or clear the “Verify hardware at print start” option
- Set or clear the “Validate setup on print test” option
- Specify restart behavior after a fast start
- Select or clear the “Prevent reprints in current job” security feature
- Specify that log files be created in the CS220 format.

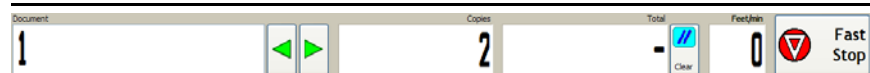
When the Application button is selected, buttons appear on the function bar allowing you to:

- Manage system setup files
- View, print, and purge the system message log
- Display, save, and print accounting information
- Shut down the printing system
- Exit the system software interface.

Status Bar

The status bar is located directly below the function bar.

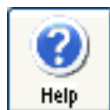
Figure 6 Status bar



The status bar contains the following indicators and buttons:

- Current document counter
- Previous and next document buttons
- Remaining number of copies to be printed counter
- Total documents printed counter
- Clear button (sets the total documents printed counter to zero)
- Current transport speed indicator
- Fast Stop button (stops printing immediately).

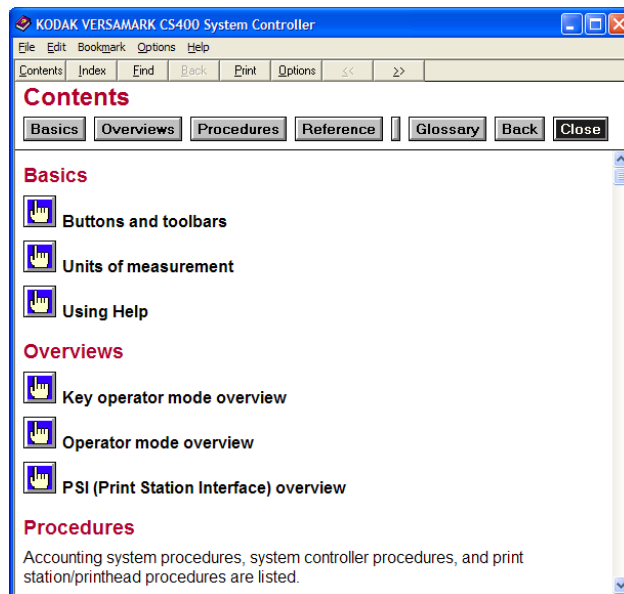
Help Button



Selecting the Help button, which is always available, displays Help (see Figure 7, below) for the current system software screen. The following oversized buttons have been added to each main Help topic to facilitate touch screen use:

- **Contents** - Displays Help topics organized into four categories: basics, overviews, procedures, and reference material.
- **Glossary** - Displays a list of terms used the Help system; you select a term to see its definition.
- **Back** - Like the standard Back button, it displays Help topics you have viewed before.
- **Close** - Closes the Help screen.

Figure 7 Help screen



Subsystem Bar

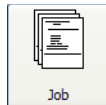
Each subsystem displays unique controls, readouts, and dialog boxes in the work area. Each subsystem may also have unique buttons to the right of the Stop button in the function bar.

The following buttons are always available, arranged vertically at the left side of the screen. You select one of these buttons to display the controls and readouts for a particular subsystem.



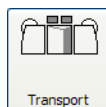
Print

- Control and monitor printing operations
- View system messages
- Set transport working maximum speed
- Make cue sensor settings
- Make printhead settings, including speed compensation and page correlation
- Control dryer power
- Adjust printhead registration
- Combine registration and cue delay
- View contents of a data file before printing
- Select and print a test pattern.



Job

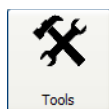
- Specify the job file type (IJPDS or MPC) and location
- View job information
- View or print IJPDS job setup information
- For MPC job files:
 - Specify how MPC automatic setup information is handled
 - View and edit print field parameters
 - Specify the font directory
 - Edit fixed messages.
- Configure logical printers
- Specify printing options for a logical printer, including cue mark printing
- Control how job files are handled by the system after a job finishes printing.



Transport

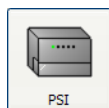
- Specify minimum start and print speeds
- Specify runout length

- Specify web tension
- Configure the system for page correlation
- Configure up to eight transport inputs for special uses
- Configure up to eight transport output signals that can be used to activate various external devices
- Configure up to eight auxiliary outputs
- Configure a newly assembled system
- Modify the system configuration when a major component, such as a printhead, dryer, and so forth, is added to or removed from the system
- View transport diagnostic information.



Tools

- Diagnose controller software problems
- Monitor network, tach and cue, and user input connections
- Change installation parameters
- Maintain tach/cue hardware
- View and/or print a printing hardware inventory list
- Perform minor maintenance on narrow format printers
- View and save or print diagnostic information.



PSI (Print Station Interface)

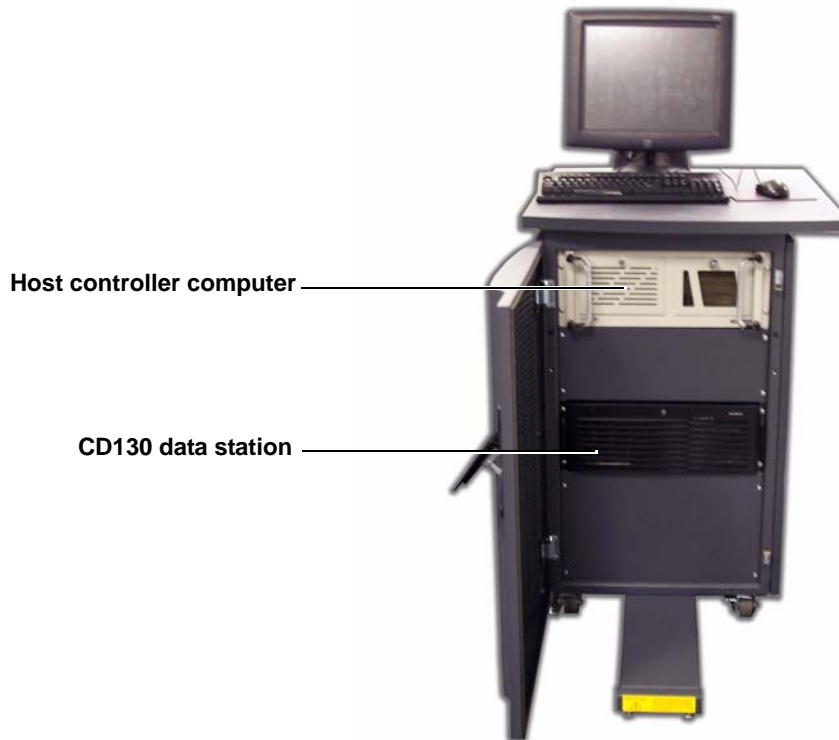
- Monitor and control print station and printhead operations
- Control printhead contrast
- Put printheads into or bring them out of standby mode
- Specify print station IP addresses
- Perform print station and printhead diagnostic procedures (for trained personnel only)
- Download a variety of files (including InkDex files) to print stations and printheads
- Delete InkDex files.

Work Area

Each subsystem displays its own controls, readouts, and dialog boxes in the work area, which is the part of the screen right of the subsystem bar and below the function and status bars.

Configuration

Figure 8 CS400 computers



The CS400 comprises the following major components:

- Host controller computer

Note: The Print Station Interface (PSI) software (for 9-inch printheads only) is integrated into the system software that runs in the host controller computer.

- CD130 data station
- Network switch
- CS400 cabinet
- Second cabinet (for two or more data stations).

The CS400 is highly customizable; therefore, yours may not contain every component or the same number of components as described here.

Some of the possible interconnections of the CS400 components are shown in Figure 9. The transport is not shown. A wide variety of printer and data station combinations are possible, with up to 16 total printheads.

Printing is started, monitored, and stopped at the CS400. The system controller software sends information in the job file to specific RIPs in the data stations in accordance with instructions in the job file and the physical configuration of the system.

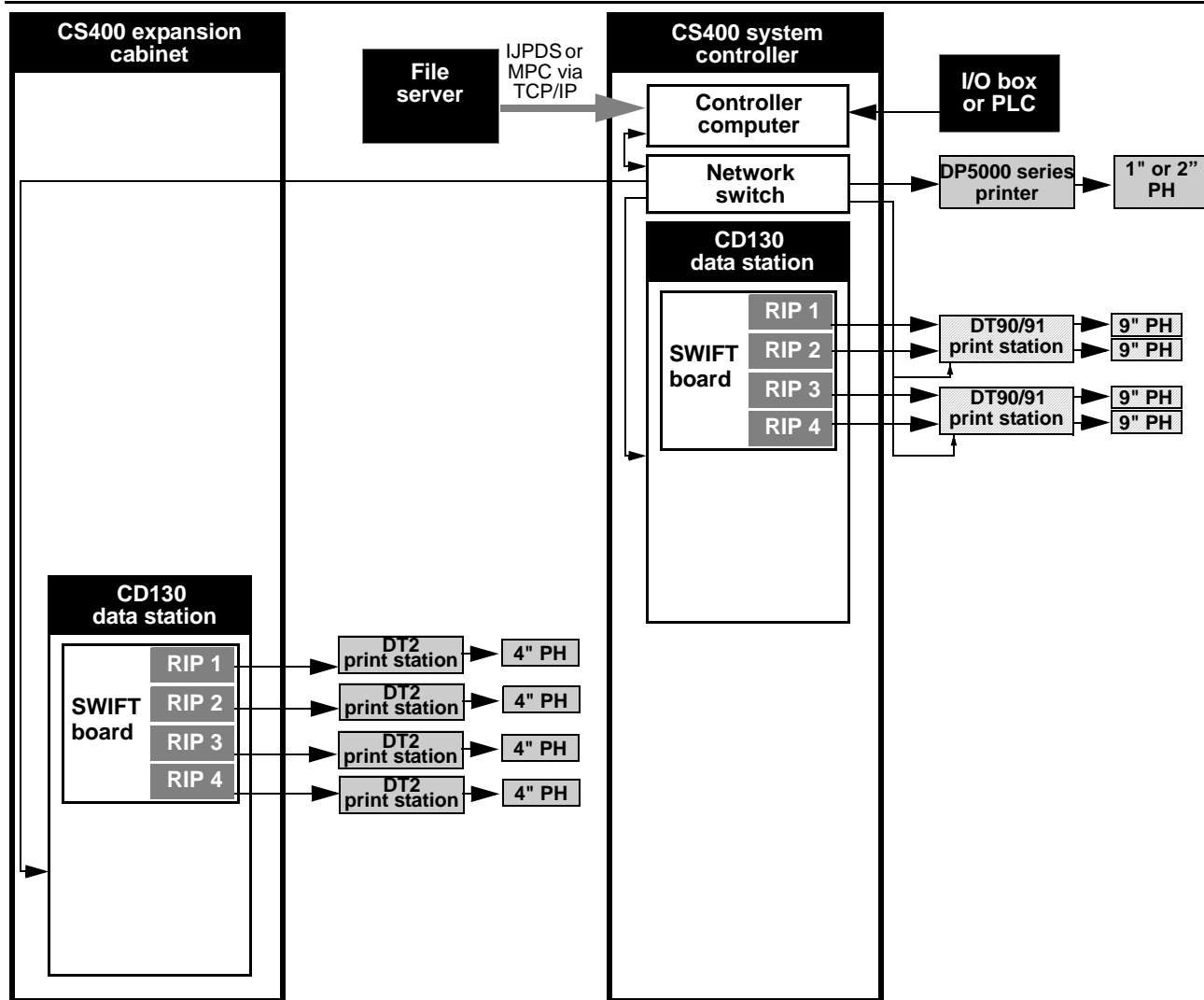
The CS400 can control systems with a mixture of printhead sizes, including the following:

- 9-inch printheads
Receive data from the CS400 through a CD130 data station. One data station must be dedicated to 9-inch printheads; all RIPs in one data station should be the same type. Each pair of RIPs in a 9-inch data station can be configured to provide a print width of 18 inches (2 x 8.96). One DT90 or DT91 print station is required for each pair of 9-inch printheads.
- 4-inch printheads
Receive data from the CS400 through a CD130 data station. One data station must be dedicated to 4-inch printheads; all RIPs in one data station should be the same type. All four RIPs in a 4-inch data station can be configured to provide a print width of 17 inches (4 x 4.27). A DT2 Print Station is required for each 4-inch printhead.
- 1-inch or 2-inch printheads
Receive data from the CS400 through the integrated data system in the printer. A printer is required for each printhead. The DP5122 and DP7122 printers have a 2-inch printhead. The DP5120 and DP5240 printers have a 1-inch printhead.

The installer or operator identifies the correlation of the RIPs available to each printhead used in the job. As many as four sets of tach and cue cables can be connected from the printing system, and the controller determines how the tach and cue signals are routed to each RIP, based on the operator identification of the printheads and RIPs. Internally, the controller routes up to eight outputs of tach and cue information to the data station(s). Each of these internal outputs can supply two RIPs, and each RIP can drive one printhead. Thus, there is a physical limitation of sixteen printheads.

A data station, which has two pairs of RIPs (four RIPs total), must supply its data to the same type of printhead. So a data station can supply data for four 9-inch printheads or four 4-inch printheads. A data station can also supply data to 1-inch or 2-inch printheads, but to only one of these printheads from each pair of RIPs.

Figure 9 CS400 components and connections



Specifications

CONFIGURATIONS/UP TO 16 PRINTHEADS

8 per data station:

4.27" printheads – DP6240 printer

3.41" printheads – DP6300 printer

2.77" printheads – DP5300 printer

4 per data station:

8.96" printheads – DH90 and DH91 (requires PSI [Print Station Interface])

1 per data station:

2.13" printheads – DP5122 printer

2.13" printheads – DP7122 printer

1.07" printheads – DP5120 and DP5240 printers

2.58" printheads – DP4300 printer

INPUT DATA FORMATS

IJPDS & MPC

DATA PREP SOFTWARE

Job files are created using KODAK VERSAMARK Composer software or MPC Data Prep software, or any user-supplied software that generates an IJPDS (Inkjet Printer Data Stream) or MPC file.

INPUT MEDIA

CD/DVD-ROM

Dedicated file server

Any operating system recognized/mounted file system

NETWORKING

The CS400 comes with an Ethernet adapter card that has a connection for twisted pair cabling. The controller supports all networking protocols supported by WINDOWS XP operating system.

CONTROLLER NETWORK CARD

1x10/100 mBit on processor, dedicated
2x10/100/1000 mBit on PCI, 1 available for user

Controller Display

17" LCD touch screen

Controller Computer

Industrial grade high-performance computer

CONTROLLER PHYSICAL DIMENSIONS

Width: 36" (91.5 cm) – includes top work surface

Depth: doors closed – 32" (81.3 cm)
doors open – 72.5" (184 cm)

Height: 40" (101.6 cm) [without monitor]

Weight: 380 lbs. (172.4 kg)

POWER REQUIREMENTS

200–240 VAC, 50/60 Hz, 10 amp

ENVIRONMENTAL OPERATING RANGES

Temperature: 60°F–85°F (15.6°C–29.4°C),

Relative humidity: 10%–90% non-condensing

Temperature: 85°F–104°F (29.4°C–40°C),

Relative humidity: 10%–60% non-condensing

Glossary

ASCII American Standard Code for Information Interchange. A standard 7-bit code used to represent a set of characters numbered 0-127. Extended, or 8-bit, ASCII adds characters 128-255. ASCII is usually used on PCs, workstations, and most minicomputers.

bitmap An arrangement of dots that represents text or graphics. The data station uses the dots in an arrangement of binary 1s and 0s to represent the presence and absence of ink drops and sends this data to the printheads.

bpi Bits per inch. A measure of tape density giving the number of bits that can be recorded on 1 inch (25mm) of magnetic tape.

category I font A KODAK VERSAMARK font that defines characters in cells that include character and line spacing. Character cells cannot overlap. Line escapement is in the positive Y direction only. See also *font*.

category II font A KODAK VERSAMARK font that defines characters in bounding boxes that contain only the character image. Character definitions allow both positive and negative X and Y character escapements and offsets. Line escapement is defined using positive and negative X and Y values. This font category permits character overlapping, vertical printing, and right-to-left printing. See also *font*.

cue A signal that represents the start of a document. A cue signal occurs each time the cue sensor detects the leading edge of a piece of substrate or a preprinted cue mark on a web.

cue compensation The optional process of generating cue signals to compensate for occasional missing cue signals from the cue sensor.

cue interval The distance between cue marks on a web. This distance usually equals the document length plus the space between two documents.

cue mark A preprinted mark on a web that is the reference point for the start of a new document.

cue noise A false cue signal that results from some object or imperfection on the substrate that the cue sensor detects or from imperfections in the circuitry of the cue sensor.

cue sensor A sensor that detects the beginning of a mark on a web or the leading edge of a piece of substrate.

cue window An interval during which a signal from the cue sensor is expected.

data station The component of the printing system that receives character-coded input data and produces image data in bitmap format that is sent to the printheads at the print stations.

document A unit of input data that is printed in one area of the substrate. A document may include more than one page. Most common data preparation establishes one document for each cue mark on a web or one document for each piece in cut-sheet printing. See also *page*.

dot 1. The smallest mark that can be printed by the printing system. 2. A unit of measure related to the resolution of the printhead and tach encoder. With a 300-dpi resolution, a distance of 1 dot equals 1/300 inch.

downstream The direction that is the same as substrate movement. See also *upstream*.

dpi Dots per inch, a measure of resolution.

EBCDIC Extended Binary-Coded Decimal Interchange Code. A standard 8-bit code used to represent a set of characters numbered 0 - 255. EBCDIC is usually used on IBM mainframe and midrange systems.

EOT marker A reflective strip on a magnetic tape that indicates the end of data (End Of Tape).

fixed data Print fields containing text and/or graphics that are printed on every document or on selected documents. See also *variable data*.

fixed message A text message composed during data preparation that can be printed on every document or on selected documents.

font A collection of characters that have the same typeface, style, weight, and point size. In KODAK VERSAMARK printing systems, fonts can also contain graphics identified by one or more characters codes. See also *category I font* and *category II font*.

IJPDS Inkjet Printer Data Stream. The proprietary KODAK VERSAMARK file format for job files used with KODAK VERSAMARK printing systems. See also *job file* and *MPC*.

ILS Interline spacing. The distance, in drops, to be added to the space between lines specified by the font. This is the Y component of line spacing.

image A pattern of filled and unfilled dots. It can be a character, a line of characters, or a graphic.

job file A file that contains information describing a print job. The file can contain setup information, fixed messages, font information, and variable data. For KODAK VERSAMARK printing systems, the standard file format for a job file is IJPDS. See also *MPC*.

MPC Multiple printer controller. A job file format accepted by MPC2 and newer system controllers. See also *IJPDS*.

orientation The relative position of the top left corner of a print field. Print fields can be rotated 360° in 90° increments, allowing four different orientations of 0°, 90°, 180°, and 270°. See also *rotation*.

page The data for a document in a page buffer. If the document data is equal to or less than the page buffer length, there is one page per document. If the document data length is greater than the length of the page buffer, there are two or more pages per document. See also *document*.

page correlation A feature that uses page correlation marks as machine-readable representations of numbers that are used to ensure that portions of a document, such as its front and back sides, match. Correlation marks are read by cue sensor hardware set up for page correlation use.

piece A discrete segment of substrate upon which the image is printed. For example, an envelope.

print field A portion of the complete document image that can be positioned and rotated separately.

print station The component of the printing system that receives image data in bit map format from the data station and produces a printed image as output. Each print station contains a fluid controller, umbilical, and printhead.

print width The maximum width of the area that can be printed by the printhead. It is usually given in inches or dots.

printhead The part of the print station that forms charged ink drops, allows uncharged drops to fall on the substrate, and recovers charged drops to be returned to the fluid cabinet. The printhead receives data in bit map format from the data station through a fiberoptic cable and uses ink and charge voltages from the fluid cabinet to create inkjet images.

resolution The degree of sharpness of an image created by a computer, measured in dots per inch (dpi).

RIP Raster image processor. The part of the data station that builds raster bit maps from character data received from the data input processor and sends bitmapped data to the printheads.

rotation The relative position of the top left corner of a print field. Print fields can be rotated to orientations of 0°, 90°, 180°, or 270°. See also *orientation*.

stitching The process where a single contiguous image is produced by two or more printheads.

substrate The surface on which an image is printed. The substrate can be a continuous sheet (*web*) or separate pieces of various types of material.

system controller The component of a printing system that accepts input data from magnetic tape, disk, or a network drive. It then formats the data according to job setup instructions and sends character-coded image data to the appropriate data stations and RIPs. The system controller is the primary operator interface to the printing system.

upstream The direction that is opposite that of the substrate movement. See also *downstream*.

variable data Print fields that change from document to document. See also *fixed data*.

web A continuous sheet of substrate.

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