



QUANTUM DS

Capabilities Overview

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Section 1 Introduction

The Digital Check Quantum DS (Desktop Sorter) has been designed using features/concepts from both the Digital Check SmartSource series scanners and the legacy Quantum product lines. This hybrid design allowed Digital Check to create a cost-effective, yet durable reader-sorter for use in a variety of processing environments. Its compact design and straightforward installation eliminates the need for special environmental considerations, such as a raised floor or dedicated electrical circuits; allowing it to be installed in a normal office environment. It was also designed to be durable and robust, with an integrated single baseplate to minimize potential alignment issues (as is typical with a modular product design) and improve wall-clock throughput.

Digital Check is committed to providing cost effective check and item processing hardware and middleware to enable clients to perform their mission critical tasks in an efficient and cost effective manner. As part of that commitment, Digital Check is pleased to include in its portfolio of payment processing systems, the Quantum DS as the next generation multi-pocket reader-sorter, perfectly suited to meet low to medium volume processing requirements. At a rated speed of 200 (6-inch / 15.2 cm) documents per minute, it is an intelligent powerhouse that fits on a desktop at an affordable price.



Figure 1 - Quantum DS



Figure 2 - Quantum DS - View from right side



Figure 3 - Quantum DS – rear view

Section 2 Standard Features and Options

Overview

The Quantum DS track was laid out to provide capabilities comparable to the SmartSource Open Professional and Quantum reader-sorters. The Quantum DS incorporates an open track, to allow for the easy removal of items in the track when necessary. The Quantum DS provides codeline recognition (MICR and/or OCR), upstream front image capture, multi-line endorsing, downstream rear image capture and sorting in a 12-pocket configuration. The system also incorporates an open track design, to allow items that are taller than the image cameras to be processed. Note that only the bottom 4.25 inches (10.8 cm) of the item will be captured by the image cameras.

Platform Features

AUTO-FEEDER / INPUT HOPPER

The input hopper of the Quantum DS can handle up to 300 (24 lb/90gsm) items. It was designed to allow additional items to be added to the input hopper while it is actively processing items. It also features the SmartSource Open Professional *auto-open* feature once the hopper is empty. This allows the operator to easily re-fill the hopper while in an idle state. Once items have been added and the sorter has received the command to begin processing, the input hopper is automatically closed. The feeder area also incorporates our industry proven, infra-red optical, two-position, double document detection hardware and software as a standard feature on the Quantum DS.



Figure 4 - Input Hopper

MICR READER

The MICR (Magnetic Ink Character Recognition) reader is auto-sensing for E13B and CMC7 fonts and provides the same high read rates you have come to depend on with Digital Checks scanners. A MICR reader option is included to favor either: fewest *mis-reads* or fewest *can't-reads*. The MICR read rate is greater than 99.7% with a variety of document types, including both low level and very high level MICR printing, in addition to normal MICR documents.

OCR READER

Up to two OCR codelines (selected under application control) may also be recognized. These fonts include OCR-A, OCR-B and E13B. The height of these two codelines is also software selectable within the image capture height

constraints, to provide flexibility in capturing codeline information, regardless of its position on the document.

The two scanbands, each 0.50 in (1.27 cm) in height, are supported with a maximum of 96 characters per band. The position of the bands is configurable and controlled by the application. With combined MICR/OCR (MOCR) read, only one additional scan band is available.

Barcode recognition is also available as part of the OCR software option. Barcode fonts currently include 2 of 5, 3 of 9, UPC and GS1.

E13B OCR (MOCR) is provided at no additional charge to enable combined MICR/OCR reading of E13B documents, resulting in combined read rates of up to 99.9%.

IMAGE SUBSYSTEM

The front image camera on the Quantum DS is positioned *upstream* of all functions except for MICR reading. The front image camera captures at 300 dpi and can provide multiple renditions of the item for subsequent processing. Up to three unique image renditions/resolutions of the front of the item can be captured in a single pass. Options include multiple, compressed greyscale and/or black and white image renditions to provide flexibility for image exchange as well as image archiving applications (i.e. 240, 200, 120 or 100 dpi, greyscale [JPEG] / 240 or 200 dpi, bi-tonal [CCITT]). High-resolution image renditions may also be produced for CAR, LAR and ICR software engines, providing exceptional quality images for the data-mining applications. The early availability of the front image also provides time for inline pocketing decisions based on the image data without interrupting item flow.

The rear image camera is positioned *downstream* from the endorser to allow the rear image of the item to be captured after any physical endorsement has been printed. The rear image camera captures at 300 dpi and can provide multiple renditions of the item for subsequent processing. Up to two unique image renditions/resolutions of the back of the item can be captured in a single pass. Options include multiple, compressed greyscale and/or black and white image renditions to provide flexibility for image exchange as well as image archiving applications (i.e. 240, 200, 120 or 100 dpi, greyscale [JPEG] / 240 or 200 dpi, bi-tonal [CCITT]).

Image renditions are made available to the application software with Tagged Image File Format (TIFF) 6.0 image file format using the CAPI file structure. For technical information about the image file structure, refer to Digital Check CAPI Programmers Reference document; which is available along with the CAPI software.

REAR ENDORSER

The Quantum DS provides the same high quality endorsement capability as the SmartSource Professional series of scanners. This includes multiple quality settings, 1 to 4 lines of endorsement and the ability to include graphics, such as logos. The endorser mechanism also offers two selections for the physical endorsement height on the item. The same ink cartridge as is used by the SmartSource series of scanners is used for endorsing on the Quantum DS.

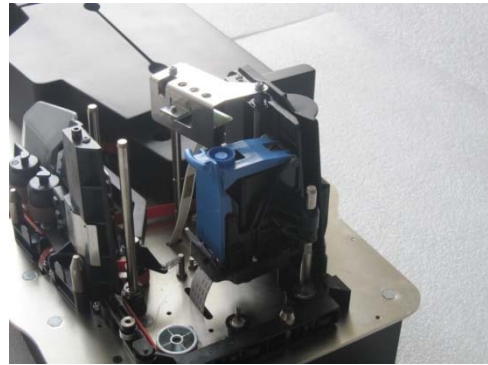


Figure 5 - Endorser

The rear, non-impact, 600-dpi ink-jet endorser prints as many as four lines of text and/or graphical information under control of the application software and endorsement decisions can be based on data read from the document (MICR or OCR) codeline. If required, information from the document codeline can be included in the endorsement of the same item.

The endorser is located in the track before the rear image scanner. An operator positions the print head in one of two vertical positions for height control. The application controls horizontal positioning. A programmatically controlled cleaning cycle sprays small amounts of ink from the nozzles to maintain proper print head function. The ink-drop count is tracked (and reset when the ink cartridge is changed) to deliver a low-ink warning message that can be displayed by an application.

Characteristics of the endorser are as follows:

- Endorsing in real-time - decisions may be based upon the MICR code line
- Ink-jet endorser printing at 10 characters per inch (cpi)
- Two manually-selectable height positions, each with as many as four lines of printing at application software-selectable horizontal positions
- Variable horizontal print location of as many as 56 characters for a 6-inch (15.2 cm) document, controlled by the application software
- Three levels of print quality (economy, standard, or premium)
- Support for one or two resident fonts
- Support for graphical content, TrueType fonts, and various foreign fonts

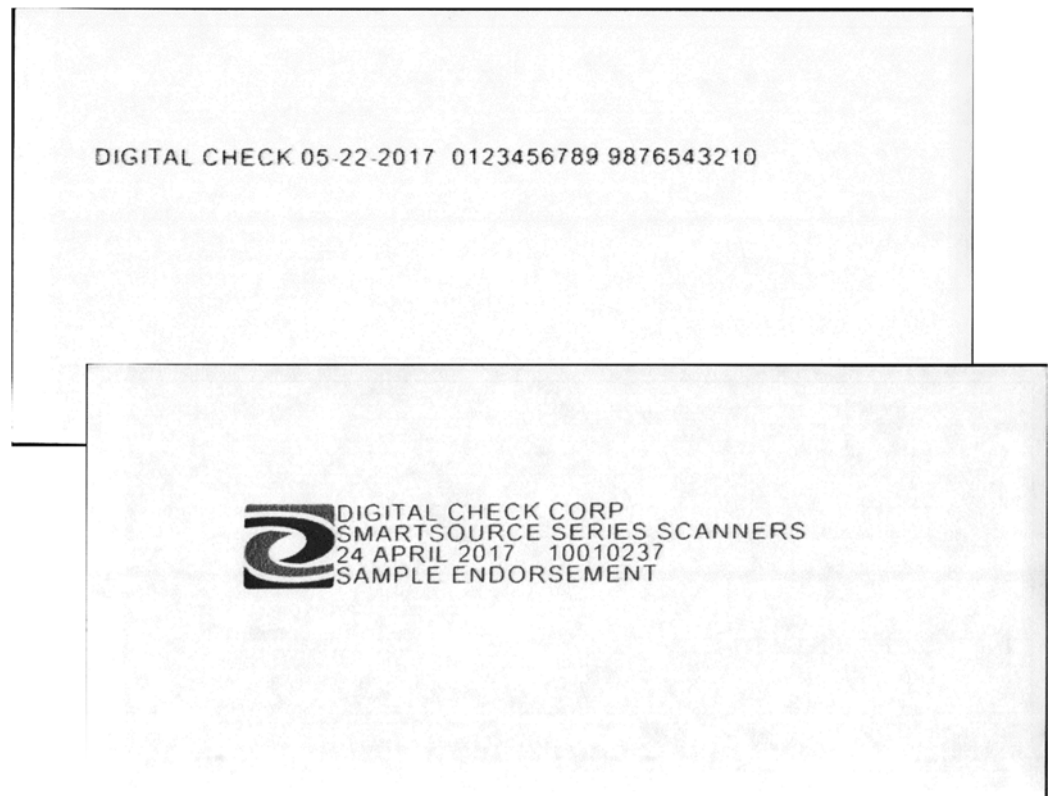


Figure 6 - Sample Rear Endorsements

SORT POCKETS

The sort pocket configuration for the Quantum DS is 12 pockets. The pockets each hold up to 200 items and include pocket full sensors and indicators for easy operator identification and action.



Figure 7 - Sort Pockets

- Upon detection of a pocket full status, the specific pocket indicator light changes from green to yellow. The pocket full indicator automatically resets (to green) once the pocket has been emptied.
- When there is a track exception (e.g. document jam condition) in the pocket area, the pocket indicator light changes from green to red. The indicator resets (to green) once the exception has been cleared.

An operator-adjustable pocket limit bar provides a capability to adjust the depth of the pocket for more effective stacking of longer or shorter documents.

The Quantum DS track includes the capability (if no other pocket is selected by the application software) to eject the document through the end of the unit into a customer-supplied receptacle (tray or bin).

The system also provides the capability to define *logical pockets*. Logical pockets allow the system to define multiple physical pockets to be defined as a single logical pocket, enabling greater throughput due to less frequent stoppages.

OPERATOR COMMUNICATION AND CONTROLS

Although the primary control of the Quantum DS is via a PC-based graphical user interface (GUI), controlled by the application software; status indicators (i.e. LEDs) on the Quantum DS are provided for additional operational feedback to the operator to indicate the following conditions:

- power is connected to the unit
- data interface is functioning
- unexpected track stop indicator



Figure 8 - LEDs and Stop/Start Button

In addition, indicators at each pocket provide an indication to the operator as to the status of each pocket. (see *Sort Pockets*)

The Start/Stop button may be used to flush the track after an exception condition (e.g. document jam). Documents in the track are routed to the last pocket (e.g. pocket 12) in this process. This feature may also be disabled/enabled by the application software.

Track Controller

The Quantum DS employs a user-provided, single track controller (system controller) for both track control and image capture/data storage. The minimum technical specification for the system is contained in Appendix D.

Application Interface - CAPI

The Quantum DS system software includes the Common API (CAPI), Microsoft Windows-based track interface and utilities. These combine to make the Quantum DS a powerful, industry-standard and cost-saving document processor.

CAPI is the system software interface to the Quantum DS that controls all processing and imaging functions. Quantum DS CAPI has been designed for smooth migration of applications written for SmartSource or legacy Quantum CAPI and offers the following advantages:

- Common development tools
- Common interface to the application
- Common and intuitive operator interface
- Faster development and training cycles

A System Exerciser is included with the system software. The System Exerciser is a tool that enables testing of the system functions and runs under the Windows operating system. Images captured using the System Exerciser can be displayed using the ImageView utility to visually confirm images captured.

Section 3 Quantum DS Deployment

The Quantum DS runs under control of application software with a middleware interface. The application and middleware software require an underlying operating system, all of which constitute the platform. Quantum DS devices are designed for a smooth implementation, especially where application software written for the CAPI-based legacy Quantum series products is being migrated to the Quantum DS platform.

The CAPI middleware supports the following operating system environments:

- Windows 7 Professional (32-bit and 64-bit)
- Windows 10 Professional (32-bit and 64-bit)

The architecture for the Quantum DS assumes that each Quantum DS device is controlled by a dedicated track controller PC. The Quantum DS is connected to the track controller PC via a USB 2.0 connection. It is through this connection that the application provides all control commands and retrieves codeline (MICR and/or OCR) data along with all image data.

See Appendix D for the minimum requirements of the track controlled PC.

Section 4 Support and Services

Maintenance

Maintenance and support is made easy by Digital Check's diagnostic software, preventive maintenance and a first-class, worldwide network of Authorized Service Providers (ASP). Digital Check's equipment is designed to perform reliably and to be easy to maintain and repair. Industry-standard components are arranged to provide ready access for field replacement of components and parts. Diagnostic indicators are readily visible, and status messages are easy to understand. The number of tests and adjustments required for maintenance and support are minimal and straightforward.

Maintenance for the Quantum DS assumes on-site support. The Quantum DS comes equipped with a simple service fixture, to allow a single service engineer to easily access all parts of the machine from either the top or the bottom. The single, durable base plate also eliminates flimsy module connections, resulting in a lower service call rate compared to competitive devices.

Internationally, maintenance and support contracts are available through our network of Digital Check Authorized Service Providers (ASP). Pricing for such service is established by the local ASP based on their specific criteria.

Support

For Digital Check independent software vendors and other business partners, the Digital Check support desk provides additional expertise for your technical questions.

Additional support services and updated product information and API information is available online at the API support portal of the Digital Check web site. ASPs may contact their Digital Check representative, support desk or support portal for maintenance documentation, parts catalog and related pricing.

Product-Related Documentation

PS13-0203-300	Quantum DS Specification Sheet
PS14-0217-200	Quantum DS Specification Sheet (Spanish)
PS14-0218-200	Quantum DS Specification Sheet (French)
82275345-000	Quantum DS Series Installation and Operations Guide
82275344-000	Quantum DS Maintenance Manual
43266808-005	Document Design Guidelines

Additionally, the Common Application Program Interface (CAPI) Programming Reference Guide is an HTML Help file that is provided along with the CAPI software.

Appendix A Quantum DS Specifications

Performance	Sustained 200 documents per minute (dpm) for 6-inch (15.2 cm) documents
Hopper capacity	300 documents – 24 lb / 90gsm
Pocket capacity	200 documents per pocket – 24 lb / 90gsm
Number of pockets	12 pockets
MICR reader	Auto-detect reads intermixed E13B and CMC7 documents
OCR reader	Up to two OCR codelines selected under application control – Fonts: OCR-A, OCR-B, E13B Barcode recognition (Requires OCR reader) – 2 of 5, 3 of 9, UPC, GS1
Rear ink-jet endorser	Up to 600 dot per inch (dpi) print resolution Logo graphics 1 to 4 lines of endorsement text True type fonts Selectable quality level (Economy, Standard, Premium)
Image	Image renditions available - Bi-tonal (black/white) - Grey level (256 grey shades) Image resolutions available - 240 or 200 dpi, bi-tonal - 240, 200, 120 or 100 dpi, grey level Image Capture combinations available Front image capture (up to three images) - 240 or 200 dpi, bi-tonal (CCITT) - 240 or 200 dpi (full resolution), grey level (JPEG) - 120 or 100 dpi, grey level (JPEG) Rear image capture (up to two images) - 240 or 200 dpi, bi-tonal (CCITT) - 240 or 200 dpi (full resolution), grey level (JPEG) - 120 or 100 dpi, grey level (JPEG)
Power	100-240 V 5A 50/60 Hz
Non-volatile Memory (NVM)	4KB
Safety / Compliance	UL/TUV, CSA, CE, FCC-Class A, VCCI, CCC compliant with China RoHS
Operating Systems	Microsoft Windows 7 Professional - 32-bit Microsoft Windows 7 Professional - 64-bit Microsoft Windows 10 Professional - 32-bit Microsoft Windows 10 Professional - 64-bit

Operating Environment	Temperature: 15°C to 40°C (59°F to 104°F) Humidity: 20% to 85% RH non-condensing at 40°C Altitude: Sea level to 8,000 ft (excludes endorser cartridge)
Application API	Digital Check CAPI for Quantum DS
Device Driver Signing	Microsoft WHQL-compliant
Dimensions:	
QDS2008-SYS	Length: 39.7 in 100.8 cm Depth: 13.5 in 34.3 cm Height: 8.8 in 22.5 cm Weight: 46.3 lbs 21.0 kg
QDS20012-SYS	Length: 49.3 in 125.2 cm Depth: 13.5 in 34.3 cm Height: 8.8 in 22.5 cm Weight: 59.5 lbs 27.0 kg
Shipping Dimensions: (boxed for shipping)	
QDS2008-SYS	Length: 47.6 in 121.0 cm Depth: 17.7 in 45.0 cm Height: 11.9 in 30.2 cm Weight: 97.0 lbs 44.1 kg
QDS20012-SYS	Length: 57.1 in 145.0 cm Depth: 17.7 in 45.0 cm Height: 11.9 in 30.2 cm Weight: 128.0 lbs 58.2 kg
<i>Includes maintenance fixture</i>	

Appendix B Document Specifications

	Minimum	Maximum
Length	7.4 cm (2.9 in)	23.5 cm (9.25 in)
Height	5.1 cm (2.0 in)	10.8 cm (4.25 in.) ¹
Length to Height ratio	1.5 : 1	--
Thickness	0.1 mm	0.15 mm
Paper weight (nominal)	75 gsm (20 lb) - long grain	90 gsm (24 lb) - short or long grain
Card stock (degraded stop rate)	--	131 gsm (35 lb)
Automated Teller Machine (ATM) envelope ² height (degraded stop rate)	--	10.8 cm (4.25 in)
ATM envelope length	--	23.5 cm (9.25 in)
MICR correction label or strip	Single correction label thickness with strip not to exceed maximum document height	
Carrier envelope	Not to exceed maximum height and length with document inserted	

¹ The maximum viewable image height (field of view) is 10.8 cm (4.25 in) measured from the bottom of a document.

² ATM envelope specifications apply to 75 gsm (20 lb) or 90 gsm (24 lb) stock.

Contact Digital Check with questions about processing documents that are outside of the specification ranges listed above.

Appendix C Configuration Guidelines

This table lists the styles to be ordered for the 12-pocket Quantum DS configuration. Optional features are noted in the right-hand column. Variations are noted below.

QDS20012-SYS	200 DPM SYSTEM, 12 POCKETS	
QDS200-OCR	OCR/BARCODE	Optional
QDS200-LTNT7	CAPI FOR WINDOWS 7 / WINDOWS 10	
QDS200-THL	Capi SW Op&HW Diag Lic Key 200 DPM	
68749423-000 ¹	PWR CORD-USA/CANADA 125V	

Configuration Notes:

¹ For installation in countries other than the USA and Canada, the appropriate line cord needs to be selected from the table below.

Line Cord Table

For installation in countries other than the USA and Canada, include the appropriate line cord (power cord) in the configuration from this table:

STYLE ID	DESCRIPTION
68722321-000	PWR CORD-W EUROPE 10A 250V
82235805-000	PWR CORD-SWISS 10A 250V
82235813-000	PWR CORD-ITALY 10A 250V
68722099-000	PWR CORD-UK 10A 250V
82235755-000	PWR CORD-AUSTRALIA 10A 250V
82235763-000	PWR CORD-DENMARK 10A 250V
82235797-000	PWR CORD-INTL NO PLUG
82263435-000	PWR CORD-BRAZIL IEC 60320-C13
82235771-000	PWR CORD-S AFRICA 10A 250V
82235748-000	PWR CORD-SJT US/CAN 250V
82235789-000	PWR CORD-ISRAEL 10A 250V

Upgrade styles:

QDS200-UPOCR	Upgrade for OCR/Barcode
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Appendix D Track Controller – Minimum Requirements

A Track Controller needs to be provided by the system integrator or user. The application software is then installed and runs on this PC Track Controller.

The minimum requirements for the track controller (system controller) to drive one Quantum DS device is as follows:

CPU:	Intel® Core™ i3 processor, dual-core, 3.3 GHz CPU
Memory:	2 GB DDR
Disk:	250 GB
USB:	USB 2.0 port (to connect Quantum DS)
DVD Reader:	To load software
Operating System:	Microsoft Windows 7 (32-bit or 64-bit) or Microsoft Windows 10 (32-bit or 64-bit)
Keyboard, display, mouse	

Appendix E Supplies and Consumables

	Catalog Number	Description
	822120984	Ink Cartridge
	750306904	Feed Tire Kit - 1 set of 3 tires per kit
	750850920	Feed Rollers & Separator Assembly
	750489908	Separator Tire (25/kit)
	IS0033	Check Scanner Cleaning Card featuring Waffletechnology® (15/box)
	751804907	Image Glass Cleaning Pads (pre-saturated with isopropyl alcohol) – 80 / carton

	Catalog Number	Description
	750381907	Track Clearing Spatula (package of 5)
	752010884	Cotton Wiping Cloths (6 in x 6 in) (box of 150)
	751447848	Cotton Wiping Cloths (6 in x 6 in) (box of 600)
	161308994	USB Cable - 2 Meter USB 2.0 A/B Cable, White
	750501900	Micro-duster (box of four 10 oz cans) <i>Note: For shipment within the continental US only.</i>
	752010901	Digital Check SmartJogger

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