

KDC200 USER MANUAL

Rev1.4



KoamTac
A New Wave in Auto ID

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KoamTac doesn't assume any product liability arising out of, or in connection with, the application or use of any product, circuit, or application described herein.

Follow all warnings and instructions marked on manual and units

Use only the power source specified in this manual or marked on the units

TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS UNIT TO ANY TYPE OF MOISTURE

DO NOT LOOK DIRECTLY INTO LASER or point the laser into another person's eyes. Exposure to the beam MAY CAUSE EYE DAMAGE.



Caution RF EXPOSURE INFORMATION.

A minimum separation distance of 7.9 inches (20cm) must be maintained between the user and the external antenna of repeater to satisfy FCC RF exposure requirements. For more information about RF exposure, please visit the FCC

CAUTION

Changes or modifications not expressly approved by the manufacturer responsible for compliance could void the user's authority to operate the equipment

WARNING

This device complies with part 15 of the FCC 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.

INFORMATION TO USER:

This equipment has been tested and found to comply with the limit of a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, 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, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

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

CAUTION

RISK OF EXPLOSION IF BATTERY IS REPLACED AN INCORRECT TYPE.
DSPOSE OF USED BATTERIES ACCORDING TO THE INSTRUCTIONS

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Chapter 1 KDC200 Introduction

KoamTac data collector KDC200 is a compact, light and powerful reader with a rechargeable battery, OLED display, large memory and connections to PC, PDA and cellphone using Bluetooth and Serial/USB cable.

KDC200 is well suited for a variety of portable applications. It can be used as an accessory to a PDA or cellphone as well as an independent data collector.

The key features of KDC200 are

- **Bright OLED display**
- **Optional Bluetooth V2.0+EDR, Class2, SPP (Serial Port Profile)**
- **Built in Serial & USB connector**
- **Rechargeable Li-Poly battery with separate installation space for easy replacement**
- **Top of the line laser scan engine**
- **Auto uploading scanned data to the host device upon connecting either serial, USB or Bluetooth**
- **Large data memory**

KDC200 also provides seamless integration of barcode capability into your application by providing a user friendly data synchronization software and application software development kit.

Chapter 2 Installation and Operation

Unpacking

The standard KDC200 package¹ contains:

- One laser scanning data collector unit,
- One USB cable,
- One Neck strap and
- One CD containing the software and user manual.



¹The package content may vary by region.

Installation

Prior to installing the included software on your PC, verify that your system meets the minimum system requirements.

1. Microsoft Windows operating system: XP or Vista
2. Free space on hard drive of 512 MB.
3. Accessible USB port for connecting KDC200 to your computer
4. 256M byte memory or larger.

Affix the neck strap to the KDC200

Use the included neck strap properly to avoid dropping the unit.

Fit the small thin cord of the strap around the pillar of the KDC200 and loop the thick cord of the strap through the thin loop in order to attach the hand strap.

Wear the neck strap when carrying the product to avoid dropping the unit.

Do not swing the product around on the strap, since contact with another object may damage the unit and cause it to malfunction.

Copy the Provided Programs into your PC

Create a directory for the KTSync program.

Copy the “KTSync.exe” program from the CD into the new directory on your hard drive.

It is recommended that you also copy “KTReader.inf” and “KDC200.User.Manual.1.2.pdf” into the same directory.

Connect the KDC200 USB connector to your PC

Connect KDC200 to PC USB port. Use the included USB extension cable if needed.

The “New hardware found” message will pop up.

Follow the prompts and select the option to search for the best driver for your device.

Please select the directory containing the “KTReader.inf” file and continue hardware installation procedure.

A message will pop-up that new hardware is found and recognized as a serial device.

Charge the battery

The battery is charged by connecting KDC200 to a USB port. It takes about two hours to fully charge the battery. The front panel LED will illuminate in orange during the battery charge. The front panel LED will illuminate in green upon charging the battery in full.

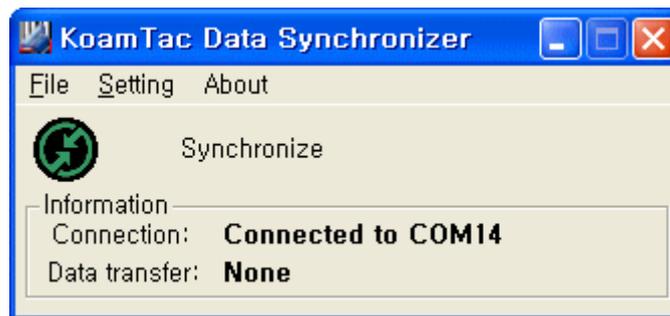
Configure KDC200 options and system settings

User can access menu selection mode by pushing both buttons on the left side of the KDC200 simultaneously.

- Please set KDC200 options properly for the best performance.
- Please refer KDC200 menus section for the details on options.



User also can configure most of options at KTSync > Setting > Barcode & KDC menu. Please refer Chapter 3 Synchronization for the detailed description of each option.



Location of buttons



Basic Operation

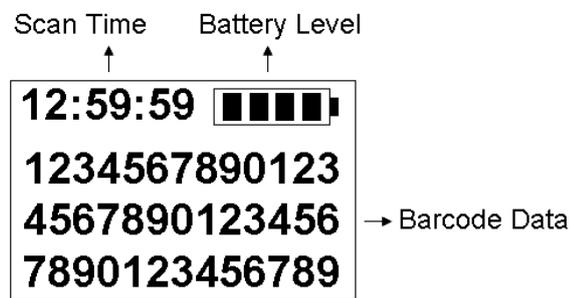
Reading barcodes

Point KDC200 to the barcode and press the scan button.

A high beeper tone will be heard and the front panel LED will illuminate in green upon a successful scan.

A low beeper tone will be heard and the front panel LED will illuminate in red upon an unsuccessful scan.

The scanned barcode will be displayed, along with time stamp and battery level.



When the barcode cannot be read, try the following:

- Check if the width of barcode label does not exceed the width of the light beam.
- Change the angle between the barcode and KDC200.
- Change the distance between the barcode and KDC200.
- Check option settings defined in KDC200 menu section.

Upload barcode data to PC.

Use the included Synchronization program to upload barcode data from KDC200 to your PC. Please refer Chapter 3 for the details of Synchronization process.

KDC200 Menus

User can access menu selection mode by pushing both buttons on the left side of KDC200 simultaneously. The table below summarizes KDC200 menus. Please refer to Chapter 4 for the details of each option.

User should set KDC200 optional parameters properly for the best scanning result.

- Set proper security level. To increase the reliability ,user can set the security level to a number higher than 1 (the default value) up to 4. If the security level is n , then the decoder will keep reading the barcode until it decodes the same value n times.
- Select only necessary barcodes to increase the reliability further.
- Maximize the minimum barcode length. Small barcode length such as 2 or 3 can result in some errors.

Level 1	Level 2	Note
View Data	Delete	Review and delete stored data
Set Barcodes	EAN13	Enable/Disable Symbology
	EAN8	Enable/Disable Symbology
	UPCA	Enable/Disable Symbology
	UPCE	Enable/Disable Symbology
	CODE39	Enable/Disable Symbology
	ITF14	Enable/Disable Symbology
	CODE128	Enable/Disable Symbology
	I2of5	Enable/Disable Symbology
	CODABAR	Enable/Disable Symbology
	EAN128	Enable/Disable Symbology
	CODE93	Enable/Disable Symbology
	CODE35	Enable/Disable Symbology
	BooklandEAN	Enable/Disable Symbology
	EAN13withAddon	Enable/Disable Symbology
	EAN8withAddon	Enable/Disable Symbology
	UPCAwithAddon	Enable/Disable Symbology
UPCEwithAddon	Enable/Disable Symbology	
(Bar)Code Options	CodaBar_NoStartStopChars	
	UPCE_as_UPCA	
	EAN8_as_EAN13	

	UPCE_as_EAN13	
	ReturnCheckDigit	
	VerifyCheckDigit	
	UPCA_as_EAN13	
	I2of5_VerifyCheckDigit	
	Code39_VerifyCheckDigit	
	I2of5_ReturnCheckDigit	
	Code39_ReturnCheckDigit	
	UPCE_ReturnCheckDigit	
	UPCA_ReturnCheckDigit	
	EAN8_ReturnCheckDigit	
	EAN13_ReturnCheckDigit	
Scan Options	Scan Angle	Narrow/Wide
	Filter	Normal/High
	Time Out	1..10 sec
	Minimum Barcode Length	2..36
	Security Level	1..4
Data Process	Wedge / Store	Wedge Only
		Wedge & Store
		Store Only
		Wedge & Store if Sent
		Wedge & Store if Not Sent
	Data Format	Barcode only
		Packet data
Handshake	Enable/Disable Handshake	
Bluetooth	Power	Enable/Disable
	Pairing	Enter Pairing Mode
	Auto Connect	Enable/Disable
	Auto PowerOff	Enable/Disable
	Auto PowerOn	Enable/Disable
	Beep Warning	Enable/Disable
	PWR OFF Time	1min ~ 30min
System	Memory Status	# of stored barcode, amount of remaining memory

	Reset Memory	Empty data memory
	Sleep Timeout	Disable.. 10min.
	Date / Time	YYYY:MM:DD, HH:MM:SS
	Battery	% left
	Version	FW version. Serial Number
	Factory Default	Restore factory default settings

View Data Menu

User can browse and delete scanned barcode in View Data menu.

Set Barcodes Menu

KDC200 supports most of popular barcode symbologies. However, it is important to select only the required symbologies to provide the best scan performance. Please refer to Appendix A for the details of supporting symbologies.

Barcode Options Menu

KDC200 supports various barcode options including transmission of start and stop characters, symbology conversion, verification of optional check character, and transmission of check digit. Please refer Appendix A for the details of each option.

Scan Options Menu

- Scan Angle: User can control the laser beaming angle. Wide is 54° and Narrow is 27°. Default is Wide.
- Filter: User may use Higher filter mode for poor quality barcode. Default is Normal
- Timeout: User can set scanning timeout up to 10 sec. Default timeout is 2 sec.
- Minimum barcode length: User can set the smallest barcode size up to 36. It is strongly recommended to maximize the minimum length to prevent possible wrong readings. Default is 4.
- Security Level: Higher security level provides more reliable readings with some performance degradation. It is recommend to increase the security level for poor quality barcodes. Default is 1.

Data Process Menu

Wedge / Store - KDC200 provides three modes of data transmission.

- Wedge Only: KDC200 doesn't store scanned barcode in the memory and just transmits it to the host
- Wedge & Store: KDC200 stores scanned data in the memory and transmits it to the host
- Store Only: KDC200 stores scanned data in the memory but doesn't transmit it to the host.
- Wedge & Store if Sent: KDC200 stores scanned data in the memory if it transmits to the host successfully
- Wedge & Store if Not Sent: KDC200 stores scanned data in the memory if it fails to transmits to the host

Data Format - KDC200 provides two data formats

- Barcode Only: KDC200 transmits scanned barcode only. User may incorporate proper data transmission error detection and correction mechanism in this mode.
- Packet Data: KDC200 transmits packet data with checksum to minimize transmission error. KTSync program operates in Packet Data mode and user shouldn't change this option while using KTSync program.

Handshake - KDC200 provides handshake mode when sending packet data

- Handshake mode will increase the reliability of packet data transmission.
- The default is disable handshake mode.

Bluetooth Menu

KDC200 supports rich Bluetooth features to increase usability as well as to minimize the power usage. Please refer to Chapter 3 for details on Bluetooth functions.

System Menu

- Memory Status: User can check the number of stored barcodes and memory usages in this menu.
- Reset Memory: This menu enables user to erase all stored barcodes.
- Sleep Timeout: KDC200 goes to sleep mode after scanning barcode to minimize the power consumption. Default sleep timeout is 5 sec.
- Date/Time: User can set current data and time in this menu. KTSync program also provides automatic date and time synchronization with PC date and time function.
- Battery: This menu shows the current status of battery power level.
- Version: This menu shows the firmware version number and KDC200 serial number.

LED Status

LED Color	Status
Green	<ul style="list-style-type: none">• Successful Reading• USB is connected and battery is fully charged
Orange	<ul style="list-style-type: none">• Low battery• USB is connected and battery is charging
Red	<ul style="list-style-type: none">• No reading• Empty battery

Empty Battery

KDC200 will display “Empty Battery Connect USB” message if the battery becomes empty. User should synchronize the data immediately to prevent the loss of collected data.

Buffer Full

KDC200 will display “Buffer Full” message if the size of collected data reaches 200K byte or collected 10,240 data. User should synchronize and clear the memory to continue data collection using Synchronization program.

Reset

User can reset KDC200 as follows:

- Plug KDC200 USB connector to PC USB port.
- Press lower menu button and scan button together for 5 seconds.
- Release lower menu button and scan button once LED becomes yellow.
- Initial screen (“KoamTac Data Collector KDC200”) is displayed once reset.
- KDC200 stores collected data into flash memory and wouldn’t lose the data during reset process.



Replacing Battery

User can purchase new battery from local distributor and replace the Li-polymer rechargeable battery as follows:

- Disassemble back cover (Unscrew middle screw only)
- Replace battery and assemble back cover



Chapter 3 Bluetooth

KDC200 supports a generic Bluetooth COM port and compatible with following Bluetooth stacks.

- BlueSoleil
- Broadcom (Widcomm)
- Microsoft Windows XP SP2, Vista and Mobile
- Toshiba

KDC200 may be able to connect to other Bluetooth stacks supporting SPP (Serial Port Profile) other than listed above.

Power On/Off Bluetooth Power

Bluetooth is very power consuming process and careful power management is required. It is strongly recommend to **POWER OFF** Bluetooth if KDC200 wouldn't be used for an extended period.

Auto Power Off Bluetooth

User can Enable/Disable Auto Bluetooth Power Off feature in Auto PowerOff menu. The default is Enable and strongly recommended to keep it Enable to maximize the KDC200 operation time.

If Auto PowerOff is enabled, KDC200 powers off Bluetooth if KDC200 is **NOT CONNECTED** to the Host for the duration defined in PWR OFF Time menu. User can power on Bluetooth manually once powered off.

PWR OFF Time

If Auto PowerOff is enabled, KDC200 powers off Bluetooth if KDC200 is **NOT CONNECTED** to the Host during the time duration defined in this option. User can set Auto power off time between 1minute to 30 minutes.

Auto Power On Bluetooth

User can Enable/Disable Auto Bluetooth Power On feature in Auto PowerOff menu. The default is Disable.

If Auto PowerOn is enabled, KDC200 powers on Bluetooth if KDC200 Bluetooth power is off and user triggers scan button. Host program may have to open COM port again to reconnect to KDC200.

Pairing KDC200 to Host Device

User should pair KDC200 with Host Device first. This pairing process doesn't have to be repeated once Host device recognizes KDC200.

User can set KDC200 to pairing mode by selecting Pairing menu.

- “Pairing started” message will be displayed once entering pairing mode.
- Enter PIN “0000” once requested by Host
- “Pairing success” message is displayed once host sets up Bluetooth connection successfully before pairing timeout (60sec).
- “Pairing failed” message is displayed if failed to setup a Bluetooth connection with Host.
 - User can ignore this message if Host shows “Connected” message
 - KDC200 doesn't show “Pairing success” message unless Host opens corresponding Bluetooth COM port

Connecting KDC200 to Host Device

User should connect KDC200 to host device before using Bluetooth feature. Please refer to host device manual for the proper Bluetooth connection procedure.

KDC200 would display “Bluetooth connected” message once connected with host device.

Auto Connecting KDC200 to Host Device on Power On

KDC200 can be connected to host device automatically upon Power On Bluetooth if Auto Connect is Enabled. The default is Disabled and discouraged to use this feature unless fully tested with host device.

Some host devices do not support this feature and will result delay and power loss if Enabled but not connected automatically.

Beep Warning

KDC200 beeps the Bluetooth connection status.

- High short beep tone will be played once Bluetooth is connected.
- Low short beep tone will be played once Bluetooth is disconnected.

KDC200 will beep 5 times with short beep if

- “Beep Warning is ENABLED” and
- “Auto PowerOff is DISABLED” and
- “KDC200 is DISCONNECTED from HOST” and
- “Bluetooth power is ON”.

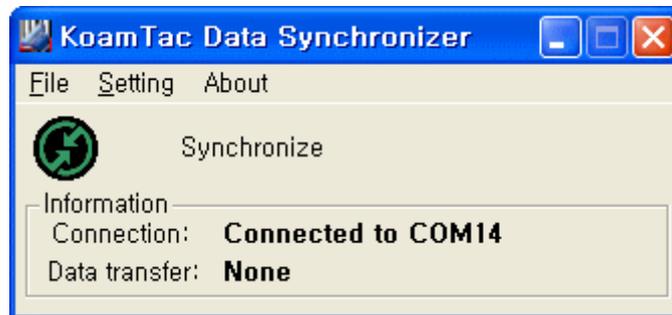
KDC200 will beep for one second if Bluetooth power becomes OFF by Auto PowerOff option

Chapter 4 Synchronization

KTSync has two major functions – Synchronization and Keyboard Emulation. KoamTac Synchronization provides data upload functions to any Windows XP application. Keyboard Emulator enters scanned data directly into any XP application programs as if it was manually typed on the keyboard. KTSync also provides the following additional functions:

- Prefixes, suffixes add function which further eliminates the need for manual data entry
- Symbology and Scan Option selector
- Barcode Wedging.

You will see the following screen when launching KTSync application.



File Menu

- Connect : Select com port manually
- Synchronize: Synchronize KDC200 data with host manually

Setting Menu

- Synchronize: Select Synchronize options
- Barcode & KDC: Select Barcode and KDC options

About Menu

- KTSync version information

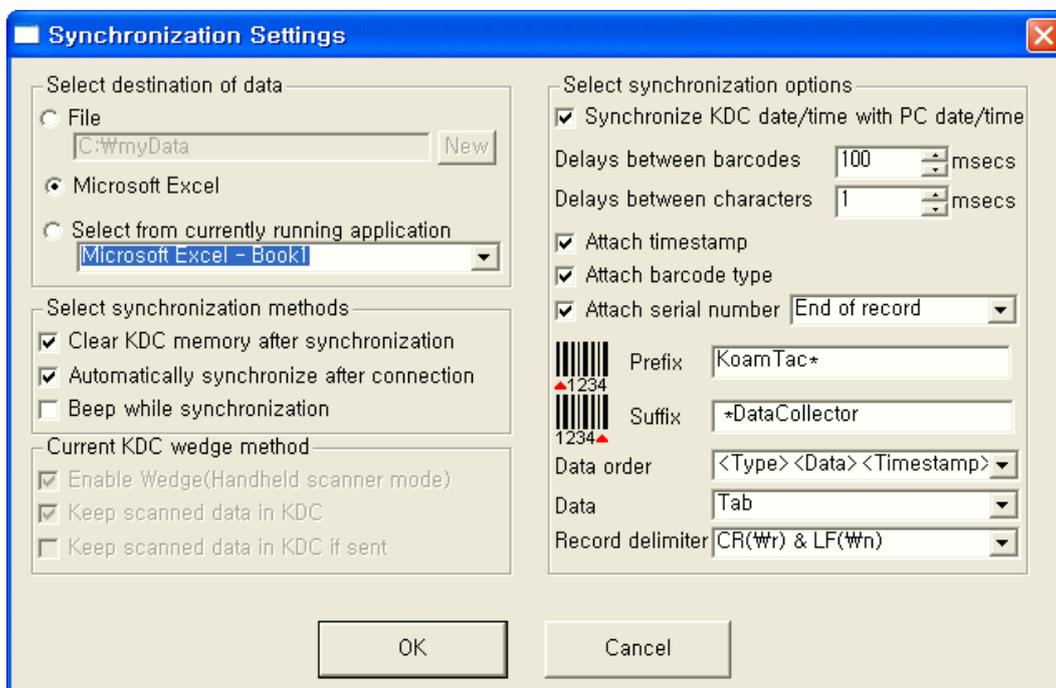
Connection

The KoamTac KDC200 connects to com port automatically once it is plugged into USB port. User can also manually assign com port using Connection submenu under File menu if needed.



Synchronization

KDC200 provides several synchronization options with hosts such as PC, PDA and Cellphone. The standard package includes the software for Windows XP/Vista synchronization. If you need cellphone or PDA integration, please contact your local representative. User can configure various Synchronization and Keyboard Emulation functions in the “Synchronization Settings” option.



Select destination of data

User can save the collected data into a file or import to a Windows application.

User can select the target directory and filename by clicking “New” icon. “C:\MyData” is the default directory.

There are two options to import the collected data into a Windows application

- Import into Excel if “Microsoft Excel” is selected
- Import into user selected application if “Select from currently running application”

User should not operate the PC during the synchronization process. It can interrupt synchronization process and will result in undesired behavior.

Select Synchronization Method

There are two synchronization options that user can select.

Clear KDC200 memory after synchronization

User can clear the KDC200 memory after synchronization if this option is selected. KDC200 can store maximum 10,240 or 200K byte barcode data. It is important to clear the KDC200 memory periodically to prevent memory full status which will prevent user from storing additional data.

Automatically synchronize after connection

User can synchronize collected data with PC automatically by selecting this option. It is important to configure other synchronization options properly before performing an automatic synchronization operation.

Beep while synchronization

User can enable or disable beep tone during the synchronization process. KTSync program generates a beep tone for each barcode data coming from KDC200 if beep tone is enabled. It beeps 5 times once KTSync finishes synchronization process.

Current KDC Wedge Methods

This section shows current KDC200 Wedge/Store option under Data process menu. KDC200 can be configured in one of the following three Wedge/Store mode

- Wedge Only – The scanned data is transmitted to the host. However, KDC200 wouldn't store the scanned data.
- Wedge & Store – The scanned data would be stored in KDC200 and transmitted to the host.

- Store Only – The scanned data would be stored in KDC200. However, KDC200 wouldn't transmit scanned data to the host.
- Wedge & Store if Sent: The scanned data would be stored in KDC200 if it transmits to the host successfully

Enable Wedge (Handheld scanner mode)

Enable Wedge (Handheld scanner mode) would be marked if either Wedge only or Wedge & Store option is selected.

Keep Scanned Data in KDC

Keep scanned data in KDC would be marked if either Store only or Wedge & Store option is selected.

Select Synchronization Options

Synchronize KDC200 time with PC time when connected

This option enables user to synchronize KDC200 date and time with host computer date and time. KDC200 date and time would be synchronized with PC date and time once connected to PC.

Delays

User can set transmission delays between barcodes and characters during the synchronization process. It is important to set proper delays to prevent errors during the transmission of collected barcodes. Some Windows applications such as Excel require longer delay time.

Prefix and Suffix

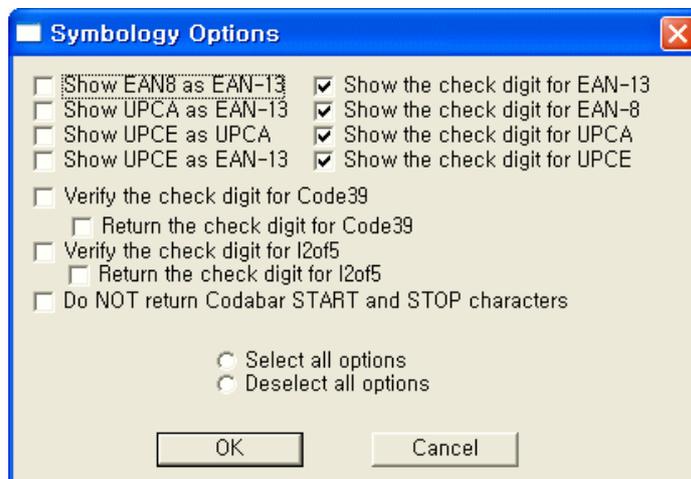
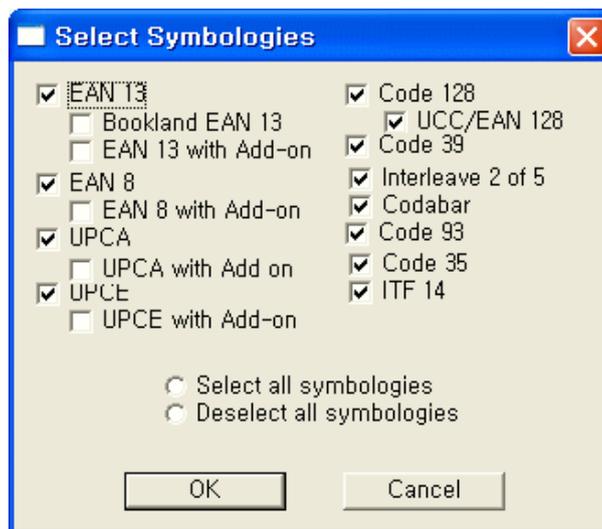
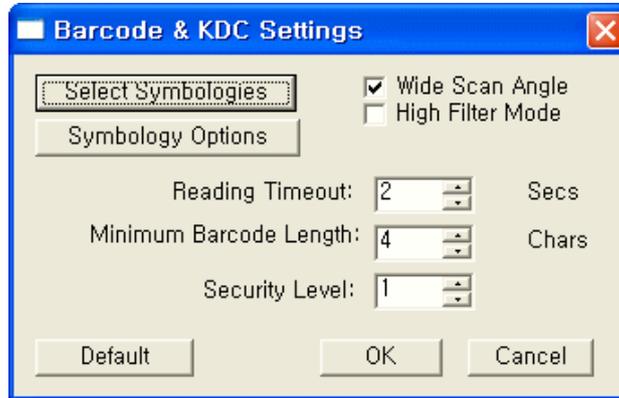
- Enter the characters you want to append in the prefix and suffix field.
- The character set would be any combination of ASCII characters including alphanumeric, line fee (“\n”) and carriage return (“\r”)

Order and Delimiter

- User can select the order of data – Type, Data, Timestamp
- User can select the delimiter between data – Tab, Space, Comma, Semicolon
- User can select the delimiter between records – LF, CR, Tab, LF & CR

Barcode Selection

User can configure barcode options in the Scan Module Settings menu. Please refer to Appendix A for the proper settings of barcode options for your application. It is very important to configure proper barcode options for the best performance.



Chapter 5 Troubleshooting

Problem	Possible Cause	Possible Solution
The laser scanner is not working	Batteries are dead	Charge the battery by connecting USB cable with PC
	Hardware failure	Contact technical support
The scanner is not scanning	Damaged barcode	Try to scan a different barcode
	Out of scan range	Move the scanner closer or farther from the barcode
	Incorrect angle	Change the angle until the scanner reads the barcode
	Not supported symbology	Contact sales for the possibility of custom symbology support
	Scan options	Check the option settings
	Dirty Scan Window	Clean the scan window
The scanner reads wrong barcode	Damaged Scan Window	Replace the scan window
	Dirty Scan Window	Clean the scan window
	Poor quality printing	Select only necessary barcodes Increase the minimum barcode length Increase security level
Can't communicate with PC, PDA or cellphone	Cable is not connected properly	Check the proper connection of cable between scanner and PC, PDA and cellphone
	Bluetooth is not connected	Check the Bluetooth connection between KDC200 and host device.
	Software is not working properly	Reload the software
	COM configuration	Check COM port configurations
LED blinks yellow	Low battery	Charge the battery by connecting USB cable with PC Will lose collected data if the battery is empty.
Buffer Full Message	No Memory	Clear the Memory using Synchronization program
Empty Battery Message	No Battery	Connect USB immediately. Synchronize the collected data and charge KDC200

Chapter 6 Warranty

LIMITED WARRANTY AND DISCLAIMERS

BY OPENING THE PACKAGE OF THIS PRODUCT YOU AGREE TO BECOME BOUND BY THE LIABILITY AND WARRANTY CONDITIONS AS DESCRIBED BELOW.

UNDER ALL CIRCUMSTANCES THIS MANUAL SHOULD BE READ ATTENTIVELY, BEFORE INSTALLING AND OR USING THE PRODUCT.

Serial number

A serial number appears on the KDC200 label. This official registration number is strictly related to the device purchased. Make sure that the serial number appearing on your KDC 200 is not removed. Removing the serial number will affect the warranty conditions and liability disadvantageously, so please be strict at maintaining the label with serial number on the KDC200. Units with the serial number label removed should not be operated.

Warranty/Warranty period/Liability

KoamTac, Inc. ("KoamTac") manufactures its hardware products in accordance with industry-standard practices. Unless otherwise agreed in a contract, KDC200 is warranted for a period of one year after purchase, covering defects in material and workmanship except rechargeable battery. KoamTac will repair or, at its opinion, replace products that prove to be defective in material or workmanship under proper use during the warranty period. KoamTac will not be liable in cases (i) in which the unit has been repaired or altered unless done or approved by KoamTac, (ii) in which the unit has not been maintained in accordance with any operating or handling instructions supplied by KoamTac, (iii) in which the unit has been subjected to unusual physical or electrical stress, misuse, abuse, power shortage, negligence or accident or (iv) in which the unit has been used other than in accordance with the product operating and handling instructions. Preventive maintenance is the responsibility of the customer and is not covered under this warranty. Under no circumstance will KoamTac be liable for any direct, indirect, consequential or incidental damages arising out of use or inability to use either the hardware or software, even if KoamTac has been informed about the possibility of such damages.

Warranty Coverage and Procedure

During the warranty period, KoamTac will repair or replace defective products returned to KoamTac's warehouse. International customers should contact the local KoamTac office or support center. If warranty service is required, KoamTac will issue a Return Material Authorization Number. Products must be shipped in the original or comparable package, shipping and insurance charges prepaid. KoamTac will ship the repaired or replacement product freight and insurance prepaid. Customer accepts full responsibility for its software and data including the appropriate backup thereof. Repair or replacement of a product during warranty will not extend the original warranty term.

Contact Information

116 Village Blvd. Suite 200, Princeton, NJ 08540, USA

TEL: +1-908-734-4335, FAX: +1-609-226-4373

Email: info@koamtac.com

URL: www.koamtac.com

WARNING

CAUTION: Changes or modifications not expressly approved by the manufacturer responsible for compliance could void the user's authority to operate the equipment

Appendix A. Barcode and Scan Options

KDC200 uses a high performance laser scan engine, but it still needs proper setting for the best performance.

Reading a barcode is a delicate and complicated process. Please do not try to change default settings unless you clearly understand the impact of the changes.

Supporting Barcodes

KDC200 supports the following barcode symbologies. It is important to select only the required symbologies to provide the best scan performance.

- EAN13, EAN8, UPCA, UPCE
- Bookland EAN, EAN13 with Addon, EAN8 with Addon, UPCA with Addon, UPCE with Addon
- Interleave 2 of 5, ITF14
- Code128
- Codabar
- EAN128
- Code39
- Code93
- Code35

Bookland EAN vs. EAN-13

“Bookland EAN” (that is, the group ISBN, ISSN, and ISMN) is supported by KDC200. This group of symbology is essentially a EAN-13 barcode with fixed prefix: 977 for ISSN, 978 for ISBN and 979 for ISMN. If EAN-13 and Bookland EAN are both enabled, then Bookland EAN takes precedence. Bookland EAN does not have any options.

The Bookland EAN barcode does not contain any groupings – that is, there are no ‘-’ separators. Thus, the ISBN 957-630-239-0 will be transmitted as 9576302390.

Addon Symbologies

By default, the 2- or 5-digit add-on symbol with a UPCE, UPCA, EAN-8, and EAN-13 barcode is neither decoded nor transmitted. Its transmission for specific symbologies can be enabled by setting the appropriate

“withAddon” options. There are 4 options – one for each symbology: **UPCEwithAddon**, **UPCAwithAddon**, **EAN8withAddon**, and **EAN13withAddon**. The decoding of add-on symbols is typified by the following table, which explains the process for EAN-13 symbols:

Mode	Behavior	Value of flags	
		EAN13	EAN13withAddon
Auto-discrimination	If add-on symbol is present, then it is also decoded; otherwise only the EAN-13 symbol is decoded.	true	true
With add-on	Only EAN-13 barcodes with 2 or 5 add-on symbol are decoded.	false	true
Without add-on	The add-on symbol is ignored.	true	false

The add-on symbol is appended to the EAN-13 barcode. The process is similar for UPCE, UPCA, and EAN-8 barcodes. Note that all the UPCE, UPCA, EAN-8, and EAN-13 formatting and conversion options are in effect. The following table should help explain the effect of various options for EAN-8 barcode 12345670 + 12:

Barcode	EAN8_as_EAN13	EAN8_ReturnCheckDigit	EAN13_ReturnCheckDigit
1234567012	false	true	N/A
123456712		tFalse	
00000123456712	true	N/A	false
000001234567012			true

The add-on symbol neither contains check digit nor a terminating guard band. Every effort has been made to reduce the decoding error; however, it is likely to decode a partial scan of a 5-digit add-on symbol as a 2-digit add-on symbol. It is strongly recommended that the security level be set to minimum 2 while decoding add-on symbols.

Since the decoder takes a conservative view on the add-on symbols, it is likely that the add-on symbol will be missed in the auto-discrimination mode. Auto-discrimination mode should then be avoided.

Barcode Options

KDC200 supports the following barcode options

- Transmission of start and stop characters
- Reverse direction
- Symbology conversion
- Verification of optional check character
- Transmission of check digit.

Transmission of Start and Stop characters

For Codabar symbols user can choose not to transmit the start and stop symbols (the so called “NOTIS Editing”). By default, they are transmitted. Setting the field **CodaBar_NoStartStopChars** to true disables the transmission.

Reverse Direction

This option may be selected if direction oriented symbologies are selected such as code35.

Symbology conversion

By default the EAN-8, UPCE, and UPCA symbols are transmitted in their native format. It is possible to show them in a different format. User can choose to display UPCE symbols as either UPC-A or EAN-13 symbols, EAN-8 symbols as EAN-13 symbols, and UPC-A symbols as EAN-13 symbols. The following table shows the effect of setting various options:

Option	EAN-8	UPC-A	UPC-E	All others
EAN8_as_EAN13	Converted to EAN-13	No effect	No effect	No effect
UPCA_as_EAN13	No effect	Converted to EAN-13	No effect	
UPCE_as_EAN13	No effect	No effect	Converted to EAN-13	
UPCE_as_UPCA	No effect	No effect	Converted to UPC-A	

Verification of Optional “Check Digit”

Code39 and Interleave 2 of 5 have an optional check digit, which, by default, is not verified. Their verification can be enabled by selecting the option **VerifyCheckDigit** to true or user can enable the verification for individual symbologies:

Option Selected	Verify Code39 check digit	Verify I2of5 check digit
VerifyCheckDigit	Yes	Yes
Code39_VerifyCheckDigit	Yes	No effect
I2of5_VerifyCheckDigit	No effect	Yes

If the check digit verification fails then the barcode is not transmitted.

Transmission of “Check Digit”

By default, the check digit – optional or mandatory – is not transmitted. Its transmission can be enabled for all symbologies by enabling **ReturnCheckDigit** option.

Option Selected	Is the check digit returned?					
	EAN-13	EAN-8	UPC-A	UPC-E	Code39	I2of5
ReturnCheckDigit	Yes	Yes	Yes	Yes	Yes	Yes
EAN13_ReturnCheckDigit	Yes	No effect				
EAN8_ReturnCheckDigit	No effect	Yes	No effect	No effect	No effect	No effect
UPCA_ReturnCheckDigit	No effect	No effect	Yes	No effect	No effect	No effect
UPCE_ReturnCheckDigit	No effect	No effect	No effect	Yes	No effect	No effect
Code39_ReturnCheckDigit	No effect	No effect	No effect	No effect	Yes	No effect
I2of5_ReturnCheckDigit	No effect	No effect	No effect	No effect	No effect	Yes

Resolution of inconsistencies

Three types of inconsistencies could arise in the assignment of symbology options. The decoder has pre-defined strategies to resolve these inconsistencies:

If **UPCE_as_EAN13** is true, then **UPCE_as_UPCA** is ignored.

If symbology conversion is selected but the target symbology is not enabled, then the decoder still outputs the symbol in the target symbology. For example, suppose UPC-E is enabled and **UPCE_as_EAN13** is true but EAN-13 is disabled. All UPC-E symbols will be shown as EAN-13 and EAN-13 options (if specified) will be

applied.

For the two symbologies that have optional check digits – Code39 and Interleave 2 of 5, the decoder will always transmit the check digit if the verification is disabled:

Verify Check Digit	Return Check Digit	Description
Disabled	Enabled or Disabled	Check digit is not verified but is transmitted
Enabled	Disabled	Check digit is verified but is not transmitted
Enabled	Enabled	Check digit is verified and is transmitted

System Information

User can set up sleep time between 1 and 10 seconds. Please set up correct date and time before using the KDC200 for the first time, after replacing the battery or after resetting the device.

User can check the memory and battery status in the system menu. The installed firmware version and device serial number can also be verified in the system menu.

Miscellaneous Barcode Information

How tall should a linear barcode symbol be?

Industry standards suggest a height of either 6.5mm or 15% of the symbol length, whichever is greater. Symbols of lesser than recommended heights may cause recognition problems.

Should I use check characters?

Yes, we recommend the use of check-characters in barcodes. Operating without check-characters is not safe and will lead to errors that are costly to correct. Using check-characters positively effects data integrity especially when character density is at the limits and/or image quality is not at it's best.

Prevents Interleave 2 of 5 Partial Reading

A partial scan of an Interleave 2 of 5 symbol may decode and cause incorrect data to be read. To prevent partial scans on long symbols, user should include bearer bars. These are bars that run along the top and bottom edges of the symbol in the scanning direction. If a partial scan of the symbol occurs, the scanning beam will hit the bearer bar and will not decode. The bearer bar must touch the top and bottom of all the bars and must be at least 3X wide.

Another solution for the short scanning problem is to fix all Interleave 2 of 5 symbols to a set number of digits. Zeros can be used to pad the data to the set number of digits. The application program would then be set to only

accept scans of the correct number of digits.

Finally, a check digit may be used. The Interleave 2 of 5 symbology has an optional check character which uses a weighted Modulo 10 scheme. The check character is the last character in the symbol and should be checked by the decoder and then transmitted with the data. Since Interleave 2 of 5 must always have an even number of digits, the leftmost character may need to be a zero when the check character is added. The standard check digit is calculated by assigning alternating 3,1,3,1... weights to respective data digits. These weights are then multiplied by their respective data digits and the products are summed. The check digit is the digit needed to be added to the sum to make it an even multiple of 10. An example would be if the sum of the products was 37, the check digit would be 3.

How many barcodes can we store?

The number of barcodes that can be stored in these bytes depends upon the size of the barcodes

Example: If only UPCA barcodes are scanned and the check digit is not transmitted, then each barcode takes up 11 (barcode data) + 2 (total bytes) + 2 (length and type) + 4 (time stamp) = 19 bytes. The maximum number of UPCA barcodes that can be saved is $204,800/19 = 10,778$. However, the maximum number of barcodes that can be stored is 10,240. Therefore, the KDC200 can store 10,240 UPCA barcodes.

If different length barcodes are mixed, then a user cannot compute a priori the maximum number of barcodes that can be stored.

What happens when the data buffer is full?

When the buffer is full, KDC200 displays buffer full message and ignores the command to scan barcodes. User should clear the buffer to continue the data collection.