DIEBOLD NIXDORF

BA9x BCR

2D Barcode Reader

User Manual

We would like to know your opinion on this publication.

Please send us a copy of this page if you have any constructive criticism.
We would like to thank you in advance for your comments.
With kind regards.

Your Opinion:

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Order-No.: **01750292649 D**

BA9x BCR

2D Barcode Reader

User Manual

Edition September 2018

Contents

Manufacturer´s Certification

The device complies with the requirements of the EEC directive 2014/30/EU with regard to 'Electro-magnetic compatibility" and 2014/35/EU "Low Voltage Directive" and RoHS directive 2011/65/EU.

Therefore, you will find the CE mark on the device or packaging.

FCC-Class A Declaration

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 expense. Modifications not authorized by the manufacturer may void users' authority to operate this device.

CAN ICES-3 (A)/NMB-3(A).

Safety Notes

The device may only be repaired by authorized qualified personnel. Unauthorized opening of the device and inexpertly carried-out repairs may not only seriously jeopardize the safety of the user, but also cancel all warranty and liability agreements.

Do not look directly at the aiming and illumination LEDs of the Barcode Reader Module.

Warranty

Diebold Nixdorf guarantees generally a warranty engagement for 12 months beginning with the date of delivery. This warranty engagement covers all those damages which occur despite a normal use of the product.

Damages because of

- improper or insufficient maintenance,
- improper use of the product or unauthorized modifications of the product,
- inadequate location or surroundings

will not be covered by the warranty.

For further information of the stipulation look at your contract.

All parts of the product which are subject to wear and tear are not included in the warranty engagement.

Please order spare parts at the Diebold Nixdorf customer service.

Supplier's Declaration of Conformity

Product Description: 2D Barcode Reader
Model: BA9x BCR

Party issuing Supplier's Declaration of Conformity
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151 Lorong Chuan New Tech Park #05-01 A/B
Singapore 556741

Phone: +65 6747 3828

Responsible Party – U.S. Contact Information
Diebold Nixdorf
5995 Mayfair Road
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Phone: +1 330 490 5049

FCC Compliance Statement (for products subject to Part 15)

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.

Introduction

The BA9x BCR is a compact high speed 2D Barcode Reader module designed for attachment to iPOS plus Family of All-in-one POS as well as the BA9x Family of touch monitors.

Features at a glance

- High performance decoder for fast scanning response
- High-speed image sensor capture images at up to 100 fps
- Swivel in the horizontal axis over an angle of ± 165 degree
- Data Editing function allows capturing of up to 16 codes on multiple images in one go
- 3 programmable operating modes, HID keyboard emulation, Virtual COM & IBM USB-OEM

About this manual

This manual is intended to help you to install and operate the BA9x BCR (2D Barcode Reader) for BA9x touch monitors and iPOS Plus systems. The detailed table of contents will help you find the information you need quickly and easily.

Notes in the manual are marked by this symbol.

This symbol is used for warnings.

Product overview

General description

The Barcode Reader Module is an add-on module as an attachment to iPOS plus Family of All-in-one such as iPOS plus Advanced and iPOS plus Braswell as well as for BA92, BA93 and BA93W. It is capable of reading 1D linear and 2D barcode codes and OCR fonts.

The BA9x BCR can operate in one of the three programmable USB modes:

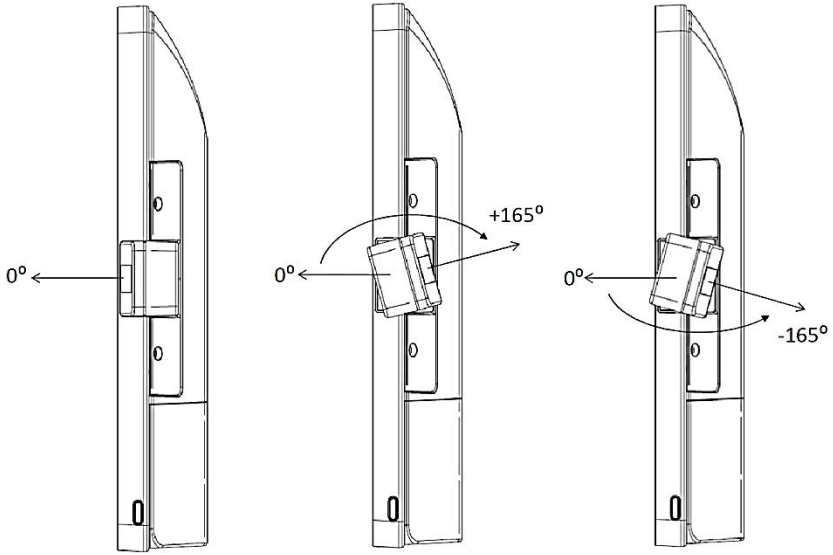
- HID keyboard emulation (Factory Default)
- Virtual COM
- IBM USB-OEM

Programming can be either by commands and the regular scanning of configuration barcodes. The provided device driver must be installed to operate the module in the Virtual COM mode. In this mode application has full control on the device using commands. Control by command is not possible when in Keyboard Emulation mode, configuration of the engine is only by scanning configuration barcodes.

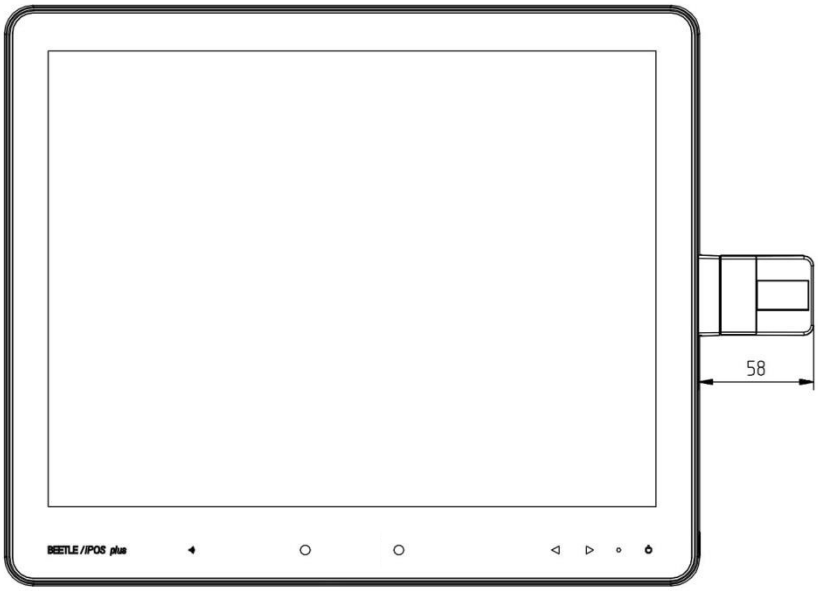
Operating the Barcode Reader

The Barcode Reader engine can be programmed in many ways that suit the user application environment. In general, the barcode should be placed in front of the Barcode Reader with the aiming beam shining on. If the barcode label is in scanning range it will be decoded and the data will be transmitted to the host application.

The Barcode reader is able to rotate 165 degrees clockwise and 165 degrees anti-clockwise, please see illustration below. Do not rotate the barcode reader beyond this rotating range. Doing so may damage the reader.



The front view of the iPOS plus Braswell with the Barcode Reader attached on the side, protruding 58mm:



Before first time use

Delivery items

Unpack the components and verify that what has been delivered is identical to the information on the delivery ticket.

The Barcode Reader consists of the following items, as shown in the picture below.

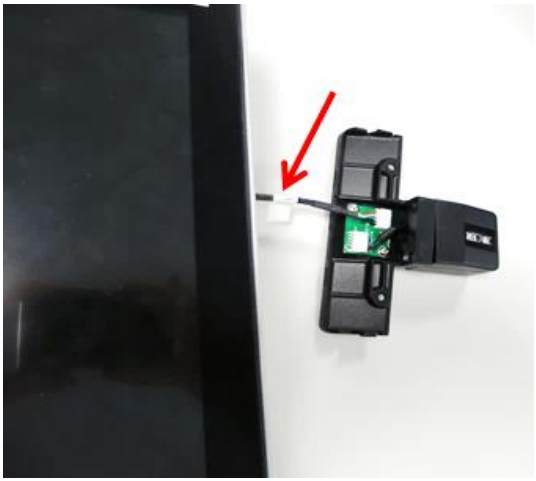
- The BA9x BCR Barcode Reader
- Two M3x6 Torx screws
- USB cable (01750257103)

Hardware installation for iPOS plus Advanced systems

The 2D Barcode Reader can be installed on either the right or the left side of the screen/display. You will find a flap at the rear side of the display at the position for the peripherals.

Mounting on the right side (seen from the front)

Follow the instructions below to install the 2D Barcode Reader **to iPOS Plus Advanced** systems.



Attach the cable connector to the 2D Barcode Reader.

V

View from the back of the display.

T

Then, fit the 2D Bar-code Reader in place at the back of the display.

And, fasten the Torx screws onto the 2D Barcode Reader

Mounting on the left side (seen from the front)

A

Attach the cable connector to the 2D Barcode Reader.

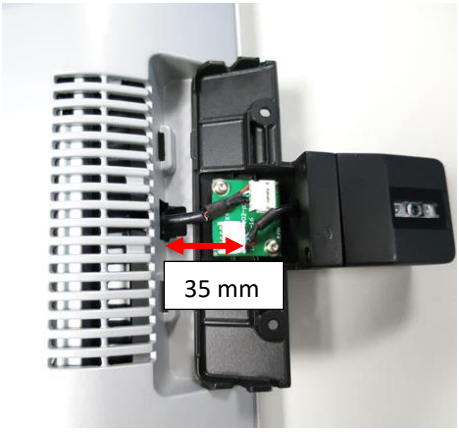
View from back of the display.

Then, fit the 2D Bar-code Reader in place at the back of the display.

And, fasten the two Torx screws onto the 2D Barcode Reader.

But, please check the protrusion length of the cable connector from the system, before proceeding to connect it to the 2D Barcode Reader:

If, the protrusion length of the cable connector is as such, then…



Extend the cable connector by about 35 mm from the system, before connecting it to the 2D Barcode Reader.

Then, flip the 2D Barcode Reader over to the other side, before…

fitting it in place and putting on the two Torx screws.

And if, however, the the protrusion length of the cable connector is as such, then…

first connect the cable to the 2D Barcode Reader.

Then, flip the 2D Barcode Reader over to the other side, while making a slight bend on the wire as seen, before…

fitting the 2D Barcode Reader in place and putting on the two Torx screws.

Hardware installation for iPOS plus Braswell systems

The 2D Barcode Reader can be installed on either the right or the left side of the screen/display. You will find a flap at the rear side of the display at the position for the peripherals.

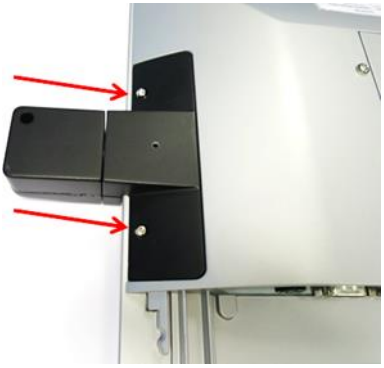
Mounting on the right side (seen from the front)

Follow the instructions below to install the 2D Barcode Reader **to iPOS plus Braswell** systems.

Attach the cable connector to the 2D Barcode Reader.

View from the back of the display.

Then, fit the 2D Barcode Reader in place at the back of the display.



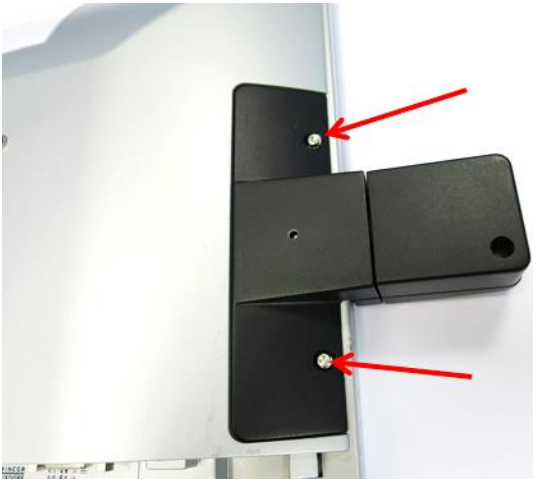
And, fasten the two Torx screws onto the 2D Barcode Reader.

Mounting on the left side (seen from the front)

Attach the cable connector to the 2D Barcode Reader.

View from the back of the display.

Then, fit the 2D Barcode Reader in place at the back of the display. .



And, fasten the two Torx screws onto the 2D Barcode Reader

Hardware installation for BA9x systems

The 2D Barcode Reader can be installed on either the right or the left side of the screen. You will find a flap at the rear side of the display at the position for the peripherals.

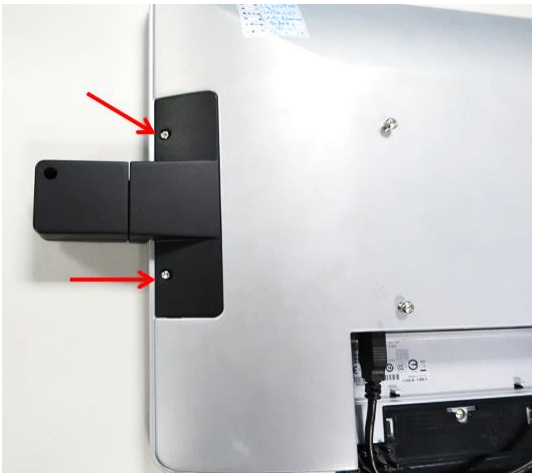
Mounting on the right side (seen from the front)

Follow the instructions below to install the 2D Barcode Reader **to BA9x** systems.

Attach the cable connector to the 2D Barcode Reader.

View from the back of the display.

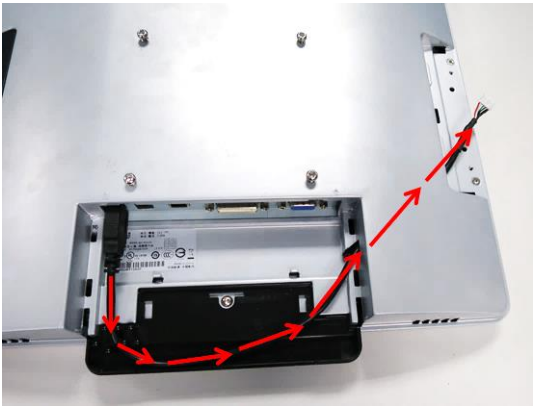
Then, fit the 2D Bar-code Reader in place at the back of the display.



And, fasten the two Torx screws onto the 2D Barcode Reader

Mounting on the left side (seen from the front)

With this USB cable – 01750257103. ..



Connect it at the back of the display, and route it in the direction indicated by the arrows.

Then, attach the other end of the cable with the 2D Barcode Reader.

View from the front of the display.

Then, fit the 2D Barcode Reader in place at the back of the display.

And, fasten the two Torx screws onto the 2D Barcode Reader.

Factory Default Settings

The BA9x BCR is pre-configured in factory with the following settings. User has the following choices for re-configuring the device settings:

1) UMT (Universal Menu Tool) for Windows
2) Configuration barcodes
3) Commands via USB-COM

Interface	USB-HID Keyboard
Trigger setting	Auto trigger enabled
Illumination detection	None
Extended read time	1 second
Double read reset time	700 millisecond
Illumination LED brightness	Low
Aiming LED brightness	Standard
Buzzer beep frequency	2700 Hz
Buzzer beep duration	100 msec

Enabled Codes

1D Codes	UPC, EAN, Code 39, Tri-Optic, Codabar, Industrial 2 of 5, Inter-leave 2 of 5, S-Code, Code 93, IATA, MSI/Plessey, UK/Plessey, Telepen
GS1 DataBar	GS1, GS1 DataBar Limited, GS1 DataBar Expanded
Composite	Composite GS1 DataBar
2D Codes	PDF417, QR Code, Micro QR, Data Matrix (ECC 200), Aztec Code, Maxi Code

Software Installation

Device Driver Installation

The following are instructions for installing/setting up the device drivers needed for Windows and Linux to operate the BA9x BCR as a USB-COM device. Use the provided USB cable (P/N: 01750257103), plug it to the connector X1 of the BA9x BCR and USB Type A connector to a BEETLE system.

Windows

On the host PC running Windows 7, install the VCP device driver by executing the installer, Installer.exe. For Windows 8.1 and above the BA9x BCR is recognised by the inbox VCP driver of Windows, there is no need to execute the installer.exe.

If you are going to use Diebold Nixdorf JavaPOS, execute WNJavaPOS_BA9xBCR-1.13.2-1-files!.exe to install the BA9x BCR Device Service. The logical name is *BA9XBCR*.

Linux

Linux comes with inbox CDC driver that can detect the BA9x BCR and load it automatically, but on the older kernel (2.6 and before) manual set up is needed.

The procedure for manual set up is as follow:

1) Prepare a script as follow, and name it as "`init_ba9xbcr.sh`".

```
#!/bin/sh
# Name: init ba9x barcode reader
# version 1.0.0.0
# NOV 24, 1026
#

modprobe cdc_acm
cd /sys/bus/usb/drivers/cdc_acm
echo "065a a002" > new_id
```

2) Put the script in the path, say "`/usr/local/javapos/init_ba9xbcr.sh`".

3) Edit the file "`/etc/rc.d/rc.local`" and insert the path name of the script, "`/usr/local/javapos/init_ba9xbcr.sh`", at the last line.

4) Save the file "`rc.local`" and reboot the PC.

5) Execute a "`ls /dev/ttyACM0`" to check, if exist it is successfully set up.

6) Use "`/dev/ttyACM0`" to access the BA9xBCR.

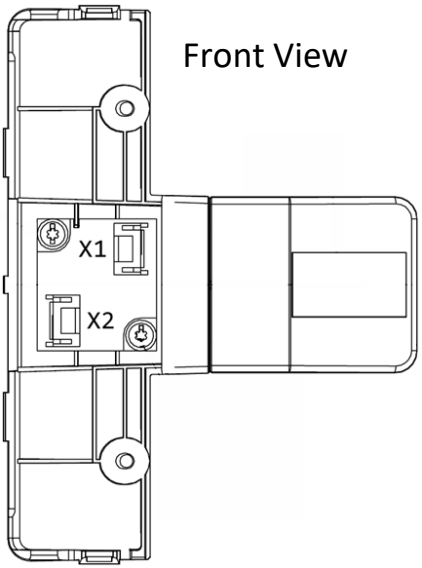
JavaPOS / OPOS UDM

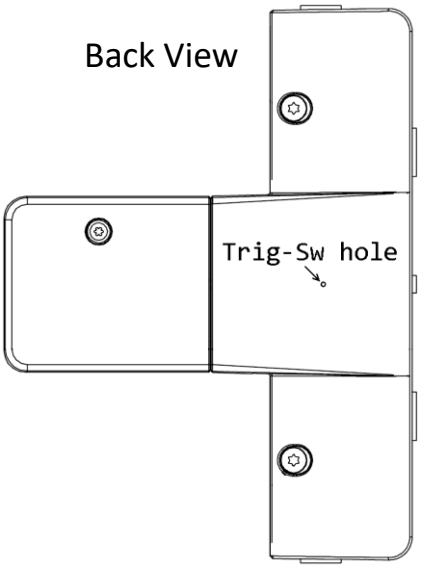
For application using JavaPOS the BA9x BCR has to be first set to IBM USB-OEM mode by scanning the QR code in the section below. The logical name of the device is, “WN_SCANNER_USB_TT”. Please get the most current release from your Sales representative.

Configuring the BA9x BCR

The chapter is a collection of commonly use 2D configuration barcodes for easy re-configurations of the device. For settings you need but not found here please use the UMT software. Configuration of the BA9xBCR is normally by scanning barcodes or by command send via the USB interface. In case the settings got messed up, use a straightened paper clip and push it through the pin-hole to trigger the barcode reader to scan the barcode for restoring to factory default.

Locating the pin-hole





Restoring to USB-COM Default

Scanning the above barcode is equivalent to executing the following commands and setting to the default readable codes and prefixes shown in the sections below.

Command	Description
C01	Set factory default (USB-COM)
+I	Enable auto trigger for fix mount
[DDI	No illumination detection
Y1	Extended read time = 1 sec
[DDC	Illumination LED brightness = Low
[DDE	Aiming LED brightness = Standard
[DF0Q2Q7Q0Q0	Buzzer beep frequency = 2700 Hz
W4	Buzzer beep duration = 100 msec
Z2	Save current settings as Start-up Settings

Restoring to IBM USB-OEM Default

Scanning the above barcode is equivalent to executing the following commands and setting to the default readable codes and prefixes shown in the sections below.

Command	Description
SU1	Set factory default (IBM USB-OEM)
+I	Enable auto trigger for fix mount
[DDI	No illumination detection
Y1	Extended read time = 1 sec
[DDC	Illumination LED brightness = Low
[DDE	Aiming LED brightness = Standard
[DF0Q2Q7Q0Q0	Buzzer beep frequency = 2700 Hz
W4	Buzzer beep duration = 100 msec
Z2	Save current settings as Start-up Settings

Restoring to USB HID Keyboard Default

Scanning the above barcode is equivalent to executing the following commands and setting to the default readable codes and prefixes shown in the sections below.

Command	Description
SU	Set factory default (USB-HID Keyboard)
+I	Enable auto trigger for fix mount
[DDI	No illumination detection
Y1	Extended read time = 1 sec
[DDC	Illumination LED brightness = Low
[DDE	Aiming LED brightness = Standard
[DF0Q2Q7Q0Q0	Buzzer beep frequency = 2700 Hz
W4	Buzzer beep duration = 100 msec
Z2	Save current settings as Start-up Settings

Default Readable Codes

Readable Codes	Enabled
UPC,+2,+5, EAN13,+2,+5, EAN8,+2,+5	yes
Code39, Tri-Optic	Yes
Codabar, Industrial/Standard 2of5, Interleaved 2of5	Yes
S-Code under Interleaved 2of5	No
Code-128, Code-93	Yes
IATA	No
MSI/Plessey	Yes
UK/Plessey, Telepen, Code-11, Matrix 2of5	No
Postal Codes	No
GS1 DataBar, Composite GS1 DataBar	Yes
Composite EAN, Composite UPC	No
PDF417, Micro PDF417	Yes
Codablock F	No
QR-Code, Micro-QR, Data-Matrix ECC-200, Aztec-Code	Yes
Aztec Runes, Chinese-sensible code	No
Maxi-Code	Yes
OCR Codes	No

Code Options	Settings
UPC-A	Transmit leading 0 & CD
UPC-E	Transmit leading 0 & CD, not converted to UPC-A, disable UPC-E1
EAN-8/EAN-13	Transmit CD, disable ISBN/ISSN/ISMN conversion
EAN-13	Disable EAN forced add-on
Code39	Normal, no check CD, transmit CD
Codabar, 2of5, Code-128, MSI/Plessey, QR-Code, Data-Matrix, Aztec-Code, Maxi-Code.	Same as factory default

Default Prefixes

Codes	Prefix
UPC-A, +2, +5	A
EAN-13/JAN-13, +2, +5	A
EAN-8/JAN-8, +2, +5	B
UPC-E, +2, +5	C
UPC-D1 to D5	Note1
GS1 Databar	E
Standard 2 of 5/Industrial 2 of 5	H
Interleave 2 of 5 (ITF)	I
Code128	K
Code93	L
Code39	M
Codabar (NW 7)	N
MSI / Plessey	O
EAN 128/GS1-128	P
PDF417	Q
Data Matrix	R
MicroPDF417	S
Maxicode	T
QR Codes	U
Aztec/Aztec Rune	V
GS1 DataMatrix	W
GS1 QR Code	Note1

Note1: Not supported

Diagnostic

Transmit software version - Z1

The scanner will transmit the software version to the receiving application running on the connected BEETLE system.

@MENU_OPTO@ZZ@Z1@ZZ@OTPO_UNEM@

Interface Settings

USB-HID Interface (keyboard emulation)

Settings for “All 1D Code”

Enable – [BCM

@MENU_OPTO@ZZ@BCM@ZZ@OTPO_UNEM@

Disable – [BCY

@MENU_OPTO@ZZ@BCY@ZZ@OTPO_UNEM@

Settings for “All 2D Code”

Only – [BCB

@MENU_OPTO@ZZ@BCB@ZZ@OTPO_UNEM@

Enable - BCN

@MENU_OPTO@ZZ@BCN@ZZ@OTPO_UNEM@

Disable – [BCZ

@MENU_OPTO@ZZ@BCZ@ZZ@OTPO_UNEM@

Good Read Buzzer

Enable – W8

@MENU_OPTO@ZZ@W8@ZZ@OTPO_UNEM@

Disable – W0

@MENU_OPTO@ZZ@W0@ZZ@OTPO_UNEM@

1D Decode Mode

Difficult label mode – [DM3

@MENU_OPTO@ZZ@DM3@ZZ@OTPO_UNEM@

Standard mode – [DM2

@MENU_OPTO@ZZ@DM2@ZZ@OTPO_UNEM@

Semi-quick mode – DM1

@MENU_OPTO@ZZ@DM1@ZZ@OTPO_UNEM@

Quick mode – [DM0

@MENU_OPTO@ZZ@DM0@ZZ@OTPO_UNEM@

LED illumination mode

Enable LED illumination – [D39

@MENU_OPTO@ZZ@D39@ZZ@OTPO_UNEM@

Disable LED illumination – [D3A

@MENU_OPTO@ZZ@D3A@ZZ@OTPO_UNEM@

LED illumination alternating – [D3B

@MENU_OPTO@ZZ@D3B@ZZ@OTPO_UNEM@

Prevent specular reflection – D3Q

@MENU_OPTO@ZZ@D3Q@ZZ@OTPO_UNEM@

LED illumination brightness

Standard brightness – [DDB

@MENU_OPTO@ZZ@DDB@ZZ@OTPO_UNEM@

Low brightness – [DDC

@MENU_OPTO@ZZ@DDC@ZZ@OTPO_UNEM@

LED Aiming ON/OFF

Enable – [D3D

@MENU_OPTO@ZZ@D3D@ZZ@OTPO_UNEM@

Disable – [D3E

@MENU_OPTO@ZZ@D3E@ZZ@OTPO_UNEM@

LED Aiming brightness

High brightness – [DDD

@MENU_OPTO@ZZ@DDD@ZZ@OTPO_UNEM@

Standard brightness – [DDE

@MENU_OPTO@ZZ@DDE@ZZ@OTPO_UNEM@

Low Brightness – [DDF

@MENU_OPTO@ZZ@DDF@ZZ@OTPO_UNEM@

Auto-trigger for fix-mount

Disable - +F

@MENU_OPTO@ZZ@+F@ZZ@OTPO_UNEM@

Enable - +I

@MENU_OPTO@ZZ@+I@ZZ@OTPO_UNEM@

Auto-trigger Detection mode

Green aiming detection – [DDG

@MENU_OPTO@ZZ@DDG@ZZ@OTPO_UNEM@

LED illumination detection - DDH

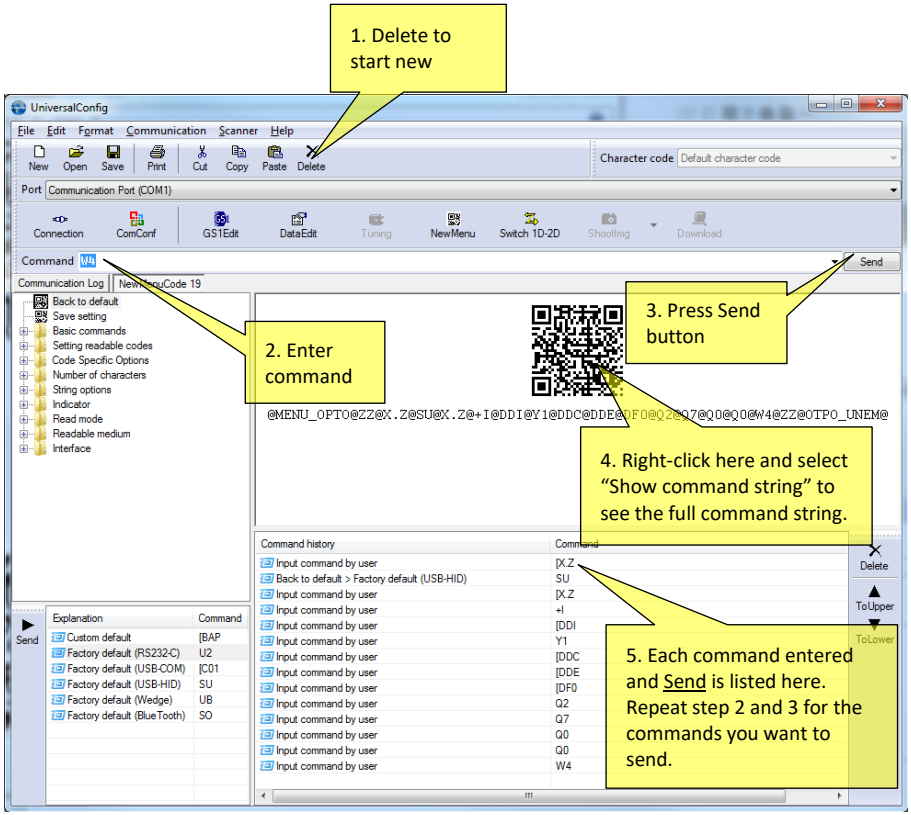
@MENU_OPTO@ZZ@DDH@ZZ@OTPO_UNEM@

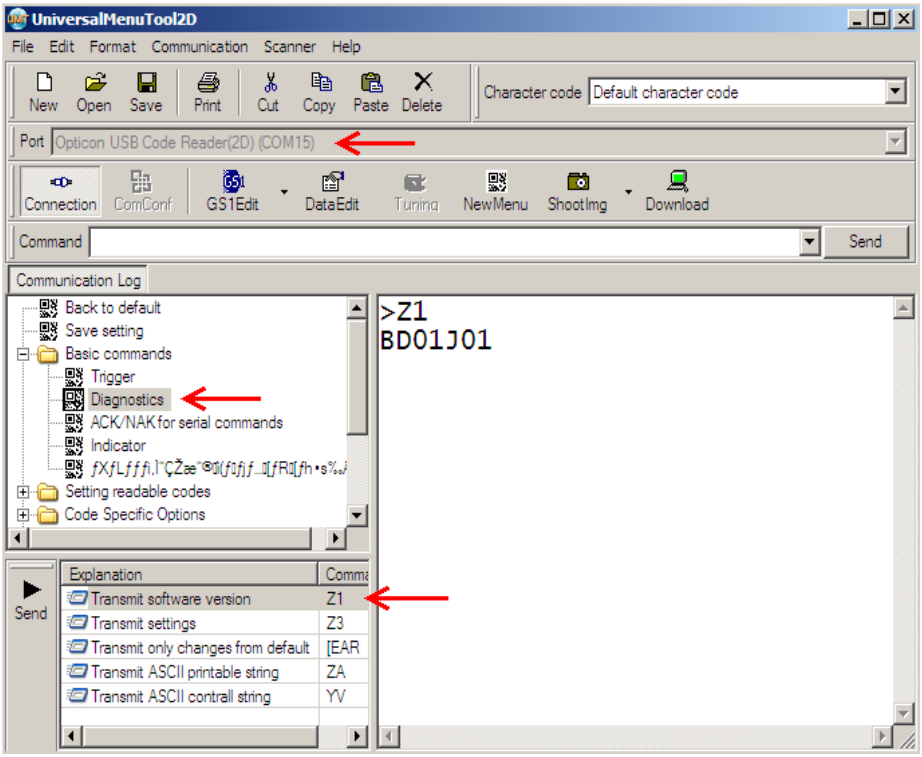
No illumination detection – [DDI

@MENU_OPTO@ZZ@DDI@ZZ@OTPO_UNEM@

Other Barcodes menu

Run UniversalMenuTool2D (UMT). Select “Opticon USB Code Reader (2D) (COMx)“ for Port selection. Click the “Connection“ button to connect to the selected port. Select from the left panes the command that you want, press the “Send” button and a 2D barcode will be generated on the upper right pane. If you are configurating before attaching to the system you can just scan the barcode directly off the screen. Because of reflection aim at an angle of at least 15° to the axis perpendicular to the screen. Otherwise capture the screen image and print a hardcopy. To prepare another configuration barcode, press the “Delete” button to clear the screen first.




UniversalMenuTool2D
File Edit Format Communication Scanner Help
New Open Save Print Cut Copy Paste Delete
Character code Default character code
Port Opticon USB Code Reader(2D) (COM15)
Connection ComConf GS1Edit DataEdit Tuning NewMenu ShootImg Download
Command Send
Communication Log
Back to default
Save setting
Basic commands
Trigger
Diagnostics
ACK/NAK for serial commands
Indicator
Setting readable codes
Code Specific Options
>Z1
BD01J01
Send
Explanation
Comma
Transmit software version Z1
Transmit settings Z3
Transmit only changes from default [EAR
Transmit ASCII printable string ZA
Transmit ASCII contrall string YV

Configuring with Commands

The BA9x BCR can also be configured by sending command via the serial interface.

Command Format

Command Header	Command ID note1		Command Terminator
<ESC> (1Bh)	None	1 to 2 characters (ASCII)	<CR> (0Dh)
	[(5Bh)	3 characters (ASCII)	
	] (5Dh)	4 characters (ASCII)	

note1: It is possible to send multiple command IDs between a single header and terminator, except for a single command (1-character) IDs.

Precautions

When sending multiple commands in a sequence, the subsequent command is not received while the previous command is still being executed. Check the RTS signal for busy state before sending the next commands.

Settings configured by commands are not retained in the non-volatile memory and will be lost when the scan engine is powered down. To retain the setting in non-volatile memory save them using the command “Z2”.

Command packet maximum buffer size is 1000 characters, sending more than the maximum may result in commands not executed correctly.

Commands

Basic Commands

The reading operation can be started and terminated by sending commands. When the read time is set to 0 seconds, the read time with the Z command will be 'Indefinitely' and reading will continue until a Y command is received.

	Commands	Description
Command Trigger	Z	Start Reading
	Y	Stop Reading

Diagnostic

	Commands	Description
Diagnostic	Z1	Transmit software version
	ZA	Transmit ASCII printable string
	YV	Transmit ASCII control string
Device Information	[EFKQ0	Model Number
	[EFKQ1	Firmware Version
	[EFKQ2	Interface
	[EFKQ3	Focus Type
	[EFKQ4	ID
	[EFKQ5	Serial Number

ACK/NAK for Serial Commands

	Commands	Description
ACK/NAK	WC	Enable ACK/NAK for serial commands
	WD	Disable ACK/NAK for serial commands

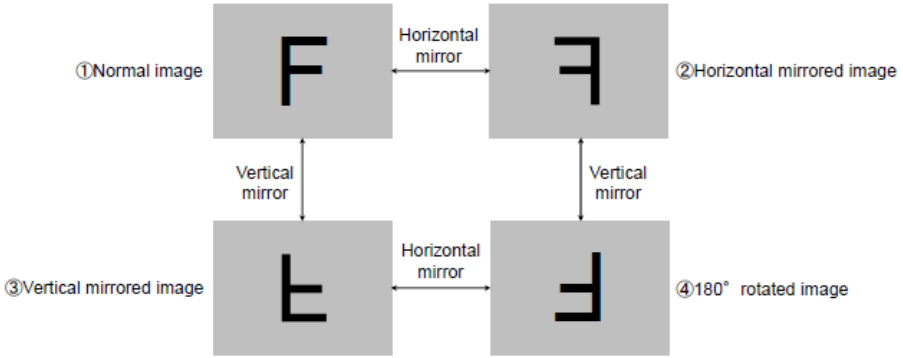
Reboot the Module

	Commands	Description
Software Reboot	RV	Reboot the module

Image settings

When the module is mounted upside down, the module should rotate the sensor data by 180º. This configuration is required especially for image acquisition and OCR reading.

	Commands	Description
Horizontal mirrored image	[EFU	Disable horizontal mirrored image configuration (default)
	[EFV	Enable horizontal mirrored image configuration
Vertical mirrored image	[E8J	Disable vertical mirrored image configuration (default)
	[E8I	Enable vertical mirrored image configuration



Disable 2D Menu Code Format

	Commands	Description
Enable/Disable 2D menu code format	[D1Y	Enable 2D menu code format (default)
	[D1Z	Disable 2D menu code format

Buzzer

	Commands	Description
Buzzer	B	Sound the good read beep
	E	Sound the error beep

Direct Numerical Input Command

	Commands	Description
Direct Input numerical values	Q0	0
	Q1	1
	Q2	2
	Q3	3
	Q4	4
	Q5	5
	Q6	6
	Q7	7
	Q8	8
	Q9	9

Baud Rate Setting

	Commands	Description
Baud Rate	K1	300bps
	K2	600bps
	K3	1200bps
	K4	2400bps
	K5	4800bps
	K6	9600bps
	K7	19200bps (default)
	K8	38400bps
	K9	57600bps
	SZ	115200bps
	[D90	230400bps
	[D91	460800bps
	[D92	921600bps

Character Format

	Commands	Description
Data bit	L0	7 data bits
	L1	8 data bits (default)
Parity bit	L2	No parity (default)
	L3	Even parity
	L4	Odd parity
Stop bit	L5	1 stop bit (default)
	L6	2 stop bit

Handshaking

	Commands	Description
Handshaking	P0	No handshaking (default)
	P1	Busy/ready
	P2	Modem
	P3	ACK/NAK
	P4	ACK/NAK NO RESPONSE

Inter Character Delay

	Commands	Description
Inter Character Delay	KA	No Delay (default)
	KB	20ms delay
	KC	50ms delay
	KD	10ms delay

Data Buffer Mode

	Commands	Description
Data Buffer Mode	[D80	Data buffer disable
	[D81	Data buffer enable (default)

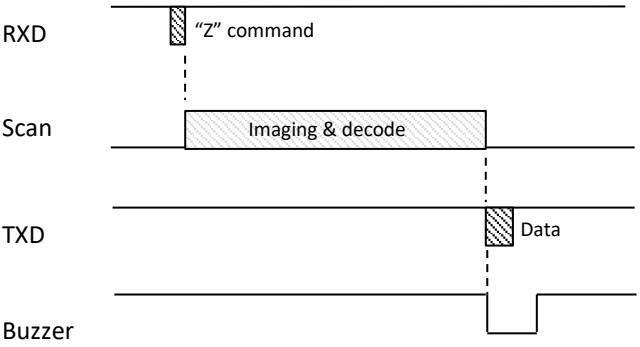
Low Power Mode

	Commands	Description
Disable/Enable Low Power Mode	[XSC	Disable low power mode (default)
	[EB8	Enable low power mode

Transition Time

	Commands	Description
Low power mode transition time	[EBA Qa Qb Qc Qd	Set low power mode transition time with numerical values, 1000a+100b+10c+d seconds. Default: 5 seconds

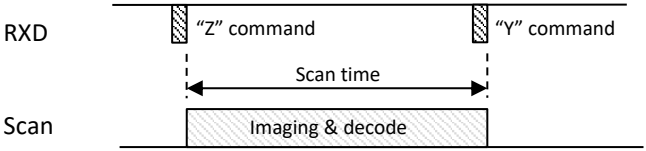
Code Read Time



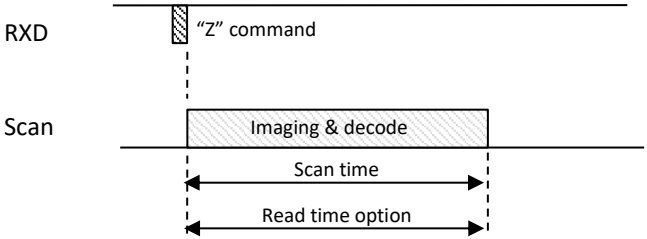
	Commands	Description
Synchronous with trigger signals	Y0	Synchronous with trigger signals
Read time option	Y1	1 second *(Default)*
	Y2	2 second
	Y3	3 second
	Y4	4 second
	Y5	5 second
	Y6	6 second
	Y7	7 second
	Y8	8 second
	Y9	9 second
	YL	Read time x10 times
	YM	Indefinitely

The diagrams below illustrate the read code time of the Synchronous with trigger signal versus Read Time Option.

Synchronous with trigger signal



Read time option setting



Trigger Delay

To start scanning after the trigger delay setting time.

	Commands	Description
Trigger Delay	[DEC Qa Qb Qc Qd	Trigger delay time, (1000x+100b+10c+1d) x 10ms. Default: 0ms

Setting Readable Codes

1D Codes

Symbologies	Single command	Multiple command	Disable command	Default	Mini length	CD trans mission	CD check	Remark
UPC	J1	R1	[X4B	✓	-	✓	✓	
UPC Add-on 2 UPC Add-on 5	J2 J3	R2 R3	[X4C [X4D		-	✓		
EAN	µ4	R4	[X4E	✓	-	✓	✓	
EAN Add-on 2 EAN Add-on 5	J5 J6	R5 R6	[X4F [X4G		-	✓		
EAN-13	JG	JU	[DDM		-	✓		
EAN-13 Add-on 2 EAN-13 Add-on 5	JH JI	JV JW	[X4N [X4P		-	✓		
EAN-8	JA	JO	[DDN		-	✓		
EAN-8 Add-on 2 EAN-8 Add-on 5	JB JC	JP JQ	[X4M [X4O		-	✓		
Code 39	A2	B2	VB	✓	1	✓	×	
Tri-Optic	JD	JZ	[DDJ	✓	-	-		
Codabar	A3	B3	VC	✓	2	✓	×	
Industrial 2of 5	J7	R7	[X4K	✓	5	✓	×	
Interleaved 2of 5	J8	R8	[X4L	✓	6	✓	×	
S-Code	RA	R9	[DDK	✓	5	×		
Code 128	A6	B6	VE	✓	1	-	✓	
Code 93	A5	B5	VD	✓	1	-	✓	
IATA	A4	B4	VH	✓	5	×	×	
MSI/Plessey	A7	B7	VF	✓	3	✓	✓	
UK/Plessey	A1	B1	VA	✓	2	✓	✓	
Telepen	A9	B9	VG	✓	1	-	✓	
Code 11	[BLB	[BLC	[BLA		1	×	✓	
Matrix 2 of 5	AB	BB	[DDL		5	✓	×	

2D Codes

Symbologies	Single	Multiple	Disable	Default	Remark
PDF417	[BC3	[BCF	[BCR	✓	
Micro PDF417	[BC4	[BCG	[BCS		
Codablock F	[D4R	[D4P	[D4Q		Code128 must be disable
QR Code	[BC1	[BCD	[BCP	✓	
Micro QR	[D38	[D2U	[D2V	✓	
Data Matrix (ECC 200)	[BC0	[BCC	[BCO	✓	
Aztec Code	[BC5	[BCH	[BCT	✓	
Aztec Runes	[BF4	[BF2	[BF3		
Chinese-sensible code	[D4K	[D4L	[D4M		
Maxi Code	[BC2	[BCE	[BCQ	✓	

Postal Code

Symbologies	Single	Multiple	Disable	Default	Remark
Chinese Post Matrix 2 of 5	JE	JS	JT		
Korean Postal Authority	JL	WH	WI		
Intelligent Mail Barcode	[D5H	[D5F	[D5G		
POSTNET	[D6C	[D6A	[D6B		
PLANET	[DG2	[DG3	[DG4		
Japan Postal	[D5R	[D5P	[D5Q		
Netherland KIX Code	[D5M	[D5K	[D5L		
Australian Postal	[D6O	[D6M	[D6N		
UK Postal (Royal mail)	[DG7	[DG8	[DG9		
4-State Mailmark Barcode	[DGS	[DGS	[DGU		

GS1 DataBar

Symbologies	Single		Multiple		Disable		Default	Remark
GS1 DataBar ·GS1 DataBar Omnidirectional ·GS1 DataBar Truncated ·GS1 DataBar Stacked ·GS1 DataBar Stacked Omnidirectional	J9	[BC6	JX	[BCI	SJ	[BCU	✓	
GS1 DataBar Limited	JJ		JY		SK		✓	
GS1 DataBar Expanded ·GS1 DataBar Expanded ·GS1 DataBar Expanded Stacked	JK		DR		SL		✓	

Composite Code

Symbologies	Multiple	Disable	Default	Remark
Composite GS1 DataBar ·CC-A ·CC-B ·Limited CC-A ·Limited CC-B ·Expanded CC-A ·Expanded CC-B	[BHE	[BHF	✓	
Composite GS1-128 ·CC-A ·CC-B ·CC-C				
Composite EAN ·EAN-13 CC-A ·EAN-13 CC-B ·EAN-8 CC-A ·EAN-8 CC-B	[D1V	[D1W		
Composite UPC ·UPC-A CC-A ·UPC-A CC-B ·UPC-E CC-A ·UPC-E CC-B				

OCR

Documents	Single	Multiple	Disable	Default	Remark
Machine readable Passports	[DJ1	[DJ2	[DJ3		
Machine readable Visa-A	[DJ4	[DJ5	[DJ6		
Machine readable Visa-B	[DJ7	[DJ8	[DJ9		
Official Travel Documents 1	[DJA	[DJB	[DJC		
Official Travel Documents 2	[DJD	[DJE	[DJF		

Documents	Single	Multiple	Disable	Default	Remark
ISBN (OCR font-B)	[DJG	[DJH	[DJI		

Other Options

Symbologies	Single	Multiple	Disable	Default	Remark
All codes (1D, 2D)	A0		B0		Excluding add-on
All 1D codes	[BCA	[BCM	[BCY		Including add-on
All 2D codes	[BCB	[BCN	[BCZ		*1, *2

Setting of Code Specific Options

Code	Item	Command	Description	Default
UPC-A	UPC-A Leading zero CD transmission	E3	UPC-A, No leading zero, transmit CD	✓
		E5	UPC-A, No leading zero, not transmit CD	
		E2	UPC-A, Leading zero, transmit CD	
		E4	UPC-A, Leading zero, not transmit CD	
UPC-E	UPC-E Leading zero CD transmission	E7	UPC-E , No leading zero, transmit CD	✓
		E9	UPC-E , No leading zero, not transmit CD	
		E6	UPC-E , Leading zero, transmit CD	
		E8	UPC-E , Leading zero, not transmit CD	
	UPC-A, E conversion	6Q	Transmit UPC-E	✓
		6P	Transmit as UPC-A	
	UPC-E1 conversion	KP	Disable UPC-E1	✓
		KQ	Enable UPC-E1	

Code	Item	Command	Description	Default
EAN-13 and EAN-8	CD transmission	6J	Not transmit EAN-13 CD	
		6K	Transmit EAN-13 CD	✓
	CD transmission	6H	Not transmit EAN-8 CD	
		6I	Transmit EAN-8 CD	✓
	ISBN conversion	IB	Disable ISBN conversion	✓
		IA	Enable ISBN conversion	
		IK	Enable ISBN if possible	
	ISSN conversion	HN	Disable ISSN conversion	✓
		HO	Enable ISSN conversion	
		4V	Enable ISSN if possible	
	ISMN conversion	IO	Disable ISMN conversion	✓
		IP	Enable ISMN conversion	
		IQ	Enable ISMN if possible	
	EAN13 forced add-on 1	-G	Enable EAN forced add-on when EAN13 starts with 378/ 379 / 529	
		-H	Disable EAN forced add-on when EAN13 starts with 378/ 379 / 529	✓
	EAN13 forced add-on 2	-C	Enable EAN forced add-on when EAN13 starts with 434 / 439 / 414 / 419 / 977 /978	
		-D	Disable EAN forced add-on when EAN13 starts with 434 / 439 / 414 / 419 / 977/ 978	✓

Code	Item	Command	Description	Default
Code 39 and It.Pharm	Full ASCII conversion	D5	Normal Code 39	✓
		D4	Full ASCII Code 39	
		+K	Full ASCII Code 39 if possible	
	It. Pharm conversion	D6	It. Pharm only	D5
		D7	It. Pharm if possible	D5
	CD check	C1	Not check CD	✓
		C0	Check CD	
	CD transmission	D8	Not transmit CD	
		D9	Transmit CD	✓
	ST/SP transmission	D1	Not transmit ST/SP	✓
		D0	Transmit ST/SP	
	Leading A transmission	DA	Not transmit leading A for It. Pharm	✓
		DB	Transmit leading A for It. Pharm	
	Concatenation	+M	Disable concatenation	✓
		+L	Enable concatenation	

Code	Item	Command	Description	Default
Codabar	ABC, CX conversion	HA	Enable only Codabar normal mode	✓
		H4	Enable only ABC code	
		H5	Enable only CX code	
		H3	Enable Codabar / ABC and CX	
	CD check	H7	Not check CD	✓
		H6	Check CD	
	CD transmission	H9	Not transmit CD	
		H8	Transmit CD	✓
	Space insertion	HE	Disable space insertion	✓
		HD	Enable space insertion	
	ST/SP transmission	F0	Not transmit ST/SP	✓
		F3	ST/SP: ABCD/ABCD	
		F4	ST/SP: abcd/abcd	
		F1	ST/SP: ABCD/TN*E	
		F2	ST/SP: abcd/tn*e	
		HJ	ST/SP: <DC1><DC2><DC3><DC4> /<DC1><DC2><DC3><DC4>	

Code	Item	Command	Description	Default
Code 128	EAN128 conversion	OF	Disable GS1-128	✓
		JF	Enable GS1-128 only	
		OG	Enable EAN-128 if possible	
	Concatenation	MP	Disable concatenation (FNC2 message append)	✓
		MO	Enable concatenation (FNC2 message append)	

Code	Item	Command	Description	Default
IATA	CD check	4H	Not check CD	✓
		4I	Check FC / SN only	
		4J	Check FC / CPN / SN	
		4K	Check FC / CPN / AC / SN	
	CD transmission	4M	Not transmit CD	
		4L	Transmit CD	✓

Code	Item	Command	Description	Default
MSI/ Plessey	CD check	4A	Not check CD	
		4B	Check 1 CD = MOD 10	✓
		4C	Check 2 CD = MOD 10/MOD 10	
		4D	Check 2 CD = MOD 10/MOD 11	
		4R	Check 2 CD = MOD 11/MOD 10	
		4S	Check 2 CD = MOD 11/MOD 11	
	CD transmission	4G	Not transmit CD	
		4E	Transmit CD 1	✓
		4F	Transmit CD 1 and CD 2	

Code	Item	Command	Description	Default
UK/ Plessey	CD transmission	4O	Not transmit CD	
		4N	Transmit CD	✓
	Space insertion	DO	Disable space insertion	✓
		DN	Enable space insertion	
	X conversion	DP	Conversion A -> X disable	✓
		DQ	Conversion A -> X enable	

Code	Item	Command	Description	Default
Telepen	Conversion output mode	D2	Numeric mode	✓
		D3	ASCII mode	

Code	Item	Command	Description	Default
Code 11	CD check	[BLF	Not check CD	
		[BLG	Check 1CD	
		[BLH	Check 2CD	
		[BLI	Check auto 1 or 2 CD	✓
	CD transmission	[BLJ	Not transmit CD	✓
		[BLK	CD transmit	

Code	Item	Command	Description	Default
Korean Postal Authority code	CD transmission	*+	CD transmit	
		*-	Not transmit CD	✓
	Transmit dash	*.	Transmit dash	✓
		*/	Not transmit dash	
	Upside down reading	*9	Upside down reading enabled	
		*8	Upside down reading disabled	✓

Case Conversion

	Commands	Description
Case Conversion	YZ	No case conversion (default)
	YW	Convert to upper case
	YX	Convert to lower case
	YY	Exchange case

Set Prefix/Suffix

Additional characters can be added to the output data.

Preamble	Prefix	Data	Suffix	Postamble
Max 8 digits	Max 4 digits		Max 4 digits	Max 8 digits
Default: Empty	Default: Empty		Default: CR	Default: Empty

	Command		Description
Prefix/Suffix	Prefix/Suffix commands	Value commands	Set Prefix/Suffix

Example:
To set C39: as prefix and <CR> <LF> as suffix to Code 39,

<ESC> M4 0C Q3 Q9 6A O4 1M 1J <CR>

Or by scanning menu barcodes:

1. Scan “ZZ” to start
2. Scan “M4” to set Code 39 prefix
3. Scan “0C” to set C
4. Scan “Q3” to set 3
5. Scan “Q9” to set 9
6. Scan “6A” to set :
7. Scan “O4” to set Code 39 suffix
8. Scan “1M” to set CR
9. Scan “1J” to set LF
10. Scan “ZZ” to end

Code	Prefix Command	Suffix Command
Clear all codes Prefix / Suffix	MG	PR
All codes Prefix / Suffix	RY	RZ
Preamble / Postamble	MZ	PS

Code	Prefix Command	Suffix Command
UPC-A	N1	N6
UPC-A add-on	M0	O0
UPC-E	N2	N7
UPC-E add-on	M1	O1
EAN-13	N3	N8
EAN-13 add-on	M2	O2
EAN-8	N4	N9
EAN-8 add-on	M3	O3
Code 39	M4	O4
Tri-optic	MC	PN
Codabar	M5	O5
Industrial 2 of 5	M6	O6
Interleaved 2 of 5	M7	O7
S-code	MB	OB
Matrix 2 of 5	GL	GM
Chinese Post Matrix 2 of 5		
IATA	I8	I9
MSI/Plessey	N0	N5
Telepen	L8	L9
UK/Plessey	MA	OA
Code 128	M9	O9
GS1-128	[XMX	[XOX
Code 11	[BLD	[BLE
Korean Postal Authority	*$	*%
Intelligent Mail Barcode	[D5I	[D5J
POSTNET	[D6D	[D6E
PLANET	[DG5	[DG6
Japan Postal	[D5S	[D5T
Netherlands Kix Code	[D5N	[D5O
UK Postal (Royal Mail)	[DGA	[DGB
Australian Postal	[D6P	[D6Q
4-state Mailmark barcode	[DGV	[DGW
GS1 DataBar	OE	PQ
GS1 DataBar	[D6G	[D6J
GS1 DataBar Limited	[D6H	[D6K
GS1 DataBar Expanded	[D6I	[D6L
Composite code	RR	RS

Code	Prefix Command	Suffix Command
Codablock-F	[D4S	[D4T
Data Matrix	MD	PO
Aztec	[BF0	[BF1
Chinese Sensible Code	[D4N	[D4O
QR Code	MK	PW
Maxicode	ML	PX
PDF417	OC	PY
MicroPDF417	OD	PZ
Machine Readable Passports	[DJJ	[DJP
Machine Readable Visas-A	[DJK	[DJQ
Machine Readable Visas-B	[DJL	[DJR
Official Travel Documents 1	[DJM	[DJS
Official Travel Documents 2	[DJN	[DJT
ISBN	[DJO	[DJU

Value Command (ASCII)

ASCII	Command	ASCII	Command	ASCII	Command	ASCII	Command
<SPACE>	5A	A	0A	a	$A	^@ (NULL)	9G
!	5B	B	0B	b	$B	^A (SOH)	1A
"	5C	C	0C	c	$C	^B (STX)	1B
#	5D	D	0D	d	$D	^C (ETX)	1C
$	5E	E	0E	e	$E	^D (EOT)	1D
%	5F	F	0F	f	$F	^E (ENQ)	1E
&	5G	G	0G	g	$G	^F (ACK)	1F
'	5H	H	0H	h	$H	^G (BEL)	1G
(	5I	I	0I	i	$I	^H (BS)	1H
)	5J	J	0J	j	$J	^I (HT)	1I
*	5K	K	0K	k	$K	^J (LF)	1J
+	5L	L	0L	l	$L	^K (VT)	1K
,	5M	M	0M	m	$M	^L (FF)	1L
-	5N	N	0N	n	$N	^M (CR)	1M
.	5O	O	0O	o	$O	^N (SO)	1N
/	5P	P	0P	p	$P	^O (SI)	1O
:	6A	Q	0Q	q	$Q	^P (DLE)	1P
;	6B	R	0R	r	$R	^Q (DC1)	1Q
<	6C	S	0S	s	$S	^R (DC2)	1R
=	6D	T	0T	t	$T	^S (DC3)	1S
>	6E	U	0U	u	$U	^T (DC4)	1T
?	6F	V	0V	v	$V	^U (NAK)	1U
@	6G	W	0W	w	$W	^V (SYN)	1V
[	7A	X	0X	x	$X	^W (ETB)	1W
\	7B	Y	0Y	y	$Y	^X (CAN)	1X
]	7C	Z	0Z	z	$Z	^Y (EM)	1Y
^	7D	0	Q0			^Z (SUB)	1Z
_	7E	1	Q1			^[(ESC)	9A
`	7F	2	Q2			^\ (FS)	9B
{	9T	3	Q3			^] (GS)	9C
|	9U	4	Q4			^^ (RS)	9D
}	9V	5	Q5			^_ (US)	9E
~	9W	6	Q6			DEL (ASCII127)	9F
		7	Q7				
		8	Q8				
		9	Q9				

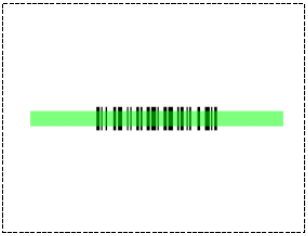
Read Modes

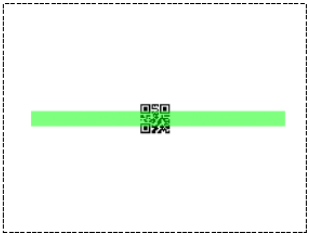
	Commands	Description
Single Read	S0	Single Read in a single trigger. Reading stops after success reading of a single code or exceeding the read extended time. (Default)
Multiple Read 1	[D3P	Multiple read in a single trigger, the module saves the read data in memory not to read the same data.
Multiple Read 2	S1	Multiple read in a single trigger, the module read the same data.

Central Reading

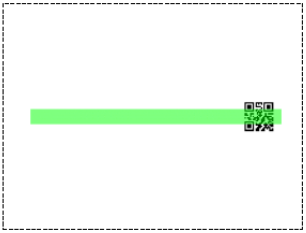
This function is used to read a target code when multiple codes are closely positioned. Reading can be activated only when the code is in the central portion of an image as shown below.

	Commands	Description
Central Reading	[D00	Enable central reading; read only a code at the center of aiming LED
	[D0Z	Disable central reading; read an entire image (Default)





Readable



Unreadable

Trigger Repeat

Trigger repeat helps the user to properly aim the module before it starts scanning. Aiming LED is emitted when the trigger is pressed and code at the center of the beam is read when trigger is released.

Note: Trigger is not externally accessible, only through a pin-hole. Trigger is used for configuration purposed, not for operational use.

	Commands	Description
Trigger Repeat	/K	Disable trigger repeat (Default)
	/M	Enable trigger repeat

Auto Trigger

When auto trigger is enabled, the module automatically detects an object in front and starts reading it.

	Commands	Description
Auto Trigger	+F	Disable presentation auto trigger (Default)
	+I	Enable presentation auto trigger
Auto Trigger Mode	[DL5	Presentation auto trigger mode (Default)
	[DL6	Hand held auto trigger mode

Auto Trigger Sensitivity

The sensitivity varies with the ambient environment and adjustment may be necessary.

	Commands	Description
Auto trigger sensitivity	[XMF	Sensitive
	[XMH	Normal (Default)
	[XMJ	Insensitive

Double Read Reset Time

The time to end the auto trigger scanning can be adjusted.

	Commands	Description
Auto trigger read time adjustment	[EFH	Long time
	[EFI	Normal time (Default)
	[EFJ	Short time

Auto Trigger Sleep Mode

When nothing is detected after a specific configurable period while in auto trigger mode, the scan engine goes into sleep mode. The scan engine performs presence detection at specified time intervals in sleep mode and when a target is detected or any event such as trigger occurs, the unit exits from sleep mode. Setting a time of 0 seconds means that sleep mode is disabled.

	Commands	Description
Auto trigger sleep mode	[EBW Qa Qb Qc Qd	Transition time to sleep mode, (1000a+100b+10c+1d) msec Default: 10sec

Detection Mode

There are three methods for detecting a target code.

(1) Green aiming detection

When a target code falls within the green aiming light, the target is detected. This mode is recommended for indoor use only because target detection is reduced in environments with higher illumination levels than typically found indoors.

(2) Warm white illumination detection

When a target code falls within the range of the field of view of the warm white light, the target is detected. This mode is preferred in a dark environment.

(3) No illumination detection

A target code is detected without illumination light. The power consumption will be reduced, but the effectiveness of detection will also be reduced. Ambient light is used for detection in this mode, so this mode should not be used in a dark environments. Best used in a well-lit areas.

	Commands	Description
Auto trigger	[DDG	Green aiming detection
	[DDH	Warm white illumination detection
	[DDI	No illumination detection *(Default)*

LED illumination

	Commands	Description
LED illumination mode	[D39	Enabled LED illumination (Default)
	[D3A	Disable LED illumination
	[D3B	LED illumination alternating
	[D3Q	Prevent specular selection
LED illumination bright-ness	[DDB	Standard Brightness
	[DDF	Low Brightness *(Default)*

LED Aiming

	Commands	Description
LED Aiming ON/OFF	[D3D	Enable LED aiming (Default)
	[D3E	Disable LED aiming
LED Aiming brightness	[DDD	High brightness
	[DDE	Standard brightness *(Default)*
	[DDF	Low brightness

Quiet Zone

This option allows the scan engine to decode barcodes that have smaller start and/or end margins than standard for the symbologies. Note that this option may increase the possibility of partial and ghost reads, so do not use smaller margin checks unless necessary.

	Commands	Description
Margin Check	YN	No margin check
	YO	Margin check 1/7 nominal
	YP	Margin check 2/7 nominal
	YQ	Margin check 3/7 nominal
	YR	Margin check 4/7 nominal
	YS	Margin check 5/7 nominal
	YT	Margin check 6/7 nominal
	YU	Margin check nominal (Default)

Redundancy

When redundancy is enabled, a 1D code label has to be scanned and decoded multiple times and the results must be the same, before it considered correctly decoded. The redundancy count is the number of times that the label has to be scanned in addition to the first scan. Selecting a higher redundancy count reduces the probability of reading errors, but it makes the output response slower.

	Commands	Description
Redundancy	X0	Read 1 time, redundancy = 0
	X1	Read 2 time, redundancy = 1
	X2	Read 3 time, redundancy = 2 (Default)
	X3	Read 4 time, redundancy = 3
	BS	Read 5 time, redundancy = 4
	BT	Read 6 time, redundancy = 5
	BU	Read 7 time, redundancy = 6
	BV	Read 8 time, redundancy = 7
	BW	Read 9 time, redundancy = 8

Buzzer Loudness

	Commands	Description
Buzzer Loudness	T0	Maximum (Default)
	T1	Loud
	T2	Normal
	T3	Minimum

Good Read Buzzer

The good read buzzer is activated after a barcode was successfully decoded and the data was output. 3 types of tone and 5 types of duration are configurable. Buzzer also can be disabled.

	Commands	Description
Buzzer Disable/Enable	W0	Disable Buzzer
	W8	Enable Buzzer (Default)
Buzzer Tone	W1	Single tone buzzer (3000Hz) (Default)
	W2	High – Low
	W3	Low – High
Buzzer tome frequency setting	[DF0 Qa Qb Qc Qd	Numerical setting of buzzer tone frequency, (1000a+100b+10c+d) Hz *Default*: 2,700Hz
Buzzer duration	W7	50ms
	[EFW	75ms
	W4	100ms *(Default)*
	W5	200ms
	W6	400ms

Start-up Buzzer

This setting determines whether the scan engine emits a beep when it is powered on.

	Commands	Description
Startup buzzer	GD	Disable startup buzzer (Default)
	GC	Enable startup buzzer

Read Timeout Buzzer

In case a barcode is not read within the timeout period, an error buzzer sounds when the read operation ends.

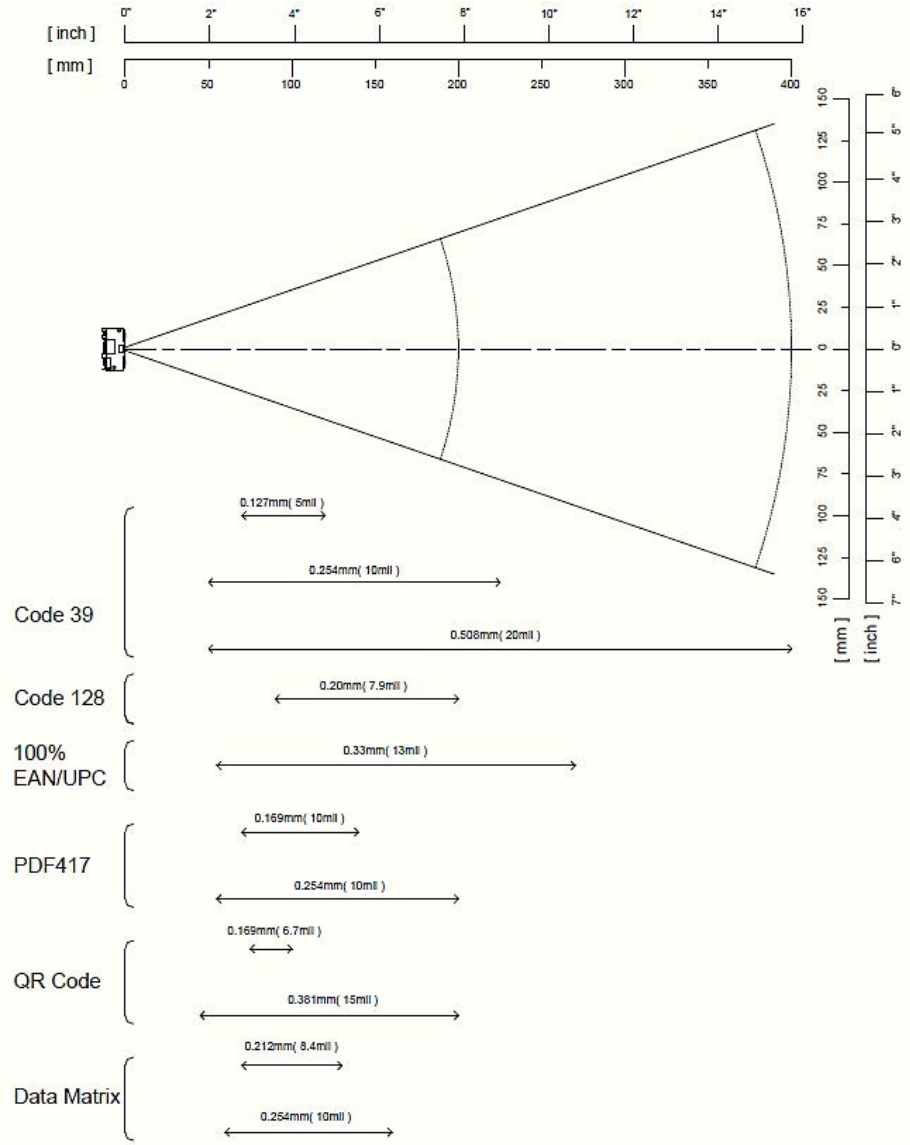
	Commands	Description
Read timeout buzzer	[EAP	Disable read timeout buzzer (Default)
	[EAQ	Enable read timeout buzzer

Intermediate Buzzer

When one label is decoded, an intermediate buzzer sounds to indicate that the label is decoded but it does not yet meet the conditions to output data.

	Commands	Description
Intermediate buzzer	[EBY Q0	Disable intermediate buzzer
	[EBY Q1	Enable intermediate buzzer (Default)

Scanning Ranges



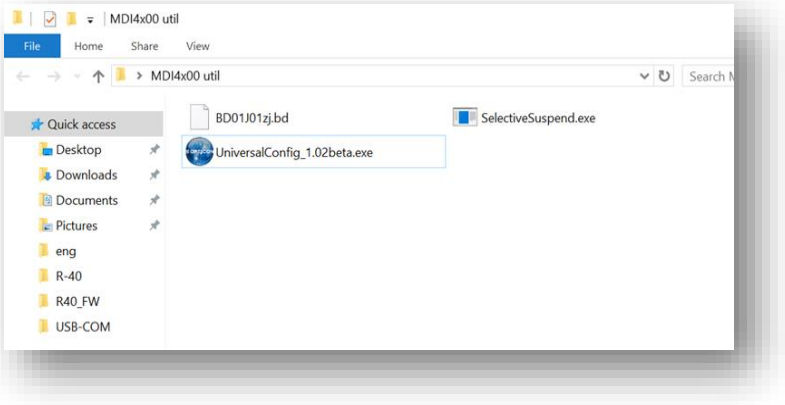
Updating Firmware

Step 1

Restore to factory default by scanning the barcode below:

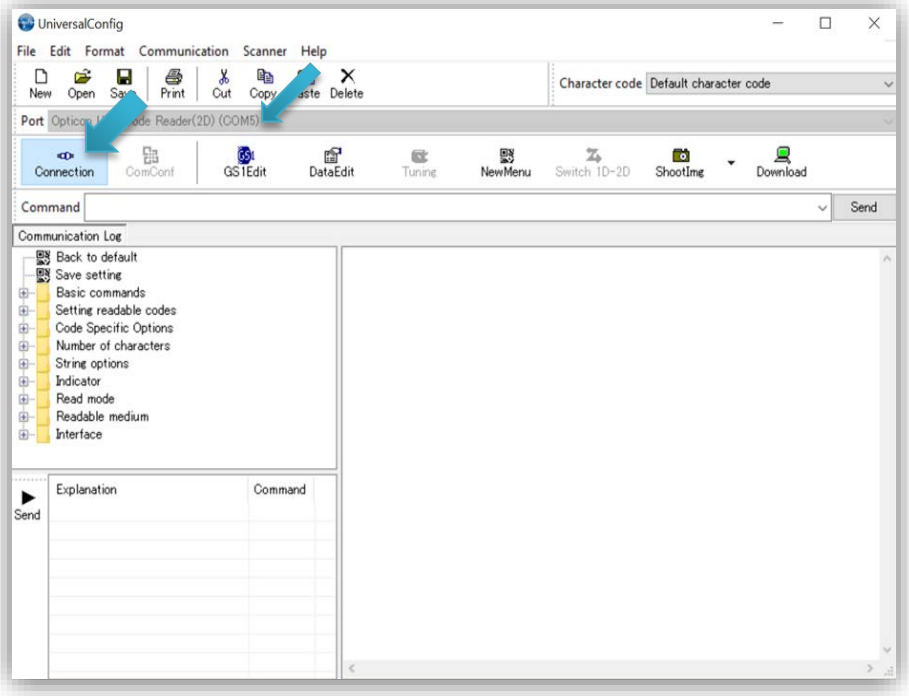
Step 2

Launch the *UniversalConfig* software.



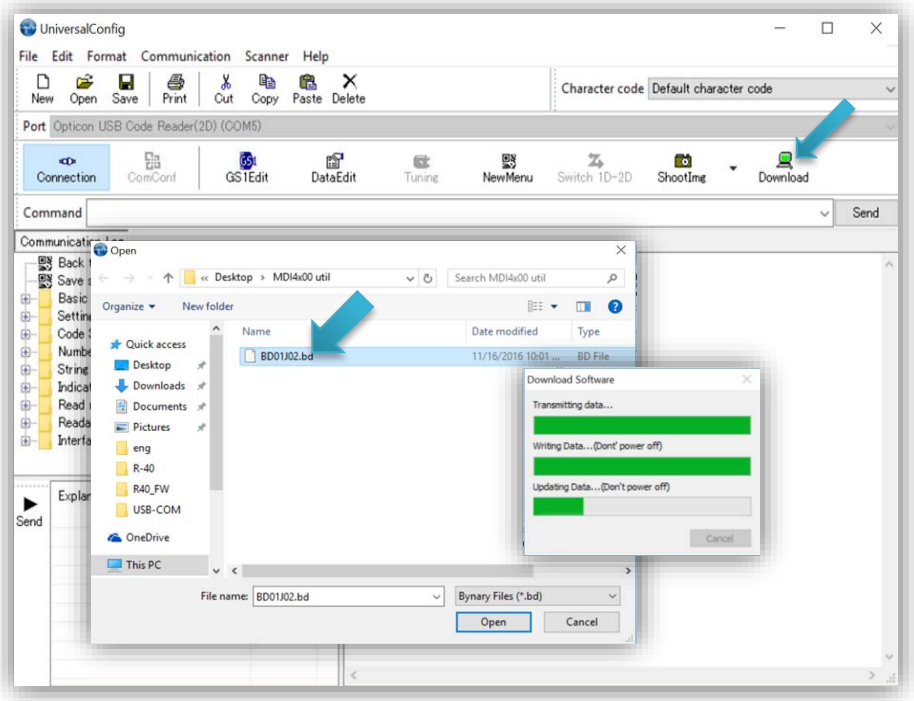
Step 3

Select “Port” and Click the “Connection” Button.



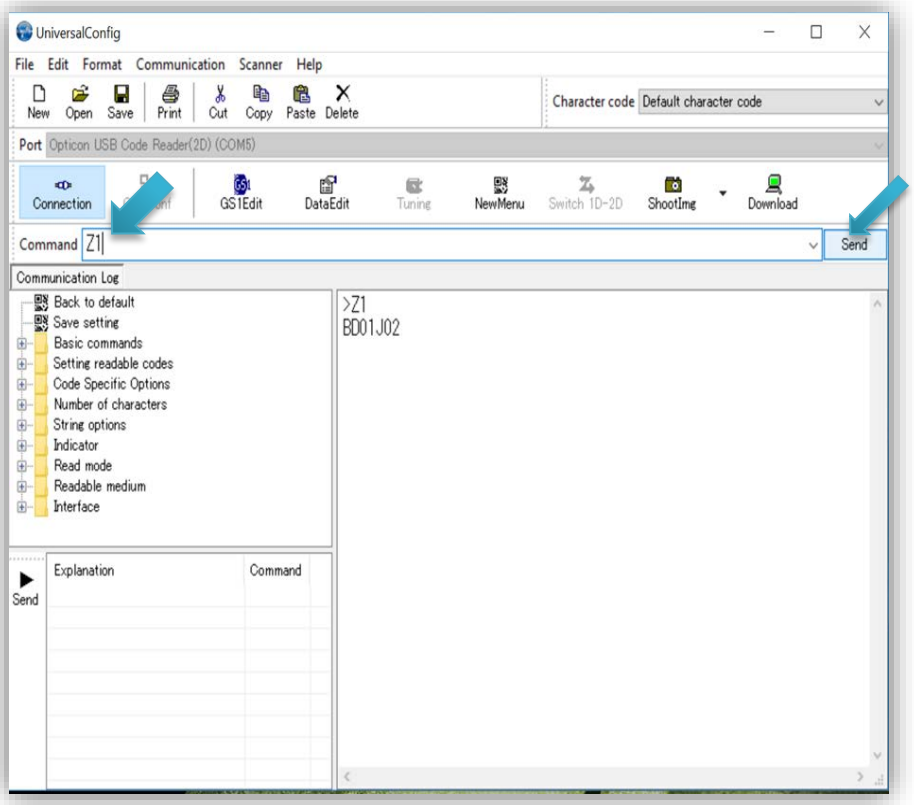
Step 4

Click “Download” button and select the file.



Step 5

Download is completed. Check the version using “Z1” command.



Care and cleaning instructions

In order to guarantee good reading results, the BA9x BCR should be cleaned from time to time. This can be carried out by using a damp cloth.

Technical data

Model	BA9x BCR
Rated Voltage	5V +/- 5%
Rated Current	250 mA (Operating)
Standby current	12mA
Physical Interface	USB 2.0, bus-powered
Application Interface	HID Keyboard Emulation, USB-COM or IBM USB-OEM
Scan Method	CMOS Imaging (black & white)
Number of pixel	640 x 480 pixels
Image Capture speed	Up to 100 fps
Illumination	White LED
Aiming pattern	Green LED, bar pattern
Minimum resolution	1D code: 0.1 mm (4 mil) 2D code: 0.169 mm (6.7 mil)
OCR readable documents	Machine readable passports, Machine readable Visa-A & Visa-B, Official travel documents 1 & 2
Firmware upgrade	Yes
Operating Systems	Windows 7, 8.1 and 10, Linux
Symbologies	UPC/EAN/JAN, GS1 DataBar, Code 39, Code 128, Code 93, Code 11, Codabar/NW7, Interleaved 2 of 5, S-Code, IATA, JPN (Customer barcode), Code 2 of 5, Matrix 2 of 5, MSI/Plessy UK/Plessy, Telepen, Trioptic, GS1-128, PDF417, Micro PDF417, Codablock F, EAN Composite, UPC Composite, GS1-Databar, GS1-Databar Composite, GS1-128 Composite, Aztec Code, Aztec Runes, Data Matrix (ECC 200), Data Matric (ECC 000-140), QR Code, GS1-Datamatrix, Micro QR Code, Maxi Code, GS1-QR Code, OCR
Operating Condition	5 to 40 degree Celsius 10 to 90% RH
Weight	64 g
Dimensions	93.6 x 126.7 x 32.7 mm

Abbreviation index

AAMVA	American Association of Motor Vehicle Administrators
API	Application Programming Interface
CE	European symbol of Conformity
DUKPT	Derived Unique Key Per Transaction
eMSR	Encrypted Magnetic Strip Reader
EC	European Community
FCC	Federal Communications Commission
ICES	Interference-Causing Equipment Standard
ISO	International Standards Organization
HID	Human Interface Device
MSR	Magnetic Strip Reader
POS	Point-Of-Sale
RoHS	Restriction of Hazardous Substances
TDEA(Triple DES)	Triple Data Encryption Algorithm
USB	Universal Serial Bus

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