



BeeVision 200

User Manual

Version 1.2.1



1 Overview	3
2 Installation	4
3 Connection Ports.....	5
4 Turning ON/OFF	8
5 Field of View.....	9
Optical Center	9
Field of View	10
Focus Adjustment	12
6 Communication Interfaces.....	12
7 Volumizer	13
Camera Settings Page	17
Merge Cameras.....	20
IO Settings.....	22
Trigger Settings Page	23
Illumination Settings Page	25
Integration Page.....	26
Network Settings Page.....	31
System Settings Page	33
External Devices Page	34
Scale Settings Page	34
Scanner Settings Page.....	34
Printer Settings Page.....	34
IP Cam Settings Page.....	35
Browse History Page	36

System Information Page.....	36
Logs Page	36
8 Volumizer API.....	37
Web Service	37
9 Technical Drawings	44

1

Overview

This document provides a description of installation, configuration and usage of BeeVision™ 200 high performance barcode reader.

BeeVision barcode readers are equipped with Volumizer™ software that enables users to easily configure the device, scan barcodes and share the results. Users can use the BeeVision barcode readers with Volumizer-GUI available on an attached monitor or with Volumizer-WebUI from their browser on their PC, tablet or smart-phone.

With Volumizer-API, users can control their barcode reader remotely and integrate it into their software infrastructure.

2

Installation

BeeVision 200 barcode reader is depicted below.

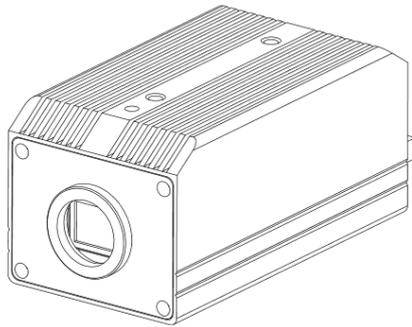


FIGURE 1 BEEVISION 200 BARCODE READER

A lens should be attached to the front side of the BeeVision barcode reader. BeeVision barcode readers are designed to be used with C-mount type lenses. The focal length of the selected lens depends on the area that should be covered and also the barcode properties. 25mm C-mount lens is generally recommended for barcode reading application.

Adding illumination is also strongly recommended particularly for reading barcodes on objects that are in-motion. Without proper illumination, the exposure (shutter) time must be a relatively high value causing blurring in the images if objects are moving. Blurring degrades the decoding capability.

If you receive the illumination module with BeeVision barcode readers, a mounting bracket is also provided. The bracket is to mount the illumination to a separate location preferably with a 45-degree tilt as depicted in the following figure.

If illumination module is directly mounted on the lens, glaring may occur in the image and thus on the barcode. Having a tilt angle between the barcode reader and the illumination module decreases glaring and increases the decoding quality.

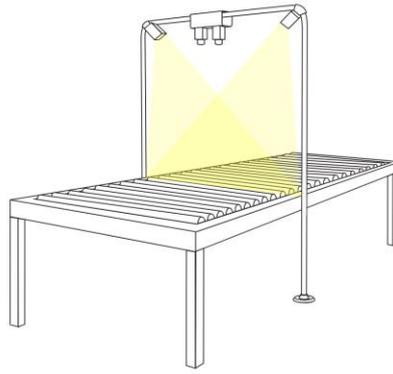


FIGURE 2 BARCODE CAMERAS AND ILLUMINATION

For illumination and lens accessories, you can get in contact with BeeVision team (info@beevision.ai).

3

Connection Ports

FIGURE 3 below shows the connection ports that are located on the backside of the BeeVision 200.

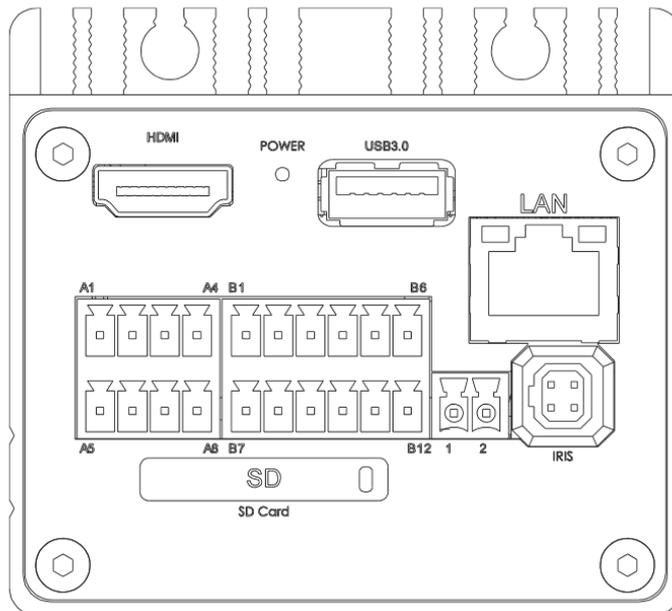


FIGURE 3 BACK SIDE OF BEEVISION 200

HDMI port: To connect to an external monitor to view Volumizer user interface (UI).



Even though it may work, it is not recommended to use a USB monitor with the device.

USB 3.0 port: The USB 3.0 port is typically used for touch-screen, keyboard or mouse connections. An USB hub can be attached to increase the number of USB slots.

Ethernet port: To communicate with any computer or server system for the data transfer.

8-pin connector (A1-A8): For power and RS232 connections. Descriptions of the pins are provided in the table below.

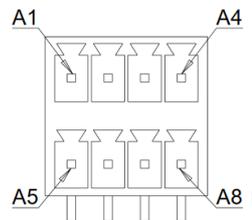


FIGURE 4 8 PIN CONNECTOR

Number	Name	Type	Description
A1	POWER-IN	Power	Power input 8-40VDC (12VDC is recommended)
A2	GROUND	Power	Ground for power and RS232
A5	NA	NA	
A6	NA	NA	
A4	RS232 Rx1	Input	Input of RS232

A8	RS232 Tx1	Output	Output of RS232
A3	RS232 Rx0	Input	Reserved and not available
A7	RS232 Tx0	Output	Reserved and not available

12-pin Connector (B1-B12): For illumination, output, input and RS485 connections.

Number	Name	Type	Description
B3	ISO_IN1+	Input	Photoelectric sensor Input (+)
B9	ISO_IN1-	Input	Photoelectric sensor Input (-)
B4	ISO_OUT1A	Output	Output (+)
B10	ISO_OUT1B	Output	Output (-)
B5	FLASH_OUTPUT+	Output	Reserved for the Illumination
B11	FLASH_OUTPUT-	Output	Reserved for the Illumination
B8	NA	NA	
B2	NA	NA	

B1	GROUND	Power	Signal Ground
B7	EARTH	NA	Earth of device casing
B12	RS485_A	Input / Output	RS485+
B6	RS485_B	Input / Output	RS485-

SD Card: SD card slot is not supported.

IRIS: Iris control slot is currently not supported.

2-pin Connector: 2-pin connector is used for AC power synchronization. It is currently not supported.

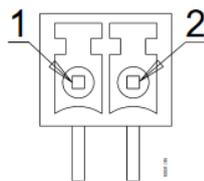


FIGURE 5 2-PIN CONNECTOR

4

Turning ON/OFF

When the power cord is inserted into the power port, the device is automatically turned on and will be ready for use. The input mains voltage for the power adapter provided with the BeeVision barcode readers must be at an interval between 100V-240V and 50Hz/60Hz. BeeVision 200 requires an input voltage between 8-40 VDC. Max power consumption of the BeeVision 200 barcode reader is 15W. It is recommended to use the provided power adapter.

To connect the BeeVision barcode reader to a computer or a local network for data transfer, simply use an Ethernet cable. The detailed explanation of the connection is provided in the [NETWORK SETTINGS PAGE](#). Please refer to chapter [8 VOLUMIZER API](#) for more details on how to integrate BeeVision to your system.



BeeVision 200 barcode readers are not equipped with Wi-Fi interface; nevertheless, an USB wireless adapter can be attached. Please get in contact with BeeVision team for Wi-Fi support request.

In order to view the decoded barcodes and device settings on a monitor, just connect one end of any standard HDMI male-to-male cable to the HDMI port of the device and the other end to the monitor. If you use a touch-screen monitor, connect the USB cable to the USB 3.0 port on the device for enabling touch operation. After connecting the cable for the first time, you may need to restart the device depending on the driver of the touch-screen monitor. If you have problems using the touch-screen, get in touch with the BeeVision support team.



The mouse cursor is by default hidden in Volumizer UI. If you would like to connect a mouse and a keyboard, you can enable/disable mouse cursor with **Ctrl+Shift+M** combinations in your keyboard.

To turn off the device, simply unplug the power cord.



BeeVision starts in headless mode when no monitor is attached and the device can only be controlled via Volumizer-WebUI or Volumizer API web services. In order to bring up Volumizer GUI, connect a monitor and reboot the device.

5

Field of View

Optical Center

The optical center of the device is shown in FIGURE 6 below. When mounting the device, align it according to the optical center and center the projection of this point on the decoding area center.

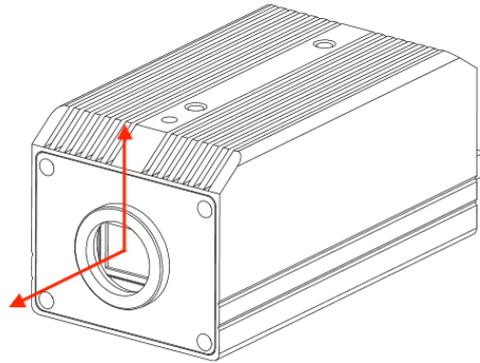


FIGURE 6 OPTICAL CENTER OF THE BEEVISION 200

Field of View

The field of view of BeeVision depends on the selected lens. The field of view of the recommended 25mm lens, optionally provided with the BeeVision 200, is $20^{\circ} \times 15^{\circ}$ as illustrated in FIGURE 7.

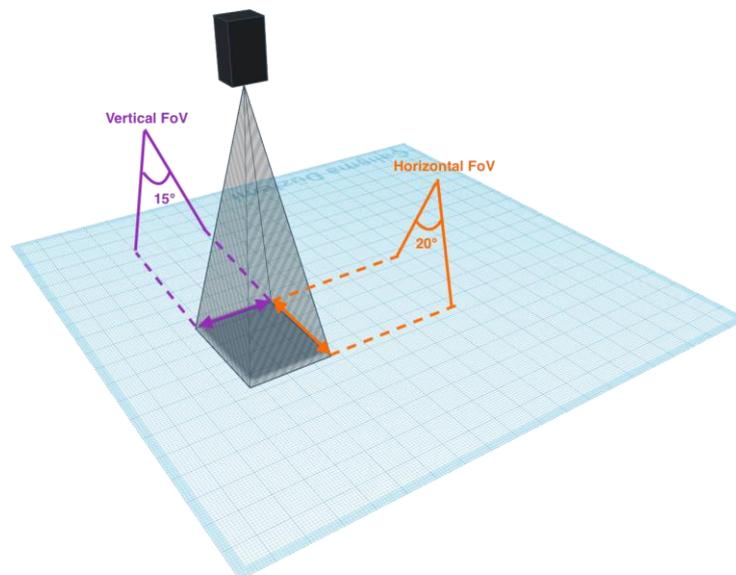


FIGURE 7 HORIZONTAL AND VERTICAL FIELD OF VIEW

The recommended installation height for the BeeVision 200 is 125cm (5.0MP version) if low quality printed barcodes are expected. If printing quality is reliable and good, the installation height can be 175cm. For maximum area coverage, the installation height may be increased but if the barcode thickness is low, decoding performance will be degraded. You can find the table about the coverage areas at different installation heights below for 5.0MP version of BeeVision 200.

CAMERA INSTALLATION HEIGHT (CM)	LENS FOCAL LENGTH (MM)	PACKAGE HEIGHT (CM)	FOV LENGTH (CM)	FOV WIDTH (CM)	PIXEL PER MM ON PACKAGE
125	25	0	35.0	41.5	5.9
125	25	60	17.9	21.3	11.5
150	25	0	42.1	50.2	4.9
150	25	60	25.0	29.8	8.2
175	25	0	49.3	58.7	4.2
175	25	60	32.1	38.3	6.4

Let's take a look at the following example application.

Conveyor width: 60cm

Object Height Range: 0-60cm

Minimum Barcode Thickness: 0.3mm

The BeeVision barcode readers should be installed as following provided that there is enough illumination. (Assuming barcodes may be printed with low quality). Following configuration provides you a solid barcode reading performance.

Installation Height: 125cm

Number of Cameras: 3

Total Coverage at the conveyor surface:124.5cm

Total Coverage at 60cm high object surface: 63.9 cm



Set the Aperture to the minimum value to get highest depth-of-field and so focus over a long range. Aperture should be fixed at 1.6 (lowest value) with the 25mm lens provided with the BeeVision barcode readers.

If you are using the BeeVision 200 for image capture, aperture might be set to a slightly larger value.

Focus Adjustment

After the aperture adjustment, focus of the lens should be manually adjusted. The easiest way to change the focus of the camera is to connect a monitor to the BeeVision 200 and turn on the live view. If monitor is not available, users can use WebUI by entering the IP address of the BeeVision 200 on the address bar of their Google Chrome browser. However, live streaming with WebUI is currently not supported, users have to manually capture single images to be able to select the best focus.

To capture and view single images with WebUI, stream must be stopped and 'Capture and Decode' button must be used. 'Send images as base64-string' on the Integration-Web Service page must be also enabled.

Best practice while adjusting the focus is to place a paper with a text at the farthest point and adjust the focus so that the text on the paper is clearly legible. Once the focus is set, the corresponding metal knob must be tightened.

Here is the summary of steps to adjust focus:

- Mount the BeeVision 200 to desired height
- Place a paper with text on the ground
- Connect a HDMI monitor and start the camera view on Camera Settings page (or use WebUI as described above)
- Enable the 'Show Original Size' view to be able to see enlarged image
- Adjust focus so that text is clear (not blurred)
- Tighten the knob on the lens when done

6

Communication Interfaces

Following communication interfaces are supported with BeeVision barcode readers.

- USB interface
- Serial interface (RS232) to transfer data to user computer
- Ethernet interface for communicating over the internet or local network to a central server via web-service or TCP socket

7

Volumizer

Volumizer is the software installed in the BeeVision barcode readers that enables users to control the device, change settings and decode barcodes. It has a graphical user interface (GUI) that can be used when BeeVision is connected to a monitor. It also has a web-based user interface (WebUI) that can be accessed from a browser with the following address: `http://IP_address_of_device`. Google Chrome browser is officially supported.

Users can navigate to pages from the main menu as shown in FIGURE 8 and FIGURE 9.

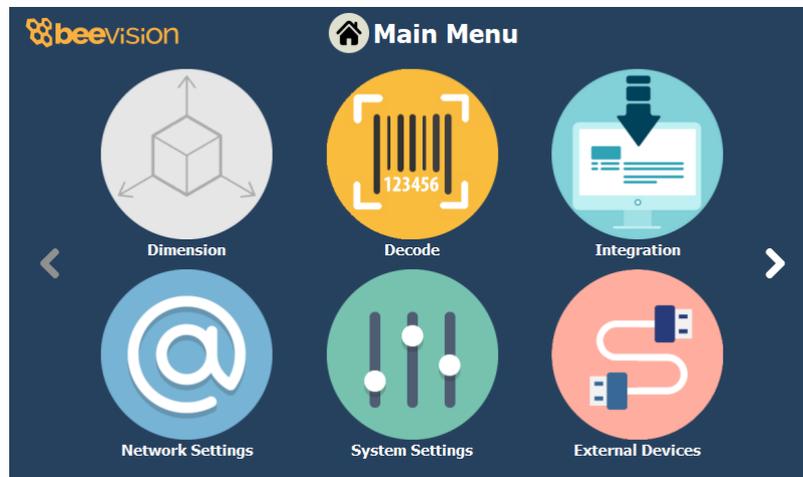


FIGURE 8 MAIN MENU OF VOLUMIZER GUI

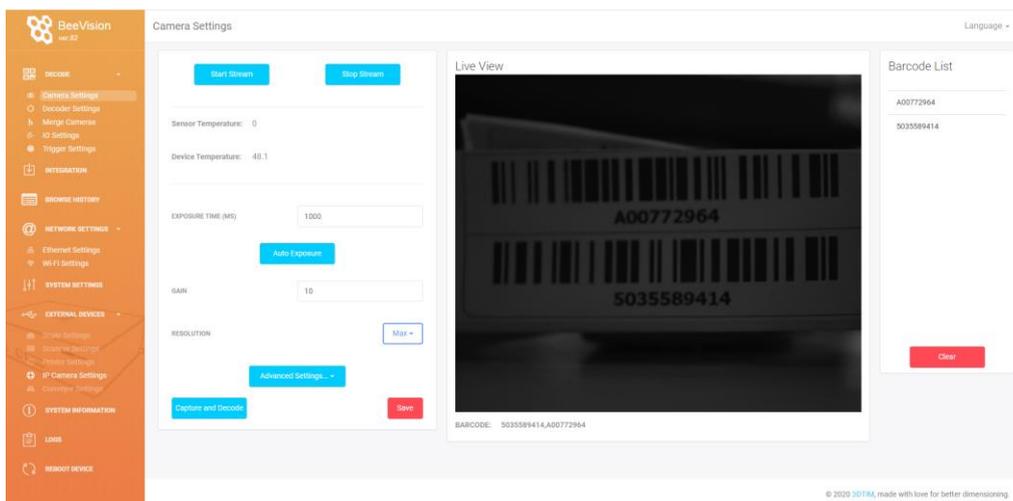


FIGURE 9 VOLUMIZER WEBUI

Following pages are included in Volumizer GUI and WebUI:



Brings up decoding submenu

Decode



Camera
Settings

Change camera settings and view
decoding results



Decoder
Settings

Change decoding related settings
such barcode type, length, etc.



IO Settings

Change input and output port
settings



Trigger
Settings

Change camera trigger settings



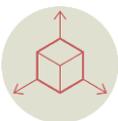
Merge
Cameras

Merge slave BeeVision barcode
readers with master device



Illumination
Settings

Change illumination settings. (Not
supported with every illumination
type)



Dimension

Brings up dimensioning submenu.
Disabled in BeeVision 200



Integration

Change result sharing options



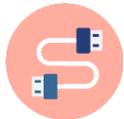
Network Settings

Change Ethernet and Wi-Fi settings



System Settings

Change system settings such as language, time, date and device operation mode



External Devices

Brings up External Devices submenu



Scale Settings

Change scale connection settings.
Disabled in BeeVision 200



Scanner
Settings

Change handheld and fixed-mount
barcode scanner connection
settings. Disabled in BeeVision 200



Printer
Settings

Change label printer settings.
Disabled in BeeVision 200



Conveyor
Settings

Change conveyor and PLC
connection settings (might be
disabled based on the model)



IP Cam
Settings

Change IP camera settings (might be disabled based on the model)



Browse History

Browse previous measurement results



System Information

View information about the system such as model name, certification status, SW checksum, etc.



Reboot

Restarts the device



Logs

View system log and parameter change log

GUI Navigation Icons:



Opens up the previous upper menu page



Opens up the main menu page

Functions of pages are described in details in the following sections.

Decode Page

In Decode page, users can navigate to 6 sub-pages: Camera Settings, Decoder Settings, Merge Cameras, IO Settings, Trigger Settings and Illumination Settings pages.

Camera Settings Page

Camera Settings page is used for changing basic camera and illumination settings and viewing the stream.

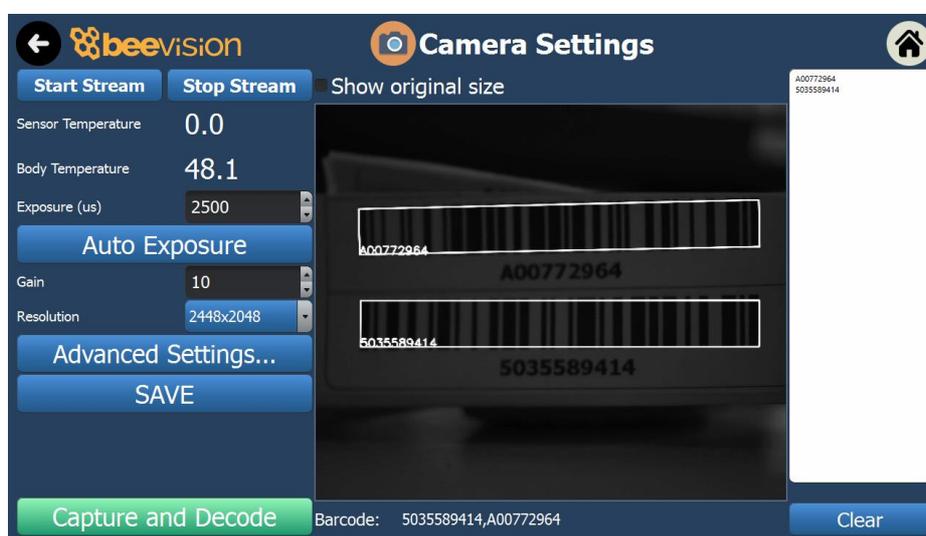


FIGURE 10: CAMERA SETTINGS PAGE IN VOLUMIZER GUI

Start Stream: Starts a live stream. If external input is selected as the trigger method, this button is disabled. Starting stream does not automatically start decoding operation. Decoding is started if Decode button is pressed after the stream is started. Decoded barcodes are added to the list on the right side of the page.

Stop Stream: Starts the ongoing live stream and also the decoding if enabled.

Sensor Temperature: Reports the temperature in the image sensor. Sensor temperature reporting is not supported in BeeVision 200.

Body Temperature: Reports the temperature in the camera.

Exposure (us): Sets the exposure (shutter) time to the desired value in microseconds. If Auto Exposure is enabled, setting exposure time here disables auto-exposure and enables manual exposure. Minimum value is 0 and maximum value is 46000.

Please note that exposure time plays a vital role in barcode decoding operation. Here are the recommended exposure times given that adequate illumination is provided.

Conveyor Speed: 0.65m/sec → Exposure Time \leq 500us

Conveyor Speed: 0.75m/sec → Exposure Time \leq 420us

Conveyor Speed: 0.85m/sec → Exposure Time \leq 350us

If the exposure time is set to a high value, blurring will occur in the images that causes substantial decrease in the decoding capability.

Auto Exposure: When pressed, enables the auto-exposure function of the camera. Once enabled, exposure time and gain set by the user are disregarded. To enable the manual exposure setting again, set a new value to the Exposure entry field. Auto Exposure is not recommended in dynamic barcode reading applications.

Gain: Sets the gain of the image capture in dB. Gain feature increases the brightness of the image. Setting it to a high value increases the noise in the image and hence decreases the barcode decoding capability. A value higher than 24 is not recommended. Having a too bright image increases the decoding duration as well. A value between 10-20 is generally sufficient for barcode decoding. Minimum permissible value is 0 and maximum permissible value is 36.

Resolution: Select an available image resolution. Max resolution is recommended for wider area coverage. If some parts of the image should not be taken into account, smaller resolution values can be picked to capture smaller images.

Advanced Settings: Brings up a new menu to set the illumination settings:

Enable light: Enables the trigger of the connected light. With every camera trigger, connected light is also triggered.

Light pre-output time (us): Some lights need a certain time to reach max illumination capacity. A pre-output time can be set to trigger lights in advance to the camera trigger. A value between 0 and 100 microseconds can be set.

Light output pulse width (us): Set the output time of the light. When set to 0, light trigger time is equal to the exposure time. Recommended value is 0.

Save: Saves the exposure, gain, resolution settings, and advanced settings to the memory; otherwise, they are reset after a reboot.

Capture and Decode: If the live stream is not started, pressing “Capture and Decode” button captures a single-shot and also decodes barcodes on captured image. Decoded barcodes are added to the list on the right side of the page. If streaming is enabled, the button is used for enabling or disabling the decoding function during the stream.

Decoder Settings

Settings related to the decoding operation can be changed in this page.

Barcode Type and Length: When pressed a popup appears to select barcode type(s) and required barcode length per specific barcode type. This way barcodes can be quickly filtered based on their length and type. Setting the length to 0 means no filtering. If a new line character exists at the end of the barcode, that is also counted here. Thus, using regular expressions might be a better method to filter the barcodes if the barcode length is not certain.



Enabling decoding of 2D barcodes such as QR, Matrix, etc. decreases the decoding speed significantly. Enable only the barcode types that your application requires.

Decode Timeout: Maximum permissible time for a decoding operation on a single image. Recommended value is 0 that means no filtering on decode time.

Number of Expected Barcodes: Set the max number of barcodes per image. For example, if the number of expected barcodes is set to 1, decoding operation on that image is ended after a successful decoding. If no limit is set, whole image is scanned for more barcodes until the end. Setting an expected barcode number may increase the decoding operation speed. 0 means no limit in the barcode number.

Same Barcode Allowed After # of Barcodes: Decode the same barcode again only after provided number of different barcodes are decoded. Not applicable when using capture and decode button. This option is useful if a single result should be shared with user interface and same decodes are to be ignored within a trigger interval. Recommended value is 5.

Same Barcode Possible After Certain Timeout: When checked, same barcode can be decoded again after given timeout value in millisecond (ms).

Enable Low Contrast Enhancement: When checked, enables camera contrast enhancement feature to increase the ability to decode barcodes. It is recommended to enable this option.

Enable Barcode Match Criteria: This is another advanced barcode filtering option. When checked, decoded barcodes will be checked if they pass the regular expression (regex) criteria set below.

Barcode Match Criteria RegEx: The regular expression (regex) to filter the decoded barcodes.

Test Match Criteria Manually: Barcodes can be tested manually if they match with the entered regex value. Green means pass, red means rejection.

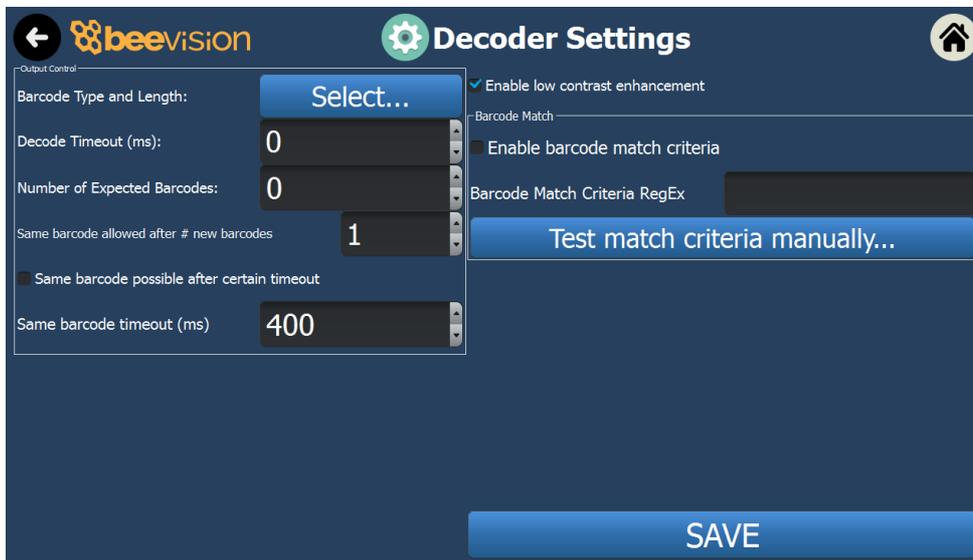


FIGURE 11: DECODER SETTINGS PAGE IN VOLUMIZER UI

Merge Cameras

In most of the barcode decoding applications, a single camera is not sufficient to cover the required area. Multiple cameras should work in harmony. This page helps the user set the necessary roles for the barcode reader cameras.

Network Role: Master or Slave: BeeVision barcode readers have master and slave modes. The master behaves as the main camera that communicates with the user's interface. There should be only one master in a BeeVision barcode reader network. A slave camera communicates only with the master camera. The decode results are sent to the master camera and master camera sends them to the customer if decode results pass the assigned criteria.

Master Camera Address: If the camera is a slave, the IP address of the master camera should be set here.

Send images to master: Enable image sharing with the master camera in addition to the decode results. When enabled, master camera shares the image from slaves with the user's interface.

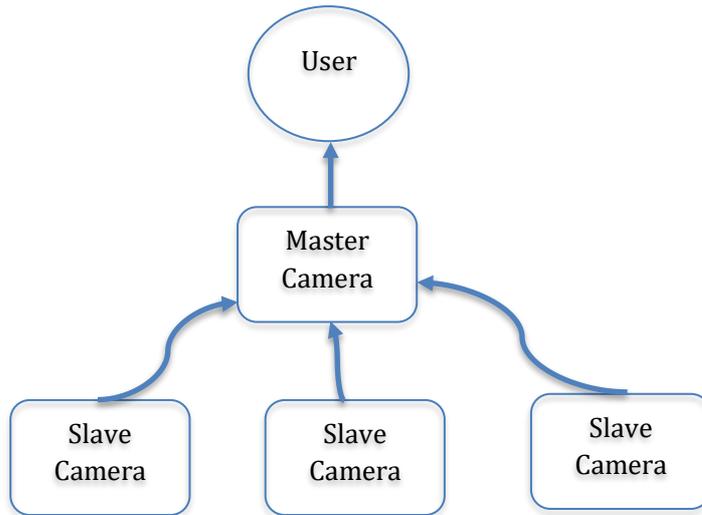


FIGURE 12 MASTER-SLAVE NETWORK

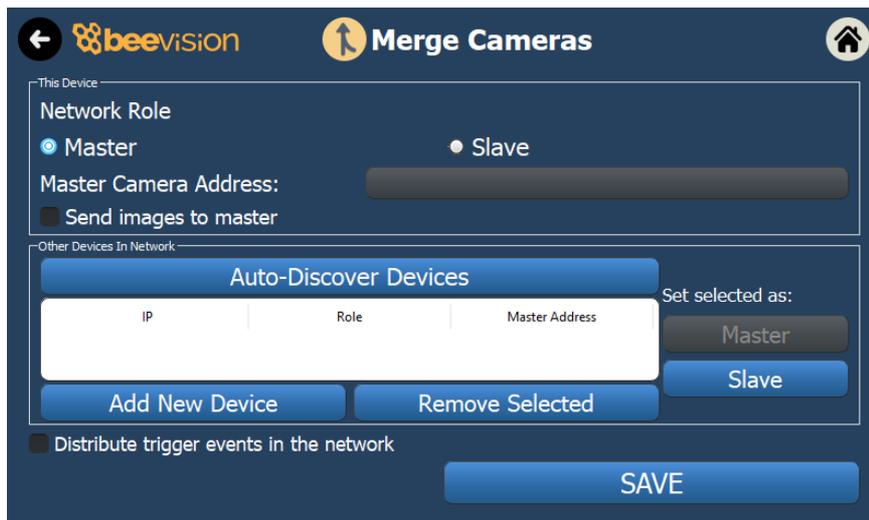


FIGURE 13: MERGE CAMERA PAGE IN VOLUMIZER UI

Auto-Discover Devices: Discover the other BeeVision 200 barcode readers in the local network. The IP addresses of the discovered devices are listed below the button. If remote camera is a slave, its master address is also indicated. Settings of remote cameras can be verified this way.

Add New Device: Manually add an IP address of a BeeVision 200 camera. Then a role can be assigned to the new camera.

Remove Selected: Remove a camera from the list above.

Set selected as Slave: Set the role of the selected remote camera as slave.

Set selected as Master: Set the role of the selected remote camera as master.

Distribute trigger events in the network: If only one camera receives an external trigger, trigger event can be shared in the network with other cameras that have network-triggering enabled. There might be a delay between master and slave cameras when using network trigger. Recommended trigger method is using external triggers for all cameras independent of their slave or master configuration.

Save: Save the master-slave selection, master address, image sharing, and trigger event distribution settings in the memory. If not saved, settings are reset after a reboot.

IO Settings

Settings related to BeeVision 200's input and output ports can be changed in this page.

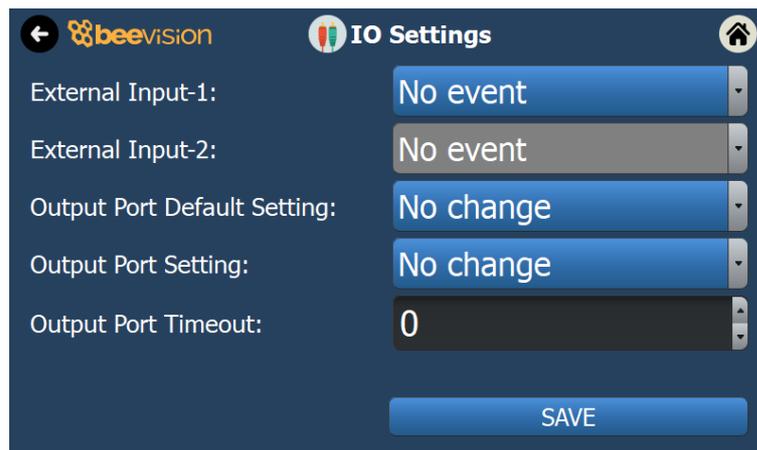


FIGURE 14: IO SETTINGS PAGE IN VOLUMIZER UI

External Input-1: Setting for which type of input signal will fire an event, when an external input signal is connected to the BeeVision 200. Applicable if trigger mode is selected as external.

No event: Not fire any event regardless from input signal.

Event at rising edge: Event fired after receiving input signal's rising edge.

Event at falling edge: Event fired after receiving input signal's falling edge.

Event at both edges: Event fired after receiving input signal's rising or falling edge.

Event at low: Event(s) fired when the input signal is in low level.

Event at high: Event(s) fired when the input signal is in high level.

External Input-2: Not available.

Output Port Default Setting: Default signal level of output port. The output port is set to the default value after it is changed.

No change: Output value is not brought back to the default state

High: Default output signal is high.

Low: Default output signal is low.

Output Port Setting: Sets output port signal to desired level according to selected operation status.

No change: Output port is not changed.

High at success: Sets output signal to high upon successful decoding within trigger interval.

Low at success: Sets output signal to low upon successful decoding within trigger interval.

High at failure: Sets output signal to high upon failed decoding within trigger interval.

Low at failure: Sets output signal to low upon failed decoding within trigger interval.

Output Port Timeout: Defines how long is output port stays at the set signal level.



Output default value and output setting value should be considered together. Setting them to the same value would cause no movement in the output level.

Trigger Settings Page

Select the trigger type to start capturing and decoding of the BeeVision 200 barcode reader.

Trigger: Select the trigger type from following options:

Software: Decode operation can be started with software such as pressing on the Start button in Camera Settings page. Camera captures frames with software trigger independent of the external signal.

External: Decode operation can be controlled with an external input.

Free Run: Decode operation starts immediately after software start does not stop until the device is turned off.

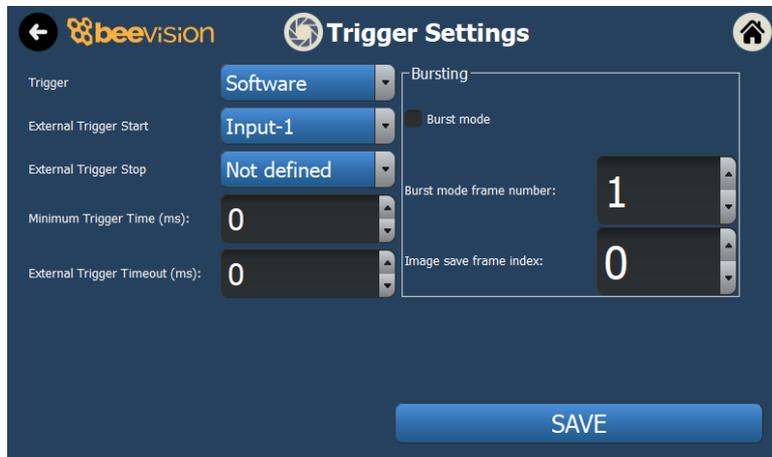


FIGURE 15: TRIGGER SETTINGS PAGE IN VOLUMIZER UI

External Trigger Start: Defines how to start decode operation externally.

Input-1: Start decode operation after receiving desired signal from BeeVision 200's input 1 port.

Network: Start decode operation after receiving start command from network via API. If BeeVision 200 is integrated with BeeVision 270 dimensioner, network triggering method should be selected.

External Trigger Stop: Defines how to stop decode operation externally.

Input-1: Stop decode operation after receiving desired signal from BeeVision 200's input 1 port.

Network: Stop decode operation after receiving stop command from network via API

On success: Stop decode operation after decoding desired number of barcodes.

Not defined: Stop command not defined, use timeout to stop decoding. If BeeVision 200 is integrated with BeeVision 270 dimensioner, this triggering stop method should be selected.

Minimum Trigger Time: When external trigger stop signal is received before the desired decode duration, stop signal is ignored and decode operation stops after entered value in millisecond (ms).

External Trigger Timeout: When external trigger stop is not defined, timeout value in millisecond (ms) can be set to stop decode operation after receiving an

external trigger. 0 means no timeout. If BeeVision 200 is integrated with BeeVision 270 dimensioner, a certain amount of timeout value should be set here to stop decoding after receiving network trigger from BeeVision 270.

Burst Mode: Capture assigned number of frames when BeeVision 200 gets external trigger signal. Should be used only when trigger start is defined and trigger stop is not defined.

Burst Mode Frame Number: Number of frames that will be captured at each trigger signal.

Image Save Frame Index: Desired frame number to be used as barcode record image.

Illumination Settings Page

Based on the provided illumination module, finer settings can be adjusted. Enabling or disabling flash is done in Advanced Settings in Camera Settings page.

Connect: If supported, a serial connection between the camera and the illumination module is established.

Light COM Port: The correct COM port value must be selected in the Light COM Port option to be able to connect to the illumination module.

Current Temperature: Displays the current temperature value of the illumination module.

Turn on/off light column sections: Disable or enable certain columns of LEDs in the illumination module.

Run Self-Test: Tests LED columns one-by-one and reports their status.

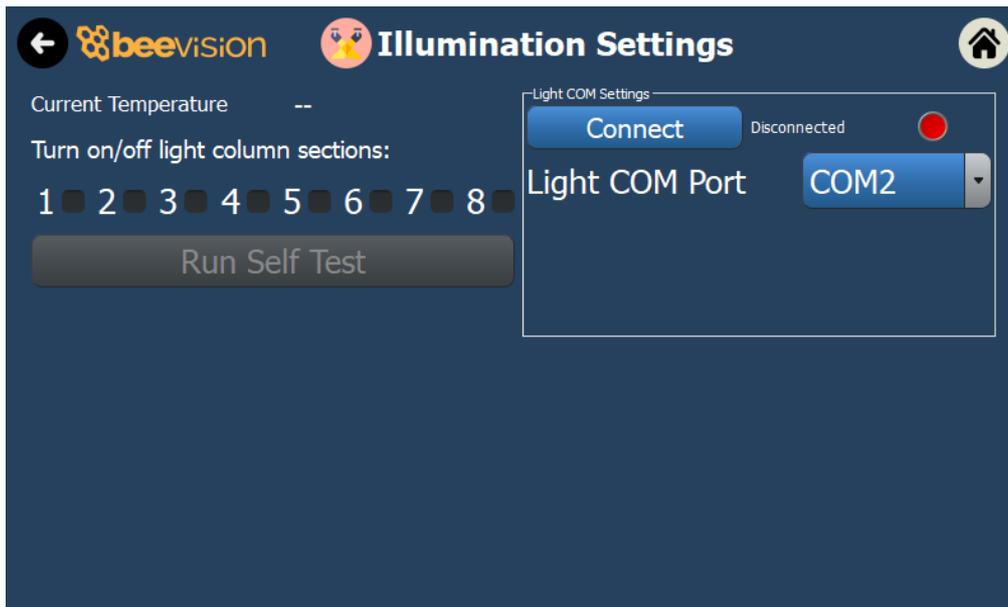


FIGURE 16: ILLUMINATION SETTINGS PAGE IN VOLUMIZER UI

Integration Page

Data sharing features can be modified in this page. For decode result sharing, 5 different modes are supported: SQL, Web Service, File Sharing, TCP/IP and RS232 as shown in Figure 17.

SQL

Send results to a SQL server: Barcode decode results can be directly inserted to a SQL server available in the network. Inserted columns and values are as following:

REFID: a numeric decode ID incremented with every successful decode

BARCODE: The decoded barcode string

PICTUREPATH: The path of the image file that is saved in a network drive if enabled in File Sharing tab. Otherwise, empty.

Server Address: The network IP address of the SQL server

Server Port: The port number that SQL server uses.

Database Name: The name of the SQL database.

Table Name: The name of table in the SQL database that barcode result will be inserted to.

User Name: Login credential user name.

Password: Password for the database.

Connection timeout: Timeout for the connection trial.

Reconnect to server with every message: Disconnects and reconnects again with every new result.

Check Connection: Check if a connection with the SQL server can be established.

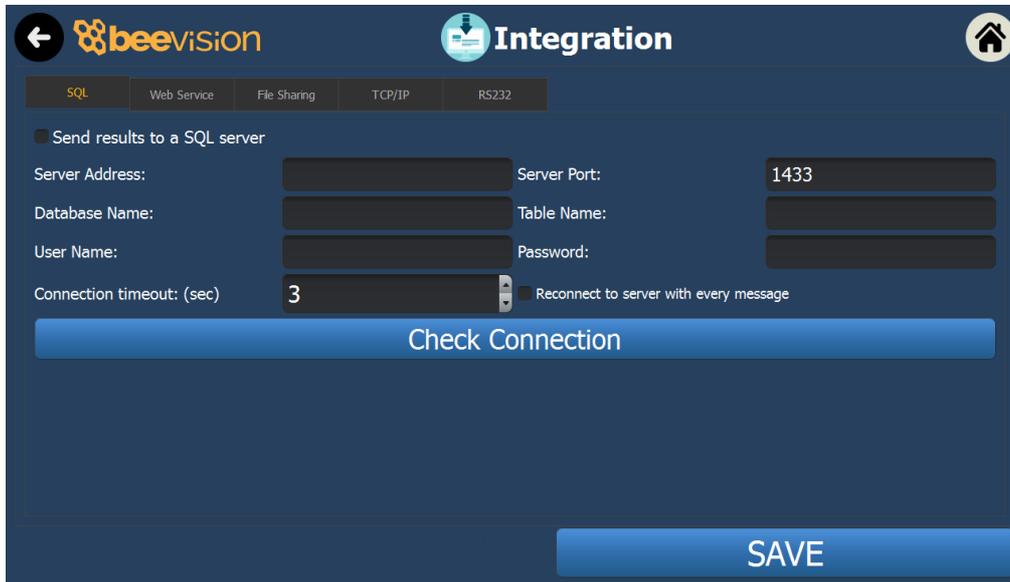
The image shows a screenshot of the BeeVision Integration page. At the top, there is a navigation bar with the BeeVision logo and the word 'Integration'. Below this, there are tabs for 'SQL', 'Web Service', 'File Sharing', 'TCP/IP', and 'RS232'. The 'SQL' tab is selected. Underneath, there is a checkbox labeled 'Send results to a SQL server'. Below this checkbox are several input fields: 'Server Address', 'Server Port' (with the value '1433'), 'Database Name', 'Table Name', 'User Name', and 'Password'. There is also a 'Connection timeout: (sec)' field with the value '3' and a 'Reconnect to server with every message' checkbox. At the bottom of the form area, there is a large blue button labeled 'Check Connection'. At the very bottom of the page, there is a blue button labeled 'SAVE'.

FIGURE 17 INTEGRATION PAGE

Web Service

Send results to a web server: This option is required when decode results should be shared with a remote server in an asynchronous fashion. When a barcode is successfully decoded, results are automatically sent to the listening web server address defined here.

If BeeVision 270 dimensioner is integrated with BeeVision 200, this option must be enabled and the web server address of the BeeVision 270 must be entered as described below.

Web Server Address: Address of the listening service at remote web server.

If BeeVision 270 dimensioner is integrated with BeeVision 200, following address must be entered to send the barcode results to BeeVision 270:

`http://local_ip_of_BeeVision270/beevisionservice/setExternalBarcodeResult`

An HTTP POST request is called at the web server address. Results are in JSON format and have the following keys and corresponding values:

StatusCode : <int>

StatusMessage : <string>

BarcodeList: {Barcode: <string>, BarcodeType: <int>}

ImageBase64: <string>

Send images as base64-string: Enable image sharing. There are 2 ways to get images: either within the results or as a separate web service with a different address than results web-service.

Send images as base64-string within results: ImageBase64 field is populated with the object image encoded as base64 string; otherwise, it is left empty.

Send images to different web-service address: Send images to a different web service address, i.e. not in the results web-service. ImageBase64 field of the results data is left empty when this feature is selected.

When image is sent to a separate address, data format is as follows:

StatusCode: <int>

StatusMessage: <string>

Barcode: <string>

ImageBase64: <string>

Image Quality: Image size can be adjusted by changing the image quality. Expected image size is indicated below.

File Sharing

Keep barcode records: When this option is enabled, every decode result is saved in an XML file stored in the device. This file can be downloaded from WebUI to user's computer or to a network drive or to a USB drive connected to the BeeVision device.

Save records to a USB drive...: Shows the list of the USB drives connected to BeeVision barcode scanner USB ports. When one selected, decode records can be saved to that USB drive.

Save records to a network address...: Searches and shows the list of available drives in the same network as BeeVision barcode reader. When a folder is selected, barcode records can be saved to that address.



If BeeVision barcode reader is connected to a large network with many computers or when the speed of the connection is slow, searching

available network drives may take a long time when clicked on “Save records to a network address...” and Volumizer may seem frozen. In this case, please be patient and wait until the operation is complete.

Delete barcode records...: User is asked to confirm of deleting all existing barcode records. When accepted, records are deleted permanently.

Save images internally: When enabled, decode images are saved in the internal disk.

Save images to a network address...: Searches and shows the list of available drives in the same network as BeeVision 200. When a folder is selected, images can be saved to that address.



If BeeVision barcode reader is connected to a large network with many computers or when the speed of the connection is slow, searching available network drives may take a long time when clicked on “Save images to a network address...” and Volumizer may seem frozen. In this case, please be patient and wait until the operation is complete.

Delete existing images...: User is asked to confirm of deleting all existing images. When accepted, images are deleted permanently.

TCP/IP

Send results via a TCP socket: Results are sent via a TCP socket acting as client or acting as server every time a barcode is decoded.

Act as client: Results are sent via a TCP socket acting as client when this option is selected.

Act as server: Results are sent via a TCP socket acting as server when this option is selected.

Connect: Connects to the selected TCP socket with provided settings when acting as client option is selected. If “Send results via a TCP socket” is enabled, connection is automatically established during the boot process.

Start: Starts an internal server and sends results via a TCP socket with the provided settings when acting as server option is selected. If “Send results via a TCP socket” is enabled, server is automatically started during the boot process.

Socket IP: IP address of the remote TCP socket when acting as client.

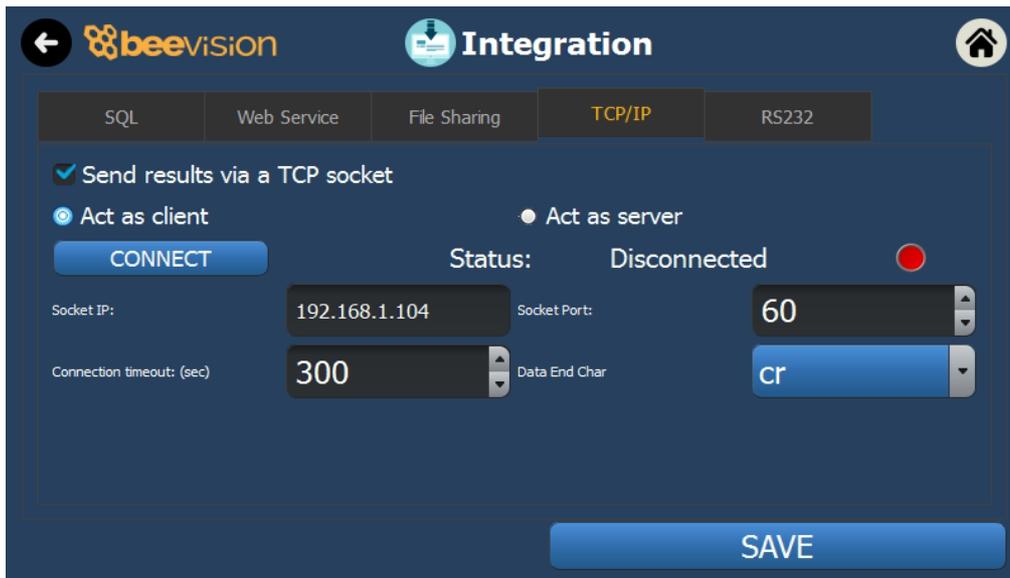


FIGURE 18 INTEGRATION PAGE TCP/IP TAB

Socket Port: Port number of the remote TCP socket when acting as client or port number of the internal server's TCP socket when acting as server.

Connection Timeout (ms): The timeout interval in milliseconds for the TCP socket connection when acting as client.

Data End Char: Select a character that indicates the end of transmission. Available options are CR, LF, and CRLF.

Data scheme is as following. Data delimiter is comma.

barcode, deviceID, branchID, date, time, endChar

An example TCP socket transmission is as following:

123456789, 1, 1, 29.12.2019,09:00:00, \n

RS232

Share results with RS232: When enabled decode results are written to the existing serial connection.

Data scheme: *barcodeEndchar*

Example: 123456789\n

Connect: Connect to the selected port with provided settings. If "Share results with RS232" is enabled, connection is automatically established during the boot process.

Port: Select the port that can be used for RS232 data output.

Baud Rate: Set the baud rate of the RS232 communication.

Append: Set the transmission end character after the measurement results data. Available options are Nothing, CR, LF, CRLF, End-of-Text characters.

Open Terminal: Brings up the terminal window at selected port name. Input and output can be followed in the terminal window.

Network Settings Page

Network settings page includes 2 sub-pages: Ethernet settings page and Wi-Fi settings page.

Ethernet Settings Page

DHCP is enabled by default as factory settings. Plus, an alternative static IP is set following the scheme below:

IP: 10.2.1.<last_three_numbers_of_serial_number>

Subnet:255.0.0.0

When an Ethernet cable is connected to a BeeVision barcode reader, by default BeeVision tries to get an automatic IP via DHCP for 3 minutes. If the automatic IP could not be set, it settles back to the alternate static IP.

If you directly connect the BeeVision barcode reader to your PC, you should set the IP of your PC accordingly, such as 10.2.1.1, to be able to use the web interface from your browser or to control BeeVision via Volumizer-API.



After you connect BeeVision barcode reader to a computer using an Ethernet cable, you should wait for longer than 3 minutes before BeeVision barcode reader assigns itself the alternate static IP when dynamic (DHCP) is selected.

To test a successful connection, you can ping the device's static IP.

If you would like to connect BeeVision barcode readers to an access point, just connect the cable and BeeVision can receive automatic settings with DHCP. You can also set local area network (LAN) settings in Ethernet page of GUI or WebUI.

Static: The settings provided in this page are used for Ethernet connection. The user sets IP, Subnet and Gateway addresses. DNS is the same as Gateway.

Dynamic: Device uses the DHCP protocol. The router assigns an IP address, Gateway and Subnet Mask automatically.

 Settings changes have no effect until the “Apply” button is pressed.

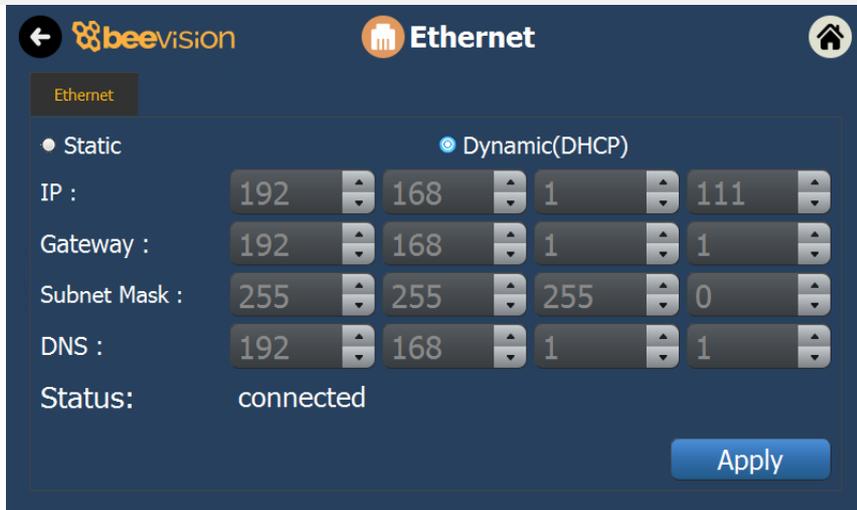


FIGURE 19: ETHERNET SETTINGS PAGE IN VOLUMIZER UI

Wi-Fi Page

The wireless connection settings can be changed in this page. If there is no Wi-Fi interface on your BeeVision device, a warning message appears.

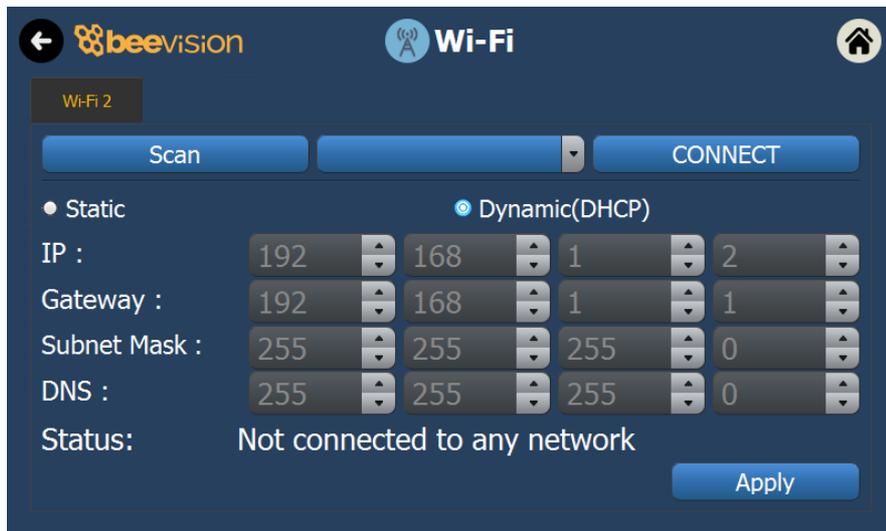


FIGURE 20: WI-FI SETTINGS PAGE IN VOLUMIZER UI

Static: The settings to create a Wi-Fi connection are provided in this page. The user sets IP, Subnet and Gateway addresses. DNS is the same as Gateway.

Dynamic: Device uses the DHCP protocol. The router assigns an IP address, Gateway and Subnet Mask automatically.

 Settings changes have no effect until the “Apply” button is pressed.

Scan: Scans available Wi-Fi networks. Results are displayed in the drop-down list next to the button. Users can select a network from the drop-down list.

 If your Wi-Fi is not listed in the available networks, please reboot the device and retry.

Connect: Connects to the selected network. If the network is password protected, the user will be asked to enter a password. Connection status with connected network name is showed in the lower right corner above the “Connect” button.

System Settings Page

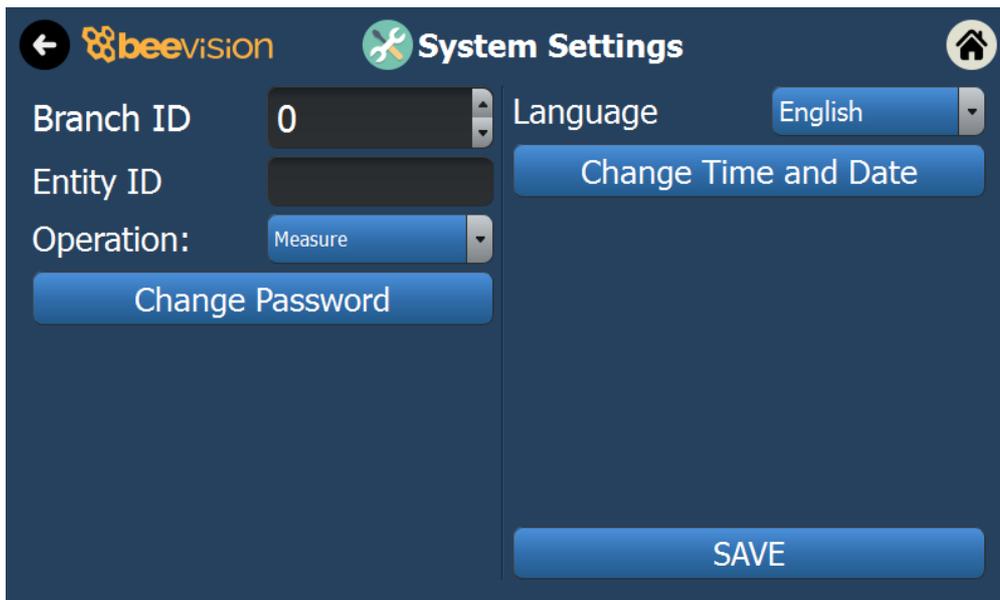


FIGURE 21 SYSTEM SETTINGS PAGE IN VOLUMIZER UI

Branch and Entity ID: These IDs helps users differentiate which BeeVision barcode reader is used if there are many devices in operation.

Operation: No function.

Language: Language of the device is set from this section. There are currently two options: English and Turkish.

Change Password: An admin password is required to make changes in calibration or settings of the device. The admin password is set in this section. The default password is 1111. The password should not start with 0.

Change Time and Date: Change the devices date and time.

Save: Saves the new settings. If not pressed, settings are deleted after a reboot.

External Devices Page

In this page settings related to the external devices can be modified. There are 5 pages: Scale Settings, Scanner Settings, Printer Settings, Conveyor Settings, IP Cam Settings as shown in Figure 22.

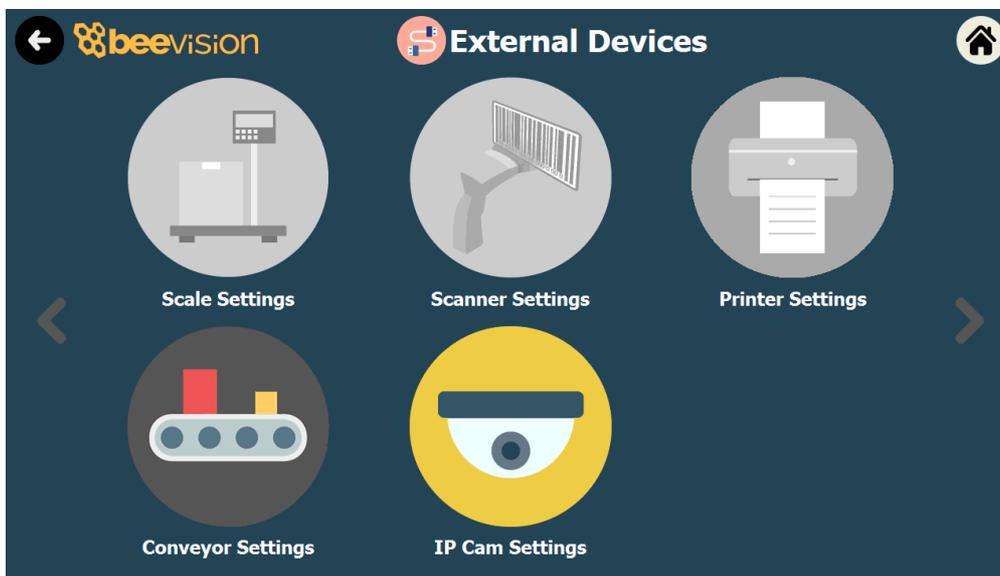


FIGURE 22 EXTERNAL DEVICES PAGE

Scale Settings Page

Scale connection is not supported in BeeVision barcode readers.

Scanner Settings Page

External scanner connection is not supported in BeeVision barcode readers. For connection multiple BeeVision barcode readers, refer to the Merge page.

Printer Settings Page

External printer connection is not supported.

IP Cam Settings Page

BeeVision barcode readers support image capturing with IP cameras. When enabled, the image from the IP camera replace the image capture by the camera itself. Users need to set following data to capture images from an IP camera:

Image Capture Address: HTTP address of the camera that returns a JPEG image. For example: 192.168.1.88/camera/current.jpg

User name: User name of the IP-camera

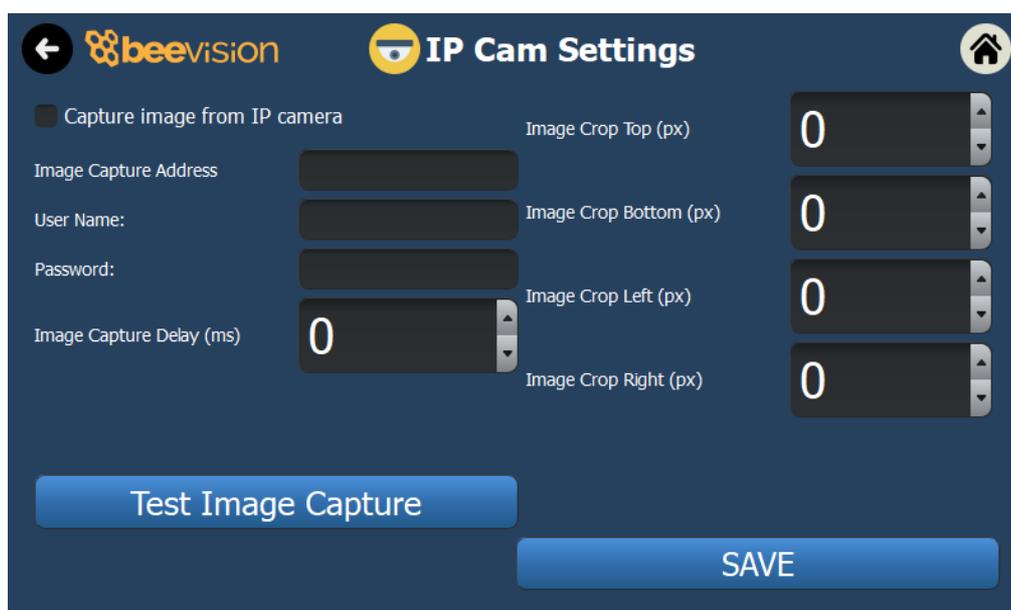


FIGURE 23 IP CAM SETTINGS PAGE

Password: Password of the IP-camera

Image Crop Top (px): The number of rows that should be cropped from the top of the image.

Image Crop Bottom (px): The number of rows that should be cropped from the bottom of the image.

Image Crop Left (px): The number of columns that should be cropped from the left side of the image.

Image Crop Right (px): The number of columns that should be cropped from the right side of the image.

After necessary fields are filled, “Test Image Capture” button can be used to test the image capture. If the capture is successful, a frame with the image is shown; otherwise, a failure message is shown.

If “Capture image from IP camera” is enabled, an image from the IP camera is taken upon a successful measurement and the image data is sent to the address defined in the “Asynchronous Image Sharing” in Sharing tab of the Integration page (see for more details about image sharing in Integration Page).

Browse History Page

Browse History page shows the saved previous decode results. Saved images can also be viewed by clicking on the image icons.

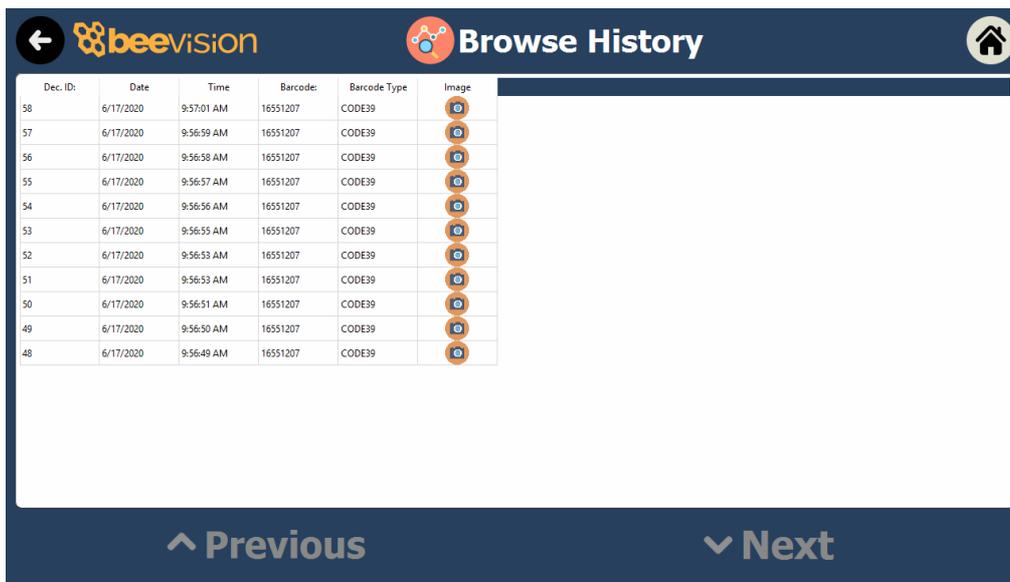


FIGURE 24 BROWSE HISTORY PAGE IN VOLUMIZER UI

System Information Page

System Information page includes data about the device and its features.

Check for Updates: Users can check whether a newer version of Volumizer is available. If an update is found, user is asked to update the Volumizer.

Logs Page

In this page, users can view System logs.

System Log is the general log file of the device. There are 3 types of log messages: INFO, WARNING and ERROR.

8

Volumizer API

BeeVision barcode reader employs web-service communication to transfer data to the user SW infrastructure. Users may freely select the programming language to communicate with the Volumizer. Please, ask for support by dropping an email to info@beevision.ai if you require an assistance.

Web Service

BeeVision devices support server and client modes in web service communication.

Client Mode

When a BeeVision device behaves as a client, it calls (consumes) the web-service of a remote web-server when a successful decoding is performed. This way, results are automatically sent to the customer database in an asynchronous fashion. The address of the service from remote web server is set in the "Integration Settings" page of GUI and WebUI. The data that is sent consists of following fields and values in JSON format:

Data Structure of BeeVision 200 Web Service in Client Mode

Field Name	Data Type	Brief Description
StatusCode	int	0: success. Negative value: failure
StatusMessage	string	Empty when successful otherwise error explanation
BarcodeList	string	List of the decoded barcode results with following data: Barcode: decoded barcode BarcodeType: Type of the decoded barcode such as Code128, EAN8, etc. Example: "BarcodeList":{"Barcode":"123456789","BarcodeType":25}

DecodeID	string	Unique ID of the decoded image
UnitID	string	Unit ID that is assigned to the device
BranchID	string	Branch (Location) ID that is assigned to the device
Date	string	Decode date
Time	string	Decode time
SerialNumber	string	Serial number of the barcode reader
ImageBase64	string	Image of the object encoded as Base64 string (if not enabled, left empty)

An example successful decode result message:

```
{
  "StatusCode":0,"StatusMessage":"OK","BarcodeList":{
    [{"Barcode":"8698096241029","BarcodeType":131072},
    {"Barcode":"17403886","BarcodeType":8192},
    {"Barcode":"17426111","BarcodeType":8192}],
    "DecodeID":"1905623","UnitID":"","BranchID":"0",
    "Date":"05.10.2020","Time":"09:10:14","SerialNumber":"160249",
    "ImageBase64":""
  }
```

If you are interested in deciphering the barcode type as well, please get in touch with BeeVision team.

Image can be sent with a separate web service. An example of separate image message:

```
{
  "StatusCode":0,"StatusMessage":"","Barcode":"31959968681",
  "ImageBase64":"<long_string_representation_of_image>"
}
```

With separate image sharing message, multiple barcodes are separated with comma as delimiter.

Server Mode

BeeVision has an internal web server listening port 27018 for incoming requests. Users should make HTTP requests with GET method if no data is passed from user to BeeVision device, otherwise, POST method should be used. HTTP Version 1.1 is supported.

Connection Protocol: HTTP based web service

Port: 27018



Service Address: `<device_ip>:27018/beevisionservice/<command_name>`

Return Data: Returns corresponding data in **JSON** format. If an error at HTTP request occurs, the HTTP error code is returned. If an error occurs during internal operation, **StatusCode** and **StatusText** fields in returned JSON data provides more information about the error.

If the operation is successful, returned StatusCode is 0. If the operation fails, returned StatusCode has a negative value indicating the type of the error.

Accepted Commands by Volumizer API



Following commands may behave differently or may not exist at Volumizer version prior to 3.0.3. Please, update your Volumizer if you are using an older version.

Accepted Commands at BeeVision 200 Web Server

Available at `http://<device_ip>:27018/beevisionservice/<command>`

Command Name	HTTP Method Type	Brief Description
<code>/getSerial</code>	GET	Returns the serial number of the BeeVision device
<code>/getSWVersion</code>	GET	Returns the version number of the Volumizer SW

/getUserSettingsFile	GET	Returns user settings
/setUserSettingsFile	POST	Overwrites user settings. It is advised to get settings first with <code>getUserSettingsFile</code> command, modify settings and resend them with <code>setUserSettingsFile</code> command
/resetDevice	GET	Reboots the device
/checkForUpdates	GET	Checks for Volumizer SW update and returns an <code>UpdateExists</code> Boolean indicating the check result.
/updateVolumizer	GET	Updates Volumizer. <code>CheckForUpdates</code> must be run in prior to this command
/getRecordsFile	GET	Returns the results of all previous measurements as an XML file.
/getEthernetSettings	GET	Returns Ethernet settings
/setEthernetSettings	POST	Overwrites Ethernet settings. Required fields in JSON data are: dynamicIP: dynamic or static ip1: first 3 digits of IP ip2: second 3 digits of IP ip3: third 3 digits of IP ip4: fourth 3 digits of IP gateway1: first 3 digits of gateway gateway2: second 3 digits of gateway gateway3: third 3 digits of gateway gateway4: fourth 3 digits of gateway subnet1: first 3 digits of subnet

		<p>subnet2: second 3 digits of subnet</p> <p>subnet3: third 3 digits of subnet</p> <p>subnet4: fourth 3 digits of subnet</p> <p>Example JSON data:</p> <pre>{ "dynamicIP": "static", "ip1": "10", "ip2": "2", "ip3": "1", "ip4": "110", "subnet1": "255", "subnet2": "0", "subnet3": "0", "subnet4": "0", "gateway1": "0", "gateway2": "0", "gateway3": "0", "gateway4": "0" }</pre> <p>If you change IP address with this command, do not forget to update the address of the BeeVision barcode reader in your program</p>
/getWifiSettings	GET	Returns Wi-Fi settings
/setWifiSettings	POST	<p>Overwrites Wi-Fi settings. Same JSON fields as in setEthernetSettings command are required with this POST method</p> <p>If you change IP address with this command, do not forget to update the address of the BeeVision barcode reader in your program</p>
/scanWifiNetworks	GET	Starts a Wi-Fi scan and returns available Wi-Fi networks. This operation takes longer than 4 seconds
/connectToWifi	POST	Connects to the given network name. JSON data must include “network” and “password” key and corresponding values
/downloadBarcodeRecordsFile	POST	<p>Downloads the previously saved decode results as an XML file for a selected time.</p> <p>Requires From, To and Download All fields as in the following example.</p> <pre>{ "DownloadAll": 1, "From": "", "To": "" }</pre> <p>If DownloadAll is 1, then whole file is downloaded, otherwise results between given dates are downloaded.</p>

/getDateAndTime	GET	Returns the date and time of the device in the following scheme: <pre>{ "StatusCode":0, "StatusMessage":"Operation successful", "Date":"22/05/2019", "Time":"00:27:07" }</pre>
/setDateAndTime	POST	Overwrites the device date and time. It is recommended to get date and time data first with getDateAndTime, modify the data and set it with setDateAndTime
/downloadImagesZip	GET	Downloads a zip file containing all of the images that device saved so far. This operation might take a long time if number of images is high.
/deleteBarcodeImages	GET	Deletes the images saved in the device.
/deleteBarcodeRecords	GET	Deletes the decode results saved in the device.
/getDeviceInfo	GET	Returns the device related information as provided below. <pre>{ "StatusCode":0, "StatusMessage":"Operation successful", "DeviceModel":"BeeVision 200", "SWChecksum":"12d6c1d5322723d59fe81731627ba4fe", "CertificateNumber":"N/A", "MinWidth":"10", "MinLength":"10", "MinHeight":"10", "MaxWidth":"80", "MaxLength":"80", "MaxHeight":"80", "WidthAccuracy":"1", "LengthAccuracy":"1", "HeightAccuracy":"1" }</pre>
/printZPLLabel	POST	Send a ZPL formatted message to print a label using connected printer. Sample provided below: <pre>{ "ZPLMessage":"^XA ^FX Top section with company logo, name and address. ^CF0,60 ^FO50,50^GB100,100,100^FS ^FO75,75^FR^GB100,100,100^FS ^FO88,88^GB50,50,50^FS ^FO220,50^FD3DTIM Elektronik^FS ^CF0,40 ^FO220,100^FDODTU^FS ^FO220,135^FDAnkara 06800^FS ^FO220,170^FDTurkey^FS</pre>

		<pre>^F050,250^GB700,1,3^FS ^XZ" }</pre>
--	--	--

Notes
