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SINESECU TECHNOLOGY CO., LTD.

Sinosecu Passport Reader SDK-DLL

API Manual-Websocket

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1 Outline

This development manual needs to be used in conjunction with passport reader device.

1.1 Update history

Version	Date	Update content
1.0.1	2019.3	Revised Version
1.0.2	2019.6.13	Communicate with the web side in JSON format

1.2 Development background

Passport reader interface is released in two forms, one is a dynamic library based on the C/S architecture, and the other is a websocket service based on the B/S architecture. This document describes a development interface based on the B/S architecture.

2 Terminology

2.1 Machine readable zone MRZ and visual recognition zone VIZ

Visual recognition zone is referred to as VIZ, which is an OCR area outside the MRZ, wherein MRZ represents a machine identification area, which stores MRZ codes, commonly known as machine-readable zone. As shown below

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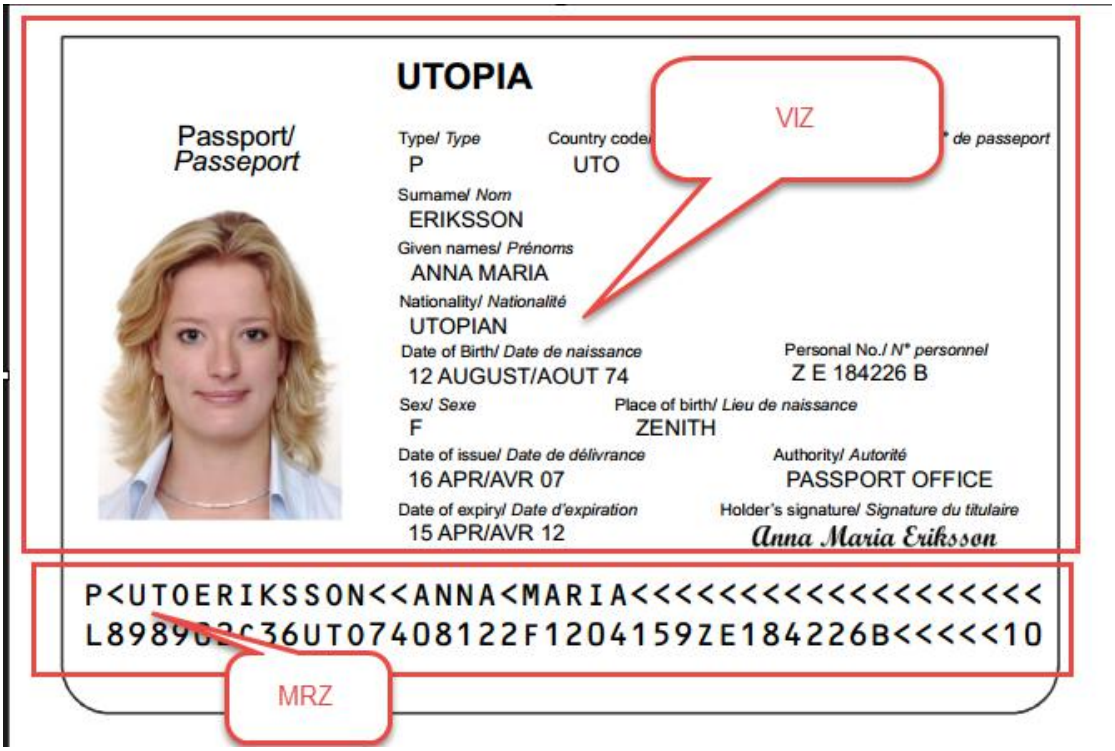

3 Working process

3.1 Connect passport reader

Process of establishing a connection is shown in Figure 3-1. The Web directly initiates the connection. After successful connection, the WebSocket background service connects to the passport reader and initializes the card reader core.

If the passport reader did not connected to the computer when the connection is established, the initialization will fail and the background service will send a message to the web to notify the device status is abnormal. At this point, the web side does not need to do anything. When the device is connected to the computer, it will automatically initialize, and after the initialization is successful, notify the web device that the connection is successful.

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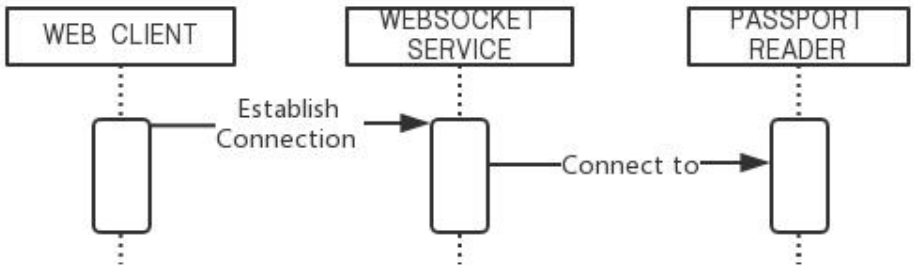

Figure 3-1 Connecting a passport reader

3.2 Obtain device information

After the web end successfully connects to the background service, the background service initializes the core and preloads device related information, including the device name and device serial number. The web side can send an instruction to the background service to obtain the device information. The process is shown in Figure 3-2.

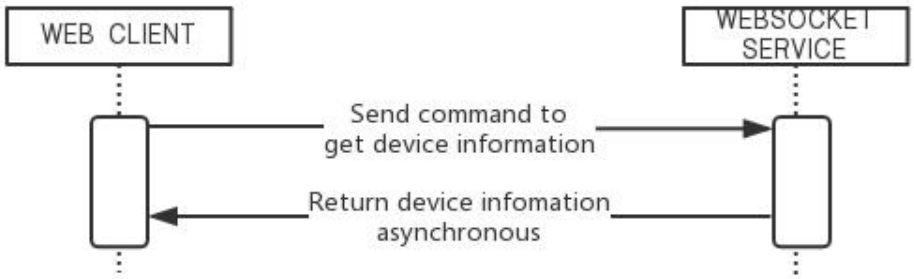

Figure 3-2 Obtaining device information

3.3 Set card reading parameters

Web terminal can directly set part of the card reading parameters, including whether to read the chip information, whether to read the layout information, and the like. Figure 3-3 shows the parameter setting process.

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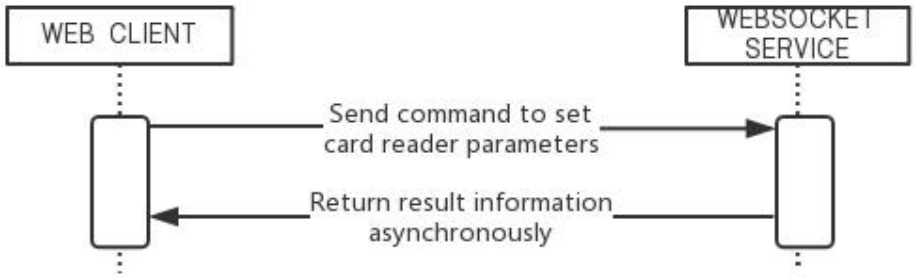

Figure 3-3 Setting the card reading parameters

3.4 Read document information

After the card reader core is successfully initialized, the passport reader waits for the ID to be placed. Once the document is detected, the passport reader will take a picture of the document and reading the document information. Then the background service sends the text information and the image information of the document to the web end in an asynchronous manner. The card reading process is shown in Figure 3-4.

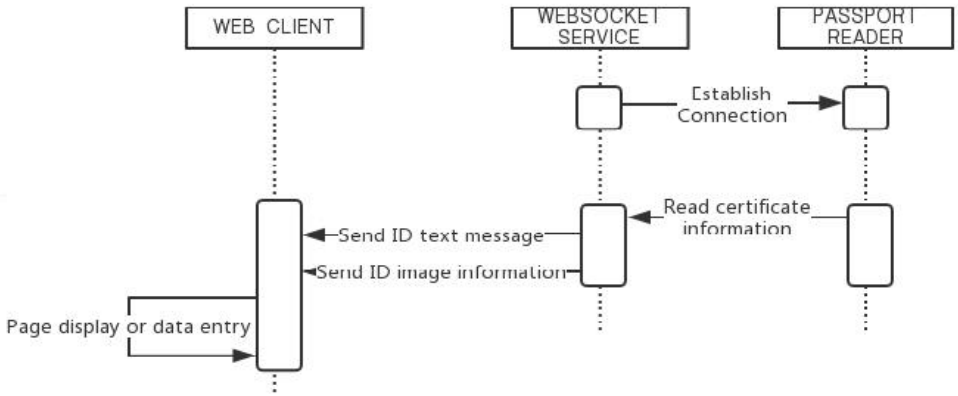

Figure 3-4 read the certificate information

3.5 Real-time status notification

When the background service detects that the device is disconnected, reconnected, or the program is abnormal, it will send a notification to the web. The web side needs to display the notification message to the staff in an intuitive form. The process is shown in Figure 3-5.

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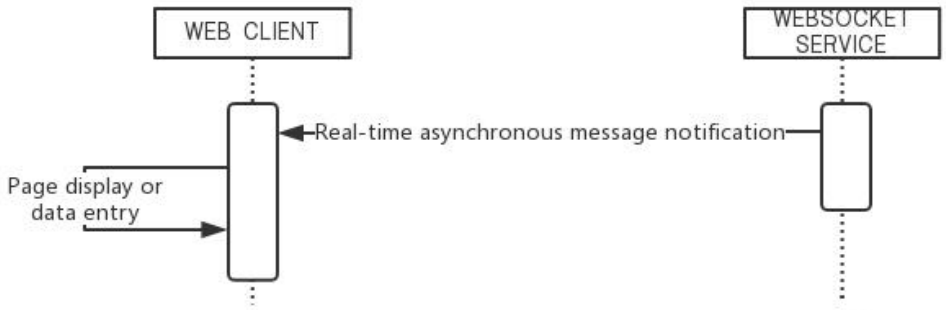

Figure 3-5 Real-time status notification

4 Interface specification

4.1 Interface format definition

4.1.1 Communication protocol

Communication protocol USES WebSocket, background service listens on local 90 port.When using HTTP access, the Url should be "ws://127.0.0.1:90/echo";When using HTTPS, the connection Url should be "WSS ://127.0.0.1:90/echo".

The sample connection code is as follows:

```
try {
        var websocket = null;
        var host = “ws://127.0.0.1:90/echo”;       // http      access method
        // var host = “wss://127.0.0.1:90/echo”;    // https     access method
        websocket = new WebSocket(host);
} catch (exception) {
        console.log(“error.”);
}
```

4.1.2 Message format

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Web-side and background communication use JSON data format, and each field is case-sensitive, and the definition is as follows:

Name	Value	Remarks
Type	Request	Request indicates the request message, sent from the web to the background.
	Reply	Reply indicates the response message, which is sent from the background to the web.
	Notify	Notify indicates notification messages, including document information, device connection status, background service status, etc.
Commands	Instruction set	Send multiple instructions at once.
Command	Set	Set means to set the card reading parameters;
	Get	Get means that the web side requests to obtain the specified information;
	CardDetected	CardDetected indicates that a document has been detected;
	CardTakenaway	CardTakenaway means that the document was detected to be taken away;
	Display	Display indicates that the instruction execution result or notification message needs to be displayed to the web interface;
	Save	Save means that the web needs to save the data, usually the certificate information;
	ReConnect	Reconnect indicates that the web side needs to rebuild the connection;
	AskForSupport	AskForSupport indicates that technical support is required;
	RestartService	RestartService indicates that the background service is about to restart.
Operand	Operating object	For example, when the web side requests the device name from the background, the Command value is Get, and the Operand value is DeviceName.

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		See the description of each interface for details.
Param	Parameter	If it is a request message, Param indicates the parameters required to execute the instruction; if it is a notification message, it generally indicates the identity of the document information or the background service.
Succeeded	Y|N	Y indicates that the instruction was successfully executed. N indicates that the instruction failed to executed.
Result	Instruction execution result	If the instruction is executed successfully, Result represents the information to be obtained by the web; if it fails, Result represents the error message or the reason description.

4.2 Obtain Device Information

4.2.1 Get device online status

Features		Get device online status
Request	Type	Request
	Command	Get
	Operand	OnLineStatus
Answer	Type	Reply
	Command	Get
	Operand	OnLineStatus
	Succeeded	Y means success; N means failure
	Result	If succeed, store the device online status; if it fails, store the error message.

4.2.2 Get device name

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Features		Get device name
Request	Type	Request
	Command	Get
	Operand	DeviceName
Answer	Type	Reply
	Command	Get
	Operand	DeviceName
	Succeeded	Y means the device name is obtained; N means failure
	Result	If successful, store the device name; if it fails, store the error message.

4.2.3 Get the device serial number

Features		Get the device serial number
Request	Type	Request
	Command	Get
	Operand	DeviceSerialNo
Answer	Type	Reply
	Command	Get
	Operand	DeviceSerialNo
	Succeeded	Y means success; N means failure
	Result	If succeed, store the device serial number; if it fails, store the error message.

4.3 Set the card reading parameters

4.3.1 Set whether to read the visual recognition zone(VIZ)

Features		Set whether to read the contents of visual recognition zone when reading the card
Request	Type	Request
	Command	Set
	Operand	VIZ
	Param	True means to read the chip; False means not to read the chip.
Answer	Type	Reply
	Command	Set
	Operand	DG
	Succeeded	Y means the setting is successful; N means failure.

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	Result	If there is an error, the Result field stores the error message.

4.3.2 Set whether to read the chip information

Features		Set whether to read the chip data when reading the card
Request	Type	Request
	Command	Set
	Operand	RFID
	Param	True means read the visual recognition zone(VIZ); False means not read
Answer	Type	Reply
	Command	Set
	Operand	RFID
	Succeeded	Y indicates that the command was successfully executed; N indicates failure.
	Result	If there is an error, the Result field stores the error message.

4.3.3 Set whether to enable rejection Features

Features		Set whether to enable Rejection Features
Request	Type	Request
	Command	Set
	Operand	Rejection
	Param	True means read the visual recognition zone(VIZ); False means not read
Answer	Type	Reply
	Command	Set
	Operand	Rejection
	Succeeded	Y indicates that the command was successfully executed; N indicates failure.
	Result	If there is an error, the Result field stores the error message.

4.3.4 Set whether to enable callback mode

Features		Set whether to enable callback mode
Request	Type	Request
	Command	Set

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	Operand	IfEnableCallback
	Param	True means read the visual recognition zone(VIZ); False means not read
Answer	Type	Reply
	Command	Set
	Operand	IfEnableCallback
	Succeeded	Y indicates that the command was successfully executed; N indicates failure.
	Result	If there is an error, the Result field stores the error message.
Remark	If the callback mode is enabled, once a document is placed, a document placement event notification will be send to the web.	

4.3.5 Set whether to send a notification to the WEB side that the detected ID is put in or take out.

Features		Set the notification to the WEB end if the ID was put in or take out
Request	Type	Request
	Command	Set
	Operand	IfNotifyCardDetected
	Param	True means read the visual recognition zone(VIZ); False means not read
Answer	Type	Reply
	Command	Set
	Operand	IfNotifyCardDetected
	Succeeded	Y indicates that the command was successfully executed; N indicates failure.
	Result	If there is an error, the Result field stores the error message.

4.3.6 Set whether to reidentification MRZ on the white light image

Features		Set whether to re-identify MRZ using white light image
Request	Type	Request
	Command	Set
	Operand	MRZOnWhiteImage
	Param	True means that this feature is enabled; False means that this feature is disabled.

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Answer	Type	Reply
	Command	Set
	Operand	MRZOnWhiteImage
	Succeeded	Y indicates that the command was successfully executed; N indicates failure.
	Result	If there is an error, the Result field stores the error message.
Remark	By default, the infrared image is used to recognition the MRZ. When the infrared image recognition effect is poor or the MRZ is not recognized, the features are enabled.	

4.3.7 Set whether to detect UV retardation

Features		Set whether to detect UV retardation
Request	Type	Request
	Command	Set
	Operand	IfDetectUVDull
	Param	True means detecting violet retardation; False means not detecting
Answer	Type	Reply
	Command	Set
	Operand	IfDetectUVDull
	Succeeded	Y indicates that the command was successfully executed; N indicates failure.
	Result	If there is an error, the Result field stores the error message.
Remark	When this feature is enabled, the ultraviolet detection result is returned together with the document text information. The field name is UVDull; the content of the field consists of three parts: "Detect whether the instruction is executed successfully" "Is there a ultraviolet retardation characteristic" "Description information". The first part and the second part are Y or N, and the third part only display content when an error occurs or the violet retardation is not detected. For example: When the detection command is executed successfully and the ultraviolet retardation characteristic is detected, the field content is “YY” . When the detection instruction is executed successfully, but the ultraviolet retardation characteristic is not detected, the field content	

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	is “YN does not detect the ultraviolet retardation characteristic” When the device does not support taking ultraviolet photo, the field content is “NN device does not support taking ultraviolet photo”

4.3.8 Set whether to detect UV fiber

Features		Set whether to detect UV fiber
Request	Type	Request
	Command	Set
	Operand	IfDetectFibre
	Param	True means detecting UV fiber; False means not detecting
Answer	Type	Reply
	Command	Set
	Operand	IfDetectFibre
	Succeeded	Y indicates that the command was successfully executed; N indicates failure.
	Result	If there is an error, the Result field stores the error message.
Remark	When this feature is enabled, the ultraviolet detection result is returned together with the document text information. The field name is UVDull; the content of the field consists of three parts: "Detect whether the instruction is successfully executed" "Whether UV fiber is detected" "Description information", the first part and the second part take the value Y or N, and the third part represents the ultraviolet fiber number or error description. For example: The detection instruction was executed successfully, and the detected ultraviolet fibers number is 5, then the field content is “YY5”. When the detection instruction is executed successfully, but the UV fiber is not detected, the field content is “YN0”. When the device does not support taking ultraviolet photo, the field content is “NN device does not support violet photo”	

4.3.9 Setting whether the test document is original or a copy

Features		Set whether the test document is original or a copy
Request	Type	Request
	Command	Set

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	Operand	IfCheckSourceType
	Param	True means detecting UV fiber; False means not detecting
Answer	Type	Reply
	Command	Set
	Operand	IfCheckSourceType
	Succeeded	Y indicates that the command was successfully executed; N indicates failure.
	Result	If there is an error, the Result field stores the error message.
Remark	When this feature is enabled, the test results are returned along with the document text information. The field name is SourceType; the content of the field consists of three parts: "Detect whether the instruction is executed successfully", "Wether the document is original", "Description information", the first part and the second part are Y or N, and the third part is only when the instruction is in error. content. For example: The detection instruction is executed successfully, and the test document is the original, then the field content is “YY0”. The detection instruction is executed successfully, and it is detected that the document is a copy, then the field content is “YN1” or “YN2” or “YN4”, which means copy, color copy and moiré, respectively. When the instruction execution meet an error, the field content is "NN error content description"	

4.3.10 Set the identification barcode

Features		Set whether to enable barcode recognition
Request	Type	Request
	Command	Set
	Operand	BarCodeRecog
	Param	True means to enable barcode recognition False means disable
Answer	Type	Reply
	Command	Set
	Operand	BarCodeRecog
	Succeeded	Y indicates that the command was successfully executed; N indicates failure.
	Result	If there is an error, the Result field stores the error

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		message.
Remarks	When the Features are enabled, the barcode identification result is returned together with the document text information.The field name is BarCode and the field content is BarCode content;If bar code recognition fails, field content is empty.	

4.3.11 Manual trigger

Features		The web side sends the notification of identification certificate to the background service
Request	Type	Notify
	Command	Trigger
	Operand	ManualRecog
	Param	TTimeout in seconds
Remark	After the implementation of the interface, if successful, the backend will push the certificate information to the web page.	

4.4 Background service send the message to the web side.

4.4.1 Send document text information

Features		Send text information for the certificate	
Request	Type	Notify	
	Command	Save means that the web page should save the card reading information.	
	Operand	CardContentText	
	Param	Field name 1	Field content 1
		Field name 2	Field content 2
		...	...

When the passport reader detects that the document is placed, it will automatically read the card, and then the WebSocket background service will send the document information to the web end. The document text information generally includes multiple fields, which fields are uploaded by the configuration file, and the settings of the configuration file are controlled by the tray program. If setting is empty, all fields are uploaded by default.

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4.4.2 Send ID image information

Features		Send the Base64 code of the image saved after reading the card	
Request	Type	Notify	
	Command	Save means that the web page should save the image or display the image on the page.	
	Operand	Images	
	Param	White	Optional, white light image
		IR	Optional, infrared image
		UV	Optional, UV image
		OcrHead	Optional, layout avatar
		ChipHead	Optional, chip avatar

Type of image sent by the background service to the web is determined by the configuration file, and the setting of the configuration item is controlled by the tray program.

4.4.3 Send real-time messages

Features		Send real-time messages
Request	Type	Notify
	Command	CardDetected indicates that a document is detected (only in the callback mode, this notification will be sent to the WEB) CardTakenaway indicates that the document was detected to be taken away (this notification will be sent to the WEB only after the CardTakenaway feature is enabled) Display indicates that the web page should display information or pop-up prompts on the interface. ReConnect indicates that the web side needs to rebuild the connection. AskForSupport indicates that request administrator or technician support RestartService indicates that the WebSocket service needs to be restarted.
	Operand	RealtimeMessage
	Param	Real-time messages, including device abnormal status notifications, card reading errors, and other internal errors.

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4.5 Get BASE64 encoded image data

Features		Get the BASE64 code of the image	
Request	Type	Request	
	Command	Get	
	Operand	Base64Image	
	Param	This parameter is an integer. The bit 0-bit4 of this parameter determines the image save type. If the bit is 1, it will be saved, and 0 will not be saved. The remaining bits must be 0 Bit 0: White light full image Bit 1: Infrared full image Bit 2: UV full image Bit 3: Avatar Bit 4: Chip avatar Example: To get a white light image and a chip image, the parameter value should be set to 17 (binary value 0001 0001)	
Answer	Type	Reply	
	Command	Get	
	Operand	Base64Image	
	Succeeded	Y means success; N means failure。	
	Result	If it fails, the error message is stored; if it succeed, the following data is returned in JSON message format (only the images contained in the request are returned):	
		White	BASE64 encoding of white light image
		IR	BASE64 encoding of infrared image
		UV	BASE64 encoding of UV image
		OcrHead	BASE64 encoding of the layout avatar
		ChipHead	BASE64 encoding of chip avatar

4.6 Obtain encoded data of static text on WEB side in different language environments

Features		Obtain encoded data of WEB-end text in different language environments
Request	Type	Request
	Command	Get
	Operand	WebConstant

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	Param	Field can be customized by a third-party integrator. For details, please check the cfg\Locale.xml configuration file.
Answer	Type	Reply
	Command	Get
	Operand	WebConstants
	Succeeded	Y means success; N means failure。
	Param	Same as request content
	Result	Returns a constant string with the language type consistent with WebSocket.

5 Interface call example

5.1 Establish a WebSocket connection

```
try {
        var websocket = null;
        var host = “ws://127.0.0.1:90/echo”;       // http      access method
        // var host = “wss://127.0.0.1:90/echo”;    // https     access method
        websocket = new WebSocket(host);
        if (websocket !== null) {
            websocket.onopen = function() {
            }
            websocket.onclose = function() {
            }
            websocket.onerror = function() {
            }
            websocket.onmessage = function(event) {
                var jsonReply = null;
                try {
                    jsonReply = JSON.parse(event.data);
                    ... ...
```


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```
                    } catch (exception) {
                    }
                }
} catch (exception) {
        console.log("error.");
}
```

5.2 Get device information

5.2.1 Get device online status

Request JS	var request = {
	Type: "Request",
	Command: "Get",
	Operand: "OnLineStatus"
	};
	
	try {
	websocket.send(JSON.stringify(request));
	} catch (exception) {
	console.log("error.");
	}

Answer	websocket.onmessage = function(event) {
	var repJson = null;
	try {
	replyJson = JSON.parse(event.data);
	if (replyJson.Type == 'Reply' && replyJson.Operand ==
	'OnLineStatus') {
	console.log(replyJson.Result);
	}

	} catch (exception) {
	console.log("error.");
	}
	}

5.2.2 Get device name

See 5.2.1 for the code, just change Operan to DeviceName.

5.2.3 Get the device serial number

See 5.2.1 for the code, just change Operan to DeviceSerialNo.

5.3 Set the read card parameters

5.3.1 Set whether to read the visual recognition zone(VIZ)

Request
JS
	var request = {
	Type: "Request",
	Command: "Set",
	Operand: "VIZ",
	Param: "Y"
	};
	
	try {
	websocket.send(JSON.stringify(request));
	} catch (exception) {
	console.log("error.");
	}

Answer	websocket.onmessage = function(event) {
	var repJson = null;
	try {
	replyJson = JSON.parse(event.data);

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```
            if (replyJson.Type == 'Reply' && replyJson.Operand == 'VIZ')
{
                if (replyJson.Succeeded !== 'Y') {
                    console.log(replyJson.Result);
                }
            }
        } catch (exception) {
            console.log("error.");
        }
}
```

5.3.2 Set whether to read the chip information

See 5.3.1 for the code, just change Operan to RFID.

5.3.3 Manual trigger

notify JS

```
var request = {
    Type: "Notify",
    Command: "Trigger",
    Operand: "ManualRecog",
     Param: 2
};
try {
    websocket.send(JSON.stringify(request));
} catch (exception) {
    console.log("error.");
}
```


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5.4 Web end receives the information from the background.

5.4.1 Receive document text information

Receive document text information	websocket.onmessage = function(event) {
	var msg = null;
	try {
	msg = JSON.parse(event.data);
	if (msg .Type == 'Notify' && msg .Operand == 'CardContentText') {
	// msg.Param; Card reading text information }
	} catch (exception) {
	console.log("error.");
	}
	}

5.4.2 Receive document image information

Receive id image information	websocket.onmessage = function(event) {
	var msg = null;
	try {
	msg = JSON.parse(event.data);
	if (msg .Type == 'Notify' && msg .Operand == 'Images') {
	if (msg.Param.hasOwnProperty("White")) {
	// msg.Param.White; Processing white light images
	} else if (msg.Param.hasOwnProperty("IR")) {
	// msg.Param.IR;Processing infrared images
	} else if (msg.Param.hasOwnProperty("UV")) {

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	// msg.Param.UV; Processing ultraviolet images
	} else if (msg.Param.hasOwnProperty("OcrHead")) {
	// msg.Param.OcrHead; Processing layout avatar } else if (msg.Param.hasOwnProperty("ChipHead")) {
	// msg.Param.ChipHead;Processing chip head
	} else if (msg.Param.hasOwnProperty("SidHead")) {
	// msg.Param.SidHead; Processing of second generation id CARDS
	}
	}
	} catch (exception) {
	console.log("error.");
	}
	}

5.4.3 Receive real-time messages

Receive document text information	websocket.onmessage = function(event) {
	var msg = null;
	try {
	msg = JSON.parse(event.data);
	if (msg .Type == 'Notify' && msg .Operand == 'RealtimeMessage') {
	if (msg.Command == 'Display') {
	alert(msg.Param);
	} else if (msg.Command == 'ReConnect') {
	// Re-establish connection
	} else if (msg.Command == 'AskForSupport') {

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	alert(msg.Param);
	} else if (msg.Command == 'RestartService') {
	alert('Background service needs to be restarted');
	// Re-establish connection }
	}
	} catch (exception) {
	console.log("error.");
	}
	}

5.5 Get the specified image

Request
JS
	var request = {
	Type: "Request",
	Command: "Get",
	Operand: "Base64Image",
	Param: "17" // request Get white light and chip avatar
	};
	
	try {
	websocket.send(JSON.stringify(request));
	} catch (exception) {
	console.log("error.");
	}

Answer	websocket.onmessage = function(event) {
	var msg = null;
	try {
	msg = JSON.parse(event.data);
	if (msg .Type == 'Notify' && msg .Operand == 'Images') {

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```
                if (msg.Param.hasOwnProperty("White")) {
                    // msg.Param.White; Processing white light images
                } else if (msg.Param.hasOwnProperty("IR")) {
                    // msg.Param.IR; Processing infrared images
                } else if (msg.Param.hasOwnProperty("UV")) {
                    // msg.Param.UV; Processing ultraviolet images
                } else if (msg.Param.hasOwnProperty("OcrHead")) {
                    // msg.Param.OcrHead; Processing layout avatar
                } else if (msg.Param.hasOwnProperty("ChipHead")) {
                    // msg.Param.ChipHead; Processing chip avatar
                } else if (msg.Param.hasOwnProperty("SidHead")) {
                    // msg.Param.SidHead; Processing ID avatar
                }
            }
        } catch (exception) {
            console.log("error.");
        }
}
```

5.6 Execute multiple instructions at once

Take obtaining device connection status, device name, and device serial number as an example:

Request JS

```
var request = {
    Type: "Request",
    Commands: [
        {Command:"Get", Operand:"OnLineStatus"}, /* Equipment state */
        {Command:"Get", Operand:"DeviceName"},    /* Name */
        {Command:"Get", Operand:"DeviceSerialNo"} /* serial
```


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	number */
	]
	};
	
	try {
	websocket.send(JSON.stringify(request));
	} catch (exception) {
	console.log("error.");
	}

Answer	websocket.onmessage = function(event) {
	var retmsg = event.data;
	var jsonMsg;
	
	try {
	jsonMsg = JSON.parse(retmsg);
	if (jsonMsg.Type == 'Reply') {
	if (jsonMsg.hasOwnProperty('Commands')) {
	for (var index in jsonMsg.Commands) {
	processReply(jsonMsg.Commands[index]);
	}
	} else {
	processReply(jsonMsg);
	}
	}
	return;
	} catch (exception) {
	console.log("error.");
	}
	}

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```
function processReply(msgReply) {
    if (msgReply.Command == 'Get') {
        if (msgReply.Succeeded == 'Y') {
            if (msgReply.Operand == 'DeviceName') {
                /* msgReply.Result; */
            } else if (msgReply.Operand == 'DeviceSerialNo') {
                /* msgReply.Result; */
            } else if (msgReply.Operand == 'OnLineStatus') {
                /* msgReply.Result; */
            }
        }
    }
}
```

6 Technical support

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