



DECEMBER 2016

ETHERNET RELAY CARD

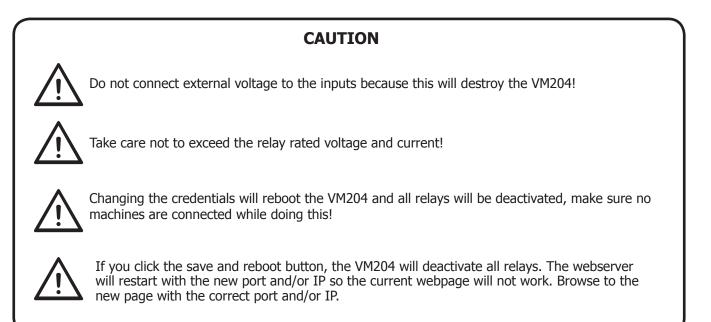


WWW.VELLEMANPROJECTS.EU

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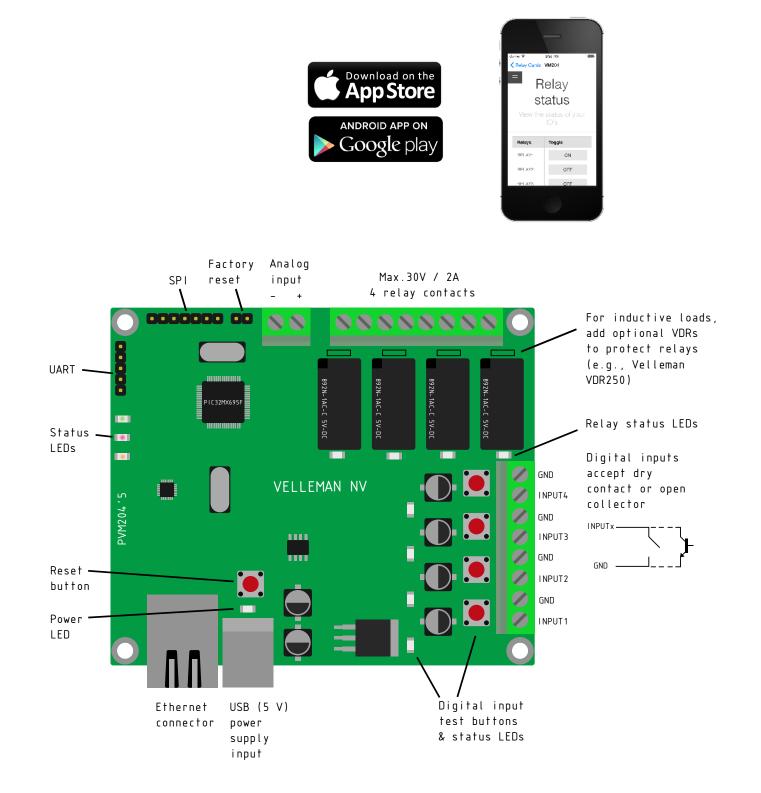
Let's get started!



Introduction to the VM204

The VM204 is an Ethernet controlled board with 4 relay contacts, 4 digital inputs and 1 analog input. You can connect these I/O's to different devices and control or check them from anywhere you like using your PC, smartphone or tablet. The VM204 can also send email notifications when the status of an input changes and features an embedded webserver.

If you wish to control your VM204 with your smartphone or tablet, free apps are available for Android® and iOS \mathbb{R} .

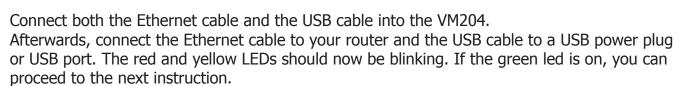


1. Connecting the Ethernet relay card or VM204

First of all make sure you have a DHCP enabled network. If you don't know what DHCP is then don't worry, a regular home network is usually DHCP enabled.

 \triangle Make sure to remove the blue shunt from the card to ensure a correct start up. This shunt is located on the factory reset pins next to the analog input. (you will need the shunt for future firmware upgrades, so make sure to keep it)

 A Please make sure to upgrade your firmware to version 1.1. Download here: <u>http://www.vellemanprojects.eu/support/downloads/?code=VM204</u> Please see section 4 of the user manual for more information on upgrading the firmware.



To continue, download the iOS- or Android app via the links below: iOS: <u>www.appstore.com/vm204</u> Android: <u>https://play.google.com/store/apps/details?id=be.velleman.VM204</u>

Or install the PC application via the link below:

1.1 Using the iOS and Android app for the first time

First, make sure your smartphone or tablet is connected to the same network/Wi-Fi as the VM204. Then open the app and follow these simple steps to add your personal VM204 to your app:

1. Add a new relay card by tapping the <+> button.

Carrier ຈ	8:53 AM	100% 💼
	Relay Cards	+

2. Tap the <scan> button below to search for your VM204.

Carrier 奈		8:5	3 AM	100% 💼
Relay Cards				
CARD IDENTIFI	ICATION			
Name:				
Username:				
Password:				
LOCAL NETWO	DRK SETTINGS			
Local IP:				
Local Port:				
EXTERN NETW	ORK SETTINGS			
External IP:				
External Por	rt:			
LOCAL IP SELE	ECTION			
Connect to	local network			
			1	
		Scan Sa	ve Cancel	

3. Your VM204 should pop up in the list, be sure to select it.

Carrier 穼	9:11 AM	100% 📖
K Back	Discovery	
VM204 192.168.8.21		

Fill out the default credentials: 4.

Login: admin

Password: VM204 (capital letters). We will explain how you can change your credentials later on.

Carrie	er 🗢		9:12 AM		100% 🛑
< F	Relay Cards		VM204		
	CARD IDENTIFICATION				
	Name:	VM204			
	Username:	admin	←	_	
	Password:	VM204	~		
	LOCAL NETWORK SET	TINGS			
	Local IP:	192.168.8.21			
	Local IP:	192.100.0.21			
	Local Port:	80			
	EXTERN NETWORK SET	TTINGS			
	External IP:				
	External Port:				
	LOCAL IP SELECTION				
	Connect to local ne	etwork			
			¥		
		Scan	Save	Cancel	

5. Continue by tapping the <Save> button, there should be a Relay card added to the list now.

Carrier 🗢	9:11 AM	100% 🗖
< Back	Discovery	
VM204 192.168.8.21		

 Tap on the name of your newly added relay card (standard name is VM204) to go to the control page of your VM204. Head forward to chapter **2. Controlling the** VM204 and discover all the possibilities.

Carrier 🗢		9:12 AM		100% 🗪
Relay Cards		VM204		
Relay status Settings		Polov		
		View the stat	status	
	Relays	Toggle	Inputs	Status
	RELAY1	OFF	INPUT1	OFF
	RELAY2	OFF	INPUT2	OFF
	RELAY3	OFF	INPUT3	OFF
	RELAY4	OFF		
	Relays	Pulse	Analog	
	RELAY1	ACTIVATE	Analog valu	e: 0.00V
	RELAY2	ACTIVATE		
	RELAY3	ACTIVATE		
	RELAY4	ACTIVATE		
		Ab	oout	
		Device i	nformation	

7. To edit your relay card, go back and slide over the name of your relay card to the left (for iOS) or long press the name of your relay card (for Android) and tap <Edit>. If you wish to delete your relay card, tap <Delete>.

Carrier 9:13 AM 100% Relay Cards + Edit Delete				
	Carrier ᅙ	9:13 AM		100% 💼
		Relay Cards		+
Edit Delete		Keidy Guida		
			Edit	Delete
				20.000

1.2 Using the PC application for the first time

If you choose to use your PC to control the VM204, make sure your PC is connected to the same network/Wi-Fi as the VM204. Then open the VM204 discovery application and follow these simple steps to connect your VM204:

1. Click the <Discover Devices> button.

IP Address Host Name Port MAC Address Firmware Version 192.168.8.21 VM204 80 D8-80-39-3D-C7-0E 1.0	Velleman - VM2 elp	04 Discoverer			
IP Address Host Name Port MAC Address Firmware Version	Mall	മന്തരത	0		
	//@///	annan		MAC Address	Firmware Version
	121 C 2 2 2 2				
	192.168.8.21				

2. A new row will be added. Click on your device and a webpage should open.

🕒 192168.8.21 × 🔼	Read with the Read Institution from the	
← → C 192.168.8.21		☆ <table-cell> 💿 🖾 ≡</table-cell>
	Authentication Required X The server http://192168.92180 requires a username and	
	password. The server says: Protected Area.	
	User Name: Password:	
	Log In Cancel	

Fill out the default credentials:
 Login: admin
 Password: VM204 (capital letters).
 We will explain how you can change your credentials later on.

4. You now have access to the VM204 and will be able to control it. Head to the next chapter to discover the possibilities.

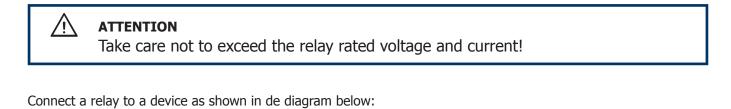
C VM204 Control Page ×						
← → C □ 192.168.8.21					두 상	-1 💿 😳 🗔 😑
Relay status						<u>^</u>
Settings		Polo	v etatue			
			y status			
		View the st	atus of your IO	S		
	Relays	Touris	turn to	Status		
		Toggle	Inputs			
	RELAY1	OFF	INPUT1	OFF		
	RELAY2	OFF	INPUT2	OFF		
	RELAY3	OFF	INPUT3	OFF		
			INPUT4	OFF		
	RELAY4	OFF				
	Relays	Pulse	Analog			
	RELAY1	ACTIVATE	Analog value:	0.00V		
	RELAY2	ACTIVATE				
	RELAY3	ACTIVATE				
	RELAY4	ACTIVATE				
		A	bout			
			information			
		Device				
	Board name					
	VM204 MAC address					
	D8-80-39-3D	-C7-0E				

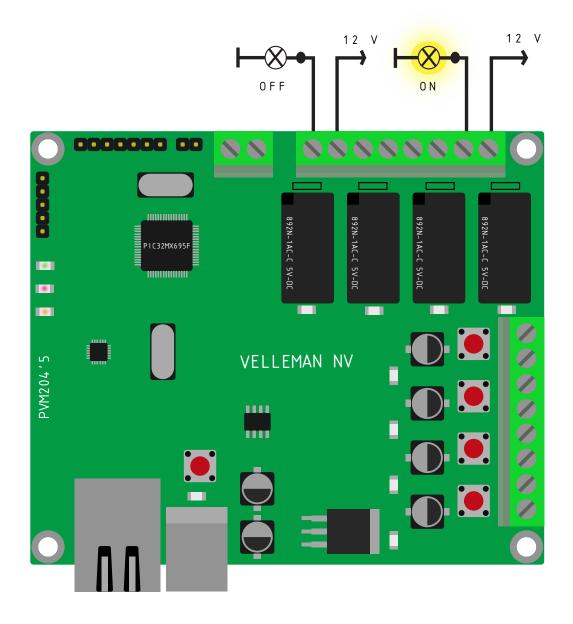
2. Controlling the VM204

The VM204 has 3 different Input/Outputs: relays, inputs and an analog input. By using these I/Os, you can read statuses from sensors or switches via the inputs and control devices via the relays.

2.1 Relay

A relay (electro-mechanical switch) is used to switch external connected electrical devices. An external supply is used that suits the connected device. The relay does not generate any power; therefor it is a dry contact.





Controlling the relay

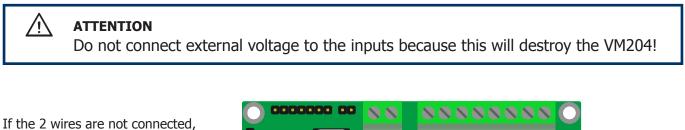
You can control the relays you connected via the Main page of your control panel by tapping/clicking on the $\langle OFF \rangle$ or $\langle ON \rangle$ button.

The toggle buttons represent the current state of the relay. This means that if you see ON in the button, the relay is closed and is passing through current. If the button says OFF the relay is open and is not passing any current.

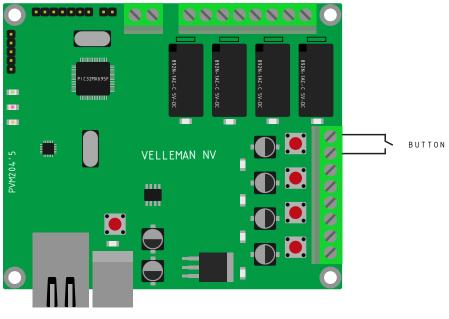


2.2 Input

Inputs are used to sense whether 2 terminals are connected to each other or not. These digital inputs accept dry contact or open collector.



If the 2 wires are not connected, the status of the input will be OFF, if the 2 wires are connected the status of the input will be ON.

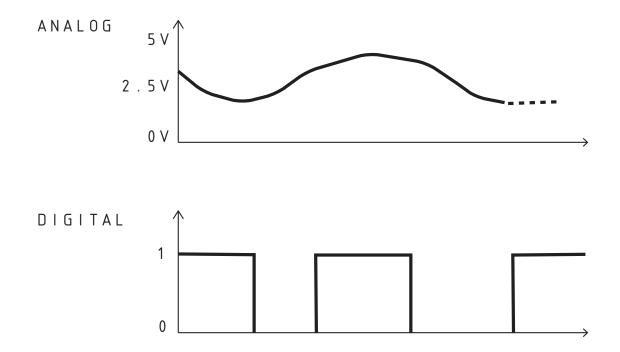


The status of the inputs can also be checked on the main page, here:

Carrier 奈 ✓ Relay Cards		9:12 AM VM204		100'	% 🖚
Relay status					
Settings		Relay View the stat			
	Relays	Toggle	Inputs	Status	
	RELAY1	OFF	INPUT1	OFF	
	RELAY2	OFF	INPUT2	OFF	
	RELAY3	OFF	INPUT3	OFF	
			INPUT4	OFF	
	RELAY4	OFF			
	Relays	Pulse	Analog		
	RELAY1	ACTIVATE	Analog valu	e: 0.00V	
	RELAY2	ACTIVATE			
	RELAY3	ACTIVATE			
	RELAY4	ACTIVATE			
	pard name		out		

2.3 Analog input

The analog input is a special kind of input which does not read 1's and 0's but measures the exact voltage on the input. This means you can read sensors like a thermistor or an anemometer. The grafic below shows an example of an analog and a digital signal:



The analog value can be read from the main page, here:

Carrier 奈 ✔ Relay Cards		9:12 AM VM204		100%	Þ
Relay status					
Settings		Relay View the state			
	Relays	Toggle	Inputs	Status	
	RELAY1	OFF	INPUT1	OFF	
	RELAY2	OFF	INPUT2	OFF	
	DELAVO	0.55	INPUT3	OFF	
	RELAY3	OFF	INPUT4	OFF	
	RELAY4	OFF	V	*	
	Relays	Pulse	Analog		
	RELAY1	ACTIVATE	Analog valu	e: 0.00V	
	RELAY2	ACTIVATE			
	RELAY3	ACTIVATE			
	RELAY4	ACTIVATE			
			out		

2.4 API (Application Programming Interface)

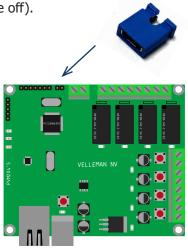
The VM204 has an API which makes it easier for developers to control the relay card from their own application. The complete reference for accessing the API calls can be found in 'Settings' and then 'API Reference'.

2.5 Factory reset

To return to the default settings, follow these steps:

- 1. First, make sure the power of the card is on (the yellow and red LEDs should be on).
- 2. Place the blue shunt back on the factory reset pins (2 pins) next to the analog input.
- 3. Unplug the USB cable (the yellow and red LEDs should now be off).
- 4. Remove the blue shunt.
- 5. Plug the USB cable back in.

Make sure you follow the correct order!



3. Editing the VM204

To start editing the VM204, go to 'Settings' in the left menu bar.

3.1 Credentials



WARNING

changing the credentials will reboot the VM204 and all relays will be deactivated, make sure no machines are connected while doing this!

If you want to control or edit the VM204, you must first be authenticated. The default Login and password are still: **Login:** admin

Password: VM204 (capitals)

If you want to change the credentials go to 'Settings' then 'Authentication'. Fill out the form and click or tap <save and reboot>.

Control			
Authentication			
Network		Auther	tication
E-mail		Manag	e access
Customize			
Notifications	Credentials		/
API	Login:	admin	
API Reference	Password:		K
About			
		Save and reboot	
		NLab	
		Net	work
		Network c	onfiguration
	Web interface		
	Port:	80	
	DHCP		
	☑Enable DHCP		
	IP address:	192.168.8.21	
	Gateway:	192.168.8.1	
	Subnet mask:	255.255.255.0	
	Primary DNS:	195.130.130.5	
	Secondary DNS:	195.130.131.5	

3.2 Network settings

In general, the network settings are set up to suit your convenience and can remain unadjusted. If however you are an experienced user, we created an opportunity for you to adjust the network configuration of the VM204.

If you want to change the port*

which the webserver is running on, you can change it by going to 'Settings' and then 'Network'. Now you can enter a new port in the web interface subsection. Click or tap <Save and reboot> to finalise.

If you click the save and reboot button, the VM204 will deactivate all relays. The webserver will restart with the new port and/or IP so the current webpage will not work. Browse to the new page with the correct port and/or IP.

Control Authentication Network E-mail		Network Network configuration
Customize Notifications API API Reference About	Web interface Port: DHCP ⊛Enable DHCP	80
	IP address: Gateway: Subnet mask: Primary DNS: Secondary DNS:	192 198.8.21 192 198.8.1 295 295 0.0 195 130 130.5 196 130 131.5
	Server	E-mail E-mail settings
	Saver: Port:	sintp example.com 587 11.5

3.3 Email settings

The VM204 is capable of sending emails even with SSL/TLS encryption. This makes the VM204 compatible with Gmail, Outlook, etc... In the email settings, you can enter the email address from which emails will be sent via the VM204.

Go to 'Settings' in the left menu bar and scroll down to the Email section. Fill out the credentials of your ISP or any webmail service and press <Save> to finalise.

You can test your credentials by clicking <Test mail settings>. This will send an email to the address that has been saved into the VM204. If everything is filled out correctly, you will receive an email saying "If you received this mail, everything is OK".

and the second		لم
Control		
Authentication	E-mail	
Network		
E-mail	E-mail settings	
Customize	Server	
Notifications	Server: smtp.example.com	
API		
API Reference	Port: 587	
About	II TLS	
	Authentication	
	Username: email@example.com	
	Password:	
	Save Test mail settings	
	Customize	
	Customize the IO's names Customize the layout with CSS and javascript/JQuery	
	Cardname	
	Cardname: VMt204	
	Relays	
	Relay 1: RELAY1	
	Relay 2: RELAY2	

3.4 IO settings

It is possible to customize the IO names, set the Pulse time of the Relays, customize the look and feel and even the functionality of the website.

Changing the IO names

The name of the VM204 and all the relays and inputs can be changed by going to 'Settings', 'Customize' and then fill out a new name in the name field of either the card name, relays or inputs (blue arrows). Don't forget to click <Save> when you are done.

A specific card name makes it easy to browse to the relay card in your local network without remembering the IP address. It also makes it easy to distinguish multiple cards in the same network.

Control				
Authentication		Cu	stomize	
Network				
E-mail	Quete		ze the IO's names	
Customize			vith CSS and javascript/JQuery	
Notifications	Cardname			
API	Cardname:	VM204	←──	
API Reference				
About	Relays			
	Relay 1:	RELAY1	←──	
	Relay 2:	RELAY2		
	Relay 3:	RELAY3		
	Relay 4:	RELAY4		
	Pulse			
	Relay 1:	60 seco	ds <	
	Relay 2:	60 seco	ds	
	Relay 3:	60 seco	ds	
	Relay 4:	60 seco	ds	
	Inputs			
			-	-
	Input 1:	INPUT1	←──	
	Input 2:	INPUT2		
	Input 3:	INPUT3		
	Input 4:	INPUT4		
	Analog			

If you give each relay and input a different name, it's easy to remember what the relay is controlling or what the input is reading. For example 'lights bathroom' or 'doorbell'. These names will also be used when sending e-mails from the VM204.

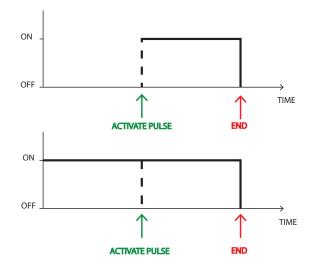
Set the Pulse time

Another customizable feature is activating the relays for a certain amount of time. This is the pulse feature. The length of the pulse can be set in the 'Pulse' section using seconds (as shown in the picture above, red arrow).

The pulse can work in two ways:

The first way, as shown in the first diagram is when you activate the pulse when the relay was in the OFF state. The relay will be in the ON state for the amount of time that you have set.

The second way is when you activate the pulse while the relay is already in the ON state. The relay will remain in the ON state for the amount of time that you have set.



The look, feel and functionality

The two next fields in the Custom section are 'Custom js' and 'Custom css'. They allow you to add a URL to Javascript or a CSS file, which can alter the looks and functionality of the website.

3.5 Notifications

The 'Notification' settings allow you to enable and disable email notifications for different actions. When an action is triggered an e-mail will be sent from the account you gave up in your email settings.

First make sure you enter the correct email addresses to which you want to send the notifications (blue arrow). If you want to enter more then one email address, type a ';' inbetween the addresses with no spaces. For example: alice@email.com;trudy@email.com;john@email.com

To disable the email notifications, simply uncheck the 'Enabled' box (red arrow). Don't forget to save!

Control Authentication Network E-mail	Notifications Configure e-mail notifications	Ŷ
Customize Notifications API API Reference About	Notifications Notification To: alice@email.com.trudy@em Enabled Swvc	

Actions

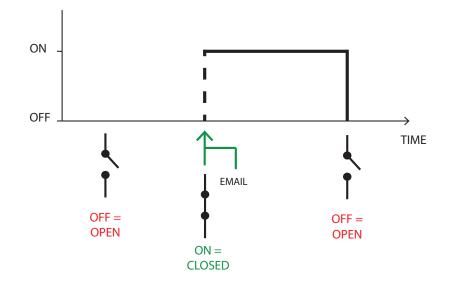
There are 4 different actions to which you can enable an email notification. You can choose one or more actions by opening the notification list (as shown in the picture) and selecting the actions you want to get notified of.

Control Authentication Network E-mail Customize	Notifications	
Notifications API API Reference About	Notifications Notification To: Input 1 rising Input 2 rising Input 2 rising Input 3 rising Input 4 rising Input 1 falling Input 3 falling Input 3 falling Input 4 falling Inpu	
	Boot Analog	

We will now explain each action in detail.

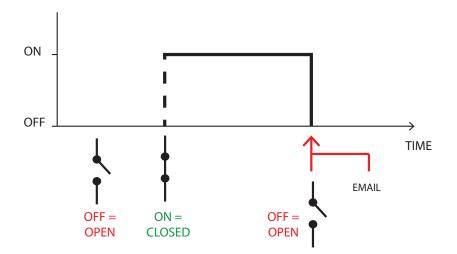
A. Input rising:

An email will be sent if the corresponding Input transfers from a **low to a high (or from off to on)** state. For example: when the doorbell goes off. This can be done for each individual input.



B. Input falling:

An email will be sent if the corresponding Input transfers from a **high to a low (or from on to off)** state. For example: when the heating is turned off. This can be done for each individual input.

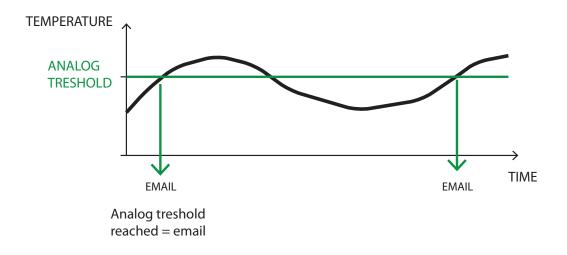


C. Boot:

When the VM204 is **powered up** and has an IP, the card will send an e-mail notifying you it started up. For example: when the power is rebooted after a power failure.

D. Analog threshold:

When the analog value reaches a **specified value**, it will send an email. If the analog value goes below the threshold and then above, it will send an email again. For example: if the temperature outside drops below 0C°. The analog treshold is in this case 0.



You can set the analog treshold value in the 'Alarm value' box after you select this action in the list (see picture below). The alarm value must be between 1 and 1024. This value can be calculated by multiplying your voltage value times 155. For example if your voltage value is 3.3 V then the calculation is: $3.3 V \times 155 = 511.5 => 512$. Floating-point numbers are not valid so round your value up or down. The maximum voltage that can be sensed is 6.6 V (=1024).

Control	
Authentication	
Network	Notifications
E-mail	Configure e-mail notifications
Customize	Notifications
Notifications	Notification Analog •
API	To: alke@penal.com/trudy@pen
API Reference About	Alam value 128
ADOUL	<
	Enabled
	Save
	API
	Get or generate a new API key
	API
	API Key: zdd.HZbelDVLADFEDNZIKE8g5D3AIYq Regenerate
	About
	Device information

3.6 API

The API key allows the user to login to the relay card without the credentials but with only a single key. This key is only valid when accessing the API urls that can be found in the API Reference page which will help you to control the relay card from your own programme.

3.7 API reference

The API reference shows you a list of all commands and requests that can be made with your own programme.

3.8 About

This section shows you the device information such as Board name, MAC address, System up-time, Firmware version, Analog max. value and Analog min. value.

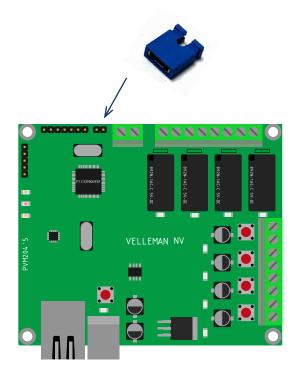
4. Upgrading the firmware

In case there is new firmware available or if there should be any problems with your Ethernet relay card, you can always reinstall/upgrade the firmware by following these steps.

- 1. Before we start, it is important to copy/remember/note your IP address for later on. You can find this either in the 'settings' page of the VM204 app or in the IP column in the discovery software. You won't be able to do this after step 3.
- 2. Go to the download page of the VM204 on the Velleman website: <u>http://www.velleman.eu/support/downloads/?code=VM204</u>

Download the 'VM204 Firmware V1.0'.

3. Mount the blue shunt onto the factory reset pins (2 pins), located next to the analog input.



4. Power cycle the card by first unplugging the USB cable and then inserting it again.

5. Open the VM204 FW application which is included in the VM204 PC software. You can download this PC software on the product page here:

http://www.velleman.eu/support/downloads/?code=VM204

Communication Settings Ethernet		
	Connect	Load Hex File
	Erase	Program-Verify
IP Address		
192 . 168 . 1 . 11	1	
192 . 100 . 1 . 11		

5. Hopefully you remembered your IP address! Copy it into the 'IP Address' field and press <Connect>. Normally, you should see 'device connected'.

Communication Settings Ethernet		
	Erase-Program-Verify	Load Hex File
IP Address 192 , 168 , 8 , 19	Device connected Bootloader Firmware Version: 1.0	

6. Press <Load Hex File> and open the Hex file you downloaded during step 2.

VM204 Firmware Application		— ×
Communication Settings		
Ethernet	Disconnect	ad Hex File
	Erase-Program-Verify	
IP Address	Device connected Bootloader Firmware Version: 1.0	
192 . 168 . 8 . 19	Hex file loaded successfully	

7. Press <Erase - Program - Verify>, this will first reprogram the VM204 and then restart it.

Communication Settings Ethernet		
Laternet	Disconnect	ad Hex File
	Erase-Program-Verify	
IP Address	Device connected Bootloader Firmware Version: 1.0 Hex file loaded successfully Flash Erased	

Communication Settings				
Ethernet		ad Hex File		
	Erase-Program-Verify			
IP Address	Device connected Bootboader Firmware Version: 1.0 Hex file loaded successfully Flash Erased Programming completed Verification successfull Command issued to run application			

Vellemen

ORDERCODE: VM204

REVISION: HVM204'1

1				
1				

