EVAstream

Electrical connections - PCB Setting

Table of contents

1 About this manual

1.1 Language

This manual is meant for the qualified electrician who performs the electrical connection of the product. Read and understand this manual before connecting and using this product. This manual is originally written in English. All other language versions are translations of the original manual.

1.2 Other relevant documents

Document	
EVAstream: Mounting - Installation	www.evaoptic.com/support/download
EVAstream: User manual	www.evaoptic.com/support/download
EVA LED underwater light	www.evaoptic.com/support/download

1.3 Used symbols

This manual contains safety instructions. Ignoring these instructions may lead to injury or damage to the appliance. Each safety instruction is indicated with a signal word. The signal word corresponds with the level of risk of the described hazardous situation.

⚠ DANGER	This symbol indicates a hazardous situation which, if not avoided, will result in death or serious injury.
⚠ WARNING	This symbol indicates a hazardous situation which, if not avoided, could result in death or serious injury.
⚠ CAUTION	This symbol indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.
NOTICE	Indicates a situation that, if not avoided, could result in damage to the product or to the environment.

2 Safety

2.1 Safety warnings and regulations

⚠ DANGER

Electrical shock hazard. Fatal injury will occur. Switch off all electricity near the pool before installation or service.

⚠ WARNING

Electrical shock hazard. Risk of electric shock and injury. The product must be installed by a certified electrician. Incorrect installation will cause electrical hazards.

⚠ WARNING

Electrical shock hazard. Risk of electric shock due to incorrect mounting.

- Make sure you read the enclosed documents carefully.
- Never connect the product to the main power before connecting all loose wires properly.
- Always disconnect the product from the main power after use and before servicing.

⚠ WARNING

Electrical shock hazard. Risk of electric shock due to leakage of current.

- Make sure to install the turbine with a PE-grounding.
- It's important to connect the installation niche to the pool grounding, never to the house grounding

NOTICE

Risk of product damage. Prolonged disturbance of frequency may permanently damage the equipment.

- Never place multiple cables in one conduit.
- Never place the motor control unit near a frequency controller.

2.2 General safety instructions

Follow the NEN1010 guidelines. Follow the specific installation requirements of IEC 60364-7-702: 2010 (Electric low-voltage installations - Part 7-702: Requirements for special installations, spaces, and areas – Swimming pools and fountains). Install the controller in or outside of zone 2 (NOT in zones 0 or 1) according to IEC 60364-7-702: 2010. The power supply must be equipped with an earth leakage circuit breaker (ELCB) with a nominal differential current ≤ 30mA.

The EVAstream was developed as a counter-current swimming machine for use in a swimming pool. Use for any other purpose is not permitted. Requests for exceptions to this should be submitted to the manufacturer for technical analysis. Only after written approval by EVA Tech B.V. may the EVAstream be applied in any other way than as prescribed in this document.

The general terms and conditions of EVA Tech B.V. apply to all our offers and agreements. EVA Tech B.V. expressly rejects the applicability of the general (purchasing) conditions of counterparties. The warranty provisions of the EVAstream and the general terms and conditions of EVA Tech B.V. can be found at www.evastream.nl

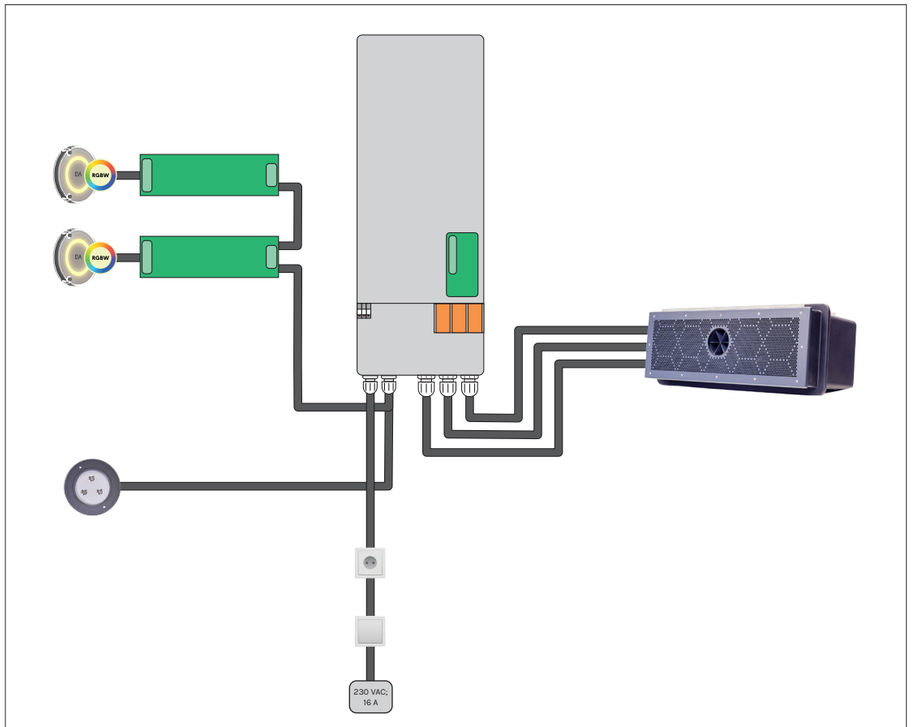
3 Product

3.1 Intended use and reasonably foreseeable unintended use

The EVAstream is intended to be used as a counter-current swimming machine. The PIEZO control panels are intended to be used to control the EVAstream.

3.2 Description

The EVAstream is a counter-current machine. The machine can be equipped with several control panels and EVA RGBW underwater lighting. The machine is controlled by the motor control unit (MCU).



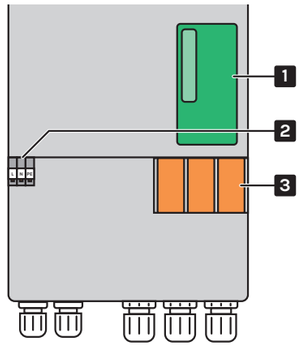
Overview of an EVAstream configuration

NOTICE

Risk of product damage. Prolonged disturbance of frequency may permanently damage the equipment.

- Never place multiple cables in one conduit.
- Never place the motor control unit near a frequency controller.
- For safety reasons, it is not allowed to mount lights other than EVA Optic to the EVAstream motor control unit.

3.3 Connections



Connections in the motor control unit:

1. Control print (32 pins)
2. Power connection
3. EVAstream turbine connection

3.4 General specifications

EVAstream	
Power input	230 VAC; 10A
Cable motor	5 m, 16 mm2
	Extend with max. 20 m using 25 mm2 cable
	(Flexible cable of fine copper wire strands)
EVA Piezo	
Cable	10m 7-wired aqua cable
	Optional: 30m 7-wired aqua cable
DMX	
Cable	2 wires > 0.22 mm2 + shield 110 Ohm

3.5 Electrical specifications

AC/DC Power Supply - INPUT	FIT	PRO	MAX
Voltage range	180-264 Vac	180-264 Vac	180-264 Vac
	254-370Vdc	254-370Vdc	254-370Vdc
Frequency range	47-63Hz	47-63Hz	47-63Hz
AC current (230VAC)	5.5A	9A	11A
Nominal power	1200VA	2000VA	2400VA
Power factor (type)	>0.9	>0.9	>0.9

AC/DC Power Supply - OUTPUT	FIT	PRO	MAX
DC bus voltage (stabilized)	26Vdc	28Vdc	28Vdc
DC bus current	46A	71A	86A

Protections

Short circuit, overload, over voltage, over temperature.

Safety standards

SELV, UL62368-1, CSA C22.2 No. 62368-1, TUV EN62368-1 + A11, EAC TP TC 004, BSMI CNS14336-1 approved, EN55032 (CISPR32) Class A/B, EN61000-3-2/3, EN61000-4-2/3/4/5/6/8/11, EN55024, EN61204-3, EN61000-6-2, BSMI CNS13438.

Motor Control Unit	FIT	PRO	MAX
Control input	DMX512	DMX512	DMX512
Motor PMSM 3xDC Output	RPM range	RPM range	RPM range
	10-100%	10-100%	10-100%
IP rating	IP20	IP20	IP20
Dimensions housing	660x185x115 mm (cable gland on bottom)		

Working temperature

Max. 32°C, mount in a dry and condensation-free area.

Safety measures

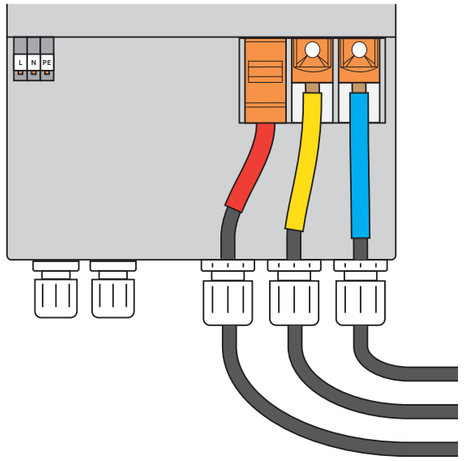
EVA Torque control, Voltage/current control, Mosfet temperature control

4 Electrical installation

⚠ DANGER

Electrical shock hazard. Fatal injury will occur. Switch off all electricity near the pool before performing the electrical installation.

4.1 Connect EVAstream turbine to Motor Control Unit



Cable connections in Motor Control Unit

Dismantling cable
Length 16 mm

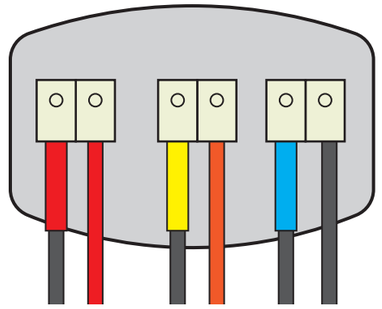
Connect the cables from the EVAstream Turbine to the Motor Control Unit:

- Make sure the cables are properly finished (as shown in the photo). Dismantling length should be 16 mm.
- Place the red, yellow and blue cable (do not change the colors of the cables) in the terminal block (like the yellow and blue cables in the drawing).
- Secure the cables by closing the orange clamps in the terminal block (with the T-LOX knee lever connection) with a standard screwdriver (like the red cable in the drawing).

If the cables are not long enough, they can be extended:

You can extend the cable from the Turbine to the Motor Control Unit with max. 20 m. Use the EVA CCB 16x25 connection box with a 25 mm² or 35 mm² cable.

Go to the next step for installation with an extension for the turbine cables or go directly to step 4.2 if extending the cables is not necessary.



Color scheme of the cables in the Connection Box

Correct use of the cables in the Connection Box

Connect the EVAstream turbine cables to the Connection box (EVA-CCB-16x25)

- Connect the cables (3x1x25mm2 cable) attached to the EVAstream turbine to the connection box.
- The cable connection box must be placed above the ground, in an accessible place.
- Always lay the cables in separate conduits from the EVAstream turbine to the Motor Control Unit.

Connect the Connection box (EVA-CCB-16x25) to the Motor Control Unit

- Use the EVA-C25M1-x cables (to a maximum cable length of 20 m) to connect the Connection box with the Motor Control Unit.
- Make sure the cables are properly finished (as shown in the photo). Dismantling length should be 16 mm.
- Use red, orange and black cables (as shown in the illustration and photo). Do not change the colors of the cables!

Screw the cables into the correct holes

Dismantling cable
Length 16 mm

⚠ CAUTION

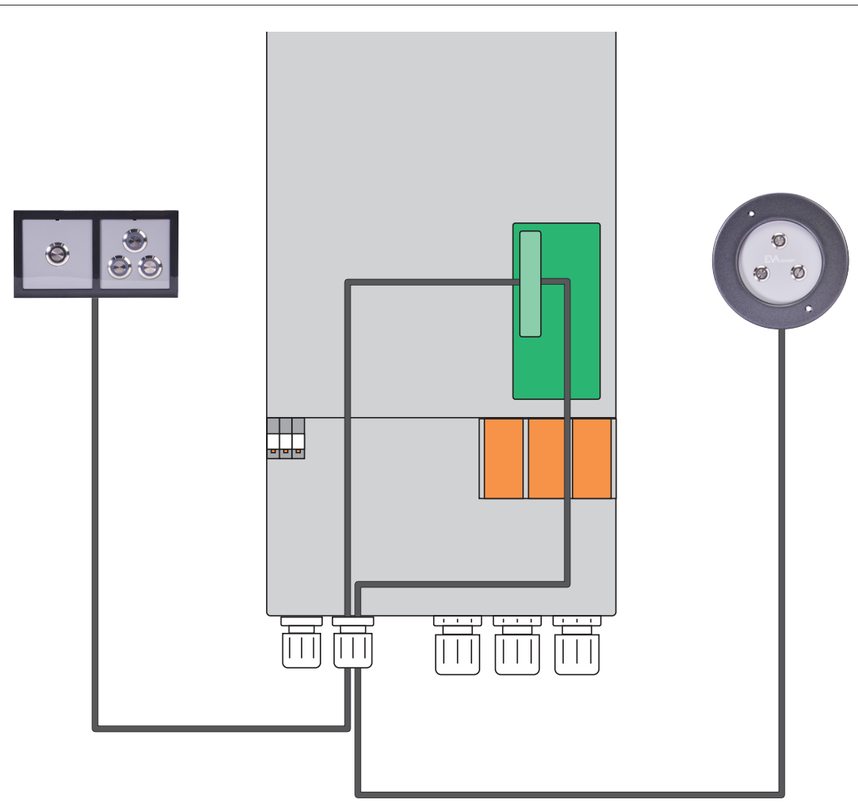
Electrical shock hazard. Risk of electric shock due to leakage of current:
- Never connect the product to the main power before the installation is finished.

What kind of control unit are you going to use?

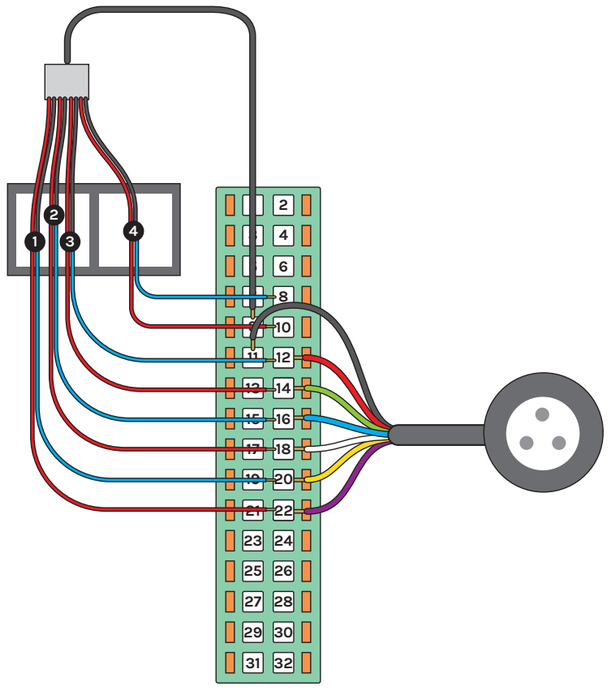
EVA Piezo3 and/or EVA Piezo SQ3/SQ4: Go to step 4.2

Only the EVA experience web app?
No electrical connection is needed, go directly to step 4.3

4.2 Connect EVA Piezo to Motor Control Unit



Overview of an EVA Piezo configuration (You can have one or both units)



Electrical connections on the control print of the Motor Control Unit

General

- You can install only an EVA Piezo3 or SQ3/SQ4, or you can install both.
- The illustration shows the back side of the EVA Piezo SQ4.
- The buttons of the Piezo SQ3 are installed similar to the first three buttons of the Piezo SQ4.
- You can put multiple cables into one port.
- Always check the wire coloring of the Piëzo and 12Vdc polarity before installation.
- To extend the cables always use a minimum core diameter of 0.25mm2 with a maximum cable length of 30 metres. We recommend using cable type LiYY 16 x 0.25mm2 (Lapp Unitronic) or similar.

EVA Piezo3

- Connect the 7 wired cable from the EVA Piezo3 to the Control Print of the Motor Control Unit on the indicated numbers.

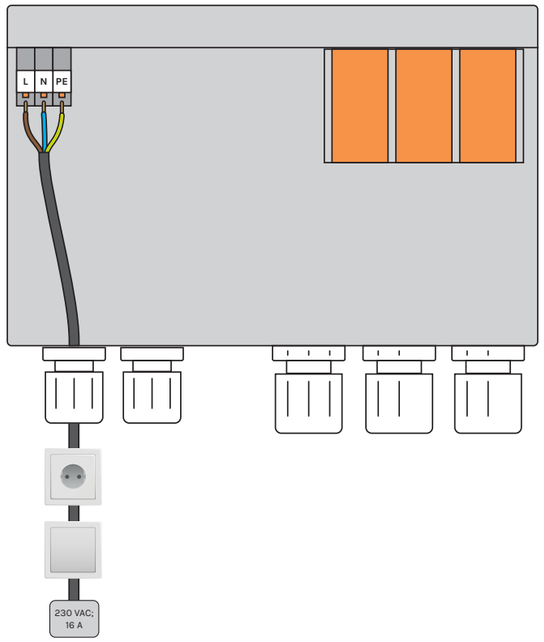
Piezo SQ3 / SQ4

- Connect the blue and one of the red cables from the EVA Piezo SQ3/SQ4 to the Control Print of the Motor Control Unit.
- Combine the black and the remaining red cables from the EVA Piezo SQ3/SQ4 and connect to the Control Print of the Motor Control Unit. Group the wires 7, 9, 11, 13, 15, 17, 19, and 21 to the Piëzo 4 switch, sw 9 (always use a cable with a minimum core diameter of 0.5mm^2).

4.3 Finishing the installation of the Motor Control Unit

⚠ WARNING

Electrical shock hazard. Fatal injury will occur. Switch off all electricity near the pool before performing the electrical installation.



Connect the Motor Control Unit to the mains (230 VAC; 16 A)

- Connect the 3 wired cable (230 VAC; 16 A) to the Motor Control Unit on the indicated L. N. and PE.
- Connect an on/off button (power switch) to the socket and install near to the pool.

5 PCB Settings - General information

5.1 Preparation

Check if the electrical connections are installed correctly

5.2 EVAstream LEDs

Orange:
DMX is connected or PCB set as master

Green flashing with high sequence:
Starting software on PCB
Green flashing with sequence of 1 sec:
PCB is ready

How do you want to use your EVAstream?

Controlling with EVA Experience web app Go to chapter 6
Options:

- EVAstream + EVA LED underwaterlighting + EVA Piezo
- EVAstream + EVA LED underwaterlighting
- Only EVAstream

Controlling without EVA Experience web app Go to chapter 7
Options:

- EVAstream controlled by EVA Piezo
- EVAstream controlled by EVA AA-77-SL (DMX)

6 Controlling with EVA Experience web app

6.1 Technical tablet requirements

The EVA Experience Controller can only be operated with a touchscreen tablet or a smartphone.

We recommend a screen size of 9.7 inch to 11 inch for optimal functioning of the web environment.

The following tablet operating systems are generally suitable:

- Android tablets with Android version 12 or higher.
- Apple tablets with iOS 15.3 or higher.

6.2 Network connection

An internet connection is not required to operate the EVA Experience Controller with a tablet. However, the tablet must be connected to the same WiFi network as the controller. There are 2 options for this:

1. New network (Access Point Mode)
Create a new WiFi network with the EVA Experience Controller, and connect the tablet to this network. This option is suitable if the home network does not provide sufficient coverage around the pool:

- Due to the EVA Experience Controller's own network, it is not necessary to further expand the cover age of the home network.
- Your device is not connected to the internet.

2. Home network
Connect the tablet and the EVA Experience Controller to the home network. This option is preferred if the home network provides sufficient coverage around the pool:

- The tablet remains connected to the home network while operating the EVA Experience Controller.
- Switching networks on the tablet is not necessary to operate the controller.

WiFi networks of 2.4 GHz are supported.

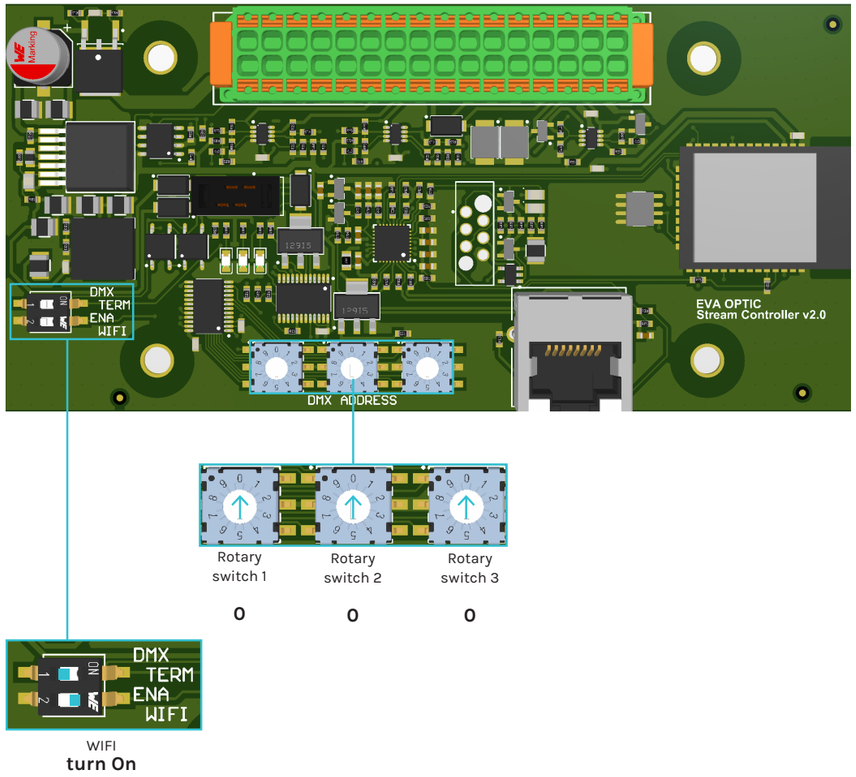
6.3 Setting the PCB and WIFI

Before you want to connect to the home network or create a new network, the rotary switches must first be set correctly and the WIFI must be switched on.

1. Setting the Printed Circuit Board (PCB):
Go to the green Printed Circuit Board (EVA SP-ECA-PRO). This is located in the Motor Control Unit of the EVAstream or in a separate power supply box.

Set the Rotary switches at **000**

2. Turn WIFI on for installation
On the green Printed Circuit Board, set the ENA WIFI button to ON by sliding switch 2 to the right.



The green Printed Circuit Board (EVA SP-ECA-PRO) is the master in all cases for control. The EVA LED underwater lighting and EVA Piezo can be linked to this if desired.

When the rotary switches of the Printed Circuit Board (EVA SP-ECA-PRO) are set to 000, the EVA Piezo has the following functions:

EVA Piezo control options:

Button 1:	On / stand-by (pause)
Button 2:	Slowdown (in 5% increments) In stand-by start on 30%
Button 3:	Speed up (in 5% increments) In stand-by start on 100%
Button 2+3:	Child lock
Button 4:	On / Off

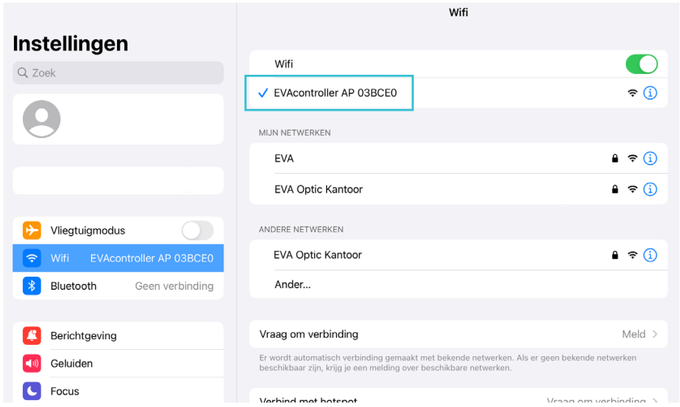
6.4 New network configuration (AP mode)

Create a new WiFi network with the Printed Circuit Board (PCB) and connect the tablet to this network. This option is suitable if the home network does not provide sufficient coverage around the pool.

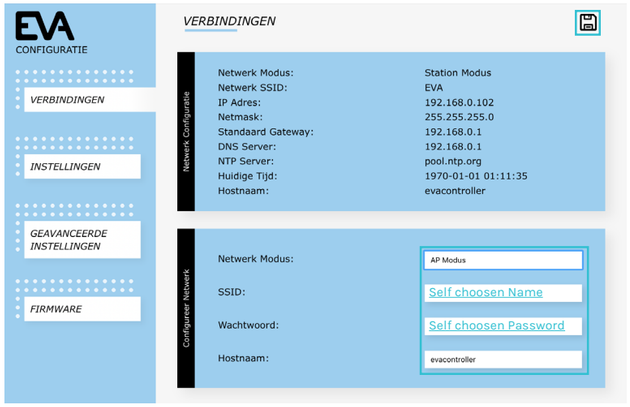
1 **Connect tablet to Printed Circuit Board (PCB):**
Open the screen on the tablet with WiFi connections, and connect to the network:

EVAcontroller AP ###### (or via IP 192.168.4.1)

A screen with the EVA logo will automatically appear. Click on Continue under the logo.

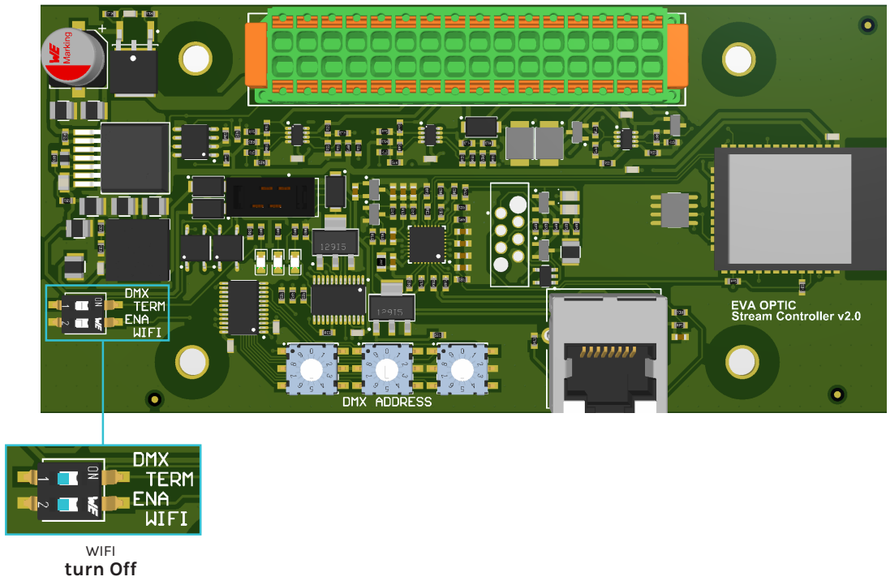


2 **Connect Printed Circuit Board (PCB) to new network:**
The following setup screen opens automatically:



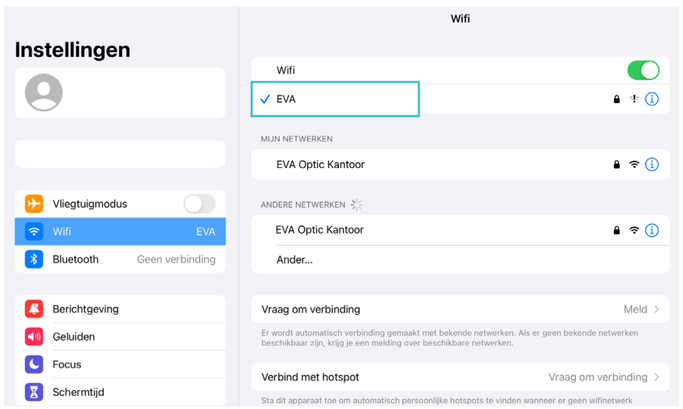
1. Select AP Mode next to Network Mode.
2. Enter a self choosen Name for the new network next to Network SSID (only letters and numbers).
3. Enter a self chossen Password next to Password. **Minimum 8 characters!**
4. Check if evacontroller is filled in next to Hostname.
5. The other settings usually do not need to be changed. Click the save icon at the top right.

3 **Disconnect the wifi connection on the Printed Circuit Board (PCB):**
On the Printed Circuit Board (PCB), set the ENA WIFI button to OFF again (slide switch 2 back to the left). The PCB is now connected to the new network.



WIFI
turn Off

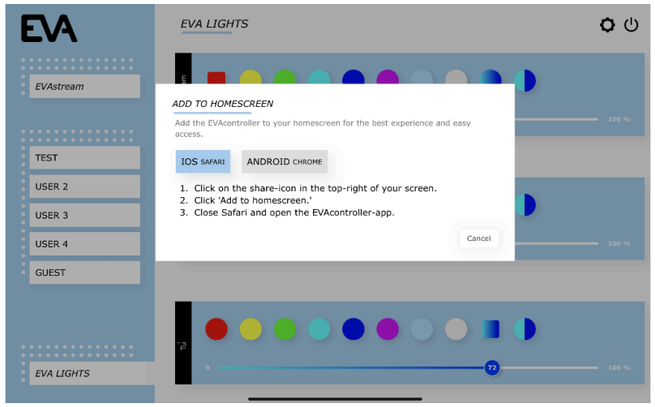
4 **Connect the tablet to home network:**
Open the screen with WiFi connections on the tablet and connect to the new network.



5 **Connect tablet to EVA Experience web app environment:**
Go to your internet browser and enter the following address in the address bar:

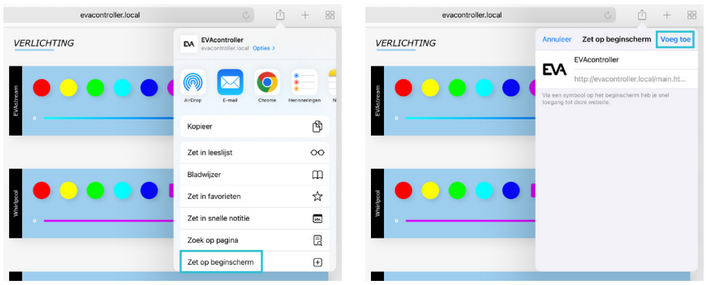
http://evacontroller.local (or via IP 192.168.4.1)

You will see the following screen:

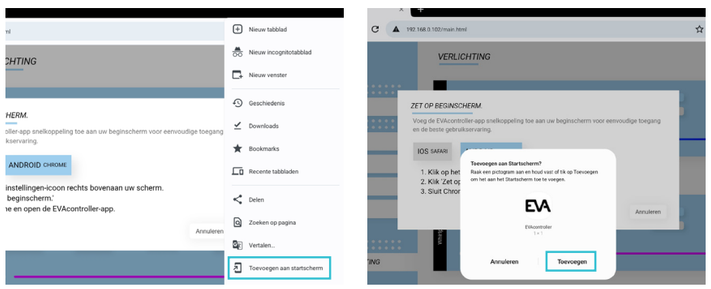


The pop-up provides instructions for creating an EVA shortcut icon on your tablet's desktop (for easy access to the EVA Experience web app environment in the future).

1. Click on the share icon to the right of the address bar.
2. Select Add to Home Screen.
3. Name the icon EVAstream and select Add.
4. The icon is now added to your tablet's desktop.



Apple IOS



Android

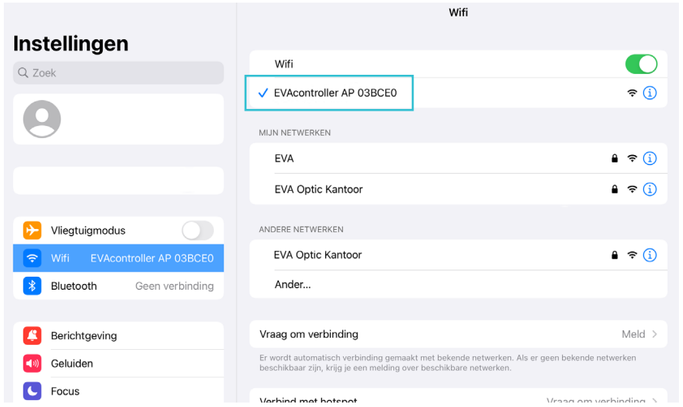
6.5 Home network configuration

Connect the tablet and the Printed Circuit Board (PCB) to the home network. This option is preferred if the home network provides sufficient coverage around the pool.

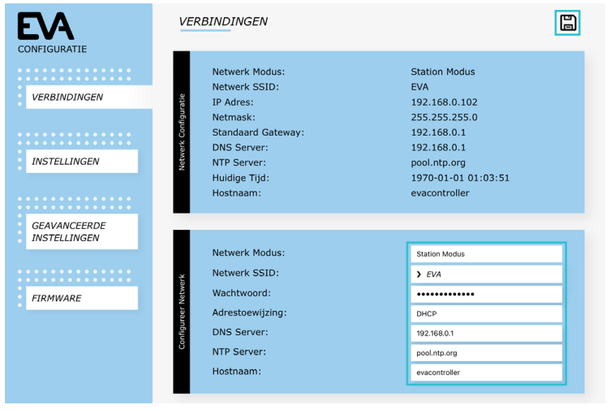
1 **Connect tablet to Printed Circuit Board (PCB):**
On the tablet, open the screen with WiFi connections, and connect to the network:

EVAcontroller AP ######

A screen with the EVA logo will automatically appear. Click on Continue under the logo.

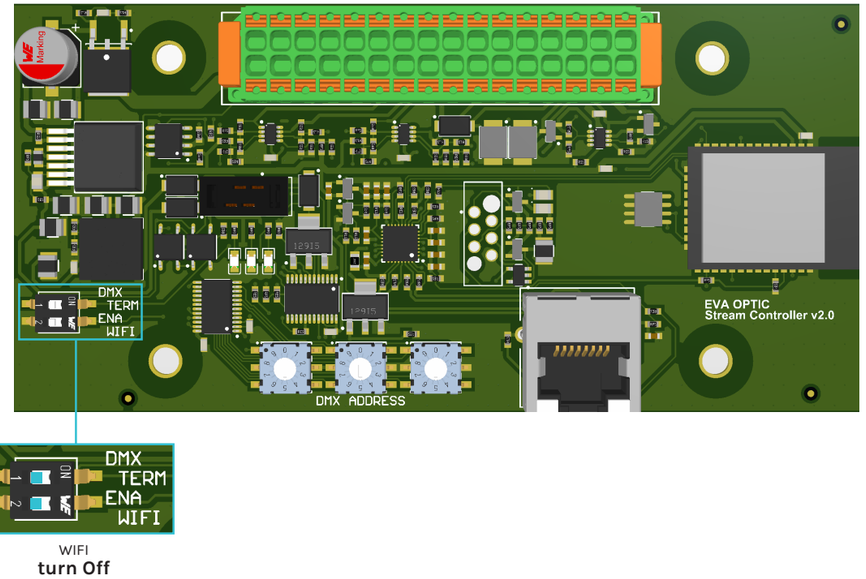


2 **Connect Printed Circuit Board (PCB) to home network:**
The following setup screen opens automatically:

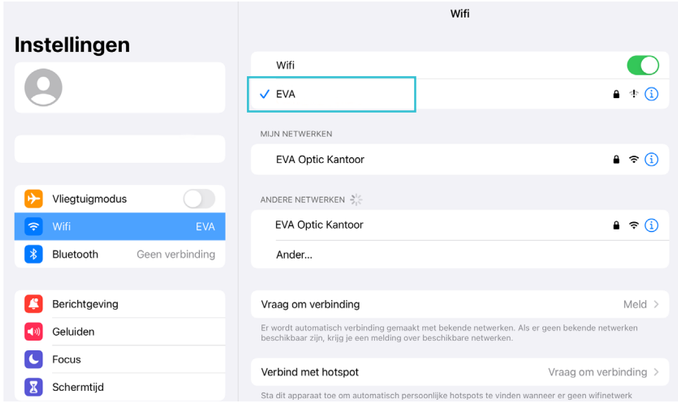


1. Select Station Mode next to Network Mode.
2. Choose your Home network next to Network SSID.
3. Enter your Password next to Password.
4. Check if evacontroller is filled in next to Hostname.
5. The other settings usually do not need to be changed. Click the save icon at the top right.

3 **Disconnect the wifi connection on the Printed Circuit Board (PCB):**
On the Printed Circuit Board (PCB), switch the ENA WIFI button to OFF (slide switch 2 back to the left). The PCB is now connected to the home network.



4 **Connect the tablet to home network:**
Open the screen with WiFi connections on the tablet and connect to the home network.



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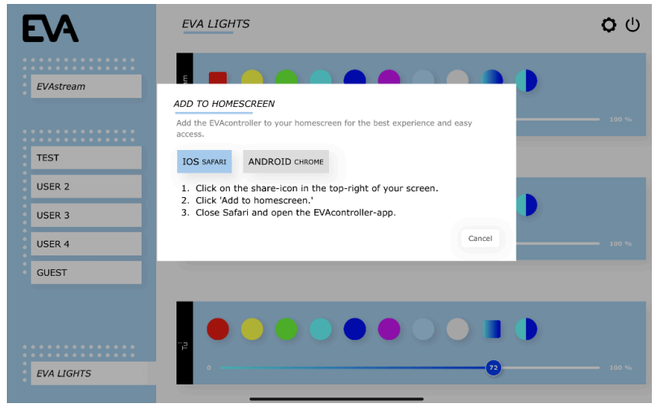
http://evacontroller.local

You will see the following screen:



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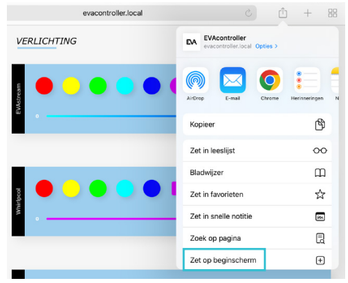
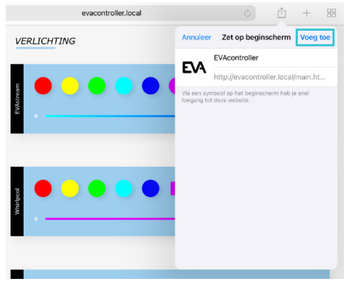
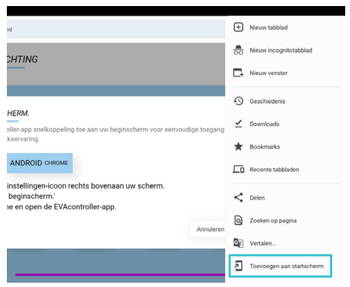
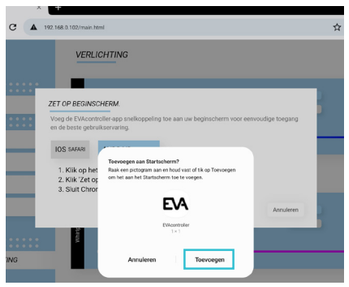




Apple IOS





Android

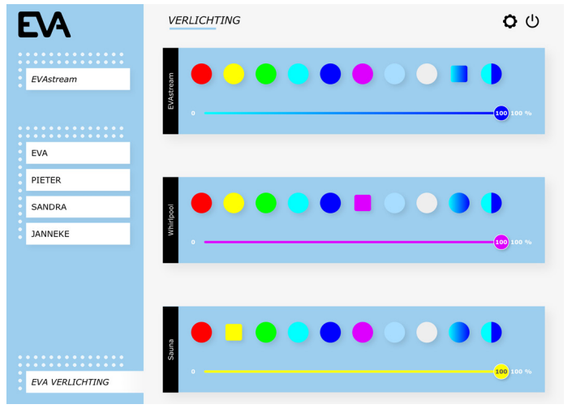
6.6 Settings for first use

Before using the EVA Experience web app environment for the first time, it is advisable to enter a number of settings:

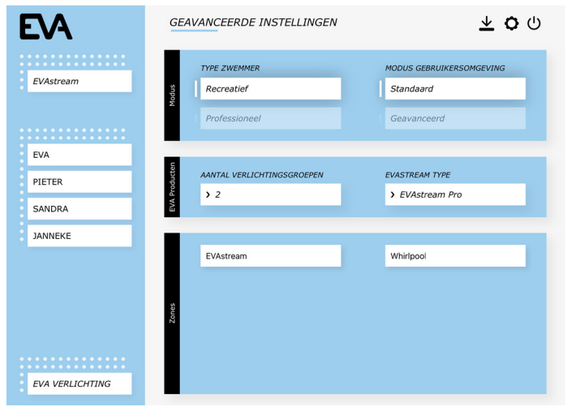
1 Click on the EVA app icon you created in the previous step, or go to your internet browser and enter the following address in the address bar:

http://evacontroller.local

You will now see the home page of the EVA Experience web app environment:

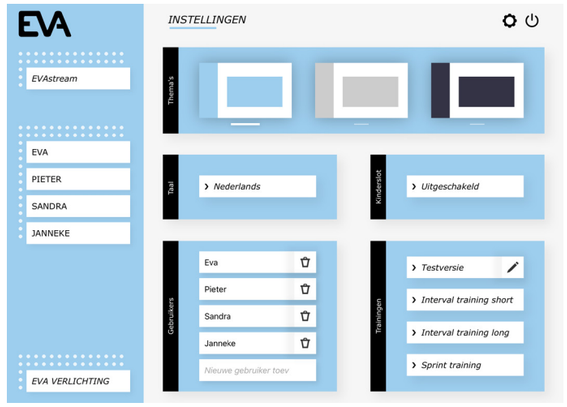


2 Click twice on the gear icon at the top right of the screen to go to the **advanced settings** for linked EVA products:



1. Select number of groups at lighting groups and give recognizable names al Zones (block below). Only enter multiple zones when there are several light groups such as EVAstream Lamps, Jacuzzi Lamps, etc. NB! The first group is always the lighting group linked to the EVAstream. The lighting in this group automatically changes color during training.
4. Select the correct EVAstream type at EVAstream type.

3 Click once on the gear icon at the top right of the screen to go to the **basic settings**:



On this page you can select the color scheme of the web environment, set your language, set a child lock, create users and link EVAstream training courses to the users:

Setting parental control Select
1. Select Enabled at parental control.
2. Enter first the Mastercode 6738 and after that a own choosen code (4 digits).
From now on you can use both codes (master code and your own code). If you forget your own code, you can always use the master code to create a new own code.

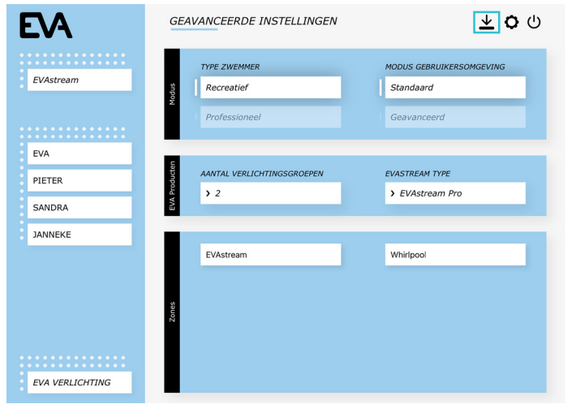
When the child lock is enabled, you will be asked to enter the code at various times, before use of the EVAstream.

Set users
1. Select Add New User and enter the name of the user followed by Enter.
2. Add workouts to the user by selecting them in the right menu Programs.

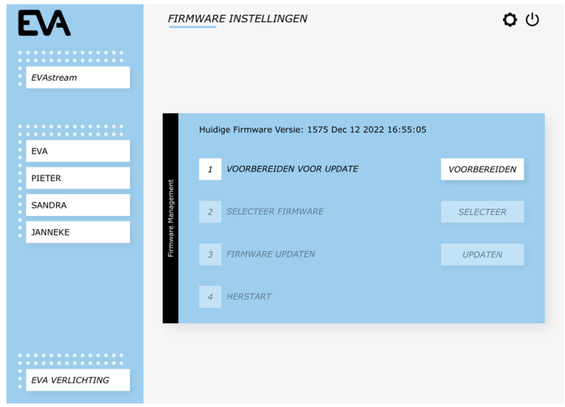
6.7 Update Firmware

It is possible that the EVA Experience web app needs a firmware update, for new or additional functionality, or to fix any errors in a current firmware version. New versions will be available on our website.

1 Click twice on the gear icon at the top right of the screen to go to the **advanced settings**. In this screen click on the download icon at the top right of the screen.



2 Now follow the steps on the next screen:



1: Click the button Prepare > Ok > Ok
2: Click Select and select the firmware file you saved at 1.
3: Click Update. The new firmware is now installed on your tablet.
4: Will Reboot to restart the EVA Experience web app environment.

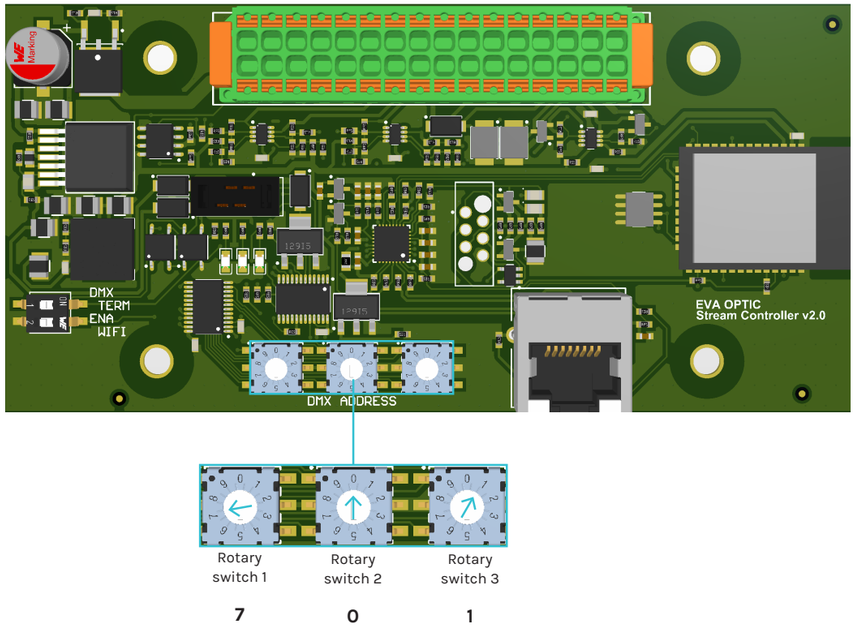
7 Controlling with EVA Piezo (without Experience web app)

Use the following settings when the EVAstream is only controlled by EVA Piezo inside or outside the pool.

Setting the Printed Circuit Board (PCB):

Go to the green Printed Circuit Board. This is located in the Motor Control Unit of the EVAstream.

Set the Rotary switches at **701**



When the rotary switches of the Printed Circuit Board (EVA SP-ECA-PRO) are set to 701, the EVA Piezo has the following functions:

EVA Piezo control options:

Button 1:	On / stand-by (pause)
Button 2:	Slowdown (in 10% increments) In stand-by start on 30%
Button 3:	Speed up (in 10% increments) In stand-by start on 100%
Button 4:	On / Off

8 Disposal

8.1 Decommissioning

⚠ WARNING

Electrical shock hazard. Risk of electric shock and injury. Make sure to disconnect the product from the mains cable before decommissioning.

1. Switch off the power.
2. Switch off the power around the swimming pool.
3. Disconnect the mains cable.
4. Disconnect all other cables.

8.2 Disposal

Before disposing of the different materials, separate them into recyclables, normal waste and special waste. Comply with local legal regulations and provisions when disposing the product and the individual components. A product marked with the WEEE symbol must be sent for separate collection of electrical and electronic devices. Contact your supplier for more information.

Attachments

Overview of the EVAstream Control Print

Function	Type	Port		Type	Function
Fan 24Vdc	-	1	2	+	Fan 24Vdc
ppm output 2	-	3	4	+	ppm output 2
ppm output 1	-	5	6	+	ppm output 1
piezo 4 LED 12Vdc	-	7	8	+	piezo 4 LED 12Vdc
piezo 4 switch	sw	9	10	sw	piezo 4 switch
piezo 3 LED 12 Vdc	-	11	12	+	piezo 3 LED 12 Vdc
piezo 3 switch	sw	13	14	sw	piezo 3 switch
piezo 2 LED 12 Vdc	-	15	16	+	piezo 2 LED 12 Vdc
piezo 2 switch	sw	17	18	sw	piezo 2 switch
piezo 1 LED 12 Vdc	-	19	20	+	piezo 1 LED 12 Vdc
piezo 1 switch	sw	21	22	sw	piezo 1 switch
dmx G (shield)	G	23	24	G	dmx G (shield)
dmx in/out	-	25	26	-	dmx in/out
dmx in/out	+	27	28	+	dmx in/out
24Vdc in	-	29	30	-	24Vdc out
24 Vdc in	+	31	32	+	24 Vdc out

Eva Tech B.V.
De Velde 1
8064 PH Zwartsluis
The Netherlands
www.evaoptic.com