



MLX80339-210

Code-Free Start to Run Kit

Characterizing and tuning fan applications without code



Doc # 322557 - Revision 4 – 27/07/2026

Contents

1. Revision history	3
2. Before You Start	4
2.1. What is needed for the exercise	4
2.2. Getting your components	4
2.3. Exercise Goal	5
3. Characterizing and tuning the Wonsmart fan	6
3.1. Registering your 'Start to Run' account.....	6
3.2. Connecting the hardware	8
3.3. Launching the web tool	11
3.3.1. Create a New Motor item	12
Communication parameters.....	21
Motor parameters.....	22
Diagnostic Parameters	23
3.3.2. Download EEPROM & Write To chip	23
3.4. Optional: determining the number of pole pairs	25
4. Finetuning an existing configuration file (local)	28
4.1. Registering your account at MyMelexis	28
4.2. Installing the Start To Run Configuration GUI	29
4.3. Connecting the MCM hardware board.....	30
4.4. Melexis Configuration GUI: UART mode	31
4.4.1. Run the "Start To run Configuration GUI"	31
4.4.2. Importing the default motor configuration file & spinning the motor	33
4.4.3. Changing parameters in the Start To Run Configuration GUI	35
4.5. Melexis Configuration GUI: PWM mode	36
4.5.1. Importing the default motor configuration file	36
4.5.2. Modifications to the PWM speed curve	39
5. Updating the MCM board firmware	42
5.1. Connect the hardware.....	42
6. Disclaimer.....	48

1. Revision history

Version	Date	Description
001	31/3/2026	Initial version
002	9/4/2026	Updating screenshots
003	22/4/2026	Elaborating on STR registration procedure
004	27/7/2026	Added ordering info in section 2.2, link to YouTube video in section 2.3, self-registration in section 3.1, connectivity info in section 3.2, 4.3, 4.5 and update instructions of MCM81339 board firmware in section 5.

Table 1 Revision history

2. Before You Start

2.1. What is needed for the exercise

The following hardware is needed for this exercise. The actual fan & power supply is depending on your actual needs.



2.2. Getting your components

Here is what to order:

- MCM81339 board: request and order from melexis.com/contact or via a distributor/local representative
- Motor: connect your own 12V/24V BLDC motor, or order a Wonsmart fan directly:
 - Via Amazon: <https://www.amazon.com/Brushless-Centrifugal-Potentiometer-Compatible-Machines/dp/B0D14Q9R62>
 - Via Wonsmart: <https://www.wonsmartmotor.com/24v-high-pressure-small-air-blower-product/>

The remainder of the instructions uses this Wonsmart motor.

- AC/DC Power supply
Depending on your motor voltage you can go for a standard 12V or 24V power supply. Here are some examples how to order them:
 - 24V
 - Distributor: Mouser
 - Part number: 675-TE40A2403B01
 - Description: Wall Mount AC/DC Adapter, Class II, 24Vdc/40W, Level VI
 - 12V
 - Distributor: Digi-Key
 - Part number: 179-SMI24-12-V-P6-ND
 - Description: 12V 24W AC/DC External Wall Mount Class II Adapter, multi-blade input included, so no separate blade kit is needed.
- USB-C cable: a standard data USB-C cable (not charge only)

If you are located outside the US, you also need the interchangeable blade plug kit (EU, UK, AU): Mouser part number 831-KT1027K

We are working to get full kits containing all the components available commercially in the future.

2.3. Exercise Goal

The intention of this exercise is to demonstrate the capabilities of the Melexis Start to Run environment in conjunction with the code-free MLX80339-210 chip driving a reference low power fan.

The MLX80339-210 can drive both 12 V and 24 V motors. You are invited to connect your own 12V/24V BLDC motor, but for the sake of this introduction you will find a Wonsmart fan together with a matching power supply. The rest of the Quick Start Guide is based on the Wonsmart fan, but you can execute the same steps with your motor as well.

The MLX80339-210 chip does not contain firmware; its core functionality is implemented entirely in motor-control logic. As a result, it is fully **parameter-configurable** only.

The MCM81339 board, however, does contain firmware. Before starting either use case, make sure that the MCM board firmware is up to date. If an upgrade is required, follow the procedure described in section 5.

This Quick Start Guide will guide you through 2 different use cases:

1. Characterizing & tuning the Wonsmart fan (Cloud connection required)

This entails automatic measuring the motor's main parameters and generating the correct parameter set that the motor logic needs to make the motor run reliably. You can verify the default motor

performance and change user parameters in an iterative way. This is done by using a web tool that runs in the Melexis cloud.

2. Finetuning an existing configuration file (local)

If you already have a code-free generated parameter file (in hex format) for your motor, you can skip the characterization step above and immediately start finetuning the behaviour of the MLX80339 in conjunction with your or the Wonsmart fan/motor. This is done by running a local Windows application.

Both use cases will result in a tuned Code-Free parameter file (hex format) that can be used to program the parameters of the MLX80339-210 chip in a production environment.

For information how to connect the MLX80339-210 to your ECU unit in your application, please refer to the MLX80339-210 datasheet.

For information how to control the MLX80339-210 from your ECU unit, please refer to <https://github.com/melexis/mlx-codefree-communication>.

If you want to first see what this kit & code-free can achieve, have a look at:

<https://www.melexis.com/en/product/MLX80339/code-free-PWM-Serial-motor-driver-2A#VideosSection>

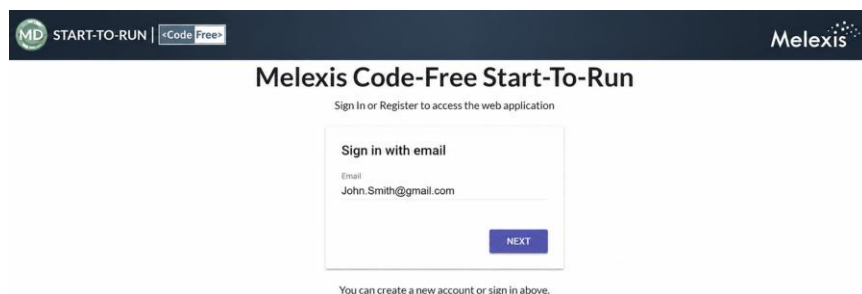
3. Characterizing and tuning the Wonsmart fan

3.1. Registering your 'Start to Run' account

You need to register in either of the following situations:

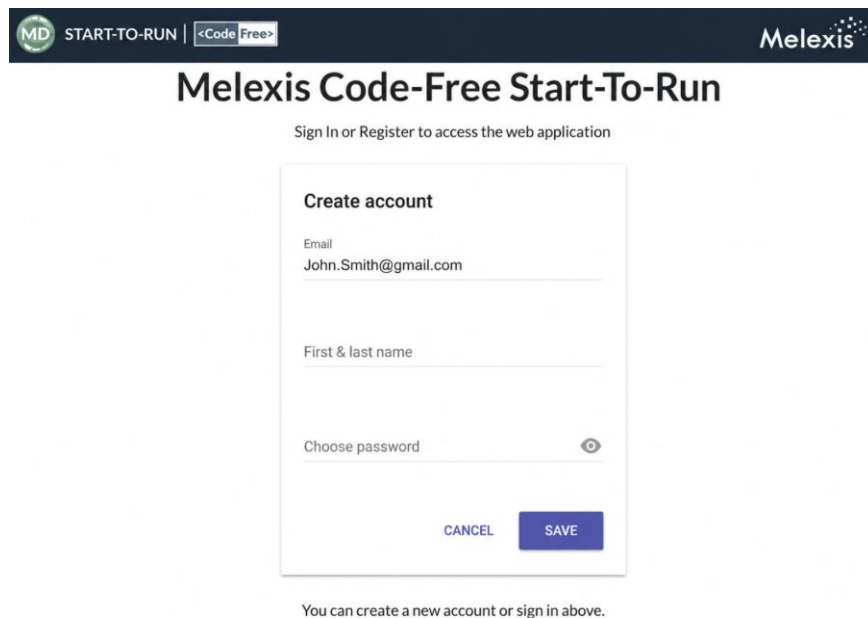
- You already have a Melexis Start-to-Run account, but it is not enabled for Code-Free. **In this case, you must register using a different email address.**
- This is your first time using Melexis Start-to-Run Code-Free.

Browse to <https://starttorun.melexis.com/>



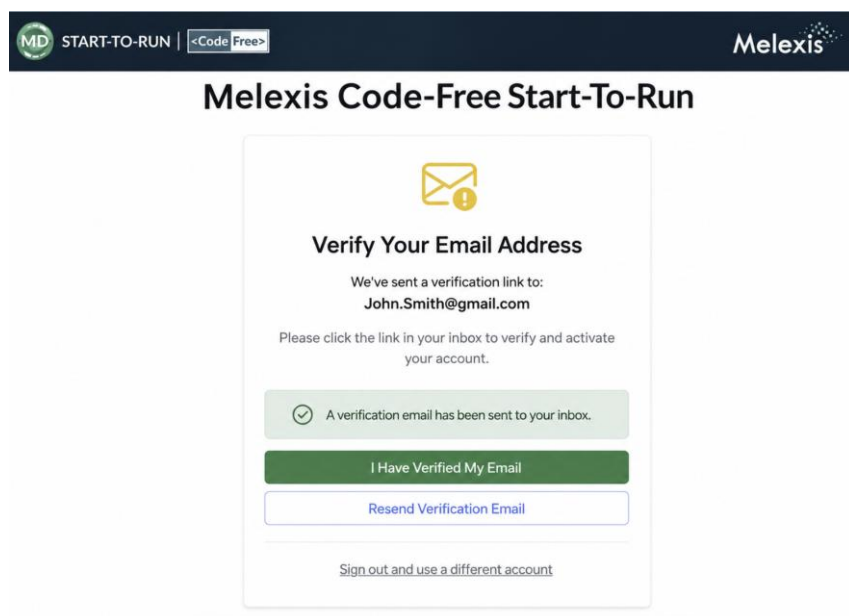
The screenshot shows the Melexis Code-Free Start-To-Run web application interface. At the top, there is a dark header bar with the 'MD START-TO-RUN' logo on the left, a 'Code-Free' badge in the center, and the 'Melexis' logo on the right. Below the header, the title 'Melexis Code-Free Start-To-Run' is centered. Underneath the title, a small instruction reads 'Sign In or Register to access the web application'. The main content area features a white box with the heading 'Sign in with email'. Inside this box, there is an 'Email' label followed by a text input field containing 'John.Smith@gmail.com'. A blue 'NEXT' button is positioned at the bottom right of the input field. Below the white box, a small note states 'You can create a new account or sign in above.'

Enter your email address and click NEXT.



The screenshot shows the 'Melexis Code-Free Start-To-Run' web application interface. At the top, there is a dark blue header with the 'MD START-TO-RUN | <Code Free>' logo on the left and the 'Melexis' logo on the right. Below the header, the title 'Melexis Code-Free Start-To-Run' is centered. Underneath the title, it says 'Sign In or Register to access the web application'. The main content area features a 'Create account' form. The form has three input fields: 'Email' (pre-filled with 'John.Smith@gmail.com'), 'First & last name', and 'Choose password' (with a toggle icon). At the bottom of the form are two buttons: 'CANCEL' and 'SAVE'. Below the form, a message states: 'You can create a new account or sign in above.'

Complete **all** required fields and click SAVE.



The screenshot shows the 'Melexis Code-Free Start-To-Run' web application interface for email verification. At the top, there is a dark blue header with the 'MD START-TO-RUN | <Code Free>' logo on the left and the 'Melexis' logo on the right. Below the header, the title 'Melexis Code-Free Start-To-Run' is centered. The main content area features a 'Verify Your Email Address' section. It starts with an envelope icon and the title 'Verify Your Email Address'. Below the title, it says 'We've sent a verification link to: John.Smith@gmail.com'. Then, it says 'Please click the link in your inbox to verify and activate your account.' Below this, there is a green checkmark icon and the text 'A verification email has been sent to your inbox.' Below that are two buttons: 'I Have Verified My Email' (green) and 'Resend Verification Email' (blue). At the bottom, there is a link that says 'Sign out and use a different account'.

You will receive an email from starttorun@melexis.com asking you to verify your email address.

Click the verification link in the email to complete your registration. You will then be redirected to the Start-to-Run Code-Free home page.

Important Note: A setup without end stops must be used.
Driving Direction: The default driving direction used is UVW.

My Motors

Search motors...

☒ Show successful measurements only

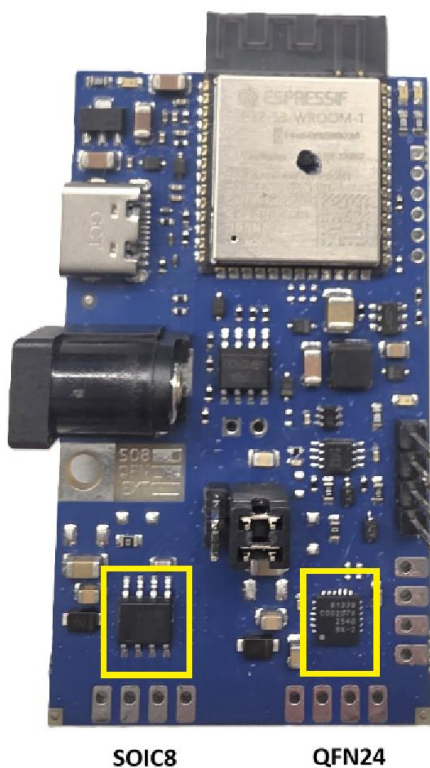
Create New Motor

Please create a motor first.

Store your password securely, as you will need it for future logins.

3.2. Connecting the hardware

To setup your hardware configuration, you will need to connect your MCM board to the peripherals.



SOIC8

QFN24

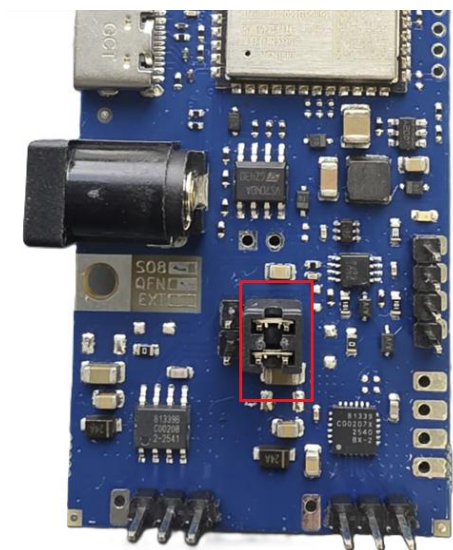
The MCM board contains 2 MLX BLDC driver chips:

- MLX81339 QFN24
 - Using the Melexis Start To Run cloud environment, this chip is used to characterize your motor by doing a series of measurements. The MLX81339 QFN chip is designed only for this purpose and is not available for sales

- MLX81339 SOIC8
 - This is the Code-Free MLX81339 development chip that you will use to drive your motor. You can use this chip once you have generated a configuration file that matches your motor. In your final application you will use the ROM equivalent version MLX80339-210 that is available from distributors in sample or mass production quantities.
The behaviour of your motor with the MLX81399 chip on the MCM board will be identical to the MLX80339-210 ROM chip.

STEP 1: Setup the MCM board

Move the jumper to the RIGHT position as the characterizing and tuning needs to be done on the MLX81339 QFN24 chip.



STEP 2: Connecting the MCM board



Connect the UVW cables of your motor to the UVW connections on the MCM81339 board. The picture above shows a Wonsmart connection as an example. The Wonsmart's UVW wires are colored yellow, blue and white. You can connect them by soldering, mounting pin headers on the MCM81339 board and a female connector on the Wonsmart side, or using screw connectors.

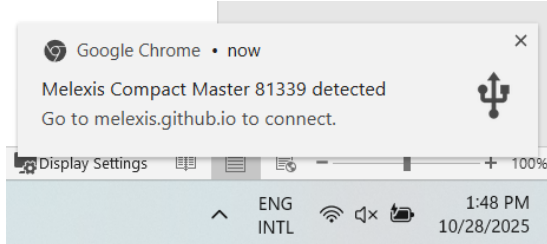
Connect the other cables.



STEP 3: Connect the USB cable to the PC

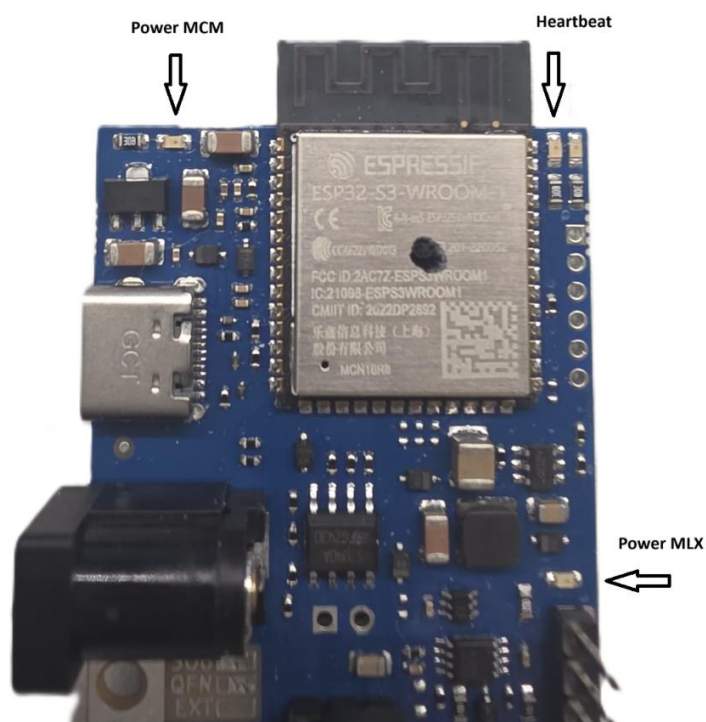
STEP 4: Insert the Power Supply in the mains

If all is well you should see a notification popping up.



If there is a notification, you are now set for the next step. If there is no notification the cables are not connected correctly.

Take notice of the LED's on the MCM board



3.3. Launching the web tool

Double check that the power supply and USB cable is connected. You should see a solid Power MCM led and flashing heartbeat LED on the MCM board.

Browse to <https://starttorun.melexis.com/> and login with the credentials of step 3.1

3.3.1. Create a New Motor item

MD START-TO-RUN | <Code Free>

Melexis Account

Important Note: A setup without end stops must be used.
Driving Direction: The default driving direction used is UVW.

My Motors

☒ Show successful measurements only

Create New Motor

Please create a motor first.

Press the 'Create New Motor' button.

Fill in a Motor name & the maximal current (see rating label on Wonsmart motor) and leave the other fields as they are and press the 'Create' button. (See section 3.4 to derive the number of pole pairs for your custom motor)

MD START-TO-RUN | <Code Free>

Melexis Account

Home / New Motor

Motor name

First STR characterization

Maximal Current [A]

2

Shunt resistance (value used for applicable products only) [Ohm]

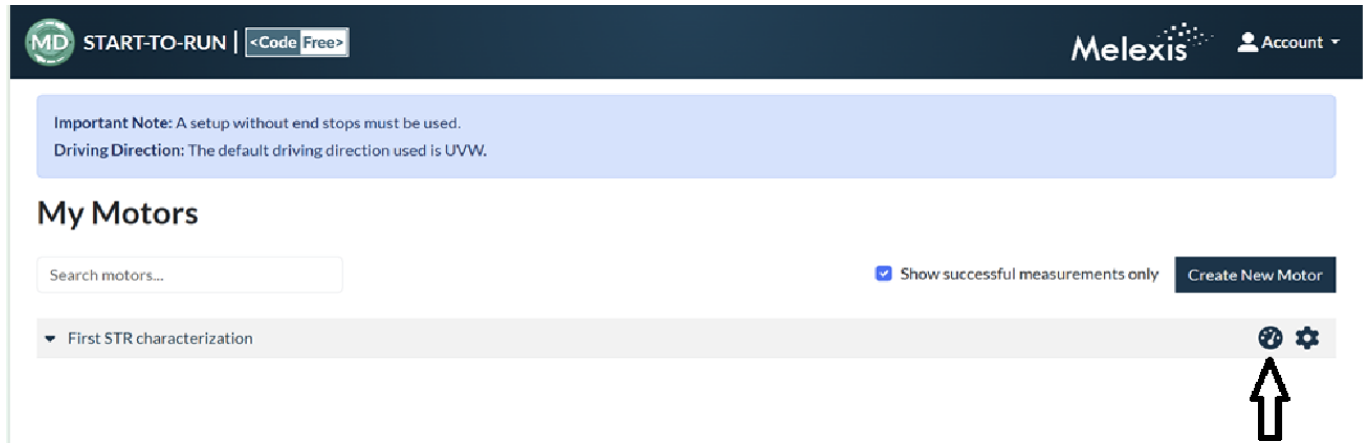
0.002

Number of Pole Pair ([I do not know](#))

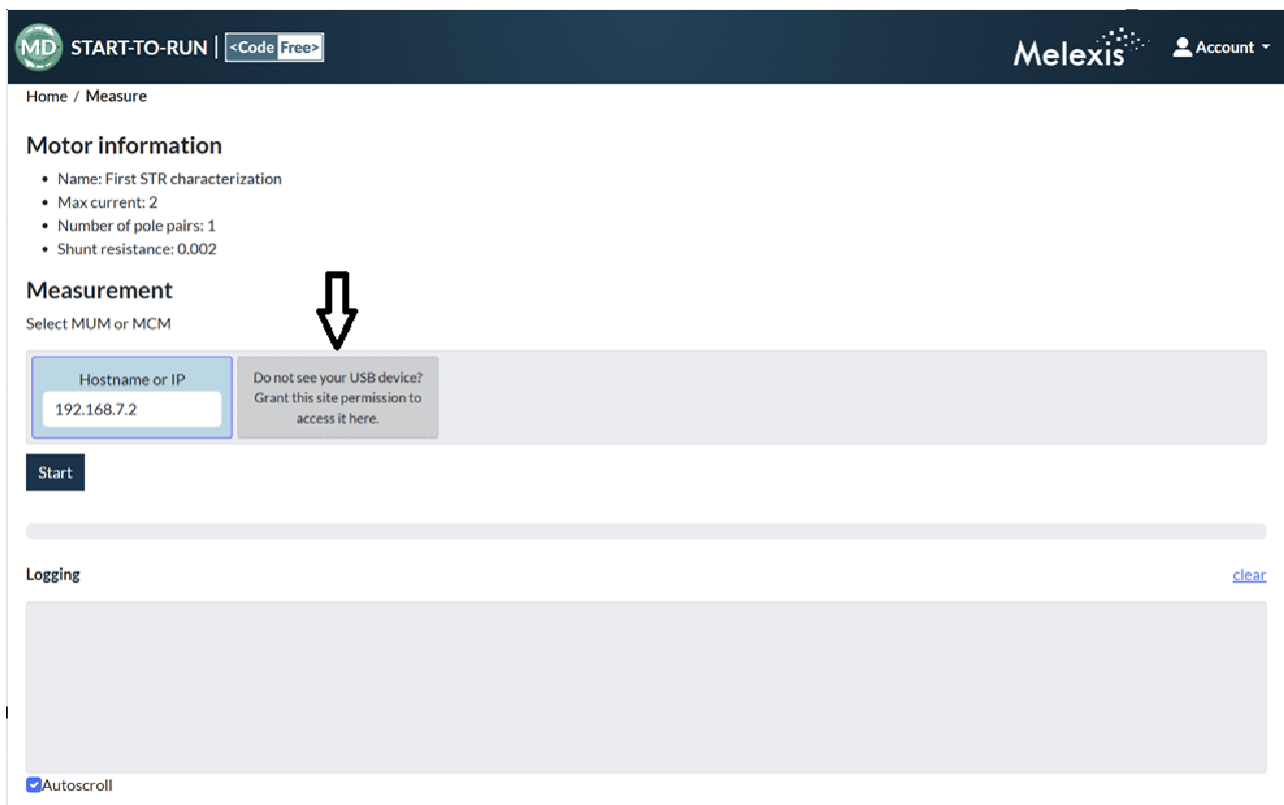
1

Create

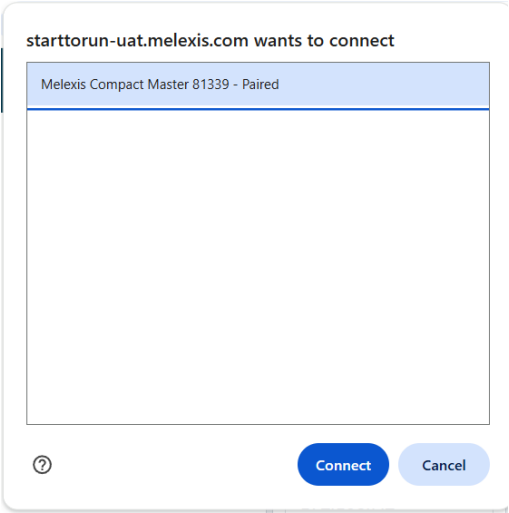
The application goes back to the overview screen, where you can press the measure button of your motor configuration



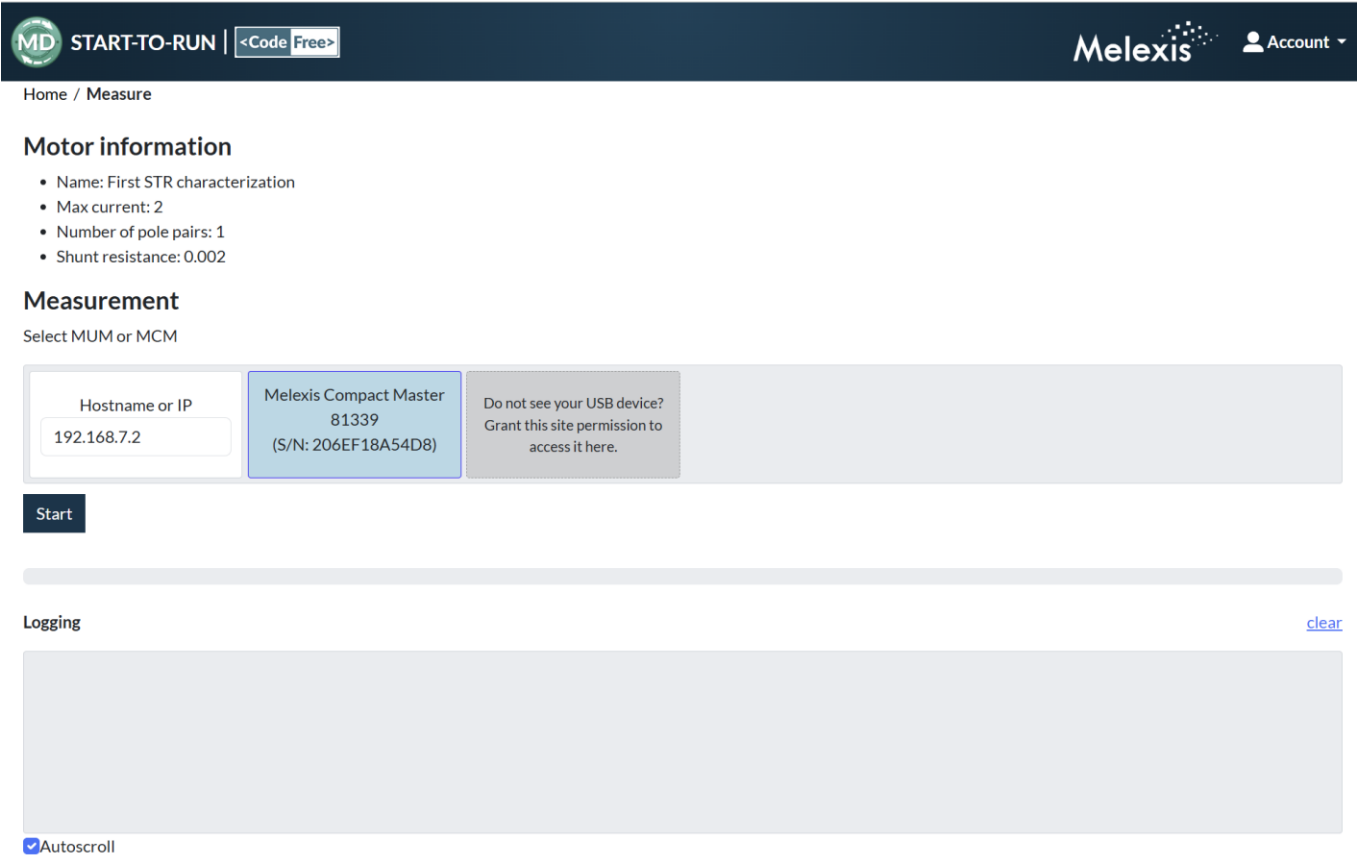
The motor information screen is displayed, we still need to connect your MCM board to the web application



Select the grey box. In the next dialog box select the Melexis Compact Master line (should become blue) and press the Connect button



Your MCM board is now connected to the web tool.



Press the Start button to get the measurements started. After a couple of second the “Power MLX” led should turn on.

The logging windows reflects the ongoing activity, while the percentage bar indicates the progress.

Home / Measure

Motor information

- Name: First STR characterization
- Max current: 2
- Number of pole pairs: 1
- Shunt resistance: 0.002

Measurement

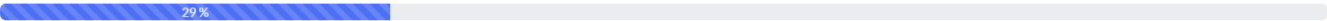
Select MUM or MCM

Hostname or IP
192.168.7.2

Melexis Compact Master
81339
(S/N: 206EF18A54D8)

Do not see your USB device?
Grant this site permission to
access it here.

Stop



Logging clear

Connection to Melexis Compact Master 81339 established
Server v0.34.0
Detecting Melexis IC type...
Uploading firmware...
Check phase connections...
Measuring coil resistance...
Measuring coil resistance...

☒ Autoscroll

After a while the motor should start running at a high speed. Let this run for a while (this takes a couple of minutes); the right parameters are being measured and then collected.

71%

Logging clear

Measuring inertia...
Measuring inertia...
Detecting maximum speed...
Measuring DEMF...
Detecting maximum speed...
Measuring load...
Detecting maximum speed...

☒ Autoscroll

At the end of the measurement, the measurement data is presented.



Home / Measurement

Chip info

- Characterized with: MLX81339 KLV-BMx-202-RE

Motor info

- Name: First STR characterization
- Motor type: 3 phase BLDC
- Max current: 2 A
- Number of pole pairs: 1
- Shunt resistance: 35.0 mOhm

Measurement results

- VSM reference: 24.0 V
- Phase resistance (1 coil, assuming star configuration): 822 mOhm
- Phase inductance (1 coil, assuming star configuration): 262 uH
- Mechanical BEMF constant: 0.291 V_{ph,pk}/(1k m-rpm)
- Inertia: 1.183e-6 kg*m²
- Static friction coefficient: 0.000e+0 N*m
- Linear friction coefficient: 8.074e-8 N*m/m-rpm
- Quadratic friction coefficient: 5.609e-12 N*m/(m-rpm²)
- Max speed: 31492 m-rpm

Download Measurement CSV

Automatic controller tunings

Please request an autotuning first.

Request AutoTuning

We are now only one step away from generating the correct EEPROM parameter set! Press the 'Request Autotuning' button.



Home / Measurement / Request Auto Tuning

Auto Controller Tuning Parameters

Maximum Current [A]

2

Request

Press the 'Request' button again. This will take us back to the main screen. After the auto tuning operation stops you should see the "finished" state.

The screenshot shows the Melexis web interface. At the top, there's a navigation bar with 'MD START-TO-RUN | <Code Free>' and 'Melexis Account'. Below this, the breadcrumb 'Home / Measurement' is visible. The main content area is divided into sections: 'Chip info' (Characterized with: MLX81339 KLV-BMx-202-RE), 'Motor info' (Name: First STR characterization, Motor type: 3 phase BLDC, Max current: 2 A, Number of pole pairs: 1, Shunt resistance: 35.0 mOhm), and 'Measurement results' (VSM reference: 24.0 V, Phase resistance: 822 mOhm, Phase inductance: 262 uH, Mechanical BEMF constant: 0.291 V.ph.k/(1k m-rpm), Inertia: 1.183e-6 kg*m^2, Static friction coefficient: 0.000e+0 N*m, Linear friction coefficient: 8.074e-8 N*m/m-rpm, Quadratic friction coefficient: 5.609e-12 N*m/(m-rpm^2), Max speed: 31492 m-rpm). A 'Download Measurement CSV' button is present. Below this, the 'Automatic controller tunings' section shows a progress bar with '50 usec', '2 A', and 'finished' (circled in red). A magnifying glass icon is also visible. A 'Request AutoTuning' button is at the bottom.

Select the magnifying glass.

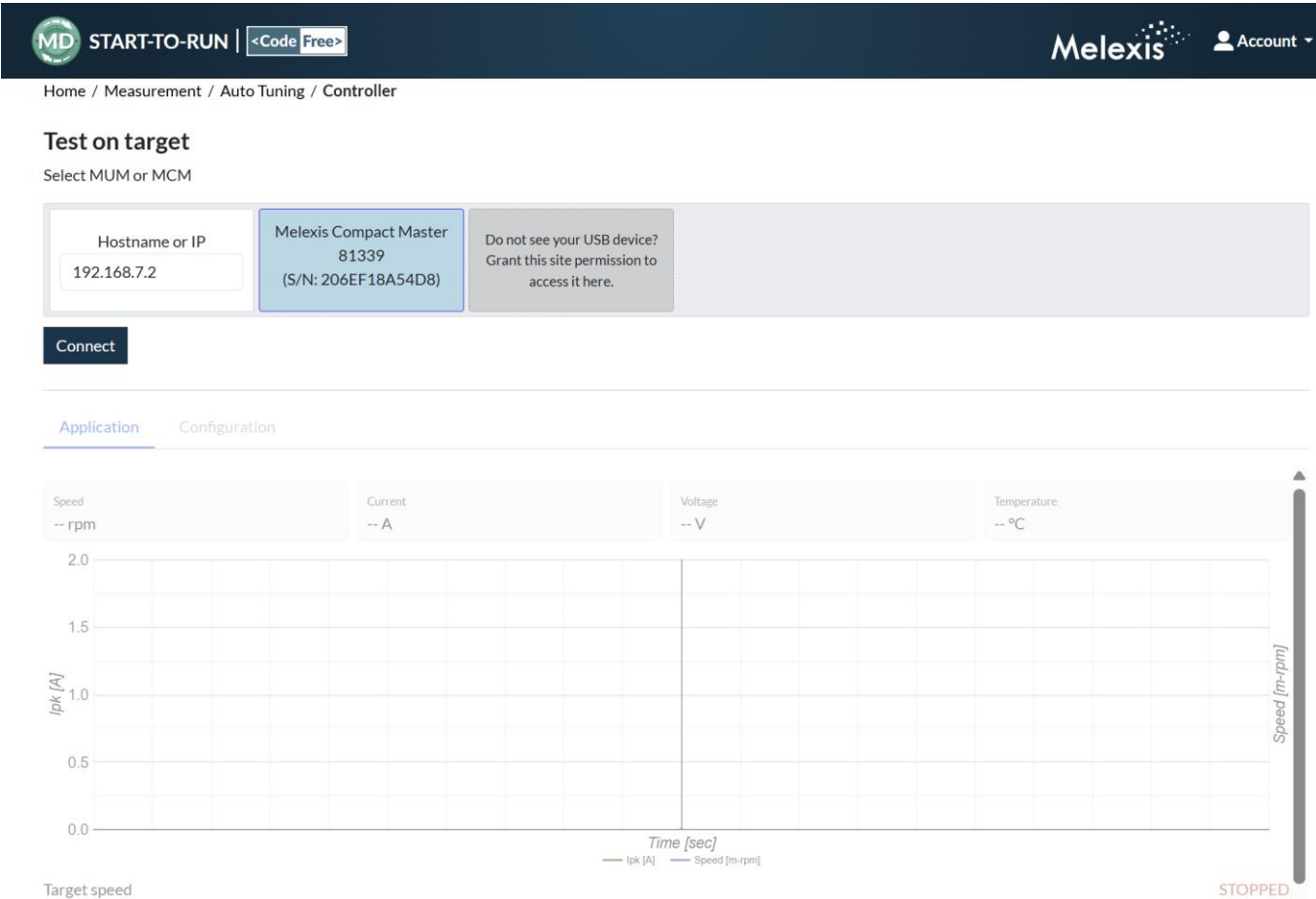
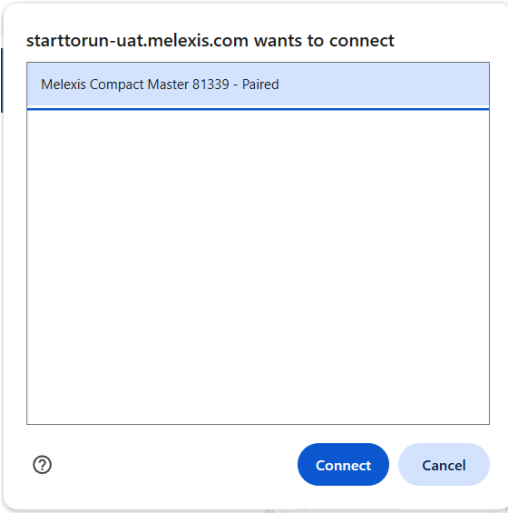
The screenshot shows the Melexis web interface. At the top, there's a navigation bar with 'MD START-TO-RUN | <Code Free>' and 'Melexis Account'. Below this, the breadcrumb 'Home / Measurement / Auto Tuning' is visible. The main content area is divided into sections: 'Chip info' (Characterized with: MLX81339 KLV-BMx-202-RE), 'Motor info' (Name: First STR characterization, Motor type: 3 phase BLDC, Max current: 2 A, Number of pole pairs: 1, Shunt resistance: 35.0 mOhm), and 'Auto controller tuning info' (FOC period: 50 usec, Maximum current: 2 A). A 'Test Code-Free' button is present at the bottom.

Select the 'Test Code-Free' button.

Verify whether your Melexis Compact Master 81339 box is still colored blue.

If it is colored blue, then proceed to the next page.

If it is not blue, the MCM board is not connected to your PC anymore. In that case: make sure the USB cable is connected and select the adjacent grey box. In the following dialog box select the Melexis Compact Master line and press the Connect button. Now the Melexis Compact Master line should turn blue again.



Press the 'Connect' button. The motor will now be configured with the "start to run" configuration parameters. Wait until the graph at the bottom of the screen is moving.

Test on target

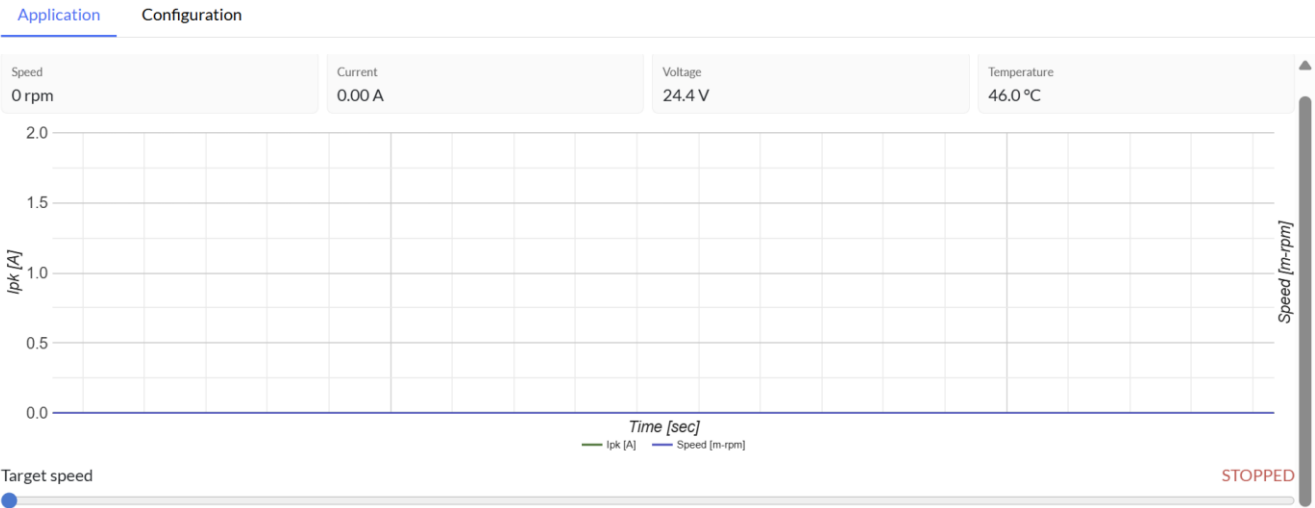
Select MUM or MCM

Hostname or IP
192.168.7.2

Melexis Compact Master
81339
(S/N: 206EF18A54D8)

Do not see your USB device?
Grant this site permission to
access it here.

Disconnect Connected



Move the slider to the right, the motor should start running.

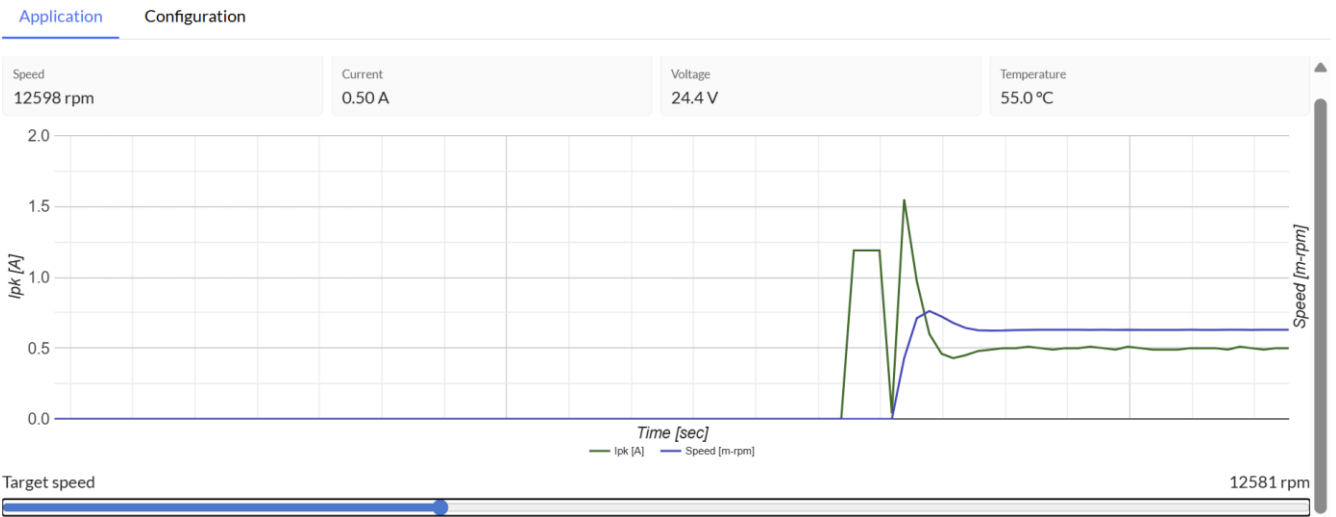
Home / Measurement / Auto Tuning / Controller

Test on target

Select MUM or MCM

Hostname or IP 192.168.7.2	Melexis Compact Master 81339 (S/N: 206EF18A54D8)	Do not see your USB device? Grant this site permission to access it here.
-------------------------------	--	---

Disconnect Connected



In the following text we will explain how to finetune the user parameters.

Move the slider back to the starting position at the left – the motor will stop spinning.

Select the configuration tab.

Following parameters can be changed

Communication parameters

MD

START-TO-RUN | <Code Free>

Melexis

Account

Home / Measurement / Auto Tuning / Controller

Test on target
Select MUM or MCM

Hostname or IP
192.168.7.2

Melexis Compact Master
81339
(S/N: 206EF18A54D8)

Do not see your USB device?
Grant this site permission to
access it here.

Disconnect

Connected

Application

Configuration

Communication

☐ PWM

☐ I2C

☐ UART 1 Wire

☒ UART 2 Wire

Address :

126

Baudrate :

2 Mbps

Bus Timeout :

0.5 sec

- PWM
- I2C
- UART 1 wire
- UART 2 wire

This will set the default communication method to communicate with the 80339-210 chip.

Motor parameters

Motor

Direction :
☒ UVW ☐ UYW

Motor Voltage (V) :

24

Max Speed (rpm) :

31492

Min Speed (%) :

10

Boost : ☐

Startup :
☐ Open Loop ☒ V90

Start Current (mA) :

2000

Max Run Current (mA) :

2000

Acceleration Limit (%/s) : Off

Deceleration Limit (%/s) : Off

- Direction
 - This field define the default direction of the motor
- Motor Voltage
 - Valid values are 12V or 24V depending on the connected motor. It is advised not to change this value
- Startup
 - Fast startup/V90: default. This is achieved by applying a startup pulse of 90 degrees from the motor start angle. At this time, keep the default.
 - Slow startup/openloop: the motor will be rotated with a linear acceleration towards the minimum motor speed
- Max Speed (rpm)
 - By default the max speed as configured by the Melexis Start to Run is displayed here. For sure you can lower this to fit you application needs
- Min Speed (%)
 - This is the minimum running speed of the motor expressed in % of the maximum speed. Depending on the motor, this value could be tuned upwards or downwards.
- Start Current (mA)
 - This is the current that will be used by the motor to start up.
- Max Run Current (mA)

- This is the maximum current that will be consumed by the motor. You can lower this number to fit your application
- Acceleration Limit (%/s)
 - With this setting you can control the acceleration speed of the motor expressed in %rpm per second
- Deceleration Limit (%/s)
 - With this setting you can control the deceleration speed of the motor expressed in %rpm per second
- Boost
 - This will further accelerate the motor in case the maximum motor voltage is reached, but there is still headroom for the current (not at max current yet)
 - When max motor voltage is reached & max current is not reached yet

Diagnostic Parameters

Diagnostic

Over Voltage : 38 V

Under Voltage : 12 V

Over Temperature : 125 °C

- Over Voltage: the MLX80339-210 will go in protection mode when you exceed this voltage
- Under Voltage: the MLX80339-210 will go in protection mode when you are lower than this voltage
- Over Temperature: MLX80339-210 will go in protection mode when you exceed this chip junction temperature

3.3.2. Download EEPROM & Write To chip

✓ All changes saved

Download EEPROM

Write To Chip

After changing some of these parameters, press the “Write To Chip” button, and move back to the “Application” tab to verify the behaviour of the chip.

When you are done with the verification of the pre-configured parameters of the MLX Start To run environment complemented by the user- configured parameters, you can export the EEPROM hex file that you will need to program in the production environment.

Press “Download EEPROM” and save this file. You can now use this file in the local MLX Start To Run GUI tool and verify it using the final MLX80339-210 chip. This is explained in section 4.

3.4. Optional: determining the number of pole pairs

When you create a new Motor configuration and you do not know how many pole pairs your motor has, you can select the “I do not know” link. Make sure that your motor is connected to the pinheader below the QFN component.



MD START-TO-RUN | <Code Free> Melexis Account

Home / New Motor

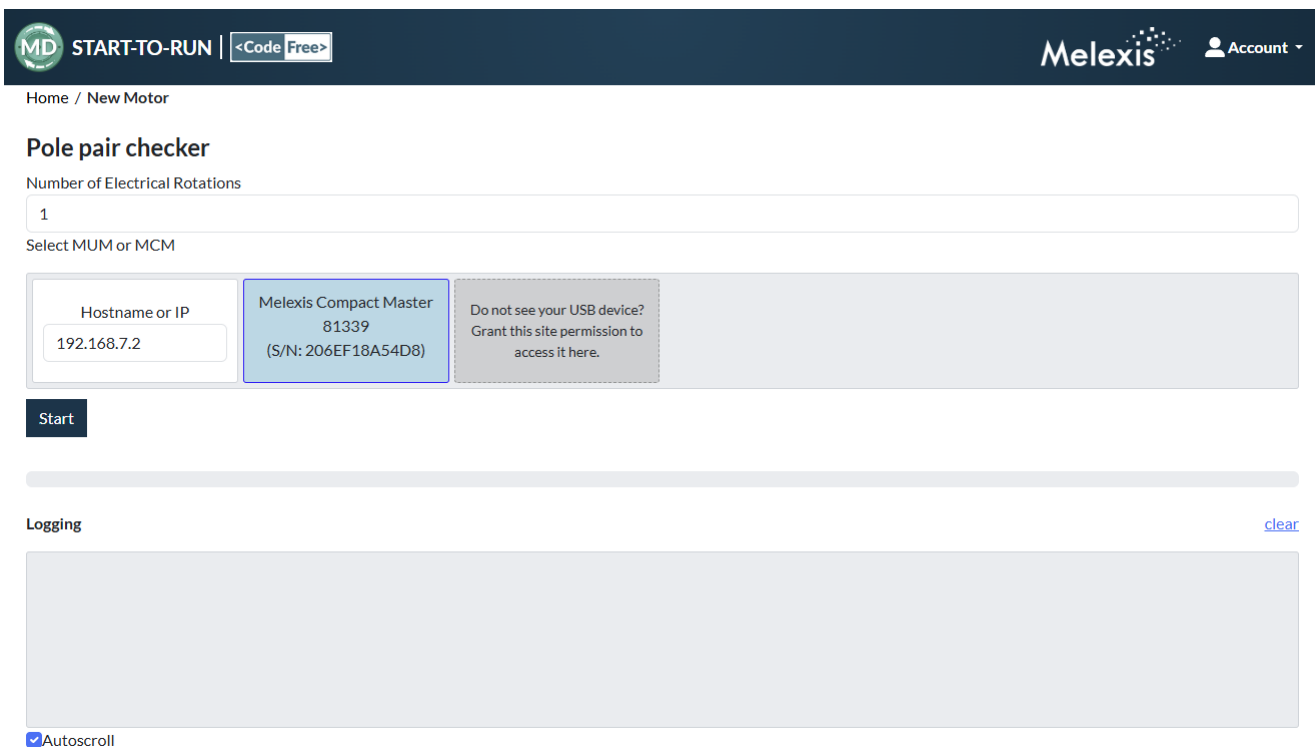
Motor name
Wonsmart-24V-2A test

Maximal Current [A]
2

Shunt resistance (value used for applicable products only) [Ohm]
0.002

Number of Pole Pairs **(I do not know)**
1

Create



MD START-TO-RUN | <Code Free> Melexis Account

Home / New Motor

Pole pair checker

Number of Electrical Rotations
1

Select MUM or MCM

Hostname or IP 192.168.7.2	Melexis Compact Master 81339 (S/N: 206EF18A54D8)	Do not see your USB device? Grant this site permission to access it here.
-------------------------------	--	---

Start

Logging [clear](#)

☒ Autoscroll

Press the “Start” button. The MLX Start to Run software will start checking the motor.

MD

START-TO-RUN | <Code Free>

Melexis

Account

Home / New Motor

Pole pair checker

Number of Electrical Rotations

1

Select MUM or MCM

Hostname or IP

192.168.7.2

Melexis Compact Master

81339

(S/N: 206EF18A54D8)

Do not see your USB device?

Grant this site permission to

access it here.

Start Rotating

60 %

Logging

clear

Connection to Melexis Compact Master 81339 established

Server v0.34.0

Detecting Melexis IC type...

Uploading firmware...

Measuring Vsm...

Measuring coil resistance...

Alignment Completed...

☒Autoscroll

This procedure may take some time. Once the Start Rotating button becomes available, click it, observe the motor, and count the number of full mechanical rotations.

MD

START-TO-RUN | <Code Free>

Melexis

Account

Home / New Motor

Pole pair checker

Number of Electrical Rotations

1

Select MUM or MCM

Hostname or IP

192.168.7.2

Melexis Compact Master

81339

(S/N: 206EF18A54D8)

Do not see your USB device?

Grant this site permission to

access it here.

Start

100 %

Logging

clear

Server v0.34.0

Detecting Melexis IC type...

Uploading firmware...

Measuring Vsm...

Measuring coil resistance...

Alignment Completed...

Running motor slowly in open loop...

☒Autoscroll

Done

Did the motor perform exactly 1 mechanical rotation?

Yes

No

A motor with 1 pole pair will complete exactly one full mechanical rotation. In this case, select Yes. You will be taken to the initial measurement screen.

A motor with more than 1 pole pair will have rotated less than one full revolution. For example, a motor with 2 pole pairs will have rotated half a revolution only. In this case, select No and enter the expected number of pole pairs again. Repeat this Pole Pair Checker sequence until the motor completes one full mechanical rotation. Then select Yes to return to the initial measurement screen where the correct number of pole pairs is pre-filled.

 START-TO-RUN | <Code Free>

 Account ▾

Home / New Motor

Motor name

Wonsmart-24V-2A test

Maximal Current [A]

2

Shunt resistance (value used for applicable products only) [Ohm]

0.002

Number of Pole Pair ([I do not know](#))

1

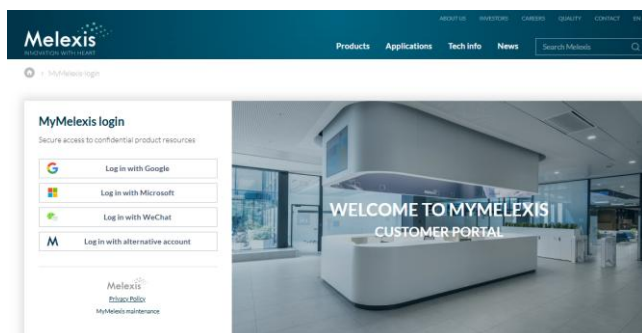
Create

4. Finetuning an existing configuration file (local)

4.1. Registering your account at MyMelexis

To access specific Code-Free Start-to-Run documents, such as the Start-to-Run Configuration GUI installer, you will need to create an account on MyMelexis.

1. Browse to melexis.com/mymelexis



2. Access MyMelexis using “Login with Google”, “Microsoft”, “WeChat”. You can use the alternative account option in case you want to register based on a different type of email.
3. Follow the instructions to complete the login procedure. You will then be taken to the registration page.

Complete your registration

One last step! Please complete the form so we can verify your details and grant you access to the content you need.

Note that currently MyMelexis is only available to access the inductive simulator.

Name

Company email

Job title*

Company name*

Company address: street & nr*

Company address: city*

Company address: postal code*

Company address: country*

Region*

Are you already a customer?*

Area of Interest*

Please specify your area of interest*

MLX80339-210 code-free

Success!

Submit

4. Fill out all required fields. Select “Other” as Area of interest and specify “MLX80339-210 code-free” as extra info below.
5. Submit the registration. Once your request is validated and approved, you can proceed to download the installer.

4.2. Installing the Start To Run Configuration GUI

Melexis provides all-in-one software (GUI), containing drivers and user interface.

The installation package is available on MyMelexis (melexis.com/mlx80339-210).

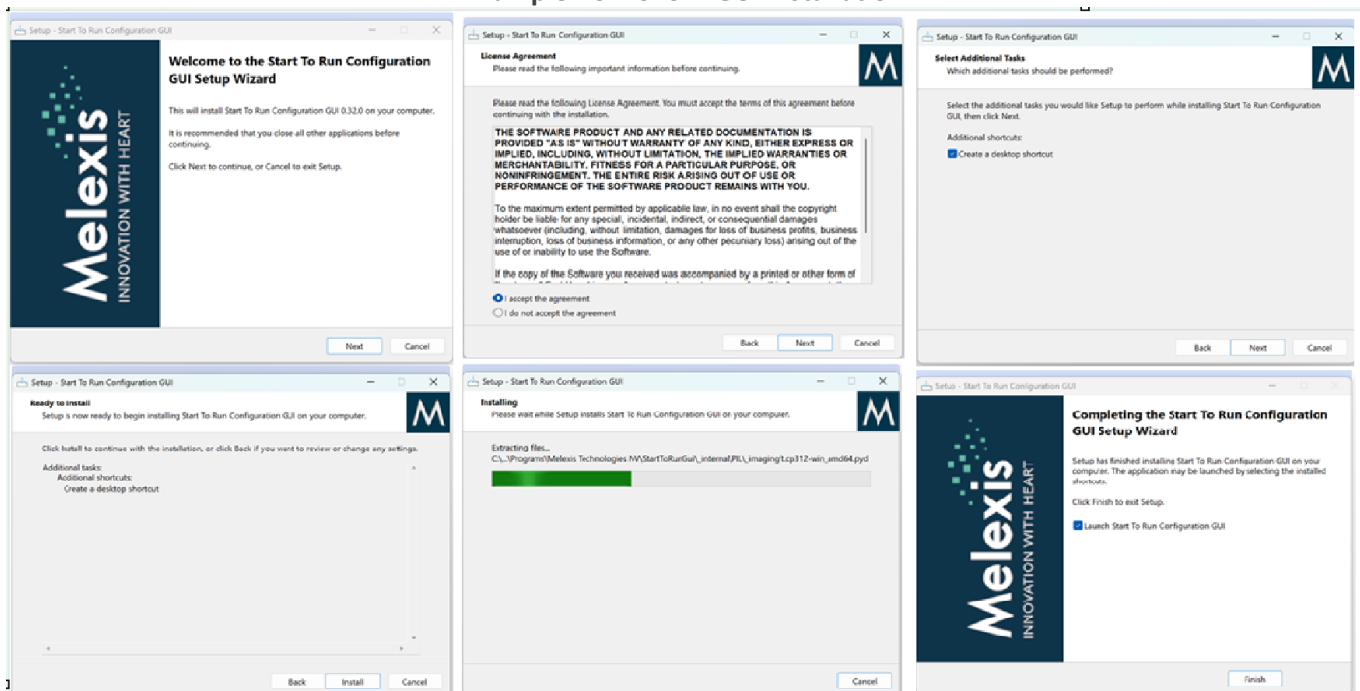
If you are requested to login, use your Melexis credentials. You should then find the following content.

MLX80339-210

☐	Name ↓ ↑ ▼	Type ↓ ↑ ▼	Size ↓ ↑	Status ↓ ↑	Rev. ↓ ↑	Release ↓ ↑	Actions
☐	MLX80339-210_PP-Kit_Manual	Manual	17.84MB	Beta	001	14 November 2025	
☐	Start-to-Run_Configuration-GUI_Installation-file	Installation file	46.14MB	Beta	018	20 November 2025	

Download the installation file and install it on your PC.

Example flow of SW GUI installation

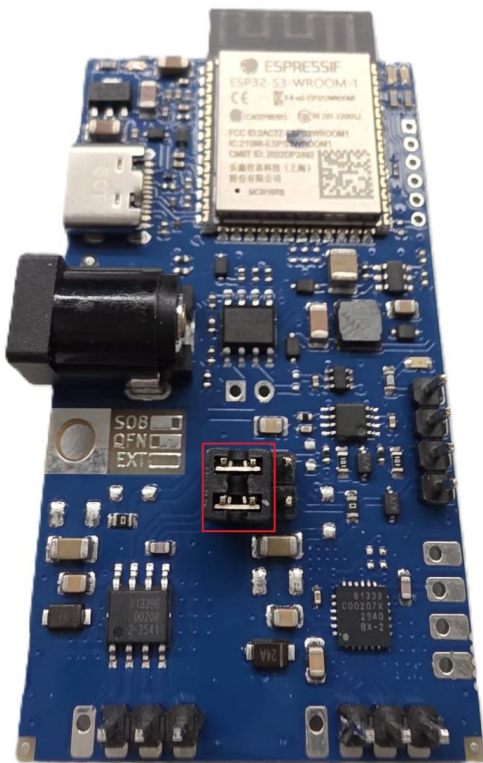


4.3. Connecting the MCM hardware board

After installation of the Configuration GUI it is time to setup the hardware.

STEP 1: Setup the MCM board

Move the jumper to the left position. This will activate the MLX81399-210 chip on the MCM board. This chip is the development version of the MLX80339-210 ROM version that you will use in your products.



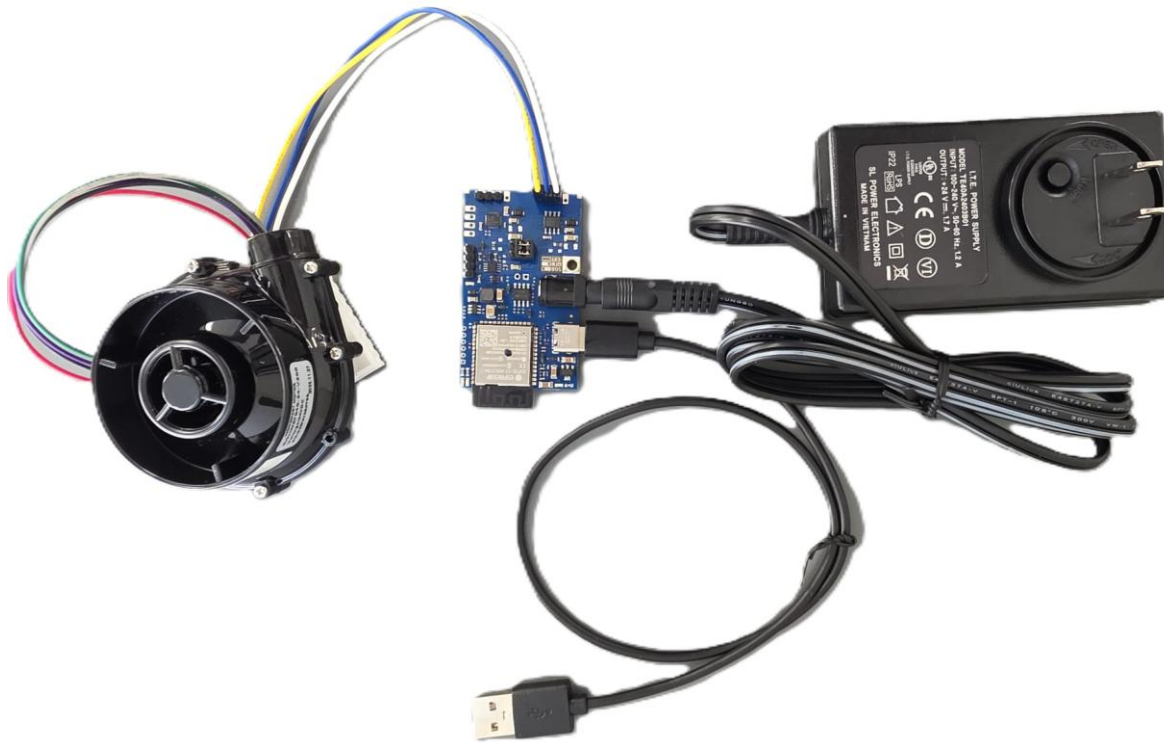
STEP 2: Connect the MCM board to the peripheral cables

Prepare the cable layout as indicated in the picture on the next page.

Connect the UVW cables of your motor to the UVW connections on the MCM81339 board. The Wonsmart's UVW wires are colored yellow, blue and white. Use the U,V and W connections under the SO8 chip.

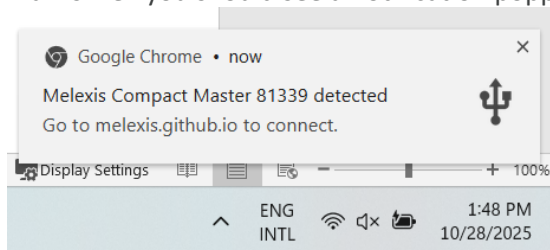
You can connect them by soldering, mounting pin headers on the MCM81339 board and a female connector on the Wonsmart side, or using screw connectors.

Finally insert the power and USB cable in the MCM board. Note that the motor must be connected as indicated in the picture!



STEP 3: Connect the USB cable to the PC

If all is well you should see a notification popping up.



If there is a notification, you can close this window and you are set for the next steps.

If there is no notification the cables are not connected correctly. Please check the cabling.

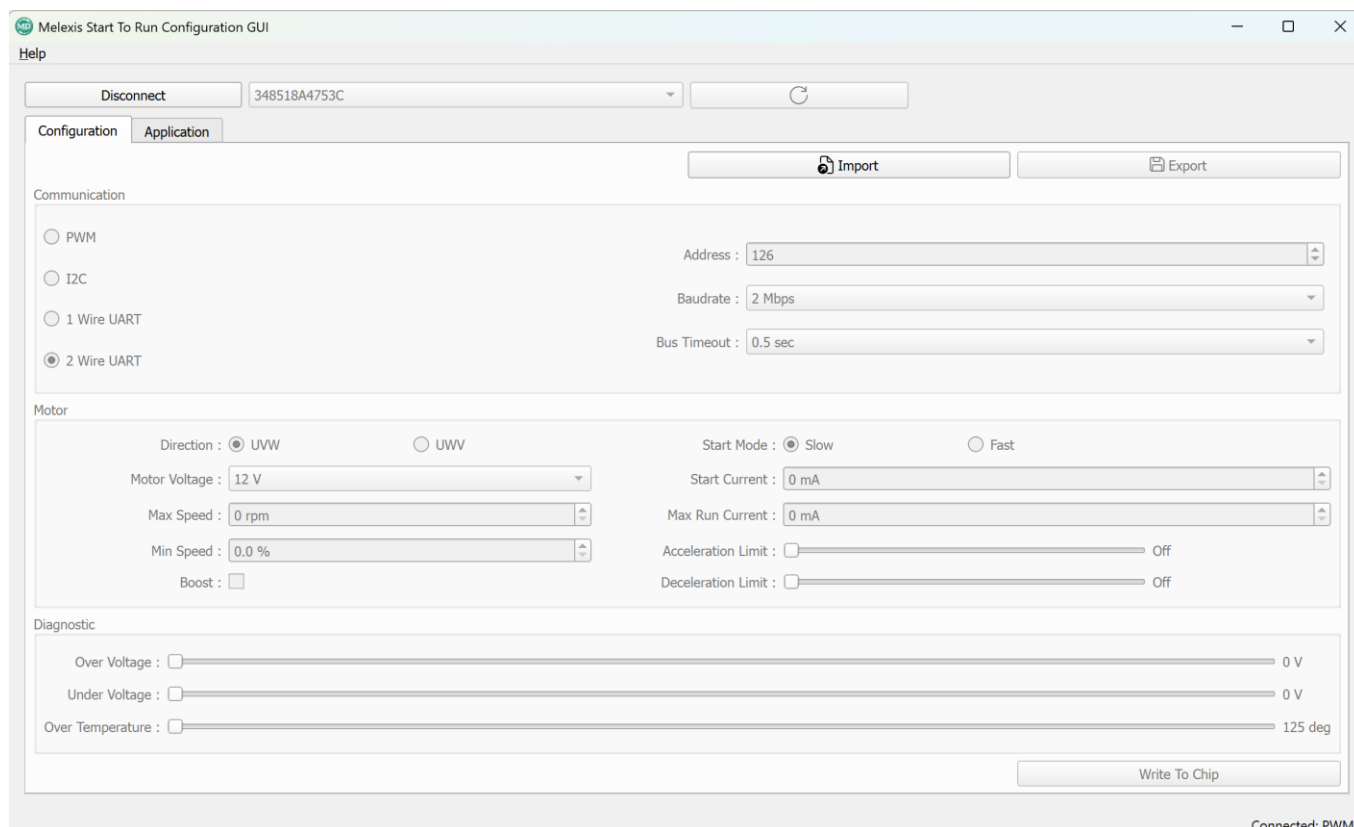
STEP 4: Insert the Power Supply in the mains

4.4. Melexis Configuration GUI: UART mode

In this test we will use UART as the communication interface to the chip.

4.4.1. Run the “Start To run Configuration GUI”

Start the Configuration GUI and select the “Connect” button.



The application consists of three main panes:

1. **Communication Pane**

In this pane, you select the communication protocol used to interface with the chip. When using the **PWM protocol**, you can also edit the speed curve through an 8-point configuration.

2. **Motor Pane**

This pane contains all motor-related parameters that the customer can modify. For now these are greyed out since no parameter file has been imported yet.

3. **Diagnostic Pane**

This pane provides configurable thresholds for the key diagnostic parameters: **overvoltage**, **undervoltage**, and **overtemperature**. These are out of scope of the current test.

When these 3 panes are greyed out, it is normal that you cannot edit/select any of the fields.

At the **right bottom corner** you see the current connection state. If connected it will also state the communication method that is being used. For now there are 3 states:

Disconnected

Connected: PWM

Connected: UART 2 wire

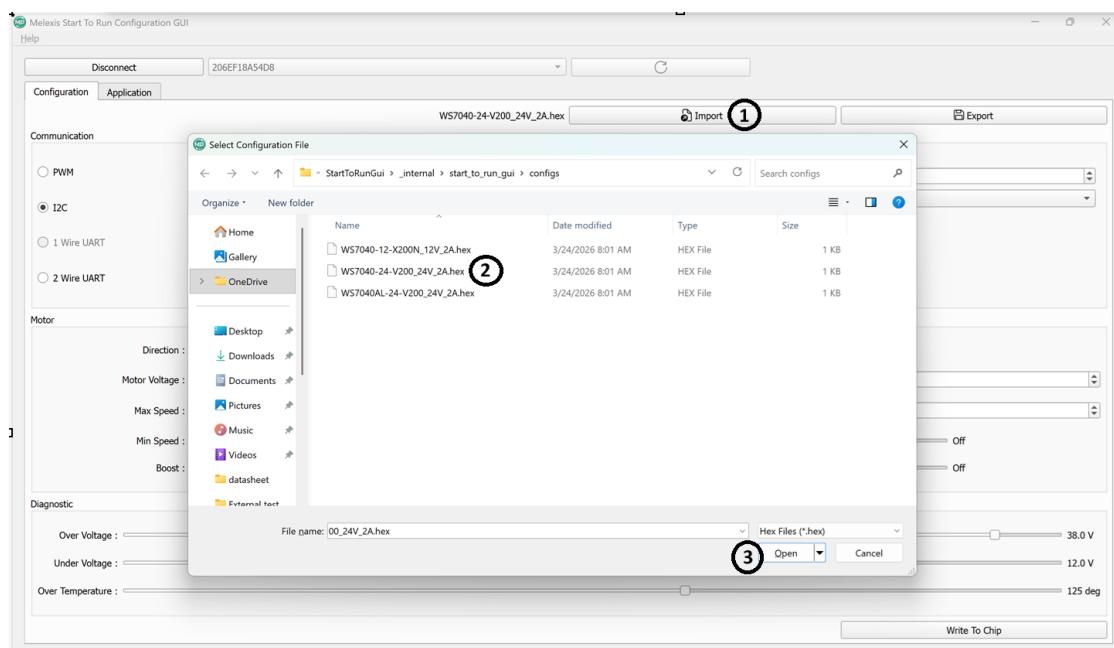
Connected: I2C

4.4.2. Importing the default motor configuration file & spinning the motor

In this step we will import the basic configuration parameters of your motor. For the standard Wonsmart fan motor this is available in the installation folder. For specific customer motors, this file is created after characterizing and tuning the motor in the Start To Run environment. Section 3.3.2 instructs to save your configuration file- this is where you can pick it up now.

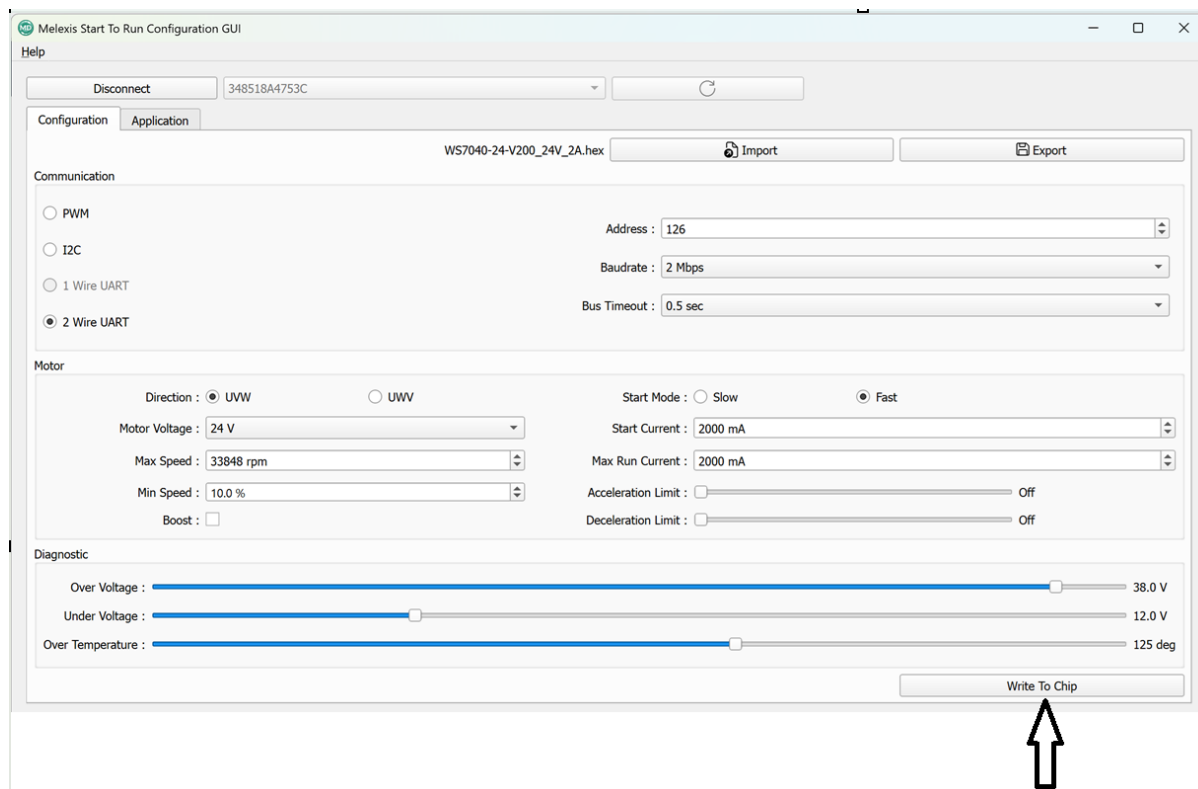
Select the Import button (1)

- If you have a Wonsmart motor, **make sure you select the file that corresponds to the type of your motor and select (2) and (3).** For example:

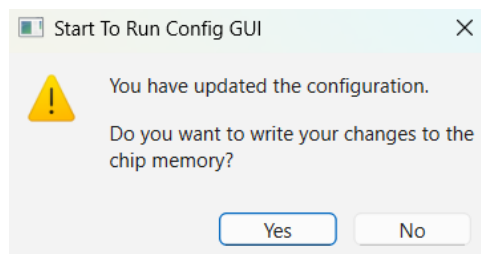


- If you are using your own motor, you have to open the hex file that you created and exported in the Code-free Start-to-Run web environment.

You should now see the actual pre-defined parameters in the motor pane of the application. We will reconfigure some of them in a later step. Write these parameters to the chip (1)

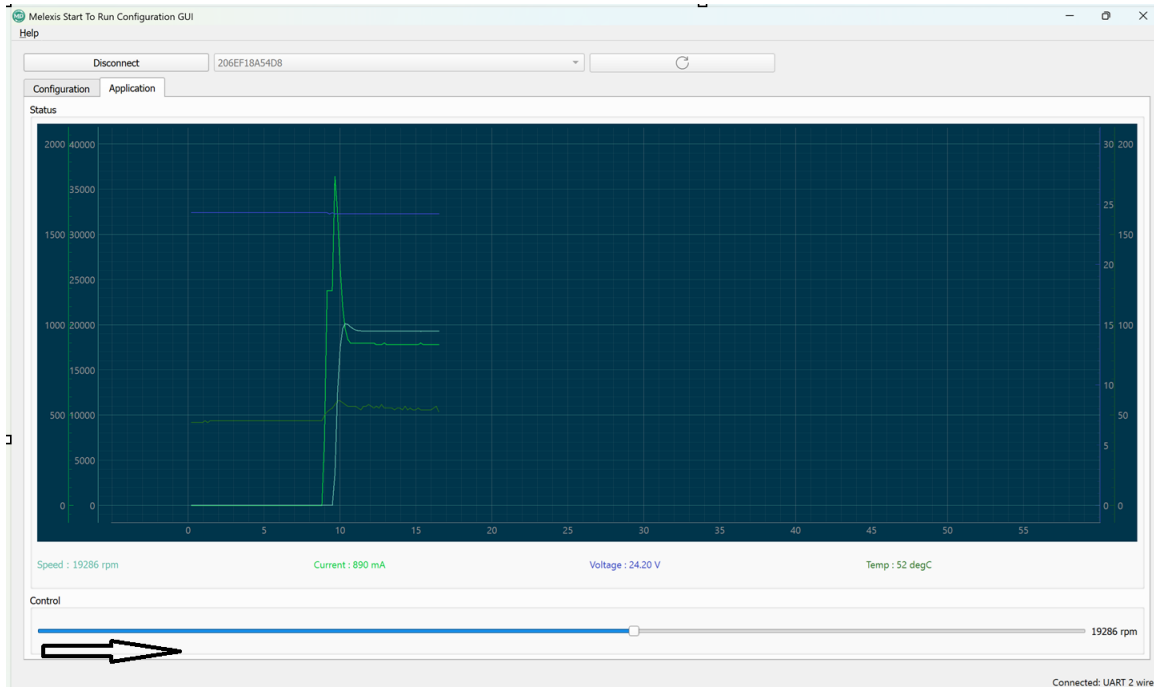


If you get the following message, then please select Yes. This message is displayed when existing data will be overwritten by new data.



Then go to the Application tab (next to Configuration tab). You are now ready to spin the motor.

Pull the slider, the motor should start running.

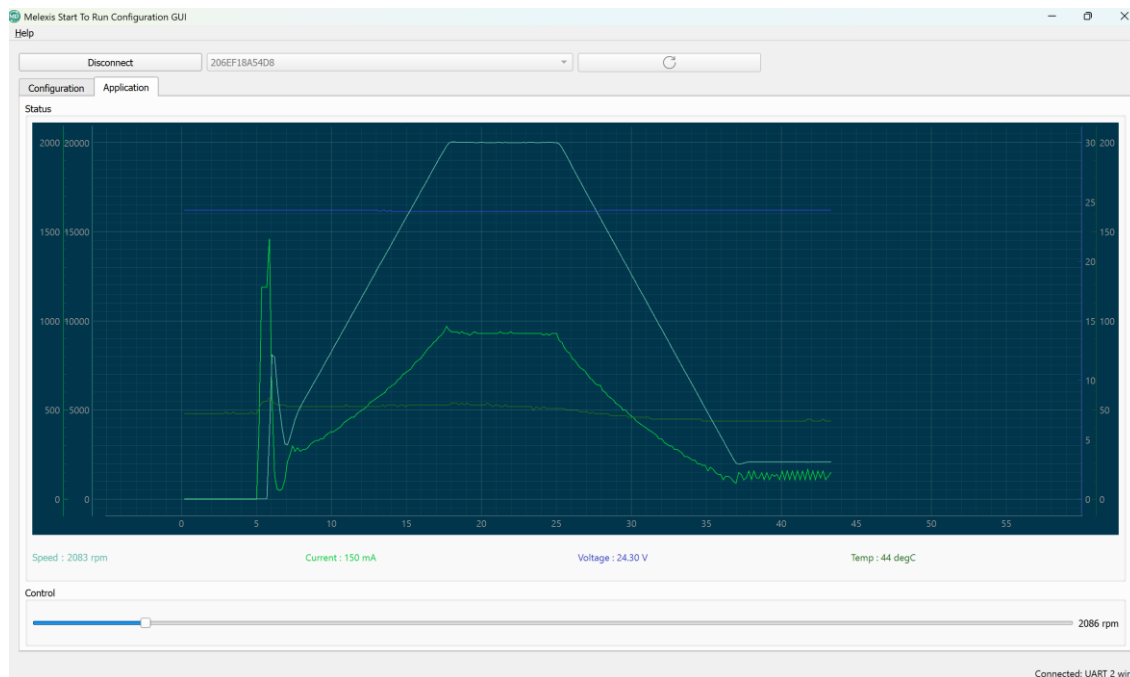


4.4.3. Changing parameters in the Start To Run Configuration GUI

If your motor is still running, move it to 0 rpm and go back to the Configuration tab.

Change the following parameters and press the “Write To Chip” button.

Go back to the Application tab and push the slider to the right.



You should now see that the motor is much slower ramping up to its max speed and ramping down with the same rate.

You are now free to play with the parameters and notice the impact on the motor behaviour.

4.5. Melexis Configuration GUI: PWM mode

In this test we will use PWM as a communication interface to the chip. This will be done by most basic customers.

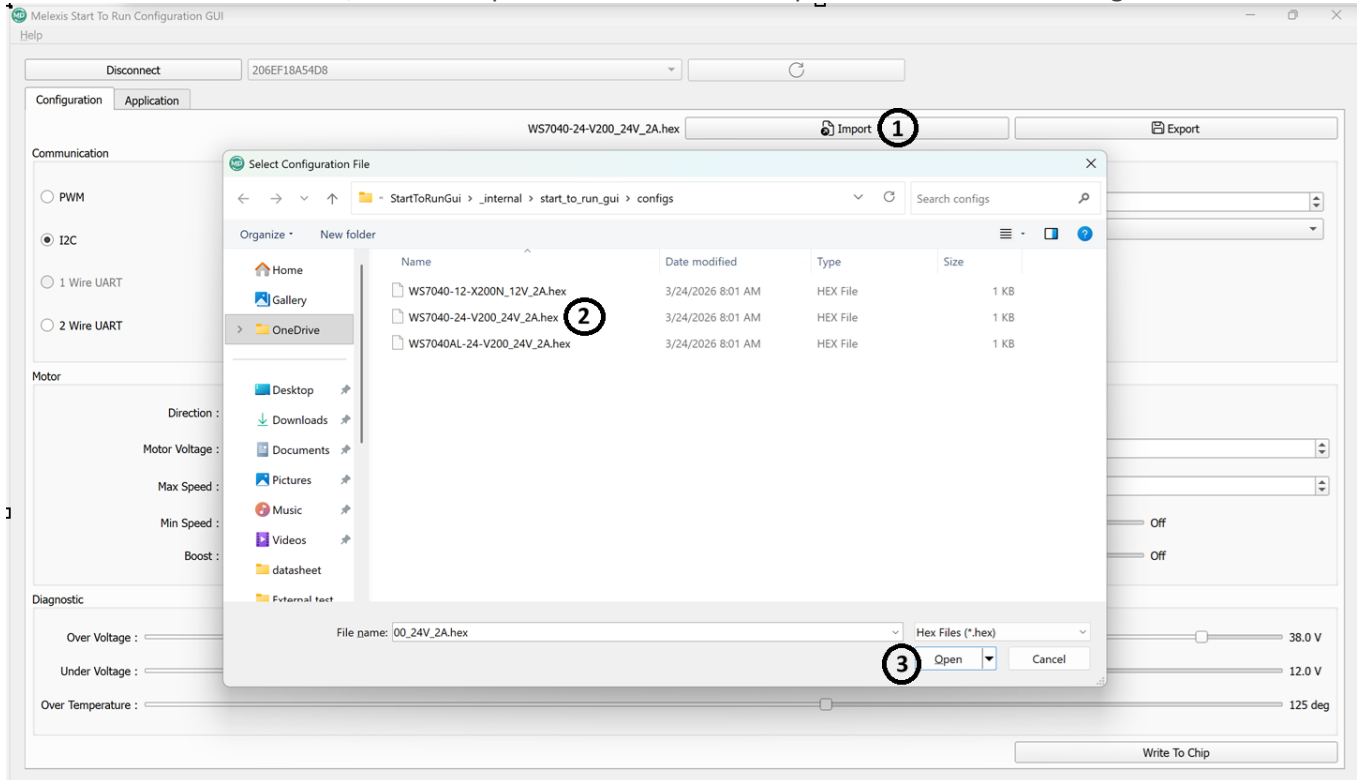
4.5.1. Importing the default motor configuration file

You can skip this step, if you have previously executed the steps in section 4.4.

For the standard Wonsmart fan motor the default file is available in the installation folder. For specific customer motors, this file needs to be created by the STR environment. See section 6.

On next page we show the steps based on a Wonmart fan that already has a default configuration file.

For this test, import the pre-installed configuration file.



Select the Import button and **make sure you select the file that corresponds to the motor that is in your kit. For example:**



After importing the default parameter set, select the PWM mode.

The screenshot shows the 'Melexis Start To Run Configuration GUI' with the 'Configuration' pane selected. The 'Communication' section is active, showing a table for PWM speed curve configuration. The 'Motor' section is also visible, showing settings for direction, voltage, speed, and current. The 'Diagnostic' section shows three sliders for Over Voltage, Under Voltage, and Over Temperature. A 'Write To Chip' button is at the bottom right.

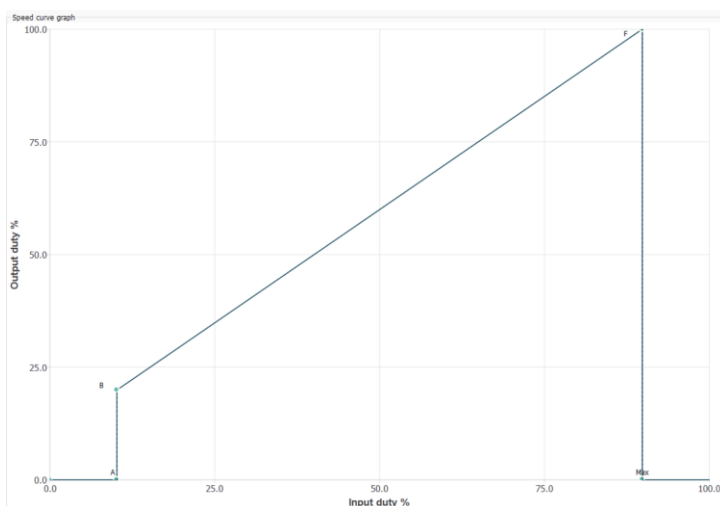
	Min	2	3	4	5	6	7	Max
Input	10	10	10	10	10	10	90	90
Output	10	20	20	20	20	20	100	0

In the **Communication Pane**, you will find the 8-point PWM speed-curve editor.
This editor allows you to define a speed curve consisting of up to eight points. For each point, you specify:

Input: the PWM duty cycle (in %)

Output: the target motor speed (in % of the maximum speed)

If no PWM curve has been defined previously, the configuration tool will load the default speed curve shown below.

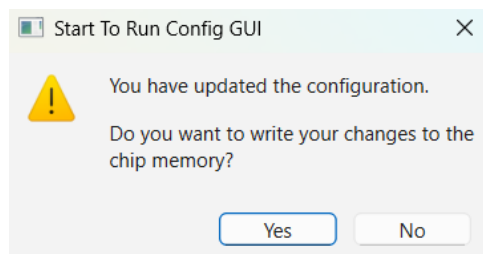


Important guidelines

- For each successive point, the input values must increase or remain equal, there is no restriction on the output values.
- Zero values (input *and* output) between defined points are not permitted.

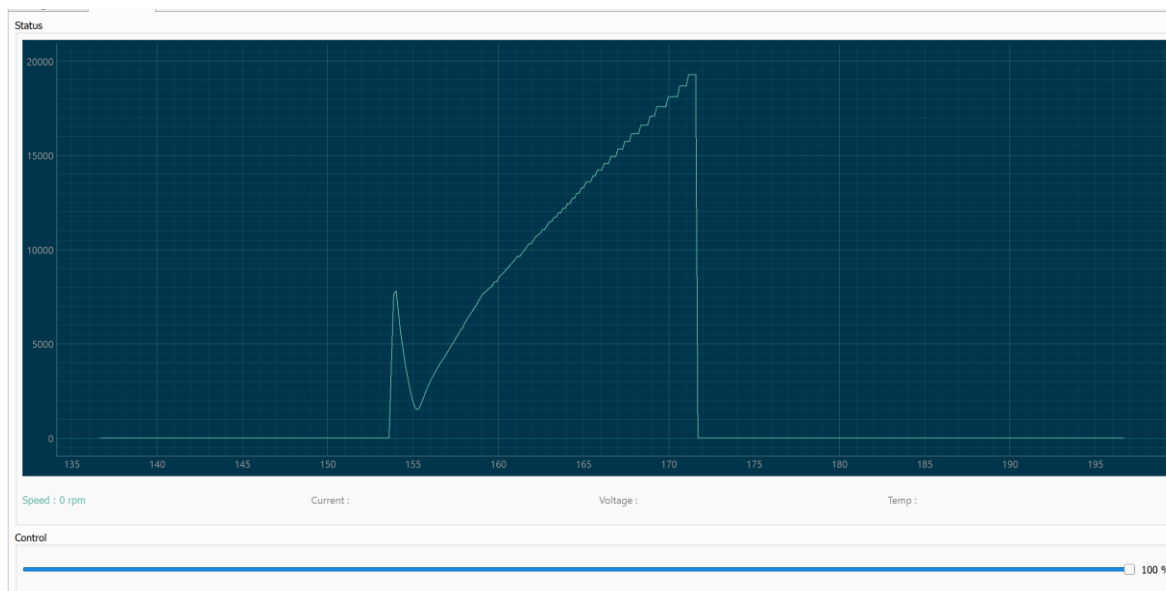
For now, we will use the default PWM speed curve and **write the current parameters to the chip**.

If you get the following message, then please select Yes. This message is displayed when existing data will be overwritten by new data.



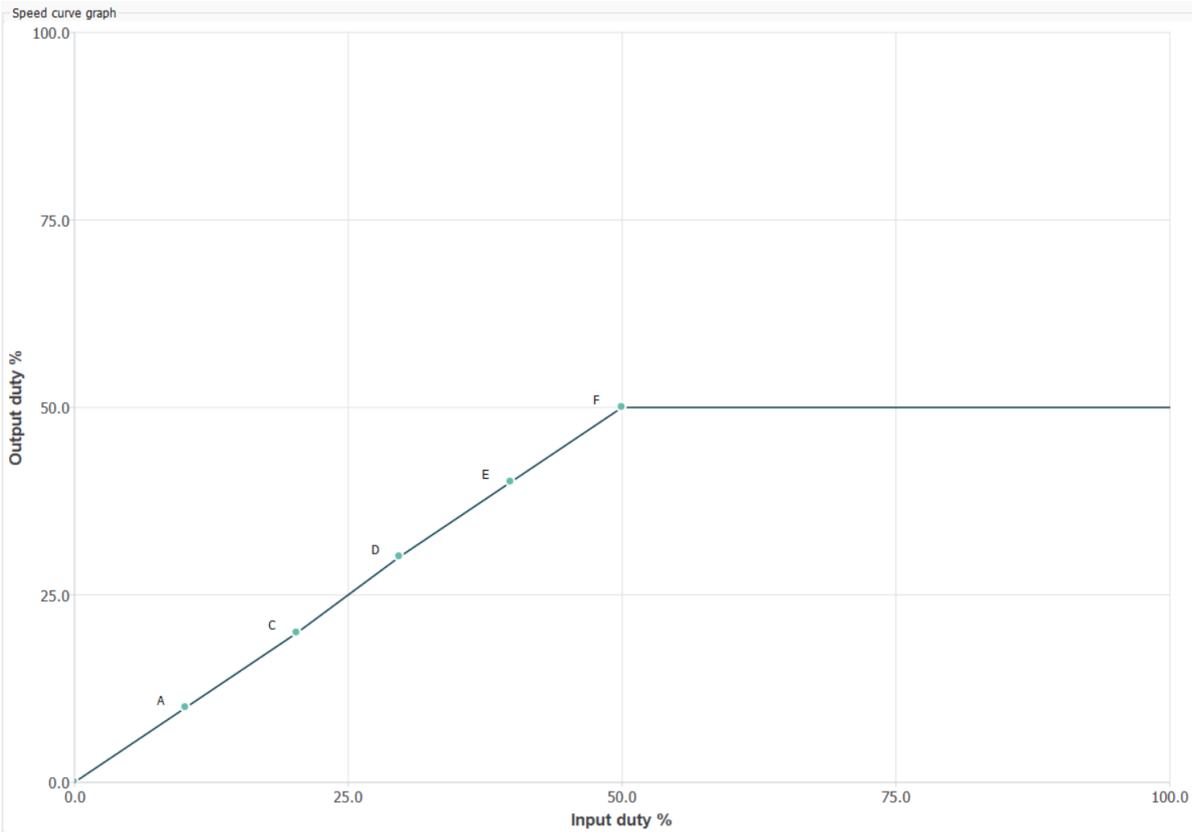
Next, open the Application tab and gradually move the slider to the right (across the full PWM range).

- For coarse grain control (5% steps) use the Page Up and Down keys.
- For fine grain control (1% steps) you can use the arrow keys
- You will notice that the motor speed follows the defined speed curve
- The bump at the start is due to the fast startup and is not related to the speed curve



4.5.2. Modifications to the PWM speed curve

Let us modify the speed curve to the following shape:



This results in the following points in the editor.

Communication

☒ PWM

☐ I2C

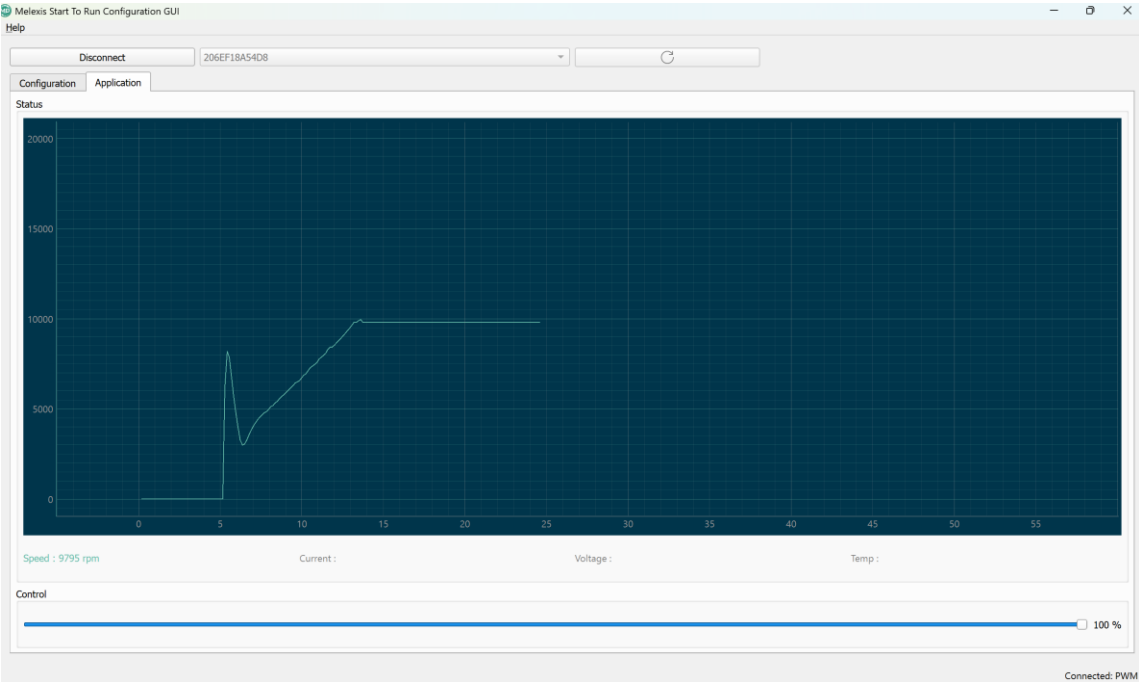
☐ 1 Wire UART

☐ 2 Wire UART

	Min	2	3	4	5	6	7	Max
Input	0.0	10.0	10.0	20.0	30.0	40.0	50.0	50.0
Output	0.0	10.0	10.0	20.0	30.0	40.0	50.0	50.0

Bus Timeout : 0.5 sec

Write this new dataset to the chip & select the application tab. Move the slider in small steps to the right (following the PWM range). You will notice that the motor speed follows the defined speed curve.



The bump at the start is due to the fast startup and is not related to the speed curve.

You can further play around with variations on the speedcurve.

In the end save the current set of motor parameters: you can export the configuration to a file on your PC and import it later on. This file can later also be used to configure the MLX80339 in the production line.

The screenshot shows the 'Melexis Start to Run Configuration GUI' with the 'Application' tab selected. The 'Communication' section is active, showing a table of parameters for PWM, I2C, 1 Wire UART, and 2 Wire UART. The 'PWM' option is selected. The table has columns for 'Min', '2', '3', '4', '5', '6', '7', and 'Max'. The 'Input' row shows values: 0, 10, 10, 20, 30, 40, 50, 50. The 'Output' row shows values: 0, 10, 10, 20, 30, 40, 50, 50. The 'Bus Timeout' is set to 0.5 sec. An 'Export' button is highlighted with a downward arrow.

	Min	2	3	4	5	6	7	Max
Input	0	10	10	20	30	40	50	50
Output	0	10	10	20	30	40	50	50

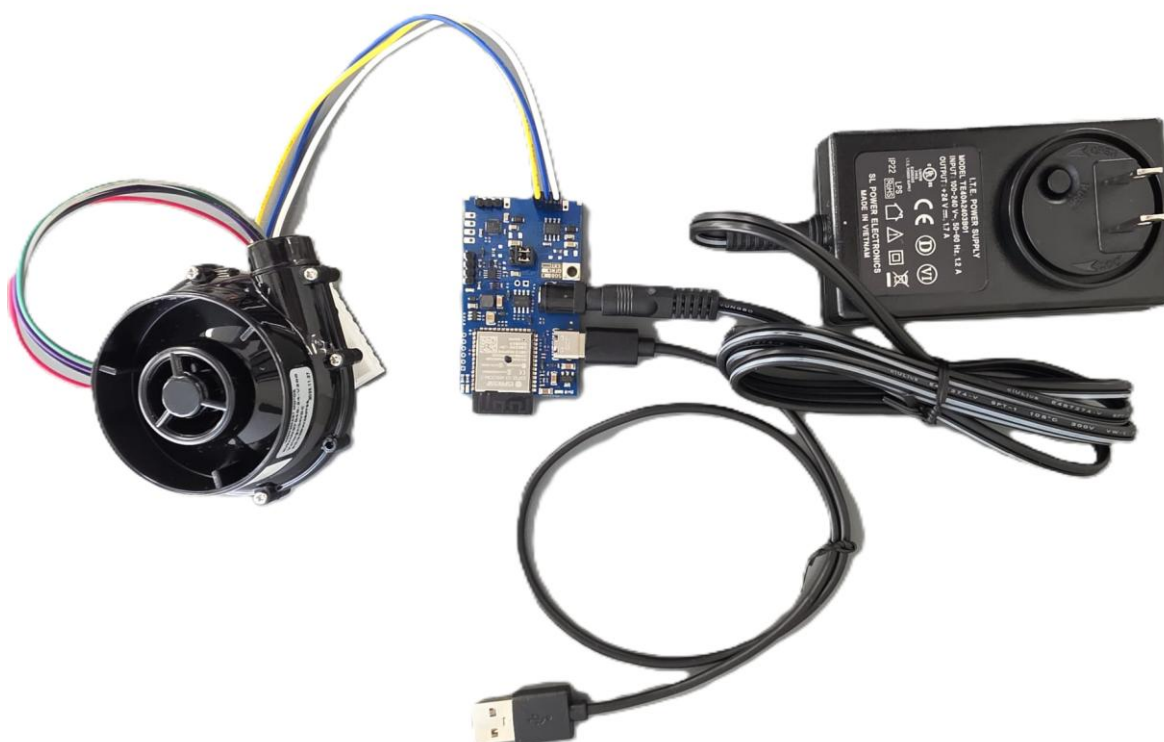
5. Updating the MCM board firmware

The Start-to-Run Code-Free environment is continuously being developed. As a result, you may occasionally need to upgrade the firmware of the MCM board.

Check regularly for available firmware updates. Always perform an upgrade when prompted by the Melexis Configuration GUI.

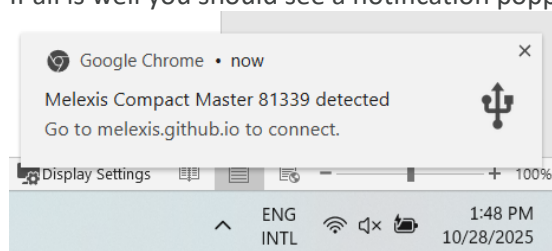
5.1. Connect the hardware

Connect your full setup as depicted below. You are free to connect your specific motor.

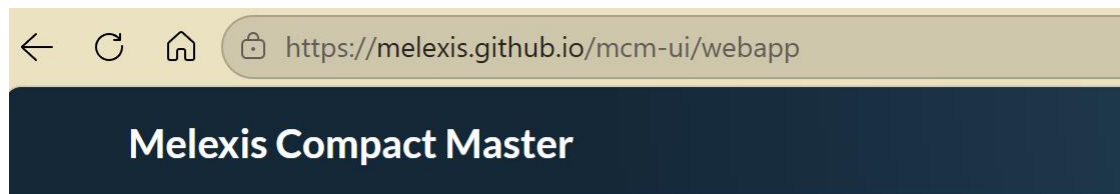


Connect the powered DC supply and insert the USB cable in your PC.

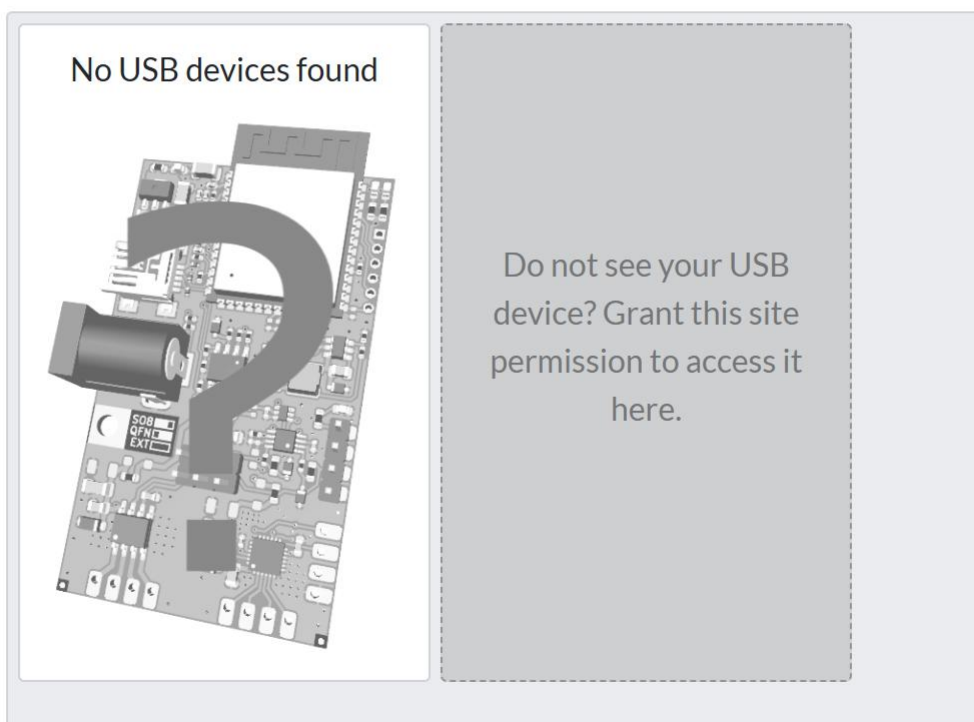
If all is well you should see a notification popping up.



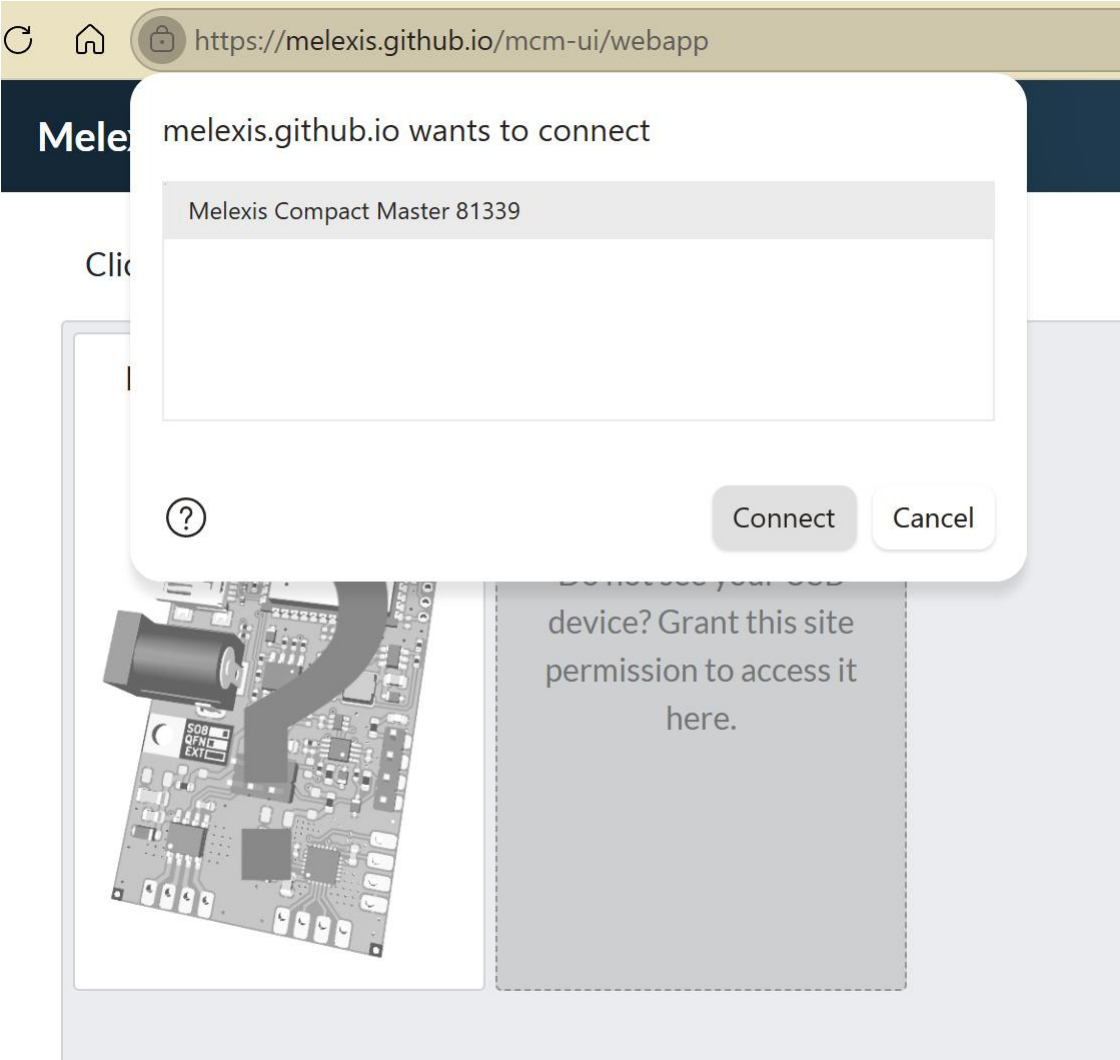
Click on this notification. The following screen should appear.



Click on a board below to open the UI.



Click on the board and select the "Melexis Compact Master 81339".



  <https://melexis.github.io/mcm-ui/webapp>

Melexis Compact Master

Click on a board below to open the UI.



Melexis Compact Master
81339
(S/N: 3CDC75F8FC60)



Do not see your USB
device? Grant this site
permission to access it
here.

Now the board should have turned blue, select it again. You are ready for the next step.

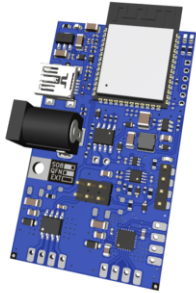
Select the “System” menu and click on “upgrade”.

Melexis Compact Master 81339

I2C ▾ PWM ▾ UART ▾ System ▾ Disconnect

Home

Melexis Compact Master (MCM) for controlling UART protocol busses.
The device is for development only.



details

configuration

upgrade

reboot

Confirm the upgrade process.

Melexis Compact Master 81339

I2C ▾ PWM ▾ UART ▾ System ▾ Disconnect

System Upgrade

Press 'Upgrade' to upgrade the firmware from v0.35.0 to v0.37.0.

Upgrade

During the update you can see the progress indicator.

↻ 🏠 🔒 https://melexis.github.io/mcm-ui/webapp/system/upgrade

Melexis Compact Master 81339

System Upgrade

Press 'Upgrade' to upgrade the firmware from v0.35.0 to v0.37.0.

Upgrade

7 %

Transferring binary...

Note that actual firmware numbers can be different. Once the progress indicator reaches 100%, the upgrade has finished.

If you select the “System” menu & upgrade again, you should see this window.



Perform a “Power on Reset”: remove the DC power supply and the USB cable and plug them in again. Then proceed to the next step.

Disconnect the MCM board



6. Disclaimer

The content of this document is believed to be correct and accurate. However, the content of this document is furnished "as is" for informational use only and no representation, nor warranty is provided by Melexis about its accuracy, nor about the results of its implementation. Melexis assumes no responsibility or liability for any errors or inaccuracies that may appear in this document. Customer will follow the practices contained in this document under its sole responsibility. This documentation is in fact provided without warranty, term, or condition of any kind, either implied or expressed, including but not limited to warranties of merchantability, satisfactory quality, non-infringement, and fitness for purpose. Melexis, its employees and agents and its affiliates' and their employees and agents will not be responsible for any loss, however arising, from the use of, or reliance on this document. Notwithstanding the foregoing, contractual obligations expressly undertaken in writing by Melexis prevail over this disclaimer.

This document is subject to change without notice, and should not be construed as a commitment by Melexis. Therefore, before placing orders or prior to designing the product into a system, users or any third party should obtain the latest version of the relevant information.

Users or any third party must determine the suitability of the product described in this document for its application, including the level of reliability required and determine whether it is fit for a particular purpose.

This document as well as the product here described may be subject to export control regulations. Be aware that export might require a prior authorization from competent authorities. The product is not designed, authorized or warranted to be suitable in applications requiring extended temperature range and/or unusual environmental requirements. High reliability applications, such as medical life-support or life-sustaining equipment or avionics application are specifically excluded by Melexis. The product may not be used for the following applications subject to export control regulations: the development, production, processing, operation, maintenance, storage, recognition or proliferation of:

- 1. chemical, biological or nuclear weapons, or for the development, production, maintenance or storage of missiles for such weapons;*
- 2. civil firearms, including spare parts or ammunition for such arms;*
- 3. defense related products, or other material for military use or for law enforcement;*
- 4. any applications that, alone or in combination with other goods, substances or organisms could cause serious harm to persons or goods and that can be used as a means of violence in an armed conflict or any similar violent situation.*

No license nor any other right or interest is granted to any of Melexis' or third party's intellectual property rights.

If this document is marked "restricted" or with similar words, or if in any case the content of this document is to be reasonably understood as being confidential, the recipient of this document shall not communicate, nor disclose to any third party, any part of the document without Melexis' express written consent. The recipient shall take all necessary measures to apply and preserve the confidential character of the document. In particular, the recipient shall (i) hold document in confidence with at least the same degree of care by which it maintains the confidentiality of its own proprietary and confidential information, but no less than reasonable care; (ii) restrict the disclosure of the document solely to its employees for the purpose for which this document was received, on a strictly need to know basis and providing that such persons to whom the document is disclosed are bound by confidentiality terms substantially similar to those in this disclaimer; (iii) use the document only in connection with the purpose for which this document was received, and reproduce document only to the extent necessary for such purposes; (iv) not use the document for commercial purposes or to the detriment of Melexis or its customers. The confidentiality obligations set forth in this disclaimer will have indefinite duration and in any case they will be effective for no less than 10 years from the receipt of this document.

This disclaimer will be governed by and construed in accordance with Belgian law and any disputes relating to this disclaimer will be subject to the exclusive jurisdiction of the courts of Brussels, Belgium.

*The invalidity or ineffectiveness of any of the provisions of this disclaimer does not affect the validity or effectiveness of the other provisions.
The previous versions of this document are repealed.*

Melexis © - No part of this document may be reproduced without the prior written consent of Melexis. (2026)

IATF 16949 and ISO 14001 Certified