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PAC EVK Quick Start: Build and Flash

00:00:07.280 --> 00:00:07.960
Welcome back.

00:00:07.960 --> 00:00:11.200
This is the Getting Started With PAC part 4:

00:00:11.200 --> 00:00:15.000
Firmware Configuration
+ Building & Flashing.

00:00:15.360 --> 00:00:19.560
At this point we should already have
the firmware installed, the project

00:00:19.560 --> 00:00:23.920
opening Keil and the pack device package
installed in Keil.

00:00:24.080 --> 00:00:26.200
In this video we will do three things.

00:00:26.200 --> 00:00:29.560
First, we will select the correct EVK configuration.

00:00:29.880 --> 00:00:33.960
Second, we will select the MPOS mode
for sensorless control.

00:00:34.320 --> 00:00:37.080
Third,
we'll select the J-Link to build

00:00:37.080 --> 00:00:40.080
and flash the firmware to the EVK.

00:00:40.120 --> 00:00:42.320
Okay so we're back in Keil.

00:00:42.320 --> 00:00:46.800
Step one is selecting the correct
evaluation board in the firmware.

00:00:47.320 --> 00:00:51.600
This ensures the correct pin
mapping and hardware setup is being used.

00:00:52.080 --> 00:00:55.200
So navigate to the source folder and open



00:00:55.200 --> 00:00:58.200
the config_board.h file.

00:00:58.200 --> 00:01:01.200
We will scroll down to the board
selection here.

00:01:01.240 --> 00:01:04.240
You'll see multiple boards listed.

00:01:04.560 --> 00:01:07.640
So you'll first uncomment
the board that you're using.

00:01:10.800 --> 00:01:11.400
And you will

00:01:11.400 --> 00:01:14.400
comment out the rest of the other options.

00:01:15.240 --> 00:01:18.240
Only one board should be selected.

00:01:18.360 --> 00:01:22.640
Quick note if you're using
a different PAC family like the PAC52,

00:01:23.040 --> 00:01:27.040
you'd open the corresponding family folder
and repeat the same process.

00:01:27.080 --> 00:01:28.880
Next is the MPOS mode.

00:01:28.880 --> 00:01:32.880
This is how the firmware determines
the rotor position and speed.

00:01:33.240 --> 00:01:36.320
So for this you go to the config_app.h file.

00:01:36.960 --> 00:01:41.760
You will go down to the MPOS mode
selection. For this sensorless.

00:01:41.760 --> 00:01:46.200
bring up we will select MPOS LBG1, with start, align
and go.

00:01:46.920 --> 00:01:50.360
This uses the Luenberger estimator
with align and go startup.



00:01:50.720 --> 00:01:53.720
So essentially it will align the rotor.

00:01:54.240 --> 00:01:58.400
Next it will ramp the motor
then transition into the estimator

00:01:58.400 --> 00:02:00.360
base control.

00:02:00.360 --> 00:02:03.920
Optionally, in the config features.h file,

00:02:05.000 --> 00:02:06.760
this is where you enable

00:02:06.760 --> 00:02:10.720
extras like auto-tuning,
which we'll use later,

00:02:10.720 --> 00:02:15.760
during the motor bring-up and other
advanced features. For first bring up,

00:02:15.920 --> 00:02:18.640
we'll leave these as defaults.

00:02:18.640 --> 00:02:23.080
Once the motor spins smoothly
we will enable features one at a time.

00:02:23.400 --> 00:02:23.680
Okay.

00:02:23.680 --> 00:02:28.360
So now we'll set up Keil to use J-Link
for programing and debugging.

00:02:28.800 --> 00:02:32.720
So in your project,
go to Options for Target.

00:02:34.520 --> 00:02:37.520
Here you'll go to the Debug tab.

00:02:37.720 --> 00:02:40.440
And in the dropdown you will select

00:02:40.440 --> 00:02:43.440
J-Link J-Trace Cortex.



00:02:43.760 --> 00:02:46.200
Next you will click settings.

00:02:46.200 --> 00:02:50.400
Here in the Adapter section
you should see your J-Link information,

00:02:50.760 --> 00:02:55.680
such as the serial number.
And in the SW Device section,

00:02:56.080 --> 00:02:59.880
make sure to confirm
that the PAC device is being detected.

00:03:00.280 --> 00:03:05.520
If the device doesn't appear,
the two most common issues are SWD

00:03:05.840 --> 00:03:09.720
wiring and forgetting to power the board.

00:03:10.680 --> 00:03:11.360
The evaluation

00:03:11.360 --> 00:03:14.720
board must be powered
before Keil can detect the device.

00:03:15.280 --> 00:03:19.000
And for the SWD wiring,
make sure the polarities

00:03:19.000 --> 00:03:22.600
match on your isolator board
and your EVK board.

00:03:24.960 --> 00:03:27.680
Okay,
so now we will close these two windows.

00:03:27.680 --> 00:03:30.040
Now we will build the firmware.

00:03:30.040 --> 00:03:32.160
So go ahead and first save all.

00:03:32.160 --> 00:03:35.160
Next click on build

00:03:35.360 --> 00:03:36.680
here on the build output,



00:03:36.680 --> 00:03:38.880
you should see it compiling.

00:03:38.880 --> 00:03:40.440
Okay so we finished building.

00:03:40.440 --> 00:03:43.800
We should see a clean build
with zero errors.

00:03:44.040 --> 00:03:46.680
We can ignore the warnings.

00:03:46.680 --> 00:03:49.600
Next we will flash the firmware
to the EVK

00:03:49.600 --> 00:03:52.600
by clicking download.

00:03:53.280 --> 00:03:53.600
Okay,

00:03:53.600 --> 00:03:55.440
it finished downloading.

00:03:55.440 --> 00:03:59.920
If programming or downloading
fails, make sure to double check again

00:03:59.960 --> 00:04:02.960
your EVK being powered and your SWD

00:04:03.320 --> 00:04:06.520
connections being secured and polarities.

00:04:06.520 --> 00:04:08.400
Make sure polarities are correct.

00:04:08.400 --> 00:04:12.760
Another thing you can also do
is disconnecting your J-Link

00:04:12.760 --> 00:04:18.280
and reconnecting, as well as recycling
power for your evaluation board.

00:04:18.960 --> 00:04:20.080
Another quick note.

00:04:20.080 --> 00:04:23.640



If you're still running
into flash issues, you can also

00:04:23.640 --> 00:04:26.640
check Keil's flash download options.

00:04:27.040 --> 00:04:30.040
This is in the options for target.

00:04:30.800 --> 00:04:33.600
Go to the debug tab and click on settings.

00:04:34.640 --> 00:04:37.320
But this time you'll click on flash download.

00:04:37.320 --> 00:04:42.120
Make sure it is on erase full chip
and the program verify and reset

00:04:42.120 --> 00:04:43.960
run are all checked.

00:04:43.960 --> 00:04:46.840
Go ahead and click okay

00:04:46.840 --> 00:04:49.000
and you can try downloading again.

00:04:49.000 --> 00:04:49.720
And that's it.

00:04:49.720 --> 00:04:54.080
The firmware is now configured for
your EVK. You've build successfully,

00:04:54.080 --> 00:04:57.040
and we flash to the PAC device.

00:04:57.040 --> 00:05:00.200
On the next video
will open thePAC FOC GUI.

00:05:00.440 --> 00:05:04.360
We will show you how to set the COM port
and how to verify

00:05:04.360 --> 00:05:06.480
the UART communication
with the firmware.