# XMC1000 / XMC4000 Motor Control Application Kit

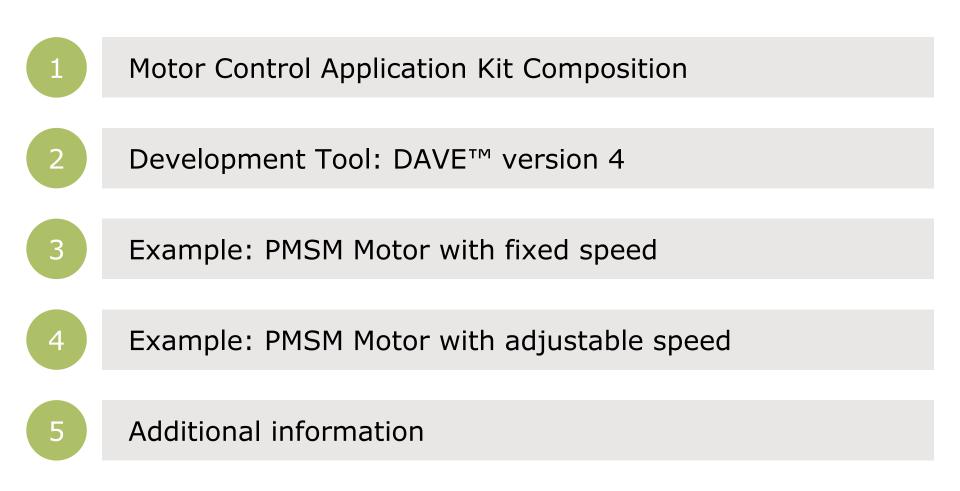
Getting Started 01 v1.0

**Induction Motor V/F Control App** (ACIM\_FREQ\_CTRL)



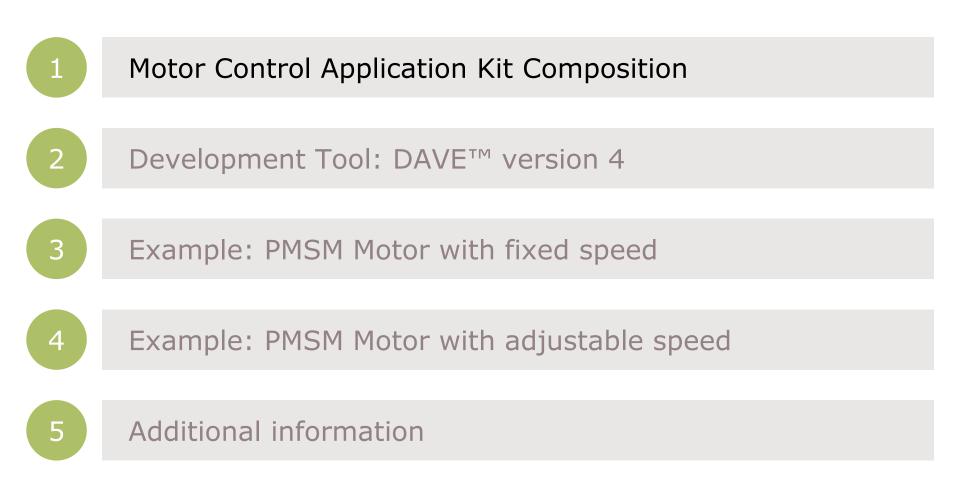


# Induction Motor V/F Control App



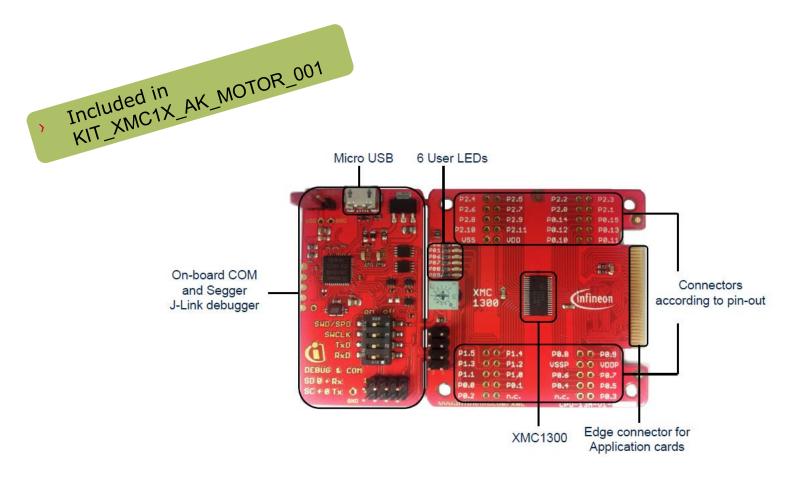


# Induction Motor V/F Control App



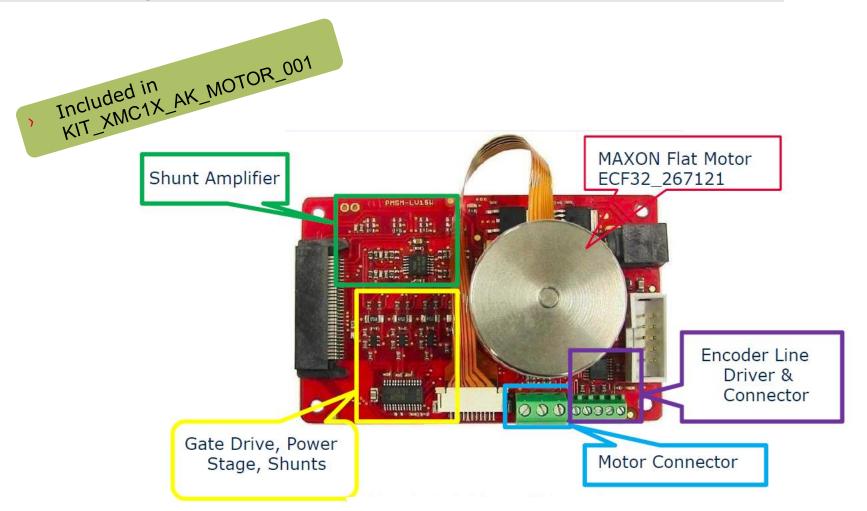


#### Kit composition – XMC 1300 Boot Kit



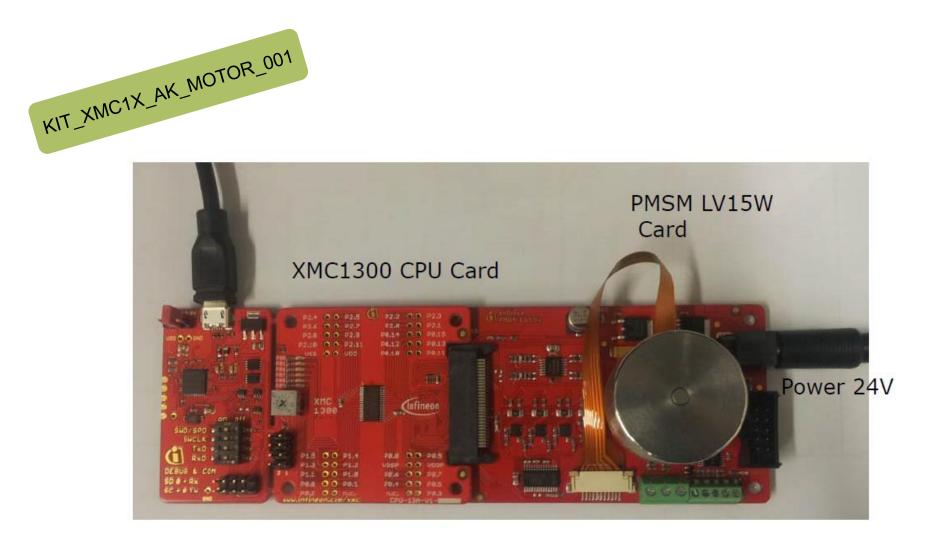


#### Kit composition – PMSM LV 15W Card



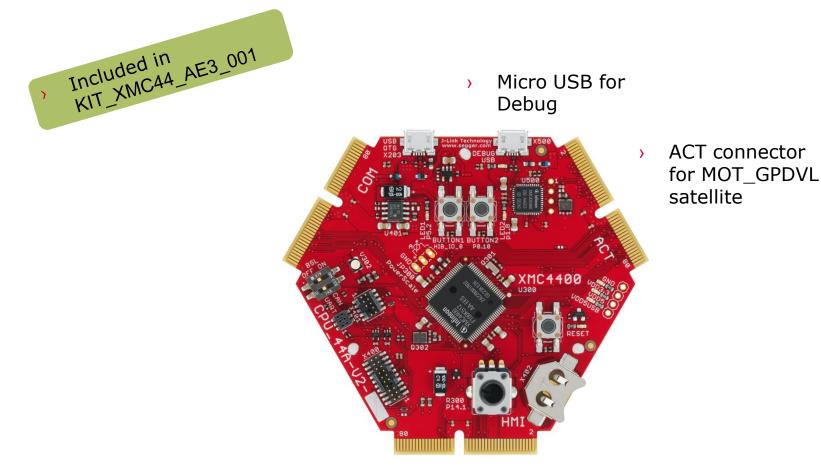


## Kit composition – connection XMC1300





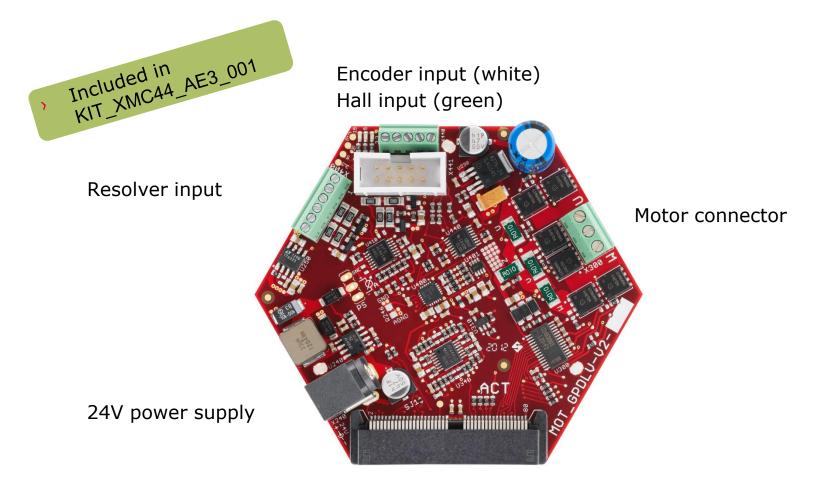
## Kit composition – XMC4400 Enterprise Kit



Copyright © Infineon Technologies AG 2015. All rights reserved.



# Kit composition – General Purpose Motor Drive



ACT connector to CPU Card (e.g. CPU\_44A)

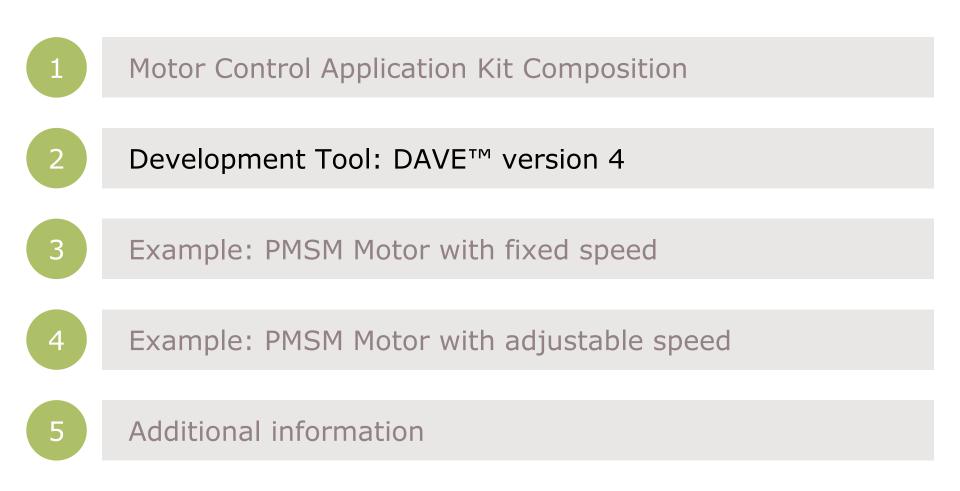


### Kit composition – connection XMC4400





# Induction Motor V/F Control App





#### Development Tool: DAVE<sup>™</sup> version 4

- > DAVE<sup>™</sup> is a free development platform for code generation by Infineon
- The Software package: DAVE<sup>™</sup>, Examples, Videos, Apps, XMCLib... can be downloaded from
- http://www.infineon.com/DAVE
- > This Getting started is based on DAVE<sup>TM</sup> v. 4.1.2





# Induction Motor V/F Control App





# Getting started limitations

- > The following example shows the default usage of the App.
- This Getting Started shows how to create an example with the default settings.
   Only the used App configurations are described. More information about the spectrum of the App can be found in the Help or an Application Note.
- The creation is described in steps. If a step is specific to XMC1300 or XMC4400 it is mentioned in the title and a sub-step e.g. 2.a, 2.b. Variation of the example (e.g. with adjustable speed) based on the main example.
- The following examples based on ACIM\_FREQ\_CTRL/ACIM\_FREQ\_CTRL APP v.
   4.0.5 beta

# Step 1: create new project

- **Open Dave** >
- Select a workspace or use the default workspace >
- Click "OK" >

New

File  $\rightarrow$  New  $\rightarrow$  DAVE Project... >

DAVE IDE - DAVE™ - C:\Workspaces\DAVE-4.1\Motor

#### 🌜 Workspace Launcher Select a workspace DAVE<sup>™</sup> stores your projects in a folder called a workspace. Choose a workspace folder to use for this session. Workspace: C:\Workspaces\DAVE-4.1\Motor • Browse... Copy Settings OK Cancel File Edit Source Refactor Navigate Project Search Run DAVE Window H

	Open File		<b></b>	Project	
	Close	Ctrl+W	<b></b>	Example	
	Close All Ctrl	+Shift+W		Other	Ctrl+N
e	Save	Ctrl+S			

Alt+Shift+N ) 📸 DAVE Project...





#### Step 1: create new project

- Enter project name: e.g. GT\_ACIM\_XMC44\_Example1\_v1\_0 >
- Select "DAVE CE Project" for Project Type >
- Click "Next >" >
- Select your microcontro >
  - **XMC1300**: XMC130 \_

- XMC4400: XMC440 \_
- Click "Finish" >

ntroller:	Create a new C/C++ project for Infineon	tool chains
.302-TO38X0200 400-F100x512	Project Name: GT_ACIM_XMC44_Example Use default location Location: C:/Workspaces/DAVE-4.1/Mote	
New DAVE Project	Project Type:	Tool Chain:
Microcontroller Selection Page Select the microcontroller for which the project has to be created	<ul> <li>Infineon Projects</li> <li>ARM-GCC Application</li> </ul>	ARM-GCC Application
▲ Witcrocontrollers ▲ WAC4000 → WAC4500 Series → WAC4500 Series → WAC4000-F100x256 → WAC4000-F100x256 → XMC400-F100x256 → XMC400-F200x256 → XMC400-F200x256	<ul> <li>Easy Start Project</li> <li>Simple Main Project</li> <li>DAVE CE Project</li> <li>Empty Project</li> <li>ARM-GCC Library</li> <li>Empty Project</li> <li>Show project types and tool chains on</li> </ul>	nly if they are supported on the platform
Linker Option Remove unused sections Runtime Library		
Library Newlib-nano  Add floating point support for printf Add floating point support for scanf	? < Back	Next > Finish Cancel
? < Back Next > Finish	Cancel	

New DAVE Project

DAVE Project

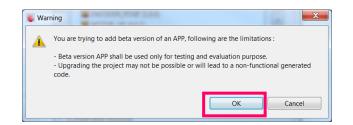
Copyright © Infineon Technologies AG 2015. All rights reserved.

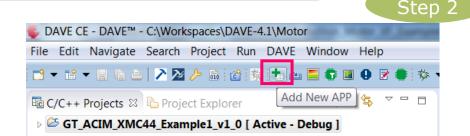
### Step 2: add APP

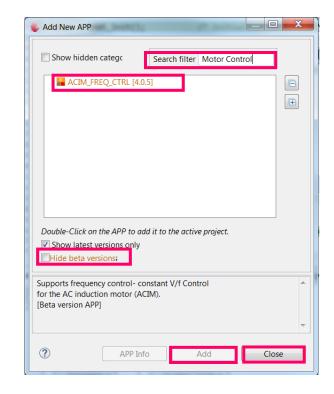
> Click "Add New App"



- Deactivate "Hide beta versions"
- > Enter in search filter "Motor Control"
- Select "ACIM\_FREQ\_CTRL"
- > Click "Add"
- Read the warning regarding beta versions and Click "OK" to confirm.
- Add in a new APP takes a few seconds
- Click "Close" to hide the "Add new APP" window





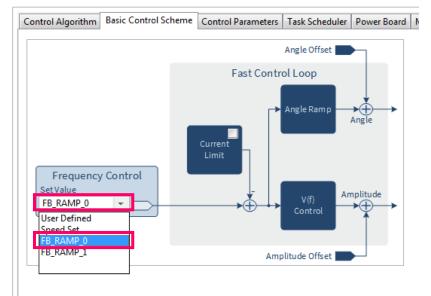


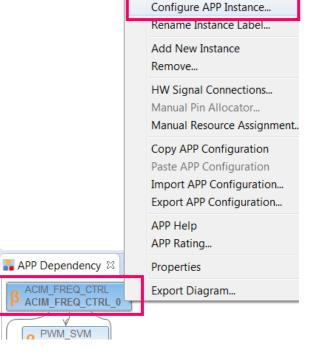
Copyright © Infineon Technologies AG 2015. All rights reserved.

nfineon

#### Step 3: APP configuration

- Open "ACIM\_FREQ\_CTRL" by double click or right click → "Configure App instance"
- Open "Basic Control Scheme" tab
- Select "FB\_RAMP\_0"
- This will add the AUTOMATION APP. This can take a few seconds.





Infineon

Step 3



#### Step 3: APP configuration

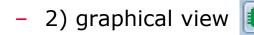
- > Open "Power Board" tab
- Set "Dead time rising edge[ns]" to 1100
- > Set "Dead time falling edge[ns]" to 885

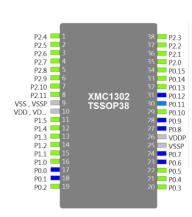
Control Algorithm	Basic Cont	rol Scheme	Control Parameters	Task Scheduler	Power Board	Mea
Power Board Con	figuration –					
DC link voltage [V	]:	24				11
Dead time rising e	dge [ns]:	1100		PWM Tin Compare		~
Dead time falling	edge [ns]:	885		value	/	
Switch delay [ns]:		500		High Side	·	Ц
Inverter enable pir	n:	Active Hig	h 👻	PWM	<u>.</u>	
Bootstrap time [m	ns]:	0		Low Side PWM	•	H
Output polarity				Phase	:	
High side switch	nes:	Active Low	-	Voltage	: →	! !
Low side switch	es:	Active Low	-		:	
Current Amplifier	Configurati	on				
VADC reference [	[V]:	3.3			Amplifier Bia Voltage	5
Rshunt [mOhms]	]:	10		≌↓	Y	
Amplifier gain:		21			<pre>{</pre>	
		4.5.74.4005			1	

#### Step 4: Pin assignment

- > The pin allocation can be done in two ways:
  - 1) table view 🚺

Filter PWM_SVM_0 •				
				E
APP Instance Name	APP Pin Name		Pin Number (Port)	
# PWM_SVM_0				
	PhaseU_High Pin		Not Selected	*
	PhaseV_High Pin		Not Selected	
	PhaseW_High Pin		Not Selected	
	PhaseU_Low Pin		Not Selected	*
	PhaseV_Low Pin		Not Selected	
	PhaseW Low Pin		Not Selected	
	Trap Pin		Not Selected	-
	Inverter Enable Pin		Not Selected	-
			Not Selected	~
			#17 ( P0.0 )	
			#18 ( P0.1 )	
			#19 ( PO.2 )	
			#20 ( P0.3 )	-
			#21 ( P0.4 )	
			#22 ( P0.5 ) #23 ( P0.6 )	
			#24 (P0.7)	
			#27 (P0.8)	1.11
			#28 ( P0.9 )	
			#29 ( P0.10 )	
			#30 (P0.11)	
			#31 (P0.12)	
			#32 (P0.13)	
			#33 (P0.14)	
			#34 (P0.15)	
(?)			#16(P1.0)	-
0		Save	Reset	Close









# Step 4: Pin assignment- table view

The Pin Allocation can be done in two ways:

- Table view: >
  - Click "Manual Pin Allocator"



- Table: select the corresponding pin for each pin
- Click "Save" \_

File Edit	Navigate	Search	Project	Run	DAVE	Window	He
H R A	2 🛛 🌽	<b>d</b> 3	👈 🖿	C	. •	2 🜒 🏇	• :
Ec/C++	Projects 🛛	陷 Proje	ect Explor	er M	anual P	in Allocato	or F

ilter PWM_SVM_0 🔻			
			88
APP Instance Name	APP Pin Name	Pin Number (Port)	
PWM_SVM_0			
	PhaseU_High Pin	Not Selected	-
	PhaseV_High Pin	Not Selected	Ŧ
	PhaseW_High Pin	Not Selected	Ŧ
	PhaseU_Low Pin	Not Selected	*
	PhaseV_Low Pin	Not Selected	-
	PhaseW_Low Pin	Not Selected	*
	Trap Pin	Not Selected	-
	Inverter Enable Pin	Not Selected	-
		Not Selected	<b>^</b>
		#17 (P0.0)	
		#18 ( P0.1 )	
		#19 ( P0.2 )	
		#20 ( P0.3 )	=
		#21 ( P0.4 )	-
		#22 ( P0.5 )	
		#23 ( P0.6 )	
		#24 (P0.7)	
		#27 ( P0.8 ) #28 ( P0.9 )	
		#28 (P0.9) #29 (P0.10)	
		#30 (P0.11)	
		#31 ( P0.12 )	
		#32 ( P0.13 )	
		#33 ( P0.14 )	
		#34 (P0.15)	
		#16 ( P1.0 )	-
?		Save Reset	Close



# Step 4: Pin assignment- graphical view

- Graphical view:
  - Click "Pin Mapping Perspective"
  - Select pin in the left table
  - Right click on a colored pin
  - Click "Assign"

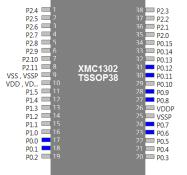
🦆 DAVE CE - DAVE™ - C:\Wo	orkspaces\DAVE-4.1\Motor
File Edit Navigate Search	h Project Run DAVE Window Help
u n e   🚬 🖉 🄑 🗃 🕏	N to ≥ ■ 🗘 🖩 O 🖡 🛑 🕏 マ 🕯 🚳 🚳
🗟 C/C++ Projects 🛛 🏠 Pro	oject Explorer 🔅 🗘 🖗 Pin Mapping Perspective
🛛 😂 GT_ACIM_XMC44_Exa	ample1_v1_0 [ Active - Debug ]
PinMapping - DAVE™ - C:\We	orkspaces\DAVE-4.1\Motor
File Edit Navigate Search	Project Run DAVE Window Help
📬 🕶 🖬 🐑 🖻 🔁 🌌	/> 🗟 🔞 👯 ங 🔤 💭 🔳 🗣 🖉 🗰 🤷
🐰 Virtual Pin View 📃 🗆	Package View
Virtual Pin List	
▲ PWM_SVM_0	
Inverter Enable Pin	
PhaseU_High Pin	P2.4 1
PhaseU_Low Pin	P2.5 2
PhaseV_High Pin	P2.6 🔲 3
PhaseV_Low Pin	P2.7 🛄 4
PhaseW_High Pin	P2.8 🔲 5
PhaseW_Low Pin	P2 9 6
Trap Pin	P2 10
	D2 11 Assign
	VDD , VD [10 p1 r [11]

Note: See legend color code for additional information



# Step 4a: Pin assignment - XMC1300

Sanual Pin Allocator			X
Filter ALL 🔻			
			ĒĒ
APP Instance Name	APP Pin Name	Pin Number (Port)	
▲ PWM_SVM_0			
	PhaseU_High Pin	#17 ( P0.0 )	-
	PhaseV_High Pin	#24 ( P0.7 )	-
	PhaseW_High Pin	#27 ( P0.8 )	-
	PhaseU_Low Pin	#18 ( P0.1 )	-
	PhaseV_Low Pin	#23 ( P0.6 )	-
	PhaseW_Low Pin	#28 ( P0.9 )	-
	Trap Pin	#31 ( P0.12 )	-
	Inverter Enable Pin	#30 ( P0.11 )	-
?	Save	Reset	e





# Step 4b: Pin assignment- XMC4400

PP Instance Name	APP Pin Name	Pin Number (Port)			
PWM_SVM_0					
	PhaseU_High Pin	#97 ( P0.5 )	-		
	PhaseV_High Pin	#98 ( P0.4 )	<b>.</b>		
	PhaseW_High Pin	#99 (P0.3)	<b>v</b>		
	PhaseU_Low Pin	#100 ( P0.2 )	Ŧ		
	PhaseV_Low Pin	#1 ( P0.1 )	*		
	PhaseW_Low Pin	#2 ( P0.0 )	<b>T</b>		
	Trap Pin	#89 (P0.7)	<b>T</b>		
	Inverter Enable Pin	#68 (P1.15)	<b>T</b>		
				0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	P0.11 P0.11 P3.3 P3.3 P3.4 P3.6 P3.6 P3.6 P3.6 P3.6 P3.6 P1.7 P1.7 P1.1 P1.7 P1.1 P1.0 P1.1 P1.0 P1.1 P1.2
				988681 1	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
2	Sa	Reset	Close	P0.0 2 P0.10 3	
Tomorrow and a set				P0.9 4 P3.2 5 P3.1 6 P3.0 7	
				USB_DM 8 USB_DP 9 VBUS 10	
					XMC4400 LQFP100
				HIB_IO_1 13 HIB_IO_0 14 RTC_XTAL1 15	
				RTC_XTAL2 = 16	

#### Step 5: Generate code

- > Click "Generate Code"
- Code Generation can take a few seconds.

DAVE CE - GT_ACIM_XMC4400_Example1_v1_0/Dave/Model/APPS/ACIM_FREQ_CTRL/v4_0_5/Uimodel,
File Edit Navigate Search Project Run DAVE Window Help
E @ ≜   ≥ ⊠ />   ▶ = = ≈ x → x ≂ x   @   % + ≥ = © = ● <b>E</b> ●   \$ * + ! ± *
$\square$ C/C++ Projects $\square$ $\square$ Project Evolorer $\bigcirc$ $\bigcirc$ $\bigcirc$ $\bigcirc$ $\bigcirc$ $\bigcirc$ $\square$ $\square$ $\square$ $\square$ Generate Code



# Step 6: Add function



 Edit main.c by adding the following function call: ACIM\_FREQ\_CTRL\_MotorStart(&ACIM\_FREQ\_CTRL\_0);

```
23 int main(void)
24 {
25
     DAVE STATUS t status;
26
627
     status = DAVE Init();
                                     /* Initialization of DAVE APPs */
28
29
     if(status == DAVE_STATUS_FAILURE)
30
     {
31
       /* Placeholder for error handler code. The while loop below can be replaced with an user error handler. */
32
       XMC_DEBUG("DAVE APPs initialization failed\n");
33
34
       while(10)
35
       {
36
37
        }
38
     }
39
40
     ACIM_FREQ_CTRL_MotorStart(&ACIM_FREQ_CTRL_0);
41
     /* Placeholder for user application code. The while loop below can be replaced with user application code. */
42
     while(10)
43
     {
44
45
     }
46 }
47
```

#### Step 7: Build project



> Build Project



File Edit Navigate Search Run Project DA	AVE Window
III (\$ 4 <mark>   &gt; 2</mark> />   &   \$   \$ 1 a = (* a )	0 🖻 🌒 🏇 ୟ
C/C++ Pro Build Active Project plorer	⇔ ⇔ @ 🖪

#### Step 8: Debug – create debug session



- > Click "Debug":
- › Double click "GDB SEGGER J-Link Debugging"
- > Click "Debug"
- The debugger is downloading the program

(See next slide)

eate, manage, and run configur	ations	Create, manage, and run configurations		
I I I I I I I I I I I I I I I I I I I	Configure launch settings from Press the 'New' button to Press the 'Duplicate' button Press the 'Delete' button Press the 'Filter' button tc Edit or view an existing c Configure launch perspective s page.	Image: Second state       Yype filter text <ul> <li>C GDB SEGGER J-Link Debugging</li> <li>C GT_ACIM_XMC44_Example1_v1_0 Debug</li> </ul>	Name: GT_ACIM_XMC44_Example1 Main Debugger Startu Project: GT_ACIM_XMC44_Example1_v1_0 C/C++ Application: Debug/GT_ACIM_XMC44_Example War Build (if required) before launchir Build configuration: Select Auto Enable auto build Use workspace settings	p & Source Common Browse e1_v1_0.elf iables Search Project Browse 19
		Filter matched 2 of 19 items		Apply Revert
		Filter matched 2 of 19 items		Debug Close

Compare	100.0%	0.013s
Erase	0.0%	0.022s
Program	0.0%	
Verify	0.0%	

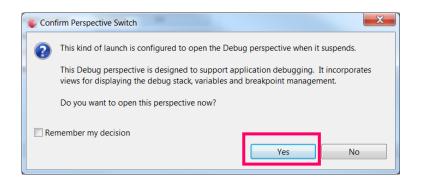
DAVE CE - GT\_ACIM\_XMC44\_Example1\_v1\_0/Dave/Model/APPS/ACIM\_FREQ

File Edit Navigate Search Project Run DAVE Window Help



#### Step 8: Debug – start program

- > Switch to debug perspective. Confirm with "YES"
- > To start the program click "Resume (F<sup>I</sup>)"

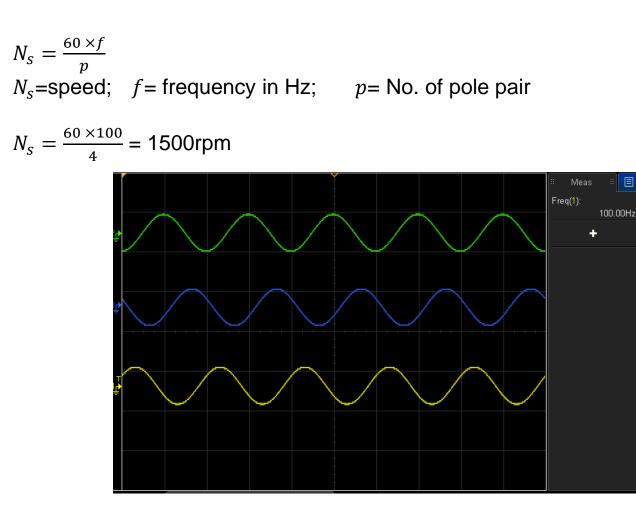


File Ed	it Source	Refactor	Navigate	Search	Window
i II (q e			. ∿ .r i≯	₹.₹	ا 🗠 ا 🌜



#### Behavior

> The Motor slowly ramps up to 1500rpm





# Induction Motor V/F Control App





# Getting started limitations

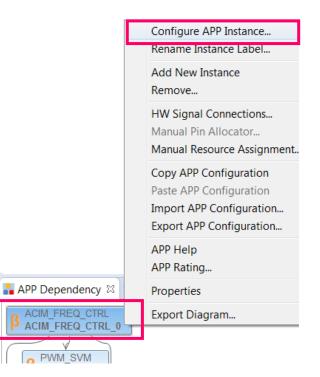
- > The following example shows the default usage of the App.
- This Getting Started shows how to create an example with the default settings.
   Only the used App configurations are described. More information about the spectrum of the App can be found in the Help or an Application Note.
- The creation is described in steps. If a step is specific to XMC1300 or XMC4400 it is mentioned in the title and a sub-step e.g. 2.a, 2.b. Variation of the example (e.g. with adjustable speed) based on the main example.
- The following examples based on ACIM\_FREQ\_CTRL/ACIM\_FREQ\_CTRL APP v.
   4.0.5 beta
- > Example 2 with adjustable speed based on example 1. Only the delta is discribed in this cheptar. The target speed is selected by adjusting the potentiometer.

#### Step 1: APP configuration



- > open "ACIM\_FREQ\_CTRL" by double click or right click → "Configure App instance"
- Open the "Measurements" tab
- Click "Enable speed set via analog input"
- This will add the ADC APP. This can take a few seconds.

Control Algorithm	Basic	Control Sche	me	Control Paramete	rs   Task Sch	eduler	Power Board	Measurements	Err
Measurement									
Current measurer	ment:	None					Ψ.		
Enable over current detection									
Enable voltag	e comp	pensation							
V Enable speed	set via	analog inpu	t						
ADC Carfin metia									
ADC Configuratio		Request sou	rce	Queue position	Refill	Exter	nal trigger		
I_Average		Queue A	Ŧ	0	Enable	E	nable		
V_DCLink		Queue A	Ŧ	1	Enable	E	nable		
Analog_Inp	ut	Queue A	Ŧ	2	✓ Enable	E	nable		
User_Define	ed 🛛	Queue A	Ŧ	3	Enable	E	nable		





## Step 1: APP configuration – XMC4400

The V/f control is less efficient than FOC control. To reduce the maximum power consumption the default values is be changed. This only applies to **XMC4400** kits.

- Open the "Control Parameters" tab
- Reduce "No load speed [rpm]" to 2000
- > Enable "User defined"
- > Set "V/f constant" to 70
- > Set "V/f offset" to 300

Control Algorithm	Basic Control S	cheme	Control Paramet	ters T	ask Scheduler	Power Board	Measurem	ents	Error Handler	Interrupt Settings	
Control Panel Para	ameters					Motor Paramet	ers				
Motor direction:	[	Clockw	ise		-	Nominal voltag	e [V]:	24			
User speed set [rp	om]:	1500				No load speed [	[rpm]:	200	)		
Over current limi	t [mA]:	500				Pole pair:		4			
Maximum voltag	e limit [%]:	100									
V/f Configuratio	on	Defau	lt 🗸	User de	efined						
V/f constant [m	nV/Hz]:	180	70								
V/f offset [mV]:	: [	1200	300								

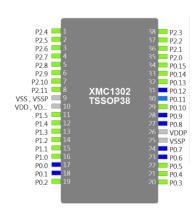
Copyright © Infineon Technologies AG 2015. All rights reserved.

# Step 2: Pin assignment

- > Assign the ADC pin in table or graphical view:
  - 1) table view 💷

Filter PWM SVM 0 •				
APP Instance Name	APP Pin Name		Pin Number (Port)	
# PWM_SVM_0				
	PhaseU_High Pin		Not Selected	*
	PhaseV_High Pin		Not Selected	
	PhaseW High Pin		Not Selected	*
	PhaseU_Low Pin		Not Selected	*
	PhaseV Low Pin		Not Selected	
	PhaseW Low Pin		Not Selected	
	Trap Pin		Not Selected	-
	Inverter Enable Pin		Not Selected	-
			Not Selected	~
			#17 ( P0.0 )	
			#18 ( PO.1 )	
			#19 ( PO.2 )	
			#20 ( P0.3 )	
			#21 ( P0.4 )	
			#22 ( P0.5 ) #23 ( P0.6 )	
			#24 (P0.7)	
			#27 (P0.8)	
			#28 ( P0.9 )	
			#29 ( P0.10 )	
			#30 (P0.11)	
			#31 (P0.12)	
			#32 (P0.13)	
			#33 (P0.14)	
			#34 (P0.15)	1.11
			#16 ( P1.0 )	+
(?)		Save	Reset	Close





Note: Pin assignment is explained in example1 step 4

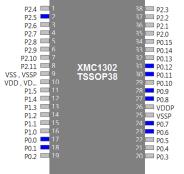




# Step 2a: Pin assignment - XMC1300

> Allocate the "Analog\_Input pin" to the potentiometer input pin

APP Instance Name	APP Pin Name	Pin Number (Port)	
ACIM_FREQ_CTRL_0			
	Analog_Input pin	#2 ( P2.5 )	Ŧ
▲ PWM_SVM_0			
	PhaseU_High Pin	#17 ( P0.0 )	-
	PhaseV_High Pin	#24 ( P0.7 )	-
	PhaseW_High Pin	#27 ( P0.8 )	-
	PhaseU_Low Pin	#18 ( PO.1 )	-
	PhaseV_Low Pin	#23 ( P0.6 )	-
	PhaseW_Low Pin	#28 (P0.9)	-
	Trap Pin	#31 ( P0.12 )	-
	Inverter Enable Pin	#30 ( P0.11 )	-





# Step 2b: Pin assignment- XMC4400

> Allocate the "Analog\_Input pin" to the potentiometer input pin

PP Instance Name	APP Pin Name	Pin Number (Port)	U		
PWM_SVM_0	AFF FIL Name	Fill Nulliber (FOIt)			
	PhaseU_High Pin	#97 ( P0.5 )	-		
	PhaseV_High Pin	#98 ( P0.4 )	-		
	PhaseW_High Pin	#99 ( P0.3 )	-		
	PhaseU_Low Pin	#100 ( P0.2 )	-		
	PhaseV_Low Pin	#1 ( P0.1 )	-		
	PhaseW_Low Pin	#2 ( P0.0 )	-		
	Trap Pin	#89 ( P0.7 )	-		
	Inverter Enable Pin	#68 ( P1.15 )	Ŧ	_	903 903 903 904 904 904 904 904 904 904 904 904 904
				P0.1 P0.0 P0.10 P0.9 P3.2	

P15.2 0 P14.15 0 P14.14 0 P14.13 0 P14.12 0 P14.12 0 P14.7 0 P14.6 0

# Step 3: Generate, build, debug

- > Repeat following steps from example 1:
  - Step 5: Generate code
  - Step 7: Build code
  - Step 8: Debug



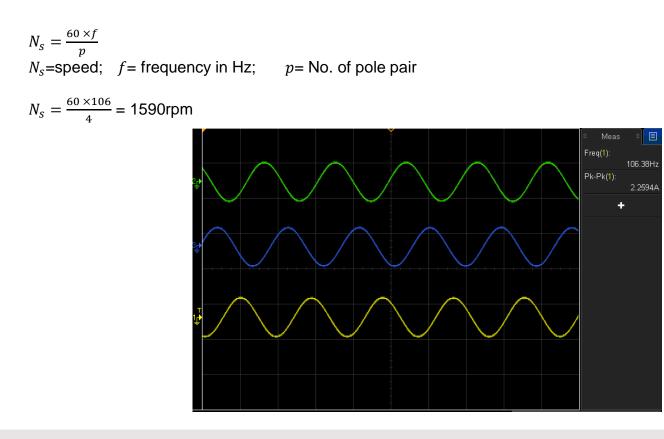
7



# infineon

#### Behavior

- > The target speed is selected by potentiometer
- > The target speed can vary from 0rpm to "No load speed"
- Motor slowly ramps up or down to the target speed





# Induction Motor V/F Control App



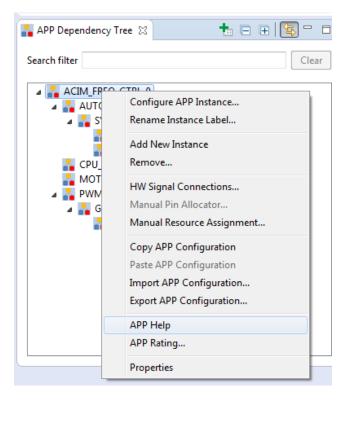


#### App help

This will show helpful information regarding to the APP:

- Right click on ACIM\_FREQ\_CTRL\_0
- Select "App Help"
- > This will show the help contents this App

ACIM_FREQ_CTRL	
Hide Locate Back Forward Stop	Contraction of the second seco
Contents   Igdex   Search   Favorites	ACIM_FREQ_CTRL
Copyright Infom	Home
License Terms and Copyright Ir      Abbreviations and Definitions      U) Overview      Overview	Overview
Architecture Description     APP Configuration Parameters     Enumerations	Overview
Diata structures     Solution (Solution)     Solution     Solution (Solution)     Solution (Solut	ACIM_FREQ_CTRL APP implements open loop V/f control algorithm to drive three phase AC Induction Motor. This is scalar control technique which involves controlling the magnitude of voltage or frequency of the induction motor. Constant V/f method maintains the constant flux density by changing the voltage in proportion with frequency. This APP provides the configurations required for the V/f control.This APP also facilitates the use of the AUTOMATION APP for runtime parameter checking, error logging and connecting to the Ramp Generator Function Block. It uses MOTOR_LIB which is math library used for common algorithms.
	The ACIM_FREQ_CTRL APP provides the following features:
	1. Basic Control Scheme: This includes mandatory V/f control algorithm parameters. 2. Advanced Control Scheme:
	This gives option for adding offset values, inserting user code via call back function and Position control algorithm. 3. Task Scheduler:
	Tasks can be scheduled from various time sources. And task execution time can be adjusted. 4. State Machine:
	Noto: relation and the security of the motor control algorithm. This APP also supports Drive State Machine (optional) which interacts with the external system and decides the motor state. 5. Measurements:
	It supports the average current measurement (overcurrent protection), DC link voltage measurement (Voltage compensation) and analog speed control measurement. 6. Parameter Monitoring: Runtime set/det of the motor parameters.
	<ol> <li>Error Handler: Logging the errors, warnings reported by the APP which can be communicated to the central system.</li> <li>Ramo Function Block Connection:</li> </ol>
	Speed of the motor can be ramped in linear or s-curve by connecting the user end speed to the ramp function block.
	Hardware and software connectivity of APP Figure 1, shows how the APP is structured in DAVE. The LLD layer provides abstraction for these hardware modules. Control algorithm is built on top of the basic building blocks like PVM (PWM_SVM) and ADC (ADC_QUEUE). It makes use of low level drivers for CCU8, ADC, SCU and GPIO.
< +	user application (main.c) USER CODE





## Where to buy - XMC1300

<b>Development Boards</b>	S	Order Number
XMC1300 Boot Kit		KIT XMC13 BOOT 001
XMC1000 Motor Control Application Kit		KIT XMC1x AK Motor 001



#### Where to buy – XMC4400

<b>Development Boards</b>	Order Number
XMC4400 Enterprise Kit	<u>KIT XMC44 EE1 001</u>
General Purpose Motor Drive Kit	KIT XMC4x MOT GPDLV 001
XMC4400 Motor Control Application Kit	<u>KIT XMC44 AE3 001</u>



# General information

- Information about all available XMC Motor Control Application Kits:
   <u>LINK</u>
- For latest updates, please refer to: <u>http://www.infineon.com/xmc1000</u> <u>http://www.infineon.com/xmc4000</u>
- > DAVE<sup>™</sup> development platform: <u>http://www.infineon.com/DAVE</u>
- > For support:

http://www.infineonforums.com/forums/8-XMC-Forum



Part of your life. Part of tomorrow.



#### **Mouser Electronics**

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

Infineon: <u>KITXMC1XAKMOTOR001TOB01</u>