Quick Start Guide Demo Distance2Go

September 2017





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Hardware Description





Board Views – Front and Back





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Tools Installation

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Flashing Tools 1. XMC Flasher



Installation Steps:

1. Download XMC Flasher .zip file from the following link

<u>http://www.infineon.com/cms/en/product/microcontroller/32-bit-industrial-microcontroller-based-on-arm-registered-cortex-registered-m/xmc-development-tools-software-tools-and-partner/xmc-programming-tools-from-infineon/channel.html?channel=5546d462557e6e890155a0532c605bfe</u>



2. Extract the downloaded .zip file and run the XMCFlasher.jar file

				×
Infineon-XMCFlasher-GS-v01_06-EN 🕨 XMCFlasher 🕨		▼ 4 Search XMCF	lasher	Q
			•	0
Name	Date modified	Туре	Size	
📙 Licenses	18.08.2017 09:43	File folder		
🔍 XMCFlasher.bat	21.10.2016 15:28	Windows Batch File	1 KB	
XMCFlasher.jar	09.06.2017 11:28	JAR File	25.445 KB	
XMCFlasher_Installation_Instructions.pdf	09.06.2017 11:23	Adobe Acrobat D	165 KB	
🏂 XMCFlasher_Release_Notes.pdf	09.06.2017 11:23	Adobe Acrobat D	259 KB	

Flashing Tools 1. XMC Flasher



Note: Might need to install Java (32-bit or 64-bit) to run the XMCFlasher.jar file.

https://java.com/en/download/



Java allows you to play online games, chat with people around the world, calculate your mortgage interest, and view images in 3D, just to name a few.



> If you are plugging in the XMC4200 for the first time into your PC/laptop, you will receive an error.



> XMC4200 serial drivers are part of deliverables, comes under the folder 'Driver'.

Distance2Go XMC4200 serial driver	~	Search XMC4.	200 serial driver 🛛 🔎
			I • 🗌 🔞
Name	Date modified	Туре	Size
Infineon_CDC_Driver.inf vcom.cat	28.05.2014 08:16 28.05.2014 08:16	Setup Information Security Catalog	2 KB 9 KB



Installation Steps:

- Right click on "My Computer"
- 2. Click "Manage" and a Computer Management window will be opened.
- 3. Click on "Device Manager"





- Now connect the demo board to the computer via USB and the board will be detected under the "Other devices" category.
- 5. Right click on "Unknown Device"



ntineon



- 6. Click "Update Driver Software"
- 7. Select "Browse My Computer for Driver Software".
- 8. Now browse to the directory where the drivers are stored (it's part of deliverable in our case under 'Driver' folder) and click "Next".





- After successful installation, the board is listed under "Ports" category in "Device Manager" tab of computer management window.
- Note down the COM port to which the board is connected. This will be helpful for working with the software later.





Tools Installation

Flashing Tools 1. XMC Flasher 2. XMC 4200 Serial Port Drivers Visualization Tool Radar GUI 1. **Firmware Development Tools** 1. DAVE 2. Segger J-Link



Installation Steps:

1. Download the latest version of Radar GUI.



2. Click on "I accept".

Http://download hitex.de/RadarGUL_v1-0-0	, ♀ ♥ 🧔 download.hitex.de	×		
ile Edit View Favorites Tools Help				
ar 🔄 Home 🙀 Gerrit 👄 XMC Docs 🊻 XMC Academy 🥌	DAVE 🕘 pmm_coding 🗿 Teleconferencing 🛽	💇 ePortal 🦉 Jira RFS mmW SW 📄 Git		
Please read the following terms and The finalization of your download is or	d conditions carefully.	such terms and conditions		
By choosing the check box "I accept"	below, you agree to have rea	ad and to be bound by the	terms and conditions set forth belo	W.
 Any purchase order placed hereun authorizations are granted by the c the placing of an order nor its confi 	der and any confirmation the ompetent export control auth rmation creates a legally bin	ereof, if any, is subject to th horities and that no impedia ading sales contract. Only th	e proviso that the required export I ment arises from the applicable exp he delivery of the product by Infine	licenses and other statutory port laws and regulations. Neither on constitutes final acceptance.
In case the required export license hereunder; then the purchase orde	s or other legally required ap r shall be void upon Infineon	oprovals are not granted wi n Technologies' request.	thin six (6) months after the confirm	nation of a purchase order
 You shall neither (a) use any produ- weapons of mass destruction (nucl administrations of such institutions licensing requirements. 	cts, information, software ar ear, biological or chemical) a or other institutions acting of	nd technology delivered by and carriers thereof nor (b) on behalf of them, with prod	Infineon Technologies in or in com supply military, paramilitary, police lucts, information, software or techn	nection with nuclear technology or a, intelligence agencies or civil nology which are subject to export
 By clicking on "I accept" you agree export control laws and regulations developed with or using products, it 	to comply with all applicable as well as the applicable an nformation, software or tech	e national and international nti-terrorism regulations. Yo nnology delivered by Infined	laws and regulations, including but bu also agree not to export, re-expo on Technologies, in violation of any	t not limited to the EU and US ort or transfer any products applicable laws or regulations of

3. Save and install the Deneon Radar GUI executable file

- Radar GUI is preinstalled in Deneon after installation

Note: The initial download page will change in the future, as soon as the IFX webserver is available.

- 4. Click on the Deneon link after installation on your Desktop.
- 5. If a new update is available for the Radar GUI, then please click on the green button labeled "update" appeared right to the start button in the Radar GUI tab. After update, Deneon will restart and then click "Start" button in the Radar GUI tab to run GUI.









6. Radar GUI at the start checks the compatibility of firmware version running in the connected device and will prompt by a message to follow the links to update the firmware.





Default layout of Radar GUI for D2G demo boards is depicted in the following picture. For further help on Radar GUI please click on the help section as shown in the figure below.





Go through the different sections of this Radar GUI help.

ລ	and a second sec	
Help 🛛		
#		-
Deneon Launcher Aadar GUI Radar GUI Application Main Application Window Chart tab view features Radar GUI Perspective Recording and Playback Default path Recording options Recording Data Format	Radar GUI Application The Radar GUI software is JAVA based Graphical User Interface (GUI). It represents graphical support for Infineon's radar devices and enab showing raw and processed data from a device, and provides features for enhanced data display and data graphical analyzes. Main Application Window After Radar GUI application has been launched, the following window will appear (see Figure 1).	les
Recording	Antel Radai Gor application has been launened, the following window will appear (see Figure 1).	
Playback	Rader GUI	
	Frequency Domain 🛱 Time Domain	
	Spectrum 9 1500 100 <	
	30° N/A N/A	-
	۳	



Tools Installation

Flashing Tools

- 1. XMC Flasher
- 2. XMC 4200 serial port drivers

Visualization Tool

1. Radar GUI

Firmware Development Tools

1. DAVE

2. Segger J-Link

Firmware Development Tools 1. Installing DAVE



Installation Steps:

1. If you have a previous version of DAVE installed, check your hard drive location:



C:\Users\"your login name"\Infineon\D_LibraryStore_4.1

If this folder exists, rename or delete it.

2. Download the latest version of DAVE from



www.infineon.com/dave

Scroll down to the "DAVE[™] Download" link.



Download can take up to 1 hour!



Firmware Development Tools 1. Installing DAVE (cont 'd)



- Select either the 32-bit or 64-bit version depending on your system (leave DAVE[™] SDK unchecked as it is not needed)
- 4. Fill out the form and you will get a personal download link





Thank you for your registration!





Your Infineon Community Team

Firmware Development Tools 1. Installing DAVE (cont'd)



- 5. Unzip the downloaded zip file on your hard drive
- 6. Depending on your PC, you may need to have administrator access to install the software.
- 7. Start the executable and make sure to install DAVE, the Library Store and SEGGER drivers (all boxes checked)

💽 D/	AVE™ v4	×
Cu	stom Setup	
S	elect the program features you want installed.	
	■ ✓ DAVE [™] -4.2.4: IDE for component based programming with DAVE [™] APPs ✓ DAVE [™] v4 Library Store: DAVE [™] APPs and other libraries; only if default Library store not installed yet ✓ SEGGER J-Link v5.10I: J-Link debug and USB drivers	
Insig	AllStrate ² < Back Install Can ce	

Firmware Development Tools 2. Installing J-Link



- 8. Accept license agreement and keep clicking "Next" then click "Finish".
- 9. When the Segger JLINK installation starts, click "Next".



Firmware Development Tools 2. Installing J-Link (cont 'd)



10. Keep clicking "Next".

- 11. If something like the screen below appears, click "Select All" (if it is not greyed out) and then "OK".
- 12. Click "Finish".

SEGGER J-Link DLL Updater V5.10		
The following 3rd-party applications using JLinkARM.dll have been found:		
Select All Select None		
elect the ones you would like to replace by this version.	\sim	
n case of doubt, do not replace existing DLL(s).		
Tou can aways perform this operation at a later time via start menta.		ancel



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Demo Distance2Go USB Connections



Demo Distance2Go USB Connections Firmware flash



- 1. Only connect USB to **Debugger** module
 - To flash the Firmware



Demo Distance2Go USB Connections Radar GUI



2. Only connect USB to Main D2G module

- To use Radar GUI

Note: Firmware must be flashed beforehand otherwise flash it using first connection scheme





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Building, Flashing and Debugging Overview



Two ways to proceed from this step to flash the firmware:

- 1. XMC Flasher
- 2. Dave Project



1. Open the XMC flasher .jar file and click on the connect button to select the device name

XMC [™] Flasher	
Connect Disconnect	Select File File:
Connection Status: Not connected Selected Emulator Serial Number: Selected Device Name: Unique Chip ID:	Program Verify
	Erase
infineon	



 Select the Device name form new window opened (XMC4200-256), then click 'OK'.

✓ XMC™ Flasher File Configurations BMI	Target Log About	
Connect	Disconnect Select File	
	Select Device Name to connect	X
Connection Status: Selected Emulator Serial Number: Selected Device Name:	List of Targets:	
Unique Chip ID:	XMC1404-0200	^
	XMC4100-128	
	XMC4104-128 XMC4104-64	
	XMC4104-04 XMC4108-64	
infineon	XMC4200-256	<u> </u>
		Ok



3. If connection is successful, then 'Connection Status' would be connected. You can then see the 'Unique Chip ID' as well.

✓ XMC™ Flasher	
File Configurations BMI Target Log About	
Connect Disconnect	Select File File:
Connection Status:ConnectedSelected Emulator Serial Number:591105238Selected Device Name:XMC4200-256Unique Chip ID:B200004067038A0030A928041	Program Verify Erase
infineon	AND



 After connection is done, select the .hex file (firmware is flashed through .hex file) by clicking on Select File button.





- 5. Navigate to the binary folder containing Radar_D2G_FMCW.hex file and select it.
- 6. Click on 'Open' in the dialogue box.

Select File	Exclusion BANDOD				x
○ ○ ● ▲ «	Workspaces > DAVE-4.3 > Distance2Go > Rad	dar_D2G_FMCW ► Del	bug 🕨	✓ ✓ Search Debug	م
Organize 🔻	New folder				0
•	Name	Date modified	Туре	Size	
Libraries	📙 Algorithm	21/08/2017 15:40	File folder		
A Music	👢 Dave	21/08/2017 15:40	File folder		
Pictures	👢 Distance2Go	21/08/2017 15:40	File folder		
Videos	👢 Driver	21/08/2017 15:40	File folder		
	L HostCommunication	21/08/2017 15:40	File folder		
🔊 Compute	👢 Libraries	21/08/2017 15:40	File folder		
System[👃 Math	21/08/2017 15:40	File folder		
aliassad ≡	L Peripherals	21/08/2017 15:40	File folder		
🔗 swdepo	👃 Startup	21/08/2017 16:28	File folder		
STRES AE	Radar_D2G_FMCW.hex	21/08/2017 16:29	HEX File	264 KB	
Network					
🔷 My Backu 🗸					
	File name: Radar_D2G_FMCW.hex			▼ HEX-Files(*.hex)	•
			-	Open Cancel	



- 7. Successful selection of hex file will list the name of .hex file under `Select File' button.
- 8. Now click 'Program' button.





9. SEGGER progress window will open. It will also verify if the .hex file is flashed or not.





Congrats! You have successfully flashed the firmware using XMC Flasher.



Building, Flashing and Debugging Overview



Two ways to proceed from this step to flash the firmware;

- 1. XMC Flasher
- 2. Dave Project



- 1. Import/Open FW project in DAVE
- 2. Connect Distance2Go kit
- 3. Create Debug Configurations
 - To start flashing and debugging within the DAVE project



- 1. Import/Open Distance2Go firmware project in DAVE
 - a. Navigate to File > Import
 - **b**. Infineon > DAVE Project

	- C:\workspaces\D
File Edit Source Refactor Navigate Search	Project DAVE
New Open File	Alt+Shift+N ►
Close	Ctrl+W
Close All	Ctrl+Shift+W
Save Save As	Ctrl+S
Save All Revert	Ctrl+Shift+S
Move Rename	F2
 Refresh Convert Line Delimiters To 	F5
Print	Ctrl+P
Switch Workspace Restart	۲
🔤 Import	
🚵 Export	
Export Properties	Alt+Enter
Export Properties 1 ifxRadar_D2Go.c [DISTANCE2GO_FW/] 2 main.c [DISTANCE2GO_FW] 3 mcu_xmc.c [DISTANCE2GO_FW//src] 4 mcu_xmc.h [DISTANCE2GO_FW//inc]	Alt+Enter

😜 Import	
Select	Ľ
Select an import source:	
type filter text	
 > >>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>	
? < Back Next > Finish	Cancel



- c. Check "Copy Projects Into Workspace"
- d. Select "Browse" beside "Select Root Directory"

Select Root Directory	Browse
◎ Select Archive File	Browse
Project List:	
	Select All
	Deselect All
	Refresh
Copy Projects Into Workspace	

- infineon
- d. Select `Distance2Go' Folder from location where you have extracted the .zip file of DAVE project. For example, here we have in the USB drive INTENSO/All_Deliverables/Distance2Go

Browse For Folder	×
Select Directory	
🔺 🖳 Computer	^
SystemDisk (C:)	
4 👝 INTENSO (D:)	=
All_Deliverables	
 → ▲ 📜 Distance2Go	
Radar_D2G_FMCW	-
< III	F
Folder: Distance2Go	
Make New Folder OK Cano	el ""



- e. The Project File should appear under Project List. Press 'Finish'.
- f. Check 'Copy Projects Into Workspace'

Select Root Directory	C:\Workspaces\DAVE-4.3\Distance2Go	Browse
Select Archive File		Browse
Project List:		
Radar_D2G_FMCW	(C:\Workspaces\DAVE-4.3\Distance2Go\Radar_D2G_FMCW)	Select
		Deselect
		Refres
Copy Projects Into Wor	rkspace	



> The following should appear. Expand the `C/C++ Projects' dropdown

DAVE CE - Radar_D2G_FMCW/main.c - DAVE™ - C:\Workspace	es\DAVE-4.3\D2GoTest	
File Edit Source Refactor Navigate Search Project DA	VE Window Help	
∷ ६│ ↗ ⊠ ≯: ८: ﷺ 🕇 🔤 🗣 🛛 오 👻	Image: Weight of the second	🗉 DAVE IDE 💊 DAVE CE 🕸 Debug
🗟 C/C++ Projects 🕴 🎦 Project Explorer 📃 🗖	i main.c ≅	
 	2* \file main.c] 6 7* /* 8 **Copyright (C) 2017 Infineon Technologies AG 9 ** All rights reserved. 10 ** 11 ** 12 ** 13 ** This document contains proprietary information of Infineon Technologies AG. 14 ** Passing on and copying of this document, and communication of its contents 15 ** is not permitted without Infineon's prior written authorization. 16 ** 19 /* 20	
APP Dependency Tree 33 to Residual Clear Search filter Clear ADC_MEASUREMENT_ADV_G1 ADC_MEASUREMENT_ADV_G2 CMSIS_DSP_0 DIGITAL_IO_BGT_POWER_ENABLE DIGITAL_IO_PLI_CE DIGITAL_IO_PLI_TRIG1 DIGITAL_IO_PLI_TRIG1 DIGITAL_IO_PL_TRIG1 DIG	<pre>25 #include <dave.h> // Declarations from DAVE Code Generation (includes SFR declaration) 26 27 #include "defines.h" // Contains all the definitions of the header files used in base firmware and Host USB communication 28 29 /* 30</dave.h></pre>	
	4	4
DIGITAL_JO_SPLM_CS_BGT24 DIGITAL_JO_SPLM_CS_PLL DIGITAL_JO_SPLM_CS_PLL DIGITAL_JO_SPLM_DATA DMA_CH_J DMA_CH_J DMA_CH_Q DMA_DOPPLER_CH_I	A APP Dependency 🕌 HW Signal Connectivity 🖾 Console 🕮 🔲 Properties 🦹 Problems	



There are two ways to build a project:

- 1. Build Active Project via toolbar button
- 2. Right-click on 'Active Project' \rightarrow 'Build Project'



DAVE CE - Rada	ar_D2G_FMCW/main.c - DAVE [™] - C:\Workspaces\
File Edit Source	e Refactor Navigate Search Project DAVE
86 🔁 🛛 🌽	i 📸 📩 🔤 🖨 🔳 🛛 🖻 🌒 🔍 🔻 🎋
C/C++ Projects	🛿 🔁 Project Explorer 📃 🗖
	⟨¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬
A 🚰 Radar_	New
	Go Into
⊳ 🗁 Dav	Open in New Window
Dist	Index +
Doc	Build Configurations
⊳ 🗁 Hos _	Make Targets
🛛 🗁 Libr	Build Project
Þ 🗁 Mat	Clean Project
🖻 🗁 Peri 👔	Сору
🖻 🗁 Star 📋	Paste
🖻 庙 cont 🔀	Delete
🖻 庙 defi	Move
🖻 🖻 mai	Rename
🖻 🖻 mici 🛌	Import
🖻 🖻 vers 🌄	Export



Confirm successfully built by looking in the console

👬 APP Dependency 🚠 HW Signal Connectivity 🖳 Console 🛛 🗆 Properties 😰 Problems	0 0 😨 📰 📲 ≕ 🗟 🛃 ≕ 🖬 🚽 🖬 🕶 🗖
CDT Build Console [Radar_D2G_FMCW]	
'Invoking: ARM-GCC Print Size'	
"C:/DAVEv4/DAVE-4.3.2/eclipse/ARM-GCC-49/bin/arm-none-eabi-size"format=berkeley "Radar_D2G_FMCW.elf"	
text data bss dec hex filename	
93938 1916 36200 132054 203d6 Radar_D2G_FMCW.elf	
'Finished building: Radar_D2G_FMCW.siz'	
'Invoking: ARM-GCC Create Listing'	
"C:/DAVEv4/DAVE-4.3.2/eclipse/ARM-GCC-49/bin/arm-none-eabi-objdump" -h -S "Radar_D2G_FMCW.elf" > "Radar_D2G_FMCW.lst"	
'Finished building: Radar_D2G_FMCW.lst'	
17:53:39 Build Finished (took 40s.244ms)	
	P



In order to flash and debug the firmware in DAVE, need to follow these step.

 Select the debug configurations by clicking on the drop down menu of Debug button as shown in Figure below, i.e. `Debug' → `Debug Configurations'





Following debug configurations are opened.

2. Double click on the 'GDB SEGGER J-Link Debugging' to create debug configurations.

C GDB MikroE Debugging C GDB SEGGER J-Link Debugging	 Configure launch settings from this dialog: Press the 'New' button to create a configuration of the selected type. Press the 'Duplicate' button to copy the selected configuration. Press the 'Delete' button to remove the selected configuration. Press the 'Filter' button to configure filtering options. Edit or view an existing configuration by selecting it. Configure launch perspective settings from the 'Perspectives' preference page. 	
Filter matched 2 of 22 items		



Click on the 'Debug' button to flash and debug the DAVE project.

Debug Configurations		×
Create, manage, and run configur	ations	-
Image: Second Secon	Name: Radar_D2G_FMCW Debug Main > Debugger Startup Project: Radar_D2G_FMCW C/C++ Application: Debug\Radar_D2G_FMCW.elf Build (if required) before launching Build configuration: Select Automatically Image: Select Automatically Image: Select Select Select Automatically Image: Select Se	Browse Variables Search Project Browse Disable auto build nfigure Workspace Settings
Filter matched 3 of 23 items		Apply Revert
0		Debug Close



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Radar GUI

1. Click on the Deneon link on your Desktop.



2. Click start button in radar GUI tab

Deneon Launcher - Infineon tools in one place			
XDENEON Se	arch for apps	Q Scan QR Code 🔛	Old Installer Help
My Tools Installable Tools			
2	Į,	S.	
QR Easy Setup	Radar GUI	XMC Flasher	
Start Update	Start	Start	

References



> Infineon BGT24MTR11 – 24Ghz radar IC – Datasheet

<u>https://www.infineon.com/dgdl/Infineon-BGT24MTR11-DS-v03_01-EN.pdf?fileId=5546d46256fb43b301576b97728c07f5</u>

Infineon XMC4200 32-bit ARM Cortex[™]-M4 Microcontroller - Datasheet





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