

DC6688EMT User Manual

User Manual of DC6688EMT Emulator for DC6688 Family

User Manual Document Revision 1.9

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DragonFLASH[™]

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1 Introduction

This document briefly describes the details of the development tool 'Emulator for DC6688 Family (DC6688EMT)'.

1.1 Package

- 1. Emulator
- 2. Power Adaptor(5VDC Output) with USB Cable
- 3. USB Cable
- 4. User Manual
- 5. Software Installation CD

1.2 Useful Links

- 1. EMT Page download latest software installer and user manual http://www.dragonchip.com/TechDoc/DevelopmentTools/EMT.htm
- 2. Technical Website of DC6688 Product Family http://www.dragonchip.com/TechDoc/DC6688.htm

2 Hardware Description

2.1 Control Interface



2.2 IDE Connector

Connect the emulator to the target board through the IDE Connector. A box header/pin header with 20x2 pins and 2.54mm pitch should be put on the target board. Only connect those pins that exist in the part being emulated. The connector pin assignment is listed below:



Warning! Do not supply over 3.6V to VDD pin

Pin	Description	Pin	Description
1	PD3	2	PD2
3	PC3	4	IRI
5	VDD(3.3V)	6	VSS
7	PC2	8	NC
9	PC1	10	NC
11	PC0	12	NC
13	PB7	14	PA0
15	PB6	16	PA1
17	PB5	18	PA2
19	PB4	20	PA3
21	PB3	22	PA4
23	PB2	24	PA5
25	PB1	26	PA6
27	PB0	28	PA7
29	PC5	30	PC4
31	PD1	32	PD0
33	NC	34	PD4
35	NC	36	NC
37	NC	38	NC
39	NC	40	NC

1T/4T Version

Pin	Description	Pin	Description
1	PD3	2	PD2
3	PC3	4	IRI
5	VDD(3.3V)	6	VSS
7	PC2	8	PD1
9	PC1	10	PD0
11	PC0	12	NC
13	PB7	14	PA0
15	PB6	16	PA1
17	PB5	18	PA2
19	PB4	20	PA3
21	PB3	22	PA4
23	PB2	24	PA5
25	PB1	26	PA6
27	PB0	28	PA7
29	PC5	30	PC4
31	PD6	32	PD5
33	NC	34	PD4
35	NC	36	NC
37	NC	38	NC
39	NC	40	NC

FL32T/1TS Version (F30ST / FL32T / FL64T / FL96T)

Pin	Description	Pin	Description
1	NC	2	NC
3	NC	4	NC
5	VDD(3.3V)	6	VSS
7	PC2	8	NC
9	PC1	10	NC
11	PC0	12	NC
13	PB7	14	PA0
15	NC	16	PA1
17	NC	18	PA2
19	NC	20	PA3
21	PB3	22	PA4
23	PB2	24	PA5
25	PB1	26	PA6
27	PB0	28	PA7
29	NC	30	NC
31	NC	32	NC
33	NC	34	NC
35	NC	36	NC
37	NC	38	NC
39	NC	40	NC

F2R Version

Pin	Description	Pin	Description
1	NC	2	NC
3	PC3	4	NC
5	VDD(3.3V)	6	VSS
7	PC2	8	NC
9	PC1	10	NC
11	PC0	12	NC
13	PB7	14	PA0
15	NC	16	PA1
17	NC	18	PA2
19	NC	20	PA3
21	PB3	22	PA4
23	PB2	24	PA5
25	PB1	26	PA6
27	PB0	28	PA7
29	NC	30	PC4
31	NC	32	NC
33	NC	34	NC
35	NC	36	NC
37	NC	38	NC
39	NC	40	NC

F2T Version

3 Software Installation

Install the following components in order:

1) Keil PK51 Prof. Developers Kit (recommend v9.05 or v9.06)

- 2) Dragonchip 'DC_TOOL_Rev2.4.6.exe' or higher which includes the following items:
 - a. Source Code Template
 - b. DragonICE Driver
 - c. Software SLP

3.1 Source Code Template

This useful tool can help to generate Keil Project Templates for various DC6688 products with all necessary project settings for using emulators. User can either start the development with the generated source code template or compare the project settings with their existing Keil project.

🔇 Source Code Template						
Device						
Family DC6688	•					
Series DC6688FLE	•					
Part No. DC6688FL96E/ET	-					
Language type © C						
Version 1.0.1 Copyright 2012 Dragonchip Ltd. All rights reserved. Ready						

3.2 Keil Project Settings

All necessary Keil Project Settings are listed in this section.

1) Enter 'Options for Target'



2) 'Device' Tab - Select DC6688 part from the list.

V Options for Target 'Target_2'					
Device Target Output Listing Us Database: Dragonchip Product Vendor: DC6688FLE Device: DC6688FL96E/ET Toolset: C51 DC6688FLB DC6688FL8 DC6688FL96E/ET DC6688FL96E/ET DC6688FSB DC6688FSE DC6688FSE DC6688FSE DC6688FSX	er C51 AX51 LX51 Locate LX51 Misc Debug Utilities s ✓ Use Extended Linker (LX51) instead of BL51 ✓ Use Extended Assembler (AX51) instead of A51 Enhanced 8051 8-bit Core with on-Chip Debugger(OCD). Its architecture is 3 times faster compared to legacy 80C51, area optimized, and low power. Main features and peripherals: up to 95KB on-chip FLASH (CODE+DATA), 256B+2KB on-chip RAM, 8-bit stack pointer, 2 DPTRs, Two-level priority levels. up to 271/O lines, 3 Timers/Counters, 1 24-bit Timer/Counter, Watchdog timer, 2 UARTs, SPI - Serial Peripheral Interface (Master) IZC - Inter-Integrated Circuit (Master)				
OK Cancel Defaults Help					

3) 'Target' Tab – Always check the 2 boxes for ROM and XRAM setting.



Note: The Clock frequency in this page is invalid setting. The setting should be selected in 'Programming Setting' instead.

4) 'Debug' Tab - Follow the settings shown below:



5) 'Utilities' Tab - Follow the settings shown below:

🕱 Options for Target 'Target_2'							
Device Target Output Listing User C51 AX51 LX51 Locate LX51 Misc Debug Utilities							
Configure Flash Menu Command							
Use Target Driver for Flash Programming							
DragonICE Driver Settings IV Update Target before Debugging							
Init File:Edit							
C Use External Tool for Flash Programming							
Command:							
Arguments:							
Run Independent							

6) Click 'Settings' in 'Utilities' tab to enter Programming Setting. Input relevant settings for programming the emulator chip.

	Programming Settings
	Magent DragonFLASH™
	Device Family DC6688 Series DC6688FLE Part No. DC6688FL96E/ET
and Clock	SLP Board Clock Frequency DC6688EDP-USB Rev2.0 Ilenancy
Ĺ	Firmware
Soloct paths of	Program Flash Size (KB) 95
Firmware files	Program File Compiler Output-
(All these files should be put in the Keil	Fill Unused Byte: O UXUU Model: Model: Wead Lock Data File -Not Specified (Optional)- Browse 6130:0100:FE00
project folder)	Fill Unused Byte: C UxUU @ Uxt+F Read Lock Custom Info C:\Documents and Settings\Danny Ho\桌面\SourceCode\Ct Browse OK
	Model (2 bytes) – configure by Custom Info file Version (2 bytes) – configure by Custom Info file Checksum (2 bytes) – generate automatically from Program file

Note: Program File does not need to select path.

4 View Memory Content

The memory content can be viewed in the Keil Memory Windows during debug.

Memory	Size	Memory Type	Start Address	End Address	Example
Program Flash	Up to 2000B	code	0x0000	0x07CF	C:0x00000
EEPROM	16 bytes	xdata	0x100	0x10F	X:0x0100
Internal SRAM	64 bytes	idata	0x00	0x3F	l:0x00
SFR	128 bytes	data	0x80	0xFF	D:0x80
XFR	256 bytes	xdata	0x00	0xFF	X:0x0000

DC6688FLB

Memory	Size	Memory Type	Start Address	End Address	Example
Program Flash					
FL16B	Up to 12KB	code	0x0000	0x2FFF	C:0x0000
FL32B	Up to 24KB	code	0x0000	0x5FFF	C:0x0000
Data Flash					
FL16B	4KB	code	0x6000	0x6FFF	C:0x6FFF
FL32B	8KB	code	0x6000	0x7FFF	C:0x6000
Internal SRAM	256 bytes	idata	0x00	0xFF	l:0x00
Expanded SRAM	2KB	xdata	0x0200	0x09FF	X:0x0200
SFR	128 bytes	data	0x80	0xFF	D:0x80
XFR	256 bytes	xdata	0x00	0xFF	X:0x0000

DC6688FLX/FLE/FLT/FL96TE

Memory	Size	Memory Type	Start Address	End Address	Example
Program/Data Flash					
FL32T	Up to 31KB			0x7BFF	
FLX/FL64T	Up to 64KB	code	0x0000	0xFFFF	C:0x0000
FLE/FL96T	Up to 95KB			0x17BFF	
FL96TE	Up to 95KB			0x17BFF	
Internal SRAM	256 bytes	idata	0x00	0xFF	l:0x00
Expanded SRAM					
FLX/FLE	2KB		0x0200	0x09FF	X:0x0200
FL32T	2KB	xdata	0x0200	0x09FF	X:0x0200
FL64T/FL96T	3KB		0x0200	0x0DFF	X:0x0200
FL96TE	3KB		0x8200	0x8DFF	X:0x8200
SFR	128 bytes	data	0x80	0xFF	D:0x80
XFR	256 bytes	xdata	0x00	0xFF	X:0x0000

DC6688FSB/FSX/FSE/FST

Memory	Size	Memory Type	Start Address	End Address	Example
Program Flash FSB FST FSX/FSE	Up to 30KB Up to 29.5KB Up to 62KB	code	0x0000	0x77FF 0x75FF 0xF7FF	C:0x0000
EEPROM	64 bytes	xdata	0x100	0x13F	X:0x0100
Internal SRAM	256 bytes	idata	0x00	0xFF	l:0x00
SFR	128 bytes	data	0x80	0xFF	D:0x80
XFR	256 bytes	xdata	0x00	0xFF	X:0x0000

5 Supplementary Information

5.1 Limitations 5.1.1 Keil IDE

1) DragonICE does not support the following features.



5.1.2 Hardware

- 1. <u>4T version emulator</u>
 - 1.1. Instruction Timing

The instruction process time in emulator is slightly different from that of IC. If the timing accuracy is critical for specific application, use timer instead of software delay.

1.2.<u>UART0</u>

Baud-rate generator cannot use Timer 2.

1.3.<u>No UART1</u>

1.4. I2C interrupt address

Emulator uses interrupt number 11 (0x005B) while IC uses interrupt number 10 (0x0053).

2. Voltage Supply

The voltage supply to emulator chip is at 3.3V (VDD). User should only do emulation at this voltage level.

3. Peripherals

When the emulator is stopped in debugging platform, all the running peripherals (e.g. timer 2) will still keep running. Hence, the peripherals will be out of synchronization with the code instruction.

 <u>Counter A in one shot mode</u> In one shot mode (CAM = 0), this bit have to reset to 0 every time before setting CAS = 1.

5.2 Troubleshooting

1) Driver Installation

After installing the DragonICE driver, plug the emulator to PC, the driver will be installed automatically. In case the PC fails to locate the driver, select the driver path "C:\WINDOWS\system32" manually.

- <u>Upgrade Keil Project</u>
 When uv2/ uv3 projects are closed, user can choose to upgrade the project to an uv4 project (*.uvproj).
- 3) Complie Keil Project

Always compile the code before entering the Keil debugging environment. Otherwise the emulated flash content may not be updated and the debug action may not match with the displayed code.

For example,

a) Cursor jumped to a wrong code location in debugger.

b) 'Step' instruction wrong executed as 'Free Run' instruction.

6 Revision History

Document Rev No.	Issued Date	Section	Page	Description	Edited by	Reviewed by
1.0	Aug, 2012			First release	Celia Ki	Danny Ho
1.1	Oct, 2012			Revised section 5.1.2	Danny Ho	Celia Ki
				Revised section 3.2		
1.2	Apr, 2013	5.1.2		Add item about I2C	Danny Ho	Celia Ki
1.3	Sept, 2013	All		Add F2R emulator	Danny Ho	Celia Ki
1.4	Dec, 2013	1.1 2.2		Revise ordering information Revise IDE connector description	Celia Ki	Danny Ho
1.5	June, 2014	1.1		Remove ordering information	Danny Ho	Celia Ki
		4		Added FL32T / FST		
1.6	July, 2014	2.2		Added FL32T pin assignment	Danny Ho	Celia Ki
1.7	July, 2014	2.2, 4		Added FST description	Danny Ho	Philip Hung
1.8	Oct, 2014	2.2, 4		Added FL64T/FL96T description	Danny Ho	Philip Hung
1.9	Oct, 2014	2.2, 4		Added F2STR	Danny Ho	Philip Hung

The following table shows the revision history for this document.

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