

DMON and the AGGA-4

The move towards chips containing many functional units as well as one or more CPUs poses new challenges for developers. The complexity of these 'Systems on Chip', with perhaps thirty or forty functional units of many different types can make what is happening difficult to visualize or understand. Interactions can no longer be monitored using traditional tools such as in-circuit emulators and logic analyzers as the units are within one chip, and the already difficult task of software debugging becomes even more challenging and time consuming. DMON was created to help address these problems and to be the system of choice for visualizing, monitoring and debugging SoCs.

DMON can be run on PCs and Unix workstations. It connects to a debug unit on the SoC that allows it access the SoC's internal bus, and can use UART, Ethernet, USB, JTAG and SpaceWire debug links. It takes a GUI based approach, providing an overall view of all units in the system and their states. The user can open detail windows for any units of interest, displaying information in real time and drilling down to read and perhaps modify a fully documented version of a unit's registers. Programs can be downloaded and debugged using powerful software debugging aids and data monitoring facilities. A client server configuration allows the user be located remotely, linked over an SSL secured Internet connection to the DMON server connected to the SoC. DMON automatically detects the devices on an SoC if plug-and-play information is present, or can use a configuration file. Its library of known CPUs and other functional units is large and continually expanding, and can be added to by the user to support user defined units, making it well suited for monitoring and debugging all kinds of heterogeneous systems. Command entry and scripting can be done using DMON's own commands, TCL, and Python. DMON places minimal demands on the SoC, stealing some bus cycles, and has no SoC memory footprint.

DMON was originally developed for the market in China, then extended with support from ESA (DMON2) under contract No. 4000112849/14/NL, and subsequently developed under contract from ESA to support the AGGA-4. The tool can be downloaded from www.ocetechnology.com

File Edit Connect Monitor Tasks Configuration Language Help

0x00000000 Timer 2 Count

0x00000200 SPI0 Status en...

0x00000000 Memory OR

MemCF1 0x177102E

MemCF2 0x01000284

MemCF3 0x01000200

Console InternalLog TUI Python Batch

13: ESA : Spacewire Interface

14: ESA : Spacewire Interface

15: ESA : RESFIRM Status and Control

16: ESA : LB092 Configuration Register

17: ESA : Serial General Purpose Output

18: ESA : MII Bus BT Controller

19: ESA : AOSM4 ADS to APB Bridge

20: ESA : Serial Peripheral Interface

21: ESA : Communication Interrupt Controller

22: ESA : LB092 Interrupt Controller

23: ESA : LB092 ADS Status And Failing Registers

24: ESA : LB092 Input/Output

25: ESA : General Purpose Input Output

26: ESA : Debug UART/SW

27: ESA : UART with DMA

28: ESA : UART with DMA

29: ESA : Reset Service

30: ESA : Watchdog

31: ESA : AOSM4 Version

Target Initialised

WCF CPU flash memory

Runtime Path:

Initialised from C:\Projects\OCR\trunk\deon_product\com.own.deon\

DNMR installed at C:\Projects\OCR\trunk\deon_product\com.own.deon\

No license information available

Please input command and parameters

Parameters can involve symbols, hex, decimal, octal and binary numbers

Allowed operators are +, -, /, *, %, ^, ~, &, !, (,)

Unary + or - at start of parameter must be preceded by comma

DEON >

CH Status

Channel#	Active	Mask	Priority	Pending	InputSel	CarSel	CodeSel
Channel_0	disabled	Pending Register	Set Low	No	first bypass of DQPS (DM 0)	Local	Local
Channel_1	disabled	Pending Register	Set Low	No	first bypass of DQPS (DM 0)	Local	Local
Channel_2	disabled	Pending Register	Set Low	No	first bypass of DQPS (DM 0)	Local	Local
Channel_3	disabled	Pending Register	Set Low	No	first bypass of DQPS (DM 0)	Local	Local
Channel_4	disabled	Pending Register	Set Low	No	first bypass of DQPS (DM 0)	Local	Local
Channel_5	disabled	Pending Register	Set Low	No	first bypass of DQPS (DM 0)	Local	Local
Channel_6	disabled	Pending Register	Set Low	No	first bypass of DQPS (DM 0)	Local	Local
Channel_7	disabled	Pending Register	Set Low	No	first bypass of DQPS (DM 0)	Local	Local
Channel_8	disabled	Pending Register	Set Low	No	first bypass of DQPS (DM 0)	Local	Local
Channel_9	disabled	Pending Register	Set Low	No	first bypass of DQPS (DM 0)	Local	Local

IM

Register Value: 0x00000000

Mode Input Format Com... [2:1] 0 0

IFCFormality SynchMode [2:0] 0 0

DDCMainInSel local [1] 0

DDCMainInSel local [0] 0

Register Value: 0x00000000

Ino 0 [2:0] [2:0] 0 0 0 0 0 0

Register Value: 0x00000000

Thread0 0 [0:0] [0:0] 0 0 0 0 0 0

Thread1 0 [0:1] [0:1] 0 0 0 0 0 0

Thread2 0 [20:20] [20:20] 0 0 0 0 0 0

Register Value: 0x00000000

Ino 0 [2:0] [2:0] 0 0 0 0 0 0

Register Value: 0x00000000

Thread0 0 [0:0] [0:0] 0 0 0 0 0 0

0x00000000 Reset Status Reg...

0x00000200 UART Transm...

UART Loopback

Enable Disable

Reset UART

System Overview

CH Config

Configuration Window for Channel 0

Channel 0 Disabled Save Copy Save Load Printlog

InputSel	CodeSel	CarSel	CarSelator	Adress	DMA
Register Value: 0x00000000	Trigger Integration Epoch [0] 0				
StartOFFboothSel	shft register 1 of v... [1:0] 0 0				
StartVPCO	do nothing [3] 0				
StartCSE1	do nothing [4] 0				
StartCSE2	do nothing [5] 0				
ResetSCSE1	do nothing [6] 0				
ResetSCSE2	do nothing [7] 0				
VPCOLongIn	2x 14 bit [8] 0				
GPSLSen	one reloaded [9] 0				