

Firmware updates

Firmware updates available here:

<http://int.rigol.com/Support/SoftDownload/3>

Filename: DSG800_UpdateFile.sys

Format has some similarities with GEL files used to update Rigol oscilloscopes

<https://www.eevblog.com/forum/testgear/rigol-dsxxxx-gel-firmware-file-format/>

- offset -	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	0123456789ABCDEF
0x00000000	599c	4655	7379	7330	4000	0000	7802	0000	Y.FU	sys0	@...	x...					
0x00000010	6461	7430	0200	0000	4453	4738	4100	3030	dat0	....	DSG8A	.00					
0x00000020	3030	3030	3030	3030	0000	0000	0000	0000	00000000	.....						
0x00000030	0000	0000	0000	0000	0100	0000	0000	0000	.....							
0x00000040	4453	4738	4100	3030	3030	3030	3030	3030	DSG8A	.0000000000							
0x00000050	0100	0000	0800	0000	7802	0000	496e	6465	.....	x...	Inde						
0x00000060	7800	3030	0000	1006	1002	0000	0028	0000	x.00	.....	(..					
0x00000070	696e	6465	782e	6269	6e00	3030	3030	3030	index	.bin	.000000						
0x00000080	3030	3030	3030	3030	3030	3030	3030	3030	0000000000000000								
0x00000090	0000	0000	55aa	9966	6699	aa55	8804	0000	....	U..ff..U	....					
0x000000a0	5365	7475	7000	3030	0000	f806	9c7e	0400	Setup	.00	.....	~..				
0x000000b0	0000	1000	444f	5259	5f58	4d4c	2e62	696e	....	DORY_XML	.bin						
0x000000c0	0030	3030	3030	3030	3030	3030	3030	3030	.0000000000000000								
0x000000d0	3030	3030	0000	0000	00aa	9966	6699	aa55	0000	.....	ff..U						
0x000000e0	2483	0400	4670	6761	0030	3030	0000	9006	\$....	Fpga	.000	....				
0x000000f0	02e8	0500	0000	0800	766d	752e	7262	6600	.....	vmu	.rbf						
0x00000100	3030	3030	3030	3030	3030	3030	3030	3030	0000000000000000								
0x00000110	3030	3030	3030	3030	0000	0000	01aa	9966	00000000	.....	f						
0x00000120	6699	aa55	286b	0a00	5265	7300	3030	3030	f..U	(k..	Res	.0000					
0x00000130	0000	d806	907c	1700	0000	2000	5265	7344	.....	|....	.ResD						
0x00000140	6174	612e	6269	6e00	3030	3030	3030	3030	ata	.bin	.00000000						
0x00000150	3030	3030	3030	3030	3030	3030	0000	0000	00000000000000	....						
0x00000160	02aa	9966	6699	aa55	b8e7	2100	4670	6761	...ff..U	...!	Fpga						
0x00000170	0030	3030	0000	8006	fc99	0b00	0000	1000	.000	.....						
0x00000180	646f	7279	5f77	7261	7070	6572	2e62	696e	dory_wrapper	.bin							
0x00000190	0030	3030	3030	3030	3030	3030	3030	3030	.0000000000000000								
0x000001a0	0000	0000	03aa	9966	6699	aa55	b481	2d00	.....	ff..U	..-						
0x000001b0	4473	7050	726f	0030	0000	2006	957c	2b00	DspPro	.0..	..|+						
0x000001c0	0000	5000	446f	7279	4170	706c	6963	6174	..P	.DoryApplicat							
0x000001d0	696f	6e2e	7369	6d00	3030	3030	3030	3030	ion	.sim	.00000000						
0x000001e0	3030	3030	0000	0000	04aa	9966	6699	aa55	0000	.....	ff..U						
0x000001f0	4cfe	5800	4669	7245	7261	0030	3900	b006	L.X	.FirEra	.09...						
0x00000200	4600	0000	5000	0000	4669	7273	7445	7261	F...P...FirstEra								
0x00000210	7365	2e62	696e	0030	3030	3030	3030	3030	se	.bin	.00000000						
0x00000220	3030	3030	3030	3030	0000	0000	09aa	9966	00000000	.....	f						
0x00000230	6699	aa55	94fe	5800	7665	7200	3030	3030	f..U	..X	.ver	.0000					
0x00000240	2200	b006	4500	0000	0000	2000	5665	7273	"...E	.....	.Vers						
0x00000250	696f	6e2e	6269	6e00	3030	3030	3030	3030	ion	.bin	.00000000						
0x00000260	3030	3030	3030	3030	3030	3030	0000	0000	00000000000000	....						

0x00000270	9999 9999 9999 aa55		.....U
0x00000278	6b5f d3a8 6269 6e30	4000 0000 1002 0000	k_...bin0@.....
0x00000288	6461 7430 0200 0000	4453 4738 4100 3030	dat0....DSG8A.00
0x00000298	3030 3030 3030 3030	0000 0000 0000 0000	00000000.....
0x000002a8	0000 0000 0000 0000	0100 0000 0000 0000	.....
0x000002b8	55aa 9966 6699 aa55	0700 0000 0000 0000	U..ff..U.....
0x000002c8	5365 7475 7000 3030	0000 f806 9c7e 0400	Setup.00.....~..
0x000002d8	0000 1000 444f 5259	5f58 4d4c 2e62 696e	....DORY_XML.bin
0x000002e8	0030 3030 3030 3030	3030 3030 3030 3030	.0000000000000000
0x000002f8	3030 3030 0000 0000	00aa 9966 6699 aa55	0000.....ff..U
0x00000308	4670 6761 0030 3030	0000 9006 02e8 0500	Fpga.000.....
0x00000318	0000 0800 766d 752e	7262 6600 3030 3030	....vmu.rbf.0000
0x00000328	3030 3030 3030 3030	3030 3030 3030 3030	0000000000000000
0x00000338	3030 3030 0000 0000	01aa 9966 6699 aa55	0000.....ff..U
0x00000348	5265 7300 3030 3030	0000 d806 907c 1700	Res.0000.....|..
0x00000358	0000 2000 5265 7344	6174 612e 6269 6e00	.. .ResData.bin.
0x00000368	3030 3030 3030 3030	3030 3030 3030 3030	0000000000000000
0x00000488	84f6 6c19 6269 6e30	4000 0000 9c7e 0400	..l..bin0@.....~..
0x00000498	6461 7430 0100 0000	4453 4738 4100 3030	dat0....DSG8A.00
0x000004a8	3030 3030 3030 3030	0000 0000 0000 0000	00000000.....
0x000004b8	0000 0000 0000 0000	0300 0000 0000 0000	.....
0x000004c8	3c3f 786d 6c20 7665	7273 696f 6e3d 2231	<?xml version="1
0x000004d8	2e30 2220 656e 636f	6469 6e67 3d22 7574	.0" encoding="ut
0x000004e8	662d 3822 3f3e 3c43	6f6e 6669 6754 7970	f-8"?><ConfigTyp
0x000004f8	653e 3c55 4954 3e3c	4944 2049 443d 2230	e><UIT><ID ID="0
0x00000508	3130 3030 3030 3030	3030 3030 3030 3022	1000000000000000"
0x00000518	3e3c 4374 726c 5479	7065 3e47 7569 5769	><CtrlType>GuiWi
0x00000528	6e3c 2f43 7472 6c54	7970 653e 3c42 6b4d	n</CtrlType><BkM
0x00000538	6f64 653e 303c 2f42	6b4d 6f64 653e 3c62	ode>0</BkMode><b
0x00000548	5374 6174 653e 313c	2f62 5374 6174 653e	State>1</bState>
0x00000558	3c52 6563 743e 303b	303b 3332 303b 3234	<Rect>0;0;320;24
0x00000568	303c 2f52 6563 743e	3c2f 4944 3e3c 4944	0</Rect></ID><ID
0x00000578	2049 443d 2230 3230	3030 3030 3030 3030	ID="020000000000
0x00048324	e157 7ec8 7262 6630	4000 0000 02e8 0500	.W~..rbf0@.....
0x00048334	6461 7430 0100 0000	4453 4738 4100 3030	dat0....DSG8A.00
0x00048344	3030 3030 3030 3030	0000 0000 0000 0000	00000000.....
0x00048354	0000 0000 0000 0000	0300 0000 0000 0000	.....
0x00048364	ffff ffff ffff ffff	ffff ffff ffff ffff	.....
0x00048374	ffff ffff ffff ffff	ffff ffff ffff ffff	.....
0x00048384	6af7 f7f7 f7f7 f7f3	fbf3 f9fb f9f1 f9f9	j.....
0x00048394	fdfd f9fb fbf3 f9f9	fbff ffff fdff f9f9	.....
0x000483a4	fdfd fdff f9fd f9fb	fbff 27ff ffff ffff'
0x000483b4	ffff ffff ffff ffff	ffff ffff ffff ffff	.....
0x000483c4	ffff ffff ffff ffff	ffff ffff ffff ffff	.....
0x000483d4	ffff ffff ffff ffff	ffff ffff ffff ffff	.....
0x000483e4	ffff ffff ffff ffff	ffff ffff ffff ffff	.....
0x000483f4	ffff ffff ffff ffff	ffff ffff ffff ffff	.....
0x00048404	ffff ffff ffff ffff	ffff ffff ffff ffff	.....

```

0x00048414  ffff ffff ffff ffff ffff ffff ffff ffff .....
0x002d81b4  858e 370a 7369 6d30 4000 0000 957c 2b00 ..7. sim0@....|+.
0x002d81c4  6461 7430 0100 0000 4453 4738 4100 3030 dat0.... DSG8A.00
0x002d81d4  3030 3030 3030 3030 0000 0000 0000 0000 00000000.....
0x002d81e4  0000 0000 0000 0000 0300 0000 0000 0000 .....
0x002d81f4  7f49 4152 0000 0000 002b 7c24 0000 0240 .IAR.....+|$...@
0x002d8204  2200 4c01 0101 0000 0000 0000 0000 0040 ".L.....@
0x002d8214  18f0 9fe5 18f0 9fe5 18f0 9fe5 18f0 9fe5 .....
0x002d8224  18f0 9fe5 ffff ffff 18f0 9fe5 18f0 9fe5 .....
0x002d8234  4c00 2240 189f 0840 509f 0840 889f 0840 L."@...@P...@...@
0x002d8244  c09f 0840 ffff ffff 30a0 0840 70a0 0840 ...@....0...@p...@
0x002d8254  0101 0000 4000 0000 002b 7be4 0050 2de9 ....@.....+{..P-.
0x002d8264  6900 a0e3 0000 8de5 3730 a0e3 403f 83e3 i.....70...@?...
0x002d8274  3e20 a0e3 0910 a0e3 b401 9fe5 769c 00fb > .....v...
0x002d8284  8300 a0e3 0000 8de5 3730 a0e3 403f 83e3 .....70...@?...
0x002d8294  5820 a0e3 0910 a0e3 9801 9fe5 6e9c 00fb X .....n...
0x002d82a4  9d00 a0e3 0000 8de5 3730 a0e3 403f 83e3 .....70...@?...

```

0x00: Section CRC

0x0c: Section size

0x04: data type? sys (header section), bin, rbf (FPGA), sim (IAR)

0x18: DSG8A (padded to 16 bytes with 0x30)

0x38: Section type (1 system? 3 file?)

0x0018, 0x0040, 0x0290, ...: DSG8A (padded to 16 bytes with 0x30) Magic to mark start of a block?

Index:

0x0014: Number of entries (files) in

Section start

Dory Application file

Extract application file

Section/file: DoryApplication.sim

```

0x002d81b4  858e 370a 7369 6d30 4000 0000 957c 2b00 ..7. sim0@....|+.
0x002d81c4  6461 7430 0100 0000 4453 4738 4100 3030 dat0.... DSG8A.00
0x002d81d4  3030 3030 3030 3030 0000 0000 0000 0000 00000000.....
0x002d81e4  0000 0000 0000 0000 0300 0000 0000 0000 .....
0x002d81f4  7f49 4152 0000 0000 002b 7c24 0000 0240 .IAR.....+|$...@
0x002d8204  2200 4c01 0101 0000 0000 0000 0000 0040 ".L.....@
0x002d8214  18f0 9fe5 18f0 9fe5 18f0 9fe5 18f0 9fe5 .....

```

Extract application file (slow):

dd skip=2982388 count=2849941 if=~ /share/DSG800_UpdateFile.sys of=./DoryApplication.sim bs=1

IAR Simple-Code file format

http://netstorage.iar.com/SuppDB/Public/UPDINFO/006220/simple_code.htm

0x002d81f4	7f49	4152	0000	0000	002b	7c24	0000	0240	.IAR.....+|\$...@
0x002d8204	2200	4c01	0101	0000	0000	0000	0000	0040	".L.....@
0x002d8214	18f0	9fe5	18f0	9fe5	18f0	9fe5	18f0	9fe5	.....
0x002d8224	18f0	9fe5	ffff	ffff	18f0	9fe5	18f0	9fe5	.....
0x002d8234	4c00	2240	189f	0840	509f	0840	889f	0840	L."@...@P...@
0x002d8244	c09f	0840	ffff	ffff	30a0	0840	70a0	0840	...@....0...@p...@
0x002d8254	0101	0000	4000	0000	002b	7be4	0050	2de9	....@....+{..P-
0x002d8264	6900	a0e3	0000	8de5	3730	a0e3	403f	83e3	i.....70...@?..
0x002d8274	3e20	a0e3	0910	a0e3	b401	9fe5	769c	00fb	>v...
0x002d8284	8300	a0e3	0000	8de5	3730	a0e3	403f	83e3	.....70...@?..
0x002d8294	5820	a0e3	0910	a0e3	9801	9fe5	6e9c	00fb	X .....n...
0x002d82a4	9d00	a0e3	0000	8de5	3730	a0e3	403f	83e3	.....70...@?..

Magic: .IAR

Flags: 0000 0000 (all reserved)

Program bytes: 0x002b7c24

Version: 0000

Records

Type: 02 Entry record (program entry point)

Entry address: 4022004c

Segment type: 01

Type: 01 Data record

Segment type: 01

Record flags: 0000

Start address: 0000 0000

Number of bytes: 0000 0040

Data bytes (@ 0x002d8214)

Type: 01 Data record

Segment: type: 01

Record flags: 0000

Start address: 4000 0000

Number of bytes: 002b 7be4

Data bytes (@ 0x002d825c)

Length check: 0x2b7be4 + 0x40 = 0x2b7c24

Extract vector table:

dd skip=32 count=64 if=./DoryApplication.simo of=./fw-vectors-0x00000000.bin bs=1

Extract application:

```
dd skip=108 count=2849764 if=./DoryApplication.simo of=./fw-app-0x40000000.bin bs=1
```