



# Pressure Control System Report

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# System Architecture

## CASE STUDY

Pressure Controller Assumptions:

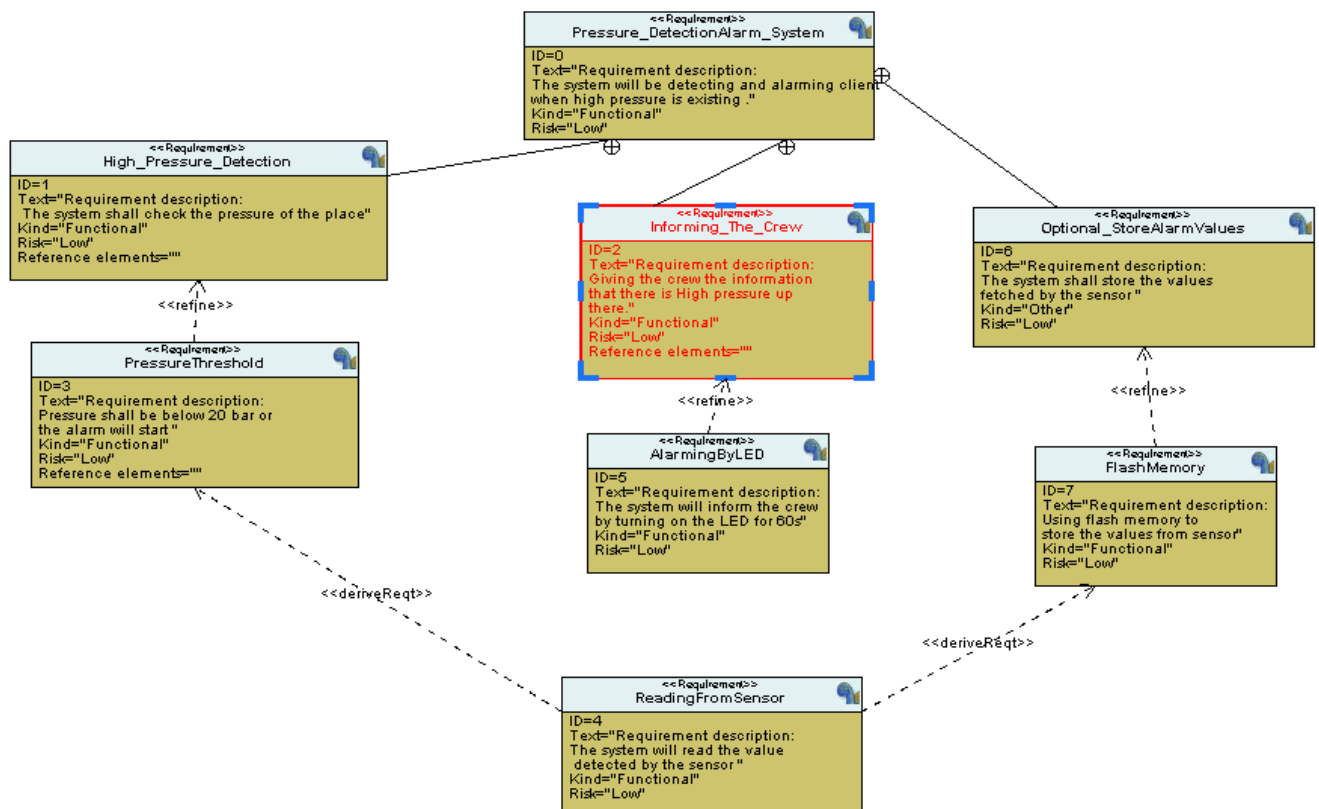
- 1- The controller set up and shutdown procedures are not modeled
- 2- The controller maintenance is not modeled
- 3- The pressure sensor never fails ∪ The alarm never fails
- 4- The controller never faces power cut
- 5- The "keep track of measured value" option is not modeled in this version of the design

## METHOD

Waterfall Modelling.

## REQUIREMENT

Requirement Diagram

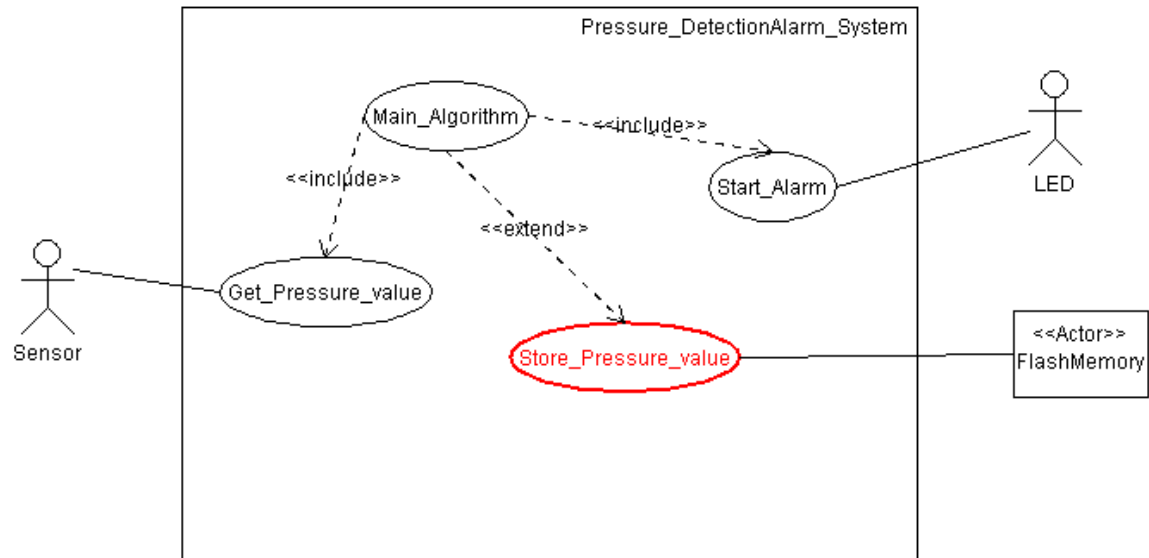


## SPACE EXPLORATION

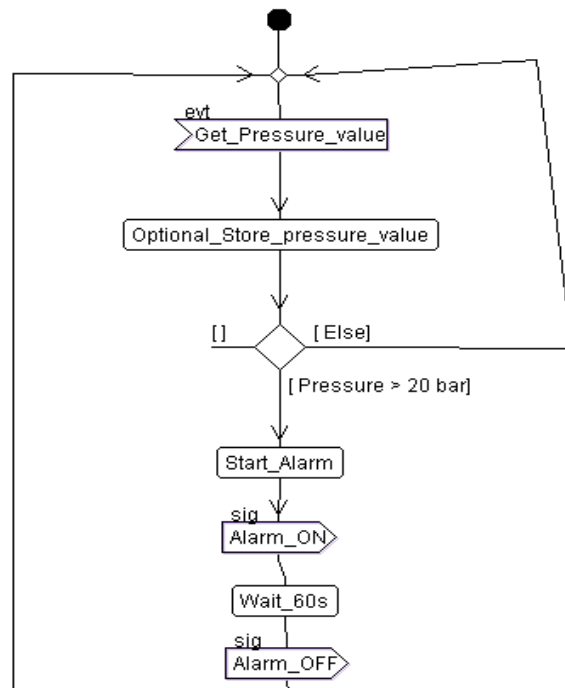
Working on STM32F103C6

## SYSTEM ANALYSIS

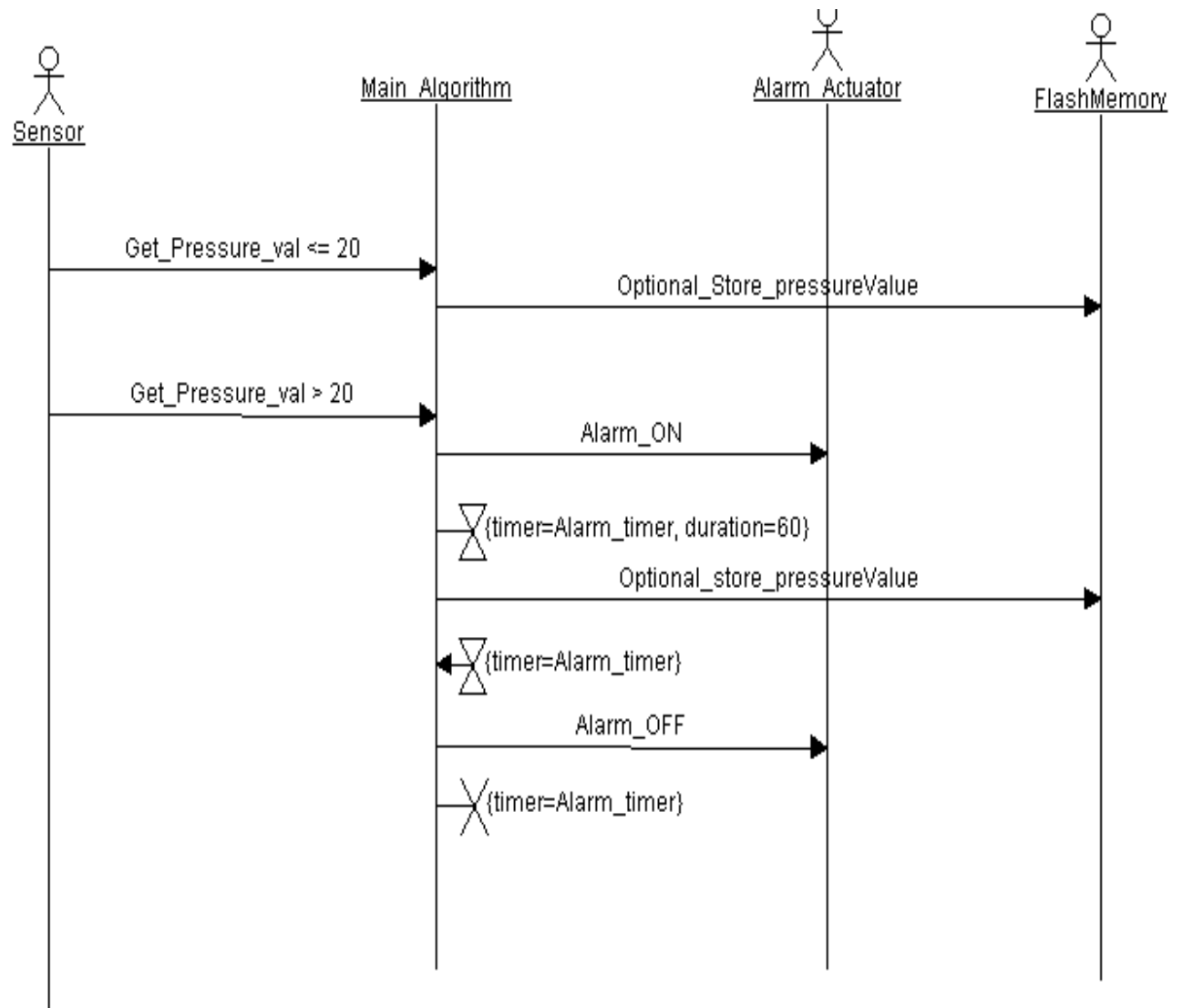
### USE CASE DIAGRAM



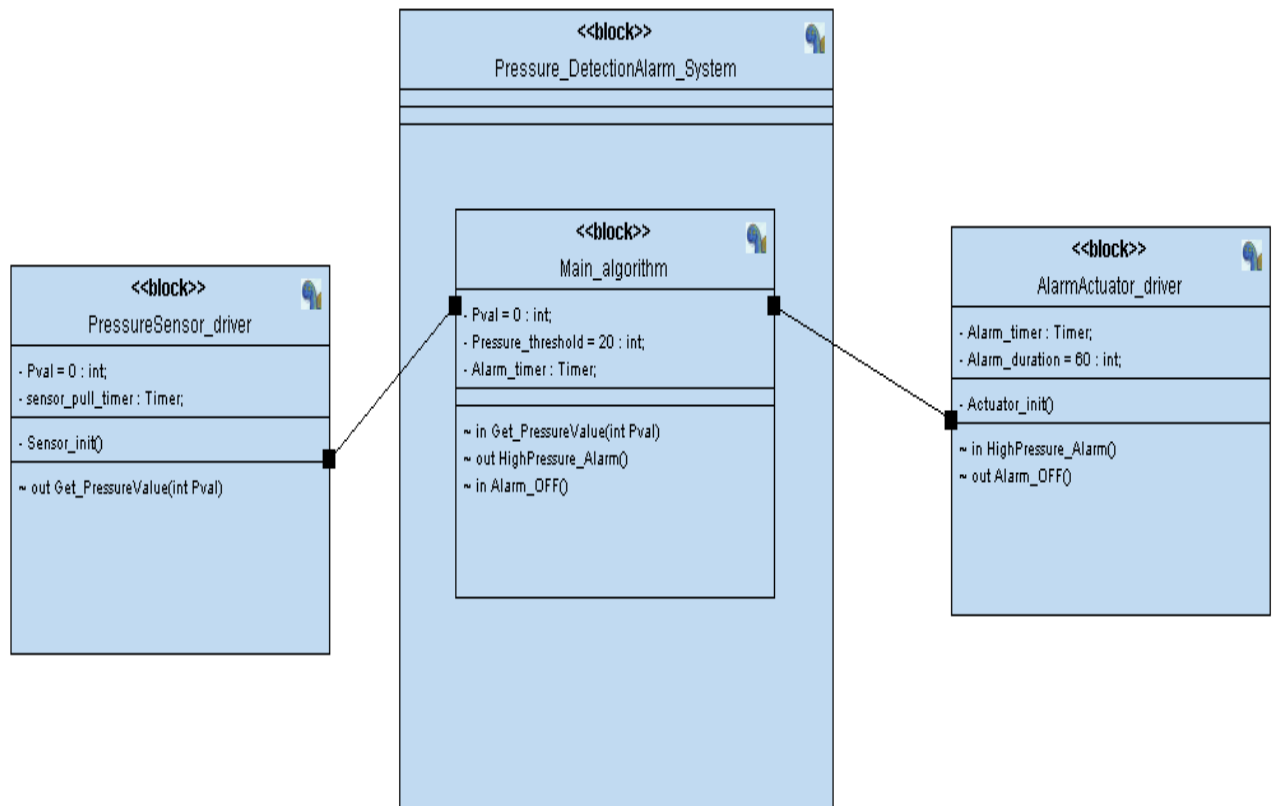
### ACTIVITY DIAGRAM

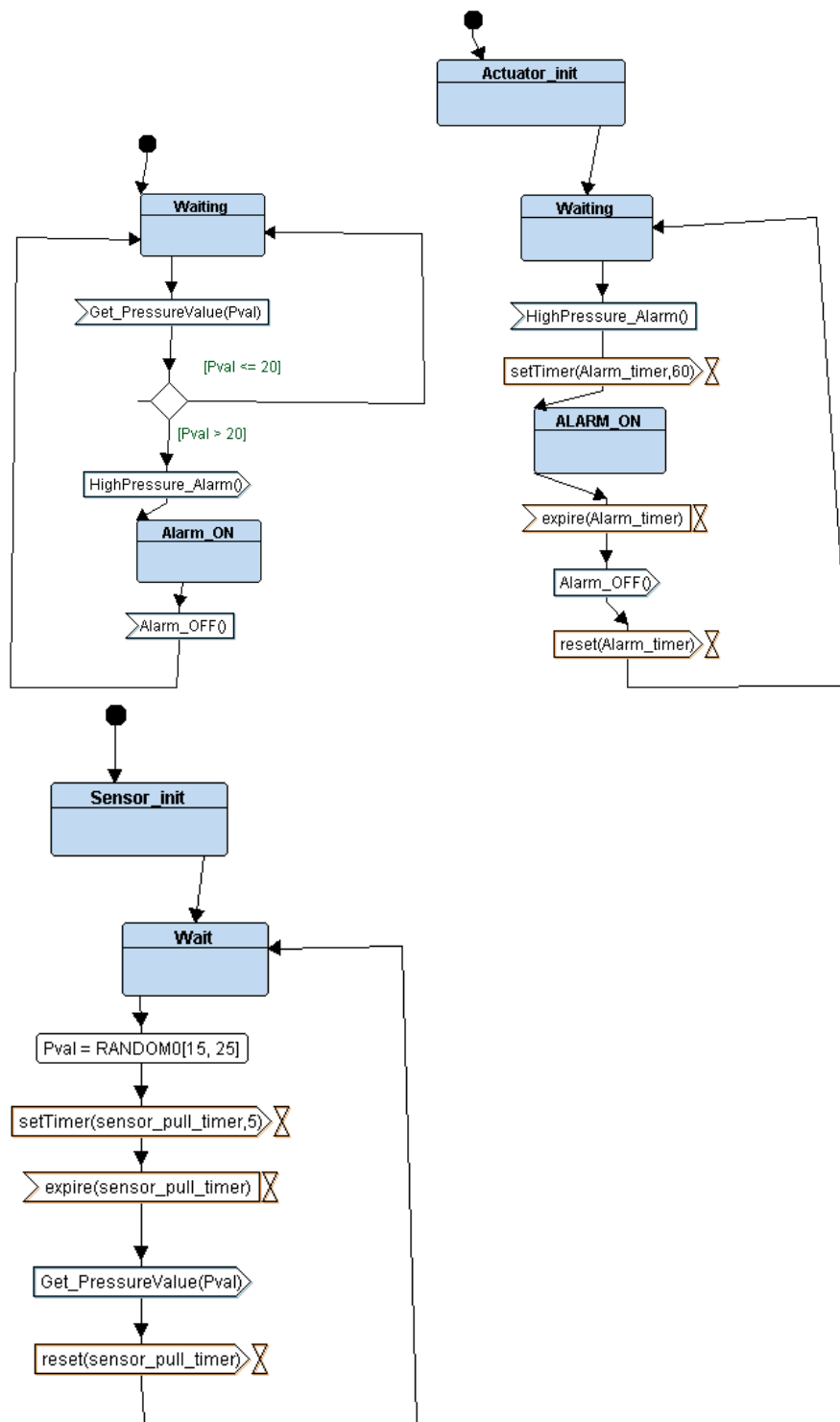


## SEQUENCE DIAGRAM



## SYSTEM DESIGN





## Symbols table

20000028	B	_E_bss
20000008	D	_E_data
080004cc	T	_E_text
20001028	B	_heap_End
20000008	B	_S_bss
20000000	D	_S_data
20002028	B	_stack_top
20000010	B	Alarm_Back_Signal
08000140	T	Alarm_OFF
20000014	B	ALARM_state
2000001c	B	ALARM_State_id
20000000	D	alarmTimer
080004c0	W	Bus_Fault
20000008	b	counter
080004c0	T	Default_Handler
08000198	T	Delay
080003b8	T	Get_PressureValue
080001bc	T	getPressureVal
08000224	T	GPIO_INITIALIZATION
080004c0	W	H_Fault_Handler
08000174	T	HighPressure_Alarm
080002b8	T	main
080004c0	W	MM_Fault_Handler
080004c0	W	NMI_Handler
20000018	B	PS_Forward_Signal
080003dc	T	PS_Get_Pressure_random
20000020	B	PS_state
20000024	B	PS_State_id
20000004	D	pull_time
2000000c	B	Pval
08000410	T	Reset_Handler
080001d4	T	Set_Alarm_actuator
080002a4	T	setup
0800001c	T	ST_ALARM_init
080000fc	T	ST_ALARM_OFF
080000c4	T	ST_ALARM_ON
08000048	T	ST_ALARM_WAITING
0800039c	T	ST_PS_init
080002dc	T	ST_PS_WAITING
080004c0	W	Usage_Fault_Handler
08000000	T	vectors

## Executable file Details

### ELF Header:

Magic: 7f 45 4c 46 01 01 01 00 00 00 00 00 00 00 00 00  
Class: ELF32  
Data: 2's complement, little endian  
Version: 1 (current)  
OS/ABI: UNIX - System V  
ABI Version: 0  
Type: EXEC (Executable file)  
Machine: ARM  
Version: 0x1  
Entry point address: 0x8000000  
Start of program headers: 52 (bytes into file)  
Start of section headers: 71324 (bytes into file)  
Flags: 0x5000002, has entry point,

### Version5 EABI

Size of this header: 52 (bytes)  
Size of program headers: 32 (bytes)  
Number of program headers: 2  
Size of section headers: 40 (bytes)  
Number of section headers: 16  
Section header string table index: 13

### Section Headers:

[Nr]	Name	Type	Addr	off	Size	ES	Flg
Lk	Inf	A					
[ 0]		NULL	00000000	000000	000000	00	
0	0	0					
[ 1]	.text	PROGBITS	08000000	008000	0004cc	00	AX
0	0	4					
[ 2]	.data	PROGBITS	20000000	010000	000008	00	WA
0	0	4					
[ 3]	.bss	NOBITS	20000008	010008	002020	00	WA
0	0	4					
[ 4]	.debug_info	PROGBITS	00000000	010008	0006ce	00	
0	0	1					
[ 5]	.debug_abbrev	PROGBITS	00000000	0106d6	000383	00	
0	0	1					
[ 6]	.debug_loc	PROGBITS	00000000	010a59	000348	00	
0	0	1					
[ 7]	.debug_aranges	PROGBITS	00000000	010da1	0000a0	00	
0	0	1					
[ 8]	.debug_line	PROGBITS	00000000	010e41	000299	00	
0	0	1					
[ 9]	.debug_str	PROGBITS	00000000	0110da	0002ae	01	MS
0	0	1					
[10]	.comment	PROGBITS	00000000	011388	000011	01	MS
0	0	1					
[11]	.ARM.attributes	ARM_ATTRIBUTES	00000000	011399	000033	00	
0	0	1					
[12]	.debug_frame	PROGBITS	00000000	0113cc	000230	00	
0	0	4					
[13]	.shstrtab	STRTAB	00000000	0115fc	00009d	00	
0	0	1					
[14]	.symtab	SYMTAB	00000000	01191c	0004a0	10	
15	34	4					
[15]	.strtab	STRTAB	00000000	011dbc	000232	00	
0	0	1					

### Key to Flags:

w (write), A (alloc), X (execute), M (merge), S (strings)



I (info), L (link order), G (group), T (TLS), E (exclude), x (unknown)  
 O (extra OS processing required) o (OS specific), p (processor specific)

There are no section groups in this file.

Program Headers:

Type	Offset	VirtAddr	PhysAddr	FileSiz	MemSiz	Flg
Align						
LOAD	0x008000	0x08000000	0x08000000	0x004cc	0x004cc	R E
0x8000						
LOAD	0x010000	0x20000000	0x080004cc	0x00008	0x02028	RW
0x8000						

Section to Segment mapping:

Segment Sections...

00	.text
01	.data .bss

There is no dynamic section in this file.

There are no relocations in this file.

There are no unwind sections in this file.

Symbol table '.symtab' contains 74 entries:

Num:	Value	Size	Type	Bind	Vis	Ndx	Name
0:	00000000	0	NOTYPE	LOCAL	DEFAULT	UND	
1:	08000000	0	SECTION	LOCAL	DEFAULT	1	
2:	20000000	0	SECTION	LOCAL	DEFAULT	2	
3:	20000008	0	SECTION	LOCAL	DEFAULT	3	
4:	00000000	0	SECTION	LOCAL	DEFAULT	4	
5:	00000000	0	SECTION	LOCAL	DEFAULT	5	
6:	00000000	0	SECTION	LOCAL	DEFAULT	6	
7:	00000000	0	SECTION	LOCAL	DEFAULT	7	
8:	00000000	0	SECTION	LOCAL	DEFAULT	8	
9:	00000000	0	SECTION	LOCAL	DEFAULT	9	
10:	00000000	0	SECTION	LOCAL	DEFAULT	10	
11:	00000000	0	SECTION	LOCAL	DEFAULT	11	
12:	00000000	0	SECTION	LOCAL	DEFAULT	12	
13:	00000000	0	FILE	LOCAL	DEFAULT	ABS	startup.c
14:	08000410	0	NOTYPE	LOCAL	DEFAULT	1	\$t
15:	08000000	0	NOTYPE	LOCAL	DEFAULT	1	\$d
16:	000001f4	0	NOTYPE	LOCAL	DEFAULT	12	\$d
17:	00000000	0	FILE	LOCAL	DEFAULT	ABS	alarm.c
18:	20000000	0	NOTYPE	LOCAL	DEFAULT	2	\$d
19:	0800001c	0	NOTYPE	LOCAL	DEFAULT	1	\$t
20:	00000010	0	NOTYPE	LOCAL	DEFAULT	12	\$d
21:	00000000	0	FILE	LOCAL	DEFAULT	ABS	driver.c
22:	08000198	0	NOTYPE	LOCAL	DEFAULT	1	\$t
23:	000000bc	0	NOTYPE	LOCAL	DEFAULT	12	\$d
24:	00000000	0	FILE	LOCAL	DEFAULT	ABS	main.c
25:	080002a4	0	NOTYPE	LOCAL	DEFAULT	1	\$t
26:	00000134	0	NOTYPE	LOCAL	DEFAULT	12	\$d
27:	00000000	0	FILE	LOCAL	DEFAULT	ABS	sensor.c
28:	20000008	0	NOTYPE	LOCAL	DEFAULT	3	\$d
29:	20000008	0	NOTYPE	LOCAL	DEFAULT	3	counter
30:	20000004	0	NOTYPE	LOCAL	DEFAULT	2	\$d
31:	080002dc	0	NOTYPE	LOCAL	DEFAULT	1	\$t
32:	0000017c	0	NOTYPE	LOCAL	DEFAULT	12	\$d
33:	00000000	0	FILE	LOCAL	DEFAULT	ABS	
34:	20000010	4	OBJECT	GLOBAL	DEFAULT	3	Alarm_Back_signal

35: 08000225	126	FUNC	GLOBAL	DEFAULT	1 GPIO_INITIALIZATION
36: 080004c1	10	FUNC	WEAK	DEFAULT	1 NMI_Handler
37: 20000008	0	NOTYPE	GLOBAL	DEFAULT	2 _E_data
38: 2000000c	4	OBJECT	GLOBAL	DEFAULT	3 Pval
39: 080004c1	10	FUNC	WEAK	DEFAULT	1 H_Fault_Handler
40: 20000000	0	NOTYPE	GLOBAL	DEFAULT	2 _S_data
41: 20000028	0	NOTYPE	GLOBAL	DEFAULT	3 _E_bss
42: 20000000	4	OBJECT	GLOBAL	DEFAULT	2 alarmTimer
43: 20000014	4	OBJECT	GLOBAL	DEFAULT	3 ALARM_state
44: 080003dd	50	FUNC	GLOBAL	DEFAULT	1
PS_Get_Pressure_random					
45: 080004c1	10	FUNC	WEAK	DEFAULT	1 MM_Fault_Handler
46: 08000411	176	FUNC	GLOBAL	DEFAULT	1 Reset_Handler
47: 20002028	0	NOTYPE	GLOBAL	DEFAULT	3 _stack_top
48: 20000018	4	OBJECT	GLOBAL	DEFAULT	3 PS_Forward_Signal
49: 0800001d	42	FUNC	GLOBAL	DEFAULT	1 ST_ALARM_init
50: 080004c1	10	FUNC	WEAK	DEFAULT	1 Bus_Fault
51: 080001bd	24	FUNC	GLOBAL	DEFAULT	1 getPressureVal
52: 20000020	4	OBJECT	GLOBAL	DEFAULT	3 PS_state
53: 080004c1	10	FUNC	GLOBAL	DEFAULT	1 Default_Handler
54: 20000008	0	NOTYPE	GLOBAL	DEFAULT	3 _S_bss
55: 20000024	1	OBJECT	GLOBAL	DEFAULT	3 PS_State_id
56: 08000049	122	FUNC	GLOBAL	DEFAULT	1 ST_ALARM_WAITING
57: 080001d5	80	FUNC	GLOBAL	DEFAULT	1 Set_Alarm_actuator
58: 08000175	36	FUNC	GLOBAL	DEFAULT	1 HighPressure_Alarm
59: 080002b9	34	FUNC	GLOBAL	DEFAULT	1 main
60: 080002dd	192	FUNC	GLOBAL	DEFAULT	1 ST_PS_WAITING
61: 080003b9	36	FUNC	GLOBAL	DEFAULT	1 Get_PressureValue
62: 080000c5	56	FUNC	GLOBAL	DEFAULT	1 ST_ALARM_ON
63: 080004c1	10	FUNC	WEAK	DEFAULT	1 Usage_Fault_Handler
64: 2000001c	1	OBJECT	GLOBAL	DEFAULT	3 ALARM_State_id
65: 20001028	0	NOTYPE	GLOBAL	DEFAULT	3 _heap_End
66: 080000fd	66	FUNC	GLOBAL	DEFAULT	1 ST_ALARM_OFF
67: 080002a5	18	FUNC	GLOBAL	DEFAULT	1 setup
68: 08000199	34	FUNC	GLOBAL	DEFAULT	1 Delay
69: 20000004	4	OBJECT	GLOBAL	DEFAULT	2 pull_time
70: 0800039d	28	FUNC	GLOBAL	DEFAULT	1 ST_PS_init
71: 080004cc	0	NOTYPE	GLOBAL	DEFAULT	1 _E_text
72: 08000000	28	OBJECT	GLOBAL	DEFAULT	1 vectors
73: 08000141	50	FUNC	GLOBAL	DEFAULT	1 Alarm_OFF

No version information found in this file.

Attribute Section: aeabi

File Attributes

Tag\_CPU\_name: "Cortex-M4"  
 Tag\_CPU\_arch: v7E-M  
 Tag\_CPU\_arch\_profile: Microcontroller  
 Tag\_THUMB\_ISA\_use: Thumb-2  
 Tag\_ABI\_PCS\_wchar\_t: 4  
 Tag\_ABI\_FP\_denormal: Needed  
 Tag\_ABI\_FP\_exceptions: Needed  
 Tag\_ABI\_FP\_number\_model: IEEE 754  
 Tag\_ABI\_align\_needed: 8-byte  
 Tag\_ABI\_align\_preserved: 8-byte, except leaf SP  
 Tag\_ABI\_enum\_size: small  
 Tag\_ABI\_optimization\_goals: Aggressive Debug  
 Tag\_CPU\_unaligned\_access: v6