FaultM	/lodel	Dataltem	Span	Туре	FaultClass	Min	Max	Threshold	Delta	State	Value
TempN	Message	1	1	INT	VAT	NA	NA	100	10	NA	NA
TempN	Message	1	1	INT	FVAT	NA	NA	100	10	NA	NA
BoardS	Status	1	1	DOUBLE	VOR	10	13	NA	1	NA	NA
BoardS	Status	1	1	DOUBLE	FVOR	10	13	NA	1	NA	NA

	BoardStatus	1	1	DOUBLE	FVOR	10		13 NA	1	NA	NA						
								TestSuit	e1								
	Decription	Complete	suite														
		T	T12	T	T	T	T	Requirements Test7	coverage	T10	Test10	T144	T	T43	T42	T45	T
Message1 (BoardStatus)	Voltage_Error_Absent	Test 1	Test2	Test3	Test4	Test5	Test6	rest/	T EST8	rests	Testio	Lestii	Test12	Test13	Test13	Test15	Test16
Message2 (TempMessage)	Temperature Alarm Absent	T	T	F	F	T	T	T	F	F	F	F	F	T	T	F	T
Message3 (BoardStatus)	Temperature_Alarm_Absent Voltage_Error_Absent	T	T	T	T	F	T	F	F	T	F	Т	F	F	Т	F	F
Message4 (TempMessage)	Temperature_Alarm_Absent	T	F	T	F	T	T	Т	T	T	F	F	F	F	F	T	F
				Test3	Test4	Test5	Test6	Test7	Test8	Test9	Test10	Test11	Test12	Test13	Test13	Test15	Test16
14 (D C4t)	Exch	nanged dat 12	ta 12	12	12	12		20 20	12	20	12	20	20	12	20	20	20
Message1 (BoardStatus) Message2 (TempMessage)	voltage temp 1	50		120	120	50		50 50	120	120		120	120		50	120	20 50
Message3 (BoardStatus)	voltage	12	12		12	20		12 20	20	12		12	20		12	20	20
Message4 (TempMessage)		50	120	50	120	50		50 50	50	50	120	120	120		120	50	
	Oracles																
	temperature	"==50"	"==120"	"==50"	"==120"	"==50"	"==50"	"==0"	"==120"			"==120"	"==0"	"==50"	"==120"	"==0"	"==0"
	temperature_alarm	"==0" "==0"	"==1" "==0"	"==0" "==0"	"==1" "==0"	"==0" "==1"	"==0" "==0"	"==0" "==1"	"==1" "==1"	"==0" "==0"	"==1" "==1"	"==1" "==0"	"==0" "==1"	"==0" "==1"	"==1" "==0"	"==0" "==1"	"==0" "==1"
	voltage_Error	==0	==0	==0	==0	==1	==0			oftware (for refe		==0	==1	==1	==0	==1	==1
	temperature	50	120	50	120	50		50 0	120	50	120	120	0	50	120	0	0
	temperature_alarm	0		0	1	0		0 0	1	C	1	1	1	0	1	0	0
	voltage_Error	0	0	0	0	1		0 1	1	C	1	0	1	1	0	1	1
								Mutant	s				,				
	MUTANT 1	12	12	12	12	12		20 20	12	20	12	20	20	12	20	20	20
	voltage	110	120		120			110 110	120	120		120			110	120	
	temp_1 voltage	12			120	20		12 20	20	120		120	20	20	12	20	20
	temp_1	110			120	110		110 110	110	110	120	120	120		120	110	120
	temperature	110	120	110	120	110		110 0	120	110	120	120	0	110	120	110	0
	temperature_alarm	1	1	1	1	1		1 0	1	1	. 1	1	0	1	1	1	0
	voltage_error	0			0	0		0 1	1	C		0		-	0	1	1
	PASS KILLED	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	IKUE	TRUE	FALSE	TRUE	TRUE	TRUE	FALSE	TRUE	FALSE	TRUE
ļ	KILLED									TRUE							
	MUTANT 2																
	voltage	12	12	12	12	12		20 20	12	20	12	20	20	12	20	20	20
	temp_1	50			90	50		50 50	90	90	90	90	90	50	50	90	50
	voltage	12			12	20		12 20	20	12		12	20	20	12	20	20
	temp_1	50 50		50 50	90	50 50		50 50 50 0	50	50	90	90	90	90 50	90	50	90
	temperature temperature_alarm	50		50	90	50		50 0	120 1	50		90	0		90	0	0
	voltage_error	0		0	0	1		0 1	1		1	0	1	1	0	1	1
	PASS	TRUE	FALSE	TRUE	FALSE	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE	FALSE	TRUE	TRUE	FALSE	TRUE	TRUE
	KILLED				•					TRUE			•				
	MUTANT 3									-							
	voltage temp_1	50	50	120	120	50		20 20 50 50	120	120		20 120		50	20 50	20 120	20 50
	voltage	15			15	20		15 20	20	120	20	120	20		15	20	20
	temp_1	50		50	120	50		50 50	50	50		120			120	50	120
	temperature	0		0	0	0		0 0	0	C	0	0	0	0	0	0	0
	temperature_alarm	0	0	0	0	0		0 0	0	0	0	0	0	0	0	0	0
	voltage_error PASS	FAICE 1	FAICE 1	FALSE 1	FALSE	FALSE	FALSE	1 TRUE	TALCE	FALSE		FALSE 0	TRUE 1	FALSE 1	FALSE 0	TRUE 1	TRUE 1
	KILLED	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	IKUE	FALSE	TRUF	FALSE	FALSE	IKUE	FALSE	FALSE	IKUE	IKUE
	MELLO									mor							
	MUTANT 4																
	voltage	9	9	9	9	9		20 20	9	20		20	20		20	20	20
	temp_1	50	50	120	120	50		50 50	120	120		120			50	120	50
	voltage temp 1	9 50	120	9 50	9 120	20 50		9 20 50 50	20 50	50	20 120	120	20 120	20 120	9 120	20 50	20 120
	temp_1 temperature	30	120	30	120	0		0 n	0	- 0	120	120	120	120	120	0	
	temperature_alarm	0	0	0	0	0		0 0	0	C	0	0	0	0	0	0	0
	voltage_error	1	. 1	1	1	1		1 1	1	С		0		1	0	1	1
	PASS	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	TRUE	TRUE
	KILLED									TRUE							
	MUTANT 5		1		I						1						
	voltage	12	12	12	12	12		13 13	12	12	12	13	12	12	13	12	13
	temp_1	50			120	50		50 50	120	120		120	120	50	50	120	50
	voltage	12	12	12	12	20		12 13	13	12	13	12	13	13	12	13	13
	temp_1	50			120	50		50 50	50	50		120	120	120		50	120
	temperature	50	120		120	50		50 50	50	50		120		120	120	0	0
	temperature_alarm	0		0	1 0	0		0 0	1	C	0 0	1	1	1	1	0	0
	voltage_error PASS	TRUE		TRUE	TRUE	TRUE 1	TRUE	0 0 FALSE	EVICE	TRUE	FALSE		FALSE	FALSE	TRUE	FALSE	FALSE
	KILLED	INUE	TRUE	INUE	INUE	INUE	INUE	IALSE		TRUE	INDE	INUE	IALSE	IALDE	INUE	INLIE	INDE
	•	•															
	MUTANT 6																
	voltage	12			12	12		20 20	12	20		20			20	20	
	temp_1	50			120	50		50 50	120	120		120		50	50	120	50
	voltage	12			12	20		12 20	20	12		12	20	20	12	20	20
	temp_1 temperature	50 50	120	50 50	120 120	50 50		50 50 50 0	50 120	50 50	120	120 120	120 0	120 50	120 120	50 0	120
	temperature_alarm	0			120	0		0 0	120	0		120	1		120	0	0
	voltage_error	0	0	0	ō	1		0 1	1	C	1	0	1	1	0	1	1
	PASS	TRUE		TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
	KILLED							N/A:	mutation	opration not cov							-

| XILLED | | Mutation analysis Results | FMC | 100,00% | MOC | 83,33% | MS | 100,00% |

	TestSuite2									
	Decription Lack of message									
	Requirements coverage									
		Test 1	Test2	Test3	Test4					
Message1 (TempMessage)	Temperature_Alarm_Absent	T	T	F	F					
Message2 (TempMessage)	Temperature_Alarm_Absent	T	F	T	F					
		Test 1	Test2	Test3	Test4					
		nanged dat								
Message1 (TempMessage)		50								
Message2 (TempMessage)	temp_1	50	120	50	120					
	Oracles									
	temperature	"==50"	"==120"	"==50"	"==120"					
	temperature_alarm	"==0"	"==1"	"==0"	"==1"					
	voltage_Error	"==0"	"==0"	"==0"	"==0"					
	Outputs original software (for reference)									
	temperature	50	120		120					
	temperature_alarm	0	1	0	1					
	voltage_Error	0	0	0	0					
	Mutants									
	MUTANT 1									
	temp_1	110	120							
	temp_1	110	120		120					
	temperature	110	120	110	120					
	temperature_alarm	1	1	1	1					
	voltage_error	0	0	0	0					
	PASS	FALSE	TRUE	FALSE	TRUE					
	KILLED TRUE									
				r						
	MUTANT 2									
	temp_1	50	50		90					
	temp_1	50	90	50	90					
	temperature	50	90	50	90					
	temperature alarm	0	0	0						