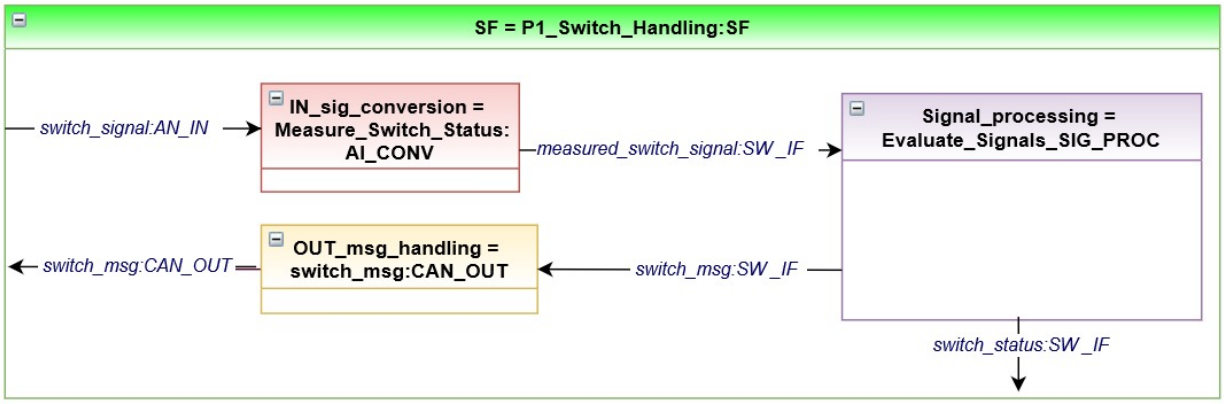
SRS_P1_SWITCH

1 Scope

*This document is describing the Software requirements for the system function **Switch_Handling**. The SRS_Switch Specification created by Visioneer Tool using the Visioneer System-Kit.*

2 Internal_Block_Diagram

(Note: The IBD is autmotically generated out of the functions, signals and connections defined in the RML classes)



3 Func_Req_dscr = P1_Switch_Handling

3.1 Scope

Switch_Handling its SF specific requirements.

3.2 Execution_Rate

SRDS-603 - Execution_rate = tbd

3.3 Interface_Req = Switch_its_IF_REQ

(Note: All following Switch_Handling specific IF requirements tables are autmotically generated out of the merged IF signals)

3.3.1 Input_Signals = Switch_its_Input_Signals

SRDS-602 - Switch_its_Input_Signals

Name	Type_and _direction	Sender	Receiver	Intended usage	Availability	bool	Connector Pin
switch_signal	AN_IN	Transmit_el. Signals	Measure Switch Status	If the switch is closed, the LED shall lit.	permanent	SWITCH_OPEN = “100 Ohm <= R < 200 Ohm”; SWITCH_CLOSED = “200 Ohm <= R < 300 Ohm”; SWITCH_SC_GND = “R < 100 Ohm”; SWITCH_SC_BAT = “ 300 Ohm <= R < 400 Ohm”; SWITCH_OP_CIRC = “R >= 400 Ohm”;	x1.3

3.3.2 Input_SW_IFs

No Input Software Interfaces

3.3.3 Input_Frames

No Input Frames

3.3.4 Input_Messages

No Input Messages

3.3.5 Output_Signals

No Output Signals

3.3.6 Output_SW_IFs = Switch_its_Output_SW_IFs

SRDS-607 - Switch_its_Output_SW_IFs

Name	Type_and _direction	Sender	Receiver	Intended usage	Update_rate	bool	Default Value
switch_status	SW_IF	Measure Switch Status	Evaluate Signals	tbd	*Execution_rate of sender SF = tdb*	OPEN CLOSED	tbd

3.3.7 Output_Frames = Switch_its_Output_Frames

SRDS-606 - Switch_its_Output_Frames

Name	Type and Direction	Update rate	Availibility	Messages	Sender	Receiver
DCU_status	CAN_OUT	200 ms	key_pos_1-3	switch_msg	P1_ECU	BCM

3.3.8 Output_Messages = Switch_its_Output_Messages

SRDS-605 - Switch_its_Output_Messages

Name	Type_and _direction	Sender	Receiver	Intended usage	bool	Frame
switch_msg	CAN_OUT	Evaluate Signals	Activate Seat Heating	Shall be used to en/dis-able the seat heating.	SWITCH_OPEN = “Bit 0 is set”; SWITCH_CLOSED = “Bit 1 is set”; SWITCH_ERROR = “Bit 2 is set”;	DCU_status

3.3.9 Parameter = Switch_its_Parameter

SRDS-608 - Switch_its_Parameter

Name	Intended usage	Decoding	Default Value	Storage Location	Receiver
SWITCH_PARAM	If set, Switch_Handling enabled	tbd	tbd	tbd	Switch_Handling

3.3.10 Diag_Services

Diag_Services = tbd

3.3.11 Events = Switch_its_Events

SRDS-604 - Switch__its_Events

Name	Event_Activity	Event latency time	Event qualification criteria	Event reoccurance handling	Event trace data
switch_event	If the switch is pressed, the LED shall lit.	200 ms	tbd	tbd	tbd

3.4 Measure_Switch_Status = switch_signal:AN_IN_CONV

Described in separate Sub-Specification ->> SRS_P1_HSI (link).

3.5 Signal_Processing = Evaluate_Signals

3.5.1 Scope

The signal processing requirements of Evaluate_Signals are described.

3.5.2 IN_connects = Evaluate_Signals_its_IN_Connects

SRDS-610 - Evaluate_Signals_its_IN_Connects

Name	Type	Sender	Receiver	Intended usage	Update_rate	bool	Default Value
measured_switch_status	SW_IF	Measure Switch Status	Evaluate Signals	tbd	*Execution_rate of sender SF = tbd*	OPEN CLOSED FAULTY	tbd

3.5.3 Mode_Dependency = Evaluate_Signals_its_Mode_dependency

(Note: The Switch specific mode handling table is autmotically generated out of the merged modes)

SRDS-609 - Evaluate_Signals_its_Mode_dependency

LIFE_CYCLE_PHASES	CAR_MODES	ECU_MODES	Emergency_off _Mode	Disturbance _Modes	Expected SubF status
OPERATION CAR_FACTORY	OCCUPANCY KEY_POS_1 DRIVING	WAKE_UP DIAGNOSTIC	SAFE_OPERATION	NORMAL_VOLTAGE	**SubF enabled**
ECU_PRODUCTION CAR_TRANSPORT	PARKING CRANKING MOTOR_STOP	START_UP SLEEP POWER_DOWN	FAIL_SAFE_MODE	LOW_VOLTAGE or HIGH_VOLTAG	**SubF disabled**

3.5.4 Evaluation = switch_status:EVAL

3.5.4.1 Logic_Table = switch_status_its_Logic_table

(Note: the headings of the table is automaticlly created due to the SF signals, modes and parameters. The table contents must be finalized manually. *To illustrate* an example for *the text conversion capablities, this table is finalized completely,)*

SRDS-611 - switch_status__its_Logic_table

SWITCH_ PARAM	LIFE_CYCLE _PHASE	CAR_MODES	ECU_ MODES	Emergency_off _Mode	Distrubance _Modes	measured switch_status	switch_status
enable	OPERATION or CAR_FACTORY	OCCUPANCY or KEY_POS_1 or DRIVING	WAKE_UP or DIAGNOSTIC	SAFE_OPERATION	NORMAL_VOLTAGE	OPEN	**OPEN**
enable	OPERATION or CAR_FACTORY	OCCUPANCY or KEY_POS_1	WAKE_UP or DIAGNOSTIC	SAFE_OPERATION	NORMAL_VOLTAGE	FAULTY or CLOSED	**CLOSED**

		or DRIVING					
enable	OPERATION or CAR_FACTORY	OCCUPANCY or KEY_POS_1 or DRIVING	WAKE_UP or DIAGNOSTIC	SAFE_OPERATION	LOW_VOLTAGE or HIGH_VOLTAGE	x	**FROZEN** (previous value)
x	x	x	x	FAIL_SAFE_MODE	x	x	**CLOSED**
x	x	x	START_UP or SLEEP or POWER_DOWN	x	x	x	**CLOSED**
x	x	PARKING or CRANKING or MOTOR_STOP	x	x	x	x	**CLOSED**
x	ECU_PRODUCTION_or CAR_TRANSPORT	x	x	x	x	x	**CLOSED**
disable	x	x	x	x	x	x	**CLOSED**

3.5.4.2 Functional_Requirements = switch_status_its_text_conversion

(Note: Those textual requirements are automatically created out of the logic table)

SRDS-577 - If SWITCH_PARAM is enable

and LIFE_CYCLE_PHASE is OPERATION or CAR_FACTORY

and CAR_MODE is OCCUPANCY or KEY_POS_I or DRIVING

and ECU_MODES is WAKE_UP or DIAGNOSTIC

and Emergency_off_Mode is SAVE_OPERATION

and Disturbance_Modes is NORMAL_VOLTAGE

and measured_switch_status is OPEN,

then **switch_status** shall be OPEN.

SRDS-575 - If SWITCH_PARAM is enable

and LIFE_CYCLE_PHASE is OPERATION or CAR_FACTORY

and CAR_MODE is OCCUPANCY or KEY_POS_I or DRIVING

and ECU_MODES is WAKE_UP or DIAGNOSTIC

and Emergency_off_Mode is SAVE_OPERATION

and Disturbance_Modes is NORMAL_VOLTAGE

and measured_switch_status is FAULTY or CLOSED,

then **switch_status** shall be CLOSED.

SRDS-576 - If SWITCH_PARAM is enable

and LIFE_CYCLE_PHASE is OPERATION or CAR_FACTORY

and CAR_MODE is OCCUPANCY or KEY_POS_I or DRIVING

and ECU_MODES is WAKE_UP or DIAGNOSTIC

and Emergency_off_Mode is SAVE_OPERATION

and Disturbance_Modes is LOW_VOLTAGE or HIGH_VOLTAGE,

then **switch_status** shall be FROZEN (previous value).

SRDS-619 - If SWITCH_PARAM is disable,

or LIFE_CYCLE_PHASE is ECU_PRODUCTION_or CAR_TRANSPORT,

or CAR_MODE is PARKING or CRANKING or MOTOR_STOP,

or ECU_MODES is START_UP or SLEEP or POWER_DOWN,

or Emergency_off_Mode is FAIL_SAFE_MODE,

then **switch_status** shall be CLOSED

3.5.5 Evaluation = switch_msg:EVAL

3.5.5.1 Logic_Table = switch_msg_its_Logic_table

(Note: the headings of the table is automaticlly created due to the SF signals, modes and parameters. The table contents must be finalized manually. *To illustrate* an example for *the text conversion capablities, this table is finalized completely,)*

SRDS-625 - switch_status__its_Logic_table

SWITCH_ PARAM	LIFE_CYCLE _PHASE	CAR_MODES	ECU_ MODES	Emergency_off _Mode	Distrubance _Modes	measured switch_status	switch_msg
enable	OPERATION or CAR_FACTORY	OCCUPANCY or KEY_POS_1 or DRIVING	WAKE_UP or DIAGNOSTIC	SAFE_OPERATION	NORMAL_VOLTAGE	OPEN	**OPEN**
enable	OPERATION or CAR_FACTORY	OCCUPANCY or KEY_POS_1 or DRIVING	WAKE_UP or DIAGNOSTIC	SAFE_OPERATION	NORMAL_VOLTAGE	CLOSED	**CLOSED**
enable	OPERATION or CAR_FACTORY	OCCUPANCY or KEY_POS_1 or DRIVING	WAKE_UP or DIAGNOSTIC	SAFE_OPERATION	NORMAL_VOLTAGE	FAULTY	**FAULTY**
enable	OPERATION or CAR_FACTORY	OCCUPANCY or KEY_POS_1 or DRIVING	WAKE_UP or DIAGNOSTIC	SAFE_OPERATION	LOW_VOLTAGE or HIGH_VOLTAGE	x	**FROZEN** (previous value)
x	x	x	x	FAIL_SAFE_MODE	x	x	**CLOSED**
x	x	x	START_UP or SLEEP or POWER_DOWN	x	x	x	**CLOSED**
x	x	PARKING or CRANKING or MOTOR_STOP	x	x	x	x	**CLOSED**
x	ECU_PRODUCTION_or CAR_TRANSPORT	x	x	x	x	x	**CLOSED**
disable	x	x	x	x	x	x	**CLOSED**

3.5.5.2 Functional_Requirements = switch_msg_its_text_conversion

(Note: Those textual requirements are automatically created out of the logic table)

SRDS-624 - If SWITCH_PARAM is enable

and LIFE_CYCLE_PHASE is OPERATION or CAR_FACTORY

and CAR_MODE is OCCUPANCY or KEY_POS_I or DRIVING

and ECU_MODES is WAKE_UP or DIAGNOSTIC

and Emergency_off_Mode is SAVE_OPERATION

and Disturbance_Modes is NORMAL_VOLTAGE

and measured_switch_status is OPEN,

then **switch_msg** shall be OPEN.

SRDS-623 - If SWITCH_PARAM is enable

and LIFE_CYCLE_PHASE is OPERATION or CAR_FACTORY

and CAR_MODE is OCCUPANCY or KEY_POS_I or DRIVING

and ECU_MODES is WAKE_UP or DIAGNOSTIC

and Emergency_off_Mode is SAVE_OPERATION

and Disturbance_Modes is NORMAL_VOLTAGE

and measured_switch_status is CLOSED,

then **switch_msg** shall be CLOSED.

SRDS-620 - If SWITCH_PARAM is enable

and LIFE_CYCLE_PHASE is OPERATION or CAR_FACTORY

and CAR_MODE is OCCUPANCY or KEY_POS_I or DRIVING

and ECU_MODES is WAKE_UP or DIAGNOSTIC

and Emergency_off_Mode is SAVE_OPERATION

and Disturbance_Modes is NORMAL_VOLTAGE

and measured_switch_status is FAULTY,

then **switch_msg** shall be FAULTY.

SRDS-622 - If SWITCH_PARAM is enable

and LIFE_CYCLE_PHASE is OPERATION or CAR_FACTORY

and CAR_MODE is OCCUPANCY or KEY_POS_I or DRIVING

and ECU_MODES is WAKE_UP or DIAGNOSTIC

and Emergency_off_Mode is SAVE_OPERATION

and Disturbance_Modes is LOW_VOLTAGE or HIGH_VOLTAGE,

then **switch_msg** shall be FROZEN (previous value).

SRDS-621 - If SWITCH_PARAM is disable,

or LIFE_CYCLE_PHASE is ECU_PRODUCTION_or CAR_TRANSPORT,

or CAR_MODE is PARKING or CRANKING or MOTOR_STOP,

or ECU_MODES is START_UP or SLEEP or POWER_DOWN,

or Emergency_off_Mode is FAIL_SAFE_MODE,

then **switch_msg** shall be CLOSED

3.6 OUT_msg_Handling = switch_msg:CAN_OUT

Described in separate Sub-Specification ->> SRS_P1_CAN (link).

4 Nonfunct_Req_descr = NF_Req

4.1 Quality_Req

SRDS-511 - The system shall have high qualitiy.

4.2 Reusability_Req

SRDS-510 - All components of the system shall be reusable.

4.3 Criticality

SRDS-626 - Criticality = tbd

5 Abbreviations = Used_Abbreviations

P1 = "Project 1 (Example Project)"

BCP = "Body Control Platform"

ECU = "Electronic Control Unit"

IF = "Interface"

SF = "System Function"

SRD = "System Requirement Description"

SRS = "Software Requirement Specification"

SUPL = "Supplement"

UC = "Microcontroller"

PLCC = "Plastic Leaded Chip Carrier"

NVM = "Non-volatile memory"

RAM = "Random access memory"

EEPROM = "electrically erasable programmable read only memory"

Dig_IO = "Digital Input Output"

ADC = "Analog Digital covnerter"

CAN = "Controller Area Network"

tbd = "To be defined"

PWM = "pulse wide modulation"

I2C = "Inter-Integrated Circuit"

SPI = "Serial Peripheral Interface"

UART = "Universal Asynchronous Receiver Transmitter"

init = "initialization"

req = "requirement"

NF_Req ="non-functional requirement"