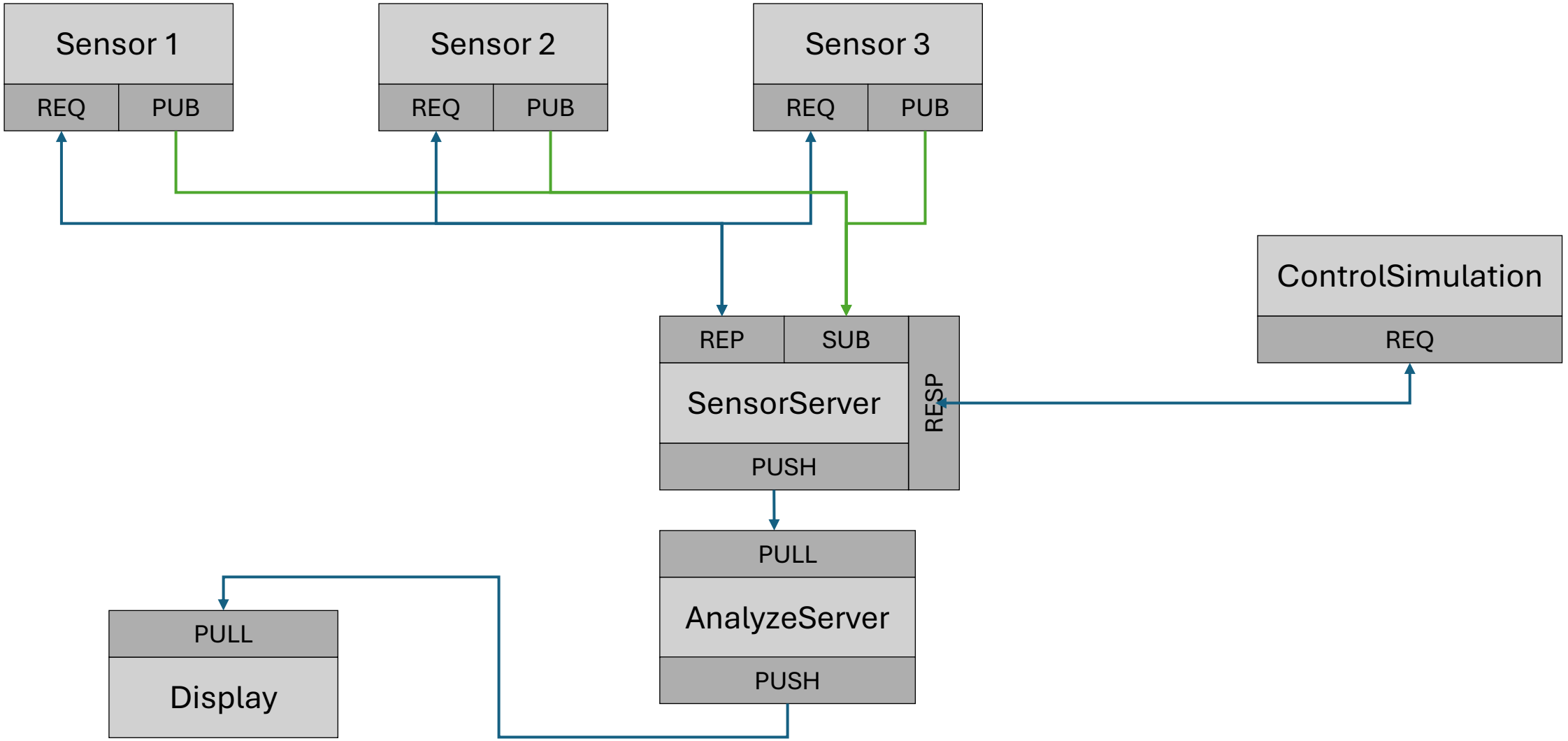
DISTRIBUTED SYSTEMS LABORATORY

SENSOR MONITORING UNIT

OVERVIEW COMMUNICATION SYSTEM



ENUMERATION IN COMMUNICATION

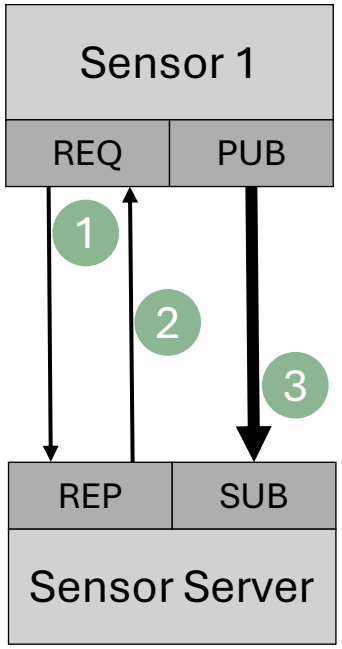
Type	Enum	
Name	sens_type	
Description	categorisation or type of trasmitting sensor	
value name	**enum id**	**Description**
TYPE_TEMPERATURE	0	sensor type is temperature sensor
TYPE_PRESSURE	1	sensor type is pressure sensor
TYPE_ROTATION	2	sensor type is rotation sensor
TYPE_ANGLE	3	sensor type is angle sensor

Type	Enum	
Name	disp_threshold_status	
Description	Status of Threshold check	
value name	**enum id**	**Description**
NO_EVALUATION	0	no evaluation run
VALUE_INSIDE_AREA	1	measured Value is inside the area
VALUE_TO_HIGH	2	sensor value is over upper theshold
VALUE_TO_LOW	3	sensor value is over lower theshold

Type	Enum	
Name	ctrl_request_id	
Description	ReadSetDataByIdentifier request identification number	
value name	**enum id**	**Description**
GET_SENSOR_MAX_ID	0	get number of registerd sensors
UNSUBSCRIBE_SENSOR_ID	1	set Sensor ID to delete from System
SUBSCRIBE_SENSOR_ID	2	set Sensor ID to delete from System
SET_LOWER_THRESHOLD	3	set lower threshold of Sensor for Alert
SET_UPPER_THRESHOLD	4	set upper threshold of Sensor for Alert
DISPLAY_GRAPH	5	display measured values in seperate window

Type	Enum	
Name	sens_signal_unit	
Description	Unit descriptin of the sensor signal	
value name	**enum id**	**Description**
UNIT_UNSPECIFIED	0	no unit specified
UNIT_TEMP_KELVIN	1	Unit of temperature sensor Kelvin
UNIT_TEMP_CELSIUS	2	Unit of temperature sensor Celsius
UNIT_PRES_BAR	3	Unit of pressure sensor Bar
UNIT_PRES_PASCAL	4	Unit of pressure sensor Pascal
UNIT_ROTA_RPM	5	Unit of rotation sensor round per minute
UNIT_ROTA_ANGLE	6	Unit of angle sensor in degree

SENSOR TO SENSOR SERVER COMMUNICATION



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Type	Message
Name	sens_status
Transmitter	Sensor / SensorServer
Receiver	SensorServer / AnalyseServer
Description	status information of sensor / measured values

signal name	**position**	**Description**	**datatype**
timestamp	1	timestamp of data measurement	uint64
id	2	sensor identification number	uint32
sig_value	3	sensor signal value	int 32
factor	4	multiplicationf factor of signal value	uint32
offset	5	offset of multiplication value	uint32
sig_unit	6	signal unit of measured value	sensor_signal_unit
active	7	sensor is (un)subscibed	uint32

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Type	Message
Name	sens_com_join
Transmitter	Sensor
Receiver	SensorServer
Description	Connect new sensors to system

signal name	**position**	**Description**	**datatype**
connect	1	connection request	uint32
type	2	type of sensor	sensor_type
sample_freq	3	sample frequency of sensor	uint32

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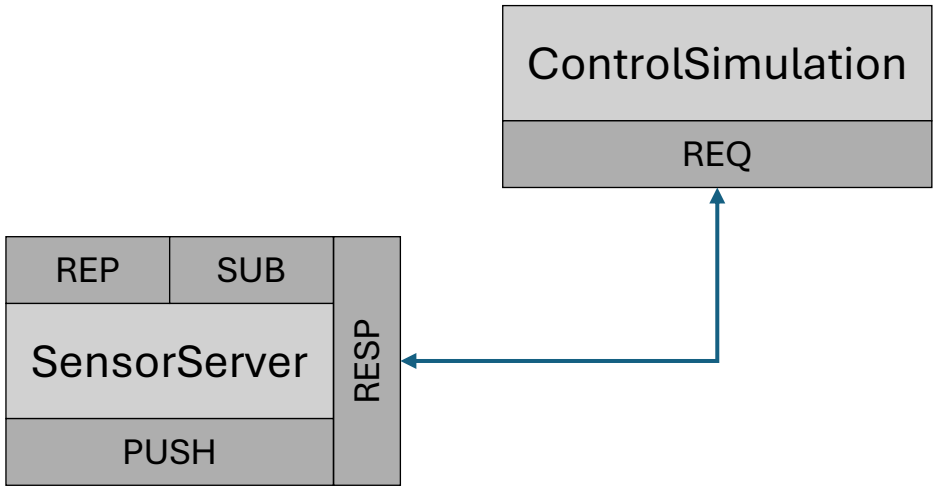
Type	Message
Name	sens_com_join_resp
Transmitter	SensorServer
Receiver	Sensor
Description	Response on ComJoin to handshake the connection

signal name	**position**	**Description**	**datatype**
sensor_id	1	sensor id as handshake	uint32

CONTROL FUNCTIONS BY REMOTE - REQUEST

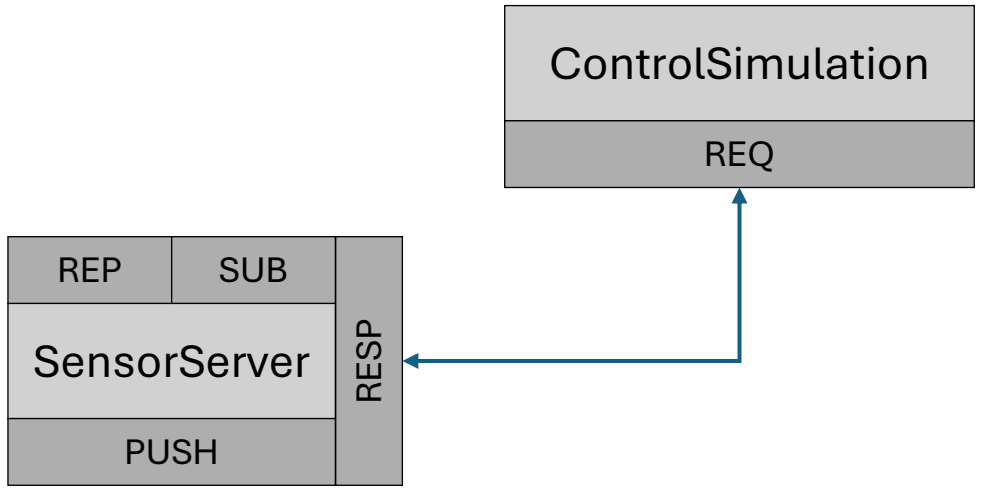


Type	Message
Name	ctrl_RSDBI
Transmitter	SimControl
Receiver	SensorServer
Description	ReadSetDataByIdentifier message

signal name	**position**	**Description**	**datatype**
id	1	request id	request_id
value_0	2	buffer for value or parameter	uint32
value_1	3	buffer for value or parameter	uint32
value_2	4	buffer for value or parameter	uint32
value_3	5	buffer for value or parameter	uint32
value_4	6	buffer for value or parameter	uint32
value_5	7	buffer for value or parameter	uint32
value_6	8	buffer for value or parameter	uint32
value_7	9	buffer for value or parameter	uint32

	request_id					
signal name	GET_SENSOR_MAX_ID	UNSUBSCRIBE_SENSOR_ID	UNSUBSCRIBE_SENSOR_ID	SET_LOWER_THRESHOLD	SET_UPPER_THRESHOLD	DISPLAY_GRAPH
id	0	1	2	3	4	5
value_0	-	sensor_id	sensor_id	sensor_id	sensor_id	sensor_id
value_1	-	-	-	lower_threshold	upper_threshold	-
value_2	-	-	-	-	-	-
value_3	-	-	-	-	-	-
value_4	-	-	-	-	-	-
value_5	-	-	-	-	-	-
value_6	-	-	-	-	-	-
value_7	-	-	-	-	-	-

CONTROL FUNCTIONS BY REMOTE - RESPONSE

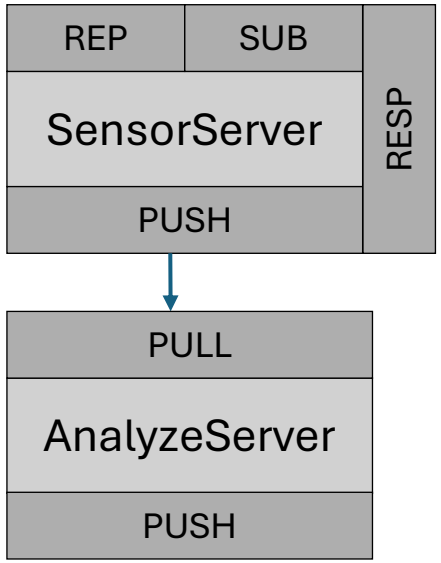


Type	Message
Name	ctrl_RSDBI_resp
Transmitter	SensorServer
Receiver	SimControl
Description	ReadSetDataByIdentifier response message

signal name	**position**	**Description**	**datatype**
id	1	request id	request_id
value_0	2	buffer for value or parameter	uint32
value_1	3	buffer for value or parameter	uint32
value_2	4	buffer for value or parameter	uint32
value_3	5	buffer for value or parameter	uint32
value_4	6	buffer for value or parameter	uint32
value_5	7	buffer for value or parameter	uint32
value_6	8	buffer for value or parameter	uint32
value_7	9	buffer for value or parameter	uint32

	request_id					
signal name	GET_SENSOR_MAX_ID	UNSUBSCRIBE_SENSOR_ID	UNSUBSCRIBE_SENSOR_ID	SET_LOWER_THRESHOLD	SET_UPPER_THRESHOLD	DISPLAY_GRAPH
id	0	1	2	3	4	5
value_0	number of sensors	sensor_id	sensor_id	sensor_id	sensor_id	sensor_id
value_1	-	ack=1	ack=1	lower_threshold	upper_threshold	ack=1
value_2	-	-	-	ack=1	ack=1	-
value_3	-	-	-	-	-	-
value_4	-	-	-	-	-	-
value_5	-	-	-	-	-	-
value_6	-	-	-	-	-	-
value_7	-	-	-	-	-	-

CONTROL FUNCTIONS BY REMOTE – TO ANALYZE SERVER



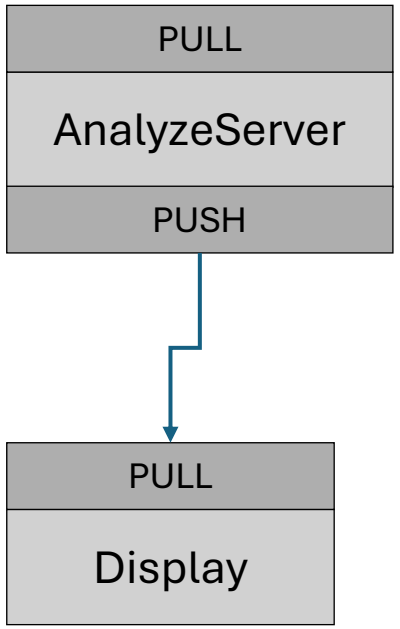
Type	Message
Name	ctrl_request_transfert
Transmitter	SensorServer
Receiver	AnalyseServer
Description	Transfert analyse request

signal name	position	Description	datatype
sensor_id	1	ID of sensor to set treshold	uint32
request_type	2	request_type	ctrl_request_id
value	3	value to set (default -> 0)	uint32

Type	Enum
Name	ctrl_request_id
Description	ReadSetDataByIdentifier request identification number

value name	enum id	Description
GET_SENSOR_MAX_ID	0	get number of registerd sensors
UNSUBSCRIBE_SENSOR_ID	1	set Sensor ID to delete from System
SUBSCRIBE_SENSOR_ID	2	set Sensor ID to delete from System
SET_LOWER_THRESHOLD	3	set lower threshold of Sensor for Alert
SET_UPPER_THRESHOLD	4	set upper threshold of Sensor for Alert
DISPLAY_GRAPH	5	display measured values in seperate window

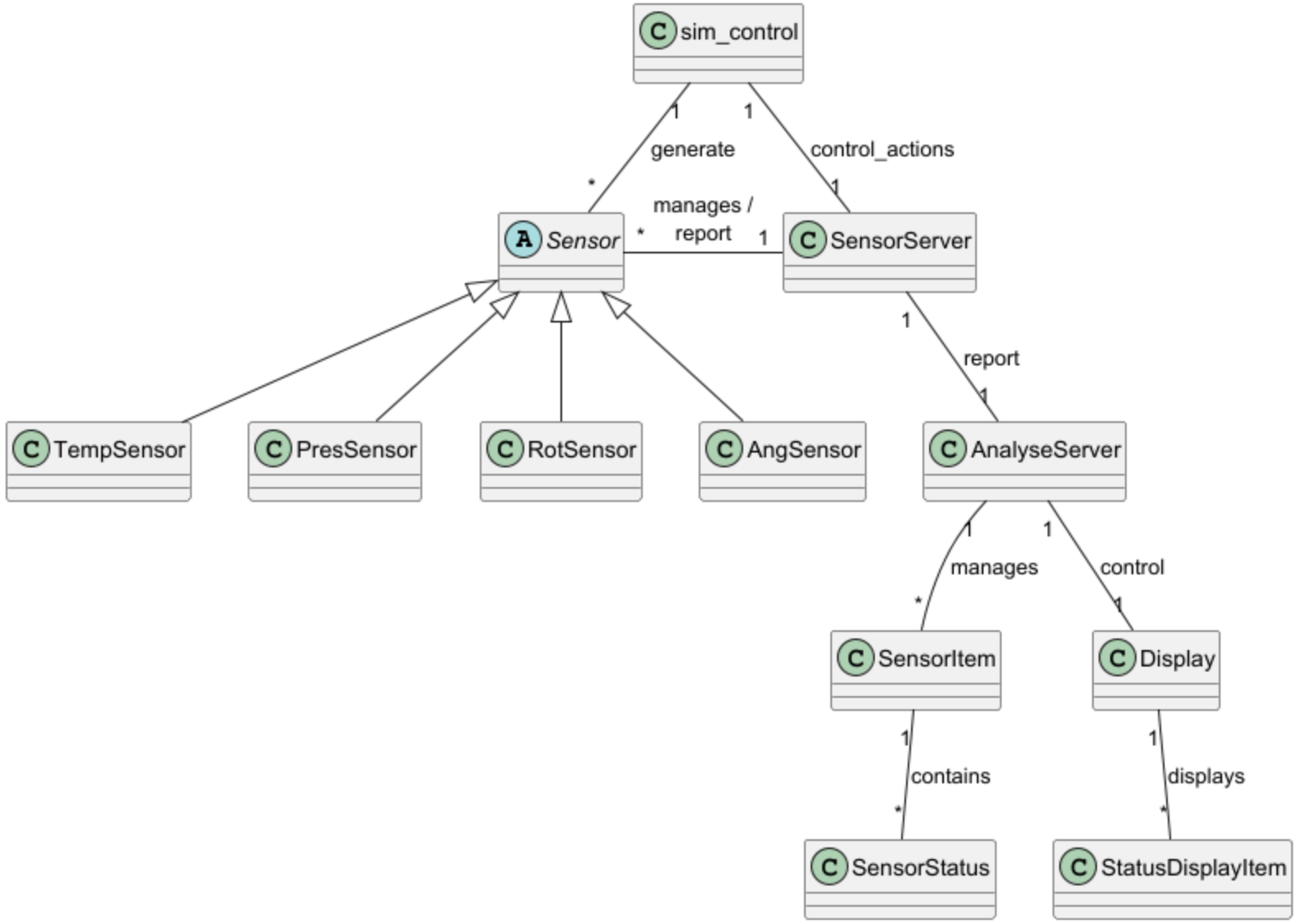
DISPLAY COMMUNICATION



Type	Message		
Name	disp_sensor_status		
Description	Status displayed in the Display		
signal name	**position**	**Description**	**datatype**
sensor_id	1	sensor id	uint32
fequency	2	Sensor is (un)subcsibed	uint32
type	3	timestamp of data measurement	sensor_type
active	4	sensor signal value	int 32
timestamp	5	timestamp of data measurement	uint32
sig_value	6	sensor signal value	uint32
factor	7	factor of multiplication value	sensor_signal_unit
offset	8	offset of multiplication value	uint32
sig_unit	9	signal unit of measured value	uint32
lower_threshold	10	lower threshold for signal	uint32
upper_threshold	11	upper threshold for signal	uint32
threshold_status	12	status of theshold	disp_threshold_status

Type	Message		
Name	disp_trans_done		
Description	Transmittion Done Flag -> Data gets displayed		
signal name	**position**	**Description**	**datatype**
done	1	done flag	uint32

CLASS DIAGRAM



More Details on GitHub: https://github.com/theRealHarlequin/distributed-systems/blob/master/_01_project/_09_docu/class_diag.png

SEQUENCE DIAGRAM