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6.17 Hull Temperature Measurement system (450000)

6.17.1 System description hull temperature measurement system

The hull temperature sensors will be placed at different places at the ships hull, according the provided document: 9445016 Hull temperature sensor positions.pdf.

The sensors will be connected to a HART \circledR to Ethernet Gateway, in four loops, according below overview and addressing :

according below overview and addressing.									
		Transmitter			Polling		Modbus	Configuration	
Loop	Transmitter	s/n	Channel	Sensor PT100	address	HES	register	date	
	LOOP 1								
1	94455003-13	231783930	1	94455001-26	13	DV1	9203	3-4-2024	
1	94455003-13	231783930	2	94455001-27	13	DV2	9205	3-4-2024	
1	94455003-14	231783631	1	94455001-28	14	DV3	9207	3-4-2024	
1	94455003-14	231783631	2	94455001-29	14	DV4	9209	3-4-2024	
1	94455002-2	221545153	1	94455001-34	2	DV5	9211	29-3-2024	
1	94455002-3	231710002	1	94455001-35	3	DV6	9213	29-3-2024	
1	94455003-15	231783630	1	94455001-30	15	DV7	9215	3-4-2024	
1	94455003-15	231783630	2	94455001-31	15	DV8	9217	3-4-2024	
1	94455003-16	231783632	1	94455001-32	16	DV9	9219	3-4-2024	
1	94455003-16	231783632	2	94455001-33	16	DV10	9221	3-4-2024	
1	94455003-12	231783931	1	94455001-24	12	DV11	9223	3-4-2024	
1	94455003-12	231783931	2	94455001-25	12	DV12	9225	3-4-2024	
1	94455003-17	231783628	1	94455001-36	17	DV13	9227	19-4-2024	
1	94455003-17	231783628	2	94455001-37	17	DV14	9229	19-4-2024	
	LOOP 2								
2	94455003-3	231783933	1	94455001-6	3	DV17	9235	12-4-2024	
2	94455003-3	231783933	2	94455001-7	3	DV18	9237	12-4-2024	
2	94455003-4	241049001	1	94455001-8	4	DV19	9239	12-4-2024	
2	94455003-4	241049001	2	94455001-9	4	DV20	9241	12-4-2024	
2	94455003-5	221350569	1	94455001-10	5	DV21	9243	12-4-2024	
2	94455003-5	221350569	2	94455001-11	5	DV22	9245	12-4-2024	
2	94455003-8	231783629	1	94455001-16	8	DV23	9247	12-4-2024	
2	94455003-8	231783629	2	94455001-17	8	DV24	9249	12-4-2024	
2	94455003-9	231783626	1	94455001-18	9	DV25	9251	12-4-2024	
2	94455003-9	231783626	2	94455001-19	9	DV26	9253	12-4-2024	
	LOOP 3								
3	94455003-10	231922015	1	94455001-20	10	DV33	9267	19-4-2024	
3	94455003-10	231922015	2	94455001-21	10	DV34	9269	19-4-2024	
3	94455003-11	221350126	1	94455001-22	11	DV35	9271	19-4-2024	
3	94455003-11	221350126	2	94455001-23	11	DV36	9273	19-4-2024	
3	94455003-6	231783932	1	94455001-12	6	DV37	9275	19-4-2024	
3	94455003-6	231783932	2	94455001-13	6	DV38	9277	19-4-2024	
3	94455003-7	231783627	1	94455001-14	7	DV39	9279	19-4-2024	

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3 94455003-2 231922335	3	94455002-1	231862006	1	94455001-1	1	DV43	9287	29-3-2024			
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Ch 1: Number of slaves 3 configured DV69 9339 Ch 1: Number of slaves 3 communicating DV70 9341 Ch 1: Number of slaves 4 configured DV71 9343 Ch 1: Number of slaves 4 communicating DV72 9345 Total number of slaves configured DV73 9347 Total number of slaves	_		slaves									
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Ch 1: Number of slaves 4 configured DV71 9343 Ch 1: Number of slaves 4 communicating DV72 9345 Total number of slaves configured DV73 9347 Total number of slaves	2		SIGVES				DV70	93/11				
4 configured DV71 9343 Ch 1: Number of slaves 4 communicating DV72 9345 Total number of slaves configured DV73 9347 Total number of slaves			slaves				5470	2341				
Ch 1: Number of slaves 4 communicating DV72 9345 Total number of slaves configured DV73 9347 Total number of slaves	4		5.4765				DV71	9343				
4 communicating DV72 9345 Total number of slaves DV73 9347 Total number of slaves			slaves				, _					
Total number of slaves configured DV73 9347 Total number of slaves	4						DV72	9345				
Total number of slaves			slaves									
							DV73	9347				
communicating DV74 9349			slaves									
		communicating					DV74	9349				

There will no visualization or alarming in the MAS software for these sensors. The data will be directly available for the client system without interference of the MAS system.



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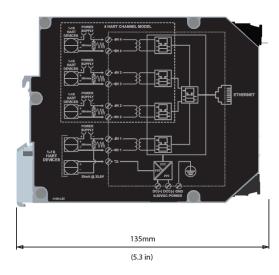
6.17.2 Operation

In order to save energy, the HART® to Ethernet Gateway will be switched off from the main power when not in use. The MAS will receive an MQTT command to start the measuring cycle and switch the power relay to the converter on (Via KEB1 DO60.12). Then the measurement cycle will be performed and at the end the MAS system will receive an MQTT command that the cycle has ended and MAS will switch the power relay off again.

6.17.3 Technical details

The will be switched in a 4-loop configuration, all wired to the Main Technical Space AMCS cabinet +CB.01, see below the converter connections:

Figure 7. HES Installation Dimensions, Same for 1 and 4 Channel Version (4 channel shown)



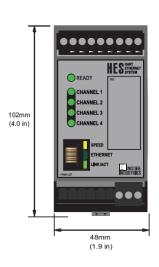


Figure 8. Terminal Designations

	Top Terminals (Left to Right)				Davi		Bottom Terminals (Left to Right)			
Input Single Channel	T1	T2	T3		9-30V		B1	B2	В3	
onigie onamiei	TX	+IN	-IN			(+) DC	(-) DCC	GND	
Top Terminals (Left to Right)									1	
Input	T1	T2	T3	T4	T5	T6	T 7	Т8	Т9	
Four Channel			- 11							
	TX	+IN	–IN	+IN	–IN	+IN	–IN	+IN	–IN	
	Channel 1		Chann	Channel 2		Channel 3		Channel 4		

TX = Power for 2-Wire transmitter +IN = Positive input -IN = Negative input (+)DC = Positive power input (-)DCC = Negative power input GND = Ground

NOTE:
1. Terminal blocks can accommodate 14-22 AWG solid wiring.
2. Tighten terminals to four inch-pounds (maximum).

See also the cable- and multiline-diagram: I-615-HULL MEASURING REV5.01.pdf.