MARPOWER®

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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® to Ethernet Gateway, in four loops, according below overview and addressing :

Loop	Transmitter	Transmitter s/n	Channel	Sensor PT100	Polling address	HES	Modbus register	Configuration 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

3	94455003-7	231783627	2	94455001-15	7	DV40	9281	19-4-2024
3	94455003-1	231783934	1	94455001-2	16	DV41	9283	29-3-2024
3	94455003-1	231783934	2	94455001-3	16	DV42	9285	29-3-2024
3	94455002-1	231862006	1	94455001-1	1	DV43	9287	29-3-2024
3	94455003-2	231922335	1	94455001-4	2	DV44	9289	19-4-2024
3	94455003-2	231922335	2	94455001-5	2	DV45	9291	19-4-2024
LOOP 4							
4	94455002-4	231862541	1	94455001-38	4	DV49	9299	19-4-2024
4	94455002-5	232027011	1	94455001-39	5	DV50	9301	19-4-2024
4	94455002-6	232027010	1	94455001-40	6	DV51	9303	19-4-2024
4	94455002-7	232027007	1	94455001-41	7	DV52	9305	19-4-2024
4	94455002-8	232027018	1	94455001-42	8	DV53	9307	19-4-2024
4	94455002-9	211346769	1	94455001-43	9	DV54	9309	3-4-2024
4	94455002-10	231862542	1	94455001-44	10	DV55	9311	3-4-2024
4	94455002-11	211346913	1	94455001-45	11	DV56	9313	19-4-2024
4	94455002-12	231862543	1	94455001-46	12	DV57	9315	19-4-2024
Diagnostics							
1	Ch 1: Number of slaves configured					DV65	9331
1	Ch 1: Number of slaves communicating					DV66	9333
2	Ch 1: Number of slaves configured					DV67	9335
2	Ch 1: Number of slaves communicating					DV68	9337
3	Ch 1: Number of slaves configured					DV69	9339
3	Ch 1: Number of slaves communicating					DV70	9341
4	Ch 1: Number of slaves configured					DV71	9343
4	Ch 1: Number of slaves communicating					DV72	9345
	Total number of slaves configured					DV73	9347
	Total number of 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)*
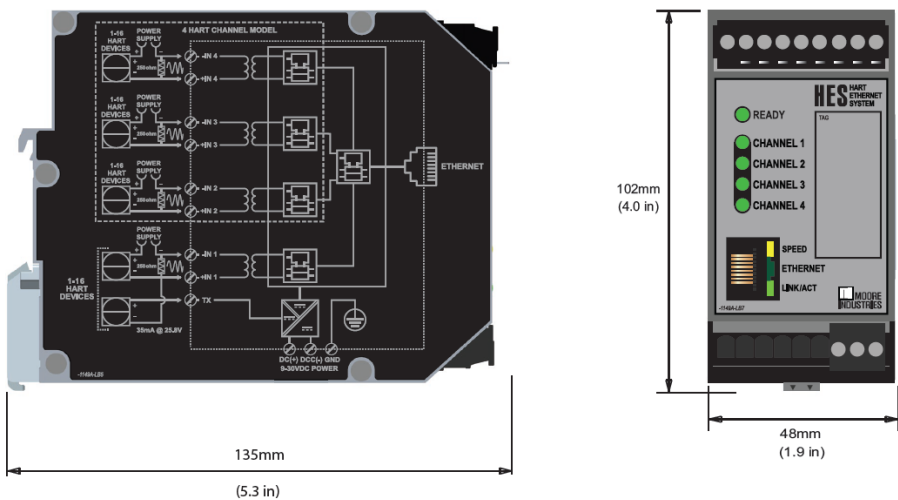

Figure 8. *Terminal Designations*

Input Single Channel	Top Terminals (Left to Right)		
	T1	**T2**	**T3**
	TX	+IN	−IN

Power 9-30VDC	Bottom Terminals (Left to Right)		
	B1	**B2**	**B3**
	(+) DC	(−) DCC	GND

Input Four Channel	Top Terminals (Left to Right)								
	T1	**T2**	**T3**	**T4**	**T5**	**T6**	**T7**	**T8**	**T9**
	TX	+IN	−IN	+IN	−IN	+IN	−IN	+IN	−IN
		Channel 1		Channel 2		Channel 3		Channel 4	

KEY:
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.