Volume 1

Section B.35.2.A_1 Engineering

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7. Interface with other systems

The metering system is interconnected with the SCADA and Automation System, delivered by ABB Process Industries GmbH – Germany. The metering system (remote) operation/supervision will be done from the SCADA engineering stations/computers by the Station Dispatcher / Control Room operators.
This interconnection is physically realized by a duplex serial link, RS 485 / RS 422, which is installed between the Flow Computer Electronic Cabinet / Logic Interface and SCADA Remote Terminal Unit (RTU).
The Logic Interface is transmitting to SCADA, through this serial link all the metering data provided by the flow computers, as well as the data provided by the logic interface, itself. In this way the SCADA operator will have the full overview of the metering system and can operate/supervise the measuring process.

The "Modbus Exchange Table" between the metering system and SCADA system is shown below.

" Modbus Exchange Table " **S927 300-500 rev. 1_05, 25.11.2002**

1. Page 1.

Type of signal	RP570 Type	Start	End used	Length +20%	Extra spares	End of range	Range
Signed 16 Digital value 16 bits	DVM	26624	26638	15	8	26646	23
Signed 16 Analog value 12 bits	AVM	26647	26694	48	2	26696	50
Counter 32 bits	PCM	22784	22847	64	0	22847	4
Binary information 16 bits	IDM	26697	26705	9	0	26705	9
Limit Switch 8 bits	IDM	26706	26707	2	2	26709	4
Write value 12 bits	SPM	27035	27044	10	7	27051	17
Write value 12 bits	IXS	27052	27053	2	2	27055	4
General Output	GOM	27034	27034	1	0	27034	1

Length column integrate 20% spare, Extra spares column are supplementary spares.
General note: N/A – not applicable

Modscan /Modscan

12-12-2007

2. General

Logic Interface (BM) --> RTU (ABB) STATION															
RTU Type	RTU Blk Adr	T Box Addr	Frame Address	Type	Signal source	Modbus tags	Designation	Modbus scale min	Modbus scale max	Unit	No. of decimals	SCADA Type	SCADA LN	SCADA IX Process	SCADA IX SCADA
PCM	1	0	22784	SIGN 32	Logic Interface	G_VOL	Total current counter gross volume (1)	N/A	N/A	m^3	1		D6MS001_M	33	
PCM	2	1	22786	SIGN 32	Logic Interface	G_VOL_D	Total current counter gross volume default (2)	N/A	N/A	m^3	1		D6MS001_M	34	
PCM	3	2	22788	SIGN 32	Logic Interface	NET_VOL	Total current counter net volume	N/A	N/A	Sm^3	1		D6MS001_M	35	
PCM	4	3	22790	SIGN 32	Logic Interface	NET_VOL_D	Total current counter net volume default	N/A	N/A	Sm^3	1		D6MS001_M	36	
PCM	5	4	22792	SIGN 32	Logic Interface	MASS	Total current counter mass	N/A	N/A	t	1		D6MS001_M	37	
PCM	6	5	22794	SIGN 32	Logic Interface	MASS_D	Total current counter mass default	N/A	N/A	t	1		D6MS001_M	38	
PCM	7	6	22796	SIGN 32	Logic Interface	G_VOL_T	Total current counter gross volume (in & without alarm) (3)	N/A	N/A	m^3	1		D6MS001_M	39	
PCM	8	7	22798	SIGN 32	Logic Interface	NET_VOL_T	Total current counter net volume (in & without alarm)	N/A	N/A	Sm^3	1		D6MS001_M	40	
PCM	9	8	22800	SIGN 32	Logic Interface	MASS_T	Total current counter mass (in & without alarm)	N/A	N/A	t	1		D6MS001_M	41	
DVM	1	0	26624	SIGN 16	Logic Interface	G_FLOW	Total instantaneous gross flow rate	0	2400	m^3/h	1		D6MS001_M	119	69
DVM	2	1	26625	SIGN 16	Logic Interface	NET_FLOW	Total instantaneous net flow rate	0	2400	Sm^3/h	1		D6MS001_M	120	70
DVM	3	2	26626	SIGN 16	Logic Interface	MASS_FLOW	Total instantaneous mass flow rate	0	2400	t/h	1		D6MS001_M	121	71
AVM	1	23	26647	SIGN 12	Sampler	SAMP_LEVEL	Value of sampler level (4)	0	100	%	0		D6MS001_M	72	
AVM	2	24	26648	SIGN 12	BS & W	BSW	Value of BS & W	0	10	%	1		D6MS001_M	74	
AVM	3	25	26649	SIGN 12	Logic Interface	PF1	Performance factor of the sampler (5)	0	2	N/A	2		D6MS001_M	73	
AVM	4	26	26650	SIGN 12	RTU	PdT_H_R	PDT Threshold SP H back indication	0	2000	mbar	0		D6MS001_C	83	
AVM	5	27	26651	SIGN 12	RTU	PdT_HH_R	PDT Threshold SP HH back indication	0	2000	mbar	0		D6MS001_C	82	
AVM	6	28	26652	SIGN 12	Logic Interface	Temp	Station temperature	-30	70	°C	1		D6MS001_M	77	
AVM	7	29	26653	SIGN 12	Logic Interface	Pres	Station pressure	0	100	bar	2		D6MS001_M	75	
AVM	8	30	26654	SIGN 12	Logic Interface	Dens	Station density	700	1000	kg/m3	0		D6MS001_M	79	
AVM	9	31	26655	SIGN 12	Logic Interface	Load_q_R	Loading quantity back indication	0	40960	m3	0		D6MS001_C	134	84
AVM	10	32	26656				Spare								
AVM	11	33	26657				Spare								

Logic Interface (BM) --> RTU (ABB) STATION															
RTU Type	RTU Blk Adr	T Box Addr	Frame Address	Type	Signal source	Modbus tags	Designation	Modbus scale min	Modbus scale max	Unit	No. of decimals	SCADA Type	SCADA LN	SCADA IX Process	SCADA IX SCADA
IDM	1	73	26697	BIT 0	BS & W	BSW_Fail	BS & W Transmitter failure	N/A	N/A	N/A	N/A		D6MS001__M	14	
IDM	1	73	26697	BIT 1	Sampler	REC_Fail	Level of receiver default (6)	N/A	N/A	N/A	N/A		D6MS001__M	12	
IDM	1	73	26697	BIT 2	Sampler	SAMP_FAST	Alarm pulse frequency of sampler (7)	N/A	N/A	N/A	N/A		D6MS001__M	13	
IDM	1	73	26697	BIT 3	Logic Interface	QUANTITY_R	Loading quantity reached (8)	N/A	N/A	N/A	N/A		D6MS001__M	11	
IDM	1	73	26697	BIT 4	Logic Interface	QUANTITY_N_R	Loading quantity nearly reached (9)	N/A	N/A	N/A	N/A		D6MS001__M	10	
IDM	1	73	26697	BIT 5	MOV by-pass	STATUS_MOV_BP	MOV available	N/A	N/A	N/A	N/A		XXXXXXXXX	XX	
IDM	1	73	26697	BIT 6	RTU	FCV_A/M_Back	Automatic/manual back indication	N/A	N/A	N/A	N/A		D6MS001__Y	11	
IDM	1	73	26697	BIT 7	RTU	BATCH_Back	Start/stop batch back indication	N/A	N/A	N/A	N/A		D6MS001__X	11	
IDM	10	82	26706	BIT 0	MOV by-pass	ZSL_MOV_BP	Limit switch by-pass valve closed	N/A	N/A	N/A	N/A	DB	XXXXXXXXX	XX	
IDM	10	82	26706	BIT 1	MOV by-pass	ZSH_MOV_BP	Limit switch by-pass valve open	N/A	N/A	N/A	N/A	DB	XXXXXXXXX	XX	

3. CDN - A.

Logic Interface (BM) –> RTU (ABB) RUN A															
RTU Type	RTU Blk Adr	T Box Addr	Frame Address	Type	Signal source	Modbus tags	Designation	Modbus scale min	Modbus scale max	Unit	No. of decimals	SCADA Type	SCADA LN	SCADA IX Process	SCADA IX SCADA
IDM	1	73	26697	BIT 0	BS & W	BSW_Fail	BS & W Transmitter failure	N/A	N/A	N/A	N/A		D6MS001__M	14	
IDM	1	73	26697	BIT 1	Sampler	REC_Fail	Level of receiver default (6)	N/A	N/A	N/A	N/A		D6MS001__M	12	
IDM	1	73	26697	BIT 2	Sampler	SAMP_FAST	Alarm pulse frequency of sampler (7)	N/A	N/A	N/A	N/A		D6MS001__M	13	
PCM	10	9	22802	SIGN 32	CDN12-A	G_VOL_A	Current counter gross volume	N/A	N/A	m^3	1		D6MS001A_M	33	
PCM	11	10	22804	SIGN 32	CDN12-A	G_VOL_D_A	Current counter gross volume default	N/A	N/A	m^3	1		D6MS001A_M	34	
PCM	12	11	22806	SIGN 32	CDN12-A	NET_VOL_A	Current counter net volume	N/A	N/A	Sm^3	1		D6MS001A_M	35	
PCM	13	12	22808	SIGN 32	CDN12-A	NET_VOL_D_A	Current counter net volume default	N/A	N/A	Sm^3	1		D6MS001A_M	36	
PCM	14	13	22810	SIGN 32	CDN12-A	MASS_A	Current counter mass	N/A	N/A	t	1		D6MS001A_M	37	
PCM	15	14	22812	SIGN 32	CDN12-A	MASS_D_A	Current counter mass default	N/A	N/A	t	1		D6MS001A_M	38	
DVM	4	3	26627	SIGN 16	CDN12-A	G_FLOW_A	Instantaneous gross flow rate	0	1200	m^3/h	1		D6MS001A_M	119	69
DVM	5	4	26628	SIGN 16	CDN12-A	NET_FLOW_A	Instantaneous net flow rate	0	1200	Sm^3/h	1		D6MS001A_M	120	70
DVM	6	5	26629	SIGN 16	CDN12-A	MASS_FLOW_A	Instantaneous mass flow rate	0	1200	t/h	1		D6MS001A_M	121	71
AVM	12	34	26658	SIGN 12	CDN12-A	TT_A	Instantaneous pipe temperature	-30	+70	°C	1				
AVM	13	35	26659	SIGN 12	CDN12-A	PT_A	Instantaneous pipe pressure	0	100	bar g	1				
AVM	14	36	26660	SIGN 12	CDN12-A	DENSITY_A	Instantaneous density	700	1000	kg/m^3	1		D6MS001A_M	79	
AVM	15	37	26661	SIGN 12	CDN12-A	A_TT_A	Average pipe temperature	-30	+70	°C	1		D6MS001A_M	77	
AVM	16	38	26662	SIGN 12	CDN12-A	A_PT_A	Average pipe pressure	0	100	bar g	1		D6MS001A_M	75	
AVM	17	39	26663	SIGN 12	CDN12-A	SV_A	Flow control valve output	0	100	%	0		Y3FCV411_D	10	
AVM	18	40	26664	SIGN 12	Filter-A	PDT_A	Value of Filter differential pressure transmitter	0	2000	mbar	1		Y3MS001A_M	80	
AVM	19	41	26665	SIGN 12	Logic Interface	Load_F_A_R	Loading flowrate Run A back indication	0	2000	mbar	1		D6MS001A_C	134	
AVM	20	42	26666				Spare								
AVM	21	43	26667				Spare								

Logic Interface (BM) --> RTU (ABB)
RUN A

RTU Type	RTU Blk Adr	T Box Addr	Frame Address	Type	Signal source	Modbus tags	Designation	Modbus scale min	Modbus scale max	Unit	No. of decimals	SCADA Type	SCADA LN	SCADA IX Process	SCADA IX SCADA
IDM	2	74	26698	BIT 0	CDN12-A	NT_NL_A	Transfer status (no transfer no leakage) (10)	N/A	N/A	N/A	N/A				
IDM	2	74	26698	BIT 1	CDN12-A	NT_L_A	Transfer status (no transfer / leakage) (10)	N/A	N/A	N/A	N/A				
IDM	2	74	26698	BIT 2	CDN12-A	T_NP_A	Transfer status (transfer not pumping) (10) no flow detected.	N/A	N/A	N/A	N/A				
IDM	2	74	26698	BIT 3	CDN12-A	T_P_A	Transfer status (transfer pumping) (10) transfer & flow detected.	N/A	N/A	N/A	N/A				
IDM	2	74	26698	BIT 4	MOV-A	STATUS_MOV_A	MOV available	N/A	N/A	N/A	N/A		Y3MOV412_A	XX	
IDM	2	74	26698	BIT 5	FCV-A	STATUS_FCV_A	FCV available	N/A	N/A	N/A	N/A		Y3FCV411_A	XX	
IDM	3	75	26699	BIT 0	CDN12-A	AL_LEAK_A	Leakage (14)	N/A	N/A	N/A	N/A				
IDM	3	75	26699	BIT 1	CDN12-A	AL_TT_A	Pipe temperature transmitter failure	N/A	N/A	N/A	N/A				
IDM	3	75	26699	BIT 2	CDN12-A	AL_TR_A	Pipe temperature out of range	N/A	N/A	N/A	N/A				
IDM	3	75	26699	BIT 3	CDN12-A	AL_PT_A	Pipe pressure transmitter failure	N/A	N/A	N/A	N/A				
IDM	3	75	26699	BIT 4	CDN12-A	AL_PR_A	Pipe pressure out of range	N/A	N/A	N/A	N/A				
IDM	3	75	26699	BIT 5	CDN12-A	AL_DT_A	Density transmitter failure	N/A	N/A	N/A	N/A		Y3MSQ01A_A	[illegible]	FF
IDM	3	75	26699	BIT 6	CDN12-A	AL_DR_A	Density out of range	N/A	N/A	N/A	N/A		Y3MSQ01A_F	[illegible]	13
IDM	3	75	26699	BIT 7	CDN12-A	AL_BSWR_A	BSW out of range	N/A	N/A	N/A	N/A				
IDM	3	75	26699	BIT 8	CDN12-A	AL_U_FLOW_A	Under flow rate	N/A	N/A	N/A	N/A				
IDM	3	75	26699	BIT 9	CDN12-A	AL_E_FLOW_A	Excess flow rate	N/A	N/A	N/A	N/A				
IDM	3	75	26699	BIT 10	CDN12-A	AL_MAJ_A	Alarm "major"	N/A	N/A	N/A	N/A				
IDM	3	75	26699	BIT 11	CDN12-A	AL_MIN_A	Alarm "minor"	N/A	N/A	N/A	N/A				
IDM	3	75	26699	BIT 12	Filter-A	AL_PDSH_A	PdT Filter default	N/A	N/A	N/A	N/A				
IDM	3	75	26699	BIT 13	Filter-A	AL_PDSHH_A	PdT Filter default	N/A	N/A	N/A	N/A				
IDM	3	75	26699	BIT 14	Logic Interface	AL_COM_A	Communication failure (CDN 12 - Logic Interface)	N/A	N/A	N/A	N/A				
IDM	10	82	26706	BIT 2	HV-A	ZSH_HV_A	Limit switch open of HV	N/A	N/A	N/A	N/A	DB	Y3HV421__D	10	
IDM	10	82	26706	BIT 3	HV-A	ZSL_HV_A	Limit switch closed of HV	N/A	N/A	N/A	N/A	DB	Y3HV421__D	10	
IDM	10	82	26706	BIT 4	MOV-A	ZSH_MOV_A	Limit switch open of MOV	N/A	N/A	N/A	N/A	DB	Y3MOV412_D	10	
IDM	10	82	26706	BIT 5	MOV-A	ZSL_MOV_A	Limit switch closed of MOV	N/A	N/A	N/A	N/A	DB	Y3MOV412_D	10	

4. CDN - B.

Logic Interface (BM) --> RTU (ABB) RUN B											
RTU Type	RTU Blk Adr	T Box Addr	Frame Address	Type	Signal source	Modbus tags	Designation	Modbus scale min	Modbus scale max	Unit	No. of decimals
PCM	16	15	22814	SIGN 32	CDN12-B	G_VOL_B	Current counter gross volume	N/A	N/A	m^3	1
PCM	17	16	22816	SIGN 32	CDN12-B	G_VOL_D_B	Current counter gross volume default	N/A	N/A	m^3	1
PCM	18	17	22818	SIGN 32	CDN12-B	NET_VOL_B	Current counter net volume	N/A	N/A	Sm^3	1
PCM	19	18	22820	SIGN 32	CDN12-B	NET_VOL_D_B	Current counter net volume default	N/A	N/A	Sm^3	1
PCM	20	19	22822	SIGN 32	CDN12-B	MASS_B	Current counter mass	N/A	N/A	t	1
PCM	21	20	22824	SIGN 32	CDN12-B	MASS_D_B	Current counter mass default	N/A	N/A	t	1
DVM	7	6	26630	SIGN 16	CDN12-B	G_FLOW_B	Instantaneous gross flow rate	0	1200	m^3/h	1
DVM	8	7	26631	SIGN 16	CDN12-B	NET_FLOW_B	Instantaneous net flow rate	0	1200	Sm^3/h	1
DVM	9	8	26632	SIGN 16	CDN12-B	MASS_FLOW_B	Instantaneous mass flow rate	0	1200	t/h	1
AVM	22	44	26668	SIGN 12	CDN12-B	TT_B	Instantaneous pipe temperature	-30	+70	°C	1
AVM	23	45	26669	SIGN 12	CDN12-B	PT_B	Instantaneous pipe pressure	0	100	bar g	1
AVM	24	46	26670	SIGN 12	CDN12-B	DENSITY_B	Instantaneous density	700	1000	kg/m^3	1
AVM	25	47	26671	SIGN 12	CDN12-B	A_TT_B	Average pipe temperature	-30	+70	°C	1
AVM	26	48	26672	SIGN 12	CDN12-B	A_PT_B	Average pipe pressure	0	100	bar g	1
AVM	27	49	26673	SIGN 12	CDN12-B	SV_B	Flow control valve output	0	100	%	0
AVM	28	50	26674	SIGN 12	Filter-B	PDT_B	Value of Filter differential pressure transmitter	0	2000	mbar	1
AVM	29	51	26675	SIGN 12	Logic Interface	Load_F_B_R	Loading flowrate Run B back indication	0	2000	mbar	1
AVM	30	52	26676				Spare				
AVM	31	53	26677				Spare				

Logic Interface (BM) –> RTU (ABB) **RUN B**											
RTU Type	RTU Blk Adr	T Box Addr	Frame Address	Type	Signal source	Modbus tags	Designation	Modbus scale min	Modbus scale max	Unit	No. of decimals
IDM	4	76	26700	BIT 0	CDN12-B	NT_NL_B	Transfer status (no transfer no leakage) (10)	N/A	N/A	N/A	N/A
IDM	4	76	26700	BIT 1	CDN12-B	NT_L_B	Transfer status (no transfer / leakage) (10)	N/A	N/A	N/A	N/A
IDM	4	76	26700	BIT 2	CDN12-B	T_NP_B	Transfer status (transfer not pumping) (10) no flow detected.	N/A	N/A	N/A	N/A
IDM	4	76	26700	BIT 3	CDN12-B	T_P_B	Transfer status (transfer pumping) (10) transfer & flow detected.	N/A	N/A	N/A	N/A
IDM	4	76	26700	BIT 4	MOV-B	STATUS_MOV_B	MOV available	N/A	N/A	N/A	N/A
IDM	4	76	26700	BIT 5	FCV-B	STATUS_FCV_B	FCV available	N/A	N/A	N/A	N/A
IDM	5	77	26701	BIT 0	CDN12-B	AL_LEAK_B	Leakage (14)	N/A	N/A	N/A	N/A
IDM	5	77	26701	BIT 1	CDN12-B	AL_TT_B	Pipe temperature transmitter failure	N/A	N/A	N/A	N/A
IDM	5	77	26701	BIT 2	CDN12-B	AL_TR_B	Pipe temperature out of range	N/A	N/A	N/A	N/A
IDM	5	77	26701	BIT 3	CDN12-B	AL_PT_B	Pipe pressure transmitter failure	N/A	N/A	N/A	N/A
IDM	5	77	26701	BIT 4	CDN12-B	AL_PR_B	Pipe pressure out of range	N/A	N/A	N/A	N/A
IDM	5	77	26701	BIT 5	CDN12-B	AL_DT_B	Density transmitter failure	N/A	N/A	N/A	N/A
IDM	5	77	26701	BIT 6	CDN12-B	AL_DR_B	Density out of range	N/A	N/A	N/A	N/A
IDM	5	77	26701	BIT 7	CDN12-B	AL_BSWR_B	BSW out of range	N/A	N/A	N/A	N/A
IDM	5	77	26701	BIT 8	CDN12-B	AL_U_FLOW_B	Under flow rate	N/A	N/A	N/A	N/A
IDM	5	77	26701	BIT 9	CDN12-B	AL_E_FLOW_B	Excess flow rate	N/A	N/A	N/A	N/A
IDM	5	77	26701	BIT 10	CDN12-B	AL_MAJ_B	Alarm "major"	N/A	N/A	N/A	N/A
IDM	5	77	26701	BIT 11	CDN12-B	AL_MIN_B	Alarm "minor"	N/A	N/A	N/A	N/A
IDM	5	77	26701	BIT 12	Filter-B	AL_PDSH_B	PdT Filter default	N/A	N/A	N/A	N/A
IDM	5	77	26701	BIT 13	Filter-B	AL_PDSHH_B	PdT Filter default	N/A	N/A	N/A	N/A
IDM	5	77	26701	BIT 14	Logic Interface	AL_COM_B	Communication failure (CDN 12 - Logic Interface)	N/A	N/A	N/A	N/A
IDM	10	82	26706	BIT 6	HV-B	ZSH_HV_B	Limit switch open of HV	N/A	N/A	N/A	N/A
IDM	10	82	26706	BIT 7	HV-B	ZSL_HV_B	Limit switch closed of HV	N/A	N/A	N/A	N/A
IDM	10	82	26706	BIT 8	MOV-B	ZSH_MOV_B	Limit switch open of MOV	N/A	N/A	N/A	N/A
IDM	10	82	26706	BIT 9	MOV-B	ZSL_MOV_B	Limit switch closed of MOV	N/A	N/A	N/A	N/A

5. CDN - C.

Logic Interface (BM) –> RTU (ABB) RUN C											
RTU Type	RTU Blk Adr	T Box Addr	Frame Address	Type	Signal source	Modbus tags	Designation	Modbus scale min	Modbus scale max	Unit	No. of decimals
PCM	22	21	22826	SIGN 32	CDN12-C	G_VOL_C	Current counter gross volume	N/A	N/A	m^3	1
PCM	23	22	22828	SIGN 32	CDN12-C	G_VOL_D_C	Current counter gross volume default	N/A	N/A	m^3	1
PCM	24	23	22830	SIGN 32	CDN12-C	NET_VOL_C	Current counter net volume	N/A	N/A	Sm^3	1
PCM	25	24	22832	SIGN 32	CDN12-C	NET_VOL_D_C	Current counter net volume default	N/A	N/A	Sm^3	1
PCM	26	25	22834	SIGN 32	CDN12-C	MASS_C	Current counter mass	N/A	N/A	t	1
PCM	27	26	22836	SIGN 32	CDN12-C	MASS_D_C	Current counter mass default	N/A	N/A	t	1
DVM	10	9	26633	SIGN 16	CDN12-C	G_FLOW_C	Instantaneous gross flow rate	0	1200	m^3/h	1
DVM	11	10	26634	SIGN 16	CDN12-C	NET_FLOW_C	Instantaneous net flow rate	0	1200	Sm^3/h	1
DVM	12	11	26635	SIGN 16	CDN12-C	MASS_FLOW_C	Instantaneous mass flow rate	0	1200	t/h	1
DVM	13	12	26636	SIGN 16			Return from GOM BlkNr. 1				
AVM	32	54	26678	SIGN 12	CDN12-C	TT_C	Instantaneous pipe temperature	-30	+70	°C	1
AVM	33	55	26679	SIGN 12	CDN12-C	PT_C	Instantaneous pipe pressure	0	100	bar g	1
AVM	34	56	26680	SIGN 12	CDN12-C	DENSITY_C	Instantaneous density	700	1000	kg/m^3	1
AVM	35	57	26681	SIGN 12	CDN12-C	A_TT_C	Average pipe temperature	-30	+70	°C	1
AVM	36	58	26682	SIGN 12	CDN12-C	A_PT_C	Average pipe pressure	0	100	bar g	1
AVM	37	59	26683	SIGN 12	CDN12-C	SV_C	Flow control valve output	0	100	%	0
AVM	38	60	26684	SIGN 12	Filter-C	PDT_C	Value of Filter differential pressure transmitter	0	2000	mbar	1
AVM	39	61	26685	SIGN 12	Logic Interface	Load_F_C_R	Loading flowrate Run C back indication	0	2000	mbar	1
AVM	40	62	26686				Spare				
AVM	41	63	26687				Spare				
IDM	6	78	26702	BIT 0	CDN12-C	NT_NL_C	Transfer status (no transfer no leakage) (10)	N/A	N/A	N/A	N/A
IDM	6	78	26702	BIT 1	CDN12-C	NT_L_C	Transfer status (no transfer / leakage) (10)	N/A	N/A	N/A	N/A
IDM	6	78	26702	BIT 2	CDN12-C	T_NP_C	Transfer status (transfer not pumping) (10) no flow detected.	N/A	N/A	N/A	N/A
IDM	6	78	26702	BIT 3	CDN12-C	T_P_C	Transfer status (transfer pumping) (10) transfer & flow detected.	N/A	N/A	N/A	N/A
IDM	6	78	26702	BIT 4	MOV-C	STATUS_MOV_C	MOV available	N/A	N/A	N/A	N/A
IDM	6	78	26702	BIT 5	FCV-C	STATUS_FCV_C	FCV available	N/A	N/A	N/A	N/A

Logic Interface (BM) –> RTU (ABB) RUN C											
RTU Type	RTU Blk Adr	T Box Addr	Frame Address	Type	Signal source	Modbus tags	Designation	Modbus scale min	Modbus scale max	Unit	No. of decimals
IDM	7	79	26703	BIT 0	CDN12-C	AL_LEAK_C	Leakage (14)	N/A	N/A	N/A	N/A
IDM	7	79	26703	BIT 1	CDN12-C	AL_TT_C	Pipe temperature transmitter failure	N/A	N/A	N/A	N/A
IDM	7	79	26703	BIT 2	CDN12-C	AL_TR_C	Pipe temperature out of range	N/A	N/A	N/A	N/A
IDM	7	79	26703	BIT 3	CDN12-C	AL_PT_C	Pipe pressure transmitter failure	N/A	N/A	N/A	N/A
IDM	7	79	26703	BIT 4	CDN12-C	AL_PR_C	Pipe pressure out of range	N/A	N/A	N/A	N/A
IDM	7	79	26703	BIT 5	CDN12-C	AL_DT_C	Density transmitter failure	N/A	N/A	N/A	N/A
IDM	7	79	26703	BIT 6	CDN12-C	AL_DR_C	Density out of range	N/A	N/A	N/A	N/A
IDM	7	79	26703	BIT 7	CDN12-C	AL_BSWR_C	BSW out of range	N/A	N/A	N/A	N/A
IDM	7	79	26703	BIT 8	CDN12-C	AL_U_FLOW_C	Under flow rate	N/A	N/A	N/A	N/A
IDM	7	79	26703	BIT 9	CDN12-C	AL_E_FLOW_C	Excess flow rate	N/A	N/A	N/A	N/A
IDM	7	79	26703	BIT 10	CDN12-C	AL_MAJ_C	Alarm "major"	N/A	N/A	N/A	N/A
IDM	7	79	26703	BIT 11	CDN12-C	AL_MIN_C	Alarm "minor"	N/A	N/A	N/A	N/A
IDM	7	79	26703	BIT 12	Filter-C	AL_PDSH_C	PdT Filter default	N/A	N/A	N/A	N/A
IDM	7	79	26703	BIT 13	Filter-C	AL_PDSHH_C	PdT Filter default	N/A	N/A	N/A	N/A
IDM	7	79	26703	BIT 14	Logic Interface	AL_COM_C	Communication failure (CDN 12 - Logic Interface)	N/A	N/A	N/A	N/A
IDM	10	82	26706	BIT 10	HV-C	ZSH_HV_C	Limit switch open of HV	N/A	N/A	N/A	N/A
IDM	10	82	26706	BIT 11	HV-C	ZSL_HV_C	Limit switch closed of HV	N/A	N/A	N/A	N/A
IDM	10	82	26706	BIT 12	MOV-C	ZSH_MOV_C	Limit switch open of MOV	N/A	N/A	N/A	N/A
IDM	10	82	26706	BIT 13	MOV-C	ZSL_MOV_C	Limit switch closed of MOV	N/A	N/A	N/A	N/A

6. Commands.

RTU (ABB) --> Logic Interface (BM)															
RTU Type	RTU Blk Adr	Tbox Addr	Frame Address	Type	Signal source	Modbus tags	Designation	Modbus scale min	Modbus scale max	Unit	Nr of decimals	SCADA Type	SCADA LN	SCADA IX Process	SCADA IX SCADA
GOM	1	410	27034	SIGN 16	RTU	LOAD_Q	Loading quantity (11)	0	40960	m^3	0		D6MS001__C	14	
SPM	1	411	27035	SIGN 12	RTU	LOAD_F_A	Loading flowrate Run A (12)	0	1200	m^3/h	0		D6MS001A_C	14	
SPM	2	412	27036	SIGN 12	RTU	LOAD_F_B	Loading flowrate Run B (12)	0	1200	m^3/h	0		D6MS001B_C	14	
SPM	3	413	27037	SIGN 12	RTU	LOAD_F_C	Loading flowrate Run C (12)	0	1200	m^3/h	0		D6MS001C_C	14	
SPM	4	414	27038	SIGN 12	RTU	AL_PDSH_VALUE	PdT filter threshold value (13)	0	2000	mbar	0		D6MS001__X	16	
SPM	5	415	27039	SIGN 12	RTU	AL_PDSHH_VALUE	PdT filter threshold value (13)	0	2000	mbar	0		D6MS001__X	15	
SPM	6	416	27040	SIGN 12	RTU	FCV_MANU_A	Value when the FCV of run A is in manual mode	0	100	%	0		Y3FCV411_D	13	
SPM	7	417	27041	SIGN 12	RTU	FCV_MANU_B	Value when the FCV of run B is in manual mode	0	100	%	0		Y3FCV412_D	13	
SPM	8	418	27042	SIGN 12	RTU	FCV_MANU_C	Value when the FCV of run C is in manual mode	0	100	%	0		Y3FCV41X_D	13	
IXS	1	428	27052	BIT 0	RTU	FCV_A	FCV output auto status (active on "1")	N/A	N/A	N/A	N/A		D6MS001__Y	14	
IXS	1	428	27052	BIT 1	RTU	FCV_M	FCV output manual status (active on "1")	N/A	N/A	N/A	N/A		-		
IXS	2	428	27052	BIT 2	RTU	BATCH_ST	Start of batch (active on "1")	N/A	N/A	N/A	N/A		D6MS001__X	14	
IXS	2	428	27052	BIT 3	RTU	BATCH_SP	Stop of batch (active on "1")	N/A	N/A	N/A	N/A		-		
IXS	3	428	27052	BIT 4	RTU	MOV_O_A	MOV command to open (active on "1")	N/A	N/A	N/A	N/A		Y3MOV412_D	13	
IXS	3	428	27052	BIT 5	RTU	MOV_C_A	MOV command to close (active on "1")	N/A	N/A	N/A	N/A		-		
IXS	4	428	27052	BIT 6	RTU	MOV_O_B	MOV command to open (active on "1")	N/A	N/A	N/A	N/A		Y3MOVXXX_D	13	
IXS	4	428	27052	BIT 7	RTU	MOV_C_B	MOV command to close (active on "1")	N/A	N/A	N/A	N/A		-		
IXS	5	428	27052	BIT 8	RTU	MOV_O_C	MOV command to open (active on "1")	N/A	N/A	N/A	N/A		Y3MOVXXX_D	13	
IXS	5	428	27052	BIT 9	RTU	MOV_C_C	MOV command to close (active on "1")	N/A	N/A	N/A	N/A		-		
IXS	6	428	27052	BIT 10	RTU	MOV_O_BP	MOV by pass command to open (active on "1")	N/A	N/A	N/A	N/A				
IXS	6	428	27052	BIT 11	RTU	MOV_C_BP	MOV by pass command to close (active on "1")	N/A	N/A	N/A	N/A				
IXS	7	428	27052	BIT 12	RTU	ACK	Alarm acknowledgement (one for all runs)	N/A	N/A	N/A	N/A				
IXS	7	428	27052	BIT 13	RTU	ACK_Dummy	Dummy (for the second bit of the acknowledge)	N/A	N/A	N/A	N/A				
IXS	8	428	27052	BIT 14	RTU		Spare								
IXS	8	428	27052	BIT 15	RTU		Spare								

RTU (ABB) --> Logic Interface (BM)															
RTU Type	RTU Blk Adr	Tbox Addr	Frame Address	Type	Signal source	Modbus tags	Designation	Modbus scale min	Modbus scale max	Unit	Nr of decimals	SCADA Type	SCADA LN	SCADA IX Process	SCADA IX SCADA
IXS	9	429	27053	BIT 0	RTU		Spare								
IXS	9	429	27053	BIT 1	RTU		Spare								
IXS	10	429	27053	BIT 2	RTU		Spare								
IXS	10	429	27053	BIT 3	RTU		Spare								
IXS	11	429	27053	BIT 4	RTU		Spare								
IXS	11	429	27053	BIT 5	RTU		Spare								
IXS	12	429	27053	BIT 6	RTU		Spare								
IXS	12	429	27053	BIT 7	RTU		Spare								
IXS	13	429	27053	BIT 8	RTU		Spare								
IXS	13	429	27053	BIT 9	RTU		Spare								
IXS	14	429	27053	BIT 10	RTU		Spare								
IXS	14	429	27053	BIT 11	RTU		Spare								
IXS	15	429	27053	BIT 12	RTU		Spare								
IXS	15	429	27053	BIT 13	RTU		Spare								
IXS	16	429	27053	BIT 14	RTU		Spare								
IXS	16	429	27053	BIT 15	RTU		Spare								

Notes :

1 Cumulating of volumes transferred during the batch without any alarm. This value is reset to zero at each start of batch
2 Cumulating of volumes transferred during the batch with alarms pressure, temperature, or other. This value is reset to zero at each start of batch
3 Cumulating of both previous values
4 This value is determined according to the level transmitter connected to the sampler receiver
5 The performance factor is calculated within the logic interface according to API standard.
6 A bit is set when the value of the level transmitter of the sampler is out of range of the transmitter
7 A bit is set when the period between two pulses is higher than the period authorised by the sampler
8 A bit is set when the loading quantity is reached
9 A bit is set when the loading quantity is nearly achieved.
10 Current status of the CDN12 run computer
11 Crude oil quantity determined for the batch
12 Used for FCV management by the CDN12 during the batch (with controller in auto mode)
13 When the value is above the threshold, an alarm is raised
14 "Leakage" means that pulses are received by the CDN 12, while the station is out of transfer.

7. Extra Spares.

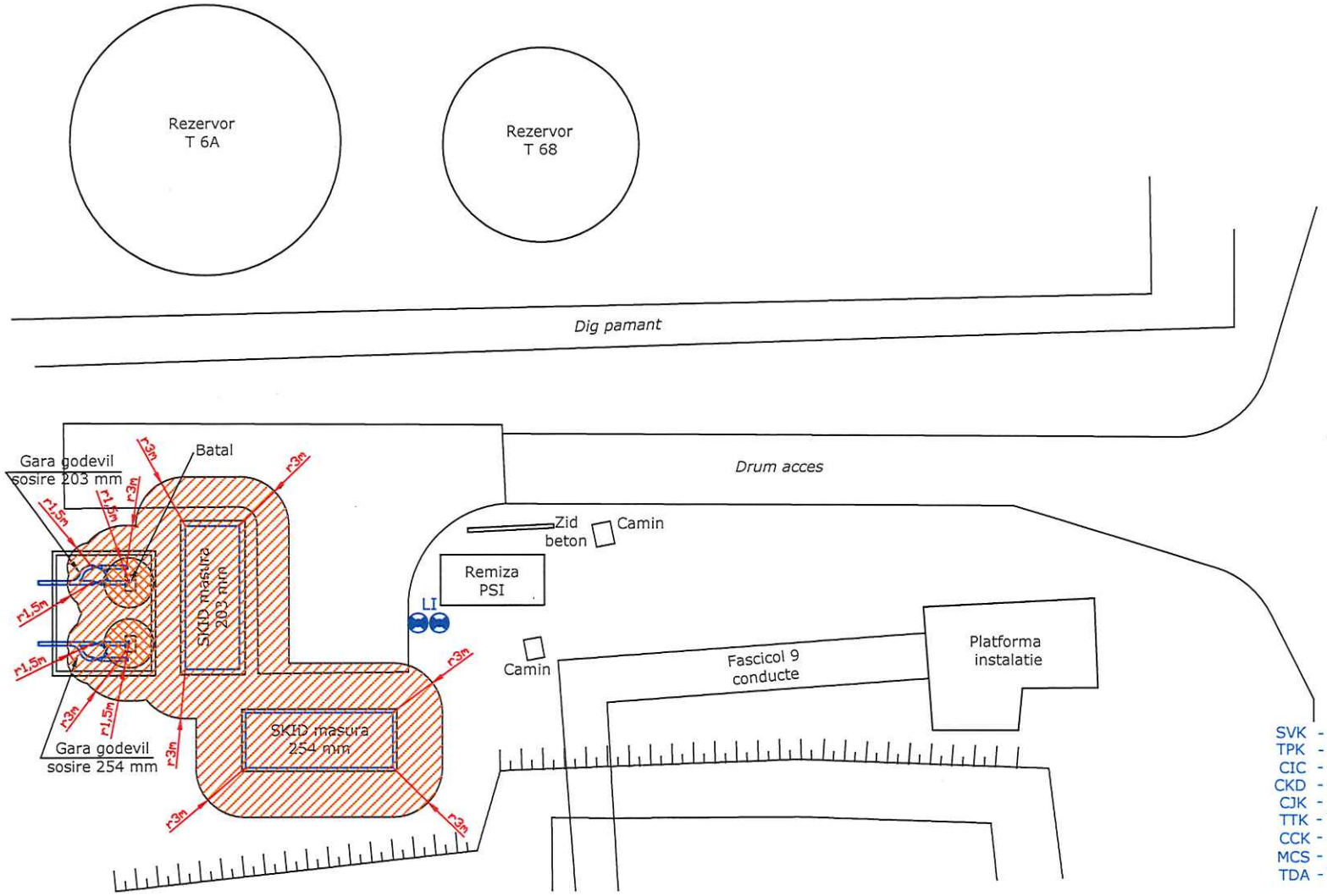
EXTRA SPARE Logic Interface (BM) --> RTU (ABB)											
RTU Type	RTU Blk Adr	Tbox Addr	Frame Address	Type	Signal source	Modbus tags	Designation	Modbus scale min	Modbus scale max	Unit	Number of decimals
PCM	28	27	22838	SIGN 32			Spare				
PCM	29	28	22840	SIGN 32			Spare				
PCM	30	29	22842	SIGN 32			Spare				
PCM	31	30	22844	SIGN 32			Spare				
PCM	32	31	22846	SIGN 32			Spare				
DVM	14	13	26637	SIGN 16			Spare				
DVM	15	14	26638	SIGN 16			Spare				
DVM	16	15	26639	SIGN 16			Spare				
DVM	17	16	26640	SIGN 16			Spare				
DVM	18	17	26641	SIGN 16			Spare				
DVM	19	18	26642	SIGN 16			Spare				
DVM	20	19	26643	SIGN 16			Spare				
DVM	21	20	26644	SIGN 16			Spare				
DVM	22	21	26645	SIGN 16			Spare				
DVM	23	22	26646	SIGN 16			Spare				
AVM	42	64	26688	SIGN 12			Spare				
AVM	43	65	26689	SIGN 12			Spare				
AVM	44	66	26690	SIGN 12			Spare				
AVM	45	67	26691	SIGN 12			Spare				
AVM	46	68	26692	SIGN 12			Spare				
AVM	47	69	26693	SIGN 12			Spare				
AVM	48	70	26694	SIGN 12			Spare				
AVM	49	71	26695	SIGN 12			Spare				
AVM	50	72	26696	SIGN 12			Spare				

Logic Interface RTU (ABB) --> (BM)											
RTU	RTU	Tbox	Frame	Type	Signal source	Modbus tags	Designation	Modbus scale		Unit	Number of decimals
SPM	9	419	27043				Spare				
SPM	10	420	27044				Spare				
SPM	11	421	27045				Spare				
SPM	12	422	27046				Spare				
SPM	13	423	27047				Spare				
SPM	14	424	27048				Spare				
SPM	15	425	27049				Spare				
SPM	16	426	27050				Spare				
IXS	10	430	27054	BIT 0			Spare				
IXS	10	430	27054	BIT 1			Spare				
IXS	11	430	27054	BIT 2			Spare				
IXS	11	430	27054	BIT 3			Spare				
IXS	12	430	27054	BIT 4			Spare				
IXS	12	430	27054	BIT 5			Spare				
IXS	13	430	27054	BIT 6			Spare				
IXS	13	430	27054	BIT 7			Spare				
IXS	14	430	27054	BIT 8			Spare				
IXS	14	430	27054	BIT 9			Spare				
IXS	15	430	27054	BIT 10			Spare				
IXS	15	430	27054	BIT 11			Spare				
IXS	16	430	27054	BIT 12			Spare				
IXS	16	430	27054	BIT 13			Spare				
IXS	17	430	27054	BIT 14			Spare				
IXS	17	430	27054	BIT 15			Spare				

Logic Interface RTU (ABB) --> (BM)											
RTU	RTU	Tbox	Frame	Type	Signal source	Modbus tags	Designation	Modbus scale		Unit	Number of decimals
IXS	18	431	27055	BIT 0			Spare				
IXS	18	431	27055	BIT 1			Spare				
IXS	19	431	27055	BIT 2			Spare				
IXS	19	431	27055	BIT 3			Spare				
IXS	20	431	27055	BIT 4			Spare				
IXS	20	431	27055	BIT 5			Spare				
IXS	21	431	27055	BIT 6			Spare				
IXS	21	431	27055	BIT 7			Spare				
IXS	22	431	27055	BIT 8			Spare				
IXS	22	431	27055	BIT 9			Spare				
IXS	23	431	27055	BIT 10			Spare				
IXS	23	431	27055	BIT 11			Spare				
IXS	24	431	27055	BIT 12			Spare				
IXS	24	431	27055	BIT 13			Spare				
IXS	25	431	27055	BIT 14			Spare				
IXS	25	431	27055	BIT 15			Spare				

8. Conversion.

MODBUS TAG	TYPE	MINI	MAXI	PHYSICAL VALUE	NUMBER OF DECIMALS	MODBUS TELEGRAM VALUE DECIMAL	MAX. TELEGRAM VALUE DECIMAL	COMMENTS
G_FLOW	SIGN 16	0	2400	600 m3/h	1	8192	32768	
G_FLOW	SIGN 16	0	2400	123.4 m3/h	1	1684	32768	
G_VOL	SIGN 32			123456.7m3	1	1234567		
TT_A	SIGN 12	-30	70	21.5°C	1	16875	+/- 32752	
TT_A	SIGN 12	-30	70	-5°C	1	8192	+/- 32752	
PT_A	SIGN 12	0	100	12.3bar	1	4030	+/- 32752	
DENSITY_A	SIGN 12	700	1000	850kg/m3	1	16384	+/- 32752	Out of range ! / 3000 sev. values, not possible with SIGN 12.
DENSITY_A	SIGN 16	700	1000	850kg/m3	1	16384	32768	
PDT_A	SIGN 12	0	2000	1500mbar	1	24576	32000	Out of range ! / 20000 sev. values, not possible with SIGN 12.
PDT_A	SIGN 16	0	2000	1500mbar	1	24576	32768	
LOAD_Q	USIGN 12	0	40000	30000m3	- 1	24576	32000	Out of range ! / 4000 sev. values, not possible with SIGN 12.
LOAD_Q	USIGN 16	0	655360	30000m3	- 1	3000	65536	handle as unsigned in MicroSCADA
LOAD_Q	USIGN 16	0	655360	300000m3	- 1	30000	65536	handle as unsigned in MicroSCADA
LOAD_Q	USIGN 16	0	655360	30000m3	0	30000	65536	



LEGENDA

Echipamente SKID-uri masura

- SVK - Servoventil cu indicator de pozitie
- TPK - Transmitator de presiune
- CIC - Bloc adaptor cablu insotitor de caldura
- CKD - Contor de debit
- CJK - Cutie de jonctiune
- TTK - Transmitator de temperatura
- CCK - Cofret de comanda cu doua comutatoare
- MCS - Motor asincron servocomanda SKID
- TDA - Traductor de debit cu adaptor

Echipamente gari godevil

- LPG - Bloc limitator de presiune
- SG - Semnalizator pozitie godevil
- TTG - Traductor de temperatura
- SVG - Servoventil cu indicator de pozitie
- LI - Corp de iluminat constructie antiexploziva

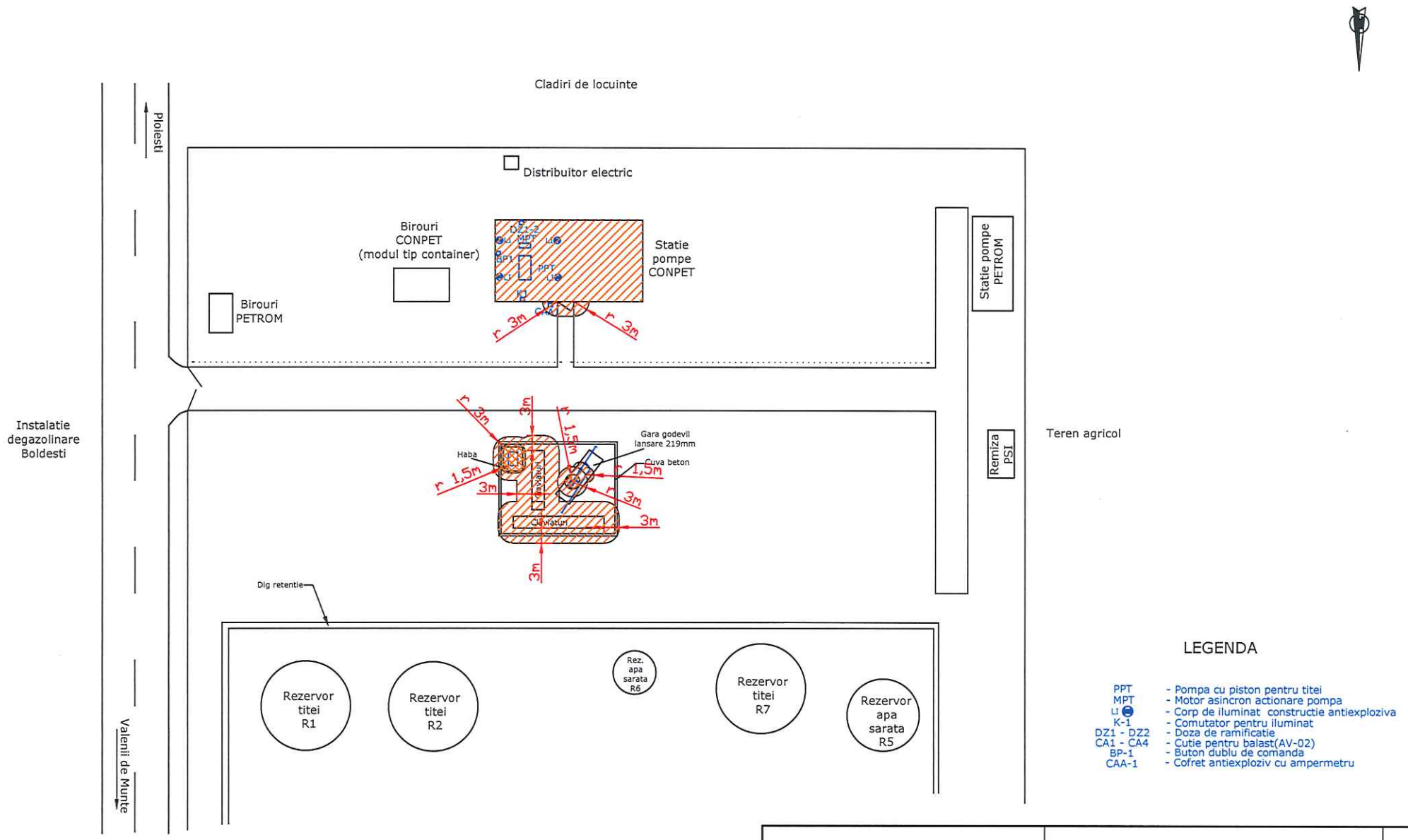
COMBUSTIBIL VEHICULAT	TITEI
GRUPA DE EXPLOZIE	IIA
TEMP. DE INFLAMABILITATE	+30°C
LIMITE DE EXPLOZIBILITATE LEL LES	 0.6% vol 7 % vol
CLASA DE TEMPERATURA	T3

ZONARE

- Zona 0
- Zona 1
- Zona 2
- Zona neclasificata

S.C. SERVICE IMPLEMENTARE PRODUCȚIE S.A. PETRILA			"DEPOZIT ȚIȚEI BRAZI"
SEF PROIECT	ING. ZAHARIEA V.		SIP – P3199.DCC – A
INTOCMIT	ING. ZAHARIEA V.		Planul de zonare si planul instalatiilor electromecanice
DESENAT	ING. BRETEANU A.		
VERIFICAT	ING. SELEJAN A.		Iunie 2018

Beneficiar: S.C. CONPET S.A.
Loc. Brazi, Jud. Prahova



LEGENDA

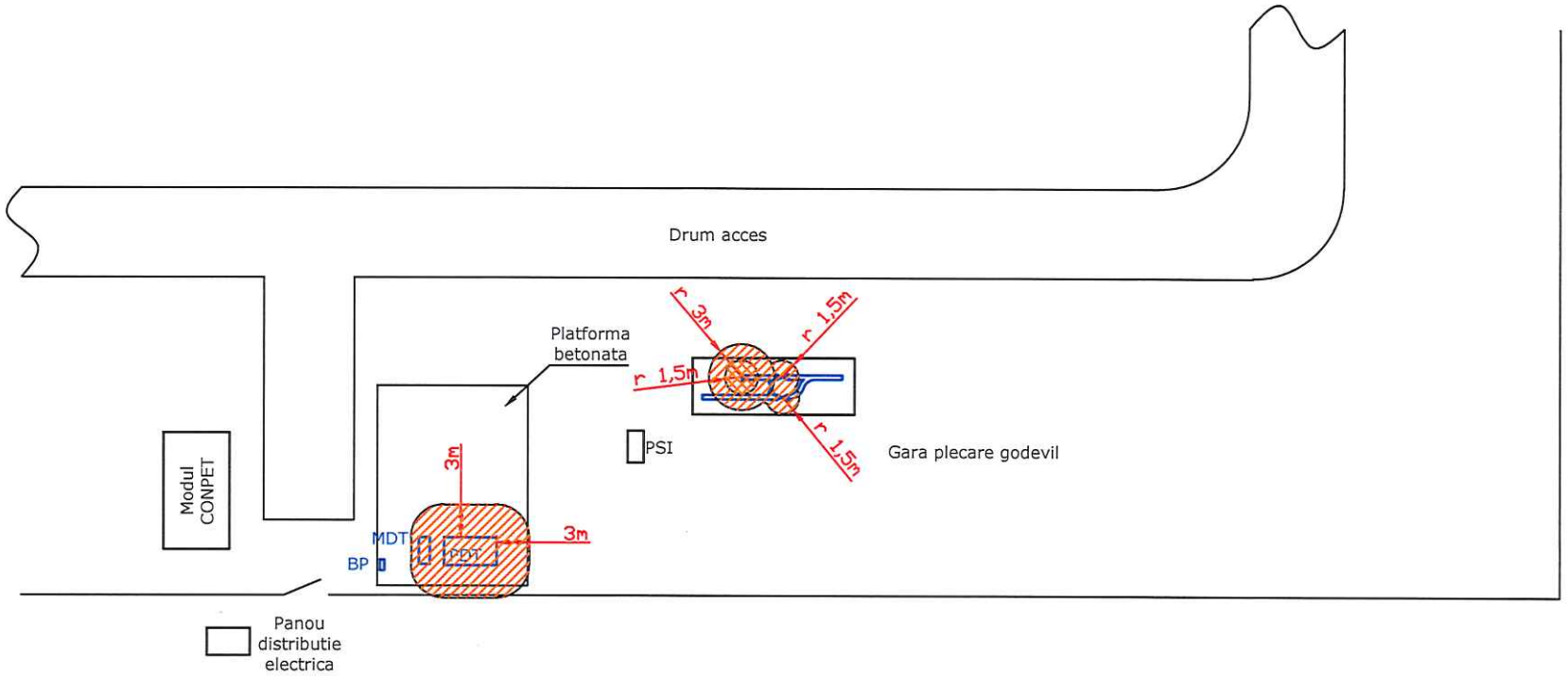
PPT	- Pompa cu piston pentru titei
MPT	- Motor asincron actionare pompa
LI	- Corp de iluminat constructie antiexploziva
K-1	- Comutator pentru iluminat
DZ1 - DZ2	- Doza de ramificatie
CA1 - CA4	- Cutie pentru balast(AV-02)
BP-1	- Buton dublu de comanda
CAA-1	- Cofret antiexploziv cu ampermetru

ZONARE

- Zona 0
- Zona 1
- Zona 2
- Zona neclasificata

COMBUSTIBIL VEHICULAT	TITEI
GRUPA DE EXPLOZIE	IIA
TEMP. DE INFLAMABILITATE	+30°C
LIMITE DE EXPLOZIBILITATE LEL	0.6% vol
LES	7 % vol
CLASA DE TEMPERATURA	T3

S.C. SERVICE IMPLEMENTARE PRODUCȚIE S.A. PETRILA		" STATIE TITEI BOLDESTI "
SEF PROIECT	ING. ZAHARIEA V.	
INTOCMIT	ING. DINU N.	
DESENAT	ING. STOICA D.	
VERIFICAT	ING. SELEJAN A.	
Octombrie 2018		SIP – P3364.DCC – 01
		Planul de zonare și planul instalațiilor electromecanice
		Beneficiar: CONPET S.A. Punct de lucru: Loc. Boldesti-Scaieni, Jud. Prahova



LEGENDA

PDT - Pompa duplex pentru titei
MDT - Motor asincron pentru pompa duplex
BP - Buton dublu de comanda

ZONARE

Zona 0
Zona 1
Zona 2
Zona neclasificata

COMBUSTIBIL VEHICULAT	TITEI
GRUPA DE EXPLOZIE	IIA
TEMP. DE INFLAMABILITATE	+30°C
LIMITE DE EXPLOZIBILITATE LEL	0.6% vol
LES	7 % vol
CLASA DE TEMPERATURA	T3

S.C. SERVICE IMPLEMENTARE PRODUCȚIE S.A. PETRILA			STATIE TITEI OCHIURI
SEF PROIECT	ING. ZAHARIEA V.		SIP – P3362.DCC 01
INTOCMIT	ING. DINU N.		Planul de zonare și planul instalațiilor electromecanice
DESENAT	ING. STOICA D.		
VERIFICAT	ING. SELEJAN A.		Octombrie 2018

Beneficiar: CONPET S.A.
Punct de lucru: Loc. Gura Ocnitei, Ochiuri, Jud. Dambovita

COMBUSTIBIL VEHICULAT	TITEI
GRUPA DE EXPLOZIE	IIA
TEMP. DE INFLAMABILITATE	+30°C
LIMITE DE EXPLOZIBILITATE LEL LES	 0.6% vol 7 % vol
CLASA DE TEMPERATURA	T3

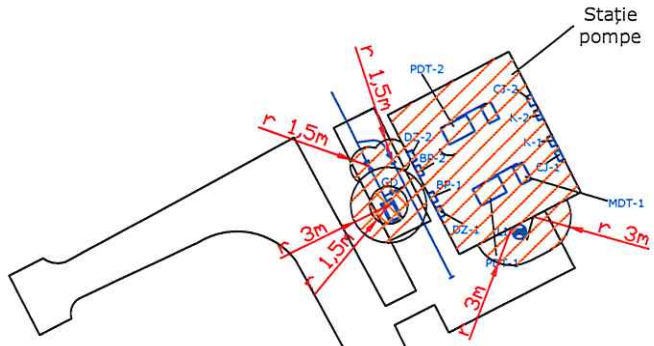
R8

Teren viran

S.N.P. PETROM
SUC. TÂRGOVIŞTE

LEGENDA

R1, R8 - Rezervoare ţiţei
GD - Gară lansare godevil
BP-1, BP-2 - Butoane duble de comandă
PDT-1, PDT-2 - Pompe duplex pentru ţiţei
MDT-1, MDT-2 - Motoare asincrone acţionare pompe pentru ţiţei
K-1, K-2 - Comutatoare iluminat
CJ-1, CJ-2 - Cutii de joncţiune
DZ-1, DZ-2 - Doze de ramificaţie
LI - Corp de iluminat construcţie antiexplozivă



S.N.P. PETROM
SUC. TÂRGOVIŞTE

S.N.P. PETROM
SUC. TÂRGOVIŞTE

S.N.P. PETROM
SUC. TÂRGOVIŞTE

Drum comunal

ZONARE

Zona 0
Zona 1
Zona 2
Zona neclasificata

S.C. SERVICE IMPLEMENTARE PRODUCŢIE S.A. PETRILA			" STAŢIE ŢIŢEI TEIŞ "	
SEF PROIECT	ING. ZAHARIEA V.		SIP – P3348.DCC 01	
INTOCMIT	ING. DINU N.		Planul de zonare şi planul instalaţiilor electromecanice	
DESENAT	ING. STOICA D.			
VERIFICAT	ING. SELEJAN A.		Octombrie 2018	Beneficiar: CONPET S.A. Punct de lucru: Loc. Şotânga, Teiş, Jud. Dâmboviţa