SRT / SRAE
SOFTWARE
DOCUMENTATION
SUPER-USER

1. DESCRIPTION

chapter 1

Release : 2.1

REVISIONS DOCUMENT

Release	*Author*	*Date*	*Modifications*
1.0	**M.Mersier**	**06/22/2005**	• **Creation (SRA)**
2.0	**M.Mersier**	**09/11/2006**	• **Update (SRT)**
2.1	**O.Nazorek**	**11/12/2006**	• **Update (SRAE)**

1.1 SRT box unit

1.1.1 Pin out

CT AS218-35PA DEUTSCH		
Pin	**Signal**	**Description**
1	RX_ETH_N	RX_N Ethernet 10/100 Base T
2	VBATT_AUX	Positive Supply Aux
3	VBATT_AUX	Positive Supply Aux
4	TX_ETH_P	TX_P Ethernet 10/100 Base T
5	RX_ETH_P	RX_P Ethernet 10/100 Base T
6	VBATT_AUX	Positive Supply Aux
7	VBATT_AUX	Positive Supply Aux
8	OUT_PELV3	Proportional Electro valve Output 3
9	OUT_PELV4	Proportional Electro valve Output 4
10	TX_ETH_N	TX_N Ethernet 10/100 Base T
11	IN_PKUP2P	Electromagnetic Pick-up Input 2 Positive
12	IN_PKUP2_3N	Electromagnetic Pick-up 4 Negative
13	I_O_SYNCRO	Digital Input Iso9141
14	RX	RS232 loop current RX
15	IN_LAP_TRIGGER	Digital Input for Lap Trigger
16	OUT_PELV1	Proportional Electro valve Output 1
17	INP_KNOCK_2N	Knock 2 Input negative
18	INP_KNOCK_2P	Knock 2 Input positive
19	IN_PKUP3P	Electromagnetic Pick-up Input 3 Positive
20	TX	RS232 loop current TX
21	CAN1_H	CAN1 Serial Line (H)
22	IN_HALL4	Hall Effect Sensors Input 4
23	IN_HALL6	Hall Effect Sensors Input 6
24	OUT_PELV2	Proportional Electro valve Output 2
25	INP_KNOCK_1P	Knock 1 Input positive
26	INP_KNOCK_1N	Knock 1 Input negative
27	IN_AN13	Single Ended Input 13 (0-5V)
28	IN_ENCP	Enable Code Programming
29	CAN1_L	CAN1 Serial Line (L)
30	CAN0_L	CAN0 Serial Line (L)
31	IN_HALL5	Hall Effect Sensors Input 5
32	IN_HALL2	Hall Effect Sensors Input 2
33	OUT2_HB1	Output H Bridge1
34	IN_LAMBDA2_VS-	Input Vs- Lambda 2
35	IN_LAMBDA2_VS+	Input Vs+ Lambda 2
36	IN_VBINJ	Input Injector battery Supply
37	IN_AN14	Single Ended Input 14 (0-5V)
38	IN_LAMBDA1_VS+	Input Vs+ Lambda 1
39	IN_TC2N	Differential input 2 Negative
40	CAN0_H	CAN0 Serial Line (H)
41	IN_HALL3	Hall Effect Sensors Input 3

42	OUT2_HB1	Output H Bridge1
43	IN_LAMBDA2_IP+	Input Ip+ Lambda 2
44	GND_TEMP3_4	Analog Ground Temp3_4 (Vref)
45	IN_TEMP4	NTC-PT1000 Input 4
46	IN_LAMBDA1_VS-	Input Vs- Lambda 1
47	IN_LAMBDA1_IP+	Input Ip+ Lambda 1
48	IN_TC2P	Differential input 2 Positive
49	IN_HALL1	Hall Effect Sensors Input 1
50	OUT1_HB1	Output H Bridge1
51	EXTGNDMA3	External GNDMA
52	IN_TEMP3	NTC-PT1000 Input 3
53	GND_POWER_AUX	Ground Power Aux (PWR3)
54	IN_TC1N	Differential input 1 Negative
55	EXTGNDMS	Digital Output Ground
56	SHIELD1	Wiring Shield PK
57	OUT1_HB1	Output H Bridge1
58	EXTVREF3	External Reference Supply 3 (5V)
59	GND_POWER_AUX	Ground Power Aux (PWR3)
60	GND_POWER_AUX	Ground Power Aux (PWR3)
61	IN_TC1P	Differential input 1 Positive
62	OUT2_HB2	Output H Bridge2
63	OUT2_HB2	Output H Bridge2
64	GND_POWER_AUX	Ground Power Aux (PWR3)
65	OUT1_HB2	Output H Bridge2
66	OUT1_HB2	Output H Bridge2

CT2 AS218-35PN DEUTSCH		
Pin	**Signal**	**Description**
1	OUT_LAMBDA1	Lambda1 Heater Output
2	OUT_IGN4	Ignition Output 4
3	OUT_IGN4	Ignition Output 4
4	EXTVREF1	External Reference Supply 1 (5V)
5	OUT_LAMBDA2	Lambda2 Heater Output
6	IN_AN8	Single Ended Input 8 (0-5V)
7	OUT_IGN4	Ignition Output 4
8	OUT_IGN6	Ignition Output 6
9	OUT_IGN6	Ignition Output 6
10	EXTGNDMA1	External GNDMA1
11	IN_AN10	Single Ended Input 10 (0-5V)
12	IN_AN2	Single Ended Input 2 (0-5V)
13	IN_AN7	Single Ended Input 7 (0-5V)
14	IN_PKUP1N	Electromagnetic Pick-up 1 Negative
15	OUT_IGN6	Ignition Output 6
16	OUT_IGN5	Ignition Output 5
17	EXTVREF2	External Reference Supply 2 (5V)
18	EXTGNDMA2	External GNDMA2
19	IN_AN11	Single Ended Input 11 (0-5V)
20	IN_AN5	Single Ended Input 5 (0-5V)
21	IN_PKUP1P	Electromagnetic Pick-up Input 1 Positive
22	IN_TEMP1	NTC-PT1000 Input 1

23	OUT_IGN5	Ignition Output 5
24	OUT_IGN5	Ignition Output 5
25	OUT_INJ5	Injector Output 5 (fuel)
26	IN_AN6	Single Ended Input 6 (0-5V)
27	IN_AN4	Single Ended Input 4 (0-5V)
28	IN_AN3	Single Ended Input 3 (0-5V)
29	IN_AN9	Single Ended Input 9 (0-5V)
30	GND_TEMP1_2	Analog Ground Temp1_2 (Vref)
31	IN_TEMP2	NTC-PT1000 Input 2
32	IN_AN12	Single Ended Input 12 (0-5V)
33	OUT_IGN2	Ignition Output 2
34	OUT_INJ2	Injector Output 2 (fuel)
35	VBATTP	Positive Battery Supply
36	VBATTP	Positive Battery Supply
37	IN_AN1	Single Ended Input 1 (0-5V)
38	SHIELD2	Wiring Shield PK
39	VBATTN	Negative Battery Supply
40	VBATTN	Negative Battery Supply
41	OUT_IGN2	Ignition Output 2
42	OUT_IGN2	Ignition Output 2
43	OUT_INJ4	Injector Output 4 (fuel)
44	PWR_GND_INJECTOR	Power Output Ground Injector (PWR2)
45	PWR_GND_INJECTOR	Power Output Ground Injector (PWR2)
46	PWR_GND_INJECTOR	Power Output Ground Injector (PWR2)
47	PWR_GND_INJECTOR	Power Output Ground Injector (PWR2)
48	PWR_GND_IGNITION	PWR_GND_IGNITION
49	OUT_IGN3	Ignition Output 3
50	OUT_IGN3	Ignition Output 3
51	OUT_INJ3	Injector Output 3 (fuel)
52	PWR_GND_IGNITION	Power Output Ground Ignition (PWR1)
53	PWR_GND_IGNITION	Power Output Ground Ignition (PWR1)
54	PWR_GND_IGNITION	Power Output Ground Ignition (PWR1)
55	PWR_GND_IGNITION	Power Output Ground Ignition (PWR1)
56	OUT_IGN1	Ignition Output 1
57	OUT_IGN3	Ignition Output 3
58	OUT_INJ8	Injector Output 8 (fuel)
59	OUT_INJ7	Injector Output 7 (fuel)
60	PWR_GND_IGNITION	Power Output Ground Ignition (PWR1)
61	GND_POWER_AUX	Ground Power Aux (PWR3)
62	OUT_IGN1	Ignition Output 1
63	OUT_IGN1	Ignition Output 1
64	OUT_INJ6	Injector Output 6 (fuel)
65	OUT_INJ1	Injector Output 1 (fuel)
66	GND_POWER_AUX	Ground Power Aux (PWR3)

1.1.2 Characteristics.

1.1.2.1 Analog Inputs.

- Number of Inputs = 14.
- Range 0-5V
- 10 bit A/D converter
- Input resistance 383kΩ (pull up 5 V)
- Analogic anti aliasing filter 1 pole. (f_{cut} 240 Hz)
- Protection to short circuit to ground and battery, open circuit diagnostic

1.1.2.2 Temperature inputs.

- Number of Inputs = 4.
- In block selectable NTC/PT1000
- 10 bit A/D converter
- Temperature Range –30 °C … +200 °C
- Analogic anti aliasing filter 1 real pole. (f_{cut} 5 Hz)
- Protection to short circuit to ground and battery, open circuit diagnostic

1.1.2.3 Thermo Couple input .

- Number of Inputs = 2.
- Differential Input with gain 105
- 10 bit A/D converter
- Analogic anti aliasing filter 1 real pole. (f_{cut} 117 Hz), (one filter a input and one filter a output)
- Protection to short circuit to ground and battery, open circuit diagnostic

1.1.2.4 Linear Lambda (UEGO).

- Number of Inputs = 2.
- Manage Vs and Ip cell.
- Vs cell polarization 30 uA.
- Analogic anti aliasing filter. (fcut 20 Hz)
- Stoichiometric ratio 4 V output.
- Open load reading 4 V.
- 10 bit A/D converter.

1.1.2.5 Speed Inputs

- Inputs PK1 to PK3 are electromagnetic or Hall Effect type according to the use input.
- Inputs Hall4 to Hall6 are Hall effect type input..

1.1.2.6 Knock Inputs

- 2 differential input piezo sensor interface with direct logic selection

1.1.2.7 Injectors Outputs

- Number of outputs = 8.
- Max. current (permanent) = 4A.
- Clamp = 60 V.

1.1.2.8 Ignition Coils Outputs

- Number of outputs = 6.
- Max. current (permanent) = 15A.
- Feedback control software selectable = 3 / 6 A.

1.1.2.9 Electro valve Outputs

- Number of outputs = 4.
- Max. current (permanent) = 5A.

1.1.2.10 Lambda Heater Output

- Number of outputs = 2.
- Max. current (permanent) = 3A.

1.1.2.11 Full H-Bridge Outputs

- Number of outputs = 2.
- Max. current (permanent) = 7A.

1.1.2.12 Communication

- Asynchronous serial Line (current loop 20mA).
- CAN Line 1Mbit/sec ended or not by electric beam.
- CAN Line for client use, with software programmable speed (min 125 Kbit/sec) ended or not by electrical beam.
- ETH Line for vision and/or Telemetry

1.2 SRAE box unit

1.2.1 Pin out

TYCO_AMP		
Pin	**Signal**	**Description**
1	OUT_GND_AUX	Power Output Ground Aux (PWR3) (20A with 2.5mm)
2	OUT_GND_AUX	Power Output Ground Aux (PWR3) (20A with 2.5mm)
3	OUT_GND_AUX	Power Output Ground Aux (PWR3) (20A with 2.5mm)
4	OUT_GND_AUX	Power Output Ground Aux (PWR3) (20A with 2.5mm)
5	VBATT_AUX	Positive Supply Aux (20A with 2.5mm)
6	VBATT_AUX	Positive Supply Aux (20A with 2.5mm)
7	OUT2_HB	Output Hbridge (9A with 0.75mm)
8	VBATTN	Negative Battery Sypply (3.5A with 0.35mm)
9	SHIELD_PK1	Wiring Shield PK (3.5A with 0.35mm)
10	IN_DELPHIA_GND	Digital Output Ground Delphia GNDMS
11	IN_HALL_GND1	Digital Output Ground Hall1-2-3 (Vcc)
12	SHIELD_PK2	Wiring Shield PK (3.5A with 0.35mm)
13	IN_HALL4	Hall Effect Sensor Input 4 (3.5A with 0.35mm)
14	IN_LAMBDA1_VS-	Input Vs- Lambda 1
15	IN_PKUP3P	Electromagnetic Pick-up 3 Positive (3.5A with 0.35mm)
16	IN_PKUP4N	Electromagnetic Pick-up 4 Negative (3.5A with 0.35mm)
17	IN_PKUP6P	Electromagnetic Pick-up 6 Positive (3.5A with 0.35mm)
18	INP_KNOCK_2N	Knock Input 2 Negative (3.5A with 0.35mm)
19	INP_KNOCK_1N	Knock Input 1 Negative (3.5A with 0.35mm)
20	IN_LAMBDA_ON/OFF_AGND	Analog Groung Lambda On/off (3.5A with 0.35mm)
21	IN_LAMBDA_ON/OFF	Lambda On/off Input (3.5A with 0.35mm)
22	VBINJ	Injector Battery Supply (3.5A with 0.35mm)
23	IN_AN1	Single Ended Input 1 (0-5V) (3.5A with 0.35mm)
24	IN_AN8	Single Ended Input 8 (0-5V) (3.5A with 0.35mm)
25	IN_AN3	Single Ended Input 3 (0-5V) (3.5A with 0.35mm)
26	IN_TC2P	Differential Input 2 Positive (3.5A with 0.35mm)
27	IN_TC1P	Differential Input 2 Positive (3.5A with 0.35mm)
28	IN_TEMP1	Analog Ground Temp1 (Vref) (3.5A with 0.35mm)
29	OUT1_HB	Output Hbridge (9A with 0.75mm)
30	VBATTP	Positive Battery Supply (3.5A with 0.35mm)
31	SHIELD_PK3-PK4	Wiring Shield PK (3.5A with 0.35mm)
32	N.C	not connected
33	IN_HALL_GND2	Digital Output Ground Hall4-5-6 (Vcc)
34	IN_HALL2	Hall Effect Sensor Input 2 (3.5A with 0.35mm)
35	IN_LAMBDA1_IP+	Input Ip+ Lambda 1
36	IN_LAMBDA1_VS+	Input Vs+ Lambda 1
37	IN_PKUP3N	Electromagnetic Pick-up 3 Negative (3.5A with 0.35mm)
38	IN_PKUP4P	Electromagnetic Pick-up 4 Positive (3.5A with 0.35mm)
39	IN_PKUP6N	Electromagnetic Pick-up 6 Negative (3.5A with 0.35mm)
40	INP_KNOCK_2P	Knock Input 2 Positive (3.5A with 0.35mm)
41	INP_KNOCK_1P	Knock Input 1 Positive (3.5A with 0.35mm)

42	SHIELD_PK5-PK6	Wiring Shield PK (3.5A with 0.35mm)
43	IN_AN2	Single Ended Input 2 (0-5V) (3.5A with 0.35mm)
44	IN_AN4	Single Ended Input 4 (0-5V) (3.5A with 0.35mm)
45	IN_AN5	Single Ended Input 5 (0-5V) (3.5A with 0.35mm)
46	IN_AN6	Single Ended Input 6 (0-5V) (3.5A with 0.35mm)
47	IN_AN7	Single Ended Input 7 (0-5V) (3.5A with 0.35mm)
48	IN_TC2N	Differential Input 2 Negative (3.5A with 0.35mm)
49	IN_TC1N	Differential Input 1 Negative (3.5A with 0.35mm)
50	GND_TEMP1	Analog Ground Temp1 (Vref) (3.5A with 0.35mm)
51	VBATTN	Negative Battery Supply (9A with 0.75mm)
52	TERM2_CAN0	CAN0 Terminations
53	TERM2_CAN1	CAN1 Terminations
54	TX_ETH_N	TX_N Ethernet 10/100 Base T
55	RX_ETH_N	RX_N Ethernet 10/100 Base T
56	CAN1_H	CAN1 Serial Line (H)
57	TX	RS232 loop current TX
58	CAN0_L	CAN0 Serial Line (L)
59	IN_HALL3	Hall Effect Sensor Input 3 (3.5A with 0.35mm)
60	IN_HALL5	Hall Effect Sensor Input 5 (3.5A with 0.35mm)
61	IN_PKUP1P	Electromagnetic Pick-up 1 Positive (3.5A with 0.35mm)
62	IN_PKUP2P	Electromagnetic Pick-up 2 Positive (3.5A with 0.35mm)
63	IN_PKUP5P	Electromagnetic Pick-up 5 Positive (3.5A with 0.35mm)
64	EXTVREF1	External Reference Supply 1 (5V) (3.5A with 0.35mm)
65	EXTGNDMA1	Analog Output Ground Reference ExtVref1 (3.5A with 0.35mm)
66	EXTGNDMA1	Analog Output Ground Reference ExtVref1 (3.5A with 0.35mm)
67	EXTVREF2	External Reference Supply 2 (5V) (3.5A with 0.35mm)
68	EXTGNDMA2	Analog Output Ground Reference ExtVref2 (3.5A with 0.35mm)
69	EXTGNDMA2	Analog Output Ground Reference ExtVref2 (3.5A with 0.35mm)
70	IN_TEMP2	NTC-PT1000 Input 2 (3.5A with 0.35mm)
71	IN_TEMP3	NTC-PT1000 Input 3 (3.5A with 0.35mm)
72	GND_TEMP4	Analog Ground Temp4 (Vref) (3.5A with 0.35mm)
73	VBATTP	Positive Battery Supply (9A with 0.75mm)
74	TERM1_CAN0	CAN0 Terminations
75	TERM1_CAN1	CAN1 Terminations
76	TX_ETH_P	TX_P Ethernet 10/100 Base T
77	RX_ETH_P	RX_P Ethernet 10/100 Base T
78	CAN1_L	CAN1 Serial Line (L)
79	RX	RS232 loop current RX
80	CAN0_H	CAN0 Serial Line (H)
81	IN_HALL1	Hall Effect Sensor Input 1 (3.5A with 0.35mm)
82	IN_HALL6	Hall Effect Sensor Input 6 (3.5A with 0.35mm)
83	IN_PKUP1N	Electromagnetic Pick-up 1 Negative (3.5A with 0.35mm)
84	IN_PKUP2N	Electromagnetic Pick-up 2 Negative (3.5A with 0.35mm)
85	IN_PKUP5N	Electromagnetic Pick-up 5 Negative (3.5A with 0.35mm)
86	EXTVREF1	External Reference Supply 1 (5V) (3.5A with 0.35mm)
87	EXTVREF1	External Reference Supply 1 (5V) (3.5A with 0.35mm)
88	EXTGNDMA1	Analog Output Ground Reference ExtVref1 (3.5A with 0.35mm)

89	EXTVREF2	External Reference Supply 2 (5V) (3.5A with 0.35mm)
90	EXTVERF2	External Reference Supply 2 (5V) (3.5A with 0.35mm)
91	EXTGNDMA2	Analog Output Ground Reference ExtVref2 (3.5A with 0.35mm)
92	GND_TEMP2	Analog Ground Temp2 (Vref) (3.5A with 0.35mm)
93	GND_TEMP3	Analog Ground Temp3 (Vref) (3.5A with 0.35mm)
94	IN_TEMP4	NTC-PT1000 Input 4 (3.5A with 0.35mm)
1A	OUT_GND_IGNITION	Power Output Ground Ignition (PWMR1) (14A with 1.5mm)
2A	OUT_GND_IGNITION	Power Output Ground Ignition (PWMR1) (14A with 1.5mm)
3A	OUT_GND_INJECTOR	Power Output Ground Injector (PWMR2) (9A with 0.75mm)
4A	OUT_GND_INJECTOR	Power Output Ground Injector (PWMR2) (9A with 0.75mm)
5A	OUT_IGN3_LOG	Out Cmd Logic Ignition 3 (3.5A with 0.35mm)
6A	IN_DIG_GND	Digital Output Ground (Vcc) (3.5A with 0.35mm)
7A	OUT_IGN2_LOG	Out Cmd Logic Ignition 2 (3.5A with 0.35mm)
8A	OUT_IGN4_LOG	Out Cmd Logic Ignition 4 (3.5A with 0.35mm)
9A	OUT_IGN1_LOG	Out Cmd Logic Ignition 1 (3.5A with 0.35mm)
10A	OUT_IGN6_LOG	Out Cmd Logic Ignition 6 (3.5A with 0.35mm)
11A	IN_ENCP_GND	Enable Code Programming Ground (3.5A with 0.35mm)
12A	OUT_IGN5_LOG	Out Cmd Logic Ignition 5 (3.5A with 0.35mm)
13A	N.C	
14A	N.C	
15A	N.C	
16A	OUT_IGN6	Ignition Output 6 (14A with 1.5mm)
17A	OUT_GND_IGNITION	Power Output Ground Ignition (PWRM1) (14A with 1.5mm)
18A	OUT_INJ7	Injector Output 7 (9A with 0.75mm)
19A	OUT_INJ3	Injector Output 3 (9A with 0.75mm)
20A	IN_DIG3	Digital Input 3 (3.5A with 0.35mm)
21A	IN_DIG7	Digital Input 7 (3.5A with 0.35mm)
22A	IN_DIG2	Digital Input 2 (3.5A with 0.35mm)
23A	IN_DIG6	Digital Input 6 (3.5A with 0.35mm)
24A	IN_DIG4	Digital Input 4 (3.5A with 0.35mm)
25A	IN_LAP_TRIGGER	Digital Input Lap Trigger (3.5A with 0.35mm)
26A	IN_DIG1	Digital Input 1 (3.5A with 0.35mm)
27A	IN_ENCP	Enable Code Programming (3.5A with 0.35mm)
28A	N.C	
29A	N.C	
30A	N.C	
31A	OUT_IGN1	Ignition output 1 (14A with 1.5mm)
32A	OUT_GND_IGNITION	Power Output Ground Ignition (PWMR1) (14A with 1.5mm)
33A	OUT_GND_IGNITION	Power Output Ground Ignition (PWMR1) (14A with 1.5mm)
34A	OUT_GND_INJECTOR	Power Output Ground Injector (PWMR2) (9A with 0.75mm)
35A	OUT_GND_INJECTOR	Power Output Ground Injector (PWMR2) (9A with 0.75mm)
36A	OUT_GND_INJECTOR	Power Output Ground Injector (PWMR2) (3.5A with 0.35mm)
37A	OUT_GND_INJECTOR	Power Output Ground Injector (PWMR2) (3.5A with 0.35mm)
38A	OUT_GND_INJECTOR	Power Output Ground Injector (PWMR2) (3.5A with 0.35mm)
39A	OUT_GND_INJECTOR	Power Output Ground Injector (PWMR2) (3.5A with 0.35mm)
40A	N.C	not connected
41A	N.C	not connected
42A	N.C	not connected
43A	N.C	not connected
44A	OUT_LS2	Low Side Output 2 (3.5A with 0.35mm)
45A	OUT_LS1	Low Side Output 1 (9A with 0.75mm)

46A	OUT_IGN2	Ignition Output 2 (14A with 1.5mm)
47A	OUT_IGN3	Ignition Output 3 (14A with 1.5mm)
48A	OUT_IGN4	Ignition Output 4 (14A with 1.5mm)
49A	OUT_IGN5	Ignition Output 5 (9A with 0.75mm)
50A	OUT_INJ8	Injector Output 8 (9A with 0.75mm)
51A	OUT_INJ2	Injector Output 2 (6A with 0.5mm)
52A	OUT_INJ1	Injector Output 1 (6A with 0.5mm)
53A	OUT_INJ4	Injector Output 4 (6A with 0.5mm)
54A	OUT_INJ6	Injector Output 6 (6A with 0.5mm)
55A	OUT_INJ5	Injector Output 5 (6A with 0.5mm)
56A	OUT_PELV4	Proportional Electro valve Output 4 (6A with 0.5mm)
57A	OUT_LAMBDA	Lambda Heater Output (6A with 0.5mm)
58A	OUT_PELV3	Proportional Electro valve Output 3 (6A with 0.5mm)
59A	OUT_PELV1	Proportional Electro valve Output 1 (6A with 0.5mm)
60A	OUT_PELV2	Proportional Electro valve Output 2 (9A with 0.75mm)

1.2.2 Characteristics.

1.2.2.1 Analog Inputs.

- Number of Inputs = 8.
- Range 0-5V
- 10 bit A/D converter
- Input resistance 383kΩ (pull up 5 V)
- Analogic anti aliasing filter 1 pole. (f_{cut} 240 Hz)
- Protection to short circuit to ground and battery, open circuit diagnostic

1.2.2.2 Temperature inputs.

- Number of Inputs = 4.
- In block selectable NTC/PT1000
- 10 bit A/D converter
- Temperature Range –30 °C … +200 °C
- Analogic anti aliasing filter 1 real pole. (f_{cut} 5 Hz)
- Protection to short circuit to ground and battery, open circuit diagnostic

1.2.2.3 Thermo Couple inputs.

- Number of Inputs = 2.
- Differential Input with gain 105
- 10 bit A/D converter
- Analogic anti aliasing filter 1 real pole. (f_{cut} 117 Hz), (one filter a input and one filter a output)
- Protection to short circuit to ground and battery, open circuit diagnostic

1.2.2.4 Lambda ON/OFF

- Number of input = 1
- Not differential Input (Same ground as all other analogue inputs)
- Input with very high input impedance dedicated to ON/OFF oxygen sensor
- Analog anti aliasing filter 1 real pole (f_{cut} 117Hz)
- Open load detection reading 0.45V
- 10 bit A/D converter

1.2.2.5 Linear Lambda (UEGO).

- Number of Inputs = 1.
- Manage Vs and Ip cell.
- Vs cell polarization 30 uA.
- Analogic anti aliasing filter. (fcut 20 Hz)
- Stoichiometric ratio 4 V output.
- Open load reading 4 V.
- 10 bit A/D converter.

1.2.2.6 Variable reluctance frequency inputs

- Number of inputs = 6
- From 100mV to 60V with commutation to zero crossing and rearmament to ½ of crest signal
- Highest frequency of the impulses 10KHz

1.2.2.7 Hall frequency Inputs

- Number of Inputs = 6
- Interface for Hall Effect sensor is composed by a filtered resistive circuit and a pull up to 5V.
- Signal varying from 0 to 18V with a 2.5V commutation threshold
- Hall 2 input can be customized for Delphia sensor:
  RF capacitor 470pF, pull down 3.92KOhm, resistor divider 26.7 KOhm and 68.1 KOhm (1nF in parallel) to GND. Signal clamped to 5V

1.2.2.8 Knock Inputs

- 1 differential input piezo sensor interface with direct logic selection

1.2.2.9 Digital Input

- Number of inputs = 6
- 4 acquiered by A/D converter and 2 by digital input
- Input resistance 4.75 KOhm (pull up 5V)
- Analogic anti aliasing filter 1 real pole (f_{cut} 80Hz)
- Protection to short circuit to ground and battery

1.2.2.10 Lap Trigger input

- Number of input = 1
- Input resistance 4.75 KOhm (pull down or pull up hardware selectable)
- Analogic anti aliasing filter 1 real pole (f_{cut} 1.5 MHz)
- Protection to short circuit to ground and battery

1.2.2.11 Injectors Outputs

- Number of outputs = 8.
- Max. current (permanent) = 4A.
- Clamp = 60 V.

1.2.2.12 Ignition Coils Outputs

- Number of outputs = 6.
- Max. current (permanent) = 15A.
- Feedback control software selectable = 3 / 6 A.

1.2.2.13 Command logic Ignition

- Number of output = 6

1.2.2.14 Low Side

- Number of output = 2
- Up to 2A

1.2.2.15 Electro valve Outputs

- Number of outputs = 4.
- Max. current (permanent) = 5A.

1.2.2.16 Lambda Heater Output

- Number of outputs = 1.
- Max. current (permanent) = 3A.

1.2.2.17 H-Bridge Outputs

- Number of outputs = 1.
- Max. current (permanent) = 7A.

1.2.2.18 Communication

- Asynchronous serial Line (current loop 20mA).
- CAN Line 1Mbit/sec ended or not by electric beam.

- CAN Line for client use, with software programmable speed (min 125 Kbit/sec) ended or not by electrical beam.
- ETH Line for vision and/or Telemetry