

ICCS CAN I/O

Controllers



The **ICCS CAN I/O** modules are part of the Intelligent Control and Command Systems (ICCS) product range. They can be easily integrated into your CAN network or used as standalone modules.

With three different designs the ICCS CAN I/O offers flexible connection and mounting options.

- **ICCS CAN I/O** – the stable base of the CAN I/O series and the forerunner of all other versions. It can be connected to the PCB and used as a standalone module.
- **ICCS CAN I/O 22P** is specially designed for easy connection to the PCB.
- **ICCS CAN I/O Waterproof** has IP68 protection and is suitable for use in harsh environmental conditions.

Optional variants with 5 V reference voltage or RS232 / RS485 communication interfaces are available.

Applications

- Input and output extensions for CAN bus systems
- Analogue sensor to CAN module
- Connection of digital and analogue sensors via the CAN bus

Technical data

General information	
Connector	Molex Mini Fit 22 Ways
Dimensions	x 66 x 33 mm (CAN I/O)
	95 x 77 x 35 mm (CAN I/O waterproof)
	85 x 62 x 21.5 mm (22P)
Weight	75 g (CAN I/O), 95 g (22P), 170 g (CAN I/O waterproof)
Operating temperature	-40 °C to 85 °C (no full load at 85 °C)
Storage temperature	-40 °C to 85 °C
Ingress protection	IP53 (CAN I/O and 22P) IP68 (CAN I/O Waterproof)
EMC	E1
Operating voltage V _{supply}	9 V to 30 V DC
Pre-fusing	10 A / block
Current consumption	30 mA
Sleep mode consumption	500 µA
Processor type	Freescale HCS08
Clock frequency	40 MHz
Flash memory	60 kB
RAM	4 kB
EEPROM	1 kB available for graphical programming

CAN bus	
acc. ISO 11898-2	High speed
acc. CAN 2.0 B	29 Bits extended address identifier
acc. CAN 2.0 A	11 Bits address identifier
Baud rate	20 kBit/s to 1000 kBit/s (125kBit/s default value)

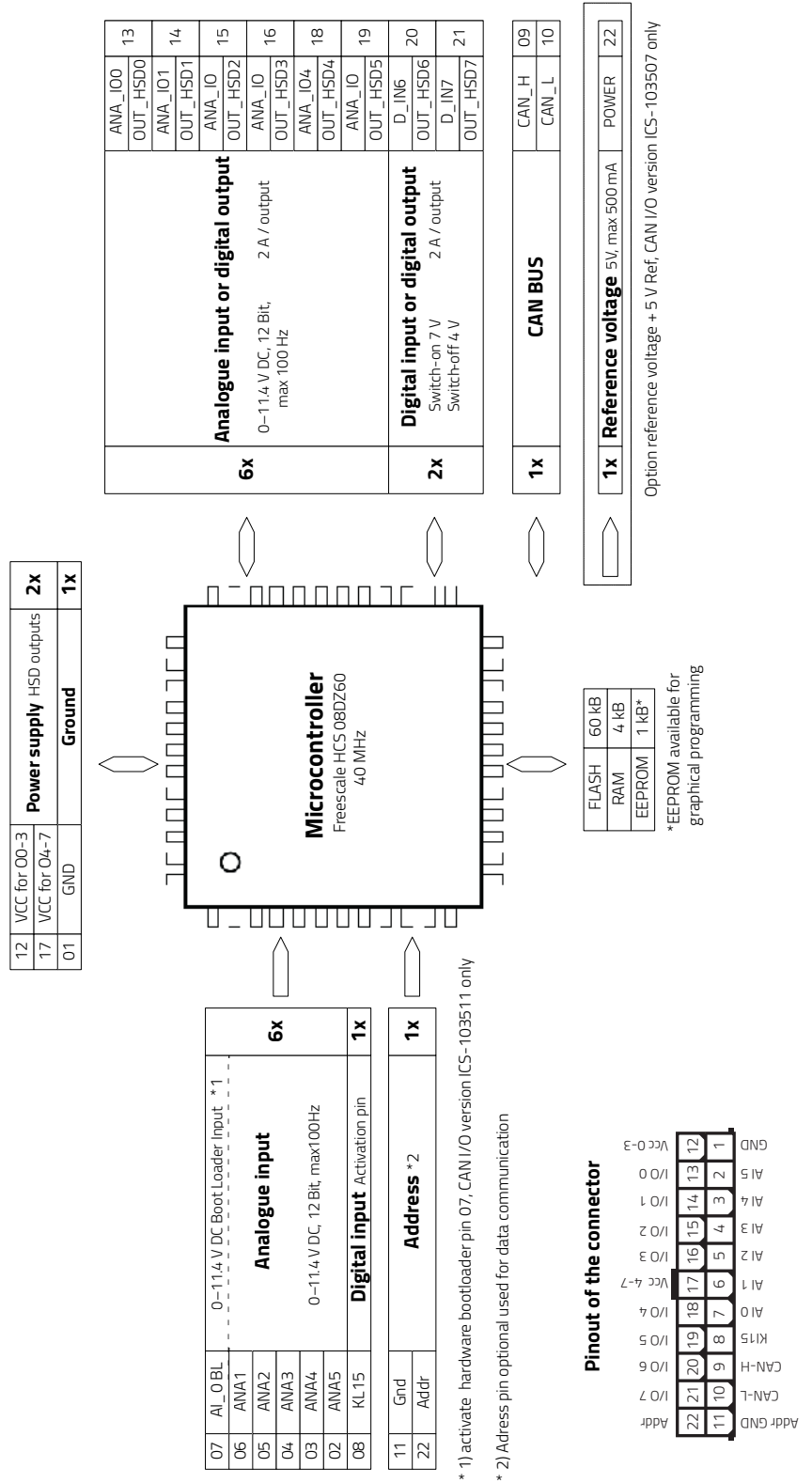
Inputs / outputs overview		
6	Analogue inputs	5 x 0–11.4 V DC 12 Bit 1 x 0–33.67 V DC 12 Bit
1	Activation pin	KL15 Wake-up Input
6	Analogue inputs or digital outputs	0–11.4 V DC 12 Bit High side outputs max 2 A
2	Digital inputs or digital outputs	Switch-on / switch-off level: 7 V / 4 V DC High side outputs max 2 A

Inputs / outputs details	
Analogue inputs	
Input voltage max	V _{supply}
Measuring range	0–11.4 V DC / 0–33.67 V DC
Resolution	12 Bit
Input resistance	22.6 kΩ for 0–11.4 V and 66.6 kΩ for 0–33.67 V
Input frequency	60 Hz for 0–10 V, 40 Hz for 0–30 V
Digital inputs	
Input voltage	0 V to V _{supply}
Switch-on level	7 V DC
Switch-off level	4 V DC
Input resistance	22.6 kΩ (66.6 kΩ for KL15)
Input frequency	max 100 Hz
Digital outputs	
Load current	max 2 A diagnostic current sense
PWM outputs	
PWM frequency	max 1 kHz
Duty cycle	0 to 100 %
Resolution	0.1 %
Load current	max 1 A

* Every analogue input is also usable as a digital input in the programming software.

Hardware map

- **ICS-103511:** ICCS CAN I/O Hardware-bootloader
- **ICS-103504:** ICCS CAN I/O Software-bootloader
- **ICS-103507:** ICCS CAN I/O Software-bootloader with reference voltage 5 V
- **ICS-103505:** ICCS CAN I/O 22P
- **ICS-104096:** ICCS CAN I/O 22P FreqIN (ANA3 & ANA5)



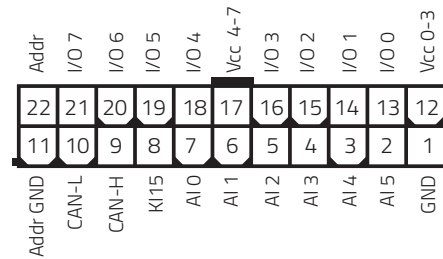
Pin assignment

Connector of ICS-103511, ICS-103507, ICS-103504, ICS-103505, ICS-104096		
Pin	Description	Function
1	GND	Ground
2	ANA5	Analogue input 0–30 V
3	ANA4	Analogue input 0–10 V
4	ANA3	Analogue input 0–10 V
5	ANA2	Analogue input 0–10 V
6	ANA1	Analogue input 0–10 V
7	ANA0	Analogue input 0–10 V (BL) *1
8	KL15	Activation pin
9	CAN H	CAN Bus High
10	CAN L	CAN Bus Low
11	Addr GND	Address GND
12	VCC for O0-3	Power supply HSD output 0–3
13	ANA_IO0 OUT_HSD0	Analogue input 0–10 V Digital output
14	ANA_IO1 OUT_HSD1	Analogue input 0–10 V Digital output
15	ANA_IO2 OUT_HSD2	Analogue input 0–10 V Digital output
16	ANA_IO3 OUT_HSD3	Analogue input 0–10 V Digital output
17	VCC for O4-7	Power supply HSD output 4–7
18	ANA_IO4 OUT_HSD4	Analogue input 0–10 V Digital output
19	ANA_IO5 OUT_HSD5	Analogue input 0–10 V Digital output
20	D_IN6 OUT_HSD6	Digital input Digital output
21	D_IN7 OUT_HSD7	Digital input Digital output
22	Addr	Single wire address

*1) Activation pin for bootloader, version ICS-103511 only

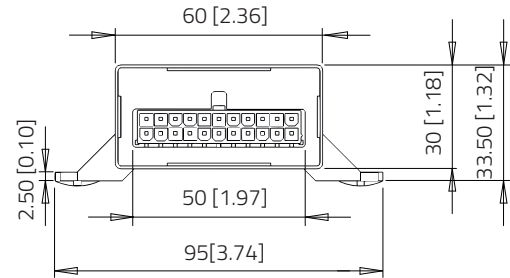
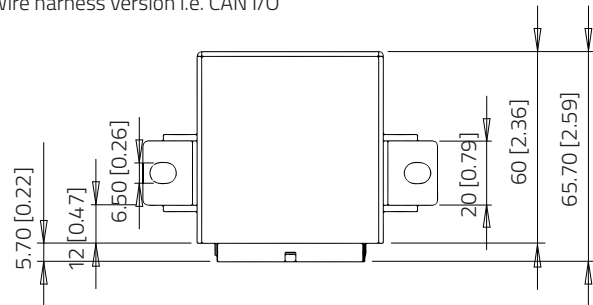


Connector module

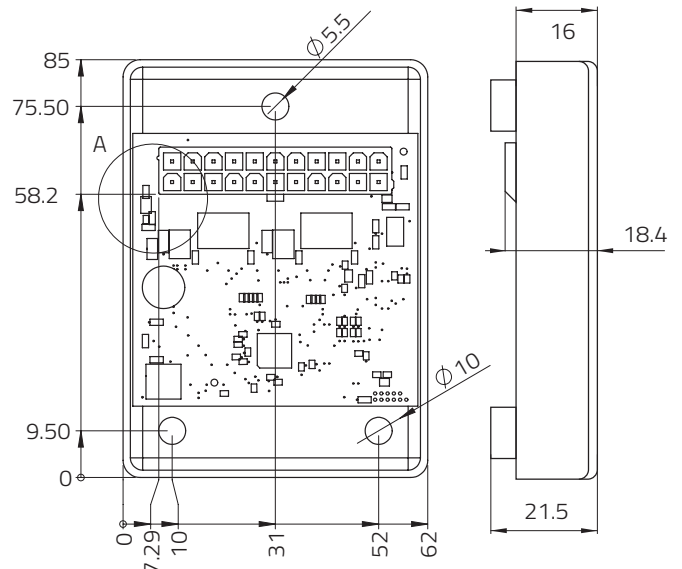


Dimensions in mm [in inch]

Wire harness version i.e. CAN I/O



PCB mountable version, i.e. 22P

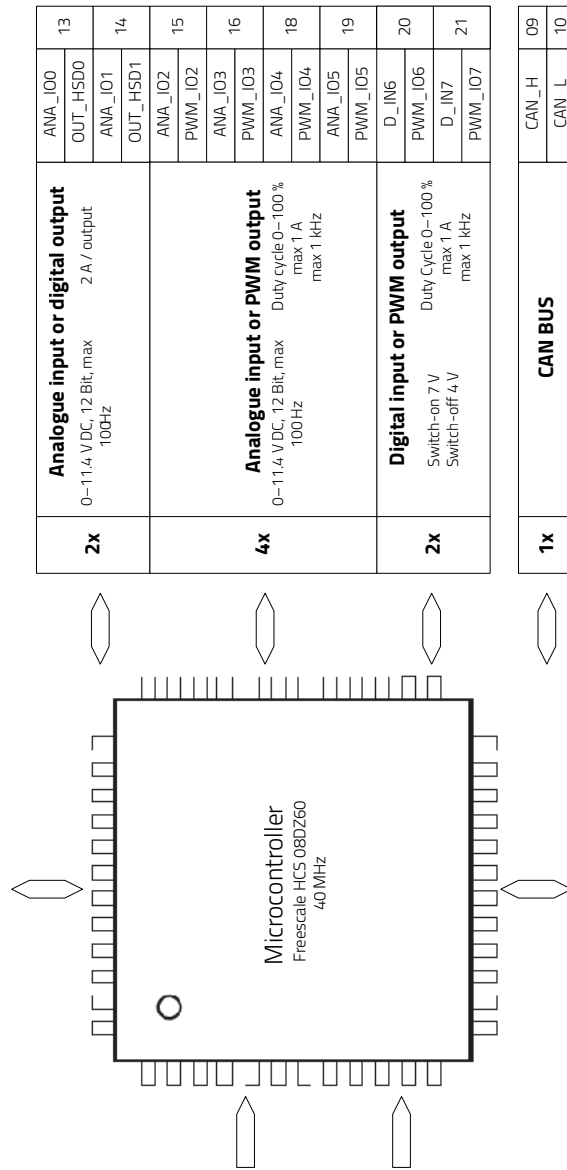


Hardware map

- **ICS-103506:** ICCS CAN I/O Software-bootloader Diode on PWM-output
- **ICS-103508:** ICCS CAN I/O Software-bootloader 2 x RPM & 6 x PWM-output



12	VCC für 00-3	Power supply HSD outputs	2x
17	VCC für 04+7		
01	GND	Ground	1x



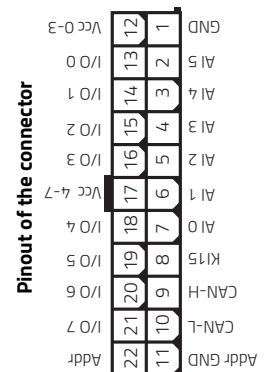
2x	Analogue input or digital output 0–11.4 V DC, 12 Bit, max 100Hz 2 A / output	ANA_IO0	13
		OUT_HSD0	
4x	Analogue input or PWM output 0–11.4 V DC, 12 Bit, max 100 Hz Duty cycle 0–100 % max 1 A max 1 kHz	ANA_IO1	14
		OUT_HSD1	
		ANA_IO2	15
		PWM_IO2	
2x	Digital input or PWM output Switch-on 7 V Switch-off 4 V Duty Cycle 0–100 % max 1 A max 1 kHz	ANA_IO3	16
		PWM_IO3	
		ANA_IO4	18
		PWM_IO4	
1x	CAN BUS	ANA_IO5	19
		PWM_IO5	
		D_IN6	20
		PWM_IO6	
		D_IN7	21
		PWM_IO7	
		CAN_H	09
CAN_L	10		

07	ANA0	Analogue input 0–11.4 V DC, 12 Bit, max 100Hz ----- 0–11.4 V DC, 12 Bit, max 5 kHz	6x
06	ANA1		
05	ANA2		
03	ANA4		
04	ANA3		
02	ANA5		
08	KL15	Digital input Activation pin	1x
11	Gnd	Address*	1x
22	Addr		

* 2) Address pin optionally used for data communication

FLASH	60 kB
RAM	4 kB
EEPROM	1 kB*

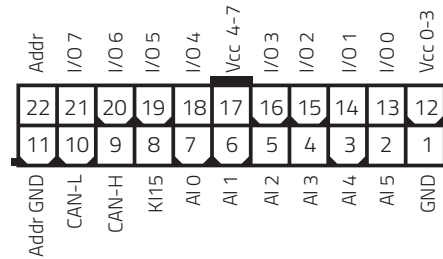
*EEPROM available for graphical programming



Pin assignment

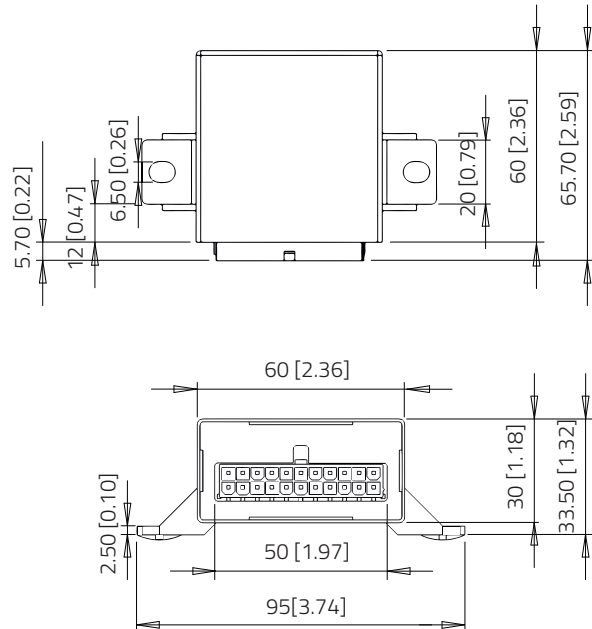
Connector of ICS-103508, ICS-103506		
Pin	Description	Function
1	GND	Ground
2	ANA5	Analogue input 0–10 V max 5 kHz
3	ANA4	Analogue input 0–10 V
4	ANA3	Analogue input 0–10 V max 5 kHz
5	ANA2	Analogue input 0–10 V
6	ANA1	Analogue input 0–10 V
7	ANA0	Analogue input 0–10 V
8	KL15	Activation pin
9	CAN H	CAN Bus High
10	CAN L	CAN Bus Low
11	Addr GND	Address GND
12	VCC for 00–3	Power supply HSD output 0–3
13	ANA_IO0 OUT_HSD0	Analogue input 0–10 V Digital output and status output
14	ANA_IO1 OUT_HSD1	Analogue input 0–10 V Digital output and status output
15	ANA_IO2 OUT_HSD2	Analogue input 0–10 V PWM output and status output
16	ANA_IO3 OUT_HSD3	Analogue input 0–10 V PWM output and status output
17	VCC for 04–7	Power supply HSD output 4–7
18	ANA_IO4 OUT_HSD4	Analogue input 0–10 V PWM output and status output
19	ANA_IO5 OUT_HSD5	Analogue input 0–10 V PWM output and status output
20	D_IN6 OUT_HSD6	Digital input PWM output and status output
21	D_IN7 OUT_HSD7	Digital input PWM output and status output
22	Addr	Single wire address

Connector module



Dimensions in mm [in inch]

Wire harness version i.e. CAN I/O



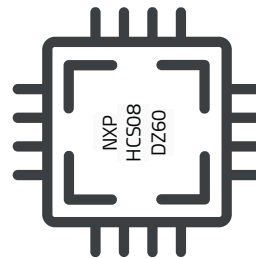
Hardware map

- **ICS-105371:** ICCS CAN I/O RS232 Gateway



12	VCC for OUT 0-3	Power supply HSD outputs	2x
17	VCC for OUT 4-7		
01	GND		1x
		Ground	

2x	Analogue input or digital output IN: 0 – 11.4V, 12 Bit, 22.6 kΩ OUT 2 A max	ANA_IO0	13
		OUT_HSD0	
4x	Analogue input or digital / PWM output IN: 0 – 11.4V, 12 Bit, 22.6 kΩ OUT 2 A max PWM OUT: 500 Hz 2 A 1 KHz 1 A	ANA_IO1	14
		OUT_HSD1	
		ANA_IO2	15
		OUT_HSD2	
2x	Digital input or digital / PWM output OUT 2 A max PWM OUT: 500 Hz 2 A 1 KHz 1 A	ANA_IO3	16
		OUT_HSD3	
		ANA_IO4	18
		OUT_HSD4	
		ANA_IO5	19
		OUT_HSD5	
		D_IN6	20
		OUT_HSD6	
		D_IN7	21
		OUT_HSD7	



FLASH	60 kB
RAM	4 kB
EEPROM	1 kB*

*EEPROM available for graphical programming

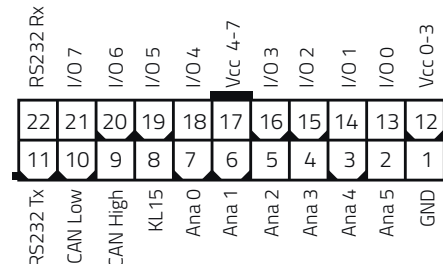
07	ANAO	Analogue inputs 0 – 11.4 V, 12 Bit, 22.6 kΩ	6x
06	ANA 1		
05	ANA2		
03	ANA4		
04	ANA3		
02	ANA5	Analogue input / 0-33.7 V, 12 Bit / 66.6 kΩ	1x
08	KL15	Digital input / activation pin	1x

09	CAN high	CAN bus	1x
10	CAN low		
11	RS232 Tx	RS 232	1x
22	RS232 Rx		

Pin assignment

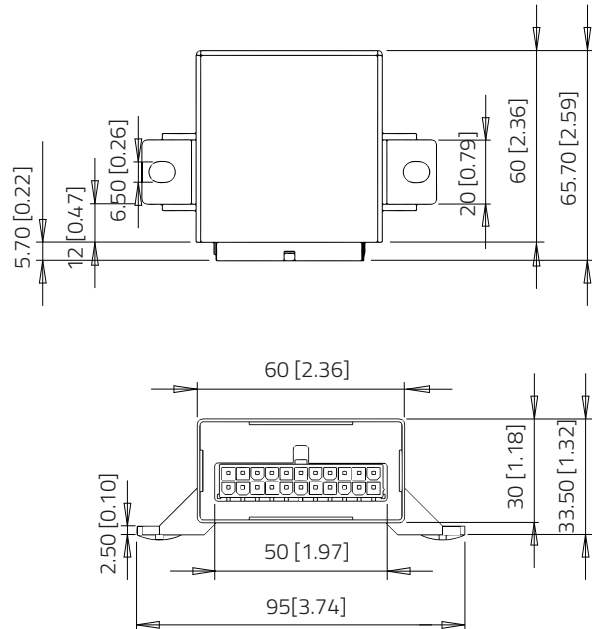
Connector of ICS-105371		
Pin	Description	Function
1	GND	Ground
2	ANA5	Analogue input 0–30 V
3	ANA4	Analogue input 0–10 V
4	ANA3	Analogue input 0–10 V
5	ANA2	Analogue input 0–10 V
6	ANA1	Analogue input 0–10 V
7	ANA0	Analogue input 0–10 V
8	KL15	Activation pin
9	CAN H	CAN Bus High
10	CAN L	CAN Bus Low
11	RS232 Tx	RS 232
12	VCC for 00-3	Power supply HSD output 0–3
13	ANA_IO0 OUT_HSD0	Analogue input 0–10 V Digital output and status output
14	ANA_IO1 OUT_HSD1	Analogue input 0–10 V Digital output and status output
15	ANA_IO2 OUT_HSD2	Analogue input 0–10 V PWM output and status output
16	ANA_IO3 OUT_HSD3	Analogue input 0–10 V PWM output and status output
17	VCC for 04-7	Power supply HSD output 4–7
18	ANA_IO4 OUT_HSD4	Analogue input 0–10 V PWM output and status output
19	ANA_IO5 OUT_HSD5	Analogue input 0–10 V PWM output and status output
20	D_IN6 OUT_HSD6	Digital input PWM output and status output
21	D_IN7 OUT_HSD7	Digital input PWM output and status output
22	RS232 Rx	RS 232

Connector module



Dimensions in mm [in inch]

Wire harness version i.e. CAN I/O

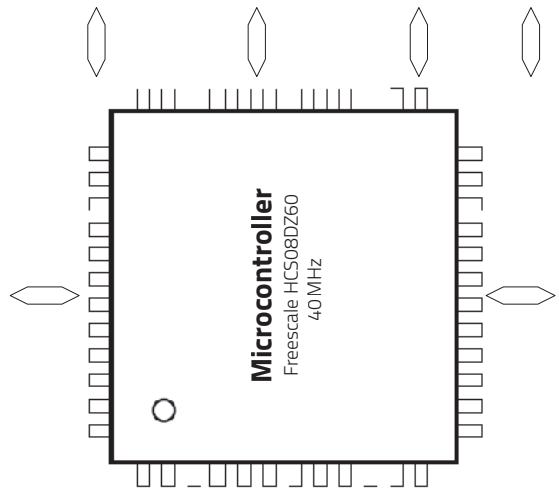


Hardware map

- **ICS-101976:** ICCS CAN I/O Waterproof



B1	VCC for 00-3	Power supply HSD outputs	2x
B8	VCC for 04-7		
B6	GND	Ground	2x
C1			



C7	ANAO	Analogue input 0-11.4 V DC / 0-20 mA, max 30 Hz	6x
C6	ANA1		
C5	ANA2		
C4	ANA3		
C3	ANA4		
C2	ANA5		

C8	KL15	Digital input Activation pin	1x
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Pinout of the connector



2x	Analogue input or digital output 0-11.4 V DC, 12 Bit, max 100 Hz 2 A / output	ANA_IO0	A1
		OUT_HSD0	A1
4x	Analogue input or PWM output 0-11.4 V DC, 12 Bit, max 100 Hz Duty Cycle 0-100 % max 1 A max 1 kHz	ANA_IO1	A2
		OUT_HSD1	A2
		ANA_IO2	A3
		OUT_HSD2	A3
		ANA_IO3	A4
		OUT_HSD3	A4
2x	Digital input or PWM output Switch-on 7 V Switch-off 4 V Duty Cycle 0-100 % max 1 A max 1 kHz	ANA_IO4	A5
		OUT_HSD4	A5
		ANA_IO5	A6
		OUT_HSD5	A6
1x	CAN BUS	D_IN6	A7
		OUT_HSD6	A7
		D_IN7	A8
1x	Optional RS485	Opt. A	B4
		Opt. B	B5
1x	Reference voltage 5 V max 500 mA	POWER	B7

FLASH	60 KB
RAM	4 KB
EEPROM	1 kB*

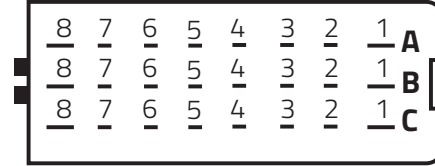
*EEPROM available for graphical programming

Pin assignment

Connector of ICS-101976		
Pin	Description	Function
A1	ANA_IO0	Analogue input 0–10 V
	OUT_HSD0	Digital output
A2	ANA_IO1	Analogue input 0–10 V
	OUT_HSD1	Digital output
A3	ANA_IO2	Analogue input 0–10 V
	OUT_HSD2	Digital / PWM output
A4	ANA_IO3	Analogue input 0–10 V
	OUT_HSD3	Digital / PWM output
A5	ANA_IO4	Analogue input 0–10 V
	OUT_HSD4	Digital / PWM output
A6	ANA_IO5	Analogue input 0–10 V
	OUT_HSD5	Digital / PWM output
A7	D_IN6	Digital input
	OUT_HSD6	Digital / PWM output
A8	D_IN7	Digital input
	OUT_HSD7	Digital / PWM output
B1	VCC for O0-3	Power supply HSD output 0–3
B2	CAN H	CAN Bus High
B3	CAN L	CAN Bus Low
B4	Opt. A	Optional RS485-A
B5	Opt. B	Optional RS485-B
B6	GND	Ground
B7	VREF_OUT	5 V reference
B8	VCC for O4-7	Power supply HSD output 4–7
C1	Addr GND	Address GND
C2	ANA5 / D_ANA5	Analogue input 0–30 V
C3	ANA4 / D_ANA4	Analogue input 0–10 V
C4	ANA3 / D_ANA3	Analogue input 0–10 V
C5	ANA2 / D_ANA2	Analogue input 0–10 V / 0–20 mA
C6	ANA1 / D_ANA1	Analogue input 0–10 V / 0–20 mA
C7	ANA0 / D_ANA0	Analogue input 0–10 V / 0–20 mA
C8	KL15	Activation pin

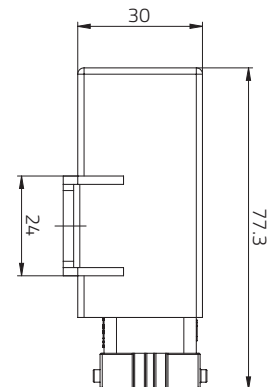
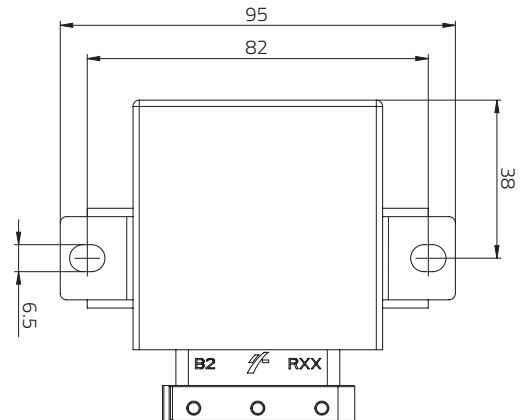
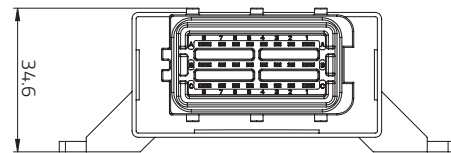


Connector module



Dimensions in mm

Wire harness version i.e. CAN I/O Waterproof



Order information

Available references	Part number WE ICS
ICCS CAN I/O Hardware Bootloader	ICS-103511
ICCS CAN I/O Software Bootloader	ICS-103504
ICCS CAN I/O Software Bootloader Diode on PWM output	ICS-103506
ICCS CAN I/O 2 x RPM 6 x PWM Software Bootloader	ICS-103508
ICCS CAN I/O + 5 V REF Software Bootloader	ICS-103507
ICCS CAN I/O Waterproof	ICS-101976
ICCS CAN I/O 22P	ICS-103505
ICCS CAN I/O 22P freqIN	ICS-104096
ICCS CAN I/O RS232 Gateway ICS-105371	ICS-105371

Mating connector (CAN I/O and 22P)	Part number WE eiSos
Housing: Female Dual Row Plug WR-MPC4	649 022 113 322
Crimp contact: WR-MPC4, AWG 16	649 005 137 22
Crimp contact: WR-MPC4, AWG 24-18	649 006 137 22
Crimp contact: WR-MPC4, AWG 28-22	649 007 137 22

For 100 pieces packages, please add „DEC“ at the end of the reference.

Mating connector (CAN I/O WP)	Part number WE eiSos
Housing: FCI SICMA: 24 Pins (18 x 1.5 mm + 6 x 2.8 mm), female	211 PC24950033
FCI Locking cam	211 A247 001
Terminals: SICMA-3 1.5 terminal female, 0.34...0.75 mm ²	211 CC251160
Terminals: SICMA-3 1.5 terminal female, 1.00...2.00 mm ²	211 CC252160
Terminals: SICMA-3 2.8 terminal female, 0.35...0.75 mm ²	211 CC351160
Terminals: SICMA-3 2.8 terminal female, 1.0...2.5 mm ²	211 CC352160
Plug seals for unused contact chambers	210 A015019



For more information write us an e-mail ics@we-online.com, call +49 7940 9810-0 or visit us at www.we-online.com/ics

Würth Elektronik ICS GmbH & Co. KG
Intelligent Power & Control Systems
Gewerbepark Waldzimmern · Würthstraße 1
74676 Niedernhall · Germany
Tel.: +49 7940 9810-0 · Fax +49 7940 9810-1099
ics@we-online.com · www.we-online.com/ics

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