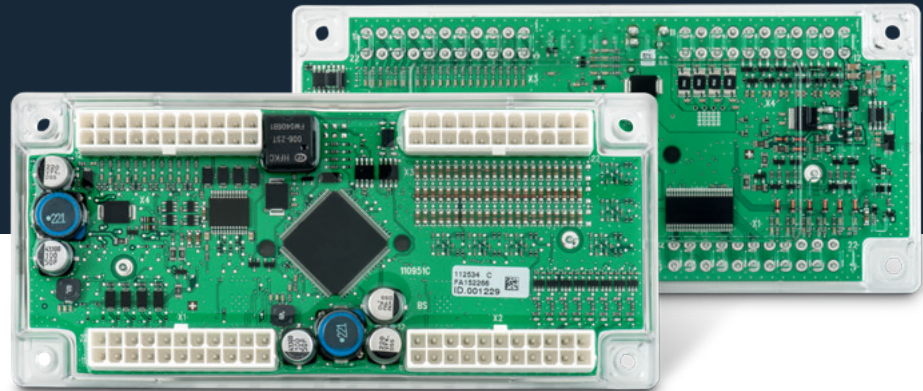# WÜRTH ELEKTRONIK MORE THAN YOU EXPECT

ICCS CAN CONTROLLER 88P

Controllers

The **ICCS CAN Controller 88P** is graphically programmable control unit for mobile machines and commercial vehicles. The 16-bit processor (HCS12XEQ) with integrated co-processor has enough computing power to handle complex tasks. To control many loads with low power, the 88P module has 28 low-side outputs. Digital information, analogue voltages, currents and signal frequencies can be captured and processed. The 88P module provides 4 PWM outputs to drive proportional valves, which can also be used as digital outputs. As with our other controllers, these can be graphically programmed for mobile vehicle applications and used as an extension to the existing CAN bus network. It can be used as a stand-alone solution or for PCB mounting.

Applications

- Connection of binary and analogue sensors via the CAN bus
- Input and output extensions for CAN bus systems
- Control unit for power distribution
- Monitoring of fuses and switching of relay

Technical data

General information	
Housing	Transparent
Connector	4 x Molex Mini Fit 22 Ways
Dimensions	77 x 167 mm
Weight	~235 g
Operating temperature	-40 °C to 85 °C (no full load at 85 °C)
Storage temperature	-40 °C to 85 °C
Ingress protection	IP 54
Operating voltage Vsupply	9 to 30 V DC
Pre-fusing	10 A (HSD outputs)
Current consumption	50 mA
Sleep mode consumption	< 1 mA
Processor type	Freescale HCS12 XEQ
Clk frequency	100 MHz
Flash memory	384 kB
RAM	24 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 1 MBit/s (125 kBit/s default value)

Inputs / outputs overview		
12	Analogue inputs	0–11.4 V DC, 12 Bits
23	Digital inputs	Switch-on / switch-off: 0.85 / 0.55 Vsupply
4	Coding inputs	High or low active selectable
8	Digital inputs or PWM inputs	PWM inputs: up to 5 kHz
2	Wake up input	1 x high active / 1 x low active
1	Wake up output	Low active 300 mA
27	Digital low side outputs	300 mA max each
4	Digital or PWM high side outputs	max 2 A (Digital) / 1 A (PWM mode) Current measurement

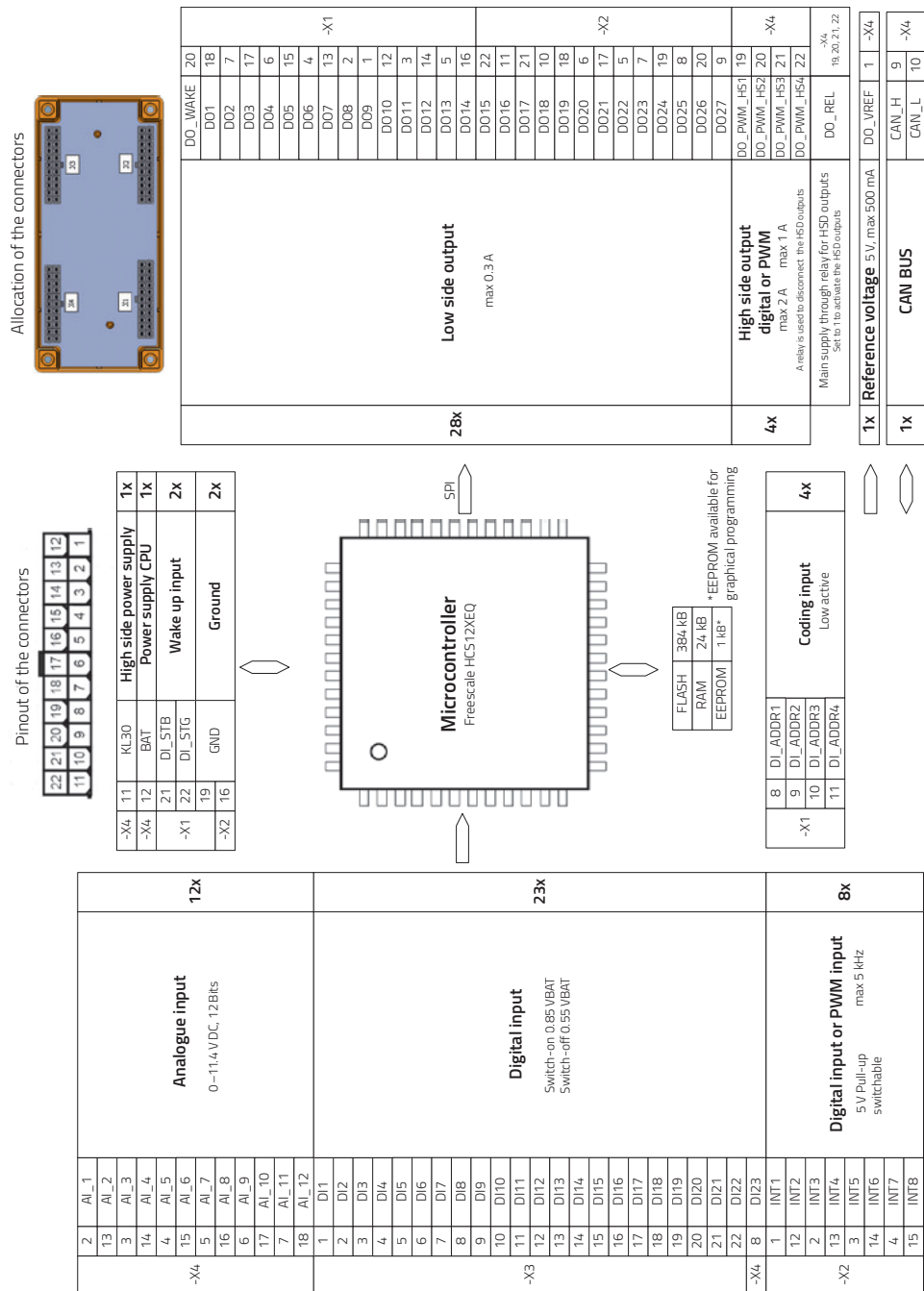| Inputs / outputs details	
Analogue inputs	
Input voltage max	Vsupply
Measuring range	0–11.4 V DC
Resolution	12 Bit
Input resistance	22.6 kΩ
Digital inputs	
Input voltage	0 V DC to Vsupply
Switch-on level	0.85 Vsupply
Switch-off level	0.55 Vsupply
Input resistance	**59.8 kΩ**
Digital outputs	High side
Load current	max 2 A current measurement for regulation
Coding inputs	Low active
Input resistance	112.6 kΩ
Pull-up resistance	2 kΩ (switchable)

Inputs / outputs details

PWM inputs	
Input resistance	100 kΩ
Pull-up resistance	2 kΩ (switchable)
Input frequency	up to 5 kHz
Digital outputs	Low side (switch to GND)
Load current	max 0.3 A
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

Allocation of the connectors

Pinout of the connectors

Low side output — max 0.3 A — 28x

		-X1														-X2										-X4
20	18	7	17	6	15	4	13	2	1	12	3	14	5	16	22	11	21	10	18	6	17	5	7	19	8	20	9
DO_WAKE	DO1	DO2	DO3	DO4	DO5	DO6	DO7	DO8	DO9	DO10	DO11	DO12	DO13	DO14	DO15	DO16	DO17	DO18	DO19	DO20	DO21	DO22	DO23	DO24	DO25	DO26	DO27

High side output digital or PWM — max 2 A   max 1 A — A relay is used to disconnect the HSD outputs — 4x

-X4			
19	20	21	22
DO_PWM_HS1	DO_PWM_HS2	DO_PWM_HS3	DO_PWM_HS4

-X4, 19, 20, 21, 22

Main supply through relay for HSD outputs — Set to 1 to activate the HSD outputs

DO_REL — 1x

-X4
1
DO_VREF

Reference voltage 5 V, max 500 mA — 1x

CAN BUS — 1x

-X4	-X4
9	10
CAN_H	CAN_L

Microcontroller
Freescale HCS12XEQ

SPI

FLASH	384 kB
RAM	24 kB
EEPROM	1 kB*

*EEPROM available for graphical programming

Coding input — Low active — 4x

-X1	
8	DI_ADDR1
9	DI_ADDR2
10	DI_ADDR3
11	DI_ADDR4

	High side power supply	1x
-X4 · 11	KL30	Power supply CPU 1x
-X4 · 12	BAT	
-X1 · 21	DI_STB	Wake up input 2x
-X1 · 22	DI_STG	
-X2 · 19	GND	Ground 2x
-X2 · 16		

Analogue input 0–11.4 V DC, 12 Bits — 12x

-X4		
2	AI_1	
13	AI_2	
3	AI_3	
14	AI_4	
4	AI_5	
15	AI_6	
5	AI_7	
16	AI_8	
6	AI_9	
17	AI_10	
7	AI_11	
18	AI_12	

Digital input Switch-on 0.85 VBAT Switch-off 0.55 VBAT — 23x

-X3	
1	DI1
2	DI2
3	DI3
4	DI4
5	DI5
6	DI6
7	DI7
8	DI8
9	DI9
10	DI10
11	DI11
12	DI12
13	DI13
14	DI14
15	DI15
16	DI16
17	DI17
18	DI18
19	DI19
20	DI20
21	DI21
22	DI22
	DI23

Digital input or PWM input max 5 kHz — 5 V Pull-up switchable — 8x

-X4		-X2	
1	INT1	3	INT5
12	INT2	14	INT6
2	INT3	4	INT7
13	INT4	15	INT8

Pin assignment

X4 Connector

Pin	Description	Function
1	AI_VREF	+5 V Reference voltage
2	AI_1	Analogue input 0–10 V DC
3	AI_3	Analogue input 0–10 V DC
4	AI_5	Analogue input 0–10 V DC
5	AI_7	Analogue input 0–10 V DC
6	AI_9	Analogue input 0–10 V DC
7	AI_11	Analogue input 0–10 V DC
8	DI23	Digital input
9	CAN_H	CAN Bus High
10	CAN_L	CAN Bus Low
11	KL30	High side power supply
12	BAT	Power supply
13	AI_2	Analogue input 0–10 V DC
14	AI_4	Analogue input 0–10 V DC
15	AI_6	Analogue input 0–10 V DC
16	AI_8	Analogue input 0–10 V DC
17	AI_10	Analogue input 0–10 V DC
18	AI_12	Analogue input 0–10 V DC
19	Out_HS 1	Digital / PWM high side output
20	Out_HS 2	Digital / PWM high side output
21	Out_HS 3	Digital / PWM high side output
22	Out_HS 4	Digital / PWM high side output

X3 Connector

Pin	Description	Function
1	DI1	Digital input
2	DI2	Digital input
3	DI3	Digital input
4	DI4	Digital input
5	DI5	Digital input
6	DI6	Digital input
7	DI7	Digital input
8	DI8	Digital input
9	DI9	Digital input
10	DI10	Digital input
11	DI11	Digital input
12	DI12	Digital input
13	DI13	Digital input
14	DI14	Digital input
15	DI15	Digital input
16	DI16	Digital input
17	DI17	Digital input
18	DI18	Digital input
19	DI19	Digital input
20	DI20	Digital input
21	DI21	Digital input
22	DI22	Digital input

X1 Connector

Pin	Description	Function
1	DO9	Digital output low side
2	DO8	Digital output low side
3	DO11	Digital output low side
4	DO6	Digital output low side
5	DO13	Digital output low side
6	DO4	Digital output low side
7	DO2	Digital output low side
8	DI_ADDR1	Coding input
9	DI_ADDR2	Coding input
10	DI_ADDR3	Coding input
11	DI_ADDR4	Coding input
12	DO10	Digital output low side
13	DO7	Digital output low side
14	DO12	Digital output low side
15	DO5	Digital output low side
16	DO14	Digital output low side
17	DO3	Digital output low side
18	DO1	Digital output low side
19	GND	Ground
20	DO_WAKE	Wake up output (usable as low side)
21	DI_STB	Wake up input
22	DI_STG	Wake up input

X2 Connector

Pin	Description	Function
1	INT1 (freq in)	Digital / PWM input
2	INT3 (freq in)	Digita l/ PWM input
3	INT5 (freq in)	Digital / PWM input
4	INT7 (freq in)	Digital / PWM input
5	DO22	Digital output low side
6	DO20	Digital output low side
7	DO23	Digital output low side
8	DO25	Digital output low side
9	DO27	Digital output low side
10	DO18	Digital output low side
11	DO16	Digital output low side
12	INT2 (freq in)	Digital / PWM input
13	INT4 (freq in)	Digital / PWM input
14	INT6 (freq in)	Digital / PWM input
15	INT8 (freq in)	Digital / PWM input
16	GND	Ground
17	DO21	Digital output low side
18	DO19	Digital output low side
19	DO24	Digital output low side
20	DO26	Digital output low side
21	DO17	Digital output low side
22	DO15	Digital output low side

Allocation of the connectors

(Connector module)

22	21	20	19	18	17	16	15	14	13	12
11	10	9	8	7	6	5	4	3	2	1
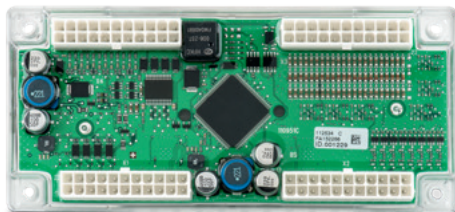
Dimensions
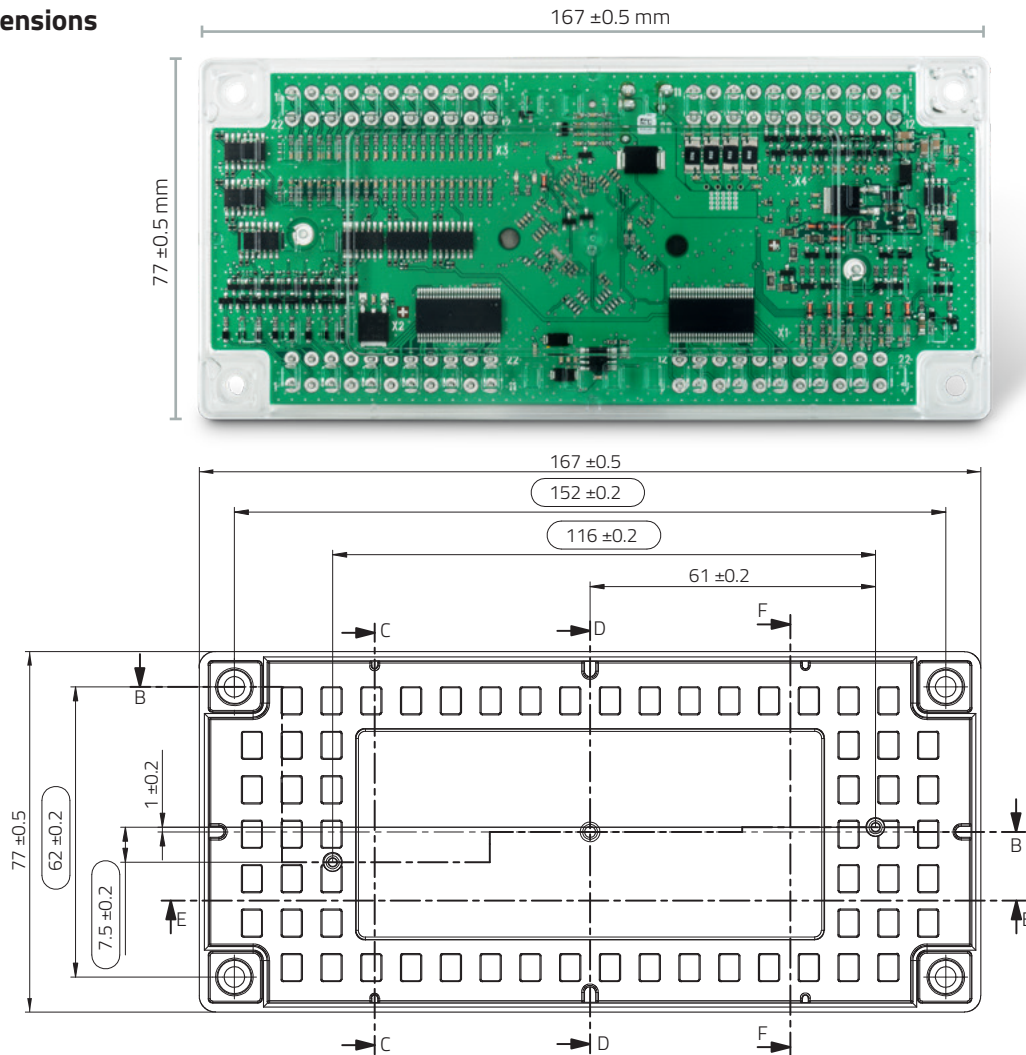
Order information

Available References	Part number WE ICS
ICCS CAN Controller 88P (unprogrammed)	ICS-100635

Mating connector	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.

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**

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