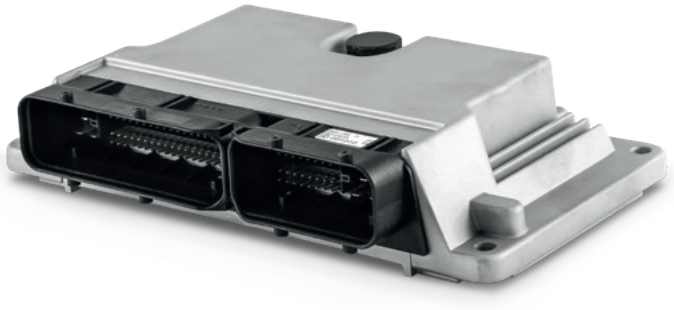
ICCS – Intelligent Control and Command Systems

ICCS 121P CAN Controller

ICCS 121P CAN Controller is a part of the Intelligent Control and Command Systems (ICCS) product range, which can be easily implemented in your CAN network, or used as a standalone module. The 16 bit processor NXP HCS12XEQ with an integrated co-processor has sufficient computing power to handle complex tasks. The two CAN and an optional LIN master interfaces allow the data exchange between independent bus systems or enable gateway / filter functions.



Applications

- Transmission of sensor values to the CAN bus
- CAN to CAN gateway function
- LIN to CAN gateway function
- Direct supply of loads up to 2 A
- Interface between switches and CAN bus
- Ligthing system handling
- Protected power splices with built-in poly fuses

GENERAL INFORMATION	
Housing	Metal housing
Connector	1 x 81 pins, 1 x 40 pins
Dimensions	95.1 x 179 x 39.3 mm
Weight	~530 g
Operating temperature	-30 °C to 70 °C
Storage temperature	-30 °C to 70 °C
Ingress protection	IP65
Operating voltage	9-30 V (with limitation on 12 V LIN bus)
Pre-fusing	10 A / Power entry
Current consumption	50 mA
Processor type	NXP HCS12XEQ
Clock frequency	100 MHz
Flash memory	384 kB
RAM	24 kB
EEPROM	1 kB available for graphical programming
E1 certification	ECE10 Rev.05 : 058257

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 (125 kBit/s default value)

LIN BUS	
LIN 2.1 master	Pull-up to Vsupply, 1 kΩ & diode
Baud rate	4800 to 115200 bps
Vsupply	Recommended max 12 V (1 kΩ-12 V LIN)

INPUTS / OUTPUTS OVERVIEW		
4	Analogue inputs	0-10 V DC / 0-20mA
3	Analogue inputs	0-10 V DC
3	Analogue inputs	0-30 V DC
3	Analogue inputs	0-5 V DC
4	Frequency inputs	Switch on / switch off level : see Inputs / outputs details
16	Digital inputs	Switch on/switch off level : see Inputs / outputs details
16	Digital outputs	Low side outputs max 300 mA / channel
16	Digital outputs	High side outputs max 2 A / channel

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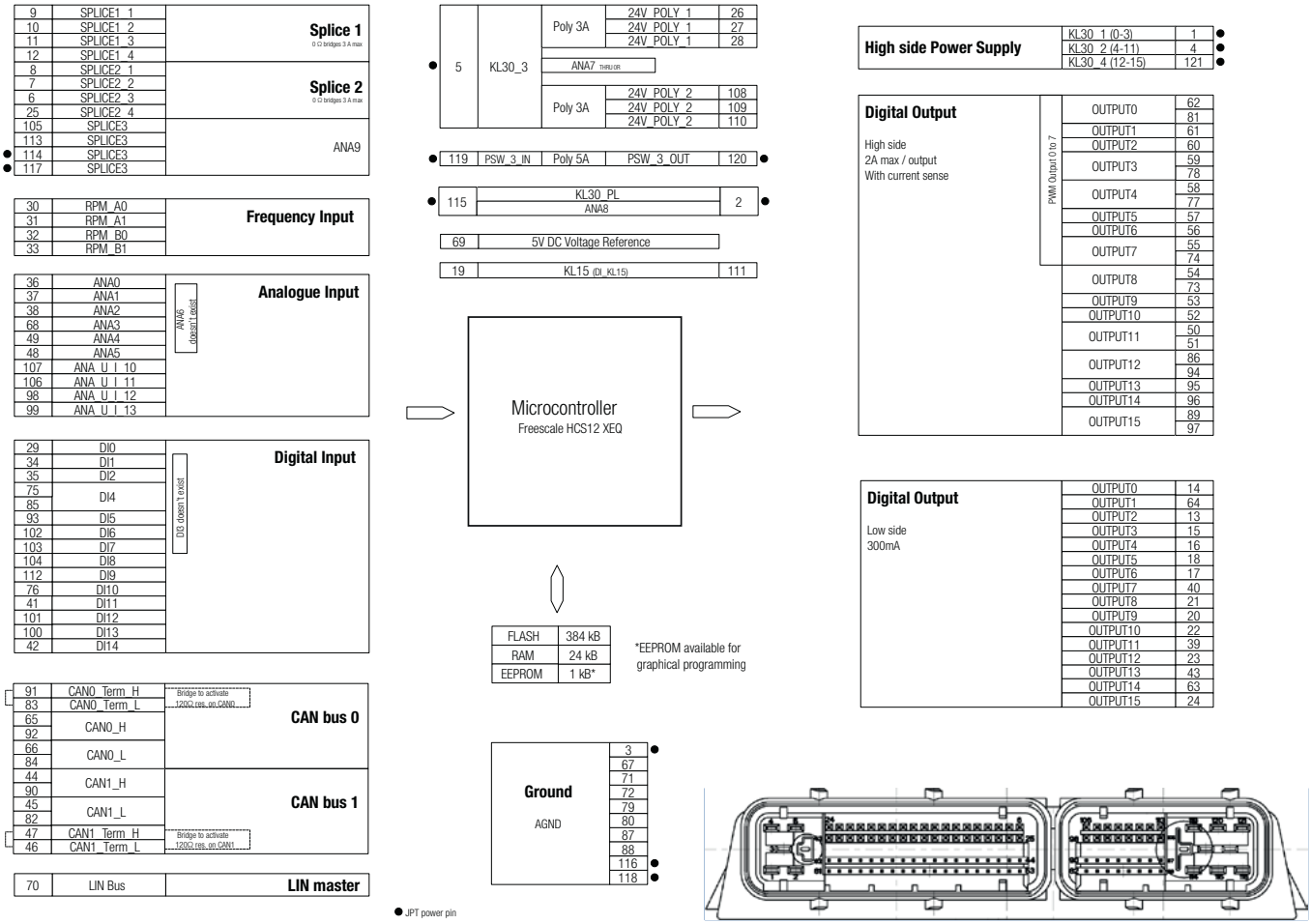
INPUTS / OUTPUTS DETAILS	
Analogue inputs	**4 x 0-10 V DC / 0-20 mA**
Voltage / current	0-11.4 V DC / 0-23 mA
Resolution	12 bits
Input resistance	22.6 kΩ
Pull-down resistance	Switchable 0.5 kΩ in 0-20 mA mode (4x)
Analogue inputs	**3 x 0-10 V DC**
Input voltage	0-11.4 V DC
Resolution	12 bits
Input resistance	22.6 kΩ
Analogue inputs	**3 x 0-5 V DC**
Input voltage	0-5 V DC
Resolution	12 bits
Input resistance	61.6 kΩ
Analogue inputs	**3 x 0-30 V DC**
Input voltage	0-33.6 V DC
Resolution	12 bits
Input resistance	66.6 kΩ

INPUTS / OUTPUTS DETAILS	
Frequency inputs	**4**
Input resistance	100 kΩ
Input frequency	5 kHz (max)
Switch-on level	3 V DC
Switch-off level	2 V DC
Digital inputs	**16**
Input voltage	0 V DC to Vsupply
Switch-on level	7 V DC
Switch-off level	5 V DC
Input resistance	22.6 kΩ
Digital outputs	**16 x Low Side**
Load current	300 mA
Digital outputs	**16 x High Side**
Load current	max 2 A Diagnostic current sense, freewheel diode
PWM outputs	**8 of 16 digital outputs**
PWM frequency	max 1 kHz
Duty cycle	0 to 100 %
Resolution	0.10 %
Load current	max 1 A

Hardware Map



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PIN ASSIGNMENT FOR 81 PINS CONNECTOR

Pin	Description	Function
1	KL30_1	Power supply for outputs 0-3
2	KL30_PL	Internal link between two pins (115-2) measured from ANA_8 0-30 V
3	GND	Ground, all ground pins are interconnected
4	KL30_2	Power supply for outputs 4-11
5	KL30_3	Power supply input for polyfuse / ANA in 7 0-30 V
6	splice 2	Signal distribution 0 Ω all splice 2
7	splice 2	Signal distribution 0 Ω all splice 2
8	splice 2	Signal distribution 0 Ω all splice 2
9	splice 1	Signal distribution 0 Ω all splice 1
10	splice 1	Signal distribution 0 Ω all splice 1
11	splice 1	Signal distribution 0 Ω all splice 1
12	splice 1	Signal distribution 0 Ω all splice 1
13	LSD output 2	LSD output 300 mA
14	LSD output 0	LSD output 300 mA
15	LSD output 3	LSD output 300 mA
16	LSD output 4	LSD output 300 mA
17	LSD output 6	LSD output 300 mA
18	LSD output 5	LSD output 300 mA
19	KL15	Wake up / ignition - internally bridged to 111
20	LSD output 9	LSD output 300 mA
21	LSD output 8	LSD output 300 mA
22	LSD output 10	LSD output 300 mA
23	LSD output 12	LSD output 300 mA
24	LSD output 15	LSD output 300 mA
25	splice 2	Signal distribution 0 Ω all splice 2
26 27 28	Power supply poly	3 A polyfuse output (shared between pin 26, 27, 28) supplied by KL30_3
29	DI_0	Digital input
30	Freq_A0	Frequency input / digital encoder
31	Freq_A1	Frequency input / digital encoder
32	Freq_B0	Frequency input / digital encoder
33	Freq_B1	Frequency input / digital encoder
34	DI_1	Digital input
35	DI_2	Digital input
36	ANA_0	Analogue input 0-10 V
37	ANA_1	Analogue input 0-10 V
38	ANA_2	Analogue input 0-10 V
39	DI_16 / LSD output 11	Digital input shared with a low side output
40	DI_15 / LSD output 7	Digital input shared with a low side output
41	DI_14	Digital input
42	DI_11	Digital input
43	LSD output 13	LSD output 300 mA
44	CAN1 H	CAN 1 H also available on pin 90
45	CAN1 L	CAN 1 L also available on pin 82
46	CAN1 term L	Wire bridge to CAN1 term H to link a 120 Ω resistor
47	CAN1 term H	Wire bridge to CAN1 term L to link a 120 Ω resistor
48	ANA_5	Analogue input 0-5 V
49	ANA_4	Analogue input 0-5 V
50	HSD output 11	Digital output 2 A HSD shared with pin 51
51	HSD output 11	Digital output 2 A HSD shared with pin 50
52	HSD output 10	Digital output 2 A HSD
53	HSD output 9	Digital output 2 A HSD
54	HSD output 8	Digital output 2 A HSD shared with pin 73
55	HSD output 7	Digital output 2 A HSD shared with pin 74 (PWM)

PIN ASSIGNMENT FOR 81 PINS CONNECTOR

Pin	Description	Function
56	HSD output 6	Digital output 2 A HSD (PWM)
57	HSD output 5	Digital output 2 A HSD (PWM)
58	HSD output 4	Digital output 2 A HSD shared with pin 77 (PWM)
59	HSD output 3	Digital output 2 A HSD shared with pin 78 (PWM)
60	HSD output 2	Digital output 2 A HSD (PWM)
61	HSD output 1	Digital output 2 A HSD (PWM)
62	HSD output 0	Digital output 2 A HSD shared with pin 81 (PWM)
63	LSD output 14	LSD output 300 mA
64	LSD output 1	LSD output 300 mA
65	CAN0 H	CAN 0 H also available on pin 92
66	CAN0 L	CAN 0 L also available on pin 84
67	GND	Ground, all ground pins are interconnected
68	ANA_3	Analogue input 0-5 V
69	5V Vref	Switchable 5 V reference approx. 400 mA
70	LIN bus	LIN master type shared with DI_17
71	GND	Ground, all ground pins are interconnected
72	GND	Ground, all ground pins are interconnected
73	HSD output 8	Digital output 2 A HSD shared with pin 54
74	HSD output 7	Digital output 2 A HSD shared with pin 55 (PWM)
75	DI_4	Digital input distribution to pin 85
76	DI_10	Digital input
77	HSD output 4	Digital output 2 A HSD shared with pin 58 (PWM)
78	HSD output 3	Digital output 2 A HSD shared with pin 59 (PWM)
79	GND	Ground, all ground pins are interconnected
80	GND	Ground, all ground pins are interconnected
81	HSD output 0	Digital output 2 A HSD shared with pin 62 (PWM)

- DI_3 and ANA6 do not exist in the design.
- Each analogue input is also usable as a digital input in the programming software.
- All digital outputs HSD are equipped with freewheel diodes.

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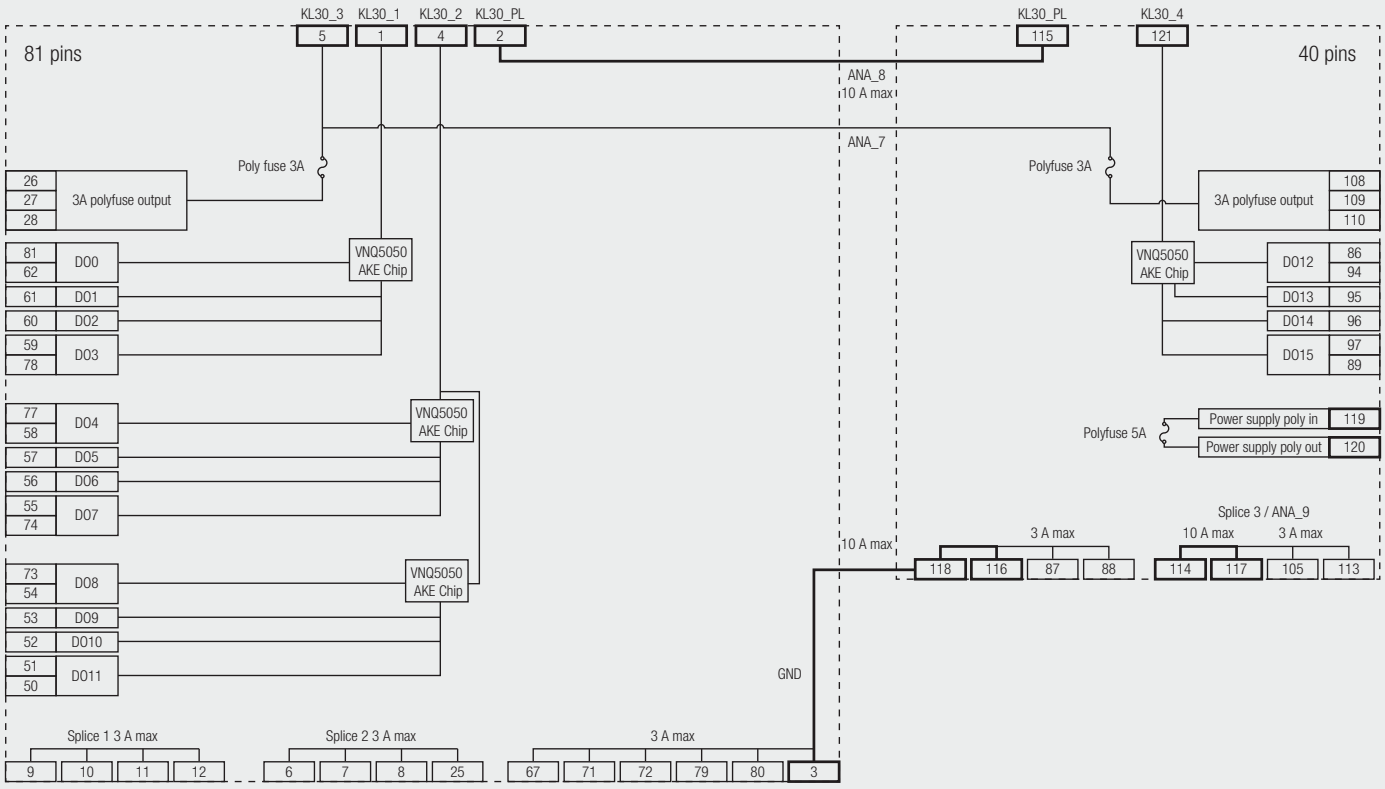
PIN ASSIGNMENT FOR 40 PINS CONNECTOR		
Pin	**Description**	**Function**
82	CAN1 L	CAN 1 L also available on pin 44
83	CAN0 term L	Wire bridge to CAN0 term H to link a 120 Ω resistor
84	CAN0 L	CAN 0 L also available on pin 66
85	DI_4	Digital input distribution to pin 75
86	HSD output 12	Digital output 2 A HSD shared with pin 94
87	GND	Ground, all ground pins are interconnected
88	GND	Ground, all ground pins are interconnected
89	HSD output 15	Digital output 2 A HSD shared with pin 97
90	CAN1 H	CAN 1 H also available on pin 44
91	CAN0 term H	Wire bridge to CAN0 term L to link a 120 Ω resistor
92	CAN0 H	CAN 0 H also available on pin 65
93	DI_5	Digital input
94	HSD output 12	Digital output 2A HSD shared with pin 86
95	HSD output 13	Digital output 2 A HSD
96	HSD output 14	Digital output 2 A HSD
97	HSD output 15	Digital output 2 A HSD shared with pin 89
98	ANA_U_I_12	ANA in 0-10 V / 0-20 mA
99	ANA_U_I_13	ANA in 0-10 V / 0-20 mA
100	DI_13	Digital input
101	DI_12	Digital input

PIN ASSIGNMENT FOR 40 PINS CONNECTOR		
Pin	**Description**	**Function**
102	DI_6	Digital input
103	DI_7	Digital input
104	DI_8	Digital input
105	splice 3	Hardwired signal distribution connected to ANA in 9 0-30 V
106	ANA_U_I_11	ANA in 0-10 V / 0-20 mA
107	ANA_U_I_10	ANA in 0-10 V / 0-20 mA
108 109 110	Power supply poly	3 A polyfuse output (shared between pin 108,109,110) supplied by KL30_3
111	KL15	Wake up / ignition - internally bridged to 19
112	DI_9	Digital input
113	splice 3	Hardwired signal distribution connected to ANA in 9 0-30 V
114	splice 3	Hardwired signal distribution connected to ANA in 9 0-30 V
115	KL30_PL	Internal link between two pins (115-2) measured from ANA_8 0-30 V
116	GND	Ground, all ground pins are interconnected
117	splice 3	Hardwired signal distribution connected to ANA in 9 0-30 V
118	GND	Ground, all ground pins are interconnected
119	Power supply poly in	5 A polyfuse protected line 119-120
120	Power supply poly out	5 A polyfuse protected line 119-120
121	KL30_4	Power supply for output 12-15

Power supply distribution - Schematic



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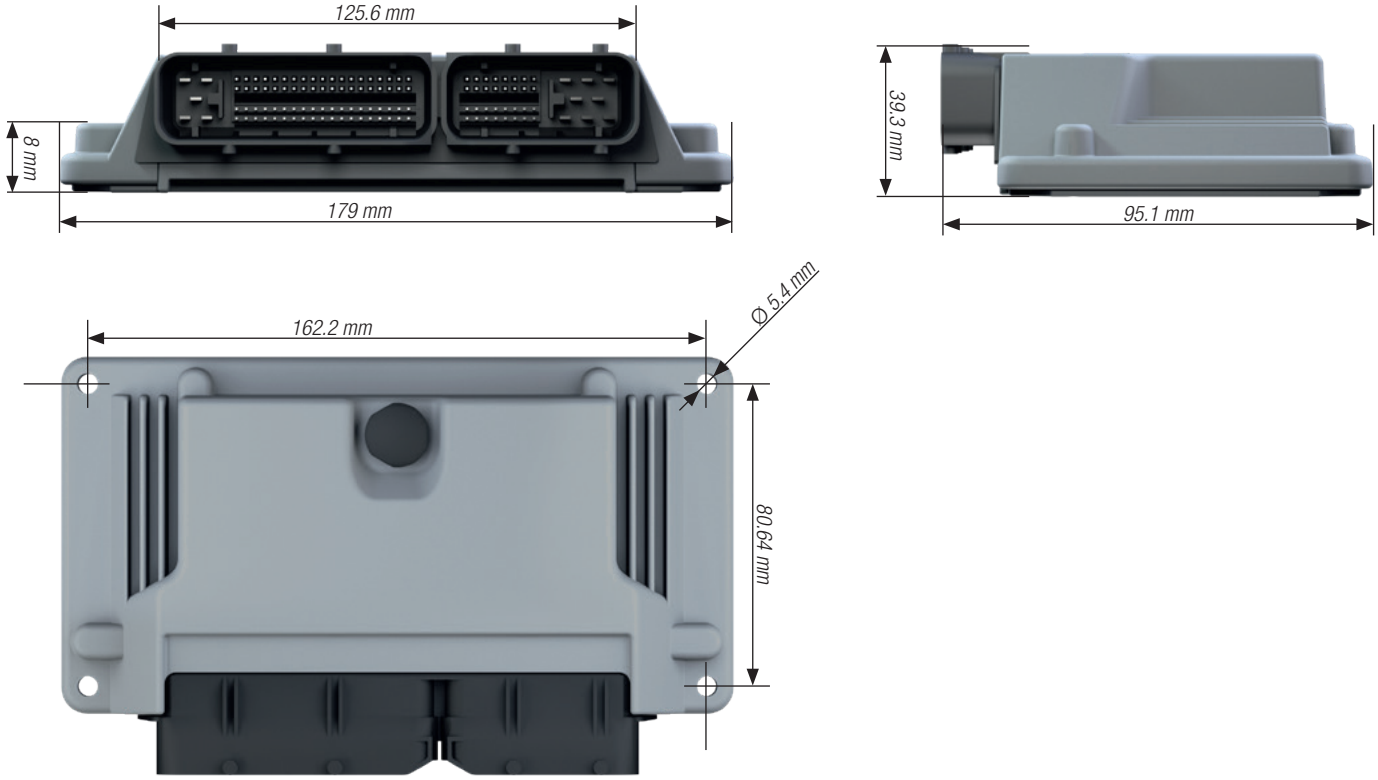
Dimensions



Order information

AVAILABLE REFERENCE	PART NUMBER WE ICS
ICCS 121P XEQ	ICS-103362

MATING CONNECTOR 40 PINS	PART NUMBER TYCO
Crimp contact MQS 0.50-0.75 mm²	968221-1
Single wire seal JPT 1.5 mm²	828905-1
Crimp contact JPT 1.5-2.5 mm²	927768-3
Locking for 40 pins connector	368388-1
Locking lever for 40 pins connector (type A)	1473255-1
Housing for 40 pins connector	1473252-1

MATING CONNECTOR 81 PINS	PART NUMBER TYCO
Crimp contact MQS 0.50-0.75 mm²	968221-1
Single wire seal JPT 1.5 mm²	828905-1
Crimp contact JPT 1.5-2.5 mm²	927768-3
Locking for 81 pins connector	368382-1
Locking lever for 81 pins connector (type A)	1473247-1
Housing for 81 pins connector	1473244-1

This item is a standard product, please consider the relevant datasheet notes.
The user is responsible for the product's functionality in its purposed system environment.

For more information visit us at www.we-online.com/ics or call +49 7940 9810-0

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