CAN-IO 14 valve controller

Product documentation

Supply voltage U_B:	10 to 32 V DC
Output current I_A:	max. 20 A

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HAWE HYDRAULIK

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Contents

1 Overview of CAN-IO 14 valve controllers

Programmable logic valve controls control and regulate complex mobile or stationary hydraulic systems.
The CAN-IO 14 valve controllers are freely programmable PLCs with integrated proportional valve amplifiers. The CAN-IO 14+ and CAN-IO 14 PRO variants are available.
Highly precise functions are possible thanks to the feedback measurement at the valve outputs.
Thanks to the extensive setting and programming options, the CAN-IO 14 can be used extremely flexibly.

CAN-IO 14+ valve controller

Features and benefits:

- Up to 8 IPWM outputs
- Up to 16 analog inputs
- High protection class
- Up to 2 CAN bus interfaces
- Flexible programming in HAWE eDesign or C
- Configurable as a CAN slave
- Free parametrization of all inputs and outputs

Intended applications:

- Control of proportional valves in mobile work machines and industry
- Distributed machine controllers
- CAN slave applications

2 Available versions, main data

2.1 CAN module

CAN-IO 14+

Order coding	CAN-IO 14+
Order number	6962 945400
Description	Programmable logic control - Up to 4 IPWM outputs - Up to 4 PWM outputs - Up to 14 analogue inputs - 1 CAN bus interface - Flexible programming in eDesign or C - Free parametrization of all inputs and outputs

CAN-IO 14 PRO

Order coding	CAN-IO 14 PRO
Order number	6964 0049-68
Description	Programmable logic controller - 32-bit processor - Up to 8 IPWM outputs - Up to 16 analog inputs - 2 CAN bus interfaces - Flexible programming in C - Free parametrisation of all inputs and outputs

Other properties See Chapter 3

2.2 Accessories

CAN-IO 14 cable

Order coding	CAN-IO 14: 2.5 m cable
Order number	6219 3002-00
Description	Fully equipped CAN-IO 14 central plug type Aptiv 211PC249S0033 with 2.5 m cable. Single wires labelled with open ends for flexible assembly. Suitable for CAN-IO 14+ and CAN-IO 14 PRO.

CAN-IO 14 Plug-Set

Order coding	CAN-IO 14 Plug-Set
Order number	6219 3001-00
Description	Aptiv 211PC249S0033 plug for independent assembly of connectors with customer's own number of wires and wire lengths. Suitable for CAN-IO 14+ and CAN-IO 14 PRO. Content: 1 housing with lock 20 crimp contacts, 1.5 mm² 8 crimp contacts, 2.8 mm² 12 seals

PEAK-System CAN USB dongle

Order coding	PCAN-USB ADAPTER
Order number	6964 0021-72
Description	USB-CAN adapter from PEAK-System. For connecting a CAN-IO 14 and a PC. Please download the driver software from www.hawe.com/edocs to guarantee problem-free operation.

CAN-IO 14 Starter Kit

Order coding	CAN-IO 14 Starter Kit
Order number	6964 0023-10
Description	Connector type Aptiv 211PC249S0033, crimp contacts and cable seals for custom design of the connection cable. Suitable for CAN-IO 14+ and CAN-IO 14 PRO.
Port	Europlug type C Aptiv 211PC249S0033 D-Sub plug DE-9 (CAN bus) D-Sub plug DE-9 (RS232) Magnetic plug by DIN EN 175301-803
Protection class	IP 20
Supply voltage	100...240 V AC, 50...60 Hz
output voltage	24 V DC
Output current	Max. 1 A
CAN termination	120 Ω terminal resistor integrated in D-Sub plug
Potentiometer:	R = 10 kΩ P_{max} = 0.5 W U_{max} = 250 V

2.3 Software

Programming

The HAWE CAN-IO 14+ and HAWE CAN-IO 14 PRO are supplied with firmware. Logic and functions must be programmed or parameterised via logical linking of the inputs and outputs. Without programming or parameterisation, the CAN-IO 14 will not work.

HAWE Visual Tool

Designation	HAWE Visual Tool
Products	- CAN-IO 14+ - CAN-IO 14 PRO
Description	The free software HAWE Visual Tool offers a clear graphic representation of all inputs and outputs. By configuring user parameters, functions can be created with a clear logic. The communication takes place via RS232 or the PEAK Systems CAN-USB dongle.
Functions	Configuration and scaling of inputs and outputs Configuration of the CAN communication Logical linking of inputs and outputs Copying settings
Download	www.hawe.com/edocs

HAWE eDesign

Designation	HAWE eDesign
Products	CAN-IO 14+
Description	The free software HAWE eDesign is a graphic programming interface. Pre-defined functions and logic modules can be combined extremely easily to create a program even without knowledge of programming. HAWE eDesign is a pure Cloud solution that requires no compiler installation on the computer. The communication takes place via the PEAK Systems CAN-USB dongle.
Functions	Programming of functions and logic Worldwide access to programs Configuration and scaling of inputs and outputs
Link	edesign.hawe.com

CodeWarrior

Designation	CAN-IO CodeWarrior
Products	CAN-IO 14+
Description	The free software CAN-IO CodeWarrior is a programming environment from Freescale. CodeWarrior can be used to program complex functions and controls in C. Extensive function libraries are available. The function modules are specifically adapted to the HAWE product range. The communication takes place via the PEAK-System CAN-USB dongle.
Functions	C programming environment Debugging
Download	www.hawe.com/edocs

Visual Studio Code

Designation	Visual Studio Code
Products	CAN-IO 14 PRO
Description	The CAN-IO 14 PRO can be programmed in C using Visual Studio Code. The programme is transferred using GCC Compiler. Extensive function libraries are available. The function modules are specifically adapted to the HAWE product range. Communication takes place via the PEAK-System CAN-USB dongle. The programming environment, compiler and function libraries can be loaded as a package.
Download	www.hawe.com/edocs

3 Parameters

3.1 General

General parameters

Designation	Programmable logic valve control
Version	Module
Port	Central plug type Aptiv 211PC249S0033
Attachment	2 x ∅7
Installation position	As desired
Weight	approx. 170 g
Protection class	IP 6K8 with correct mounting position (plug downward)
Ambient temperature	-40 to +85°C

3.2 Electrical parameters

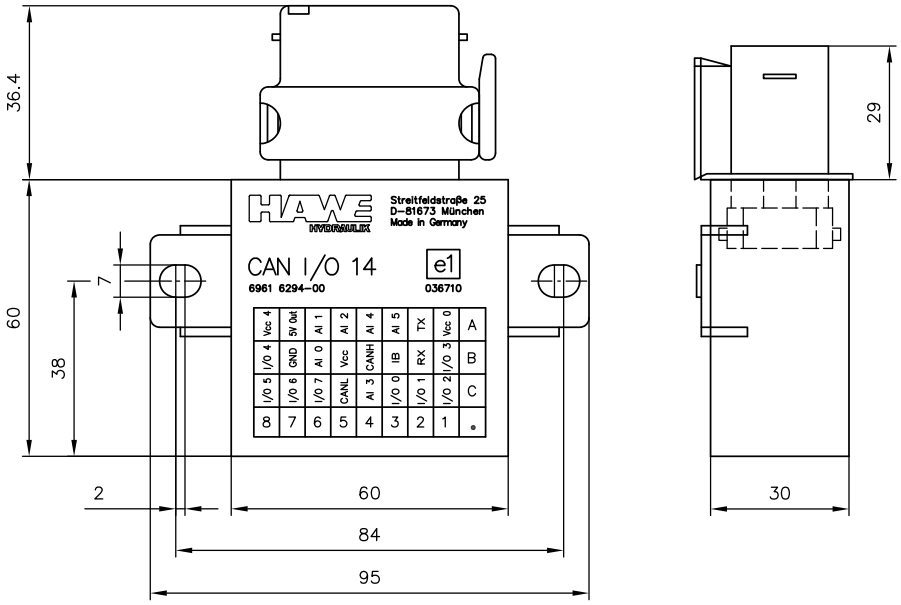
Supply voltage U_B	CAN-IO 14+: 9 to 30 V DC CAN-IO 14 PRO: 9 to 32 V DC
Fuse	20 A
Idle current I_L	< 50 mA
Analogue inputs	6 configurable, multi-functional inputs, 12-bit resolution **CAN-IO 14+:** ▪ 0 to 10 V DC; (max. 11.4 V DC); RE = 12.6 kΩ ▪ 0 to 24 mA; (max 24.5 mA); RE = 235 Ω ▪ Up to 2.2 kHz; RL = 12.6 kΩ ▪ 1 kΩ pull-up
Digital inputs	1 x digital input, short-circuit-proof, max. 30 V DC, R_E = 12 kΩ Switching point 4.5 V DC All analogue inputs can also be used as a digital input
I/Os	8 configurable I/Os **CAN-IO 14+:** Outputs ▪ 4 x IPWM (current-controlled) ▪ 4 x PWM ▪ Load current of max. 2.5 A (current-controlled to max. 1.8 A) ▪ PWM frequency of max. 1 kHz ▪ Dither frequency of 0 to 250 Hz ▪ Dither amplitude of 0 to 100% Inputs; 12-bit resolution: ▪ 0 to 10 V DC; (max. 11.3 V DC); RL = 12.6 kΩ **CAN-IO 14 PRO:** Outputs: ▪ 8 x IPWM (current-controlled) ▪ Load current of max. 2.5 A (current-controlled to max. 1.8 A) ▪ PWM frequency of max. 1 kHz ▪ Dither frequency of 0 to 250 Hz ▪ Dither amplitude of 0 to 100% Inputs; 12-bit resolution: ▪ 0 to 32 V DC; RL = 30 kΩ
Voltage output	1 x 5 V DC, max. 200 mA
Interfaces	CAN bus (ISO 11898-2 CAN 2.0A+B) RS232 (max. 19.2 kBaud)

3.3 Standards and directives

CE (EMC)	2014/30/EU
E1-approval	2009/19/EC ECE R-10

4 Dimensions

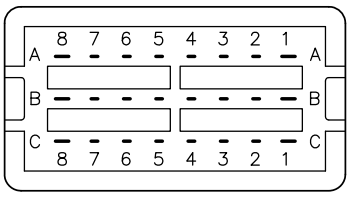
All dimensions in mm, subject to change.



Connection pattern

	C	B	A
8	I/O 5	I/O 4	U_B (Output 4...7)
7	I/O 6	GND	5 V Out
6	I/O 7	AI 0	AI 1
5	CAN L	U_B	AI 2
4	AI 3	CAN H	AI 4
3	I/O 0	DI	AI 5
2	I/O 1	RS232 RX / CAN 1 L *	RS232 TX / CAN 1 H *
1	I/O 2	I/O 3	U_B (Output 0...3)

* CAN-IO 14 PRO



Layout plan

Pin	Name	Function	Comment
A1	U_B (Output 0...3)	Supply voltage Output 0...3	
A2	COM 1.1	RS232 TX / CAN 1 High *	
A3	AI 5	Analogue input 5	Also digital input
A4	AI 4	Analogue input 4	Also digital input
A5	AI 2	Analogue input 2	Also digital input
A6	AI 1	Analogue input 1	Also digital input
A7	5 V Out	Stabilised 5 V output voltage	
A8	U_B (Output 4...7)	Supply voltage Output 4...7	
B1	IO 3	IPWM Output 3	Also analogue input or digital input
B2	COM 1.0	RS232 RX / CAN 1 Low *	
B3	DI	Digital input	Also frequency input
B4	COM 0.1	CAN 1 High	
B5	U_B	Supply voltage CAN-IO	Also digital input or frequency input
B6	AI 0	Analogue input 0	Also digital input or frequency input
B7	GND	Weight	Also PGND, AGND, RS232 GND
B8	IO 4	PWM Output 4	Also analogue input or digital input
C1	IO 2	IPWM Output 2	Also analogue input or digital input
C2	IO 1	IPWM Output 1	Also analogue input or digital input
C3	IO 0	IPWM Output 0	Also analogue input or digital input
C4	AI 3	Analogue input 3	Also digital input
C5	COM 0.0	CAN 0 Low	
C6	IO 7 I	PWM Output 7	Also analogue input or digital input
C7	IO 6	PWM Output 6	Also analogue input or digital input
C8	IO 5	PWM Output 5	Also analogue input or digital input

* CAN-IO 14 PRO

Further information

Additional versions

- ESX-3CM mobile controllers: ESX-3CS
- ESX-3CM mobile controllers: ESX-3CM
- Programmable logical valve control type PLVC 41: D 7845-41
- Proportional amplifier type EV2S: D 7818/1
- Proportional amplifier type EV1D: D 7831 D
- Proportional amplifier type EV1M3: D 7831/2

Application

- Proportional directional spool valve, type PSL and PSV size 2: D 7700-2
- Proportional directional spool valve, type PSL, PSM and PSV size 3: D 7700-3
- Proportional directional spool valve, type PSL, PSM and PSV size 5: D 7700-5
- Proportional directional spool valve banks type PSLF and PSVF size 7: D 7700-7F
- Proportional directional spool valve type EDL: D 8086
- Proportional pressure-limiting valve type PDV and PDM: D 7486
- Directional seated valve type EM and EMP: D 7490/1
- Directional spool valve type NSWP 2: D 7451 N
- Variable displacement axial piston pump type V60N: D 7960 N
- Variable displacement axial piston pump type V30D: D 7960
- Variable displacement axial piston pump type V30E: D 7960 E
- Proportional pressure-limiting valve type PDV and PDM: D 7486
- Proportional flow control valve type SE and SEH: D 7557/1

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