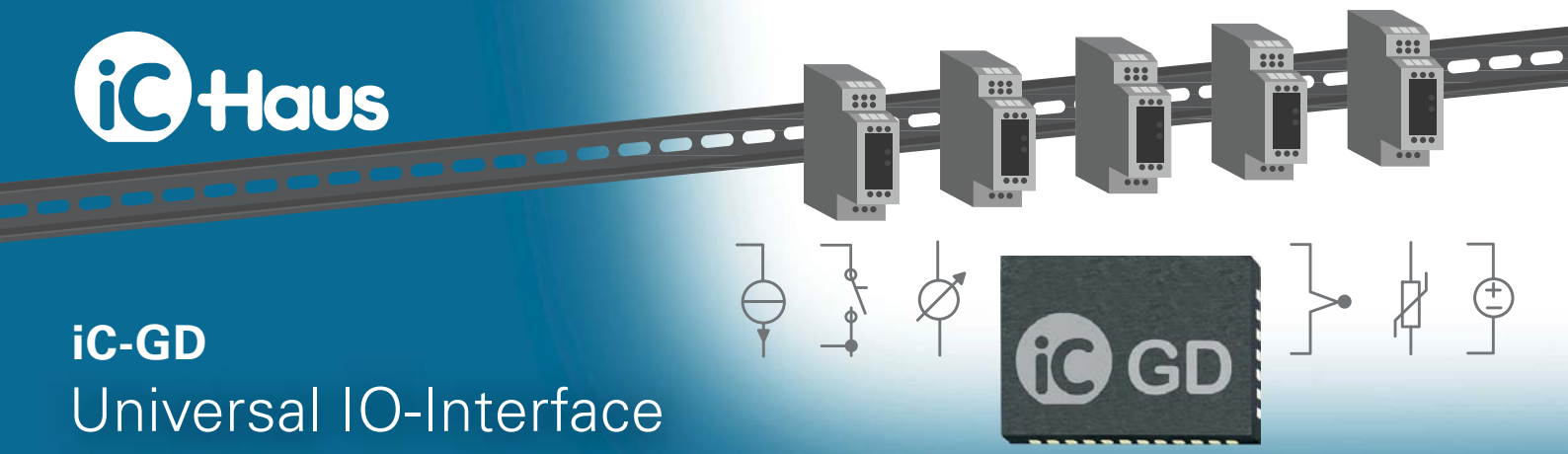
iC-GD
Universal IO-Interface



Description

iC-GD is a dual channel interface IC that provides a variety of interfaces for measurement and control signal transmission. Both channels, each with 4 pins, can be addressed via the SPI interface and configured by an external EEPROM or SPI. The low-side and high-side drivers are designed for high driving currents of at least 500 mA with integrated current measurement and current limitation. They are short-circuit proof by shut down in case of overtemperature or overload. The high/low-side drivers can be connected in parallel for higher currents and feature an active freewheeling diode and reverse polarity protection. The analog outputs provide voltages in the range of ±10 V or currents in the range of 0/4 to 20 mA with a resolution of 14 bits.

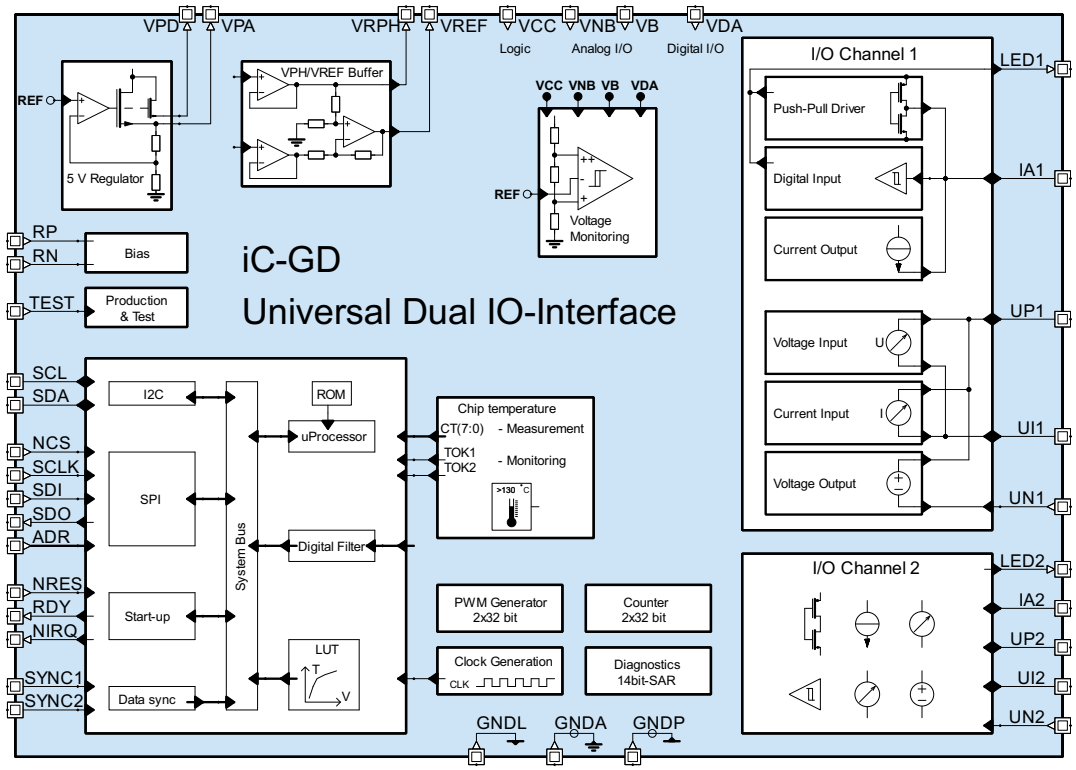
Applications

- SPS control system
- Data acquisition
- Sensor interfaces

Features

- Two channels, each configurable as input or output
- Low-side and high-side switches with up to 500 mA per channel, current limitation, current measurement, status messages, cable break detection, freewheeling diode, reverse polarity protection, optional parallel connection of both channels
- Output of ±10 V or 0/4...20 mA with 14-bit resolution
- Measurement of ±10 V, ±1 V, ±100 mV, ±10 mV, ±20 mA, 4...20 mA with 14 bit
- Input for Pt 100, Pt 1000 temperature sensors
- Multi-function 32 bit counter
- Digital output with pulse-width modulation option
- Internal temperature measurement with 1 K resolution
- SPI interface
- Calibration and configuration by external EEPROM via serial interface
- Error message at overtemperature, overload and undervoltage
- Shutdown of the outputs in case of error
- Operating ambient temperature range -20...85 °C

Block Diagram



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Universal IO-Interface

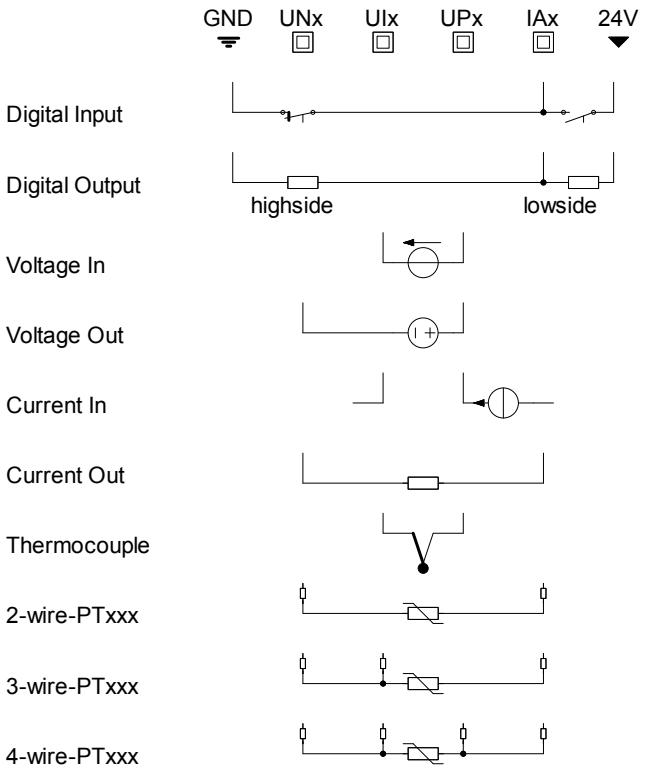
Description

Configured as analog inputs, a 16-bit DAC processes differential voltages in the range of ±10 V, ±1 V, ±100 mV, ±10 mV, or currents in the range of ±20 mA or 4 to 20 mA. Pt-temperature sensors (in 2-, 3- and 4-wire configuration) and various thermocouples can also be connected for temperature measurement with a resolution of 0.1 K, after calibration. Also, an integrated temperature sensor supplies the absolute chip temperature with a resolution of 1 K, after calibration.

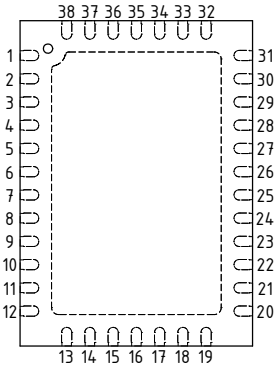
The analog inputs can be bandwidth-limited over a wide range from 2 kHz to 0.5 Hz by means of a configurable input filter. Additionally a fast mode with an 8 kHz limit is available. In digital input mode, two 32-bit counters are available with various functions such as counting direction, start value, end value, or in combination as a gated counter. An LED signals the state of the digital input even without the iC-GD being powered. The digital output can be operated pulse-width modulated with a resolution of either 125 ns or 16 µs and a cycle time of up to 8.192 ms or 1.048 s respectively. If not all pins of a channel are used, it is possible to use certain functions per channel simultaneously.

A variety of monitoring functions for supply voltage, cable break and overload permit comprehensive system diagnostics. Each IC holds a unique serial number for identification.

Connectivity



Pin Configuration QFN38-5x7



Pin Functions

No.	Name	Function
1 - 3	ADR0 - 2	Address 0 - 2 input
4	VCC	Supply voltage 3.3 ... 5 V
5	GNDL	Logic Ground
6	TEST	Test
7	VPD	5 V voltage output
8	VRPH	Modulator mid voltage
9	VREF	Modulator reference voltage
10 / 23	LED1 / 2	LED1 / 2 driver output
11	VNB	Supply voltage -15 V
12 / 21	UN1 / 2	Voltage negative channel 1 / 2
13 / 20	UI1 / 2	Voltage current channel 1 / 2
14 / 19	UP1 / 2	Voltage positive channel 1 / 2
15 / 18	IA1 / 2	Current output analog / digital channel 1 / 2
16	GNDP	Power Ground
17	VDA	Supply voltage 24 V
22	VB	Supply voltage +15 V
24	VPA	5 V voltage output
25 / 26	RP / RN	Resistor pin 1 / 2
27	GNDA	Analog Ground
28	NRES	Reset input (low active)
29	RDY	Ready output
30	NCS	Chip select input (low active)
31	SCLK	SPI clock input
32	SDI	SPI data input
33	SDO	SPI data output
34 / 35	SYNC1 / 2	Synchronization channel 1 / 2
36	IRQ	Interrupt output
37	SCL	I²C clock input
38	SDA	I²C data input

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