

Irinos IR-AIN

Digital measurement box with
analogue inputs $\pm 10\text{ V}$



- 8 differential analogue inputs $\pm 10\text{V}$
- Direct sensor power supply with 24V DC
- Very high accuracy and stability
- Synchronous data acquisition up to 10.000 measurement values / s (all channels simultaneously)
- Expandable with other Irinos-Boxes via ILink-Interface (mixed operation possible, e.g. with inductive probes and incremental encoders)
- Available with integrated ethernet interface for direct connection to PC



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Proven measurement technology

The measurement electronic of the Irinos-Box IR-AIN is based on more than 30 years of experience of precision measurement.

Each measurement channel has its own input circuit with high-class analogue components. It is designed with differential input terminals, which allows for a stable measurement even if the cabling situation is difficult.

The AD-converter and the reference voltage have a low temperature sensitivity over the whole measurement range. All channels are sampled synchronously (no multiplexing).

Pre-calibration

All measurement channels are digitally pre-calibrated for the measurement range ± 10 V. Calibration of the Irinos-Box by the user is not required.

This enables an easy installation and a quick replacement of the Irinos-Box by an identical one.

24V supply for sensors

Each measurement channel is equipped with a 24 V DC output. External sensors can be supplied directly.

Reference voltage +10 V

Each measurement channel is equipped with a +10 V reference output. This allows for example the direct connection of a potentiometer.



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Expansion

Multiple Irinos-Boxes can be connected via the ILink-Interface. It does not matter, whether they are of the same type IR-AIN or for other measurement inputs (e.g. for inductive probes or for incremental encoders).

The ILink-Interface contains three different functionalities:

- Data exchange between Irinos-Boxes
- Synchronisation of multiple Irinos-Boxes
- Power supply for the Irinos-Boxes

The amount of Irinos-Boxes has no influence on reading the measurement values from the PC, except that more channels are available. All measurement values are transferred via a single ethernet connection from the Irinos-System to the PC. This allows an easy integration into Windows based measurement software (DLL available).

Synchronous HighSpeed-Measurement

Many measurement applications require the realtime acquisition of various measurement channels, allowing further calculations (e.g. concentricity measurement).

With the Irinos-Box IR-AIN, it is possible to get 10.000 measurement values / s. This value is independent of the number of channels. It is for example possible to have a realtime measurement with 32 channels acquiring $32 * 10.000 \text{ values/s} = 320.000 \text{ measurement values / s}$ in total.

All measurement values are acquired synchronously and buffered in the internal memory of the Irinos-Box before they are transferred to the PC.

Galvanic Isolation

Each Irinos-Box has galvanic isolation.

The galvanic isolation from the power supply ensures that external noise will not influence the measurement electronics.

Additionally the ILink-Interface has galvanic isolation, which allows for a robust communication between multiple Irinos-Boxes. Further it avoids ground loops or similar negative effects.

Labelling

Each measurement channel can be labelled via an optional label carrier. It is suitable for 8 plastic-labels, which are widely used in switch cabinet construction. They can be printed with many commercially available plastic-label printers.



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Specifications

Analogue inputs	
Sensor inputs for	All sensors with analogue output ± 10 V or lower. For example: <ul style="list-style-type: none">○ Temperature sensors○ Force sensors○ Pressure transducers
Number of channels	8 analogue inputs, directly connected (8x M16 7-pin)
Channel setup	8 independent differential input channels (no multiplexing -> no settling time)
Synchronisation	Simultaneous acquisition of all measurement channels (jitter using one Irinos-Box: 0ns; jitter using multiple Irinos-Boxes: < 250 ns)
Calibration	Pre-calibration of all measurement channels. No calibration of the measurement channels required by the customer.
Measurement range	-10 .. +10 V DC
Max. resolution	0,3 mV (16 Bit)
Calibration range	64000 digits: -32000 -> -10 V 0 -> 0 V +32000 -> +10 V
Input impedance	typically 1 MOhm On request for special applications: > 10 MOhm.
Measurement speed	10.000 measurement values / s independent of the number of channels

Power supply for sensors	
Output voltage	Input voltage from ILink minus voltage drop of thermo fuse. With power supply 24,0 V DC: min. 23,5 V, typically 23,9 V DC at 100 mA output current min. 22,5 V, typically 23,2 V DC at 1 A output current
Output current	max 1 A (sum for all 8 channels)
Overload protection	Self-resetting thermofuse, Rated current: 1,5 A @ 23°C / 1,1 A @ 50°C



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Power supply

Rated voltage	24 V DC \pm 10 %
Reverse voltage protection	yes
Power consumption	\leq 5 watt
Coupling	galvanic isolation
Forwarding	If multiple Irinos-Boxes are used, the power-supply is forwarded via the ILink-Interface to all Irinos-Boxes (no separate power supply required).

Use an Irinos power supply, e.g. IR-PU50.

Ethernet-Interface (only available for types IR-AIN-...-ETHIL)

Connector	M12 D-coded (industrial standard)
Speed	10 / 100 MBit/s (auto-negotiation)
Max. cable length	100 m
	Auto-Crossover

Digital Inputs (only available for types IR-AIN-...-ETHIL)

Connector	M12 A-coded (industrial standard)
Number of inputs	2 (shared connector)
Voltage range	0 .. 26,4 V DC
Voltage levels	Similar to IEC61131-2: Low: 0 .. 5 V High: 10,8 .. 26,4 V
Input current	ca. 4 mA typical at 24V.
Coupling	galvanic isolation
Power supply	24V available for switches (e.g. push-button or foot pedal) via a high impedance resistor. No supply for external components (e.g. active sensors).

Casing

	Aluminium designer housing, black anodized, rear plate clear anodized, front plate with cover foil
Dimensions	160 x 98 x 33 mm (H x W x D)
Protection class	Up to IP65 with the IP65 Irinos-Box type, using appropriate connectors
Mounting (standard)	2 tapped brushed M4 on the rear side
Mounting options	<ul style="list-style-type: none">o adaption for hat rail mountingo adaption for aluminium profile 40mm, Item or similaro adaption for front side mounting
Labelling	Optional label carrier for plastic labels type „Murrplastik ABB 17x9“ (order number Murrplastik: 86421020).



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Miscellaneous

Temperature range	operation: 5 - 50 °C / storage: 0 - 70 °C
Status indication	Status LED (types with integrated ethernet interface) Numeric display (types without ethernet interface) showing box-number and/or error.
Expansion	System expansion up to 32 Irinos-Boxes via ILink-Interface (max. 256 probes possible). Combinable with other inputs, e.g. for incremental encoders, analog inputs, digital in/outputs, etc.
Connection to PC	Standard ethernet. DLL available for easy integration into PC software (Windows based).



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Ordering information

Preferred types have shorter lead times.

Irinos-Boxen IR-AIN with analogue inputs		
Order-No.	Description	Preferred type
828-5010	IR-AIN-8-D10-M16-ETHIL (*) 8 analogue inputs ± 10 V, directly connected , including Ethernet -Interface for direct connection to a PC, including 2 digital Inputs, protection class IP53 if appropriate connectors are used.	
828-5011	IR-AIN-8-D10-M16-IL 8 analogue inputs ± 10 V, directly connected , without Ethernet -Interface (additional Irinos-Box), without digital inputs, protection class IP53 if appropriate connectors are used.	Yes
828-5012	IR-AIN-8-D10-M16IP-IL 8 analogue inputs ± 10 V, directly connected , without Ethernet -Interface (additional Irinos-Box), without digital inputs, protection class IP65 if appropriate connectors are used.	

(*) Exactly one Irinos-Box with ethernet interface allowed per Irinos-System.

Accessories labelling and mounting		
Order-No.	Description	Preferred type
828-5040	IR-MIPL-8-ABB179 Labelling carrier for 8 plastic labels	Yes
828-5041	IR-MHRM-1 Adapter for hat rail mounting	Yes
828-5042	IR-MFFM-1 Front-side mounting kit	Yes
828-5043	IR-MITEM-40 Mounting bracket for aluminium profile 40mm (Item or similar)	Yes
828-5044	IR-MWIP-40 Stand for aluminium profile 40mm (Item or similar)	Yes



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Ethernet cables		
Order-No.	Description	Preferred type
828-5050	Ethernet cable IR-CETH-RJ45-M12-010 Length 1m , Cat5e, 1 x RJ45, 1 x M12 SpeedCon D-coded	Yes
828-5051	Ethernet cable IR-CETH-RJ45-M12-020 Length 2m , Cat5e, 1 x RJ45, 1 x M12 SpeedCon D-coded	Yes
828-5052	Ethernet cable IR-CETH-RJ45-M12-050 Length 5m , Cat5e, 1 x RJ45, 1 x M12 SpeedCon D-coded	Yes
828-5053	Ethernet cable IR-CETH-RJ45-M12-100 Length 10m , Cat5e, 1 x RJ45, 1 x M12 SpeedCon D-coded	
828-5054	Ethernet cable IR-CETH-RJ45-M12-150 Length 15m , Cat5e, 1 x RJ45, 1 x M12 SpeedCon D-coded	

Accessories ILink connection cable between multiple Irinos boxes		
Order-No.	Description	Preferred type
828-5055	ILink connection cable IR-ILINK-002-IP40 Length 0,2 m, protection class IP40	Yes
828-5056	ILink connection cable IR-ILINK-010-IP40 Length 1 m, protection class IP40	Yes
828-5057	ILink connection cable IR-ILINK-020-IP40 Length 2 m, protection class IP40	
828-5058	ILink connection cable IR-ILINK-030-IP40 Length 3 m, protection class IP40	
828-5059	ILink connection cable IR-ILINK-050-IP40 Length 5 m, protection class IP40	
828-5060	ILink connection cable IR-ILINK-100-IP40 Length 10 m, protection class IP40	
828-5061	ILink connection cable IR-ILINK-002-IP65 Length 0,2 m, protection class IP65	
828-5062	ILink connection cable IR-ILINK-010-IP65 Length 1 m, protection class IP65	
828-5063	ILink connection cable IR-ILINK-020-IP65 Length 2 m, protection class IP65	
828-5064	ILink connection cable IR-ILINK-030-IP65 Length 3 m, protection class IP65	
828-5065	ILink connection cable IR-ILINK-050-IP65 Length 5 m, protection class IP65	
828-5066	ILink connection cable IR-ILINK-100-IP65 Length 10 m, protection class IP65	



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