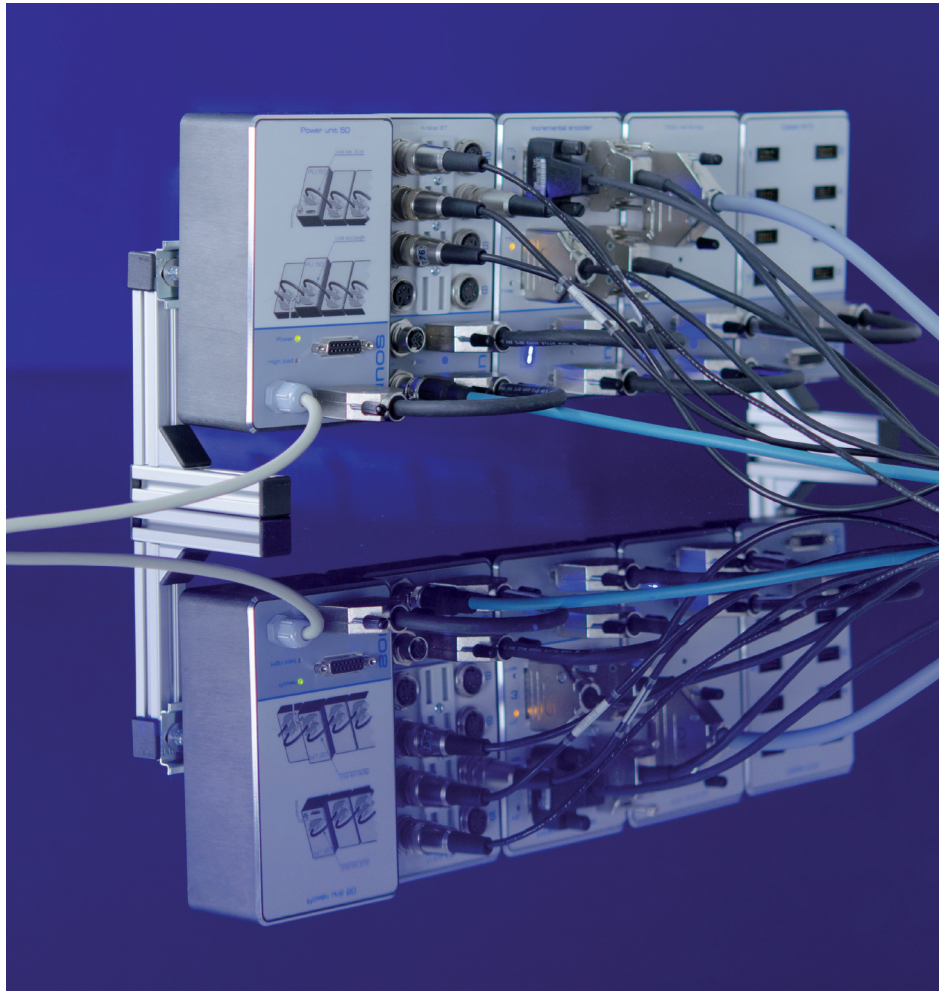# Irinos

Modular high-speed measurement system for production measurement

- Connection to PC via standard ethernet interface

- Irinos-Boxes for inductive probes, incremental encoders, analog inputs, digital in-/outputs & thermocouples available.

- Expandable system

- Synchronous data acquisition up to 10.000 measurement values / s (all channels simultaneously)

- Multiple galvanic isolation for high noise immunity

- Mounting and labelling accessories available

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Modular system design

Because of its modular design in the form of Irinos-Boxes, the Irinos system can be scaled to fit various measurement applications. 32 Irinos-Boxes at a maximum can be cascaded. This provides up to 256 measurement inputs.

Each Irinos-Box is dedicated to a certain type of measurement probe or sensor type. Different box types can be combined.

All Irinos-Boxes are connected via the ILink-Interface in line topology. The ILink-Interface containes three different functionalities:

• Data-exchange between Irinos-Boxes

• Synchronisation of multiple Irinos-Boxes

• Power-supply for the Irinos-Boxes

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

The Irinos-Box containing the Ethernet-Interface is the main box („Master-Box"). All others are „Slave-Boxes"
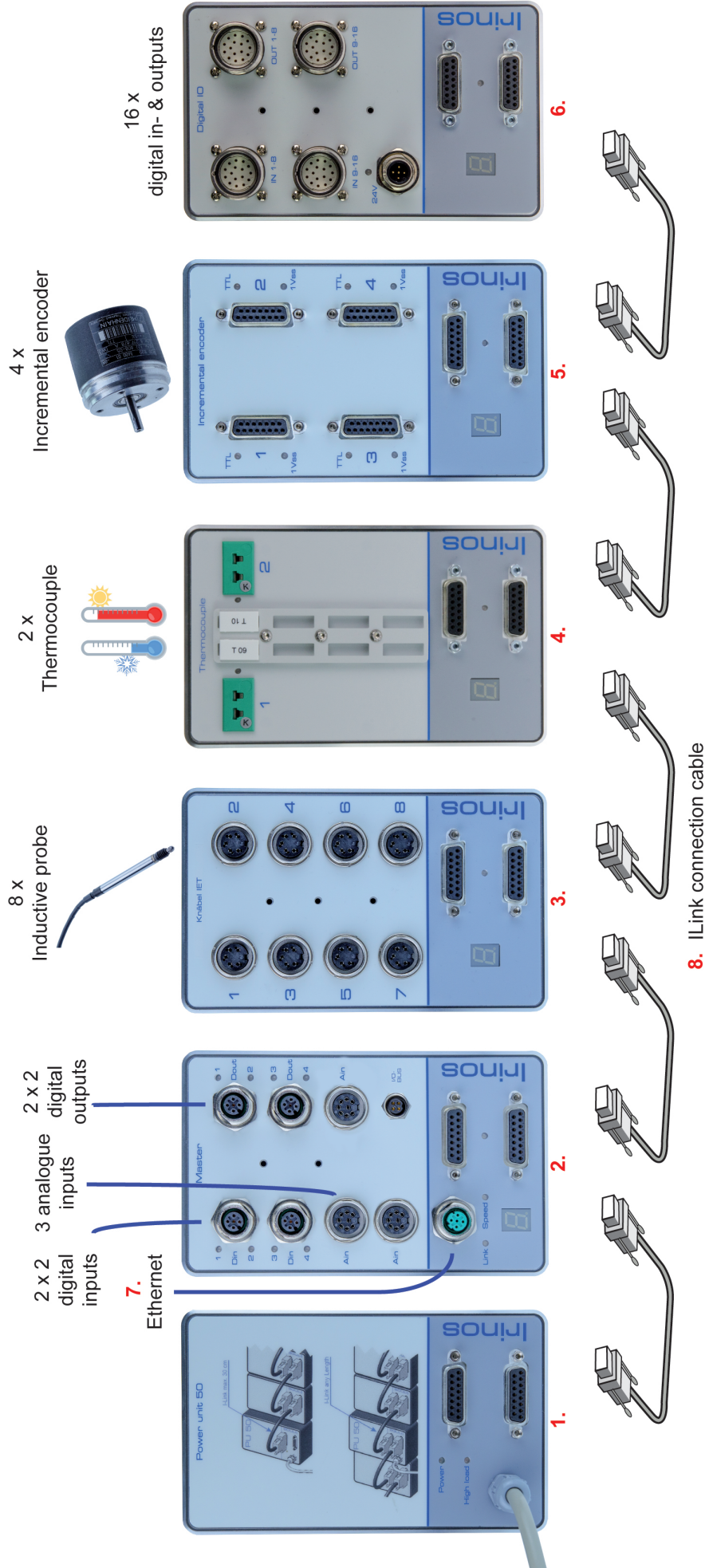
There are 2 types of Master-Boxes:

1. The Irinos-Box IR-MASTER has an ethernet interface, digital in-/outputs and analog inputs. This helps reducing the variant variety by using only slave measurement boxes.

2. An Irinos measurement box with integrated ethernet interface is used („integrated Master-Box"). This is the better option for cost-sensitive applications.

Following two example systems are presented. System 1 uses a separate Master-Box IR-MASTER. System 2 uses an integrated Master-Box.

Example system 1

Separate Master-Box

16 x
digital in- & outputs

4 x
Incremental encoder

2 x
Thermocouple

8 x
Inductive probe

2 x 2 digital outputs

3 analogue inputs

2 x 2 digital inputs

Ethernet

7.

6.

5.

4.

3.

2.

1.

8. ILink connection cable

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Example system 1

Separate Master-Box

This system consists of:

No	Qty	Order-No.	Description
1	1	828-5017	IR-PU-50-HWS-F Power supply 50W
2	1	828-5000	IR-MASTER-KB1-68-68-3-SYSP-ETHIL Master for the connection to the PC via Ethernet, with Irinos IO-Bus, 3 analogue inputs ± 10 V and 4 digital in- and outputs
3	1	828-5007	IR-TFV-8-IET-M16-IL Measurement box for 8 inductive probes Knäbel IET, directly connected
4	1	828-5027	IR-TEMP-2-TCK-MINIJACK-IL Measurement box for 2 thermocouples (K type)
5	1	828-5014	IR-INC-4-SEL1VSS-DSUB15F-IL Measurement box for 4 incremental encoders 1Vss or TTL/RS422
6	1	828-5019	IR-DIO-16-16-M23-EXTP-IL I/O box with 16 digital inputs & 16 digital outputs, connected via M23 connector
7	1	828-5050	IR-CETH-RJ45-M12-010 Ethernet connection cable, Length 1m
8	5	828-5055	IR-ILINK-002-IP40 ILink cable for the connection of two Irinos-Boxes, Length 0,2m

Example system 2

IR-TFV as an „integrated Master-Box"

Control panel

5.

8 x
analogue inputs

4.

4 x
Incremental encoder

3.

7./8.   ILink connection cable

8 x
Inductive probes
(directly mounted)

2.

2 digital
inputs

6.
Ethernet

Power supply

1.
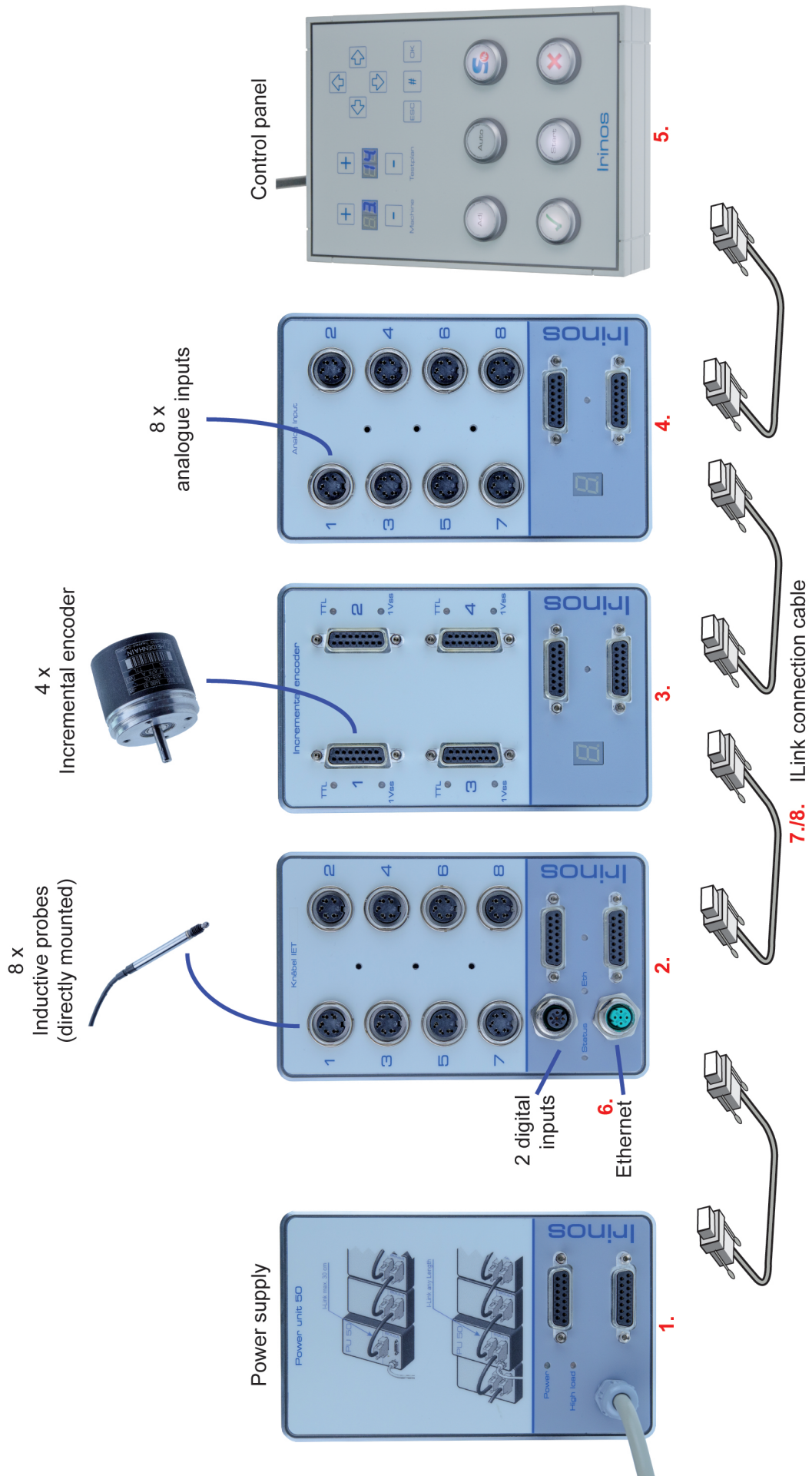
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Example system 2

IR-TFV as an „integrated Master-Box"

This system consists of:

No	Qty	Order-No.	Description
1	1	828-5017	IR-PU-50-HWS-F
			Power supply 50W
2	1	828-5006	IR-TFV-8-IET-M16-ETHIL
			Measurement box for 8 inductive probes Knäbel IET, directly connected, with ethernet interface and 2 digital inputs
3	1	828-5014	IR-INC-4-SEL1VSS-DSUB15F-IL
			Measurement box for 4 incremental encoders 1Vss or TTL/RS422
4	1	828-5011	IR-AIN-8-D10-M16-IL
			Measurement box with 8 analogue inputs ± 10 V
5	1	828-5029	IR-HMI-MPA-0-0-IL
			Control panel
6	1	828-5050	IR-CETH-RJ45-M12-010
			Ethernet connection cable, Length 1m
7	3	828-5055	IR-ILINK-002-IP40
			ILink cable for the connection of two Irinos-Boxes, Length 0,2m
8	1	828-5056	IR-ILINK-010-IP40
			ILink cable for the connection of the Control panel, Length 1mm

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Automatic box addressing

A unique box number is assigned to all Irinos-Boxes by the Master-Box during the startup phase. On all boxes, which have a numeric display, the box number is shown. Concurrently the auto-termination of the ILink-interface is activated at the boxes at the end of the ILink-Line.

Distributed measurement acquisition

The max. total cable length for the ILink cabling is 20m. This allows for spatial separation of the Irinos-Boxes.

Due to their compact design, the Irinos-Boxes can be placed next to the measurement device in many cases. Interference-prone cabling is thereby eliminated. Extension cables for probes are not necessary.

Synchronous HighSpeed-Measurement

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

With many Irinos-Boxes, 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 values/s = 320.000 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.

Common power supply

A 24 V DC power supply is required for all types of Irinos-Boxes. For easy cabling, only one power supply is required. It is connected to any Irinos-Box via the ILink-Interface. This supply is forwarded to all other Irinos-Boxes via ILink.

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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.

XSync-Technology for inductive probes

If cabling is difficult, e.g. in miniature measurement devices, phase-shifted sine-signals can cause noise on the measurement signals.

The XSync-Technology ensures that the sine-signals of all Irinos-Boxes IR-TFV are in phase.

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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Mounting

Different mounting options are available for the Irinos-System:

1. The easiest and cheapest possibility is direct fastening via two tapped bushes M4 on the rear side.

2. Adapter for DIN rail mounting.

3. Front side mounting kit for quick exchange of Irinos-Boxes.

4. Mounting kit for 40mm aluminium profile (Item or similar). Via an additional stand, a complete mounting unit can be build up.

Tapped bushes M4 on the rear side	Adapter for hat-rail mounting	Front size mounting kit

EMC compliant design

During the development of the Irinos-System, special care has been taken to fulfill all relevant EMC regulations.

Windows-DLL for easy integration

For easy integration into a Windows based application, a DLL is available free of charge. Various suppliers of measurement software have already integrated the Irinos system.

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Integrated webserver

An integrated webserver provides support during setup and maintenance. Current measurement values as well as system information can be accessed via a standard webbrowser.

The webserver is independent of the measurement software. Probes can be mechanically adjusted without the availability of a measurement software (e.g. 0-point adjustment).

All measurement values can be accessed in parallel to the measurement software. In case a final measurement value is not as expected (e.g. wrong scaling), the webserver can help to locate the reason for this.

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Overview of available Irinos-Boxes

Digital measurement box for inductive probes (IR-TFV)

- Connection of 8 inductive probes Tesa halfbridge, Knäbel IET, Feinprüf/Mahr, Solartron LVDT (others on request)

- High accuracy and stability

- Synchronous data acquisition (no multiplexing)

- XSync-Technology:
  Synchronous sine-oscillators to avoid interference between probes.

- Pre-calibrated for the respective probe

- Available with quick-change system TAS10

- Available with Ethernet-Interface as an „integrated Master-Box"

Digital measurement box for incremental encoders 1 Vss and TTL/RS422

- Connection of 4 incremental encoders with 1 Vss- or TTL/RS422-interface

- 200x interpolation with 1 Vss-interface

- Integrated error detection (1Vss)

- Available with Ethernet-Interface as an „integrated Master-Box"

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Digital measurement box for analogue inputs ± 10 V

- ○ 8 differential analogue inputs ± 10 V
- ○ Direct sensor supply with 24V DC
- ○ High accuracy and stability
- ○ Synchronous data acquisition (no multiplexing)
- ○ Available with Ethernet-Interface as an „integrated Master-Box"

Ethernet communication box (Master-Box)

- ○ Integrated Ethernet-Interface for the connection of the Irinos-System to a PC via Standard Ethernet 10/100 MBit/s
- ○ Irinos I/O-Bus for the connection of external I/Os via I/O-Boxes

Optional:

- ○ 3 differential analogue inputs ± 10V
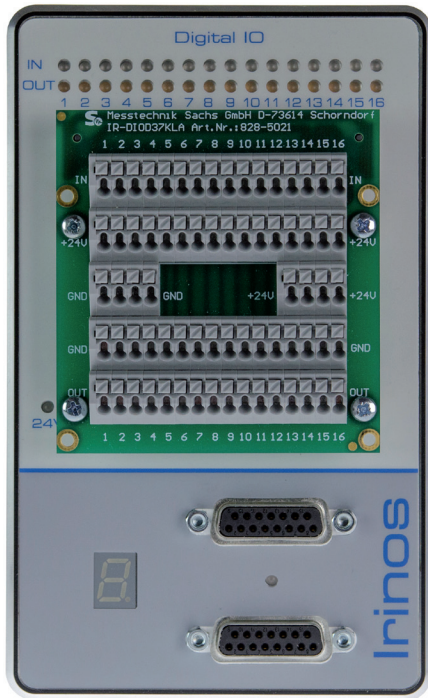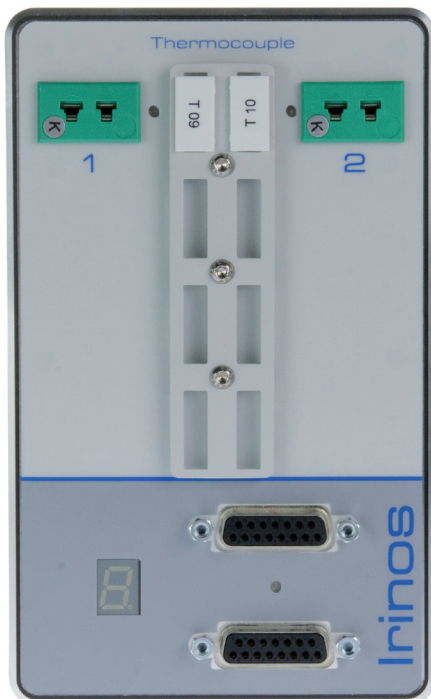- ○ 4 integrated digital in- and outputs

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I/O-Box with 16 digital in- and outputs

- 16 digital inputs

- 16 digital outputs

- Connection via DSUB-37 or
  via direct plug-in block (picture) or
  via 4 connectors M23

Temperature measurement for thermocouples

- 2 inputs for thermocouples

- Integrated „cold junction compensation" for very high measurement stability

- Galvanic isolation of each channel avoids unwanted interference between multiple thermocouples.

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Power supply for the Irinos-System

- ○ 50 Watt power
- ○ Input voltage 115 / 230 V AC
- ○ Output voltage 24 V DC
- ○ Long life expactancy
  (industrial premium power supply)

Control panel

- ○ 6 robust push buttons with user-definable functionality, each equipped with a LED for individual illumination, printable labels available
- ○ Selection of the machine- and testplan number (each from 1 to 99)
- ○ 7 membrane keys (4 x arrow + ESC + # + OK) with user-definable functionality
- ○ Direct connection to the Irinos system (no separate power supply required)
- ○ Easy integration into the measurement application via Bit-I/O

More types coming soon.

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General specification

The specification of the different box types can be found in the respective data sheets.

Data recording	
Static / continuous measurement	Measurement rate ca. 30-100 Hz for smooth online view
Dynamic measurement	Up to 10.000 measurement values/s on all channels simultaneously:
	1 channel -> total measurement rate 10.000 values/s
	10 channels -> total measurement rate 100.000 values/s
	32 channels -> total measurement rate 320.000 values/s
	Please note: most measurement channels support this data rate. See datasheet of respective Irinos-Boxes
Synchronisation	Simultaneous acquisition of all measurement channels (covering all Boxes of an Irinos-System)

Expansion / ILink-Interface	
Max. number of Irinos-Boxes	32
Max. number of measurement channels	Depending on box types used.
	E.g. with IR-TFV max. 256 measurement channels.
Max ILink cable length	20 m (Total length of ILink line-topology)
ILink termination	automatically
Box addressing	automatically

Casing*	
	Aluminium designer housing, black anodized, rear plate clear anodized, front plate with cover foil
Dimensions	Standard: 160 x 98 x 33 mm (H x W x D)
	Power supply IR-PU: 160 x 98 x 57 (H x W x D)
Protection class	Uo to IP65 (different box types available, usage of appropriate connectors required)
Mounting (standard)	2 tapped brushed M4 on the rear side
Mounting options	○ adaption for hat rail mounting
	○ adaption for aluminium profile 40mm, Item or similar
	○ adaption for front side mounting
Labelling	Optional label carrier for plastic labels type „Murrplastik ABB 17x9" (order number Murrplastik: 86421020).

* Does not apply to the control panel box.

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Subject to change without notice.