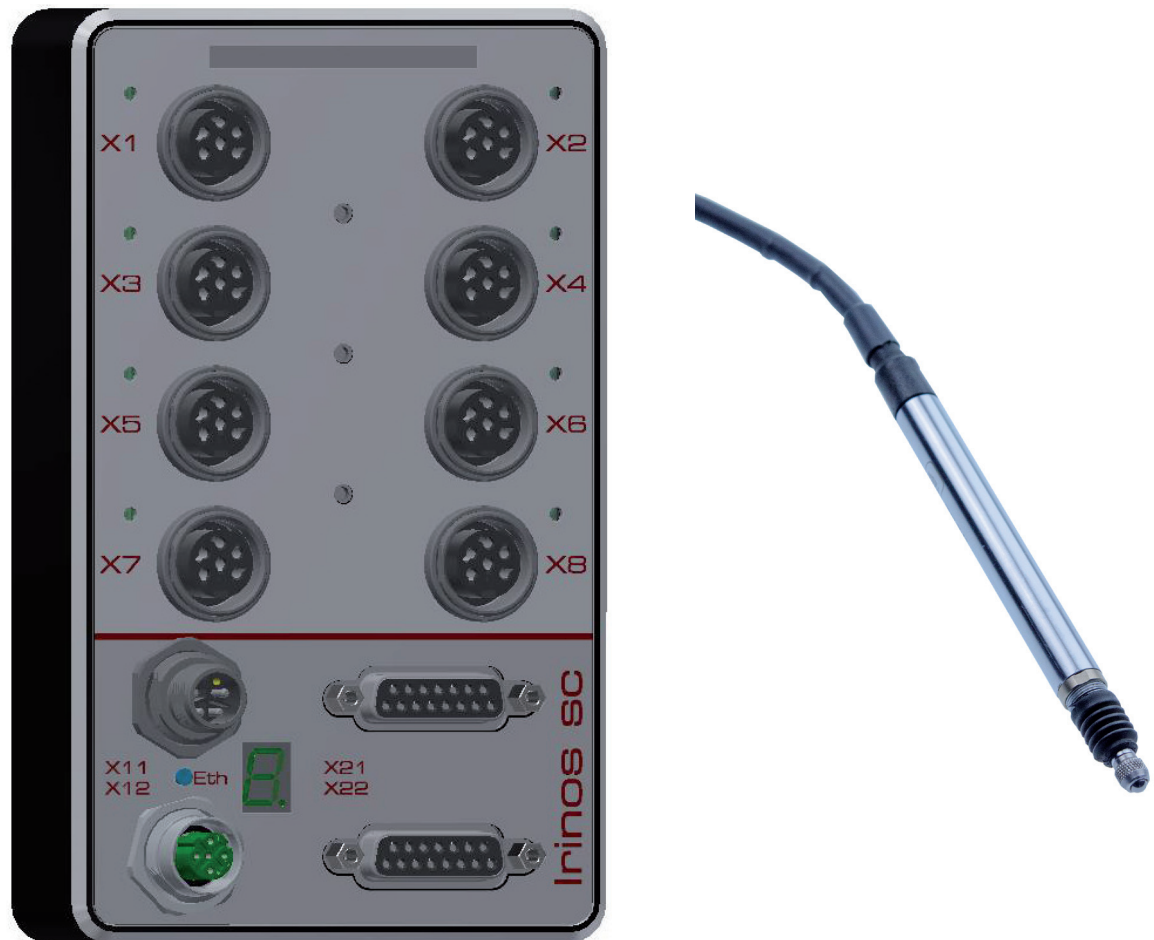


# Irinos SC-TFV

Digital data acquisition for  
inductive probes



- Interface for 8 inductive probes Tesa halfbridge, Knäbel IET, Solartron LVDT or Feinprüf / Mahr.
- Very high accuracy and stability
- Synchronous data acquisition up to 4.000 measurement values / s (all channels simultaneously)
- Expandable with other Irinos SC - Boxes
- Available with integrated ethernet interface for direct connection to PC



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# Irinos SC-TFV

## Proven measurement technology

The measurement electronic of the Irinos-Box SC-TFV is based on more than 30 years of experience with conditioners for inductive probes. These are worldwide recognized for their high accuracy and measurement stability.

Each measurement channel has its own input amplifier, using high-class analogue components. Data acquisition is done synchronously (no multiplexing required).

The measurement method uses the whole sine signal of the inductive probe. Compared to the widely used 1- or 2-point measurement, this method provides superior noise immunity.

## Pre-calibration

All measurement channels are pre-calibrated for the respective inductive probe type. 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.

## Use as analogue input $\pm 10V$

Each probe input can be switched to an analog input  $\pm 10V$  single ended. This allows mixed operation with probes and external sensors with analog output.

## Expansion

Multiple Irinos-Boxes from the SC series can be connected via the SCLink-Interface. It does not matter, whether they are of the same type SC-TFV or for other measurement inputs (e.g. for incremental encoders).

The SCLink interface combines the data exchange between the Irinos boxes, their time synchronization and the forwarding of the power supply. Cascading takes place via a single connection cable. A maximum of 12 Irinos-Boxes can thus be connected in a line to form a complete measuring system.

The number of Irinos boxes is irrelevant for reading out the measured values on the PC. Only the number of available channels changes when cascading. The PC always communicates with the system via a single Ethernet connection.



# Irinos SC-TFV

## 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 SC-TFV, it is possible to get 4.000 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  $32 * 4.000 \text{ values/s} = 128.000 \text{ measurement values / s}$  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 SCLink-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.



# Irinos SC-TFV

## Technical Data

### Inputs for inductive probes

|                   |                                                                                                                                                                |
|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Suitable probes   | Depends on box type                                                                                                                                            |
| Channel count     | 8 probes directly connected (Connector 8x M16 5pin 270°)                                                                                                       |
| Channel type      | 8 independent channels<br>(no multiplexing -> no settling time)                                                                                                |
| Synchronisation   | Simultaneous acquisition of all measurement channels                                                                                                           |
| Calibration       | All channels are precalibrated to<br>All channels are factory calibrated to the respective probe. No calibration of the measuring inputs by the user required. |
| Measurement type  | Integrating for low noise sensitivity                                                                                                                          |
| Measurement speed | 4000 measurements/s per channel, independent of channel count                                                                                                  |

### Inputs for inductive probes **Tesa Halfbridge and compatible ones**

|                   |                                                                                |
|-------------------|--------------------------------------------------------------------------------|
| Measurement range | $\pm 2000 \mu\text{m}$ with Tesa GT21<br>$\pm 5000 \mu\text{m}$ with Tesa GT61 |
| Resolution        | $0,0625 \mu\text{m}$ with Tesa GT21                                            |
| Linearity         | Linearity error $< 0.001\%$ of measurement range                               |
| Stability         | $0.1 \mu\text{m}$ typical with Tesa GT21                                       |
| Input impedance   | 2 kOhm                                                                         |
| Sine-oscillator   | 13.4 kHz $3 V_{\text{eff}}$                                                    |

### Inputs for inductive probes **Solartron LVDT probes**

|                   |                                                                                                                                                                                                  |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Measurement range | $\pm 1000 \mu\text{m}$ with AX/1/S<br>$\pm 1500 \mu\text{m}$ with AX/1.5/S<br>$\pm 2500 \mu\text{m}$ with AX/2.5/S<br>$\pm 5000 \mu\text{m}$ with AX/5/S<br>$\pm 10000 \mu\text{m}$ with AX/10/S |
| Resolution        | $0.3125 \mu\text{m}$ with AX/1/S                                                                                                                                                                 |
| Linearity         | Linearity error $< 0.001\%$ of measurement range                                                                                                                                                 |
| Stability         | $0.1 \mu\text{m}$ typical with AX/1/S                                                                                                                                                            |
| Input impedance   | 2 kOhm                                                                                                                                                                                           |
| Sine-oscillator   | 5 kHz $3 V_{\text{eff}}$                                                                                                                                                                         |



# Irinos SC-TFV

## Sine-oscillator

|                          |                                             |
|--------------------------|---------------------------------------------|
| Coupling                 | AC (practically free of DC components)      |
| Short circuit protection | yes                                         |
| Voltage-controlled       | yes                                         |
| Synchronisation          | No jitter within a single Irinos-Box SC-TFV |

## Power supply

|                                         |                                                                                                                                  |
|-----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| Rated voltage                           | 24 V DC $\pm$ 10 %                                                                                                               |
| Connector type at Master-Box (Typ -EPI) | M12 L-coded in assignment according to industrial standard or via DSUB of the SCLink interface.                                  |
| Reverse polarity protection             | yes                                                                                                                              |
| Power consumption                       | $\leq$ 4 watt                                                                                                                    |
| Coupling                                | galvanis isolation                                                                                                               |
| Forwarding                              | When cascading several Irinos boxes, the power supply is forwarded via the SCLink interface (no separate power supply required). |

Use an Irinos power supply IR-PU.

## Ethernet interface at Master-Box (Typ -EPI)

|                  |                                        |
|------------------|----------------------------------------|
| Connector        | M12 D-coded (industrial standard)      |
| Speed            | 100 MBit/s (auto cross-over detection) |
| Max cable length | 100 m, Recommendation: < 30m           |

## 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    | IP65 when mated with suitable mating connectors (housing and communication connector), probe connector design according to common probe manufacturer standard IP40.                        |
| Mounting (standard) | 2 tapped brushed M4 on the rear side                                                                                                                                                       |
| Mounting options    | <ul style="list-style-type: none"><li>○ adaption for hat rail mounting</li><li>○ adaption for aluminium profile 40mm, Item or similar</li><li>○ adaption for front side mounting</li></ul> |
| Labelling           | Optional via labelling carrier.                                                                                                                                                            |



# Irinos SC-TFV

## Miscellaneous

|                   |                                                                                                                                                                                                |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Temperature range | operation: 0 - 50 °C / storage: 0 - 70 °C                                                                                                                                                      |
| Status indication | Numeric display showing box-number and/or error.                                                                                                                                               |
| Expansion         | System expansion up to 12 Irinos-Boxes via SCLink-Interface (max. 96 probes possible).<br>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).<br>Alternatively, access via a Telnet-like interface is possible.                                      |



# Irinos SC-TFV

## Ordering information

Two different basic types are available, the master box and the slave box. A master box is like a slave box with additional Ethernet interface and connection option for the power supply. A system consists of exactly 1 master box and optional slave boxes.

| Type                  | TESA Half bridge<br>e.g. GT21 | Knäbel IET | Solartron LVDT<br>e.g. AX/1/S | Feinprüf/Mahr<br>e.g. 1301 |
|-----------------------|-------------------------------|------------|-------------------------------|----------------------------|
| <b>-EPI</b><br>Master | 828-3045                      | 828-3086   | 828-3087                      | 828-3089                   |
| <b>-IL</b><br>Slave   | 828-3003                      | 828-3007   | 828-3024                      | 828-3036                   |

### Irinos-Boxes SC-TFV for probes TESA halfbridge

| Order No | Description                                                                                                                                                                                                                                  |
|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 828-3045 | <b>SC-TFV-8-TESA-M16-EPI</b><br>8 channel <b>Tesa</b> and compatible ones,<br>measurement range $\pm 2000 \mu\text{m}$ with TESA GT21,<br><b>including Ethernet</b> interface for direct connection to a PC,<br>power supply via M12 L-coded |
| 828-3003 | <b>SC-TFV-8-TESA-M16-IL</b><br>8 channel <b>Tesa</b> and compatible ones,<br>measurement range $\pm 2000 \mu\text{m}$ with TESA GT21,<br><b>without Ethernet</b> interface (additional box for system expansion)                             |

### Irinos-Boxes SC-TFV for probes Knäbel IET

| Order No | Description                                                                                                                                                                              |
|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 828-3086 | <b>SC-TFV-8-IET-M16-EPI</b><br>8 channel <b>Knäbel IET</b> $\pm 200 \mu\text{m}$ ,<br><b>including Ethernet</b> interface for direct connection to a PC,<br>power supply via M12 L-coded |
| 828-3007 | <b>SC-TFV-8-IET-M16-IL</b><br>8 channel <b>Knäbel IET</b> $\pm 200 \mu\text{m}$ ,<br><b>without Ethernet</b> interface (additional box for system expansion)                             |



# Irinos SC-TFV

## Irinos-Boxes SC-TFV for probes Solartron LVDT

| Order No | Description                                                                                                                                                                                                                         |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 828-3087 | <b>SC-TFV-8-SOLVDT-M16-EPI</b><br>8 channel <b>Solartron LVDT</b> ,<br>measurement range with AX/1/S $\pm 1000 \mu\text{m}$ ,<br><b>including Ethernet</b> interface for direct connection to a PC,<br>power supply via M12 L-coded |
| 828-3024 | <b>SC-TFV-8-SOLVDT-M16-IL</b><br>8 channel <b>Solartron LVDT</b> ,<br>measurement range with AX/1/S $\pm 1000 \mu\text{m}$ ,<br><b>without Ethernet</b> interface (additional box for system expansion)                             |

## Irinos-Boxes SC-TFV for probes Feinprüf/Mahr

| Order No | Description                                                                                                                                                                                                                      |
|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 828-3089 | <b>SC-TFV-8-FEINP-M16-EPI</b><br>8 channel <b>Feinprüf/Mahr halfbridge</b> ,<br>measurement range $\pm 1000 \mu\text{m}$ ,<br><b>including Ethernet</b> interface for direct connection to a PC,<br>power supply via M12 L-coded |
| 828-3036 | <b>SC-TFV-8-FEINP-M16-IL</b><br>8 channel <b>Feinprüf/Mahr halfbridge</b> ,<br>measurement range $\pm 1000 \mu\text{m}$ ,<br><b>without Ethernet</b> interface (additional box for system expansion)                             |

## Accessories labelling and mounting

| Order No | Description                                                                                |
|----------|--------------------------------------------------------------------------------------------|
| 828-5040 | <b>IR-MIPL-8-ABB179</b><br>Labelling carrier for 8 plastic labels                          |
| 828-5081 | <b>IR-MIPL-8-COLOR</b><br>Labelling carrier with 8 coloured labelling fields for engraving |
| 828-5041 | <b>IR-MHRM-1</b><br>Adapter for DIN rail mounting                                          |
| 828-5042 | <b>IR-MFFM-1</b><br>Front-side mounting kit                                                |
| 828-5043 | <b>IR-MITEM-40</b><br>Mounting bracket for aluminium profile 40mm (Item or similar)        |
| 828-5044 | <b>IR-MWIP-40</b><br>Stand for aluminium profile 40mm (Item or similar)                    |





# Irinos SC-TFV

| Accessories power supply (1 pcs. required per system) |                              |                        |                   |
|-------------------------------------------------------|------------------------------|------------------------|-------------------|
| Type                                                  | Europe<br>(Schuko Connector) | USA / Mexico<br>(Nema) | India<br>(Type D) |
| Power 30 W                                            | 828-5046                     | 828-5100               | 828-5082          |
| Power 80 W                                            | 828-5083                     | tbd                    | 828-5088          |

| Accessories Ethernet cable |                                                                                                             |
|----------------------------|-------------------------------------------------------------------------------------------------------------|
| Order No                   | Description                                                                                                 |
| 828-5050                   | Ethernet cable <b>IR-CETH-RJ45-M12-010</b><br>Length <b>1m</b> , Cat5e, 1 x RJ45, 1 x M12 SpeedCon D-coded  |
| 828-5051                   | Ethernet cable <b>IR-CETH-RJ45-M12-020</b><br>Length <b>2m</b> , Cat5e, 1 x RJ45, 1 x M12 SpeedCon D-coded  |
| 828-5052                   | Ethernet cable <b>IR-CETH-RJ45-M12-050</b><br>Length <b>5m</b> , Cat5e, 1 x RJ45, 1 x M12 SpeedCon D-coded  |
| 828-5053                   | Ethernet cable <b>IR-CETH-RJ45-M12-100</b><br>Length <b>10m</b> , Cat5e, 1 x RJ45, 1 x M12 SpeedCon D-coded |
| 828-5054                   | Ethernet cable <b>IR-CETH-RJ45-M12-150</b><br>Length <b>15m</b> , Cat5e, 1 x RJ45, 1 x M12 SpeedCon D-coded |
| 828-5076                   | Ethernet cable <b>IR-CETH-RJ45-M12-200</b><br>Length <b>20m</b> , Cat5e, 1 x RJ45, 1 x M12 SpeedCon D-coded |



The boxes are connected via the SCLink interface using ILink type cables. **The maximum total cable length (20m) must be observed.**

| <b>Accessories ILink-cable</b> |                                                                                        |
|--------------------------------|----------------------------------------------------------------------------------------|
| <b>Order No</b>                | <b>Description</b>                                                                     |
| 828-5055                       | ILink connection cable <b>IR-ILINK-002-IP40</b><br>Length 0.2 m, Protection class IP40 |
| 828-5056                       | ILink connection cable <b>IR-ILINK-010-IP40</b><br>Length 1 m, Protection class IP40   |
| 828-5057                       | ILink connection cable <b>IR-ILINK-020-IP40</b><br>Length 2 m, Protection class IP40   |
| 828-5058                       | ILink connection cable <b>IR-ILINK-030-IP40</b><br>Length 3 m, Protection class IP40   |
| 828-5059                       | ILink connection cable <b>IR-ILINK-050-IP40</b><br>Length 5 m, Protection class IP40   |
| 828-5060                       | ILink connection cable <b>IR-ILINK-100-IP40</b><br>Length 10 m, Protection class IP40  |
| 828-5061                       | ILink connection cable <b>IR-ILINK-002-IP65</b><br>Length 0.2 m, Protection class IP65 |
| 828-5062                       | ILink connection cable <b>IR-ILINK-010-IP65</b><br>Length 1 m, Protection class IP65   |
| 828-5063                       | ILink connection cable <b>IR-ILINK-020-IP65</b><br>Length 2 m, Protection class IP65   |
| 828-5064                       | ILink connection cable <b>IR-ILINK-030-IP65</b><br>Length 3 m, Protection class IP65   |
| 828-5065                       | ILink connection cable <b>IR-ILINK-050-IP65</b><br>Length 5 m, Protection class IP65   |
| 828-5066                       | ILink connection cable <b>IR-ILINK-100-IP65</b><br>Length 10 m, Protection class IP65  |
| 828-5079                       | ILink connection cable <b>IR-ILINK-150-IP65</b><br>Length 15 m, Protection class IP65  |
| 828-5077                       | ILink connection cable <b>IR-ILINK-200-IP65</b><br>Length 20 m, Protection class IP65  |

Unused SCLink sockets (DSUB sockets) on the Irinos boxes can be sealed via the following protective cap in IP65:

| <b>Accessories Protective Cap SCLink - Interface</b> |                                                      |
|------------------------------------------------------|------------------------------------------------------|
| <b>Order No</b>                                      | <b>Description</b>                                   |
| 828-7020                                             | <b>Protective cap DSUB15 Female IP65 with screws</b> |

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