IST ULTRASTAB
Power Supply for IT/ITN ULTRASTAB transducers

High performance 6-channel power supply for multi-channel laboratory measurement applications.

Features

- Current output or ±10 V voltage output
- Six individual channels with 9-pin D-sub female connector for IT/ITN transducers
- Safety standard laboratory “banana” output jacks
- 19’’ rack mountable cabinet.

Special features

- Universal mains input (100 … 240 V rms, 50/60 Hz)
- 15-pin D-Sub male connector for access to status signals for all six channels
- LED indicators showing operational status of unit and of each individual channel (“Operational”, “Not operational”, “Not connected”).

Advantages

- Convenient solution when operating 1 to 6 IT/ITN transducers in one setup
- Integrates in standard 19’’ rack system typically used in laboratory and industrial test setups
- The output current version allows measurement signal to travel long distances by using external burden resistor, i.e., current-to-voltage conversion is done by a precision resistor in attached measurement system (eg.: Power Analyser, etc.).

Applications

- Laboratory setup
- Industrial test bench
- Analogue current measurement frontend for multi-input power analyser, eg. for 3-phase measurements on AC motors, power inverters etc.

Standards

- IEC 61010-1: 2001
- IEC 61000-6-2: 2005
- IEC 61000-6-4 : 2007.

Application Domain

- Laboratory and Industrial.

Mains INPUT

Parameter	Symbol	Unit	Value
Mains supply voltage		V rms	100 … 240 [1]
Fuse rating		AT	2.5
Rated power supply frequency	*f*	Hz	50/60
Power consumption	P_C	W	< 150 [2]

Notes: [1] IEC-type dual fused inlet socket
[2] All channels driven at max 1 A secondary output current.

Transducer port

Parameter	Symbol	Unit	Value	Comment
Supply voltage	U_C	V DC	±15	
Ripple		mV rms	< 15	
Noise		mV rms	< 15	
Load regulation		%	< 5	

Environmental and mechanical characteristics

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Ambient operating temperature	T_A	°C	10		40	
Ambient storage temperature	T_S	°C	−20		85	
Relative humidity	*RH*	%	20		80	
Dimensions		mm				483 × 88 × 290 W × H × D
Mass	*m*	kg		4.2		

Electrical data - status port

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Collector-Emitter voltage, off-state	$V_{CE\ off}$	V	4		45	
Collector-Emitter current, on-state	I_{CE}	mA	2		30	
Reverse Collector-Emitter voltage, off-state	$V_{CER\ off}$	V			5	
Collector-Emitter voltage, on-state	$V_{CE\ on}$	V		0.2	1	1)
				0.8	1	2)

Notes: 1) Conditions: see diagram A on page 5
2) Conditions: see diagram B on page 5.

Insulation characteristics

Insulation voltage between rack electronics and status port connections: 3 kV rms.

Compatibility chart

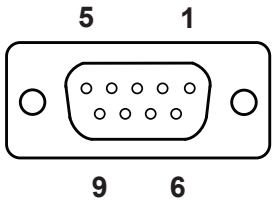
The IST ULTRASTAB supports the products (transducers), which are shown in the table below:

Current range	Products
60 A	IT 60-S, IT 65-S
200 A	IT 200-S, IT 205-S
400 A	IT 400-S, IT 405-S
600 A	IT 605-S, ITN 600-S
700 A	IT 700-S
900 A	ITN 900-S
1000 A	IT 1000-S/SP1, ITN 1000-S

Transducer connector 1 to 6:

The pinout for the transducer connector 9-pin D-Sub female, located on the back panel of the IST ULTRASTAB, is shown in the table below:

Pin 1: Output current return
Pin 2: N/C
Pin 3: Ground
Pin 4: Ground
Pin 5: Negative supply - 15 V
Pin 6: Output current
Pin 7: N/C
Pin 8: Normal operation
Pin 9: Positive supply + 15 V

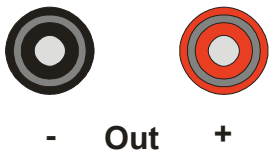


9-pin D-Sub female
UNC 4-40 screw lock

“Banana” jacks output terminals 1 to 6:

Two “Banana” jacks, located on the back panel of the IST ULTRASTAB, allow the connection of the secondary current outputs or the ± 10 V voltage outputs to the measurement device.

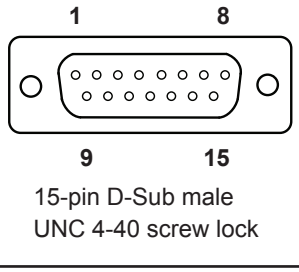
Red: Current output or ±10 V voltage output depending on IST version. In current output case, this terminal is connected directly to pin 6 of the corresponding transducer port
Black: Current output return or ±10 V signal ground. In current output case, this terminal is connected directly to pin 1 of the corresponding transducer port



Status/Interlock connector

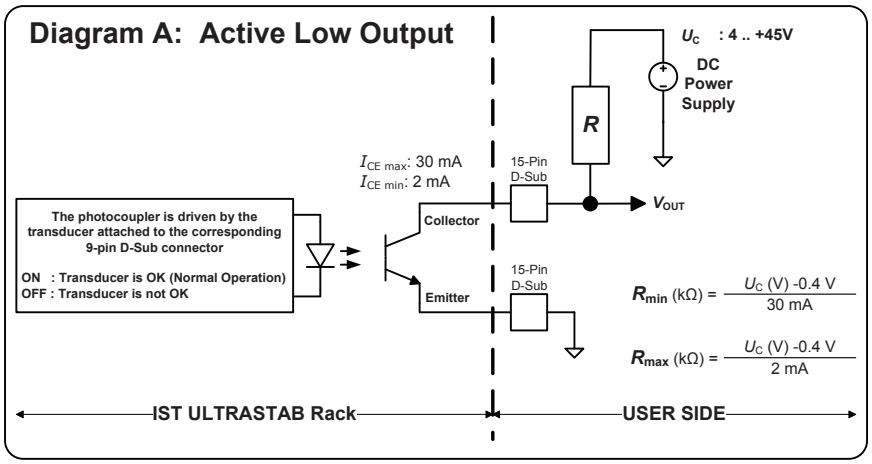
All IT/ITN ULTRASTAB transducers attached to the IST ULTRASTAB generate a status signal, which provides information about the operation of the transducer. This signal is routed through a photocoupler in the IST ULTRASTAB and available in one 15-pin D-Sub male connector containing status signals for 6 channels.

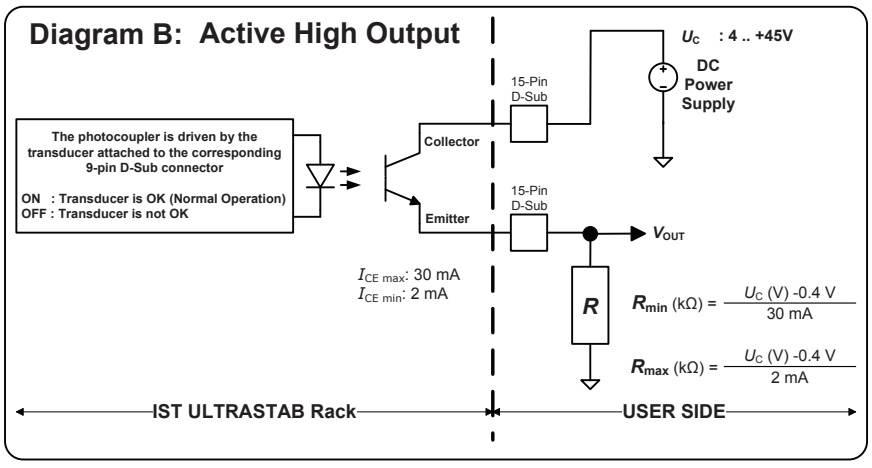
Power Status: Pin 1 Collector & Pin 5 Emitter
Channel 1: Pin 9 Collector & Pin 13 Emitter
Channel 2: Pin 2 Collector & Pin 6 Emitter
Channel 3: Pin 10 Collector & Pin 14 Emitter
Channel 4: Pin 3 Collector & Pin 7 Emitter
Channel 5: Pin 11 Collector & Pin 15 Emitter
Channel 6: Pin 4 Collector & Pin 8 Emitter



All signals on the status/interlock connector are optically isolated, photocouplers type, floating Collector and Emitter.

Status/Interlock port Wiring





In the diagram A, the active low output signal V_{out} switches to GND when the corresponding transducer is OK (Normal operation and Green LED is lit). In the same manner, the transistor is switched off (No current from collector to emitter) to indicate that the corresponding transducer is not OK. Consequently, V_{out} switches to U_C and the corresponding Green LED is OFF, whereas the corresponding Red LED is lit.

In the diagram B, the active high output signal V_{out} switches to U_C when the corresponding transducer is OK (Normal operation and Green LED is lit). In the same manner, the transistor is switched off (No current from collector to emitter) to indicate that the corresponding transducer is not OK. Consequently, V_{out} switches to GND and the corresponding Green LED is OFF, whereas the corresponding Red LED is lit.

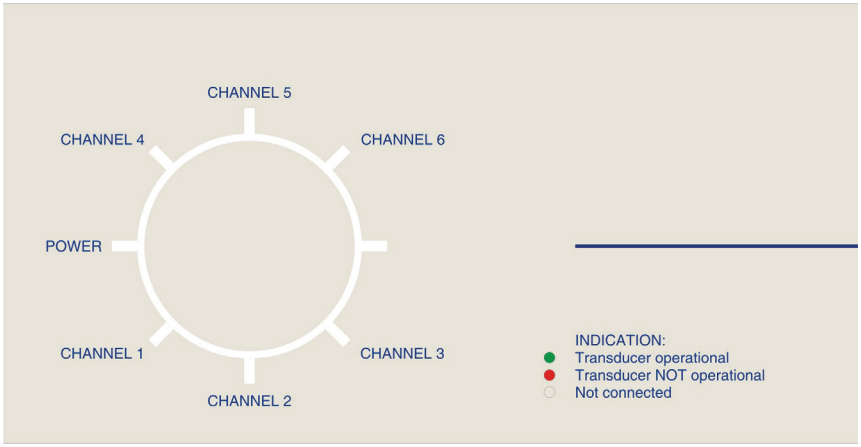
The power supply voltage U_C must be between 4 V and 45 V DC and the resistor value R must be chosen between a minimum value R_{min} and a maximum value R_{max}.

Some recommended standard values of R are given in the following table:

Power supply voltage U_C	R_{min} (kΩ)	R_{max} (kΩ)	R standard values ± 5 %
5 V	0.153	2.3	180 Ω, 1 kΩ or 2.2 kΩ
12 V	0.386	5.8	470 Ω, 2.2 kΩ or 4.7 kΩ
24 V	0.786	11.8	1 kΩ, 2.2 kΩ or 10 kΩ

FRONT PANEL

INDICATOR PANEL



The illuminated indicator panel has seven fields that are lit in the following modes:

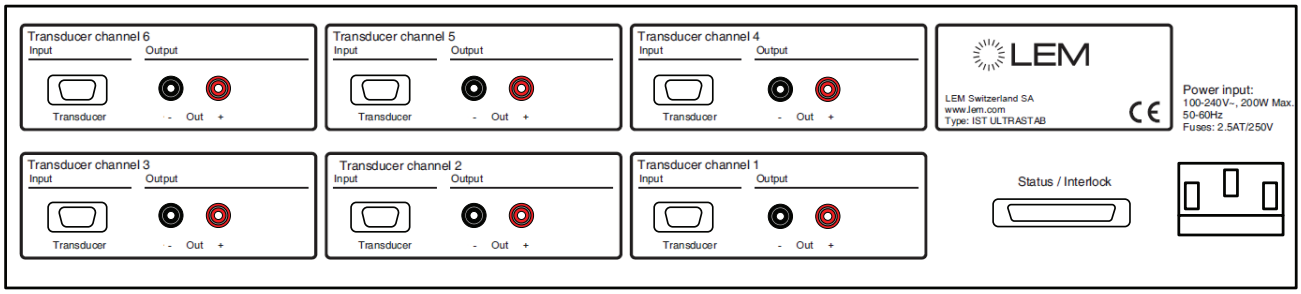
POWER:

- **Green light** - mains power is applied.
- **No light** - Unit is in off-state.

CHANNEL 1 to 6:

- **Green light** - Indicated transducer is attached and normal operation signal is OK. Transducer is operational.
- **Red light** - Indicated transducer is attached and normal operation signal is not OK.
- **No light** - No transducer is connected.

BACK PANEL



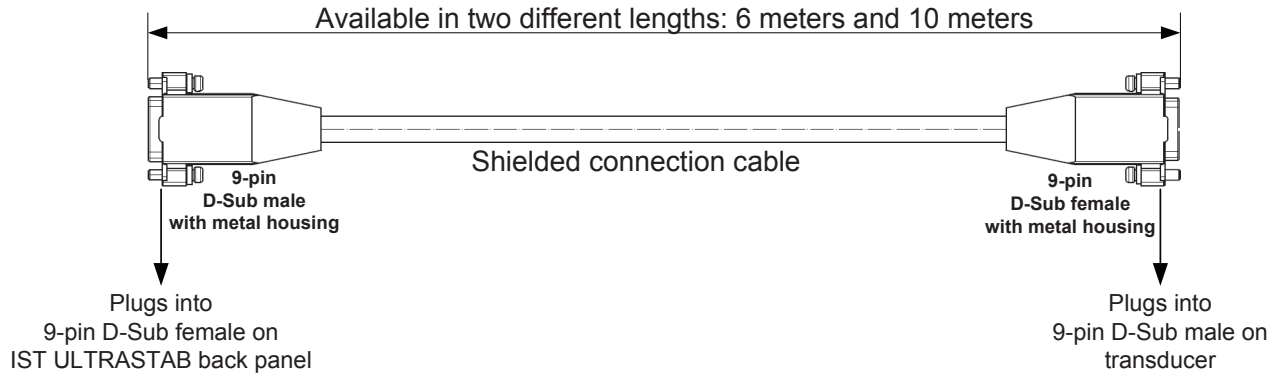
CONNECTING THE TRANSDUCERS

The IST ULTRASTAB rack provides 6 connectors (9-pin D-Sub) on the back panel for connecting up to 6 IT/ITN individual transducers.

Each 9-pin D-Sub connector is used to connect the supply voltage to the DC power input of the transducer. It also routes the secondary current lines and the status signal from the transducer to the IST ULTRASTAB unit.

Connect the transducers at the 9-pin D-Sub connectors on the IST ULTRASTAB back panel via the shielded connection cables which have to be ordered separately.

The shielded connection cable for operating a transducer is shown in the following figure:



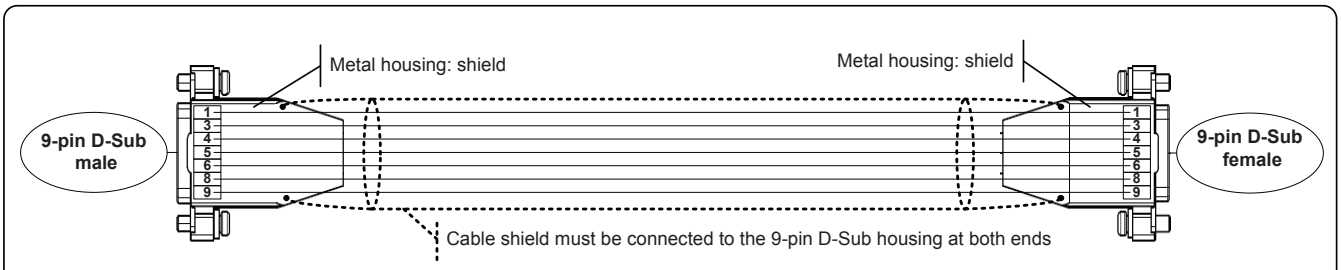
Connecting a transducer to IST ULTRASTAB

The following 2 shielded connection cables are available:

Description	Order number
Shielded connection cable length = 6 meters	71.12.08.000.0
Shielded connection cable length = 10 meters	71.12.13.000.0

It is recommended to use the connection cables indicated above. It is also possible to configure your own cable, bearing the following description in mind.

The connection cable wiring is shown below:



Transducer to IST ULTRASTAB connection cable wiring

To prevent any malfunction that may occur due to the cable/wire voltage drop (i.e., its length and the wire resistance inside the cable) between the IST ULTRASTAB rack and the transducer, a cable with at least 7 wires, each having a cross section AWG 22, AWG 23 or ≥ 0.25 mm², must be used.
In addition, it is recommended to use shielded cables in order to limit the effects of noise due to electromagnetic interference (EMI).