

UTP MICROPHONES - WIND TUNNEL TESTING

# The World's Thinnest Condenser Microphones



**UTP** - Ultra-Thin Precision microphones - 1 mm



**GRAS**  
An Axiometrix Solutions Brand



## THE CHALLENGE

Validation of CFD (Computational Fluid Dynamics) modeling is an important part of designing vehicles that move in airflow. However, airflow and turbulence cannot be fully simulated and predicted realistically – CFD methods do not provide all the answers needed in the design process. For these reasons, high-quality measurements are a must. Only very small, thin, and aerodynamically correctly shaped sensors can overcome these challenges – validating the modeling AND supplying the additional measurement data needed.

## THE SOLUTION

This is why we at GRAS have developed the new UTP microphones – Ultra-thin Precision microphones.

UTP microphones are surface-mounted condenser microphones with all the expected quality and precision of a classical measurement microphone. They beat any flush- or surface-mounted microphone on the market – superior performance, unbeatable price, fast and repeatable mounting – and should be a first choice for cost-effective, high-precision testing.

The height of the single sensor is only 1 mm (0.04 inches) and, therefore, ideal for measurements in boundary layers and turbulence.

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*Turbulence is the most important unsolved problem of classical physics*

*Richard P. Feynman*  
Nobel Prize Winner in physics

## THE 48LX UTP MICROPHONE FAMILY

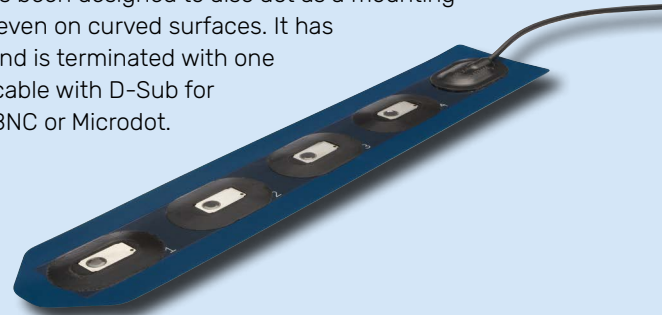
### 48LX-1 UTP, Medium Pressure

48LX-1 is for medium pressure applications. It has TEDS and is terminated with a male Microdot connector.



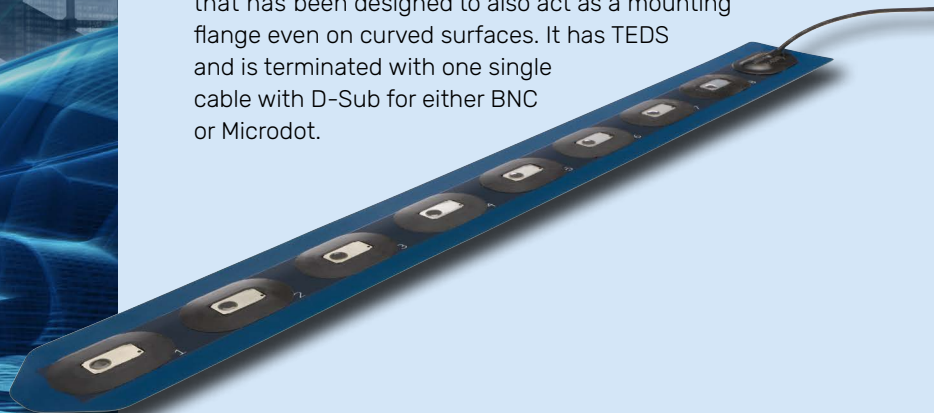
### 48LX-4 UTP Line Array, Medium Pressure

48LX-4 is a line array with four UTP microphones mounted on a strip. The strip is a thin, flexible PCB that has been designed to also act as a mounting flange even on curved surfaces. It has TEDS and is terminated with one single cable with D-Sub for either BNC or Microdot.



### 48LX-8 UTP Line Array, Medium Pressure

48LX-8 is a line array with eight UTP microphones mounted on a strip. The strip is a thin, flexible PCB that has been designed to also act as a mounting flange even on curved surfaces. It has TEDS and is terminated with one single cable with D-Sub for either BNC or Microdot.

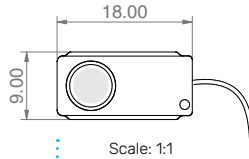


## EXPLORE THE DESIGN

The ultra-thin ¼" condenser microphone common to all versions



- Low profile – just 1 mm.
- ¼" condenser microphone.
- Wide frequency range – 10 Hz to 70 kHz  
Wide dyn. range – 54 dB(A) to 170 dB.
- Integrated cable. The line arrays come with a single cable with D-Sub.



- Small footprint.
- Edge for click mounting in hard fairing.
- Hole for safe removal from the fairing.
- CCP technology for easy integration with existing hardware.
- TEDS for easy sensor identification.



## UTP MICROPHONES

Tiny – therefore ideal for small cavities. Line array versions ideal for mildly curved surfaces.

## SUPERIOR PERFORMANCE - UNBEATABLE PRICE

Explore the benefits, the very small things which make the BIG difference

### Quality Data

UTP provides accurate data from precision condenser microphones manufactured to narrow specifications.

### In-situ Verification

When mounted, UTP microphones can be verified easily and accurately even on curved surfaces – a major advantage when you want to check the integrity of your measurement setup.

### Small Form Factor

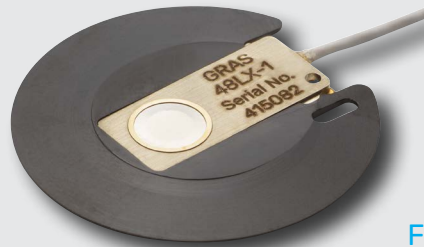
Can be used in small or difficult-to-access spaces and cavities where conventional microphones are too big.

### Low Profile

With a height of 1 mm the door opens to a whole new world of what can be measured in boundary layers and turbulent flow.

### Fast and Repeatable Mounting

*Single UTP microphones* are pushed and locked into a recess in the fairing and can be remounted with very good repeatability. *UTP line arrays* are mounted with masking tape, when remounted the geometry is maintained.



### Simple Connection – and TEDS

CCP technology and only one cable provide simple connection and avoid acoustic interference from messy cabling. All 48LX versions have TEDS.

### Flow-optimized Fairings

The fairing has a rise angle of 7.5° ensuring minimal disturbance to the sound field/airflow.

### Cost-saving Solution

Fast mounting and repositioning, CCP interface with integral cabling and in-situ verification all add up to faster measurements and increased efficiency.

## MOUNTING – FAST AND REPEATABLE

The UTP microphones are easy to mount and remove, even in confined spaces.

The single UTP microphones can be mounted in a hard fairing which can be used as a permanently mounted dock. A click mechanism ensures easy and stable mounting. The microphone can easily be removed, leaving the mounting position ready for future measurements. The fairing is secured with double-sided adhesive tape.

The UTP line arrays are mounted using masking tape. Reproducing a previous setup can be done quickly and geometry is maintained.



The single UTP microphones are mounted in the fairing which is mounted with double-sided adhesive tape.



The microphone is click mounted in the fairing for proper fixation and easy removal (shown from the inside).



The UTP line arrays are mounted using masking tape. Mounting is very simple and a matter of minutes. When remounting, the original setup is easy to repeat and the strip ensures that geometry is maintained.





## IN-SITU VERIFICATION

Fast and reliable in-situ verification saves time and increases confidence.

A special verification adapter with a soft cushion allows for quick, easy and reliable in-situ verification. Four distance spacers ensure that the correct volume is achieved and that this volume can easily be reproduced.

Even on slightly curved surfaces, this verification method is so precise that demounting is not necessary.



The UTP microphones can be verified in-situ by simply placing the calibrator over the microphone.



The soft cushion ensures an airtight and stable volume for the verification.



The spacers make it easy to hold the calibrator still during verification.

## SPECIFICATIONS

### GRAS 48LX-1 UTP Microphone, Medium Pressure

<b>Frequency range</b>	20 Hz - 40 kHz ( $\pm 1$ dB) 10 Hz - 70 kHz ( $\pm 3$ dB)
<b>Dynamic range</b>	54 dB(A) - 170 dB
<b>Sensitivity</b>	0.6 mV/Pa ( $\pm 3$ dB)

48LX-1 is front vented and has TEDS



#### Dimensions (mm)

Total height is 1 mm.



RA4810 Fairing

### GRAS 48LX-4 UTP Line Array, 4 Channel, Medium Pressure

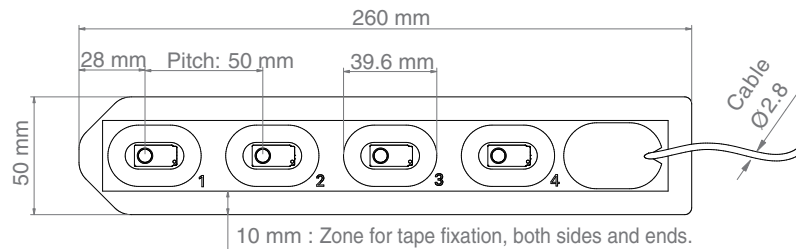
<b>Frequency range</b>	20 Hz - 20 kHz ( $\pm 1$ dB) 10 Hz - 70 kHz ( $\pm 3$ dB)
<b>Dynamic range</b>	54 dB(A) - 170 dB
<b>Sensitivity</b>	0.6 mV/Pa ( $\pm 3$ dB)

48LX-4 is front vented and has TEDS



#### Dimensions

Total height is 1.35 mm.



### GRAS 48LX-8 UTP Line Array, 8 Channel, Medium Pressure

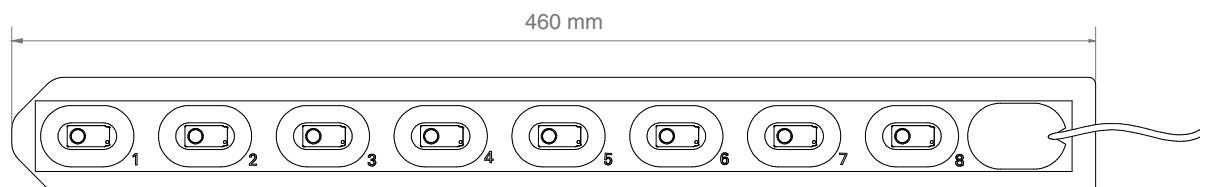
<b>Frequency range</b>	20 Hz - 20 kHz ( $\pm 1$ dB) 10 Hz - 70 kHz ( $\pm 3$ dB)
<b>Dynamic range</b>	54 dB(A) - 170 dB
<b>Sensitivity</b>	0.6 mV/Pa ( $\pm 3$ dB)

48LX-8 is front vented and has TEDS



#### Dimensions

Total height is 1.35 mm.



ACCESSORIES



RA4810



DB0475



RA4800

FAIRING

RA4810	Hard Fairing for 48LA/48LX-1, with Click Mount, 1 pc.
RA4810-2	Hard Fairing for 48LA/48LX-1, with Click Mount, 10 pcs.
RA4810-10	Hard Fairing for 48LA/48LX-1, with Click Mount, 50 pcs.
DB0475	Self-adhesive Mounting Pad for Hard Fairing (Included with RA4810/RA4810-2/RA4810-10)
RA4811	Soft Fairing and Mounting Kit for UTP Microphone Sets

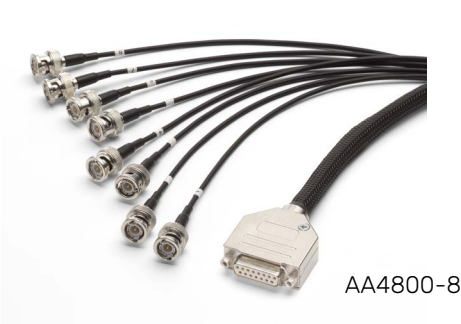
VERIFICATION AND CALIBRATION

VERIFICATION	
RA4800	Adapter for Sensitivity Verification of Flush/Surface Mics.

CALIBRATION	
RA4801	Adapter for Sensitivity Calibration of 48LA/48LX-1
RA4802	Actuator for Frequency Calibration of 48LA/48LX-1
RA4803	Sensitivity and Frequency Calibration Kit for 48LX-4 /48LX-8
RA4804	Pistonphone Adaptor for 48LX-4/48LX-8
RA4805	Actuator and Pistonphone Adapter for 48LA/48LX-1



AA4800-4



AA4800-8

CABLES

48LX-1	
AE0101	Microdot Male to BNC Male Adapter

48LX-4	
AA4800-4	1.5 m 48LX-4 Splitter Cable D-Sub/4xBNC Male
AA4801-4	1.5 m 48LX-4 Splitter Cable D-Sub/4xMicrodot Male
AA4802-4	1.5 m 48LX-4 Splitter Cable D-Sub/4xSMB Female
AA4803-4	1.5 m 48LX-4 Splitter Cable D-Sub/4xInfiniteband
AA4804-4	1.5 m 48LX-4 Splitter Cable D-Sub/D-Sub 25

TAPE

DB0507	Mounting Tape for 48LX Series Line Arrays
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CABLES

48LX-8	
AA4800-8	1.5 m 48LX-8 Splitter Cable D-Sub/8xBNC Male
AA4801-8	1.5 m 48LX-8 Splitter Cable D-Sub/8xMicrodot Male
AA4802-8	1.5 m 48LX-8 Splitter Cable D-Sub/8xSMB Female
AA4803-8	1.5 m 48LX-8 Splitter Cable D-Sub/8xInfiniteband
AA4804-8	1.5 m 48LX-8 Splitter Cable D-Sub/D-Sub 25

D-SUB EXTENSION CABLES	
AA4810	5 m 48LX Extension Cable D-Sub/D-Sub
AA4811	10 m 48LX Extension Cable D-Sub/D-Sub
AA4812-CL	48LX Extension Cable D-Sub/D-Sub Custom Length

Customized cables are available upon request

## GRAS WORLDWIDE

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### About GRAS Sound & Vibration

GRAS is a leading manufacturer of state-of-the-art measurement microphones. We serve R&D, production engineering, QA and production units within aerospace, automotive, audiology and consumer electronics with strict requirements for microphone accuracy and repeatability. GRAS microphones are designed to live up to the high quality, durability and accuracy that our customers have come to expect and trust.

GRAS Sound & Vibration is represented through subsidiaries and distributors in more than 40 countries and is part of Axiometrix Solutions, a leading test solutions provider comprised of globally recognized measurement brands. Read more at [www.grasacoustics.com](http://www.grasacoustics.com)

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