

# TOMELLERI ENGINEERING

HI-End articulated arms technology

Tomelleri Engineering S.r.l. Viale del Lavoro 12/a - 37069 VILLAFRANCA (VR) ITALY - Tel +39 0456304744  
- Fax +39 0456303657 [www.tomelleri-engineering.it](http://www.tomelleri-engineering.it) - [info@tomelleri-engineering.it](mailto:info@tomelleri-engineering.it)

## SPACE - Measurement Arm

**SPACE** is a portable articulated arm CMM ideal for quick and accurate inspection of any parts within its range.

**SPACE** is the result of nearly 30 years of experience in production of portable measurement arms.

**SPACE** arm is available in several size: from 1.8m to 9.0m diameter range, and in 6 or 7 axis configuration.

The counter-balance system with a double spring also gives the machine characteristics of precision light-weight and easy handling.



**SPACE** is the top of reliability, accuracy, and flexibility in use. Touch trigger probe, “floating” probe, laser scanners and laser forks can be quickly interchanged thanks to a high-precision mount.

The **SPACE** arm can be used in combination with **Laser Scanners** for point cloud inspection or reverse-engineering, in 6 or 7 axis configuration.

**SPACE** arm has some unique features like the magnetic brake, which prevent accidental fall of the arm, or the smart the sensitive “floating” probe.

**SPACE** it's the perfect equipment for touch or laser inspection and reverse-engineering. It's suitable also for pipe inspection with laser fork and dedicated software.



## EXPLORER - Measurement Arm



**EXPLORER** when you need to measure a large volume!

**EXPLORER** is the unique portable arm available in the worldwide market with a measuring range of 5.0m, 7.0m up to 9.0m!

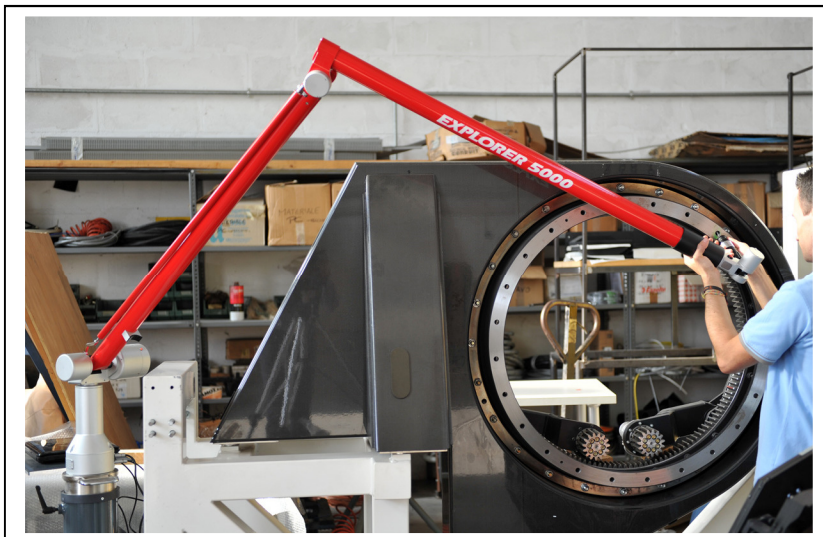
**EXPLORER** is the result of a great experience in large volume metrology of Tomelleri Engineering. The Explorer arm is the product you need when other equipment cannot reach that large size with such incredible accuracy performance.

**EXPLORER** it's the perfect equipment for touch probe inspection of large parts, where you need to "explore" big parts with great flexibility. When your part to inspect is big and heavy, don't move it, take the **EXPLORER** arm on it and get your measures done quickly.

**EXPLORER** is standard equipped with electromagnetic brake on the second axis, which allow the operator to lock the second axis at required high and use the arm safely and comfortably.

**EXPLORER** is suitable with Laser Forks for pipe inspection, our all standard accessories line, and Laser Scanners for point cloud inspection or Reverse-engineering.

**EXPLORER** the largest portable measurement arm ever! Up to 9.0m of measuring range, all within incredible accuracy of 0.1mm per point on the measuring volume.



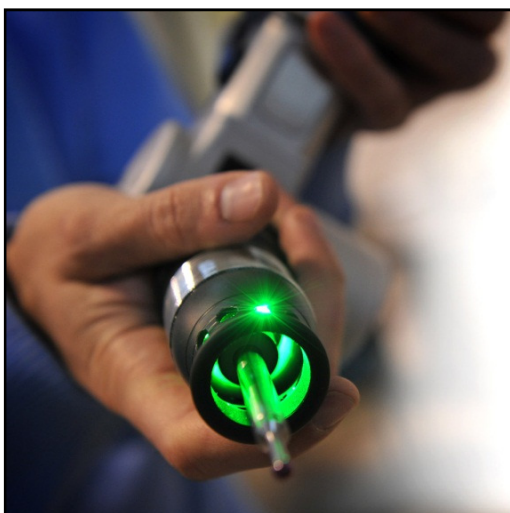
SPACE serie (6 axes arm) – all values in mm - *=2 sigma error					
SPACE	Measuring range	Volumetric accuracy*	Single point accuracy*	Point Repeatability*	Weight (Kg)
<b>SPACE 1.8</b>	<b>1800mm</b>	<b>0,035</b>	<b>0,028</b>	<b>0,020</b>	<b>7,9</b>
<b>SPACE 2.5</b>	<b>2500mm</b>	<b>0,048</b>	<b>0,036</b>	<b>0,028</b>	<b>8,4</b>
<b>SPACE 3.2</b>	<b>3200mm</b>	<b>0,060</b>	<b>0,043</b>	<b>0,035</b>	<b>8,8</b>
<b>SPACE 4.0</b>	<b>4000mm</b>	<b>0,080</b>	<b>0,053</b>	<b>0,045</b>	<b>9,5</b>

SPACE serie PLUS (6 and 7 axes arm) – all values in mm - *=2 sigma error					
SPACE <i>Plus</i>	Measuring range	Volumetric accuracy*	Single point accuracy*	Point Repeatability*	Weight (Kg)
<b>SPACE 1.8 PLUS 6 Axes</b>	<b>1800mm</b>	<b>0,024</b>	<b>0,022</b>	<b>0,015</b>	<b>8,4</b>
<b>SPACE 2.5 PLUS 6 Axes</b>	<b>2500mm</b>	<b>0,028</b>	<b>0,026</b>	<b>0,019</b>	<b>8,9</b>
<b>SPACE 3.2 PLUS 6 Axes</b>	<b>3200mm</b>	<b>0,042</b>	<b>0,039</b>	<b>0,025</b>	<b>9,3</b>
<b>SPACE 4.0 PLUS 6 Axes</b>	<b>4000mm</b>	<b>0,058</b>	<b>0,051</b>	<b>0,030</b>	<b>10,0</b>

<b>SPACE 1.8 PLUS 7 Axes</b>	<b>1800mm</b>	<b>0,032</b>	<b>0,029</b>	<b>0,020</b>	<b>8,9</b>
<b>SPACE 2.5 PLUS 7 Axes</b>	<b>2500mm</b>	<b>0,040</b>	<b>0,036</b>	<b>0,025</b>	<b>9,4</b>
<b>SPACE 3.2 PLUS 7 Axes</b>	<b>3200mm</b>	<b>0,053</b>	<b>0,046</b>	<b>0,030</b>	<b>9,8</b>
<b>SPACE 4.0 PLUS 7 Axes</b>	<b>4000mm</b>	<b>0,066</b>	<b>0,057</b>	<b>0,035</b>	<b>10,5</b>

SPACE serie EXPLORER (6 and 7 axes arm) – all values in mm - *=2 sigma error					
SPACE <i>Explorer</i>	Measuring range	Volumetric accuracy*	Single point accuracy*	Point Repeatability*	Weight (Kg)
<b>SPACE EXPLORER 5.0 6 Axes</b>	<b>5000mm</b>	<b>0,065</b>	<b>0,050</b>	<b>0,040</b>	<b>12,5</b>
<b>SPACE EXPLORER 7.0 6 Axes</b>	<b>7000mm</b>	<b>0,080</b>	<b>0,060</b>	<b>0,050</b>	<b>14,0</b>
<b>SPACE EXPLORER 9.0 6 Axes</b>	<b>9000mm</b>	<b>0,100</b>	<b>0,080</b>	<b>0,060</b>	<b>16,5</b>

<b>SPACE EXPLORER 5.0 7 Axes</b>	<b>5000mm</b>	<b>0,075</b>	<b>0,060</b>	<b>0,050</b>	<b>13,5</b>
<b>SPACE EXPLORER 7.0 7 Axes</b>	<b>7000mm</b>	<b>0,090</b>	<b>0,070</b>	<b>0,060</b>	<b>15,0</b>
<b>SPACE EXPLORER 9.0 7 Axes</b>	<b>9000mm</b>	<b>0,110</b>	<b>0,090</b>	<b>0,070</b>	<b>17,5</b>



SPACE arm is the only one arm with very wide range of sizes and configuration: from 1.8m to 9.0m of range, with great accuracy performance.

The high repeatability probe mount, ensure an easy and reliable use of the arm, switching from one probe configuration to another, having the system automatically recognizing the type and the parameters of the probe in use.

SPACE arm is interfaced with many 3<sup>rd</sup> party inspection or reverse-engineering software and it's extremely easy to install on any consumer PC based system, 32 or 64bits.

## SPACE SCAN – Laser scanning solution



**SPACE SCAN** system is the combination of the **SPACE 7 AXES ARM + HI-END Scanner, SLP by LDI**, a new family of line-range laser probes that are ideal for complex-profile contour scanning.

Capturing up to 225,000 points per second, the **SLP LASER SCANNER** are your answer for high-accuracy, high-speed, non-contact 3D scanning.

The **SLP LASER SCANNER** can be quickly applied to the rotating 7<sup>th</sup> axis of the SPACE ARM.

**SPACE SCAN system** features digital (ASCII) coordinate output, a visible beam, a Class II rating for safe and easy-to-see operations and a long standoff.

**Double CMOS cameras** featuring simultaneous scanning, are standard to assist with steep sidewall and recessed geometry capture.

Any of the **SLP scanner** can be used on the **SPACE SCAN system**, as well as any 3<sup>rd</sup> party software integrated.

SPACE SCAN - 7 axis laser scanning arm - *2 sigma error - **with mod. SLP-500					
SPACE SCAN	Measuring range	TACTILE Volumetric accuracy*	LASER SCANNER Volumetric accuracy**	Point Repeatability*	Weight (Kg)
<b>SPACE SCAN 1.8 7 Axis</b>	<b>1800mm</b>	<b>0,032</b>	<b>0,060</b>	<b>0,020</b>	<b>9,7</b>
<b>SPACE SCAN 2.5 7 Axis</b>	<b>2500mm</b>	<b>0,040</b>	<b>0,068</b>	<b>0,025</b>	<b>10,2</b>
<b>SPACE SCAN 3.2 7 Axis</b>	<b>3200mm</b>	<b>0,053</b>	<b>0,081</b>	<b>0,030</b>	<b>10,6</b>
<b>SPACE SCAN 4.0 7 Axis</b>	<b>4000mm</b>	<b>0,066</b>	<b>0,094</b>	<b>0,035</b>	<b>11,3</b>
<b>SPACE SCAN 5.0 7 Axis</b>	<b>5000mm</b>	<b>0,075</b>	<b>0,100</b>	<b>0,045</b>	<b>13,9</b>
<b>SPACE SCAN 7.0 7 Axis</b>	<b>7000mm</b>	<b>0,090</b>	<b>0,115</b>	<b>0,060</b>	<b>15,4</b>
<b>SPACE SCAN 9.0 7 Axis</b>	<b>9000mm</b>	<b>0,110</b>	<b>0,135</b>	<b>0,075</b>	<b>17,9</b>

Laser SCANNER specifications					
LDI – model SLP	Laser line length (mm)	Sample rate (pts/sec)	LASER SCANNER accuracy*	Point Repeatability*	Stand-off distance (mm)
<b>SLP-250</b>	<b>25</b>	<b>75000</b>	<b>0,010</b>	<b>0,020</b>	<b>72-110</b>
<b>SLP-500</b>	<b>50</b>	<b>75000</b>	<b>0,020</b>	<b>0,030</b>	<b>73-136</b>
<b>SLP-2000</b>	<b>200</b>	<b>75000</b>	<b>0,075</b>	<b>0,035</b>	<b>200-500</b>



## ACCESSORIES



### LASER FORK

Ideal accessory for PIPE INSPECTION, allows quick and precise measurement without direct contact with the pipe.

5 forks size are available (aperture mm):

**30mm      50mm      80mm      150mm      200mm**

Pipes from 1mm to 180mm of diameter can be measured with the use of laser forks, while larger dia. can be measured with the touch probe.



### HARD PROBE

The mechanical probe is the standard touch probe, available with different sphere diameter.

Points can be taken touching the part and pushing the button on board the probe body.

The smallest usable probe diameter is 1mm to guarantee the point accuracy, the maximum length suggested is 100mm. Any of the Renishaw standard M4 stylus is applicable.



### TOUCH TRIGGER (Renishaw™ LP2) PROBE (EXCLUSIVE FEATURE!)

The touch trigger probe acquire points applying the minimum force on the measured part.

Is a very precise, quick and comfortable in use, acquires points only touching the surface, without triggering buttons.

Available with many different stylus length and sphere diameters.

The model offered is produced by **Renishaw™ (model LP2 kit)**



### FLOATING PROBE (EXCLUSIVE FEATURE!)

Is the revolutionary new concept probe designed by Tomelleri Engineering. It is a rigid mechanical probe suspended on a spring driven by an aluminum ring that triggers the probe with a simple touch.

The integrated force control avoid to apply uncontrolled load on the part, improving accuracy and repeatability.

The control ring is isolated from the probe stylus to avoid thermal impact from the hands of the user.

## MOBILE TRIPOD

Stable and practical, is the ideal accessory to move easily and quickly the SPACE arm.

The handwheel at the base allows you to quickly switch the retractile wheels from measurement position to mobile position, and vice versa in a gradual way without shocks.

The tripod is adjustable in height (range 900-1400mm) and the weight of the tripod column is balanced by a gas spring. A side handle allows for vertical and horizontal movement of the tripod.

A removable and rotary shelf, allows positioning of the laptop next to the measuring arm.



ALL the SPACE arms products are MADE IN ITALY.