

# **SIM-IDB Project**

**Metrology for digital transformation to support health services in LAC and address measurement challenges associated with pandemics such as COVID-19**

**Feb 2024**

**General Objective: to achieve new digital metrology services with a focus on the health area adapted to the conditions of the region and its countries and deployed to address emerging technologies as a result of the COVID-19 crisis**



# **SIM-IDB Project**

**Metrology for digital transformation to support health services in LAC and address measurement challenges associated with pandemics such as COVID-19**

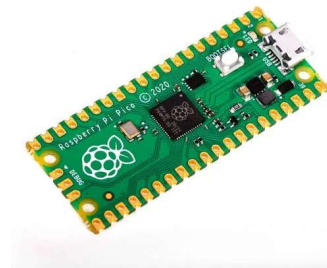
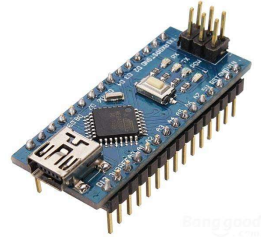
## **Activities**

- **Development of diagnostic studies and action plan on metrology and DT for health in LAC**
- **4 awareness workshops developed in the SIM sub-regions (SURAMET, ANDIMET, CAMET and CARIMET)**
- **3 courses on technology associated with the digitization of metrological services**
- **Execution of 4 joint R + D + i projects between SIM INMs on metrology issues for digital transformation.**
- **Pilots: 4 services to be implemented, with regional support.**
- **Participation of SIM representatives in international forums on Metrology and Quality Infrastructure.**

## P1- Development of a thermohygrobarometer with digitalization criteria

### Objectives:

- Build capabilities in constructing a low cost IoT thermohygrobarometer
- Design and implement its calibration
- Design and implement the protocol of its Digital Calibration Certificate (collaboration)
- Advance in the sensors' network
- Advance in the scheme of its remote calibration (collaboration)



## P1- Development of a thermohygrobarometer with digitalization criteria

- Argentina
- Peru
- Chile
- Trinidad & Tobago
- Costa Rica
- Ecuador
- Bolivia
- Mexico





## P2 - OPTICAL 3D MEASURING SYSTEMS - Dimensional traceability for industrial and medical applications

### MOTIVATION OF THE PROJECT

- *The change from measurement as a quality control tool to a fully integrated step in the production process*
- *The industrial manufacturing processes are changing: 3D printing / adaptive manufacturing technologies*
- *Measuring systems are now able to measure and adapt its measurement process in real-time*



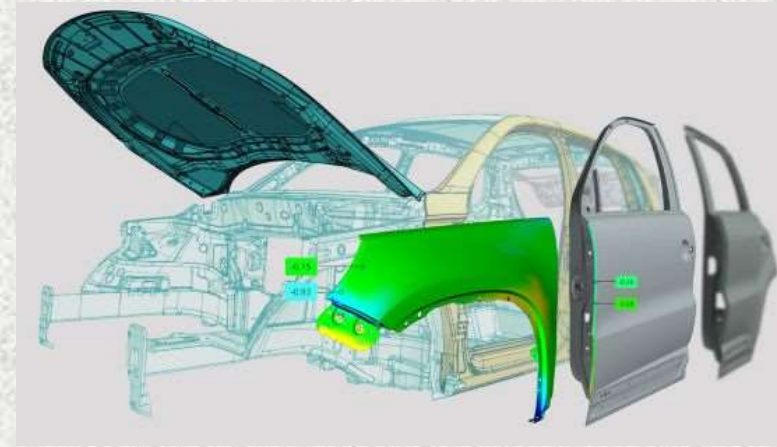
## P2 - OPTICAL 3D MEASURING SYSTEMS - Dimensional traceability for industrial and medical applications

*The general objective:*

Study of optical 3D measuring systems

*Key objectives:*

- 1- Study of traceability and the standards or guidelines used
- 2- Patterns required for performance evaluation according to standards or guidelines
- 3- Study of typical sources of errors
- 4- Working groups with companies that use optical 3D metrology
- 5 - Development of special patterns for specific applications





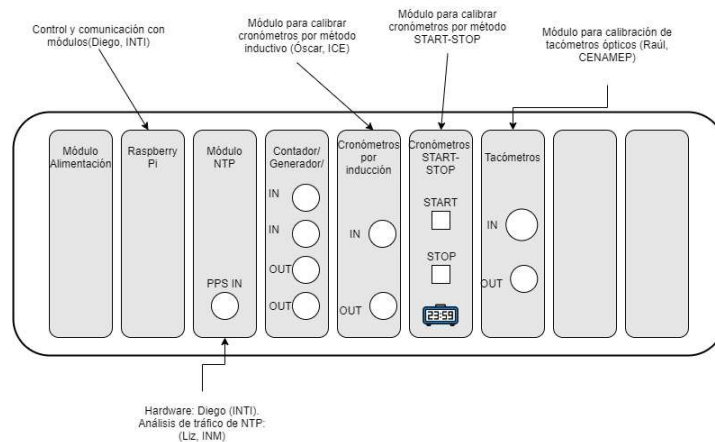
## P2 - OPTICAL 3D MEASURING SYSTEMS - Dimensional traceability for industrial and medical applications



## P3 - Time and frequency digital platform

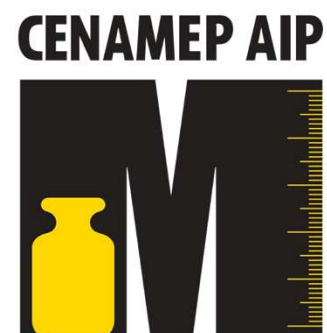
This project aims to conceptualize, design and implement an economic and open platform for time and frequency measurements.

The main goal of this project is to propose and build a modular and economic measurement system capable of performing time and frequency measurements with traceability to a known reference.





## P3 - Time and frequency digital platform



## P4 - Metrological evaluation of lung ultrasound using virtual vector machine for diagnosis of acute respiratory distress syndrome

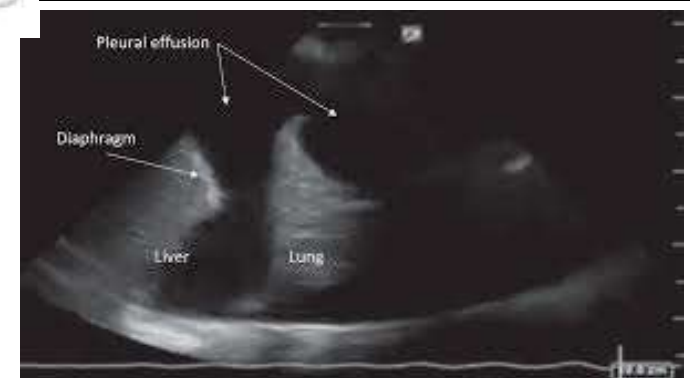
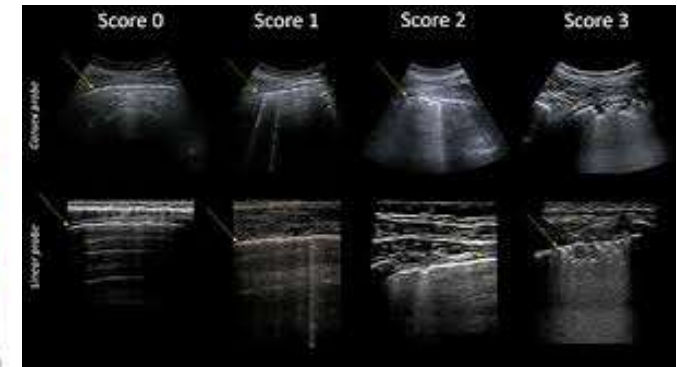
- Lung ultrasound (LUS)

- Ultrasonography of lungs



- LUS “scores” (LUSS)

- Semiquantitative score that measures lung aeration loss caused by different pathological conditions (**ARDS**, for instance)



## • Virtual Vector Machine (VVM)

- Supervised learning models with associated learning algorithms that analyze data for classification and regression analysis
- $VVM \subset Machine\ Learning \subset Artificial\ Intelligence$



## • Main objective

- Find out the applicability of VVM to help on the Diagnostics of ARDS (**DARDS**) based on LUS images



# Main outcomes

- An automated tool to diagnose ARDS based on different LUS scores
  - Technologically validated
  - Metrologically validated
  - Free to use worldwide
- Spread out knowledge of LUS, ARDS, VVM among SIM's NMI
  - Technical exchange
  - Internships
  - Culturalization on M4DT regarding **ultrasound usefulness**



## P4 - Metrological evaluation of lung ultrasound using virtual vector machine for diagnosis of acute respiratory distress syndrome





# The aim

CABUREK SIM-M4DT

Develop services that address the needs of users  
(e.g: sectors, value chains, private and public actors)





# The structure

CABUREK SIM-M4DT



WG1 DIGITAL  
CALIBRATION  
CERTIFICATE  
ENGLISH



WG3 LAB-AUTOMATION  
+ REMOTE CALIBRATION  
ENGLISH



WG4 LAB-AUTOMATION  
SPANISH

Regional exchange



Technical Committee

# Current status

- Due to the pandemic until July 2021 only virtual workshops were carried out
- A contract between INTI and SIM was signed on august 2022. This agreement will allow SIM to execute the IADB funds. INTI keeps the role of executing agency for the IDB





# Current status

- 2 research projects are beginning the execution through presential activities:
  - Project “Develop of a thermohygrobarometer with digitalization criteria”. Coordinator: Hugo Gasca (CENAM). First activity: October 6-12, 2022. Host institution: CENAMEP Panamá. 8 SIM representatives. IADB support: about U\$S 16-500
  - Project “Optical 3D measuring systems - Dimensional traceability for industrial and medical applications”. Coordinator: Bruno Gastaldi (INTI). First activity: November 7-11, 2022. 6 SIM representatives. IADB support: about U\$S 8.500



## Current status

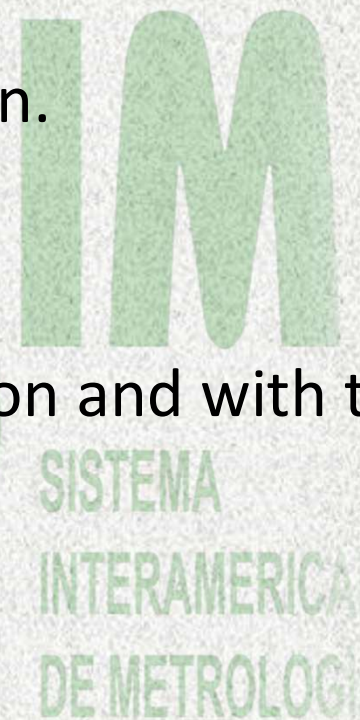
- November 21-25, 2022, the first presencial meeting of the CABUREK Project for the implementation of the 3 pilot services in the field of digital transformation (Component 2) Will take place in Lima.
- 40 attendees. IADB support: U\$S about 65.000

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# Conclusions

- Very fast progress in digital transformation.
- High interest in the NMIs.
- Support of IDB and regional agencies
- Opportunities for interregional cooperation and with the QI





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Thanks for your attention!!!

Héctor Laiz  
INTI-Argentina  
laiz@inti.gob.ar

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