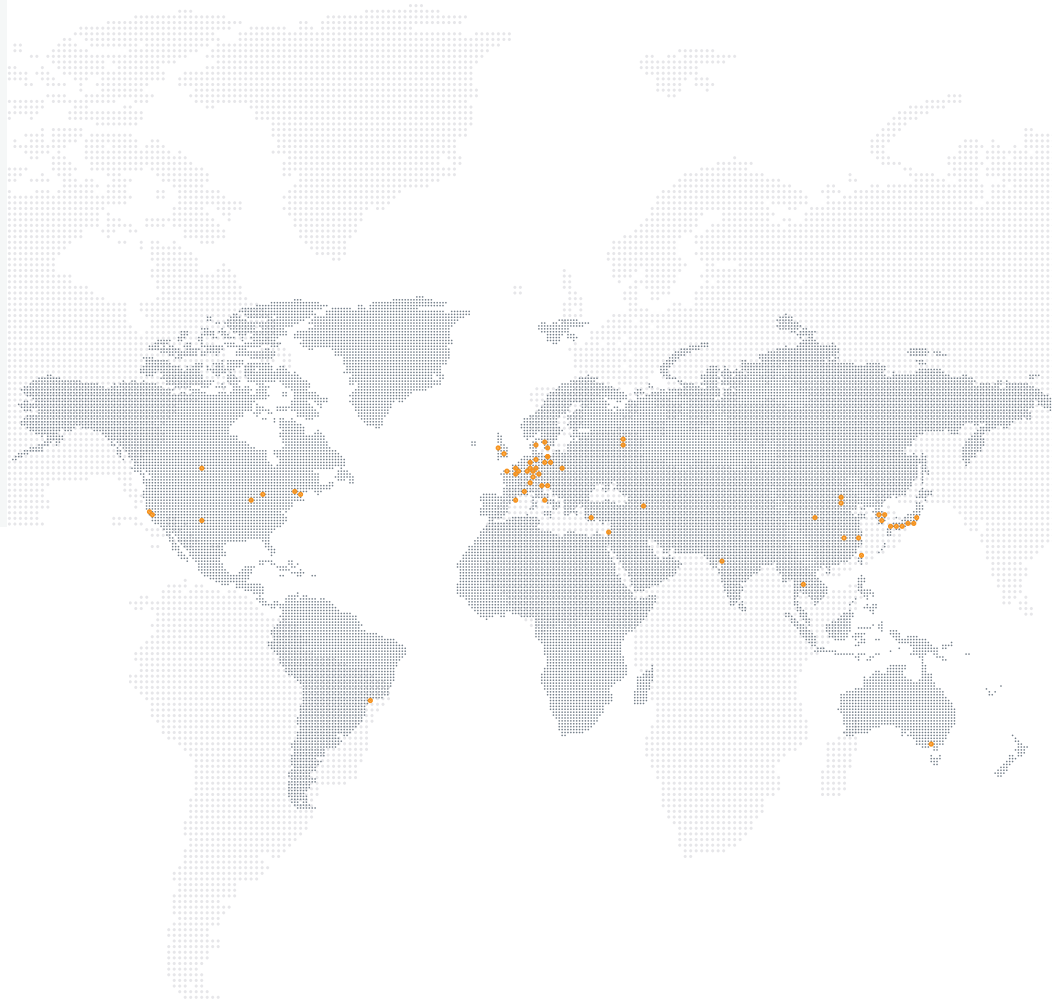




INSTRUMENTATION
TECHNOLOGIES



SOLUTIONS FOR **PARTICLE THERAPY** ACCELERATORS



LIBERA

Providing cutting-edge solutions for a precisely known, stable and reliable beam.

APPLICATIONS:

Ion Therapy
Proton Therapy
Targeted Alpha Therapy (TAT)
Inter-Operation Radiation Therapy (IORT)
Very High-Energy Electron Therapy (VHEET)
Radiotherapy (X-ray Therapy)
Fast Neutron Therapy (FNT)
Boron Neutron Capture Therapy (BNCT)
Radioisotope Production

HEADQUARTERS

Instrumentation Technologies, d.o.o.,
Velika pot 22, SI-5250 Solkan,
Slovenia, EU

PHONE

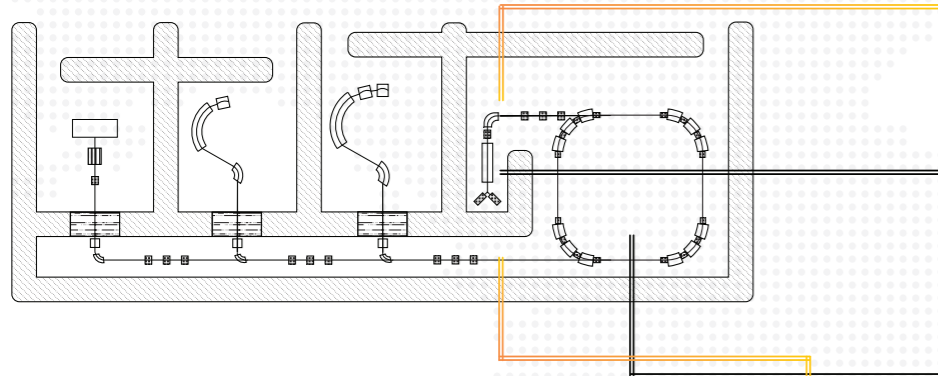
+386 5 335 26 00

EMAIL & WEBSITE

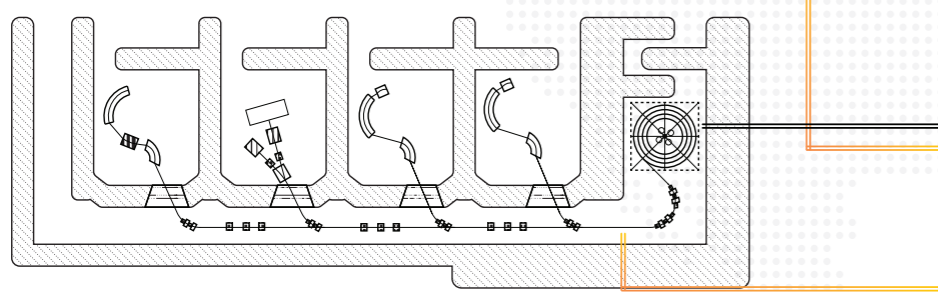
info@i-tech.si
sales@i-tech.si
www.i-tech.si

USE CASES

SYNCHROTRON-BASED FACILITY



CYCLOTRON-BASED FACILITY



TRANSFER LINE

- Beam diagnostics
- Reference signal

LINAC INJECTOR

- Beam diagnostics
- LLRF controls
- Reference signal

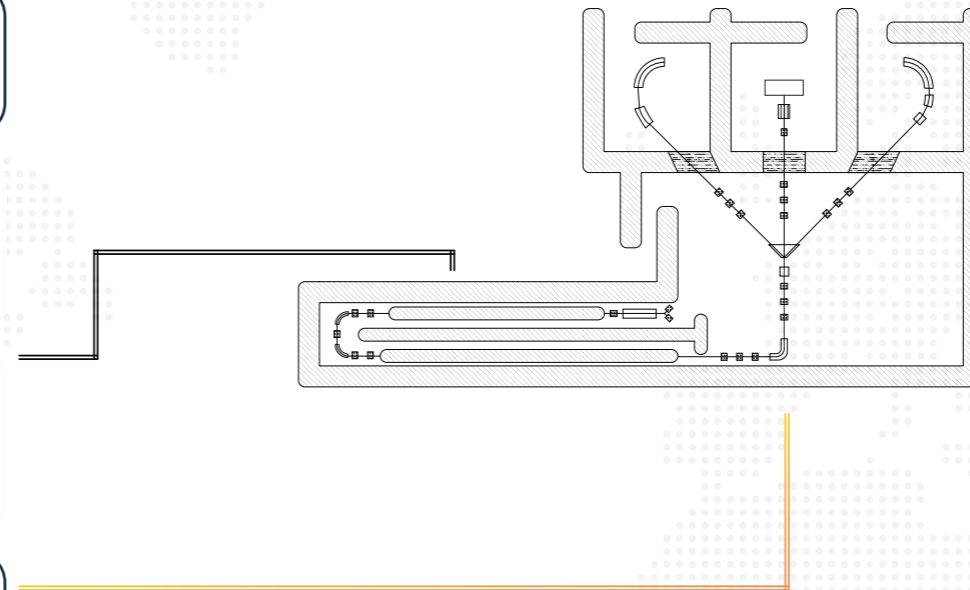
ACCELERATOR

- Beam diagnostics
- LLRF controls
- Reference signal

EXTRACTION LINE

- Beam diagnostics
- Reference signal

LINAC-BASED FACILITY



Case Study

Linac for Image Guided Hadron Therapy



A model of the LIGHT Proton therapy Solution

Beam diagnostics instrumentation

High-resolution **particle-optimized beam position, relative charge (and phase) measurement** for different beam modes and regimes.

Exchange of information & fast correction of the global-orbit beam position.

Beam-loss detection & monitoring.

Detection of unexpected events and communication to the Machine Protection System.

General-purpose **RF signal & DC current acquisition** (with digitizers and current meters).

Electronics for LLRF controls

Guarantee that the particles always have the optimal energy by assuring the **desired phase & amplitude** of the electric field in the RF cavities in **real-time**.

Guarantee that the RF cavities are always in tune with the **desired RF frequency**.

Protect the machine in case of unexpected events, **prevent false shutdowns and optimize availability** of the accelerator machine.

Stream all generated data to an external server for **treatment-archiving** purposes.

Reference signal generation

Generated by a **stabilized low-noise** reference master-oscillator.

Customized for the RF frequency of the machine.

With the option of generating coherent **harmonics/subharmonics** where required.

Advanced Oncotherapy is a specialist developer and provider of a breakthrough proton therapy system, the LIGHT system, which is the result of 25 years of work at CERN and ADAM. LIGHT will provide active energy modulation, a fast beam intensity and energy change as well as modularity and reduced shielding.

AVO-ADAM:

“*Instrumentation Technologies is a key supplier and an industrial partner providing the LLRF controls and BPM electronics for the LIGHT system. Via the Libera platforms, with ad-hoc features design, I-Tech has met the requirements of the LIGHT system. We are pleased to collaborate with such a professional, open and flexible team that has helped us enhance our customer experience.*”

CONTROL - SYSTEM INTEGRATION

All the common accelerator control system interfaces are supported and seamlessly integrated. We have joined forces with the world's leading provider of control systems, Cosylab, on numerous projects.



“ *Cosylab has extensive experience in integrating monitoring hardware from Instrumentation Technologies into control systems of a multitude of projects and end-customers. For example, we successfully integrated the Libera beam-position monitor into the Front-end Software Architecture of FAIR at GSI in Darmstadt. Cosylab also integrated Libera into the beam instrumentation and content subsystems at the JINR (Joint Institute for Nuclear Research) in Dubna, Russia. In all of these cases, we have found the beam-position HW solutions from Instrumentation Technologies to be state-of-the-art and easily integrated into the accelerator control systems of the end customer. We look forward to many more integration projects that leverage the characteristics of the Libera beam-monitors from Instrumentation Technologies!* ”

RELIABILITY & ROBUSTNESS

We understand the importance of the **availability and reliability** of these machines, as we know that our solutions are used in **critical** parts of accelerators and therefore are well aware of the impact on the design of our systems.

With **more than 20 years of experience** in the field & **thousands of instruments continuously operating worldwide**, we have maximized their availability. We have also established processes which are followed during the development and testing of each produced unit, to **make sure this requirement is met.**

SERVICES & SUPPORT

Requirement definition

Technical proposal identification

Commissioning assistance

On-site & remote support

Warranty extension

Instrument customization

On-site demonstration & testing

Hands-on training

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sales@i-tech.si

