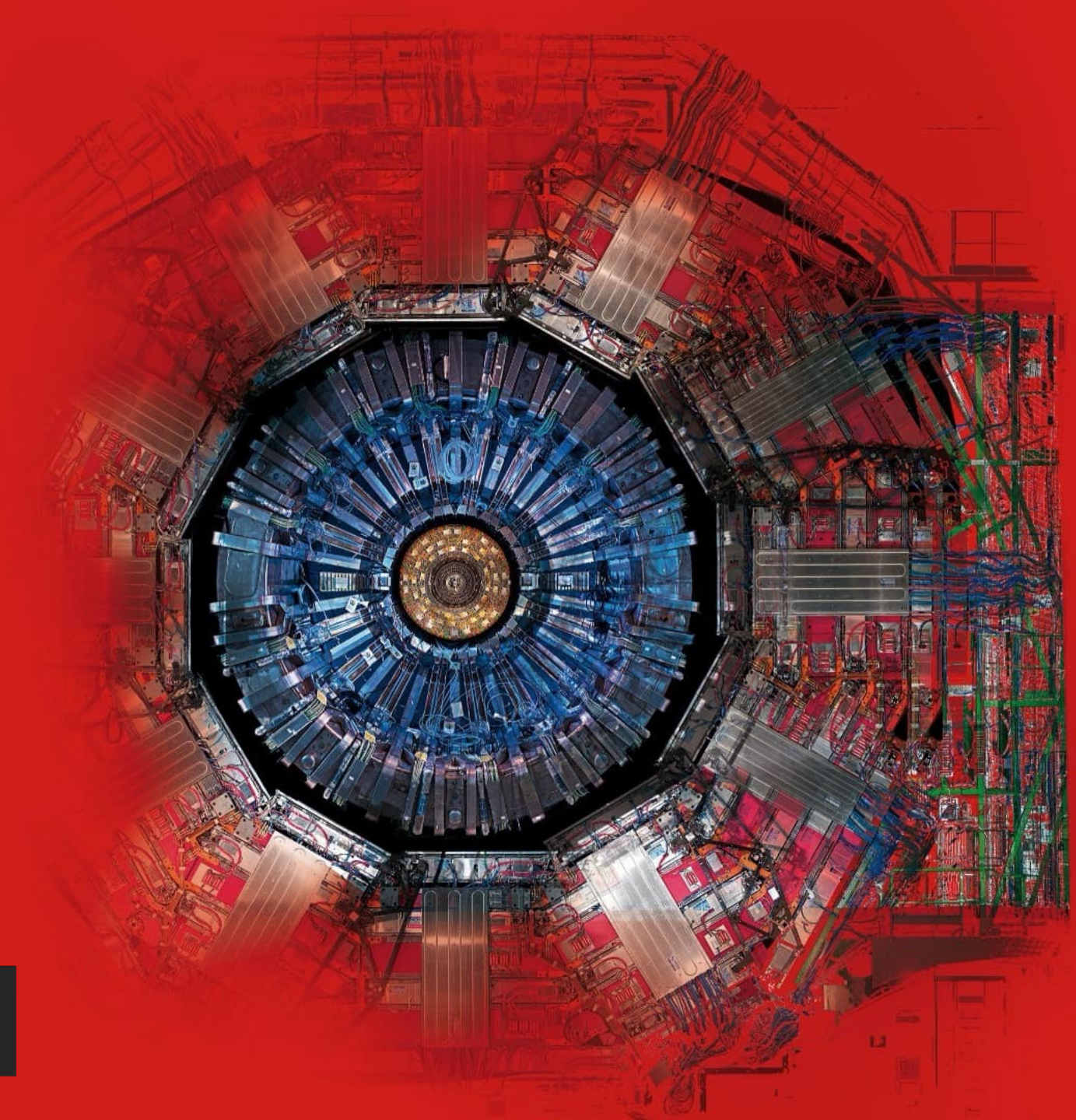




Company Overview



CAEN Group

Founded in 1979, **CAEN S.p.A.** (Costruzioni Apparecchiature Elettroniche Nucleari) is an important industrial spin-off of the INFN.

Core business: Electronic Instrumentation for physics experiments (world leader)

Spin-off activities:

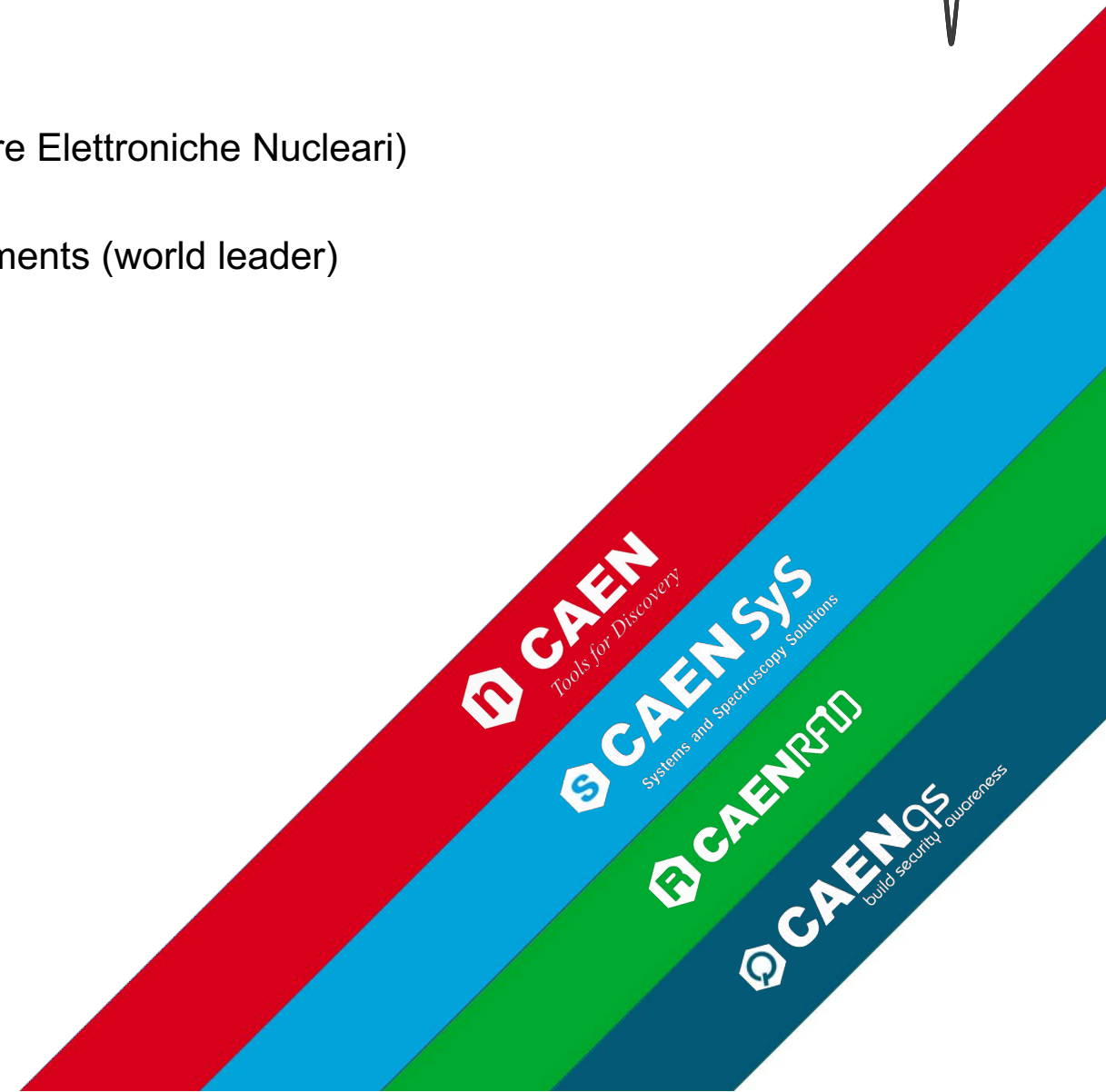
CAEN S.p.A.

- **CAEN SyS** – CAEN Spectroscopy Division (2016)
- **CAEN RFID s.r.l.** (2003)
- **CAENqS s.r.l.** (2012)

Total Employees (production not included) **167 People:**



- 15 Ph.D.s
- 84 Bachelor's and Master's Degrees
- 62 Diploma Engineers
- 6 Technical Staff



Quality Certification



www.imq.it



CISQ is a member of
The International Certification Network
www.iqnet-certification.com

CERTIFICATO N. 9105.CAEN
CERTIFICATE N.

SI CERTIFICA CHE IL SISTEMA DI GESTIONE PER LA QUALITA' DI
WE HEREBY CERTIFY THAT THE QUALITY MANAGEMENT SYSTEM OPERATED BY

C.A.E.N. SPA
VIA VETRAIA 11 - 55049 VIAREGGIO (LU) Italy
UNITA' OPERATIVE/OPERATIVE UNITS
Vedere gli Allegati per gli altri Siti (n° 2 allegati)
View the Annexes for the other Sites (n° 2 pages)
Operazioni esterne / External operations

E' CONFORME ALLA NORMA/IS IN COMPLIANCE WITH THE STANDARD
ISO 9001:2015

PER LE SEGUENTI ATTIVITA' / FOR THE FOLLOWING ACTIVITIES
Progettazione, fabbricazione e collaudo di apparecchiature elettroniche
Design, manufacturing and test of electronic equipment

Ulteriori informazioni riguardanti l'applicabilità dei requisiti ISO 9001:2015 possono essere ottenute consultando l'organizzazione
Further clarifications regarding the applicability of ISO 9001:2015 requirements may be obtained by consulting the organization

IL PRESENTE CERTIFICATO E' SOGGETTO AL RISPETTO DEL
REGOLAMENTO PER LA CERTIFICAZIONE DEI SISTEMI DI GESTIONE
THE USE AND THE VALIDITY OF THE CERTIFICATE SHALL SATISFY THE
REQUIREMENTS OF THE RULES FOR CERTIFICATION OF MANAGEMENT SYSTEMS

DATE:	PRIMA CERTIFICAZIONE FIRST CERTIFICATION	EMISSIONE CORRENTE CURRENT ISSUE	SCADENZA EXPIRY
	16/02/1998	02/06/2024	20/06/2027


IMQ S.p.A. - VIA QUINTILIANO, 43 - 20138 MILANO ITALY
Management Systems Division - Public Group



ACCREDITED
MS N° 0005MS
VAF: 19



www.cisq.com
CISQ è la Prima rete Italiana di Esperti di
Certificazione dei sistemi di gestione (certificati CISQ)
in Italia (Federation of Management system
Certification Bodies)



Building trust together.

Certificate

CISQ/IMQ has issued an IQNET recognized certificate that the organization:

C.A.E.N. SPA
VIA VETRAIA 11 - 55049 VIAREGGIO (LU) Italy
VIA MONTECRISTO 7 - 57037 PORTOFERRAIO (LI) Italy

has implemented and maintains a
Quality Management System

for the following scope:
Design, manufacturing and test of electronic equipment

which fulfills the requirements of the following standard:
ISO 9001:2015

Issued on: 2024/06/02
Expires on: 2027/06/20

Registration Number: **IT-1066-9105.CAEN**



Alex Stoichitoliu
President of IQNET



Mario Romersì
President of CISQ



This attestation is directly linked to the IQNET Member's original certificate and shall not be used as a stand-alone document.

IQNET Members:
AENOR Spain APNOR Certification France APCER Portugal CCC Cyprus CISQ Italy CDC China CQM China CQS Czech Republic
Cris Cert Croatia DQS Holding GmbH Germany EAGLE Certification Group USA FCAY Brazil FONDONORMA Venezuela ICONTEC
Colombia ICS Bosnia and Herzegovina INTECO Costa Rica IRAM Argentina JOA Japan KPO Korea LSQA Uruguay MIRTEC Greece
MSZT Hungary Nemko AS Norway NSAI Ireland INYCE-SIGE Mexico PCBQ Poland Quality Austria Austria SR Israel SIQ Slovakia
SIRIM QAS International Malaysia SGS Switzerland SBAC Romania TSE Türkiye YUQS Serbia

*The list of IQNET Members is valid at the time of issue of this certificate. Updated information is available under www.iqnet-certification.com

Worldwide presence

Worldwide sales network offices in Italy, Germany, USA, Distributors in more than 30 countries.

Portfolio: > 5000 customers

Customers Include all world leading research centres as:

- **Europe: CERN, INFN, CEA, CNRS; GSI, ESO, ISIS, Ganil, PSI, ...**
- **USA: FNAL, SLAC, Los Alamos, BNL, Jlab, ...**
- **Asia: J-Park, KEK, Riken, IHEP, TIFR, ...**
- **Africa: iThemba Labs, ...**

And private companies.



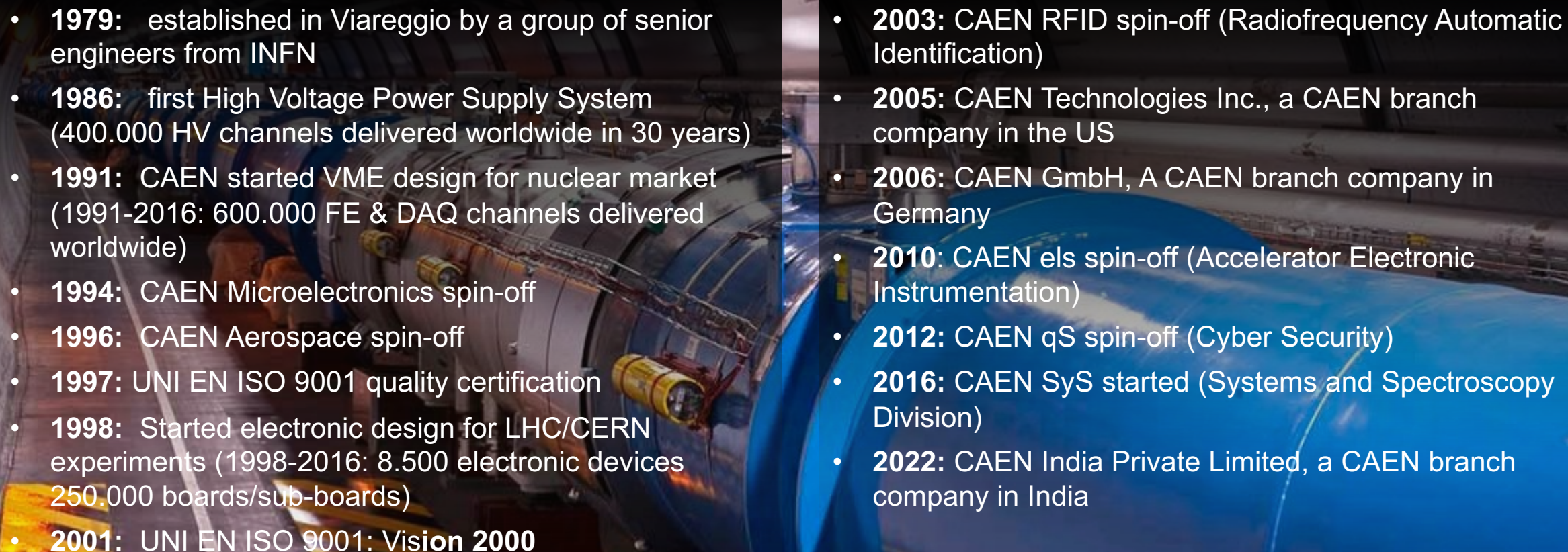
CAEN Headquarters

CAEN boasts more than 40 authorized distributors worldwide and maintains four headquarters strategically located across the globe.



- **CAEN S.p.A.** (Italy)
- **CAENspa India Private Limited** (India)
- **CAEN GmbH** (Germany)
- **CAEN Technologies** (U.S.A.)

Milestones

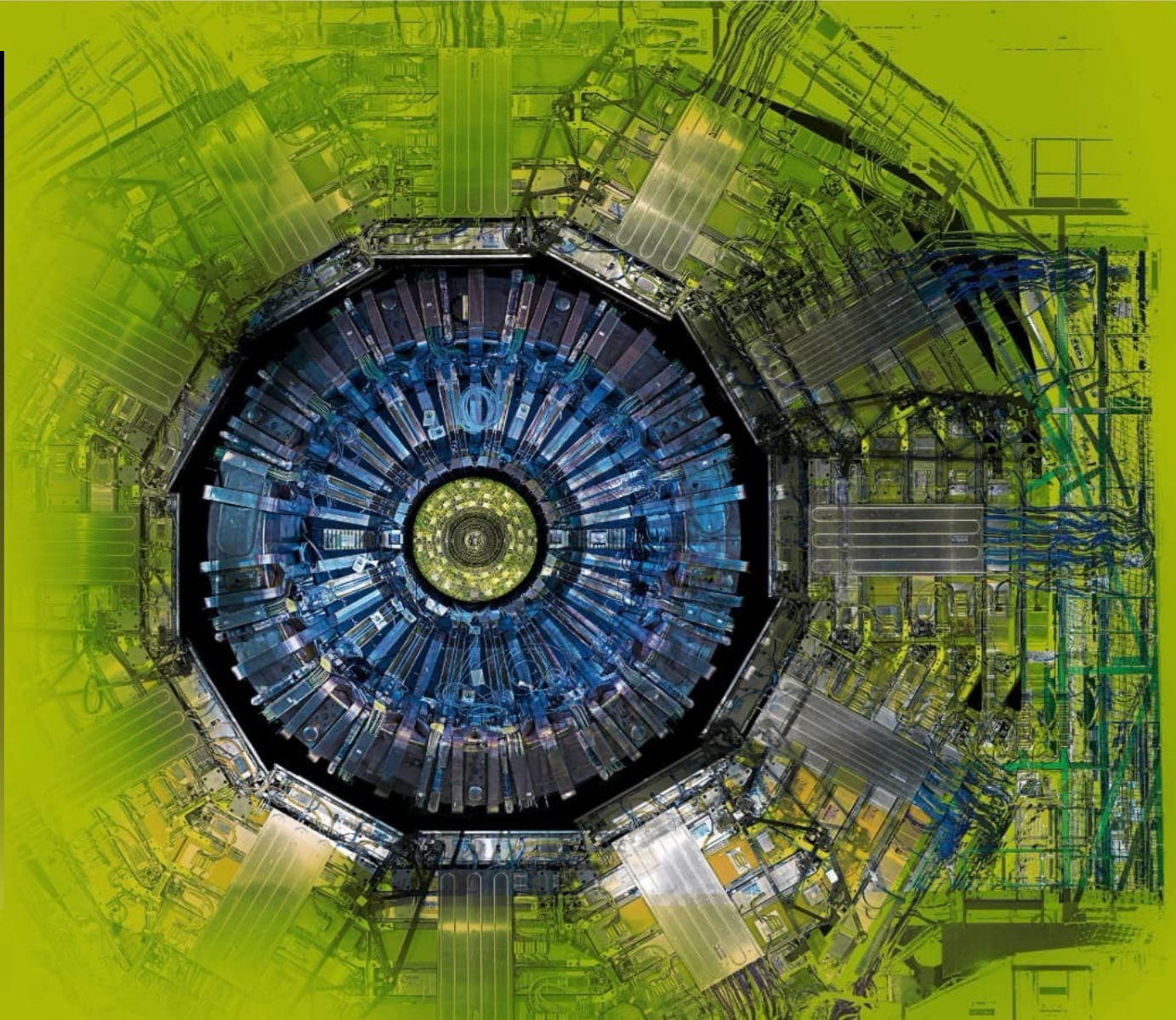
- 
- **1979:** established in Viareggio by a group of senior engineers from INFN
 - **1986:** first High Voltage Power Supply System (400.000 HV channels delivered worldwide in 30 years)
 - **1991:** CAEN started VME design for nuclear market (1991-2016: 600.000 FE & DAQ channels delivered worldwide)
 - **1994:** CAEN Microelectronics spin-off
 - **1996:** CAEN Aerospace spin-off
 - **1997:** UNI EN ISO 9001 quality certification
 - **1998:** Started electronic design for LHC/CERN experiments (1998-2016: 8.500 electronic devices 250.000 boards/sub-boards)
 - **2001:** UNI EN ISO 9001: Vision 2000
 - **2003:** CAEN RFID spin-off (Radiofrequency Automatic Identification)
 - **2005:** CAEN Technologies Inc., a CAEN branch company in the US
 - **2006:** CAEN GmbH, A CAEN branch company in Germany
 - **2010:** CAEN els spin-off (Accelerator Electronic Instrumentation)
 - **2012:** CAEN qS spin-off (Cyber Security)
 - **2016:** CAEN SyS started (Systems and Spectroscopy Division)
 - **2022:** CAEN India Private Limited, a CAEN branch company in India

Market

For more than 45 years CAEN has been providing Scientists and Engineers with the most advanced electronic instrumentation for any particle or radiation detectors

Strong of an extremely close collaboration with the world major research laboratories CAEN is proud to produce the best tools for:

- High Energy Physics
- Astrophysics
- Neutrino Physics
- Dark Matter Investigation
- Nuclear Physics
- Material Science
- Medical Applications
- Homeland Security
- Industrial Applications
- Spectroscopy Applications...



Key strengths

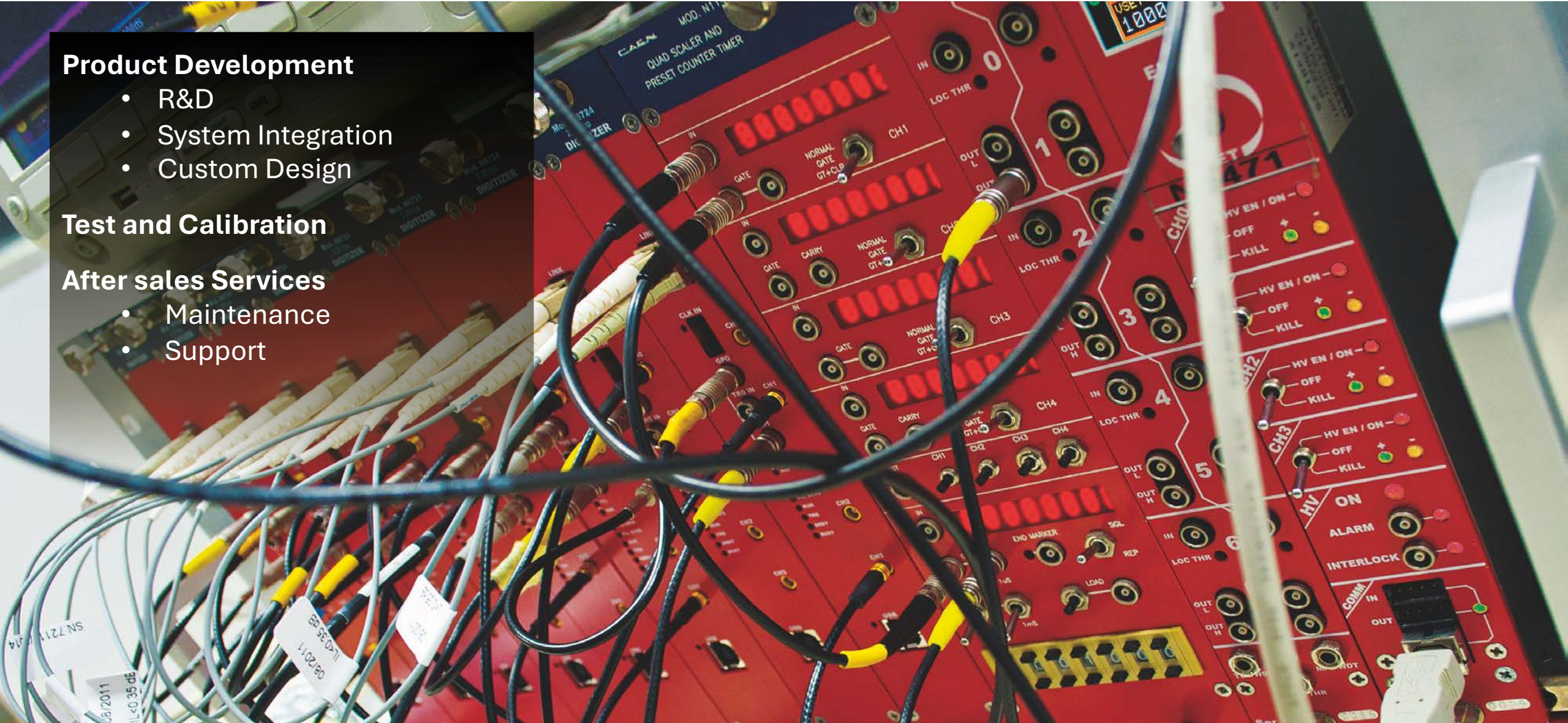
Product Development

- R&D
- System Integration
- Custom Design

Test and Calibration

After sales Services

- Maintenance
- Support



Product Development

- **The R&D division is strong of high level Physicists and Engineers who adopt forefront technologies to design innovative products**
- **Ongoing collaborations with important institutes such as: CERN, Elettra, CEA, CNRS, PSI, INFN, etc.**

Test

- All assembling activities are outsourced
- Experienced group of engineers dedicated to in-house Test and Calibration of the entire production
- All procedures are ISO certified providing the complete traceability of the products



Maintenance and Support services

- All assembling activities are outsourced
- Experienced group of engineers dedicated to in-house Test and Calibration of the entire production
- All procedures are ISO certified providing the complete traceability of the products



Power Supplies Expertise

High Voltage & Low Voltage Power Supplies for Particle Physics Experiments and Laboratories providing:

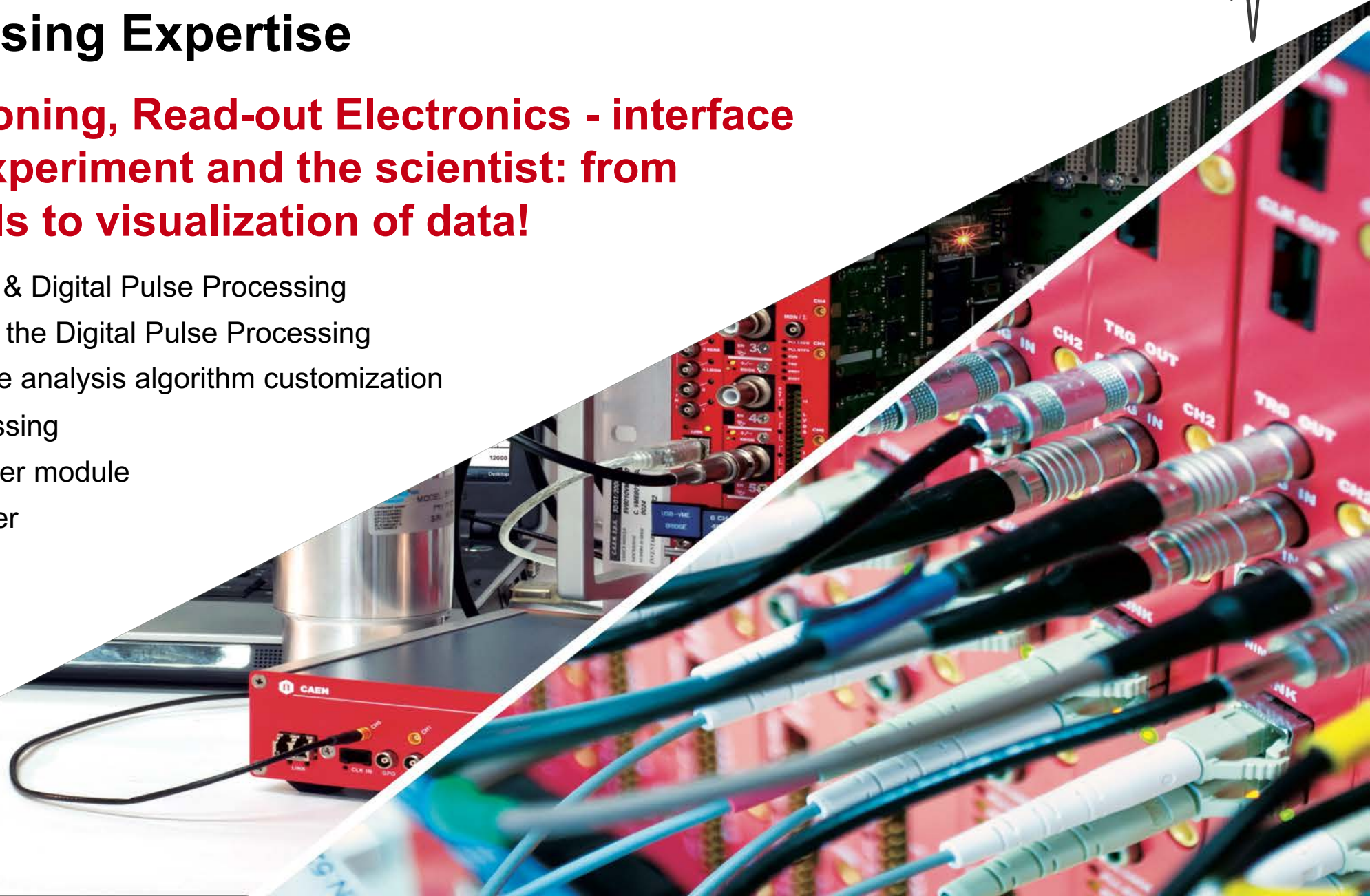
- Integration: Multi-Channel CAEN Systems (up to 768 HV ch/system)
- Granularity: NIM, VME Modules, Rack-Mount and Desktop Devices - from 1 ch to 48 ch/module
- Custom: Stand-alone Power Supplies
- HV Components: PCB mountable HV DC-DC converters
- Hostile Area developments for LHC



Pulse Processing Expertise

Signal Conditioning, Read-out Electronics - interface between the experiment and the scientist: from detector signals to visualization of data!

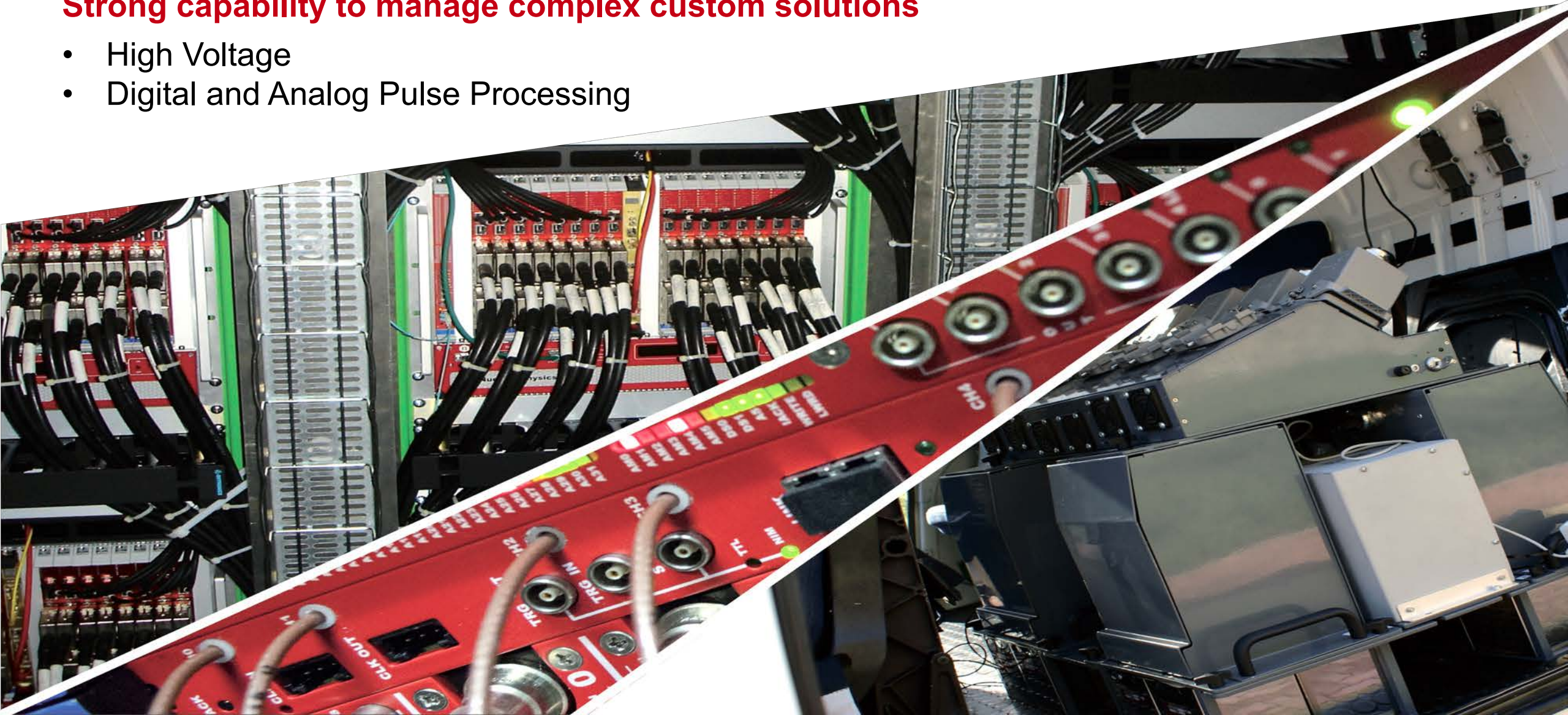
- Waveform Digitizers & Digital Pulse Processing
- FPGA algorithms for the Digital Pulse Processing
- Open FPGA for pulse analysis algorithm customization
- Analog Pulse Processing
- Programmable Trigger module
- Multichannel Analyzer
- Preamplifiers
- Custom project



Custom Developments: Case History

Strong capability to manage complex custom solutions

- High Voltage
- Digital and Analog Pulse Processing



CERN/LHC Electronics in Hostile Environments

“EASY” Multi Function System

- 2 kGauss magnetic field
- $1 \cdot 10^{11}$ p/cm² TD - 15 kRad TID
- $2 \cdot 10^{12}$ n/cm² TD

Designed with COTS components to work in “hostile” areas



CAEN & LHC Experiments

1998 – 2024

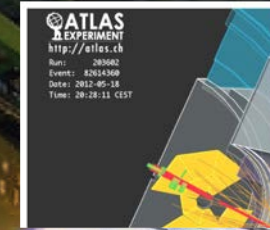
SYNERGY for SUCCESS

26 years of joint efforts to achieve
top performances

- **8.500
electronic devices**
- **250.000
boards/sub-boards**

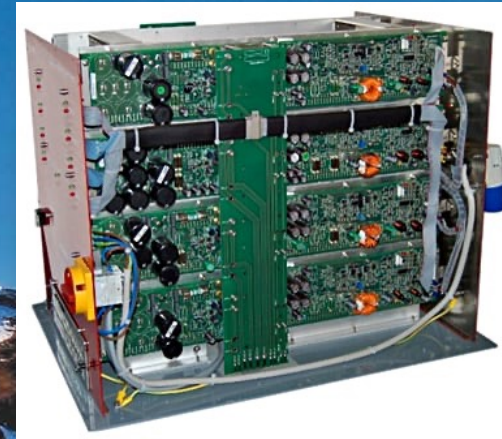


CAEN has received the "CMS Crystal Award" for the development and production of the power system for the CMS/LHC Tracker



LV Power Supply for ALMA (ESO)

- Design of custom LV Power Supply System for ALMA
- **86 Complex LV Systems delivered (688 power channels)**
- **Harsh environmental condition (desert at 5,000 m altitude)**
- **Designed to operate for at least 30 years; 24/7 (24 hours a day, seven days a week)**



San Pedro de Atacama (5000 meters above sea level), Chajnantor plateau Chile.
The most complex ground-based astronomical observatory in the world.

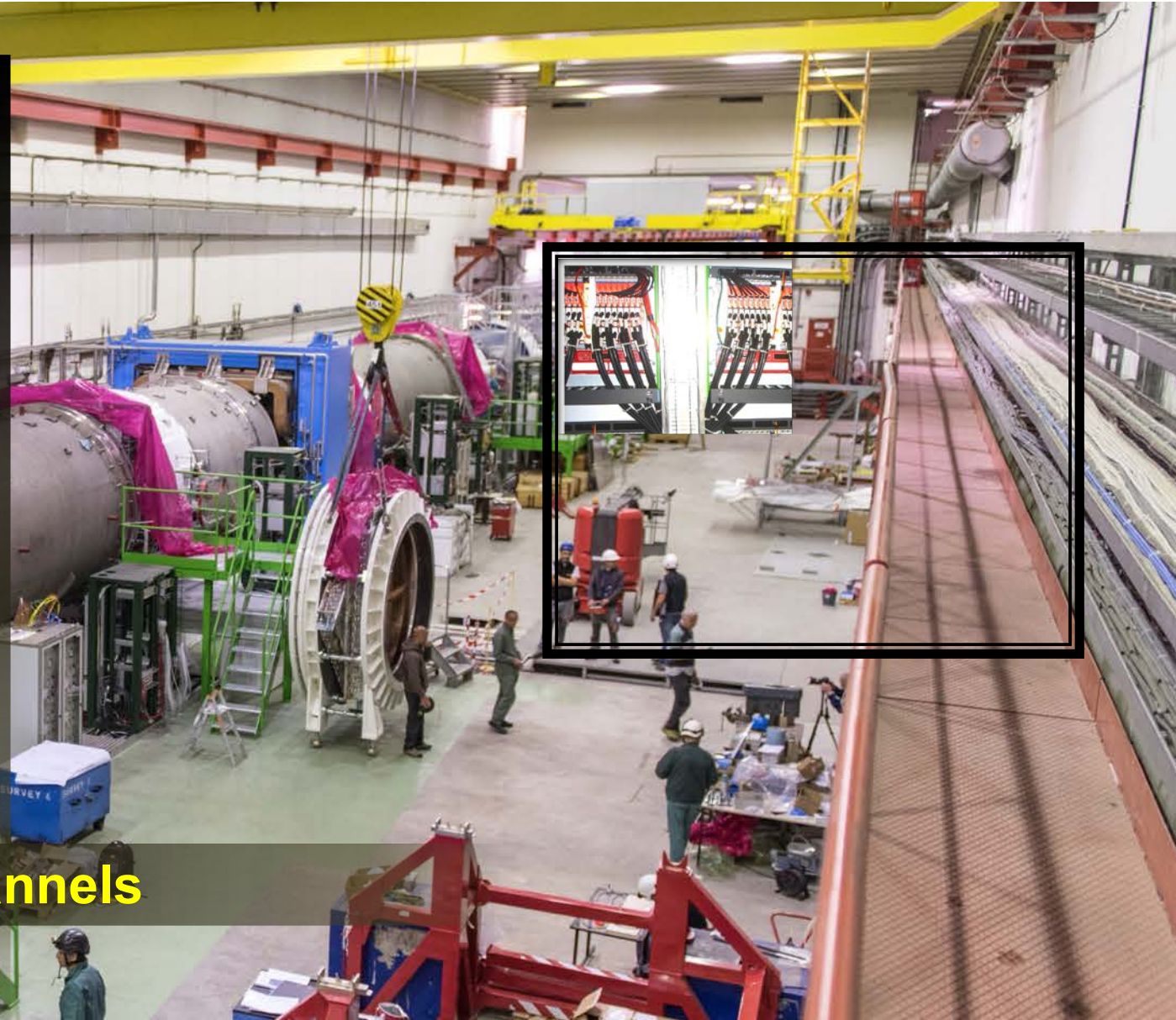
NA62@CERN

CAEN was contract-awarded to design and manufacture the Calorimeter REAdout Module (CREAM) for the NA62@CERN Liquid Krypton Calorimeter (LKr)

VME 6U form factor:

- 32 channel
- 14 bit 50 MS/s ADC
- 2 Vpp input dynamics (differential)
- 14-bit programmable DC offset adjustment ($\pm 1V$)
- Memory buffer:
 - 26 MB circular buffer
 - 5.2 GB event buffer
- Gbit Ethernet port for data readout
- VME64X compliant interface

455 modules - 13,249 read-out channels



XMass @ Kamioka, Japan

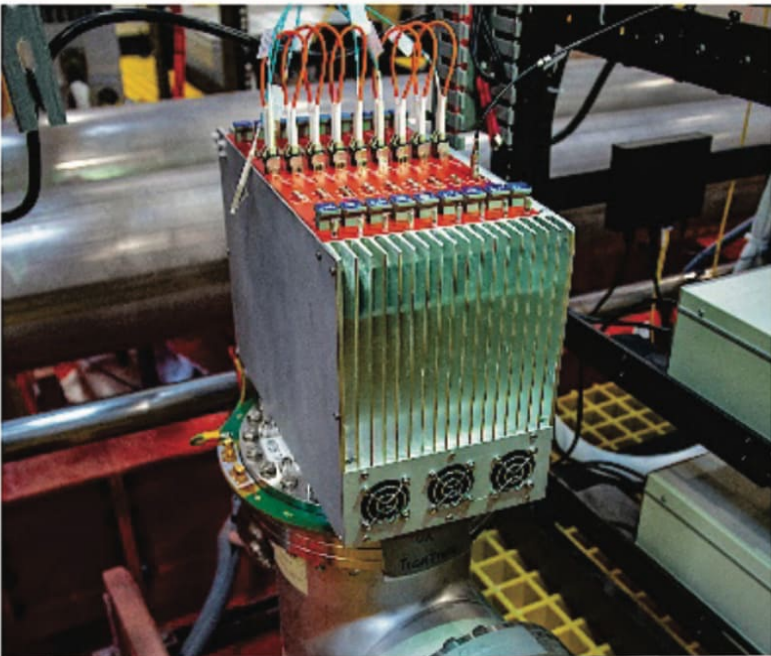
- Dark Matter experiment using a liquid Xenon TPC
- Equipped with 84 digitizers modules
- 672 channels - 10 bit @ 1GHz

Readout Bandwidth = ~ 2 MB/s/ch
Total aggregate throughput = ~ 1 GB/s



ICARUS @ Fermilab, USA

- Liquid Argon TPC Readout System aimed at studying neutrino
- Equipped with 874 digitizers modules
- 55.936 channels - 12 bit @ 2.5MHz



A2795 houses 64 amplifiers, AD converter, digital control, and optical link.

Pierre Auger Observatory

- Based on A7501 PCB mount HV DC-DC converter
- **Extended Temperature working range:**
-10°C ÷ 70°C
- **Designed for long working life in harsh environment**



- A detection area of 3.000 km² (the size of Luxembourg)
- Mendoza Province (Argentina)



- High efficiency
- 2100 V/100 µA output ranges
- Available with positive or negative polarity
- Stand alone architecture
- Compact package:
34,5 x 62,9 x 119 mm³

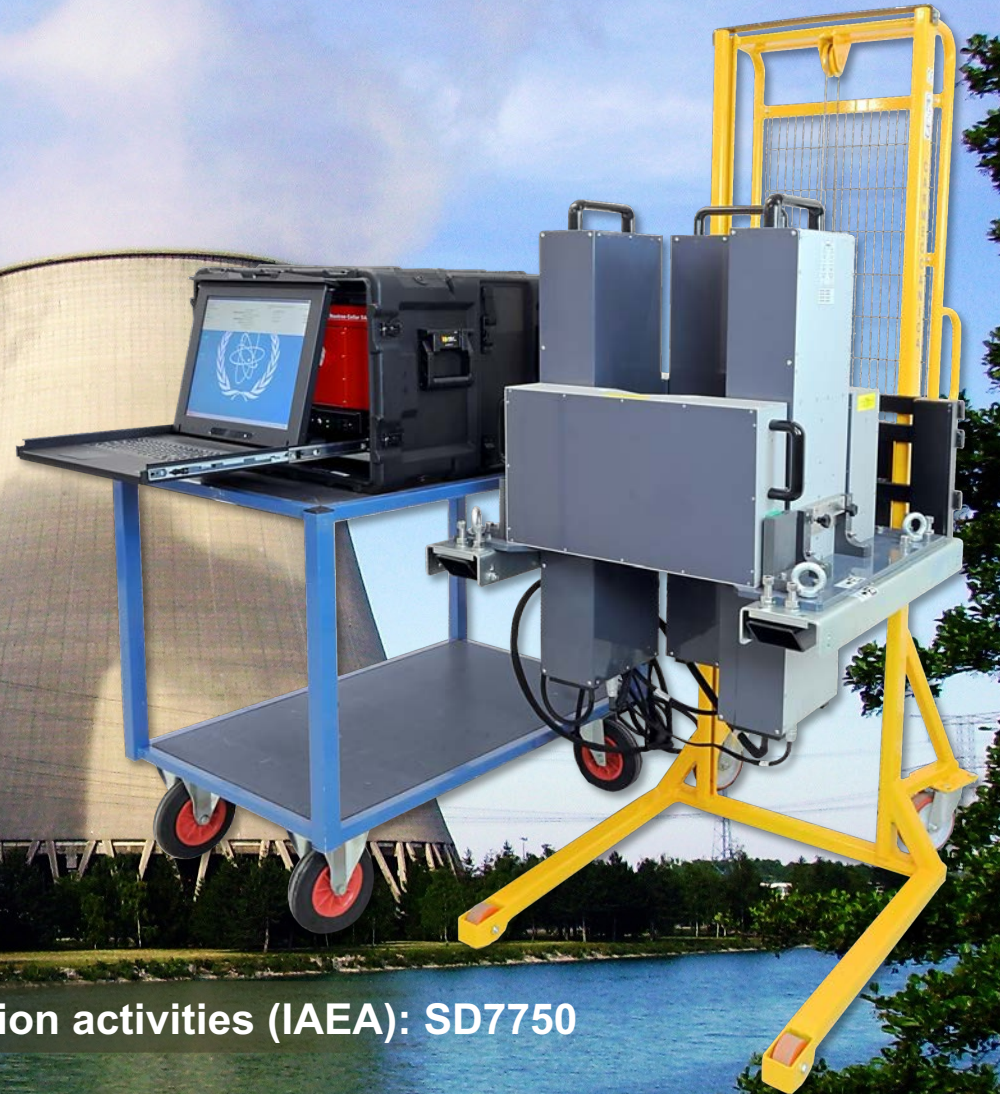
A tailored solution for Large Area experiments in harsh environment: A7501PB

International Atomic Energy Agency

- **12 liquid scintillators**
- **Digital DPP and Waveform readout**
- **Sustained throughput: 340 MB/s**

The Fast Neutron Collar (FNCL) is a liquid scintillator-based instrument developed as an efficient NDA (non-destructive assay - test) tool for verification of modern NPP's Fresh Fuel Rods

Fast neutron counting System for safeguards and non-proliferation activities (IAEA): SD7750



CAEN SyS - CAEN Spectroscopy Division



What we do

Providing nuclear measurement solutions and technical expertise for a wide array of applications.

SNIPER-GN - Special Nuclear material Portable identifier

- **Search and secure operations**
- **Airport security checkpoints**
- **Nuclear facilities and radiation-sensitive areas**
- **Radiological Dispersal Device (RDD) detection and identification**
- **First responder prompt intervention Customs border inspections**

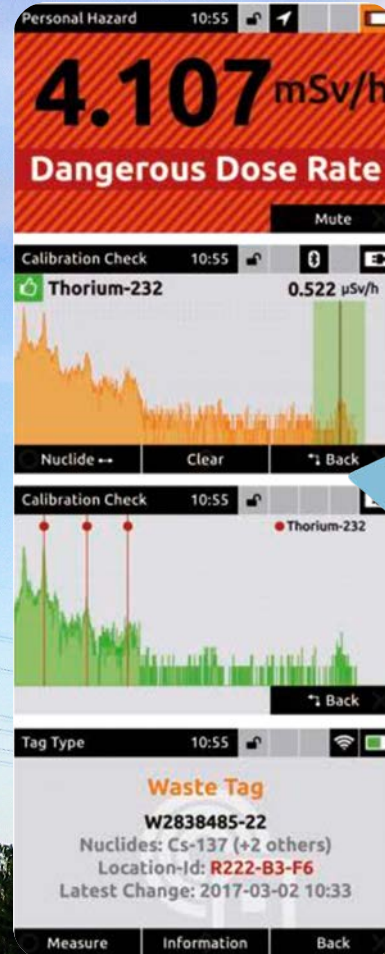


NATO Stock Numbers

Nuclear Safety & Security

DigiWaste - Digital Platform for Nuclear Waste Management

- Decommissioning & Dismantling
- Interim Storage of Nuclear Waste
- Radioprotection
- Legacy Waste



Nuclear Safety & Security

GAMON - Global Measurement Platform for Nuclear Safety and Security

- Ring monitor systems around nuclear facilities
- Nationwide environmental monitoring networks
- Area monitor system in nuclear research laboratories
- Portable, mobile measurement stations for emergency response



Different models for applications



CAENqS

STRATEGIC PARTNER



Solutions

- Next Generation Security
- Threats and vulnerabilities Protection
- Mobility and endpoint Security
- Next Generation Network

Services

- Managed Security Services
- Technologies Consulting
- Risk & Vulnerability Assessment
- Compliance Consulting



CAENqS Solutions

Security Architecture

- IT security strategy definition, roadmap and approach
- Definition and design of security controls and solutions
- People, process, technology and data security assessment
- Security policies and processes
- Operations and monitoring
- Business impact analysis
- Security risk assessment

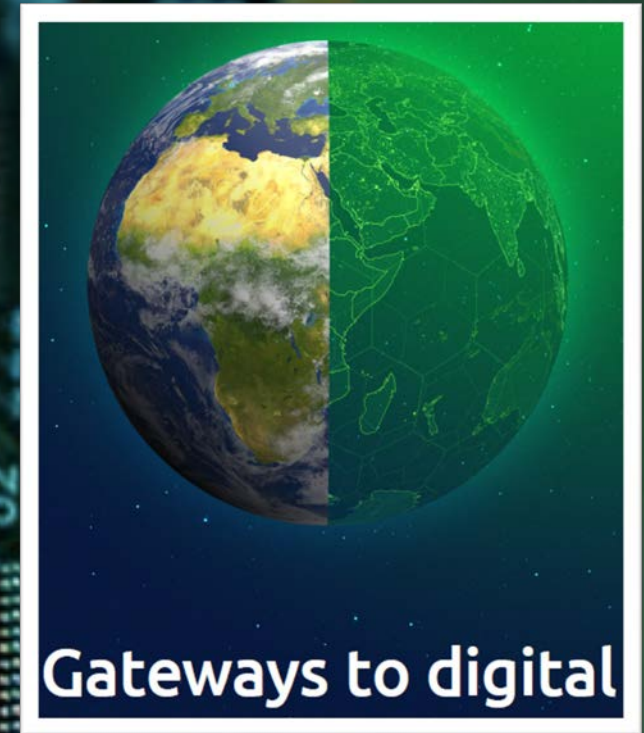
Threats and Vulnerabilities

- Vulnerability assessment
- Penetration test
- Wireless security test



CAEN RFID

- The first Italian company providing UHF RFID products
- Key player in the EU RFID scenario (GS1, RAIN...)
- Worldwide customers in manufacturing, logistics, transport, healthcare, fashion, retail...
- Totally in-house HW, SW & support skills
- Key partner in EU funded projects
- An “added value manufacturer”



CAEN RFID



RAIN (UHF) RFID is an enabling technology for several fields of applications:

- Embedded
- Fashion - Retail
- Cold Chain - Pharma
- Waste Management
- Access Control
- Industrial Manufacturing
- Transportation - Logistics
- FMCG - Supply Chain
- Leisure
- We are the Technology provider & design center for Datalogic Spa

Winning Synergies

CAEN is always open to cooperate with its Partners and Customers to evaluate new projects and partnerships

