SInteSY

engineering for life science


S210.smartSensor
STEM CELLS LABORATORY (Probe2)
TEMPERATURE
[degC +/-0.8]
24.6
RELATIVE HUMIDITY
[%RH +/-2]
42
BAROMETRIC PRESSURE
[mbar +/-5]
1012
OXYGEN
[% +/-0.1]
20.9
CARBON DIOXIDE
[% +/-70ppm]
0.04
Temperature(CO2)
24.4 [degC +/-1.0]
RelativeHumidity(CO2)
42 [%RH +/-3]
Touch Screen Technology
SinteSy
www.sintesy.it

Established in 1997, **SINTESY S.r.l.** is specialized in design and production of electronic devices and software systems.

Over the years, the Company has become an important reference point and partner for Customers who look for state-of-the-art, competitive and turnkey solutions in different markets: industrial control, security, telecommunications, motion control and, above all, medical devices.

The SINTESY.eagle® family represents a wide and innovative set of hardware and software products completely designed and developed by the qualified team of engineers of the Company for the control of alarms in cryobanks, biological laboratories and medical gas systems.
This DCS system (Distributed Control System) consists of various electronic RTU devices and a powerful and modular SCADA software (Supervisory Control And Data Acquisition), developed with Java technology.

Nowadays SINTESY is able to supply professional and customized systems which represent solid solutions for:

The automation of cryobanks, based on cryogenic freezers of different brands with their own electronics

The supervision of biological laboratories equipped with the most important and employed equipments for cryopreservation and processing of human blood, cells, tissues and organ products

The traceability of biological samples from collection to transplantation passing through storage and manipulation processes, including the inventory of samples

The supervision of Medical Gas Pipeline Systems (MGPS), including the reading of pressure, levels and alarms of typical gases used in hospitals such as oxygen, nitrogen, medical air...

The telemetry system that allows the remote control of equipments and plants using the GPRS/GSM network.

From the drawing of required specification (User Requirement Specifications) to the installation, the SINTESY team will help you finding and creating the best solution for your needs in terms of reliability, safety and costs.

our history

A many years experience guarantees the highest standard for reliable and innovative solutions for automation and supervision of cryobanks, biobanks, biological laboratories and medical gas systems

QUALITY ASSURANCE

The quality of our products and services reflects the quality of all the processes that allow the design, implementation and production of them. SINTESY S.r.l. works in accordance with the highest quality models across the various departments and its management systems are certified according to the ISO 9001 and ISO 13485 standards certified by the Notified Body IMQ S.p.A. (Milan). Most of the hardware and software products are certified as Medical Devices according to the European Directive 93/42/EEC and amendments.

biobanks and cryobanks

SINTESY is able to assist you with high standard solutions for automation and/or supervision of cryobanks and biobanks. The system that we provide is certified Medical Device and can guarantee the control of the most important brands of cryogenic freezers, using their serial communication protocols

Cryopreservation of cells and tissues represents the future of medicine for the study of diseases and therapies. The control of conservation conditions is the key point for a successful cryopreservation: SINTESY gives you the key.

In accordance with national and international standards, SINTESY developed an innovative and state-of-the-art system for the control of plants of cryoconservation, where automation and supervision of processes and variables merge in reliable solutions to avoid any danger of damage for samples, even for long term storage.

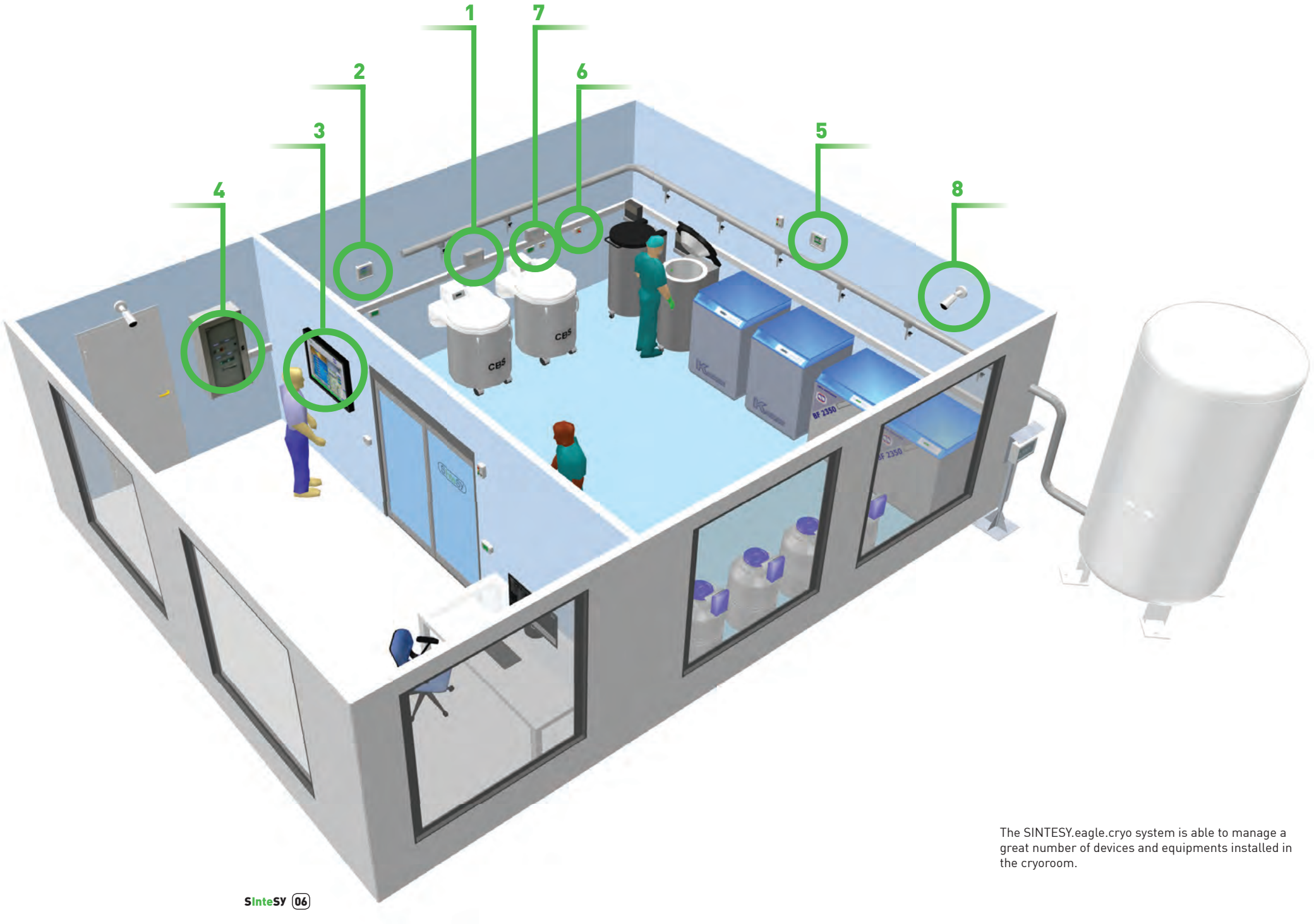
SINTESY designed a modular system able to guarantee the automatic management of a cryobank (cooling, filling and degassing procedures for example) and the generation of visual and acoustic alarms, both locally and remotely; in this way, operators are always aware about possible dangerous situations that may occur in the cryobank. Preset users receive phone calls, SMS and/or e-mails in case of alarm thanks to S140, the efficient device for the dispatch of alarms.

For each plant, SINTESY works to guarantee firstly the safety of operators by installing ambient sensors (CO_2/O_2) and "watchdog" systems, then the safety of biological samples by controlling the temperature and the liquid nitrogen level inside the cryogenic freezers and finally the safety of data collected, stored in the database.

Three fundamental entities make the SINTESY.eagle® system a perfect and flexible solution for biobanks and cryobanks:

- **RTU** (Remote Telemetry Unit) connected to physical transducers that generate digital or analog signals. Dewar controller units, designed by SINTESY (S170) or by other Companies, such as TEC3000, M505CE, 4-20UNIT, 2301, (*) ... are considered RTU too.
- The **S300.smartPLC** (Programmable Logic Controller), for automation and control. It represents the unique product on the market which is able to fully control different cryogenic freezers, belonging to different brands, without mechanically or electrically modifying them. In this way, their Medical Device certification and the warranty are preserved.
- The **SINTESY.eagle.cryo** software, installed on the industrial PC which is connected to the PLC and to the intranet/ internet. The software manages a data base (DBMS), performs the web server functionality, allows the user to analyze data, alarms and events.


AFL-17D
30/09/14 11:32
Sonde Oxy 1
20.72 %
Cuve 33
A: -148.0 °C
B: -158.0 °C
N: 52.0 %
Cuve 1
A: -162.0 °C
B: -174.0 °C
N: 59.0 %
Cuve 3
A: -160.0 °C
B: -172.0 °C
N: 66.0 %
Cuve 5
A: -164.0 °C
B: -174.0 °C
N: 57.0 %
Cuve 31
A: -140.0 °C
B: -152.0 °C
N: 46.0 %
Cuve 40
A: -164.0 °C
B: -176.0 °C
N: 56.0 %
Cuve 39
A: -170.0 °C
B: -170.0 °C
N: 66.0 %
Sonde Oxy 4
20.46 %
Cuve 2
A: -152.0 °C
B: -178.0 °C
N: 67.0 %
Cuve 34
A: -158.0 °C
B: -170.0 °C
N: 68.0 %
Cuve 4
A: -130.0 °C
B: -162.0 °C
N: 73.0 %
Cuve 9
A: -164.0 °C
B: -164.0 °C
N: 73.0 %
Cuve 6
A: -154.0 °C
B: -164.0 °C
N: 72.0 %
Cuve 32
A: -156.0 °C
B: -172.0 °C
N: 71.0 %
Cuve 35
A: -164.0 °C
B: -180.0 °C
N: 71.0 %
Sonde Oxy 6
20.79 %
Cuve 16
A: -168.0 °C
N: 100.0 %
Cuve 22
A: -133.0 °C
B: -164.2 °C
N: NORMAL
Cuve 21
A: -178.0 °C
B: -186.0 °C
N: 69.0 %
Cuve 20
A: -176.0 °C
N: 70.0 %
Cuve 19
A: -174.0 °C
B: -184.0 °C
N: 71.0 %
Cuve 18
A: -174.0 °C
N: 74.0 %
Cuve 17
A: -178.0 °C
B: -186.0 °C
N: 60.0 %



The SINTESY.eagle.cryo system is able to manage a great number of devices and equipments installed in the cryoroom.

1

S170
S170, S170-10 and S170-20 are dewar controllers developed by SINTESY. Dewar controllers of other brands too are managed by the SINTESY.eagle® system.

2

S300.smartPLC
Automation and supervision terminal which totally controls the biobank/cryobank and the liquid nitrogen pipeline.

3

SINTESY.eagle.cryo
Medical Device software developed to display and store alarms, events and data collected by the RTUs installed in the plant.

4

S140
GSM telephone dialer. In case of alarm, it dispatches alarm phone calls, SMS and/or e-mail to warn preset users or technicians.

5

S200.smartOxygen
The module displays the value of oxygen concentration (or other gases) as detected by gas sensors installed in the biobank/cryobank.

6

S188
Emergency button. When pressed by users, the system activates an alarm and takes safety measures.

7

S187
Cooling button. It allows users to manually control the activation or deactivation of the cooling process of the line.

8

Cameras
The video recording system monitors restricted areas to ensure the highest level of safety and security.

laboratories Wi-Fi eagle.lab

Two Medical Device systems that represent solid solutions for the supervision of biological laboratories, in accordance to the most stringent international standards and guidelines

Cryogenic refrigerators, microbiological incubators, programmable rate freezers, hoods, oxygen sensors, ultra freezers, gas cylinders, blood banks refrigerators and any other equipment installed in your laboratory: SINTESY offers the possibility to supervise all of them, both locally and from remote sites, thanks to modular and high-tech solutions. Find the one that fits your needs among wireless and wired solutions.

The Wi-Fi Technology: SINTESY.eagle.easy and S2000

A dedicated software, SINTESY.eagle.easy, and an ad hoc field device named S2000: two medical devices which communicate using the Wi-Fi technology and represent the innovative, flexible and economic solution proposed by SINTESY.

- **S2000** is a transportable data logger, able to read analog and digital signals, temperature probes (PT100 or PT1000), environmental parameters (ambient temperature and humidity) and RS485/RS232 protocols. The S2000 sends the collected data to the PC/Server through the Wi-Fi network of the facility saving costs for cables routing.

- The **SINTESY.eagle.easy** software, installed on your server or a common PC, allows the system administrator to fully and independently configure the system and all the S2000 devices, to analyze data received by the data loggers by means of tables or graphs. It is even possible to store data, events and alarms in a powerful database and to manage alarm conditions dispatching phone calls, SMS and/or e-mails thanks to S140, the SINTESY GSM dialer.

The wired solution: SINTESY.eagle.lab

A structure similar to the system proposed for cryobanks can be implemented for your biological laboratories too: a solid solution to satisfy the need of supervision and the management of areas and equipments.

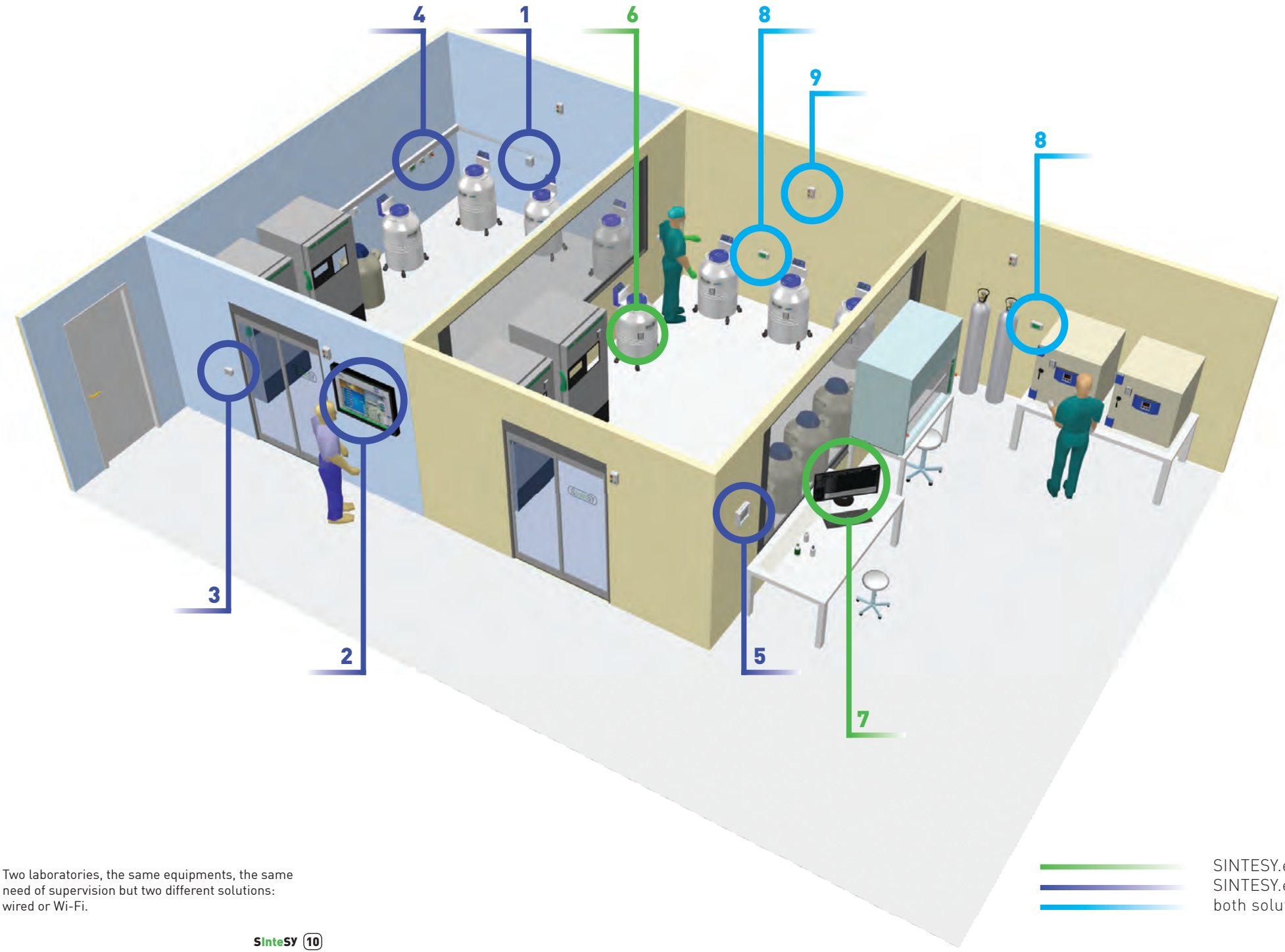
The solution consists of:

- **RTU** (Remote Telemetry Unit) connected to physical transducers that generate digital or analog signals. Pressures, temperatures, flow rates, levels, O_2 and CO_2 percentages, alarm contacts and much more: a wide range of physical quantities that can be read and measured by the SINTESY.eagle family of devices.

- The **SINTESY.eagle.lab** software, installed on an industrial PC. The user-friendly interface allows to easily manage alarm conditions, to analyze events and data, to fully monitor the status of your laboratory in real-time, to manage the access of personnel into the restricted areas.

REGULATORY FRAMEWORK

Systems can meet the more stringent requirements of the applicable directives (cfr. Directive 2006/86 Annex I, C.2, D.6, D.7, Annex II, D.1) and specific guidelines (JACIE, GMP) used for biological laboratories and IVF laboratories (In Vitro Fertilisation).



Two laboratories, the same equipments, the same need of supervision but two different solutions: wired or Wi-Fi.

SINTESY.eagle.easy
SINTESY.eagle.lab
both solutions

1

S114
It measures the liquid nitrogen level and temperature inside cryogenic refrigerators and converts these physical quantities into 4/20mA signals.

2

SINTESY.eagle.lab
Certified Medical Device, this software displays the 3D rendering of the laboratory, the values of controlled parameters, active alarms, trends, tables, ... and stores collected data.

3

S182
RFID badge reader. Only authorized personnel, endowed with badge (S184), is allowed in restricted areas.

4

S186
Deadman alarm function: if the button isn't pushed for a programmable time, the system activates an alarm.

5

S200.smart
Supervision terminal that displays detected alarms in the laboratory and the values of controlled parameters.

6

S2000
Portable Wi-Fi datalogger: it measures temperatures, levels, clean contacts, environmental temperature and humidity of cryogenic refrigerators, ultra freezers, blood banks, hoods and any other equipment of the laboratory.

7

SINTESY.eagle.easy
Supervision software, certified Medical Device. It stores and displays data, collected and sent by a great number of S2000 modules through the Wi-Fi network.

8

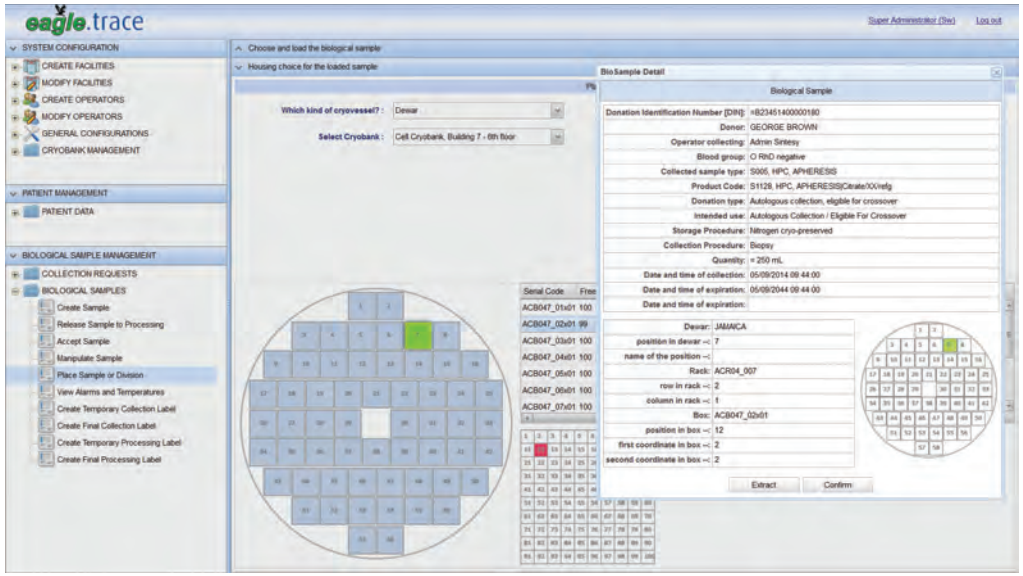
S210.smartSensor
Oxygen sensor to prevent anoxia of operators. In addition or as alternative, it measures the carbon dioxide level and ambient temperature and humidity too.

9

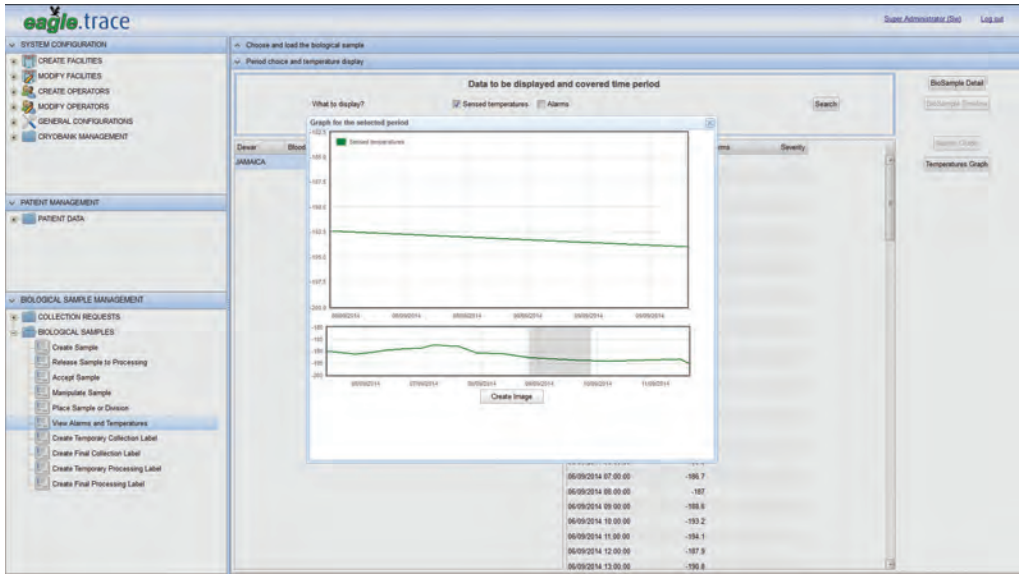
S185
Acoustic and visual indicator to warn about the activation of any kind of alarm within the laboratory.

traceability of biological samples

The solution for the traceability of biological samples that works in cooperation with another software of the SINTESY.eagle® family to link the temperature values and alarms to each sample stored



1.



2.

SINTESY.eagle.trace is the cloud solution for the traceability of biological samples in biomedical and research centers, cryobanks, laboratories and all contexts where the traceability of events and products is required or recommended.

The software offers a powerful tool for traceability at all stages of processing of biological samples: from the collection of the sample from a donor, to the storage and manipulation in controlled conditions, until the possible transplantation to a patient.

SINTESY.eagle.trace can be integrated with another software of the SINTESY.eagle® family used for the supervision and/or automation of biobanks/cryobanks.

ISBT 128

ISBT 128 is a global standard maintained by International Council for Commonality in Blood Banking Automation (ICCBBA). It is used for the identification, labeling, and information transfer of human blood, cells, tissues and organ products. ISBT 128 allows an unambiguous and precise transfer of biological information, gathering more information in less space and performing an auto-verification of data inherent in coding.

1. Users can analyze the details of each collected sample and easily place it inside a dewar.

2. Temperatures and possible alarms detected for a specific biological sample during the selected period.

Discover the main features of SINTESY.eagle.trace:

System management
The software considers three kinds of structures: clinical, collection units and processing units. Isn't your structure one of them? SINTESY.eagle.trace can be personalized according to specific customer requirements.

Patient management
The software application permits tracing patients, whose data are stored in the database, and can only be accessed by dedicated and authorized personnel.

Sample management
For each biological sample, a collection request can be drawn up, specifying all the requested data, the manipulation/s to be made, and showing any tests already performed. It is possibile to receive biological samples from other centers even if only the label, readable by a bar code reader, is available.

Adaptability
The software can be adapted by the manufacturer in order to perfectly fit the work-flow of your biological center according to specific SOP.

Graphical interface
The modular graphical interface is user-friendly and intuitive for all operators in the industry: the graphical representation helps and supports the user in navigating the application and in completing the forms, using different colors as an element of accessibility.

Sample search and details
A collected sample can be searched on the basis of its characteristics (family of product, donor, time of collection,...) or its positioning inside the cryoroom and inside a specific cryogenic freezer. Graphical tools allow the user to configure dewars, freezers and all racks so that each sample can be easily positioned and searched every time you need.
The "trace.inventory" software package can be considered also as a stand-alone product and can be purchased singularly.

Temperatures and alarms
For each biological sample, the temperature pattern and the relative alarms over time can be displayed and analyzed thanks to the integration to another software of the SINTESY.eagle® family.

Labelling
A label can be created and printed of any dimension specified in the ISBT128 standards and/or of personalized dimensions in the case of sterile packs of non-standards dimensions.

REGULATORY FRAMEWORK

SINTESY eagle.trace is developed in accordance with:
Directives 2006/86/EEC and **93/42/EEC**
JACIE, Joint Accreditation Committee-ISCT&EBMT
GAMP 5, Good Automated Manufacturing Practice
CFR-21, Code of Federal Regulations Title 21 Part 11

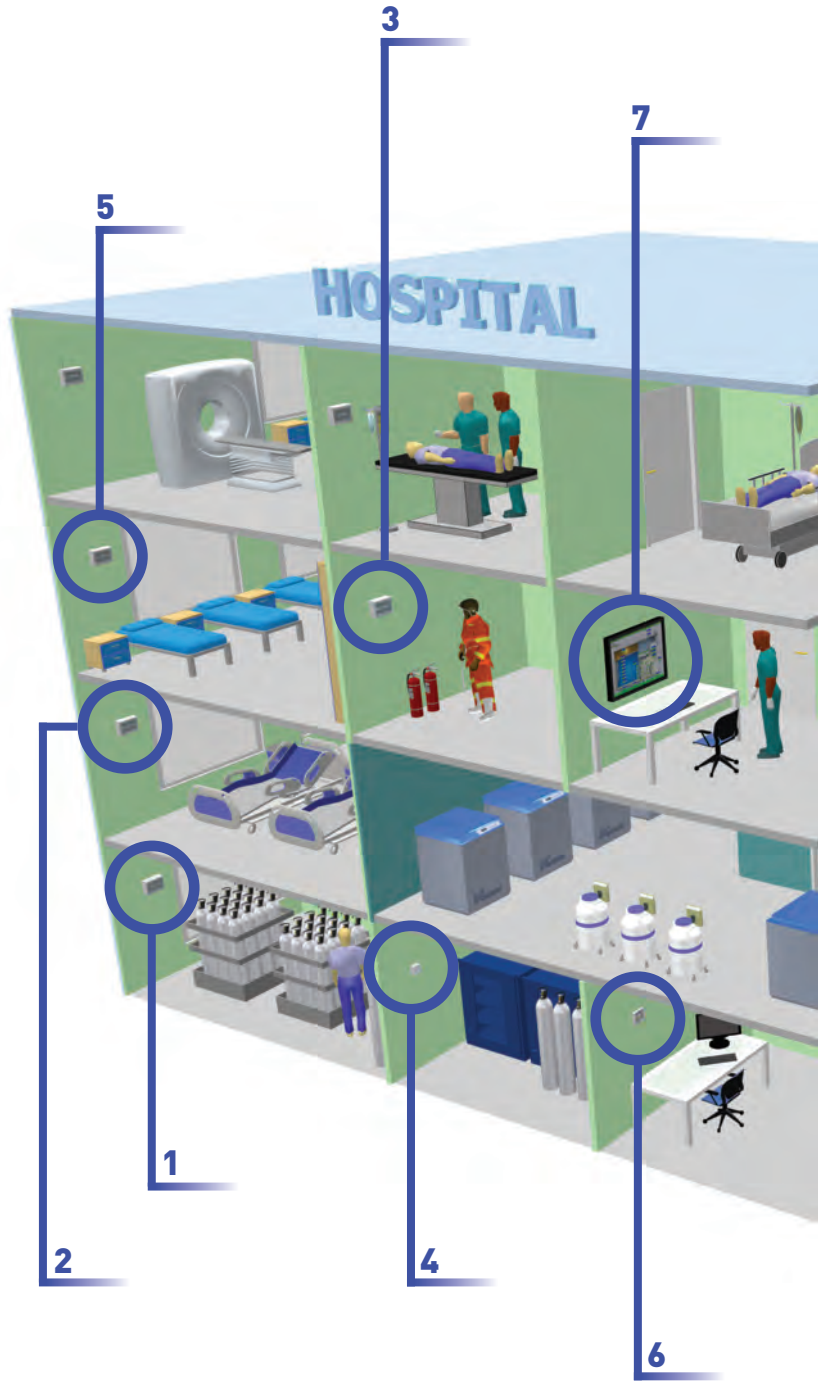
Medical Gas Pipeline Systems (MGPS)

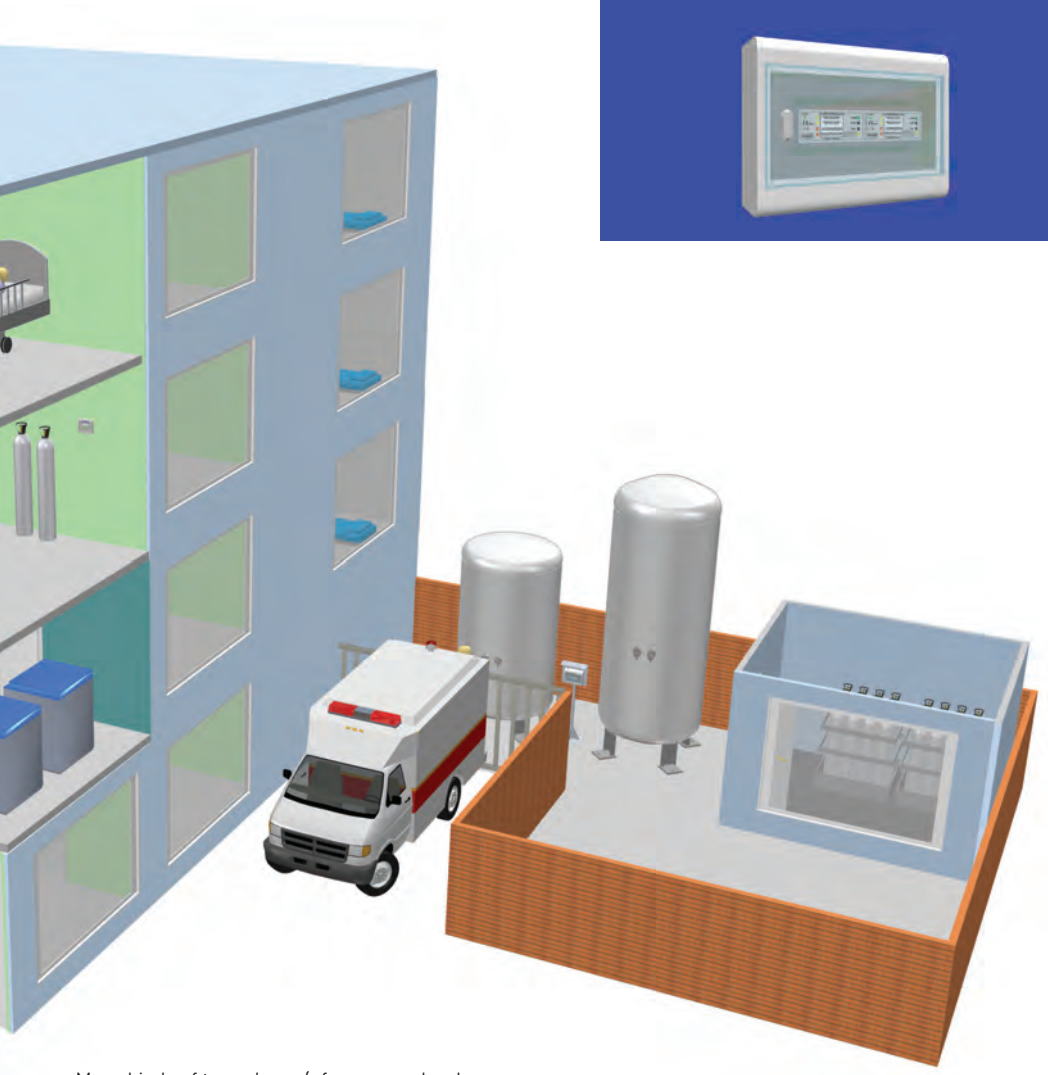
The SINTESY.eagle.gas solution completely fulfills the requirements of the EN 7396-1 and 7396-2 standards regarding alarms management in medical gas systems.
Both hardware and software components are Medical Device certified, in class IIb according to 93/42/EEC european directive

The control and supervision of medical gas pipeline systems (MGPS) might represent an hard task to complete.
The task becomes even harder if it is requested to monitor several hospitals or buildings, with many equipments and systems, and a large number of physical quantities to measure.
The solution is a SCADA system (Supervision Control And Data Acquisition) that gathers information toward a single control room, where all of the variables and alarms of the plant are displayed, if available, the LAN/WAN interconnection can be used.

SINTESY offers a turnkey solution, Medical Device certified, based on:

- **RTU** modules, properly connected with transducers and sensors. The detection of pressures, levels, temperatures, flow rates, and alarm contacts and any other analog/digital signal can be implemented by the wide set of medical devices of the SINTESY.eagle® family.
- **S200.smart**, the supervision terminal that displays the status of the plant and possible alarms. It manages the SINTESY telephone dialer for the dispatching of alarms call/SMS/e-mails and sends data to the industrial PC through the LAN network.
- **SINTESY.eagle.gas.** Running on an industrial PC, the software allows to store data and events in the database, to analyze data by means of tables, trends and reports and to easily identify the different geographic areas: cities, hospitals, buildings and floors are virtually represented on the screen and simply accessible by a mouse click.





Many kinds of transducer (of pressure, level, temperature, ...) installed in different areas of the hospital can be easily monitored by the SINTESY.eagle.gas system, using the RS485 bus or the Ethernet network.

1

S120-1
Used to detect and remote operative alarms of the central medical gas supply system.

2

S120-2
Used to detect and remote emergency alarms of vacuum and monitored gases such as oxygen, nitrous oxyde, medical air...

3

S120-3
Used to control the status (open/closed) of shut-off valves.

4

S122
Medical device that reports alarms to firefighters and safety personnel.

5

S100
Programmable microPLC usually used is in medical gas systems for alarms detection (pressure switch, thermal switch, ...).

6

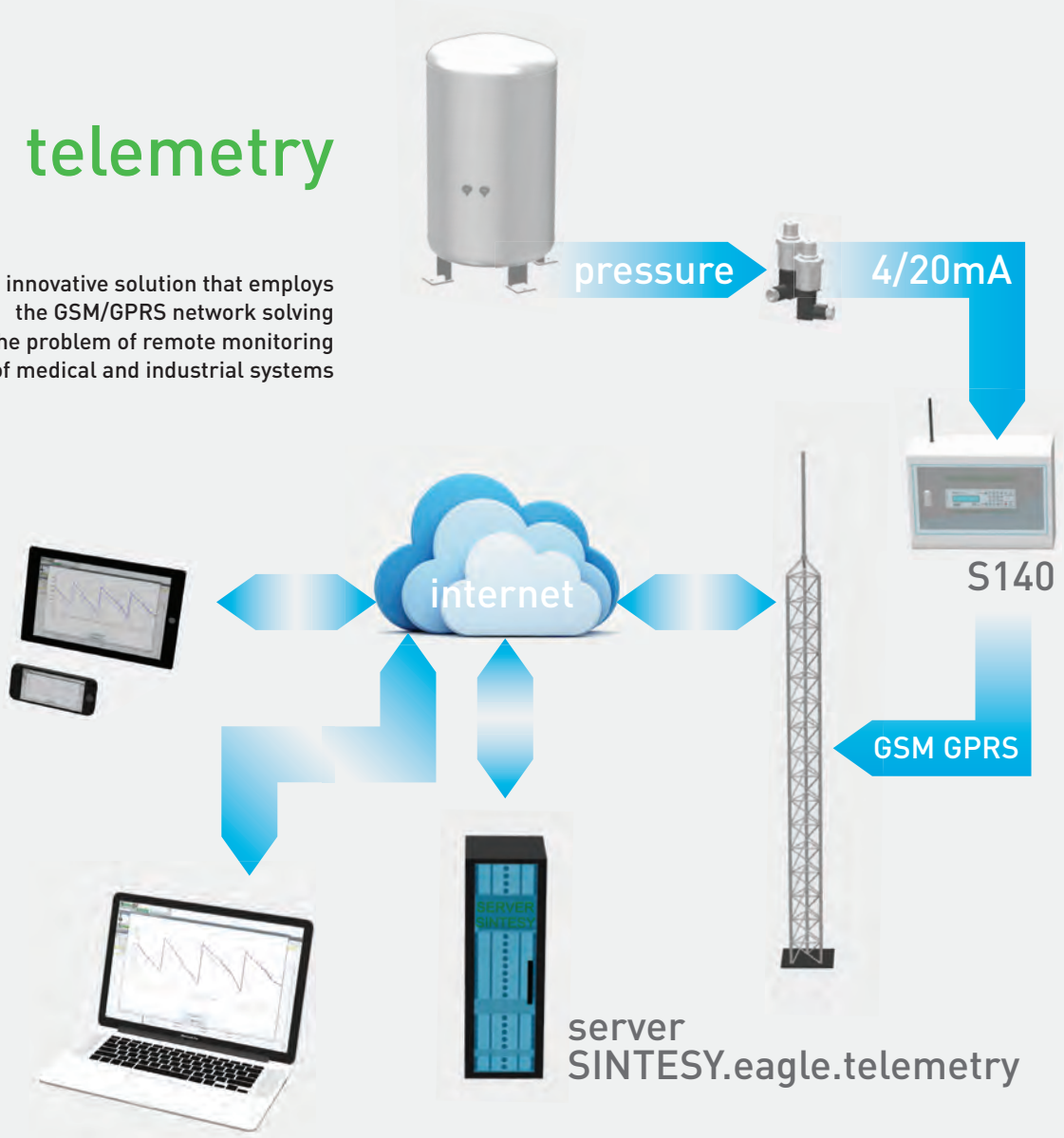
S200.smart
Supervision terminal that displays alarms detected by RTUs installed to control the MGPS.

7

SINTESY.eagle.gas
Certified Medical Device, this software displays scaled maps of the plant, description of alarms and recorded data.

telemetry

An innovative solution that employs the GSM/GPRS network solving the problem of remote monitoring of medical and industrial systems



Sometimes, common communication systems such as the LAN network and the RS485 protocol don't represent the suitable answer to the need of monitoring medical or industrial equipments.

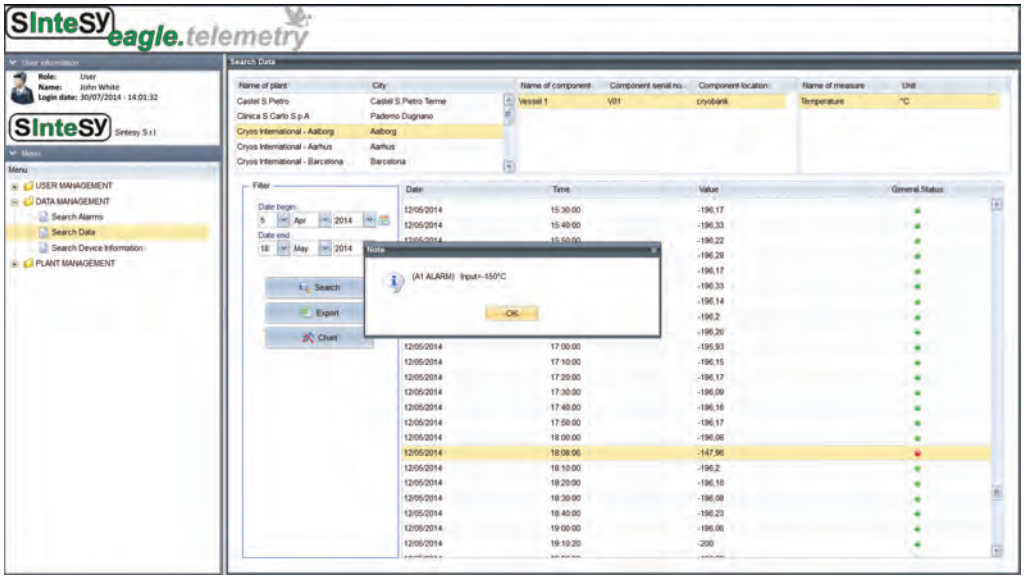
Cryogenic tanks, medical gas distribution systems, cylinder packs, environmental control system, and so on, might be installed in an unreachable areas.

The SINTESY telemetry service is the solution that offers a supervision system based on the GSM/GPRS network, just like your mobile phone.

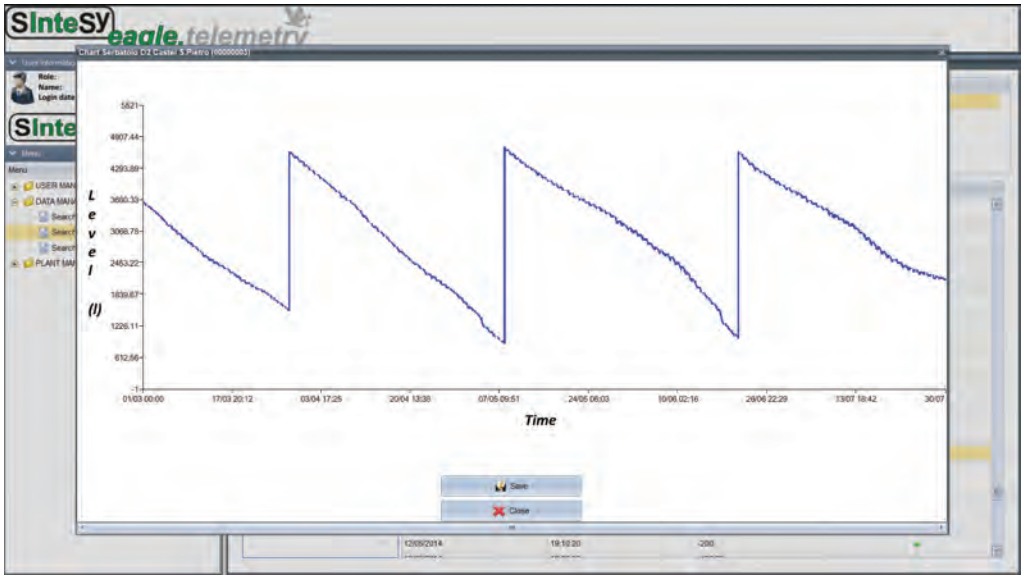
It consists of:

- A low cost RTU module of the SINTESY.eagle® family, named **S140**. This medical device is able to implement a great number of functions: it is able to measure the quantities of interest of the monitored equipments: pressure, level, temperature, alarm contacts...
  The module is equipped with a common SIM card which allows the dispatching of phone calls, SMS and/or e-mails in the event that an alarm condition is detected, so that operators are promptly warned about the possible dangerous situation. The S140 works as an efficient data logger: its internal memory is able to store more than 10000 data and up to 1000 events, including power failures, alarm detections and activities of the GSM module. Through the GSM/GPRS network, all the recordings are periodically sent to the server and consultable using the dedicated software.

- **SINTESY.eagle.telemetry** is the medical device software developed by SINTESY for the storage and management of data collected by the S140 modules installed in different plants. Using a common web-browser (running on smartphones, tablets or PC), operators can easily access all information, create charts and tables, export data in Excel format. In case of alarm, the S140 module dispatches alarm messages to pre-set users and sends recorded data and events to the server: then, thanks to SINTESY.eagle.telemetry, users can promptly and fully analyze the status of the plant from a remote site or just sitting at their office.



Using a common web-brower, users can gain all information sent by the S140 module such as data and alarms.



Collected data can be displayed in a chart to allow their analysis and exportation.

services

SINTESY works to guarantee the highest quality of products and services, aiming to the complete satisfaction of our Customers

SINTESY provides services in accordance with quality standards such as ISO 9001, ISO 13485 and GAMP guidelines.

Hardware and software design

Every hardware and software product of the SINTESY.eagle® family was born in SINTESY. A qualified and well-experienced team of engineers works to create state-of-the-art and reliable solutions for operators and end users of medical and research centres. Our knowledge is at your disposal at every stage of the development of your project: definition of the user requirement specifications (URS), hardware and software design and implementation, costs analysis, drafting of the technical documentation and testing in factory and on site (FAT and SAT).

Installation and commissioning

The SINTESY.eagle plant, designed in accordance with the customer requirements, can be installed by qualified personnel from SINTESY or third parties. In accordance with GAMP procedures, the validation of the plant consists of IQ (Installation Qualification), OQ (Operational Qualification) and PQ (Performance Qualification). Each tests, performed on the basis of the project documentation, is described in a dedicated document named SAT (Site Acceptance Test).

Routine maintenance

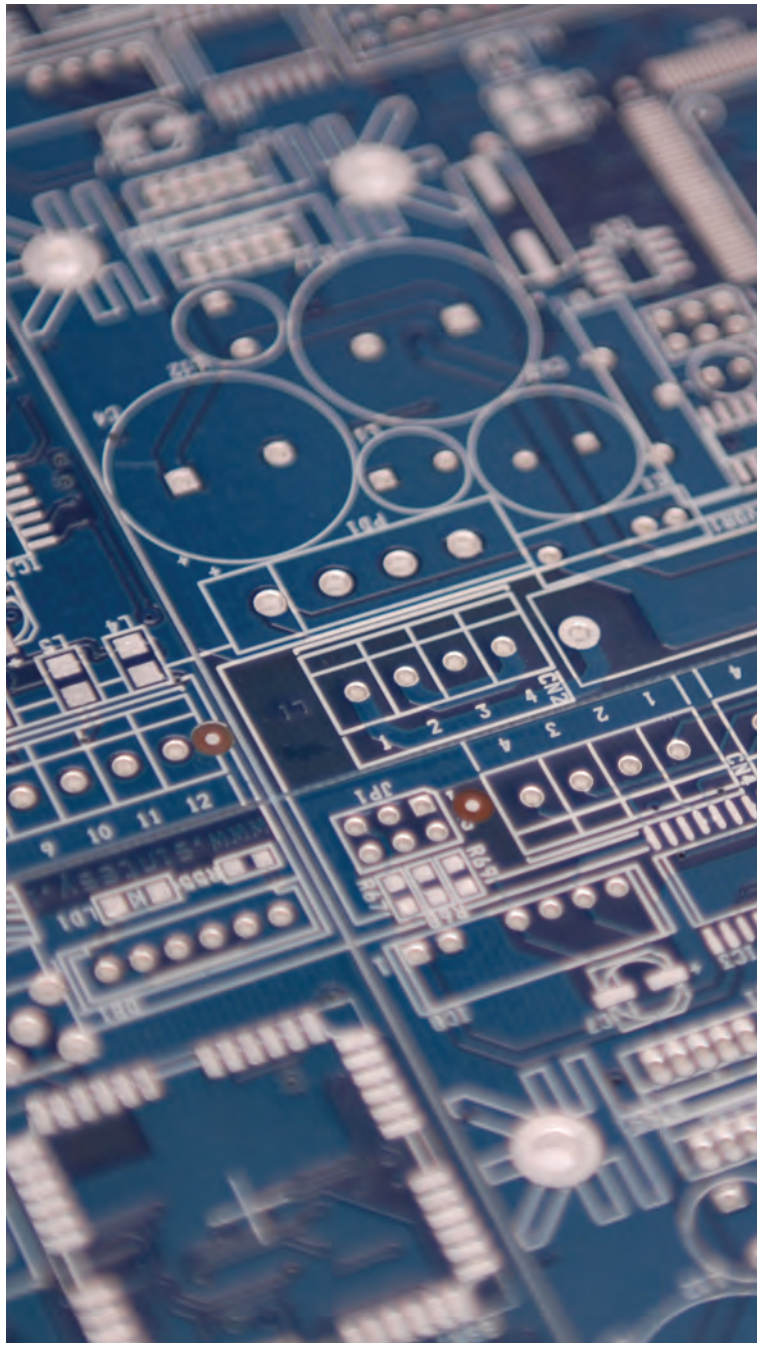
Maintenance activities can be performed by qualified and properly trained personnel, from SINTESY or third parties. Procedures and frequencies are defined during the design stage of the project.

Helpdesk

All of the SINTESY.eagle® solutions for biobanks/cryobanks, laboratories and MGPS can be connected to the Internet and remotely controlled by the SINTESY qualified team of technicians at the Company headquarters. In particular, the helpdesk service supports operators during start-up activities, when they are still inexperienced about the system.

Certified calibration of sensors

SINTESY offers the possibility to periodically calibrate your temperature probes and data loggers using instruments certified by accredited bodies which guarantee the accuracy of the measurement within declared ranges.



Programmable Logic Controllers (PLC)

S300.smartPLC

Supervision and automation terminal.
Specifically designed to fully control the automation of CRYOBANKs and BIOBANKs.
LCD color screen with touch screen, 5.7", 320x240 pixel.
Dedicated software (SINTESY.eagle®), able to perform most of the functions required for the management of a cryobank, such as: degassing of the insulated pipeline (up to 4 different trunk lines can be controlled); synchronized filling, using the SINTESY AGF® algorithm (Automated Group Filling) or the standard one; external LN_2 tank control (pressure and level); management of alarms, ventilation system, antitheft system, telephone dialer (S140), ...
Up to 32 cryogenic freezers controlled.
Supported brands: CRYO DIFFUSION equipped with S170; AIR LIQUIDE with 4-20 UNIT and the S170-20; CHART-MVE with TEC3000 and TEC2000; TAYLOR WHARTON with the M505CE; CBS with 2301 and S170-20 (*).

S200.smart

Supervision terminal. Used in supervision systems to show the status of RTU installed (S100, S110, S120, S140, S170, S180, ...).
Typical application: hospital where a control room detects and manages all alarms coming from central supply system and different departments or buildings.
LCD color screen with touch screen, 5.7", 320x240 pixel.
Alarms are displayed in chronologic order and consist of configurable text messages that include the description of the alarm and its location. Visual and acoustic indicators to warn operators about possible dangerous situations. Management of the SINTESY telephone dialer S140, in order to dispatch alarm calls, SMS and e-mails.
The module can be used as Master (detecting alarms and data from different RTUs installed in the plant) or Slave (connected to and managed by the supervision PC or by a S200.smart in Master mode).

S200.smartOxygen

Used to show the values detected by gas sensors (CO_2, NO_2, H_2, NH_3, ...) installed inside rooms with potentially dangerous situation, for example cryobanks, biobanks ad biological laboratories, especially if the liquid nitrogen is used.
Typical application: displaying of the oxygen percentage in biobanks/cryobanks, scientific laboratories or other rooms with danger of anoxia for operators.
LCD color screen with touch screen, 5.7", 320x240 pixel.
Visual and acoustic indicators to warn operators about possible dangerous conditions.
Usually installed inside sensible rooms, positioned at 200-240 cm from the floor so that operators can easily read concentration values and, if necessary, take safety actions.

hardware products

The SINTESY.eagle® family gathers a great number of hardware products completely designed and manufactured by the SINTESY team of engineers and technicians. These products are able to work in cooperation, sharing information and achieving high performance levels. Main features and abilities of devices merge into customized and reliable systems that represent the best solution to Customer requirements. The set of hardware products includes PLC (Programmable Logic Controllers), gas sensors, RTUs (microPLC, datalogger, telephone dialer, ...), cryogenic freezers controllers, communication tools and utility devices

Products marked with this symbol are certified Medical Device, CE0051 according to European Directive 93/42/EEC and 2007/47/EEC, Annex II; class IIa following Annex IX, rule 2

Products marked with this symbol are certified Medical Device, CE0051 according to European Directive 93/42/EEC and 2007/47/EEC, Annex II; class IIb following Annex IX, rule 9

SENSORS

S210.smartSensor

Oxygen sensor and/or carbon dioxide sensor. A coloured LCD, with touch screen technology, displays in real time: O2 and/or CO2 percentage, room temperature and humidity. According to the values detected, the screen switches from green to yellow or red and an acoustic sound is activated for warning or alarm condition. Many output interface signals are provided: 4/20mA, RS485 bus, LAN-Ethernet.
The sensor can be connected to other SINTESY modules (S185 or S122) in order to activate remote visual and acoustic indicators and, in this way, warn operators about dangerous conditions.
Usually installed in cryobanks, biobanks and biological laboratories where liquid nitrogen is used in order to protect operators from the danger of anoxia and/or to monitor the properties of the environment in terms of temperature and relative humidity.

Remote Telemetry Unit (RTU)

S100

MicroPLC with 16 digital inputs and 16 digital outputs; power supply 24V~; LCD display with backlight; programming keyboard and high efficiency LEDs; acoustic and visual indicators according to EN7396-1 and EN60601-1-8; RS485 interface; DIN rail (9 modules); real time clock for events storage.
Normally used is in medical gas systems for alarm detection (pressure switch, thermal switch, etc...)

Other versions:

S100-1

designed for NAMUR sensors.

S110

MicroPLC with 4 analog inputs; power supply 24V~; LCD display with backlight; programming keyboard and high efficiency LEDs; acoustic and visual indicators according to EN7396-1 and EN60601-1-8; programmable inputs as 0-20mA, 4-20mA, 0-10V, 2-10V; RS485 interface; DIN rail (9 modules). Normally used is in medical gas systems for alarm detection and measurement (level, pressure, temperature, oxygen percentage, etc...).
Available version equipped with 4 analog outputs (S110-AO).

Other versions:

S110.cryoControl

designed for simple automation in biobank/cryobank: cooling of the vacuum insulated line, degassing with temperature control, oxygen percentage monitoring, reading of level/pressure of external LN_2 tank.

S110.switchOver – designed to manage two cylinder packs of gases (LN_2, CO_2, O_2, ...) and their respective solenoid valves. The system switches from one pack to the other depending on the liquid level (or its weight) or pushing a button. Oxygen alarm is also managed.

S114

Conversion module for RTD probes(PT100/PT1000) from temperature to 4/20mA signal; power supply 24V=; DIN rail (EN 60715) according to DIN 43880 (2 modules).

Versions:

S114-1

PT100 probe to 4/20mA signal; Range -200°C/+50°C;

S114-2

PT1000 probe to 4/20mA signal; Range -200°C/+50°C;

S114-3

PT100 probe to 4/20mA signal; Range 0°C/+100°C;

S114-4

PT1000 probe to 4/20mA signal; Range 0°C/+100°C.

More versions can be implemented according to Customer's requests.

S120

Module for alarm detection in medical gas systems; high efficiency LEDs; acoustic and visual indicators according to EN7396-1 and EN60601-1-8; RS485 interface; DIN rail (6 modules).

Versions:

S120-1 (230V~) and **S120-11** (24V~)
5 digital inputs; operative alarms;

S120-2 (230V~) and **S120-12** (24V~)
9 digital inputs; emergency alarms;

S120-3 (230V~) and **S120-13** (24V~)
module for valves status control with NAMUR sensors or dry contact; 5 valves.

S122

Remote alarm system; power supply 24V~; high efficiency LEDs; acoustic and visual indicators according to EN7396-1 and EN60601-1-8; RS485 interface; DIN rail (2 modules). Muting function.
Normally used in medical gas system for alarm remotization; direct connection with other modules (S100, S110, S120, S140, ...).

Other versions:

S122-1
power supply 24V=; the power supply of this module can be obtained by the voltage generator available on all the modules of SINTESY.eagle® family like the S100, S110, S120, S140, S210.smartSensor, etc. so that connections are extremely simple and cheap.

S140

Quadband GSM telephone dialer; power supply 24V~; LCD display with backlight; programming keyboard and high efficiency LEDs; acoustic and visual indicators according to EN7396-1 and EN60601-1-8; RS485 interface; DIN rail (9 modules); real time clock for events storage.
8 programmable inputs as 0-20mA, 4-20mA, 0-10V, 2-10V, digital; 8 programmable digital outputs. Voice synthesis of alarm messages (up to 69 customizable voice messages); programmable alarm SMS and e-mails (up to 69 text messages). Up to 8 configurable users as recipients of alarm messages.
The module can operate as stand-alone device or it can be part of a network of other modules connected on a RS485 bus (SINTESY.eagle® system).

Other versions:

S140-1
not equipped with the GSM module.

S2000

Portable datalogger for alarm detection in biological laboratories; battery power supply (external power supply as option) programmable visual and acoustic indicators; able to store up to 250000 records; Wi-Fi 802.11 technology used to send data to the dedicated software (SINTESY.eagle.easy).

Versions:
Possibility to read 1 or 2 temperature probes (PT100 or PT1000), digital contacts, 4/20mA signals, environmental temperature and humidity. Please contact SINTESY for further details about available versions of S2000.

DEWAR CONTROLLER

S170

Liquid Nitrogen (LN_2) Level Control System – designed to monitor and control the liquid nitrogen level of a cryogenic vessel and to read its temperature using state of the art electronic technologies. The device is composed of two different units: the base module and the terminal operator module. The module is connected to the power supply and to the I/O components (LN_2 valve, probes, LID switch) and determines the operations of the vessel. A terminal operator interface is used to display data about temperatures, levels and alarms.
Main functions: detection of liquid nitrogen level; detection of temperatures (sampled on two different points); displaying of temperatures, levels and alarms on LCD display with back light; automatic filling procedure (based on low level/high temperature); manual filling procedure; alarms detection and control; LID status (with defog, fast freeze, time-out lid alarm); hot gas by pass function (as option); daisy-chained interface for sequential or parallel filling. Remotization of all the device functions with RS485 serial protocol; compatible with the other devices of SINTESY.eagle® family; user-friendly keypad to simplify operations; up to 4000 data recorded at programmable intervals; up to 400 events recorded; connection to Real Monitor Software to get the data stored.

Other versions:

S170-10

without serial port.

S170-20

to manage AIR LIQUIDE vessels with 4-20 UNIT interface or CBS vessels with 2301 interface. (*)

ACCESS CONTROL

S180

RFID Access Control. Used as standalone device or connected to the SINTESY.eagle® supervisory system; able to manage up to 4 RFID S182 readers. Possibility to control 4 different gates with entrance detection only, or 2 gates with entrance/exit detection; 4 programmable relay outputs with 4 N.C. and N.O. contact; 4 programmable digital inputs; RS485 communication port; USB port for programming, using a PC. Power supply: 24V~; LCD display with backlight; programming keyboard and high efficiency LEDs; acoustic and visual indicators; DIN rail (9 modules).

S182 and S184

S182

RFID Reader at 125kHz. It can be wall-mounted using a smart box. Other special inclosure options are available, such as the 503 enclosure type.

S184

RFID Badge cards. Badge card with unique code using the RFID technology.

COMMUNICATION TOOLS

S130

Communication protocol repeater/converter. Power supply: 230V~; front LED panel; DIN rail (6 modules); programmable function by means of dip-switch: a) double RS232/RS485 converter; b) double RS485 repeater; c) RS232/RS422 converter.
Used to convert physical layer protocols for amplification/regeneration of electrical signals such as RS422/RS485.

S132

Communication protocols converter.

Versions:

S132-1

Industrial USB to RS232 converter.

S132-2

Industrial USB to RS485/RS422 optoisolated converter.

S150

Multibus Controller – protocol converter. Able to convert a LAN interface into up to 4 different RS485 connections; possibility to use the existing LAN/intranet connection of buildings in order to connect many RTU modules (S100, S110,...), reducing the cable routing costs.

S190

Smart Communicator equipped with analog inputs and used to convert RS485 protocol into Ethernet/LAN protocol and vice versa. Power supply 24V~; LCD display with backlight; programming keyboard and high efficiency LEDs; acoustic and visual indicators; RS485 and Ethernet communication interfaces; DIN rail (9 modules).

MEDICAL DEVICE CERTIFICATION

Most of the SINTESY.eagle® hardware and software products, used for automation and supervision of cryogenic areas and equipments, are certified Medical Device in accordance with European Directive 93/42/EEC and 2007/47/EEC. Each device is defined in Class IIa or IIb, according to the function it is intended for.

ACCESSORIES

S185
Indication panel. Red light to indicate alarms, yellow light to warn about a possible danger, green light for normal and safe condition. Acoustic indicator that can be disabled by means of a button, as option.

S186
Watchdog button that allows the system to monitor the active presence of an operator in the cryobank (dead man function). Equipped with a gray push button and a green visual indicator with a buzzer, activated in the event that the user doesn't push the button within a programmable time.

S187
Push button for line cooling. If pressed for 5 seconds, it activates the cooling and filling processes of the line; if pressed for 10 seconds, it stops them. Equipped with a yellow light to indicate the cooling/ degassing phases (blinking light) and the filling phase (light on).

S188
Emergency push-button. When pressed by the user, safety measures are taken: the S140 dialer sends alarm messages, forced ventilation is activated, liquid nitrogen is no more supplied, ...

SAFETY MEASURES

SINTESY pays serious attention to safety, at every stage of the designing and implementation of a new system. The safety of operators is the utmost priority: many devices aim to allow users to be promptly warned about dangerous conditions, to understand if any colleague is in unsafe situations, and to activate automated safety actions in case of problems. In accordance with ISO 14971 standard (Application of risk management to medical devices), SINTESY is committed to design reliable and safe systems even in case of electronic damages or faults. The same effort is made to guarantee the safety of biological samples stored in the monitored areas/equipments and the security of data and electronic records.

SCADA SOFTWARE FOR AUTOMATION AND SUPERVISION

SINTESY.eagle.cryo

SCADA system for supervision and automation of biobanks and cryobanks.
Communication interface with the S300. smartPLC terminal.
3D representation of the plant and equipments.
Possibility to implement the access control system (S180-S182-S184), the antitheft function, and the video-recording system.

SINTESY.eagle.lab

SCADA system for supervision of equipments installed in biological laboratories: small cryo vessels, programmable rate freezers, hoods, oxygen sensors, ultra freezers, blood banks refrigerators, microbiological incubators and much more.
It is part of the wired solution for the control of biological laboratories.
Communication with RTU modules for signals acquisition.
3D representation of the plant and equipments.
Possibility to implement the access control system using the S180-S182-S184 devices.

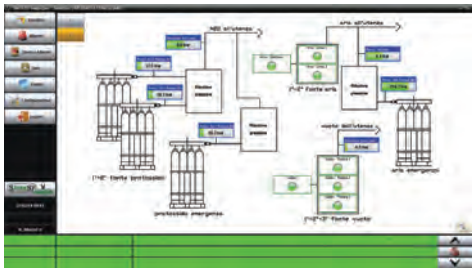
SINTESY.eagle.easy

System for supervision of equipments and environmental parameters of biological laboratories.
Communication through the Wi-Fi network.
Fully configurable by the user.
Simultaneous communication with a large number of devices, widespread in different hospitals, buildings, rooms.

software products

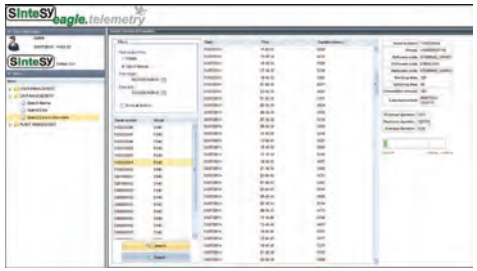
SINTESY.eagle® for supervision and automation is a SCADA system completely designed and developed by the SINTESY team of engineers. It consists of software products that, in cooperation with electronic devices (hardware RTU) , represent the solution for the management of different scientific and medical environments. Features in common: displaying real-time physical quantities such as pressure, level, temperature, and so on...; displaying real-time alarms; acoustic and visual indicators for alarm condition in accordance with EN60601-1-8; storage of measured values, with configurable frequency; storage of events and alarms; reconstruction of data in graphical and tabular form, exportable in Excel format; ability to send alarm messages (phone calls, SMS, e-mails) via telephone dialer S140 on GSM network; possibility to be assisted by remote using intranet or internet; multi-language support (IT, EN, FR, GE, others on request) and alphabet (today Latin and Cyrillic) ; ability to conduct an "inspection" by operators with periodic reports, representing the status of the whole plant; based on a powerful database (DBSM); designed according to the guidelines GAMP4 and CFR21-11

SCADA SOFTWARE FOR SUPERVISION



SINTESY.eagle.gas

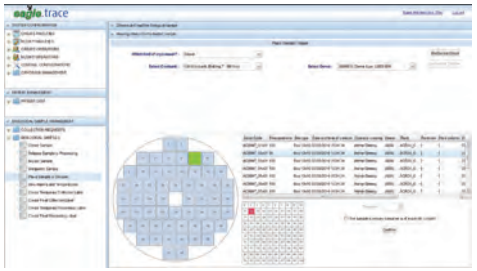
SCADA system for supervision of Medical Gas Pipeline Systems (MGPS) in accordance with EN7396-1. Multilevel representation of the plant for an easy navigation of areas and equipments.



SINTESY.eagle.telemetry

System for supervision that allows the measurement and control of remote physical variables using the GSM/GPRS network. Used in cooperation with the S140 module of the SINTESY.eagle® family.

TRACEABILITY



SINTESY.eagle.trace

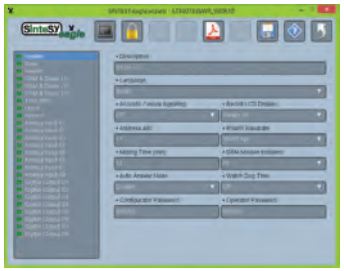
Modular system for the traceability of biological samples in biobanks and biological laboratories.
Possibility to be integrated in supervision/ automation systems implemented with SINTESY.eagle.cryo, SINTESY.eagle.lab, SINTESY.eagle.easy softwares.
Traceability of actions performed by each operator; batch records; CFR21-11.

Available version:

FULL – all functionality including SOP management.

INVENTORY – inventory function for the position of the samples inside the biobanks and cryo-container and traceability of temperatures/alarms.

UTILITY



SINTESY.eagle.wizard

Utility software which allows to easily configure all the RTUs of the SINTESY. eagle® family using their RS485 port and an user-friendly interface.
Possibility to store the configuration of each device of different plants, import and export configurations; automatic learning of RTUs connected to the same RS485 bus; configuration report in PDF form; possibility to read and export events stored into the module; upgrading and downgrading of the RTUs firmware.

reference

Just a partial list of projects and installation that SINTESY did during the last years...

Hospitals of ULSS 7 – Veneto area (Italy)

Azienda Ospedaliero Universitaria Pisana Santa Chiara – Pisa (Italy)

University CHU - Rennes (France)

Hospital "Carle" - Cuneo (Italy)

Hospital EFS Creteil - Paris (France)

BioScience Institute - San Marino (San Marino)

Istituto Superiore di Sanità - Rome (Italy)

Hospital Saint Petersburg - (Russia)

Università degli studi - Brescia (Italy)

Commissariat à l'énergie atomique et aux énergies alternatives – CEA - Paris (France)

Hospital Santa Maria della Misericordia – Udine (Italy)

Hospital CECOS - Besancon (France)

Hospital S.Orsola Malpighi - Bologna (Italy)

Hospital San Pau - Barcelona (Spain)

Hospital CECOS - Cochin (France)

Hospital Murcia - (Spain)

Centro Procreazione Medicalmente Assistita LIVET - Torino (Italy)

Cryos International - Aarhus/Aalborg/ Copenhagen (Denmark)

Hospital SAINT-ELOI CHU - Montpellier (France)

Tecnobios Procreazione - Bologna (Italy)

Hospital NIIPA - Moscow (Russia)

Hospital Clermont Ferrant - (France)

Clinica San Carlo - Milan (Italy)

LIV Hospital - Istanbul (Turkey)

progetto:: Koan moltimedia

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DEALER