Construction site monitoring
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Since its humble origins over three decades ago, Sigicom has grown to become one of the most trusted and sought after manufacturer of robust measurement equipment for remote monitoring of environmental disturbances. In the early 80’s vibration monitors, seismographs and sound level monitors comprised the main thrust of our business. In more recent times we have expanded our products portfolio adding additional dynamic and static sensors. Thanks to the company philosophy of working close with and listening to our customers, never shying away from demanding or challenging requests; our products have improved and our company has acquired unique excellence in these areas.

Today Sigicom is an independent and privately owned company with focus on providing the most cost efficient equipment for remote monitoring of environmental disturbances from infrastructure projects. Development of autonomous robust measuring equipment and the accompanying software for presentation and reporting are areas to which we devote great attention, time and energy. Sigicom is actively involved in several standardization committees around the world, giving us the opportunity to provide our customers with the most competitive equipment on the market.

Reliable in harsh environments
All our equipment is robust and reliable, built to endure the harshest environments, withstanding cold Nordic winter nights as well as the Australian summer’s heat at high noon.
We provide complete solutions for your measurements including hardware, software and web interaction for compilation and presentation of measurement data. Sigicom’s INFRA system is modular, flexible and built to last; it is fully automated and transmits data via an internet connection, allowing you the measurement consultant to control numerous instruments simultaneously.

Plug & Measure
As a measurement consultant using Sigicom’s Plug & Measure sensors you can easily connect various sensor types you need for your project, for example a sound level meter, a geophone and an air blast sensor on the same bus cable to one of our data loggers. Toggling between various measurement standards is easy and possible since the digital signal processing is done in the sensor itself. Measurement standards and other parameters can be changed remotely on your computer in the comfort of your office without having to be at the job site.
View your measurement results in illustrative tables and charts using INFRA Net. Simultaneously stakeholders (construction manager), contractor and you can receive automatic SMS and e-mail alarms when limits are exceeded, battery level is low, cables are broken and more.

INFRA Academy & Our Services
Sigicom provides “INFRA Academy” an education to our customers delivering the fundamentals, ensuring you the best possible start with your new INFRA system. As a customer you can always contact us for support and advice. Our highly skilled engineers will guide and support you through unforeseen situations that can occur when measuring. We provide state of the art calibration and service of INFRA equipment to ensure measurement accuracy and instruments reliability.

Making challenging and complex measurements easy
Sigicom is a leading supplier of measurement technology, serving a large number of customers. Our solutions are being used in many key infrastructure projects in urban areas.
This urban building site represents a typical infrastructure project where remote monitoring using the INFRA system is the most cost efficient solution.
Building lifecycle
Keep track of the environmental impact with the INFRA system.
INFRA – A complete system for remote construction site monitoring

INFRA System
The INFRA System is comprised of a data logger and digital sensors. The data logger is built with internal battery, it stores and communicates data. A series of available sensors can be connected to a single data logger. For a complete wireless solution you can use our wireless vibration monitors C10/C12 or C20/C22.

Automatic communication
Measurement data are transmitted at pre-set time intervals or when an event occurs. Data is automatically sent to INFRA Net over the Internet and an alarm is sent as an SMS to selected recipients. The system can be remotely controlled from INFRA Net.

Multistandard
The dynamic sensors have digital signal processing and measures according to national and international standards. Signal processing is done through our software which makes it easy to add new or updated standards.
Calibration
Calibration service is second nature to Sigicom as a supplier of quality measuring instruments. Therefore, we track the calibration schedule for all sensors that we have delivered and we can give the customer an automated reminder before re-calibration is required.

Customers also have the option of sending the instruments to our calibration laboratory for service.

Only the INFRA sensors needs to be calibrated.

Service & Repair
If the need for service arises, for example due to damage to an instrument, we can always be at help.

INFRA-sensors and data loggers can be sent to Sigicom for repair or other service. We have excellent troubleshooting routines. After repair, upgrade or service - and if required - we will automatically calibrate the instrument before it is returned to the customer.

Support
We consider an active and effective support department as part of our mission to provide the best functionality and reliability of the measurement systems we deliver.

Every support request we receive is registered in our case management system. All activities and status of each case entered in the system stay active until the case is resolved.

Our phone support is open weekdays (CET) 9-16 (closed for lunch 12-13).

Calibration
Telephone: +46 8 44 99 750
calibration@sigicom.com

Service & Repair
Telephone: +46 8 44 99 750
service@sigicom.com

Support
Telephone: +46 8 44 99 770
support@sigicom.com
Our educations

Training

INFRA Academy Basic is a training program for the INFRA system. These not only provide the participants with training, but offer the chance to get to know Sigicom’s calibration, service, development work and other information concerning the INFRA-system. There will also be time for questions and discussions.

Training goal

After the course, you will be able to install an INFRA measurement system, launch and remotely control the equipment. You will also be able to retrieve data and create your reports. A continuous exchange between theory and practical exercises guarantees both knowledge of the system and the ability to use all the advantages of the system.

Participants

This course is for consultants who will be using the INFRA system.

Contents

Theory and practical exercises:
- General information on what you measure and which rules exist
- Information regarding standards
- General description of the INFRA system
- Presentation of INFRA Net, the online database and user interface
- Installation of a measuring system
- Practical exercises with the installation and start-up of the sensors and data logger
- Practical exercises with INFRA Net

Education

Telephone: +46 8 44 99 750
sales@sigicom.com
Keeping you up to date

Website
On our website you can always access the latest news and interesting articles on current events and new product launches.

Customer case
Here we publish interesting, relevant and educational customer cases from challenging situations all around the world where our customers have benefited from using Sigicom’s INFRA system.

INFRA News
INFRA News is a digital newsletter bringing you the latest news and information from Sigicom. Sign up on our web page and you will be among the first to know the latest.

LinkedIn
Sigicom updates the information of our solutions, products and company on Linkedin. You even find the latest information regarding constructions site monitoring. Please follow our LinkedIn page. https://se.linkedin.com/company/sigicom-ab
On the following pages, when this symbol appears it means that a separate datasheet is available. Please contact Sigicom to request datasheets and more information on specific products.
INFRA Net web application

Internet based measurement database

2150
INFRA Net

With INFRA Net you can view real time data and information from your INFRA systems online. It is easy to manage a large number of INFRA Systems with INFRA Net. By building, administrate and report your projects directly in INFRA Net you will save time and increase your productivity.

Based on the projects and measurement points you can easily extract reports in PDF format that can be sent directly to your customer.

The web application contains a powerful analysis function allowing you to generate different types of charts and curves from transient and interval data. INFRA Net’s remote control enables you to change measurement settings, connection schedule and much more directly from your office or anywhere you have an Internet connection. Interactive presentation of data, smart and flexible alerts/alarms transmitted from INFRA Net via e-mail or SMS directly to you or other stakeholders.
INFRA Net

- Present your data
- Easy to give your customer access to view projects and data
- Dashboard with an overview of Projects, Measure points, Hardware, Data reports and Messages
- INFRA Live to present streamed measurement data
- INFRA Messages to send server data text messages and e-mails
- Reporting: Use the powerful project report function or report from single sensors
- Projects: From sensor to reports, create, change and view your projects
- Remote control: Change settings such as measurement standard, threshold, recording time, interval time, connection schedule and alarm beacon settings
- Service messages: Get alarms on low battery, GSM coverage, cable loss and other critical information
- Equipment: Provides an overview of the INFRA systems health
- Customers: Build your customer database and get the right information on your reports
- INFRA Net API allows programming access to measurement data through a REST API
- GPS position for INFRA C20/C22 and INFRA Point

INFRA Net API

Allows INFRA Net customers access to measurement data - for their own presentation systems. The INFRA Net API allows programming access to measurement data through a REST API. The API is aimed for customers who are interested in using data from INFRA Net for software development and implementation in their own presentation system and/or for customized analysis of the data.

Advantages for INFRA Net API:
- Quick and easy access to measurement data for use in your own presentation system
- Secure authorisation of access to your data
- Total system redundancy
  - Fire proof
  - Daily back-up
- Measurement data redundancy
- Power outage redundancy
- Server redundancy
- Network outage redundancy
- Low cost of data ownership
- Make data searches & update them
- JSON Output
INFRA Sim

INFRA Global Communication solution

Advantages:
- Analyze and monitoring
- Fixed cost and text messages
- Communication issues will be handled direct by Sigicom’s support team
- Put your communication accounts on hold when no measurements are planned

2160

INFRA SIM

All INFRA Systems can be delivered with a SIM card and the customers configuration for sending data to the INFRA Net web application. This communication solution provides global roaming in more than 100 countries with more than 200 mobile operators.

Fixed cost per month that includes SMS from INFRA Net messages.

Support cases involving communication will be handled directly with Sigicom Support team instead of the local mobile operator. It will be possible to put your communication accounts on hold when no measurements are planned.

Contact Sigicom for a list of countries with coverage.
The wireless system

INFRA Compact is a complete automated vibration monitoring in a small package. Benefit from a cost-effective system with everything from sensor to communication and web application – no cables required!

The world’s smallest wireless vibration monitor
The INFRA C20 is Sigicom's latest innovation. The brand-new hardware platform utilizes the latest technologies, such as modular communication, OLED color display and built in GPS. This will provide long service life in harsh conditions with unparalleled reliability.

The INFRA C20 with geophones and a data logger built into the same wireless unit. The monitor works with INFRA Net in the same way as the other INFRA sensors and data loggers. Extreme low power consumption gives the INFRA C20 up to seven months of measurement time, well ahead of all similar systems on the market.

**Advantages:**
- Excellent battery performance – even in low temperatures
- Rechargeable batteries
- Multi button keypad
- Color display
- Remote firmware upgrade
- Built-in 4G modem
- GPS

**Measures:**
- Vibration
- Vibration on sensitive electronic equipment in buildings
- Human Comfort

**Accessories – C20/C22**
- 1682 Power Supply
- 1628 Battery Charger, Li-ion
- 1679 Solar Panel Solution
- 1615 Adapter cable
- 1677 External Battery Cable
- 1257 External Antenna Connector
- 1250-1 External Antenna
- 1832 Protection Cover
- 1620 Li-ion Battery for C20/C22
- 1436 Additional AD Card

Datasheet available
Wireless Vibration Monitors

**5222 INFRA C22**

The INFRA C22 is Sigicom’s latest innovation. The brand-new hardware platform utilizes the latest technologies, such as modular communication and OLED color display. This will provide long service life in harsh conditions with unparalleled reliability.

The INFRA C22 with geophones and a data logger built into the same wireless unit. The monitor works with INFRA Net in the same way as the other INFRA sensors and data loggers. Extreme low power consumption gives the INFRA C22 up to four months of measurement time, well ahead of all similar systems on the market.

**Advantages:**
- Excellent battery performance - Even in low temperatures
- Rechargeable batteries
- Multi button keypad
- Color display
- Remote firmware upgrade
- Built-in 4G modem
- GPS

**Measures:**
- Vibration
- Vibration on sensitive electronic equipment in buildings
- Human Comfort

**Accessories - C20/C22**

- 1815-1 Leveling Plate
- 1821 Mounting Plate
- 1810-11 Ground Spike Conical
- 1888 Transport Case
- 1895 Tool Kit with Case
- 1870 Ex/ATEX Protection Box
Wireless Vibration Monitors

**Vertical/Triaxial Wireless Vibration Monitor**

**Advantages:**
- Wireless
- Rechargeable batteries
- Full remote control
- Simultaneous bargraph, waveform registration
- Live data

**Accessories – C10/C12**

- **1676** Power Supply - C10
- **1682** Power Supply - C12
- **1677** External Battery Cable
- **1615** Adapter cable
- **1675** Battery Charger, Li-ion
- **1679** Solar Panel Solution
- **1615** Adapter cable
- **1255** External Antenna Connector
- **1250** External Antenna
- **1831** Cover

**1608-2 Li-ion Battery**
(2 batteries included)
INFRA C10/C12

INFRA C10/C12 is a Vertical/Triaxial digital Geophone and a data logger built into the same wireless unit. The C10/C12 has a built-in GSM modem and GSM antenna. On the unit you have two buttons for operations and LED indicators for information.

All filtering, signal processing and detection is done digitally. Before the recording is started you only select the wanted standard that is presented in the Remote part of INFRA Net. C10/C12 records bargraph and transient data simultaneously.

The INFRA C10/C12 works with INFRA Net the same way as the other INFRA data loggers and sensors do. Low power consumption in combination with internal easily changeable Li-ion batteries, gives the INFRA C10/C12 several weeks of measurement time. Calibration is needed since the INFRA C10/C12 is a complete wireless vibration monitor, with built-in Geophones.

4210 - C10 Wireless Vertical Vibration Monitor (2 batteries included)
4212 - C12 Wireless Triaxial Vibration Monitor (2 batteries included)

**Measures:**
- Vibration
- Vibration on sensitive electronic equipment in buildings
- Human Comfort

**Accessories - C10/C12**

- 1810-11 Ground Spike Conical
- 1891 Tool Kit with Case
- 1815-1 Leveling Plate
- 1817 Mounting Plate
- 1821 Mounting Plate
- 1884 Transport Case
The INFRA Point concept

INFRA Point is a vibration monitor with a small, robust and traceable sensor, vertical or triaxial geophone.

The INFRA Point is built on a brand-new hardware platform utilizing the latest technologies, such as modular communication. This will give you unparalleled reliability as well as being future proof. INFRA Point has up to 12 months of continuous monitoring on internal rechargeable batteries (for the vertical geophone).

The monitor works with INFRA Net in the same way as the other INFRA sensors and data loggers.

**Advantages:**
- Up to 12 months of continuous monitoring on internal rechargeable batteries
- Built-in 4G modem
- OLED color display
- Simultaneous bar graph and waveform monitoring
- Remote firmware upgrade
- Digital signal processing
- GPS

Note! This product is only available in Sweden, Norway and Finland.

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**Accessories - INFRA Point**

- **1621** Li-ion Battery INFRA B100
- **1682** Power Supply
- **1628** Battery Charger, Li-ion (B50/B100)
- **1002, 1005, 1015** INFRA Point Cables (Available in different lengths)
- **1851** Wall Mount
- **1891** Tool Kit with Case

Datasheet available
The INFRA Point concept

A complete data logger with a small vertical or triaxial vibration sensor

Connect a vertical or triaxial sensor

5110 INFRA Point Vertical geophone
Geophone is a small lightweight vertical geophone that can handle the majority of measurement standards.

5112 INFRA Point Triaxial geophone
Geophone is a small lightweight triaxial geophone that can handle the majority of measurement standards.
Enabling regeneration
London is a vibrant and expanding city and as such has ever increasing demands on its transportation infrastructure. The Northern Line Extension is a vital part in the regeneration of key development areas such as Vauxhall, Battersea and Nine Elms.

The NLE consists of two new 3km running tunnels for the Northern Line of the London Underground from Kennington to Battersea, with two new stations (one at Nine Elms and one at Battersea) and two ventilation shafts in Kennington. The construction works began in 2014 across five main works sites. Sigicom have been working with FLo (Ferrovial Laing O’Rourke) and the Temple Group for the last three years providing an integrated environmental monitoring system.

Throughout the construction phase it has been necessary for the project team to effectively control and monitor a range of environmental parameters including noise, vibration and dust. Sigicom were bought in at the beginning of the project by FLo’s appointed consultants Temple group to provide an integrated, web based monitoring solution. Currently the project is monitoring 10 noise, 7 dust, 5 vibration and 4 wind/weather loggers across the five sites.

Through the use of INFRA Net (software) they have been able to simply monitor these parameters and the site team have been able to generate and manage the environmental data on a daily basis. Using our trigger system they have been able to identify and respond to environmental issues swiftly ensuring that corrective action is taken where required.

Cost effective and simple
The intention from the beginning of this project was to provide a web based system which enabled quick and simple reporting of the environmental monitoring data, this helped reduce cost and free up consultant time. With the system installed Temple have been able to hand over the routine data management and reporting tasks to the FLo team allowing them to focus on the technical areas of consultancy. The Environmental Manager for the project is Rob McCarthy from FLo:

The Sigicom System proved invaluable with its audio playback function and single point of access to all our monitoring data in enabling us to readily identify the source of noise, vibration and air quality triggers. In conjunction with the ability to download data for routine reporting it provided a cost-effective solution. The integrated web based monitoring has provided the project with proportionate data when they need it in an accessible format. The system contributed towards the NLE project being awarded a Green Apple Gold award for the implementation of environmental monitoring and control.
The cabled INFRA System is comprised of a data logger and digital sensors. The data logger is built with internal battery, it stores and communicates data. A series of available sensors can be connected to a single data logger.

Just plug and measure.
Connect many different sensors to one data logger

**4000, 4001**

**INFRA Mini**

INFRA Mini is a complete battery operated data logger with a built-in GSM/GPRS modem and GSM antenna. The logger has one outgoing connection for the INFRA bus cable and has a connection for an external GSM Antenna.

The data is stored on the exchangeable CompactFlash card. The INFRA Mini contains no measurement electronics that need calibration.

A series of available sensors can be connected to a single data logger.

- **4000** — INFRA Mini alkaline batteries/external power (batteries not included)
- **4001** — INFRA Mini Li-ion batteries/external power (batteries not included)

**1621 Li-ion Battery**

**Accessories – Mini**

- **1674-1** Battery Eliminator/Battery Charger
- **1628** Battery Charger, Li-ion (B50/B100)
- **1679** Solar Panel Solution
- **1606** Battery Holder Kit Li-ion (INFRA B100)
- **1100...** INFRA Sensor Bus Cable (Available in different lengths, please see page 46.)
- **1851** Wall Mount
Data logger with built-in communication

4030
INFRA Micro

INFRA Micro is a complete digital data logger with built-in GSM/GPRS modem or the option to connect an external modem. The INFRA Micro is equivalent to other INFRA data loggers and the external modem is controlled by automatic power switch. The data logger has one connection for the INFRA bus cable were sensors are connected. The front panel has four buttons (easy operation) and a LCD screen with 4 lines, each can display up to 20 characters.

INFRA Micro is powered by an external lead-acid battery housed within the enclosure and can be connected to an external power source e.g. solar panel, deep cycle marine battery. The data is stored on the internal CompactFlash card and automatically sent to INFRA Net.

The INFRA Micro contains no measurement electronics and needs no calibration.

A serie of available sensors can be connected to a single data logger.
(Lead-acid battery not included)

Measures:
- Vibration
- Vibration on sensitive electronic equipment in buildings
- Sound level
- Dust
- Air blast
- Motion
- Crack displacement
- Ground water level
- Pore pressure
- Wind speed and direction
- Rain intensity
- Air temperature

Accessories - Micro

1672 Battery Eliminator
1679-3 Solar Panel Door
1679 Solar Panel Solution
1618 Adapter cable
1862-1 Pole/Wall Mount Kit
1853 Bracket
1891 Tool Kit with Case
Sensors

3110
Vertical Geophone V10

- INFRA V10 is a digital Geophone that can handle the majority of measurement standards including acceleration and comfort measurement
- Dimensions: 78 x 78 x 45 mm (3.0 x 3.0 x 1.8 in) excl. pads and connector
- Weight approx. 500 gram (1.1 lbs)
- Maximum vibration level: 250 mm/s
- Frequency range: 1 – 500 Hz
- Protection class: IP67
- Designed for mounting on floor or wall. Equipped with mounting holes, both vertical and horizontal. Various mounting accessories are available.

3112
Triaxial Geophone V12

- INFRA V12 is a digital Geophone that measures vibrations from blasting, piling, sheet piling, excavation, compaction and traffic according to standards
- Dimension: 102 x 78 x 75 mm (4.0 x 3.0 x 2.9 in) excl. pads and connector
- Weight approx. 1200 gram (2.6 lbs)
- Maximum vibration level: 250 mm/s
- Frequency range: 1 – 500 Hz
- Protection class: IP67
- Designed for mounting on floor, wall or on a comfort measuring plate. Equipped with mounting holes, both vertical and horizontal. Various mounting accessories are available.

3112-1
Inverted Triaxial Geophone V12R

- INFRA V12R is a digital Geophone with the same specifications as the triaxial V12 – but designed for mounting in the ceiling or in tunnel roofs
- Dimension: 102 x 78 x 75 mm (4.0 x 3.0 x 2.9 in) excl. pads and connector
3112-2 — Triaxial Borehole Geophone V12B

- INFRA V12B is a cylindrical Triaxial borehole geophone. It is used together with a signal processing box that is directly connected to the INFRA bus cable. It has technical data similar to the Triaxial geophone V12. Cable length between sensor and electronics is up to 50 meters.
- Sensor diameter 50 mm (1.97 in)

3112-3 — Cable for borehole geophone

Accessories: 1805 Tip for quick clay
1806 Tool for quick clay tip
2850
**Sound Level Meter S50 Class 1**

- INFRA Sound Level Meter class 1. Measures sound levels outdoor, indoor and structure-born sound.
- The sound level meter measures the equivalent, or average, sound pressure level Leq. In addition, it measures the instantaneous, maximum and peak sound levels Lmax, at the same time. The interval time can be set from 1 second to 60 minutes.
- Measuring range 20-130 dB in four ranges, each with a dynamic range of 75 dB
- When triggered, a sound clip up to 10 sec. will be recorded
- Weighting: dBA & dBC
- Time constant: fast, slow and peak
- Dimensions: 78 x 270 x 70 mm (3.0 x 10.6 x 2.9 in) excl. pads, connector & bird spikes
- Weight approx. 750 gram (1.7 lbs)
- Designed for vertical mounting on a wall, pole or tripod

Various mounting accessories are available

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2851
**Sound Level Meter S51 Class 1**

-with infrasound capabilities

INFRA Sound Level Meter class 1. Measures sound levels outdoor, indoor and structure-born sound.

- The sound level meter measures the equivalent, or average, sound pressure level Leq. In addition, it measures the instantaneous, maximum and peak sound levels Lmax, at the same time. The interval time can be set from 1 second to 60 minutes.
- Measuring range 20-130 dB in four ranges, each with a dynamic range of 75 dB
- When triggered, a sound clip up to 10 sec. will be recorded
- Weighting: dBA, dBC and dBG
- Time constant: fast, slow and peak
- Dimensions: 78 x 270 x 70 mm (3.0 x 10.6 x 2.9 in) excl. pads, connector & bird spikes
- Weight approx. 750 gram (1.7 lbs)
- Designed for vertical mounting on a wall, pole or tripod

Various mounting accessories are available
**Sensors**

2810

**Air Blast Microphone S10**

- INFRA Air Blast Microphone S10 measures air blast pressure to valid national and international standards.
- It measures both maximum values for each minute and also a complete air blast record.
- Measures up to 2000 Pa with a resolution of 0.5 Pa.
- Dimensions: 78 x 158 x 65 mm (3.0 x 6.2 x 2.6 in) excl. pads and connector.
- Weight approx. 500 gram (1.1 lbs).
- Designed for vertical mounting on a wall, pole or tripod. Various mounting accessories are available.

Datasheet available

2811

**Air Blast Microphone S11**

- INFRA Air Blast Microphone S11 is used when air blast pressures higher than normal are expected, for example in tunnel systems.
- Measures up to 7000 Pa.
- Dimensions: 78 x 158 x 65 mm (3.0 x 6.2 x 2.6 in) excl. pads and connector.
- Weight approx. 500 gram (1.1 lbs).
- Designed for vertical mounting on a wall, pole or tripod. Various mounting accessories are available.

Datasheet available

2911

**Accelerometer**

When measuring vibrations, a piezoelectric accelerometer is sometimes easier to mount on sensitive equipment. It is also smaller than a geophone and not sensitive to the orientation.

Datasheet available
**2912**

**Micro Triaxial Accelerometer**

- INFRA 2912 is an extremely small accelerometer, developed for vibration monitoring of sensitive equipment. It is much smaller and lighter than a geophone and insensitive to magnetic interference. Typical applications are sensitive items like sculptures, paintings in churches and old buildings.
- It is possible to measure acceleration or particle velocity
- It is connected to the INFRA bus cable via the supplied connection box
- Dimensions: 14 x 21 x 14 mm (0.6 x 0.8 x 0.6 in)
- Weight approx. 7.5 gram (0.26 oz)
- Depending on the subject and environment, the sensor is mounted with adhesive tape, wax or removable glue
- Not suitable for outdoor use
### Sensors

#### 2550

**Dust Monitor X20DM2**

INFRA X20DM2 Dust Monitor is a high quality sensor that simultaneously measures the following parameters:
- PM10 dust concentration
- PM2.5 dust concentration
- PM1.0 dust concentration
- TSP total Suspended Particles

Intended for continuous monitoring of dust particles from demolition, construction works and traffic. Connects directly to an INFRA data logger with the INFRA bus cable. An alarm and/or alert can be automatically sent out as either e-mail or text message from INFRA Net when the predefined threshold on PM10 is breach. Interval time and alarm levels are selected via INFRA Net and can be handled remotely.

- Measurement range: PM10 and TSP 0.01–6000 µg/m³
  - PM2.5 and PM1 0.001–600 µg/m³
- 100–240VAC power supply
- Operating Temperature -5°C to +40°C
- Dimensions: 370 x 320 x 180 mm (14 x 12 x 6 in)
- Weight: 10 kg (22 lbs)
- To be mounted on a vertical pole or on a wall. Various mounting accessories are available.

**Accessories:** 2550-2 Flow-meter

#### 3300

**INFRA Gas Monitor**

Harmful concentrations of gases may occur during construction. To protect workers and to ensure compliance to regulations, e.g. the air quality directive, the INFRA system can monitor and document air quality.

The INFRA Gas monitor is a modular system for continuous monitoring of various gases. Each monitor can house up to six sensors which measures different types of gases from the selection below (additional gas monitoring sensors are available upon request). The monitor can be directly connected to Sigicom’s INFRA monitoring system with ready-made solutions for data communication, and web presentation of measurement data.

**Gases:**
- CH₄ (Methane)
- CO (Carbon monoxide)
- CO₂ (Carbon dioxide)
- NO (Nitric oxide)
- NO₂ (Nitrogen dioxide)
- SO₂ (Sulfur dioxide)
- O₃ (Ozone)
- VOC (Volatile organic compounds)

Additional gas detection units are available on request.
3250

INFRA X20SR Speed Radar

The INFRA X20SR Speed radar offers a convenient way to measure speed on moving objects. Together with other parts of the INFRA system, it allows for monitoring correlation between the speed of a passing object and resulting environmental parameters such as noise and vibration.

The technology behind the INFRA X20SR is a licence free 24 GHz doppler radar, combining low power consumption and high sensitivity. Depending on conditions, the detection range is about 50 meters for a moving person and 140 meters for a vehicle. Conditions that might deteriorate performance are heavy rain and snow.

The sensitivity of the INFRA X20SR is a lobe towards the front of the device. It is essential to compensate for the angle between the device and the velocity of the target, as described in the manual. For easy adjustment of the direction towards the target the INFRA X20SR is equipped with a ball joint.

Only available in Europe.
3243
Weather Station 4 Channel

INFRA X20WXT Weather Station is a small, lightweight and high quality sensor that simultaneously measures the following parameters:
- wind speed
- wind direction
- rain intensity or relative humidity
- air temperature

Select between two available standards, one presenting the measured quantities in SI-units, and the other in US-units. All settings, such as Interval time, is selected via INFRA Net and can be handled remotely.

- Low power consumption
- Dimensions: Ø115 x 240 mm (Ø4.5 x 9.5 in)
- Weight: 650 gram (1.4lbs)
- Protection class: IP66
- Bird spikes included, to reduce the risk that birds interfere the wind and rain measurement
- Robust, because it contains no moving parts - which is also a great benefit when simultaneously measuring noise
- To be mounted on a vertical pole or a horizontal cross arm

Accessories: 3242-2 Heating Solution

3244
Weather Station 2 Channel

INFRA X20WMT Wind Station is a small, lightweight and high quality sensor that simultaneously measures the following parameters:
- wind speed
- wind direction

It has two standards, one presenting the measured quantities in SI-units, and the other in US-units. All settings, such as Interval time, is selected via INFRA Net and can be handled remotely.

- Low power consumption
- Dimensions: Ø115 x 140 mm (Ø4.5 x 5.5 in)
- Weight: 510 gram (1.1 lbs)
- Protection class: IP66
- Bird spikes included, to reduce the risk that birds interfere the wind measurement
- Robust, because it contains no moving parts - which is also a great benefit when simultaneously measuring noise
- To be mounted on a vertical pole or a horizontal cross arm

Accessories: 3242-2 Heating Solution
Sensors

2252-1...

Extensometer Sensor (outdoor)

INFRA Extensometer is a displacement sensor that measures movement between two bolts. Distance is measured with a moving bar.

- High protection level (IP67) for outdoor applications
- Measuring range: 0-100, 0-200 or 0-750 mm with a resolution of 0.01 mm (400µin)
- Connects directly to the INFRA bus cable

Available in lengths of:
- 2252-1 — 100 mm (3.9 in)
- 2255-1 — 200 mm (7.9 in)
- 2275-0 — 750 mm (29.5 in)

3222

Extensometer Sensor (Indoor)

INFRA Extensometer is a small sensor that can be glued to a surface or mounted with adhesive tape. It measures displacement up to 10 mm with a resolution of 0.001 mm.

- The sensor is intended for indoor use only
- It has been used for monitoring of cracks in churches and other very sensitive buildings
- Connects directly to the INFRA bus cable

3247

Barometer Sensor

The barometer is used to monitor atmospheric pressure.

- Measuring range 300–1100 mbar, resolution 0.1 mbar
- Connects directly to the INFRA bus cable
2540  
**Air Humidity and Air Temperature Sensor**

Measures air humidity and air temperature with high accuracy even in tough environments like outdoor on bridges with sometimes 100% relative humidity. It is well proven in Nordic climate.

- Measuring range 0–100% relative humidity, resolution 0.1%, -40 to +70 degrees Celsius with a resolution of 0.1 degree Celsius
- Connects directly to the INFRA bus cable

2571  
**Temperature Sensor**

A temperature sensor for accurate measurement of temperature in air, water or in the ground. The sensor is based on a PT100 element in a completely water tight metal body (IP68).

- Measuring range -50 to +120 degrees Celsius with a resolution of 0.01 degree Celsius
- Connects directly to the INFRA bus cable
Sensors

2655-2, 2655-3
Groundwater Level Sensor
Measures water level with a high quality pressure sensor and automatic compensation for atmospheric pressure.
- Measuring range 0–1000 cm with a resolution of 0.5 cm
- Connects directly to the INFRA bus cable
- Can be converted to pore pressure/ Piezometer sensor with adapter 2665 and weight 2666

Available with cable lengths of:
2655-2 — 20 meters (66 ft)
2655-3 — 30 meters (98 ft)

2665, 2666
Pore Pressure/Piezometer Adapter & Weight
Converts ground water level sensor 2655 to a pore pressure/Piezometer sensor.
- 2665 — Pore Pressure Adapter
- 2666 — Pore Pressure Weight

2668...
Pore Pressure/Piezometer Tips
System for measuring pore pressure in soil. The unique BAT-system is easy to install and use. Only the pore pressure/Piezometer tip and a standard tube is installed in the ground. There are no cables to handle during installation.

When the tip is installed a pressure sensor (2655-1 with pore pressure/ Piezometer adapter and weight) is put into the metal tube. The sensor has a syringe in its lower end. When the sensor reaches the pore pressure/ Piezometer tip a rubber membrane is penetrated and the pore pressure is sensed. The sensor can be left for long term monitoring of the pore pressure.

- 2668 — Pore Pressure Tip BATMKIII STD
- 2669 — Pore Pressure Tip BATMKIII Hd
- 2671 — Water Saturation Kit
3280
**AlarmBox X80**
INFRA Alarm Box can be connected to an external warning flash light or siren and a battery.

3285
**Alarm Beacon X85**
INFRA Alarm Beacon is for example used to warn machine operators when piling, sheet piling or compacting. The alarm level can be set to a percentage of the trigger level (from 1 to 99%) — after each interval period the maximum value is compared to the alarm level and if the value is higher the alarm beacon flashes. It can also be used for high levels when blasting. In this case the alarm level can be set between 100 and 1000% of the trigger level and the beacon flashes directly if the alarm level is exceeded.

The Alarm Beacon connects directly to the INFRA bus cable.

Charged with (art.no. 1673-1/1674-1)

3288
**Wireless Alarm Beacon X88***
INFRA Alarm Beacon is for example used to warn machine operators when piling, sheet piling or compacting. The alarm level can be set to a percentage of the trigger level (from 1 to 99%) — after each interval period the maximum value is compared to the alarm level and if the value is higher the alarm beacon flashes. It can also be used for high levels when blasting. In this case the alarm level can be set between 100 and 1000% of the trigger level and the beacon flashes directly if the alarm level is exceeded.

Charged with (art.no. 1673-1/1674-1)

*) Only for EU and Norway
1606

Battery Holder Kit Li-ion B100, INFRA Mini

A battery holder that you easily can use instead of the existing battery compartment in your INFRA Mini. Two batteries (art.no. 1621-1) can be used simultaneous and it is possible to hot swap the batteries during monitoring.

1608–2

Li-ion Battery, INFRA C10/C12

- Internal Li-ion battery for INFRA C10/C12
- Weight approx: 100 gram (0.22 lbs)
- Capacity 21 Wh
- Needs a separate charger (art.no. 1675–1)

1610...

Lead-Acid Battery Cable

On all lead-acid batteries, this separate connection cable - with auto resetable thermo fuses on both poles - is needed.
- To be used in combination with the Battery charger for INFRA Master (art.no. 1673–1)
- To avoid unnecessary wear and tear on the battery terminals, we recommend to provide each battery with this cable and let it sit there permanently
- Available in size:
  1610–0 — 4.75 mm (3/16“)
  1610–1 — 6.3 mm (1/4“)
  1610–2 — 6.6 mm (~1/4”) Cable Ring

1611

Lead-Acid Battery

- Lead Acid battery for Solar panel and INFRA Master
- Weight approx. 3.3 kg (7.3 lbs)
- Needs a connection cable (art.no. 1610–0) with auto resetable thermo fuses on both poles even when the battery is charged outside of the INFRA Master
- To avoid unnecessary wear and tear on the battery terminals, we recommend to provide each battery with the Connection cable (art.no. 1610–0) and let it sit there permanently
Power supply

1620
**Li-ion Battery B50**
- Internal Li-ion battery for INFRA C20/C22
- Weight approx: 200 gram (0.44 lbs)
- Capacity 48.2 Wh
- Needs a separate charger (art.no. 1628)

1621
**Li-ion Battery B100**
- Li-ion battery for INFRA Mini/INFRA Point
- Weight approx: 425 gram (0.94 lbs)
- Capacity 96.4 Wh
- Needs a separate charger (art.no. 1628-0)
- For INFRA Mini fitted with the Battery Holder Li-ion (art.no. 1606-0)

1628
**Battery Charger, Li-ion B50/B100**
- Charges two batteries at the same time
- Output 1.9A
- For indoor use only
- Intended for:
  - 1620 Li-ion Battery B50
  - 1621 Li-ion Battery B100

1672
**Battery Eliminator, INFRA Micro**
- Can be permanently connected during monitoring
- When the lead-acid battery is fully charged, the charger will automatically switch to maintenance charging
Power supply

1673-1
Battery Charger, INFRA Master

- Can be permanently connected during monitoring
- When the INFRA Masters internal lead-acid battery is fully charged, the charger will automatically switch to maintenance charging
- Can also be used for charging a single battery. In that case, a separate connection cable (art.no. 1610-0) with auto resetable thermo fuses on both poles, is needed.

1674-1
Battery Eliminator, INFRA Mini/
Battery Charger, INFRA Alarm Beacon

Battery eliminator for INFRA Mini/X85/X88.

- Can be permanently connected during monitoring

1675...
Battery Charger, INFRA C10/C12

- Charges one separate battery at a time
- Output 1.3A
- Intended for indoor use only
- Intended for:
  Li-ion Battery, INFRA C10/C12 (art no. 1608-2)
- Power plug options:
  1675-1 — Battery Charger EU
  1675-2 — Battery Charger US
  1675-3 — Battery Charger UK

1676
Power Supply, INFRA C10

Battery eliminator for INFRA C10

- Intended for permanent connection during monitoring
- Voltage 5VDC
- Intended for both in- and outdoor use
Power supply

1677

**External Battery Cable**

With this cable an external boat or car battery (12 volt) can be connected to the INFRA Master or INFRA C10/C12/C20/C22 for extended monitoring time.

- To connect INFRA C10/C12/C20/C22 you need an adapter cable:
  - 1615 For INFRA C10/C12/C20/C22

**NOTE!** When using an external battery, the internal lead-acid battery must always be disconnected.

1679

**Solar Panel Solution**

A 10W or 25W solar panel will give a prolonged or continuously running system.

- One hour of full sunshine will give enough energy for up to 50 hours of monitoring
- Includes - a built-in battery (12V 9Ah) a charging regulator (peak efficiency >99%, self-consumption <0.12mA) and a power cable 10 meters (32.8 ft)
- The charging regulator prevents overcharging of the battery
- Available in size:
  - 1679-0 — 280 x 335 x mm (11.0 x 13.2 in) 10W
  - 1679-1 — 575 x 355 x mm (22.6 x 14.0 in) 25W
- To connect INFRA Mini/Master you only need the included adapter. To connect INFRA C10/C12/C20/C22 or INFRA Micro you need an adapter cable:
  - 1615-0 — For INFRA C10/C12/C20/C22
  - 1618-0 — For INFRA Micro
- Accessories: 1862-1, 1862-4 Pole Mount Kit

**NOTE!** When using an external battery, the internal lead-acid battery must always be disconnected.

1679–3

**Solar Panel Door for INFRA Micro**

A 10W Solar panel door for INFRA Micro Enclosure 30 will give a prolonged or continuously running monitoring system. One hour of full sunshine will typically give enough energy for up to 50 hours of monitoring.

Includes a charging regulator to prevent overcharging of the battery and a power cable.
Battery Case, INFRA Mini

This newly developed Battery Case extends the operating time of the INFRA Mini by 300%. The Battery Case contains 3 battery compartments, which respectively holds 6 alkaline batteries. Along with the INFRA Mini internal battery compartment with 6 alkaline batteries, connected with this Battery Case – this significantly extends the operating time of a INFRA Mini system.

**NOTE! The Battery Case can only be used in combination with a INFRA Mini data logger that has a serial number from 4999 (origin from December 2012).**

This is due to that from this date INFRA Mini has undergone a change in hardware and has been equipped with such as thermo fuses, new internal wiring and completely new battery compartment.

To be able to use this Battery Case in combination with earlier versions of INFRA Mini, Sigicom offers an upgrading kit – including hardware and work time.

(Batteries not included)

Please contact us for quotation and more information regarding upgrading of your INFRA Mini. Fitted with Sigicoms battery compartment.

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Power Supply, INFRA C12/C20/C22

Battery eliminator for INFRA C12/C20/C22

- Intended for permanent connection during monitoring
- Voltage 12VDC
- Intended for both in- and outdoor use
### INFRA Point – shielded cable

INFRA shielded cable with stainless contacts for INFRA Point are available in lengths of:

- 1102 — 2 meters (6.6 ft)
- 1105 — 5 meters (16.4 ft)
- 1115 — 15 meters (49.2 ft)

### INFRA Sensor Bus Cable

The INFRA Cable has moulded contacts that are waterproof (IP67) when connected according to instructions. The cable contains conductors for both data transfer and power supply for the sensors. The cable can be connected directly to any INFRA data logger and sensor.

- Total cable length in one system is max. 500 meters (1600 ft)
- Cable diameter 7 mm (0.28 in)
- Please note that the drop cable length is max. 5 meters (16.4 ft)

Available in lengths of:

- 1100 — 0.3 meters (1 ft)
- 1101 — 1 meter (3.3 ft)
- 1102 — 2 meters (6.6 ft)
- 1105 — 5 meters (16.4 ft)
- 1115 — 15 meters (49.2 ft)
- 1140 — 40 meters (131 ft)
- 1175 — 75 meters (246 ft)

### T-coupling Shielded

The shielded T-coupling is used to connect one drop cable to the main cable. The connection is made in 90 degrees from the main cable.

- Please note that the drop cable length is max. 5 meters (16.4 ft)
**1236-1**

**Termination Plug Shielded**

Like all digital communication networks, the INFRA network needs to be terminated.

The INFRA Mini has one built-in termination point in the casing, but the INFRA Master requires a termination plug on the case (when using only one of the two available outgoing cable-connectors on the INFRA Master). If both of the connectors are used, then the Termination Plug is used at the end of each main cable.

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**1248**

**INFRA Cable tester**

The INFRA Cable tester is used to verify functionality of INFRA Cables. The tester is a complement to the regular ocular control of the cables.

- You need a multimeter that can measure resistance and capacitance when using this tester

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**1472**

**Cable for Window Feed Through**

A short flat cable for feed through when connecting through window frames/doorposts etc.

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**1892**

**Self Vulcanizing Tape**

Used for insulating and protecting of cable joints. Uninsulated joints should not be placed directly on the ground.
Mounting

1710...

**Sensor Bolts**

For mounting of the different INFRA sensors, a M6 bolt is used (incl. nut and washer).

Available in lengths of:
- **1710** — Short 80 mm (3 in) V10 wall
- **1712** — Long 100 mm (4 in) C10/C12
- **1714** — Extra long 120 mm (5 in) V12 wall/floor
- **1717** — Sensor bolt 150 mm (6 in) C20/C22

1720

**Expansion Plug**

- Expansion plug – suitable for concrete, rocks, walls etc.
- Mounted in Ø8 mm (Ø0.3 in) predrilled holes
- M6 internal thread for sensor bolt
- Dimension: Ø8 x 30 mm (Ø0.3 x 1.1 in)

1740

**Magnet Mount**

Heavy duty magnet for mounting of Geophones, Air Blast Microphones, Sound Level Meters etc. Designed for mounting on for example steel columns.

- M6 internal thread for sensor bolt
- Dimensions: Ø89 x 28 mm (Ø3.5 x 1.1 in) incl. pads

1805, 1806

**Tip and Tool for Quick Clay**

Quick Clay adapter for INFRA Triaxial Borehole Geohone B12, to be used when monitoring in soft clay. Is needed to measure according to the NS8141-3:2014 standard.

- **1805** — Tip for quick clay
- **1806** — Tool for quick clay tip
1809

Ground Spike Impact Protector

Protects the ground spike when using a hammer or a sledgehammer.

1810, 1811

Ground Spike Conical

For ground mounting of INFRA sensors V10/V12, C10/C12 and C20/C22.

Ground Spike — 1810
- M6 internal thread for sensor bolts
- Length: 125 mm (4.9 in)

Extra long Ground Spike — 1811
- M6 internal thread for sensor bolts
- Length: 500 mm (20 in)

1812

Mounting Plate, INFRA V10

Can be fastened to a flat surface with double sided adhesive tape. Adapted for V10/V11 Geophones.

- Dimensions: 78 x 43 x 12 mm (3.0 x 1.7 x 0.5 in)

1813

Mounting Plate, INFRA V12

Can be fastened to a flat surface with double sided adhesive tape. Especially adapted for V12 Triaxial Geophone. Can also be used for mounting Geophones V10/V11, S10 Microphone or S50 Sound Level Meter on a wall.

- Dimensions: 102 x 78 x 12 mm (4.0 x 3.0 x 0.5 in)
Mounting

1815-1

**Leveling Plate**

Adjustable leveling plate. Intended for use with:
V10, V12, C10, C12, C20 and C22
- Intended for low frequency measurements only
- Can be fastened to a flat surface with the included bolt. For floor mounting only.
- Dimensions: 200 x 110 x 70 mm, incl. screws
  (7.9 x 4.3 x 2.8 in)

1817

**Mounting Plate, INFRA C10/C12**

Can be fastened to a flat surface with the included bolt. For floor mounting only.
- Dimensions: 175 x 90 x 12 mm (6.9 x 3.54 x 0.5 in)

1818

**Mounting Plate, INFRA C20/C22**

Can be fastened to a flat surface with double sided adhesive tape.
- Dimensions: 150 x 100 x 10 mm
  (5.9 x 3.4 x 0.4 in)

1820

**Comfort Measuring Plate, INFRA V12/C12**

Fulfills requirements for mounting and measuring of comfort levels with a V12 Geophone according to Swedish, Norwegian and German standards. Adjustable leveling plate. Also intended for use with C12.
- Dimensions: Ø150 x 35 mm (Ø 5.9 x 1.4 in) incl. screws
- Weight approx. 1500 gram (3.3 lbs)
1821

**Comfort Measuring Plate, INFRA V12/C12/C22**

Fulfills requirements for mounting and measuring of comfort levels with a V12 Geophone according to Swedish, Norwegian and German standards. Adjustable leveling plate. Also intended for use with C12 and C22.

- Dimensions: Ø 150 x 7 mm (Ø 5.9 x 0.3 in) incl. screws
- Weight approx. 650 gram (1.4 lbs)

1826

**Mounting Wedge S50**

The mounting wedge is intended for use with Sound Level Meter S50 when mounted on a wall. By using the wedge the sensing microphone will come very close to the wall, which is a requirement in many cases.

- Incl. M6 bolt, length 31 mm (1.22 in) for wall mounting (fitting Sensor Bolt)
- Dimensions: 78 x 24 x 78 mm (3.0 x 0.95 x 3.0 in) incl. pads

1850

**Wall Mount, INFRA Master**

The lockable wall/floor mount for INFRA Master can be mounted with concealed bolts and thereafter the INFRA Master case can be mounted and padlocked.

The case will be kept in place even after opening the guard.

(Padlock not included)

1851

**Wall Mount, INFRA Mini/Point**

The lockable wall/floor mount for INFRA Mini or INFRA Point can be mounted with concealed bolts and thereafter the INFRA Mini/Point case can be mounted and padlocked.

The case will be kept in place even after opening the guard.

(Padlock not included)
1853
Bracket
The lockable bracket makes it possible to mount and padlock the INFRA Micro 4030 safely on the construction site.
(Padlock not included)

1862-1...
Pole/Wall Mount Kit
Available in size: 1862-1 — 2" Pole mount enclosure (4030)
1862-4 — 12" Pole mount enclosure (4030)
1864-1 — 2" Pole mount enclosure (4060)
1864-4 — 12" Pole mount enclosure (4060)
Contact Sigicom for more details and recommendations.

1891
Tool Kit with Case
• Comes in a practical bag, with additional space for bolts, expansion plugs, couplings and termination plugs
• Toolkit necessary for mounting of sensors and opening of battery compartment in INFRA Master/Mini/Micro and C10/C12

1895
Tool Kit with Case for INFRA C20/C22
• Comes in a practical bag, with additional space for bolts, expansion plugs, couplings and termination plugs
• Toolkit necessary for mounting of sensors and opening of battery compartment in C20/C22
1250

**GSM/GPRS External Antenna**

- Is equipped with a 3 meters (9.8 ft) connection cable
- To be used during poor GSM coverage, or when the INFRA Master/Mini is mounted in a shielded area
- When using the external GSM antenna with an INFRA Master, a rewiring in the INFRA Master has to be done
- To use with C10/C12 you need an external connector (art.nr. 1255)

1250–1

**External Antenna**

- Is equipped with a 3 meters (9.8 ft) connection cable
- To use with C20/C22 you need an external connector (art.nr. 1257)

1251

**GSM/GPRS Directional Antenna**

In cases when the GSM/GPRS signal is weak a directional antenna can help.

1255

**External Antenna Connector, INFRA C10/C12**

Connector for using an external antenna with INFRA C10/C12. To be used with GSM/GPRS External antenna (art.no. 1250–0).

(INFRA C12 and antenna not included)
Antenna

1257
**External Antenna Connector, INFRA C20/C22**

Connector for using an external antenna with INFRA C20/22. To be used with External antenna (art.no. 1250-1).

(INFRA C22 and antenna not included)

1259...
**GSM-antenna Extension Cable**

Shall only be used in exceptional cases when the original cable is too short.

Available in lengths of:
- 1259 — 5 meters (16 ft)
- 1260 — 10 meters (33 ft)
- 1261 — 30 meters (98 ft)
1831
**Protection Cover, INFRA C10/C12**

For use with wall mounted INFRA C10/C12. Makes the unit less visual on a concrete wall.

Can be attached to the unit with an included letter screw.

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1832
**Protection Cover, INFRA C20/C22**

For use with wall mounted INFRA C20/C22. Makes the unit less visual on a concrete wall.

Can be attached to the unit with an included letter screw.

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1884...
**INFRA Transport Case**

A transport case for INFRA instrument in different sizes.

*Contact Sigicom for different interior fittings.*

Robust reusable containers made of Polyethylene (PE-HD) to meet the toughest requirements. Depending on size and design the containers can satisfy the toughest packaging specifications such as ATA 300 Cat I, that implies a guaranteed service life of at least 100 transports. All system containers have a recurring grid that also makes it possible to stack containers with different item numbers.

This reduces the space required for storage and transport to a minimum.

*Contact Sigicom for more details and sizes.*
Additional accessories

1470

**CompactFlash Reader with USB**

- CompactFlash reader that can be connected to the USB port of the PC
- Available in different configurations

1471, 1473

**RS 232 Cable**

- For connecting a PC to INFRA data logger (Master/Mini/Micro)
- “Null modem” type
- Necessary for downloading new software to the INFRA data logger
- RS 232 to USB, for connection to PCs without traditional RS 232 serial ports

1471 — RS-232 Cable
1473 — SB-RS232 Adapter

1870

**Ex/ATEX Protection Box for INFRA C22**

Package includes an explosion proof enclosure designed for INFRA C22.

- Full functionality of C22 (for additional information see INFRA C22)
- International approval for use in an explosive environment
- European approval for use in an explosive environment ATEX zone 1/21
- Configured for wall mount or ground mount
- Suitable for use in e.g. refineries and petrol processing plants.

(INFRA C22 – not included)

3640

**Sound Level Calibrator Class 1**

Sound level calibrator that generates a sound signal with 94dB or 114 dB at 1000 Hz. Used for functional test of Sound Level Meter S50 before and after the measurement period.
Located in Copenhagen, right by the Ørestad Metro Station, Fields is one of Scandinavia’s largest shopping and entertainment centers with more than 120 stores, 24 restaurants and leisure activities, including a large cinema area. In tune with the global customer experience trend in the world of retail, the number of leisure activities is being expanded in 2018, including the very exciting iFly Indoor Skydiving concept. Fields had some 8.2 million visitors during 2016.

The building designed to house the iFly Indoor Skydiving concept will be placed directly adjacent to the existing cinema. Both buildings sit on top of a huge subterranean parking garage.

The owners were concerned that potential vibrations from the iFly building might disturb the cinema’s high-quality sound and projection system next door even though iFly’s concept includes state of the art vibration damping of their equipment. To evaluate that risk, a specialist team was called in from NIRAS, a leading Danish consultancy company specializing in engineering and professional services. One of NIRAS’ vibrations experts engaged in the Fields project, Christian Asbjørn Andersen, says:

“The iFly building will contain some potentially vibrating ventilation fans. It will be built right next to the existing cinema on top of the parking garage, with only a small joint in the garage deck separating them. To evaluate the risk for future disturbance, before the iFly building even exists, we used a total of 16 geophones. They were strategically positioned in a loading dock inside the cinema building, and outside where the new building is to be built. Then we used an “exciter”, a rotating vibrator, to produce vibrations with thoroughly controlled frequencies and monitored the effects.”

NIRAS’ technicians conducted these field tests during two days, measuring horizontally as well as vertically induced vibrations within the 5 to 15 Hz range, with 0.5 Hz intervals. The results were then thoroughly analyzed by NIRAS’ engineers using state-of-the-art digital technology.

“Some frequencies resulted in considerable resonance outdoors, but could not be felt inside the cinema building, says Mogens Saberi, another member of NIRAS’ team of vibration experts. Some minor vibrations were picked up by the highly sensitive geophones, but would certainly not cause any problems for the cinema.”

2,200 employees in 27 countries
NIRAS A/S is an international consulting group with more than 2,200 employees. Headquartered in Allerød, Denmark the company has 51 offices in 27 countries in Europe, Asia and Africa. NIRAS provides engineering, planning, project management and other services for all aspects of the built environment, focusing on traditional construction projects as well as infrastructure, environment, climate and energy, and sustainable development consulting. The company is a member of the Danish Association of Consulting Engineers (FRI) and the International Federation of Consulting Engineers (FIDIC).
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