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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.

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.
This urban building site represents a typical infrastructure project where remote monitoring using the INFRA system is the most cost efficient solution.
INFRA

Remote Field Monitoring System

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.
INFRA Remote Field Monitoring System

**INFRA C22**
Wireless Vibration Monitor

INFRA C22 is a triaxial digital geophone and a data logger built into the same wireless unit. The C22 has a built-in 3G modem with 2G fallback. C22 records bargraph and transient data simultaneously.

**INFRA DM2**
Dust Monitor

The Dust Monitor is a high quality sensor that simultaneously measures the following parameters: PM10, PM2.5, PM1.0 and TSP.

**INFRA S50**
Sound Level Meter IEC-Class 1

S50 measures sound levels outdoor, indoor and structureborn 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 INFRA System is a self-contained monitoring and measuring system – from sensor to web presentation and report. With INFRA you can monitor and measure vibration, air blast, noise, crack movement, underwater shockwaves, weather, moisture, temperature and much more.

Applications and sensors

Open pit mining  Vibration and Air Blast  Tunnel Blasting

Rock Crusher  Vibration, Dust and Noise  Recycling

Bridge  Vibration and Extensometer  Excavations
Applications with INFRA

- High Speed Rail
- Comfort Vibrations / Low Vibrations Levels
- Historic Buildings

- Highway
- Vibration and Noise
- Train and/or Light Rail

- Pile Driving
- Vibrations and Alarm Beacon
- Demolition
Services

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 recalibration is required.

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

Only the INFRA sensors need 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
Education

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

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 SIM

All INFRA Systems can be delivered with a SIM card and the customer’s 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.

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

- Web based system
- Automated data transmission
- Wireless vibration monitor

The world’s smallest wireless vibration monitor
Excellent battery performance

INFRA Compact - Wireless Vertical Vibration Monitor

INFRA C20

The INFRA C20 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 C20 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.

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

Advantages:
- Excellent battery performance - Even in low temperatures
- Rechargeable batteries
- Multi button keypad
- Color display

* batteries not included
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.

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

**Advantages:**
- Excellent battery performance – Even in low temperatures
- Rechargeable batteries
- Multi button keypad
- Color display
- Remote firmware upgrade

* batteries not included
Li-ion Battery, INFRA 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)

Battery Charger, Li-ion (B50/B100)

- Charges two separate batteries at a time
- Output 1.3A
- Intended for indoor use only
- Intended for:
  - Li-ion Battery B50 (art.no. 1620)
  - Li-ion Battery B100 (art.no. 1621)

Power Supply, INFRA C20/C22

- Intended for permanent connection during monitoring
- Voltage 12VDC
- Intended for both in- and outdoor use

External Battery Cable, INFRA C20/C22

With this cable an external boat or car battery (12 volt) can be connected to the INFRA C1X and C2X for extended monitoring time.
Solar Panel Solution, INFRA C20/C22

A 10W 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
- To connect to C1X and C2X you need an adapter cable (art.no. 1615-0)
- Accessories: 1862-1 Pole Mount Kit

Contact Sigicom for more details and recommendations.

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)

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)

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
Leveling Plate, INFRA C20/C22

Adjustable leveling plate. Intended for use with:
V1X, C1X and C2X
• 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)

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)

Ground Spike Conical

For ground mounting of INFRA Geophone V1X, C1X and C2X.
• M6 internal thread for sensor bolts
• Length: 125 mm (4.9 in)

Ground Spike Conical

Extra long Ground Spike - for mounting of Geophones in softer soil.
For ground mounting of INFRA Geophone V1X, C1X and C2X.
• M6 internal thread for sensor bolts
• Length: 500 mm (20 in)
Transport Case, INFRA C20/C22

A transport case for INFRA instrument.

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.
INFRA Compact - Wireless Vibration Monitors

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
4212 — C12 Wireless Triaxial Vibration Monitor

Datasheet available

2 batteries included
Wireless Vibration Monitors & Accessories

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)

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:
  - Battery Charger EU (art.no. 1675-1)
  - Battery Charger US (art.no. 1675-2)
  - Battery Charger UK (art.no. 1675-3)

Power Supply, INFRA C10/C12

- Battery eliminator for INFRA C10/C12
- Intended for permanent connection during monitoring
- Voltage 5VDC
- Intended for both in- and outdoor use

External Battery Cable, INFRA C10/C12

With this cable an external boat or car battery (12 volt) can be connected to the INFRA C11X and C2X for extended monitoring time.
Solar Panel Solution, INFRA C10/C12

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) 25 W
- To connect to C10/C12/C20/C22 you need an adapter cable (art.no. 1615-0)
- Accessories: 1862-1 Pole Mount Kit

Contact Sigicom for more details and recommendations.

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.

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)

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)
Leveling Plate, INFRA C10/C12

Adjustable leveling plate. Intended for use with V1X, C1X and C2X.

- 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)

Comfort Measuring Plate, INFRA 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 (Ø5.9 x 1.4 in), incl. screws
- Weight approx. 1500 gram (3.3 lbs)

Ground Spike Conical

For ground mounting of INFRA Geophone V10, V11, V12 and C10/C12.

- M6 internal thread for sensor bolts
- Length: 125 mm (4.9 in)

Ground Spike Conical


- M6 internal thread for sensor bolts
- Length: 500 mm (20 in)
Transport Case, INFRA C1X

A transport case for INFRA instrument.

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.
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.**
INFRA Master

INFRA Master is a complete battery operated data logger with a built-in GSM/GPRS modem and built-in GSM antenna. The logger has two outgoing connections for the INFRA bus cable. There is also a connection for an external GSM antenna. The front panel consists of four buttons (easy operation) and a LCD screen with 4 lines, each can display up to 20 characters.

INFRA Master is either operated with an internal lead-acid battery or connected to mains. The data is stored on the exchangeable CompactFlash card. The INFRA Master contains no measurement electronics that need calibration.

4100 — INFRA Master internal lead-acid battery or on external power

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

Datasheet available

Lead-acid battery sold separately
With built-in communication and CompactFlash Memory

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.

4000 — INFRA Mini alkaline batteries or on external power

4001 — INFRA Mini Li-ion batteries or on external power

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

Datasheet available →
**Lead-Acid Battery, 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.

**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 the 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

**Solar Panel Solution, INFRA Master**

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) 10 W
  1679-1 — 575 x 355 x mm (22.6 x 14.0 in) 25 W
- To connect to Micro you need an adapter cable (art.no. 1618-0)

**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.
External Battery Cable, INFRA Master

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

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

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 INFRA Master will be kept in place even after opening the guard. (Padlock not included)

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.
Li-ion Battery, INFRA B100

- Li-ion battery for INFRA Mini (4001-0)
- Weight approx: 425 gram (1.14 lbs)
- Capacity 96.4Wh
- Needs a separate charger (art.no. 1628-0)
- For INFRA Mini fitted with the Battery Holder Li-ion (art.no. 1606-0)

Battery Charger, Li-ion (B50/B100)

- Charges two batteries at the same time
- Output 1.9A
- For indoor use only
- Intended for:
  - Li-ion Battery B50 (art.no. 1620-0)
  - Li-ion Battery B100 (art.no. 1621-0)

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.

Battery Eliminator, INFRA Mini/
Battery Charger, INFRA Alarm Beacon

Battery eliminator for INFRA Mini/X85/X88.
- Can be permanently connected during monitoring
**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.

*Please contact us for quotation and more information regarding upgrading of your INFRA Mini.*

(Batteries not included)

Fitted with Sigicom’s battery compartment.

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**Wall Mount, INFRA Mini**

The lockable wall/floor mount for INFRA Mini can be mounted with concealed bolts and thereafter the INFRA Mini case can be mounted and padlocked.
The INFRA Mini will be kept in place even after opening the guard.

*(Padlock not included)*
INFRA Micro

INFRA Micro is built for the option of connecting an external modem and supplying a larger battery for significant extension of measurement time (months).

In the BART customer case, the INFRA Micro provided a solid solution for the consultant to provide long term measurement with a pole mountable robust enclosure. Most important for this project was the requirement to measure both vibration and noise at the same time using Sigicom geophones and class 1 sound level meters. The INFRA Micro with 30 Ah enclosure using an external 3G modem has been field tested in Australian heat with great success.

INFRA Micro can be delivered with two different enclosures either with a 30 Ah battery or a 60 Ah battery. The system also accommodates different communication methods with the external modem and is characterized by extremely low power consumption in measurement mode with communication off (50 mW excluding sensor power).
Data logger with the possibility to connect an external modem

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.

4030 — 0 INFRA Micro
4030 — 1 INFRA Micro with Solar Panel
4030 — 5 INFRA Micro with 3G modem
4030 — 6 INFRA Micro with 3G modem and 10 W Solar Panel door

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

Datasheet available

* Only for EU, Norway, USA and Canada
External Modem 3G

- External modem for INFRA Micro 4030/4060

*Contact Sigicom for more details and recommendations.*

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External Modem GSM-R

- External modem for INFRA Micro 4030/4060

*Contact Sigicom for more details and recommendations.*

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External Modem WIFI EUR/US

- External modem for INFRA Micro 4030/4060

*Contact Sigicom for more details and recommendations.*

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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
Solar Panel Solution INFRA Micro 1679

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) 10 W 
  1679-1 — 575 x 355 x mm (22.6 x 14.0 in) 25 W 
- To connect to Micro you need an adapter cable (art.no. 1618-0)

Accessories: 1862-1, 1862-4 — Pole Mount Kit

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

Solar Panel Door for INFRA Micro 1679-3

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.

Contact Sigicom for more details and recommendations.

Pole/ Wall Mount Kit 1862-1


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.

Bracket 1853

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

Datasheet available

Horizontal Geophone V11
INFRA V11 is a digital Geophone with the same specifications etc. as the Vertical Geophone V10 but is designed for horizontal measurements.
- INFRA V11 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.

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.

Datasheet available
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

Triaxial Borehole Geophone V12B

- INFRA V12B is a cylindrical Triaxial borehole geophone. It is used together with an 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)

Tip and Tool for Quick Clay

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

- Tip for quick clay
- Tool for quick clay tip
Leveling Plate, INFRA V1X/C1X/C2X
Adjustable leveling plate. Intended for use with: V1X, C1X and C2X.

- 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)

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)

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)

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 (Ø5.9 x 1.4 in) incl. screws
- Weight approx. 1500 gram (3.3 lbs)
Sensors & Accessories

**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

![Magnet Mount](image)

**Ground Spike Conical**

For ground mounting of INFRA Geophone V1X, C1X and C2X.

- M6 internal thread for sensor bolts
- Length: 125 mm (4.9 in)

![Ground Spike Conical](image)

**Ground Spike Conical**

Extra long Ground Spike - for mounting of Geophones in softer soil.

For ground mounting of INFRA Geophone V1X, C1X and C2X.

- M6 internal thread for sensor bolts
- Length: 500 mm (20 in)

![Ground Spike Conical](image)

**Ground Spike Impact Protector**

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

![Ground Spike Impact Protector](image)

1740
1810
1811
1809
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

Datasheet available

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

Datasheet available
**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

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**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.
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

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

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
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

Datasheet available
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

Measures the different sizes simultaneously in four separate channels.

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 0.01–600 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 see page 37.

Datasheet available

Accesories: 2550-2 — Flow-meter

Transport Case, Dust Monitor X20DM2

A transport case for Dust Monitor X20DM2.

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 reduce the space required for storage and transport to a minimum.
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)

Datasheet available

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 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

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
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

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
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)

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

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
**AlarmBox X80**

INFRA Alarm Box can be connected to an external warning flash light or siren and a battery.

**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)

Datasheet available

**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)

*Datasheet available

*) Only for EU and Norway
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

Datasheet available

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

Datasheet available
Multi-monitoring methods nominated to considerate constructors scheme

Members of the UK based FLO consortium have nominated the methods used for noise and vibration monitoring in a prestigious project in the London underground system to the Considerate Constructors Scheme. The method is applied throughout the extensive Northern Line Extension project.

The extension of the Northern line to Battersea will support 25,000 new jobs and more than 20,000 new homes. Two new stations, at Nine Elms and Battersea Power Station, are to be completed in 2020.

Considerate Constructors is an independent non-profit organisation founded to improve the standing of the British construction industry by abiding to the organization’s code of practice.

The integrated monitoring was managed by a team from Temple Group, a leading UK consultancy company, using Sigicom equipment for the monitoring of vibrations, noise, dust and other environmental disturbances.

Benefits of a fully integrated system

The Northern Line Extension project is the first major infrastructure scheme to use the Sigicom environmental monitoring system in the UK.

Based on actual complaints in the past, the proven benefits of a fully integrated system covering noise, vibration and dust are, for example:

- Using the sound playback function it was possible to show that the road sweeper was kicking up dust and triggering dust alerts.
- Simultaneously viewing noise and vibration data, it was revealed that high noise piling works were NOT the source of vibrations reported by local residents.

Optimized working window

The Northern Line Environmental Team has worked closely with Temple Group to develop additional capabilities to the system. This includes, for example, a predictive capability for construction noise. This optimized the working window before which noise thresholds are breached, and when further noise mitigation is required.

Another added feature is a macro to turn raw data downloaded from the Sigicom website into pre-populated monitoring reports. These reports, complete with tables and graphs are ready to be shared with the local Environmental Health officers and the general public.
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 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 ft)
- 1115 — 15 meters (49 ft)
- 1140 — 40 meters (131 ft)
- 1175 — 75 meters (246 ft)

Cable for Window Feed Through

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

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
Cables & Additional Accessories

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 ft)

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.

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

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)
**GSM/GPRS Directional Antenna**

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

![GSM/GPRS Directional Antenna Image]

**GSM-antenna Extension Cable**

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

- 1259 — 5 meters (16 ft)
- 1260 — 10 meters (33 ft)
- 1261 — 30 meters (98 ft)

![GSM-antenna Extension Cable Image]

**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)

![GSM/GPRS External Antenna Image]

**External Antenna**

- Is equipped with a 3 meters (9.8 ft) connection cable
- To be used during poor coverage, or when the unit is mounted in a shielded area
- When using the external antenna with an INFRA Master, a rewiring in the INFRA Master has to be done
- To use with C20/C22 you need an external connector (art.nr. 1257)

![External Antenna Image]
**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

**RS 232 Cable**

- For connecting a PC to INFRA data logger
- “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.

**CompactFlash Reader with USB**

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

**Self Vulcanizing Tape**

Used for insulating and protecting of cable joints. Uninsulated joints should not be placed directly on the ground.
The new Kravis Research Building and platform structure, which are part of the River Campus Project, are now taking shape on the East River side of New York’s Rockefeller University campus. The new facility is part of an extensive program that also involves the urgently needed repair of the portion of the East River seawall adjacent to the campus.

The new building, which will be developed on a platform structure, was designed to provide state-of-the-art research facilities and other amenities for the University. By 2019 the new development will horizontally extend the campus out over the FDR Drive for the length of almost four city blocks. It will also feature a green roof that will provide the campus with almost two acres of additional landscaped green space overlooking the river.

The northern portion of the Rockefeller University campus is within the Rockefeller University Historic District (New York City Landmark-eligible, State/National Register-eligible). It is protected by restrictions on vibration produced by construction by New York City Department of Buildings regulations. The eastern boundary of the existing campus, beyond which the new facility is being constructed, is established by an approximately 45-foot tall schist retaining wall that extends along the west side of the FDR Drive.

Critical research and experiments
Additionally, as part of the university’s research facilities, the existing campus buildings contain several types of vibration-sensitive equipment used for critical research and experiments. With these factors all present on the Rockefeller University campus, keeping a handle on vibration produced by the construction of the new research facility and platform structure is essential for the project team.

AKRF, Inc., a leading provider of environmental services in New York City and the eastern seaboard of the United States, was tasked with myriad responsibilities on the project. These include securing environmental approvals, pre-construction survey work, and hazardous materials monitoring – creating and implementing a Construction Protection Plan (CPP) for the project.

The CPP was developed in consultation with the New York City Landmarks Preservation Commission (LPC) to protect the sensitive research buildings and historic architectural resources on the campus. Vibration monitoring was a key tool specified by the CPP to protect these structures. The planning of the River Campus Project was initiated in 2011 and the actual construction work commenced in October, 2015.

Daniel Abatemarco is AKRF’s leader on the vibration-monitoring task for this prestigious project at the heart of Manhattan. The primary goal of the monitoring program, as specified in the CPP, is to protect structures on the campus from potential damage caused by construction activity. However, the vibration-monitoring program also presents an opportunity to keep tabs on the construction-generated vibration to aid in communications with the faculty and students concerned about construction adjacent to their workplaces.

Consequently, Daniel needs to maintain the typical scheduled monitoring and reporting, as well as respond to inquiries from University staff in a timely and detailed manner. The convenient and flexible Sigicom INFRA Net system allows in-depth information to be at Daniel’s fingertips when questions come in from the campus. AKRF is known for its responsiveness to clients, delivering efficient and effective solutions with very fast turn-around. To maintain this reputation for responsiveness, AKRF depends on real time information provided in a clear and concise manner from INFRA Net.

Ultra-compact geophones
Implementing a vibration monitoring program for the buildings that could be affected by construction-related vibration on Rockefeller University’s 14-acre campus
Historic Campus project in New York

containing 26 buildings without disturbing or getting in the way of the University’s ongoing activities, presents unique challenges for AKRF. The structures to be monitored include buildings as well as outdoor structures including walls and a formal landscaped garden. Sigicom’s fleet of vibration monitoring hardware provided solutions to meet these challenges. This includes the ultracompact Sigicom C12 triaxial geophone, combinations of Sigicom’s INFRA Master data-loggers with networks of multiple Sigicom V12 triaxial geophone sensors, and solar panels for outdoor locations where grid power was not available. The selection of devices allows AKRF to effectively implement its monitoring program in such a way as to be integrated into the University’s campus environment without interference.

Construction of the platform over the FDR Drive, due to restrictions on FDR during over-night hours, and as such, the Drive lane closures, primarily occurs vibration-monitoring program must cover these over-night shifts and ensure that information reaches the over-night shift site superintendents quickly and reliably.

Sigicom’s INFRA Net messaging system allows for the over-night construction management and University staff to receive email and SMS alerts when vibration reaches designated thresholds so that they are always on top of the construction vibration, no matter the time of day or night.

The primary goal of the monitoring program, as specified in the CPP, is to protect structures on the campus from potential damage caused by construction activity.
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