User Manual

Correlator
COR C-300-RI

Mess- und Ortungstechnik
Measuring and Locating Technologies

Elektrizitätsnetze
Power Networks

Kommunikationsnetze
Communication Networks

Rohrleitungsnetze
Water Networks

Abwassernetze
Sewer Systems

Leitungsortung
Line Locating

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Consultation with SebaKMT

The present system manual has been designed as an operating guide and for reference. It is meant to answer your questions and solve your problems in as fast and easy a way as possible. Please start with referring to this manual should any trouble occur.

In doing so, make use of the table of contents and read the relevant paragraph with great attention. Furthermore, check all terminals and connections of the instruments involved.

Should any question remain unanswered or should you need the help of an authorized service station, please contact:

Seba Dynatronic **Mess- und Ortungstechnik GmbH**	**Hagenuk KMT** **Kabelmesstechnik GmbH**
Dr.-Herbert-Iann-Str. 6 D - 96148 Baunach	Röderaue 41 D - 01471 Radeburg / Dresden
Phone: +49 / 9544 / 68 – 0 Fax: +49 / 9544 / 22 73	Phone: +49 / 35208 / 84 – 0 Fax: +49 / 35208 / 84 249

E-Mail: sales@sebakmt.com
http://www.sebakmt.com

Terms of Warranty

SebaKMT accept responsibility for a claim under warranty brought forward by a customer for a product sold by SebaKMT under the terms stated below.

SebaKMT warrant that at the time of delivery SebaKMT products are free from manufacturing or material defects which might considerably reduce their value or usability. This warranty does not apply to faults in the software supplied. During the period of warranty, SebaKMT agree to repair faulty parts or replace them with new parts or parts as new (with the same usability and life as new parts) according to their choice.

This warranty does not cover wear parts, lamps, fuses, batteries and accumulators.

SebaKMT reject all further claims under warranty, in particular those from consequential damage. Each component and product replaced in accordance with this warranty becomes the property of SebaKMT.

All warranty claims versus SebaKMT are hereby limited to a period of 12 months from the date of delivery. Each component supplied by SebaKMT within the context of warranty will also be covered by this warranty for the remaining period of time but for 90 days at least.

Each measure to remedy a claim under warranty shall exclusively be carried out by SebaKMT or an authorized service station.

This warranty does not apply to any fault or damage caused by exposing a product to conditions not in accordance with this specification, by storing, transporting, or using it improperly, or having it serviced or installed by a workshop not authorized by SebaKMT. All responsibility is disclaimed for damage due to wear, will of God, or connection to foreign components.

For damage resulting from a violation of their duty to repair or re-supply items, SebaKMT can be made liable only in case of severe negligence or intention. Any liability for slight negligence is disclaimed.

Since some states do not allow the exclusion or limitation of an implied warranty or of consequential damage, the limitations of liability described above perhaps may not apply to you.

Contents

1 Safety Instructions

1.1 General Safety Instructions and Warnings

- Do not drop the device / the system's components or subject it / them to strong impacts or mechanical shocks.
- The limits described under Technical Data may not be exceeded.
- The device / system must be in a technically perfect condition for measurement.
- The indicated degree of protection can only be ensured if plugs or the provided protection caps are put in all sockets of the device.
- The plugs of the supplied connection cables are only compliant to the indicated degree of protection as long as they are plugged in. Plugs which are not connected or which are connected in a wrong way are not protected from water and dust ingress.
- If the O-ring seal of a socket is obviously damaged, it must be replaced in order to ensure the total protection against water and dust ingress.

1.2 General Notes

Safety precautions

This manual contains basic instructions for the commissioning and operation of the device / system. For this reason, it is important to ensure that the manual is always available to the authorised and trained operator. He needs to read the manual thoroughly. The manufacturer is not liable for damage to material or humans due to non-observance of the instructions and safety advices provided by this manual.

Locally applying regulations have to be observed!

Labelling of safety instructions

The following signal words and symbols are used in this manual and on the product itself:

Signal word / symbol	Description
CAUTION	Indicates a potential hazard which may result in moderate or minor injury if not avoided.
NOTICE	Indicates a potential hazard which may result in material damage if not avoided.
	Serves to highlight warnings and safety instructions. As a warning label on the product it is used to draw attention to potential hazards which have to be avoided by reading the manual.
	Serves to highlight important information and useful tips on the operation of the device/system. Failure to observe may lead to unusable measurement results.

Check contents

Check the contents of the package for completeness and visible damage right after receipt. In the case of visible damage, the device must under no circumstances be taken into operation. If something is missing or damaged, please contact your local sales representative.

Working with products from SebaKMT

It is important to observe the generally applicable regulations of the country in which the device will be operated, as well as the current national accident prevention regulations and internal company directives (work, operating and safety regulations).

Use genuine accessories to ensure system safety and reliable operation. The use of other parts is not permitted and invalidates the warranty.

Repair and maintenance

Repair and maintenance work has to be carried out by SebaKMT or authorised service partners using original spare parts only. SebaKMT recommends having the system tested and maintained at a SebaKMT service centre once a year.

SebaKMT also offers its customers on-site service. Please contact your service centre if needed.

Special transportation requirements

The lithium batteries of the device are dangerous goods. The transport of the batteries itselves and of devices which contain such batteries is subject to regulations based on the UN Model Regulations “Transport of Dangerous Goods” (ST/SG/AC.10-1).

Please inform yourself about the transportation requirements and follow them when shipping the device.

Electromagnetic radiation

This device is designed for industrial use. When used at home it could cause interference to other equipment, such as the radio or television.

The interference level from the line complies with the limit curve B (living area), the radiation level complies with the limit curve A (industrial area) according to EN 55011. Given that living areas are sufficiently far away from the planned area of operation (industrial area), equipment in living areas will not be impaired.

For FCC:

User Information gem. FCC 15.2:

Changes or modifications not expressly approved by the party responsible for compliance could void the user’s authority to operate the equipment

Part 15 Statement gem. FCC 15.19/RSS Gen Issue 4 Sect. 8.4

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

2 Technical description

2.1 Function

The Correlux C-300-RI is a digital correlation system to locate leaks in drinking water pipes.

Pressurized water at the leak location creates a noise which travels out in all directions of the pipe. This noise is recorded, amplified and sent wirelessly to the correlation system by two sensors (piezo microphone, hydrophone) which are attached to the pipe (e.g. valve, hydrants).

The PC software compares both signals (correlation) and calculates the exact distance to the leakage on the basis of the delay time of the signals, the sensor spacing and the sound velocity in the pipe.

The Correlux C-300-RI is suitable for both immediate measurement ("Online measurement") as well as time-delayed measurement ("Offline measurement").

Online measurement

In a so-called Online measurement, the noise recording and the correlation of the data take place at the same time.

Step	Description
1	Installing the Power transmitters "A" and "B" at two measuring points.
2	Noise recording, at the same time data transfer and live data correlation on the Correlator.

Offline measurement

In a so-called Offline measurement, the correlation of the measured data takes place only after the noise recording has been terminated.

Step	Description
1	Programming the sensors (Multi sensors and Power transmitters)
2	Installing the Power transmitters and/or Multi sensors at up to 8 measuring points.
3	Noise recording, immediately or at a preset time (e.g. at night).
4	Collecting the sensors.
5	Reading and analyzing the measured data using the Correlator.

Pinpointing

To determine the exact location of the leak after the correlation, a pinpoint search can be performed using the Multi sensors or the ground microphone connected to the Correlator.

2.2 Features of the set

The Correlux C-300-RI set mainly comprises the following components:

- **CorreluxView-3 Software for PC/laptop**
- **C-300-RI radio interface for USB connection**
- **2 Power transmitters with microphone (Transmitter A / Transmitter B)**
  for recording the leak noise at two measuring points and sending the recorded data to the Correlator

The set can be extended by the following components:

- **up to 8 multi sensors**
  for recording the leak noise of up to 8 measuring points at the same time followed by an "Offline-correlation"
- **hydrophones**
  for recording the leak noise directly at the water column

The **Transport case** offers space for the C-300-RI, 2 Power transmitters and 3 Multi sensors. The case is not only for storage and transportation purposes, but also functions as a charging station for the devices.

2.3 Power supply

The COR C-300-RI is supplied by USB.

The Power transmitters and the Multi sensors come with internal rechargeable Li-Ion batteries.

The storage places of the individual devices in the transport case function as charging stations. As soon as a device is placed in/on its station in the case, the device is automatically charged, provided the case is connected to the mains.

The case can be connected via the connection socket and the supplied connection cable to either a 12 V connector of a vehicle or to the mains

NOTE

When connected to the electrical system of a car, the transport case is powered by the vehicle's battery, even while the vehicle is not in operation. This could result in the complete discharge of the vehicle battery.

When you park the car, disconnect the Correlux transport case from the vehicle power supply.

You can find more information in the chapters which describe the individual devices.

2.4 Scope of delivery

Standard accessory The basic set comprises the following devices and accessories:

Accessory	Description	Art.no.
COR C-300-RI	USB interface	1008480
COR PT-3A	Power transmitter A	1004779
COR PT-3B	Power transmitter B	1004780
PAM CORR-2	2 x active universal microphone for PT-3	820019615
LG C-3	Charging unit for CPK 3/CMK 3	1006646
LK 13	Car charging adaptor, 3.5m	810000006
KR 22-5	Stereo headphones	810002087
VST T-1	2 x extension rod for PAM CORR-2	810000103
	2 x nylon cord 3mm blue, 2m	304035025
CSW CorreluxView	PC software	1006584

Additional accessory The following devices and accessories are available to extend the basic set.

Accessory	Description	Art.no.
COR MS-3	Multi sensor	1004815
CMK 3-8-MS	Case for 8 Multi sensors COR MS-3	2005301
LOG TP	Trivet adaptor for Sebalog Corr	128309877
LOG MWA	Magnetic angled adaptor	118303355
	Mounting set for COR MWA (Screws for angled adapters)	2007393
	Set of labels COR MS-3 (1 - 8)	2007321

Technical data Correlux C-300-RI is specified by the following parameters:

dimensions	170 x 110 x 60 mm (without antenna)
Weight	0.6 kg
Connector / Supply	USB

Power transmitter COR PT-3A/B

Parameter	Value
Sensor	Piezo sensor with active amplifier (standard) / hydrophone (optional)
Indicators	I/O LED (device On/Off) Radio LED (radio module On/Off)) Row of LEDs (battery status or measured noise level)
Operation	On/Off pushbutton
Power supply	Internal rechargeable Li-Ion battery, inductive charging

Parameter	Value
Operating time	min. 12 h
Connections	Sensor (microphone/hydrophone), Radio antenna
Dimensions (without handle)	Ø 125 x 111 mm
Weight (without sensor)	0.9 kg
Degree of protection	IP 65

Sensor PAM CORR-2

Parameter	Value
Type	Piezo sensor with magnetic adaptor (to be connected to Power transmitter or Correlator)
Active amplification	yes
Dimensions	Ø 38 x 78 mm
Weight	0.4 kg
Degree of protection	IP 68

Multi sensor COR MS-3

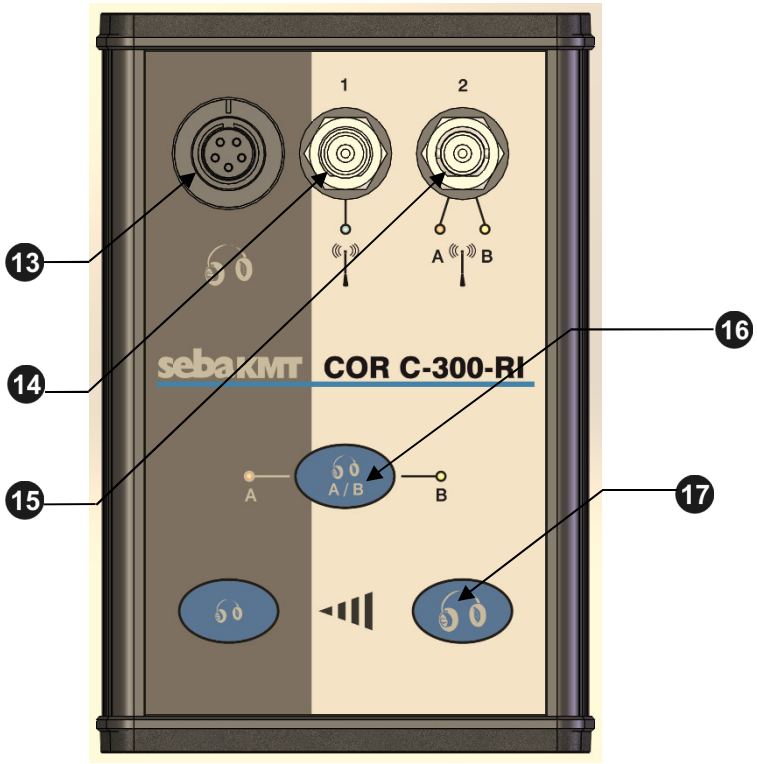
Parameter	Value
Sensor	Integrated piezo sensor with active amplifier
Adapter	Magnetic adaptor
Indicators	Status LED
Operation	On/Off magnetic switch
Power supply	Internal rechargeable Li-Ion battery, inductive charging
Operating time	min. 16 h
Dimensions	Ø 45 x 115 mm
Weight	0.4 kg
Degree of protection	IP 68

3 COR C-300-RI

3.1 Function and design

The COR C-300-RI is a portable device, acting as a radio interface between a PC or laptop and the sensor devices of the COR C-3 system. With the C-300-RI it is possible to program/configure the Multisensors (COR MS-3) and receive the analog signal of the Power-Transmitters (COR PT-3).

The C-300-RI has two external connectors to connect two different antennas - one for digital communication and one for long range analog communication.



Element	Description
13	**Headset connector**
14	**Digital antenna socket**
15	**Analog antenna socket**
16	**Audio channel switch button** A/B, A mono, B mono
17	**Volume up/down button**

3.2 Power supply

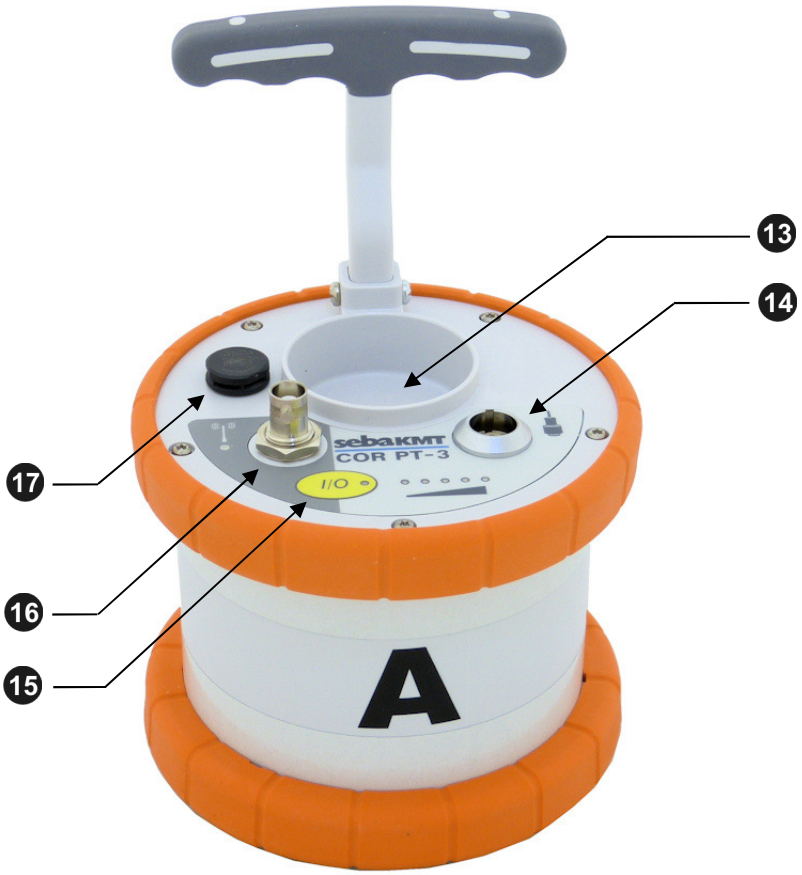
The USB connector is used for data transfer and power supply

4 The Power transmitters

4.1 Function and Design

Each Power transmitter has an active amplifier for the microphone signal, a data memory, a rechargeable Li-Ion battery, a digital radio module and an analogue radio module with antenna inside.

The sensors have the following external characteristics:



Element	Description
13	**Microphone storage place**
14	**Sensor socket** for connecting the microphone / hydrophone
15	**I/O pushbutton** short pressing ... switches the device on long pressing ... Switches the device off
16	**Antenna socket** Antenna socket for connecting the analogue radio antenna
17	**Ventilation/venting membrane**

Indicator lights The Power transmitters have the following lights (LEDs):

Element	Description
18	**LED bar** lit green ... represents the current battery level lit red ... represents the noise level
19	**I/O LED** lit green ... the transmitter is switched on flashing ... the device is charging not lit ... the transmitter is switched off
20	**Radio LED** lit red ... the transmitter is in "Active" mode, noise measurement in progress, measurement data is being sent to the Correlator not lit ... the transmitter is in "Stand-by" mode, no measurement in progress, no radio traffic

4.2 Identification number (ID)

Each Power transmitter has its own six-digit identification number (short: ID). Using this ID the device can be managed and clearly identified in the Correlator, computer and within the SebaKMT-Cloud.

The ID is deduced from the last six digits of the device's serial number (short: SN). You find the serial number on the nameplate of the device.

When entering an ID on the Correlator or computer, the preceding zero digits can be omitted.

4.3 Power supply

Battery level

The Power transmitters are fitted with internal rechargeable Li-Ion batteries This can power the device for approximately 12 hours.

In the Start menu of the Correlator two battery icons indicate the current battery status of the Power transmitters.

On the Power transmitters, the current battery status is indicated by the LED bar 18 when it is green. If only one of five LEDs is lit, the device should be charged. Otherwise, it switches itself off automatically.

Red light represents the recorded noise during the measurement and not the battery status.

Charging

The Power transmitters are charged wirelessly in the transport case. The case must be connected to a power supply. As soon as the Power transmitters are situated at their storage places in the case, they are recharged inductively.

Charging takes approximately 12 hours. The I/O LED 19 flashes when loading. The LED bar 18 indicates the progress of charging The I/O LED turns back to permanent light as soon as the battery is full.

CAUTION

No objects must be put into empty charging stations.

Risk of fire!

The charging stations are for transport and charging of the devices only.

NOTE

Any repairs must be carried out by SebaKMT or an authorized service partner.

Otherwise, the devices' resistance against water and dirt cannot be guaranteed.

Do not open the device yourself. If you have problems with the battery, please contact your SebaKMT service partner.

4.4 Commissioning

Switching ON/OFF

To turn on, briefly press the I/O pushbutton ⓯. The I/O LED is lit green when the device is turned on. To turn the device off, press the button until the LED goes out.

Stand-by

The microphone's storage place ⓭ is fitted with a magnetic switch. As a result, the Power transmitter "knows" whether the microphone is currently in use or not.

As long as the microphone rests in its storage place, the Power transmitter remains in "Stand-by" mode. The internal analogue radio module stays off as no measuring data needs to be transferred to the Correlator. This saves battery power.

As soon as the microphone is taken from the storage place, the Power transmitter switches from "Stand-by" to "Active" mode. The radio module is activated. From now on, the recorded data are directly sent to the Correlator. The row of LEDs switches from green to red and represents the recorded noise level.

4.5 Installation

The sensors should be installed directly on the pipe but, however, you can also attach them to valve rods or hydrants, for example, or any other position along the pipeline that is easily accessible.

There must be the best possible contact between the sensor foot or the mounted adapter (see below) and the pipe. If need be, clean the contact point thoroughly (preferably with a wire brush).

In some situations it might be helpful to use one of the supplied magnetic angle adapters.

5 The Multi sensors

5.1 Design and function

Each Multi sensor has a highly sensitive piezo microphone with active amplifier, a data memory, a rechargeable Li-Ion battery and a radio module with antenna inside.

The sensors have the following external characteristics:

Element	Description
22	**Status LED** flashes green ... Battery OK flashes yellow ... Battery critical flashes red ... Device needs to be re-charged flashes rapidly ... Device is charging no light ... Device is turned off
23	**ON/OFF contact area I/O**
24	**Magnetic foot (detachable)**
25	**Type plate**
26	**Carrying ring (detachable)**

5.2 Identification number (ID)

Each Multi sensor has its own six-digit identification number (short: ID). Using this ID the device in the Correlator and the CorreluxView PC software can be managed and clearly identified.

The ID is deduced from the last six digits of the device's serial number (short: SN). You find the serial number on the nameplate of the device.

When entering an ID on the Correlator or computer, the preceding zero zero digits can be omitted (see page **Fehler! Textmarke nicht definiert.**).

5.3 Power supply

Battery level The Multi sensors are fitted with internal rechargeable Li-Ion batteries This can power the device for at least 16 hours.

In the Start menu of the Correlator up to eight battery icons can be seen. They indicate the current battery status of the registered Multi sensors in reach. To know the exact battery state of a Multi sensor, read the unit's configurations menu (see page **Fehler! Textmarke nicht definiert.**). In the line **battery status** the battery level of the sensor is shown as a percentage.

When the battery level of a Multi sensor falls below a certain threshold, the indicator light of the device will flash red. The device must be charged. Otherwise, it switches itself off automatically.

Charging To charge the Power transmitters place them in the transport case. The case must be connected to a power supply. As soon as the sensors are situated at their storage places in the case, they are recharged inductively.

Charging takes approximately 6 hours. The units' indicator lights are rapidly flashing during the charging process. The indicator lights turn to permanent green light as soon as the battery is full.

CAUTION

No objects must be put into empty charging stations.

Risk of fire!

The charging stations are for transport and charging of the devices only.

NOTE

Any repairs must be carried out by an authorized service partner.

Otherwise, the devices' resistance against water and dirt cannot be guaranteed.

Do not open the Multi sensors yourself. If you have problems with the battery, please contact your SebaKMT service partner.

5.4 Switching ON/OFF

The Multi sensors have an internal magnetic switch.

To turn a Multi sensor on, briefly hold a magnet (e.g. the foot of another Multi sensor) in front of the sensor's I/O area (23). The device turns on. The indicator light flashes 3 times.

To turn the device off, hold a magnet in front of the I/O area for approximately 2 seconds. The indicator light will flash 2 times before it goes out.

5.5 Installation

The Multi sensors should be installed directly on the pipe However, you can also attach them to valve rods or hydrants, for example, or any other position along the pipeline that is easily accessible. Due to their powerful magnet, the sensors can also be attached horizontally.

There must be the best possible contact between the sensor foot or the mounted adapter (see below) and the pipe. If need be, clean the contact point thoroughly (preferably with a wire brush).

5.6 Angle adapter

In some situations, the Multi sensor cannot be attached directly to the desired measurement point due to its size, e.g. in very narrow shafts or similar. In such cases, it can be helpful to use one of the supplied angle adapters.

Magnetic connection

Thanks to its magnetic foot, the sensor is simply placed on the adapter. Then, the magnetic adapter can be attached to the pipe or fitting etc.

NOTE

The sensor's type plate and **I/O** area (23) must face away from the angle adapter - as can be seen on the picture.

Otherwise, the magnet of the angle adapter would turn off the Multi sensor unintentionally.

Screw connection

You can screw the angle adapter firmly to the sensor.

This can be useful as the holding strength between the angle adapter and the pipe in general is higher than the holding strength between the angle adapter and the sensor. When collecting the sensors, it may happen that you pull the sensor from the angle without intention. The adapter then remains on the pipe and it could be difficult to remove it.

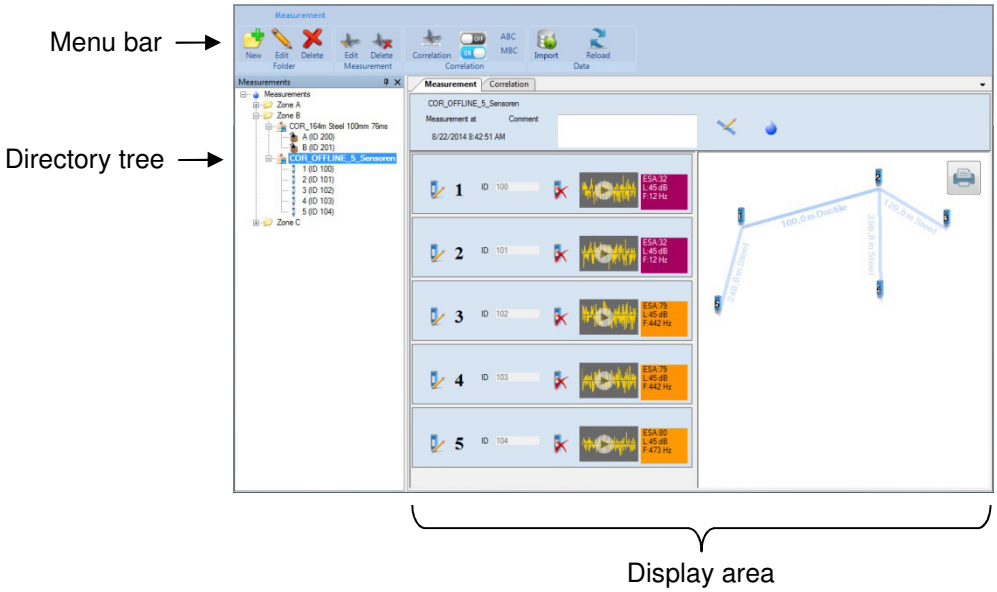
Unscrew the magnetic foot from the sensor. Take one of the supplied screws from the COR C-300-RI set to screw the angle adapter on the sensor.

Make sure that the sensor's type plate does face away from the angle adapter.

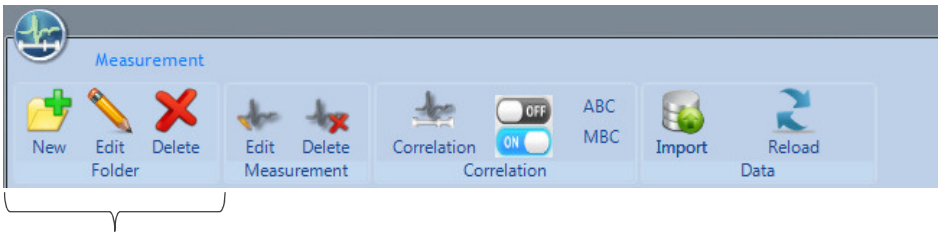
6 CorreluxView Software

6.1 User interface

The CorreluxView screen is divided into three sections - menu bar, directory tree and display area. This screen layout remains unchanged regardless of menu level.



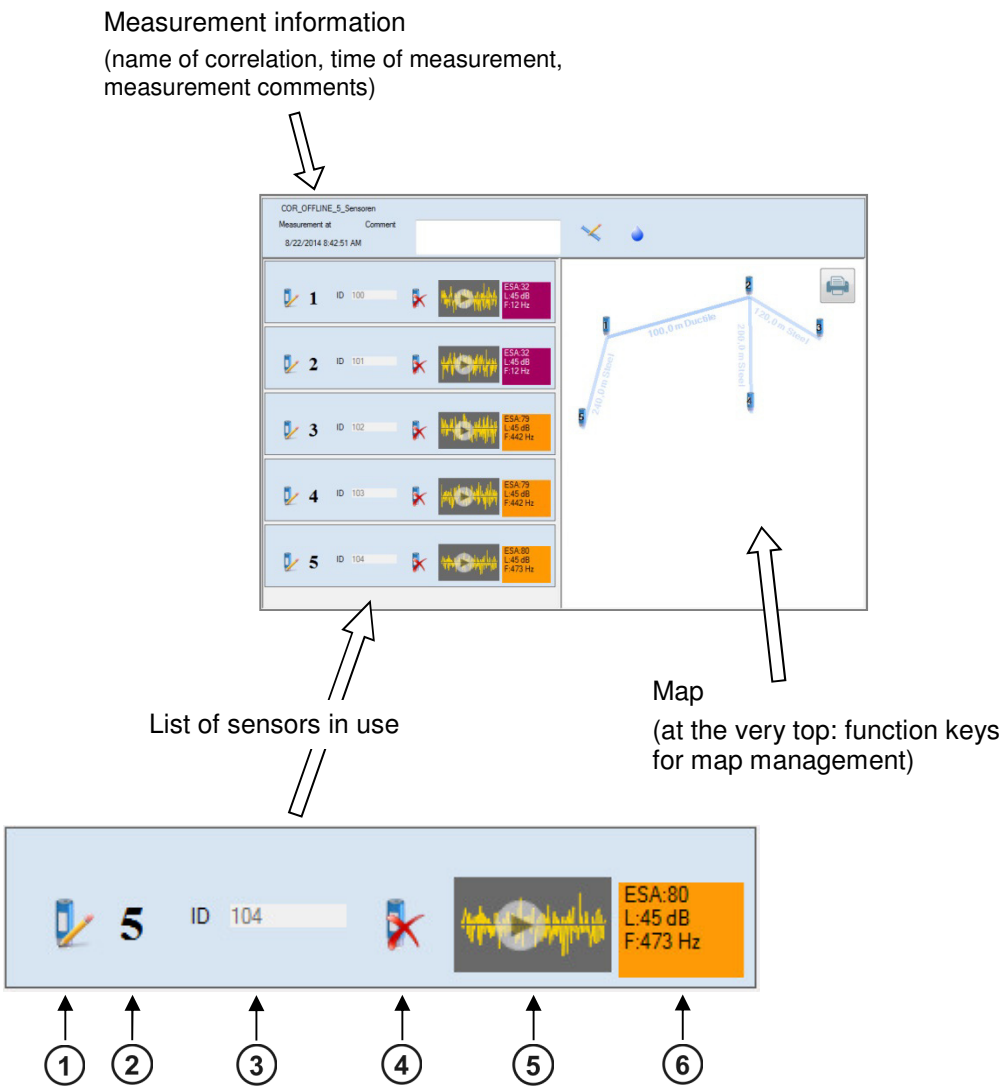
Menu bar The menu bar (ribbon) allows you to access any command or function. Function keys are combined appropriately into different segments. The CorreluxView symbol at the top left of the menu bar allows you to access system settings for the application.



Example: 'Folder' segment containing function buttons for managing directories in the directory tree

Directory tree The directory structure (the so-called "directory tree") of the application's internal database is displayed to the left of the screen. Users are free to create, edit and delete directories and subdirectories in any way they wish.

Display area The display area is divided into the following sections:



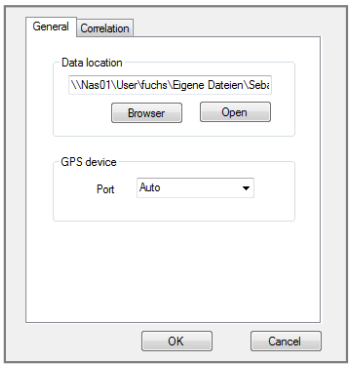
Element	Description
(1)	Button to • edit the GPS data for this sensor • edit the comment text for this sensor
(2)	Sensor number
(3)	Identification number for this sensor
(4)	Button for deleting this sensor from the list
(5)	Button for listening to the quietest recording made by this sensor
(6)	Minimum value of this sensor (ESA value, level in dB, frequency in Hz). The color of the field reflects the ESA value. **blue** **yellow** **low level** **high level**

6.2 Basic settings

You should always check basic CorreluxView software settings and adjust these if necessary before using the application.

To open the system settings menu, proceed as follows:

Step	Description
1	Click on the CorreluxView symbol  at the top left of the menu bar.
2	Click on **Settings** in the context menu.
	Result: The system settings menu opens.



6.2.1 Storage location for application database

In the **Data location** segment the storage location for the CorreluxView application database is shown. This target directory was created upon initial installation of the software. All measurement data sets that are imported to the CorreluxView application by the Correlator are saved under this location.

You can use the **Open** button to open the directory.

You can use the **Browse** button to specify a new storage location. The application will display a window allowing you to navigate to the new target directory for the application database. When you are finished, click **OK** to confirm your change.

6.2.2 GPS receiver port

The CorreluxView application allows you to connect a GPS receiver to your computer so you can use the software to specify GPS coordinates for sensors.

Use the drop-down menu in the **GPS device** segment to select the connection port for your GPS receiver.

6.2.3 System of units

You can select whether **Metric** or **Imperial (Anglo-American)** units of measurement are to be used in your CorreluxView application.

Open the **Correlation** tab. Use the drop-down menu in the **Unit** segment.

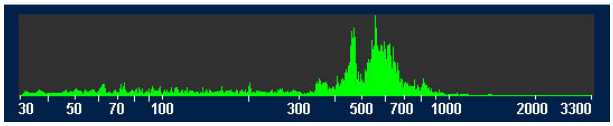
6.2.4 Logarithmic or linear coherence display

In the Correlation menu a Coherence curve is shown. You can select whether the frequency axis for the coherence curve should rise **linearly** or **logarithmically**.

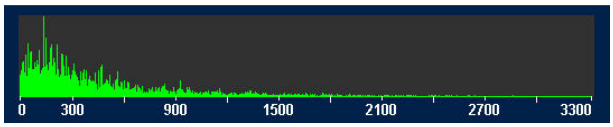
Open the **Correlation** tab. Use the drop-down menu in the **Coherence** segment.

Explanation: The frequency range of the Correlux C-300 system is from 0 to 3300 Hz. Experience shows that the frequency of leak noise ranges from 0 to 1000 Hz. The logarithmic view results in a wider display area for these lower frequencies.

Logarithmic view:



Linear view:



6.3 Creating, renaming and deleting directories

Creating a directory

To create a new directory in the directory tree, proceed as follows:

Step	Description
1	In the directory tree, select the directory under which your new directory is to be added as a subdirectory.
2	Click on New in the **Folder** segment.
	Result: A new window opens.
3	Enter the name of your new directory, then click **OK** to confirm your input.
	Result: The new directory has now been created in the database and appears in the directory tree.

Renaming a directory

You may also change the name of an existing directory. Proceed as follows:

Step	Description
1	Select the relevant directory in the directory tree.
2	Click on **Edit** in the **Folder** segment.
	Result: A window opens.
3	Enter the new name for your directory, then click on **OK** to confirm your input

Deleting a directory

To remove a directory from the directory tree, proceed as follows:

Step	Description
1	Select the relevant directory in the directory tree.
2	Click on **Delete** in the **Folder** segment.
3	Answer **Yes** to the delete confirmation prompt.
	Result: The directory as well as all measurements stored under that directory are deleted from the database.

6.4 Importing data

To import a measurement data set from the Correlator into the CorreluxView application, proceed as follows:

Step	Description
1	Connect the Correlator to your computer. (First, establish the cable connection. Then go to the Correlator's main menu, click on the  button, then on **Connect Correlator to PC**, then on **Connect**.)
	Result: Your computer will automatically recognize the Correlator as a data storage device and display it under the name 'CORRELUX'.
2	Go to the CorreluxView directory tree and select the directory under which the measurement is to be added. If necessary, first create a new directory.
3	Click on **Import** in the menu bar.
	Result: A new window opens.
4	Navigate to the Correlator's root directory ('CORRELUX'). This directory will list a set of subdirectories that contain all measurement data sets saved.
5	Select the measurement data set you want, then click on **OK**.
	Result: The data import begins. The process may take a few seconds. After the data transfer is complete, the measurement will appear in the directory tree, and will also be opened for processing in the display area.

6.5 Editing a map

The Map section is intended to provide a realistic overview of the sensors and pipelines in the measuring area.

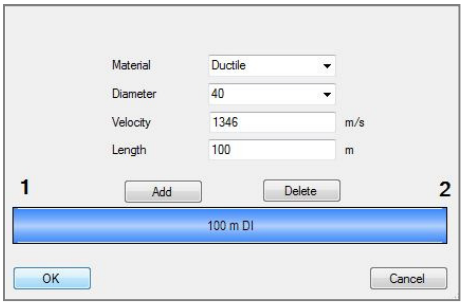
The sensors used are shown as icons. Pipelines can be drawn between these icons and the pipe parameters can be specified.

Provided that GPS data for the measuring points are known (i.e. the coordinates of the measuring points have been determined and saved prior to measurement), the CorreluxView application will automatically arrange the sensor icons in the map section so that they correspond to reality.

Arrange sensor icons To move and reposition sensor icons in the map section, proceed as follows:

Step	Description
1	The button  must be deactivated.
2	Click once on the sensor symbol you want to move.
	Result: The symbol is now highlighted and "stuck" to your mouse cursor.
3	Move your mouse cursor to the new position for the symbol, then click your mouse button again.
	Result: The sensor now occupies the new position.

Draw pipelines To draw in a new pipe section between two sensors, proceed as follows:

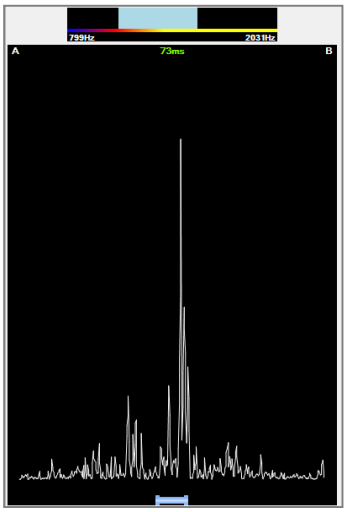
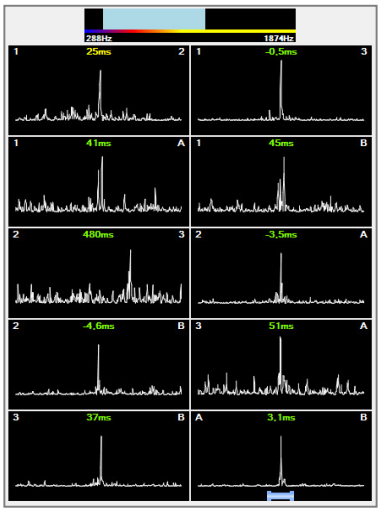
Step	Description
1	Activate the button  . It will appear highlighted.
2	In the map section, click on the first sensor (start of pipe section).
3	Move your mouse cursor to the second sensor (end of pipe section) and click on it.
	Result: A line will now connect the two sensor icons on the screen. A window opens, allowing you to enter parameters for the new pipeline. 
4	You can use the **Add** and **Delete** buttons to divide the displayed pipeline into individual sections if the line between the sensors is not consistently of the same material or does not have a consistent diameter.
5	Enter pipe data (material, diameter, length) for each pipe section. To select a section, click directly on the relevant section in the graphic.
6	Click **OK** to confirm your input.
	Result: The window will close, and the map section will now include the new information you entered.

Edit a section / change pipe data Go to the map section and double-click on a given pipeline to make changes to that pipe's data or to the way you divided it into sections. The window for inputting pipe data will open.

6.6 Correlation

6.6.1 Perform and display a correlation

To display the correlation result for a measurement, proceed as follows:

Step	Description
1	Select the relevant measurement in the directory tree.
2	Click on the **Correlation** button in the menu bar.
3	**Result:** In the case of Online measurements, a single window will appear and display the correlation result as a curve (left graphic). In the case of Offline measurements, the application will provide up to 28 miniature windows (thumbnails) to display the result of the multi-correlation (right graphic). You will probably already be familiar with these correlation diagrams from your work with the Correlator.  

Set frequency filters

The frequency diagram at the very top of the screen allows you to set a frequency filter and to repeat the correlation.

First, go to the graphic and click on your desired lower frequency limit, keeping your mouse key held down. Then move your mouse cursor to the right and let the key go when you've reached your desired upper frequency limit. The correlation/multi-correlation will update immediately, taking into consideration only the frequency range marked in blue.

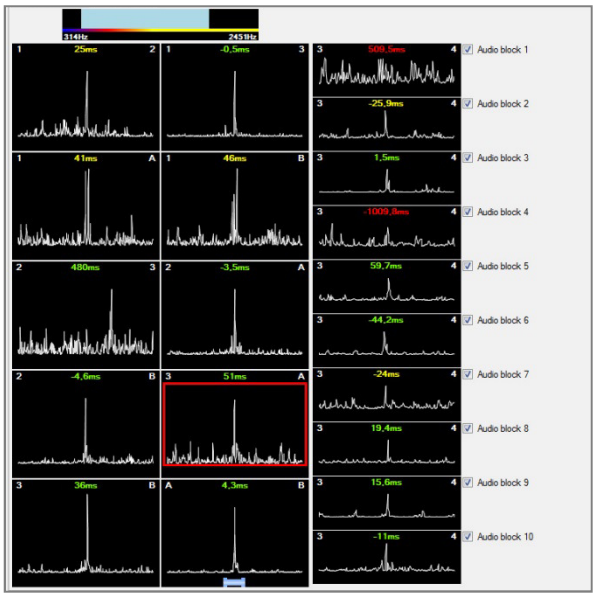
Change display area view

Using the **Measurement** tab at the top of the display area you can return to the view that shows the sensor list and the map. Use the **Correlation** tab to call the correlation or multicorrelation view again.

6.6.2 Display and select audio blocks (Offline measurements only)

Show audio blocks

Once you click on the thumbnail of a sensor pair, 10 additional thumbnails will open at the right of the screen, showing the individual correlations of the 10 audio blocks recorded by these two sensors during measurement.



Select audio blocks

Using the 10 checkboxes on the right, you have the chance to exclude, from the overall correlation, those individual audio block correlations which are "unusable".

To do this, just deactivate the checkbox next to the audio block in question.

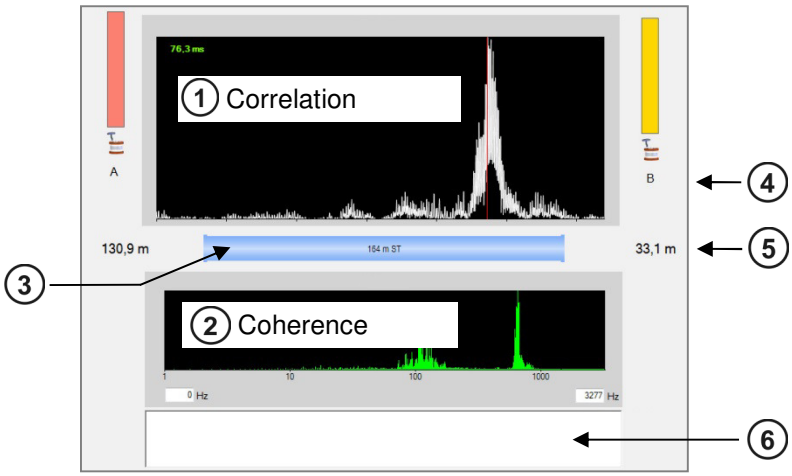
The thumbnail of the sensor pair's overall correlation, highlighted by a red rectangular frame, will be updated immediately.

The "disabled" audio block will be excluded from any correlation analysis until the corresponding checkbox is ticked again.

6.6.3 Call up the correlation analysis menu

Call up analysis menu Once you click twice on a correlation displayed by CorreluxView, the analysis menu appears which can be used to more closely examine the correlation.

Design The menu which opens is very similar to the Correlator's Correlation menu.

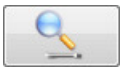


Element	Description
①	**Correlation curve** with the Lag value top left whose color indicates the quality of the correlation
②	**Coherence curve**
③	**Pipeline between A and B** Tapping the graphic opens the menu for entering pipe parameters.
④	**Sensor number**
⑤	**Distance from sensor to leak**
⑥	**Comment field** for notes on this correlation

Tools The buttons for analyzing correlation curve and coherence will probably also be familiar to you from your work with the Correlator.

Zoom … To magnify a section of the correlation curve

Click on the button, then select the area in the diagram on which you want to zoom.



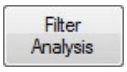
Zoom opt. … Click on the button to toggle between the following two displays:

- Display of the entire correlation range
- Display of only that portion of the correlation curve which refers to the pipe section between the two measuring points

Peak suppression … To hide a section of the curve from view

Click on the button, then select the area in the diagram that you want to suppress.

Reset … Sets all analysis tools as well as the correlation curve back to their initial states.



Automatic search for filter … Provides 10 possible filter settings for selection

Click on the button. The application will open a window which suggests 10 possible frequency filter settings, with the most sensible highlighted.

Bandpass … To delimit a frequency range

The button must first be activated. Then go to the coherence diagram and select your desired frequency range.

The correlation is updated, suppressing those frequencies which fall outside the range you selected.

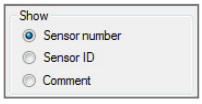
Broadband … Resets the frequency filter

Bandstop … To suppress a frequency range.

The button must first be activated. Then go to the coherence diagram and select your desired frequency range.

The correlation is updated, hiding the selected frequency range from view.

Print … Allows to print out the correlation and coherence curves that are currently displayed. Clicking on the button will open the printer dialog window.

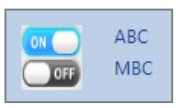


Using the radio buttons in the **Show** segment bottom right, you can select whether the two sensors (left and right of the correlation curve) are described by their Sensor number, Identification number or commentary.

6.6.4 Select a correlation method (Offline measurements only)

In the case of Offline measurements, one of the following two correlation methods for the multi-correlation can be chosen:

Correlation methods

Averaged correlation **ABC**	Minimum Block Correlation **MBC**
The CorreluxView application calculates an average over the 10 individual audio block correlations carried out for a sensor pair. This "averaged correlation" is displayed in the sensor pair's thumbnail. "Disabled" audio blocks are excluded from the calculation.	The CorreluxView application selects the quietest audio block out of the 10 individual correlations for a sensor pair and displays this in the sensor pair's thumbnail. "Disabled" audio blocks are excluded from the calculation.
In the menu bar, set the ABC slide control to ON.	In the menu bar, set the MBC slide control to ON.
	

Tento symbol indikuje, že výrobek nesoucí takovéto označení nelze likvidovat společně s běžným domovním odpadem. Jelikož se jedná o produkt obchodovaný mezi podnikatelskými subjekty (B2B), nelze jej likvidovat ani ve veřejných sběrných dvorech. Pokud se potřebujete tohoto výrobku zbavit, obraťte se na organizaci specializující se na likvidaci starých elektrických spotřebičů v blízkosti svého působiště.

Dit symbool duidt aan dat het product met dit symbool niet verwijderd mag worden als gewoon huishoudelijk afval. Dit is een product voor industrieel gebruik, wat betekent dat het ook niet afgeleverd mag worden aan afvalcentra voor huishoudelijk afval. Als u dit product wilt verwijderen, gelieve dit op de juiste manier te doen en het naar een nabij gelegen organisatie te brengen gespecialiseerd in de verwijdering van oud elektrisch materiaal.

This symbol indicates that the product which is marked in this way should not be disposed of as normal household waste. As it is a B2B product, it may also not be disposed of at civic disposal centres. If you wish to dispose of this product, please do so properly by taking it to an organisation specialising in the disposal of old electrical equipment near you.

Този знак означава, че продуктът, обозначен по този начин, не трябва да се изхвърля като битов отпадък. Тъй като е B2B продукт, не бива да се изхърля и в градски пунктове за отпадъци. Ако желаете да извърлите продукта, го занесете в пункт, специализиран в изхвърлянето на старо електрическо оборудване.

Dette symbol viser, at det produkt, der er markeret på denne måde, ikke må kasseres som almindeligt husholdningsaffald. Eftersom det er et B2B produkt, må det heller ikke bortskaffes på offentlige genbrugsstationer. Skal dette produkt kasseres, skal det gøres ordentligt ved at bringe det til en nærliggende organisation, der er specialiseret i at bortskaffe gammelt el-udstyr.

Sellise sümboliga tähistatud toodet ei tohi käidelda tavalise olmejäätmena. Kuna tegemist on B2B-klassi kuuluva tootega, siis ei tohi seda viia kohalikku jäätmekäitluspunkti. Kui soovite selle toote ära visata, siis viige see lähimasse vanade elektriseadmete käitlemisele spetsialiseerunud ettevõttesse.

Tällä merkinnällä ilmoitetaan, että kyseisellä merkinnällä varustettua tuotetta ei saa hävittää tavallisen kotitalousjätteen seassa. Koska kyseessä on yritysten välisen kaupan tuote, sitä ei saa myöskään viedä kuluttajien käyttöön tarkoitettuihin keräyspisteisiin. Jos haluatte hävittää tämän tuotteen, ottakaa yhteys lähimpään vanhojen sähkölaitteiden hävittämiseen erikoistuneeseen organisaatioon.

Ce symbole indique que le produit sur lequel il figure ne peut pas être éliminé comme un déchet ménager ordinaire. Comme il s'agit d'un produit B2B, il ne peut pas non plus être déposé dans une déchetterie municipale. Pour éliminer ce produit, amenez-le à l'organisation spécialisée dans l'élimination d'anciens équipements électriques la plus proche de chez vous.

Cuireann an siombail seo in iúl nár cheart an táirgeadh atá marcáilte sa tslí seo a dhiúscairt sa chóras fuíoll teaghlaigh. Os rud é gur táirgeadh ghnó le gnó (B2B) é, ní féidir é a dhiúscairt ach oiread in ionaid dhiúscartha phobail. Más mian leat an táirgeadh seo a dhiúscairt, déan é a thógáil ag eagraíocht gar duit a sainfheidhmíonn i ndiúscairt sean-fhearas leictrigh.

Dieses Symbol zeigt an, dass das damit gekennzeichnete Produkt nicht als normaler Haushaltsabfall entsorgt werden soll. Da es sich um ein B2B-Gerät handelt, darf es auch nicht bei kommunalen Wertstoffhöfen abgegeben werden. Wenn Sie dieses Gerät entsorgen möchten, bringen Sie es bitte sachgemäß zu einem Entsorger für Elektroaltgeräte in Ihrer Nähe.

Αυτό το σύμβολο υποδεικνύει ότι το προϊόν που φέρει τη σήμανση αυτή δεν πρέπει να απορρίπτεται μαζί με τα οικιακά απορρίμματα. Καθώς πρόκειται για προϊόν B2B, δεν πρέπει να απορρίπτεται σε δημοτικά σημεία απόρριψης. Εάν θέλετε να απορρίψετε το προϊόν αυτό, παρακαλούμε όπως να το παραδώσετε σε μία υπηρεσία συλλογής ηλεκτρικού εξοπλισμού της περιοχής σας.

Ez a jelzés azt jelenti, hogy az ilyen jelzéssel ellátott terméket tilos a háztartási hulladékokkal együtt kidobni. Mivel ez vállalati felhasználású termék, tilos a lakosság számára fenntartott hulladékgyűjtőkbe dobni.Ha a terméket ki szeretné dobni, akkor vigye azt el a lakóhelyéhez közel működő, elhasznált elektromos berendezések begyűjtésével foglalkozó hulladékkezelő központhoz.

Questo simbolo indica che il prodotto non deve essere smaltito come un normale rifiuto domestico. In quanto prodotto B2B, può anche non essere smaltito in centri di smaltimento cittadino. Se si desidera smaltire il prodotto, consegnarlo a un organismo specializzato in smaltimento di apparecchiature elettriche vecchie.

Šī zīme norāda, ka iztrādājumu, uz kura tā atrodas, nedrīkst izmest kopā ar parastiem mājsaimniecības atkritumiem. Tā kā tas ir izstrādājums, ko cits citam pārdod un lieto tikai uzņēmumi, tad to nedrīkst arī izmest atkritumos tādās izgāztuvēs un atkritumu savāktuvēs, kas paredzētas vietējiem iedzīvotājiem. Ja būs vajadzīgs šo izstrādājumu izmest atkritumos, tad rīkojieties pēc noteikumiem un nogādājiet to tuvākajā vietā, kur īpaši nodarbojas ar vecu elektrisku ierīču savākšanu.

Šis simbolis rodo, kad juo paženklinto gaminio negalima išmesti kaip paprastų buitinių atliekų. Kadangi tai B2B (verslas verslui) produktas, jo negalima atiduoti ir buitinių atliekų tvarkymo įmonėms. Jei norite išmesti šį gaminį, atlikite tai tinkamai, atiduodami jį arti jūsų esančiai specializuotai senos elektrinės įrangos utilizavimo organizacijai.

Dan is-simbolu jindika li l-prodott li huwa mmarkat b'dan il-mod m'għandux jintrema bħal skart normali tad-djar. Minħabba li huwa prodott B2B , ma jistax jintrema wkoll f'ċentri ċiviċi għar-rimi ta' l-iskart. Jekk tkun tixtieq tarmi dan il-prodott, jekk jogħġbok għamel dan kif suppost billi tieħdu għand organizzazzjoni fil-qrib li tispeċjalizza fir-rimi ta' tagħmir qadim ta' l-elettriku.

Dette symbolet indikerer at produktet som er merket på denne måten ikke skal kastes som vanlig husholdningsavfall. Siden dette er et bedriftsprodukt, kan det heller ikke kastes ved en vanlig miljøstasjon. Hvis du ønsker å kaste dette produktet, er den riktige måten å gi det til en organisasjon i nærheten som spesialiserer seg på kassering av gammelt elektrisk utstyr.

Ten symbol oznacza, że produktu nim opatrzonego nie należy usuwać z typowymi odpadami z gospodarstwa domowego. Jest to produkt typu B2B, nie należy go więc przekazywać na komunalne składowiska odpadów. Aby we właściwy sposób usunąć ten produkt, należy przekazać go do najbliższej placówki specjalizującej się w usuwaniu starych urządzeń elektrycznych.

Este símbolo indica que o produto com esta marcação não deve ser deitado fora juntamente com o lixo doméstico normal. Como se trata de um produto B2B, também não pode ser deitado fora em centros cívicos de recolha de lixo. Se quiser desfazer-se deste produto, faça-o correctamente entregando-o a uma organização especializada na eliminação de equipamento eléctrico antigo, próxima de si.

Acest simbol indică faptul că produsul marcat în acest fel nu trebuie aruncat ca şi un gunoi menajer obişnuit. Deoarece acesta este un produs B2B, el nu trebuie aruncat nici la centrele de colectare urbane. Dacă vreţi să aruncaţi acest produs, vă rugăm s-o faceţi într-un mod adecvat, ducând-ul la cea mai apropiată firmă specializată în colectarea echipamentelor electrice uzate.

Tento symbol znamená, že takto označený výrobok sa nesmie likvidovať ako bežný komunálny odpad.Keďže sa jedná o výrobok triedy B2B, nesmie sa likvidovať ani na mestských skládkach odpadu. Ak chcete tento výrobok likvidovať, odneste ho do najbližšej organizácie, ktorá sa špecializuje na likvidáciu starých elektrických zariadení.

Ta simbol pomeni, da izdelka, ki je z njim označen, ne smete zavreči kot običajne gospodinjske odpadke. Ker je to izdelek, namenjen za druge proizvajalce, ga ni dovoljeno odlagati v centrih za civilno odlaganje odpadkov. Če želite izdelek zavreči, prosimo, da to storite v skladu s predpisi, tako da ga odpeljete v bližnjo organizacijo, ki je specializirana za odlaganje stare električne opreme.

Este símbolo indica que el producto así señalizado no debe desecharse como los residuos domésticos normales. Dado que es un producto de consumo profesional, tampoco debe llevarse a centros de recogida selectiva municipales. Si desea desechar este producto, hágalo debidamente acudiendo a una organización de su zona que esté especializada en el tratamiento de residuos de aparatos eléctricos usados.

Den här symbolen indikerar att produkten inte får blandas med normalt hushållsavfall då den är förbrukad. Eftersom produkten är en så kallad B2B-produkt är den inte avsedd för privata konsumenter, den får således inte avfallshanteras på allmänna miljö- eller återvinningsstationer då den är förbrukad. Om ni vill avfallshantera den här produkten på rätt sätt, ska ni lämna den till myndighet eller företag, specialiserad på avfallshantering av förbrukad elektrisk utrustning i ert närområde.