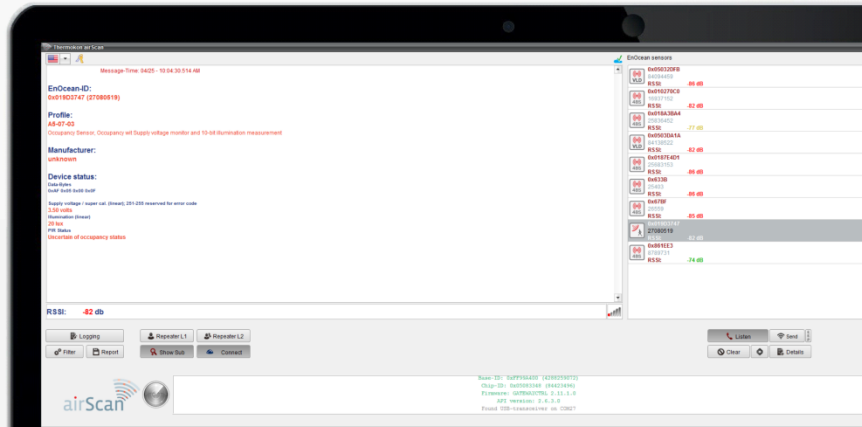


**Datasheet**

Subject to technical alteration  
Issue date: 10.02.2022 • A120 • valid from Version 5.x



valid from  
version 5.x



» **APPLICATION**

Thermokon airScan consists of an EasySens USB transceiver and the corresponding user software that turns your Windows computer into a field strength meter. airScan receives and decodes EnOcean radio telegrams, measures the RSSI (received signal strength) of each sensor allow you to determine the best position from a radio reception point of view for each sensor. airScan provides a quick overview of EnOcean telegrams, the EnOcean ID, the field strength and the manufacturer of the products.

All EnOcean telegrams can be received via the easySens USB transceiver and are displayed in the user software airScan. The EasySens USB transceiver should be positioned where the actual receiver or antenna of the receiver will be installed later on. Thermokon recommends to use the optional 3m USB Extension Cable (574044).

The latest version of the user software airScan can be downloaded from the Thermokon homepage.

» **SYSTEM REQUIREMENTS**

**OS**  
Microsoft® Windows 10 or higher

**Interface**  
1x free USB 2.0 interface for airScan stick (Art.-No. #566704)

**Internet Connection**  
An internet connection is necessary for installation/updates and activation of the software.

» **DOWNLOAD**

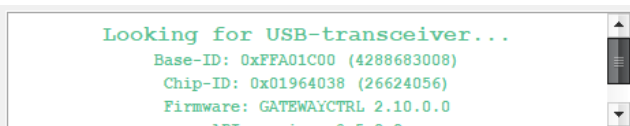
Download the user software airScan from our website [www.thermokon.de](http://www.thermokon.de)  
(Downloads -> Software/ Plugins -> EasySens -> Monitoring Software)  
Install the software according to the software installation instructions

» **COMMISSIONING**

Connect the EasySens transmitting-receiving USB with a free USB-interface of your computer. The device is automatically installed with a driver from the Windows internal driver library – internet connection is likely to be mandatory. You will be informed about the completion of the driver installation in the system tray.

If the installation does not start automatically or no driver is found, the driver installation must be started manually. The latest driver can be downloaded from: <http://www.ftdichip.com/Drivers/VCP.htm>

During start-up airScan searches the window internal list of all USB devices for it's USB transceiver containing a valid airScan license.



**Troubleshooting**

In case the driver has not been installed properly and no device is found in the network, the software fails to start.

Solution: Check the driver installation, if needed, download the driver from:  
( <http://www.ftdichip.com/Drivers/VCP.htm> )

Check in the device manager whether the USB Stick has been detected properly.  
If possible assign a small COM-Port number (i.e. COM3) to make it easier to detect.

**Please note!**

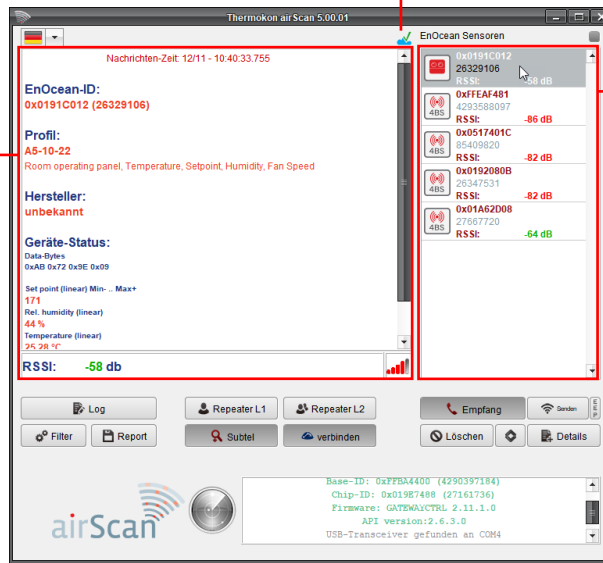
Thermokon airScan only operates with the original airScan USB.  
Third-party hardware is not supported



» **RECEIVING-TELEGRAMS**

airScan user interface

Sensor cloud connection: active inactive



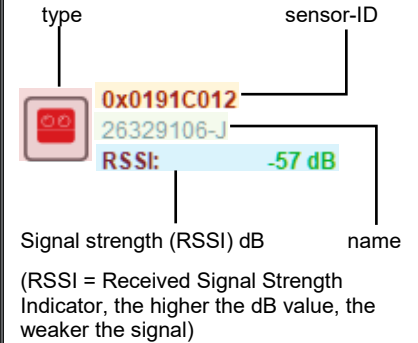
Information window

last telegram received from the sensor ID shown on the top including the decoded values and the RSSI level of this telegram.

The RSSI was generated by the USB transceiver and may be slightly different to the RSSI of the receiver later used.

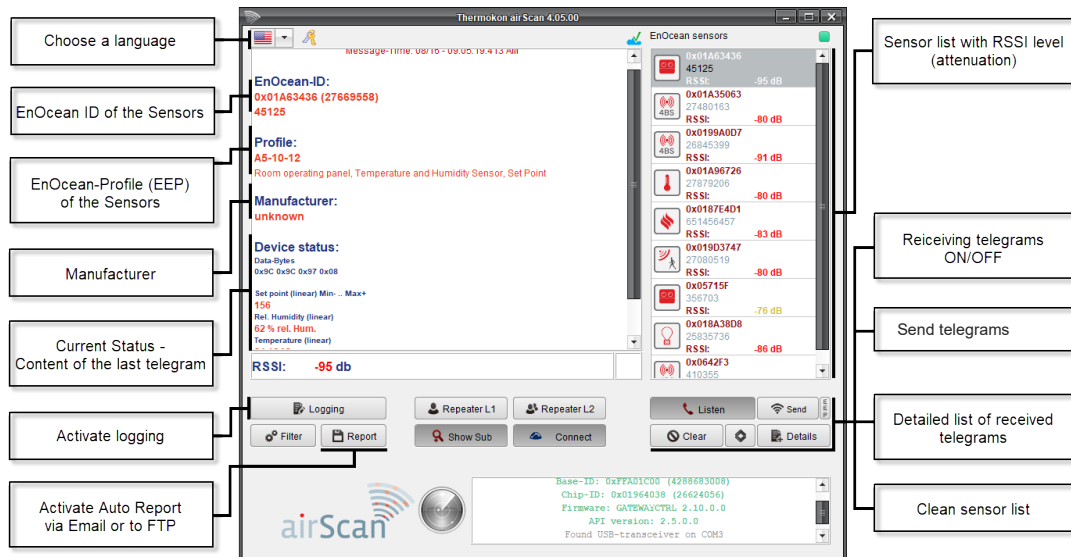
Compared with gateways with external antenne the RSSI indicated by airScan will be inferior (approx 10db)

received telegrams



Signal strength (RSSI) dB (RSSI = Received Signal Strength Indicator, the higher the dB value, the weaker the signal)

Thermokon recommends a USB-TypeA-extension cable to position the EasySens USB-transceiver, at the position the receiver's antenna shall be placed later on.



**Logging with Report Function**

Switch-on/off sending or uploading the logfile. This function is not based on the filter criteria. All telegrams are logged. Using the report function, the telegrams can directly be sent through e-mail or can be uploaded to an FTP server.

**Configure Automatic Report Function**

Define the email-credentials or the FTP server for the automatic upload of the logfile. Data formats available: XML, XLS, or CSV.

» **SENSORCLOUD**

The purpose of Sensor Cloud is to ease the decoding of the data contained in the EnOcean telegrams.

The structure of the telegram, (EEP = EnOcean Equipment Profile) is transmitted only in a LRN telegram that may be difficult to obtain, depending on the mounting position of the device. Therefore airScan stores every EEP learned locally in the text-file "C:/user/name/airScan/SensorInfo.bin".

The files contains the basic sensor information like the EnOcean ID, EEP, name and location provided by the user. Data that will be needed to identify the sensor and the payload for decoding.

Sensor Cloud offers the opportunity to share that sensor identification with the cloud to allow any other computer to retrieve the EEP from the sensor ID. No payload is transmitted to the cloud, no measurement data sent by any sensor and no personal data will be shared with the cloud. The connection to Sensor Cloud by default will be turned OFF.

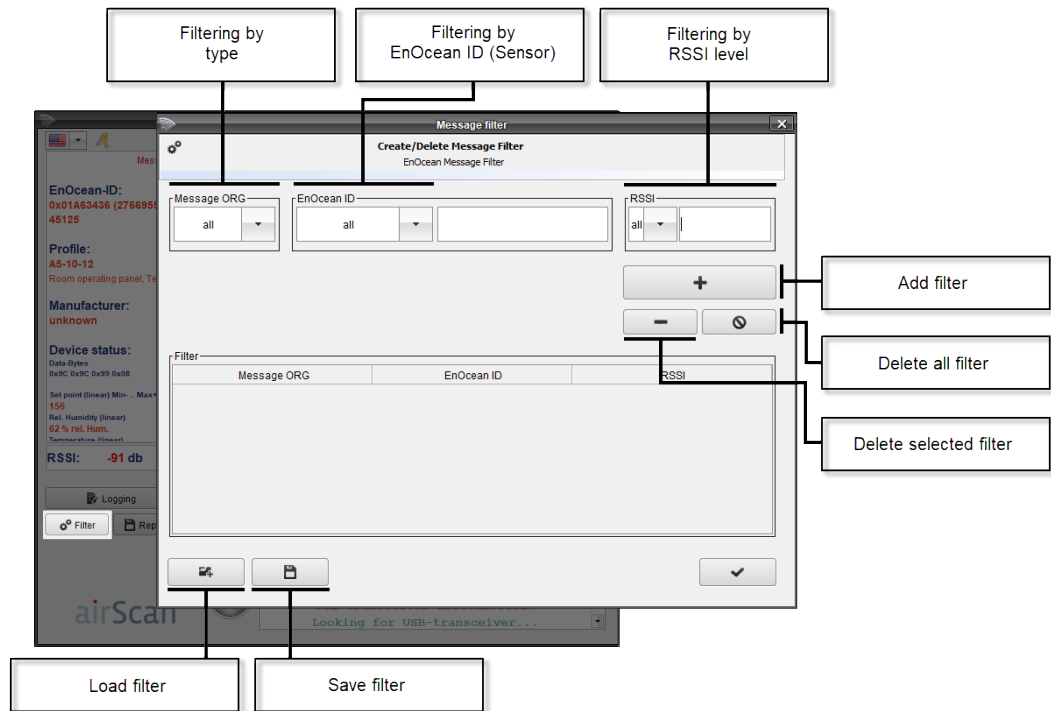
As long as airScan will not be connected to Sensor Cloud airScan saves the same data in the mentioned text file. Once connected to Sensor Cloud it will copy the data into the cloud. To prevent this either do not activate the cloud connection or delete the text file before activating the cloud connection, i.e. to keep data from a particular project "secret".

Sensor Cloud is hosted on an AWS Server in the US.

## » TELEGRAM-FILTER SETTINGS



airScan logs all telegrams in the memory. Using the "Filter" button a viewing filter can be set, that defines which telegrams will be contained in the "Details". In this case, solely telegrams corresponding to the filter settings will be displayed in the detailed view. A filter can be set on the message type, EnOcean-ID or the signal strength!

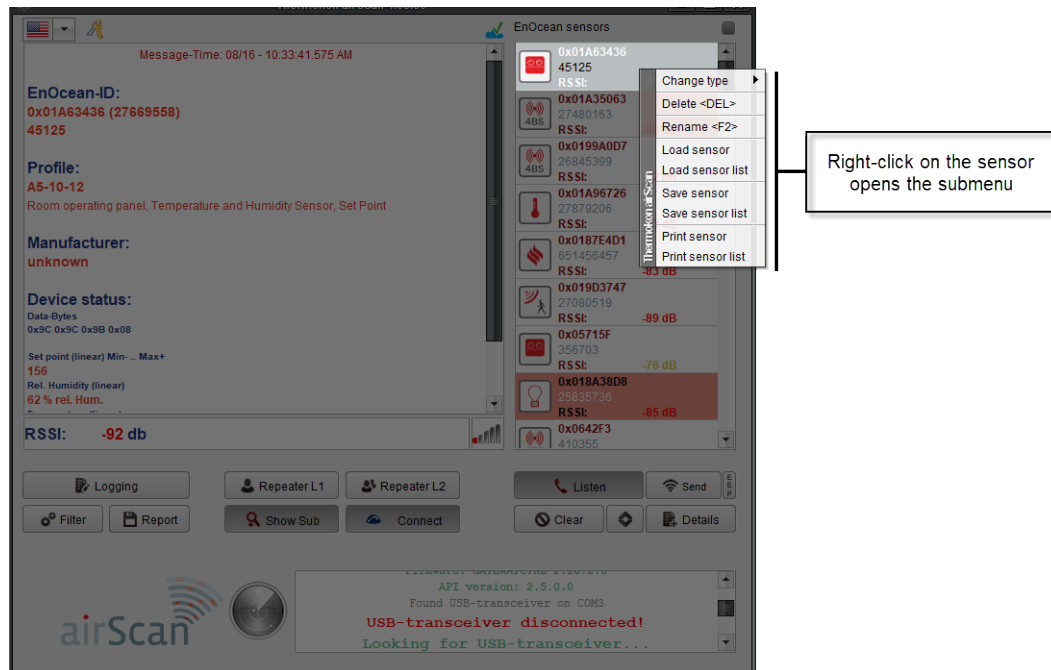


- ➔ RPS = Switch signal, e.g. electronic smart key or remote control
- ➔ 1BS = 1 Byte Sensor (e.g. window contact, window handle)
- ➔ 4BS = 4 Byte Sensor (Thermokon RF sensors with solar)
- ➔ MSC = Manufacturer Specific Command (no standard content – refer to the datasheet of the product)
- ➔ VLD = Variable Length Data (no standard content – refer to the datasheet of the product)
- ➔ ADT = Addressed Data Telegramm (no standard content – refer to the datasheet of the product)

The EEPs are the intellectual property of the EnOcean Alliance. The latest version of the EEP-list can be downloaded from the EnOcean homepage: <http://www.enocean-alliance.org/eep/>

## » SENSOR LIST FUNCTIONS

Use the right mouse button to open the submenu of a transmitter in the airScan user software.



**<Change Type>** The EEP can be assigned manually to the sensor selected. This is equal to the reception of the LRN telegram of this particular sensor or retrieving the EEP from the Sensor Cloud. A manual assignment of the profile is not necessary.

### Example:

A sensor is transmitting a telegram following the regular transmission intervals (WakeUp/HeartBeat). airConfig recognizes that this is a 4BS telegram but does not recognize the profile (EEP) and therefore cannot analyze the data.

To identify the sensor a LRN telegram must be triggered by the sensor as long as the connection to Sensor Cloud is off or the sensor ID has not been shared with the Sensor Cloud yet. Only in the LRN telegram, the sensor transmits its profile (EEP) and can be identified by airScan using the profile (EEP). The symbol changes according to the sensor type.



**<Delete >** Single or several sensors can be deleted from the list.

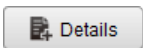
**<Rename>** A sensor description (e.g. a name or a location) can be allocated to the listed sensor. The sensor description is saved locally on your PC and saved in Sensor Cloud if connected. The description will not be stored in the EnOcean device.

**<Load Sensor>/<Load Sensor List>** Individual sensors or a complete sensor list, which was saved before, can be loaded.

**<Save Sensor> / <Save Sensor List>** Individual sensors or a complete sensor list can be saved for future use. This file contains the sensor ID, field strength measured last and the profile (EEP). To save the whole data content please use <Details> - Export XML | Export CSV | Export XLS.

**<Print Sensor> / <Print Sensor List>** Sensor-ID and the profile (if identified) can be printed.

» TELEGRAM DETAILS – SAVING LOG-FILES



When clicking on the button „Details“ a new window opens in which all telegrams received are shown considering the filter setting. This window provides information about date, time, radio ID, type of telegram (ORG) and shows the EnOcean telegram as raw data.

The column “Status” indicates if the signal is has been repeated by a L1 or L2 Repeater. L1 Repeaters only repeat telegrams originated by an EnOcean device, whereas L2 repeaters do repeat telegrams from a EnOcean device or a L1 repeater, which ever comes first.. Solar-powered sensors transmit three sub-telegrams, mechanically powered switches / devices transmit three or more telegrams depending on how much energy has been generated by the harvester. Less than 3 sub-telegrams point to a collision or a weak signal most likely due to a range issue. The loss of subtelegrams is indicating range problems more reliably that looking on the RSSI level.

If the receiver receives more than three sub-telegrams this means that the transmitted signal has been repeated and the sensor signal as well as the repeated signal have been received. In this case the RSSI level shown belongs to the signal received first (= sensor signal) (corresponding 3+3).

**NOTE!** If the number of sub-telegrams is not divideable by 3, there are telegram losses (range / reception problems oder radio collisions)

The limit of the signal strength of EnOcean based receivers is normally at about -90...-95 dB attenuation. Signals with even lower attenuation can no longer be distinguished from background noise signals.

As the attenuation of the signals varies from time to time, a safety limit of approx. 15...20dB is recommended to achieve reliable communication, especially if the measuring is done right after structural building is done. **Walls, furniture, objects and even the human bodies damp the radio signals.**

**NOTICE: Sensors with External Antenna**

For gateways / devices with external antenna, please note that the transmission/receiving quality is approx. 10 dB better than the value displayed in the airScan user software.

Time	ID	ORG	Data	Status	Repeated	RSSI	Sub	Destination
08/16 - 10:45:03.647 AM	0x019B8D7E	4BS	A5-00000408-019B8D7E-03-FFFFFFFF-03FFFFFFFF5B00	0x00	n/r	-91	3	0xFFFFFFFF
08/16 - 10:45:05.867 AM	0x061C58	4BS	A5-008C730F-00061C58-03-FFFFFFFF-03FFFFFFFF4D00	0x00	n/r	-77	3	0xFFFFFFFF
08/16 - 10:45:07.878 AM	651456457	4BS	A5-7444700F-01B7E4D1-30-03-FFFFFFFF-03FFFFFFFF5500	0x30	n/r	-85	3	0xFFFFFFFF
08/16 - 10:45:09.142 AM	45125	4BS	A5-9C9C9C08-01A63436-80-03-FFFFFFFF-03FFFFFFFF5600	0x80	n/r	-86	3	0xFFFFFFFF
08/16 - 10:45:10.610 AM	0x01A35063	4BS	A5-00066808-01A35063-03-FFFFFFFF-03FFFFFFFF5000	0x00	n/r	-80	3	0xFFFFFFFF
08/16 - 10:45:10.751 AM	0x0199A0D7	4BS	A5-B129770F-0199A0D7-03-FFFFFFFF-03FFFFFFFF5B00	0x00	n/r	-91	3	0xFFFFFFFF
08/16 - 10:45:12.432 AM	0x018A38D8	4BS	A5-BB000008-018A38D8-03-FFFFFFFF-03FFFFFFFF5000	0x00	n/r	-80	3	0xFFFFFFFF
08/16 - 10:45:12.916 AM	0x01A96726	4BS	A5-00007108-01A96726-03-FFFFFFFF-03FFFFFFFF4E00	0x00	n/r	-79	3	0xFFFFFFFF
08/16 - 10:45:17.880 AM	651456457	4BS	A5-7444700F-01B7E4D1-30-03-FFFFFFFF-03FFFFFFFF5600	0x30	n/r	-86	3	0xFFFFFFFF
08/16 - 10:45:19.286 AM	0x019D35B6	VLD	D3-A29B7880195E-019D35B6-8F-02-FFFFFFFF-03FFFFFFFF4300	0x8F	ERR	-67	2	0xFFFFFFFF
08/16 - 10:45:20.210 AM	0x05715F	4BS	A5-007A680F-0005715F-03-FFFFFFFF-03FFFFFFFF4A00	0x00	n/r	-74	3	0xFFFFFFFF
08/16 - 10:45:20.628 AM	0x01A35063	4BS	A5-00066808-01A35063-03-FFFFFFFF-03FFFFFFFF5000	0x00	n/r	-80	3	0xFFFFFFFF
08/16 - 10:45:21.287 AM	0x0199A0D7	4BS	A5-B128780F-0199A0D7-03-FFFFFFFF-03FFFFFFFF5C00	0x00	n/r	-92	3	0xFFFFFFFF
08/16 - 10:45:21.297 AM	0x01A624A0	VLD	D3-029B080158F-01A624A0-8F-03-FFFFFFFF-03FFFFFFFF4700	0x8F	ERR	-71	3	0xFFFFFFFF
08/16 - 10:45:22.895 AM	0x01A96726	4BS	A5-00007108-01A96726-03-FFFFFFFF-03FFFFFFFF4E00	0x00	n/r	-79	3	0xFFFFFFFF
08/16 - 10:45:23.231 AM	0x018A38D8	4BS	A5-BB000008-018A38D8-03-FFFFFFFF-03FFFFFFFF5000	0x00	n/r	-80	3	0xFFFFFFFF
08/16 - 10:45:23.710 AM	0x019184EC	4BS	A5-C5FF0008-019184EC-03-FFFFFFFF-03FFFFFFFF5600	0x00	n/r	-86	3	0xFFFFFFFF
08/16 - 10:45:26.777 AM	0x05148034	4BS	A5-00005D08-05148034-80-03-FFFFFFFF-03FFFFFFFF5C00	0x80	n/r	-92	3	0xFFFFFFFF
08/16 - 10:45:27.880 AM	651456457	4BS	A5-7444700F-01B7E4D1-30-03-FFFFFFFF-03FFFFFFFF5300	0x30	n/r	-83	3	0xFFFFFFFF
08/16 - 10:45:29.173 AM	45125	4BS	A5-9C9C9C08-01A63436-80-03-FFFFFFFF-03FFFFFFFF5600	0x80	n/r	-86	3	0xFFFFFFFF

HEX  
  Clear list  
  Load LOG  
  Export XML  
  Export CSV  
  Export XLS  
  Auto-Refresh  
  Auto-Scroll

Showing Sensor ID in Hexadecimal or Decimal

Load LOG, load saved log files (only XML)

Eport list as XML/CSV/XLS

List will be refreshed with every received telegram

Auto-Scroll ON/OFF

» SEND TELEGRAMS

It is possible to create and send your telegrams (e.g. temperature, status, etc.). This function is used to simulate an EnOcean transmitter for test purposes



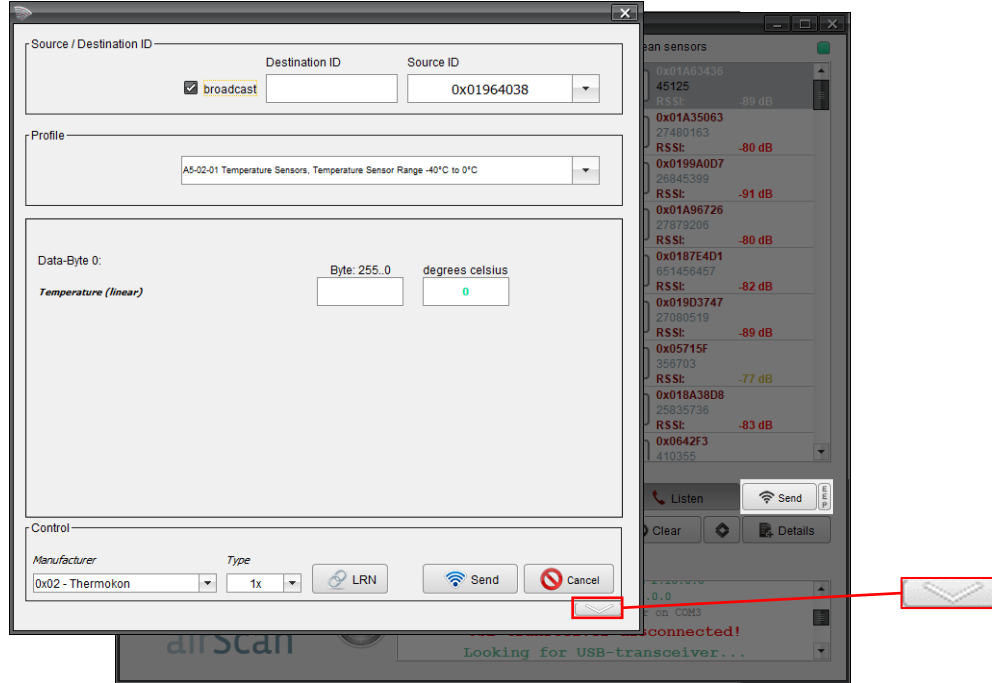
**Variant 1 (Send – Expert Mode)**

Telegram type, sending-ID, and the raw data can be entered and will be sent by airScan using the generic EnOcean ID of the AirScan USB stick. This is only recommended for experienced user.



**Variant 2 (Send with EEP Configurator)**

Activate the EEP button before pressing "Send". Using a configurator, the telegrams can be designed step by step. Only the desired values (e.g. °C/°F, Open/Close, Learn, etc.) must be entered. Via the drop-down menu, the corresponding profile types can be selected.



The „Control“section allows to send telegrams. The manufacturer can be selected and the number of sub-telegrams (1x, 3x, UTE). Click on the button "LRN" to send a learn telegram or press "Send" to send the data telegram defined by the EEP and the data entered above. (defined by the profile type).



When clicking on <Arrow down>, the airScan shows the data content of the individual data bytes which shall be sent. This maybe useful information to copy when writing user software i.e. for controllers commincating by Modbus or EVC gateways

Sample Output Telegram

Ausgabe					
RORG	DB3	DB2	DB1	DB0	Status
A5	08	28	02	80	80

» ACCESSORIES

USB extension cable 3 m/10 ft.

Art.-No.: #574044

» TECHNICAL DATA AIRSCAN



Frequency/ Modulation	868   Europe 868.300 MHz (ASK)	902   USA - Canada 902.875 MHz (FSK)	928   Japan 928.350 MHz (FSK)
Data rate	125 kBit/s		
Transmission power	<10 mW		
Dimensions	70 x 20 x 9 mm		
USB-Connection	USB-Typ-A		