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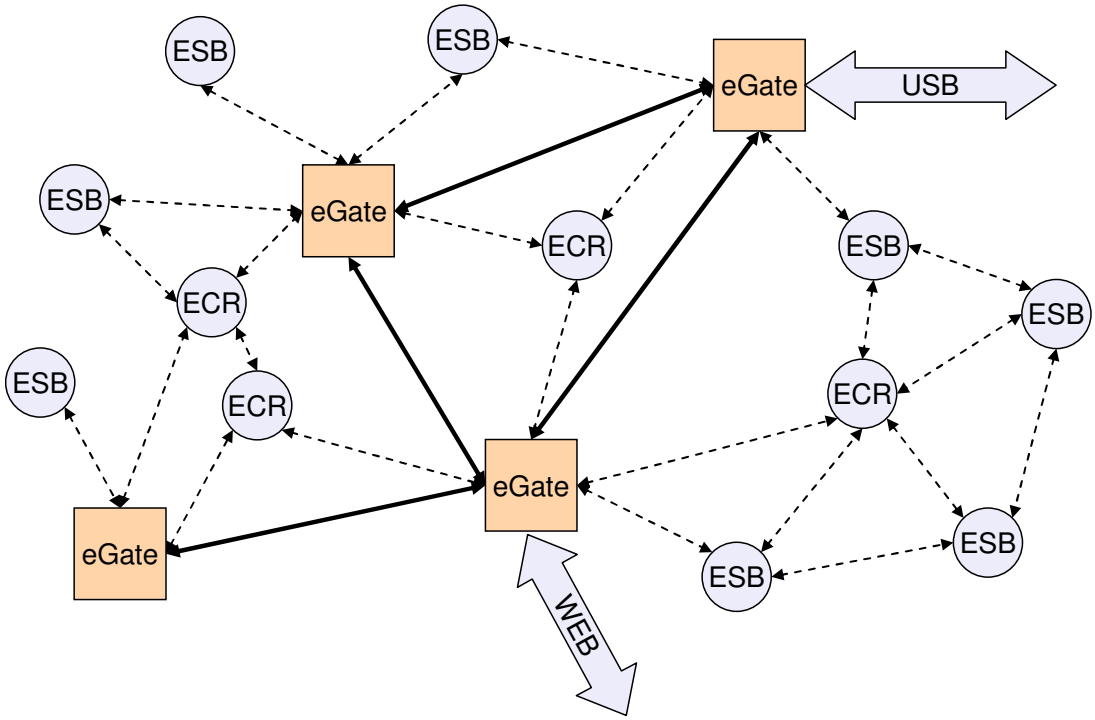
User Guide
(for ScatterViewer)

A platform for teaching & prototyping
wireless sensor networks



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Computer Systems & Telematics
Freie Universität Berlin, Germany

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1 Introduction

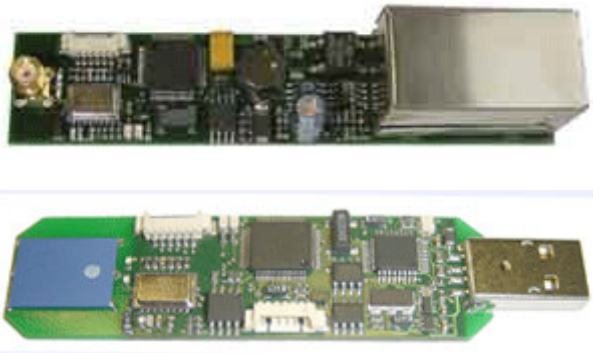
The ScatterViewer permits:

- Data Logging
- Node Managing
- OTA Flashing
- Net-Scanning
- ScatterRouting

The ScatterViewer supports three ways of using:

- As embedded applet: upload the ScatterViewer on the eGate/WEB and use it browser-based
- As executable program: run the ScatterViewer local to gain access to eGate/USB (via COM) or eGate/WEB (via IP)
- As hosted applet: host the ScatterViewer on the internet without uploading on the eGate/WEB

eGate/WEB & eGate/USB



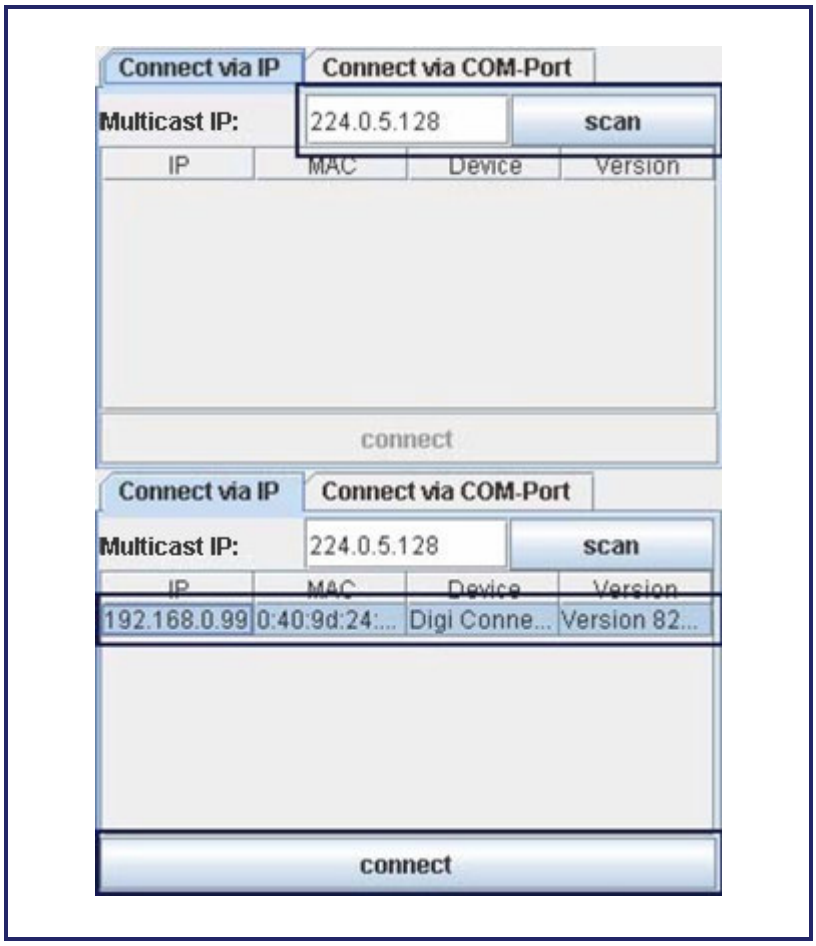
ESB (Embedded Sensor Board)

2 Connection Dialog

If you don't use the ScatterViewer as an Embedded Applet, you must choose a connection. We provide an opportunity to run a search for the discovery of the eGate/WEB. You can also connect to an eGate/USB over a serial port (WinXP/2000).

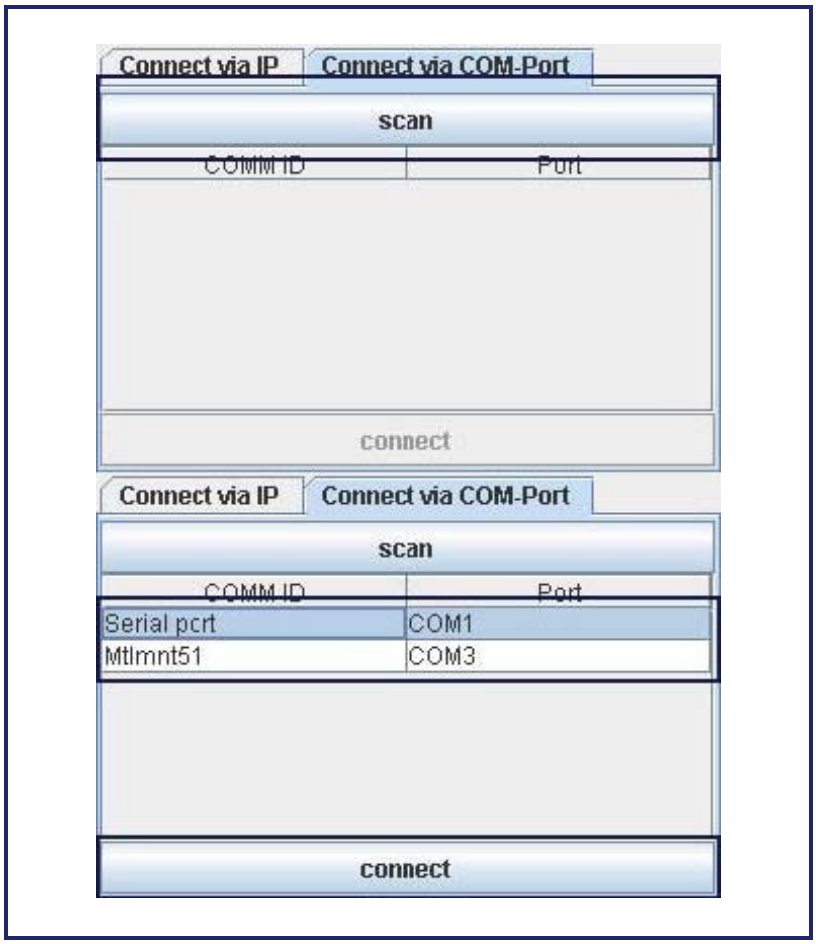
2.1 IP Connection

You should use the given IP address. Press the *scan* button to search for devices. After the search all located devices will appear in the table and the *connect* button will be activated. Choose your device and click on the *connect* button to start the ScatterViewer.



2.2 Serial Port Connection

This connection mode is only applicable on Windows XP and 2000 System because the software uses the Windows registry and loads a java com-port driver. Press the *scan* button to search for devices. After the search all located devices will appear in the table and the *connect* button will be activated. Choose your device and click on the *connect* button to start the ScatterViewer.



3 Node

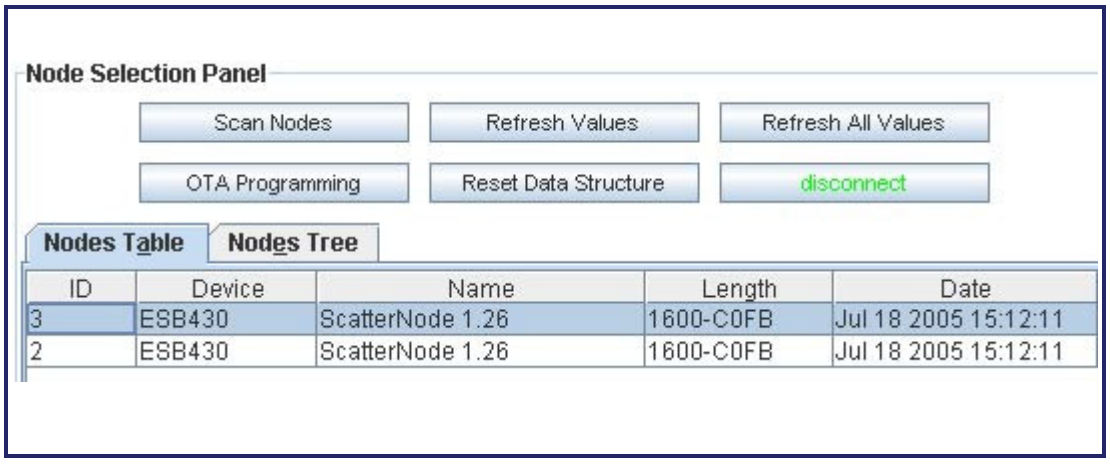
The node tab offers an overview of all reachable nodes. All located nodes will appear in the table. The software removes automatically all non-reachable nodes after a timeout and a non-answering ping.

Using:

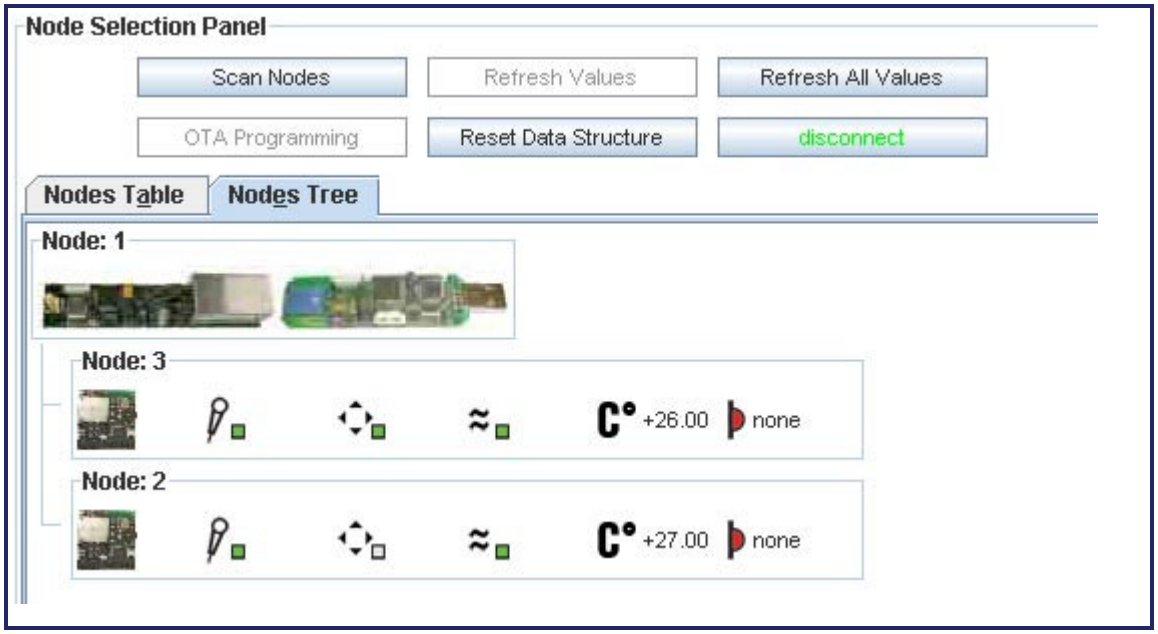
- Press the scan button to rescan the network.
- The Refresh Values button loads the values of the selected node again and the Refresh All Values button loads the values of all nodes.
- Press the OTA Programming button to flash the selected node over the air with the image of the eGate.
- The Reset Data Structure button resets the internal data structure and scans the network again.
- The disconnect button and connect button respectively enables you to disconnect and reconnect respectively to the eGate.

There are two ways available to display the nodes. Both views enable you to read the sensor values and to change all node properties. The node tab consists of the following segments:

3.1 Node Tables

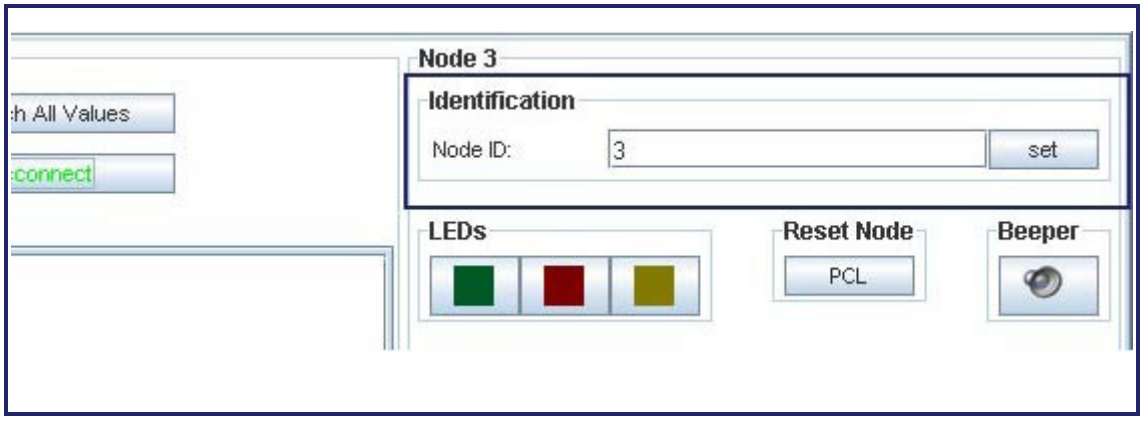


3.2 Nodes Tree



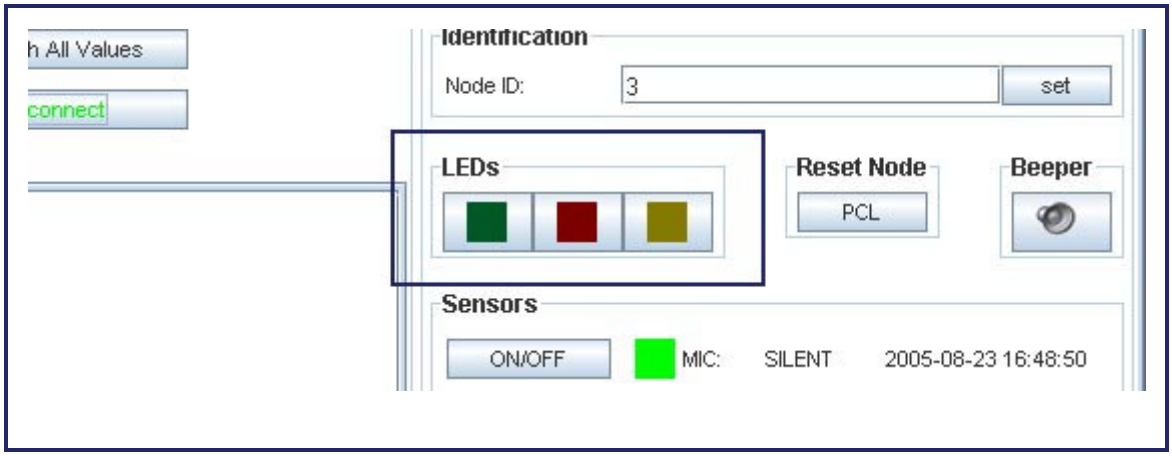
3.3 Identification

You can change the ID of the selected node and set it with a click on the *set* button.



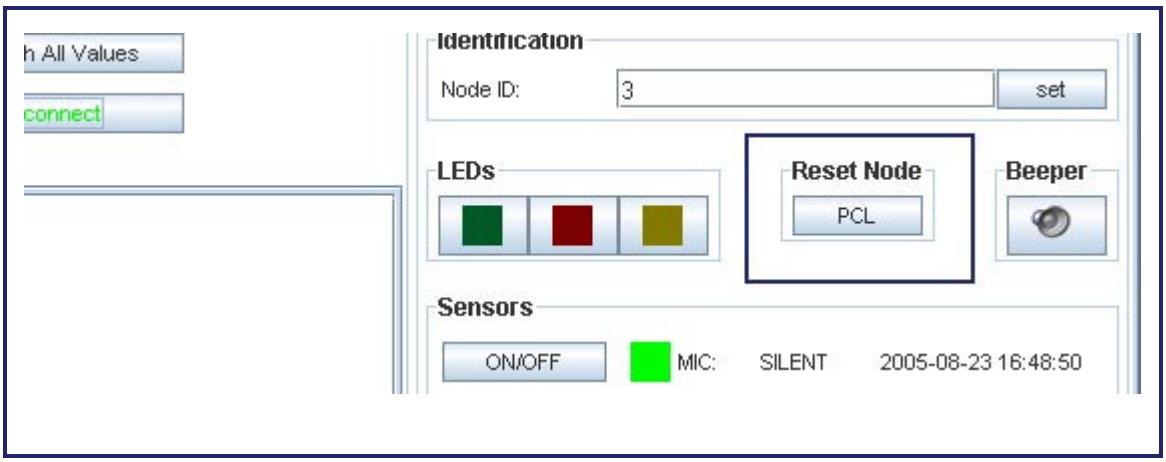
3.4 LEDs

You can switch the LEDs of the selected node with a click on the corresponding picture.



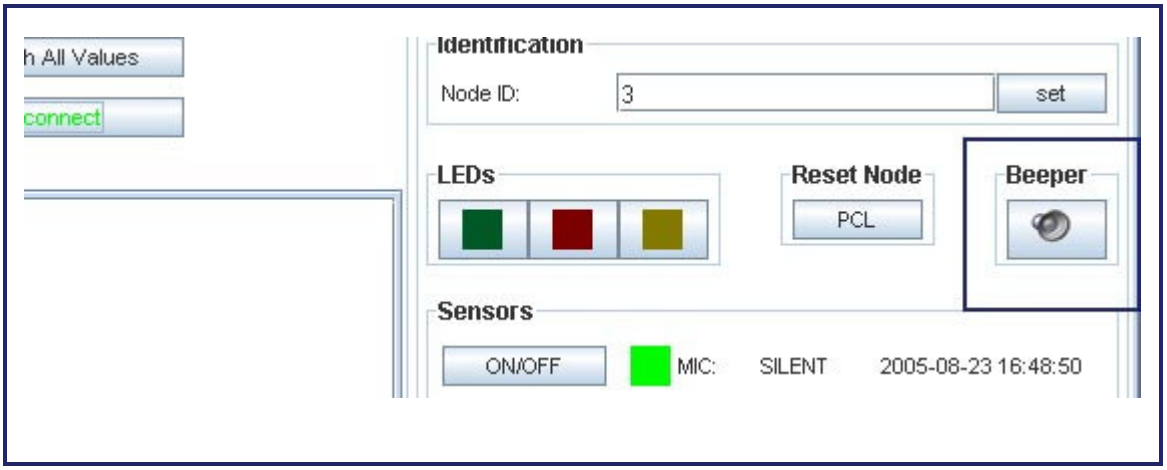
3.5 Reset Node

You can reset the selected node with a click on the *PCL* button.



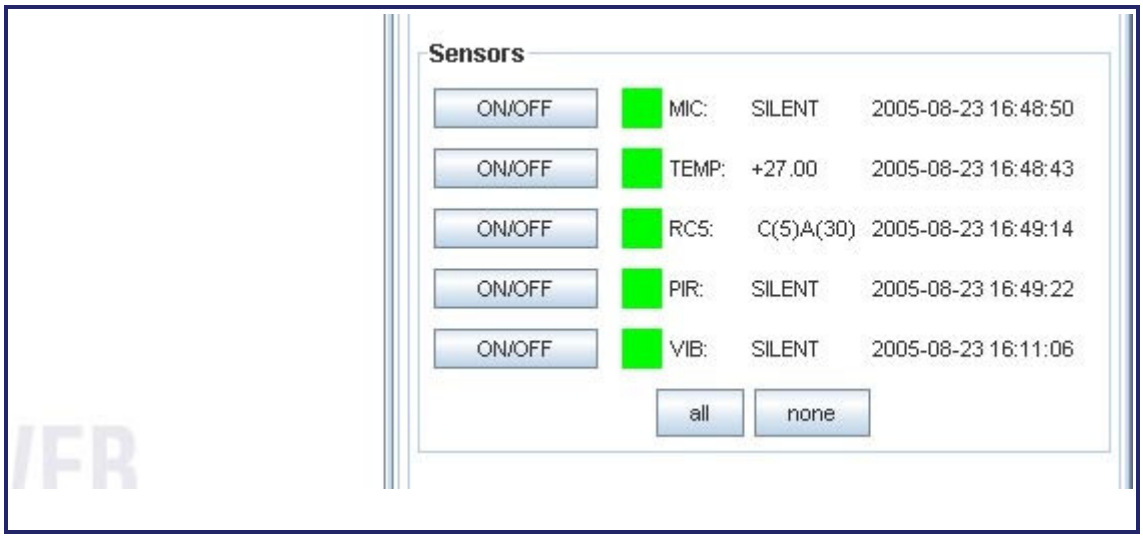
3.6 Beeper

You can switch the beeper of the selected node with a click on the beeper button.



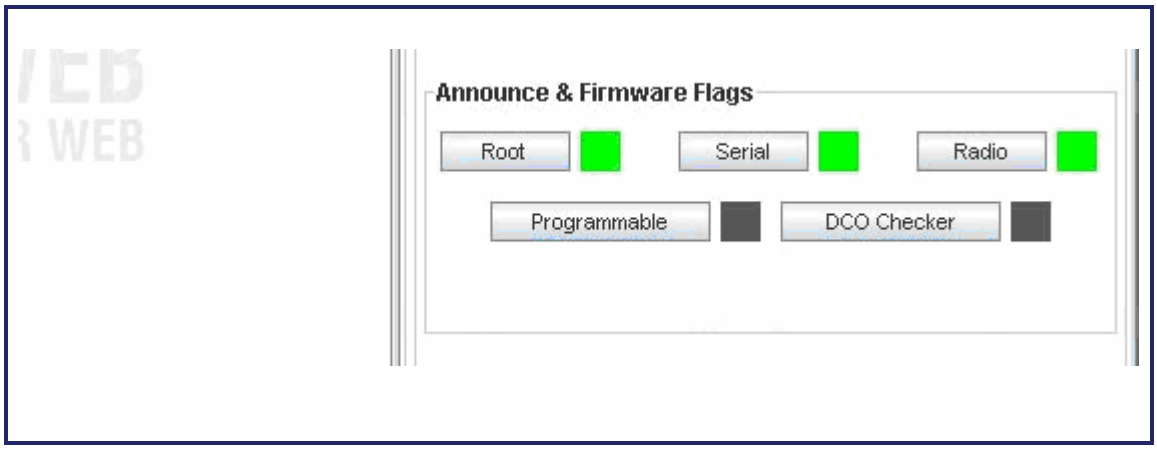
3.7 Sensors

You can switch the sensors of the selected node with a click on the corresponding button. The LEDs show you which sensors are switched on.



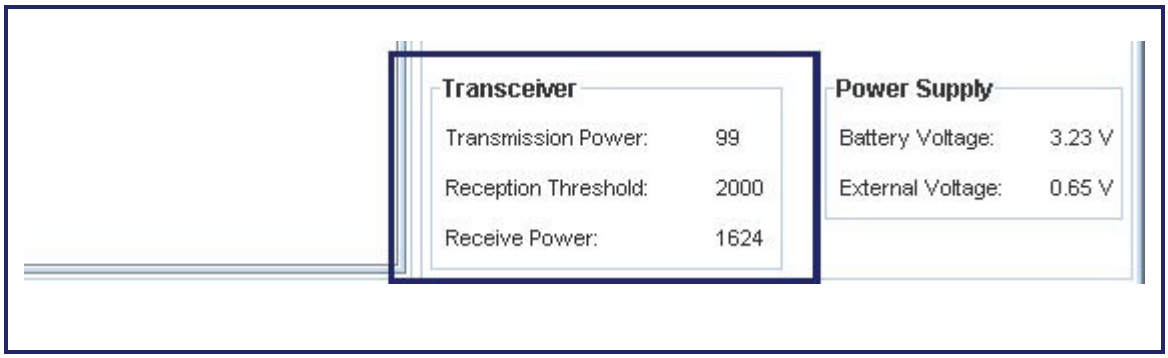
3.8 Announce & Firmware Flags

The *Root*, *Serial*, and *Radio* buttons enable you to set the announce flags. The *Programmable* and *DCO Checker* buttons enable you to set the firmware flags. The LEDs show you which flags are set.



3.9 Transceiver

This panel shows you all needed information about the transceiver like the transmission power (value range between 00 and 99), the reception threshold (value range between 0000 and 4096), and the receive power.



3.10 Power Supply

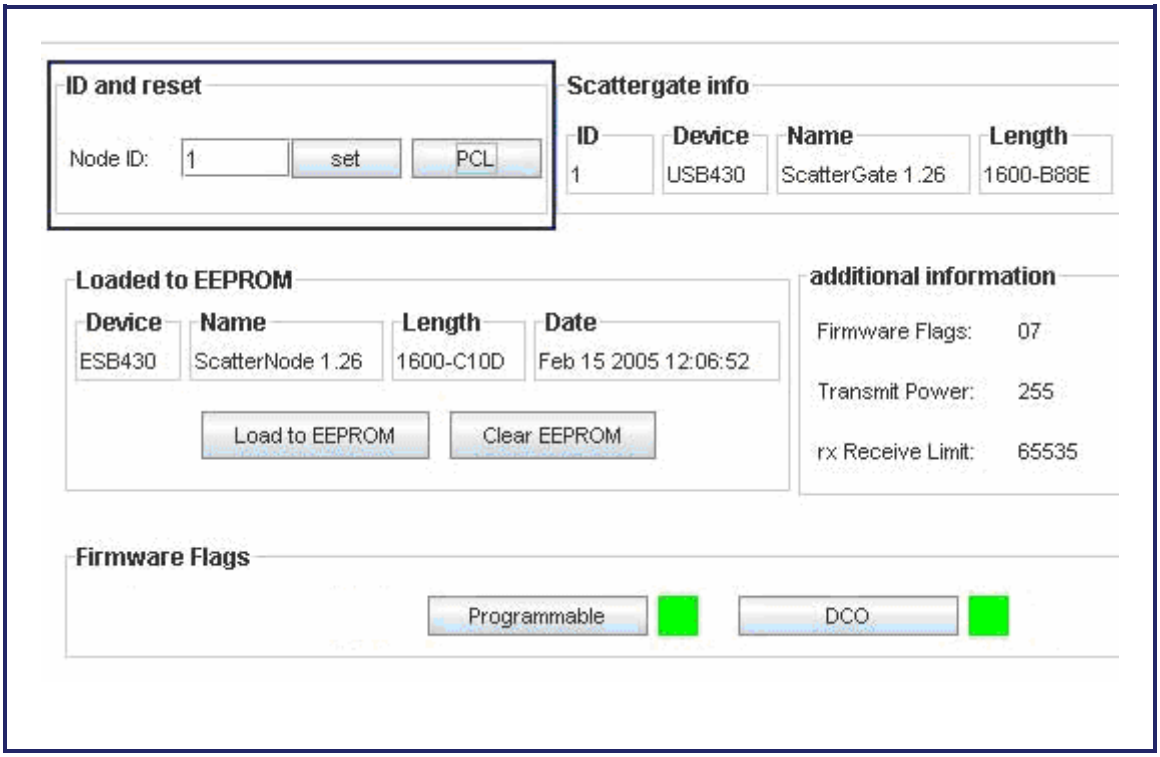
This panel shows you all needed information about the power supply like the battery voltage and the external voltage.

4 Status

The status tab combines all required information about the eGate. The status tab consists of the following segments:

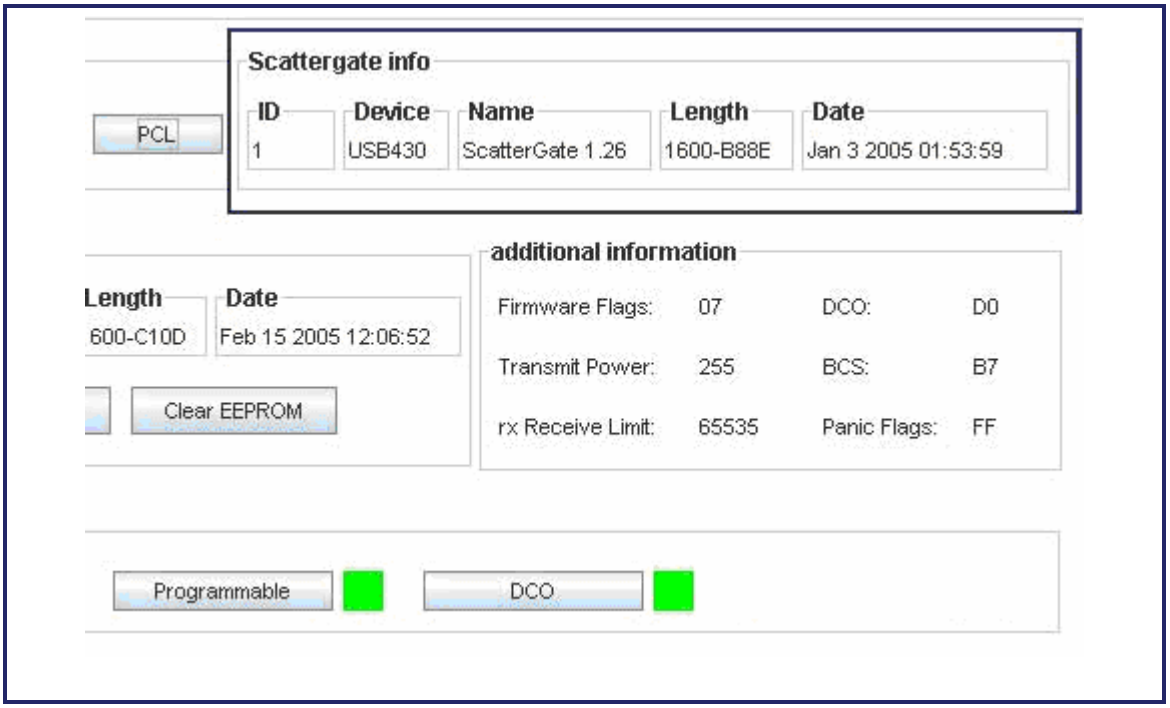
4.1 ID and reset

You can change the ID of the eGate and set it with a click on the *set* button. You can also reset the eGate with a click on the *PCL* button.



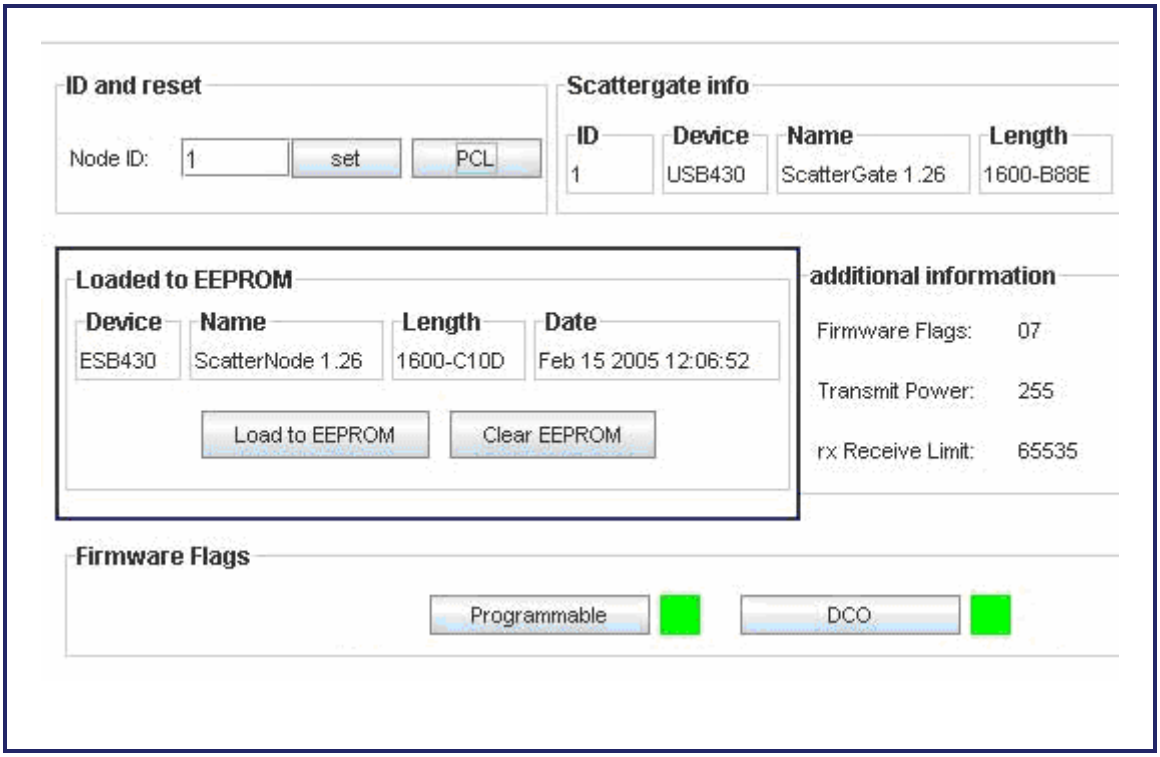
4.2 Scattergate info

The Scattergate info panel shows you all important information about the running software.



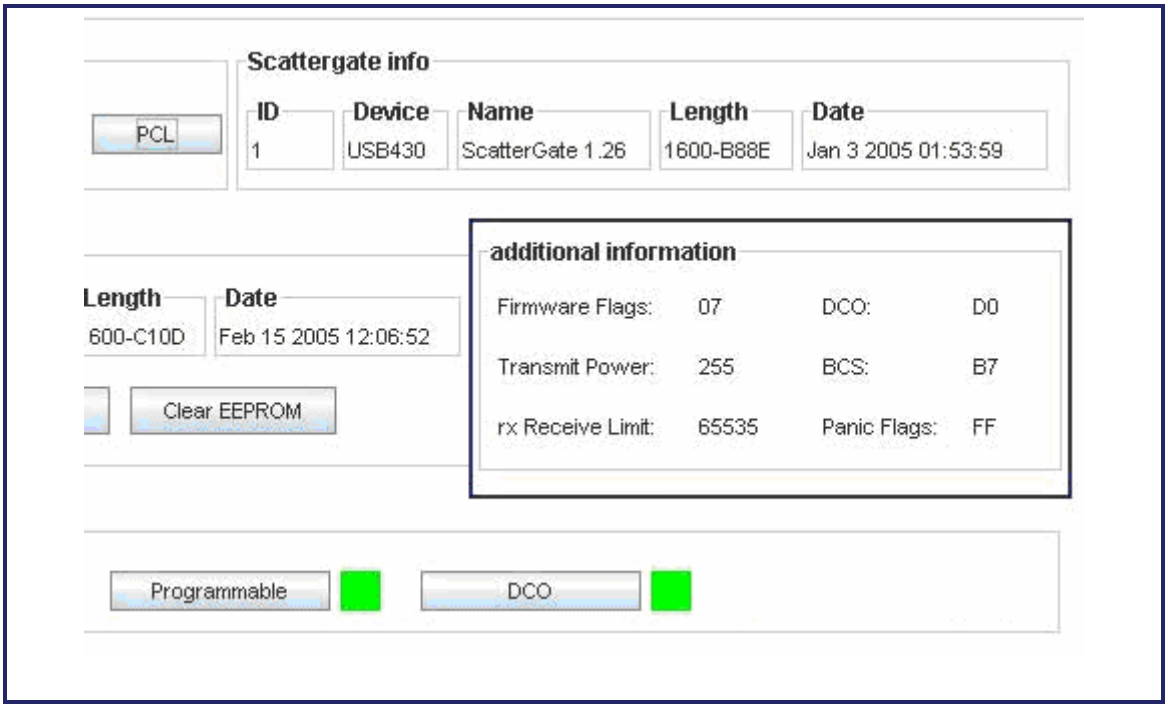
4.3 Loaded to EEPROM

You can upload a new image on the Gate with a click on the *Load to EEPROM* button. You can also clear the complete EEPROM with a click on the *Clear EEPROM* button. Is an image detected on the eGate, the software shows you any information about that.



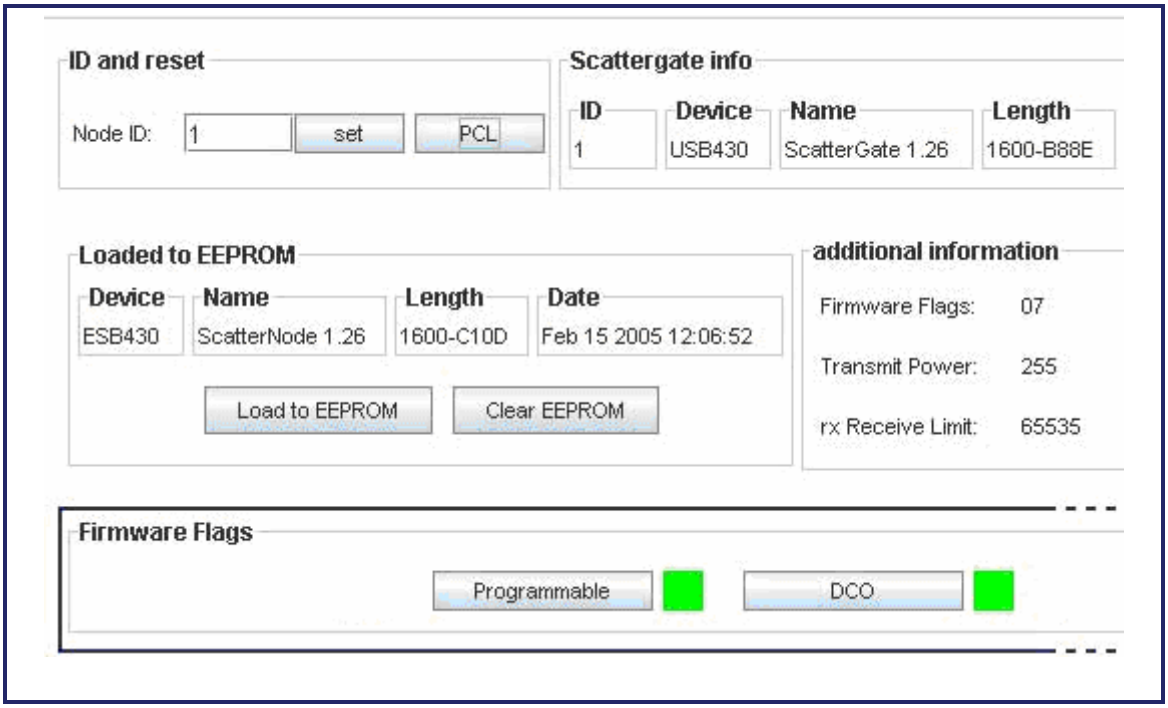
4.4 Additional Information

That panel contains additional information about the eGate like firmware flags, transmit power, RX receive limit, DCO, BCS, and panic flags.



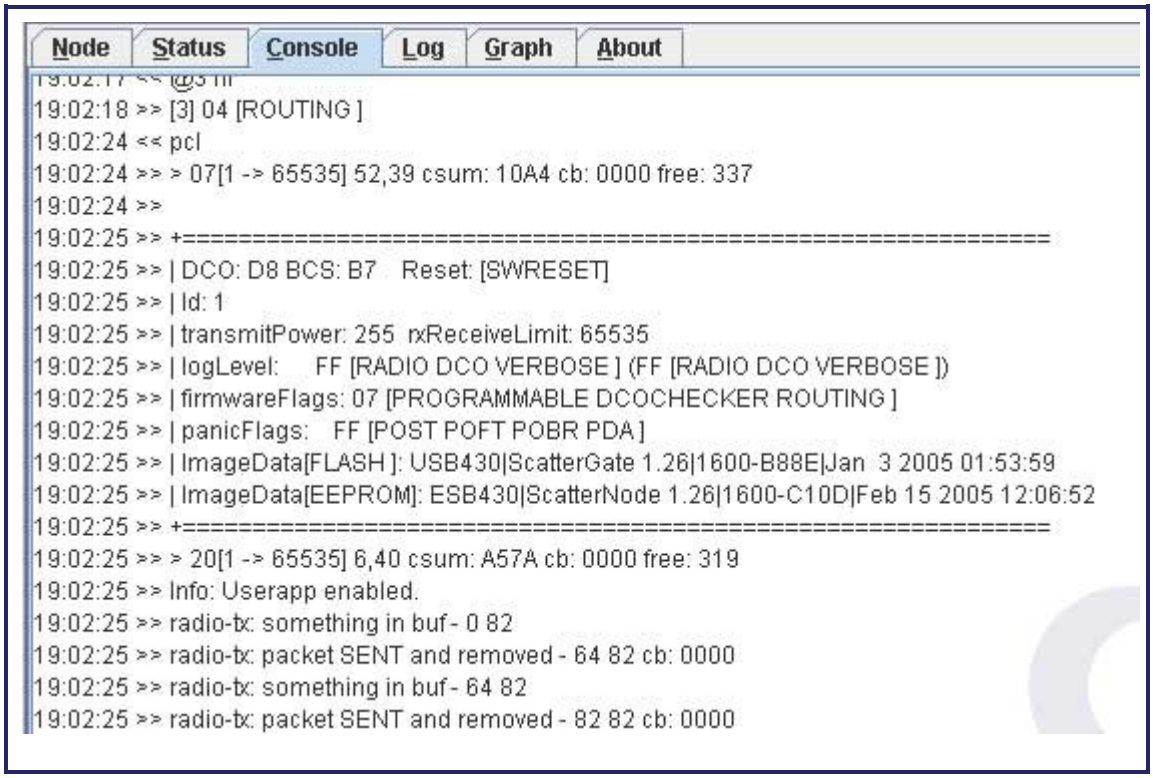
4.5 Firmware Flags

The Programmable and DCO buttons enable you to set that flags. The LEDs show you which flags are set.

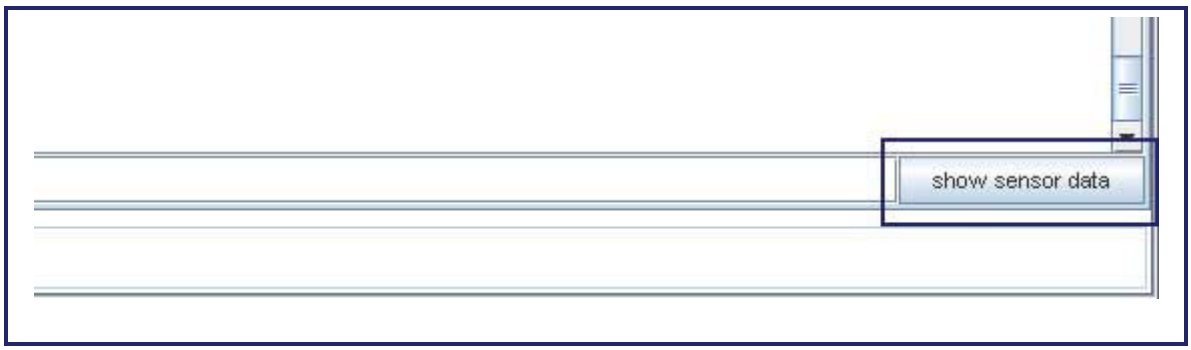


5 Console

The console is comparable to a terminal application which communicates with the eGate. It handles not only the data traffic but also the communication because it enables you to send commands over the console to the eGate or to nodes which are in the range of sending. The symbols << and >> identify the direction of communication. The << symbol means outgoing messages and the >> symbol means incoming messages.



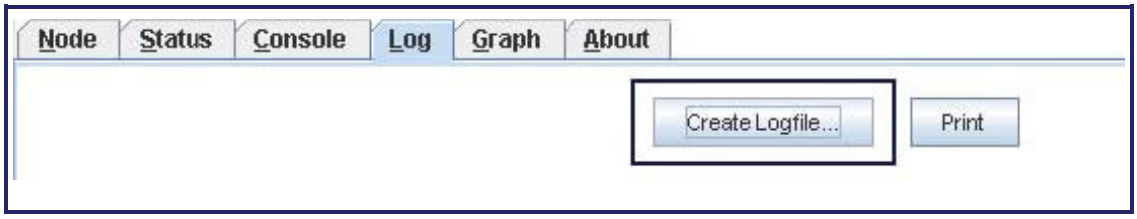
The sensor data are an extensive part of the total data traffic. So you are able to filter these data with the *show sensor data* button.



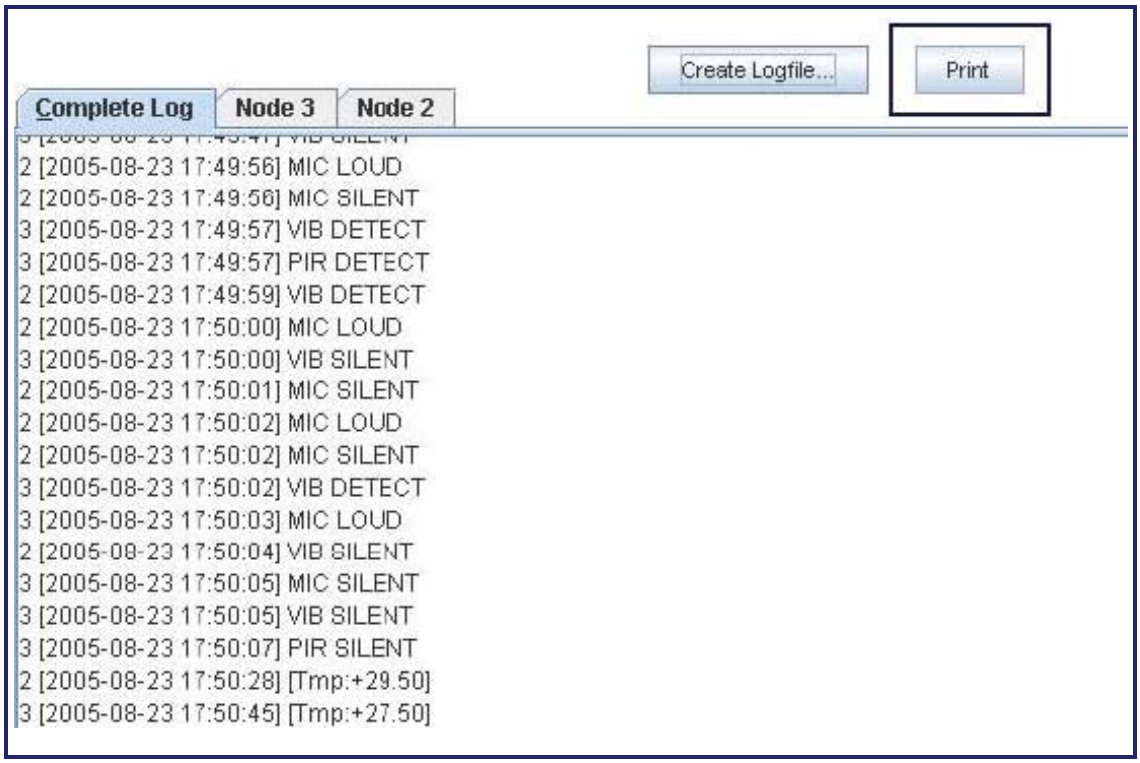
6 Log

The log tab includes all sensor events, which are obtained since the ScatterViewer is started. There is also the possibility to file all sensor events or to print them:

6.1 LogFile

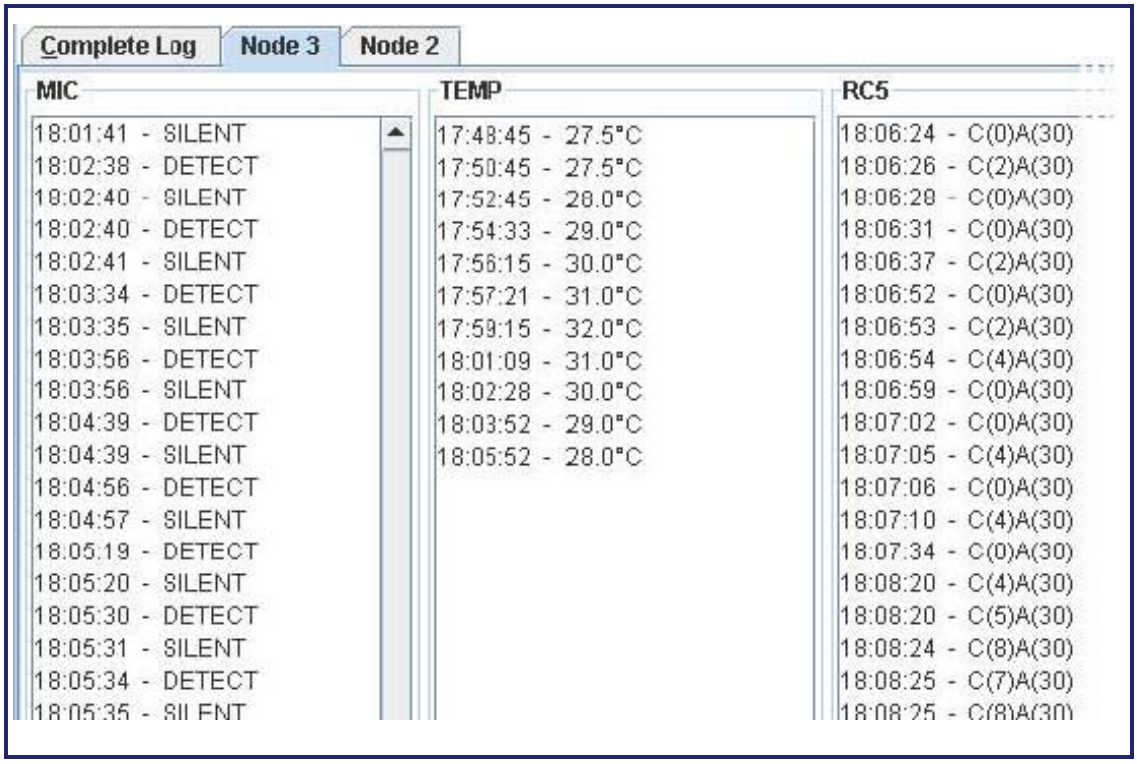


6.2 LogPrint



6.3 Tabs of the single sensor node even

The software constructs a tab for every node which is sending sensor events like microphone, temperature, RC5, movement, and vibration. If there is no node which is sending sensor events, only the empty complete log tab is visible.

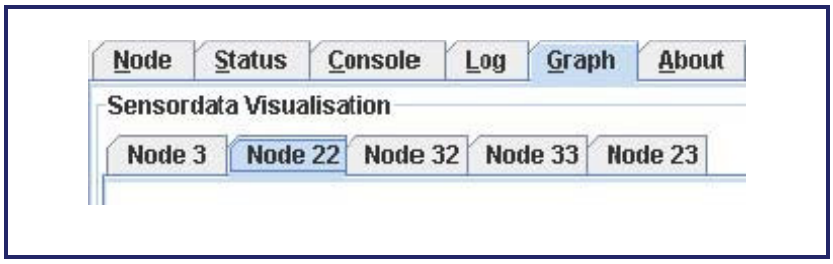


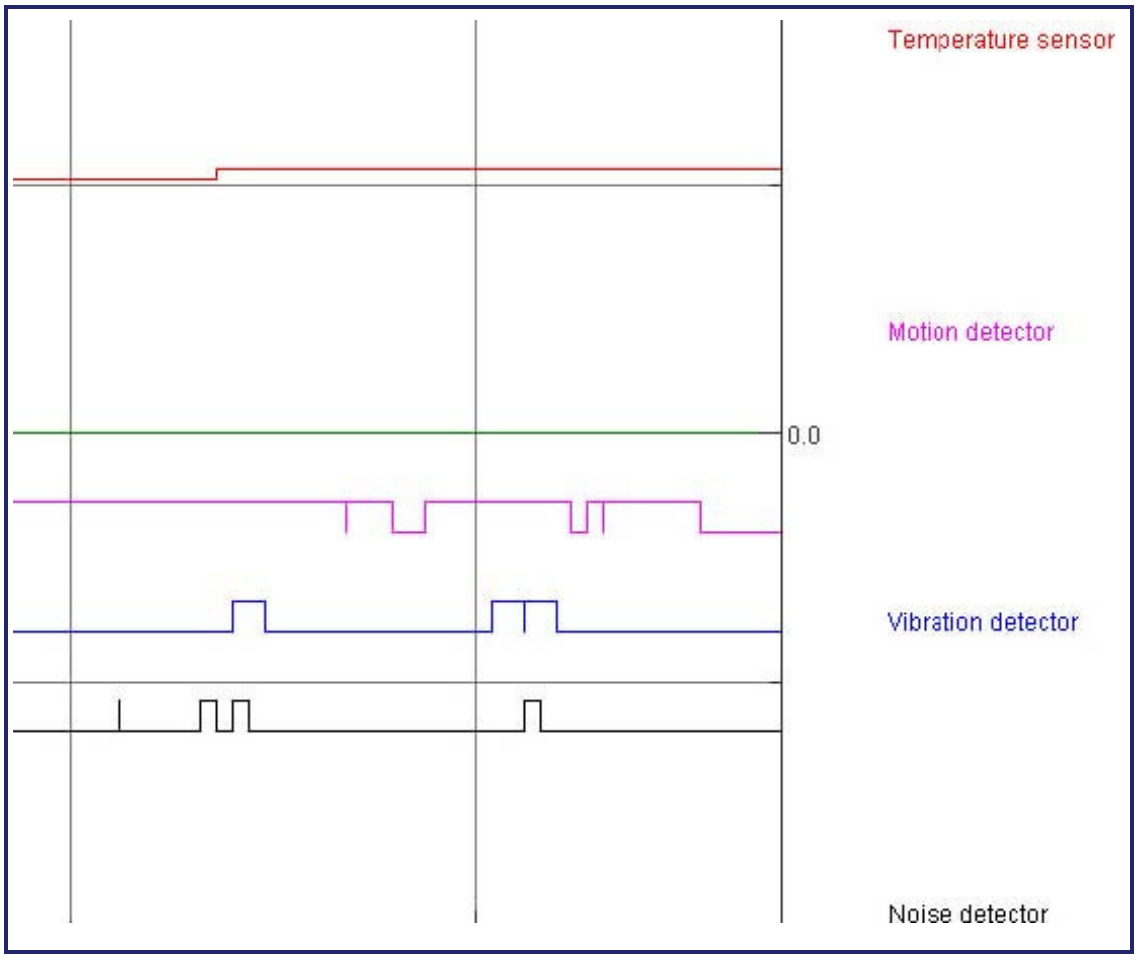
7 Graph

The graph tab is a visual realization of the received sensor events. It illustrates temperature, movement, microphone, and vibration. Thought has not been given to the RC5 sensor because it should seem obvious to you that this is unsuitable for this kind of visualization.

7.1 Tabs of the single sensor nodes

The software constructs a tab for every node which is sending sensor events like microphone, temperature, movement, and vibration. If there is no node which is sending sensor events, also no tab is visible.



7.2 The Graph

The most of the sensors like vibration, microphone, and movement are event-based. This means that we differentiate between detect and silent (sensor detecting) in contrast to the temperature sensor, which sends repeatedly the temperature (sensor repeating).