ENS Dashboard
## Content Guide

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1 Introduction
This document describes the ENS Dashboard software for Windows. The ENS Dashboard is developed for evaluation of environmental sensor devices. Main features of ENS Dashboard include:

- Monitoring and logging sensor measurement and information
- Sensor development kit firmware update

Currently, ENS Dashboard supports the following evaluation kits:

- CCS811-LG_EK_ST (CCS811 Evaluation kit)
- CCS801-DF_EK_ST (CCS801 Evaluation kit)
- ENS210-QF_EK_ST

To communicate with supporting environmental sensor devices on Windows, a USB-I^2^C bridge is required. Currently ENS Dashboard supports the following USB-I^2^C bridges:

- USB-I2C Dongle (device driver installation may be required)
- ENS-USB-I2CIO

2 Getting Started
The section describes installation steps of ENS Dashboard software for Windows.

2.1 Prerequisites
The following lists the requirements for installing and running ENS Dashboard on a Windows machine:

- Microsoft Windows 7 or above
- Microsoft .NET Framework 4.5.1 or above
- Internet connection (for installation, software update and access to the latest documentations)

Device driver installation of USB-I^2^C bridges may be required. Please refer to CCS811 and USB-I2C Dongle user manuals for more information on supported bridges:

- [https://ams.com/ccs811](https://ams.com/ccs811)
- [https://ams.com/usbi2c](https://ams.com/usbi2c)

2.2 Installation
ENS Dashboard Windows installer program can be downloaded from:

- [https://ams.com/ensdashboard](https://ams.com/ensdashboard)
The ENS Dashboard software is deployed via a Windows web installer program. An Internet connection is required during installation. Please also check the downloaded program is digitally signed by ams AG:

**Figure 1: ENS Dashboard Installer**

![Figure 1: ENS Dashboard Installer](image1)

Follow the screen instructions to proceed with the ENS Dashboard installation:

**Figure 2: Installing ENS Dashboard**

![Figure 2: Installing ENS Dashboard](image2)

Once installation is completed, ENS Dashboard can be accessed from Windows Start/Program menu:

**Figure 3: ENS Dashboard Launcher**

![Figure 3: ENS Dashboard Launcher](image3)
### 2.3 Software Update

Software update is performed automatically each time when ENS Dashboard is launched. If a newer version is available, user will be promoted for software update. Also refer to section 3.1.4 for information about software update.

Note: Users will still be able to run ENS Dashboard without Internet connection. However, they will not be able to receive software update notification if not connected to internet when launching and running ENS Dashboard.

### 3 Launcher

The **Launcher** window is shown upon on starting ENS Dashboard. The window shows a list of all currently attached shields/bridges, their connected bridge port, sensor type, UID and status.

#### Figure 4: Launcher Window

<table>
<thead>
<tr>
<th>Port</th>
<th>Sensor</th>
<th>UID</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>COM7</td>
<td>CCS801</td>
<td>16471C1680B12026</td>
<td>PART_ID: 0B01, FW: 7, H: ENS210</td>
</tr>
<tr>
<td>COM10</td>
<td>ENS210</td>
<td>3414520190226402</td>
<td>PART_ID: 0210</td>
</tr>
<tr>
<td>HID</td>
<td>CCS811</td>
<td>004BE108</td>
<td>HW_ID: 8112, FW: 1.0.0.1.1.0, H: ENS210</td>
</tr>
<tr>
<td>COM6</td>
<td>ENS210</td>
<td>34145201A97A6A00</td>
<td>PART_ID: 0210</td>
</tr>
<tr>
<td>COM3</td>
<td>CCS801</td>
<td>16472B2C80B121327</td>
<td>PART_ID: 0B01, FW: 7, H: ENS210</td>
</tr>
<tr>
<td>HID</td>
<td>CCS811</td>
<td>004BE14C</td>
<td>HW_ID: 8112, FW: 1.0.0.1.1.0, H: ENS210</td>
</tr>
</tbody>
</table>

**Status** will display auxiliary sensors (prefixed with “Extra: ”) information if available on the sensor shield device, such as humidity, temperature and pressure sensor. When the sensor device is performing measurement, sensor measurement data will also be displayed in the **Status** (same message as described in section 4.4).
3.1 Menu

Several menu options are available from the Launcher window:

<table>
<thead>
<tr>
<th>Menu</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logging</td>
<td>Enable Local Logging</td>
</tr>
<tr>
<td></td>
<td>View Log Data Files</td>
</tr>
<tr>
<td></td>
<td>Change Log Data Location</td>
</tr>
<tr>
<td>Help</td>
<td>User Guide</td>
</tr>
<tr>
<td></td>
<td>Check for Updates</td>
</tr>
<tr>
<td></td>
<td>About ENS Dashboard</td>
</tr>
</tbody>
</table>

3.1.1 Enable Local Logging

By default, measurement and error logging are enabled for all attached devices. Users can use Enable Local Logging option to enable/disable local data logging.

The default local logging location can be changed by selecting Change Log Data Location option from the menu. User will be promoted to select a new location:

Figure 5: Log file location

Please note that changing local log data location, or enabling/disabling local logging, will have not have effects on existing running devices. Existing opened device Dashboard windows will continue to run using previous local logging setup until the device Dashboard window is closed and reopened.
By default, log data are stored in #EnsDashboard folder locally under user’s profile Documents directory, typically:

\[ C:\{\text{username}\}\text{Documents}\#\text{EnsDashboard}. \]

Users can select View Log Data Files option from the menu to open log data folder in file explorer.

Local log data filenames are prefixed with sensor type and UID. In general, measurement log data filename has the following format:

\[ \text{sensor/device}_{\text{UID}}_{\text{timestamp}}.\text{csv} \]

System and error data are stored in a file separated from measurement log data file, which has the following filename convention:

\[ \#\text{sensor/device}_{\text{UID}}_{\text{SYS}}.\text{log} \]

The following screenshot shows an example of files in log data directory:

**Figure 6: Log file Directory**

Please refer to “Log File Format” document for information on log file content format.

### 3.1.2 View Log Files

Selecting this option will open current log data file folder where log data files are stored. Please refer to ENS Dashboard Log File Data document for more information on log file data.

### 3.1.3 User Guide

User can download the latest ENS Dashboard user manual by selecting this option.

### 3.1.4 Check for Software Updates

Software update is performed automatically each time when ENS Dashboard is launched:
User may also check for software update explicitly by selecting **Check for Updates** from the **Launcher** window menu. If an update is available, user will be promoted for update installation:

**Figure 8: Update Available**

Follow the screen instructions to proceed update installation:

**Figure 9: Updating ENS Dashboard**

ENS Dashboard will be restarted automatically when the update installation is completed.

### 3.1.5 About ENS Dashboard

**About ENS Dashboard** dialog displays ENS Dashboard software version information:
3.2 Device Options

Various device options are available via right-click context menu. Availability of device actions are device dependent:

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
<th>Supporting Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dashboard*</td>
<td>Main measurement window</td>
<td>ALL</td>
</tr>
<tr>
<td>Info</td>
<td>Device version and information</td>
<td>ALL</td>
</tr>
<tr>
<td>Update</td>
<td>Device firmware update</td>
<td>CCS811, CCS801</td>
</tr>
<tr>
<td>Reset</td>
<td>Device software reset</td>
<td>ALL</td>
</tr>
</tbody>
</table>

* Note: Default option, which is highlighted in bold, can also be accessed by double-click on selected device.

For example, the following shows options available for ENS210 sensor device:
**Figure 11: Context Menu**

![Context Menu](image)

**Info** option shows device information such as attached bridge and sensor shield device information:

**Figure 12: Device Info**

![Device Info](image)
3.2.1 Device Firmware Update

If the attached device supports device firmware update, when the device Update option is selected, the Dashboard will first try to query and see if there is a newer firmware release available from ams server. If so, user will be prompted a firmware update dialog similar to the following:

**Figure 13: Firmware Release from ams Server**

![Firmware Release from ams Server](image)

If attached device is already loaded with the latest firmware release, or no firmware is available from ams server, or user decided to load a different firmware release, the following dialog will be promoted instead, and user may select firmware image from local disk:

**Figure 14: Firmware Image from Local Disk**

![Firmware Image from Local Disk](image)
4 Dashboard

The Dashboard window displays sensor information and measurement data of an attached sensor device. The Dashboard window can be launched from the Launcher window, either by double-click on a selected device, or by selection “Dashboard” from the right-click option menu. By default, all devices will be running in idle mode.

Figure 15: Dashboard Window

The Dashboard displays sensor device information and measurement data as described in following sections.

4.1 Status Information

The measurement window provides the following status information at the bottom of Dashboard window:

- Bridge Communication Port
- Sensor Type and UID
- Measurement Mode
- Status

4.1.1 Sensor Type and UID

Sensor Type and UID status shows the sensor type and UID of current attached sensor device to the measurement window. Detail information of the sensor device is displayed when user hover on the status area:
Figure 16: Sensor Type and UID

Sensor type and sensor/bridge device UID information are also displayed in the Dashboard window’s title:

Figure 17: UID

4.1.2 Measurement Mode

Measurement Mode status shows current running measurement mode. For more information about measurement modes, please refer to section 4.2.1.

4.1.3 Status Message

Status displays various device message and status, such as measurement data and error message, etc. For example, the following status message is displayed when CCS811 device enters IAQ 1S measurement mode:

Figure 18: Status Message

The following message is displayed when the CCS811 sensor device is running IAQ 1S measurement mode. Measurement data are displayed:
Figure 19: Status Message with Active Device

| HID     | CCS811_004BEB61   | IAQ_15         | eCO2 = 400ppm, eTVOC = 0ppb, Rs = 21kΩ, RH/T = 22.7°C, RH = 41% |

Please refer to section 4.4 for information about measurement data display in status.

Status area is colour coded based on the device and measurement state:

Table 3: Device Menu Options

<table>
<thead>
<tr>
<th>Colour</th>
<th>Measurement/Device State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grey</td>
<td>Device is idle, not running measurement</td>
</tr>
<tr>
<td>Blue</td>
<td>Device is running in one of supported measurement mode</td>
</tr>
<tr>
<td>Amber</td>
<td>Device error, or measurement data invalid.</td>
</tr>
</tbody>
</table>

Examples of colour coded status messages when indicates error:

Figure 20: Amber coloured error status

4.2 Menu Options

The Dashboard window provides several menu options to perform sensor measurement and display. From the Dashboard window menu, user may start or switch between supported measurement modes on attached device, and toggle various measurement display options.

4.2.1 Measurement Modes

Measurement Modes menu lists all supported operation modes of sensor devices. These options allow user to switch between supported measurement modes on attached sensor device. Available measurement modes are device dependent:

Table 4: Measurement Modes

<table>
<thead>
<tr>
<th>Sensor</th>
<th>Modes</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCS811</td>
<td>IAQ 1s</td>
</tr>
<tr>
<td></td>
<td>IAQ 10s</td>
</tr>
<tr>
<td></td>
<td>IAQ 60s</td>
</tr>
<tr>
<td></td>
<td>RH/T Single Shot</td>
</tr>
<tr>
<td>ENS210</td>
<td>RH/T Single Shot</td>
</tr>
</tbody>
</table>
Note: IAQ 1s/10s/60s performs resistance/eCO2/eTVOC measurement at 1 second, 10 seconds and 60 seconds interval respectively. Please refer to evaluation kit datasheets for information about measurement and drive mode each sensor kits support.

For example, measurement **Mode** options available for ENS210 are:

**Figure 21: Measurement Modes**

4.2.2 Device Options

Additional sensor device dependent menu options may appear depends on attached sensor device and running measurement modes:

<table>
<thead>
<tr>
<th>Sensor</th>
<th>Mode</th>
<th>Options</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCS811</td>
<td>Non-Idle</td>
<td>Baseline</td>
<td>Baseline backup and restore</td>
</tr>
<tr>
<td>CCS801</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Figure 22: Sensor Device Dependent Options**

4.3 View Options

**View** menu provide options to configure measurement graphs. User can adjust various setting of displaying measurement graph. Measurement graphs can be individually enabled or disabled, by selecting corresponding measurement graph from the **View** menu. For example, for CCS811, available measurement graphs are:
Figure 23: View Options

Availability of measurement graphs are sensor device dependent. The table below shows list of measurement graphs available for all supporting devices:

**Table 6: Measurement Graphs**

<table>
<thead>
<tr>
<th>Menu</th>
<th>Graph</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCS811</td>
<td>CCS811 Resistance</td>
</tr>
<tr>
<td></td>
<td>CCS811 Current*</td>
</tr>
<tr>
<td></td>
<td>Ambient Temperature</td>
</tr>
<tr>
<td></td>
<td>Relative Humidity</td>
</tr>
<tr>
<td></td>
<td>eCO2*</td>
</tr>
<tr>
<td></td>
<td>eTVOC</td>
</tr>
<tr>
<td>CCS801</td>
<td>CCS801 Resistance</td>
</tr>
<tr>
<td></td>
<td>CCS801 Temperature</td>
</tr>
<tr>
<td></td>
<td>Ambient Temperature</td>
</tr>
<tr>
<td></td>
<td>Relative Humidity</td>
</tr>
<tr>
<td></td>
<td>eCO2*</td>
</tr>
<tr>
<td></td>
<td>eTVOC</td>
</tr>
<tr>
<td>ENS210</td>
<td>Relative Humidity</td>
</tr>
<tr>
<td></td>
<td>Temperature</td>
</tr>
</tbody>
</table>

* Graphs are hidden by default.

The following table lists general view options which will apply to all displaying measurement graphs:

**Table 7: View Options**

<table>
<thead>
<tr>
<th>Menu</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Configure</td>
<td>Adjust maximum number of display points on all measurement graphs</td>
</tr>
<tr>
<td>Reset</td>
<td>Clear measurement points from all graphs</td>
</tr>
</tbody>
</table>
4.4 Measurement Graphs

When the device is not idle and running one of supported measurement modes, the Dashboard window will display all available sensor measurement graphs by default (refer to Table 6: Measurement Graphs). This provides user a graphical overview of all sensor measurement data received from the attached device.

For example, ENS210 sensor device has only humidity and temperature measurement data available. By default, graphs for both measurement data are displayed when the device is not idle:

Figure 24: Measurement Graphs

Measurement graphs can be individually enabled/disabled. However, all sensor measurement data will still be shown in the Status.

Displaying measurement data are sensor device dependent. In general, one or more of the following measurement data may be displayed:

- {SENSOR}.T: Ambient temperature in degree Celsius °C
- {SENSOR}.RH: relative humidity in %
- {SENSOR}.Rs: sensor resistance in ohms Ω
eCO2: equivalent CO2 in ppm
• eTVOC: total equivalent TVOC in ppb

Currently, all measurement data will be displayed in measurement units as described above.

4.4.1 Graph Options

Several graph options are available via independent context menu (right-click). For example:

Figure 25: Graph Options

Context menu available for each of measurement graph:

Table 8: Measurement Graph Options

<table>
<thead>
<tr>
<th>Graph</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relative Humidity</td>
<td>Auto Scale</td>
</tr>
<tr>
<td>Ambient Temperature</td>
<td>Display Unit*</td>
</tr>
<tr>
<td></td>
<td>Auto Scale</td>
</tr>
</tbody>
</table>
5 Contact Information

Technical Support is available at:
www.ams.com/Technical-Support

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7 Revision Information

<table>
<thead>
<tr>
<th>Changes from previous version to current revision 1-11 (2018-Aug-21)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Version 1-11: Minor document corrections</td>
</tr>
<tr>
<td>Version 1-10: Updated URLs.</td>
</tr>
<tr>
<td>Version 1-09: Document content updates.</td>
</tr>
<tr>
<td>Version 1-08: Document content updates.</td>
</tr>
<tr>
<td>Version 1-07: Updated on screenshots to reflect naming changes in menu options and graphs.</td>
</tr>
<tr>
<td>Version 1-06: Removed legacy CCS EVKs support.</td>
</tr>
<tr>
<td>Version 1-05: Minor updates.</td>
</tr>
<tr>
<td>Version 1-04: Updated ENS Dashboard setup program URL.</td>
</tr>
<tr>
<td>Version 1-03: Document content updates.</td>
</tr>
<tr>
<td>Version 1-02: Various updates to reflect ENS Dashboard 2016.12.20.1437 release</td>
</tr>
<tr>
<td>Version 1-01: Various updates to reflect ENS Dashboard 2016.11.10.1234 release</td>
</tr>
<tr>
<td>Initial version 1-00</td>
</tr>
</tbody>
</table>

**Note:** Page numbers for the previous version may differ from page numbers in the current revision. Correction of typographical errors is not explicitly mentioned.