HALIOS®-IC communication board compatible with HACo software inclusive flash option.
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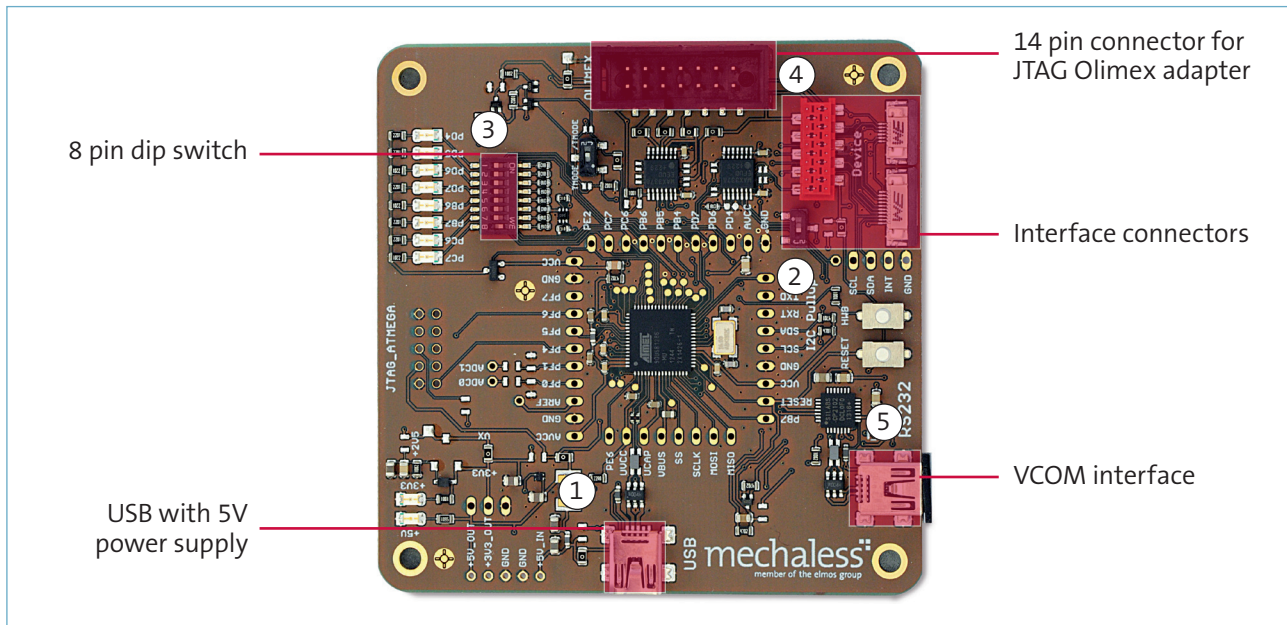


*Figure 1. Communication Board*

Connect the E909.06 HALIOS® Gesture Reference Board or any compatible HALIOS® hardware via FFC cable with the COM-board (connected via USB to PC). By using HACo it is possible to analyze and configure the signals (by each loop). By using the Gesture Debugger it is possible to analyze and configure the gestures itself.

### 1. USB with 5V power supply
Establish USB communication to HACo tool or Gesture Debugger on PC.

### 2. Interface connectors
The following table shows the pin assignment of the connectors.

Table 1. Pin assignment of the connectors

| No. | Micro Match 10 pin | ZIF 10 pin | ZIF 6 pin |
|-----|--------------------|------------|-----------|
| 1 | JTAG TDI (SPI MISO) | 5V power supply | TMODE \| /TMODE |
| 2 | JTAG TDO (SPI SCLK) | I2C - SDA | JTAG TCK (SPI /CS) |
| 3 | JTAG TMS (SPI MOSI) | I2C - SCL | GND |
| 4 | GND | EXT_INT (PB4) | JTAG TMS (SPI MOSI) |
| 5 | JTAG TCK (SPI /CS) | JTAG TDO (SPI SCLK) | JTAG TDO (SPI SCLK) |
| 6 | TMODE \| /TMODE | JTAG TDI (SPI MISO) | JTAG TDI (SPI MISO) |
| 7 | EXT_INT (PB4) | GND | |
| 8 | I2C - SCL | JTAG TMS (SPI MOSI) | |
| 9 | 5V power supply | JTAG TCK (SPI /CS) | |
| 10 | I2C - SDA | TMODE \| /TMODE | |

### 3. 8 pin dip switch
Switch 1 to switch 4 should be set to OFF.
COM-board Software Version > 0.50

Automatic device detection is implemented. The COM-board software tries to detect a connected HALIOS® device at start up. Once a device is detected on I²C or SPI the communication with that device will be established automatically. In case of E909.06 IC the software first tries I²C connection to all available I²C addresses. If no address is found the software tries to establish a SPI communication to E909.06.

COM-board Software Version < 0.50

For communication with E909.06 make sure switch 8 is set to ON and switch 7 is set to OFF. In the case of switch 7 is set to ON the µC on the COM-board connects to E909.06 via SPI instead of I²C. Default connection to the firmware in E909.06 is I²C. See table below for the available options.

Table 2.  HALIOS® device communication options with 8 pin dip switch

| Switch 8 | Switch 7 | Description |
|----------|-----------|-------------|
| OFF | don't care | device E909.11 is selected |
| ON | OFF | device E909.06 is selected, communication via I²C |
| ON | ON | device E909.06 is selected, communication via SPI |

*Note: If you set the communication for E909.06 to SPI (both switch 8 and switch 7 set to ON) you have to ensure that the E909.06 is configured as SPI slave. I²C should work at any time. You can check if SPI slave is available via the I²C connection. Just check in the HACo main window if ComLib or USB library has a label with a version tag. In this case SPI slave is not configured and you can not use it.*

Support for HACo 4.x and E909.06

The COM-board works with HACo version 5.x which can be downloaded on the Mechaless website. To enable support for HACo 4.x you have to set switch 6 to ON.

Table 3.  HACo communication options with 8 pin dip switch

| Switch 6 | Description |
|----------|-------------|
| OFF | E909.06 and HACO 5.x selected, Protocol version 02 |
| ON | E909.06 and HACO 4.x selected, Protocol version 01 |

### 4. The 14 pin connector for JTAG Olimex adapter
Flash the E909.06 with the JTAG Olimex adapter. The JTAG pins of the E909.06 must be connected to an interface connector. Before you flash or debug the E909.06 you have to make sure that the TMODE switch has the correct position (TMODE or /TMODE). This switch is located next to the connector. Default position for the Gesture Reference Board is TMODE.

### 5. The VCOM interface
The device supports an interface for a virtual COM-port on any PC. Currently this option is internally used for debug purpose.

### HACo:
The HALIOS® application development system called HACo is a graphics based environment software to configure the Elmos IC during hardware, optical and software evaluation. After setup you have the possibility to communicate with the device using your PC via USB. All received sensor data can be analyzed in a kind of oscilloscope view and can be sent from the HACo application software to your own software client. The software client is called HACo client which allows you to write your own software in C# within a client application while the HACo tool builds the server.

**Gesture Debugger:**

The gesture debugger for HALIOS® applications is a powerful tool for visualizing the detected gestures in the underlying sensor application. The gesture debugger requires that the HALIOS® gesture library is implemented in the IC. The tool can be downloaded as an executable or as a template for a C# application where you can build your own Windows software using the gesture detection which is implemented in the HALIOS® sensor application.

**Develop your own Windows based application**

If you attend to develop your own Windows based application you can download a pre-configured software template with the capability of gesture events. This template is written in C# and provides sample code with ready to use gesture events.

**Software update for the COM-board**

You can download the COM-board software from the Mechaless website as a hex file. The update can be done by using USB and the Atmel Flip tool, which can be downloaded directly from Atmel (www.atmel.com). The update procedure is as follows:

1. install the Flip tool on your PC and start the tool
2. choose the device to update in the menu bar Device->Select
3. connect the device via USB and click on the USB picture in the tool bar
4. start the bootloader mode (press and hold the RESET- and HWB-button) and then release the RESET-button before you release the HWB-button
5. click on the USB symbol in the toolbar to establish the USB connection to the bootloader
6. load the hex file in menu bar File->load hex file
7. press RUN-button

Further and more detailed instructions can be found in doc7769.pdf from Atmel. Just google for this document.

*Note: The Flip tool might have problems with a long file or path name of the hex file. If you have problems just try to rename the hex file to a short name and ensure that the path to the file is short, too. Then try again.*

**FAQ and Troubleshooting:**

General:

Please check the polarity of the TMODE switch next to the 14 pin connector for the Olimex adapter. We recommend to use the latest software version for the COM-board.

**Question:**

GPIO4...GPIO7 doesn't work as expected. It is also not possible to do a software update for E909.06 via JTAG.

**Answer:**

Check the polarity of the TMODE switch next to the 14 pin connector for the Olimex adapter. In case of the Gesture Reference Board you need to set the switch to TMODE.

**Question:**

How to read out the software version from the COM-board.

**Answer:**

To read out the software version you need to use HACo 5.x. In case of no connection switch all pins of the 8 pin dip switch to OFF.

For more information please check **www.mechaless.com** – Link "Download".

www.halios.de

## Usage Restrictions

Elmos Semiconductor AG provide the COM-Board simply and solely for IC evaluation purposes in laboratory. The Kit or any part of the Kit must not be used for other purposes or within non laboratory environments. Especially the use or the integration in production systems, appliances or other installations is prohibited.

The pcb´s are delivered to customer are for the temporary purpose of testing, evaluation and development of the Elmos IC´s only. Elmos will not assume any liability for additional applications of the pcb.

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