



Picture of a face profile,  
taken with the HTPA32x32d L5.0

## HTPAd Application Shield

For thermal imaging and easy application of our arrays we designed an application board to read thermopile sensors with an Arduino or STM32 Nucleo board.

The source code is completely open and includes all required steps from reading the EEPROM and sensor values to calculation of the final temperature image. Therefore, the C++ sample code can be viewed and modified via the Arduino IDE. The PCB is designed as an Arduino extension and supports the boards Arduino Due and STM32F446RE Nucleo.



### Supported sensor types

	T046	T039	T08
<b>I2C</b>	8x8	8x8d 16x16d 32x32d	/
<b>SPI</b>	/	/	80x64d 120x84d*

You can choose between two modes: Ethernet mode and Serial mode. The following table shows which modes are available for each sensor:

Array size	8x8	16x16	32x32	80x64	120x84*
<b>Ethernet Mode</b>	x	x	x		
<b>Serial Mode</b>	x	x	x	x	x

\* only for STM32F446 Nucleo-64

### Required Hard- & Software

You need:

- Application Shield
- Sensor of your choice
- GUI "Heimann Sensor ArraySoft v2"
- User manual

You need additionally:

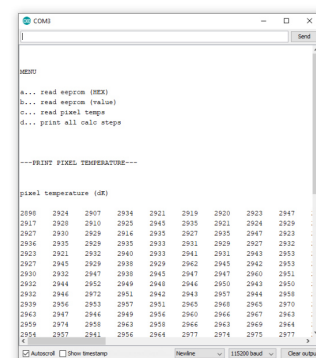
- Microcontroller platform; the PCB was created and tested for:
  - Arduino Due
  - STM32F446RE Nucleo-64
- W5500 Ethernet Shield, if you want to use the Ethernet mode
- USB and Ethernet cable

### Serial Mode

This mode prints all results in the serial monitor of the Arduino IDE. Here the EEPROM content and sensor voltages can be visualized. All you need is an Arduino Due or STM32F446RE Nucleo board. The serial mode only reads new data on request, to show which calculation steps are required and in which order.

Benefits:

- shows EEPROM content in hexadecimal or associated data type (float, short, long, ...)
- prints results after each calculation steps



### Ethernet Mode

In Ethernet mode you can connect an I2C sensor with the Heimann Sensor GUI to stream continuously. The sample code establishes via DHCP a connection or you can use your local network card. An Arduino Ethernet Shield and an Arduino Due or STM32F446RE Nucleo board are required. In the GUI you can stream the sensor images in temperature or voltage mode. Also, you can change user settings, like clock, ADC resolution and emissivity factor.

Benefits:

- false color visualization of images
- stream continuously
- switch between temperature and voltage mode
- record/replay
- change user settings

