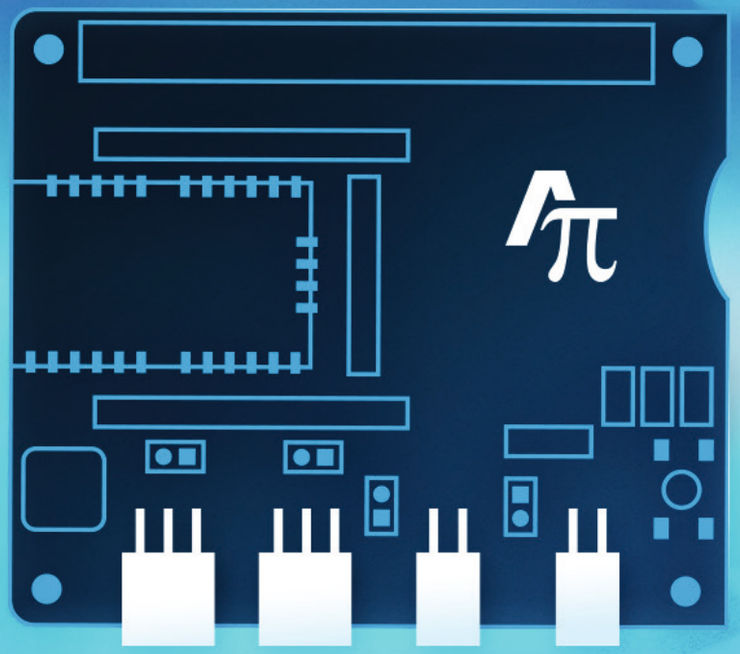
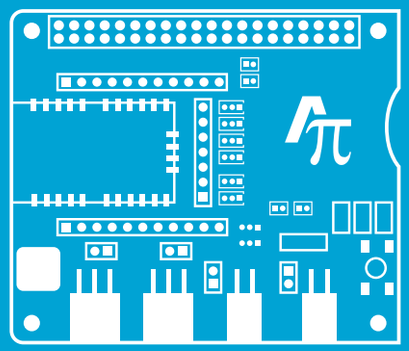
AMBER WIRELESS



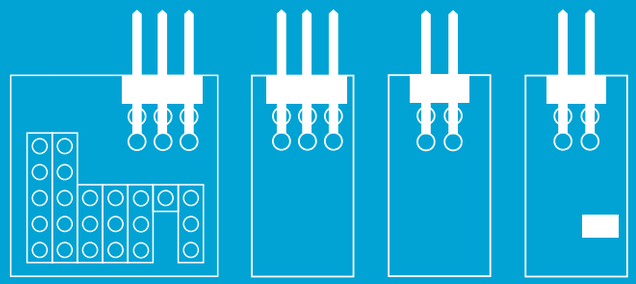
AMBER PI DESIGN KIT

Explore unlimited possibilities

PACKAGE CONTENTS



AMBER PI

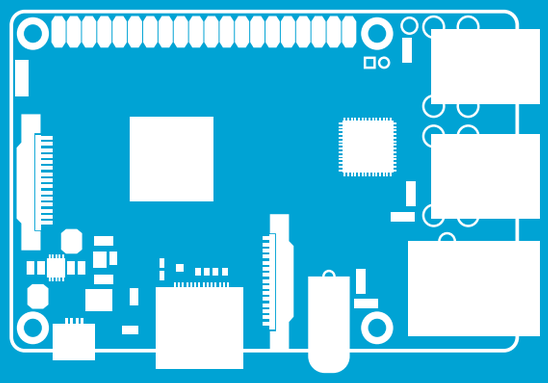


4 Sensorboards (stacked at the AMBER PI)

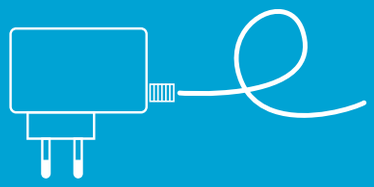
2 Antennas

1 AMBER USB Radio Stick

EXTRAS



Raspberry Pi



Power adapter

Raspberry Pi https://www.raspberrypi.org/products/

Getting started

Do NOT attach the AMBER PI board to the Raspberry Pi before installation!

For the latest quick start guide please check the AMBER webpage:
www.amber-wireless.com/en/amber-pi.html

This Quick Start Guide is based on Raspberry Pi 3 Model B.

1. Install the Raspberry Pi

Download Raspbian Jessy with PIXEL
www.raspberrypi.org/downloads/raspbian

Write the Raspbian image on SD-Card (use Win32DiskImager)
www.raspberrypi.org/documentation/installation/installing-images/windows.md

2. Setup the components

Connect the monitor, mouse and keyboard to the Raspberry Pi

Insert the SD-Card with the uploaded image

Connect the power and start!

3. Once the Raspberry Pi has started

Bluetooth

Switch off Bluetooth in the upper right corner.

Internet

Connect to the internet by clicking on the WIFI symbol right next to the Bluetooth symbol and choose your network, or connect to the internet via Ethernet.

Terminal

Open the terminal by clicking on the terminal symbol in the upper left corner. Update Raspbian by typing the following code into the terminal:

```
sudo apt-get update
sudo apt-get upgrade
```

4. Configuration of peripherals

Click on the raspberry symbol in the upper left corner and open:

Enable SPI, I2C and Serial protocols.

Reboot by typing the following into the terminal:

```
sudo reboot
```

After reboot open the file /boot/cmdline.txt by typing in the terminal:

```
sudo leafpad /boot/cmdline.txt
```

Remove string “console = serial 0,115200” and save file.

Open file: /boot/config.txt by typing in the terminal:

```
sudo leafpad /boot/config.txt
```

Check for string “enable_uart=1” and add it if not existent and save file.

Reboot by typing into the terminal:

```
sudo reboot
```

After reboot check if the changes applied in step **4.** are still valid.

5. Accessing the Raspberry Pi peripherals

First check if wiringPi is already installed by typing the following code into the terminal:

```
gpio -v
```

If a version number appears, this indicates wiringPi is already installed and you can skip ahead to step **6.** Otherwise install GIT by typing the following into the terminal:

```
sudo apt-get install git-core
```

If you get any errors here, make sure your Raspberry Pi is up to date with the latest versions of Raspbian: see step **3.**

Download WiringPi using GIT by typing the following into the terminal:

```
cd
git clone git://git.drogon.net/wiringPi
cd  ~/wiringPi
git pull origin
```

To install the downloaded files type the following into the terminal:

```
cd ~/wiringPi
./build
```

Copy the "libwiringPi.so" to /usr/lib/ by typing the following into the terminal:

```
sudo cp ~/wiringPi/wiringPi/libwiringPi.so* /usr/lib/.
```

6. **Install the Codeblocks development environment by typing into the terminal:**

```
sudo apt-get install codeblocks
```

7. **Install the AMBER PI driver**

Download the AMBER PI project from www.amber-wireless.com/en/amber-pi.html to the ~/Downloads directory.

Create a project directory by typing:

```
mkdir ~/Projects
```

Unzip the downloaded AMBER PI driver to the project directory by typing:

```
unzip ~/Downloads/AMBER_PI.zip -d ~/Projects/.
```

Start the project via Codeblocks:

```
sudo codeblocks ~/Projects/AMBER_PI/AMBER_PI.workspace &
```

Open Linker Settings in Codeblocks by clicking:

Add the library /usr/lib/libwiringPi.so to the libraries field.
Close the Linker Settings.

Rebuild the project via clicking onto:

If building runs without errors the AMBER PI driver has been installed correctly.

8. Setup the AMBER PI Hardware

Set the jumpers to the default positions (see the backside of the PCB).

Attach sensors:

- The motion sensor LIS2DW12 connects to the **SPI1** connector
- The pressure sensor LPS22HB connects to any of the I2C connectors
- The humidity and temperature sensor HTS221 connects to the remaining I2C connector

Shut down the Raspberry Pi and connect it to the AMBER PI.

9. Run the application

Restart the Raspberry Pi. Open Codeblocks by typing in the terminal:

```
sudo codeblocks ~/Projects/AMBER_PI/AMBER_PI.workspace &
```

Run the project by clicking:

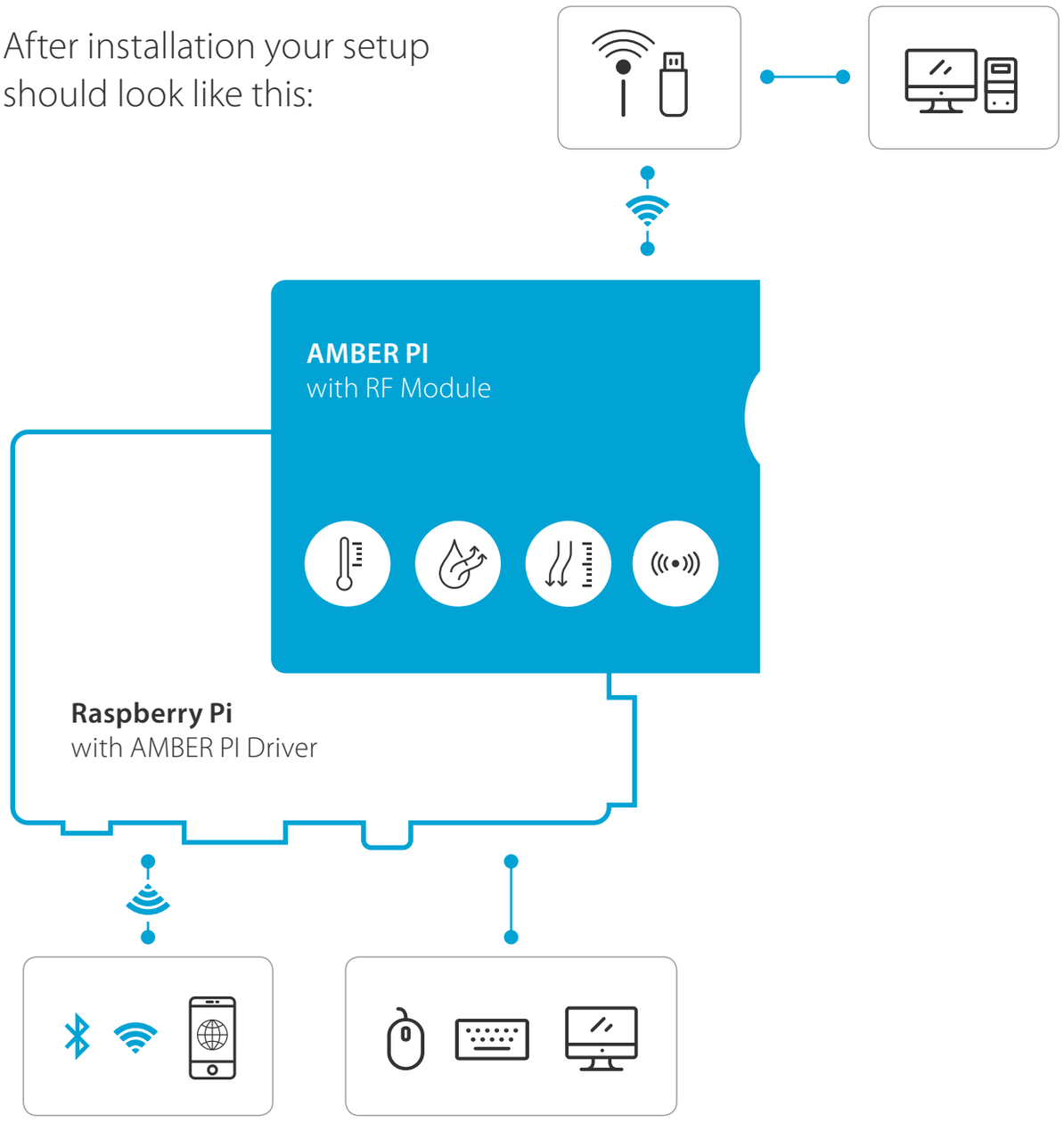
The default application will start and configure the RF module with the attached sensors. The sensor measurement values are read once per second and transmitted via RF module.

10. Receive data on a Windows computer

- Connect the AMBER USB Radio Stick to PC
- Open the terminal program e.g. HTerm www.der-hammer.info/terminal/
- Open the resulting COM port
  (driver updates are found at www.ftdichip.com/Drivers/VCP.htm)
- Open the COM port with the default user settings:
  - » in case of USB radio stick AMB8665 = 9600, 8n1
  - » in case of USB radio stick AMB8865 = 115200, 8n1
- Receive data from the AMBER PI

Setup

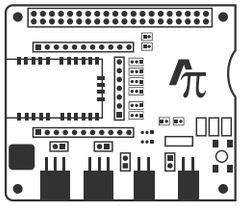
After installation your setup should look like this:



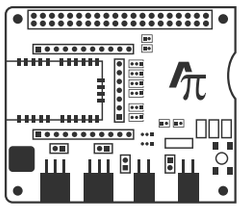
Default Configuration

Start AMBER PI & Raspberry Pi

Read
sensor values



Transmit
data to RF Stick



Receive
data with RF Stick

Application Opportunity*

Start AMBER PI & Raspberry Pi

Start PC with USB RF Stick

Send configuration data from RF Stick

Receive configuration data @ AMBER PI

Read sensor values

Event detected
i.e. temperature below 0° C

No

Yes

Send alarm signal to RF Stick

Receive alarm signal with RF Stick

* programming expenditure necessary; example not available

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