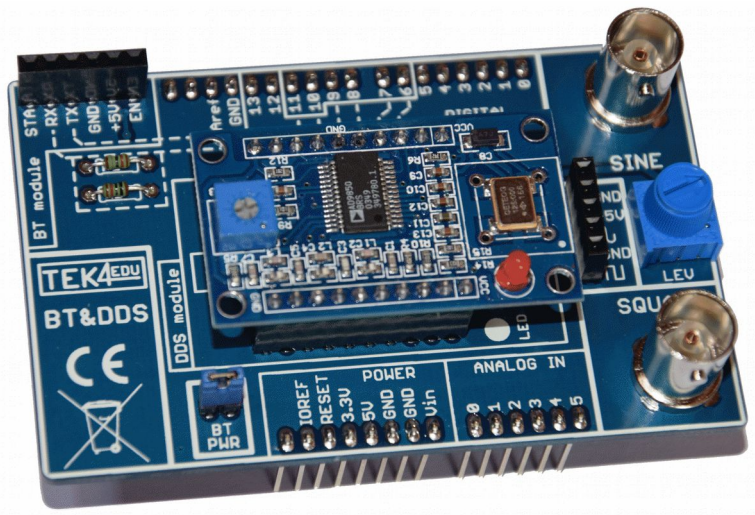
BT & DDS FUNCTION GENERATOR mod.T4E-ASB-01

Arduino Shield Board



Bluetooth®

App

TEK4EDU myGEN

ANDROID

The **BT & DDS Function Generator mod.T4E-ASB-01** board is a shield for **Arduino/Genuino UNO board** that allows you to build a compact function generator. It is controllable by a mobile **Android** device (smartphone or tablet) through its **Bluetooth** interface.
Using an Arduino board and an Android mobile device, it is possible to generate **sine**, **square** and **pulse** waveforms, with adjustable frequency, from a few Hertz to some MHz.
Using a **Power Bank** may be portable.
Generated signals can be provided at:
- experimental circuits. For example, by providing the sinusoidal signal to an audio amplifier, you can verify its frequency response or bandwith, measure its output power at a given frequency, or perform other experiments.
- an oscilloscope, to show students how to use this instrument to perform measurements (amplitude, frequency, period, ...). Also, if the instrument allows **FFT** analysis, it will be possible to show the characteristics of a periodic signal in the frequency domain.

To use the shield you do not need to know the electronics: it was designed to be used in "immediate" mode. It's enough:
1. Insert the shield on an Arduino board
2. Power up the Arduino board by connecting it to a computer or a power supply
3. Install the **Arduino Software IDE**
4. Open and **upload** the code (**sketch**)
5. Install and use the **included** App to set the generator frequency

The **myGEN App**, downloadable using the **QRcode** on the page, makes it easy to use the simulator with an **Android** device.
The function generator is ready and its outputs already provide its signals.

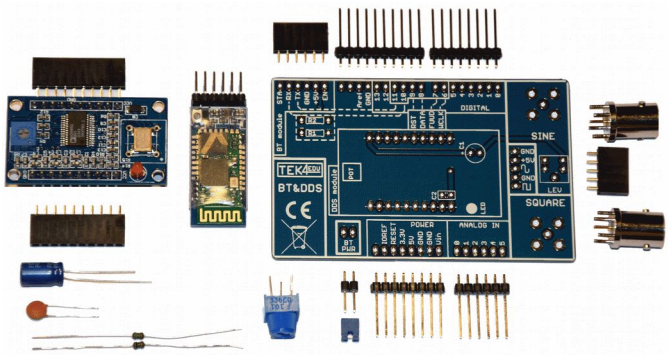
You can also set the frequency without App via the Arduino code.

Available versions are:

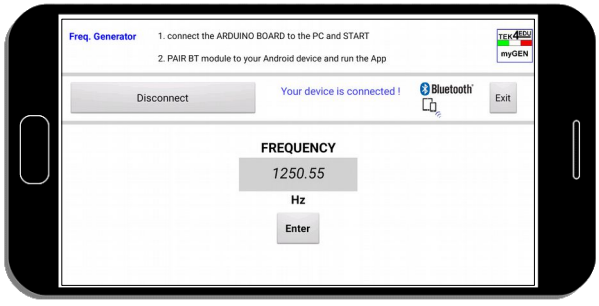
- already assembled	**mod.T4E-ASB-01**
- mounting kit	**mod.T4E-ASB-01-K**

The already assembled version includes all the components and plug-in modules needed to make the shield work.

The mounting kit version includes all the passive (connectors, resistors, capacitors ...) and active (electronic components and plug-in modules) components needed to assemble the shield and make it functional. To assemble it, you must use a normal solderng iron and plier for electronics (**not included**).



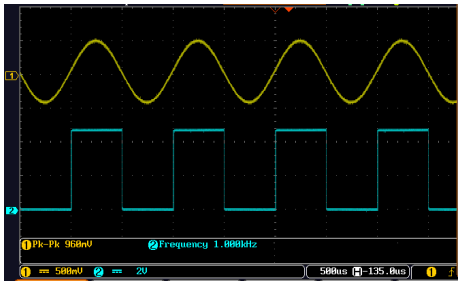
Mounting Kit version mod.T4E-ASB-01-K



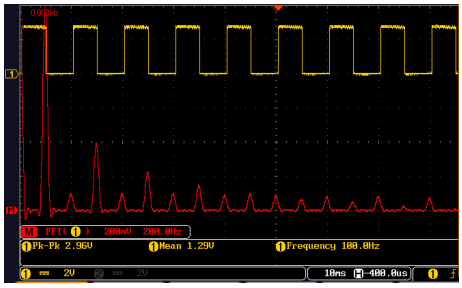
App myGEN

TEK4EDU Via Don Cesare Pellizzari 130 - 30020 Meolo (VE) - **ITALY**
www.TEK4EDU.com **info@tek4edu.com**
(+39) 0421.618.720

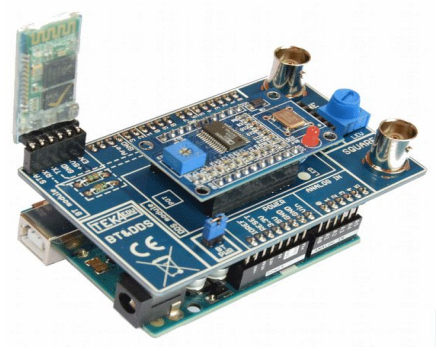
COURSE PROGRAM
- Description of the shield
- Description of the Arduino board inputs / outputs that are used by the shield
- Description of the Bluetooth protocol used to send the frequency set by the mobile device
- Shield installation
- Connecting the Arduino board to the PC with USB cable and starting PC
- Install **Arduino Software IDE** and open the file that contains the **included** code (**Sketch**)
- Installaling the **included Android App**, pairing the shield to the mobile device and starting App
- Using the generator
- Changing the name of the Bluetooth module using the **AT commands** and the Arduino code



Frequency= 1kHz
Yellow trace= CH1 (**SINE out**)
Blue trace= CH2 (**SQUARE out**)



Frequency= 100Hz
Yellow trace= CH1 (**SQUARE out**)
Red trace = **FFT** of CH1



Shield installed on Arduino UNO board (not included)

TECHNICAL SPECIFICATIONS
DDS (Direct Digital Synthesis) Technology:
- plug-in module based on the AD9850 IC of Analog Devices
- Frequency control via serial signals Reset /Data/FreqUpDate/ WordClk

Bluetooth technology:
- plug-in module based on BlueCore4-External IC of Cambridge Silicon Radio
- device control via TX / RX serial signals
- Bluetooth V2.0 3Mbps + EDR protocol compatibility
- ISM band: 2.4 GHz

Sine waveform (SINE out):
- amplitude: 1Vpp (max, HiZ load), adjustable with potentiometer (**LEV**)
- output connector: BNC
- frequency: 1.5Hz to 10MHz (-3dB), HiZ load
- output coupling: AC, without DC component

Square waveform (SQUARE out):
- amplitude: 5V TTL
- frequency: 0.1Hz to 5MHz, HiZ load
- output connector: BNC

Pulse waveform:
- adjustable duty-cycle with trimmer
- amplitude: 5V TTL
- output connector: BNC (SQUARE out)

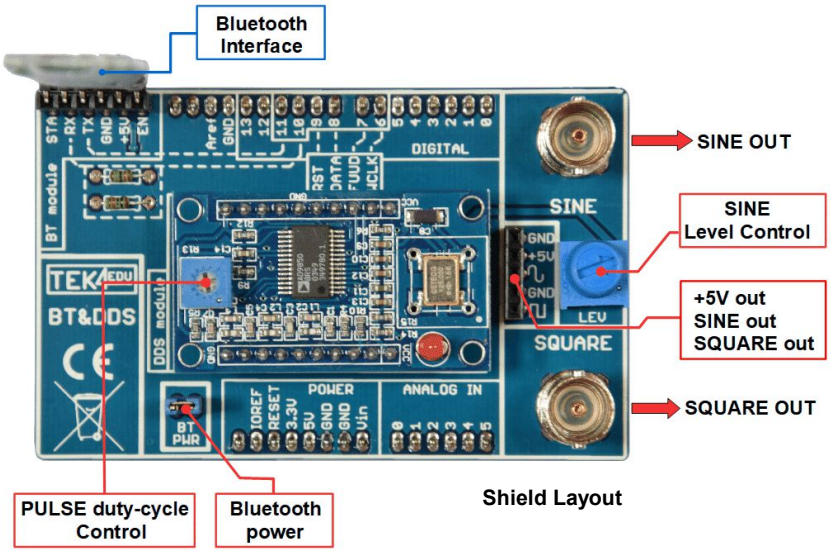
Interface to external experimental board or breadboard:
- connector: female header
- available signals: Sine, Square
- power supply: + 5V (supplied by Arduino board)

Ergonomics: blue color soldermask with white silkscreen to ensure contrast and readability

Included accessories:
- Student Manual: describes how to use shield, sketch, and Android App
- code (**sketch**) for Arduino board
- proprietary App for Android devices

Power supply:
- from the Arduino board connected to Personal Computer or Power Bank or power supply adapter (**all not included**)

Dimensions and weight: 86x54x34 mm, Total weight: 0.1kg



Shield Layout

Option:
- 12V PS ADAPTER mod.T4E-ACC-03

Accessories included:
- Student manual
- proprietary Android App

Accessories not included:
- Computer
- Android Device
- Arduino UNO board

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