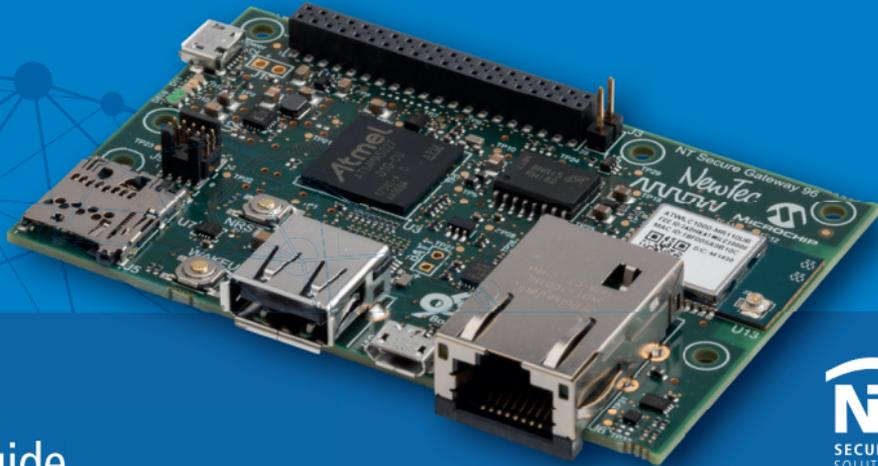


Arrow molex



Creating safety.  
With passion.

NewTec



# Shield96 Quick Start Guide



Not for production use!



## **QUICK START GUIDE**

Read user manual carefully before use!

**Board Description** Page 4

**Hardware Features** Page 5

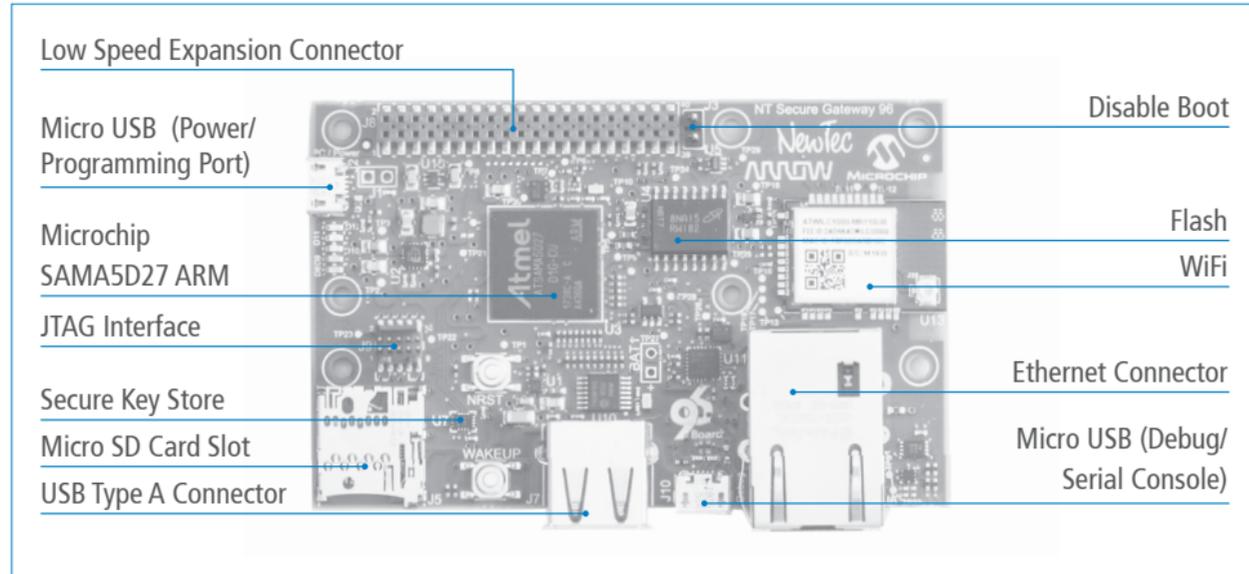
**Connectors Description** Page 7

**Starting the Board** Page 8

**Important Notice** Page 13

## Board Description

The Shield96 is based on the ATSAMA5D27 SoC and is designed in agreements of the 96 Board Community Startdart (IoT Edition Extended, 1.8V 40 Pin Connector).



## Hardware Features

| Component                | Description   |
|--------------------------|---|
| Form factor              | Conform to 96Boards IoT Edition Extended (1.8V)<br>40 Pin Low Speed Expansion Connector                                 |
| SoC                      | ATSAMA5D27, Cortex A5 Core (ARMv7-A Architecture),<br>500 MHz, 128 Mb RAM integrated (System in Package, Arm TrustZone) |
| WLAN                     | Microchip ATWILC1000-MR110xB, IEEE 802.11 b/g/n   |
| Ethernet                 | 10BASE-T/100BASE-TX IEEE 802.3 compliant  |
| USB 2.0 OTG              | USB A Connector   |
| Real Time Clock/Calendar | Microchip MCP795W1<br>Optional Batter-Backed  |
| Crypto                   | CryptoAuthentication Device ATECC608  |
| SD Card                  | One micro SD Card Slot  |
| NOR Flash                | Micron MT25QU01G BBB, 128 Mb<br>Clock frequency 166MHz (MAX) for all protocols in STR                                   |

| Component        | Description   |
|------------------|---|
| LEDS             | Power (Green), WIFI Active (Yellow), User Led (Blue), User Led (Orange), User Led (Green) |
| Buttons          | Reset Button, Wake Up Button  |
| JTAG             | 10-Pin micro header   |
| Debug USB        | Access to Serial Console  |
| Programming Port | Atmel Bossa Programming Port  |
| OS Support       | Embedded Linux  |
| Size             | 85 mm x 54 mm   |

## Connectors Description

| Pin No | Description  |
|--------|--------------|
| 1      | GND          |
| 2      | GND          |
| 3      | UART0_CTS    |
| 4      | PWR_BTN_N    |
| 5      | UART0_TxD    |
| 6      | RST_BTN_N    |
| 7      | UART0_RxD    |
| 8      | SPI0_SCLK    |
| 9      | UART0_RTS    |
| 10     | SPI0_DIN     |
| 11     | UART1_TxD(O) |
| 12     | SPI0_CS      |
| 13     | UART1_RxD(O) |
| 14     | SPI0_DOUT    |
| 15     | I2C0_SCL     |

| Pin No | Description |
|--------|-------------|
| 16     | PCM_FS      |
| 17     | I2C0_SDA    |
| 18     | PCM_CLK     |
| 19     | I2C1_SCL    |
| 20     | PCM_DO      |
| 21     | I2C1_SDA    |
| 22     | PCM_DI      |
| 23     | GPIO-A      |
| 24     | GPIO-B      |
| 25     | GPIO-C      |
| 26     | GPIO-D      |
| 27     | GPIO-E      |
| 28     | GPIO-F      |
| 29     | GPIO-G      |
| 30     | GPIO-H      |

| Pin No | Description |
|--------|-------------|
| 31     | GPIO-I      |
| 32     | GPIO-J      |
| 33     | GPIO-K      |
| 34     | GPIO-L      |
| 35     | 1V8         |
| 36     | NC          |
| 37     | 5V          |
| 38     | NC          |
| 39     | GND         |
| 40     | GND         |

## Starting the Board

### 1 Prerequisites

Shield96 (Board itself)  
SD Card Reader  
Power adapter

USB-to-Micro-USB Cable  
Micro SD Card

WIFI Antenna (optional)  
Ethernet cable (optional)

### 2 Preparation

Step 1: Download Image: **HD96.img**  
(<https://github.com/ArrowElectronics/hd96>)

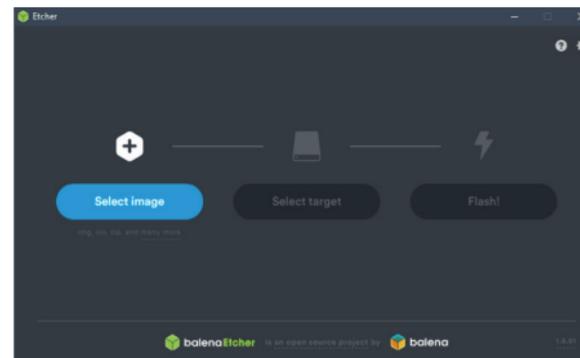


Step 2: Download and install Etcher  
Windows: (<https://www.balena.io/etcher/>)  
Linux: Install Etcher (Ubuntu)

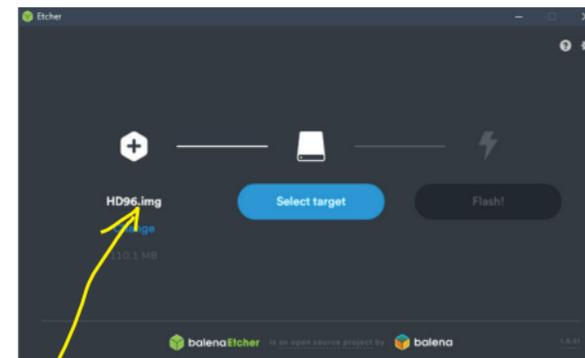
Step 3 Serial Interface Connection  
(Optional)  
Windows: PUTTY (<https://putty.org/>)  
Linux: PUTTY

## 3 Flashing Image to SD-card Windows / Linux with Etcher

Step 1: Select Image (HD96.img)

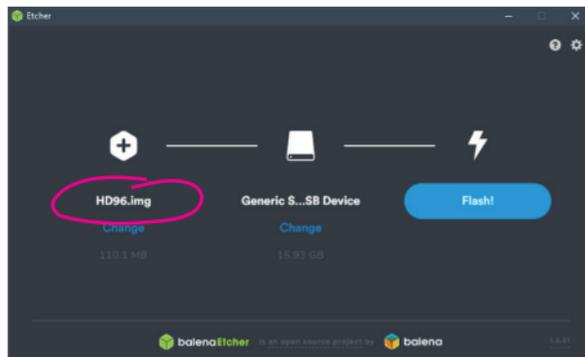


Step 2: Select SD Card

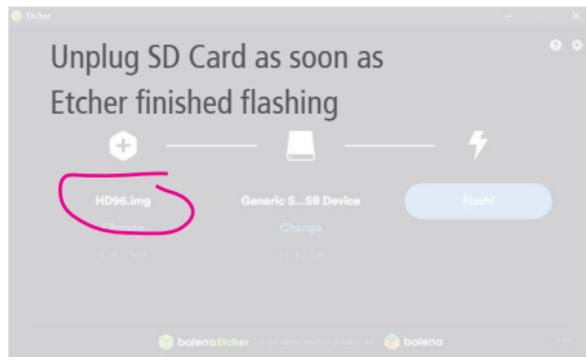


Bleibt HD96???

### Step 3: Flash Image to SD Card



### Step 4: Unplug SD Card



## 4 Power-on

Step 1: Connect Ethernet Cable

Step 2: Insert SD card into SD card slot

Step 3: Connect USB to J2 PC/Power or to J10 Debug

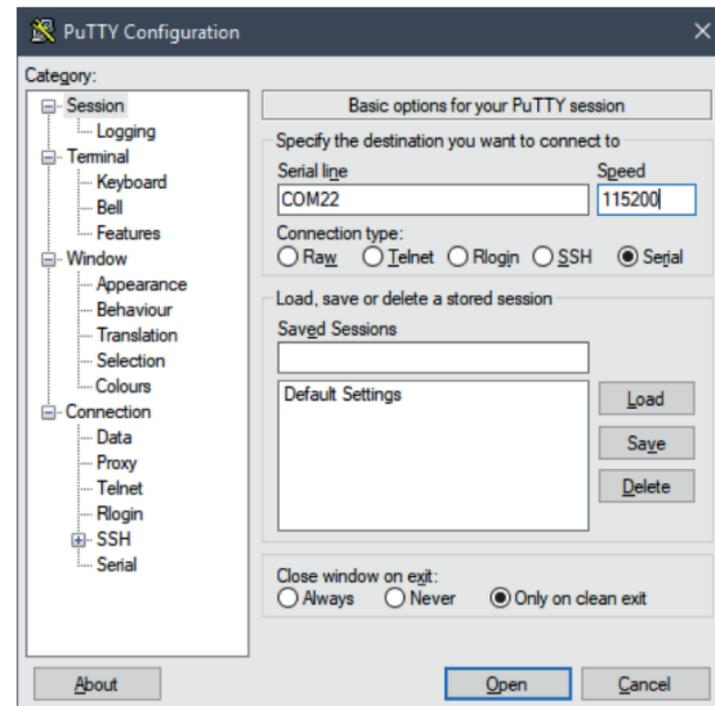
Step 4: Connect to Device over SSH

**Note:** During boot the Device will try to establish a network connection, this may take a bit longer if no Ethernet cable is connected.

## 5 Connecting to Debug Interface

If you start the Device for the first time it may be useful to see the boot messages or get the device IP address to be able to SSH to the device. You can use the J10 Debug Interface and a serial monitor like putty to connect to the device.

- Connect USB Cable to J10 Debug
- Open putty
  - Choose Connection type Serial
  - Set COM Port
  - Set Speed to 115200



PuTTY – Serial Configuration

```
COM22 - PuTTY
udevd[129]: specified group ,kvm` unknown
g_serial gadget: Gadget Serial v2.4
g_serial gadget: g_serial ready
EXT4-fs (mmcblk1p2): re-mounted. Opts: (null)
INIT: Entering runlevel: 5
Configuring network interfaces... Interface is neither WLAN0 nor P2P0
IPv6: ADDRCONF(NETDEV_UP): eth0: link is not ready
udhcpd: started, v1.29.3
udhcpd: sending discover
udhcpd: sending discover
udhcpd: sending discover
udhcpd: no lease, forking to background
done.
Starting system message bus: dbus.
Starting OpenBSD Secure Shell server: sshd
done.
Starting ntpd: done
Starting syslogd/klogd: done

Poky (Yocto Project Reference Distro) 2.6.2 Shield96 /dev/ttyS0
Shield96 login: root
root@Shield96:~$
```

PuTTY – Serial Interface

## Important Notice

The NewTec GmbH provides the enclosed product(s) under the following conditions:

This evaluation board/kit is intended for use for ENGINEERING DEVELOPMENT, DEMONSTRATION, OR EVALUATION PURPOSES ONLY and is not considered by NewTec to be a finished end-product fit for general consumer use. Persons handling the product(s) must have electronics training and observe good engineering practice standards. As such, the goods being provided are not intended to be complete in terms of required design-, marketing-, and/or manufacturing-related protective considerations, including product safety and environmental measures typically found in end products that incorporate such semiconductor components or circuit boards. This evaluation board/kit does not fall within the scope of the European Union directives regarding electromagnetic compatibility, restricted substances (RoHS), recycling (WEEE), FCC, CE or UL, and therefore may not meet the technical requirements of these directives or other related directives.

Should this evaluation board/kit not meet the specifications indicated in the User's Guide, the board/kit may be returned within 30 days from the date of delivery for a full refund. THE FOREGOING WARRANTY IS THE EXCLUSIVE WARRANTY MADE BY SELLER TO BUYER AND IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED, IMPLIED, OR STATUTORY, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE.

The user assumes all responsibility and liability for proper and safe handling of the goods. Further, the user indemnifies NewTec from all claims arising from the handling or use of the goods. Due to the open construction of the product, it is the user's responsibility to take any and all appropriate precautions with regard to electrostatic discharge.

EXCEPT TO THE EXTENT OF THE INDEMNITY SET FORTH ABOVE, NEITHER PARTY SHALL BE LIABLE TO THE OTHER FOR ANY INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES.

NewTec currently deals with a variety of customers for products, and therefore our arrangement with the user is not exclusive.

NewTec assumes no liability for applications assistance, customer product design, software performance, or infringement of patents or services described herein.

Please read the User's Guide and, specifically, the Warnings and Restrictions notice in the User's Guide prior to handling the product. This notice contains important safety information about temperatures and voltages. For additional information on NewTec's environmental and/or safety programs, please contact the NewTec application engineer.

No license is granted under any patent right or other intellectual property right of NewTec covering or relating to any machine, process, or combination in which such NewTec products or services might be or are used.

## FCC Warning

This evaluation board/kit is intended for use for ENGINEERING DEVELOPMENT, DEMONSTRATION, OR EVALUATION PURPOSES ONLY and is not considered by NewTec to be a finished end-product fit for general consumer use. It generates, uses, and can radiate radio frequency energy and has not been tested for compliance with the limits of computing devices pursuant to part 15 of FCC rules, which are designed to provide reasonable protection against radio frequency interference. Operation of this equipment in other environments may cause interference with radio communications, in which case the user at his own expense will be required to take whatever measures may be required to correct this interference.

NewTec GmbH, 2019

Creating safety.  
With passion.

NewTec

**Manufacturer:**

NewTec GmbH  
Buchenweg 3  
D-89284 Pfaffenhofen  
Germany  
product-support@newtec.de  
Phone: +49 7302 9611-0  
www.newtec.de

4060011977\_0220