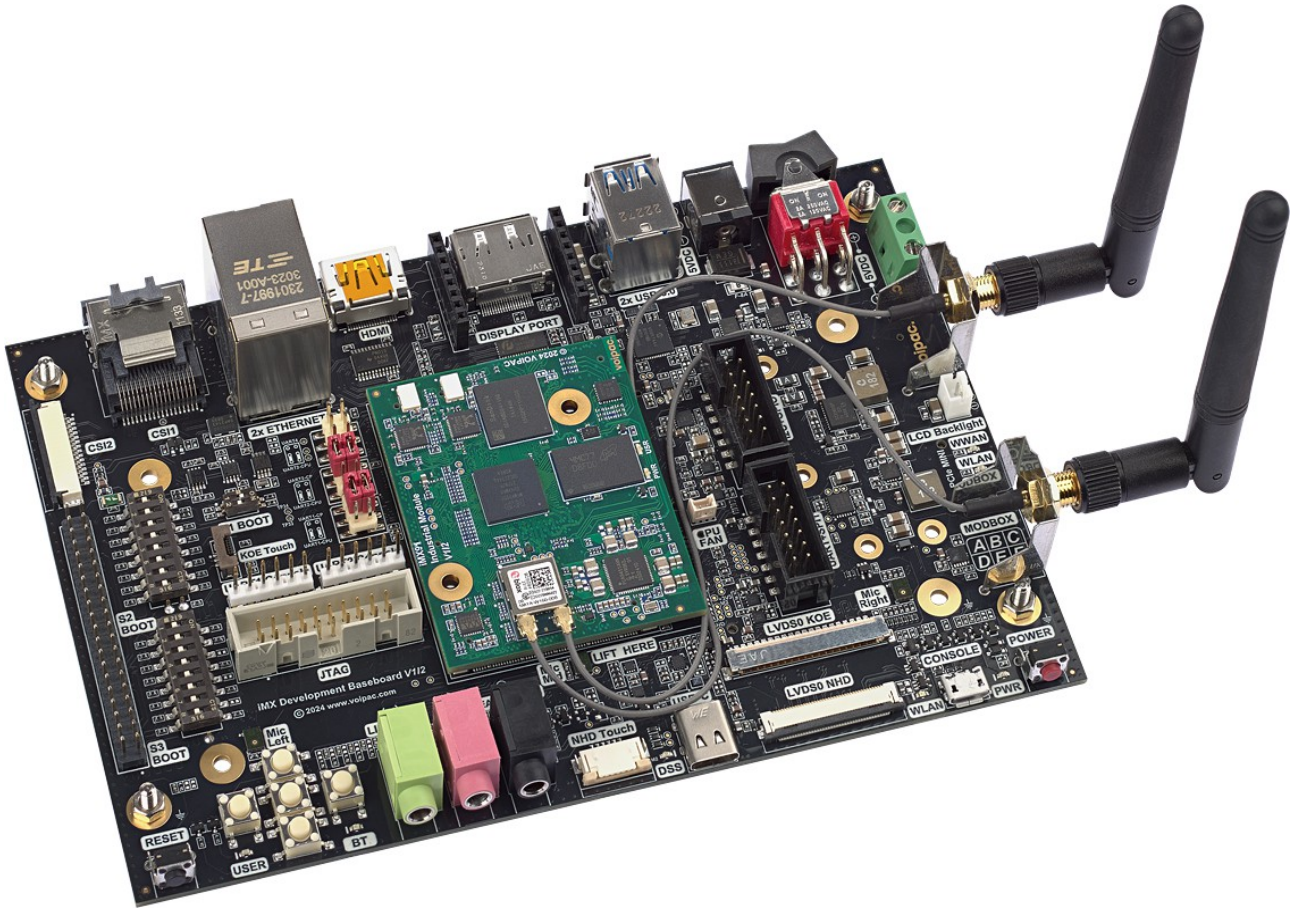
NXP Partner Program

iMX91 Industrial Development Kit

QUICK GUIDE



voipac.

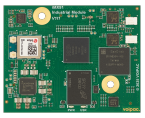
Table of Contents

Release Date: November 13, 2025

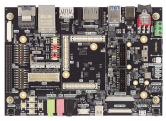
1. iMX91 Industrial Development Kit

1.1. Development Kit Parts

These items are part of each **standard configuration development kit** providing all the necessities required to start the custom design process.



iMX91 Industrial Module Max/Pro/Basic



iMX Development Baseboard

Micro USB Cable

Patch Ethernet Cable

100-pin Shielded Connector

1.2. Development Kit Accessories

These add-ons have been selected to fast-track the development process, and are available for the purchase directly from Voipac webshop. All of these items are supported by the BSP software and were thoroughly tested. An extensive documentation stored in the Voipac **Downloads** and **Wiki** sections helps with the development or any future custom design changes.

NXP Parallel TFT Display Set

Digilent MIPI-CSI Camera Set

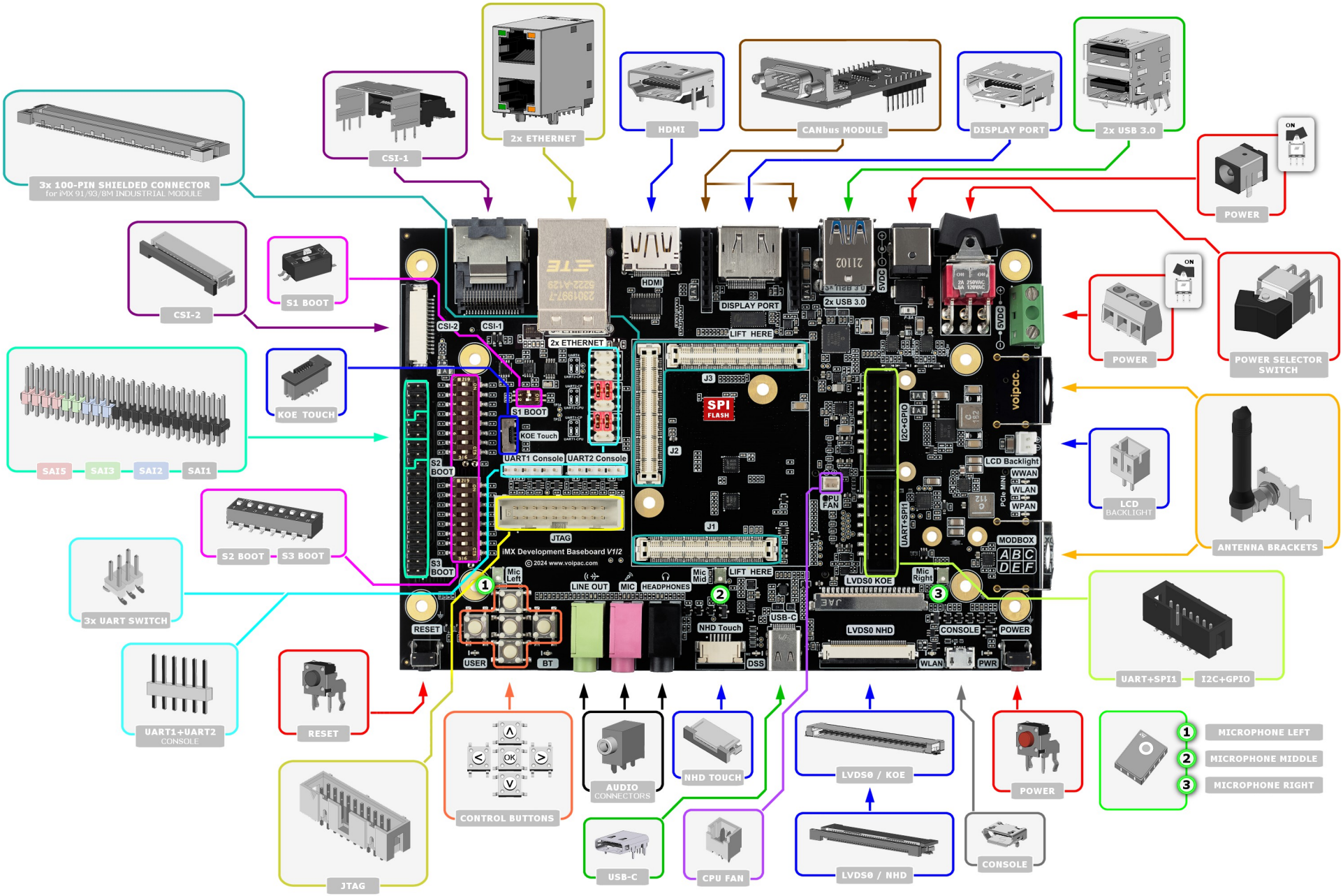
iMX9 Wifi and Bluetooth Antennas Set

Power Supply 5V 20W

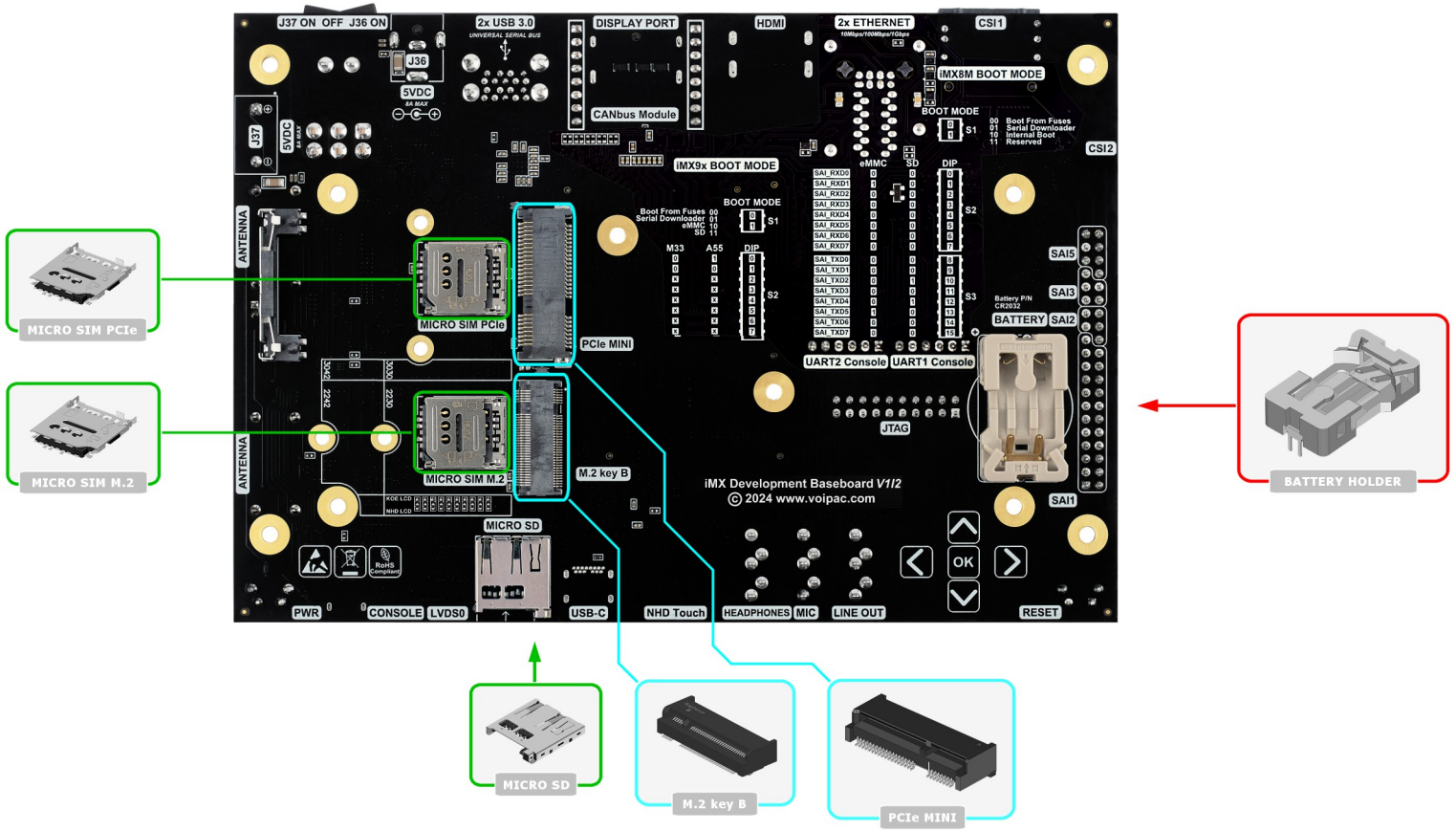
Hardware and Software Development Support

1.3. Baseboard Connectors and Main Components

BASEBOARD TOP SIDE

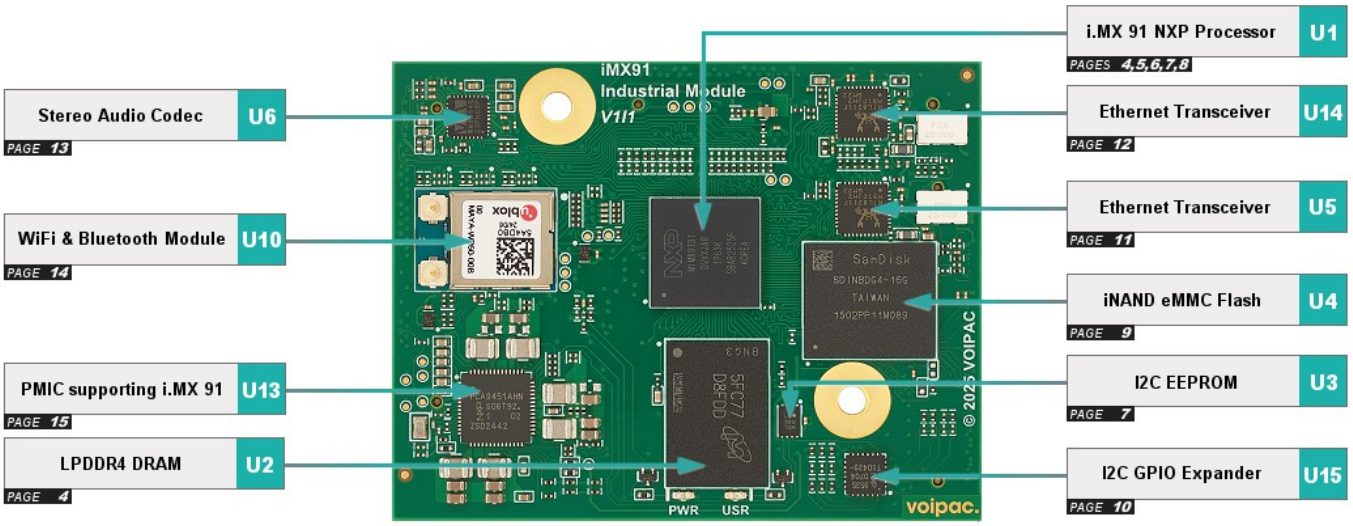


BASEBOARD BOTTOM SIDE

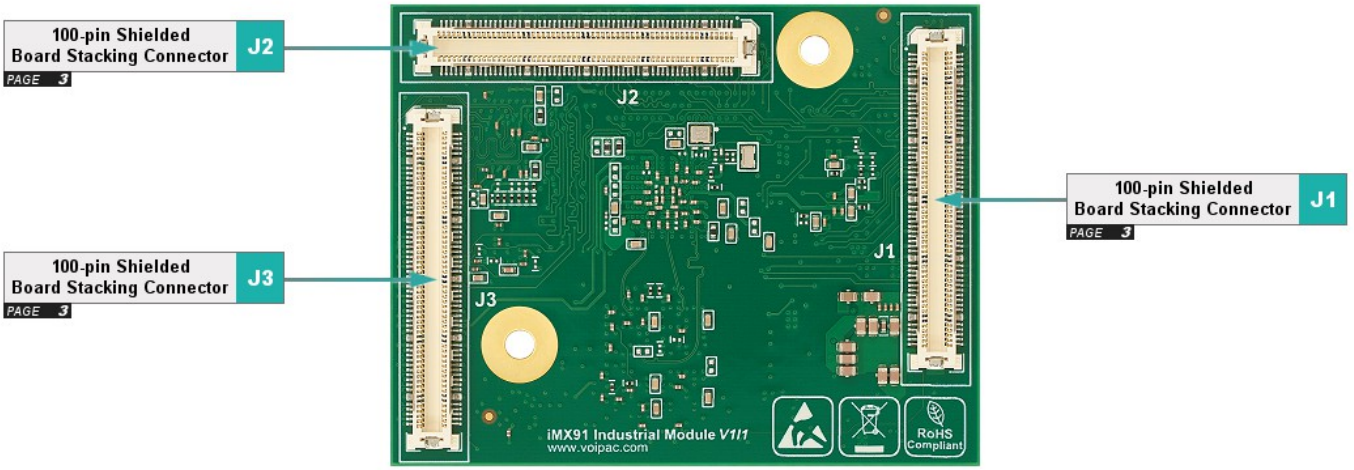


1.4. Module Key Components

MODULE TOP SIDE



MODULE BOTTOM SIDE



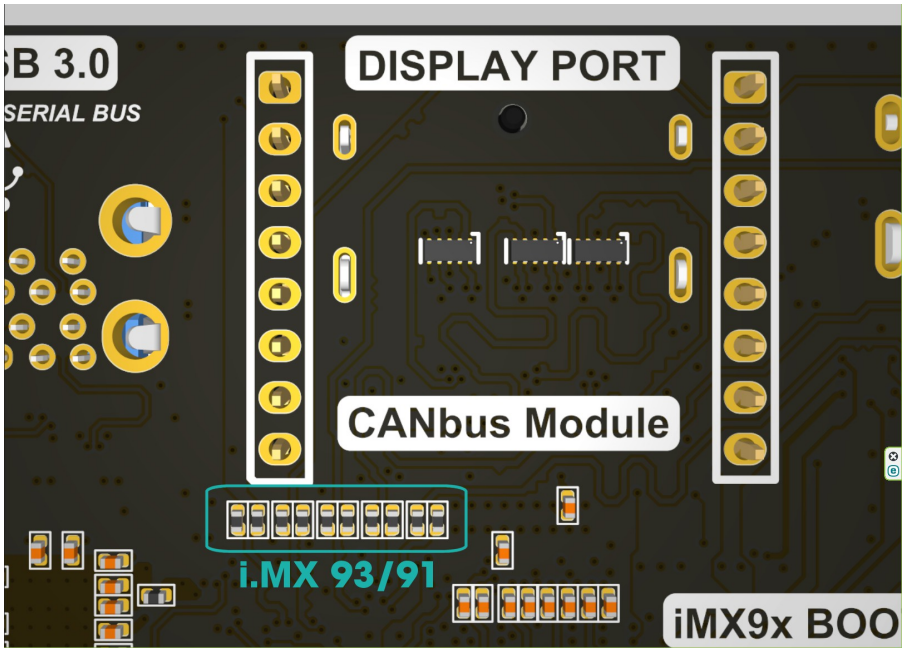
NOTE: *The page number in* ***black field*** *refers to the iMX91 Industrial Module schematics document page.*

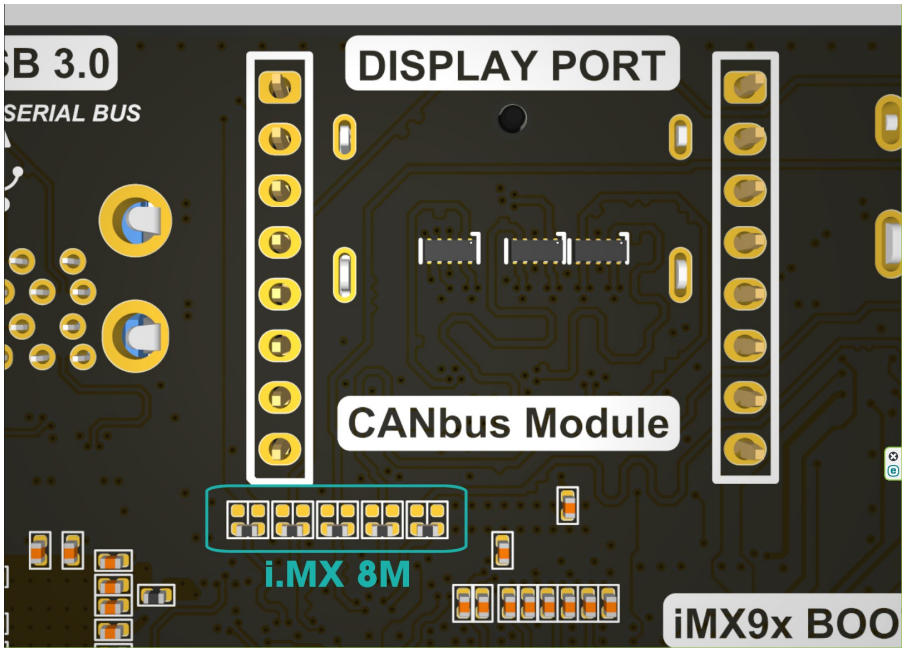
NOTE: *The confidential schematics is available for download from the* ***kit downloads*** *section of the commercial web site* ***after the development kit purchase****.*

1.5. Configurable Hardware Jumpers Setting

Make sure that the configurable 0R resistors of the universal iMX Development Baseboard are set to support the **iMX91 Industrial Module**. LVDS1 termination is necessary in case Ethernet port 2 / Upper Row is not supported (iMX8M Industrial Module is used).

NOTE: *When iMX Development Baseboard is ordered together with different types of Industrial Modules, it is by default assembled to support the module it was connected with upon delivery.*





2. Flashing Procedure

Following chapters describe how to flash **binaries** into iMX91 Industrial Module's eMMC Flash memory, or into SD card that is located on the iMX Development Baseboard.

NOTE: *The steps listed below are NOT REQUIRED for standard configuration development kits as all of them are preinstalled with software, setup for desired configuration and tested before dispatch.*
Mentioned steps are intended to be used as a starting point for software customization or when binaries recovery is needed.

3. Installing Universal Update Utility (UUU)

The **UUU** (Universal Update Utility) is an evolution of MFGTools (aka MFGTools v3). This utility is NXP's i.MX Chip image deployment tool, which has the same usage on both OS Windows and OS Linux. It means the same script works on both OS as command line tool, so users can easily integrate it into their tools with UUU library.

3.1. OS Windows

- Go to: **https://github.com/NXPmicro/mfgtools/releases**
- Select the latest stable release. Example: ***Releases/uuu_1.5.233***: **https://github.com/nxp-imx/mfgtools/releases/tag/uuu_1.5.233**
- Download Universal Update Utility (UUU): **uuu.exe**
- Save the file into: **C:\uuu**

3.2. OS Linux

```
git clone https://github.com/NXPmicro/mfgtools.git
cd mfgtools
mkdir .build && cd .build && cmake .. && make -j`nproc`
```

The binary called ***uuu***, which is used for flashing, is located in .build/uuu directory.

4. Preparing Binaries

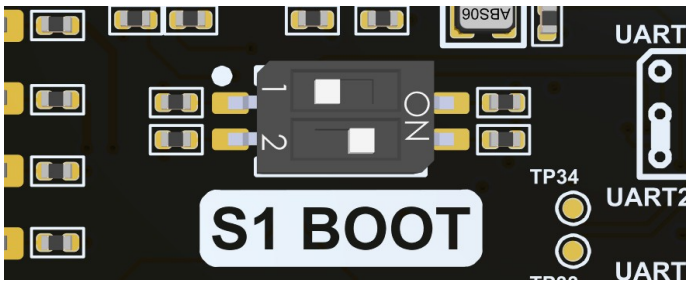
Locate the binary files for flashing the module at Voipac **Downloads** section.

- Download the default WIC filesystem image for specific module configuration: **voipac-image-imx91-*configuration*.rootfs.wic**

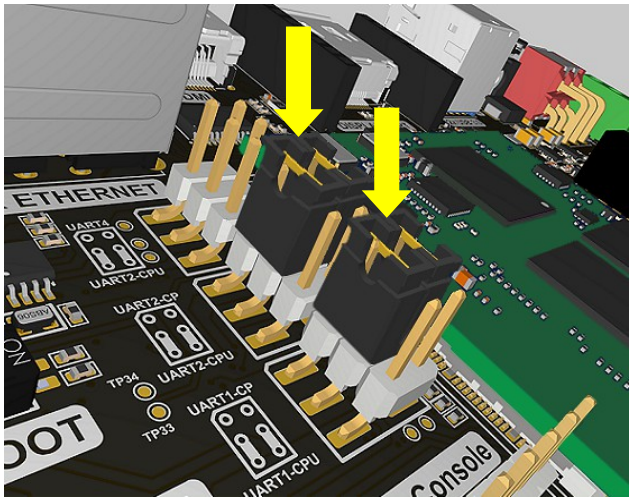
Store released Image + Bootloader to the same folder as uuu mfgtools was saved (**C:\uuu**).

5. Flashing the Binaries

- Set serial downloader mode by sliding DIP switch **S1 BOOT** positions to: **1-OFF, 2-ON**

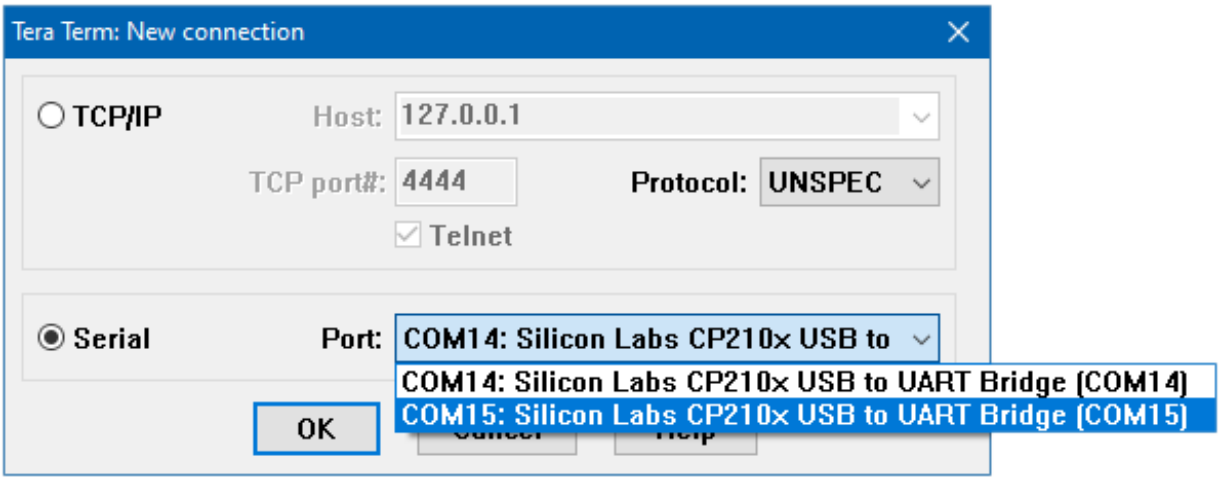


- Plug USB Micro-B cable to baseboard **CONSOLE** connector and PC
- Plug USB-C cable to baseboard **USB-C** connector and PC
  Note: *Powering of the development kit is not required during the flashing procedure.*
- Make sure that UART1 and UART2 jumpers are in CP2105 positions (USB/UART bridge) as shown at the picture below:



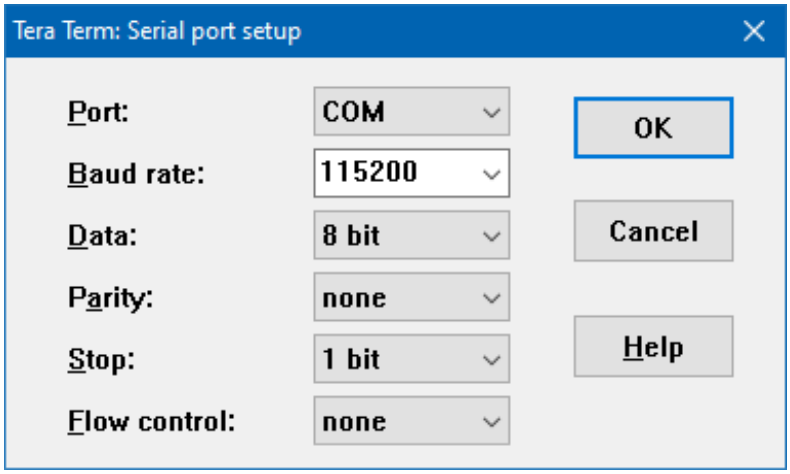
Note: *After connecting 2 development board cables, 2 serial ports named* ***Silicon Labs Dual CP2105 USB to UART Bridge*** *should appear in the controlling PC.*

SERIAL CONSOLE



- Make sure that the downloaded imx-boot and **`*.wic`** files are located in the **C:\uuu** directory

- Check the basic settings of the serial port ⟶



- Choose one of the following commands to start the flashing process:

5.1. eMMC Flash Memory *(DEFAULT)*

OS Windows

```
uuu.exe -b emmc_all voipac-image-imx91-configuration.rootfs.wic
```

OS Linux

```
sudo ./uuu -b emmc_all voipac-image-imx91-configuration.rootfs.wic
```

5.2. SD Card

OS Windows

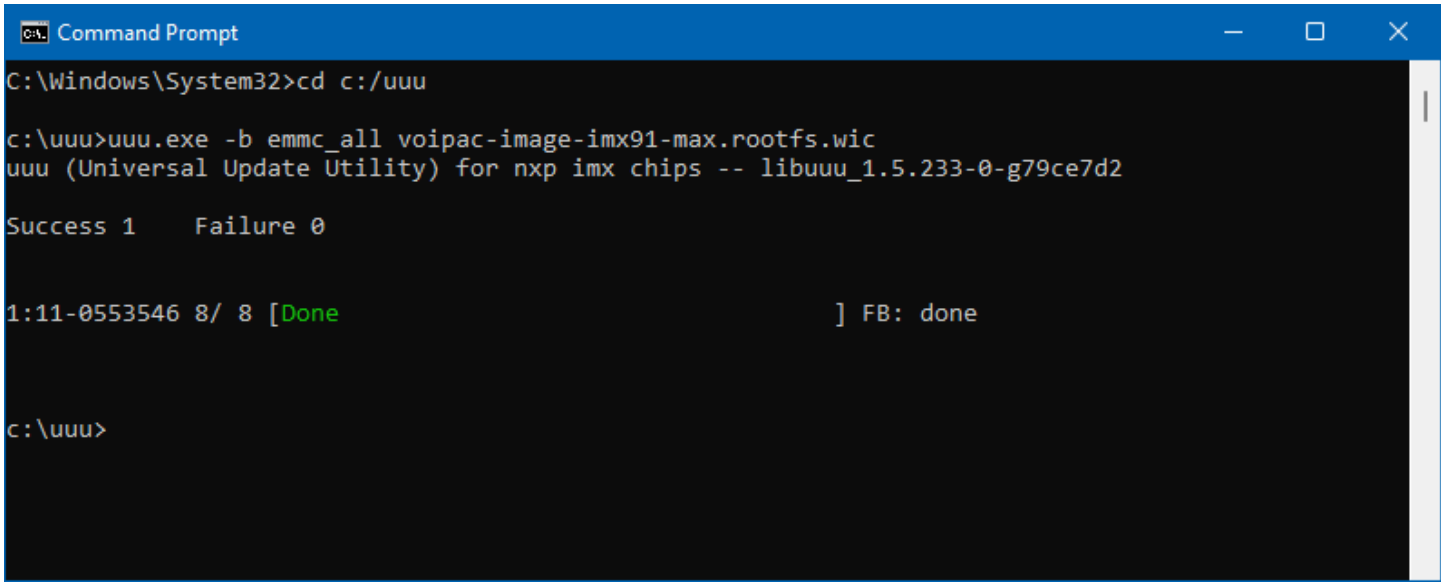
```
uuu.exe -b sd_all voipac-image-imx91-configuration.rootfs.wic
```

OS Linux

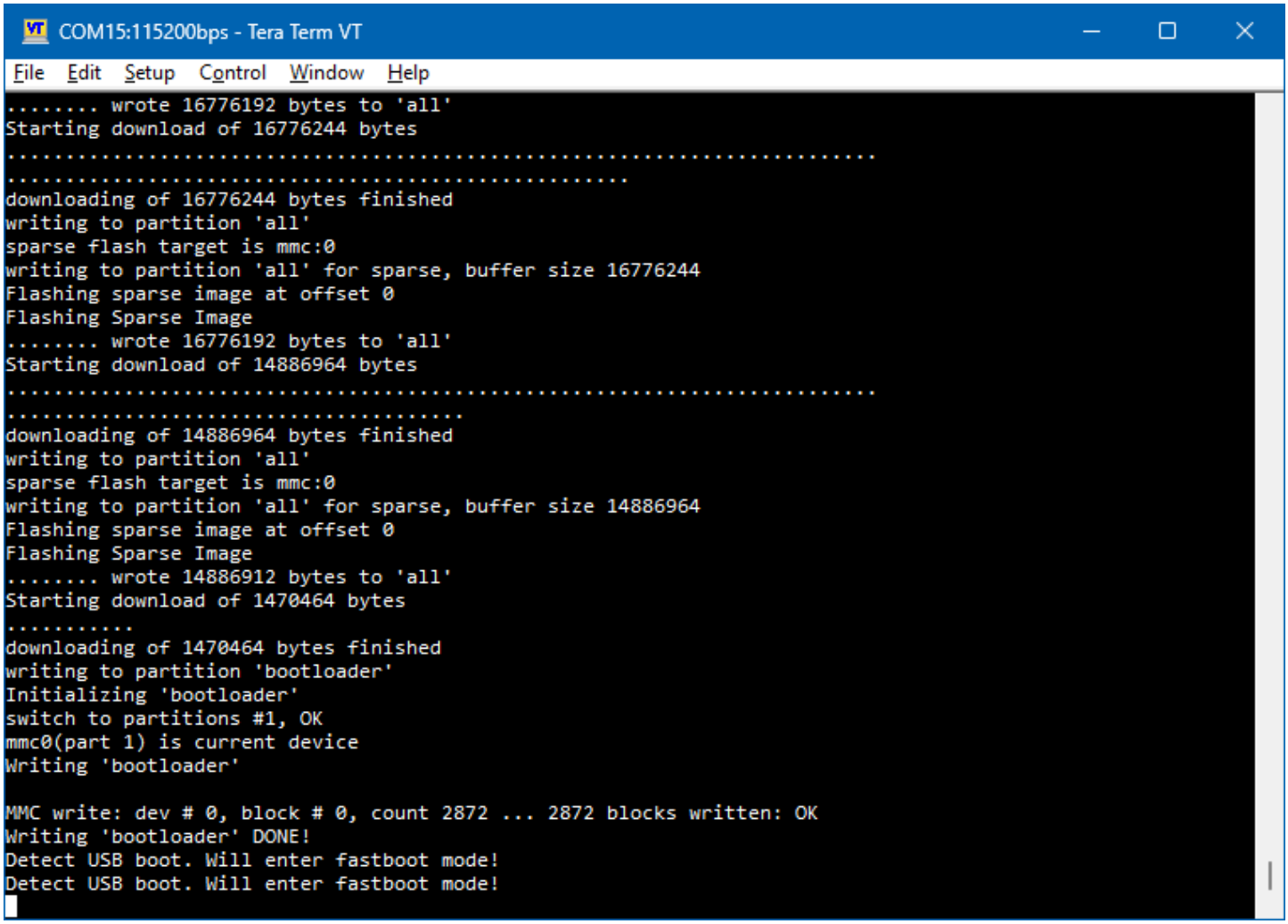
```
sudo ./uuu -b sd_all voipac-image-imx91-configuration.rootfs.wic
```

Flashing logs

UUU



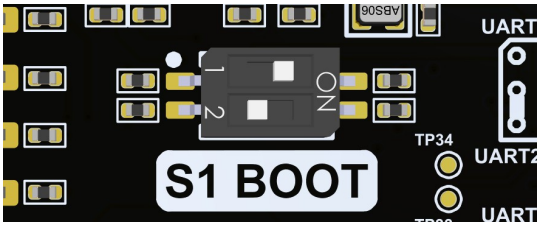
SERIAL CONSOLE



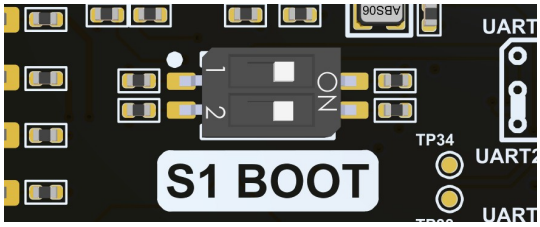
6. Running the Newly Flashed Binaries

After completing the above steps, eMMC Flash memory or SD Card is flashed and the following steps are to be performed to boot the new image:

- Unplug **USB-C** cable from PC
- Set Boot mode by sliding DIP switch **S1 BOOT** positions to boot from:

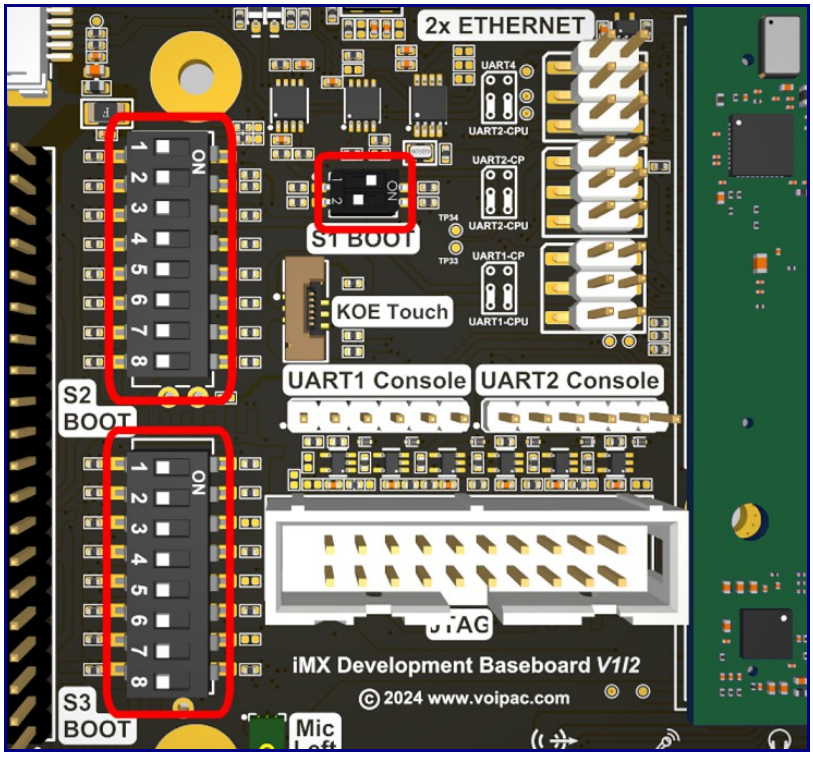


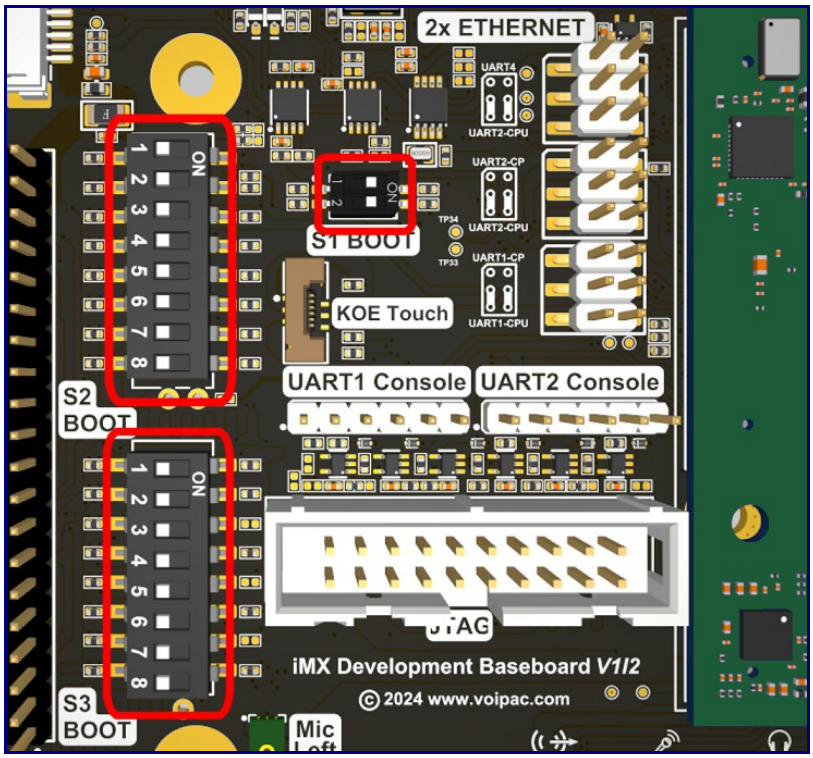
eMMC: 1-ON, 2-OFF



SD Card: 1-ON, 2-ON

eMMC FLASH MEMORY BOOT
(default)





- Connect **USB Micro-B** debug cable, switch on the power and the development kit starts booting with the new binaries.

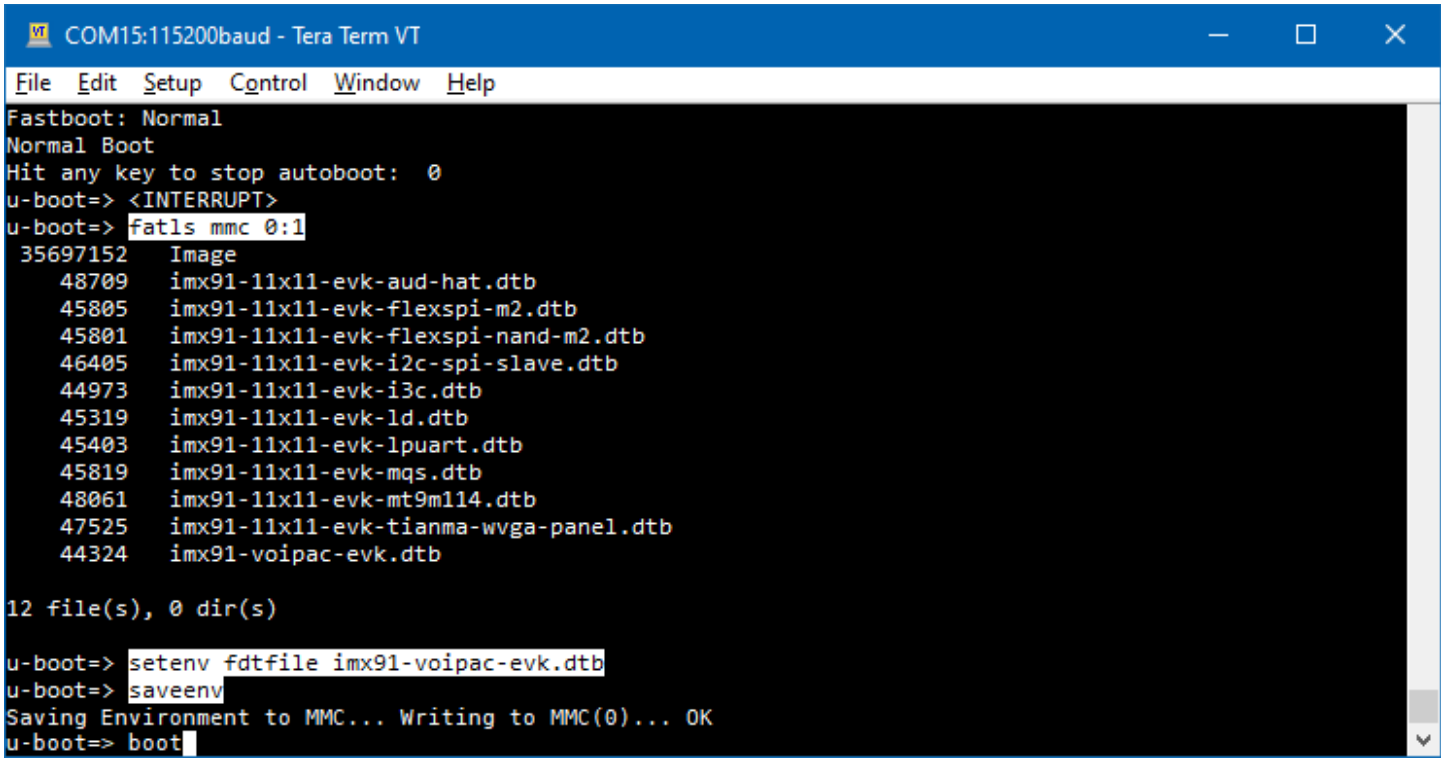
If necessary, stop autoboot to set a specific DTB file:

- Type these commands to set a DTB file for the image loaded in eMMC:

```
u-boot=>fatls mmc 0:1
u-boot=>setenv fdtfile imx91-voipac-evk.dtb
u-boot=>saveenv
```

- Type these commands to set a DTB file for the image loaded in SD Card:
  (example for TIANMA display)

```
u-boot=>fatls mmc 1:1
u-boot=>setenv fdtfile imx91-11x11-evk-tianma-wvga-panel.dtb
u-boot=>saveenv
```



- Type a **`boot`** command or reset the board to boot the Image with correct DTB file:

7. Additional Support Links

7.1. Development Kit Downloads

iMX91 Industrial Module Flyer	Voipac Downloads
iMX91 Industrial Module Datasheet	Voipac GitHub
iMX Development Baseboard Datasheet	Voipac Wiki

Note: *The **iMX91 Industrial Module Confidental Schematic** is available for download from the kit downloads section of the commercial web site after the development kit purchase.*

7.2. General Information

COMs and SBCs Feature Overview	Voipac Price List
Latest Version of the Quick Guide	

8. Operating and Safety Instructions

The development kit offers numerous connection and testing options. For safety reasons, please handle it with appropriate care by following these instructions:

- When unplugging the module from baseboard, follow the two "LIFT HERE" baseboard markings, to precede possible damage of the connectors pins.
- Do not connect any device (e.g. Display, Camera, CANbus Module, WiFi antennas,...) while the baseboard is powered, otherwise short circuit or electrical shock may occur.
- The development kit must/shall?? be connected to a grounded mains outlet. When not using the power supply available for this development kit, make sure your power source meets the following requirements:
  - Output Current: 4A
  - Output Power: 20W
  - Output Voltage: +5V
- Reliable ESD prevention is recommended.

Thank you

for purchasing Voipac's development kit.

Warranty:

VOIPAC TECHNOLOGIES s.r.o. Does Not Bear Responsibility for the Following:

- Failure of a product resulting from misuse, accident, modification, unsuitable operating environment, or improper maintenance by user
- Unless otherwise agreed in written, a product does not include technical support and the customer may be able to purchase technical support under separate agreement
- Any technical or other support provided by VOIPAC TECHNOLOGIES s.r.o. such as assistance, set-up and installation is provided WITHOUT WARRANTY OF ANY KIND.

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