

# HamGeek USRP B210 User Manual

## 1. Features:

HamGeek USRP B210 is optimized and enhanced based on the original design. It uses a newer K7 series device to replace the original S6 series and supports Vivado development while maintaining compatibility with the original functions. The main differences and similarities are as follows:

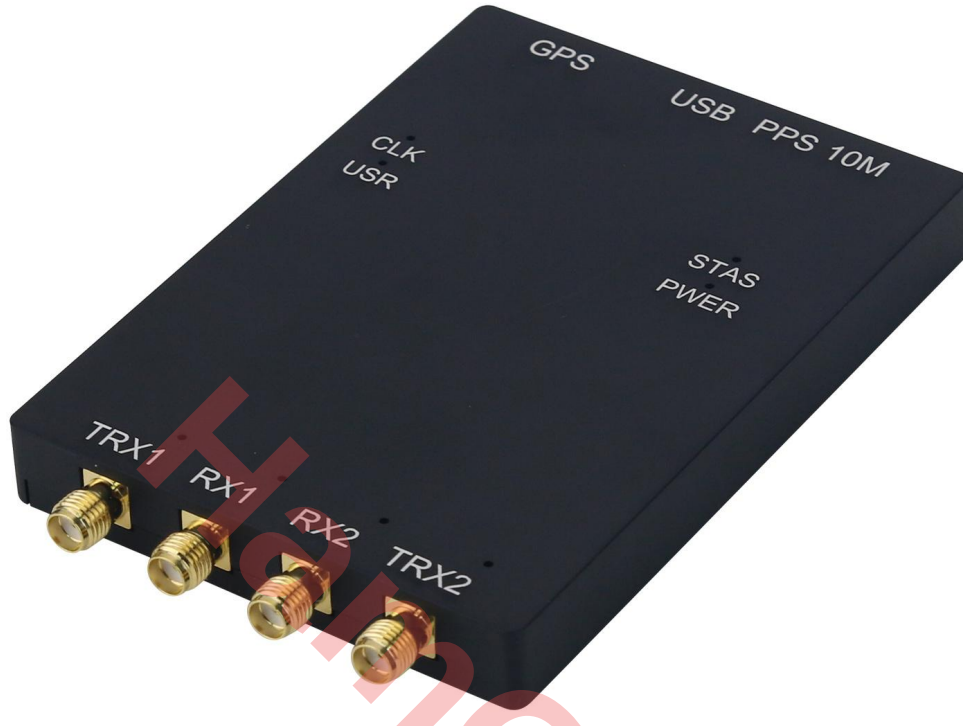
- \* Uses a USB 3.0 Type-C interface, with a maximum real-time transmission bandwidth of 56MHz.
- \* The RF front end is identical to the original design, using a segmented frequency-band architecture with simulation-optimized RF circuits.
- \* Supports PPS and 10 MHz inputs. An onboard GPS module is added and can be used instead of the PPS input.
- \* Removes the GPSDO connector and reduces the board size to 70 x 97 x 11.5mm.

## 2. Instructions for Use:

Differences from the original version:

- \* Replace the usrp\_b210\_fpga.bin file on the computer before use.
- \* Do not connect a GPSDO module.
- \* The GPS module PPS input has higher priority than the external PPS input. When the GPS module is locked, the external PPS input is unavailable.

## 3. Interface Description:



(HamGeek USRP B210 SDR Development Board with CNC Shell)

|               |                                                              |
|---------------|--------------------------------------------------------------|
| GPS           | GPS antenna input, MMCX connector                            |
| USB           | USB 3.0 host data communication, Type-C connector            |
| PPS           | External PPS input, MMCX connector                           |
| 10M           | 10MHz reference input, MMCX connector                        |
| TRX1          | TX/RX Port 1, SMA connector                                  |
| RX1           | RX Port 1, SMA connector                                     |
| RX2           | RX Port 2, SMA connector                                     |
| TRX2          | TX/RX Port 2, SMA connector                                  |
| FPC Connector | JTAG debug interface and expandable GPIO                     |
| PWER LED      | Power LED, red when powered on                               |
| STAS LED      | Status LED, blue after firmware loading                      |
| CLK LED       | PPS LED, flashes red in sync with the selected PPS pulse     |
| USR LED       | No current function; customizable                            |
| TRX1 LED      | TX/RX LED, red during transmission and blue during reception |
| RX1 LED       | RX LED, blue during reception                                |
| RX2 LED       | RX LED, blue during reception                                |
| TRX2 LED      | TX/RX LED, red during transmission and blue during reception |