Programable Radio Unit Accelerating SDR System Application
V3 Technology Co., Ltd., established in 2008, focuses on providing innovative Scientific Research and Education solutions. It is mainly oriented to Wireless communication / Spectrum security, Artificial intelligence Vision and Nuclear & Chemical Monitoring and Protection.

V3 Technology is XILINX Certified Alliance Member and Authorization Training Partner (ATP). It is also the world’s leading analog chip manufacturer – ADI’s Chinese University Program Partner. Meanwhile, it is also a long-term technology provider of IBM Research and Microsoft Research.
Typical Customers

V3 Customer Type

1000+ Commercial
200+ Educational
20+ countries and regions

Microsoft
SONY
Duke University
Fujitsu
IBM
ZTE
FRAnceteLeCOM
HUAWEI
Nokia

Research
Education
Product
Innovation

Universities:
-北京大学
-清华大学
-北京邮电大学
-復旦大学
-浙江大学
-东南大学
-中国科学院

Institutions:
-University of Cambridge
-The University of Wisconsin

Programable Radio Solution

PART 1
Main Architecture
Platform based on x86 GPP for eNB & EPC

Microsoft Research Software Radio (Sora)

Established: December 8, 2008

SoraSDR: Designed for academic and algorithm research applications. The open source project jointly developed by Microsoft Research supports 802.11a/b/g/n protocol.

IQXpert: Designed for wireless signal testing and measurement, spectrum recording and analysis application design, support Windows and Linux dual system, pre installed LTE open source protocol stack.

Providing the SDK interface for 2nd development

Platform based on Xilinx ZYNQ SoC for UE

YunSDR: Wireless communication module based on Xilinx ZYNQ/ZYNQ MPSoC FPGA designed for portable embedded applications. Projects jointly developed by XILINX and ADI support embedded Linux and LTE stack.
OAI Compatible Radio

USB3.0 Solution: Low-cost, but NOT reliable, ONLY in Lab
USRPO B210
BladeRF
LimeSDR

Standalone Solution: Box solution but need extra cable, too big
USRPO X300/310

PCIe Solution: the ONLY PCIe solution, but expensive and limited frequency range
EXMIMO2
PCle Programable Radio Card

Why PCI Express?

- Large volume of high-fidelity digital signals require a high-speed system I/O
- High Bandwidth & Throughput
- Low latency
- Reliable (Inside the PC)

1.2Gbps for 802.11 (20MHz channel, 16b A/D, 4x)
~up to 5 Gbps for 11n (4x4MIMO)
Over 10Gbps for future high-speed wireless
**V3 PCIe Radio Card**

**Full-tall, Half-length PCIe2.0 8x Card**
- Inside the box, no cable and more reliable
- 300MHz~6GHz wide frequency range
- 100MHz Real time bandwidth, support 5GNR
- Support external PA to cover more distance

**Half-tall, Half-length PCIe2.0 4x Card**, suitable for any PC with PCIe interface
- Inside the box, no cable and more reliable
- 70MHz~6GHz wide frequency range
- 20/40MHz Real time bandwidth, support 4G LTE
- Support external PA to cover more distance (upto 10 Km)
## IQXpert 4000&6000 Series: eNB & EPC Solution

### IQX4000: MIMO2x2
- **RF**: 2 Tx, 2 Rx, Half or Full Duplex, support TDD & FDD
- **Frequency Range**: 300MHz ~ 6GHz
- **ADC**: 16 bit ADC @122.88Msps
- **EVM**: -38dB LTE20 MHz downlink, 5 dB RF attenuation, 2600MHz
- **Processor**: XILINX ZYNQ SoC FPGA 7Z045 or Kintex 7K325T
- **Memory**: DDR3 SDRAM: 1GB

### IQX6000: MIMO4x4
- **Tx Power**: 10dBm@ 0.3~6GHz (P1dB 17dBm)
- **Realtime Bandwidth**: Rx 100 MHz / Tx 250 MHz
- **DAC**: 14 bit DAC@122.88Msps
- **Sync Modes**: External LO or Ref. clock
- **GPS Module inside
- **Interface**: GigaE/PCIe 2.0/USB3.0/USB2.0 OTG
Open Source 4G/5G Stack
Windows Case: SoraSDR from MSRA
TV Whitespace Network for Microsoft Redmond Campus

Sora MIMO SDR System
Commercial Case: LTE100 from Amari Soft
IQXpert 1000 series: UE Solution

IQX1000: MIMO2x2

srsLTE or OAI UE, Up to MIMO2x2
Design Flow
More Applications
SIGCOMM is the flagship conference in the field of communication network in ACM organization, is currently the world's leading conference in the field of communications network.

ChinaCOM is an International Conference on communication and network of EAI organizations, held annually in China, mainly for domestic and Asian scholars
Publications
SDR United Labs

华中科技大学

西安交通大学

清华大学

东南大学
SDR Innovation Labs
AI Vision Application on 5G MEC
All Programable SDR Platform based on OAI

Using fast wireless connection to cloud computing and data services, and to other connected devices, 5G will enable a variety of new capabilities, user experiences and devices such as self-driving cars with built-in intelligent traffic routing, improved city infrastructures, intelligent machines and sensors, augmented reality and more.

5G's combination of high-speed wireless communications and efficient cloud computing means that even the tiniest devices can access virtually unlimited computing power.

In 5G networks, applications can also be hosted in mobile edge computing nodes such as "cloudlets."

5G must be designed to be flexible and scalable, thereby, requiring flatter networks that use a variety of radio access technologies, including cellular, Wi-Fi, centimeter and millimeter waves.