Wireless Communications Laboratory

Adaptive processing equipment

- T&M TX signal generation
- Agilent E4438C ESG Vector signal generators up to 6 GHz (4 units)
- Agilent 33250A Function/Arbitrary Waveform Generator
- Agilent N5102 Baseband Studio digital signal interface module (2 Units)
- Holzworth HS1001A and HSM1001A RF Synthesizers
- Applied Instruments NS-3 AWGN generator (2 Units)
- T&M radio CH emulation
- Elektrobit Propsim C8 Multi-Channel Emulator
- T&M RX signal acquisition/analysis
- Mercury Computer Systems Echotek Series RF 3000T Tuners
- Rohde & Schwarz FSQ26 Signal Analyzer
- Agilent E4440A PSA Spectrum Analyzer
- Agilent DSO80804B Infiniium Digital Oscilloscope
- T&M DC power supplies and multimeters
- Agilent E3648A Dual Output DC Power Supply
- Agilent N6710B Custom Modular Power System
- Fluke 185 and 189 (2 units) True RMS Multimeters
- Siglent SPD3303X Linear DC 3CH programmable power supply (2 units)
- T&M RF shielding
- ETS Lindgren and Azimuth RF shielded test enclosures for device/component validation up to 6 GHz.
- Transceiver prototyping platforms and boards
- Lyrtech MIMO 4+4 – Advanced Development Solution and Nutaq SDR420 FPGA-based, MIMO-Enabled, tunable RF SDR solution
- National Instruments USRP N210 Networked Series + WBX + antennas (2 units)
- Texas Instruments TSW1400, TSW14J56EVM (3 units) and TSW14J57EVM High Speed Data Capture/Pattern Generators
- Analog Devices AD9739A FMC EBZ, AD-FMCDAQ2-EBZ-ND Dual-channel ADC+DAC
- Texas Instruments ADS54J60, ADC12D1800RF, ADC12J4000EVM, ADC12DJ5200RFEVM RF sampling ADC boards
- Texas Instruments DAC38J84EVM and DAC38RF82EVM RF DAC boards
- Xilinx Virtex-7 FPGA VC707 Evaluation Kit
- Xilinx Zynq-7000 SoC ZC706 Evaluation Kit (5 units)
- AD-FCOMMS3-EBZ 2+2 highly integrated RF Transceiver (5 Units)
- Device Under Test (DUT)/RF hardware
- Rich set of power amplifiers, filters, connectors, adapters, couplers, attenuators, etc. up to 18 GHz.
- Vaunix USB Programmable Lab Bricks: LPH-204B 4-Port Hub, LPS-402 2 – 4 GHz Phase Shifter (2 units), LSW-602P4T 10 – 6,000 MHz SP4T RF Switch, LDA-906V Attenuator (2 units)
- Aviat Networks IRU at 6 GHz and ODU at 13 GHz

Parc Mediterrani de la Tecnologia - Building B4
Av. Carl Friedrich Gauss 7
08860 - Castelldefels
Barcelona (Spain)
www.cttc.cat

- TMYTEK BBoard @28 GHz + AA Kit
- Otava 24-40GHz Wideband 8 Channel Tx/Rx TDD Beamformer Evaluation Kits (2 units)
- Sivers IMA 71-76 GHz Transceiver
- Filtronic Transceiver E-band Orpheus LB & HB
- Adaptive radio processing and edge computing assets
- Xilinx Zynq UltraScale+ MPSoC ZCU102 Evaluation Kit
- Zynq UltraScale+ RFSoC ZCU111 Development Kit with Qorvo 2x2 LTE RF Front End
- Zynq UltraScale+ RFSoC ZCU208 Development Kit with Otava 2x2 mmwave Front End
- Versal AI Core Series VCK190 Evaluation Kit
- Xilinx Alveo U50 Data Center Accelerator Card
- Xilinx Kria KV260 Vision AI Starter Kit (2 units)
- AMD-based multiprocessor workstations with Nvidia RTX2080 TI and RTX4090 GPUs.
- MSI GE75 Raider 10SGS-082ES laptop with Nvidia RTX 2080 GPU.
- Design, simulation, and T&M software
- Keysight's System Vue, ADS, VSA, Baseband Studio, Xilinx Vitis Suite, MATLAB, etc.

Edge and on Device Computing equipment

- IoT/M2M Supply, Antennas, Radios, Sensors, Actuators, Robots
- 433 MHz 8 dBi, SMA articulated antenna 868 MHz, SMA-3m wired antennas 869 MHz, magnetic mount antennas (2G/3G/868 MHz/900 MHz/1800 MHz/1900 MHz/2.1 GHz)
- Multiple Adafruit 6V solar planesl, USB/DC/solar lithium ion/polymer battery chargers, multiple Lithium-Ion battery packs, TP-Link TL-PB10400 power bandk, DC power Raspi 3, battery chargers for 6 batteries and 4 batteries.
- BLE: Bluetooth Low-Energy for Raspberry PI B+, BLE dongle IOGER GU521
- WiFi: several dongles, nano wifi+antenna 2 dBi
- 3G: 3G/GPRS shield for Arduino / Raspberry Pi (3G + GPS)
- GPS: GPS -622F
- Wizzimote: motes, bases, battery holders, antennas, crystals
- Panstamp: AVR @869 MHz, sub-GHz NRG, panStick, battery boards with sensors
- SubGHz: Semtech SX1212 @433MHz+ Cortex, SPIRIT @433MHz (ST) + Cortex, SX1276
- Zolertia Z1 Platform802.15.4 @2.4GHz (MSP430 + CC2420
- OpenMote: OpenMote CC2538, OpenBase, OpenBattery, OpenMote Antennas
- Sigfox: LE51-868 S, Sigfox TD1208
- LORA: LORA radio for Arduino, iU880A long range USB adapter, SX1276MB1LAS BiBand 433/868 MBED shield, Lora Mote 40479 eval. Tool
- LTE: Huawei E3276 USB dongle
- Arduino YUN, UNO Rev.3, Due 32bit, Motor Shield, Xbee shield, Raspi Arduino shield bridge, multiprotocol radio shield raspi, Galileo Arduino, Waspmote 802.15.4 SMA module, XBee 868 MHz SMA Module @869MHz (CC430), XBee Pro 802.15.4 SMA Module,Spark Core WiFi board,
- Raspberry Pi 2, 3, Zero W, Model B+, HDMI 5' display backpack without Toutch TFT
- Estimote and Kontakt.io beacons and cloud.
- Libelium kits with e-health sensor platform, waspmote starter kit, waspmote smartcities kit, Waspmote Event Sensor Kit.
- Node MCU ESP8266 ESP12E WiFi Version W012, MOD-WiFi-ESP8266, ESP8266-EVB
- VLC LED luminaries, PLC kit, Photodetector kit
- Ultrasonic range sensors, temperature and humidity DHT22 and AM2303 sensors

- Robot chassis 4WD 4DC motors, Alphabot, 365rpm gear moors (wheels+encoder), Raspberry Pi Motozero control 640 – DC and Stepper motor control boards and DC motors
- Edge Computing and vehicular vertical application
- Aaeon Nvidia Jetson Nano Boxer Kits (AI@Edge development system)
- Commsignia OBU OB4 model incl. antenas and V2X protocol stack
- Quectel Sub-6 GHz 5G IoT/eMBB RM500K Modem

PARADIGMS Platform

- Cloud and Edge Servers
- +10 Intel XEON servers (4 GHz CPU, 384 GB RAM, 8 TB HDD/SSD)
- 8x Intel NUC Intel i7 4GHz / 16GB RAM / 256GB SSD
- 8x GPUs including NVIDIA RTX 2080 and RTX 3070
- Several switches (e.g., 10G Netgear XS728T)
- 5G RAN
- Amarisoft Callbox Ultimate and x2 Amarisoft Callbox Mini
- Amarisoft Simbox 64 E 5G SA UE emulator
- Multiple laptops (e.g., MacBook Pro) and 5G smartphones (generic UE nodes)
- Huawei 5G CPE Pro 2
- SDR
- Multiple Ettus USRP devices including N310, N320, and B210
- Verticals
- AR/VR: Microsoft HoloLens 2 Windows Mixed Reality (WMR) headsets
- Self-Driving: Quanser QCar sensor-rich autonomous vehicle for self-driving applications