Wireless Innovations to Accelerate Development of Connected Smart Cities

Andy Lin, WISE-EC, Advantech
Edge Computing and Intelligence Solutions

Multi-Cloud Interoperability & Application Services

Edge.SRP
- Edge.SRP Signage CMS
- Edge.SRP EdgeLink
- WebAccess SCADA
- WebAccess CNC
- DeviceOn.OTA
- DeviceOn.E2I
- DeviceOn.ePaper
- DeviceOn.FaceView
- McAfee
- Acronis
- Alleantia
- Azure

DeviceOn.App
- LoRa
- Embedded Computers
- Edge Intelligence Servers
- Digital Signage Players
- AI Inference Systems

3rd Party App
- Wireless Gateways
- CO2 / Temp / Vibration / pH Sensors
- Machines / Manufacturing / KIOSK
- Air Compressor / Energy Storage / Robotic
- Display / Signage
- Camera
Embedded IoT Wireless Connectivity Solutions

Advantech Industrial Wireless

Transportation  AGV  Medical  Smart Lighting  Bridge  Construction  Aquaculture  Logistics

Optical Antenna Design  RF Certification  Software Integration  System Performance Tuning

Embedded Wireless Module


WiFi-5 Module  WiFi-6 Module  Industry-Grade GPS Module  4G LTE Module  Sensor Node Module  Wireless IoT Gateway & Sensor Node

IoT Solution
Industrial Wireless Modules

- EWM-C148 LTE Cat4 Mini PCI-e
- EWM-C148S LTE Cat4 Solder down
- EWM-W190 WiFi+BT Mini PCIe
- EWM-W195 WiFi+BT M.2 2230
- EWM-G109 GPS Mini PCI-e
- EWM-NB147 NB-IoT Mini PCI-e
Embedded Wireless Design-in Service

- 5~7 Longevity
- Window/Linux/Android
- M.2/mPCIe/LGA
- -45 ~ 85°C
- Water Proof / Dust Proof
- Add-on Software Support
4G Auto Connection Tools

Customer’s Challenges
• Wide deployment in the city
• Need auto connection function
• Need suitable SW tool

Advantech Solutions
• EWM-C117FL06E
• Advantech 4G auto connection tool
Smart Roaming

Customer’s Challenges

- Need reliable wireless module
- Need fast roaming with APs
- How to optimal wireless performance

Advantech EWM-W163

- Suitable EWM Module
- High efficiency antenna
- Support 802.11R fast roaming under win10
- Professional Wireless team
EWM-W163M201E is the M.2 standard form factor WiFi/BT module solution. Easy to implement at new medical device Ultrasound system integration. WW module level RF certification did help medical devices to save total cost and develop schedule at the system level. 802.11 ac 2*2 also apply reliable wireless connection at field application.

EWM-W163M201E:
- Wireless Design Service
- Wireless driver integration
- Longevity Support
5G Technology

**4G**
- **Business**: 2C 2B, Data/Voice
- **Frequency**: Focus <3G, Max. bandwidth 20MHz
- **Architecture**: Flat or Fix for each layer. Mainly 2TR or 4TR AAU
- **Performance**: ~10ms latency, Peak ~1Gbps, 0.1M connections/km², Speed: 350Km/hr
- **Terminal**: Smart Phone, CPE

**5G**
- **Business**: New business model: network slicing, uRLLC
- **Frequency**: Freq. 3~6GHz, mmWave, Larger bandwidth 100MHz
- **Architecture**: Distributed or Centralized Massive MIMO (64/32TR)
- **Performance**: ~1ms latency, Peak~ 10Gbps, 1M connections/km², Speed: 500km/hr
- **Terminal**: Smart Phone, CPE, Various IoT devices
EWM-C500 Cellular 5G Module for Edge Computing
M.2 5G Modem

Target Applications:
- Transportation
- Smart Factory
- Retail
- Medical & Healthcare
- Smart City

- New 30mm x 52mm M.2 Key-B PCI-e bus
- 2.4Gbps DL at 4*4 MIMO 256QAM
- 450Mbps UL
- Support FDD LTE/TDD LTE bands
- 5G/NR mmW:DL~6Gbps UL ~2.5Gbps

Sample Q2'2020
WISE-LoRa LPWAN Solution

Data collision-free with TDMA System
Smart Construction Management SRP

Purpose

- Temperature monitoring to make sure the construction cement hydration quality.
Bridge Safety Monitoring SRP

**Purpose**
- Environment Temperature & Noise & ToF Offset for monitoring facility’s safety

**WISE-3610**
IoT Private LoRa Gateway

- WISE-1510
- Mic Sensor
- Temperature Sensor
- ToF Sensor
Aquaculture Fishing Feeding System SRP

Purpose
- Water Quality & Hydrophone Monitoring and fish feeder remotely control
EPD Solution Market Focus

Smart Factory Logistics
- EPD-023M/EPD-023
  - 2.9" ePaper Display
  - ARM® Cortex®-M3 MCU
  - Rich I/O Control w/ 3 Buttons & LEDs

Smart Hospitals
- EPD-090M/092M, EPD-130M/132M
  - 9.7" & 13.3" ePaper Display
  - ARM® Cortex®-M4 MCU
  - Rich Control I/O: Expansion Pin Header & I2C

Smart Building Management
- EPD-053M/EPD-053
  - 5.5" ePaper Display
  - ARM® Cortex®-M3 MCU
  - Rich I/O Control w/ 1 Button & LED

Smart Transportation
- EPD-322M/327M, EPD-422M/427M
  - 3.1" & 4.3" ePaper Display
  - ARM® Cortex®-A8 CPU
  - 4096 Color, 1280 x 720 Pixels
  - 16 Gray Level, 2560 x 1440 & 2160 x 2880 Pixels
EPD Solution Architecture

**Vertical Market**
- Smart City Solutions
  - Retail
  - Hospital
  - Building
  - Fleet
  - Transportation
  - Parking
- Industry 4.0 Solutions
  - Factory
  - Robotics
  - Warehouse
- IIoT Solutions
  - Environment
  - Agriculture
  - Oil & Gas

**ePaper Device Management Software**
- ePaperManager
- RESTful API
  - Device Management
  - Service Management
  - Account Management
  - Image Generator

**ePaper Device Management Gateway**
- WISE-3610Z / WISE-3610W
- WISE-3240

**EPD Series Display Module**
- 2.9"
- 5.65"
- 9.7"/13.3"
- 32"/42"
Smart Building Application
Smart Bus Stop (EWM+EPD)

**Smart Bus Stop (EWM+EPD)**

- **EWM-C117 4G LTE Module**
- **EWM-C148 4G LTE Module**

**Benefits**
- Easy installation without extra cables
- Sunlight readability with better viewing angles
- Ultra low power for green energy and environment
- No power needed for emergency alerts

**Display Modules**
- EPD-322M/327M, EPD-422M/427M
Wireless Innovation for Connected Smart City

WISE-1510
WISE-3610
WISE-DB1505
WISE-DB1503
WISE-PaaS/ DeviceOn

EWM-C148
EWM-W195
EWM-W163

EPD-023
EPD-053
EPD-092
EPD-132
Co-Creating the Future of the IoT World