Pegatron 5G Private Network Solution - Digital Resilience

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Pegatron Private 5G Network Solution Brief

Pegatron private 5G network solution contains 5G-SA O-RAN based gNodeB plus 5G core system. Pegatron’s 5G solutions are cloud-native platforms running on Intel® FlexRAN™ technology to provide the maximum computing power in a highly reliable mobile private network system. Deploying Network Function Virtualization Infrastructure (NFVI) in O-RAN based cloud provides enhanced high availability and further provides flexible, fast, and customizable services. The backhaul external network can be connected to leased lines by ISPs or orbital satellites for internet connection so it’s quick and easily to setup a 5G private network to provide on demand broadband network anywhere, based on your use case for Digital Resilience applications. Applications can cover digital transformation for smart factories, public transportation, public safety, IT systems, corporate data security, etc.

**Features**

- **Band Support**: FR1: n78, n79, N48 [2023Q1]
- **Modulation**: 256QAM (DL), 64QAM (UL)
- **Ant. MIMO**: 4T4R, DL 4 Layers, UL 2 Layers
- **Profile**:
  - DL Centric 7:3, 4:1
  - UL Centric 2:3
- **GPS Grand Master**:
  - 1588v2 PTP protocol support
  - PTP to sync-E and sync-E to PTP conversion
- **OAM**:
  1. System Configuration
  2. UE management with list usage & QoS profile
  3. Network slicing management
  4. Northbound interface for higher level management
- **5G Core (Optional)**:
  - Option 1: Druid Raemis 5GC™
  - Option 2: Saviah 5GC

**Radio Unit (RU)**

- **HW**: PR1400 Series 4T4R RU, Intel® Arria® 10 FPGA platform

**gNodeB Unit (DU, CU)**

- **HW**: PG5100 Series computing platform with Intel® Xeon® Scalable Gold processor, ACC100 FEC acceleration card
- **SW**: Pegatron 5G RAN w/ Pegatron RAN portal Intel® FlexRAN™ architecture.

**5G Core (Optional)**

- **HW**: PG5100 Series computing platform with Intel® Xeon® Scalable Gold processor, same hardware unit with gNodeB.
- **SW**: Druid 5G Core or Saviah 5G Core.
Pegatron Private 5G Network Product

5G Portable

- **Standard**
  3GPP Rel.15, Protocol: O-RAN/3GPP
- **Radio Band**
  n78, n79, n48* (002301), Bandwidth up to 100MHz
- **Modulation**
  256QAM (DL), 64QAM (UL)
- **Ant. MIMO**
  4T4R, DL 4 Layers, UL 2 Layers

- **Profile**
  DL Centric 7:3, 4:1, UL Centric 2:3
- **GPS Grandmaster**
  1588v2 PTP protocol support, PTP to Sync-E & Sync-E to PTP conversion
- **OAM**
  System Configuration, UE management with list usage & QoS profile
- **Connectivity**
  Active UE from 32 users per cell, able to scale up to 128 users per cell and RU/Cell support up to 4 RUs

5G Premium

- **Standard**
  3GPP Rel.15, Protocol: O-RAN/3GPP
- **Radio Band**
  n78, n79, n48* (002301), Bandwidth up to 100MHz
- **Modulation**
  256QAM (DL), 64QAM (UL)
- **Ant. MIMO**
  4T4R, DL 4 Layers, UL 2 Layers

- **Profile**
  DL Centric 7:3, 4:1, UL Centric 2:3
- **GPS Grandmaster**
  1588v2 PTP protocol support, PTP to Sync-E & Sync-E to PTP conversion
- **OAM**
  System Configuration, UE management with list usage & QoS profile
- **Connectivity**
  Active UE from 32 users per cell up to 128 users per cell and RU/Cell support up to 4 RUs
- **Edge Computing**
  Optional RTX3080 or A40 GPU Card
  Support Kubernetes, 3rd party IoT Edge and Vision on Edge platforms

5G Portable Administrator

5G Premium Administrator

5G UE Max. 32

5G UE Max. 128
Benefits of Pegatron Private 5G Network Solution

- **Flexible**
  - Deploying Network Function Virtualization Infrastructure (NFVI) in O-RAN based cloud
  - Enhances high availability and further provide flexible, fast, and customizable services for various 5G applications.

- **Integrated**
  - Integrated 5G RAN and 5G Core into an All-in-One Intel x86 Server to deliver high-speed throughput and low latency communications for rapid deployment of advanced 5G applications which reduces deployment costs.
  - Provides northbound interface and customized API service for higher level system integration with customer’s management system and 5G application solutions.

- **Easy Setup**
  - Contains Pegatron RAN Portal webGUI management for system operations, administration, and maintenance.
  - Provide configurable profile to adjust uplink and downlink throughput for different 5G application deployment cases.

- **Portable**
  - 19” lightweight luggage suitcase that is easy to transport and deploy anywhere. (Model: Portable)
5G Digital Resilience User Case Value Chain

Challenge / Industry Pain-point

• Large-scale power, telecommunications, and sub-marine cable interruptions caused by devastating disasters or regional conflicts
• Firstline responders cannot communicate or report the status to the command center
• Traditional satellite phones can only provide voice communications, but not able to support video conversations, data transfer, real-time video transmissions, and multi-person instant meetings

Solution Description

• Integrate 5G ORAN base station and orbit satellite communications
• Emergency contact for devastating disasters and regional conflicts
• Non-interruption for IoT data link and disaster relief communications
• Disaster response for semiconductor global core supply chain in Taiwan
• Urgent message delivery for government and national security

Disaster Scene

Rescue Command Center

5G Private Network (Pegatron vRAN RU/DU/CU, 5G Core)

Pegatron Portable 5G Solution

Surveillance & Situation Streaming

Video Streaming & Call

MEC AI Server

GNSS Antenna

Base Station (O-DU+O-CU)

5G Core

5G Core

Antenna

AI Analytics

Data Transmission

Situation Monitor

Video Call

Situation Analytic & Detection

Video Streaming

Data Transmission

Third Party Application

Azure Stack Edge

Thermal Drone

5G Phone

5G MF1

5G IP Camera

Command & Control
Application Use Case of Pegatron Private 5G Network Solution

Smart Factory
In the control center, rapid deployment of lines are continuously made and updated using wireless 5G connectivity which standardizes test stations with edge computing on MEC servers.
On the factory floor, Autonomous Mobile Robots (AMR) move materials to limit human resources for repetitive tasks.
On production lines, Automated Optical Inspections (AOI) and Visual AI with continuous AI improvement on the Edge to improve accuracy. On the side, technicians use AR/VR to receive remote assistant to make repairs and discuss projects by remote collaboration anywhere.

Transportation
5G Private Network deployed in transportation uses DAS to extend 5G signals in tunnels and using Fast Fading technology for fast handover between the remote radio units.
This allows 4K IP cameras over 5G Private Network to provide high upload throughput for AI computing on edge computing servers to provide real time monitoring of physical conditions and the status of security controls in the transportation system.

Emergency
A highly reliable mobile orbital satellite 5G disaster relief network system. The mobile 5G base station uses orbital satellite communications as a backhaul network to connect to the Internet and to global data centers.

- Emergency communications for major disasters and regional conflicts
- Disaster response for global semiconductor supply chains
- Non-interruption for IOT data link and core disaster relief
- Urgent message delivery for government and national security
About PEGATRON Corporation

PEGATRON was founded on January 1, 2008. With abundant product development experience and vertically integrated manufacturing, we are committed to providing clients with innovative design, systematic production and manufacturing service in order to comprehensively and efficiently satisfy all of our customers’ needs. PEGATRON features a solid R&D team, friendly, fast service quality as well as a high degree of employee cohesion. Furthermore, we have combined EMS and ODM industries to become an emerging Design and Manufacturing Service (DMS) company. Consequently, we are able to offer industry-leading, state-of-the-art products and profitable business opportunities for our partners.

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Learn more
PEGATRON Private 5G Networks

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