Five Considerations When Choossing a Wireless Computer for Your IIoT Applications

Wireless connectivity is a key enabler in Industrial Internet of Things (IIoT) applications, escpacially in industries that rely on distributed data acquisition from end devices deployed in remote areas. IIoT gateway computers with built-in wireless capabilities are providing the computing power and connectivity options required to make this happen. We discuss fice key things to consider when choosing a wireless computer for your IIoT applications.

Technology	Distance (Max)	Transfer Speed (Max)	Data Roaming
Wi-Fi (IEEE 802.11ac 5 GHz)	50 M	450 Mbps (1 x 1) 1.3 Gbps (3 x 3)	Yes
LTE Cat 4 / 6	Dependent on the carrier	150 Mbps / 300 Mbps	Yes
LTE Cat 1	Dependent on the carrier	10 Mbps	Yes
LTE Cat M1	Dependent on the carrier	1 Mbps	Yes
NB-IoT	Dependent on the carrier	250 Kbps	No

Industrial computers with sufficient processing power and mulitple connectivity options can be ideal IIoT gateways for data collection and transmission. However, in industries that rely on distributed data acquisition in remote areas, such as energy, water and wastewater management, oil and gas and utilities, wired infrastructure is often lacking or impractical. Although wireless computers provide an ideal solution for these applications each scenario has diffferent requirements for communication distance, transfer speed, bandwidth, power consumption, costs and more. Chossing the best wireless computer for your application requries taking these factors and their inherent trade-offs into consideration.

Data Volume

The volume of data collected, processed and transferred and the frequency of transmission of
edge data to applications in a cloud should determine the computer that you choose. Multiple
connection interfaces that support high-bandwidth data transfers simlify data qcquisition and
speed up data transfer. Other important considerations are the costs of bandwidth to transfer data
and the sensitivity of the data

Network Infrastructure

Whether you choose to build your own network or use an existing one from a local carrier
depends on the initial setup fees, data rates required and total cost of ownership.New cellular
connectivity options such as LTE-M and NB-IoT are yet to be deployed in every country. So it is
crucial to check whit your carrier about their availability.

Power Consumption

Choose a solution that best fits your power bduget. For example, power-hungry Wi-Fi solutions
are not well-suited for applications that rely on solar power or batteries. Technologies such as low-
power wide-area network (LPWAN) and low-power devices, including computers, can drastically
reduce your energy costs and help meet your green-power targets

Roaming

Carefully consider whether your field devices need obile connectivity throughhout the application
site. For example, collecting data for vehicular applications in intelligent transportation systems
would require cellular connectivity with connection failover capability for seamless roaming of end
devices that are mounted on moving vehicles.

Connection Redundancy and Reliability

To ensure reliability and availability, you may need dual-SIM redundancy or more than one
wireless technology, such as Wi-Fi LTE failover. Furthermore, to provide reliable Wi-Fi or LTE
connectivity in outdoor or harsh environments, it´s important to choose a device that can work
reliably in a wide operating temperature rnge such as -40 to 75°C (-40 to 167°F).

A Comparison of the Wireless Technologies Driving IIoT Connectivity

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Case in Point -- Smart Metering

An electric utility company requested a smart metering solution to acccurately measure and bill electricity consumption for households in a medium.sized city. Due to the small data volume and low transmission frequency (about once per day), the company wanted a low-power wide-area network (LPWAN) solution instead of using a long-range (LoRa) or other unlicensed technology that would +require the company to set up its own wireless nfrastructure.

Since the local mobile carrier did not support an NB-IoT service yet, an industrial IoT gateway, the UC-2116 which comes with built-in LTE Cat M1 communication capability was installed, Besides providing both NB-IoT and LTE Cat M1 communication over LPWAN the UC-2116 also supports configuration modifications if the local carrier decides to support NB-IoT down the road, thereby reducing future costs. Furthermore, the IIoT gateway also supports a wide operating temperature range of -40 to 75°C (-40 to 167°F), making it an ideal choice for use in smart meters that are deployed outdoors.

Intelligent Connectivity Solutions Taking IIoT to the Next Level

Moxa´s easy-to-use reliable and intelligent connectivity solutions are connecting millions off edge devices to a wide variety of IIoT
applications to effortlessly bring data from the edge to the cloud.