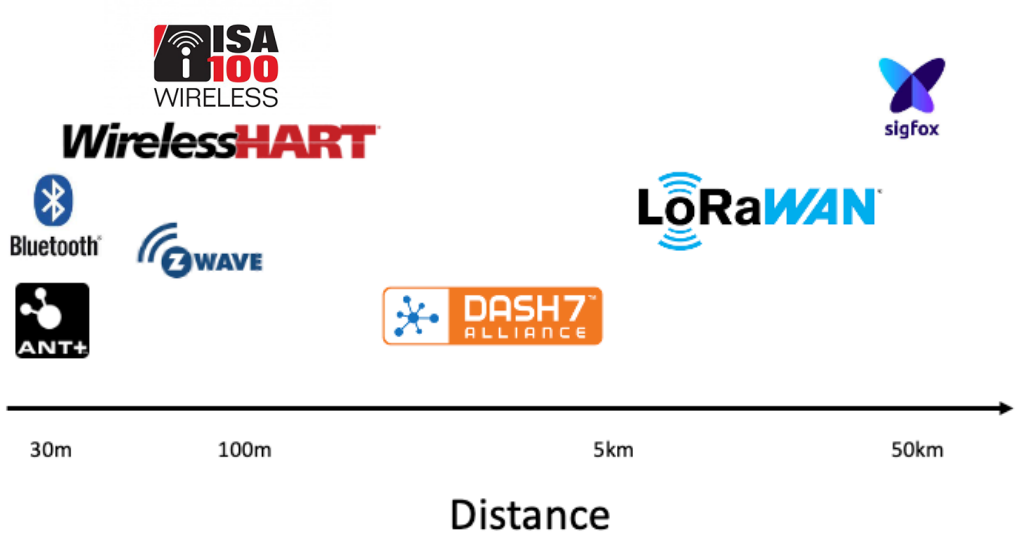
Aloxy Q&A, Dual Modality

Aloxy uses different protocols such as **LoRaWAN** and **DASH7**. There is no silver bullet technology therefor depending on the application and site specifics we suggest using different protocols or both protocols simultaneously. **LoRaWAN** and **DASH7** are different, however complimentary to offer a reliable IIoT solution.

Why use a LPWAN network?
Long range communication protocols like LPWAN (Low-Power Wide-Area Network) are used to capture more datapoints by deploying a large number of connected devices and focus on scalability, long range and low cost. Due to the lower frequency (and data rate), LPWAN has a much longer range than typical local short-range network solutions like WirelessHART or ISA100.



What is the main difference between LoRaWAN and DASH7?
Distance:
LPWAN allows for long range data transmission. The higher the spreading factor (in LoRaWAN) or the lower the data rate (DASH7), the longer the range. Due to a typical higher data rate of DASH7 the maximum range is shorter than LoRaWAN. Therefor DASH7 requires a higher number of gateways.

Reliability:
For some applications Reliability is important, i.e., how certain can you be that a message is received by the gateway. The amount of traffic has an impact on the number of network collisions causing messages to get corrupted when multiple devices transmit at the same time. One way to increase reliability is to request an acknowledgement (ACK) that the message was received, however it is important to take scalability and therefor the number of sensors, messages and gateways into account. A LoRaWAN network is more limited in scalability than DASH7 due to regulations and longer airtime of the packages which impact the available receive time of the gateways.

Maximum network Latency
LoRaWAN has a duty cycle limitation (in Europe) that could cause a latency up to a few minutes in case of collisions. DASH7 uses a listen-before-talk and adaptive – frequency – agility that reduces the chance of collisions resulting in a maximum latency up to a few seconds.

Scalability
The data transfer for DASH7 is higher than in LoRaWAN, as a result there is a higher throughput and message frequency. This reduces the number of collisions and makes DASH7 networks better scalable. It also allows DASH7 networks to facilitate over-the-air updates of the devices which are not possible in a LoRaWAN network.

Energy consumption
Because of the faster data rates, the energy consumption is lower in DASH7 than in LoRaWAN, as a result the battery will have a longer lifetime.

Downlink traffic
DASH7 allows for real-time downlink traffic, i.e., sending a message from the gateway to the device, which can be used in certain applications to identify the sensor in the field or perform a real-time action on the sensor. This is not possible in a LoRaWAN network using a Class A Device.

What is dual modality?
Aloxy developed a DASH7 communication module that can be fitted in a MultiTech LoRaWAN gateway allowing the gateway to communicate both protocols. It can be used in different ways to ultimately create the best network conditions taking scalability, and reliability in consideration.
Firstly, third-party sensors on LoRaWAN or DASH7 can be easily connected and be part of one ecosystem with only one IIoT platform.
Additionally, sensors that are located far from the gateway (up to 1 to 2 km) can communicate on LoRaWAN while sensors nearby (up to 200 to 300 meters) can communicate on DASH7.

For different applications, a different protocol can be selected that optimizes the application. For valve monitoring for example, where latency is important, DASH7 would be preferred. When trends in temperature are monitored LoRaWAN is best to cover a wide area with limited gateways.
Sensors that need firmware updates can be connected to DASH7 to perform updates over - the-air.
When the communication needs to be more symmetric (uplink and downlink) DASH7 would be preferred and when only uplinks are required LoRaWAN.

As mentioned only one IIoT platform is required, the Aloxy IIoT hub allows for different network adapters to be connected to collect data from different network protocols.