Designing a Wireless Network

Steps / Considerations / Do's & Don'ts

Patrick Ho[1]*

[1]Eaton, 74 – 1833 Coast Meridian Road, Port Coquitlam, BC Canada V3C 6G5
(*Email: PatrickHo@Eaton.com and Phone: 604-944-9247 ext. 401)

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ABSTRACT

The demand on utilities is increasing and with the use of wireless telemetry, a faster response time and a lower cost of maintenance for these networks is a key consideration in making these projects come to life.

This presentation will provide a step-by-step approach on how to design a wireless network for water / wastewater management applications. We will walk through the Wireless network design process, design steps, radio selection criteria, pros & cons, do's & don'ts, and implementation using real-world water/wastewater examples that follow the design process from requirements to specifications.

Starting with an understanding of the basic radio concepts, important design considerations (frequency band, data rate, range) and decisions will be discussed for different requirements (protocol, security, throughput, etc.) and typical scenarios.

The characteristics of available radio products such as serial data wireless modems, industrial wireless Ethernet radios, industrial wireless I/O radios, cellular modems, Ethernet switches (unmanaged & managed), network management software, etc. will be compared.

Drilling right down to the individual components, questions answered will include details like what is a modulator and what makes a good one? We will review RF (Radio Frequency) designs and modulation schemes - what are the latest advances and where are we seeing them employed? Which ones are best for high-speed data such as video links and which are best for lower speed data like pump controls? Error correction schemes and signal to noise ratios will be discussed. With this foundation, we will next discuss the various frequencies available and the pros and cons of each - including usage, ranges and throughput.

ABOUT THE AUTHOR

Patrick Ho *is Director, System Solutions for the Wireless solutions of Eaton. He has over 25 years of experience in program management and wireless / wireline communications working in Engineering, Project Management, Product Management and Sales. Prior to joining Eaton, Patrick worked for various hi-tech companies in the*

communications, aerospace, and printing industries, where he held a series of assignments in Engineering, Operations, and Project Management. He holds a BSc degree from University of Saskatchewan, Electrical Engineering, and an MBA degree from the Chinese University of Hong Kong. Patrick is responsible for delivering innovative communication solutions to Eaton's customers, with a special focus in the water / wastewater market. Contact: PatrickHo@Eaton.com.