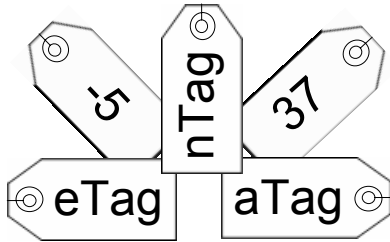


vTagNet Guide

AeroMate™ WSC
(Wire Sensors and Controls)



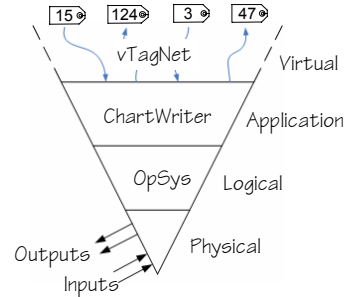
Virtual wire tag technology.

Collaborative device control.
Simple and easy to use.

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What is vTagNet technology?

vTagNet technology is a simple, but powerful construct for passing logical and numeric data between systems and devices connected through a common network or communication path. vTagNet adds Open Connectivity to smart devices via a virtual "Input/Output" layer and extends device functionality without requiring additional hardware.



vTagNet emulates a wired patch panel where each virtual wire carrying a logic signal or numeric data are assigned a numbered tag. Wire terminations are patched to the same or other remote devices by assigning the virtual tag numbers to outputs, application variables or other action related tasks.

Event Tags

Event tags (eTag) are the messengers that carry logical event information. Events can be hardware related such as a switch closure or a valve transition, or a logic state such as an alarm or a set point trigger. Since eTags source event information, they are referred to as "emitter" tags. eTags can range in value from 1 to 127.

Numeric Tags

Numeric tags (nTag) carry numeric information such as an analog voltage. nTags are distinguished from eTags by their negative tag numbers. Each nTag carries a 2-byte number representing the 15-bit normalized value of the numeric information being transported. Since nTags source numeric information, they are referred to as "emitter" tags. nTags can range in value from -16 to -1.

Action Tags

Action tags (aTag) use the information carried by eTags and nTags and are referred to as "consumer" tags. aTags are associated with software, hardware or logic related actions. aTags are passive and wait for their corresponding emitted eTag or nTag to initiate an action, task or a process. aTags can range in value from -16 to 127.

Tag Management

Simply stated, tags are autonomous information snippets emitted into any available communication path without regard to whether tag consumers utilize the information or not. As such, there is no requirement for tag management other than having a means by which a consumer tag can identify whether its matching emitter tag is active and take the appropriate action.

When a Zigbee or 802.14.5 Personal Area Network (PAN) provides the communication path between devices, End Devices associated with the PAN sleep to conserve power then wake up to emit their active tags and exchange other information with a PAN Coordinator. The PAN Coordinator is awake all the time and is responsible for collecting emitted tags and re-broadcasting them to all the End Devices whenever they wake up and report in to the PAN Coordinator.

Using a wired junction box and patch panel analogy, the PAN Coordinator is the junction box collecting all tagged wires and dynamically routes them to all End Devices. Each End Device patches through only those tagged wires that match its tagged output controls, leaving all other tagged wires unterminated. Thus, End Devices can originate and terminate tagged wire connections to be shared with all other End Devices connected through the same network.

Collaboration

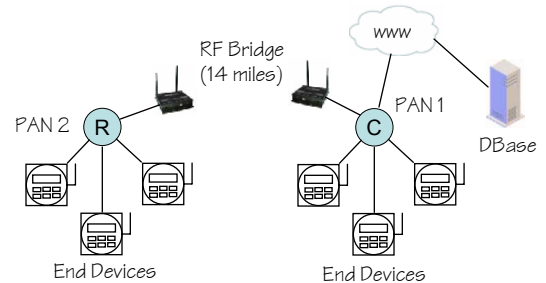
One of the most powerful benefits of vTagNet technology is that any vTagNet compatible device, connected through a common communication path, can emit its analog and logic inputs to be shared with any other device. Likewise, any vTagNet compatible device, connected through a common communication path, may utilize any or all emitted tags as additional analog and logic inputs. Through this simple method of analog and logic input sharing, any single device may acquire the functionality of all other vTagNet compatible devices connected through a common communication path.

Collaboration is achieved through each individual device determining which of the available emitted analog and logic tags it will use or consume to perform its appointed task and which of its own analog or logic tags it will emit and share with other devices.

vTagNet technology provides a collaborative, event driven system where each independent, discrete device interacts with all other devices to perform as a single functional unit. The range of functions the overall system can perform is only limited by the number and type of individual, discrete devices within the system. The specific function or functions the system performs is determined by individual device tag assignments.

Beyond The PAN

A Personal Area Network (PAN) is just one of the many ways to establish a common communication path for tag delivery. The PAN Coordinator may also be connected to a cellular gateway for direct access to the internet via the World Wide Web (www) and from here to a database center or PC computer. Tag groups are contained in structured WHIP packets that may be encapsulated or wrapped in TCP/IP or UDP packets for transport over the internet. Each WHIP packet is has a unique source identification and packet checksum.



For medium range extension of tag delivery, a PAN router may be used to share tags between devices up to 14 miles distant. As shown above, an RF bridge can provide a seamless and transparent connection between a local PAN and a remote Router connected to other End Devices.

A Closer Look

vTagNet technology is implemented in the AeroMate WSC products using a 48-byte data packet to store and transport tag information. The first 16-bytes of the data packet contain eTag data and the last 32-bytes contain nTags values.

Individual eTags are represented by their bit positions within a 16-byte (128-bit) word, providing a snapshot of the active status for all 127 eTags.

Individual nTags use 2-byte (16-bit) words to transport the nTag value. The 2-byte's left most bit is used to indicate the nTag's active status. The remaining 15 bits are the actual nTag's normalized analog value. The nTag number is represented by its 2-byte word position in the 32-byte group of 16 nTags.

The entire 48-bytes of tag data are transported within a WHIP packet. The WHIP packet structure provides the originating device identification, tag data type and a packet checksum for communications reliability. The WHIP packet may then be encapsulated in any other communication protocol packet with full accountability of the tag data's originating source.

Open Source Project

The vTagNet technology is a significant advancement in the ability of simple, independent devices to collaborate and perform complex control tasks through tag sharing. To further the development of this technology and advance its application across product boundaries, OKC Products, Inc. is sponsoring an Open Source project and inviting industry engineers and programmers to join and contribute to the project. vTagNet technology is in its infancy but holds the promise of offering a more straight forward and simpler approach to "open connectivity" for industrial controls than is offered by commonly used OPC and SCADA protocols.

SourceForge.net <http://sourceforge.net/> is the worlds largest Open Source software development web site. SourceForge.net provides free hosting to Open Source software development projects with a centralized resource for managing projects, issues, communications, and code.

The OKC products, Inc. sponsored vTagNet project is accessed via <http://sourceforge.net/projects/vtagnet>. From this link all available documentation, discussion, news and other items may be accessed for viewing or and interaction. To join the project team, send an email request through the Open Source project system for review and approval. New team members will be issued a user name and password.