

CenSys System Technical Overview

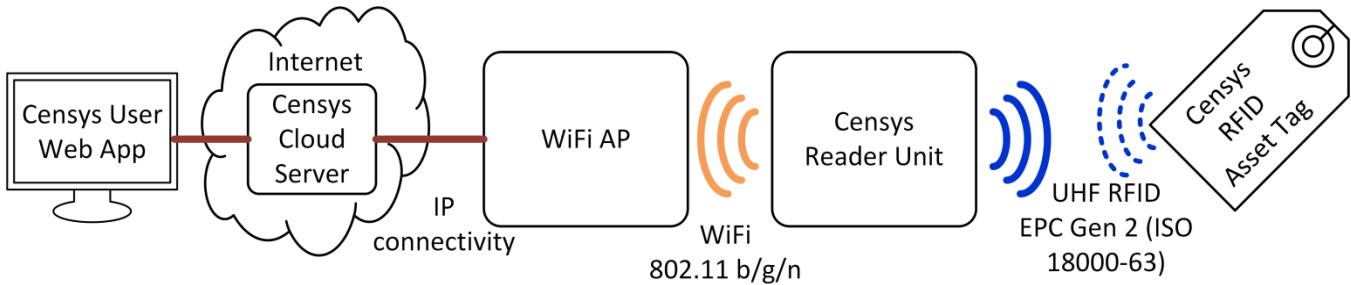
What Is CenSys?

CenSys is a system for asset tracking and monitoring. It is optimized for cost, simplicity, and ease of installation. The hardware and software use common standards based technology to deliver a cloud hosted IoT style asset tracking solution. The system is comprised of four components: RFID tags, the CenSys reader hardware unit, the cloud hosted application server, and the user interface presented on a web browser or smart phone application.



How Does CenSys Work?

The CenSys reader senses the presence and identity of passive UHF RFID tags within its field of view. When a tag enters or leaves the field of view the CenSys reader notifies the application server using a light weight messaging protocol. The CenSys reader connects to the server via the user's existing WiFi access points and internet connection. The server implements the business logic to extract and present meaningful information to the end users via a web app in a browser or smart phone.



How Do I Connect a CenSys Reader to my Network?

The CenSys reader ships in configuration mode. When the unit boots up in this mode it will present itself as an open WiFi access point. The installer connects a WiFi enabled device to the CenSys reader access point and opens the default gateway address in a browser, similar to configuring a home router. The installer then enters the local network's WiFi credentials and application server address into a web page form. Upon rebooting, if the unit is able to connect to the application server it saves these credentials, otherwise it reverts to configuration mode.

How Do I Power CenSys?

The CenSys reader has a number of power options. The units may be ordered as 5V or 12-24V compatible units. The 5V unit is intended to be powered by the supplied AC adapter connected into the unit's internal USB port. The 24V unit ships without a power supply and is intended for situations where AC power is not nearby, high density installs, or to wire in wall. Either the 5V or 24V unit may make use of the terminal block to wire to bare leads. POE power extractor adapters can be used to power CenSys readers from an existing POE system as well.

What is the WiFi Range and Performance?

The WiFi range is comparable to a laptop or smart phone. A facility setup to provide WiFi for user's mobile devices will likely have sufficient coverage. The latency from RFID tag read to server is typically less than two seconds.

What is the RFID Range and Performance?

The RFID range is dependent on a number of factors. The most important being the tag and its placement on the asset. In general a range of 10-20 feet is expected with typical asset tags. Range increases with tag size and some larger tags can exceed 20 feet. The location and environment in which the reader is installed can also impact the range. Please contact Brady for guidance on tag selection and reader placement.

The reader can be expanded use up to four external antennas to increase the RFID read area and read rate success. This results in lower cost and better performance rather than adding additional readers to the same area.

How Much Bandwidth Does it Consume?

The CenSys reader has been optimized to have a small network foot print. It only notifies the server when tagged assets are moving and the messages themselves are very small. A single tag moving past a reader generates total of 362 bytes. For example, a system with 100 readers and 1000 assets where each asset moves between readers every 60 seconds would generate a total of 47kb/s. This is comparable to the bandwidth of a single low fidelity audio stream.

What Data Does the Reader Send over the Internet

The CenSys reader sends the tag's unique EPC ID and its own unique reader ID every time it messages the server. The reader has no internal association between the tag's ID and the asset to which it is attached. Nor does the reader have any internal data indicating its location. The reader never transmits any information that could identify a patient. Readers do not communicate directly with each other.

Is it Secure?

The recommended supported WiFi security mode is WPA2 which is secured using strong encryption and out-of-channel authentication by use of a pre-shared key (PSK). End-to-end encryption and mutual authentication is enabled by a TLS v1.2 transport layer. The units are provisioned with unique RSA certificates in production to authenticate them to the cloud server. Integrators may request a server certificate for their own servers. The unit itself has a custom embedded operating system so it will not fall victim to broad known exploits. The reader unit supports over-the-air software updates pushed from the cloud server to patch security issues.