

EnSURE[®] Touch
SureTrend[®]
Architecture and Implementation Overview
Introduction for IT Professionals

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Introduction

This document will help IT professionals understand how to deploy the EnSURE® Touch instrument in your environment, and what to consider when using SureTrend®.

Assumptions

This document assumes the reader has an understanding of Wi-Fi, networks, IoT devices, and browser applications. The reader should also understand the basic function of EnSURE Touch Environmental Monitoring System. Hygiena.com contains videos that demonstrate many of the basic functions.

Overview

For a general overview of the product and updated information, please refer to <https://www.hygiena.com/ET>

Architecture

There are 4 components to Hygiena's EnSURE Touch Environmental Monitoring System:

1. Disposable test devices.
2. EnSURE Touch handheld luminometer, also referred to as the instrument.
3. SureTrend service used by the EnSURE Touch to Sync data.
4. SureTrend Web App, the browser-based user interface of SureTrend.



Hygiena manufactures many different disposable test devices used to collect samples from surfaces, products, liquids, etc. The chemistry in these devices is then activated and the device is placed in the EnSURE Touch instrument to be analyzed.



EnSURE Touch is a mobile handheld luminometer (instrument). Like a cellphone or small tablet today, it has a 5" capacitive touch screen, local storage, and supports Wi-Fi connectivity. These features allow EnSURE Touch to function autonomously.



While EnSURE Touch can operate offline and independently, it can also connect to SureTrend services. The SureTrend service provides valuable features such as backing up data in case an EnSURE Touch device is lost or damaged, managing program information across multiple instruments in your account, monitoring test results, and performing comprehensive data analysis. If you have multiple EnSURE Touch instruments at various locations worldwide, you can monitor and compare your testing procedures in real-time. Nevertheless, when Wi-Fi is unavailable, the EnSURE Touch still stores data locally on the device (autonomously); it will sync this data with SureTrend once the network becomes available ('store and forward').



The SureTrend web app is a browser-based application that allows the customer to invite their users, describe their sites, register and program their EnSURE Touch instruments, collect program information and test results from EnSURE Touch instruments, and analyze and report on the collected results.

Azure App Services

This solution leverages the Microsoft Azure App Services platform. Below are the key components and the services they use.

Firmware Embedded
Application



Azure App Services Web APIs
ct-api.hygiena.com

Azure App Services
Accessible from Public Internet

Azure App Services Web App
suretrend.hygiena.com

EnSURE Touch

EnSURE Touch uses Azure Web services to sync data with SureTrend. EnSURE Touch must be connected to the internet and registered with a SureTrend account to sync its data with SureTrend. Most users connect EnSURE Touch via Wi-Fi. This allows the data stored on the EnSURE Touch to be synced with SureTrend ('store and forward').

EnSURE Touch uses an embedded firmware OS, application, and tools. It has a rich touch user interface that works like your cellphone or tablet. With the 5-inch capacitive multipoint touch screen, customers can use most of the touch gestures they are familiar with on their smartphones, such as swiping, scrolling, and a full keyboard.

EnSURE Touch can be configured and programmed directly on the instrument, and it has onboard memory to store millions of test results. EnSURE Touch can be used without SureTrend; however, SureTrend offers additional benefits.

► EnSURE Touch Hardware

EnSURE Touch is a low power, handheld luminometer with an embedded firmware tablet for the user interface. It has local storage for instrument programming and to collect test results. It has Wi-Fi to connect EnSURE Touch to the internet to work with SureTrend. There are other sensors to help the user operate the instrument correctly such as device detection to make sure the user inserts the device, accelerometer to make sure the instrument is in the correct position when running the test, and lid sensor to make sure the lid is closed during the test.

EnSURE Touch is powered by a 2900mAh rechargeable lithium-ion battery, and the instrument can run off of USB power without a charged battery, or without a battery installed at all.

► EnSURE Touch Users

Security can be enabled on EnSURE Touch. Users will be presented with a login screen to access the features of the instrument. A list of assigned Users to the instrument will be on the login screen. The User can select their Username and supply their 4-digit pin to login. Users are assigned roles on the instrument to control access to instrument functions and settings. There is a security lockout time if inactive. There are also password recovery features in case passwords are lost or forgotten. It is important to remember that EnSURE Touch Users need a separate login to access SureTrend. All these features allow the EnSURE Touch to track and audit each user's operation activities. Furthermore, EnSURE Touch maintains a real-time clock and keeps it updated from the internet. It is almost impossible for a user to record a test at the wrong date and time.

► Instrument Registration

In order for EnSURE Touch to communicate with SureTrend it must be registered with a SureTrend account. There are instructions on SureTrend for registering an instrument, and there is a setup step in the first-time startup of EnSURE Touch to help register the instrument.

The EnSURE Touch must also be connected to a SureTrend account to capture Visual Inspection data; this allows a user to mark an obviously dirty testing location as 'not clean', helping maintain HACCP guidelines and not wasting swabs.

SureTrend

SureTrend Azure Web App is the user interface to SureTrend. The Web App is used to manage Users, User access, sites, instruments, instrument programming, test results, reports, and more.

► Accounts

While the SureTrend Web App and services are accessible from the public internet, customers create SureTrend accounts to manage their sites, Users, instruments, test results, etc. Only Users in your account can access your data, and only if they have permissions set by the Owner or Admin account.

Wi-Fi connection details for EnSURE Touch instruments can be managed through the SureTrend account. This allows control from the software and removes the need to share Wi-Fi credentials with the user. This is achieved by entering the Wi-Fi name and password for each access point in SureTrend and configuring the EnSURE Touch to connect automatically to Wi-Fi for syncing. Using SureTrend, you can also easily update your Wi-Fi settings, including cycling passwords, by updating the passwords in SureTrend, syncing them to the instruments, and then switching to your Wi-Fi access points. (Note: It is calling out the order of change. The EnSURE Touch will not be able to connect once it syncs down the new password, but it can work offline. Once the new passwords are set on the access points, the EnSURE Touch will connect).

► Sites

Sites are used to partition a SureTrend account. Users can have access to 0 or more sites. Instruments and programming are assigned to a site. The site is usually thought of as a physical location (e.g., a facility). This allows sites to function without access or clutter of data from other sites. Instruments assigned to the same site will have the same programming so they can be backups of each other in case of instrument failure and can be used as needed at that site.

You can exclude programming from an instrument, if desired, so you can have custom instruments in a site. You can reassign an instrument to another site, however the programming for the currently assigned site will be erased from the instrument and replaced with the newly assigned site.

You can also aggregate data across sites for total origination data analysis and site to site comparison, with consistent programming site to site. You can sync data to the local computers. However, you will need to differentiate the data and since it is hosted in the cloud, you need to connect and define each facility and site, so you can aggregate the data as needed.

► SureTrend Users

SureTrend Users have access to SureTrend. When you create a SureTrend account the user creating the account is the Owner. SureTrend uses email to validate user accounts so it is important to make sure the email address is correct, and emails can be received from @hygiena.com domain.

The Owner can invite Users to join their SureTrend account. Invitations are sent via email. Users can have access to 0 or more sites. Users are assigned a role to control their access to features in SureTrend. It is important to remember that the login account information for SureTrend does not give you login access to the EnSURE® Touch instrument.

It is common to have an administrator of a site with multiple Users to manage the day to day testing at the site. Then you can have a User or Administrator have access to multiple sites for reports and data analysis.

SureTrend allows for central management of all EnSURE Touch instruments connected to the account. You have the ability to manage the instruments from one location and define what each instruments should measure. It also allows for setting proper naming conventions with central management - this includes the ability to create sites, register instruments for each site and define locations and plans to test. In addition, locations and plans can be marked as global to support identical testing at multiple sites that are the same ('cookie cutter' layout).

► Other Azure Services

It is worth noting that SureTrend uses other features of Azure for data storage, scaling, security monitoring, etc. These features are not visible to end users. The point is that data stored in SureTrend is secure, encrypted, and best practices of Azure Services are utilized.

Connecting EnSURE Touch

Most customers connect one or more EnSURE Touch instruments to a Wi-Fi Access Point or hotspot. The hotspot can be a mobile phone, Windows 10 computer, Mac or a device that supports Wi-Fi hotspots. EnSURE Touch also supports tethering to a Windows 10 computer using Windows Internet Connection sharing (ICS). The Windows 10 computer must have internet access. There is some Windows setup required.



SureTrend Data Risk Level

Each customer must assess the data risk for themselves. This section will describe the type of data collected, how it is stored, and how it is transmitted. From Hygiena's perspective, the data is benign. All data in the system can be obfuscated except for the email address. Hygiena does not share or sell the data. The SureTrend data may be used to support EnSURE Touch and the use of the disposable test devices (e.g. UltraSnap™). Hygiena may use SureTrend data to improve the solution by adding features, improving performance, and fixing bugs.

► SureTrend Users

SureTrend logins require a valid email. It can be a public or corporate email. There is no email domain limitation. When a SureTrend User is created, an email is sent to validate the User. Other information collected on the account creation page is for general support information and is not verified. Users can be disabled.

► Instrument Programming

The instrument programming is specific to each customer's environment. Names assigned to Sites, Plans, Location, etc. are at the user's discretion. Many customers use coded names such as T1, T2, T3 for tables. Pass/Fail thresholds and typical RLU values depend on the type of testing. The test can be performed after cleaning or during production to show contamination rates. While Pass, Caution, and Fail values can show failures, the data is meaningless to anyone that does not understand the details of the programming.

EnSURE Touch Security

The EnSURE Touch instrument is a Smart IoT device. EnSURE Touch is a secure IoT device and the data is secure. (Hygiena has not found a way that the ET can be hacked and have not logged any reported cases). The only way to gain access to the EnSURE Touch is to unlock it. Only our support team can unlock the EnSURE Touch.

SureTrend Encryption

SureTrend data is stored in Azure SQL Server encrypted at rest. When sending data from SureTrend to the browser or the EnSURE Touch instrument, the data is sent using HTTPS using TLS 1.2.

SureTrend allows for SSO (Single Sign-On) user authentication. SSO can help in high turnover areas by preventing former employees from accessing accounts once their company account has been disabled (which is usually immediately after leaving the company).

SureTrend also has an API for integration with your Quality Management System (QMS). This can allow companies that are using a QMS for compiling test data to eliminate the manual entry of the EnSURE Touch RLU values into the QMS system. The API allows the automation of EnSURE Touch with the QMS; this integration can improve efficiencies and reduce user entry errors. You can build integration with SureTrend and send data from the QMS system by writing programming to connect to SureTrend and capture the ATP data and define test locations on the instrument. This is automated via wireless modules that eliminate human error - these are standard interactions between the QMS and SureTrend, allowing the software to talk to each other, allows building of locations and push it to the instrument (currently, only on SureTrend Premium and Power).

Communication Details, Ports and Protocols

When EnSURE Touch is registered with a SureTrend account it will sync with the SureTrend server when instructed to do so. EnSURE Touch must have an internet connection to reach SureTrend. At no time does SureTrend try to reach EnSURE Touch instrument unsolicited. However, when EnSURE Touch is instructed to sync with SureTrend it will use the following ports and protocols:

Network Ports, Protocols and IP Address - EnSURE Touch	
Port	443
Protocol	https
DNS name	et-api.hygiena.com
Static IP addresses	N/A

Network Ports, Protocols and IP Address - SureTrend	
Port	80
Protocol	https
URL	suretrend.hygiena.com
URL	www.recaptcha.net (This is only used on the account creation page)

Software Updates

EnSURE Touch updates its application software over the internet once accepted by EnSURE Touch user. If the instrument is connected to the internet, it will download the application software over https from et-api.hygiena.com (the instrument does not need to be registered with SureTrend to receive software updates). The application software size is about 5,000 KB.

Time Service

EnSURE Touch has an onboard real-time clock (RTC) to maintain the time on the instrument. There is also a super capacitor to maintain the RTC for 2 hours if the battery is removed or drained to 0. This helps maintain the RTC during battery swapping. The firmware will use Network Time Protocol (NTP) to keep the RTC current by default, and can be changed in EnSURE Touch by navigating to Settings>General>Date. This can be changed to use et-api.hygiena.com or not update the RTC.

Network Time Protocol (NTP)

Only used for Date & Time source

Port	123
Protocol	UDP
DNS name	pool.ntp.org

TeamViewer

EnSURE Touch comes with TeamViewer remote support client installed. It is not active unless the user navigates to the Settings > Support screen and requests remote support.

TeamViewer is installed and can be used for remote support.

<https://community.teamviewer.com/t5/Knowledge-Base/Which-ports-are-used-by-TeamViewer/ta-p/4139>

WiFi Module Information

Standard	Frequency Band
• IEEE802.11b, 802.11g, 802.11n	• 2.4000~2.4835GHz • (Industrial Scientific Medical Band)
Data Rate	Security
• 11b: 1/2/5.5/11Mbps • 11g: 6/9/12/24/36/48/54Mbps • 11n (20MHz): MCS0-7 (up to 72Mbps) • 11n (40MHz): MCS0-7 (up to 150Mbps)	• WEP 64/128, WPA, and WPA2 • IEEE802.1x (Windows System Only) • Software WPS configuration
Output Power	Humidity and Temperature
• 11b: 17 ± 1.5dbm • 11g: 15 ± 1.5dbm • 11n: 14 ± 1.5dbm	• Operating: 10~90% (Non-Condensing) Storage: Max. 95% (Non-Condensing) • Operating: 32~104°F (0~40°C) Storage: -4~140°F (-20~60°C)
Receive Sensitivity	Certifications
• 11n (20MHz) @MCS7: -68dBm±2dBm • 11n (40MHz) @MCS7: -64dBm±2dBm • 11g@54Mbps: -71dBm±2dBm • 11b@11Mbps: -81dBm±2dBm	• CE, FCC, Wi-Fi