

Calibration Station or Docking Station

Which one do you need for your gas detectors?

Introduction

The terms docking station and calibration station have come to embody a number of functions and purposes across various industries. While it may be fairly clear to someone with basic computer knowledge that a PC docking station will essentially turn his or her laptop into a desktop system with the keyboard, monitor, and printer already hooked up, or to a carpenter that a calibration station ensures quality control of essential measuring tools such as levels, squares and tape measures; in the gas detection industry, the terms are used interchangeably and the differences between the two are not always clear.

When referring to a calibration station or a docking station as they apply to gas detectors, the understanding is that both will perform basic maintenance functions that include bump testing and calibration. While these tests can also be performed manually, both the calibration station and the docking station provide additional features and benefits. The true difference lies in what a docking station can do above and beyond what a calibration station can do.

The reasons for bump testing and calibrating and the importance of proper gas detection instrument maintenance have been well documented, but in order to set the groundwork for the features and benefits of both the calibration station and docking station, let's just address them briefly. Consider the following:

Fact: People who work in environments where gas hazards are standard, run the risk of serious injury and death if not properly protected.

Fact: Gas detectors play an instrumental role in worker safety by providing early warnings and measuring gas exposure.

“OSHA investigations into worker deaths caused by oxygen deficiency or toxic gas almost always reveal a failure to install safety systems or utilize personal protective equipment and to follow the proper safety procedures – especially in confined spaces.”ⁱ

Fact: To provide accurate performance and results, gas detectors have to be properly used and maintained.



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The International Safety Equipment Association (ISEA) – a leading national organization of manufacturers of safety and health equipment – defines bump test as “a qualitative function check where a challenge gas is passed over the sensor(s) at a concentration and exposure time sufficient to activate all alarm indicators to present at least their lower alarm setting.” A calibration check is defined as “a quantitative test utilizing a known traceable concentration of test gas to demonstrate that the sensor(s) and alarms respond to the gas within the manufacturer’s acceptable limits.”

These two tests are fairly basic, yet critical in ensuring that a gas detector is able to perform its functions and keep the user safe. The ISEA recommends that “a bump test (function check) or calibration check of portable gas monitors be conducted before each day’s use in accordance with the manufacturer’s instructions. Any portable gas monitor which fails a bump test or calibration check must be adjusted by means of a full calibration procedure before further use, or removed from service.” A full calibration is defined as “the adjustment of the sensor(s) response to match the desired value compared to a known traceable concentration of test gas.”ⁱⁱⁱ

Manual Calibration and Bump Test

In some cases compliance with safety procedures can be achieved through manual bump tests and calibrations. Workers may be geographically dispersed with gas detection instruments scattered across a large geographic area, a situation that would require an unreasonable number of personal docking or calibration stations; a flat surface to accommodate calibration stations or docking stations and calibration gas, may not be available; and in instances where only a very small number of gas detectors are used and with low frequency, investing in another piece of equipment may not be feasible.

Yet there are obvious limitations to testing manually. The process of manually marking each instrument with the next due date, and manually keeping event logs, data records, and calibration gas status, is a process that is prone to human error and possible shortcuts. For larger gas detector fleets, manually bump testing and calibrating each unit is time consuming and uses more gas than automated testing. These limitations ultimately make it difficult to monitor whether an instrument is being properly tested or tested at all, and whether or not life-saving safety procedures are being followed, becomes a guessing game.

Calibration Station

The obvious distinction between manual maintenance and the use of either a calibration station or docking station is automation. It is the extent of automated features that is a big differentiator between these two pieces of equipment. Let’s first take a look at the calibration station.



“The most basic reason for calibrating an electrical instrument is to ensure that it is reading accurately.”^{iv} While the word calibrate has a clear meaning – defined by Merriam-Webster as “to adjust or mark (something, such as a measuring device) so that it can be used in an accurate and exact way” – there seems to be no definition for calibration station. Yet it makes perfect sense that a calibration station would be used to calibrate.

In gas detection, the truly automated functions of the calibration station are limited to bump testing, calibration checks or full calibrations, and charging or recharging of the instrument battery. While characteristics may vary slightly among manufacturers, a calibration station most commonly:

- Requires the manual push of a button to initiate testing.
- Requires manual data download to a USB device or directly to a PC equipped with a compatible software program, such as Excel.
- Provides a USB connection to connect to a PC or printer to download or print calibration and bump test reports.
- Requires manual check of calibration gas levels and expiration.

It is the portable standalone characteristic and simpler functionality of the calibration station that make it the preferred choice for many users.

Docking Station

So why complicate things with more functionality and automation? First, it is important to realize that although the calibration station is essentially a more

basic version of a docking station, both require that the user is well trained on their operation. With that said, safety regulations and demands on managers to properly maintain a gas detector fleet with easily accessible data logs and event records are becoming increasingly stringent. The docking station provides the same benefits as a calibration station, but takes it several steps further by fully addressing the increased global demands on safety.

One online definition of docking station is “a device in which a laptop computer, smartphone, or other mobile device may be placed for charging, providing access to a power supply and to peripheral devices or auxiliary features.” Again, for lack of a documented definition of gas-detector-specific docking station, consider the above definition industry- or instrument-neutral and let’s make it gas-detector-specific by focusing on the ‘access to peripheral devices or auxiliary features.’

Through networked communication, a docking station fully automates:

Bump Test and Calibration – Preset bump and calibration frequencies and instrument settings updates are automatically initiated when the instrument is docked. This ensures that instruments are tested and working accurately during use according to policy requirements, costs associated with performing regular manual calibration of gas monitoring instruments are reduced, and calibration is performed properly and at regular intervals.

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Battery Charging – Recognizes the battery type and charges as necessary.

Record Keeping – Automatically captures all data from the instrument when the detector is docked and stores it, keeping it available in compliance with documentation regulations. This includes calibration data, alarm events, employee exposures (capturing exposure levels), and unsafe behaviors such as ignoring or turning off a gas detector while in alarm or using it without calibrating.

Instrument Management – Allows parameters such as alarm and calibration gas settings to be uploaded to the instrument, eliminating manual instrument configuration changes.

Instrument Diagnostics – Provides information on sensor life, sensitivity to target gases or ambient conditions, date of last calibration, and next calibration due.

Equipped with supporting software and auxiliary features, a docking station is a complete instrument management system that significantly reduces the time associated with routine instrument maintenance, calibration, and record keeping. It provides easily accessible, objective and accurate records any time they may be required, which in turn helps avoid the possibility of fines for non-compliance. Most importantly, it provides peace of mind in knowing that gas detection instruments will keep workers safe.

Making a distinction between these two instrument maintenance devices has long been a bit of a challenge, yet in very basic terms, the difference can be summarized in the following way:

Calibration Station – **Calibrate** an instrument.

Docking Station – **Dock** an instrument. Once the instrument is docked, the actions to be performed are only limited by the features and functionality of the station.

The best solution really depends on the needs of the user.

CALIBRATION STATION	DOCKING STATION
	Automatic Instrument & Docking Station Software Upgrades
	Email Alerts & Notifications
	Optional Calibration Gas Replenishment
	Calibration Gas Monitoring
	Instrument Settings Management
Expired Calibration Gas Alert	Instrument Diagnostics
Standalone	Cloud-connected
Automated Battery Charging	Automated Battery Charging
Limited Automated Record Keeping	Automated Record Keeping
Automated Bump Test & Calibration	Automated Bump Test & Calibration

Now let's step away from the calibration station and docking station for just a moment and take a look at Android vs. Apple. While the differences between two smart phone operating systems are not directly comparable to the differences between a calibration station and a docking station, the reason for bringing this up will become clear in just a moment.

Opinions, articles, and statistics on Android vs. Apple are seemingly endless. Keeping in mind that technology is constantly changing and that this list may have changed since it was published, CNN recently presented 15 tasks as performed by iPhone and Android to show in which instances users rated one as having outperformed the other. In this particular case, iPhone took the win for ease of login, making a call

(particularly FaceTime), taking a photo (more specifically the camera), music and podcasts, checking email, setting to vibrate, and using the flashlight. Android took the lead for checking the time, keyboard (ease of typing), app organization, notifications, getting directions, and voice assistant; and they tied when it came to navigating contacts, and search functions. ^v

There are easily another 15 reasons or more why someone would choose one over the other and many may even disagree with the list above. Again, it comes down to user needs. Ideally there would be a smartphone that combines the best features of each device into one.

So, what if the features and benefits that address the requirements of calibration station users were combined with the features and benefits that address the requirements of docking station users into a single hardware platform?

What You Need, When You Need It

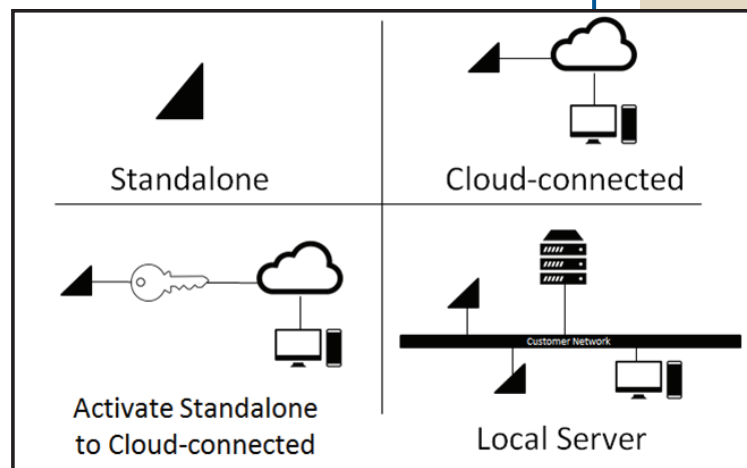
Needs that will simplify and improve safety measures are what drive the development of personal protective instruments and their accompanying devices across the industry. However, these needs differ based on size, location, and infrastructure of the customer site. With this in mind, consider the DSX™ Docking Station – a three-in-one hardware platform that easily transitions from standalone gas detector maintenance automation (standalone mode), to a feature-rich fleet management system accessible from any mobile browser or web-enabled PC, anywhere in the world (cloud-connected mode). In addition, it provides a local server mode option that addresses the needs of users who choose the docking

station functionality but prefer to maintain all information on their own server due to network connection or data storage restrictions.



- **DSX STANDALONE MODE**
A simple gas detector maintenance and record-keeping solution requiring no PC or network connection.
- **DSXi CLOUD-CONNECTED MODE**
Cloud-based record storage, fleet management, and automated maintenance and notification platform.
- **DSX-L LOCAL SERVER**
Server-based record storage, fleet management, and automated maintenance and custom data reporting.

With the use of an in-field enabled activation key the DSX Standalone will go from basic instrument charging, bump test, calibration, and record keeping functionality to cloud-based instrument fleet configuration, management, and data storage capabilities – all in a single piece of equipment.



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In all modes, the DSX provides easy bump testing and calibration of instruments, automated record keeping, auto detection of gas type used and expiration date upon connecting the cylinder to the docking station, and automatic instrument wake-up and instrument battery charging.



DSX Standalone

When ‘safety,’ ‘simple,’ and ‘standalone’ drive the reasons for choosing a docking station, the DSX in standalone mode is the ideal out-of-the-box solution. Key features include:

Simple setup with no assembly required

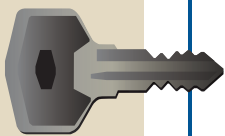
– use it out of the box with no network configuration or support required.

Optional automatic bump test or calibration upon docking the instrument

– ensures that bump tests or calibrations are initiated as needed, without the push of a button.

Direct USB data storage – eliminates worries about storage space or losing compliance data.

Automatic printing of calibration and bump test certificates with a direct connect printer – quickly provides hardcopy printouts for hot work and confined space entry.



With the use of a DSXi activation key, the standalone DSX becomes a cloud-activated fully automated instrument maintenance station. There is no need to send anything back for activation – all upgrades are easily performed in the field.



DSXi Cloud-connected

Cloud storage is becoming increasingly common

for a number of reasons. However, there continues to be a divide between advocates and those who prefer to keep critical and confidential information behind the corporate network firewall. The main concerns about storing data in the cloud are reliability and security. It is difficult to entrust information to someone else without a guarantee of access whenever needed, and reassurance that no one else will be able to get to it. Yet, “storing confidential or sensitive information in the cloud is often more secure than storing it locally.” With online storage services, data is encrypted through means of a complex algorithm, both during transmission and while at rest; authentication processes require the use of a username and password; and, multi-level authorization practices allow only specified personnel to access restricted information, ensuring no unauthorized users can access files. ^{vi vii}

Across the globe, the benefits of cloud-based services seem to outweigh any reliability or security concerns. Some of the largest service companies are making targeted efforts that leverage the cloud to deliver a variety of business-to-business services. In 2011, SAP bought SuccessFactors for \$3.4 billion, adding cloud-based personnel-management applications to its portfolio. In 2012 Oracle acquired Taleo, a cloud-based human resources application suite, to help build a name for itself in the cloud. And in 2012 SAP AG, the largest maker of enterprise-applications software, agreed to buy Ariba Inc. for \$4.3 billion in the German

company's second multi-billion dollar purchase in cloud computing. Bloomberg Business headlined the acquisition with "SAP to acquire Ariba for \$4.3 billion in push into cloud." ^{viii ix}

Cloud storage reduces the cost associated with owning supplementary data backup equipment and dedicated IT maintenance personnel; files are automatically backed up, rather than having to remember to do it consistently; information can be accessed from mobile devices, anywhere and anytime, without having to transfer files from one location to another; all syncing is automatic, ensuring that files are updated across all devices; and in case of catastrophic data loss, files can be recovered with zero downtime. ^{x xi}

In addition to the benefits listed above, the cloud-connected DSXi provides critical docking station capabilities, including:

Automated prescheduled bump test or calibration – bump test and calibration schedules can be tracked and set to be performed automatically when due. These can be scheduled to occur during non-peak hours, getting the instrument ready for use prior to the start of a shift.

Instrument settings management – company and application specific instrument parameters can be set up from any web-enabled device, anywhere in the world.

Email alerts and notifications – provides information on worker exposure and instrument usage, as well as instrument service needs.

Automatic instrument software upgrades – the docking station can automatically update instrument software upon docking, without having to be sent back and forth from service centers.

Calibration gas monitoring – automatic notification of calibration gas status eliminates the need to manually track cylinder gas levels and expiration dates, as well as the need to stock cylinders. This feature also provides an option to automatically replenish calibration gas through Industrial Scientific.

Custom data reporting – reports on instruments, users, and exposures can be configured and exported.

Simple setup – use is out of the box with no network configuration or support required.

DSX-L Local Server

The DSX in local server mode provides the option to automatically store data from all docking stations behind the local firewall, addressing network and data storage restrictions. While numerous benefits of backing up data in the cloud have been addressed, the storage location of proprietary information should ultimately be determined by company policy. In addition, the DSX-L provides



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a number of docking station benefits, including:

Automated prescheduled bump test or calibration – like the DSXi, bump tests and calibrations can be scheduled to be performed during non-peak hours, getting the instrument ready for use prior to the start of a shift.

Instrument setting management – company and application specific instrument parameters can be set up from within the company network.

Calibration gas status indicators – indicator lights ensure the awareness to order replacement gas before a cylinder is empty (the local server mode does not provide the ability to auto-replenish cylinders).

Whether in standalone, cloud-connected, or local server mode, the DSX addresses the need to comply with safety regulations and simplifies the equipment selection process by combining three options into a single platform.

Docking Station or Calibration Station?

When faced with the important decision of how to keep life-saving instruments working accurately every time they are used, the key is to be well informed. Manual maintenance, calibration stations, and docking stations

are all valid options, and each one has benefits and limitations, depending on company needs, size, location, and infrastructure. The bottom line when it comes to choosing gas detector maintenance equipment, is making the best informed decision that will ensure that safety regulations are being followed, and more importantly, that every worker returns home safely at the end of every shift.

For more information on the DSX Docking Station, please contact: 1-800-DETECTS (338-3287) or go to: www.indsci.com/dsx

ⁱ http://ehstoday.com/fire_emergencyresponse/ehs_imp_77598

ⁱⁱ <https://www.osha.gov/dts/shib/shib093013.html>

ⁱⁱⁱ ISEA Statement on Validation of Operation for Direct Reading Portable Gas Monitors, March 4, 2010 (https://www.safetysystem.com/userfiles/File/calibration_statement-2010-Mar4.pdf)

^{iv} <http://mastercalibrators.com.au/what-is-calibration/>

^v <http://money.cnn.com/interactive/technology/iphone-android-comparison/>

^{vi} <http://online-storage-service-review.toptenreviews.com/top-ten-advantages-of-using-online-storage-services.html>

^{vii} <http://computer.howstuffworks.com/cloud-computing/cloud-storage3.htm>

^{viii} <http://www.crn.com/slide-shows/cloud/240152878/the-top-10-enterprise-cloud-services-companies.htm>

^{ix} <http://www.bloomberg.com/news/articles/2012-05-22/sap-agrees-to-buy-ariba>

^x <http://online-storage-service-review.toptenreviews.com/top-ten-advantages-of-using-online-storage-services.html>

^{xi} <http://computer.howstuffworks.com/cloud-computing/cloud-storage3.htm>

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The DSX addresses the need to comply with safety regulations.

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