

Industrial Scientific
Sales Note
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Industrial Scientific Docking Station Functionality: A Full Perspective

Recognizing that gas detection devices are live-saving devices, and based upon years of experience in the field of instrument/docking station combinations, Industrial Scientific has developed a docking process that ensures complete system functionality and accuracy while also delivering strong productivity for docking station users.

Industrial Scientific instruments docking on the DSX, iNet DS, or DS2 docking platforms pass through four distinct processes in order to solve common problems and ensure a properly working system.

Process 1: Instrument Settings Verification

Before a calibration or bump test, Industrial Scientific instruments are verified at a firmware, hardware, and functionality level by the docking station. A typical list of attributes checked prior to bump test or calibration is included in *Appendix 1*. This verification simplifies user operation and validates critical functionality. For example:

- Life-critical attributes such as *alarm settings* and *TWA time base* are verified. This prevents a situation where a user has changed a setting in the instrument against what corporate settings of the device should be.
- *Firmware version* is read from the instrument and compared to a list of available versions. This allows instrument software versions to be updated in the field, adding feature enhancement without difficult logistics.
- *Assigned user* is tracked so that gas alarms are not only

associated to an instrument, but to an actual person. The iNet software, discussed later, allows alarms to be tracked by person, even if that person used a different instrument every day.

- Overall setting validation enables large fleets of instruments to be managed more easily by allowing managers to create settings groups that can be applied to instruments assigned to the group regardless of which docking station the instrument is docked on.
- It also allows careful tracking of which settings were made on which instruments at what time, by providing a complete chronological history of all settings on every instrument. This feature can be extremely useful when managing contractor or rental instruments.

If instrument settings are not as programmed in iNet Control at the administrator level, the unit is updated to the proper settings and a record is made of the change.

Process 2: Instrument Diagnostics

During this process, attributes such as backlight performance, speaker performance, alarm LED performance, and vibrating alarm performance are evaluated to make sure the unit is in the best working condition to alert the user to an alarm condition. Diagnostic data helps provide an early warning of a potential instrument failure. A complete list of diagnostics is included in *Appendix 2*.

Process 3: Bump Test and Calibration

During these processes, the instrument reacts to gas applied through the docking station.

While bump test and calibration processes can be initiated manually, Industrial Scientific docking stations perform the function prescribed for that instrument based on the needs of the

customer. A typical setting may be to “Bump test upon docking” while performing calibrations every 30th day. This feature eliminates a possible failure mode by automating how and when these processes are initiated.

Industrial Scientific enables the user to ensure that thorough bump tests verifying the functionality of the instrument are performed consistently. The pass/fail criteria of the bump test can be configured to determine the instrument’s *percentage of full concentration response* in a given *time* period, where the *percentage of full concentration* and *time* values are selectable above and below the default values respectively.

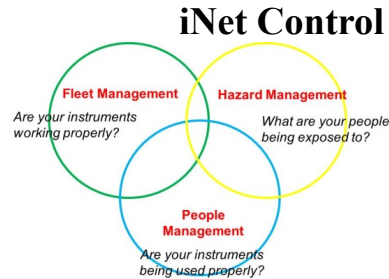
Industrial Scientific follows a procedure in calibration that calibrates each sensor in an individual manner, based on the full and stable sensor response, for the sole reason that we believe accuracy is of paramount importance in gas detection. Instruments reading too high will cause false alarms, and instruments reading too low are obviously a potential safety hazard.

Process 4: Data Retrieval, Reporting and Analysis

Docking station operations such as datalog and alarm event download should be programmed to optimize productivity around the user’s specific application. This may be different for a large bounded installation (like a refinery) compared to a dispersed field operations team.

Total cost of ownership of the gas monitoring system cannot be determined without taking into account time and effort spent on retrieving and analyzing the needed data. Although data analysis takes place after the docking process itself is completed, the time and effort taken to perform the work cannot be ignored. Data downloads on Industrial Scientific docking stations can be scheduled separately and on different intervals from bump and calibration schedules.

Industrial Scientific provides complete data management, securely accessible at any time, from any web enabled device, from anywhere in the world through the hosted iNet Control program.



iNet Control, with its functionality built around fleet management, user management and hazard management, is the portal into a hosted gas detector management system that tells you that your instruments are working properly, that your instruments are being used properly and what gas hazards your people are being exposed to. Data is provided in a dashboard format, and in the form of standard, customizable, scheduled and recurring automated reports. *Appendix 3* describes in more detail the functionality of the iNet Control software to deliver insight into a gas detection program.

Appendix 1: Typical list of attributes verified during instrument docking

- Serial Number
- Equipment Type and Equipment Sub-Type
- Part Number
- Software Version and Bootloader Version
- Hardware Version
- Setup Tech, Setup Date, Setup Version, Job Number
- Language
- Total Run Time
- Backlight Setting
- Backlight Timer
- Real Time Clock (date & time)
- Recording Interval
- TWA Time Base
- Bump Threshold
- Bump Timeout
- Bump Interval
- Calibration Interval
- Dock Interval
- OOM Warning Interval
- Custom PID Response Factors

Favorite PID Response Factors
 Accessory Pump Installed
 Users List
 Active User
 Sites List
 Active Site
 Company Name
 Company Message
 Origin Country
 Alarm Action Messages
 Active Site Displayed on Start-up
 Active User Displayed on Start-up
 Alarm Latching
 Alarms Muted
 Always On
 Audio Alarm Enabled
 Audio Alarm Enabled
 Vibrating Alarm Enabled
 Alarm Indicators
 Automatically Zero Sensors
 Bump Past Due Warning Enabled
 Bump Overdue Warning
 Calibration Overdue Warning
 Calibration Overdue – Notify and Continue
 Calibration Overdue – Turn Off Instrument
 Dock Overdue Warning
 Calibration Past Due Warning Enabled
 Can Bump in Field
 Can Calibrate in Field
 Can Change Gas Response
 Can Clear Peaks in Field
 Can Perform Quick Calibration
 Calibration Type
 Can Zero in Field
 Clock Display Mode
 Clock Displayed in 24 Hour Mode
 Clock Format – 12/24 Hour Format
 Company Name Displayed on Start-up
 Confidence Beep Enabled
 Confidence Flash Enabled
 Confidence Flash Enabled
 Confidence Indicator Enabled
 Confidence Vibrator Enabled
 Confidence Indicator Options
 Datalogging type
 Date, Time, Temp Displayed on Instrument
 Allow Shutdown While in Alarm
 Allow Alarms While Docked
 Gas Alerts Enabled
 Display Mode for Calibration/Dock
 Display Last Calibration Date
 Display Next Calibration Date
 Display Days Since Last Calibration
 Display Days Until Next Calibration
 Display Next Dock
 Calibration/Dock Days on Start-up Enabled
 Calibration/Dock Days Operation Screen Enabled
 Next/Last Calibration Date on Start-up Enabled
 Show Next (Not Last) Calibration Date on Start-up
 Start-up Calibration Display Mode
 Display Modes
 Toxic Sensor Display Units
 Temperature Display Units
 Date Format
 PID/LEL Factors Mode (Reading Screen)
 Edit LEL Correlation Factor in Field
 Edit PID Response Factor in Field
 Edit Site / User ID
 Edit Site in Field
 Edit User in Field
 Hygiene Enabled
 Initiate Bump Test on Start-up
 LEL Is Displayed as %LEL
 LEL Is Displayed as %VOL
 LEL Is Displayed as PPM
 Man Down Alarm Enabled
 Overwrite Datalog Enabled
 Pause/Resume Datalog Overwrite
 Peak Reading Displayed on Instrument
 Perform Self-Test on Start-up
 PPMLELSCREEN Displayed on Instrument
 Rotate Display 180 Degrees

STEL and TWA Displayed on Instrument
STEL Display Enabled
TWA Display Enabled
Ticks Displayed on Instrument
Ticks Mode Enabled
Site / User Displayed on Instrument
View Calibration Date on Start-up
View Datalog in Field Enabled
View Datalog in Field Enabled
View Event Log in Field Enabled
Visual Alarm Enabled
Zero Sensors on Start-up
Out-of-Motion (Man Down) Enabled
Company, Site and User Operation Screen Enabled
Gas Information Operation Screens Enabled
NFC Enabled
Can Change Sites/Users Using NFC

Appendix 2: Typical list of instrument diagnostics

Backlight LED Test
Battery Voltage
Battery State
Instrument Alarm Seconds
Instrument Life Remaining
Instrument Operation Seconds
Left/Right/Center LED Current
Speaker Voltage
Speaker Current
Speaker 1 Voltage
Speaker 2 Voltage
Vibrating Alarm Voltage
Vibrating Alarm Current

Appendix 3: Functionality of iNet Control software and docking stations for Fleet, User and Hazard Management

Fleet Management: iNet Control, in conjunction with the docking station, provides fleet management capabilities, including but not limited to:

- Event scheduling including
 - Bump test, calibration, diagnostics, data download
- Manual calibration and bump recording
- Automatic firmware updates
- Automatic settings verification and updates
- Ability to manage instrument settings within similarly configured groups
- Instrument settings history
- Instrument component history
- Bump and calibration history documentation and certificates
- Overdue bump and calibration reports

- Instrument User assignment and history
- Equipment group assignments for fleet management by area or department
- Automatic marginal and failed sensor notification and alerts
- Calibration gas monitoring and auto replenishment
- Equipment not docked and no data upload alerts

User Management: iNet Control provides user management functionality, including but not limited to:

- System and instrument user creation
- Instrument user assignment
- User assigned instrument history
- User system permission and alert assignment
- User permission sets
- Instrument user datalog & alarm tracking and history
- Instrument use without bump and calibration alerts
- Instrument Turn-off- in -alarm alerts
- Instrument settings change alerts
- Instrument bump and calibration history by user
- Software login history
- User report assignment

Hazard Management: iNet Control provides hazard management functionality, including but not limited to,

- Gas alarm alerts/reports
- Alarms by gas type
- Gas alarms by instrument user
- Gas alarm reports by longest duration
- Gas alarm reports by equipment group or location
- Amount of time spent in high alarm conditions
 - Amount of gas sensed above high alarm levels
- Alerts and reports of gas concentrations sensed above critical alarm level decision points
- Instrument datalog histories
- Instrument and user alarm trends