

Intelligent Sensors

Arc Gives You the Power to Connect



| Parameter | Value | Part Number | Temperature |
|-----------|-----------------|------------------|-------------|
| VCD | 5.86e6 cells/ml | 238399-5241-1002 | 23.09°C |
| pH | 5.39pH | 242120_0002627 | 23.43°C |
| pH | 7.27pH | 242163-5187 LW | 26.92°C |
| DO | 97.95%-sat | 243666-111-1178 | 26.90°C |
| DO | 92.76%-sat | PollytePlus TS2 | 22.79°C |
| pH | 2.72pH | 243061-erx | 296.69K |
| ORP | 93.20mV | 243110-1078 | 602.22°C |
| DO | 0.00%-vol | 243590-111-1258 | 22.98°C |
| Cond | 0.01uS/cm | Incyte Arc | 23.58°C |
| VCD | 0.00 | | |

HAMILTON
arc **Air**

Arc: The Power to C

RETHINK SENSOR MANAGEMENT BY ELIMINATING THE TRANSMITTER

Arc seamlessly connects with existing R&D, PD, and production infrastructure and reduces startup costs and integration footprint on new projects and expansions. ArcAir software reduces operational costs with:



LABORATORY
CALIBRATION



PREDICTIVE
DIAGNOSTICS



AUTOMATED
DOCUMENTATION



USER ROLES AND
PROCESS ASSIGNMENT

ANATOMY OF AN ARC SENSOR

Arc's integrated microtransmitter amplifies sensor signal for direct connection to the control system. Sensor configuration and calibration occur via USB or wireless Bluetooth®.

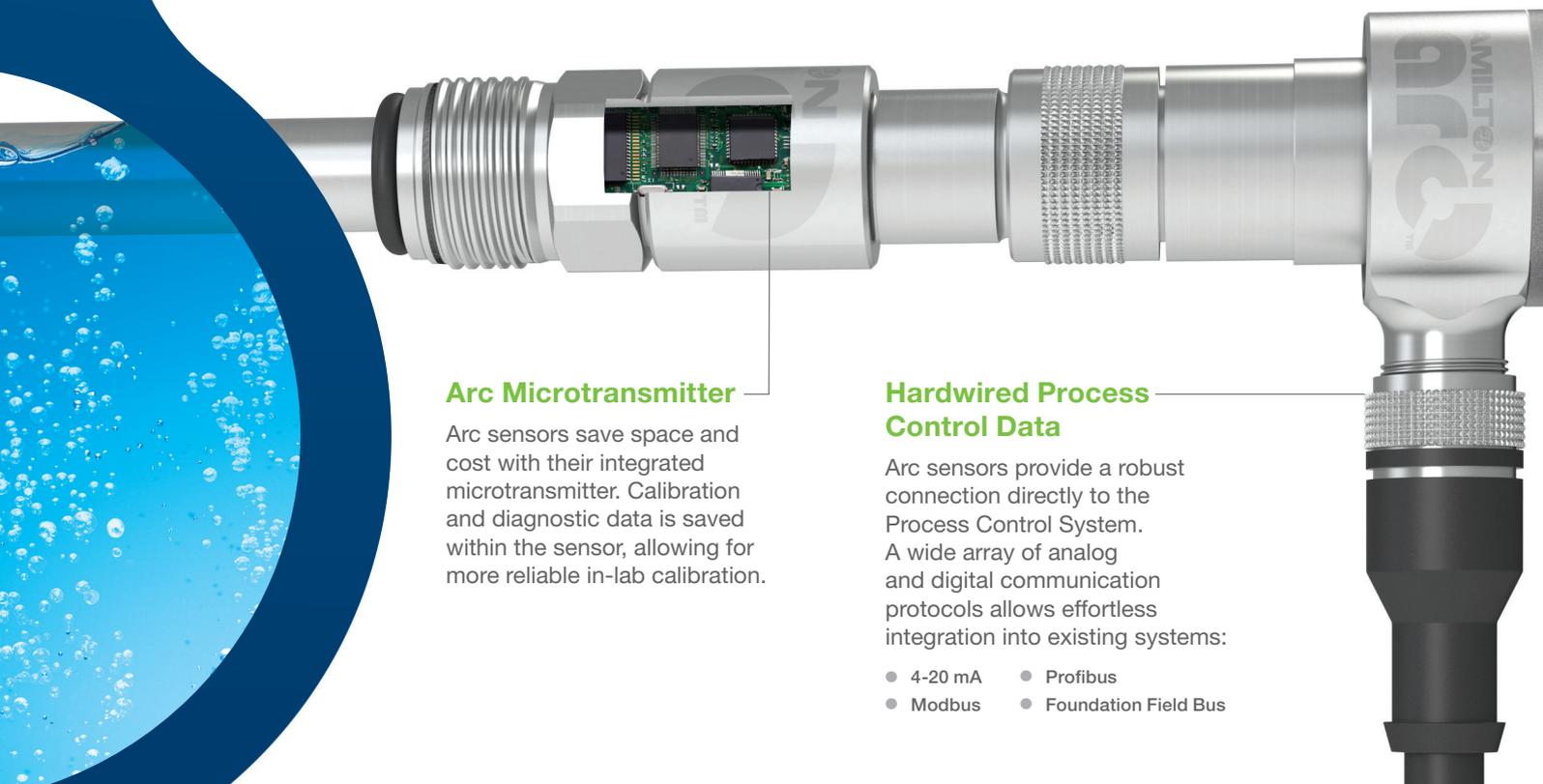
Arc Microtransmitter

Arc sensors save space and cost with their integrated microtransmitter. Calibration and diagnostic data is saved within the sensor, allowing for more reliable in-lab calibration.

Hardwired Process Control Data

Arc sensors provide a robust connection directly to the Process Control System. A wide array of analog and digital communication protocols allows effortless integration into existing systems:

- 4-20 mA
- Profibus
- Modbus
- Foundation Field Bus



Arc Sensor Types



pH



ORP



Optical Dissolved Oxygen



Polarographic Dissolved Oxygen



4-Pole Conductivity



2-Pole Conductivity



Viable Cell Density



Arc Wi Adapter (optional)

Arc Wi Adapters enable wireless communication from the sensors to the ArcAir application without interrupting the hardwired signal. An LED in the adapter provides visual indication of sensor status.

Status Lights

- Active BT Connection
- Sensor Warning
- Normal Operation
- Sensor Errors

Wireless Configuration, Calibration, and Diagnostics

Arc Wi provides wireless communication to any Bluetooth 4.0 enabled device. Configure and calibrate sensors from the convenience of a mobile phone, tablet, or computer. Sensor diagnostics are also transmitted wirelessly, providing the ability to troubleshoot sensors from the palm of your hand.

ArcAir for PC and Mobile

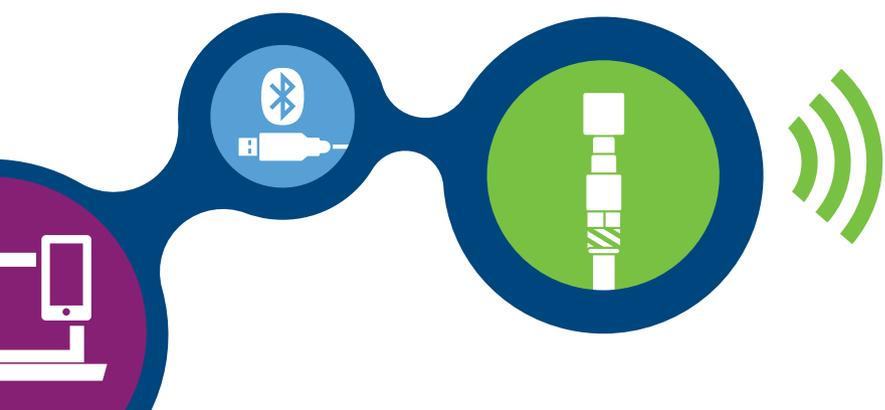
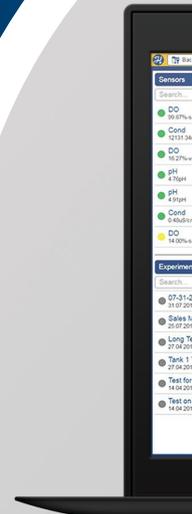
ONE TOOL FOR SENSOR MANAGEMENT AND DOCUMENTATION

ArcAir is intuitive software designed to work the way you do. Monitor all sensors in your lab from an easy-to-use dashboard with one-click access to sensor configuration, calibration, and verification. Maintenance actions are automatically recorded, and reports are generated from a centralized database.

ArcAir Software Packages

| Functionalities | ArcAir Lite | ArcAir Basic | ArcAir Advanced |
|--------------------------------------|-------------|--------------|-----------------|
| Sensor Status | ✓ | ✓ | ✓ |
| View and Sort Dashboard | ✓ | ✓ | ✓ |
| View Experiments | ✓ | ✓ | ✓ |
| Create Experiments | ✓ | ✓ | ✓ |
| Multi-language | ✓ | ✓ | ✓ |
| Configure / Calibrate / Verify | | ✓ | ✓ |
| Firmware Updates | | ✓ | ✓ |
| Audit Trail with Comment Function | | | ✓ |
| GMP Documentation Support | | | ✓ |
| User's Roles and Password Management | | | ✓ |
| Encrypted Database Backup and Change | | | ✓ |
| Reports Electronic Signatures | | | ✓ |

Mobile app is available through application stores such as App Store® or Google Play™, with in-app upgrades for Basic and Advanced. Lite version is mobile app only. Basic and Advanced are available for PC. PC software available at hamiltoncompany.com/ArcAirSoftware.



Connection Flexibility

ArcAir is compatible with Android™, iOS®, and Windows®. Connect via USB or Bluetooth 4.0.

Redefine Your Sensor Workflow

HASSLE-FREE SENSOR HANDLING

Arc breaks the reliance on at-line calibrations during start-up, takes the guesswork out of qualifying a used sensor for the next run, and eliminates the burden of manual documentation.



Grab and Go

Precalibrated sensors are waiting on the shelf for installation and sterilization with no additional at-line calibration.

Batch Calibration

Arc microtransmitters store calibration data in the sensor so you can calibrate on your time.

A dedicated batch calibration station increases efficiency and accuracy of calibrations.



Dead Sensors

Sensor health indicators, operating hours, and sterilization counters indicate if the sensor should be discarded or if it is adequate for another run.



Reports

Automatic generation of calibration and validation reports removes the risk of transcription errors. Electronic signatures enable a completely paperless workflow.

Data Analysis

Historic sensor data can be used for troubleshooting or for predicting the useful life of a sensor in a specific process.

Arc Database

ArcAir stores all calibration, validation, and configuration information in an encrypted database. All user entries and actions are logged from all devices in an automatically generated audit trail.

Compliance Ready

Ready for compliance with FDA CFR 21 Part 11 and EudraLex Volume 4 Annex 11.



Mobile Friendly

Wirelessly receive diagnostic information from the sensors without interrupting the process. Quickly sync information to the database for reporting and data analysis.



ArcAir Dashboard

Track the status of all sensors in the lab on a single screen. Colored indicators enable quick identification of sensors needing attention.



Arc for GMP Facilities

INCREASE PROCESS SECURITY AND AUTOMATE DOCUMENTATION

Traditional transmitters do not support a modern security model, leaving measuring points susceptible to uncontrolled user access. ArcAir Advanced accommodates the security and documentation needs of GMP facilities with a centralized database for distribution of user roles and storage of sensor history.

User Roles and Process Assignment

ArcAir software enables administrators to create optional user accounts and access levels for enhanced security. After login, users can only access assigned sensor groups and tasks within their role.

| Role: | Role Rights: | CFR 21 Part 11 and EU Annex 11 Compliance: | | Sensor Process Group Assignment Example: | | |
|--|---|--|--|--|-------------------------------------|-------------------------------------|
| | | ArcAir Software Settings | Electronic Signature For Report Creation/Approval | TANK 1 | TANK 2 | TANK 3 |
|  | Administrator <ul style="list-style-type: none"> • Sensor Settings • Firmware Updates • User Management • Communication Validation • Process Settings • Calibration • Audit Trail View | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
|  | Calibration Technician <ul style="list-style-type: none"> • Communication Validation • Process Setting • Calibration • Audit Trail View | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
|  | Production Technician <ul style="list-style-type: none"> • Communication Validation • Process Settings • Audit Trail View | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|  | Quality Manager <ul style="list-style-type: none"> • Audit Trail View | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

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Process Documentation

ArcAir automatically generates and archives pre- and post- process documentation.

User and Sensor Configuration

Configure new sensors with ArcAir



Sensor Calibration

Calibrate sensors under controlled laboratory conditions



CONFIGURATION REPORT

CALIBRATION REPORT

Communication Validation

Verify signal accuracy to the PCS



COMMUNICATION REPORT

Process

Capture and export process measurement data



VERIFICATION REPORT

Sensor Verification

Verify sensor performance after process



Arc Database



Audit Trail

All user's GMP relevant activities performed with ArcAir mobile and desktop are automatically logged in the audit trail

Small Footprint, Big Impact

DEMAND HIGHER VALUE FROM YOUR SYSTEM DESIGN

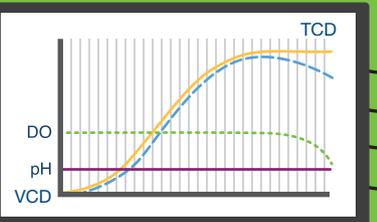
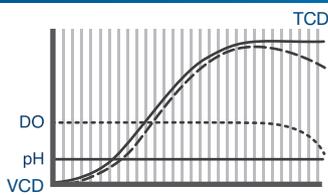
Modern equipment manufacturers implement Arc sensors to save space, improve usability, and expedite validation, ultimately reducing project installation and operating costs.

Break from the Bulk

Shrink your panel and minimize failure points by eliminating bulky transmitters. Wiring is simplified to reduce assembly and troubleshooting costs.

Powered by Arc

Accelerate feature-rich controls integration with direct access via Modbus RTU protocol. Leverage built-in algorithms for simple implementation of complex tasks like sensor health indication, error and warning descriptions, and calibration and validation variables.



More Robust IQ/OQ/PQ

Skid builders capture performance data using the ArcAir Experiments tool for enriched Factory Acceptance Testing (FAT) and Functional Performance Testing (FPT). Arc's automated reports fast-track Turn Over Package (TOP) creation for rapid on-site validation.



Green Means Go

Quickly identify sensor status from a distance with colored LEDs. Use wireless diagnostics and calibration through a mobile or PC to remotely troubleshoot when needed.





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