

Smart Sensors and Analytical Instruments



PROCESS MEASUREMENTS
MADE EASY

**Honeywell Solutions for
Analytical Measurement and Control**

Honeywell

Process Measurements Made Easy!

Precise and Reliable

Analytical measurements are essential in virtually every industrial process. Precise and reliable measurement and control of pH, ORP, conductivity/resistivity, dissolved oxygen, hydrogen purity and other variables will benefit your operation in many ways:

- Consistent product quality
- Improved process efficiency
- Reduced equipment maintenance
- Plant and employee safety
- Compliance with environmental standards

Honeywell offers depth of experience and a broad product portfolio in the demanding science of analytical measurements. From the primary sensors to the analytical instrument, Honeywell provides a broad portfolio of proven analytical measurement and control solutions to keep your operation running smoothly, efficiently and safely. Our smart sensors and analytical instruments are available from authorized Honeywell distributors throughout the world.



Typical Applications:

- Wastewater and Pure Water Treatment
- pH Measurement in Food & Dairy Industries
- Corrosion Detection
- Dearator Efficiency
- Aeration, Effluent, Stream and Aquaculture Monitoring
- Industrial Drying
- Heat Treating Furnaces and Gas Generators
- Natural Gas Pipelines
- Turbine Monitoring
- Sterilization

Industries:

- Power Generation
- Water and Wastewater
- Chemical
- Pulp and Paper
- Refining
- Pharmaceutical and Biotech
- Industrial Heating
- Semiconductor
- Food and Dairy





Process Measurements don't have to be Complicated

The DirectLine family of sensor modules provides an easy solution to simplify common process measurements. Honeywell's patented sensor technology ensures reliable and stable measurements. The DirectLine architecture combines the sensors and transmitters into a single easy to use device.

Easy-To-Install: Integral sensor/electronics reduces wiring, cable runs and panel cutouts

Easy-To-Use: Local display and keypad allows easy set-up, calibration and operation

Easy-To-Maintain: Plug-in sensors make replacements a snap!

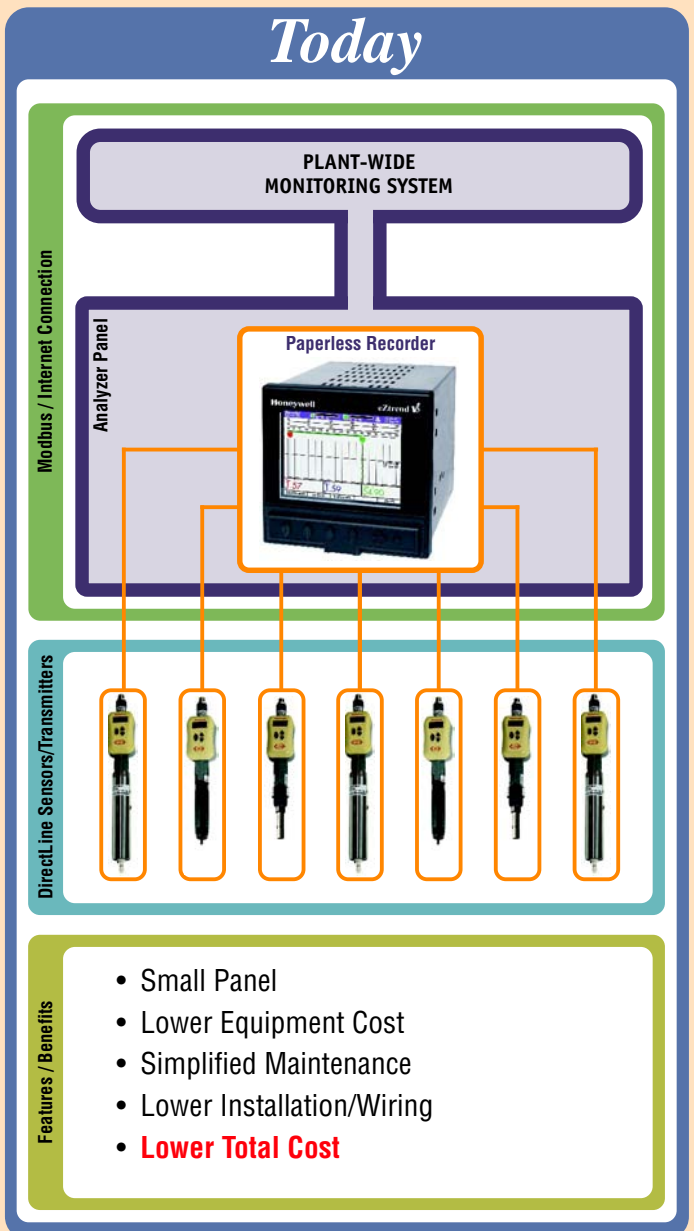
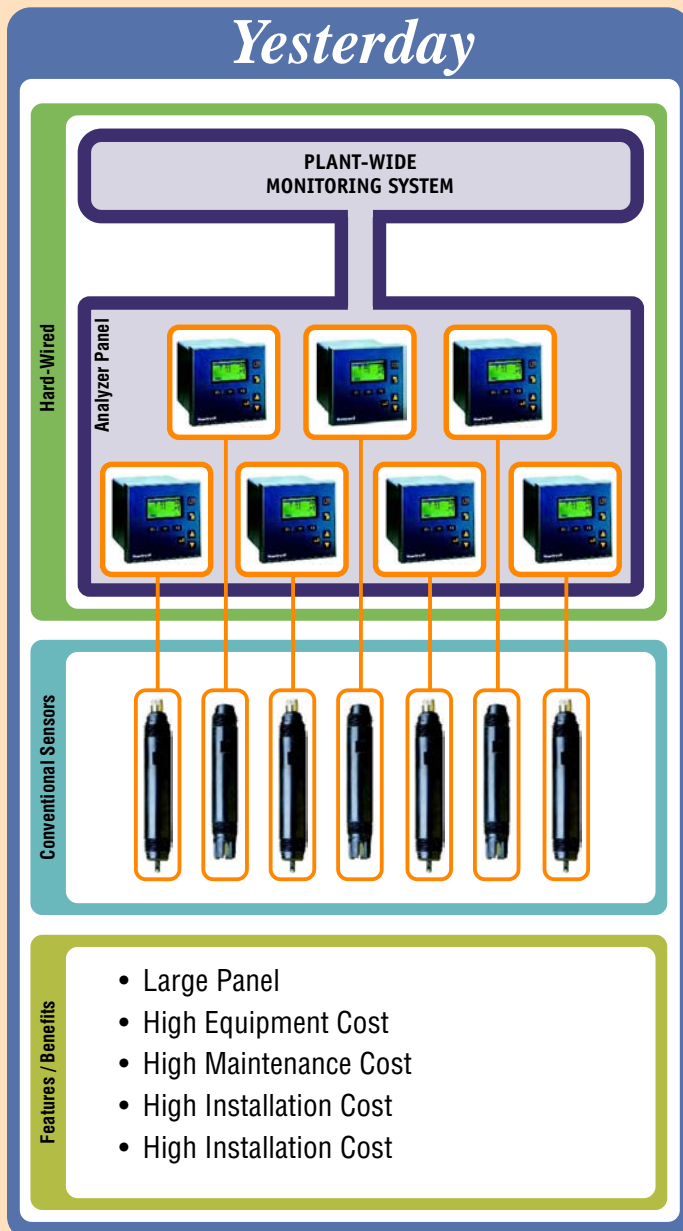
DirectLine Sensor Module at a Glance

- **Measurement:** pH, ORP, Contacting Conductivity, Dissolved Oxygen
- **Mounting:** Integral to the sensor or remote mounted; pipe, wall, or DIN rail
- **Enclosure:** Type 4X, IP 66, Plastic Case
- **Display:** LCD 4-Digit, 7-Segment
- **Output:** One 4–20 mA
- **Power:** 16-42 Vdc Loop Powered
- **Approvals:** CE, UL, CSA, FM

DirectLine® - Changing the game in pH, ORP, Conductivity & D.O. Measurement

Yesterday

Today



Elimination of Dedicated Analyzers and Associated Panel Space Results in Lower Total Cost!

The Most Versatile Multiple Input Analyzer

Get **MORE** value & performance . . .

- *Mix-n-Match process measurements*
- *Fast & Easy commissioning – even wireless configuration*
- *Entire status at a glance – graphic LED display*
- *Full global support of Honeywell Process Solutions*



UDA2182 Series Analyzers

The UDA2182 Series is a versatile, dual or single input analyzer that measures pH, ORP, contacting Conductivity and Dissolved Oxygen. The “mix-and-match” PWB design offers the user flexibility for a wide range of applications. Its common form, fit and function to older Honeywell analyzers make it a quick and easy retrofit into existing panels and installations.

- Single or dual input for pH, ORP, contacting Conductivity or Dissolved oxygen
- Dual input in any combination of measurements
- PID control option
- Up to 3 analog outputs
- Up to 4 alarm relays
- Backlit graphical LED display
- Nema 4X/IP66 case
- Infrared PC & Pocket PC configuration
- FM/CSA Class 1, Div 2 approval

pH input

The pH input will accept a wide variety of sensors – non-glass Durafet® and traditional glass Meredian® electrodes, ORP combination electrodes and the HPW700 high purity system. In addition to the basic unit the pH input has:

- Auto buffer Calibration
- High purity water solution compensation
- 0.2 sec update rate for fast responding Durafet pH electrodes

Conductivity input

The Conductivity input will accept signals from Honeywell’s standard selection of contacting conductivity cells. The Conductivity unit also has:

- Temperature compensation curves
- Calculation of % Rejection/Passage & Difference of two cells
- Conversions to ppm, ppb or ppt Total dissolved Solids (TDS)
- USP 26 alarm capability

Dissolved Oxygen input

The Dissolved Oxygen input is from Honeywell’s unique equilibrium probe. The Dissolved Oxygen unit has these additional features:

- ppm or ppb measurement
- Automatic or manual calibration
- ambient temperature & atmospheric pressure compensation

APT 2000/4000 Analyzers & Transmitters:

Honeywell’s APT Series offers both an analyzer and a transmitter design. It has a large, easy to read display with a user interface that is easy to understand.

- USP26 Alarm Capabilities
- FM Class I, Div 1 (I.S) rating
- 120/240 Vac or 24 Vdc loop power
- pH, Conductivity (contacting & toroidal), and ORP models





Name the application, Honeywell has the mounting solution! Analytical mountings provide the sensor interface to the process. Choose from a wide selection of mountings, each designed for specific installation and applications across a variety of industries.

pH Mountings

7773 Series Multi-purpose pH and ORP Electrode Mountings



7777 Series In-Line or Submersion pH/ORP Electrode Mountings



7758 Series Pipeline Electrode Mountings for Industrial pH and ORP Measurements



TL1000 Twist Lock Electrode Mounting



7774 pH Series and ORP Electrode Insertion/Removal Assemblies



Model 7794 Sanitary Durafet II pH Mounting



Conductivity Mountings

4973 In-Line or Flow Chamber Mountings for Low Conductivity Measurements



4909 Ball Valve Mounting for Insertion/Removal



4905 In-Line, Flow Chamber, or Immersion Mountings/General Purpose Conductivity



5000TC Toroidal Conductivity Cells



HPW7000 Hi-pHurity Water pH Measurement System

Accuracy and stability are combined with simplicity in this electrode mounting assembly for measuring pH in high purity water applications. A specially designed flow chamber provides optimal flow patterns and volume. The electrode cover and holder is keyed so that proper alignment is maintained during installation. An easy to remove clamp secures the cover and makes electrode removal for calibration or maintenance fast and easy. Electrode and cable shielding ensures a stable pH reading. The reference electrode is easy to refill and maintain. A calibration cup holder allows the user to calibrate right at the assembly and saves calibration time.

HPW7000 at a Glance:

- Electrodes: Separate glass measuring and flowing reference
- Mounting: Flow chamber with 0.25 inch inlet & outlet compression fittings
- Materials of Construction
 - Flow Chamber: SS 316L
 - Electrodes: Glass body, EPM o-rings, ceramic reference junction
- Electrodes Temp. Rating: Below 10° to 80°C (50° to 176°F)
- Downstream Back Pressure Rating: -10" to +1.0" w.c. (max) -24.8 to 0.248 Kpa

pH - pH is measured in a wide variety of process applications to ensure product quality, monitor effluent discharge, and to control addition of chemicals for optimum chemical reaction. Applications include process, wastewater, and pure water measurements.



Durafet® pH Electrodes: Honeywell pioneered state-of-the-art pH measurement with the first industrial, non-glass, ISFET (Ion Sensitive Field Effect Transistor) based pH sensor – the Durafet pH electrode.

- **New** waterproof Vairo Pin connector options
- Exceptionally fast response for improved product quality
- Rugged non-glass design lowers replacement costs
- Long term stability reduces calibration frequency
- 3-A Sanitary design for on-line pH measurement in Food and Dairy



Meredian® Glass pH Electrodes: Honeywell's traditional glass sensor electrodes offer time proven reliable pH measurement for selected applications. Designs include combination electrodes, as well as separate measuring and reference electrodes.

- High purity water assembly for accurate pH measurement in low conductivity sample
- Separate measuring and reference electrodes lowers replacement costs
- Platinum and gold electrodes for accurate measurement of ORP



Conductivity: Honeywell's conductivity technology measures conductivity, resistivity, and concentration in applications ranging from ultrapure water to strong acids and bases. Contacting and toroidal cell designs provide excellent stability with minimal maintenance.

- Automatic upload of cell data reduces mistakes & speeds up instrument set-up
- Application specific algorithms for accurate measurement
- Rugged designs



Dissolved Oxygen: Accurate and stable dissolved oxygen measurements can be made using Honeywell's unique equilibrium probe technology. This unique technology provides excellent performance in low parts per billion (ppb) as well as parts per million (ppm) applications.

- Unique Equilibrium probe technology
- No replacement of membrane, electrolyte or electrode
- Unaffected by fouling
- Not flow sensitive



Hydrogen Purity Concentration: The principles of thermal conductivity are used to determine the concentration of a specific gas in a binary gas mixture. This measurement is used to determine the concentration of the coolant and purge gases (H₂ and CO₂) used on start-up and operating cycles on hydrogen cooled turbine generators.

- Low drift reduces need for frequent calibrations
- Rapid response provides immediate indication of process changes



Moisture - A range of transmitters that provide in-line moisture and temperature measurements without costly and intensive maintenance. The unique patented sensors accurately and reliably measure dew point, temperature, and/or relative humidity without frequent cleaning, calibration or replacement due to saturation.

Thermal Conductivity - A thermal conductivity system that measures concentrations of hydrogen purity and CO₂ gas. This measurement is typically made in hydrogen-cooled generators.



7866 Gas Analyzer: The 7866 gas analyzer consists of a sensing unit and a control unit plus an optional remote indicator and sampling panel. The control unit provides two output signals which can be sent to a remote device for monitoring or recording purposes. Optional Modbus communications available.

- Factory configured for triple range H₂ purity applications
- Long history of safe and reliable sensor performance
- User friendly operator interface
- Two individually configured alarms



Dewpoint/Temperature Transmitters: Industrial moisture transmitters rugged enough to withstand temperature, pressure and contamination conditions typical of industrial environments.

- Rugged dual-element sensor
- Operates at temperatures up to 1000°F/538°C (with cooler)
- Operates at pressures up to 13,790 kPa (2000 psi)
- FM approval for hazardous areas



Industrial Humidity Transmitter: Humidity transmitter designed for use in industrial processes. Typical applications include hazardous, hostile industrial, chemical and pharmaceutical environments, environmental monitoring and food processing.

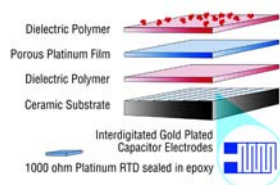
- Temperature compensated humidity measurement
- Explosion-proof option
- Single point field calibration
- Interchangeable sensor



Humidity Transmitters: High accuracy humidity transmitters targeted for OEM applications requiring %RH or %RH and temperature measurements.

- Temperature compensated %RH measurement
- Remote probe option, with user-specified cable lengths
- Single point field calibration
- NIST Traceable calibration available

PATENTED MOISTURE SENSOR



Moisture: The unique, guarded-layer sensor technology at the heart of Honeywell's moisture measurement product line provides accurate, dependable on-line moisture measurement with minimal maintenance or re-calibration. The instruments are rugged and withstand the heat, pressure and contamination often encountered in industrial atmospheres.

- Work in-situ; does not require sampling system
- Simple to maintain
- NIST traceability

Analytical Product Overview

	DirectLine	Analyzer	Transmitter	Sensor/Electrode Mountings
pH	DL421	APT4000PH, UDA2182	APT2000	DL1000, DL2000, 7777, 7774, 7773, 7758, 7794D, TL1000
Conductivity	DL423	UDA2182, APT4000CC, APT4000TC	APT2000CC, APT2000TC	DL4000, 4973, 4905, 4909/4908
Dissolved Oxygen	DL424, DL425	UDA2182		DL5000
ORP	DL422	UDA2182		DL3000, 7777, 7774, 7773, 7758
Moisture - % RH			H4111, H4112, H4114 H4129, H4139	
Moisture - Dew Point			H4112, H4114	
Hydrogen Purity		7866		



Honeywell offers a complete portfolio of products and solutions for process and machine control applications, including controllers, recorders, transmitters, actuators, smart sensors, and analytical instruments. To learn more about these offerings and how they can help your organization achieve breakthrough results, contact your local Honeywell representative, or contact us at the following phone numbers:

U.S.A.: 1-800-784-3011 France: 33 1 60 19 80 75
 Canada: 1-800-461-0013 Italy: 39 02 9214 6503
 UK: 44 1344 655251 Spain: 34 91313.61.00
 Germany: 49 69 8064-336 Asia/Pacific: 65 6355 2828
 Latin America: 1-305-805-8188

Honeywell Process Solutions

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Warranty/Remedy

Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship. Contact your local sales office for warranty information. If warranted goods are returned to Honeywell during the period of coverage, Honeywell will repair or replace without charge those items it finds defective.

The foregoing is Buyer's sole remedy and is in lieu of all other warranties, expressed or implied, including those of merchantability and fitness for a particular purpose.

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