Highlights

Anyone with any skill level can calibrate properly with Auto Calibration Mode.

Plug and play operation because calibration data is stored on the sensor and automatically uploaded to the transmitter. Quickly swap out sensors needing maintenance.

Calibrate in your shop, plant, or office and place into service.

Simple Sensor Management sensor stores the last 5 calibration vales for slope, offset, temperature, min and max temperature, time in service as well as serial number, sensor type, dates of installation and dispatch. Save the data to a file to make sensor maintenance and replacement planning easier.

Auto correction for temperature induced changes to pH buffer equilibrium.

Digital communication eliminates problems with interference in noisy process environments and signal degradation in cable runs up to 2,000 feet.

Avoid the high cost and complexity of Hart® and Profibus communications.

Among the toughest sensors available are fitted with smart electronics to extend and simplify service life and use.

Made in America

FX-300-DpH Smart Digital pH

The cost effective Foxcroft FX-300-DpH smart digital pH/ORP sensors and transmitter system makes it easier for you to use and manage your sensors with auto data storage and data transfer options.

Features at a Glance

- Data Input Ranges: -2 to +16pH, ±1000mV for ORP, -40 to 210 °C
- Automatic pH calibration mode recognizes 4.00, 6.86, 7.00, 9.18 & 10.00 pH buffers for all calibration types & corrects for temperature induced changes to pH buffer, ensuring systematic results no matter who calibrates the sensor.
- Calibration data is stored on smart digital sensor. Calibrate in the lab or instrument shop & put the pre-calibrated sensor into process use. Plug & play sensors can be swapped in and out at will.
- The live working calibrations and last five sets of historical calibrations stored on sensor can be displayed & downloaded to file including the date associated for each.
- Smart sensors automatically upload calibration data to the transmitter, or you can download configuration from the transmitter to the sensor.
- By simply using the sensor it automatically stores all calibration data, dispatch date, installation date, the time used in the field, last used date & the complete transmitter configuration in non-volatile EEPROM memory without user input.
- The software checks for correct sensor type to prevent accidental connection of incompatible sensors. The sensor item, serial & invoice numbers are all stored on the sensor.
- 100% pure digital communications have no signal degradation in noisy environments with cable lengths up to 2,000 feet with NEMA 6P & IP67 rated quick disconnect waterproof & corrosion-resistant snap connectors.

- Perform 1-point offset, 2-point or 3-point calibrations. 3-Point calibration establishes accurate separate slopes for both the acidic (-2 to +7 pH) and alkaline ranges (7-16 pH).
- Auto temperature compensation via Platinum 100 or 1000 Ohm element
- Display pH/mV or Temperature
- Fully scalable and invertible analog output 0-20 mA or 4-20 mA for pH/mV or Temperature as well as Digital Output via RS-485 Modbus RTU in standard or high resolution mode is standard in all transmitters.
- Galvanic isolation between sensor input, power & analog output (3000V rating)
- Configuration on the smart digital sensor can be saved as a file when used with the supplied Windows software for backup, archiving or tracking the configurations at each installation site. Configurations saved to file can be directly loaded to the smart digital sensor and onto any FX-300-DpH transmitter to which it is connected.
- The transmitter can create a restore point backup of the exact current working configuration and can be reverted back to this restore point configuration at any time, as well as hard reset back to the factory defaults.

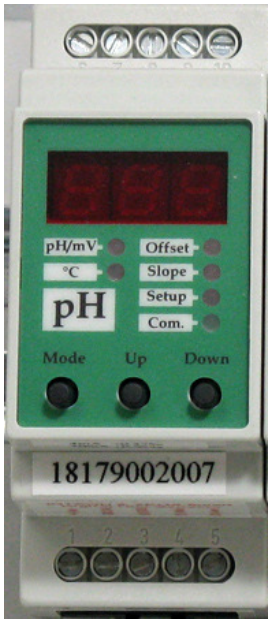
Simple Operation

Each module has a 3 digit display and 6 LEDs to indicate the active operating mode.

3 keys located on the front panel are used to view and change settings in the module. The 'Mode' key is used to select a particular operating mode including SETUP, where transmitter settings can be viewed and modified. Once in Setup mode, the 'Up' and 'Down' keys are used to scroll through the parameters. The parameter to be viewed or altered is selected with the 'Mode' key and the value is changed using the 'Up' or 'Down' keys. To change any of the parameter settings you must first turn off the software lock.

"pH/mV" indicates the run mode and displays pH or mV for ORP measurements.

- To view the absolute mV value of a pH sensor press the 'Down' key while in pH/mV LED mode.
- The current mA output from the programmed scaling can be displayed by pressing the 'Up' key in pH/mV LED display mode.



℃ mode displays the temperature.

- The temperature is calibrated by pushing the 'Up' or 'Down' buttons when in the temperature display (℃) mode after the software lock is turned off.
- Min and max temperatures are digitally stamped on sensor for process condition tracking. This feature allows tracking of process excursions even if just a single 4-20mA output for pH/ORP is used & no second analog temp output exists. MODBUS output always sends BOTH the pH/ORP value and the temperature.

"Buffer" is the calibration mode for the offset or high pH solution. Use the Up or Down keys to adjust after the software is unlocked.

"Slope" is the calibration mode for the gain, or low pH solution. Use the Up or Down keys to adjust after the software is unlocked.

"Setup" mode provides access to view and program settings in the analyzer. To make setting changes press Mode key until SETUP is illuminated, select parameter "P01" with the Up key, and change to "OFF" to unlock the software. To exit SETUP press the "Down" key until parameter "P00" is displayed, then press the "Mode" key.

"Com" LED is illuminated when Modbus is active.

Modbus Output Digital MODBUS RS-485 RTU multidrop communications is a standard feature in addition to the 4-20mA analog output.

The MODBUS RS-485 RTU has a standard resolution 0.01pH units or 1mV for ORP (this is compatible with the FX-300-DAT module). The RS-485 MODbus RTU output mode can also be set to achieve a 0.001pH or 0.1mV resolution for the highest precision.

The Modbus-master may be the FX300-DAT module or any SCADA system. A free of charge Windows data logging and graphing software and be used to monitor and record all process and temperature values from up to 247 transmitter simultaneously at distances up to 6500 feet (2 kilometers).

WINDOWS SOFTWARE FOR CALIBRATION & CONFIGURATION

Windows software is provided with a free of charge perpetual software zero cost license. Only a suitable RS-485 to USB converter assembly is required to use the Windows software. Foxcroft offers a field ready NEMA4X Windows Interface Bridge Box for Smart Digital Sensors to enable turn-key out of the box use of this Windows software.

Windows software provides convenient testing and calibration of plug and play smart digital sensor and creating complete transmitter configuration which can be saved to file as well as to additional smart digital sensors. This can be done at field installation points throughout the plant from anywhere that a laptop, desktop or tablet with a USB connection is available.

Using the Windows software to create the configuration allows for it to be saved on a PC with a filename should it need to be loaded onto a new sensor in the future or to keep track of changes to the transmitter configuration over time for the given installation point. If multiple installations will use exactly the same transmitter configuration this same file can be loaded onto multiple sensors. Loading the same configuration onto multiple smart sensors can also be done via the intelligent transmitter using the appropriate parameter call.

Automatic calibration output hold means that the last process value will continue to be sent via the analog 4-20mA and Modbus digital output while in calibration mode.

FX-300-DpH/ORP *TECHNICAL SPECIFICATIONS*

Mechanical	
Housing:	Lexan UL94V-0 (Upper part) Noryl UL94V-0 (Lower part)
Mounting:	M36 for 35 mm DIN rail
IP Class:	Housing IP40. Connector IP20
Connector:	Max 16A. Max 2.5 mm^2 Max torque 0,6 Nm
Temp.:	-15 to +50 °C
Weight:	75 grams (2.64 ounces)
Dimensions:	D 58 x W 36 x H 86 mm (2.3" X 1.4" X 3.4")
CE mark:	EN61326A

Electrical	
Power Supply:	24VDC ±10%, 6A fused 115/230VAC input
Consumption:	60 mA max
Sensor:	Combination Sensor
pH/mV Range:	-2 to +16 pH, ±1000mV ORP
Sensor Input:	Foxcroft Smart Digital Sensors Only
Accuracy:	±0.2% Excluding sensor (ideal)
Temp Sensor: Temp Range:	Integral platinum Pt100, Pt1000
Temperature Compensation:	-40 to +210°C ± 0.3°C Fixed (Manual) or Automatic using Temperature (TC) Measurement
Analog Output:	0-20mA or 4-20mA, max. 500Ω
Digital Output:	MODBUS 485-RTU
Output Hold:	Automatic in calibration mode

Standard enclosures can fit 1, 3 or 5 sensor transmitters.

Enclosures: *Wall Mount IP65/NEMA 4X polycarbonate enclosure with tinted transparent lift-up lid, 180mm (7") High x 110mm (4.3") Deep: 110mm (4.33") wide , (1) module; 182mm (7.16") wide (3) modules, or 254mm (10") wide (5) modules . Other sizes are available as special option.*

Power
The FX-300 includes a CSA/UL/CE approved universal input 115/230 VAC 50-60Hz, 24VDC power supply. This power supply is pre-wired at the factory to a 6 Amp fused power entry module that accepts a power cord with IEC #C13 connector on one end and NEMA 5-15P connector on the other end. No power wiring is required. Bypassing the factory default power wiring will void the warranty.

WARNING: Because the FX-300 transmitter is a 3-wire device, it is ABSOLUTELY critical that the 24VDC power supply is COMPLETELY separate from all other equipment. This includes all other instrumentation as well other equipment such as pumps and motors. The FX-300 cannot share plant wide 24VDC power.

Sensors

Smart electronics are built into our heavy duty solid state sensors to provide both improved service life and efficient sensor management.

Sensor Construction Core Benefits

- Reduced cost of ownership due to substantially improved sensor service life
- Industrial construction and solid-state reference require less cleaning and calibration with better performance in extreme conditions when compared to standard sensors.
- Reduced damage from mechanical wear with extremely rugged construction and fault-tolerant design
- Sensor components, design and fabrication is chosen to suit your exact application requirements for optimal performance and to minimize cost of ownership
- Specialized pH glass for repeatability, accuracy and sensitivity in applications that cause poor performance or premature failure in standard sensors.

We have basic sensor types which can be further modified to suit the application by additional features such as resistance to chlorine gas or sulfides, impact resistant glass, or wet / dry use sensors that can withstand drying out for extended periods of time.

Each sensor is available in all mounting styles: screw-in style inline; quarter turn twist lock inline, fully submersible, immersion, as well as sanitary and hot tap valve retractable injection mounting.

The basic sensor types:

- General purpose
- Acid, HF and Fluoride (up to 50,000 ppm) resistant
- Dissolved sulfides and NO_x (Nitrous and Nitric oxides) resistance
- High and ultra high temperature service up to 150°C
- Low temperatures down to -15°C
- Mining grade for abrasive slurries and viscous fluids. Solids content up to 12% consistency pulp and up to 50% solids and particulate content in mining slurry.
- Aggressive dissolved gas resistant, including chlorine, chlorine dioxide, ammonia, sulfur dioxide and volatile organic solvents and compounds
- Saturated sodium brine
- ORP (oxidation reduction potential)

Specialized pH glasses include:

- Dual pH & ORP elements to measure both parameters in one sensor
- Low profile impact resistant thick wall glass dramatically reduces breakage and resists high viscosity & abrasive fluids
- Low profile ORP element
- High pressure and temperature resistant glass, for -30 °C and up to 150 °C at pressures up to 200 psig
- Saturated sodium (brine) resistant pH glass
- High HF resistant pH glass (this is not simply thicker walled standard glass)
- Wide range pH glass for -0.5 pH (~6 molar acid) up to +14.5 pH (~6 molar base) range
- Low impedance glass for other OEM transmitters that do not support high impedance glass

pH/ORP Sensor Wiring With Extension Cable

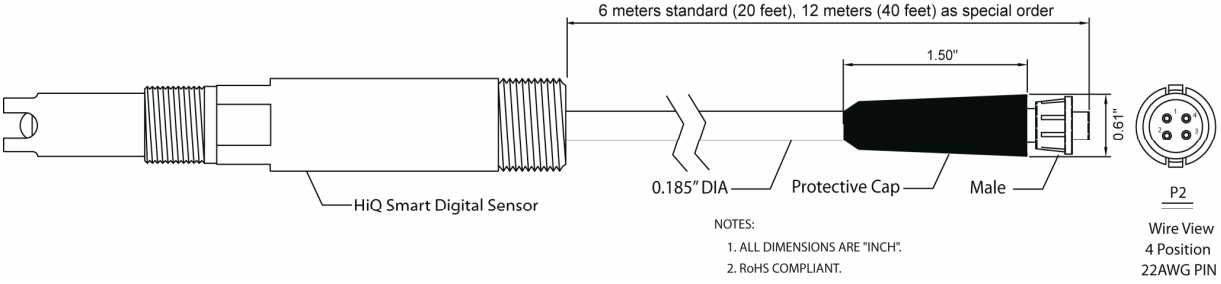
With our digital cable extensions you can locate the sensor up to 2,000 feet (610M) from the transmitter without signal degradation or interference in noisy industrial environments.

Digital cable extensions reduce your replacement sensor cost if you have long cable runs. The extension cables remain permanently installed and connected to the transmitter. Rather than replacing the entire cable run, you replace only the 10-20 foot long cable that's integral to the sensor.

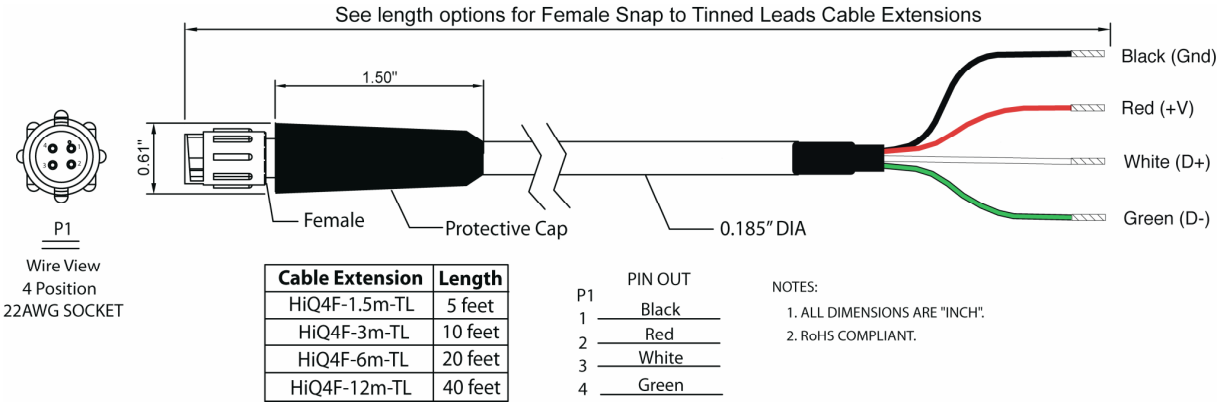
Digital pH/ORP sensors may be connected to the transmitter in three ways:

1. Directly to the transmitter using tinned leads.
2. To a cable extension with female connector on one end to the transmitter that is permanently wired using tinned leads.
3. Using cable extensions which connect to a female connector mounted on the analyzer enclosure that is pre-wired to the transmitter at the factory

Detail drawing for standard smart digital sensor with male snap connector cable termination

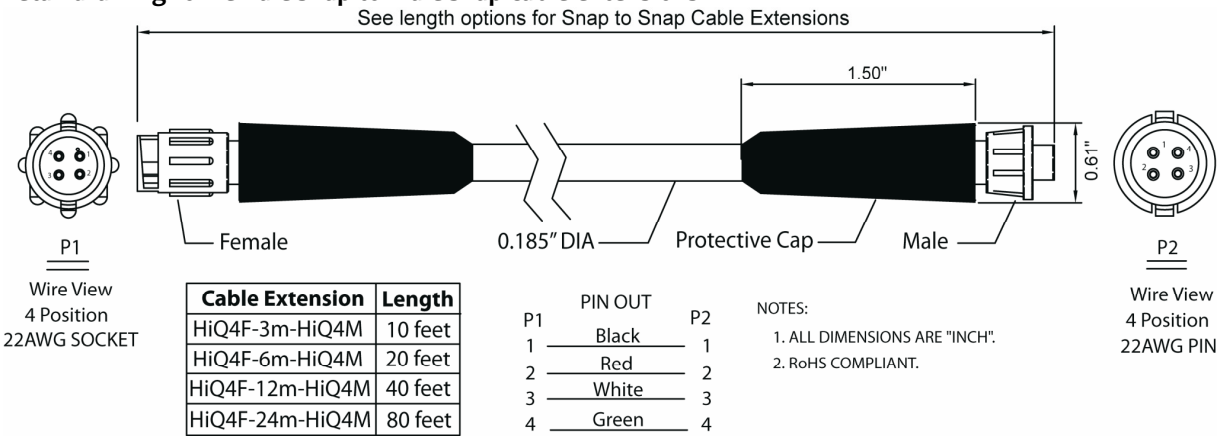


Detail drawing for female snap to tinned leads cable extensions:



Cable Extension	Length
HiQ4F-1.5m-TL	5 feet
HiQ4F-3m-TL	10 feet
HiQ4F-6m-TL	20 feet
HiQ4F-12m-TL	40 feet

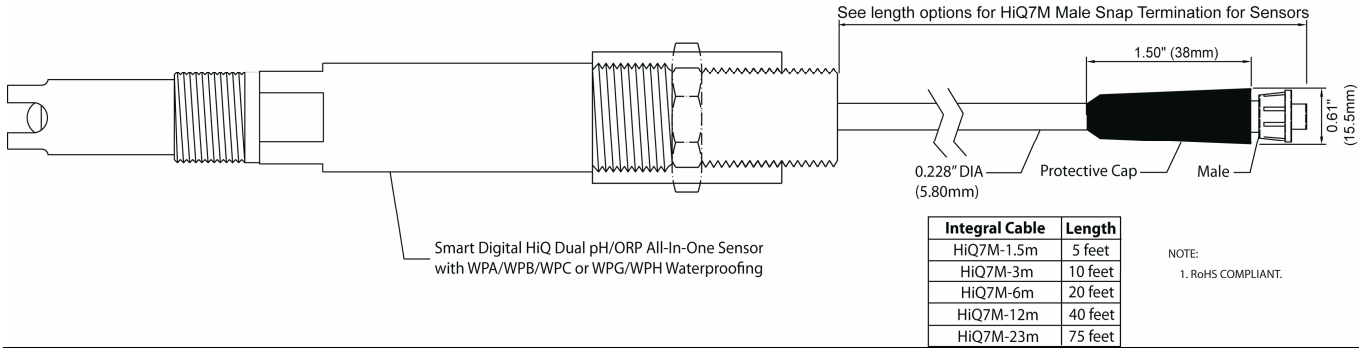
Detail drawing for female snap to male snap cable extensions:



Cable Extension	Length
HiQ4F-3m-HiQ4M	10 feet
HiQ4F-6m-HiQ4M	20 feet
HiQ4F-12m-HiQ4M	40 feet
HiQ4F-24m-HiQ4M	80 feet

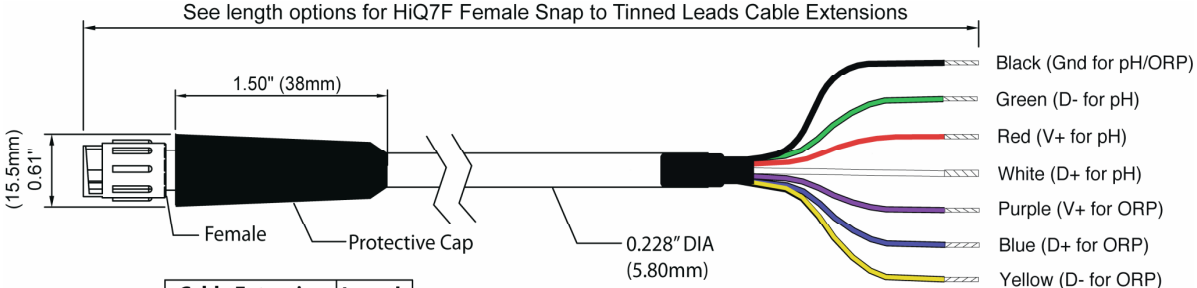
All-In-One Dual pH/ORP Sensor Wiring With Extension Cable

Drawing for smart digital Dual pH/ORP All-In-One sensor that measures both pH and ORP with standard male snap connector cable termination:



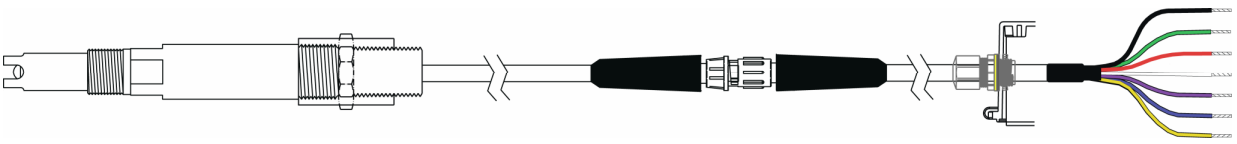
Integral Cable	Length
HiQ7M-1.5m	5 feet
HiQ7M-3m	10 feet
HiQ7M-6m	20 feet
HiQ7M-12m	40 feet
HiQ7M-23m	75 feet

Detail drawing for standard female snap to tinned leads cable extensions <u>Dual</u> pH/ORP sensors:



Cable Extension	Length
HiQ7F-1.5m-TL	5 feet
HiQ7F-3m-TL	10 feet
HiQ7F-6m-TL	20 feet
HiQ7F-12m-TL	40 feet
HiQ7F-23m-TL	75 feet

Installation Assembly Drawing for Smart Digital <u>Dual</u> pH/ORP sensors with Snap Connector Extension:



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Fax (610) 942-2769 • www.foxcroft.com • sales@foxcroft.com **Brochure FX-300-DpH**