

Quick Start Guide Foxcroft FX-300-F Fluoride Analyzer

Do not touch or move the sensor or sensor cable during operation. Doing so will induce a static charge and disrupt the readings from the high impedance fluoride sensor.

1. Mount the analyzer on the wall.
2. With water flow turned off install the sensor into the process fluid measuring tee with a quarter turn to lock. **Be sure to shake the sensor down sharply 1-2 times like a thermometer to dislodge any internal bubble that may be contacting the sensor tip before installing.**
3. Connect the sensor wires to the transmitter input terminals. Make sure that your ISE sensor is properly wired according to the schematic for "Sensors Without Preamplifiers" or "Sensors With Preamplifiers" depending the sensor type ordered.
4. Secure the sensor cable to the wall or mounting panel with cable ties to prevent cable movement during operation which can disrupt the readings.
5. Connect your 4-20mA output wires to **isolated inputs** in your control or recording device per the label on the output terminals and or the schematic. Do not apply power to the 4-20mA output.
6. Make sure your wiring connections are secure.
7. Apply 3-wire 100 to 240 VAC 50/60 Hz power to the analyzer by plugging the power cord into the socket on the right hand underside of the enclosure.
 - i) You may also connect to 3-wire 24VDC power if you have a dedicated (i.e. not shared with other equipment) 24VDC power supply and are not using the factory power supply.
8. Turn on the analyzer using the rocker switch next to the power cord socket.
9. The correct operating parameters are set at the factory to suit your application and can be viewed in "Setup" mode. The only parameters normally changed in the field are the high and low mA output values (P10 & P11). If you have problems review the parameters and if needed configure the analyzer module(s) as required. See Sections 4.1 and 4.2 below.
10. With the flow rotometer closed, open the input flow control valve and verify that water pressure will remain steady and not exceed 20 psig.
11. Use the flow rotometer and the backpressure valve to achieve a steady flow of 3 GPH minimum to 5 GPH. The flow rate must not fluctuate or fall below minimum to achieve valid results and avoid drifting.
12. With the sensor in the process fluid, **allow at least 4 hours for the sensor to reach electrochemical and thermal equilibrium.** Any readings produced before equilibrium is reached are meaningless.
13. After the sensor has reached equilibrium and the readings have stabilized, perform the 1-point offset calibration to standardize the sensor with an approved grab sample analysis result. **DO NOT PERFORM A TWO POINT CALIBRATION WITH STANDARD SOLUTIONS FOR A NEW SENSOR INSTALLATION.**

NOTE: If no keys are pressed for 10 minutes the display will show a flashing bar indicating it is in Energy Save mode. Press any key to return normal display mode. To turn off energy saving mode and show a display continuously, go to parameter 18 and toggle to off.

OFL and UFL Error Codes

The flashing "OFL" means that an overflow issue exists on the input while a flashing "UFL" means that an underflow issue exists on the input. When this error exists you will not be able to perform any programming or configuration of the transmitter until the issue is resolved. The "OFL" or "UFL" condition can be due to a variety of possible causes which are summarized below:

POTENTIAL TEMPERATURE INPUT RELATED PROBLEMS

- A temperature element is not properly connected to the transmitter input board. Electrochemical transmitters require a valid temperature input in order to operate properly.

- Check that each of the leads are firmly connected to the proper terminals per the wiring schematic
- If no sensor is available or the sensor employed does not have a temperature compensation element, please use a 110 Ohm axial resistor to simulate a P100 TC input @ 25°C or a 1100 Ohm axial resistor to simulate a Pt1000TC input @ 25°C.
- Check that the transmitter setting for the Pt100 or Pt1000 TC type matches the temperature element in the sensor.

POTENTIAL SIGNAL INPUT RELATED PROBLEMS

- The input signal value obtained from the connected sensor exceeds the lower or upper boundary limits possible for the input circuit. There are a variety of potential causes itemized below:

- Confirm that the proper type of sensor is being connected to the correct type of mating transmitter. For example: transmitters come in separate versions that are for use with sensors without integral preamplifiers and sensors that have integral preamplifiers.

- Leads are not secure or the color coding is not correct. Please refer to the documentation supplied in documentation with your shipment or contact the factory for assistance.

- The connected sensor is either damaged or expired. Connect a different known working sensor on the same transmitter to determine if the issue is with the input board or to the connected sensor.

- If you have gone through all of the troubleshooting steps and are still receiving the "OFL" or "UFL" error then most likely your input board has stopped working properly. Contact the factory.

FX-300-ISE Module Function and Programming List of Parameters

No	Parameter	Description	Range	Default
1	Lock	Software lock	On / Off	On
2	Address	Address on Modbus	Off, 1...247	Off
3	Temperature	Type of input	Pt100, Pt1000	Pt1000
4	Compensation	Temp. Comp. of pH	Auto, Set (Manual)	Auto
5	Comp. Temp.	Compensating temperature	0..150	25
6	Cable impedance	Impedance of Pt100 cable	0.0 .. 9.9Ω	0.0
7	Output variable	ISE or temperature	ISE, °C	ISE
8	Analog output range	ISE output range	0-20, 4-20	4-20
9	ISE ppm output range	Low (0-10.0), mid (0-100) and high (0-999)	10.0, 100, 999	10.0
10	0/4mA Set	Low ppm setpoint	0.00 .. 999	0.00
11	20mA set	High ppm setpoint	0.00 .. 999	10.0
12	Step change	mV increment per 'Up' or 'Down' button depression	0=0.02, 1=0.05, 2=0.10, 3=0.20, 4=0.50, 5=1.0, 6=2.0	2 (0.10mV)
13	View formula weight of ion	Grams per mol of ion	XX.XX per ion weight	19 (F only)
14	View current sensor offset	mV at iso-concentration	Per ISE sensor	-47 (F) ^a
15	View current sensor slope	mV per decade response	Per ISE sensor	-57.2 (F) ^a
16	0/4mA offset	Trim low	+/-9.99%	0.00
17	20mA gain	Trim high	+/-9.99%	0.00
18	Energy save	Energy save	On/ Off	On
19	Baudrate	Modbus	9,600/19,200	19,200
20	Back to default	Reset to default	Def = reset Par = no reset	Par

^a On the display this value will be flashing, which indicates a negative value. Parameters 9 & 15 are specific to Fluoride and cannot be changed.

Checking Parameter Settings

Check by entering “setup” mode and ensure parameter settings match the defaults shown on page 6. To change any parameter you must first turn off the software lock, parameter P01.

i) For systems supplied with Fluoride measurement module (transmitter) only:

- (1) Make sure the operating range (P09) matches the needs of your process: Low (0-9.99 ppm); Mid (0-99.9) or High (0-999)
- (2) Make sure the mA input of an external device you connect to matches the scaling of the transmitter's mA output (P10 & P11).
- (3) Make sure the temperature input (P03) is set to “999” for the PT1000 temperature element.

ii) For systems supplied with the FX-300-REL alarm relay & control module:

- (1) Make sure the analog input (P03) on the REL module matches the analog output of the ISE module (P08). Selections are 0-20mA or 4-20 mA.
- (2) Make sure display mode (P06) on the REL module matches the output variable (P07) on the ISE module (factory set to ISE).
- (3) Make sure the ISE Output (operating) range (P09) of the ISE module matches the ISE input range (P07) of the REL module.
- (4) Enter the value for the 0/4mA input (P09) on the REL module to match the 0/4 mA output (P10) of the ISE module.
- (5) Enter the value for the 20mA input (P09) on the REL module to match the 20 mA output (P11) of the ISE module.
- (6) On the REL module set the type of limit for alarm limit 1: Hi (max), Lo (min). Default is Hi.
- (7) On the REL module set the type of limit for alarm limit 2: off, Hi (max), Lo (min). Default is Lo
- (8) On the REL module set the alarm trip point for each limit by using the limit buttons on the face of the module. First unlock the software. Return to run (input) mode, press the Mode button until Limit 1 LED lights, and use the up/down keys until the set point is displayed. Press Mode button to light the Limit 2 LED, and use the up/down keys to enter the set point. Press the Mode button to return to run mode. The software will lock automatically after 10 minutes.

iii) **For systems supplied with the FX-300-TOT pH compensation and FX-300-pH modules:**

The analyzer is preconfigured as much as possible in the factory and requires little field configuration. Make sure the following parameters match between the ISE, pH and TOT modules for them to work in unison. Note that this is not a complete list of parameters, other parameters may need configuration in each module.

Parameter	ISE Par. No.	pH Par. No.	TOT Par. No.
ISE analog output (0-20mA, 4-20 mA) / TOT input	08		03
Free ISE range (Hi, Mi, Lo)	09		04
Scale 0/4 mA Free ISE output / TOT input	10		05
Scale 20 mA Free ISE output / TOT input	11		06
pH analog output (0-20mA, 4-20 mA) / TOT input		11	07
Scale 0/4 mA pH output / TOT input		13	08
Scale 20 mA pH output / TOT input		14	09
Temp. Compensation Mode (Default Auto / Man)	04	05	10
Temp. Compensation input (PT100, Default PT1000)	03	04	13
If a <u>2nd</u> pH, or ISE module installed, match its 0/40-20 mA analog output to	08	11	14
If a <u>2nd</u> pH or ISE module installed, match its measurement type (pH, ISE) to	07	10	15
If a <u>2nd</u> ISE module installed, match its operating range (Hi, Mi, Lo) to	09		16
If a <u>2nd</u> pH module installed, match its operating range (Hi, Mi, Lo) to		09	18
If a <u>2nd</u> pH or ISE module installed, scale 0/4mA output / TOT input	10	13	19
If a <u>2nd</u> pH or ISE module installed, scale 0/20mA output / TOT input	11	14	20
Type of TOTAL ISE output (0/4-20mA)	08	11	23
Scaling for 0/4-20mA TOTAL ISE output working range (Hi, Mi, Lo)	09		24
Scale TOTAL ISE 0/4mA output	10		25
Scale TOTAL ISE 20 mA output	11		26
Set pH Compensation mode (Default Auto)	04		27