WALCHEM

IWAKI America Inc.

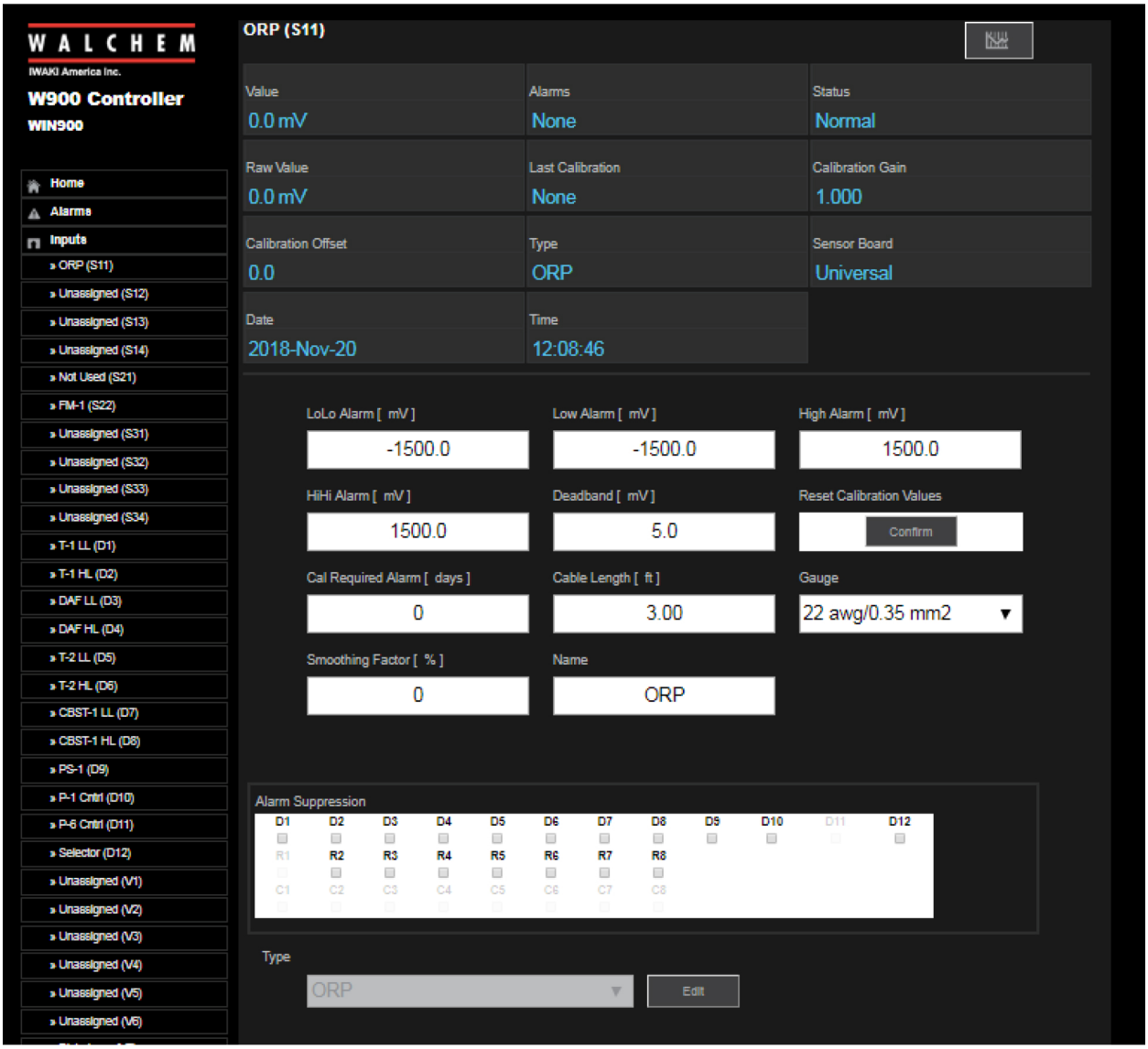
Application Note - W900 Controller - Analog Output, Disturbance Variable Control Mode

In this example, we are controlling bisulfite chemical feed to dechlorinate the water using an analog output based on an incoming analog water meter flow rate. We are monitoring ORP, and when ORP increases to a user defined value, this disturbance creates a numeric multiplier that is applied to the analog output that is controlling chemical feed. So chemical feed is increased based on the increase in the disturbance (which is the change in ORP).

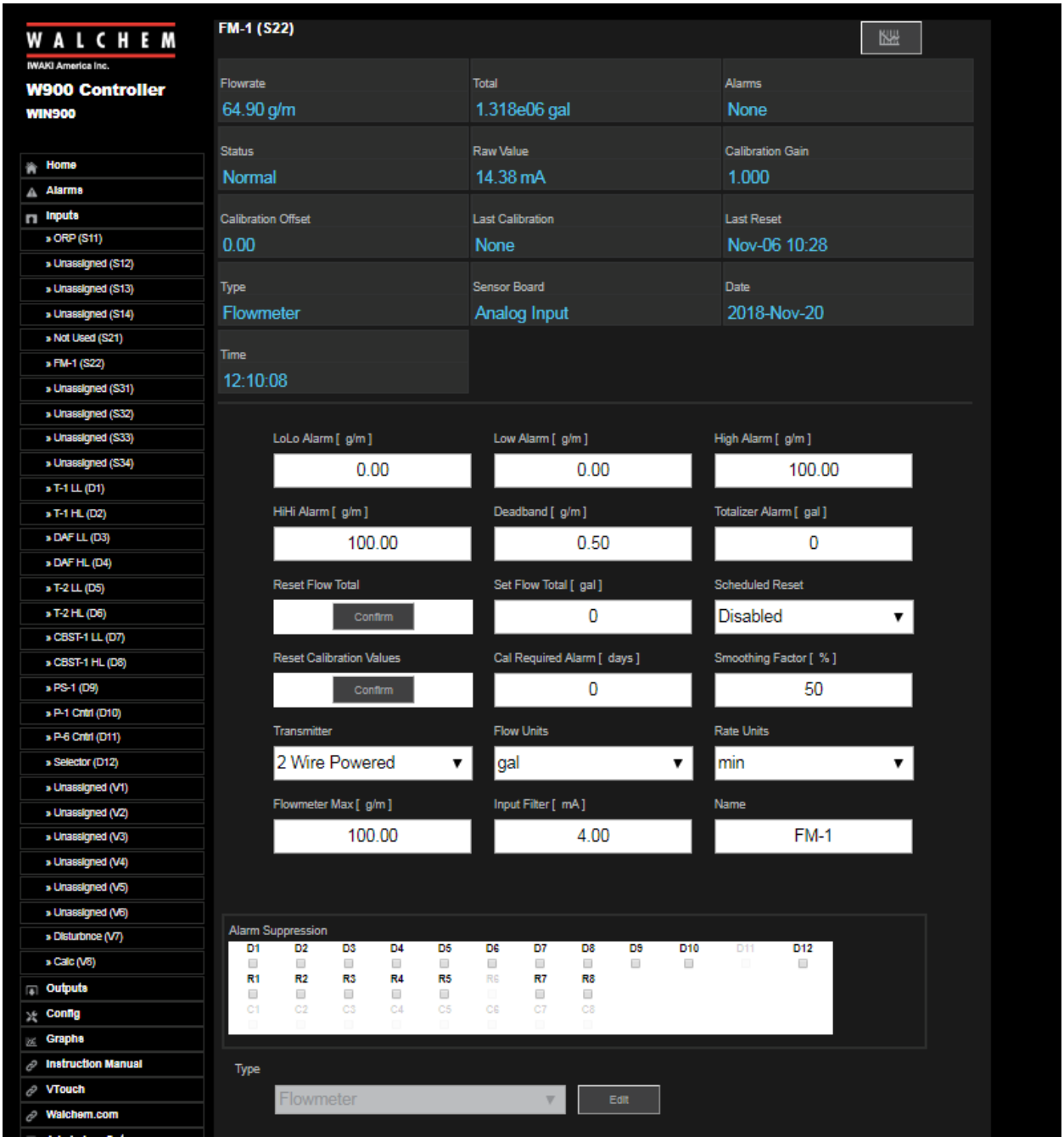
PROGRAMMING THE CONTROLLER

Inputs:

S11 = ORP sensor

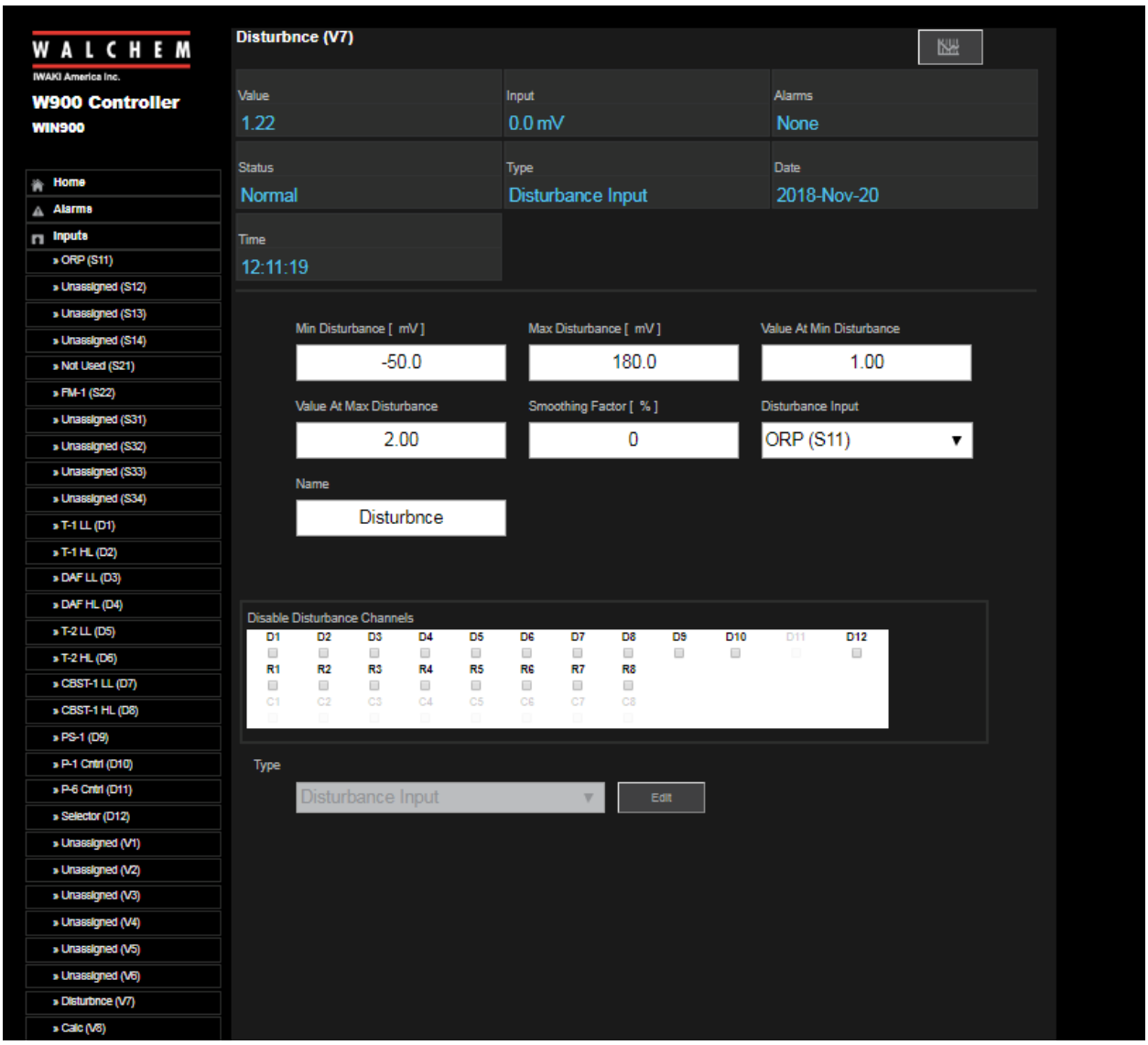


S22 = Analog flow meter, 0-100 gpm (4-20mA)



V7 = Disturbance Input; In this case it is ORP (S11). For the programming shown below, when ORP= -50mV the disturbance value = 1.00, and when the ORP = 180mV the disturbance value = 2.0. So as the ORP value goes from -50mV to 180mV, the disturbance value will go from 1.00 to 2.00. The screen shot below shows the ORP = 0.0mV which creates a 1.22 disturbance value based on our settings.

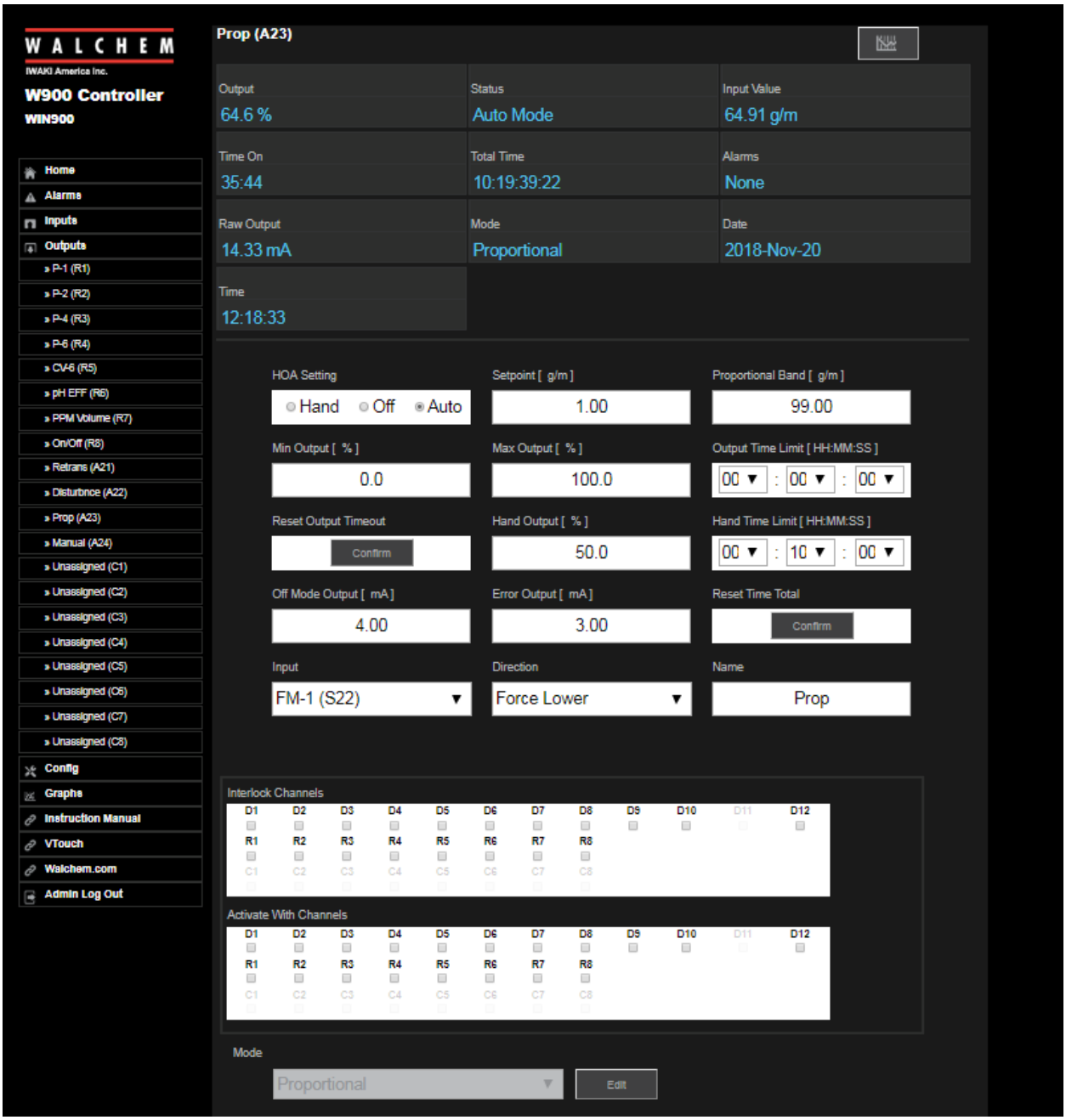
This disturbance value, in this case of 1.22, will be the multiplier applied to the analog output signal going to the chemical feed pump.



Outputs:

A23 = Proportional Control, analog output to chemical feed based on an incoming analog water meter flow rate, 0-100gpm. In this case, based on the settings shown in the screen shot below, at 1 gpm flow rate, the controller is sending 4mA to the feed pump, and at 100gpm the controller is sending 20mA to the feed pump.

Under normal conditions, this is how chemical feed is done. The ORP disturbance has not yet been factored in. See next pages for this.



A22 = Disturbance Control; Primary Output = A23 (Proportional control based only on flow rate), Disturbance Input = V7 (ORP)

You can see the primary output = 64.6% (A23), and the disturbance input = 1.22, which is then multiplied by the 64.6% to generate an increased output of 78.6%. So, the ORP value has caused a disturbance (or multiplier) of 1.22 thus causing the output to the chemical feed pump to increase until the ORP value decreases to a point where the disturbance (or multiplier) returns to 1.0.