

## QUICKSTART FOR AUTOMATIC SPILL GATE WITH DOWNSTREAM FLOW CONTROL

### 1. TO READ FLOW AND TARGET FLOW

Press the Following Keys: (-, 1, ↓, 0, ↓, ↓)

- ( 1 DSP, 2 SP .....
- 1** ( 0 Main / 1 Gate Pos Ctrl )
- ↓ ( 0 Gate Flow / 1 Gate Level )
- 0** ( Gate Flow Ctrl - M2 )
- ↓ ( Flow CFS = XX.XX / Flow Target = XX.XX ) *Current Flow and Target*
- ↓ (Level Dn Ft = X.XX / Position = X.XX *Current Level and Gate Position*

### 2. TO SET TARGET FLOW LEVEL

Press the following keys (-, 3, 1, 2, ↓, CLR, (flow target), Enter

- (1 DSP, 2 SP, 3 Logon .....
- 3** (Logon Code = 1 )
- 1**, ENTER (1 DSP, 2 SP .....
- 2** ( Flow Target )
- Clr** ( XX.XX will disappear)

Key in New Target Flow ( Example 14.5 )

**Enter** ( 14.50000)

- Returns to Main Menu

3. **DEFAULT SET POINTS** (Accessed by -, 2 ) ( -, 3, 1, ENTER, - 2 to change parameters)

Alarm Delay	1.00000	
Battery Low	11.2	( Lowest acceptable battery voltage )
<b>Dead Band</b>	<b>0.30000</b>	<b>Maximum deviation from Target without correction</b>
<b>Motor Run. Min</b>	<b>0.5</b>	<b>( Shortest Motor Pulse Length )</b>
<b>Motor Run Max.</b>	<b>50.00</b>	<b>( Longest Motor Pulse Length )</b>
<b>Maximum Interval</b>	<b>240</b>	<b>Time (in seconds) between corrections</b>
<b>Run time Error Multiplier</b>	<b>50</b>	<b>( 0 – 100) Amplifies or decreases motor runtime for changes</b>
Flow SDR 20 mA	150	Maximum Range of SDR
Flow SDR 4 mA	0	Minimum of SDR Range
Flume Width (FT)	12	Flume Width
Gate 4 mA	5.78	( Gate position at 4 mA )
Gate 20 mA	0.00	( Gate Position at 20 mA )
Gate Filter	1000	( Averaging time for gate readings - ms )
Gate High	2.48	(Software upper limit for gate position )
Gate Low	0.02000	( Software lower limit for Gate Position )
HOA	1.0000	( Software handoff to automatic – 1 is on )
Level 1 Down WISI	NA	(Does not apply)
Level Up 20 mA	NA	
Level Up 4 mA	NA	
Level up Filter	NA	
Level 1 WISI	N/A	

Level WISI Offset	N/A	
<b>Mode</b>	<b>2.0</b>	<b>( Setting for Flow Control )</b>
<b>Target Flow</b>	<b>XX.XX</b>	<b>( Desired flow at flume )</b>
Target Level	NA	
Pos Target	NA	
Version#	9	Software Version
WISI Poll Time	N/A	
X Reset (0 = Default	96.00	Standard Default

**OPERATIONAL GUIDE FOR FARMER'S INDEPENDENT HEADGATE**

Prepared for

FARMER'S INDEPENDENT DITCH COMPANY

By

Dynotek LLC  
13931 W 54<sup>th</sup> Ave  
Arvada, CO 80002

## INTRODUCTION

This guide describes the operational performance of the automated headgate actuator installed on the Farmers Independent Ditch off the South Platte river near Platteville, Colorado. Dynotek has installed a solar-powered automatic operator to raise and lower the gate as needed to maintain flow rates as allocated by the State of Colorado in accordance with ditch priorities.

In addition to a DC Motor with 1:1 gear ratio, the operator includes a RUG 3 PLC (Programmable Logic Controller ) to collect flow data from the flume, and translate it into gate commands via closed loop operational Control, and a Cell based wireless communication system. Flow set points are programmable either through the front panel, or over the internet using the cell modem and hosted internet site. Flow data from the Colorado DWR stage recorder at the flume is transmitted by hardwire to the RUG 3 PLC to maintain target flow levels. .

## OPERATION

When required for level control, the system can be set to Automatic, with Target Flow levels entered into the PLC. As river levels change, the gate will raise and lower, matching flow at the flume to the set Target level. Targets can be entered directly into the PLC front panel, or through the internet interface provided at [www.satalarm.com](http://www.satalarm.com). Access codes for this site will be provided to the ditch company for authorized personnel.

Other functions that can be addressed are Flow Rate, Set Point, Gate Position, and System Status. These items are reported at regular intervals (normally 15 minutes) and posted on the internet. Polling (requests for information) and re-setting target can be done at any time. Alarms can also be set for various conditions, such as reaching high or low gate limits, low battery level, or excess flow levels. An alarm condition will result in a text message being sent to up to 3 operators who are designated by the Ditch Company to receive alarm calls

### ENTERING PLC PARAMETERS

The PLC is programmed to provide flow control when all correct parameters are entered. The programming guide on the following pages shows the correct keystrokes for accessing system parameters. Operations covered include: 1. READING FLOW AND TARGET FLOW 2. SETTING TARGET FLOW, and 3. DEFAULT SETTINGS.

### CUSTOMER SERVICE

For further information or guidance on Automated Gate System operation, please call Dynotek Customer service at 303-748-6574.