

# ACC2 Decoder Irrigation Controller Programming Specification

## Part 1 – General

- 1.1 The controller shall be a full-featured commercial-industrial product for the purpose of irrigation management and monitoring of control valves, flow, and sensors, via two-wire decoder connections. The controller shall be a 75-station base model expandable with 75-station input modules up to 225 stations.

## Part 2 – Programming and Operational Software

### 2.1 General

- A. Display shall be selectable in 12 languages.
- B. The display shall include selectable settings for date, time, units of measurement, and regional preferences.

### 2.2 Programming

- A. The controller shall have 32 independent programs with unique day schedules, start times, and station run times.
- B. Each program shall allow Day of Week, Interval, or Odd/Even schedule types.
- C. Each program shall offer up to 10 start times.
- D. Each program may be allowed to overlap, stack, or SmartStack™ to a user-specified maximum number of simultaneous programs.
- E. Each program may have programmable Non-Water Windows, during which automatic irrigation will not be allowed.
  1. Missed irrigation as a result of water window violations is logged and announced as an alarm.
  2. Manual irrigation for maintenance purposes shall not be inhibited by Non-Water Windows.
- F. Programs may be configured as Automatic, Start to End, or Manual only.
  1. Start to End programs shall cycle continuously from a start time to an end time.
  2. Manual programs are only initiated by the user from a command, remote control, or Conditional Response statement.
- G. Each station shall be programmable in hours, minutes, and seconds of run time, from 1 second to 12 hours.
- H. The controller shall allow the creation of up to 64 “blocks” of up to 8 stations each, used to facilitate programming and operation of larger systems.

1. The blocks may be assigned a single run time within a program, and all stations will run together as a group.
- I. Each program may be assigned a programmable delay between stations, to allow for slow-closing valves or pressure recharging.
- J. Each station or block may be assigned Cycle and Soak settings to prevent runoff and waste by dividing run times into absorbable increments.

### 2.3 Operating System

- A. The controller display shall offer copy and paste functions for data entry tasks (e.g., Cycle and Soak, run times, program day schedules, flow zone and P/MV assignments, etc.).
- B. A graphical display shall graph the start times and durations of each program over time to allow the user to see the relationship between overlapping programs.
- C. The controller shall have Seasonal Adjust settings in 1% to 300% increments. Seasonal Adjust may be set by program in any of the following ways:
  1. Controller level (adjusts all programs for ease of use)
  2. Program level (adjustment by individual program)
  3. Monthly (pre-programmed adjustment for each month of the year)
  4. Solar Sync™ (automatic daily adjustment from an external sensor)
- D. The controller shall have true Calendar Date Off programming allowing specific dates to be skipped at any time of year by program. Off dates may be recurring or one-time occurrences.
- E. The controller shall provide a User Management function to limit access to programming and other operations with unique passwords for multiple users, permitting either full or partial access to controller functions.
  1. User logins and activities shall be tracked by user ID, if password security is enabled.
  2. The controller shall automatically log users out after a period of inactivity.
- F. The controller shall allow Easy Retrieve™ backup of all programming and configuration to preserve the original configuration, which may be restored anytime.
  1. The backup file shall also be stored to an SD card if desired.
  2. Multiple backups may be stored with unique file names on the SD card for different scenarios.
- G. The controller shall log all incidents and activity, organized into the following:
  1. Alarm Logs shall include the last 250 alarm events with date/time stamp to the second.
  2. Controller Logs shall include the last 250 controller events.
  3. Station Logs shall include the last 1,500 recorded irrigation events of all types.
  4. All logs shall appear in the selected language of the controller.

#### H. Flow Operations

1. Controller shall feature independent flow management and flow monitoring in each of up to 6 flow zones.
2. Controller shall allow flow budgeting at flow zone and mainline levels to monitor total monthly water usage, and provide an alarm when the budgeted amount is exceeded.

#### I. Flow management shall allow the controller to schedule simultaneous stations on within each flow zone, based on their flow characteristics, to reach a user-programmable rate of flow for the duration of the water window.

1. Station flows may be “learned” via flow sensor or entered manually by the user.
2. Individual stations may be prioritized to ensure they water earliest in flow management scenarios.
3. Flow zone assignments shall be by individual station, so that multiple programs may operate their stations in a flow-managed state within a given flow zone.

#### J. Flow monitoring uses a flow sensor to monitor actual flow and intervene when high- or low-flow conditions are detected.

1. Controller shall allow the station flows to be learned and entered automatically.
2. The station flow values shall be adjustable for high and low flow alarm limits.
3. The station flow alarm settings shall have an adjustable delay factor to allow flow to stabilize.
4. Each flow zone shall have an absolute high-flow limit, independent of the station-level flow monitoring.
5. Each flow zone shall allow unscheduled flow allowances to permit manual watering within user-programmable limits.
6. Each flow zone shall include adjustable recovery settings for high-level flow alarms, allowing irrigation to be automatically allowed after an elapsed period of time, or manually only, requiring a user to visit and clear the alarm.

#### K. Flow operations shall also include the ability to assign a separate flow sensor and master valve to the mainline level, above the independent flow zones, to monitor and protect long runs of mainline pipe

1. Flow monitoring at the mainline level shall allow faster reaction to high or unexpected flow conditions, without the delay of station-level diagnostics.
2. Mainline protection may have its own monthly water budget, high-flow, and unscheduled flow limits separately from lower-level flow zone assignments.

#### L. The controller shall permit the creation of Conditional Response statements, permitting sensor inputs or other conditions to trigger pre-programmed actions on the part of the controller.

1. A Conditional Response may allow a sensor input to start a station, block, or program.

2. The response shall be configured to either pause all other irrigation and execute the response immediately, or to execute the response together with other flow-managed activities.
  3. A Conditional Response may be configured to activate an external Status Output Station to provide a visual notification that the controller is in an alarmed state.
  4. A Conditional Response may be configured to switch from one water source (P/MV) to another based on the status of an external sensor switch.
- M. The controller shall feature a separate decoder diagnostic menu with functions to:
1. Program decoders
  2. View status or configuration of individual decoders
  3. Assign stations from one decoder output module to another
  4. Create a decoder inventory
  5. Perform diagnostic tests and display current draw for all components of the two-wire system
- N. The controller shall include a built-in wire tracking function, that generates a traceable sine wave on the two-wire path for use with standard current clamp meters to locate line faults.
- O. The controller shall include a solenoid finder feature, to chatter solenoids for up to 30 minutes to facilitate finding lost valve boxes in the landscape.

