Overview

Thursday, 21 April 2022 22:07

Basic design = numerous local modules (PICAXE) linked by RS485 to a Central Arduino.
The Arduino is connected to a Raspberry Pi web server used to configure it.

Features:

- Watering valves: Timed turn on & off according to a schedule.
- Watchdog
- Flowrate sensor to verify correct operation / detect problems and to record volume
- Rainwater tank pump control;
- Rainwater tank level sensor
- Send email in case of problems?

User interface web page:

Define a watering cycle:

- Sequence and duration of valves

Schedule:

- for each watering cycle, define the day and times that it should occur

Manually trigger; now, or oneshot.

Error detection on web page?

Modules

Thursday, 21 April 2022 22:17

PICAXE use RS485 to communicate with the central arduino

The Arduino also controls the power supply to the PICAXEs and the relay modules, to shut down systems which are malfunctioning

Planned modules:

1) 7-output relay module for the vegetable garden
2) Pump control, pressure sensor, and flowrate sensor for the lower garden, plus 1x relay for lawn circuit 1 and 1x relay for master flow valve
3) 3x output for lawn + fruit trees
4) 4x output for the lawn and above-pool slope
5) (Mouse traps in the roof)
6) Car charger

Arduino

Thursday, 21 April 2022 22:38

Error detection logic-
Rules about maximum duration, maximum number of valves open at once
Flowrate check expectation

Defines:

1) Sequences (by ID) - valves and times:

Valve# On, Valve# Off, Wait

2) Define schedule.

When the Raspberry defines a sequence and a schedule, the Arduino checks it for errors and replies with error msg if any.

Arduino has its own RTC and synchs with the PI as well.

Communicates with the PI through GPIO serial.

Configuration settings:

- Expected flowrate for each valve. Expected pressures. Alarm thresholds. Maximum run time.
- Maximum flowrate that can be supplied

Commands from PI to Arduino:

- Test commands
- Clock synch
- Valve status, sequence status
- Configure settings
- Configure sequences
- Configure Schedules
- Start/Stop manual control