# Agro-dispenser and Indicator

## Group:Crodeators

## 1.Members:

*Gangesh Gudmalwar (140050058)*
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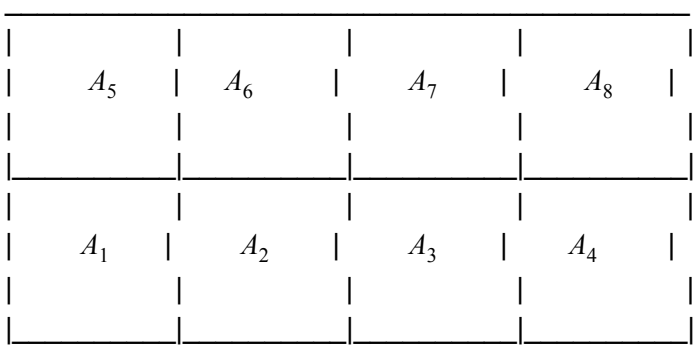
*Suyash Bhatkar (130050010)*

## 2.High level Architecture:

We will consider a constant area and divide it into 8 parts ( $A_1$ , $A_2$ , … , $A_8$ )




Each of the area will have two counters ( $B_1$ , . . . . , $B_8$ )(each a vector of 5 bits) and ( $C_1$ , . . . . , $C_8$ )(each a vector of 10 bits).
Counter $B_i$ represents the number of days land have been barren.
Counter $C_i$ represent the number of days since the plants in that area were planted

The Agro-dispenser will travel along the grid of the particular partition of the area at first and then to the other partition and will update the counter using the clock.

Whenever the Agro-dispenser enters an area block say $A_i$ , it takes input humidity (H: 3 bit vector) of that area block and the type of crop planted in

that area (Cr: 3 bit vector). The Agro-dispenser travels horizontally and then changes the row and thus in this way covers the complete block of area and then shifts to another part of land, say $A_{i+1}$ .

When the agro-dispenser is inside an area block it goes to each crop and then takes input the height of that crop(Ht: 3 bit vector) and health of that crop and then decides whether to cut it or not. It gives a 2 bit signal (Cut: 2 bit) to cut the crop (00 represents dont cut, 01 to cut it till height 7 and 11 to cut it from the root which will be needed when the duration of the crop is over and it may rot).

## 3. Description of Functionalities of Blocks

**(i) Crop Height & Health Checker** - It takes the height of crop(Ht: 3 bit vector) and health of the crop(Hl: 1 bit, 1 to represent dead and 0 to represent normal) and gives signal(Cut: 2 bit vector either 00, 01(cut till 7) or 11(report and uproot completely) ) to the controller.
**(ii) Humidity Checker and watering system -** It takes the humidity(Hd: 8 bit vector) as input after entering an area block and sends a signal to water (W: 8 bit vector to denote the level of tap to be opened to water that area block)
**(iii) Seed dispenser -** It takes the counter $B_i$ as input before entering an area block and then give a single bit output(S: 1 bit) to signal to dispense the seeds when the land is left barren for 30 days.
**(iv) Watering -** It takes the S as input and then decides whether the seeding is to be done or not and then directs the dispenser to water the soil completely i.e. sends 11111111 signal to the vector W.
**(v) Soil tiller -** It takes the counter $B_i$ (no. of days since when the land is barren) as input and then directs the Agro-dispenser to till the soil if land is barren since 1, 3, 5 days (first 3 times on alternative days).
**(vi) Duration Counter maintainer -** It takes the counter $C_i$ , S and Cut as input and then activates or deactivates the duration counter.

**(vii)Barren Counter maintainer -** It takes the counter $B_i$, S and Cut as input and then activates or deactivates the barren counter.

## 4. Assumptions and Constraints

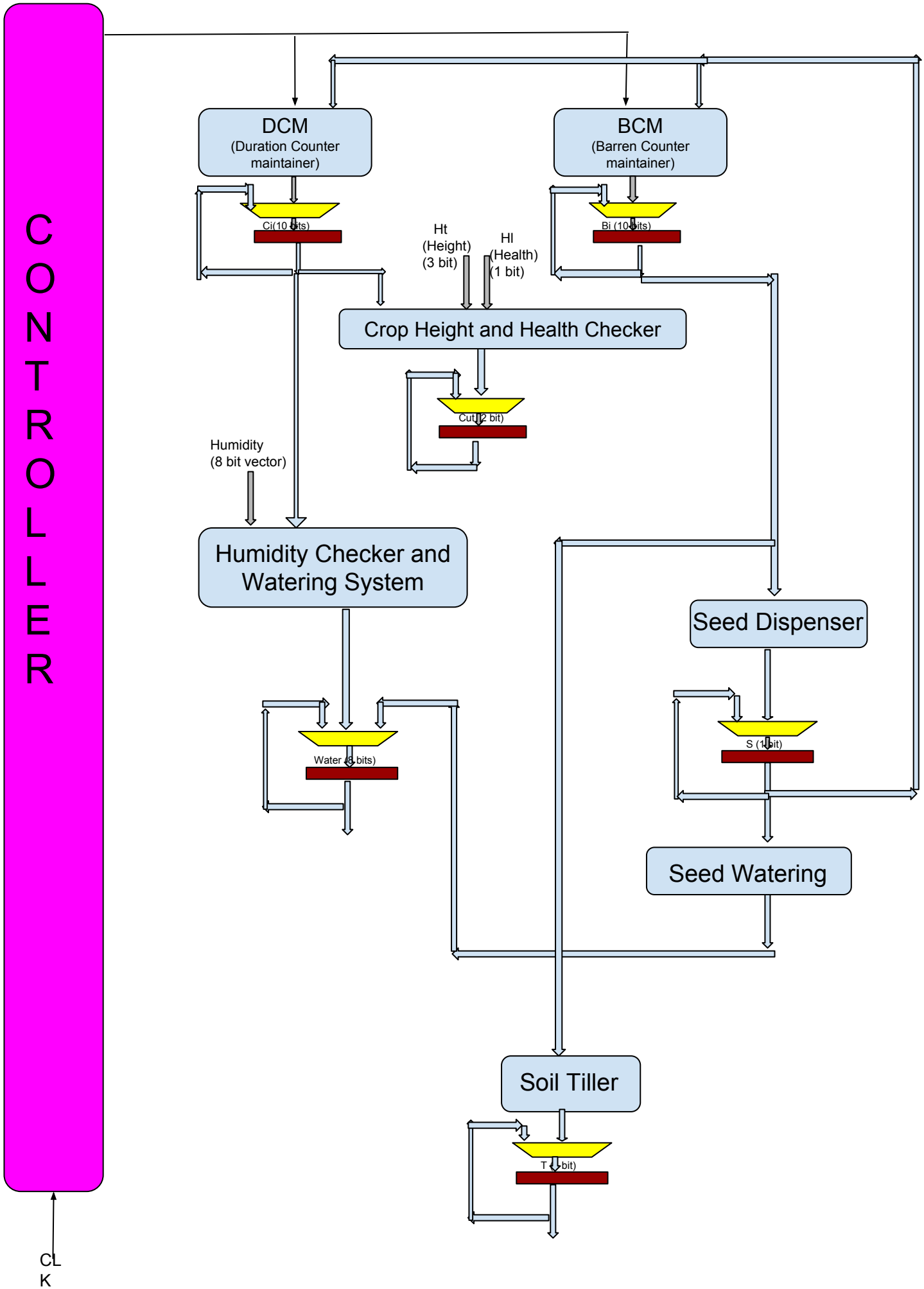
- The total area is constant ( $2X4 = 8m^2$ ).
- Humidity for a given area block is constant.
- Only a particular type of crop is grown in an area block.
- Total time taken for all operations on a crop is 1 second.
- Also the dispenser is directed manually.
- We are making an assumption that we can make more assumptions in future.
- All plants of an area block do not die at the same time i.e. majority of the crops in an area block are alive till the complete duration of the crop.
- To prevent the crop from growing beyond height 111 we will cut the crop till 110 if the crop-height is 111.

## 5. Plan for testing and verification

- Corner case: Say if one crop dies then the cutter should not cut all crops and we will seed in that area along with the all crop of that area block.

## 6. Plan for sharing of work :

- Tejesh Raut : (i)Crop height & health checker and (v)soil tiller
- Gangesh Gudmalwar : (ii)Humidity checker & watering system and (iv)watering
- Shrey Kumar: (vi) Duration counter maintainer and (vii) Barren counter maintainer
- Suyash Bhatkar: (iii)Seed Dispenser


CONTROLLER
CLK
DCM
(Duration Counter maintainer)
BCM
(Barren Counter maintainer)
Ci(10 bits)
Bi (10 bits)
Ht
(Height)
(3 bit)
Hl
(Health)
(1 bit)
Crop Height and Health Checker
Cut (2 bit)
Humidity
(8 bit vector)
Humidity Checker and Watering System
Water (8 bits)
Seed Dispenser
S (1 bit)
Seed Watering
Soil Tiller
T (1 bit)