**Protocol guidelines**

The system consist of one master and many number of bricks .Both to and fro communication is possible .The slave consist of two UART and the master consist of one UART .The TX pin of master is connected to RX pin of first slave and then the RX pin is connected to TX pin of the first slave.

TX

RX1

Master brick

TX2

RX1

Brick 2

Brick 1

TX1

RX

RX2

TX1

The protocol consist of two frames

* Synchronization frames
  + Color Synch. Frame(C)
  + Name frame(N)
  + Potentiometer frame (conditions apply).(P)
* Data frames
  + Data forward frame
  + Data reverse frame

**Synchronization Frames**

**Color synch. Frame:** This frame consist of bits which defines the color of the indicator LED placed on the brick.

This bits moves from master to slave and it is a permanent frame. It will be sent from master to the first slave and then moves to the second slave and so on. (Master to Slave).The first bit of this frame will consist of a bit(C) which helps the slaves to identify that it is a color synch frame.

**Name frame:** This frame consist of bits which tells the master the address of the brick. When each new brick is connected the slaves name is sent to the master through each slaves. The bits are send from slave to master brick.(Slave to Master).The first bit of each frame consist of a bit which defines that it is a name frame.

**Potentiometer frame:** This frame is introduced in the protocol when potentiometer is connected in the sytem.The bits are transferred from master to slaves. Used when both the potentiometer and LED bricks are connected.

**Data frames**

**Data forward frame:** The data from the master to the slave is sent through this frame. It moves from master to slaves. It is a decrementing frame. Null bits are being used in this frame format.

**Data reverse frame:** The data from the slave to master is sent through this frame. The frame moves from slave to master. It’s an incrementing frame. Null bits are being used in this frame format.