YBOT CAN BUS PROTOCOL

Using Standard Frame

* Identifier (11 bits)
  + NodeID = Tower# (0-31)
  + DestinationID = Destination Node’sID
  + OutgoingAddress = NodeID << 5 &’d DestinationID
* Message ( 8 Bytes )
  + Byte[0] = Message Type filtered by value
    - 0 = Report Node’s Status
    - 1 = Light Control
    - 2 = Game Mode
    - 3 = Transmitter State
    - 4 = Outputs
    - 5 = Node’s Status Response
    - 6 = Node Function
      * (CANBUS only, 1-Wire only, Testing,…)
    - 7 = Tower Select
* Report Status – 0
  + Reports back current status of node in following format
    - Byte[0] = Node Status Report
      * 5 = Report Node Status
      * 9 = Report Test Status
    - Byte[1] = Light Color Value
    - Byte[2] = Light State Value (Usually 1)
    - Byte[3] = Game Mode Value
    - Byte[4] = Button States (each bit will be the state of each button on the node)
    - Byte[5] = Output States (each bit will be the state of each relay on the node)
    - Byte[6] = Sun State
      * Regular Towers = (0 = off, 1 = on)
      * Solar Panel ( 0 = Not Aligned, 1 = 10 deg , 2 = 5deg, 3 = 0 deg, 9 = homed)
    - Byte[7] = Alarm State (0 = off, 1 = on, 8 = tested, 9 = not tested)
* Light Control – 1
  + Controls the NeoPixels connected to the Node each byte of the message the node receives will be used to set the light’s state
    - Byte[1] = Color Value
      * 1 = Red
      * 2 = Green
      * 3 = Yellow
      * 4 = Blue
      * 5 = White
      * 0 = Off
    - Byte[2] = State Value
      * 0 = Off
      * 1 = Solid
      * 2 = Flash and Latch
      * 3 = Flash
      * 4 = Color Wipe
      * 5 = Test/Demo
    - Byte[3] = Ring Value
      * 0 = All
      * 1 = Bottom
      * 2 = 2nd from bottom
      * 3 = 3rd from bottom
      * 4 = Top
    - Byte[4] = Repeat Value (number of times function should repeat (flash))
    - Byte[5] = Delay Value (delay in milliseconds)
* Game Mode – 2
  + Sets the Node’s Game Mode according the values received by the Node
    - Byte[1] = Game Mode Value
      * 1 = Ready / Standby
      * 2 = Start
      * 3 = Autonomous
      * 4 = Manual Autonomous
      * 5 = Manual Mode
      * 6 = End
      * 7 = Field Off
      * 8 = Debug
      * 0 = Reset
* Transmitter State – 3
  + Sets the Transmitter state according the values received by the Node
    - Byte[1] = State of Transmitter
      * 0 = All off
      * 1 = AutoMode
      * 2 = Manual Mode
* Outputs – 4
  + Sets the relay states according the value received by the Node
    - Byte[1] = Relay #
      * 0 = All
      * # = Relay#
    - Byte[2] = State
      * 0 = Off
      * 1 = On
* Node Status Response – 5
  + Print Report via Serial Port
* Node Function – 6
  + Sets the node function based on the nodes connected to the field
    - Byte[1]
      * 0 = Not Used
      * 1 = CANBUS only
      * ~~2 = 1-Wire only~~
      * 3 = XBee only
      * 4 = Wifi only
      * 5 = Mixed Mode
      * 6 = Change Baudrate
        + Byte[2] = Baudrate Index
      * 8 = Game Test Mode
        + Byte[2]

1 = Random Game

2 = Speed Game

0 = Regular Game

* + - * 9 = Network Test Mode
        + Byte[2]

1 = Network Response Testing

2 = Network Speed Testing

* Misc – 7
  + Byte[1]
    - 0 = Not Selected
    - 1 = Selected
  + Byte[2]
    - 0 = Null
    - 1 = Sun
    - 2 = Emergency
    - 3 = Home
    - 4 = Sun Tower
    - 9 = Calibrate
  + Byte[3]
    - Sun’s Tower Number (1 – 10)