UART COMMUNICATION PROTOCOL

For :

224 Channel SmartHome Project
From VB6 To Atmega32

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Firstly I Use String For Communication With The Microcontroller Because It Is Easy For Implement .

I Use Three Different Functions To Communicate :
- Toggle For ON/OFF Channels (Toggling Channels)
- Servo For Servo Channels (Setting Servo Angels)
- Sensors Refresher (Execute Servo Update)
- GetUpdates (Response = 8 Channels Data With (Y,N))

Toggle Order No Response : 6 String Chars

T	O	G	$X1	$X0	$Y

- $X0 , $X1 = ROOM_NUM That Has Channel Needs Toggling
  - - - - - - - EX : (01 , 02 , ….…. , 16)

- $Y = CHANNEL_NUM That Needs To Be Toggled
  - - - - - - - EX : (1…..8)

In Short :

The Command Is Sent Like This
"TOG015"   ; Toggle Channel 5 At Room 1
"TOG156"   ; Toggle Channel 6 At Room 15

Servo Refresh Order No Response : 9 String Chars

S	E	R	$X1	$X0	$Y	$S	$V1	$V0

- $X0 , $X1 = ROOM_NUM That Has Channel Needs Toggling

  - - - - - - EX : (01 , 02 , ….…. , 16)

- $Y = CHANNEL_NUM That Needs To Be Toggled

  (0 For "SERVO_A")
  (1 For "SERVO_B")

- $S = Angle Sign -ve OR +ve That Needs To Be Toggled

  (0 For "+ve")
  (1 For "-ve")

- $V0 , V1 = Angle Value That Needs To Be Set

  - - - - - - EX : (30 , 20, 07,.… , 90)
  (From -90 to 90)

In Short :

The Command Is Sent Like This
"SER160040"   ; Set Servo A By Angel +40 At Room 16
"SER031170"   ; Set Servo B By Angel -70 At Room 3

Sensors Refresher Order No Response : 5 String Chars

S	E	N	$X1	$X0

- $X0 , $X1 = ROOM_NUM That Has Channel Needs Toggling
  - - - - - - - EX : (01 , 02 , ….…. , 16)

In Short :

The Command Is Sent Like This
   "SEN01" ; Refresh Sensors For Room 1
   "SEN15" ; Refresh Sensors For Room 15

GetUpdates Order With Response : 5 String Chars
With Response : 22 String

THE Order :

U	P	T	$X1	$X0

- $X0 , $X1 = ROOM_NUM That Has Channel Needs Toggling
  - - - - - - - EX : (01 , 02 , ….…. , 16)

In Short :

The Command Is Sent Like This
"UPT04" ; Refresh Room 4 Number And Get It
"UPT13" ; Refresh Room 13 Number And Get It

THE Response:

R	E	S	$C7	$C6	$C5	$C4	$C3	$C2	$C1	$C0
$T1	$T0	$F	$G	$P	$As	$A1	$A0	$Bs	$B1	$B0

- $C Is The 8 Channel From HSB To LSB
- $T Is The Temperature
- $F Is The Flame Sensor Boolean
- $G Is The Gas Sensor Boolean
- $P Is The PIR Sensor Boolean
- $A Is The Servo_A Value With Sign Bit $As
- $B Is The Servo_B Value With Sign Bit $Bs

In Short :

The Response Is Received Like This :
"RES1101010038101160020"

It Means

ON/OFF Channel 0 = 0
ON/OFF Channel 1 = 0
ON/OFF Channel 2 = 1
ON/OFF Channel 3 = 0
ON/OFF Channel 4 = 1
ON/OFF Channel 5 = 0
ON/OFF Channel 6 = 1
ON/OFF Channel 7 = 1
Temperature = 38 `C
Flame Sensor = 1 (There Is Fire)
Gas Sensor = 0 (No Gas)
PIR Sensor = 1 (Movement Exits)
Servo_A Angle = -60
Servo_B Angle = 20