HMI

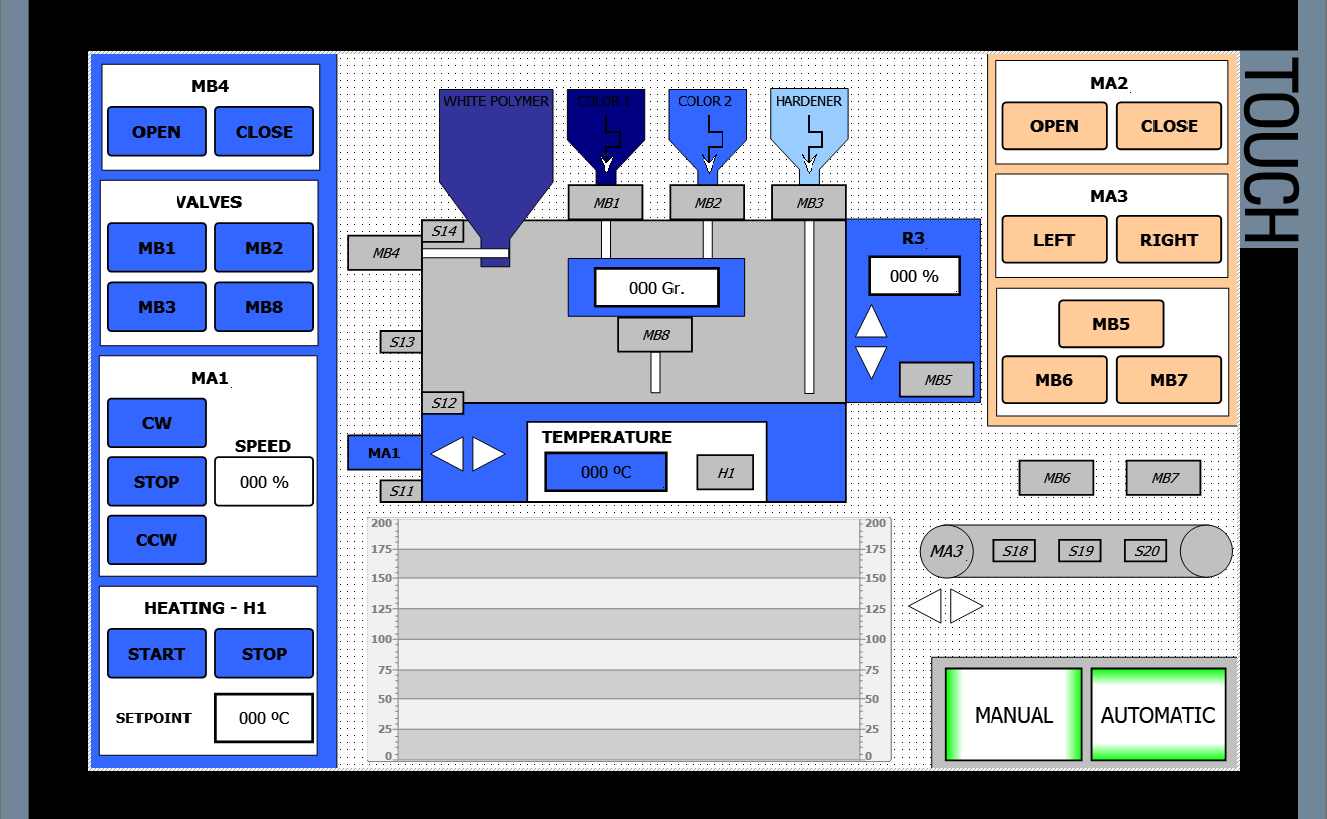
<Industrial Control>

Submitted by:

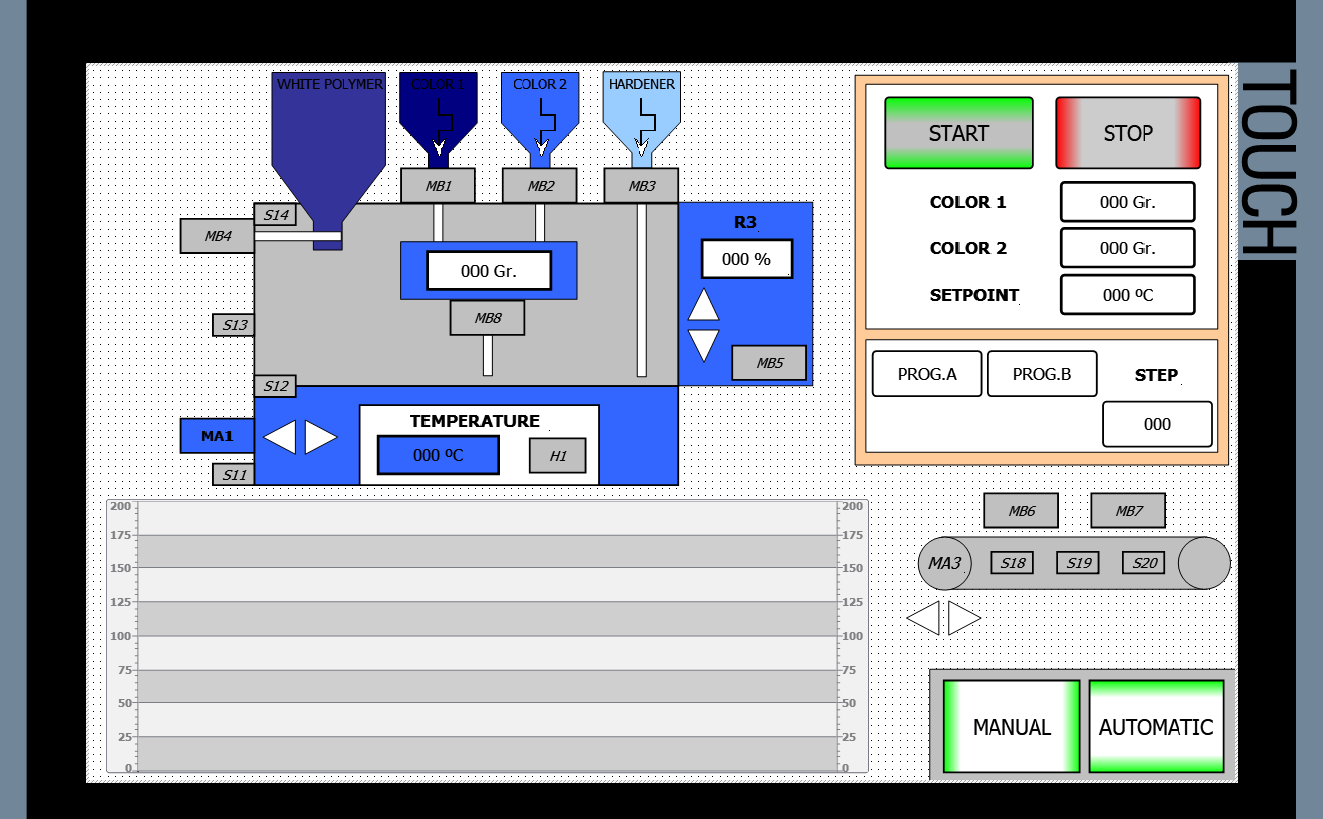
<Marco Túlio F. Hudson WS>

## MODULE B - PROGRAMMING

## HMI – SCREEN “MANUAL”



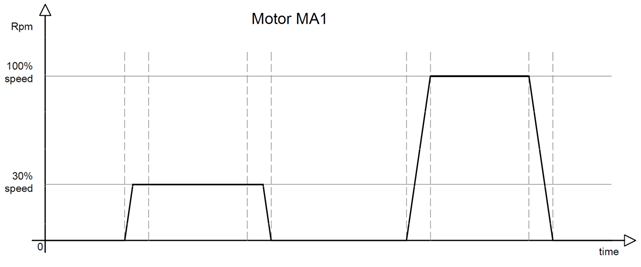
## HMI – SCREEN “AUTOMATIC”



## VSD

The changes in speed and the 0-speed will be reached in 3 seconds.

The ramps must be programmed in the variable speed device (VSD).



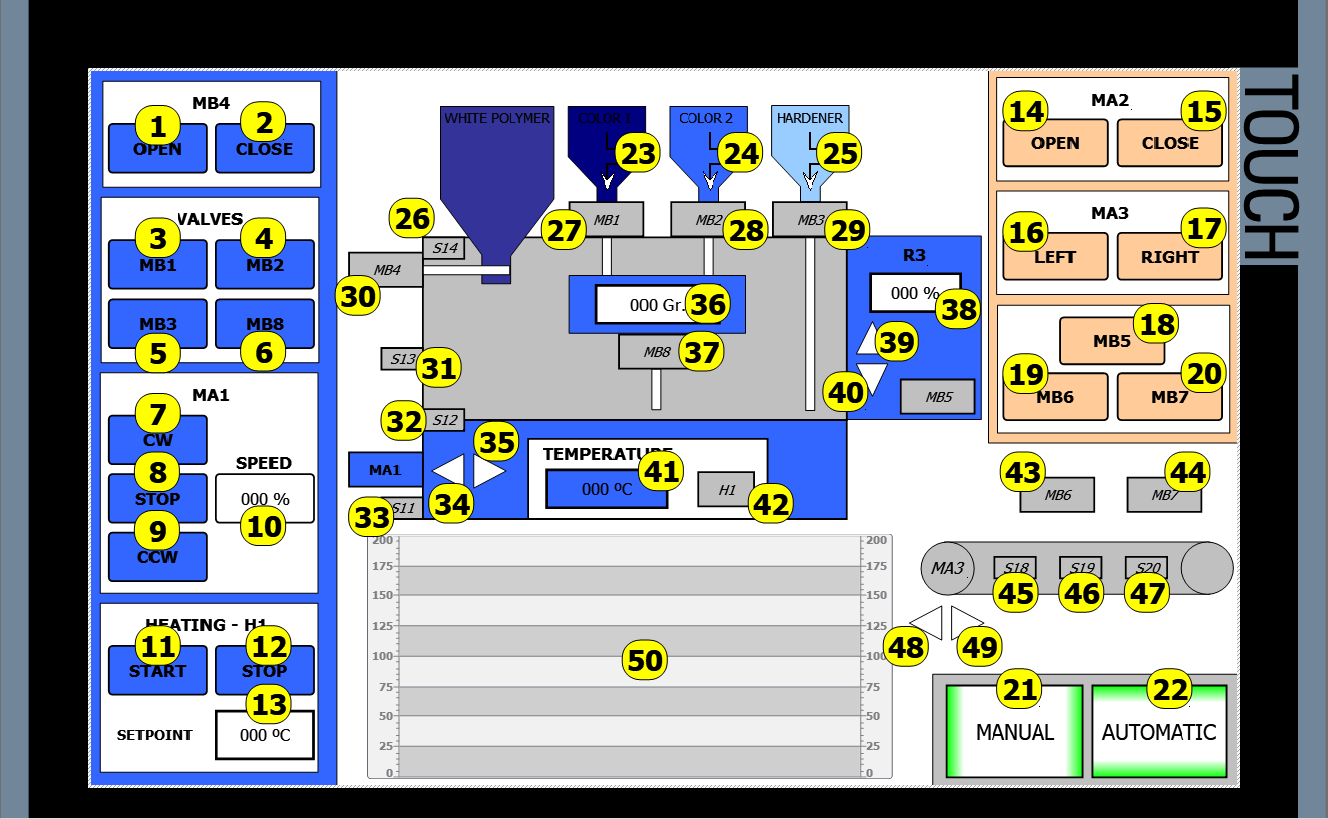
## PLC Inputs / Outputs

|  |  |  |
| --- | --- | --- |
| **SYMBOL** | **TYPE** | **COMMENT** |
| K3:DI-BIT\_0 | BOOL | PLC - Input (K3) |
| S11 | BOOL | PLC - Input (K3) |
| S12 | BOOL | PLC - Input (K3) |
| S13 | BOOL | PLC - Input (K3) |
| S14 | BOOL | PLC - Input (K3) |
| MA2\_Open (MA2\_Right - Q5) | BOOL | PLC - Output (K3) |
| MA2\_Close (MA2\_Left - Q6) | BOOL | PLC - Output (K3) |
| Q8 (Contactor for T2) | BOOL | PLC - Output (K3) |
| Q9 (Contactor for VSD) | BOOL | PLC - Output (K3) |
| P10 | BOOL | PLC - Output (K3) |
| P11 | BOOL | PLC - Output (K3) |
| P12 | BOOL | PLC - Output (K3) |
| P13 | BOOL | PLC - Output (K3) |
| K2-AO\_CH0 | INT | PLC - Output (K2) |
| K2-AO\_CH1 | INT | PLC - Output (K2) |
| K2-AI\_CH0 | INT | PLC - Input (K2) |
| S5 | BOOL | Sirius ACT Module - Input (A5) |
| S4 | BOOL | Sirius ACT Module - Input (A5) |
| S3\_L | BOOL | Sirius ACT Module - Input (A5) |
| S3\_R | BOOL | Sirius ACT Module - Input (A5) |
| P1 | BOOL | Sirius ACT Module - Output (A5) |
| P2 | BOOL | Sirius ACT Module - Output (A5) |
| S15 | BOOL | ET200SP - Input (K6) |
| S16 | BOOL | ET200SP - Input (K6) |
| S17 | BOOL | ET200SP - Input (K6) |
| S10 | BOOL | ET200SP - Input (K6) |
| S21 | BOOL | ET200SP - Input (K6) |
| K8:AI:U\_CH0 (R2) | INT | ET200SP - Input (K6) |
| K8:AI:U\_CH1 (R3) | INT | ET200SP - Input (K6) |
| K9:AQ-U\_CH0 | INT | ET200SP - Output (K9) |
| MA3\_Right (Q10) | BOOL | ET200SP - Output (K7) |
| MA3\_Left (Q11) | BOOL | ET200SP - Output (K7) |
| MB1 | BOOL | ET200SP - Output (K7) |
| MB2 | BOOL | ET200SP - Output (K7) |
| MB3 | BOOL | ET200SP - Output (K7) |
| MB4 | BOOL | ET200SP - Output (K7) |
| P16 | BOOL | ET200SP - Output (K7) |
| S6 | BOOL | IO-Link - Input (K10 + Pos.18) |
| S7 | BOOL | IO-Link - Input (K10 + Pos.18) |
| S8 | BOOL | IO-Link - Input (K10 + Pos.18) |
| S9 | BOOL | IO-Link - Input (K10 + Pos.18) |
| P14 | BOOL | IO-Link - Output (K10 + Pos.18) |
| MB5 | BOOL | IO-Link - Output (K10 + Pos.18) |
| P15 | BOOL | IO-Link - Output (K10 + Pos.18) |
| S18 | BOOL | ET200Eco - Input (A6) |
| S19 | BOOL | ET200Eco - Input (A6) |
| S20 | BOOL | ET200Eco - Input (A6) |
| MB6 | BOOL | ET200Eco - Output (A6) |
| MB7 | BOOL | ET200Eco - Output (A6) |
| MA1\_Speed | REAL | VSD (by Profinet) |
| MA1\_CW | BOOL | VSD (by Profinet) |
| MA1\_CCW | BOOL | VSD (by Profinet) |

## Control HMI / PLC Variables

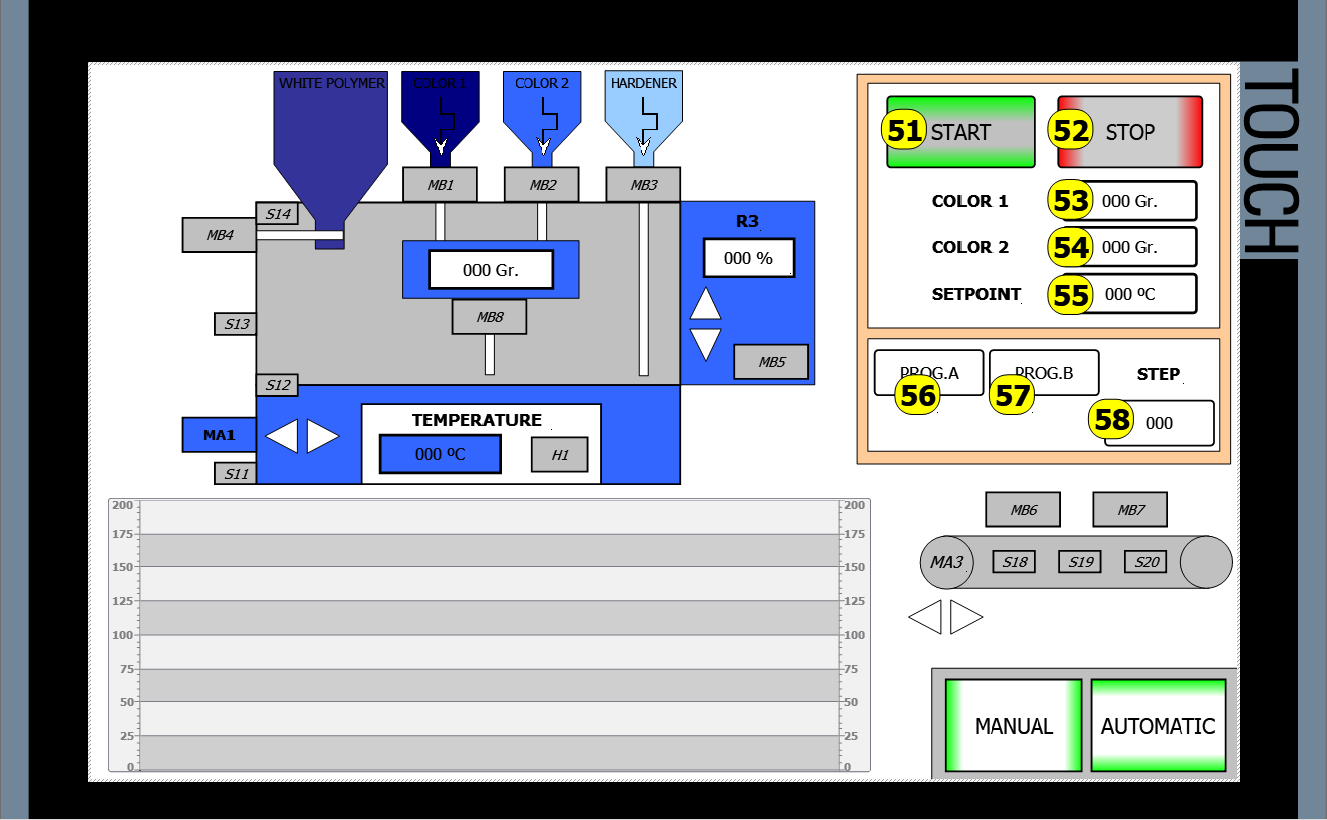
|  |  |  |
| --- | --- | --- |
| **SYMBOL** | **TYPE** | **COMMENT** |
| Emergency | BOOL | PLC-Variable |
| Reset | BOOL | PLC-Variable |
| Mode\_Auto | BOOL | PLC-Variable |
| Mode\_Manual | BOOL | PLC-Variable |
| MB4\_Open | BOOL | PLC-Variable |
| MB4\_Close | BOOL | PLC-Variable |
| MB1\_Button | BOOL | PLC-Variable |
| MB2\_Button | BOOL | PLC-Variable |
| MB3\_Button | BOOL | PLC-Variable |
| MB8\_Button | BOOL | PLC-Variable |
| MB8 | BOOL | PLC-Variable |
| MA1\_CW\_Button | BOOL | PLC-Variable |
| MA1\_Stop\_Button | BOOL | PLC-Variable |
| MA1\_CCW\_Button | BOOL | PLC-Variable |
| Start\_Heating | BOOL | PLC-Variable |
| Stop\_Heating | BOOL | PLC-Variable |
| Heating\_Setpoint | REAL | PLC-Variable |
| Temperature | REAL | PLC-Variable |
| Heater\_PWM | REAL | PLC-Variable |
| Heater\_ON | BOOL | PLC-Variable |
| Hysteresis | REAL | PLC-Variable |
| Point\_On | REAL | PLC-Variable |
| Point\_Middle | REAL | PLC-Variable |
| MA2\_Close\_Button | BOOL | PLC-Variable |
| MA2\_Open\_Button | BOOL | PLC-Variable |
| MA3\_Left\_Button | BOOL | PLC-Variable |
| MA3\_Right\_Button | BOOL | PLC-Variable |
| Drain\_tk4 | BOOL | PLC-Variable |
| MB5\_Button | BOOL | PLC-Variable |
| MB6\_Button | BOOL | PLC-Variable |
| MB7\_Button | BOOL | PLC-Variable |
| Balance | REAL | PLC-Variable |
| Thickness | REAL | PLC-Variable |
| Button\_A | BOOL | PLC-Variable |
| Button\_B | BOOL | PLC-Variable |
| Program\_A | BOOL | PLC-Variable |
| Program\_B | BOOL | PLC-Variable |
| Step | REAL | PLC-Variable |
| Start | BOOL | PLC-Variable |
| Stop | BOOL | PLC-Variable |
| Color1\_Gr | REAL | PLC-Variable |
| Color2\_Gr | REAL | PLC-Variable |
| Pause | BOOL | PLC-Variable |
| Cycle\_active | BOOL | PLC-Variable |
| MA1\_Speed\_Injection | REAL | PLC-Variable |
| Time | Time | PLC-Variable |

## Details: Screen Manual

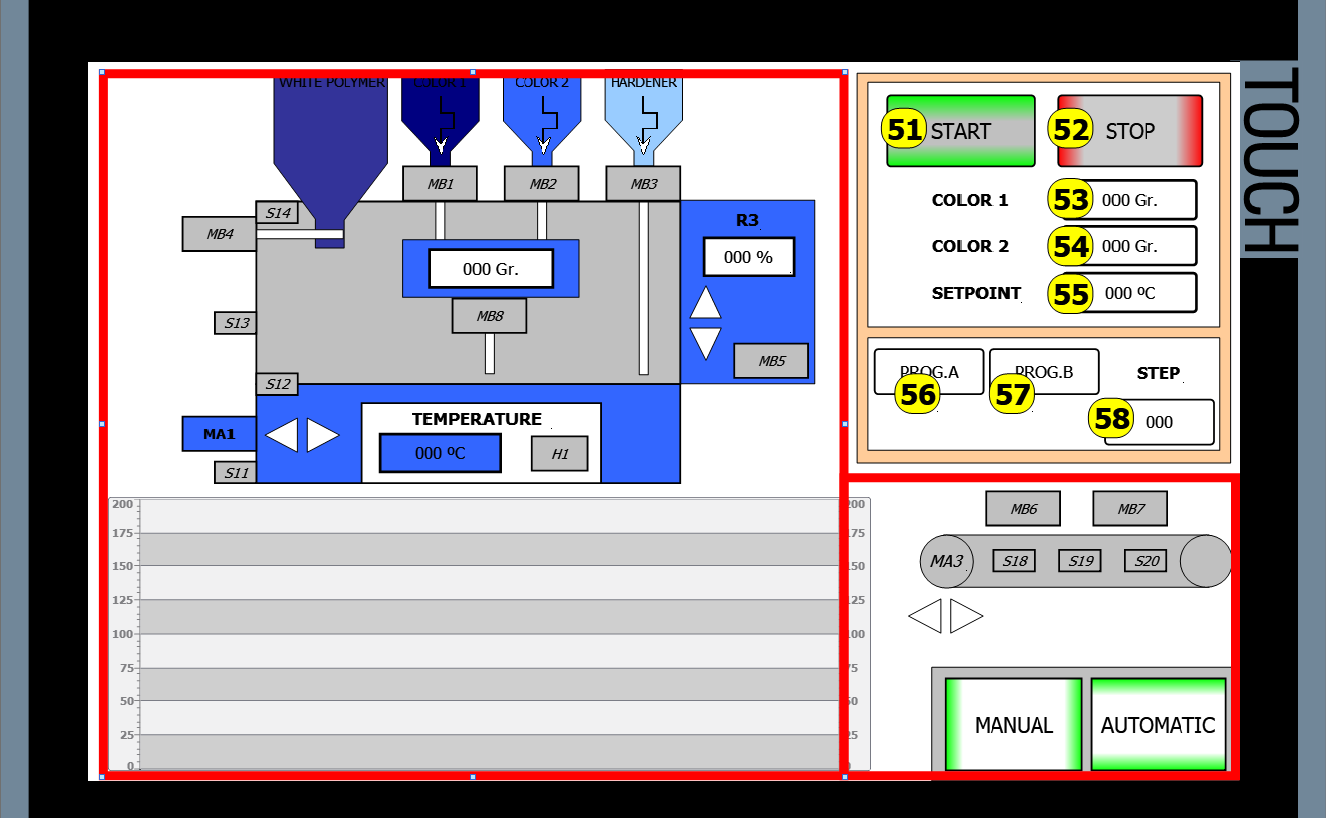


|  |  |  |  |
| --- | --- | --- | --- |
| **POSITION** | **VARIABLE** | **ACTION** | **COMMENT** |
| **1** | MB4\_Open | Button Event | Set bit while key is pressed |
| **2** | MB4\_Close | Button Event | Set bit while key is pressed |
| **3** | MB1\_Button | Button Event | Set bit while key is pressed |
| **4** | MB2\_Button | Button Event | Set bit while key is pressed |
| **5** | MB3\_Button | Button Event | Set bit while key is pressed |
| **6** | MB8\_Button | Button Event | Set bit while key is pressed |
| **7** | MA1\_CW\_Button | Button Event | Set bit while key is pressed |
| **8** | MA1\_Stop\_Button | Button Event | Set bit while key is pressed |
| **9** | MA1\_CCW\_Button | Button Event | Set bit while key is pressed |
| **10** | MA1\_Speed | Output field | Range: 0 to 110% |
| **11** | Start\_Heating | Button Event | Set bit while key is pressed |
| **12** | Stop\_Heating | Button Event | Set bit while key is pressed |
| **13** | Heating\_Setpoint | Input/Output field | Range: 50 to 200 ºC |
| **14** | MA2\_Open\_Button | Button Event | Set bit while key is pressed |
| **15** | MA2\_Close\_Button | Button Event | Set bit while key is pressed |
| **16** | MA3\_Left\_Button | Button Event | Set bit while key is pressed |
| **17** | MA3\_Right\_Button | Button Event | Set bit while key is pressed |
| **18** | MB5\_Button | Button Event | Set bit while key is pressed |
| **19** | MB6\_Button | Button Event | Set bit while key is pressed |
| **20** | MB7\_Button | Button Event | Set bit while key is pressed |
| **21** | --- | Button Event | Activate Screen "Manual" |
| Mode\_Manual | Background Control Color | State "0" = WHITE |
| State "1" = GREEN |
| **22** | --- | Button Event | Activate Screen "Automatic" |
| Mode\_Auto | Background Control Color | State "0" = WHITE |
| State "1" = GREEN |
| **23** | S15 | Visibility | State "0" = Visible |
| State "1" = Invisible |
| **24** | S16 | Visibility | State "0" = Visible |
| State "1" = Invisible |
| **25** | S17 | Visibility | State "0" = Visible |
| State "1" = Invisible |
| **26** | S14 | Background Control Color | State "0" = GRAY |
| State "1" = GREEN |
| **27** | MB1 | Background Control Color | State "0" = GRAY |
| State "1" = GREEN |
| **28** | MB2 | Background Control Color | State "0" = GRAY |
| State "1" = GREEN |
| **29** | MB3 | Background Control Color | State "0" = GRAY |
| State "1" = GREEN |
| **30** | MB4 | Background Control Color | State "0" = GRAY |
| State "1" = GREEN |
| **31** | S13 | Background Control Color | State "0" = GRAY |
| State "1" = GREEN |
| **32** | S12 | Background Control Color | State "0" = GRAY |
| State "1" = GREEN |
| **33** | S11 | Background Control Color | State "0" = GRAY |
| State "1" = GREEN |
| **34** | MA1\_CCW | Background Control Color | State "0" = WHITE |
| State "1" = GREEN |
| **35** | MA1\_CW | Background Control Color | State "0" = WHITE |
| State "1" = GREEN |
| **36** | Balance | Output field | Range: 0 to 500 |
| **37** | MB8 | Background Control Color | State "0" = GRAY |
| State "1" = GREEN |
| **38** | Thickness | Output field | Range: 0 to 100 |
| **39** | MA2\_Open | Background Control Color | State "0" = WHITE |
| State "1" = GREEN |
| **40** | MA2\_Close | Background Control Color | State "0" = WHITE |
| State "1" = GREEN |
| **41** | Temperature | Output field | Range: 0 to 200 |
| **42** | Heater\_ON | Background Control Color | State "0" = GRAY |
| State "1" = GREEN |
| **43** | MB6 | Background Control Color | State "0" = GRAY |
| State "1" = GREEN |
| **44** | MB7 | Background Control Color | State "0" = GRAY |
| State "1" = GREEN |
| **45** | S18 | Background Control Color | State "0" = GRAY |
| State "1" = GREEN |
| **46** | S19 | Background Control Color | State "0" = GRAY |
| State "1" = GREEN |
| **47** | S20 | Background Control Color | State "0" = GRAY |
| State "1" = GREEN |
| **48** | MA3\_Left | Background Control Color | State "0" = WHITE |
| State "1" = GREEN |
| **49** | MA3\_Right | Background Control Color | State "0" = WHITE |
| State "1" = GREEN |
| **POSITION** | **VARIABLE** | **ACTION** | **COMMENT** |
| **50** | Heating\_Setpoint | Trend | Style GREEN; Trend values:999 |
| Point\_ON | Trend | Style BLACK; Trend values:999 |
| Point\_Middle | Trend | Style BLUE; Trend values:999 |
| Temperature | Trend | Style RED; Trend values:999 |
| -- | Properties - Time axis | Range: 30s |
| -- | Properties - Temperature axis | Range: 200ºC |

## Details: Screen Automatic



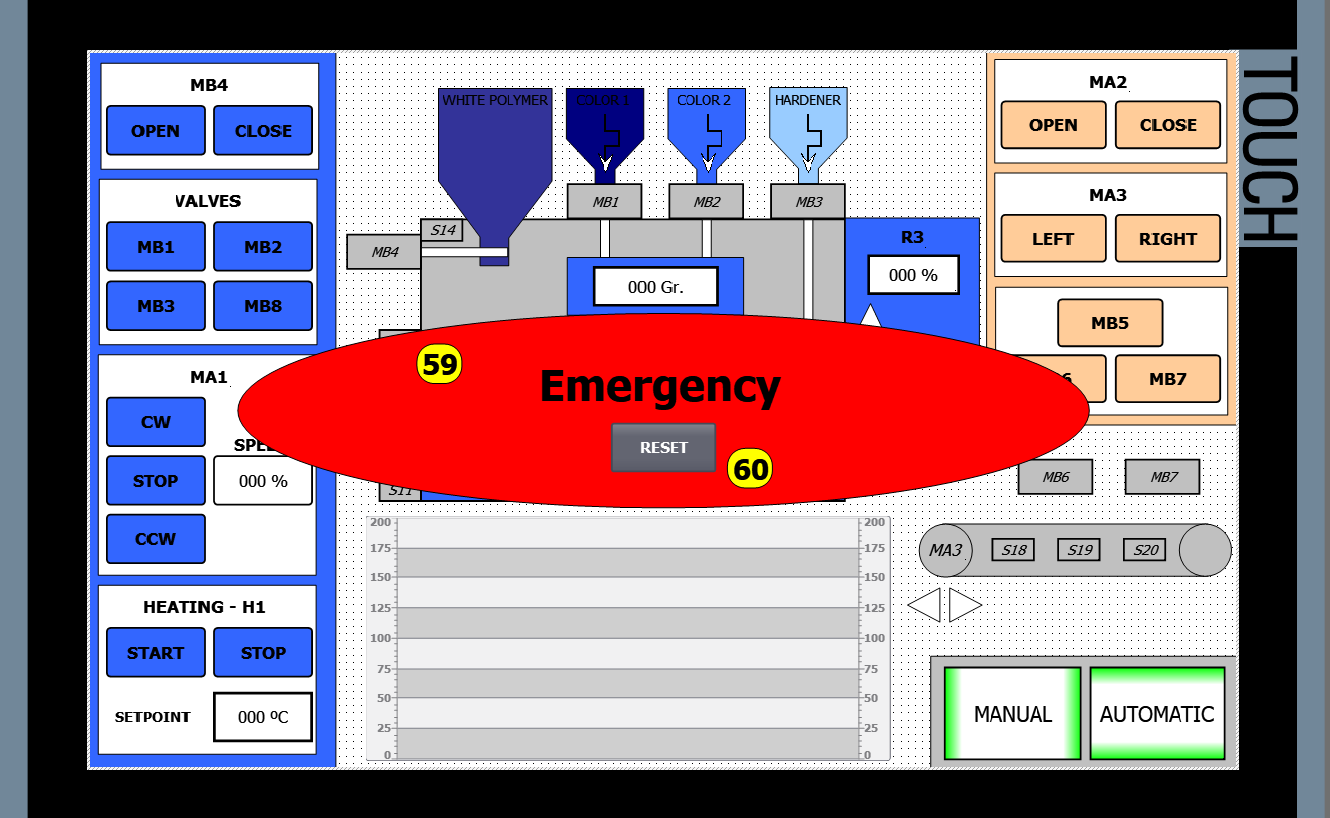
|  |  |  |  |
| --- | --- | --- | --- |
| **POSITION** | **VARIABLE** | **ACTION** | **COMMENT** |
| **51** | Start | Button Event | Set bit while key is pressed |
| **52** | Stop | Button Event | Set bit while key is pressed |
| **53** | Color1\_Gr | Input/Output field | Range: 0 to 150 |
| **54** | Color2\_Gr | Input/Output field | Range: 0 to 150 |
| **55** | Heating\_Setpoint | Output field | Range: 0 to 200 |
| **56** | Button\_A | Button Event | Set bit while key is pressed |
| Program\_A | Background Control Color | State "0" = WHITE |
| State "1" = GREEN |
| **57** | Button\_B | Button Event | Set bit while key is pressed |
| Program\_B | Background Control Color | State "0" = WHITE |
| State "1" = GREEN |
| **36** | Step | Output field | Range: 0 to 99 |



**The functions from the drawing of the Screen Automatic are the same from the drawing of the Screen Manual with the exception of the things that are outside the red square in the image.**

## Details: emergency pop-up

**The next function happens in both screens.**

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|  |  |  |  |
| --- | --- | --- | --- |
| **POSITION** | **VARIABLE** | **ACTION** | **COMMENT** |
| **59** | Emergency | Visibility | State "0" = Visible |
| State "1" = Invisible |
| **60** | Reset | Button Event | Set bit while key is pressed |