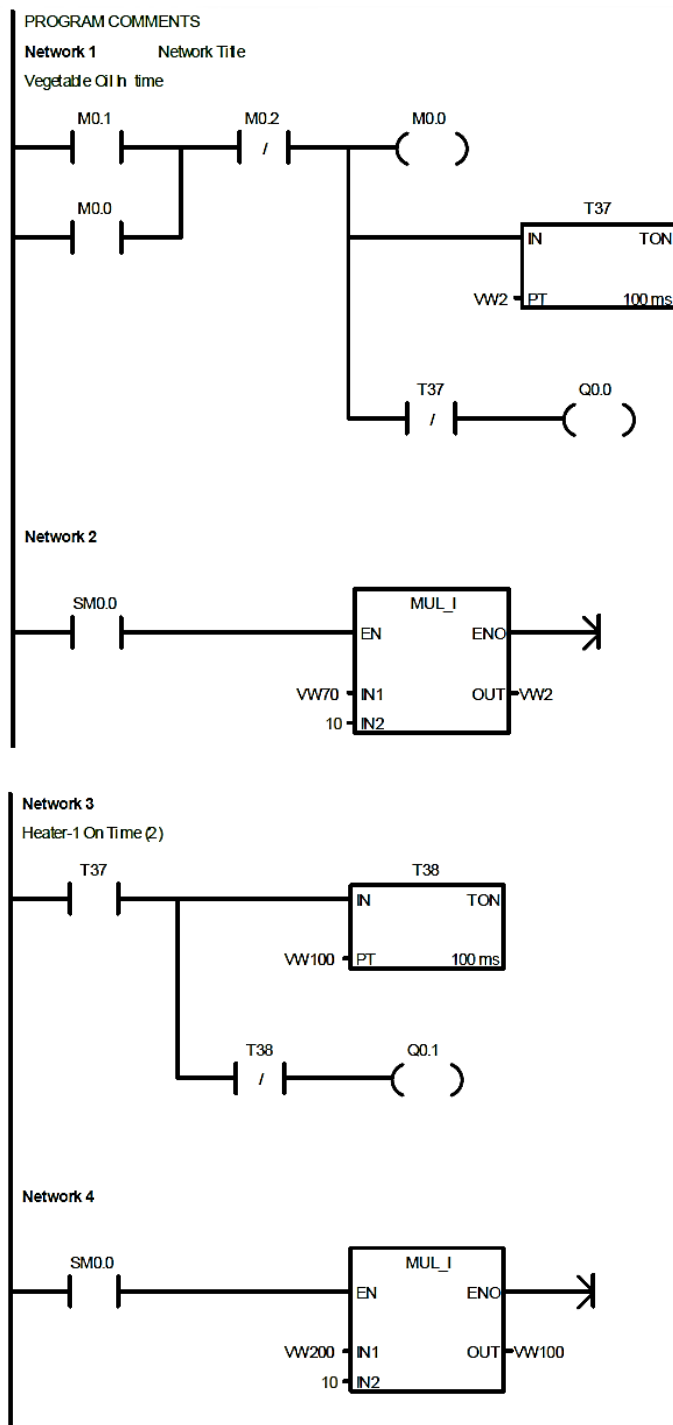


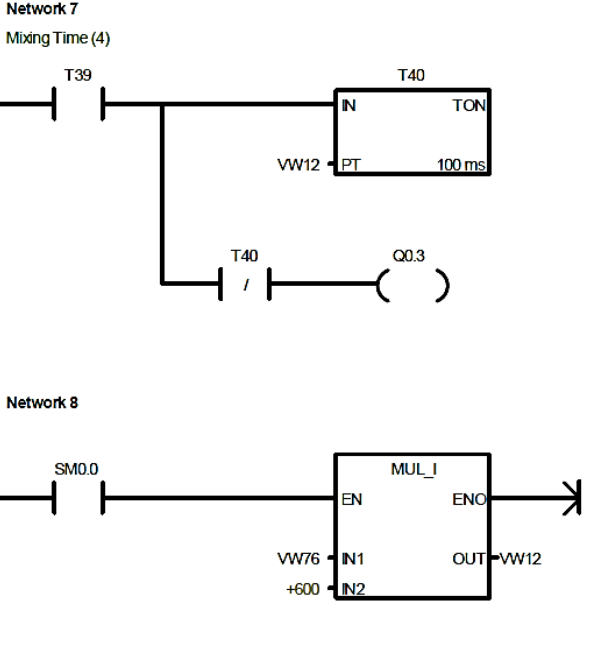
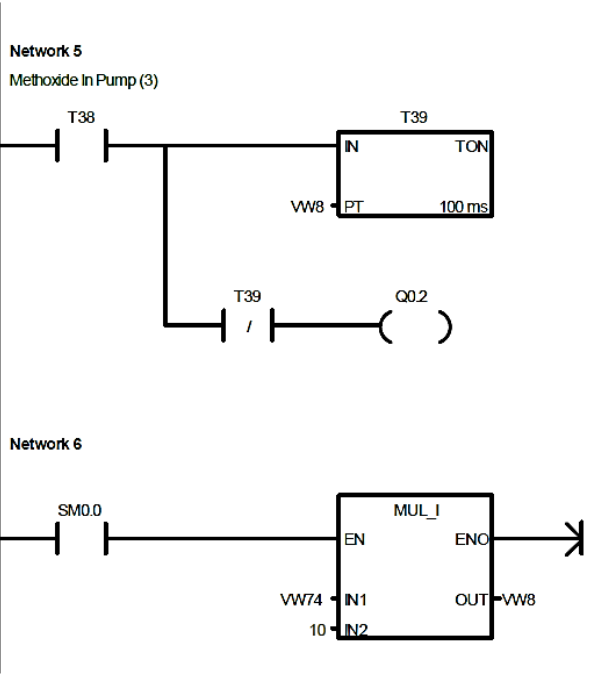
**APPENDIX-B**  
**FEATURES, SPECIFICATIONS, INTERFACES AND PROGRAM**  
**OF PLC AND HMI**

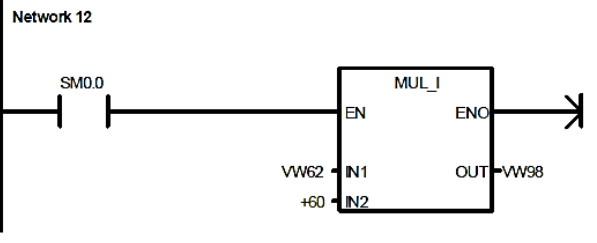
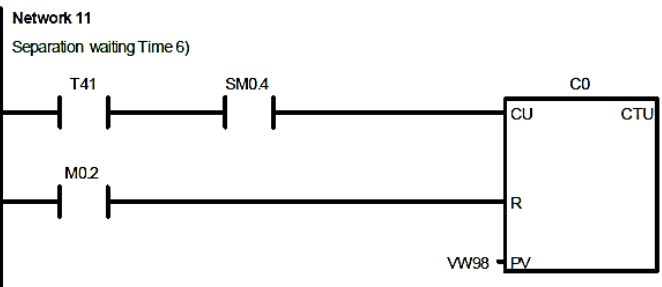
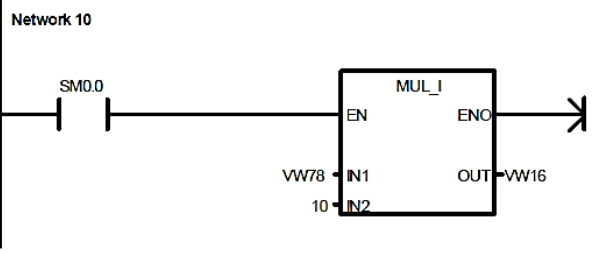
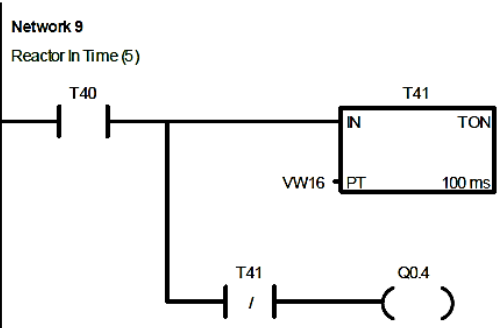
**Table B1: Features and specifications of PLC and HMI**

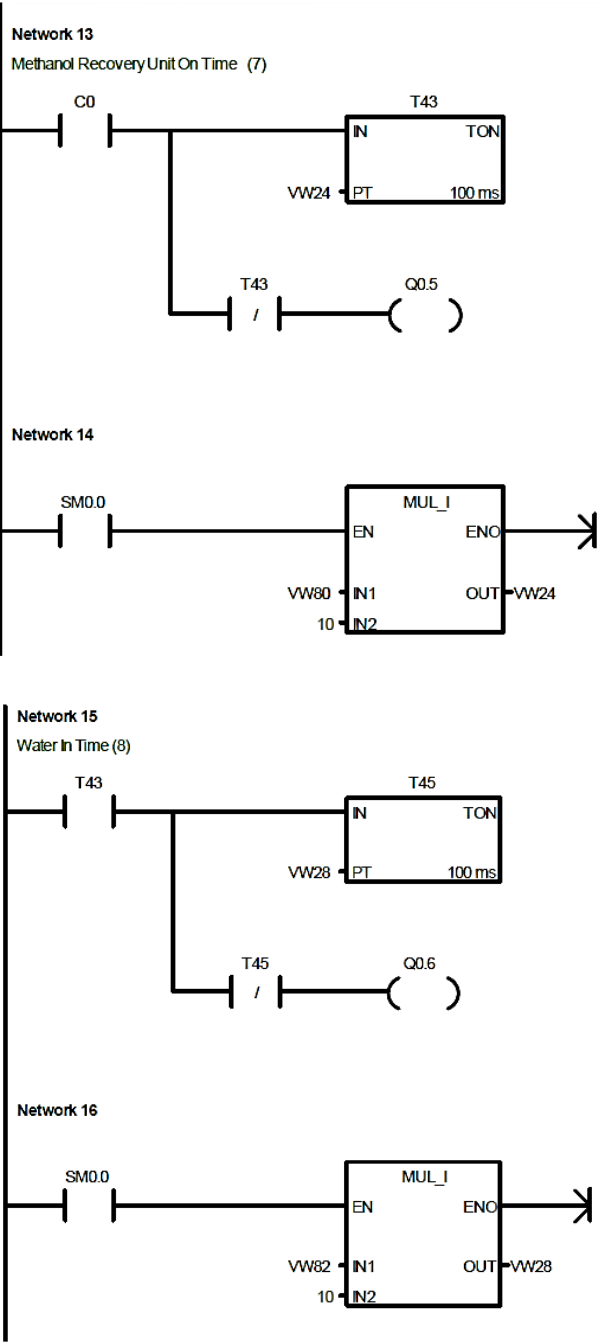
PLC		HMI	
Feature	Specifications	Feature	Specifications
Model	Siemens (S7-200 CPU)	Model	Weinview (MT6070iH)
Physical size (mm)	190 x 80 x 62	Display type	TFT LCD
Program memory: with run mode edit without run mode edit	16384 bytes 24576 bytes	Display size (diagonal)	7"
Data memory	10240 bytes	Max colors	65536
Memory backup	100 hours typical	Resolution	800 x 480
Local on-board I/O: Digital Analog	24 In/16 Out --	Pixel pitch (HxV, mm)	0.1905 x 0.0635
Expansion modules	7 modules	Viewing angle (°)	70/50/70/70(T/B/R/L)
High-speed counters: Single phase Two phase	6 at 30 kHz 4 at 20 kHz	Luminance (cd/m <sup>2</sup> )	500
Pulse outputs (DC)	2 at 20 kHz	Backlight	LED
Analog adjustments	2	Backlight Life time	30,000 hrs.
Real-time clock	Built-in	Contrast ratio	500:1
Communications ports	2 RS-485		
Floating-point math	Yes		
Digital I/O image size	256 (128 in, 128 out)		
Boolean execution speed	0.22 microseconds/instruction		

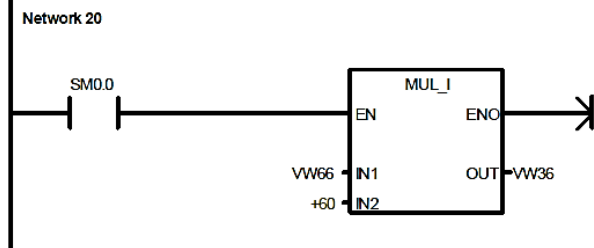
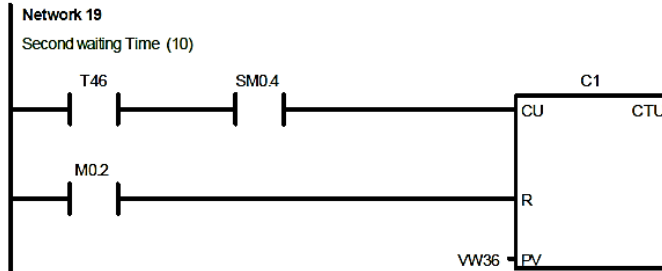
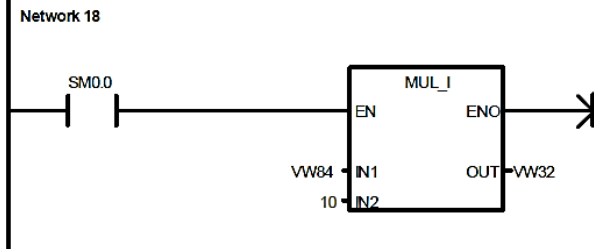
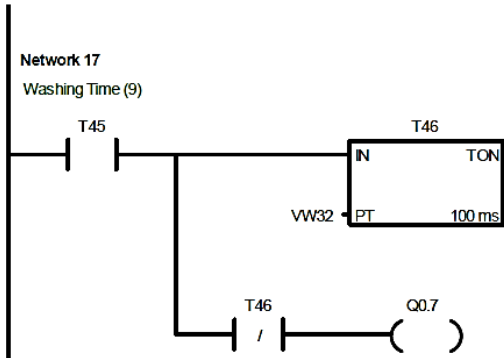
# Ladder Logic Program of the Automated Biodiesel Processor

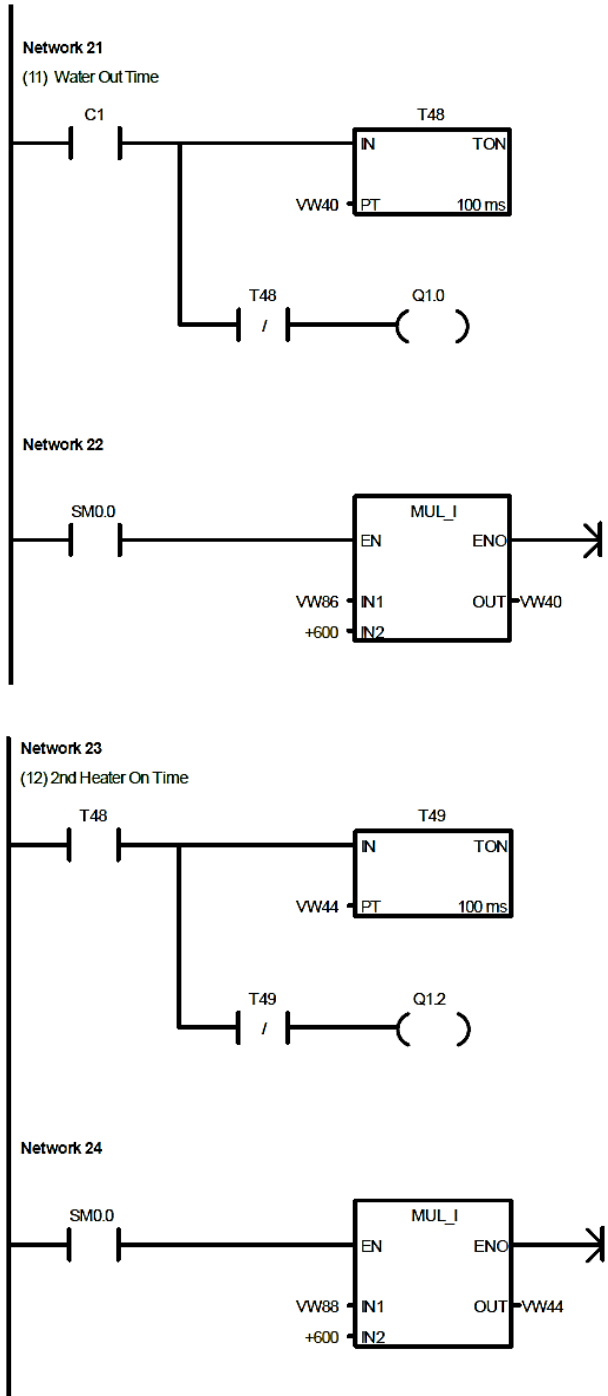


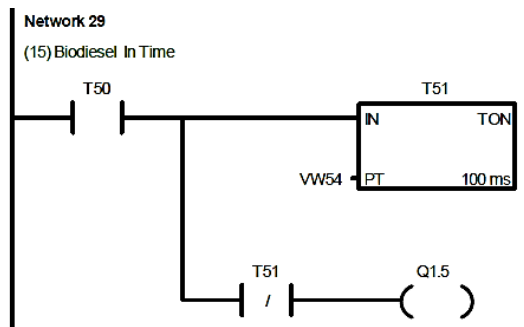
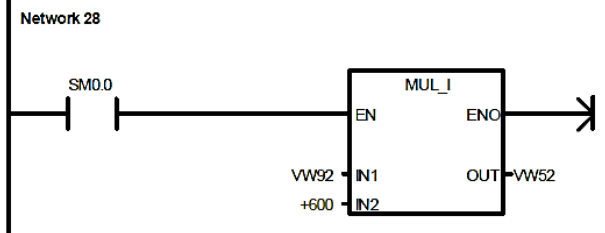
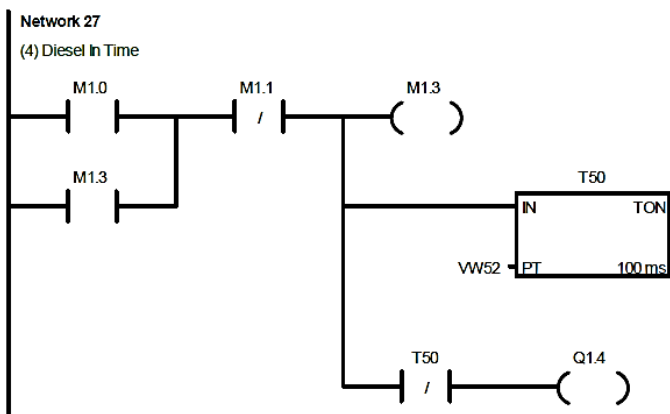
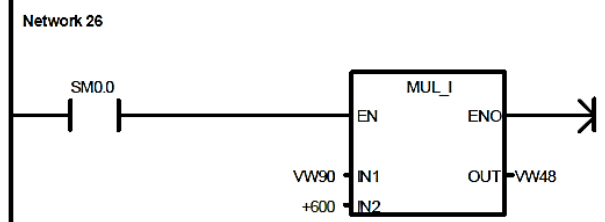
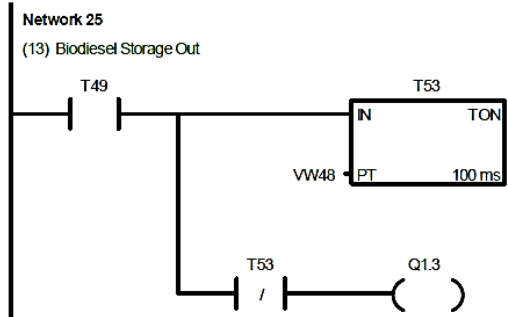




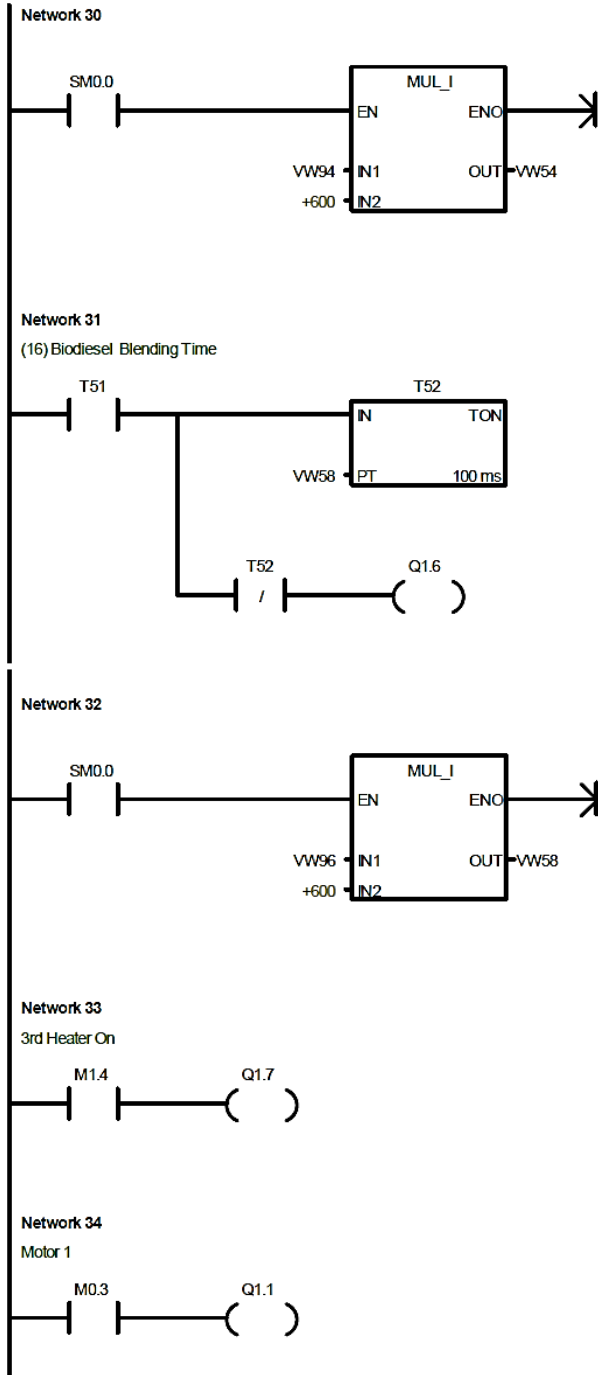












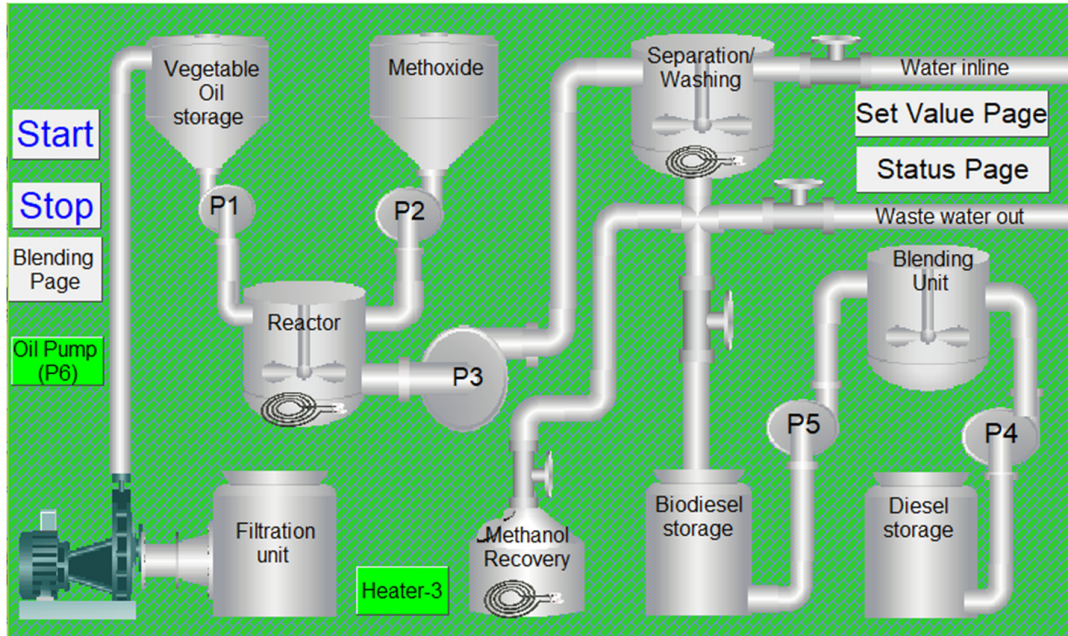


Figure B1: Main page of HMI interface

The Set Value page is titled "Set Value" in large blue text. It features a grid of input fields, each containing the value "000". The labels for these fields are as follows:

Parameter	Unit
Vegetable oil_P1	(sec)
Heater-1	(min)
Methoxide_P2	(sec)
Stirrer-1	(min)
Transfer_P3	(sec)
Waiting-1	(Hour)
Glycerin out_V3	(sec)
Water in_V4	(min)
Stirrer-2	(min)
Waiting-2	(Hour)
Water Out_V5	(min)
Heater-2	(min)
Biodiesel out	(min)

Navigation buttons for Main Page and Status Page are located at the top left and right respectively.

Figure B2: Set value page of HMI interface for setting time

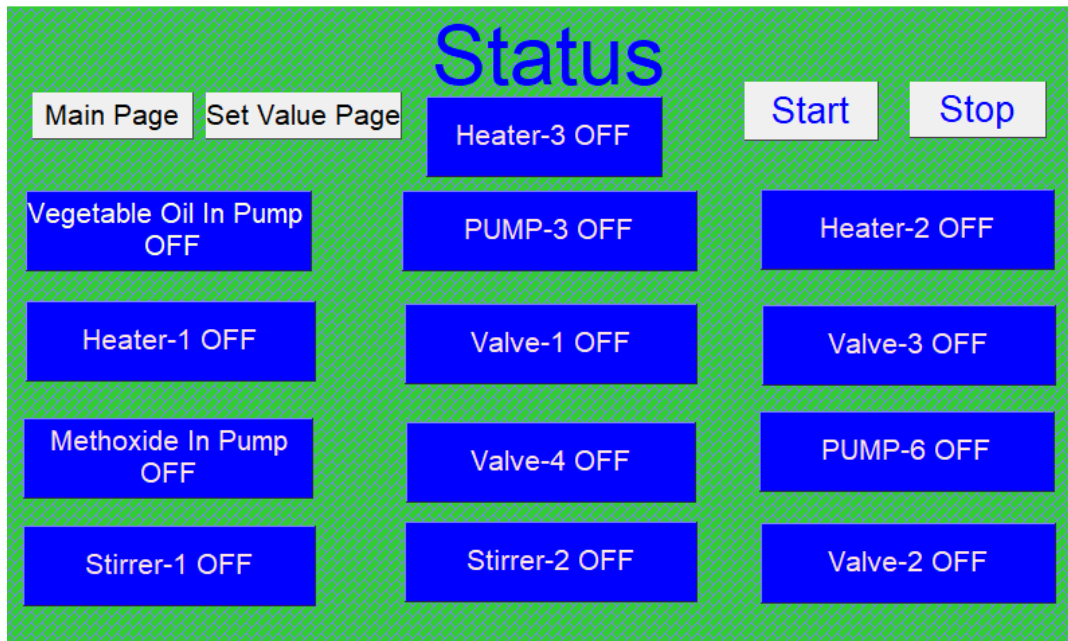


Figure B3: Status page of HMI interface

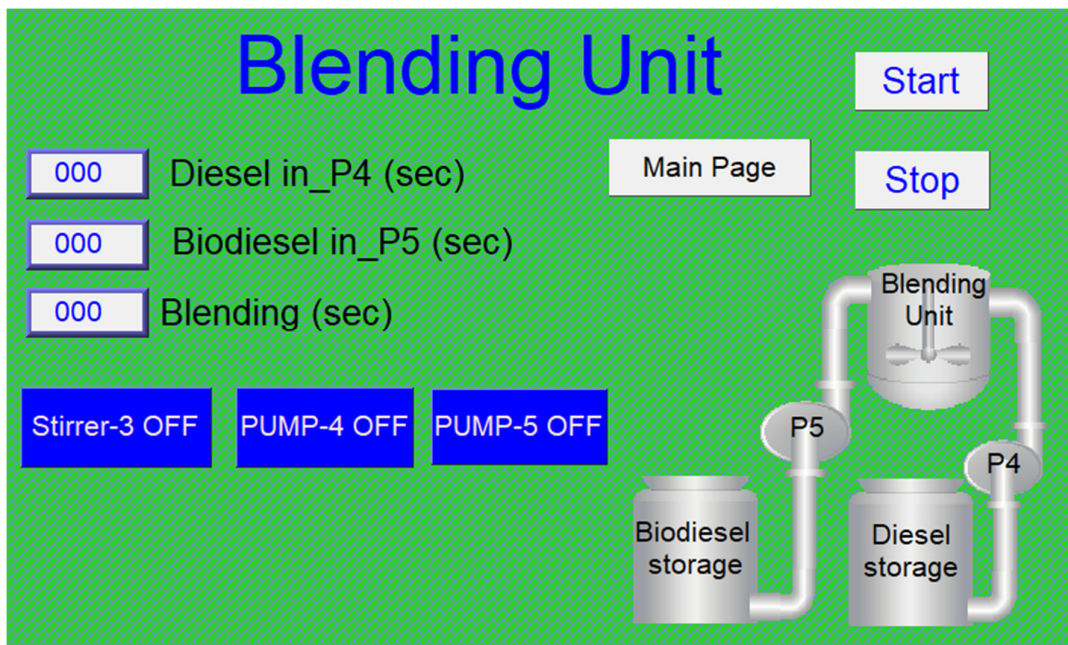


Figure B4: Status page of Blending Unit