

Smart Box Series

Booster Control Panel with Relay for 1 Pump 0,37—5,5 kW



Instruction Manual



TayTech[®]

advanced automation solutions

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1. Introduction

This manual provides the necessary information for proper installation, use and maintenance of the Smart Box Series model device. The user must read this manual before operating the device. Misusage may cause damage to the user or product and void the warranty.

This document should be viewed as an integral part of the Smart Box Series device. For this reason, it should be protected and stored for the duration of use.

The information and instructions in this manual relate to the standard use of this product. In case of special situations, functions or applications not described in this document, contact our service center for assistance.



When you receive the product, check that is not damaged during transportation. If the product is damaged, report directly to TAYTECH technical service unit within 5 days of receipt.

The information provided in this manual is subject to change without notice. Note that failure to follow the instructions given in this manual may cause physical injury or damage to objects.

The product should be installed in a sheltered, well ventilated, non-hazardous environment and used at a maximum temperature of 40° C and a minimum of -5 ° C.

2. Warnings

DANGER, WARNING symbols indicate critical points related to the product. Please consider these symbols when you see them.

	ELECTRICAL DANGER Risk of Electric Shock There is a risk of electrical shock where this warning is located.
	WARNING There is a risk of damage for human health, pump or system.

The Smart Box Series should only be used for the purpose specified in the design. Products used for different purposes are considered dangerous because they are inappropriate. In case of fire in or around the installation site, use a suitable extinguisher (dry, chemical powder, foam, carbon dioxide). Install the product in a dry and sheltered place in accordance with the degree of protection, away from heat sources and easily flammable substances.

Any part of the Smart Box Series product should not be disassembled without the permission of TAYTECH. No changes should be made to the product. Otherwise, the product will be out of warranty.

The installation and maintenance of the product must be done by the authorized person in accordance with the current standard. The environment in which the product is installed must have a grounding line.

3. Transportation



The Smart Box Set should be handled with care, as falls and bumps can cause damage. If the delivered products are not installed and started to operate immediately for any reason, the unit should be stacked neatly. The outer packaging and accessories packaged separately should not be damaged and should be stored as a whole. It should be stored in a suitable ambient temperature and dry environment.

NOTE: Check whether the product is damaged during the transportation. If there is any damage to the product, report it to TAYTECH service center within 5 days from the delivery date.

4. Operation Limits

The Smart Box Set is a smart, simple, easy to understand and reliable control panel specially developed for booster systems. It integrates all of the mechanical and electronic devices in the booster systems and controls the system perfectly. It operates without the need for industrial type electricity with its Monophase option. With the three-phase option, it can work under heavy conditions with industrial electricity.

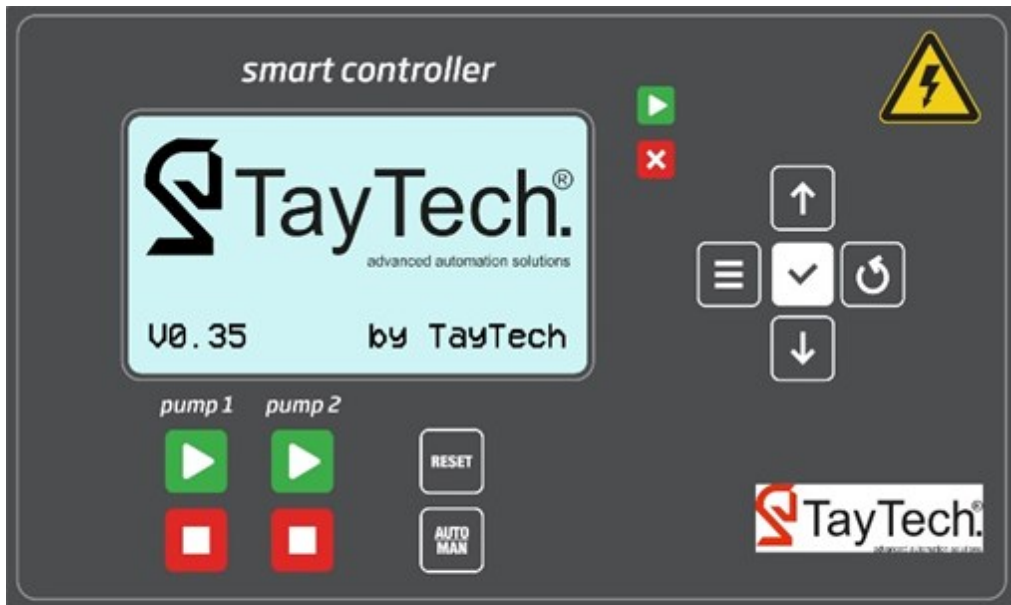
TAYTECH is not responsible for damaging the panel or users as a result of using the panel in different applications other than the manual or wrong connection.

4.1. Technical Characteristics

- Input Voltage 3 ~ 380-400VAC 50 / 60Hz. Three Phase.
- IP Protection Rating: IP54.
- Solenoid Valve Output Relay: Maximum 230V 5A.
- General Failure Relay: Maximum 230V 5A.
- Digital Inputs: 24VDC.
- Relay Outputs: 230V 5A.
- Analog Sensor: 4-20mA Pressure Transmitter.
 - ◊ 10 Bar.
 - ◊ 16 Bar.
 - ◊ 25 Bar.
- Liquid Level Electrode Connection.
- Automatic, Manual Operation Selector Button.
- Real Time Equal Aging.
- Fuse protector for motor protection.
- Current Reading.
- Pump Protection Against Current failures.
- ABS Thermoplastic Enclosure
- Ambient Temperature: -5 / +40 ° C.

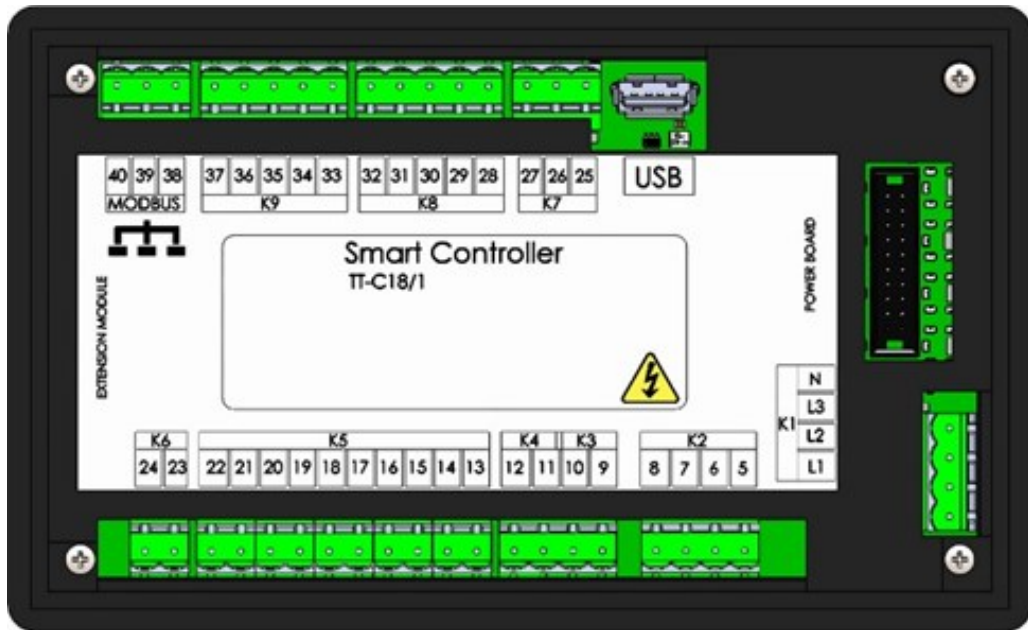
5. Control Panel Overview

5.1. Keypad and Light Indicators



BUTTON	BUTTON FUNCTION
	Pump Start Button *Note : Press and hold for 3 seconds in backup systems to deactivate spare pump
	Pump Stop Button Note : If you hold for 3 seconds in backup system, the backup pump enters the circuit.
	Menu Button (Returns to previous cell when entering value)
	Up Button
	Back Button
	Down Button
	Selection Button
	Reset Button
	Auto/Man Selection Button

5.2. Ports Description



CODE	DESCRIPTION	PIN	NAME	NOTE
K1	POWER TERMINAL	1	L1	0-300VAC
		2	L2	0-300VAC
		3	L3	0-300VAC
		4	N	Nötr
K2	CONTACTOR TERMINAL	5	P1	230VAC 1A
		6	P2	230VAC 1A
		7	P3	230VAC 1A
		8	P4	230VAC 1A
K3	FAILURE RELAY	9	COM	230VAC 1A
		10	NO	
K4	SOLENOID VALF RELAY	11	COM	230VAC 1A
		12	NO	
K5	PUMP 1 PRESSURE SWITCH / FLOATER	13	COM	24VDC 0,1A
		14	NO	
	PUMP 2 PRESSURE SWITCH / FLOATER	15	COM	24VDC 0,1A
		16	NO	
	PUMP 3 PRESSURE SWITCH / FLOATER	17	COM	24VDC 0,1A
		18	NO	
	PUMP 4 PRESSURE SWITCH / FOATER	19	COM	24VDC 0,1A
		20	NO	
FLOATER	FLOATER	21	COM	24VDC 0,1A
		22	NO	

CODE	DESCRIPTION	PIN	NAME	NOTE
K6	TRANSMITTER	23	A	24VDC 4-20mA
		24	B	
K7	FUTURE RESERVED	25	C	24VDC 0,1A
		26	B	
		27	A	
K8	PTC	28	COM	24VDC 0,1A
		29	PTC4	
		30	PTC3	
		31	PTC2	
		32	PTC1	
K9	FUTURE RESERVED	33	COM	24VDC 0,1A
		34	D	
		35	C	
		36	B	
		37	A	
K10	MODBUS RS485	38	A	3.3V 0,01A
		39	GND	
		40	B	
POWER BOARD	VOLTAGE AND CURRENT CONTROL BOARD TERMINAL			

6. Assembly

6.1. Wall Mounted Assembly

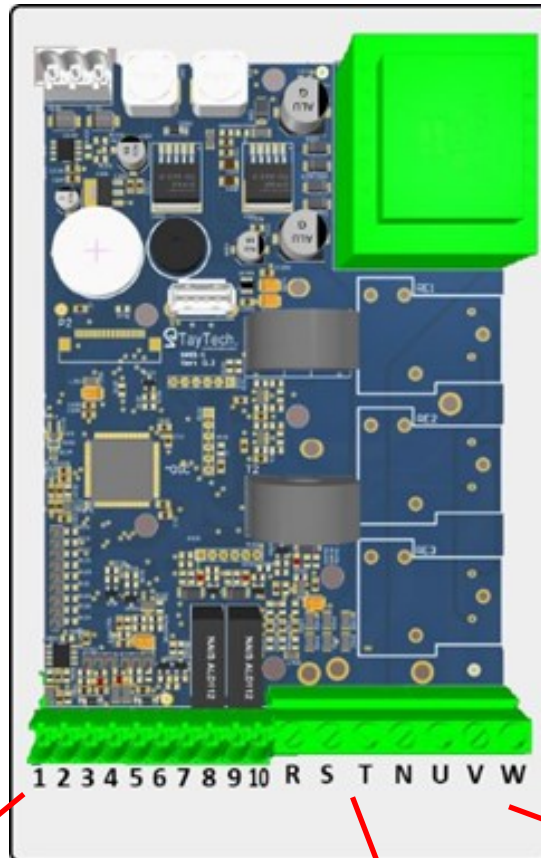


WALL

- Fix them on the wall using the mounting screws on the back of the panel.
- Please do not drill any holes in the cabinet.
- For electrical connection, install and assemble the cables regularly through the gland holes.

6.2. Electrical Connection

6.2.1. Pump Panel Installation



Sensor Connection Terminals

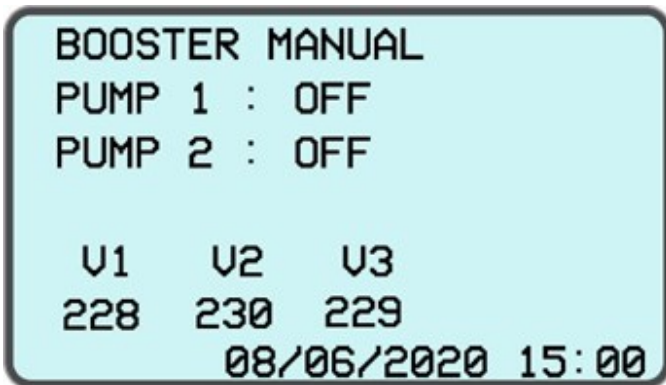
- (1-2) Floater Control
- (3-4) Pressure Switch
- (5-6) PTC Sensor
- (7-8) Solenoid Valve
- (9-10) Fault Relay

Motor Connections

3~380-400VAC
50/60 Hz

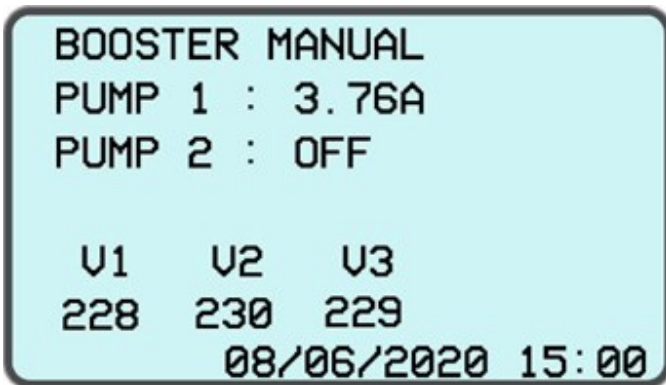
7. Functions and Settings

7.1. Manual Operation Mode



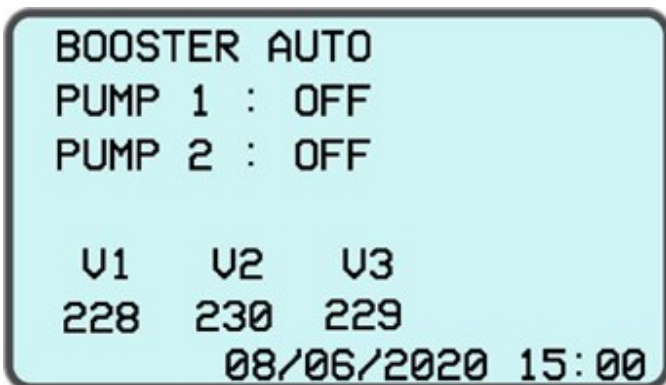
When you energize the panel for the first time, the system starts up with all settings in a manual position. If the panel is in automatic mode, you can change the operation mode from automatic to manual by pressing “**AUTO / MAN**” button.

Pump states are shown in the display in manual mode. The “**OFF**” position indicates that the pumps have stopped.



The pump is started by pressing the “**PUMP START**” button of the relevant pump. The current value consumed by the pump is read on the screen. The pump is stopped by pressing the “**PUMP STOP**” button. The pump status is “**OFF**” on the screen.

7.2. Automatic Operation Mode with Pressure Switch



When the panel is in automatic position, it automatically starts and stops with mechanical pressure switches or transmitter. According to the information coming from the mechanical pressure switch, the pumps are engaged and exited by real-time equal aging. There are 3 different pump states in automatic position. “**OFF**”, “**STOP**”, “**Current value**”

```
BOOSTER AUTO
PUMP 1 : STOP
PUMP 2 : OFF
```

```
U1    U2    U3
228   230   229
```

```
08/06/2020 15:00
```

Press the “**PUMP START**” button once to switch the pump to “**STOP**” position. Disabled when the pump is in the “**STOP**” position. The pump that is in the “**STOP**” position will never operate. To activate again, press the “**PUMP START**” button once.

```
BOOSTER AUTO
PUMP 1 : 4.25A
PUMP 2 : OFF
```

```
U1    U2    U3
228   230   229
```

```
08/06/2020 15:00
```

According to the information coming from the pressure switches, the pumps are activated and activated in order by real-time co-aging.

7.3. Automatic Operation Mode with Pressure Transmitter

```
BOOSTER AUTO
PUMP 1 : 4.25A
PUMP 2 : OFF
```

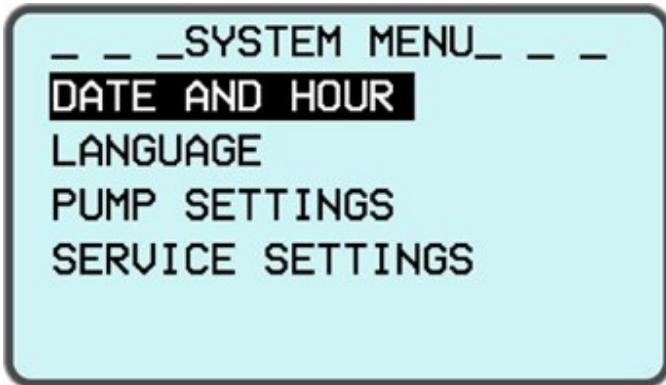
```
U1    U2    U3
228   230   229
```

```
08/06/2020 15:00
```

While the pressure transmitter is active, system pressure is seen in the lower right corner of the screen. The pumps are activated and deactivated automatically with real-time co-aging according to the set pressure values.

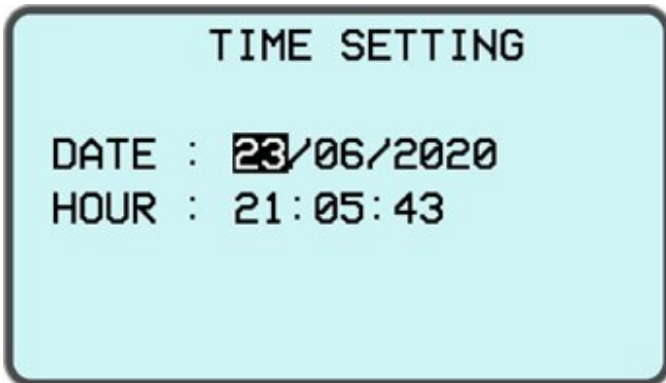
7.4. User Settings

7.4.1. System Menu



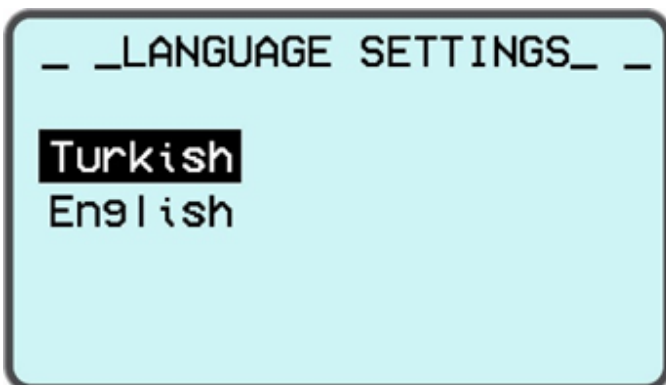
Press the “**MENU BUTTON**” once to access the system menu. Press the “**UP**” and “**DOWN**” buttons on the menu to enter, and press the “**SELECTION BUTTON**”.

7.4.1.1. Date and Time Settings



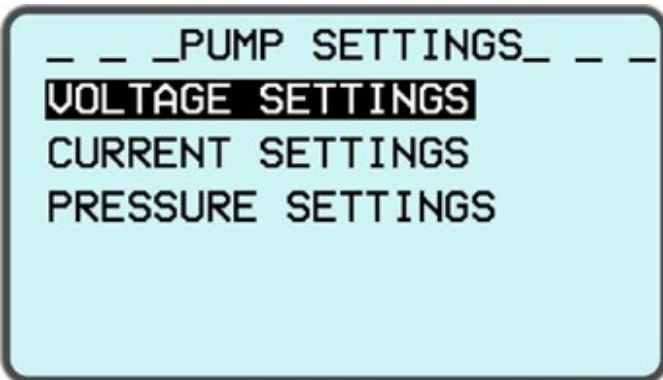
By pressing the “**UP BUTTON**” on the screen that opens, the value in the selected box is increased. After entering the desired value, it waits for 2 seconds and the box automatically moves to the right. Confirmation is done automatically after all settings are made. Date settings are made as day / month / year, time settings are made as hour / minute / second.

7.4.1.2. Language Selection



Press the “**UP**” and “**DOWN**” buttons on the screen that opens, highlight the desired language and press the “**SELECTION BUTTON**”.

7.4.1.3. Pump Settings

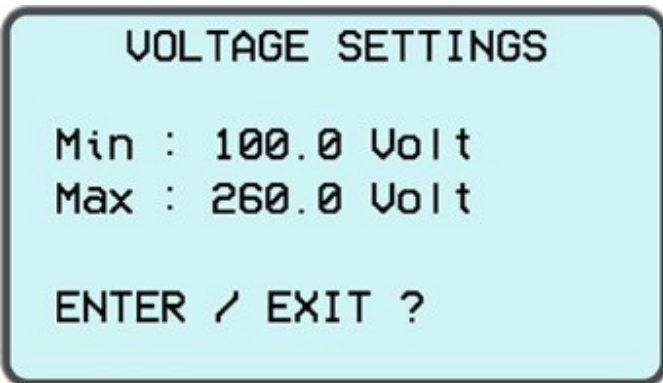


On the screen;

- Voltage Settings
- Current Settings
- Pressure Settings

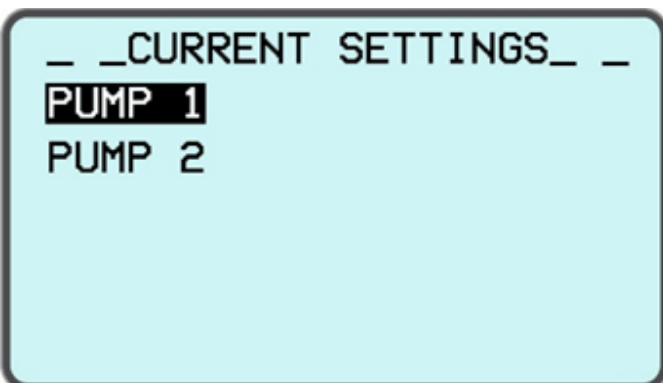
Tabs are visible.

7.4.1.3.1. Voltage Settings



Single phase minimum and maximum operating voltage value is written in the menu that opens. To adjust, press the “**SELECTION BUTTON**” and enter the value into the box selected with the “**UP**” and “**DOWN**” buttons.

7.4.1.3.2. Current Settings



Current value must be entered for each pump in the menu that opens. For the selection of the related pump, scroll with the “**UP**” and “**DOWN**” buttons and press the “**SELECTION BUTTON**”.

PUMP 1 CURRENT SETTINGS

Min : 0.945 Amp

Max : 1.55 Amp

ENTER / EXIT ?

In the menu that opens, minimum and maximum operating current values are written. To adjust, press the “**SELECTION BUTTON**” and enter the value into the box selected with the “**UP**” and “**DOWN**” buttons. **NOTE:** Writing 10% more and lower motor tag value is ideal for pump protection.

7.4.1.3.3 Pressure Settings

_ _PRESSURE SETTINGS_ _

MIN. PRESSURE

PUMP 1

PUMP 2

In the menu that opens, individual pressure values and minimum operating pressure settings are made for each pump. **NOTE: The system must work with the pressure transmitter for the settings in this menu to be active.**

MIN. PRESSURE SETTINGS

Level : 2.000 Bar

(SYSTEM DOES NOT WORK
AT MIN. PRESSURE)

Pumps do not work if the system pressure is below the minimum pressure value. To adjust, press the “**SELECTION BUTTON**” and enter the value into the box selected with the “**UP**” and “**DOWN**” buttons.

7.4.1.4. Service Menu

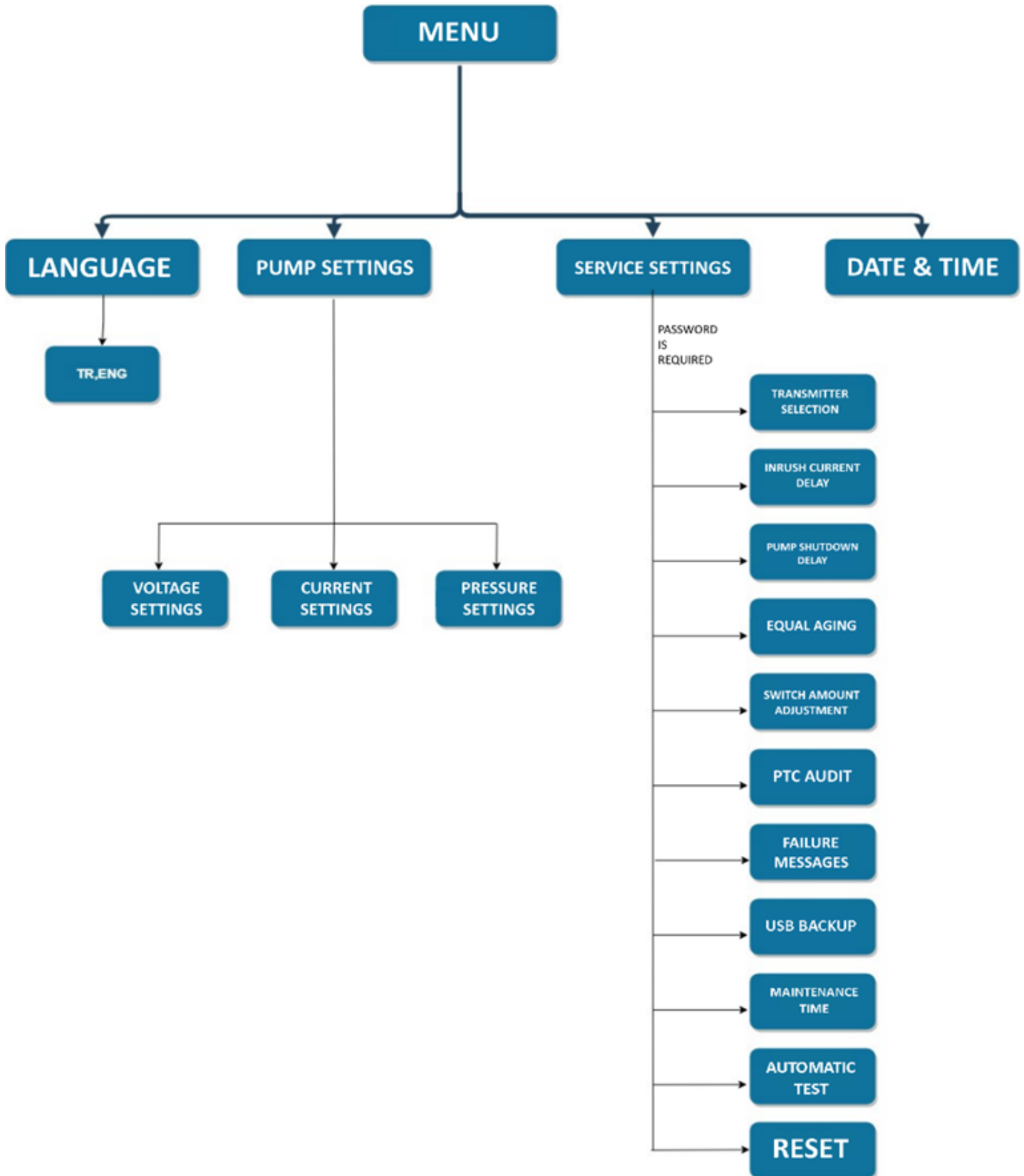
```
-- _SYSTEM MENU_ --  
DATE AND HOUR  
LANGUAGE  
PUMP SETTINGS  
SERVICE SETTINGS
```

The service menu is an encrypted menu that can not be accessed by users with system settings that only authorized services can interfere with. Require a password when logged in.

```
PASSWORD : (* )***
```

When the correct password is entered, the service settings page opens. Incorrect password entry leads to the previous menu. Press “**BACK BUTTON**” to exit without entering password.

7.5. Menu Flow



8. MODBus Connection

Data bit	7 Bit						
Baud Rate	9600						
Stop Bit	1 Bit						
Parity	Even						
Station No.	1						
Connection Type	ASCII						
HEXADECIMAL ADDRESS	MODBUS ADDRESSES	UNIT	DATA TYPE	VALUE RANGE	R/W	DESCRIPTION	
3E9	1001		WORD	4 - 5	R	System Operation Mode	4 = 1-Pump Booster 5= 2-Pump Booster
3EA	1002		WORD	0 - 2	R	Active Pump Amount	0 = 0 Pump Is Active 1 = 1 Pump Is Active 2 = 2 Pump Is Active
3EB	1003		WORD	0 - 25	R	Transmitter Selection	0 = Transmitter Is Not Selected 10 = Transmitter selection 10 bar 16 = Transmitter Selection 16 bar 25 = Transmitter Selection 25 bar
3EC	1004		BYTE	0 - 1	R	General Alarm	0 = No Failure 1 = Failure Exists
3EE	1006	AMPER	WORD	0 - 65535	R	Pump 1 Current (A)	
3F0	1008	AMPER	WORD	0 - 65535	R	Pump 2 Current (A)	
3F6	1014	VOLT	WORD	0 - 800	R	L1 Input Voltage	
3F8	1016	VOLT	WORD	0 - 800	R	L2 Input Voltage	
3FA	1018	VOLT	WORD	0 - 800	R	L3 Input Voltage	
3FC	1020	BAR	WORD	0 - 30000	R	Transmitter Value	
3FE	1022		BYTE	0 - 1	R	Pressure Switch 1	0 = Passive 1 = Active
3FF	1023		BYTE	0 - 1	R	Pressure Switch 2	0 = Passive 1 = Active
402	1026		BYTE	0 - 1	R	Floater Control	0 = No Water 1 = Water Exists
404	1028	OHM	WORD	0 - 65535	R	Pump 1 PTC Value	
405	1029	OHM	WORD	0 - 65535	R	Pump 2 PTC Value	
40E	1038	SAAT	WORD	0 - 65535	R	Pump 1 Operating Time	
410	1040	SAAT	WORD	0 - 65535	R	Pump 2 Operating Time	
416	1046	VERSIYON	WORD	0 - 65535	R	Version No.	

9. Troubleshoots



3 PHASE PHASE SEQUENCE FAILURE

Phase sequence error indicates that the phases are reversed at the main energy input of the board and stops the system. For clear the error, the power is turn off and the R, S, T phases are connected to the L1, L2, L3 connection points respectively. If the phases are correct even though the phases are correct, contact TAYTECH service center.



LOW VOLTAGE

Any of the phases gives this error when it drops below the set voltage value and stops the system. Voltage values are checked on the main screen. When the voltage value returns to normal, the system automatically resets the error and continues working. If the voltage does not improve, contact the authorized service.

HIGH VOLTAGE

When any of the phases goes above the set voltage value, it gives this error and stops the system. Voltage values are checked on the main screen. When the voltage value returns to normal, the system automatically resets the error and continues working. If the voltage does not improve, contact the authorized service.

**PUMP 1
LOW CURRENT**

If the relevant pump down below the set current value, it gives low current error on the screen and the related pump stops. In this error, the system automatically stops the pump 3 times and restarts it. If it falls to the same error 3 times, the system stops the related pump completely. In case of error, contact the authorized service.

**PUMP 2
HIGH CURRENT**

If the relevant pump rise above the set current value, it gives high current error on the screen and the related pump stops. In this error, the system automatically stops the pump 3 times and restarts it. If it falls to the same error 3 times, the system stops the related pump completely. In case of error, contact the authorized service.

**PUMP 1
PTC FAILURE**

If the temperature of the related pump rises excessively, the system lowers and stops the related pump in a failure state. If the temperature of the pump returns to normal, the system automatically activates the pump.

NO WATER

No water error means that the water in the tank is running out and stops the system from working. In the event of an error, the tank is checked and if there is still water in the tank, contact the authorized service.

PHASE 1 LOST

If any of the phases are de-energized, it warns the system that it is de-energized and stops the system. In case of error, contact the authorized service.

10. General Conditions

10.1. Warranty

All products are covered by a 24-month warranty, covering production defects and replacing / repairing defective parts.

Warranty conditions; does not cover damage caused by missing / incorrect electrical connections, improper installation, misuse or any negligence due to the installation and operation of the facility.

In addition;

- Damage due to corrosion or wear of any type or quality
- Malfunction due to incorrect installation;
- Repair, dismantling or tampering by unauthorized persons
- Natural disasters such as fire, flood, water or lightning occur

Damages that may occur due to their reasons are not considered under warranty.

The defective material must be shipped by the customer and sent to the Taytech factory address.

10.2. Maintenance



The Smart Booster K series panel does not require routine maintenance, within the working limits and provided that the instructions in this manual are followed. Special maintenance or repairs should only be carried out by authorized service centers. Only original spare parts should be used in case of repair. The manufacturer rejects all responsibility for injury or material damage resulting from maintenance interventions by unauthorized personnel.

10.3. Disposal

If the product is taken out of service, local regulations on waste regulations must be observed. According to the material categories, it should be separated within the scope of recycling. You can get help by applying to appropriate recycling centers.

10.4. Spare Parts

When you request technical information or spare parts from our sales or service / service center, always state the product model and serial number.

Any defective product component should only be made by an authorized person in accordance with the applicable standard.

11. Certification



CONFORMITY OF DECLARATION



The company name: **TAYTECH OTOMASYON ve BILISIMTEKNOLOJILERI A.S.**

İnönü Mahallesi, Atatürk Blv. No:7/2 41400 Gebze Plastikçiler O.S.B Gebze / Kocaeli

DECLARES UNDER HIS OWN RESPONSIBILITY THAT THE MACHINE DESCRIBED BELOW:

Smart Controller – Booster Series

ARE IN CONFORMITY WITH COMMUNITY DIRECTIVES REGARDING:

- European Directive 2014/35/EU (Low Voltage Directive)
- Electromagnetic Compatibility Directive 2014/30/EU

AND IN COMPLIANCE WITH THE FOLLOWING STANDARTS:

- * EN 61439-1
- * EN 61439-2
- * EN 60204-1
- * EN 55014-1
- * EN 55014-2
- * EN 61000-3-2
- * EN 61000-3-3



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