



A reliable smart environmental monitoring and control solution for modern poultry farms



USER'S GUIDE



TABLE OF CONTENTS	
BRIEF TECHNOLOGY	1
KEY FEATURES	1
USEFULNESS & APPLICATION	1
PACKAGE INCLUDES	1
SPECIFICATIONS...Smart Controller	2
SPECIFICATIONS...Relay Controller	2
INSTALLATION	3
OPERATION	3
TROUBLESHOOTING	3
WIRING DIAGRAM OF SMART CONTROLLER	3
WIRING DIAGRAM OF RELAY CONTROLLER	4
RECOMMENDED ENVIRONMENTAL CONDITIONS FOR BROILER	5
RECOMMENDED ENVIRONMENTAL CONDITIONS FOR LAYER	6
SETTING UP THE SMART CONTROLLER THROUGH USER INTERFACE	7



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1- Smart Controller



2- Relay Controller

BRIEF TECHNOLOGY

Smart PoultryCare is an automated, dual-unit microclimate and resource management system engineered to optimize poultry farm conditions for broilers and laying hens. The system comprises a Smart Controller for continuous environmental sensing and data logging, and a high-power Relay Controller for automated equipment actuation, communicating seamlessly via a local Bluetooth connection. By maintaining precise control over temperature, humidity, lighting, and air quality parameters, Smart PoultryCare enhances bird health, improves feed/water management, and maximizes overall farm productivity.

KEY FEATURES

- ❑ Real-time monitoring of light intensity, temperature, relative humidity, litter moisture, atmospheric pressure, CO₂, NH₃, CO, and H₂S.
- ❑ Supports both Automatic Control (fully autonomous self-regulation) and Semi-Automatic Control (custom user-defined target ranges).
- ❑ Output channels for magnetic contactors or relays to control up to 5 lighting systems, 5 single or 10 paired ventilation fans, 3 feeding systems, 1 humidifier, 1 air heater and 1 water pump.
- ❑ Visual and audible alarms for improper parameter regulation, hardware under-sizing/malfunction, and Bluetooth disconnection.
- ❑ Local logging to a micro SD card at 30 min intervals with future cloud-synchronization and remote control capabilities.
- ❑ 2.8" color resistive touch LCD with PIN security protection and real-time system status indicators.

USEFULNESS & APPLICATION

- ❑ **Precision Microclimate Management:** Ensures strict adherence to optimal temperature, relative humidity, and lighting regimes tailored to bird species (Broiler vs. Layer) and growth age.
- ❑ **Harmful Gas Mitigation:** Monitors and controls accumulation of toxic gases like CO₂, CO, NH₃ and H₂S, minimizing respiratory distress, mortality, and stress in birds.
- ❑ **Automated Feeding and Watering:** Automates feed delivery and water reservoir monitoring, ensuring uninterrupted resource access while reducing manual labor.
- ❑ **Energy and Operational Efficiency:** Activates heavy equipment (fans, lights, air heater, humidifier) only when required, cutting utility costs and prolonging device lifespans.
- ❑ **Traceability and Real-Time Logging:** Micro SD data logging enables complete environmental audit trails for biosecurity and production analysis.

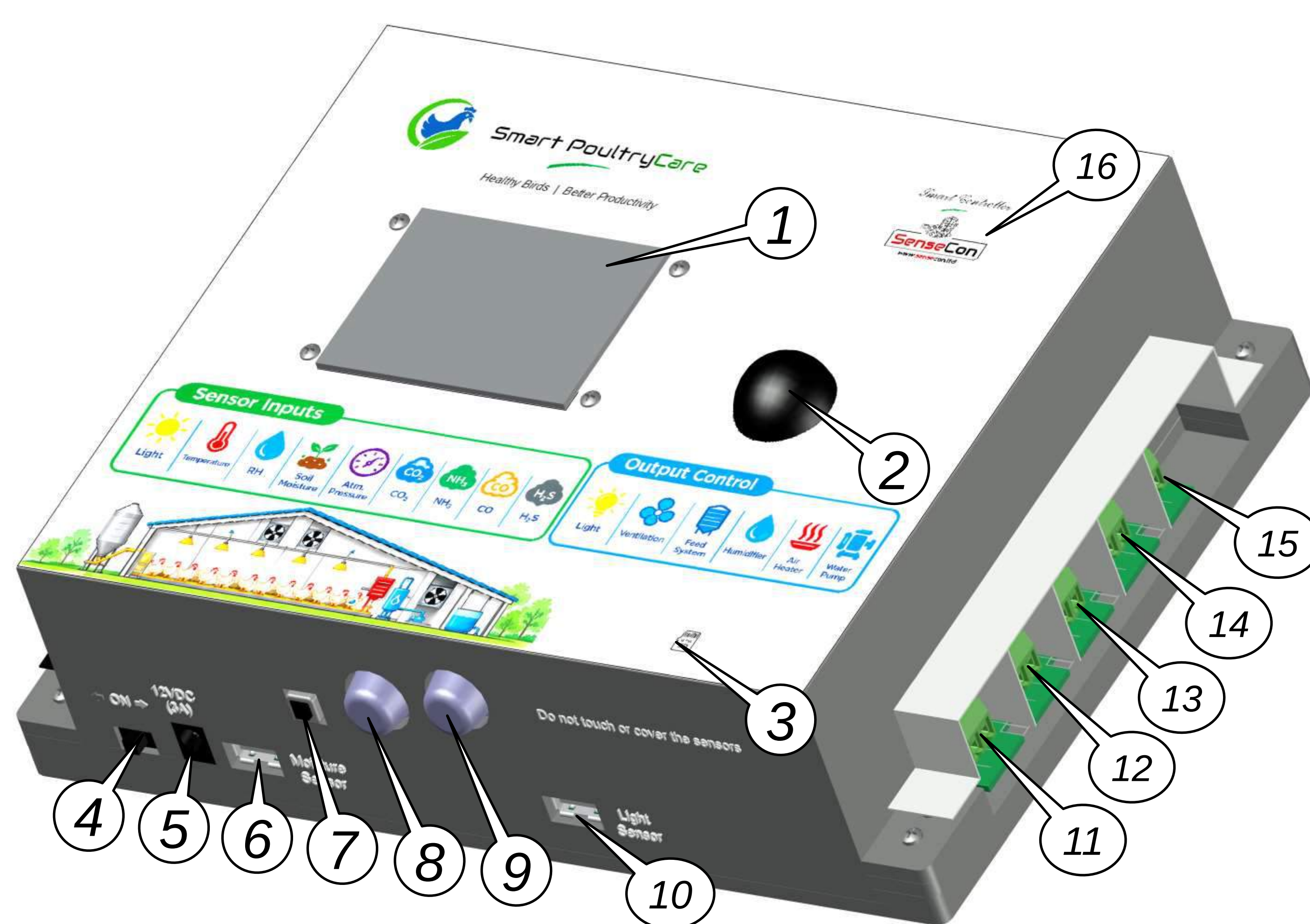
PACKAGE INCLUDES

- 1×Smart Controller
- 1×Relay Controller
- 1×12VDC, 3A power adapter (for Smart Controller)
- 1×5VDC, 2A Micro-USB adapter (for Relay Controller)
- 1×Micro SD card (pre-inserted in Smart Controller slot)
- 1×Capacitive litter moisture sensor

Note: External light sensor (Optional), 110-220V feed sensors (Compatible: AgroLogic SW2) and water level float sensor are NOT included in the standard package and must be acquired separately.



USER'S GUIDE

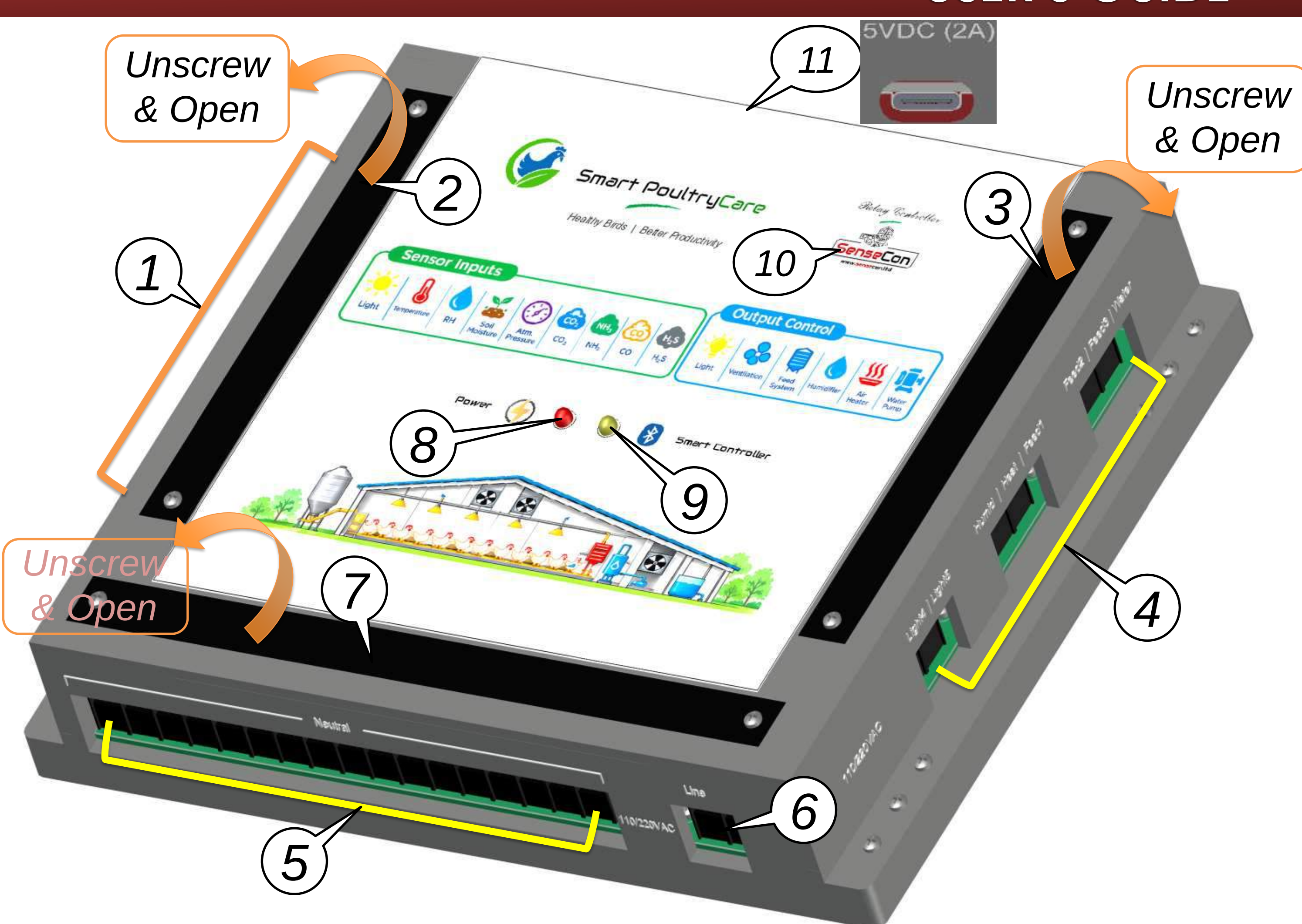


Smart Controller

1. Interactive touch screen (2.8" resistive touch)
2. Built-in light sensor (Do not cover it).
3. Micro SD card slot to insert the micro SD card (up to 32 GB) for data logging
4. Power switch to turn on/off the system.
5. Power input pin for powering up the unit at 12 VDC, 3A.
6. USB Connector for litter moisture sensor.
7. CO₂, temperature and humidity sensor (Do not cover it).
8. NH₃ and CO sensor (Do not cover it).
9. H₂S sensor (Do not cover it).
10. USB Connector for an optional light sensor.
11. Connector for water level sensor (float switch).
- 12.13.14. Connectors for feed systems 3, 2, 1 sensors (AgroLogic SW2).
15. Connector for 110-220 VAC input for water level, and all feed sensors.
16. Glowing SenseCon logo.

SPECIFICATIONS...Smart Controller

- Power Supply: 12VDC, 3A power adapter
- Display: 2.8" color resistive touch LCD
- Data Logger: Micro SD card slot with automatic logging at 30 minute intervals
- GPS Tracking: Integrated GPS receiver for real-time site coordinates (latitude, longitude, altitude)
- Wireless Communication: Bluetooth (to Relay Controller), Wi-Fi network connectivity
- Sensing Capabilities:
 - ✓ Light Intensity Sensor: Internal and external sensor, 1 to 65,535 lux
 - ✓ Temperature Sensor: -10 °C to +60 °C
 - ✓ Relative Humidity (RH) Sensor: 0% to 100% RH
 - ✓ Litter Moisture Sensor: Plug-in capacitive sensor, 0% to 100%
 - ✓ Atmospheric Pressure Sensor: 300 to 1,100 hPa
 - ✓ CO₂ Sensor: 400 to 5,000 ppm (±40 ppm)
 - ✓ NH₃, CO and H₂S Sensors: Up to 200 ppm
- Dedicated Inputs: 3×110-220VAC feeding sensor inputs (e.g., AgroLogic SW2) and 1×110-220VAC water tank float level sensor input
- Product size: L×W×H = 256 mm × 175 mm × 63 mm



Relay Controller

1. Connectors for the magnetic connectors/relays for output devices (Fan 1-5, Curtain 1, 2 and Light System 3).
2. Removable covering lid for the connectors of Fan 1-5, Curtain 1, 2 and Light System 3.
3. Removable covering lid for the connectors of Light System 4-5, Humidifier, Air Heater, Feed System 1-3 and Water Pump.
4. Connectors for the magnetic connectors/relays for output devices (Fan 1-5, Curtain 1, 2 and Light System 3).
5. 110-220 VAC input neutral and common neutral for contactors/relays of light systems, curtains, fans, feed Systems, air heater and humidifier.
6. 110-220 VAC input line.
7. Removable covering lid for the connectors of 110-220 VAC input line/neutral and common neutral for contactors/relays of light systems, curtains, fans, feed Systems, air heater and humidifier.
8. Power status LED.
9. Bluetooth connection status LED for Smart Controller.
10. Glowing SenseCon logo.
11. Power input USB connector for powering up the unit at 5 VDC, 2A.

SPECIFICATIONS...Relay Controller

- Power Supply: 5VDC, 2A C-type USB adapter
- Wireless Communication: Bluetooth (connects with Smart Controller within 10 m range)
- Output Channels:
 - ✓ 2×Sunlight curtains (Light 1 and 2)
 - ✓ 3×Lighting outputs (Light 3, 4 and 5)
 - ✓ 5×Ventilation fans (single) or 10 fans paired)
 - ✓ 3×Feeding system channels
 - ✓ 1×Humidifier
 - ✓ 1×Air heater
 - ✓ 1×Water pump
- Actuation Interface: Connected via high-power external relays or magnetic contactors
- Product size: L×W×H = 271 mm × 203 mm × 43 mm



OPERATION

1. Initial Power Up & Connection

Upon powering on, the Relay Controller emits a continuous beep until a successful Bluetooth connection is established with the Smart Controller. Initial warnings regarding improper parameter regulation may display briefly on startup; this is normal as sensors stabilize.

2. Login & Navigation

Enter the secure PIN code on the main touch LCD screen. Configure Wi-Fi network credentials (SSID and Password) if remote features are enabled.

3. System Configuration (SETUP Page)

Select Control Mode:

- **Automatic Control:** Select bird type (Broiler or Layer) and adjust the bird age slider (Days). The system automatically applies target ranges based on age-specific environmental recommendations. No further manual threshold setting is needed.
- **Semi-Automatic Control:** Set bird type and age, then manually enter desired upper/lower limits for Light, Temperature, and Relative Humidity on the Manual Setting screen.

4. Monitoring & Auto-Lock Security

View live sensor readings, active controlled devices, safe limits, site GPS coordinates, and connection status on the MONITOR page. After 2 minutes of inactivity on the monitoring page, the system automatically locks setup access, requiring PIN re-entry.



SAFETY PRECAUTIONS

- **Emergency Power Disconnect:** In an emergency or system malfunction, power off the main electrical contactor box driving the high-power equipment.
- **Sensor Protection:** Do not touch directly, wash, or cover internal/external sensor openings.
- **Water Protection:** Protect both Smart Controller and Relay Controller enclosures from direct spray, heavy moisture, and rainwater exposure.
- **Cable Integrity:** Periodically inspect terminal connectors and power lines for secure, dry connections.



INSTALLATION

Smart Controller (Component 1):

- ✓ Mount in the poultry shed at protected place from direct dust and water exposure.
- ✓ It is recommended that Smart Controller should be mounted on the central pillar of poultry shed where environmental parameters like light, temperature, RH, litter moisture, atmospheric pressure, and gases are representative of whole shed and effectively measured easily.
- ✓ Install the moisture sensor into the litter if applicable and connect to Smart Controller using USB port.
- ✓ Connect the 12VDC, 3A adapter and ensure the external light sensor (optional) is routed to a safe, light-exposed position.

Relay Controller (Component 2):

- ✓ Mount inside or adjacent to the electrical main control panel within a 10-meter range of the Smart Controller.
- ✓ Power up using the 5VDC, 2A micro-USB adapter.
- ✓ Wire high-power relays/magnetic contactors to control fans, curtains, lights, heater, humidifier, water pump, and feed systems by removing covering lids 2,3 and 7 (page 2).
- ✓ Wire external 110-220 VAC feed sensors and float type water level sensor into designated terminals on the Relay Controller.

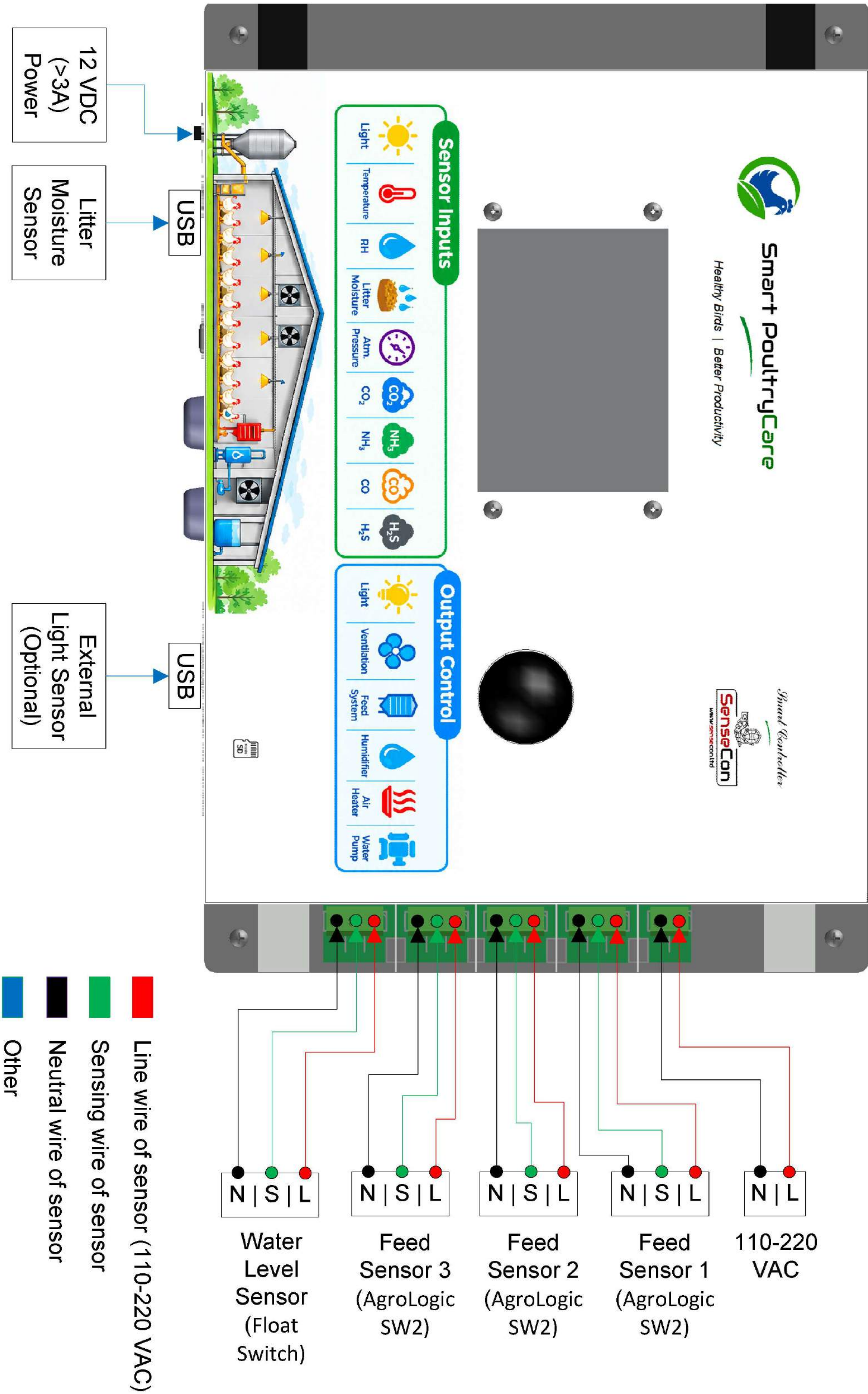


TROUBLESHOOTING

Problem / Indication	Possible Reason	Solution
Relay Controller beeps continuously upon startup	Bluetooth connection between Smart Controller and Relay Controller is not established.	Ensure both units are powered on and placed within 10 meters of each other. The beep will stop automatically once connected.
Relay Controller beeps every 7 seconds after 2 hours of operation	Environmental parameters remain out of target range due to malfunctioning or undersized equipment.	Inspect fans, air heaters, humidifiers, and curtains to ensure proper operation. Verify equipment capacity is sufficient for the poultry shed volume.
Bluetooth Disconnection Icon appears on screen	Signal loss between units.	Verify power supply and reduce distance between units. Tapping the icon hides it for 30 seconds.
Warning Message / Abnormal Parameter Icon displayed	Temperature or gas levels exceed safe bounds.	Tap the icon to hide for 30 seconds. Check ventilation fans, heating, and gas regulation devices. Icon clears automatically once parameters normalize.
Unable to re-enter Settings from Monitor or Help screen	Security timeout active (2 minutes).	Enter PIN on the security prompt to regain access to configuration screens.

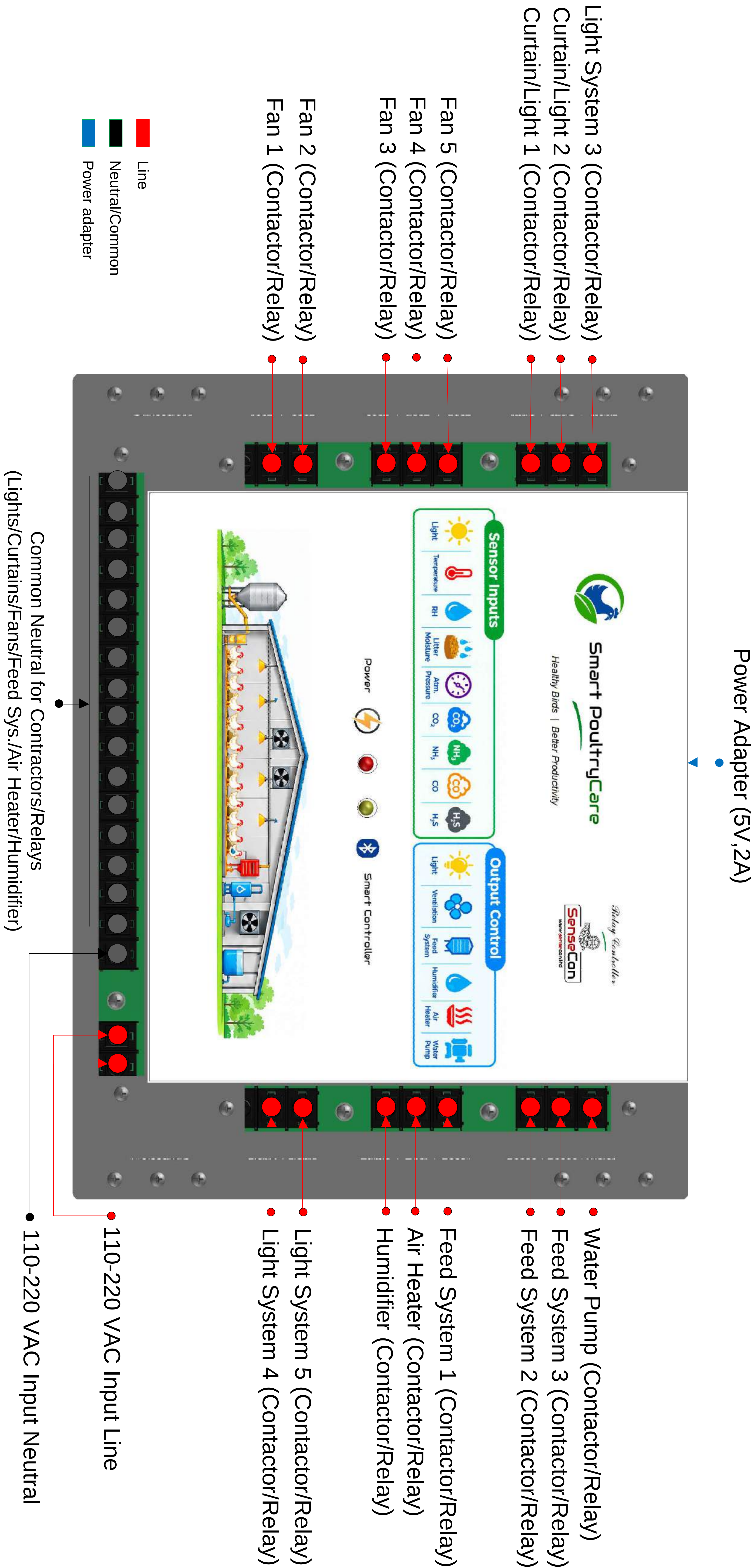


WIRING DIAGRAM OF SMART CONTROLLER





WIRING DIAGRAM OF RELAY CONTROLLER





RECOMMENDED ENVIRONMENTAL CONDITIONS FOR BROILER

Parameter	Days					References
	0-7	8-14	15-21	22-42	43+	
Light Intensity (Lux)	20-40	20-40	20-40	20-40	20-40	Olanrewaju et al. (2010)
	(light hours)	(light hours)	(light hours)	(light hours)	(light hours)	
	≤ 2 (dark hours)	≤ 6 (dark hours)	≤ 6 (dark hours)	≤ 6 (dark hours)	≤ 6 (dark hours)	
	22-24 light hours	18-20 light hours	18-20 light hours	18-20 light hours	18-20 light hours	
Temperature (°C)	32-34 (Optimal 33)	29-31 (Optimal 30)	24-30	18-27 (Optimal 21)	14-21	Fogaça et al. (2022), Liani et al. (2021), Olanrewaju et al. (2010)
Relative Humidity (%)	40-70 (Optimal 50)					Lashari et al. (2023), Prodanov et al. (2016), Weaver Jr and Meijerhof (1991)
Litter Moisture (%)	20-30 (Optimal)					-
Atmospheric Pressure (hPa)	950-1050					-
CO ₂ (ppm)	< 3000 [Control starts at 2000 ppm]					Karadöl et al. (2023), Corkery et al. (2013)
NH ₃ (ppm)	< 24 [Control starts at 16 ppm]					Song et al. (2008), Olanrewaju et al. (2008)
CO (ppm)	< 10 [Control starts at 6 ppm]					Talukder et al. (2010)
H ₂ S (ppm)	< 1 [Control starts at 0.3 ppm]					-

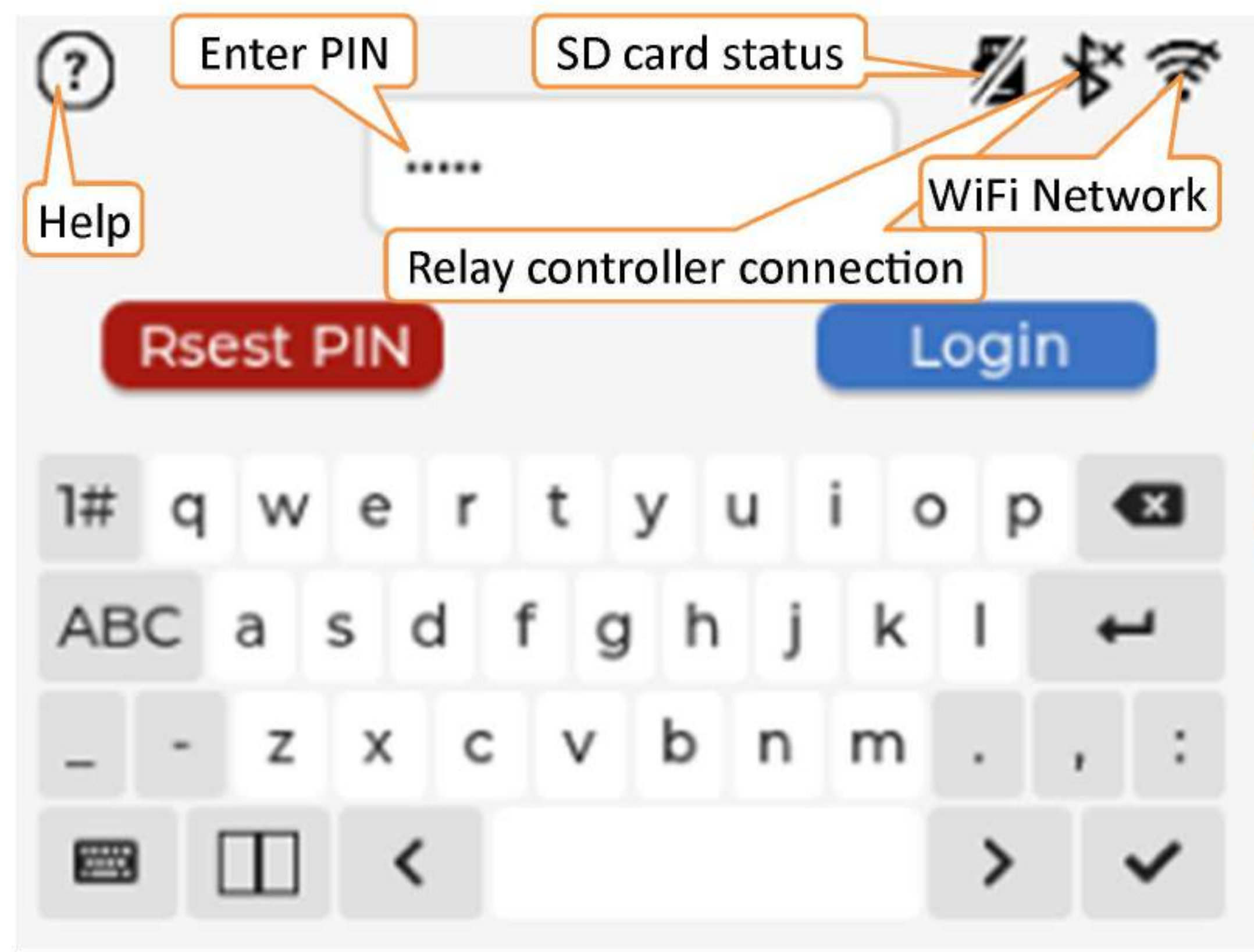
RECOMMENDED ENVIRONMENTAL CONDITIONS FOR LAYER

Parameter	Days				References
	0-21	22-42	43-126	126+	
Light Intensity (Lux)	20-40 (light hours) ≤ 10 (dark hours) <i>1- Chicks (0-42 days): 22-24 hours light for early growth.</i> <i>2-Pullets (43-126 days): Decreasing to 10-12 hours to delay sexual maturity.</i> <i>3-Laying Hens (126+ days): Increasing to 14-16 hours to stimulate egg laying.</i>				Olanrewaju et al. (2010), Olanrewaju et al. (2006), Etches (1996), North and Bell (1990)
Temperature (°C)	32-35	25-30	18-24	18-24	Lashari et al. (2023), Talukder et al. (2010)
Relative Humidity (%)	40-70				Lashari et al. (2023), Prodanov et al. (2016)
Litter Moisture (%)	20-30 (Optimal)				-
Atmospheric Pressure (hPa)	950-1050				-
CO ₂ (ppm)	< 2000 [Control starts at 1600 ppm]				Talukder et al. (2010)
NH ₃ (ppm)	< 10 [Control starts at 8 ppm]				Prodanov et al. (2016), Song et al. (2008), Olanrewaju et al. (2008)
CO (ppm)	< 10 [Control starts at 6 ppm]				(Talukder et al., 2010)
H ₂ S (ppm)	< 1 [Control starts at 0.3 ppm]				-



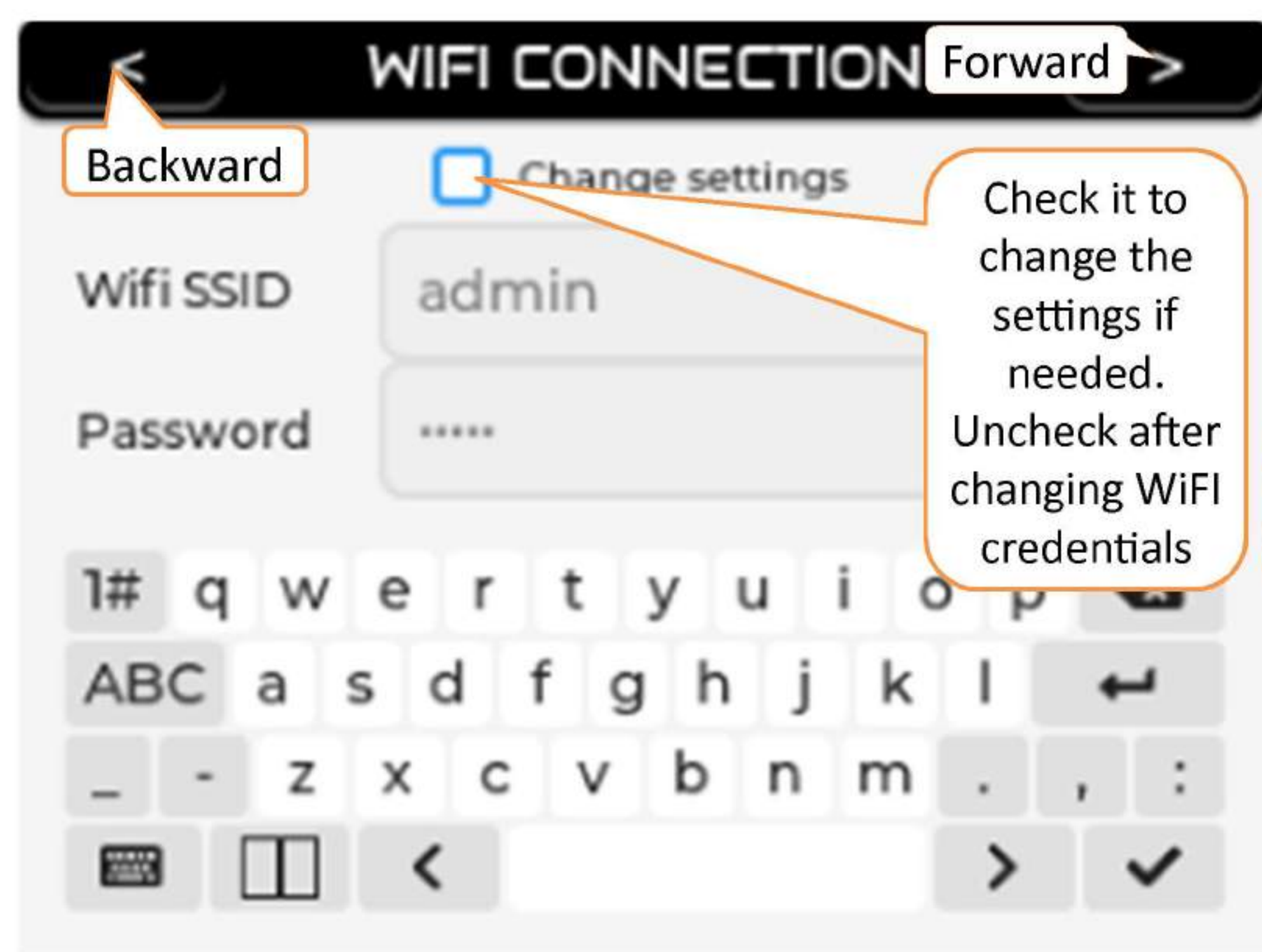
SETTING UP THE SMART CONTROLLER THROUGH USER INTERFACE

PIN page: Requires a PIN to log in or reset PIN.



1

Wi-Fi Connection: Connect by entering the network's SSID and password.

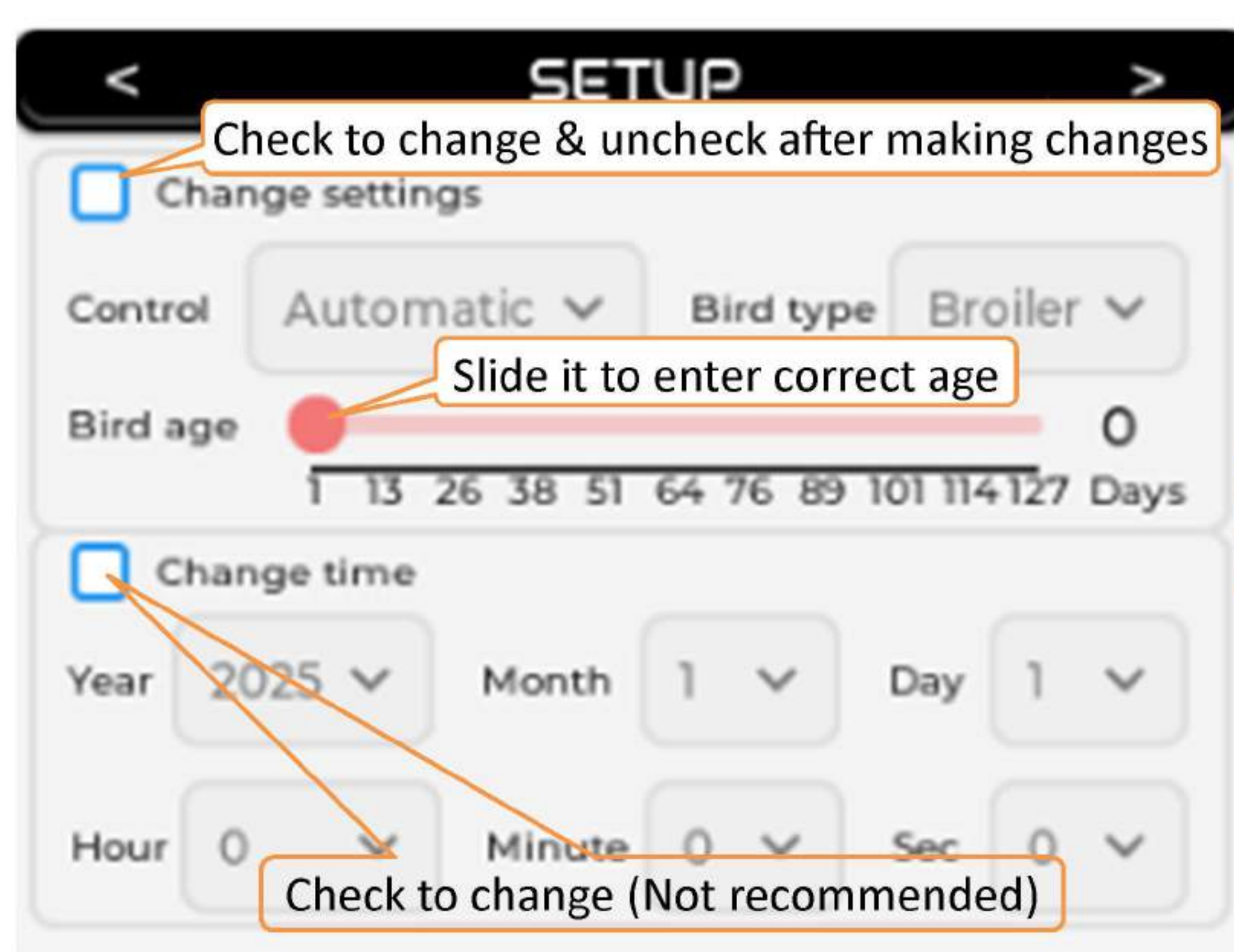


2

Setup: Set control type, bird type, and bird age. Time setting is optional and not recommended if already correct.

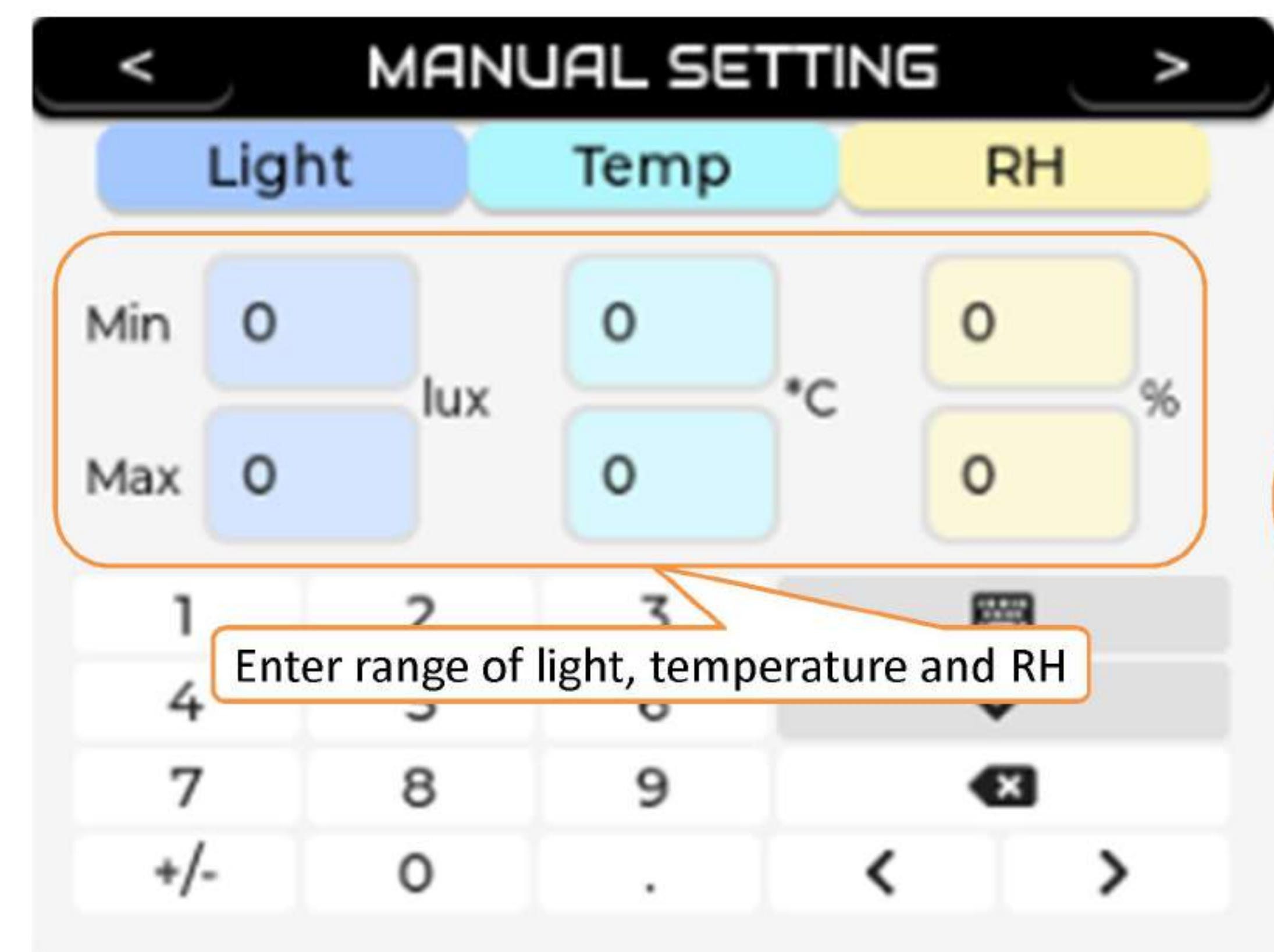
Automatic Control: No further settings are needed. Proceed to the monitoring page.

Semi-Auto Control: Set light, temperature, and RH ranges before proceeding.



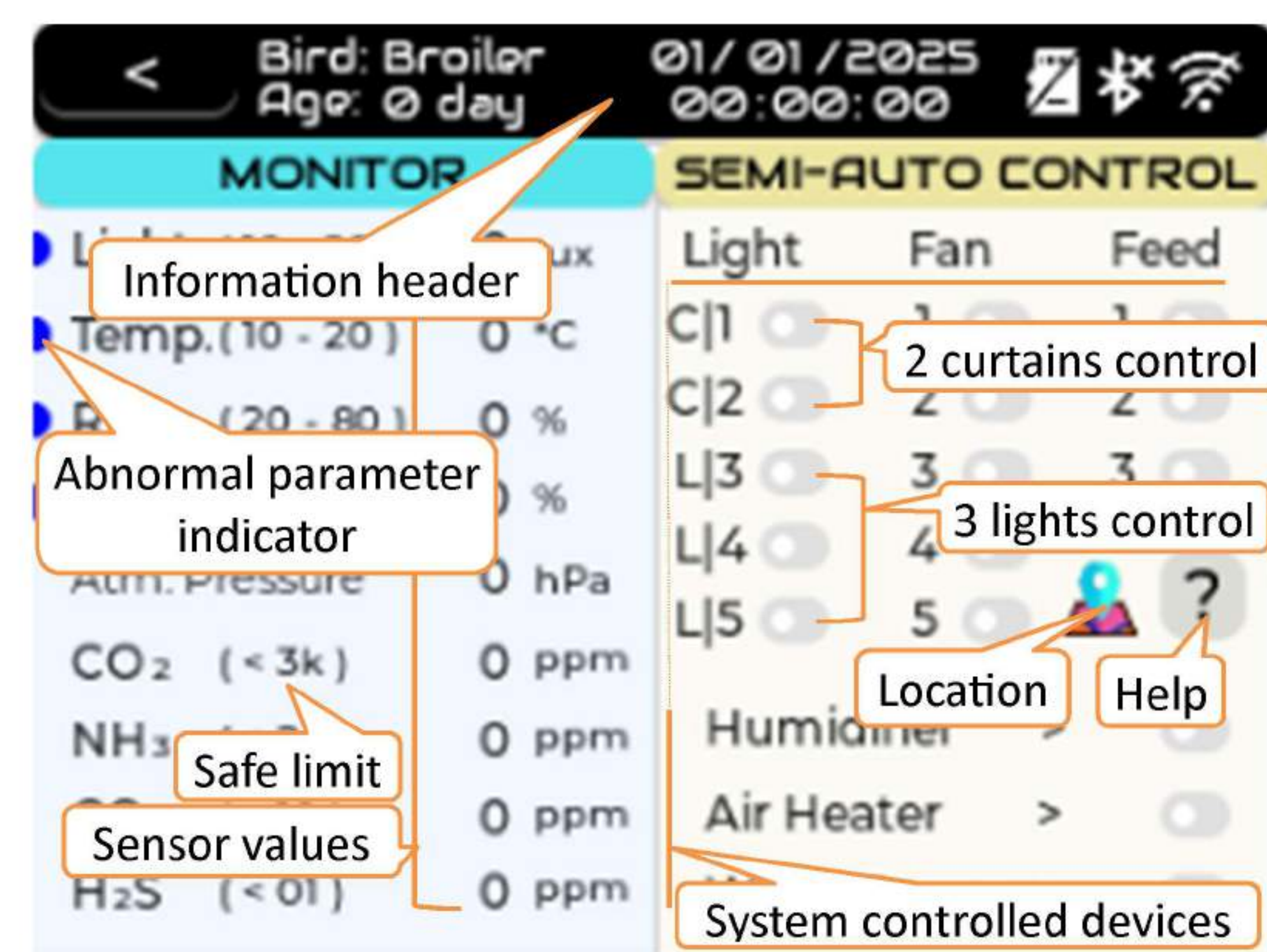
3

Semi-Auto Control: Set light, temperature, and RH ranges manually before proceeding.



4

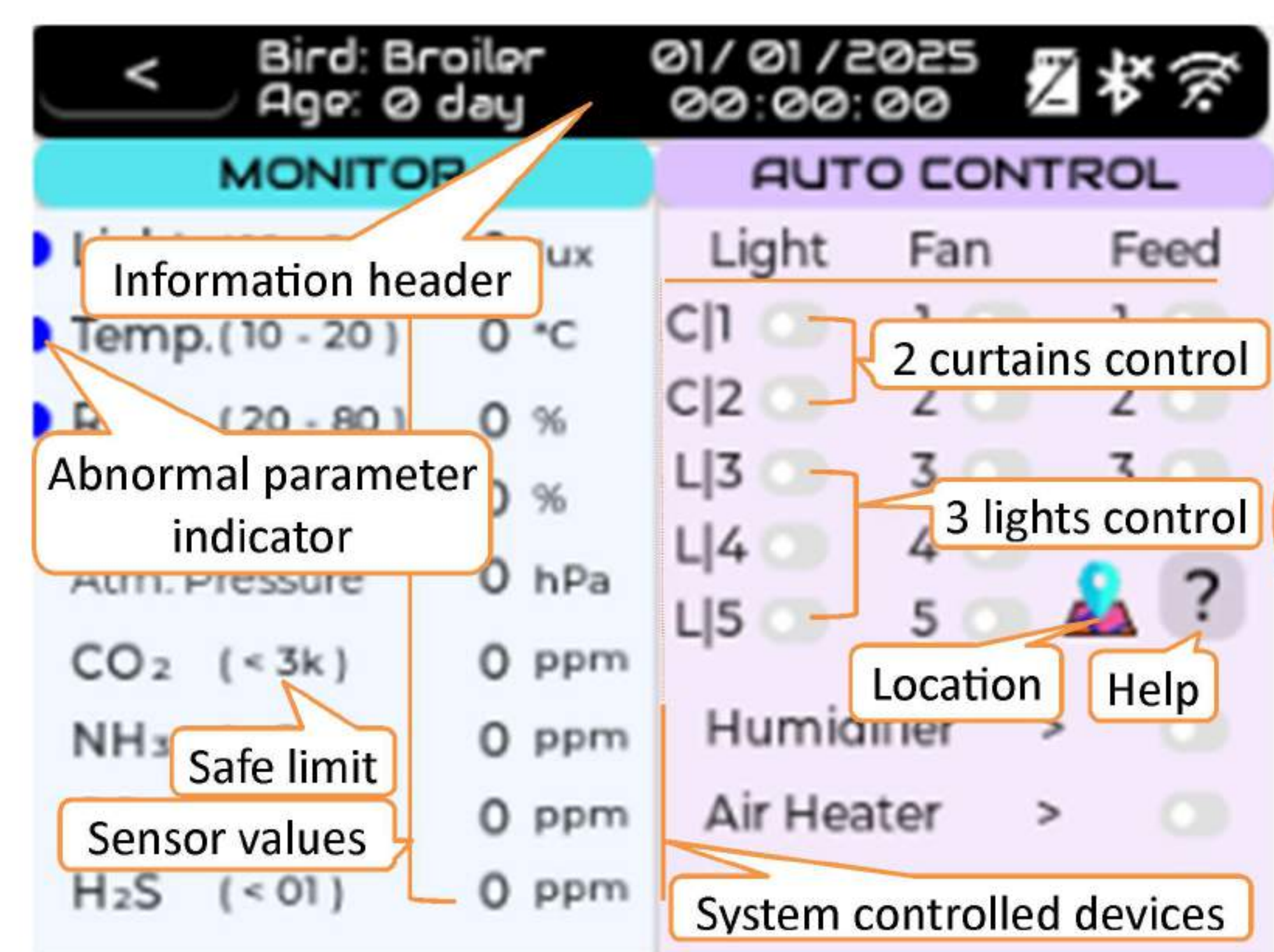
Security Timeout: After 2 minutes on the monitoring page, returning to settings requires re-entering the PIN.



5

Automatic Control: No further settings are needed to reach the monitoring page.

System Control: The system automatically controls equipment based on your settings.

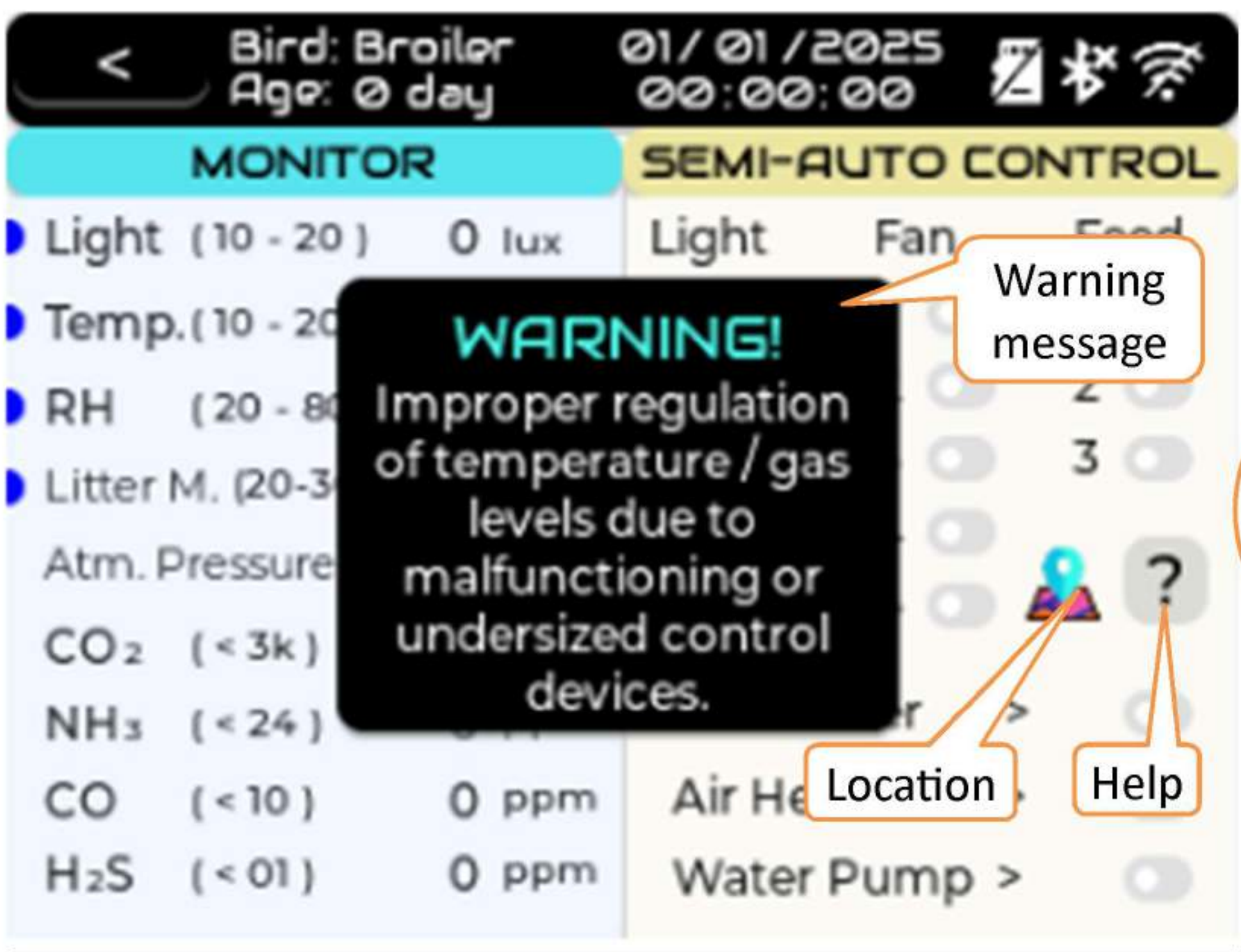


6



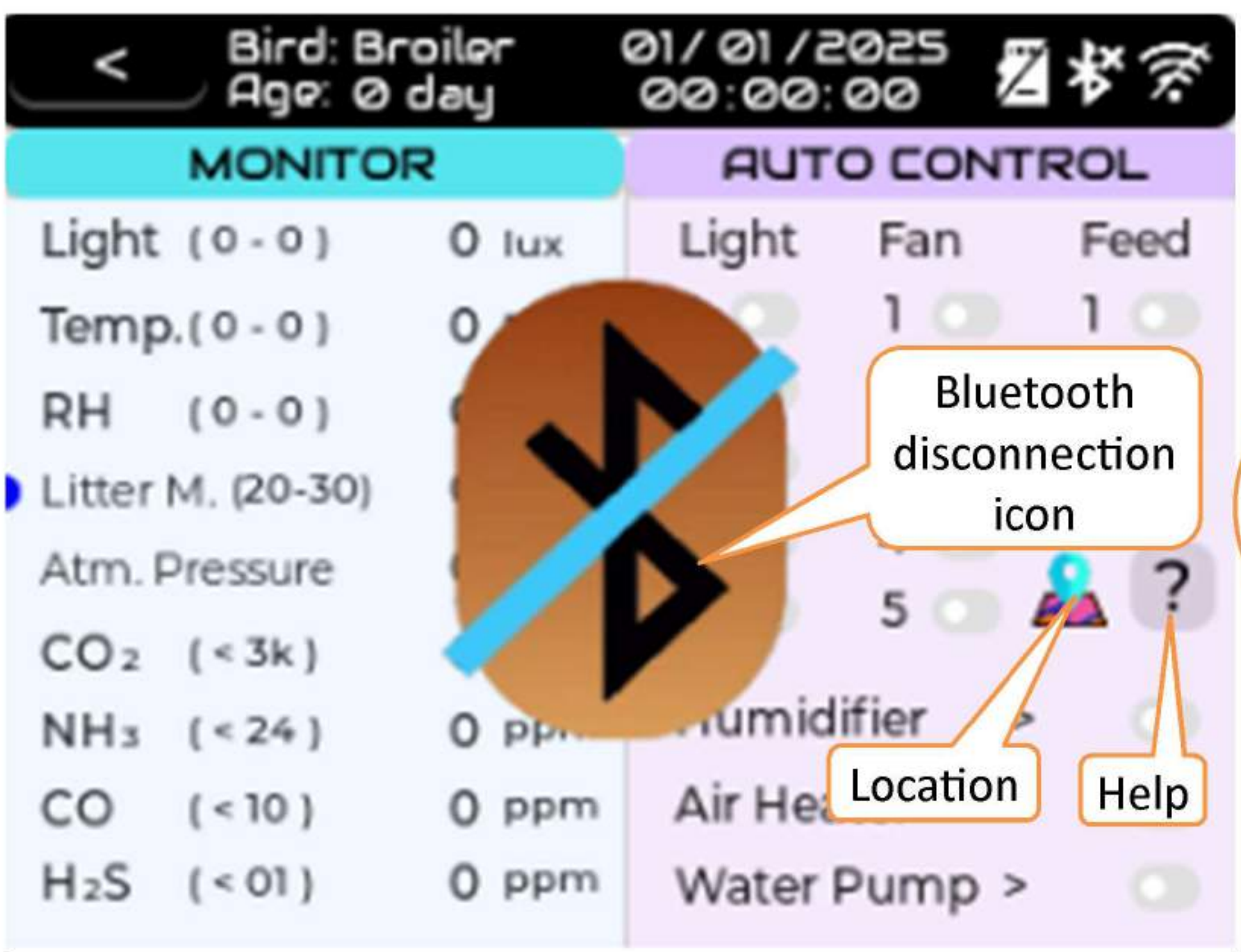
SETTING UP THE SMART CONTROLLER THROUGH USER INTERFACE

Warning message: This alert appears if temperature or gas levels remain poorly regulated. This suggests that your control devices (fans, air heaters, or humidifiers) may be malfunctioning or are undersized for the current farm area. Clicking on the icon will hide it temporarily for 30 s. Upon proper regulation of temperature and /or gas levels, this icon disappears automatically.



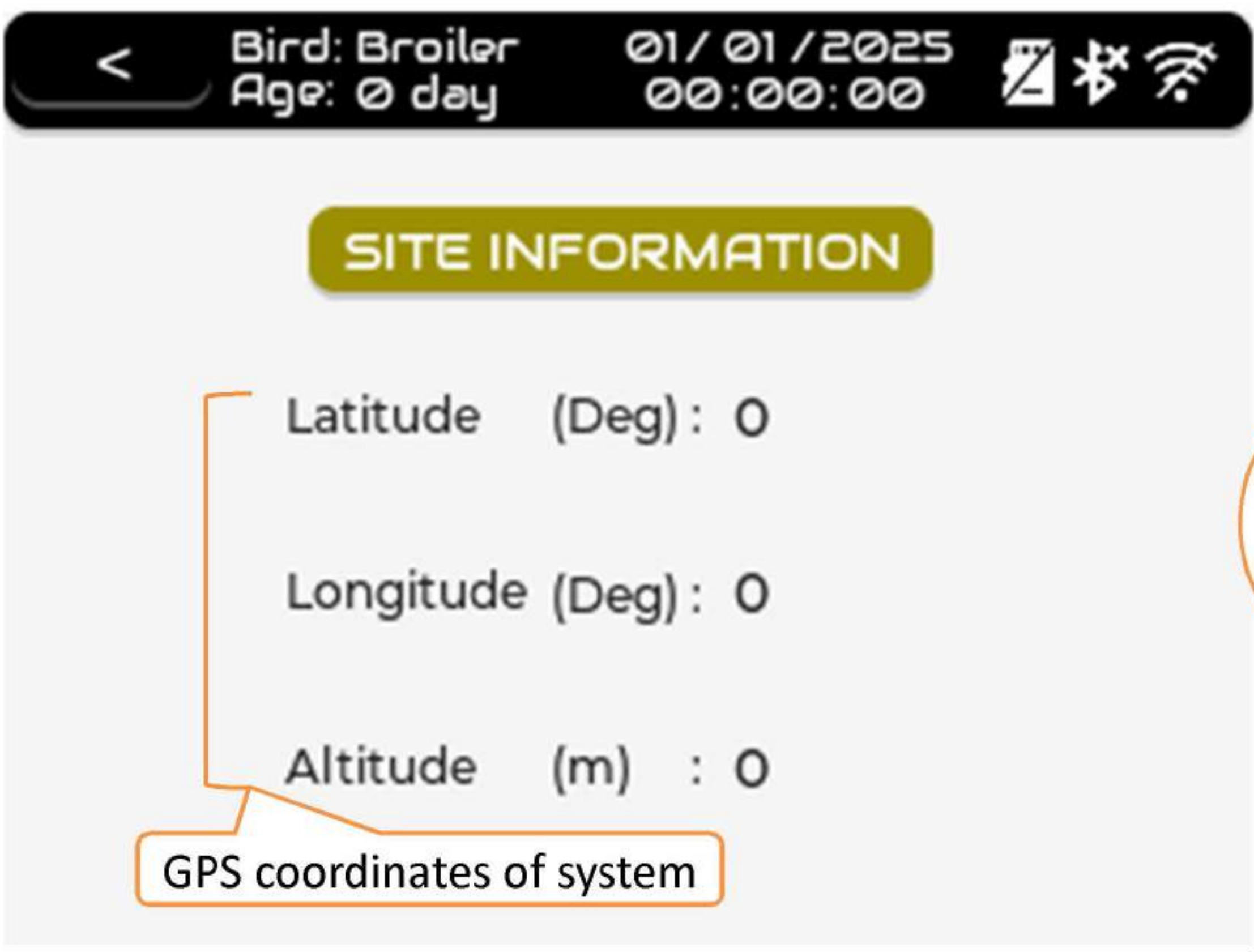
7

Bluetooth Disconnection: This icon indicates a loss of connectivity between the Smart Controller and the Relay Controller. To resolve this, ensure both units are powered on and positioned within 10 meters of each other. Clicking on the icon hides it temporarily for 30 s. Upon a successful connection, this icon disappears automatically.



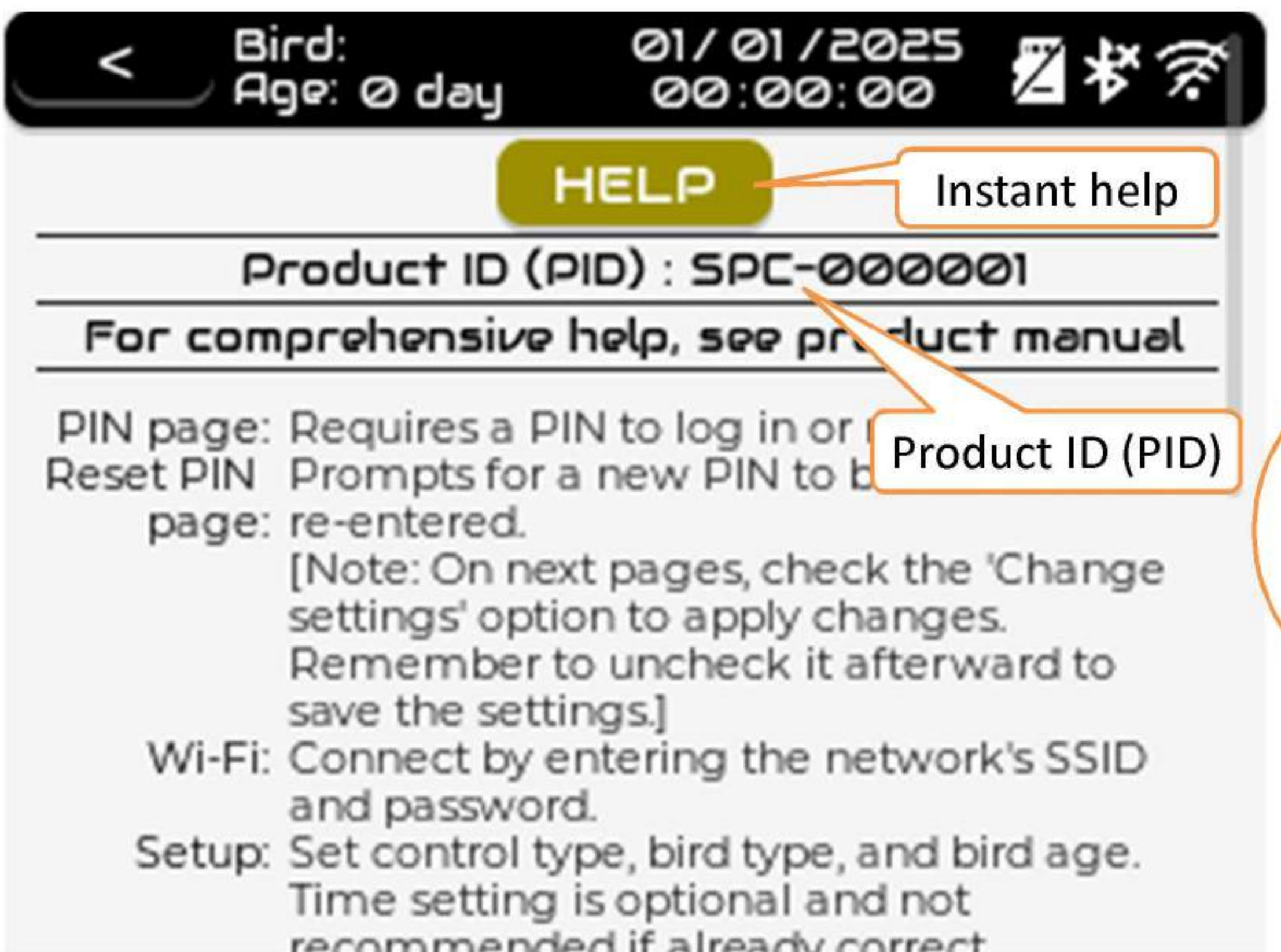
8

Location: The location icon on the right middle of monitoring page opens the GPS coordinates of site.



9

Help: This page offers instant help and Product ID (PID). Returning from the help page requires re-entering the PIN for security reasons.



10