

DC Brushless Barrier Gate Controller

User Manual

D6 Version: 3.51



Product Features

- **Safety:** 24V DC power supply, ensuring personal safety.
- **Energy-saving:** Static power consumption less than 2W, supports motors up to 200W maximum power.
- **Adjustable speed:** Independent adjustment of boom raising and lowering speeds.
- **Smooth operation:** Multi-stage speed design ensures stable working performance.
- **Quiet:** Working noise below 50dB.
- **Multiple protections:** Motor overcurrent, overload, short circuit protection, motor fault protection, reverse polarity protection.
- Supports external remote control input.
- Supports various configurable parameters.
- Supports windproof, anti-freeze, anti-rust functions.
- Supports multiple relay output modes.

Operating Environment Requirements

- Please transport, use, and store the device within the permitted humidity and temperature range.
- Do not allow any liquid to enter the device.
- Install the device in a well-ventilated area and do not block the ventilation openings.
- Do not subject the device to heavy pressure, severe vibration, or immersion.
- When transporting the device, use the original factory packaging or materials of equivalent quality.
- It is recommended to ground the device through the grounding hole to improve reliability.
- Do not disassemble the device without authorization.
- Use only accessories or attachments specified by the manufacturer, and have them installed and serviced by professional personnel.
- The boom must not be extended, shortened, or loaded with additional weights without authorization.

Operation and Maintenance Requirements

Specifications

Power Supply	DC 24V +/-10%
Motor Power	Max 200W
Static Power	<2W
Boom Raise/Lower Speed	1%-100% adjustable
Operating Temperature	-35°C ~ 75°C
Operating Humidity	30% ~ 80% (no condensation)

Safety Instructions

The following describes the correct use of the product to prevent hazards and property damage. Please read this manual carefully before using the device and strictly follow the instructions during use. Keep the manual properly after reading.

Function Directory

P-00	Boom Raise Speed
P-01	Boom Lower Speed
P-02	Boom Raise Deceleration Angle
P-03	Boom Raise End Speed
P-04	Boom Lower Deceleration Angle
P-05	Boom Lower End Speed
P-06	Boom Raise Acceleration Time

P-07	Boom Lower Acceleration Time
P-08	Horizontal Position Fine-tuning
P-09	Vertical Position Fine-tuning
P-10	Motor Type
P-11	Remote Control Learning Mode
P-12	Remote Control Learning
P-13	Remote Convoy Mode
P-14	Reverse-on-Obstacle Trigger Time
P-15	Reverse-on-Obstacle Force
P-16	Reverse-on-Obstacle Angle
P-17	Limit Learning Speed
P-18	Limit Search Mode
P-19	Manual Upper Limit Learning
P-20	Manual Lower Limit Learning
P-21	Manual Upper/Lower Limit Learning
P-22	Boom Raise Reverse Buffer Time
P-23	Boom Lower Reverse Buffer Time
P-24	Stop Buffer Time
P-25	Boom Raise Deceleration End Angle
P-26	Boom Lower Deceleration End Angle
P-27	Anti-crash Function
P-28	Lock Power Value
P-29	Open-in-place Lock Time
P-30	Close-in-place Lock Time
P-31	Reverse Lock Turns
P-32	Auto Lower Time Without Loop Detector
P-33	Vehicle Pass Delay Lower Time
P-34	Loop Detector Counting
P-35	Loop Detector Non-detection Angle
P-36	Loop Detector Trigger Buzzer Frequency
P-37	Loop Detector Signal Trigger Judgment Time
P-38	Loop Detector Signal Valid Judgment Time
P-39	/
P-40	/
P-41	Light Sensor Off Threshold
P-42	Boom Raise Priority
P-43	Boom Raise Signal Judgment Time
P-44	Relay Output Mode
P-45	/
P-46	/
P-47	/
P-48	/
P-49	Ambient Temperature
P-50	Anti-freeze Temperature Threshold
P-51	Anti-freeze Boom Raise Angle
P-52	Anti-freeze Boom Raise Time Interval
P-53	Anti-rust Open Angle
P-54	Anti-rust Boom Raise Time Interval
P-55	Set 485 Baud Rate
P-56	Set 485 Address
P-57	Controller Master/Slave Mode
P-58	Auto Close Count After Manual Raise
P-59	Auto Test
P-60	Restore Default Settings
P-61	/
P-62	/
P-63	Adaptive Mode
P-64	Boom Raise/Lower Timeout
P-65	Power-off Auto Raise/Lower Voltage
P-66	Brake Reverse Voltage Warning Threshold
P-67	Display Drive Voltage and Current
P-68	Pause on Loop Trigger During Lowering
P-69	Power-off Auto Run Function
P-70	Custom Parameter Settings
P-71	Overcurrent Protection Value

P-72	Power Output
P-73	Auto Lower Speed Without Loop Detector
P-74	/
P-75	/
P-76	/
P-77	/
P-78	Auto Send Barrier Status Data
P-79	/
P-80	Adaptive Control Coefficient
P-81	Adaptive Mode Limit Learning Power
P-82	Bluetooth Connection
P-83	Boom Raise Loop Non-detection Angle
P-84	Expansion Port Mode
P-85	/
P-86	/
P-87	/
P-88	Control Interface Disable
P-89	Loop Detector Tailgating Auto Lower Time
P-90	Barrier Limit Verification

I. Button Description

The controller has 4 buttons. From left to right, they are "Open/+", "Close/-", "Menu", and "Stop/Cancel". Various parameters of the controller can be set through these 4 buttons.

"Open/+":

In normal working mode, pressing this button raises the boom. After entering settings mode, this button can be used to increase menu items and adjust values upward. In parameter setting mode, each short press increases by one. Long press continuously increases to the maximum value, then restarts from the minimum. If long-pressed for an extended period, the continuous increase speed will accelerate.

"Close/-":

In normal working mode, pressing this button lowers the boom. After entering settings mode, this button can be used to decrease menu items and adjust values downward. In parameter setting mode, each short press decreases by one. Long press continuously decreases to the minimum value, then restarts from the maximum. If long-pressed for an extended period, the continuous decrease speed will accelerate.

"Menu": This button has 3 functions:

1. In normal working mode, long-press this button for 3 seconds to enter menu item selection mode. The LED displays "P-XX", then you can press "Open/+" or "Close/-" to select menu items;
2. In menu item selection mode, short-press "Menu" to enter parameter setting mode;
3. After parameter setting is complete, short-press to save and exit.

"Stop/Cancel":

In normal working mode, this button functions as stop. In menu item selection mode, it exits the setting mode. In parameter setting mode, pressing this button exits the current state and returns to the menu selection state (i.e., returns to the previous menu level), and the set value is invalid. If no button is pressed within 60 seconds in menu selection mode and parameter setting mode, the buzzer will sound a long beep and the controller will return to normal working mode.

II. Display

The control board has a 4-digit LED display that can show barrier gate working status, parameters, menu items, and other information. After power-on, it runs in low-power mode, where the LED display brightness is dim. Pressing any button will switch the LED display to normal working mode with high brightness. If no button is pressed, after 60 seconds it enters low-power mode with dim LED brightness to reduce power consumption. After 2 minutes without button press, the LED display will turn off, entering the lowest power consumption state.

III. Parameter Settings

You can enter the parameter setting mode by long-pressing the "Menu" button for 3 seconds. The LED will display "P-XX". Use short press or long press of "Open/+" and "Close/-" buttons to select menu items. Short press increases or decreases by one; long press continuously increases or decreases. Press "Menu" again to enter the setting for the specified item. Press "Stop/Cancel" to return to the previous level or exit settings. After completing the parameter setting, you must press "Menu" to confirm for it to take effect. Parameters set by pressing "Stop/Cancel" will not take effect. If no button is pressed within 60 seconds, the buzzer on the control board will sound a long beep, exit the setting mode, and return to normal working mode.

IV. DC Brushless Barrier Gate Controller Command List

Note: Some preset default values may differ from the default values listed in the table.

Parameter List:

Menu	Function	Default	Range	Description
P-00	Boom Raise Speed	80	10-200	The larger the value, the faster the speed; the smaller the value, the slower the speed. When adjusted to 200 and still unable to reach the required speed, increase P-72. (When P-63 is 0 or 1, values exceeding 100 are treated as 100; when P-63 is set to 2, values exceeding 100 are valid)
P-01	Boom Lower Speed	80	10-200	Same as boom raise speed.
P-02	Boom Raise Deceleration Angle	45	10-90	Used to set the position where deceleration starts during boom raising. Measured in degrees, 0 degrees represents the horizontal position and 90 degrees represents the vertical position. This parameter indicates the angle at which the boom starts to decelerate during raising.
P-03	Boom Raise End Speed	10	1-80	The boom raising ends at this speed. Too low will cause incomplete opening; too high will cause oscillation.
P-04	Boom Lower Deceleration Angle	55	0-80	Used to set the position where deceleration starts during boom lowering. Measured in degrees, 0 degrees represents the horizontal position and 90 degrees represents the vertical position. This parameter indicates the angle at which the boom starts to decelerate during lowering.
P-05	Boom Lower End Speed	5	1-80	The boom lowering ends at this speed. Too low will cause incomplete closing; too high will cause oscillation. If the P-26 command has set a boom lower low-speed angle and it is within the valid range, it will run at this speed in the low-speed uniform zone.
P-06	Boom Raise Acceleration Time	60	0-255	Time required to accelerate from start to the boom raise speed set by P-00 (larger value means longer time). (Unit: 0.01 seconds)
P-07	Boom Lower Acceleration Time	50	0-255	Time required to accelerate from start to the boom lower speed set by P-01 (larger value means longer time). (Unit: 0.01 seconds)
P-08	Horizontal Position Fine-tuning	15	0-255	Distance of the boom horizontal position from the horizontal mechanical limit. Larger value means farther, and vice versa. When the barrier gate completes self-check and is in the closed-in-place state, modifying this parameter will cause the barrier gate horizontal angle to update in real-time according to the set value. (This parameter should not be set too small, otherwise the connecting rod may hit the mechanical limit when closed in place, posing a risk of damaging the mechanism and mainboard)
P-09	Vertical Position Fine-tuning	15	0-255	Distance of the boom vertical position from the vertical mechanical limit. Larger value means farther, and vice versa. When the barrier gate completes self-check and is in the open-in-place state, modifying this parameter will cause the barrier gate vertical angle to update in real-time according to the set value. (This parameter should not be set too small, otherwise the connecting rod may hit the mechanical limit when open in place, posing a risk of damaging the mechanism and mainboard)
P-10	Motor Type	0	0-3	Value range: 0-3; Default: 1. Due to different Hall polarities of motors, different reduction ratios of barrier gate mechanisms, and left/right boom output configurations, this parameter is used to be compatible with various types of motors and barrier gates. 0: Motor positive polarity, reducer positive polarity; 1: Motor

				positive polarity, reducer negative polarity; 2: Motor negative polarity, reducer positive polarity; 3: Motor negative polarity, reducer negative polarity
P-11	Remote Control Learning Mode	0	0-1	0: Press Open, Close, Stop in sequence to complete learning; 1: Press any one button to complete learning
P-12	Remote Control Learning	0	0-50	Remote control learning: Entering P-12 will display the current number of saved remote controls. At this point, press the remote control buttons Open, Close, Stop in sequence to learn. Keep pressing until the control board beeps once, then release and press the next button. Continue until the control board gives a long beep or the number displayed on the digital tube increases by one, indicating learning is complete. You can continue learning the next remote or press Cancel to return. Remote control deletion: In this menu, press "+" or "-" to modify the learned remote control count, then press "Menu" to confirm. This will delete all learned remote controls after that count.
P-13	Remote Convoy Mode	0	0-3	0: Normal remote control mode. (Temporary convoy mode entry method: After the barrier gate is fully opened, long-press the remote control Open button for more than 5 seconds to temporarily enter convoy mode. The buzzer will sound for 2 seconds. Press Close to exit convoy mode and close the barrier gate.) 1: Remote "Open" enters convoy mode. Loop detector signals will not be processed until manual boom lowering. The boom stays raised. 2: Manual mode. All opening actions of the barrier gate will enter convoy mode, and loop detector trigger will not lower the boom. 3: Disable convoy mode.
P-14	Reverse-on-Obstacle Trigger Time	2	1-40	How long an obstacle must be encountered before it is judged as reverse-on-obstacle. (Unit: 0.05 seconds)
P-15	Reverse-on-Obstacle Force	45	1-100	How much resistance is considered as an obstacle. The reverse condition is that the resistance set by P-15 is encountered and persists for the time set by P-14, then the boom reverses.
P-16	Reverse-on-Obstacle Angle	5	0-90	When the boom is below this angle, reverse-on-obstacle will not occur. 0 disables this function.
P-17	Limit Learning Speed	40	10-80	Set different speeds for finding upper limit and lower limit. After entering the menu, the first setting is the speed for finding the upper limit. The digital tube displays "1-XX", where XX represents the speed for finding the upper limit. You can adjust the speed by pressing "Open/+" and "Close/-". After setting the upper limit speed, press "Menu" and the digital tube displays "2-XX", where XX represents the speed for finding the lower limit. Similarly, adjust the speed by pressing "Open/+" and "Close/-". After both upper and lower limit speeds are set, press "Menu" to save. If "Stop/Cancel" is pressed during setting, the parameters will be invalid.
P-18	Limit Search Mode	0	0-2	0: Search for both limits. 1: Search for upper limit. 2: Search for lower limit.
P-19	Manual Upper Limit Learning	N/A	N/A	After entering this setting, the digital tube displays L-00. The boom automatically raises to position and stops, displaying L-01. The operation is the same as P-21, finding vertical and horizontal limits. After learning the horizontal limit, it automatically returns to the setting page, indicating success. Then set P-18 to 1 to use.
P-20	Manual Lower Limit Learning	N/A	N/A	Same as P-19 but reversed. After entering the setting, it displays L-00 and automatically finds the lower limit. When in position, it stops and displays L-01. The user manually finds the horizontal and vertical positions. The first confirmation is the horizontal position, displaying

				L-02. The second is the vertical position, and it returns to the setting page. Then set P-18 to 2 to use.
P-21	Manual Upper/Lower Limit Learning	N/A	N/A	After entering this setting, the digital tube displays L-00. The barrier gate first automatically lowers the boom. When in position, it displays L-01, then automatically raises the boom. When in position, it stops and displays L-02. At this point, holding the raise or lower button will raise or lower the boom, and releasing will stop. It will alarm when reaching the mechanical limit. The user can adjust the position manually. Once determined, press Menu to learn one limit. The first Menu press is for the vertical limit, displaying L-03. The second is for the horizontal limit. After the second press, it automatically returns to the setting page, indicating learning is successful. After setting this function, P-18 must be set to 0.
P-22	Boom Raise Reverse Buffer Time	80	10-255	Buffer time from boom raise to boom lower. Too short a time may cause excessive instantaneous current. (Unit: 0.01 seconds)
P-23	Boom Lower Reverse Buffer Time	100	10-255	Buffer time from boom lower to boom raise. Too short a time may cause excessive instantaneous current. (Unit: 0.01 seconds)
P-24	Stop Buffer Time	100	10-255	Time required for the motor to stop from running when Stop is pressed during boom raise or lower. Too large will cause slow and stable stopping. Too short may cause excessive instantaneous current. (Unit: 0.01 seconds)
P-25	Boom Raise Deceleration End Angle	90	45-90	During boom raising, the boom first accelerates to P-00, then starts decelerating at P-02. At this option, it stops decelerating and enters uniform motion until boom raising ends.
P-26	Boom Lower Deceleration End Angle	10	0-45	During boom lowering, the boom first accelerates to P-01, then starts decelerating at P-04. At this option, it stops decelerating and enters uniform motion until boom lowering ends.
P-27	Anti-crash Function	1	0-8	Whether the anti-crash port signal is valid. 0: Invalid, triggering anti-crash signal does not raise the boom. 1: Valid, triggering anti-crash signal during boom lowering raises the boom. 2: Anti-crash port repurposed as "Open" port function. 3: Anti-crash port repurposed as "Close" port function. 4: Anti-crash port repurposed as loop detector port function. (After repurposing the anti-crash port, the original function port becomes invalid.) 5: Anti-crash terminal connected to radar for pedestrian anti-crash. (Valid during lowering, resumes lowering after target disappears, i.e., does not change the original raise/lower state, only used for anti-crash for pedestrians/vehicles.) 6: Anti-crash port repurposed as "Open" port function while keeping the original "Open" port valid. 7: Anti-crash port repurposed as "Fire Emergency port". When triggered, raises the boom and automatically enters convoy mode. 8: Anti-crash port repurposed as Open, Stop port repurposed as loop detector. (Original Open and loop detector ports become invalid.)
P-28	Lock Power Value	255	0-21, 255	When the motor stops in a non-mechanical lock zone, since there is no mechanical lock, the spring tension will pull the boom up. This function uses controller output control for locking, which will cause the motor and board to heat up. It is recommended to set according to actual conditions and not too high. When set to 255, it is auto-adaptive lock power.
P-29	Open-in-place Lock Time	0	0-255	How long the lock remains active after the boom reaches the open position. (Unit: seconds) When set to 255, the lock is always maintained when open in place, without timing.
P-30	Close-in-place Lock Time	0	0-255	How long the lock remains active after the boom reaches the close position. (Unit: seconds) When set to 255, the lock is always maintained

				when closed in place, without timing.
P-31	Reverse Lock Turns	0	0-20	During boom raising, if the motor reverses for various reasons, how many turns before locking.
P-32	Auto Lower Time Without Loop Detector	0	0-255	Time for the boom to automatically lower without loop detector trigger. Setting to 0 means no auto-lowering without loop detector. (Unit: seconds)
P-33	Vehicle Pass Delay Lower Time	2	0-255	How long after the loop detector signal disappears before starting to lower the boom. Default 0.2 seconds. (Unit: 0.1 seconds)
P-34	Loop Detector Counting	1	0-4	0: No raise counting, lower after vehicle passes. 1: Count raise signals, max count is 1. Decrement count when loop detector is triggered. Lower when loop detector disappears and count is 0. 2: Count raise signals, max count is 2. Decrement count when loop detector is triggered. Lower when loop detector disappears and count is 0. 3: Count raise signals, max count is 3. Decrement count when loop detector is triggered. Lower when loop detector disappears and count is 0. 4: Count raise signals, max count is 255. Decrement count when loop detector is triggered. Lower when loop detector disappears and count is 0.
P-35	Loop Detector Non-detection Angle	10	0-45	When the boom angle is below this value, loop detector signals will not be processed, and the boom lowers directly.
P-36	Loop Detector Trigger Buzzer Frequency	4	0-20	Buzzer frequency when loop detector is triggered. 0 disables. Larger number means faster beeping.
P-37	Loop Detector Signal Trigger Judgment Time	4	1-255	How long the signal must be maintained to be considered a loop detector trigger. (Unit: 0.01 seconds)
P-38	Loop Detector Signal Valid Judgment Time	4	1-255	When the loop detector is triggered, how long it must remain triggered to be considered a real loop detector signal (i.e., a vehicle is present). (Unit: 0.01 seconds)
P-39	/	/	/	/
P-40	/	/	/	/
P-41	Light Sensor Off Threshold	0	0-50	0 -- This parameter is invalid. The light sensor is fully controlled by the P-46 photosensitive threshold. Other -- Light sensor off threshold. When ambient light intensity falls below this value, the light sensor turns off after a delay. (P-41 works with P-46. P-46 sets the light-on threshold, and P-41 sets the light-off threshold. By setting P-41 to a value smaller than P-46, you can solve the problem of the light box control being unstable due to the light box illuminating the photosensitive receiver.)
P-42	Boom Raise Priority	1	0-2, 50-80	0: All control signals have the same priority in any state. 1: Boom raise has the highest priority. Other signals are ineffective during raising. 2: During boom raising, if the vehicle has already passed the loop detector, immediately start lowering without waiting for the barrier gate to fully open. 50-80: During boom raising, if the vehicle has passed the loop detector before fully open, the barrier gate starts lowering when it reaches the angle set by this value.
P-43	Boom Raise Signal Judgment Time	8	1-255	How long the raise signal must persist to be considered a valid raise signal. (Unit: 0.01 seconds)
P-44	Relay Output Mode	4	0-7	0: Traffic light mode: Relay closes when open in place, relay opens when closed in place. 1: / 2: Loop detector mode: Closes when boom starts raising, relay opens when closed in place. 3: Traffic light mode 1: Normally closed connects to red light, normally open connects to green light. Relay closes and green light turns on after barrier gate opens in place; otherwise relay opens and red light turns on. 4: Traffic light mode 2: Normally closed connects to red light, normally open connects to green light. Relay closes and green light turns on when barrier

				gate angle exceeds 60 degrees; otherwise relay opens and red light turns on. 5: Traffic light mode 3: Relay closes during boom raising, opens during boom lowering. 6: Manual lift alarm: Relay closes when boom is manually lifted more than 5 degrees after closing in place. Can be used to connect an alarm. 7: Pulse mode: Relay closes for 1 second when closed in place, then opens.
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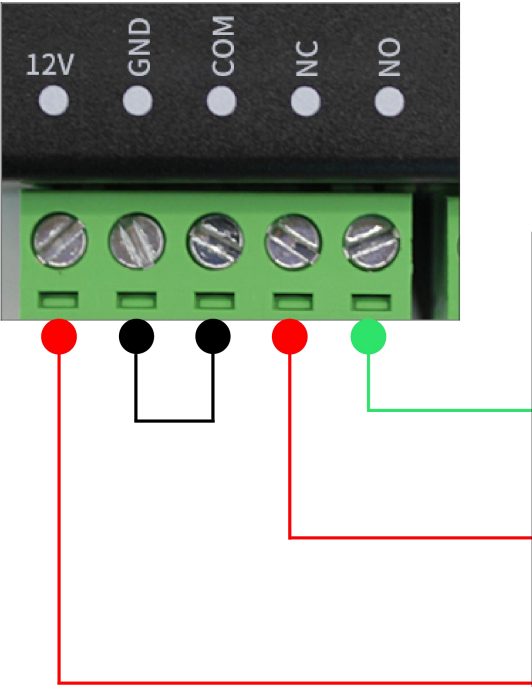
Relationship between relay output mode and relay switch closure:

Mode	Description
0: Traffic Light Mode	Relay closes when open in place, relay opens when closed in place
1: /	/
2: Loop Detector Mode	Closes when boom starts raising, relay opens when closed in place
3: Traffic Light Mode 1	Normally closed connects to red light, normally open connects to green light. Relay closes and green light turns on after barrier gate opens in place; otherwise relay opens and red light turns on
4: Traffic Light Mode 2	Normally closed connects to red light, normally open connects to green light. Relay closes and green light turns on when barrier gate angle exceeds 60 degrees; otherwise relay opens and red light turns on
5: Traffic Light Mode 3	Relay closes during boom raising, opens during boom lowering
6: Manual Lift Alarm	Relay closes when boom is manually lifted more than 5 degrees after closing in place. Can be used to connect an alarm
7: Pulse Mode	Relay closes for 1 second when closed in place, then opens

P-44 Traffic Light Wiring Diagram

(As shown in the figure below, this is the wiring diagram for common-anode LED strips; for common-cathode LED strips, simply reverse the 12V and GND connections of the power supply.)

Dc brushless control board



Note: The current of the red/green LED strip must not exceed 500mA

Traffic light wiring diagram:

Green light connected to normally open (NO) contact

Red light connected to normally closed (NC) contact

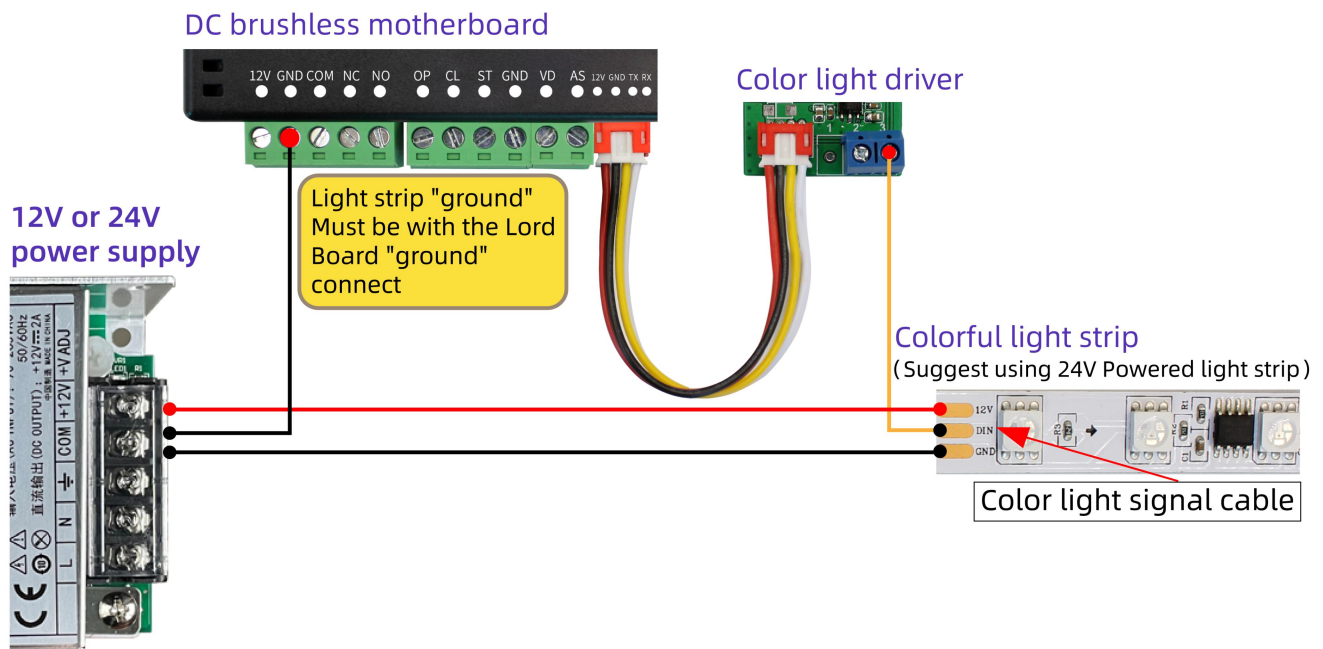
Connect the 12V light board to the 12V motherboard

P-45	/	/	/	/
P-46	/	/	/	/
P-47	/	/	/	/
P-48	/	/	/	/
P-49	Ambient Temperature	N/A	N/A	This option is used to display the current ambient temperature on the digital tube.
P-50	Anti-freeze Temperature Threshold	0	-40-0	At low temperatures, to prevent the machine from freezing, when this function is enabled and the temperature falls below the set value, if the barrier gate has not moved within the P-52 time interval, it will automatically run to the P-51 angle and then close.
P-51	Anti-freeze Boom Raise Angle	0	0-45	Range: 0-45, Default: 0. Anti-freeze opening angle. When the ambient temperature drops to the P-50 set temperature and the P-52 anti-freeze time interval has elapsed, the barrier gate will open to the angle set by this parameter, then automatically close. If this parameter is 0, the anti-freeze function is disabled. Both P-51 and P-52 must be non-zero to enable the anti-freeze function.
P-52	Anti-freeze Boom Raise Time Interval	0	0-255	When the ambient temperature is below the set temperature, timing starts. If the barrier gate has no movement within the timing period, it will open to the P-51 set angle after the time interval set by this command, then automatically close. Setting this parameter to 0 disables the anti-freeze function. (Unit: minutes)
P-53	Anti-rust Open Angle	0	0-45	The angle for anti-rust boom raising. If this parameter is non-zero, after the time interval specified by the P-54 command, the controller will open to the angle specified by this parameter, then automatically close. During normal operation, the boom raising and lowering of the barrier gate will reset the time interval and restart timing. If this parameter is 0, the anti-rust function is disabled.
P-54	Anti-rust Boom Raise Time Interval	0	0-255	If the barrier gate is installed at a site and left unused for a long time, it may rust. You can enable this parameter to make the barrier gate open once after a certain time interval. The opening angle is set by the P-53 command. If this parameter is 0, the anti-rust function is disabled. Both P-53 and P-54 must be non-zero to enable the anti-rust function. (Unit: hours)
P-55	Set 485 Baud Rate	4	0-4	Set the baud rate of the control board. Settings: 0: 9600; 1: 19200; 2: 38400; 3: 57600; 4: 115200
P-56	Set 485 Address	0	0-255	The address of this control board on the 485 bus.
P-57	Controller Master/Slave Mode	0	0-1	Set the master/slave mode of the control board. 0: Slave mode. 1: Master mode.
P-58	Auto Close Count After Manual Raise	0	0-255	When closed in place, if the boom is manually lifted more than 10 degrees, the machine will automatically lower. This parameter is how many times it lowers. When the manual lift and lower count exceeds this value, it will no longer trigger lowering. Each normal raise-lower cycle resets the accumulated auto-lower count. If set to 255, no counting is performed and this function is always active.
P-59	Auto Test	0	0-255	Auto test time interval. When set to 0, auto test is disabled. Used for auto testing and aging testing. After testing is complete, set this parameter to 0 to cancel auto test. Short press "Open" button to start open/close-in-place auto test. Long press "Open" button to start simulated lowering to middle position then raising auto test. (Unit: seconds)
P-60	Restore Default Settings	0	0-255	This option has three functions: clear remote controls, partial factory reset, and full factory reset. To prevent misoperation, specific values must be set before pressing "Menu" to complete the operation. 5: Clear remote controls. 10: Factory reset (remote controls and

				motor type are not restored). 15: Full factory reset.
P-61	/	/	/	/
P-62	/	/	/	/
P-63	Adaptive Mode	3	0-2	0: Conventional mode. 1: Use adaptive mode for limit initialization. 2: Use adaptive mode for both limit initialization and boom raise/lower.
P-64	Boom Raise/Lower Timeout	30	6-40	Set the boom raise/lower timeout. If the boom raise/lower exceeds the set time without reaching position, the barrier gate will automatically pause and report a raise timeout warning (Err5) or lower timeout warning (Err6). (Unit: seconds)
P-65	Power-off Auto Raise/Lower Voltage	0	0-21	0: Disabled. 1-21: Trigger auto raise/lower voltage. This function requires a backup power supply and must be configured with the P-69 setting. Recommended to set to 20.
P-66	Brake Reverse Voltage Warning Threshold	55	30-100	For situations where the barrier gate spring is poorly matched, when the motor decelerates and generates excessive reverse voltage, a warning is issued. The warning sound is 5 quick buzzer beeps, and the digital tube displays ERR2. This warning will not interrupt barrier gate operation. The reverse voltage effect can be reduced by lowering the barrier gate running speed or matching the spring and boom balance. (Unit: V). Setting to 0 disables this warning.
P-67	Display Drive Voltage and Current	1	0-1	0: Do not display voltage and current data. 1: During boom raising and lowering, the digital tube displays drive voltage (Unit: V) or drive current (Unit: A). In working mode, you can switch between displaying current and voltage by short-pressing the "Menu" button.
P-68	Pause on Loop Trigger During Lowering	0	0-1	0: When loop detector is triggered during lowering, the barrier gate automatically raises. 1: When loop detector is triggered during lowering, the barrier gate stops at the current position (can serve as a certain degree of anti-toll-evasion function).
P-69	Power-off Auto Run Function	1	0-4	Set the power-off auto run option. When P-65 is set to non-zero and the supply voltage is detected to be below the P-65 set value, the barrier gate handling method: 0: No action. 1: Auto raise boom. 2: Auto lower boom. 3: No action when in open/close-in-place position; auto raise when in middle position. 4: No action when in open/close-in-place position; auto low-speed lower when in middle position.
P-70	Custom Parameter Settings	/	/	Currently no function
P-71	Overcurrent Protection Value	120	20-160	Overcurrent protection value. When the barrier gate running current exceeds this value, the barrier gate automatically stops running. If overcurrent protection occurs during lowering, the barrier gate will treat it as reverse-on-obstacle. (Unit: 0.1A)
P-72	Power Output	80	20-100	Maximum limited output power % during barrier gate operation. (Non-professionals should operate with caution)
P-73	Auto Lower Speed Without Loop Detector	40	0-80	Auto lower speed without loop detector. When set to 0, it is invalid. Auto-lowering without loop detector uses P-01 (boom lower speed) as the running speed. When set to non-zero, this parameter replaces P-01 (boom lower speed) as the running speed. This function solves the problem of auto-lowering without loop detector being too fast and potentially hitting pedestrians. A relatively smaller auto-lower speed parameter can be set to prevent auto-lowering from hitting pedestrians.
P-74	/	/	/	/
P-75	/	/	/	/
P-76	/	/	/	/
P-77	/	/	/	/

P-78	Auto Send Barrier Status Data	0	0-1	When set to 1, when the barrier gate triggers a raise/lower action, it automatically sends barrier gate status commands.
P-79	/	/	/	/
P-80	Adaptive Control Coefficient	4	0-9	Adaptive control parameter. Used for optimizing the effect on some special barrier gates. (Not recommended for non-professionals to adjust this parameter)
P-81	Adaptive Mode Limit Learning Power	40	10-80	In adaptive mode, set the maximum power for limit learning. For some lower-power power supplies, if power overcurrent protection occurs during limit learning, this parameter can be reduced. For poorly matched spring counterweights where the motor torque is insufficient during limit learning raise/lower, this parameter can be increased.
P-82	Bluetooth Connection	/	/	When the mini program connects to the mainboard via Bluetooth for the first time, please enter the P-82 menu, then connect to the mainboard Bluetooth. After the mini program has the mainboard connection data, there is no need to enter the P-82 menu. You can directly connect via Bluetooth.
P-83	Boom Raise Loop Non-detection Angle	20	0-80	During boom raising, when the loop detector is below the set angle, loop detector trigger is invalid.
P-84	Expansion Port Mode	0	0-5	0: 485 mode. 1-3: TX pin repurposed as colored light strip flashing mode. Larger value means higher light strip brightness. When P-44 is set to 3, RX pin is repurposed as close-in-place status output (if the built-in relay is normally open, it becomes open-in-place status output). 4: Colored light strip flashing mode 2. 5: Colored light strip flashing mode 3.

Wiring diagram of external module for colored lights



P-85	/	/	/	/
P-86	/	/	/	/
P-87	/	/	/	/
P-88	Control Interface Disable	0	0-3	0 - All enabled. 0x01 - Disable Open/Close/Stop ports. 0x02 - Disable remote control interface. 0x03 - Disable Open/Close/Stop and remote control.
P-89	Loop Detector Tailgating Auto Lower Time	0	0-255	Used to solve the problem where the front vehicle has not left the loop detector, the rear vehicle gives an open signal, and the vehicles are too close together causing both to press the loop detector. When the front vehicle leaves and the loop detector signal does not disappear, the boom does not lower. The set value is the lower time for this situation, in units of 10 seconds. Setting to 0 disables this function.
P-90	Barrier Limit Verification	1	0-1	0 - Disable. 1 - Enable. Enabling this function can optimize the issue of some barrier gates with poorly matched parameters, where self-check easily misjudges the limit, causing incorrect self-check angles and incomplete opening/closing.

V. Error Codes

When the controller detects an abnormality, it will display an error code to indicate the type of error. Details are as follows:

Error Code	Error Cause
Err0	When clearing remote controls and restoring factory settings, the correct confirmation value must be set. An incorrect confirmation value will prompt an Err0 error.
Err1	Reserved.
Err2	Brake reverse voltage too high warning. Generally caused by poorly matched springs and excessive speed. Can be resolved by matching the spring and boom balance and reducing running speed. You can also increase the P-66 setting value to increase the trigger threshold.
Err3	Boom raise stall. Possible causes: broken barrier gate spring, boom raise speed too low, boom raise end speed too low. Can increase boom raise speed and boom raise end speed.
Err4	Boom lower stall. Possible causes: barrier gate spring too tight, boom not attached, boom lower speed or boom lower end speed too low. Check if the spring is too tight, whether the boom is attached, and increase boom lower speed or boom lower end speed.
Err5	Boom raise timeout. The cause is that the raise time exceeds 15 seconds. Can increase boom raise speed and boom raise end speed.
Err6	Boom lower timeout. The cause is that the lower time exceeds 15 seconds. Can increase boom lower speed and boom lower end speed.
Err7	Motor type selection error. Can be corrected by changing P-10 to the correct type.
Err8	Reserved.
Err9	During boom raising, the motor reverses due to situations such as a broken spring.

VI. LED Display Information Meanings

Content	Meaning
IDLE	Motor wiring not connected (or loose), or motor Hall sensor fault. By pressing buttons to enter the menu settings, find P-59, then enter the value setting interface. At this point, the 3 LED status lights on the right will become 3 Hall sensor level indicators, used to assist in diagnosing Hall detection issues.

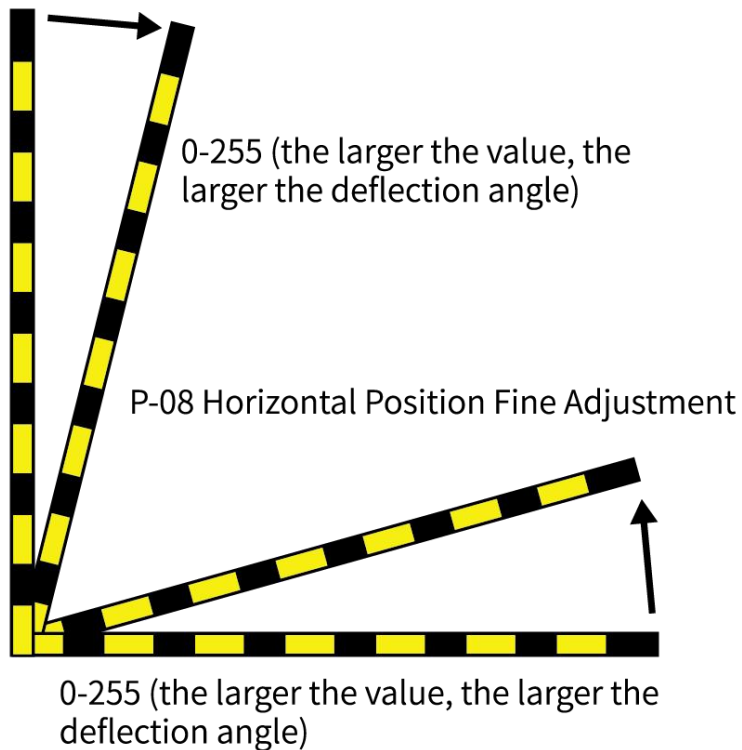


STOP	Barrier gate closed in place
CLOS	Barrier gate is closing
OPEN	Barrier gate is opening
HOLD	Barrier gate opened in place
LOCK	Barrier gate locked
FLET	Convoy mode

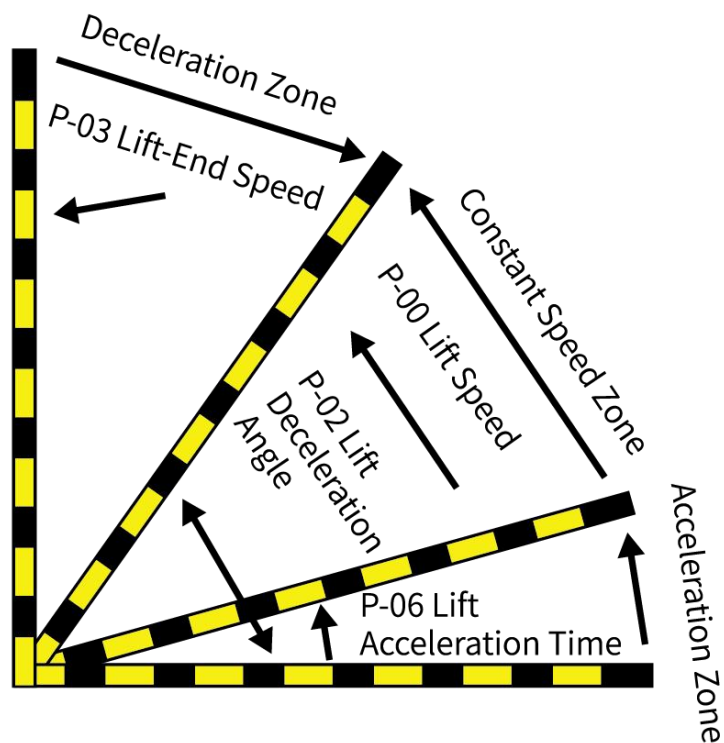
VII. Function Diagrams

1. Diagram of adjusting horizontal and vertical positions via P-08/P-09

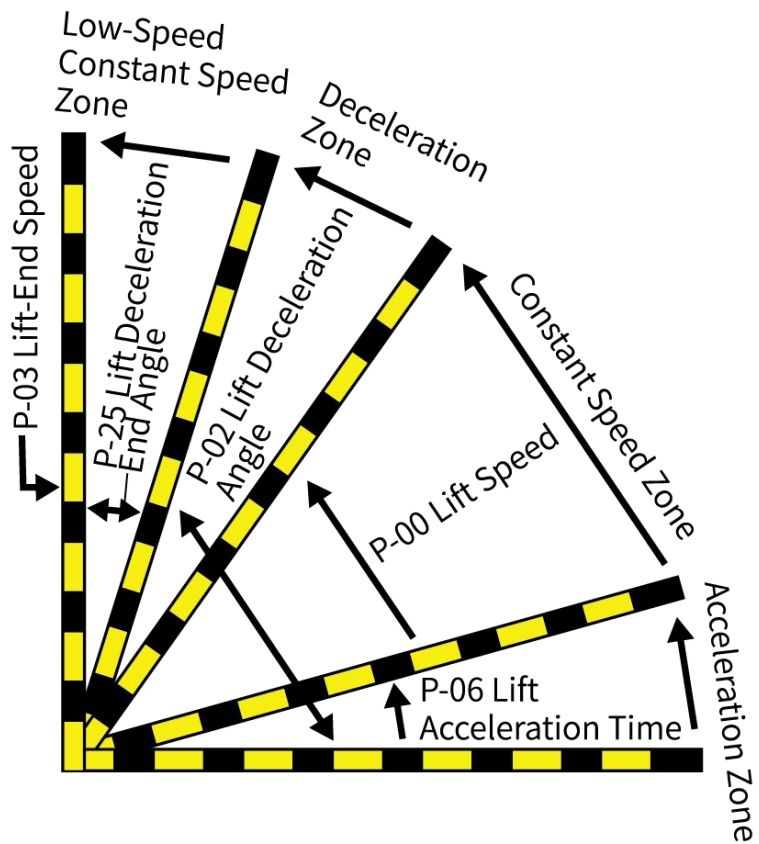
P-09 Vertical Position Fine Adjustment



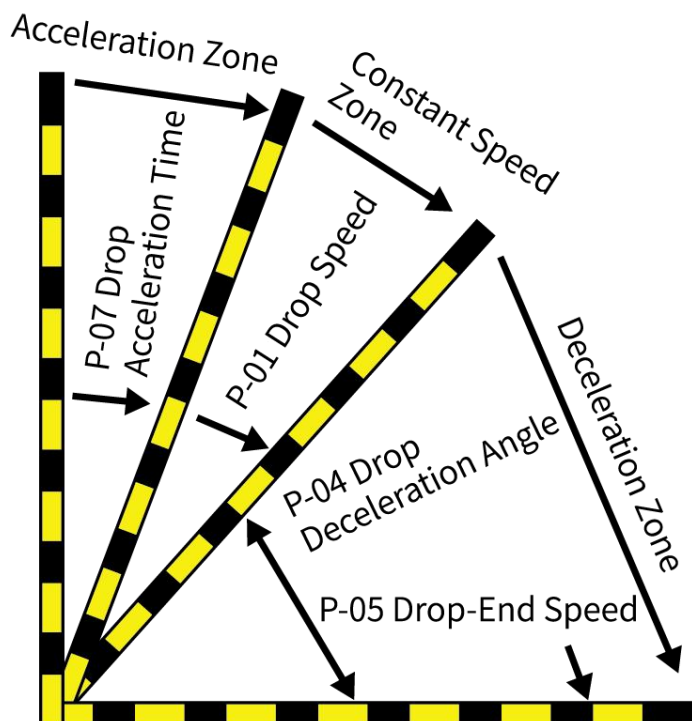
2. Diagram of boom raising without low-speed zone (P-25 ≥ 90)



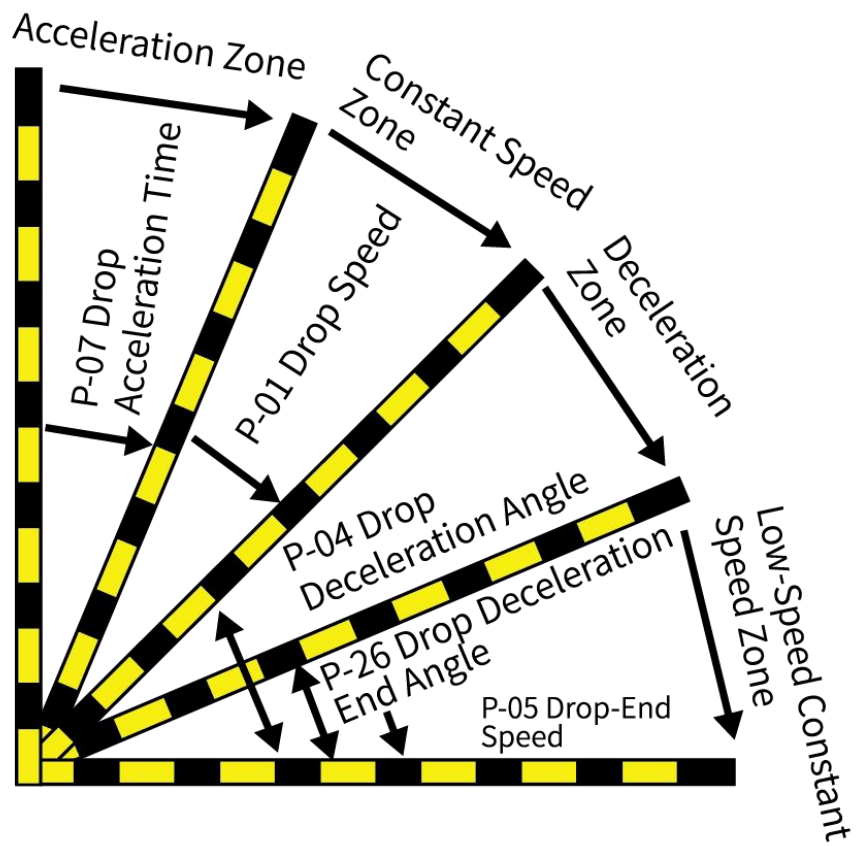
3. Diagram of boom raising with low-speed zone ($P-25 < 90$ and $P-25 > P-02$)



4. Diagram of boom lowering without low-speed zone ($P-26 = 0$)

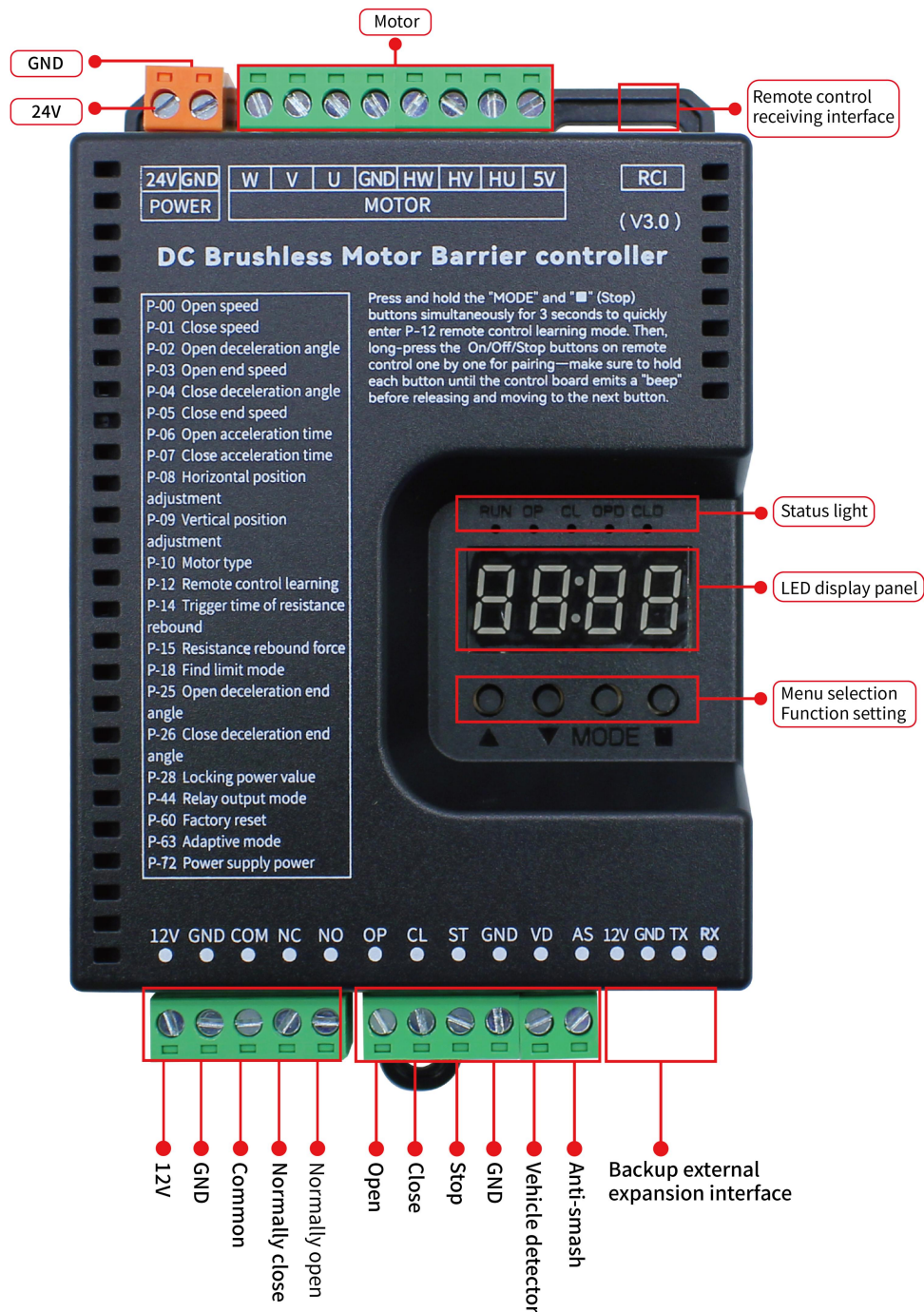


5. Diagram of boom lowering with low-speed zone (P-26 $\neq$ 0 and P-26 < P-04)



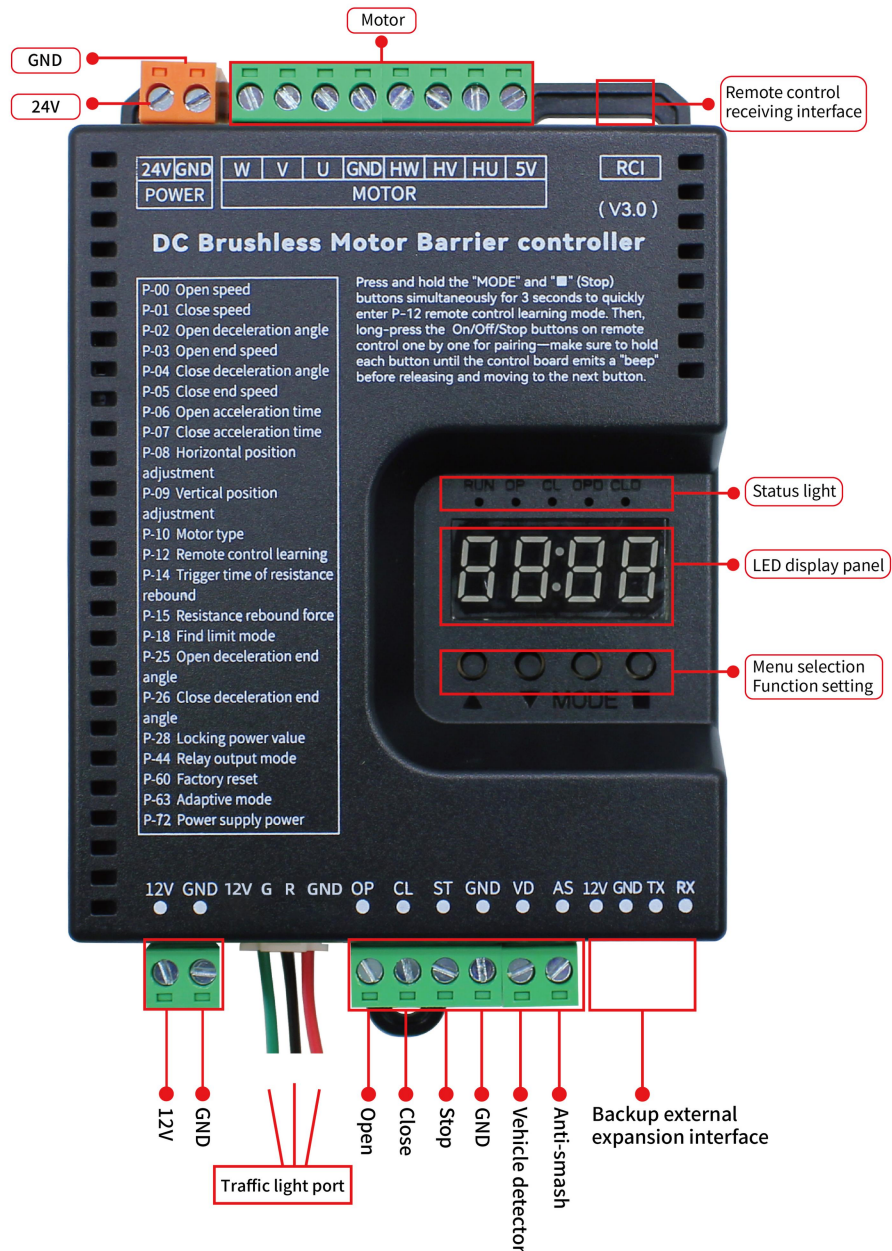
VII. DC Brushless Mainboard Wiring Diagram

As shown in the figure below:



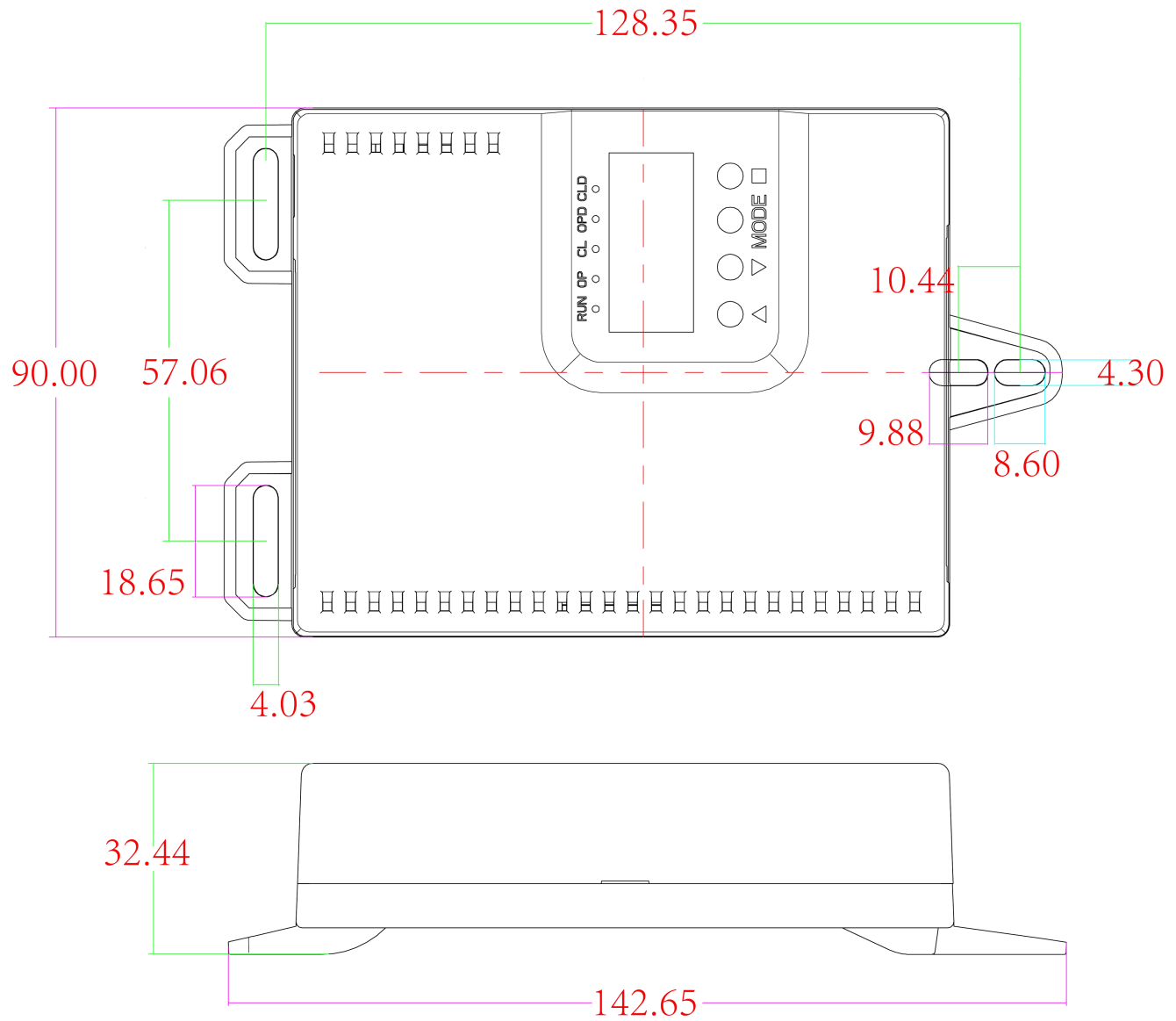
IX. Wiring Diagram with Plug-in Traffic Light Port

As shown in the figure below:



X. Barrier Gate Controller Hole Spacing Dimensions

As shown in the figure below:



Version Revision History

Date	Version	Notes
2023-10-26	V2.1	Initial draft
2024-03-30	V3.0	Added plug-in traffic light interface
2025-03-25	V3.1	Added menu function P-84: Expansion port mode
2025-04-16	V3.2	Menu function P-84 added item 4 and item 5
2025-05-30	V3.3	Added menu function P-41: Light sensor off threshold
2025-06-17	V3.4	Added menu function P-90: Barrier limit verification
2025-08-21	V3.5	Menu function P-27 added item 8
2026-05-29	V3.51	Menu function P-27 modified item 5