

LockIT 12V-24V Electronic Lock Controller Board - RS485

Technical Specifications & Communication Protocol Manual

1. Hardware Specifications & Operating Parameters

- **Operating Voltage:** DC 12V – 24V (6A minimum recommended for multi-solenoid operation).
- **Bus Architecture:** RS485 Differential Half-Duplex (1 to 99 devices on a single bus).
- **Serial Parameters:** **9600 Baud, 8 Data Bits, 1 Stop Bit, No Parity, No Flow Control** (9600-8-N-1).
- **Channel Capacity:** 24 Output Channels per Board (Controls normally closed electric cabinet locks).
- **Board Cascading:** Up to 11 control boards in series on a single RS485 bus line.
- **Checksum Algorithm:** Bitwise XOR / Block Check Character (BCC) across all preceding frame bytes.

2. DIP Switch Address Configuration Table

The hardware board address is set using the 6-position DIP switch bank on the controller board.

Board Address (Hex)	SW1	SW2	SW3	SW4	SW5	SW6	Description
0x01	ON	OFF	OFF	OFF	OFF	OFF	Board #1 (Default Single Board)
0x02	OFF	ON	OFF	OFF	OFF	OFF	Board #2
0x03	ON	ON	OFF	OFF	OFF	OFF	Board #3
0x04	OFF	OFF	ON	OFF	OFF	OFF	Board #4
0x05	ON	OFF	ON	OFF	OFF	OFF	Board #5
0x0B	ON	ON	OFF	ON	OFF	OFF	Board #11 (Maximum Cascading Limit)

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3. Master Command Table (Hexadecimal Format)

Command Function	Header	Board Addr	Lock / Param	Func Code	Checksum (BCC)	Literal Example Frame (Board 01)
Unlock Single Lock	8A	01..0B	01..18 (CH1-24)	11	8A XOR Addr XOR Lock XOR 11	8A 01 01 11 9B (Unlocks CH01)
Unlock All Locks	8A	01..0B	00 (All CH)	11	8A XOR Addr XOR 00 XOR 11	8A 01 00 11 9A (Sequential unlock)
Query Single Lock	80	01..0B	01..18 (CH1-24)	33	80 XOR Addr XOR Lock XOR 33	80 01 01 33 B3 (Queries CH01)
Query All Locks	80	01..0B	00 (All CH)	33	80 XOR Addr XOR 00 XOR 33	80 01 00 33 B2 (Queries CH01-24)

4. Response Frames & Lock Feedback Interpretation

A. Single Lock Unlock Response Frame (Returned within 200 ms)

- Format: 8A [Board_Addr] [Lock_Addr] [State] [BCC]
- Door Closing Feedback Type (Standard):
 - 8A 01 01 00 8A -> State 00: Unlock Successful / Door Open
 - 8A 01 01 11 9B -> State 11: Unlock Failed / Lock Engaged
- Door Opening Feedback Type (Custom):
 - State 11 = Success | State 00 = Failed.

B. Query Single Lock Response Frame

- Format: 80 [Board_Addr] [Lock_Addr] [State] [BCC]
- Door Closing Feedback Type:
 - 80 01 01 00 80 -> State 00: Lock is Open.
 - 80 01 01 11 91 -> State 11: Lock is Closed.

C. Query All 24 Channels Status Response Frame

- Format: 80 [Board_Addr] [State_CH17-24] [State_CH9-16] [State_CH1-8] 33 [BCC]
- Each byte represents an 8-bit status bitmask for 8 consecutive channels:
 - State 1: Channels 17 – 24 (Bitmask 01 to 80)
 - State 2: Channels 9 – 16 (Bitmask 01 to 80)
 - State 3: Channels 1 – 8 (Bitmask 01 to 80)

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- **Example:** Response **80 01 01 01 01 33 B3** indicates Channels 17, 9, and 1 are closed, and all other 21 channels are open.

D. Hardware Event Auto-Upload Frame (Autonomous Notification)

- **Format:** **82** [Board_Addr] [Lock_Addr] [State] [BCC]
- **Explanation:** When a lock status changes or the relay actuation fires, the board automatically broadcasts an auto-report frame (e.g., **82 01 01 00 82**). Custom software parsers should handle or ignore incoming frames starting with header **0x82**.

5. Checksum (BCC) Implementation Example

Python

None

```
def generate_bcc_frame(header: int, board_addr: int, lock_addr: int,
func_code: int) -> bytes:
    # Bitwise XOR calculation across all preceding payload bytes
    bcc = header ^ board_addr ^ lock_addr ^ func_code
    return bytes([header, board_addr, lock_addr, func_code, bcc])

# Example: Unlock CH01 on Board 01
frame = generate_bcc_frame(0x8A, 0x01, 0x01, 0x11)
print(frame.hex(' ').upper()) # Outputs: 8A 01 01 11 9B
```

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6. Hardware Wiring

Wiring Interface

