

lamaPLC: DM56A04 / DM36B06 digital tube display with Modbus Communication




Description

- Working voltage: **DC 5 - 28V**
- Working current: 4.3 - 42mA (*related to the brightness of the digital tube*)
- MODBUS RTU protocol, 03 read command, 06 or 16 write command.
- Device address: 1~247, **default 1**, by modifying the 485 address, up to 247 modules can be used in cascade (more than 32, please use RS485 repeater)
- Digital tube color: red
- Digital tube tube digits: 6 digits 0.36 inches / 4 digits 0.56 inches
- Communication interface: [RS-485 \(Modbus RTU\)](#)
- Function: It can display numbers, ASCII characters, letters, floating-point numbers, negative numbers, etc., and the brightness can be adjusted; it supports electronic label function, and the initial display content can be set after power-on
- Supported baud rates: 1200 2400 4800 **9600** (default) 19200 38400 57600 115200,

Character-set

	.	0	1	-	.	2	=		
(20H)	!(21H)	*(22H)	#(23H)	^(27H)	.(2cH)	-(2dH)	/(2eH)	/(2fH)	=(3dH)
?	[4]	_	'	4	!	!	-
?(3fH)	!(5bH)	\(5cH)	!(5dH)	_(5fH)	'(60H)	!(7bH)	!(7cH)	!(7dH)	-(7eH)
0	1	2	3	4	5	6	7	8	9
0(30H)	1(31H)	2(32H)	3(33H)	4(34H)	5(35H)	6(36H)	7(37H)	8(38H)	9(39H)
A	b	C	d	E	F	G	H	I	J
A(41H)	B(42H)	C(43H)	D(44H)	E(45H)	F(46H)	G(47H)	H(48H)	I(49H)	J(4aH)
2	L	n	n	o	P	Q	R	S	T
K(4bH)	L(4cH)	M(4dH)	N(4eH)	O(4fH)	P(50H)	Q(51H)	R(52H)	S(53H)	T(54H)
U	y	Y	E	a	b	c	d	e	F
U(55H)	W(57H)	Y(59H)	Z(5aH)	a(61H)	b(62H)	c(63H)	d(64H)	e(65H)	f(66H)
9	h	!	J	2	L	n	n	o	P
g(67H)	h(68H)	i(69H)	j(6aH)	k(6bH)	l(6cH)	m(6d)	n(6eH)	o(6fH)	p(70H)
9	r	S	t	u	y	Y	E		
q(71H)	r(72H)	s(73H)	t(74H)	u(75H)	w(78H)	y(79H)	z(7aH)		

The data between 00H and 1FH in the ASCII code is a control character and cannot be displayed, and 20H represents a space character. 21H to 7EH are visible ASCII characters. The characters that can be correctly displayed on the digital tube screen are as follows.



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Modbus Features

Modbus connection characteristics:

Default Modbus settings: 9600 baud, 8N1, RTU communication, slave ID: 1
 Function Code: 06/16 control, 03 read status

Address	Function	R/W
0	ASCII code The 1st digit tube displays the contents	R/W
1	ASCII code The 2nd digit tube displays the contents	R/W
2	ASCII code The 3rd digit tube displays the contents	R/W
3	ASCII code The 4st digit tube displays the contents	R/W
4	ASCII code The 5st digit tube displays the contents	R/W

5	ASCII code The 6st digit tube displays the contents	R/W
6	<p>Used in combination with register 7 (0xFFFFFFF), cannot be used alone.</p> <p>High 4 bits of the high byte (0xFFFFFFF): 0 indicates a positive number, 1 indicates a negative number</p> <p>Lower 4 bits of the high byte (0xFFFFFFF): specify the number of decimal places, ranging from 0 to 5</p> <p>Together with register 7, they specify the data to be displayed 0xFFFFFFF (for data above 65535, three bytes are needed; this byte indicates the highest 8 bits of the data.</p> <p><i>Note: This register should be used together with register 7. To write data to these two registers, use the write multiple holding register (16 function code) when displaying data.</i></p>	R/W
7	<p>Display data. Can be used in combination with register 6 (0xFFFFF), or separately.</p> <p>(1) Together with register 6, this register indicates the data to be displayed (the data is represented by 3 bytes, 0xFFFFFFF), the high byte of this register indicates the middle 8 bits of the data (0xFFFFF), and the low byte indicates the lowest 8 bits of the data (0xFFFFF).</p> <p>The high byte comes first and the low byte comes second. (0xFFFF)</p> <p><i>Note: This register is used in conjunction with register 6 to write data to these two registers using the Write Multiple Holding Register (16 function code) when displaying data.</i></p> <p>(2) When used independently, write a hexadecimal number into the register, and the digital tube will be converted into a decimal number for display.</p>	R/W
8	<p>Blink control register. Each bit represents one digital tube; the lowest bit represents the first digital tube, and so on.</p> <p>0: no blinking (default), 1: Blinking</p> <p><i>Note: This parameter is not saved when power is lost.</i></p>	R/W
9	<p>Digital tube brightness level, 1..8, 6 digits default 4, 4 digits default 8.</p> <p><i>Note: This parameter is saved upon powering down.</i></p>	R/W
10	<p>Display content is saved.</p> <p>0: No saving (default), 1: Save all digital tube display content</p> <p><i>Note: this parameter is saved when powered off.</i></p>	R/W
11	<p>Digital tube power-on initial display mode setting.</p> <p>0: Display "0"; (default), 1: Display the RS485 address of the module, 2: Display of saved data.</p> <p><i>Note: This parameter is saved at power down.</i></p>	R/W
251	<p>00: Restore factory settings Telegram: FF 06 00 FB 00 00 ED E5</p>	R/W
252	Data return delay: 0..25 (* 40 ms); Return data interval time after receiving the command (unit 40 ms)	R/W
253	RS485 Address / Slave Address: 1..247, default: 1	R/W
254	Baud rate: 0..255; 0:1200, 1:2400 2:4800, 3:9600 default, 4:19200, 5:38400, 6:57600, 7:115200, Other: Restore factory settings	R/W
255	Parity bit: 0..2; 0 :None(default) , 1: Even Parity, 2: Odd Parity	R/W

Arduino Required Components

To use these displays with an Arduino, you need an RS-485 to TTL converter module (like a MAX485 module) to translate the signals. You'll also use the Modbus library to send commands.

- Arduino Board (e.g., Arduino Uno, Nano)
- DM56A04 or DM36B06 display (4-digit and 6-digit variants, respectively)
- RS-485 to TTL Converter Module (e.g., a board with a MAX485 chip)
- External 5V to 24V DC Power Supply for the display module (Arduino's 5V pin may not be enough)
- Jumper Wires

Wiring Diagram

Connect the components as follows, using the Arduino's hardware serial pins (Pin 0/RX and Pin 1/TX):

Converter Pin	Arduino Pin	Display Pin	Description
VCC	5V	VCC	Power for converter (use external supply for display)
GND	GND	GND	Ground
RO	Pin 0 (RX)	N/A	Receiver Output
DI	Pin 1 (TX)	N/A	Driver Input
RE & DE	Pin 2	N/A	Receiver/Driver Enable (bridge and connect to one pin)
A	N/A	A (RS485A)	RS-485 Differential Signal +
B	N/A	B (RS485B)	RS-485 Differential Signal -

Note: The RE and DE pins on the MAX485 module should be connected together and wired to a single digital pin (e.g., Pin 2) to control data direction (send/receive).

Required Library

Install the **ModbusMaster** library by *Doc Walker* through the Arduino IDE Library Manager. This library simplifies Modbus RTU communication.

Arduino Example Code (Modbus RTU)

This code uses the ModbusMaster library to send a simple *“display value”* command (Function Code 6) to the display's default address (0x01).

```
#include <ModbusMaster.h>

// Initialize ModbusMaster instance
// Use Hardware Serial on pins 0 (RX) and 1 (TX)
ModbusMaster node;

#define DE_RE_PIN 2 // Pin to control RS-485 direction
```

```

void setup() {
  Serial.begin(9600); // Start serial communication
  node.begin(1, Serial); // Slave ID 1, use the standard Serial port

  // Set the direction control pin
  pinMode(DE_RE_PIN, OUTPUT);
  node.setTransmitBuffer(DE_RE_PIN); // Tell the library which pin controls
direction
}

void loop() {
  static uint16_t value_to_display = 0;
  uint8_t result;

  // Send Modbus command to display the value
  // Function 0x06 (Write Single Register)
  // Address 0x0000 (usually the register for the main value)
  // Value to display
  result = node.writeSingleRegister(0x0000, value_to_display);

  if (result == node.ku8MBSuccess) {
    // Command sent successfully
    value_to_display++;
    if (value_to_display > 9999) { // Adjust max value based on 4 or 6
digits
      value_to_display = 0;
    }
  } else {
    // Handle communication error (optional)
    // Serial.print("Error: ");
    // Serial.println(result);
  }

  delay(1000); // Update every second
}

```

Display, Modbus topics on lamaPLC

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