

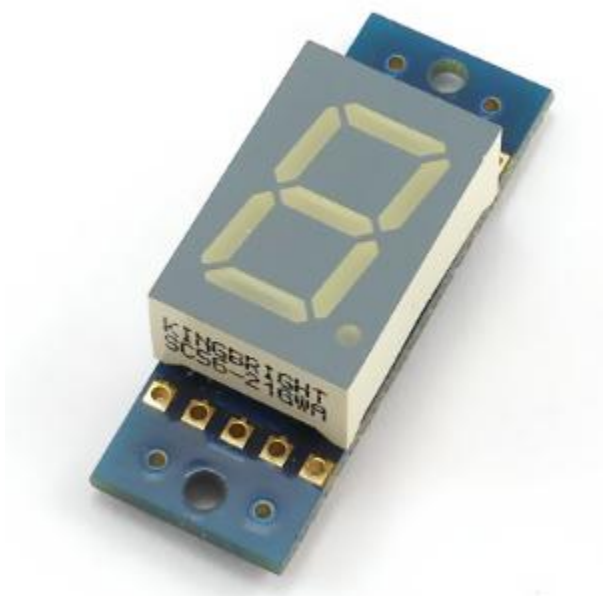


ARTEKIT

electronic artists

AK-Mr. Wood-L

Reference manual





Contents

About this document	3
Revision history	3
Contact information.....	3
Life support policy.....	3
Copyright information.....	3
Specifications	4
Product description	4
Main components	4
Environmental requirements.....	4
Handling the board	4
Board overview	5
Pin description	5
Electrical characteristics	5
Test conditions	5
Minimum and maximum values	5
Typical values.....	6
Absolute maximum ratings	6
Current consumption in operating mode	6
Normal operating parameters.....	6
Current consumption by segment.....	6
Connection details	7
Using Connector Pins.....	7
Using solder bridges.....	8
Electrical considerations.....	8

About this document

Revision history

The table below displays the revision history for the chapters in this manual.

Chapter	Date	Revision	Changes made
All	May 2014	1.0	First publication

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Specifications

Product description

The Artekit AK-Mr.Wood-L board is a 7-segment display with an embedded shift register.

The main goal of the AK-Mr.Wood-L board is to simplify the usage of 7-segment displays by lowering pin count and eliminate wiring. The board can be daisy-chained to create a larger display. Mounted on the board there is a SN74LVC595 serial-in parallel-out shift register capable to drive 16mA per segment and to provide enough current to lit them all. All signals are buffered to avoid parallel load and distributed capacitances.

Main components

The AK-Mr.Wood-L board has the following main components:

- 1 x SN74LVC595.
- 3 x SN74LVC1G34.
- 7-segment display.
- Connectors and Pads to provide signal input/output..

Environmental requirements

The AK-Mr.Wood-L board must be stored between -40°C and +100°C. The recommended operating temperature is between 0°C and +70°C.

The AK-Mr.Wood-L board may be damaged without proper anti-static handling.

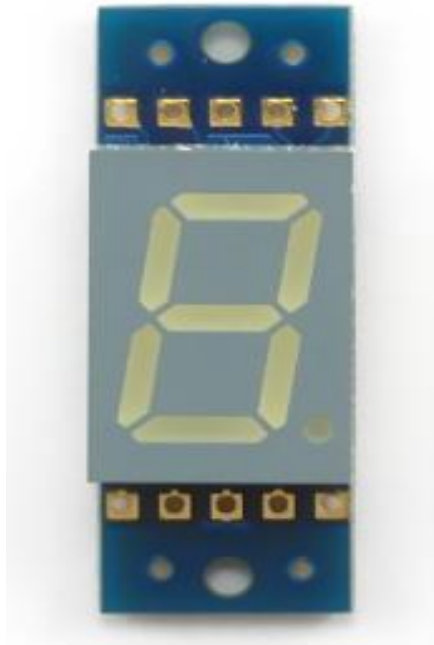
Handling the board

When handling the board, it is important to observe the following precaution:

Static discharge precaution – Without proper anti-static handling the board can be damaged. Therefore, take anti-static precautions when handling the board.

Board overview

Top View



Bottom View



Pin description

1	SER-OUT	Serial data out
2	SRCLK-OUT	Shift register clock out
3	VCC	Power Supply (3.3V to 5V)
4	SRCLK-IN	Shift register clock input
5	SER-IN	Serial data input
6	OE-IN	Output enable input
7	RCLK-IN	Latch signal input
8	GND	Ground.
9	RCLK-OUT	Latch signal output
10	OE-OUT	Output enable output

Electrical characteristics

Test conditions

Unless specified, all voltages are referenced to GND.

Minimum and maximum values

Unless otherwise specified, the minimum and maximum values are guaranteed in the worst conditions of ambient temperature, supply voltage and frequencies by tests in production on the 100% of the devices with an ambient temperature $T_A = 25\text{ }^{\circ}\text{C}$.

Typical values

Unless otherwise specified, typical data are based on $T_A = 25\text{ }^{\circ}\text{C}$, $V_{CC} = 3.3\text{V}$ (for the $2\text{V} < V_{CC} < 3.6\text{V}$ voltage range). They are given only as design guidelines and are not tested.

Absolute maximum ratings

WARNING Exceeding values beyond these absolute maximum values may cause permanent damage to the device. Operating at absolute maximum rating conditions for extended periods may affect the device reliability.

Symbol	Ratings	Min.	Max.	Unit
VCC-GND	External main supply voltage.	-0.3	5.5	V
V _{in}	Input voltage on input pins	GND-03	VCC	V

Current consumption in operating mode

Symbol	Parameter	Max.	Unit
I _{cc}	Supply current with all segment OFF	50	μA
I _{cc}	Supply current with all segments ON	85	mA

Normal operating parameters

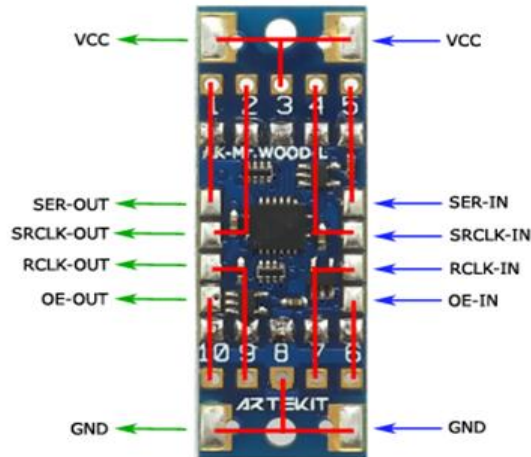
Symbol	Parameter	Value	Unit
V _{cc}	Power supply applied to VCC pin	3.3 to 5	V
V _{ih}	High level input voltage	$V_{cc} \cdot 0.7$	V
V _{il}	Low level input voltage	$V_{cc} \cdot 0.3$	V

Current consumption by segment

Symbol	Parameter	Max.	Unit
I _{seg}	Segment current at 3.3V	6.6	mA
I _{seg}	Segment current at 5V	10	mA

Connection details

The next figure explains the board connection points:

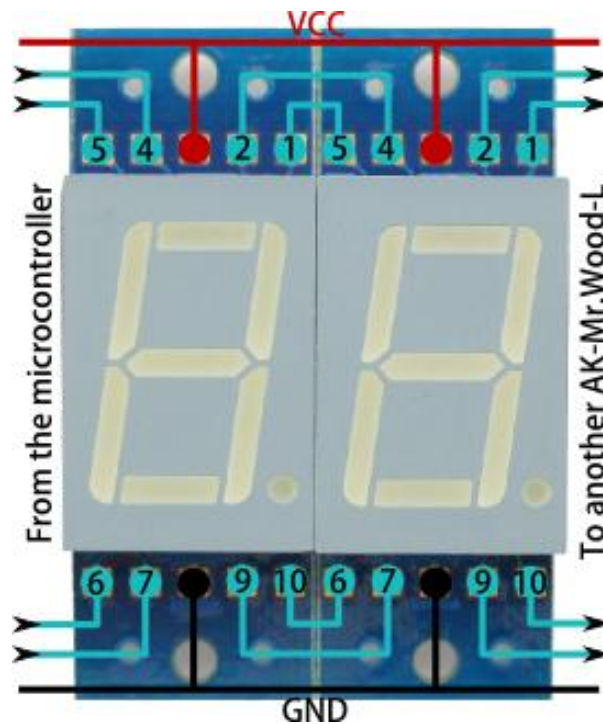


To daisy-chain two or more boards, there are two methods:

- Using the board connector pins 1 to 10
- Using solder bridges

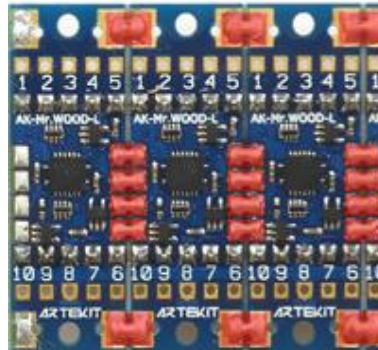
Using Connector Pins

The next figure explains how to daisy-chain two or more AK-Mr.Wood-L by using the board connectors.



Using solder bridges

The AK-Mr.Wood-L can be also daisy-chained using the solder bridges as in the next figure. The red blocks indicate the solder bridge points.



Electrical considerations

AK-Mr.Wood-L can be powered with a power supply from 3.3V up to 5V. The display is brighter at 5V.

If you want to power the board with 5V but want to drive IO signals at 3.3V, note that IO signals require at least $V_{CC} * 0.7V$ (3.5V) to sense a logical 1. In this case it is recommended to use a logic level translator for IO signals, like the AK-TXS0108.

When daisy-chaining, note that a single full-lit display (all segments ON) consumes around 85mA. Long chains may consume several Amperes. Use proper cabling and power supply for those cases.



NOTES: