VFD Tube Module IV-22 for Arduino

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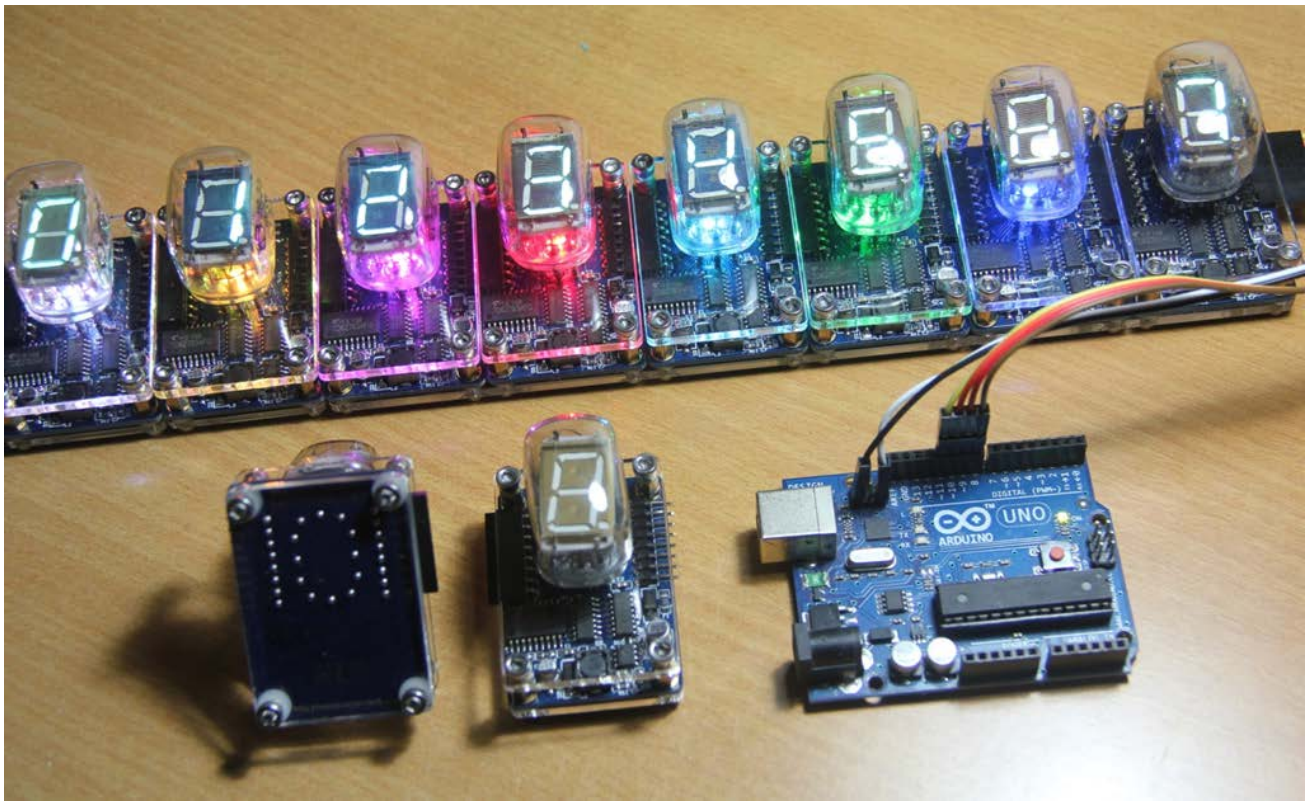

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Arduino library designed by Weihong Guan (@aGuegu)
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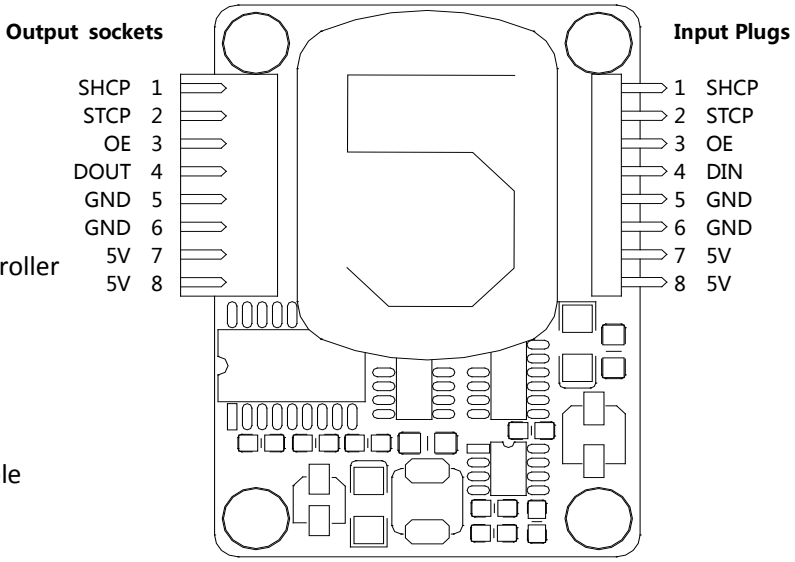
Introduction

This module is designed for VFD tube IV-22 (ИВ-22), made in former Soviet Union around 1990s. Combined with classic VFD tube, gold-plated tube basement, gold-plated PCB, RGB background LED, IV-22 module can be applied in varies of applications, presenting colorful effects. It is an all-in-one design. Boosted circuit, logic controllers, and plug sockets are all integrated. Several modules can be plugged in serial for customized needs. This makes the controlling much easier, especially for Arduino, and other similar open-source MCU platforms. Users can focus on the presentation and application, no need to worry about the voltage management or connections.

Features

- Classic, out of production, VFD tube, module IV-22
- Serial Expansibility
- RGB background LED
- Integrated boosted circuit
- Logical driven by Serial-in Parallel-out controller 74HC595
- DC supply voltage: 5V
- Power supply current: 200mA per module
- Extra 5V DC out for controller board
- Open source library & sample code available
- Gold-plated PCB



PINNING

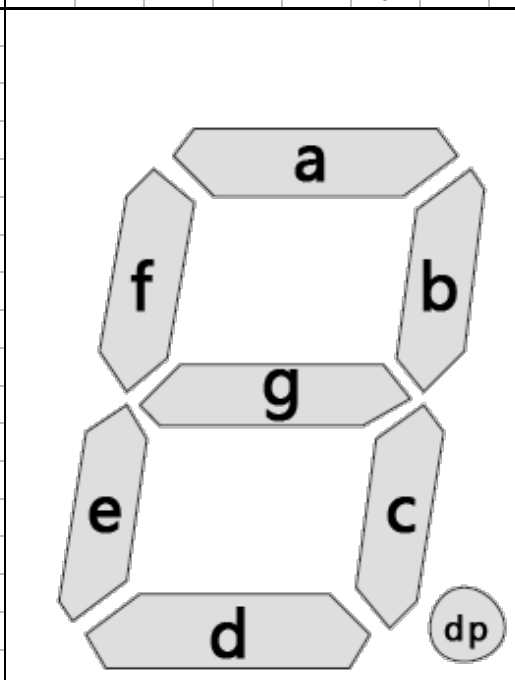
PIN	SYMBOL	DESCRIPTION
INPUT (on the RIGHT side, plugs)		
1	SHCP	SH, shift register clock input
2	STCP	ST, storage register clock input
3	OE	OE, output enable input (active LOW), brightness control
4	DIN	DS, serial data input
5-6	GND	ground (0V)
7-8	5V out	5V power in/out
OUTPUT (on the LEFT side, sockets)		
1	SHCP	SH, shift register clock output
2	STCP	ST, storage register clock output
3	OE	OE, output enable output, brightness control
4	DOUT	DS, serial data output
5-6	GND	ground (0V)
7-8	5V out	5V power in/out

Arduino library and sample code

Host on: https://github.com/aguegu/nixie-tube/

Release: https://github.com/downloads/aguegu/nixie-tube/VFDTube.zip

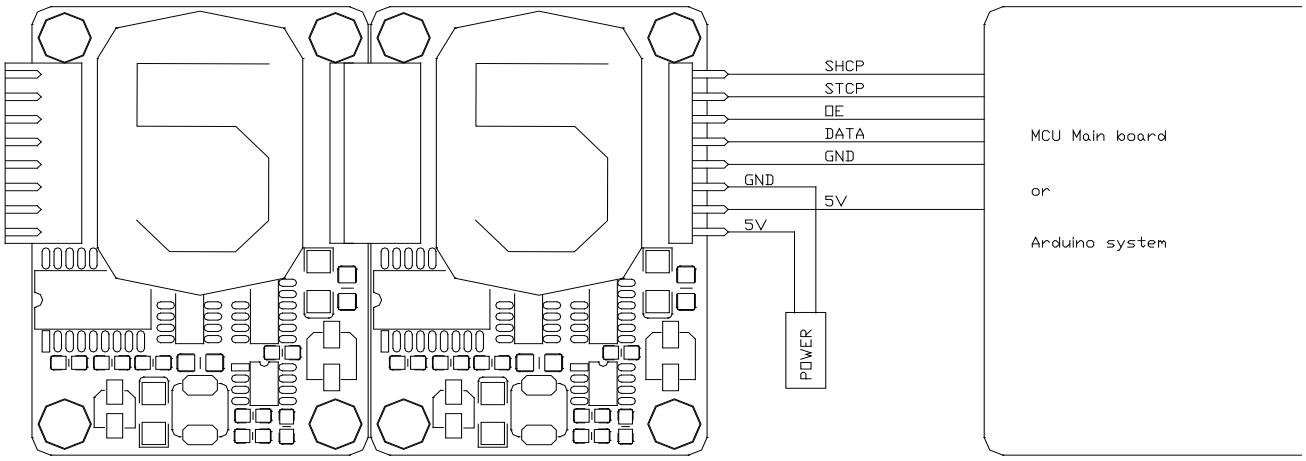
Function Table

Function	Bit 15 MSB	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0 LSB
■ LED Off/Black	X	X	X	X	X	1	1	1	X	X	X	X	X	X	X	X
□ LED White	X	X	X	X	X	0	0	0	X	X	X	X	X	X	X	X
■ LED Magenta	X	X	X	X	X	0	1	0	X	X	X	X	X	X	X	X
■ LED Cyan	X	X	X	X	X	1	0	0	X	X	X	X	X	X	X	X
■ LED Yellow	X	X	X	X	X	0	0	1	X	X	X	X	X	X	X	X
■ LED Blue	X	X	X	X	X	1	1	0	X	X	X	X	X	X	X	X
■ LED Green	X	X	X	X	X	1	0	1	X	X	X	X	X	X	X	X
■ LED Red	X	X	X	X	X	0	1	1	X	X	X	X	X	X	X	X
[ ] Digit Off									0	X	0	0	0	0	0	0
[0] Digit 0									1	X	1	1	0	1	1	1
[9] Digit 9									1	X	1	0	1	1	1	1
[8] Digit 8									1	X	0	0	0	0	0	0
[7] Digit 7									0	X	1	0	0	0	1	1
[6] Digit 6									1	X	1	1	1	1	0	1
[5] Digit 5									1	X	1	0	1	1	0	1
[4] Digit 4									1	X	1	0	1	1	0	1
[3] Digit 3									1	X	1	0	1	0	1	1
[2] Digit 2									1	X	0	1	1	0	1	1
[1] Digit 1									0	X	1	0	0	0	0	1
Segment a									X	X	X	X	X	X	X	1
Segment b									X	X	X	X	X	X	1	X
Segment c									X	X	1	X	X	X	X	X
Segment d									1	X	X	X	X	X	X	X
Segment e									X	X	X	1	X	X	X	X
Segment f									X	X	X	X	X	1	X	X
Segment g									X	X	X	X	1	X	X	X
Segment dp									X	1	X	X	X	X	X	X

(1: high, 0: low, X: don't care)

There are 2 chips of 74HC595 in serial on a single module. Display management is simplified to 74HC595 configuration, in which this IV-22 module gets its serial Expansibility. In the Arduino library for this module, all above patterns are stored in flash.

Typical Application



More References:

- Datasheet of 74HC595
- VFD on Wikipedia.org
- Seven-segment Display on Wikipedia.org

For more photos and updates, please check the designers' blogs:
Nixie Clock Home: http://www.nixieclock.org
Agu's Mill: http://aguegu.net

For any questions and suggestions, please do not hesitate to email us.
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