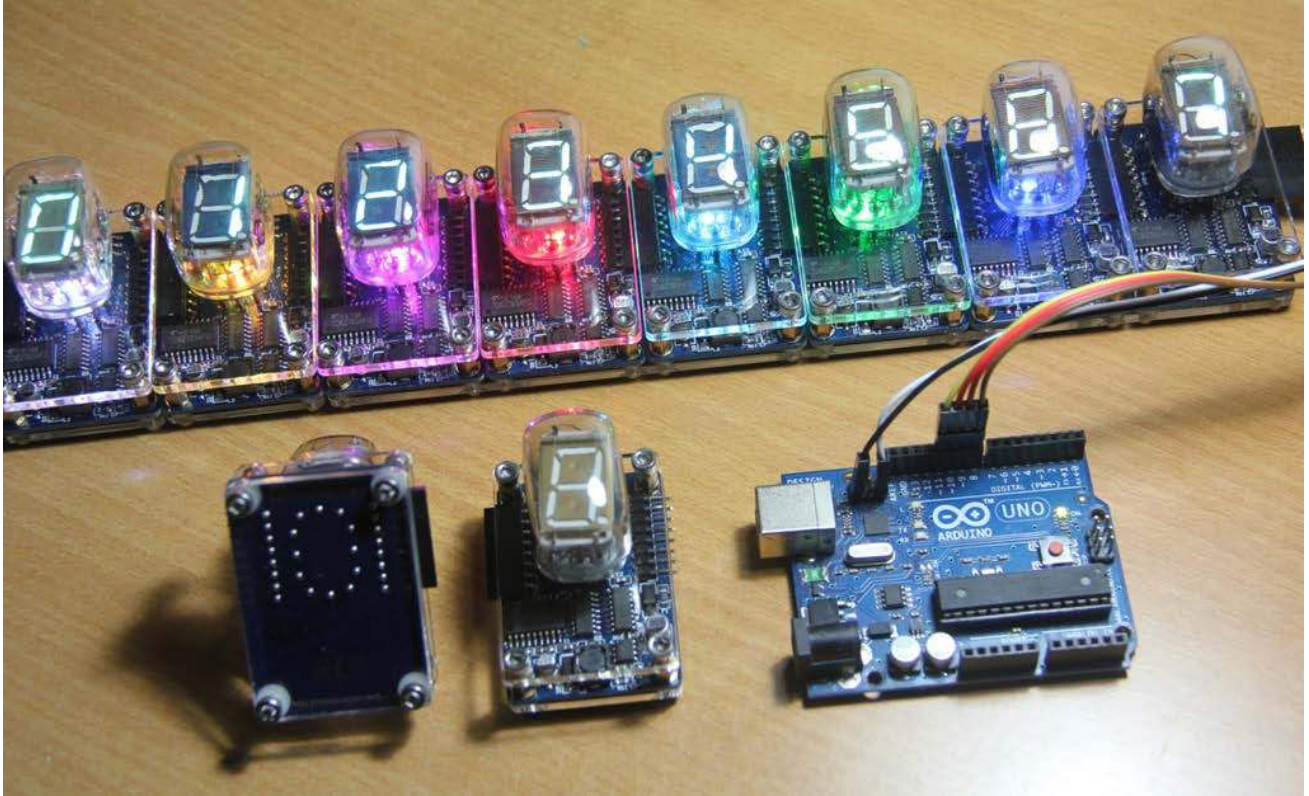


VFD Tube Module IV-22 for Arduino

Application Guide version 1.0.0 updated on November 15, 2012



Hardware designed by Yan Zeyuan ([@nixieclock](#))

Blog: <http://www.nixieclock.org>

E-mail: yanzeyuan@163.com

Arduino library designed by Weihong Guan ([@aGuegu](#))

Blog: <http://aguegu.net>

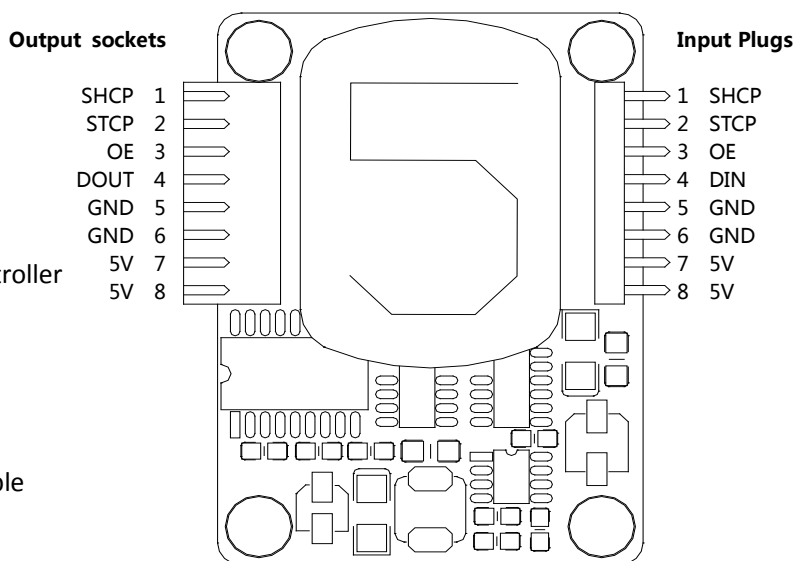
E-mail: weihong.guan@gmail.com

Introduction

This module is designed for VFD tube IV-22 (IB-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

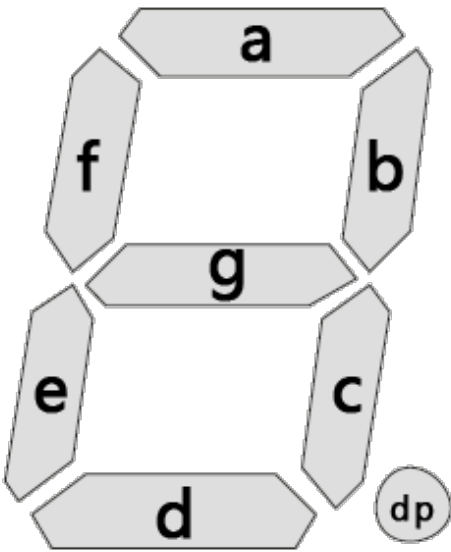
PIN	SYMBOL	DESCRIPTION
INPUT (on the RIGHT side, plugs)		
1	SHCP	SH, shift register clock input
2	STCP	ST, storage register clock input
3	OE	OE, output enable input (active LOW), brightness control
4	DIN	DS, serial data input
5-6	GND	ground (0V)
7-8	5V out	5V power in/out
OUTPUT (on the LEFT side, sockets)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

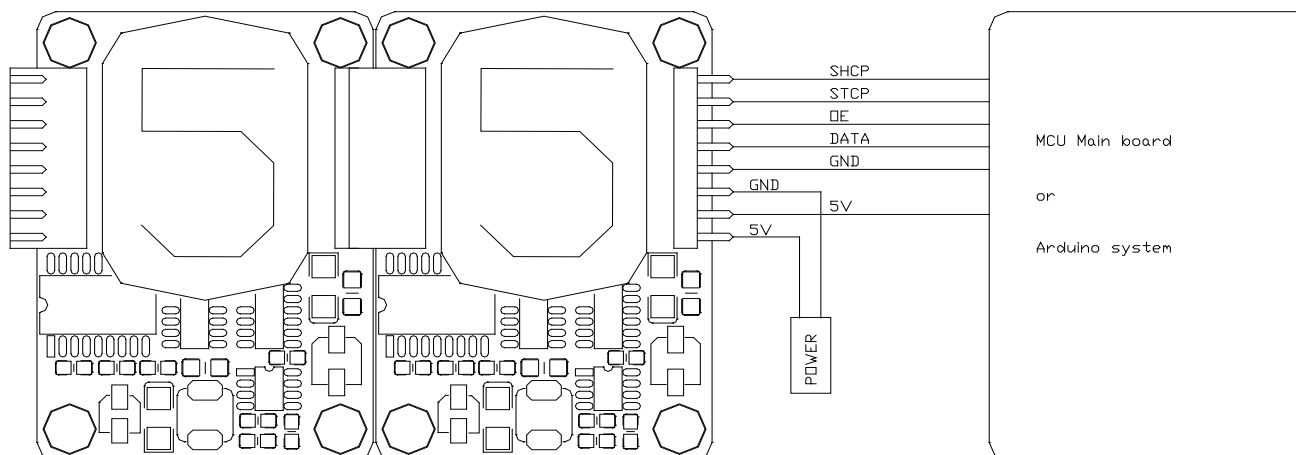
Function Table

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.

Yan Zeyuan: yanzeyuan@163.com

Weihong Guan: weihong.guan@gmail.com

This document is released to public at:

English: https://github.com/downloads/aguegu/nixie-tube/VFD_Tube_Module_IV-22_Application_Guide_v1.0.0_EN.pdf

Chinese: https://github.com/downloads/aguegu/nixie-tube/VFD_Tube_Module_IV-22_Application_Guide_v1.0.0_CN.pdf