

# Display driver module

32 SPI-driven displays

## Schematic

The concept is to buffer the time-critical clock signal. A wire connected directly to the MCU is loaded by the long distance (resistance in the connectors and wires) and could be susceptible to noise. Using a 541 buffer and shunt resistors controls this impedance. The serial data and data/command (DC) signals are also buffered to avoid time propagation errors.

The second purpose is to use a chain of shift registers to provide chip select (CS) signals. It is functionally equivalent to a DOUT module, but the header is directly compatible with GPIO on the Core.

The pinout for the display connectors is as follows:



(Power is connected to pin 10.)

## BOM v1.0

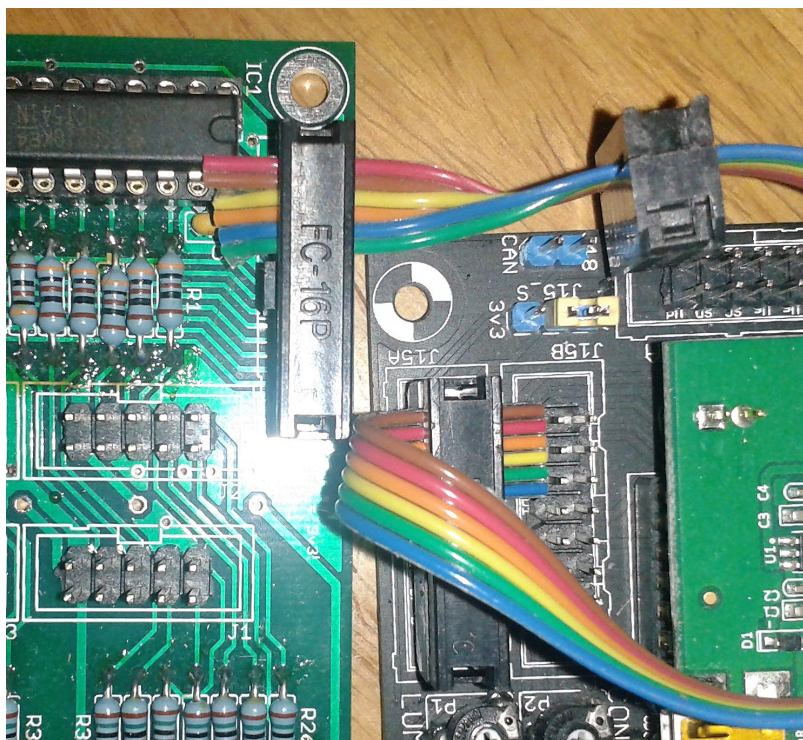
Type	Part	Value	Device
Caps	C1	100n	C025-025×050
	C2	100n	C025-025×050
	C3	100n	C025-025×050
	C4	100n	C025-025×050
	C5	100n	C025-025×050
	C6	100n	C025-025×050
	C7	100n	C025-025×050
ICs	IC1	74HC541N	74HC541N
	IC2	74HC541N	74HC541N
	IC3	74HC541N	74HC541N
	IC4	74HC595N	74HC595N
	IC5	74HC595N	74HC595N
	IC6	74HC595N	74HC595N
	IC7	74HC595N	74HC595N
Headers	J1	PINHD-2X54WALL	PAK100/2500-10
	J2	PINHD-2X54WALL	PAK100/2500-10
	J3	PINHD-2X54WALL	PAK100/2500-10
	J4	PINHD-2X54WALL	PAK100/2500-10
	J5	PINHD-2X54WALL	PAK100/2500-10
	J6	PINHD-2X54WALL	PAK100/2500-10

Type	Part	Value	Device
	J7	PINHD-2X54WALL	PAK100/2500-10
	J8	PINHD-2X54WALL	PAK100/2500-10
	J9	+5V	22-23-2031
	J10B	PINHD-2X54WALL	PAK100/2500-10
	J10B1	PINHD-2X54WALL	PAK100/2500-10
	J15A	PINHD-2X8THTTHT	PAK100/2500-16
	J15A1	PINHD-2X8THTTHT	PAK100/2500-16
Resistors	R1	~220R	0207/10
	R2	~220R	0207/10
	R3	~220R	0207/10
	R4	~220R	0207/10
	R5	~220R	0207/10
	R6	~220R	0207/10
	R7	~220R	0207/10
	R8	~220R	0207/10
	R9	~220R	0207/10
	R10	~220R	0207/10
	R11	~220R	0207/10
	R12	~220R	0207/10
	R13	~220R	0207/10
	R14	~220R	0207/10
	R15	~220R	0207/10
	R16	~220R	0207/10
	R17	~220R	0207/10
	R18	~220R	0207/10
	R19	~220R	0207/10
	R20	~220R	0207/10
	R21	~220R	0207/10
	R22	~220R	0207/10
	R23	~220R	0207/10
	R24	~220R	0207/10
	R25	~1k	0207/10
	R26	~1k	0207/10
	R27	~1k	0207/10
	R28	~1k	0207/10
	R29	~1k	0207/10
	R30	~1k	0207/10
	R31	~1k	0207/10
	R32	~1k	0207/10
	R33	~1k	0207/10
	R34	~1k	0207/10
	R35	~1k	0207/10
	R36	~1k	0207/10
	R37	~1k	0207/10
	R38	~1k	0207/10

Type	Part	Value	Device
	R39	~1k	0207/10
	R40	~1k	0207/10
	R41	~1k	0207/10
	R42	~1k	0207/10
	R43	~1k	0207/10
	R44	~1k	0207/10
	R45	~1k	0207/10
	R46	~1k	0207/10
	R47	~1k	0207/10
	R48	~1k	0207/10
	R49	~1k	0207/10
	R50	~1k	0207/10
	R51	~1k	0207/10
	R52	~1k	0207/10
	R53	~1k	0207/10
	R54	~1k	0207/10
	R55	~1k	0207/10
	R56	~1k	0207/10

## Versions

v1.0: first release. Erratum: there is a significant error in that J15 is mirrored. The simplest way to get it working is to swap pairs of the ribbon wires as shown:



Here the header notches are aligned with the silkscreen. Only the first six wires are required.

## Assembly

All parts are THT, start with resistors and caps, IC sockets then headers.

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### Interconnection to Core

J10B connects to J10B. J15A to J15A. Note the mirrored connection on v1.0

J15A1/J10B1 chain another Display Driver. Note that the J15 connection should not be mirrored for subsequent boards.

J9 is a power supply input that is sent to the displays over headers J1-J8. It may be better to wire the displays directly to the power supply rather than using the ribbon cable and connectors.

### Dimensions

The PCB is 100\*100mm with 3.2mm diameter holes centred 3.5mm from the edges.

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### License

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Last update: **2018/03/31 13:46**

