



MET1155 Dual 7-Seg Display Module

APPLICATIONS

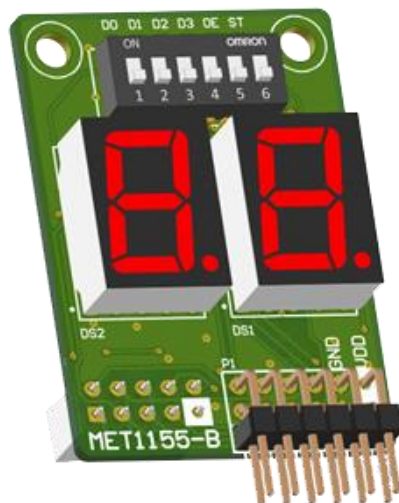
Can be used for many applications requiring a visible numerical or textual display, such as clocks, timers, and score counters.

OPERATION MODES

Three different interaction points allow for manual or automatic operation of the display. Use manually with the included DIP switches, or connect to headers for microcontroller operation. Connect to other development boards such as the EasyMx PRO, ARTY, or Arduino.

RESOURCES

Included with the board is access to datasheets, sample code, schematic, and sample projects for easy integration into the classroom.



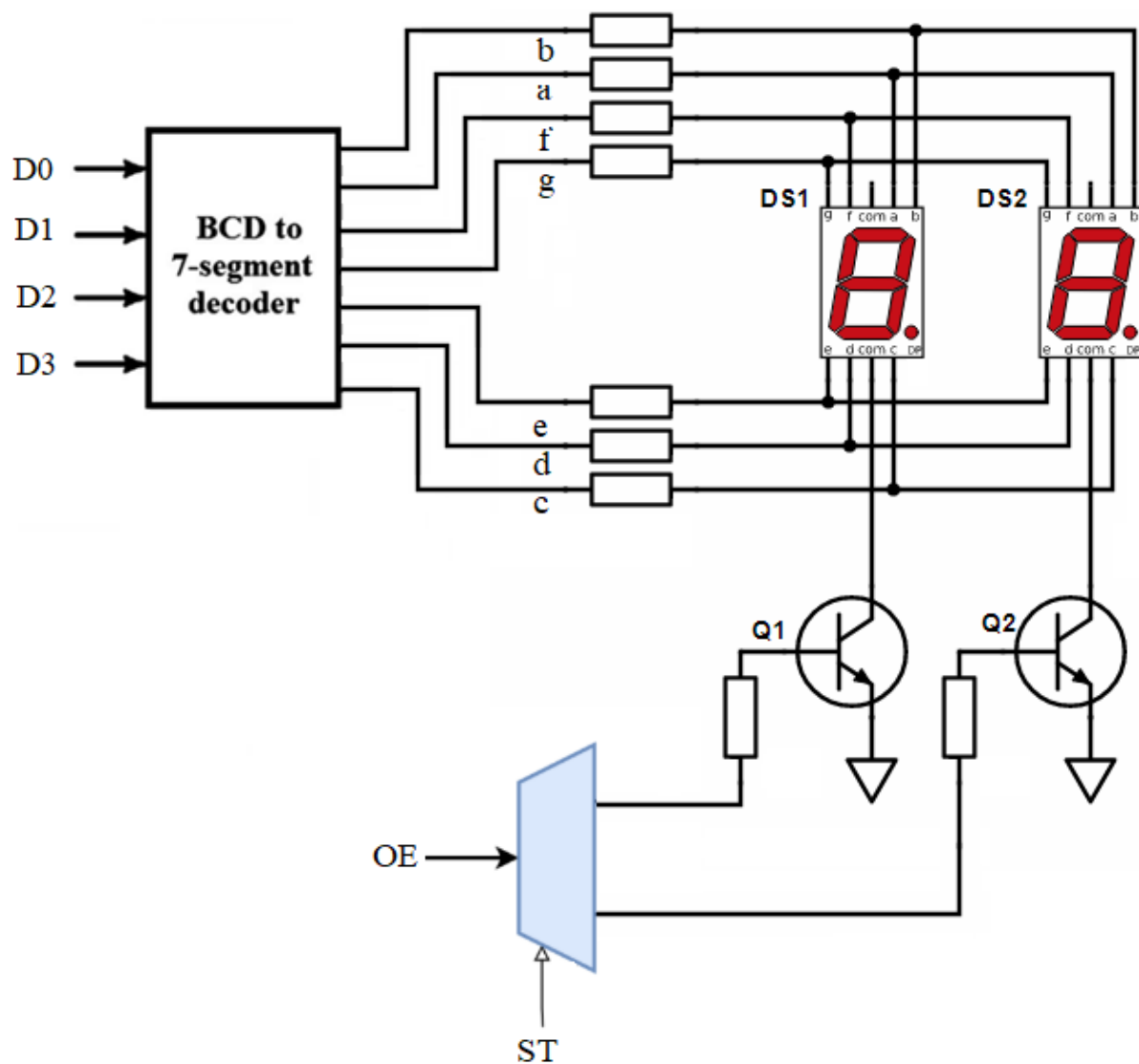
- BCD input to 7-Seg with a 1:2 demultiplexer module for minimal GPIO requirement.
- High quality and brightness 7-Segs for clear visualisation of numbers. Includes on board circuit protection.
- On board DIP switches for manual operation for education or set-and-forget applications
- Male and female headers for connecting to various development kits and other devices.

The MET1155 circuit board is an educational tool for learning about truth tables, binary coded decimals, seven segment displays, and multiplexers. MET1155 uses two red seven-segment displays, the HDSP-H153 from BROADCOM, a BCD to 7-Seg decoder, the CD74HC4511PWT from Texas Instruments, and a 1:2 demultiplexer, the SN74LVC1G19DCKR from Texas Instruments. The display consists of seven individual segments, each of which can be lit up independently to form a digit or symbol, as well as an eighth segment which can be used as a decimal place. Each display is designed for high visibility with a viewing distance of up to 7 meters (23 feet). Each segment features mitered corners and optimum contrast with the background. The display is suitable for any two digit application such as a timer, score counter, clock, or other similar applications.

The board features a switch for manual operation, as well as male and female headers for connection to various embedded development boards such as the Easy Mx Pro V7 for STM32 or the Diligent Arty S7 for FPGA. The three methods of control, labeled on the board as SW1, P1, and J1. SW1 has six DIP switches which allow for manual configuration of the BCD to 7Seg decoder and the demultiplexer. P1 utilizes a 12-position right angled 2.54mm pitch male pin header which is capable of connecting to various development kits or a breadboard. J1 utilizes a 10-position 2.54mm pitch female pass-through socket which is capable of connecting to various development kits. Both headers connect to MET1SHD for easy integration to an Arduino Uno, and MET2SHD for easy integration with a breadboard.



The circuit consists of a BCD to 7-Segment decoder (TI CD74HC45) and a 2:1/1:2 Multiplexer/Demultiplexer (TI SN74LVC). The PCB features various additional circuit protection features to ensure reliability and a consistent output.



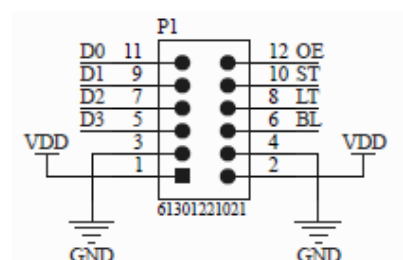
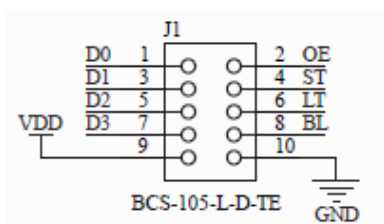
Interface Specifications

2.0

Table 2.1: Switch Functions.

Pin Name	Description
D _n	BCD Input pins.
OE	Output Enable, active LOW. HIGH will disable the multiplexer.
ST	Set which input is selected. HIGH is DS1, LOW is DS2.

Manual mode may be used by applying 3.3V or 5V to the VDD pin and ground to the GND pin on J1 or P1. The VDD pin is highlighted in white on the PCB, as well as labeled in Figure 3 and Figure 4. The switch functions for manual mode operation are outlined in Table 1. Setting ON the ST pin and OFF the OE pin will allow the D_n pins to output to DS1. Setting OFF the ST pin will allow the D_n pins to output to DS2.



The headers J1 and P1 also include a lamp-test pin (LT) and Blank pin (BL) that, when HIGH, will enable or disable all LEDs, respectively. Device functionality is described in Table 2.

Table 2.2: Device functional truth table.

OE	ST	LT	BL	D3	D2	D1	D0	DS1	DS2
H	X	H	H	X	X	X	X	X	X
L	H	H	H	X	X	X	X	#	BLANK
L	L	H	H	X	X	X	X	BLANK	#
L	X	H	H	L	L	L	L	0	
L	X	H	H	L	L	L	H	1	
L	X	H	H	L	L	H	L	2	
L	X	H	H	L	L	H	H	3	
L	X	H	H	L	H	L	L	4	
L	X	H	H	L	H	L	H	5	
L	X	H	H	L	H	H	L	6	
L	X	H	H	L	H	H	H	7	
L	X	H	H	H	L	L	L	8	
L	X	H	H	H	L	L	H	9	

L - Logic LOW, or switch OFF

H - Logic HIGH, or switch ON

