

## BG Micro Serial VFD



Figure 1. Blurry, out-of-focus close-up photograph of BG Micro Serial VFD.

## Description

The BG Micro Serial VFD is a low cost, easy-to-use alphanumeric display. The vacuum fluorescent display (VFD) emits a pleasant bluish green glow that is easily read at a distance and over a wide viewing angle. The unit display upper and lower case alphanumeric characters using a 5x7 dot matrix with no descenders. There is no visible cursor, special effects or downloadable characters. The unit understands backspace, carriage return and new line control codes. See VFD datasheet for more information.

## Interface

The BG Micro Serial VFD has an asynchronous serial input. The incoming signal can be jumper selected for either RS-232 levels or TTL levels. The serial data format is defined as eight (8) data bits, no (0) parity bits, one (1) start bit and one (1) stop bit. The serial data rate is 9600 baud.

The serial interface adapter can be removed and the native parallel interface can then be accessed. See VFD datasheet for more information.

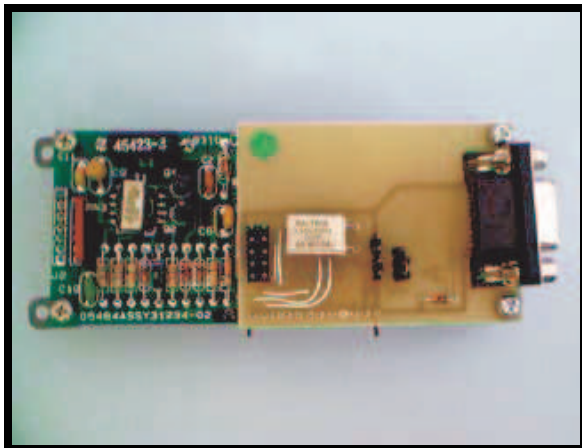


Figure 2. Rear view of BG Micro Serial VFD showing serial interface adapter (on right).

## Connections

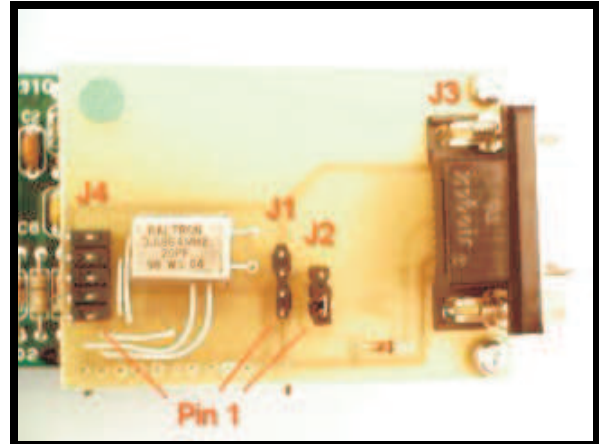


Figure 3. Connector close-up.

### J1 – Power and TTL serial input

1	Ground
2	+5V at 300mA typical, 500mA max
3	TTL serial data input
4	Ground

### J2 – Serial signal selector

1	RS-232
2	Common
3	TTL

Connect pins 2 and 3 for RS-232 signal (from J3)\*.  
Connect pins 1 and 2 for TTL signal (from J1).

\*Factory setting

### J3 – RS-232 serial data input – DB9 female

1	Not connected
2	Not connected
3	RxD – receive data
4	Not connected
5	Signal ground
6	Not connected
7	Not connected
8	Not connected
9	Not connected

### J4 – In system programming (ISP) connector

1	MOSI
2	+5V
3	LED
4	Ground
5	Reset
6	Ground
7	SCK
8	Ground
9	MISO
10	Ground

The serial adapter uses an Atmel 90S2313-10SC microcontroller to perform the interface function. The source code can be modified to add extra functionality. An Atmel/Kanda compatible programming dongle or equivalent is required to reprogram the device. This is not required for normal usage.

## Description

The 03601-88 VFD is an alphanumeric vacuum fluorescent display with one (1) line of sixteen (16) characters. Each character is composed of a 5 x 7 character cell. The display has a built-in character generator and controller. ASCII data is supplied in parallel via the 8 bit parallel input, and clocked with the WRITE line. A BUSY line reflects the status of the display. When a character is written to the display, the BUSY line will momentarily go high, indicating that the display is processing the input. Once the BUSY line goes low again, the display can accept more input. The unit is powered by +5V ( $\pm 5\%$ ) at approximately 300mA.

Pin	Name	Description
1	BUSY	Display status line. When high, the unit is processing information. When low, the unit is ready to accept new data or commands.
2	WRITE	Positive pulse writes data on the data bus D0-D7 to the controller.
3	D7	Data bit 7 (MSB)
4	D6	Data bit 6
5	D5	Data bit 5
6	D4	Data bit 4
7	D3	Data bit 3
8	D2	Data bit 2
9	D1	Data bit 1
10	D0	Data bit 0 (LSB)
11	V <sub>CC</sub>	+5V $\pm 5\%$ @ 300mA (typical)
12	GND	Ground

Table 1. Pin assignments on J1

## Data write timing

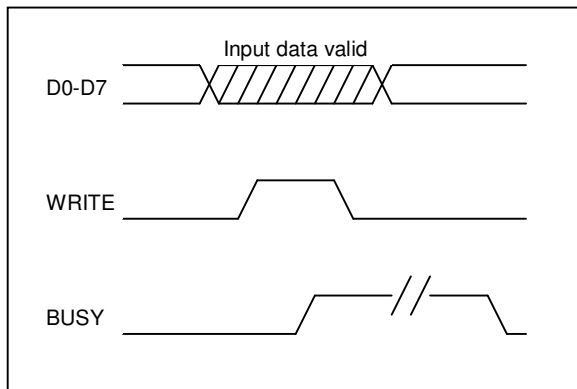
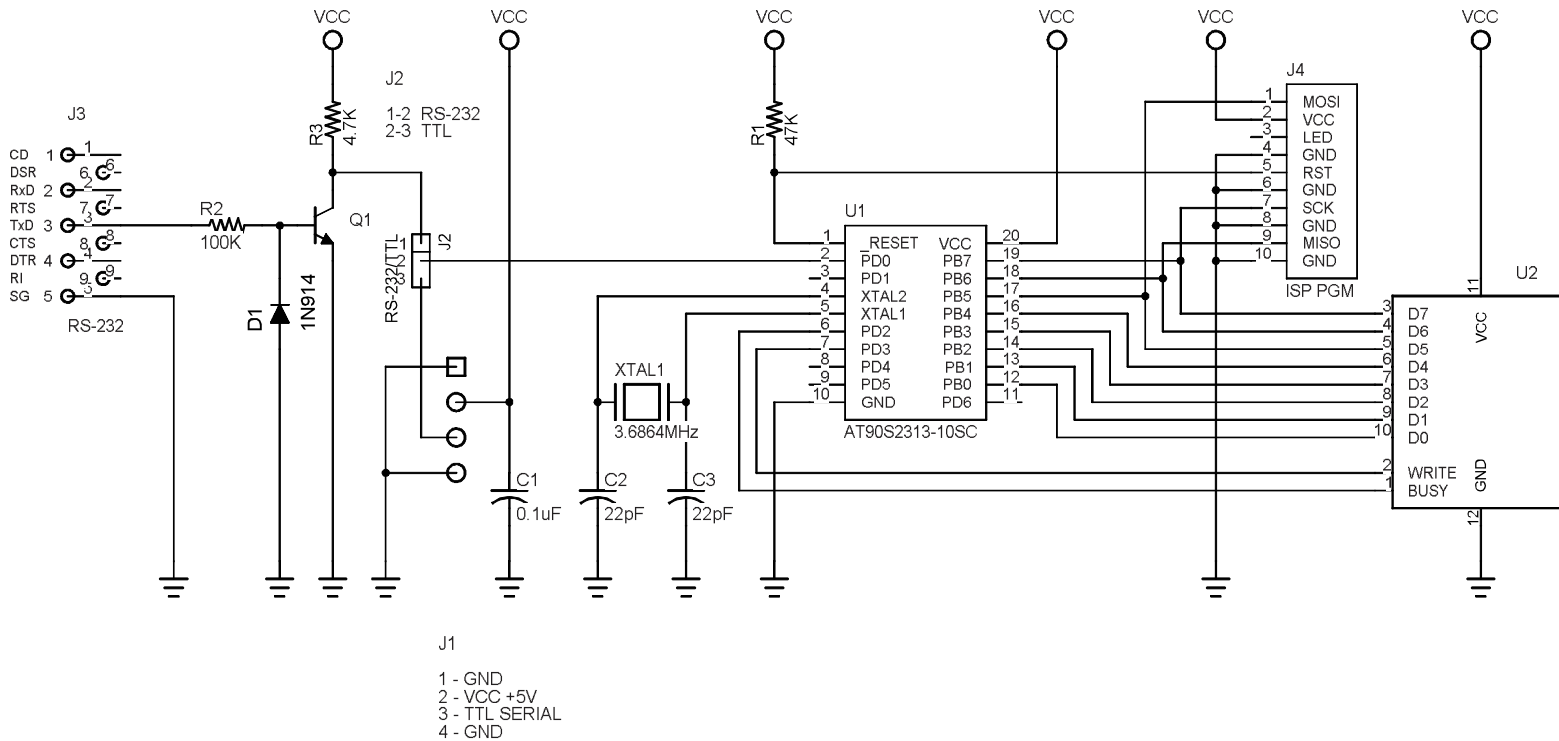


Figure 1. Data write timing

## Commands

Data		Description
Decimal	Hex	
08	08	Backspace
09	09	Forward cursor
10	0A	Line feed
13	0D	Carriage return
21	15	Clear display
22	16	Home cursor
27 xx	1B xx	Move cursor to location xx (0-15)

Figure 2. Commands



○ ○  
 MOUNTING HOLES  
 0.125 DRILL  
 TYPICAL 2 PLACES

VFD SERIAL INTERFACE  
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