

## Five Pin Output Controller

### General Description:

The FT649 is an eight pin chip that will control the output state of five of its eight pins. The chip is controlled via a 2400 baud serial line.

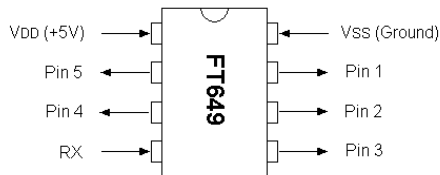
Each pin may assume one of three states. Those states are *on*, *off*, and *Serial Router Mode*.

If a pin is set to the *on* state it will be pulled up to Vdd, which is typically +5 volts. The pin will be able to source 20-25 mA.

If a pin is set to the *off* state it will be pulled down to Vss, or ground. It will be able to sink 20-25 mA.

When a pin is in *Serial Router Mode*, input bytes sent to the FT649 will be output on the indicated pin. This is useful for controlling multiple FerretTronics' chips from only a single serial line.

**Figure 1: FT649 pin out**



### Applications:

The FT649 has many uses. The simplest is a serial controlled switch. Pin states may be set to *on* or *off*.

The FT649 may also be used as a 'serial router'. This use allows multiple (up to five) FT639s and, or FT609s to be connected to a single serial port. Note that any combination of the above chips can be connected to the FT649.

### Operation:

The FT649 accepts single byte commands via the serial line connected to the RX pin. Commands consist of two pieces of data, encoded in a single byte:

**Table 1: Input Byte Format**

Function Bits					Pin Selection Bits		
Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0

The first data element, consisting of bits zero through two selects which pin will be selected as the destination of subsequent commands.

The value of the pin selection bits corresponds to the pin number minus 1. **Table 2** lists the pin selected for any given value of the Pin Selection Bits.

**Table 2: Pin Selection**

Pin 1	Pin 2	Pin 3	Pin 4	Pin 5
000	001	010	011	100

The other five bits configure the selected pin. There are three valid values:

**Table 3: Pin Configuration**

Serial Router Mode	Pin ON	Pin OFF
11110	11101	11100

When a pin is configured for *Serial Router Mode* all subsequent bits will be routed to that pin and therefore, whatever chip is connected to it.

To change the destination pin for *Serial Router Mode*, it is necessary to send another byte to the FT649, specifying the new pin number in the lower three bits.

Note that any bytes sent that are in the range of 224-228, 232-236 and 240-244 are reserved for use by the FT649, as described above. The implication is that only bytes outside of this range will be available for routing to a pin. None of the command bytes for the FT639 and FT609 fall within this range.

**Table 4** enumerates the byte values used by the FT649.

# FT649 'Skunk'

**Table 4: Reserved Bytes**

Function	Pin	Command	
		Binary	Decimal
Pin On	1	11101000	232
Pin On	2	11101001	233
Pin On	3	11101010	234
Pin On	4	11101011	235
Pin On	5	11101100	236
Pin Off	1	11100000	224
Pin Off	2	11100001	225
Pin Off	3	11100010	226
Pin Off	4	11100011	227
Pin Off	5	11100100	228
Serial Router	1	11110000	240
Serial Router	2	11110001	241
Serial Router	3	11110010	242
Serial Router	4	11110011	243
Serial Router	5	11110100	244

## Description of Input:

The FT649 requires the input of an RS232 serial pulse stream at 2400 baud, 8 bits, no parity and 1 stop bit. This chip does not require an external chip like the MAX232, or similar. All signal inversion is handled inside of the chip.

The only caveat is that the input signal must switch between 0 and V++. For most handheld and programmable microcontrollers, a direct connection is possible. For connection to a typical computer, a circuit similar to that in **Figure 2** is required

## Sample Circuit:

Note that the sample circuit only shows a single FT639 connected to the FT649. Any combination of five FT639s and, or FT609s may be used.

**Figure 2: Example PC Connection**

