



Technical Application Note TAN2004002

Synchronizing to an external device using Trigger Mode
Revised June 1, 2004

1.1. Subject

Technical Application Note (TAN2004002): Synchronizing to an external device using Trigger Mode.

1.2. Applicable Product(s)

All PGR *Dragonfly* cameras with firmware version 2.0.1.15 or higher.

1.3. Application Note Description

The Point Grey Research *Dragonfly* is a versatile IEEE-1394 digital camera that may be configured to acquire images synchronized to an external electrical signal. In order for the camera to acquire images synchronized to an external electrical signal, the signal must be connected to one of the *Dragonfly* GPIO pins and the camera's TRIGGER_MODE CSR must be correctly configured.

1.3.1. General Purpose Input/Output (GPIO) Pins

1.3.1.1. GPIO Physical Specification

The *Dragonfly* has a set of four (4) general-purpose IO pins that can be accessed via the 6-pin 2mm header shown below.

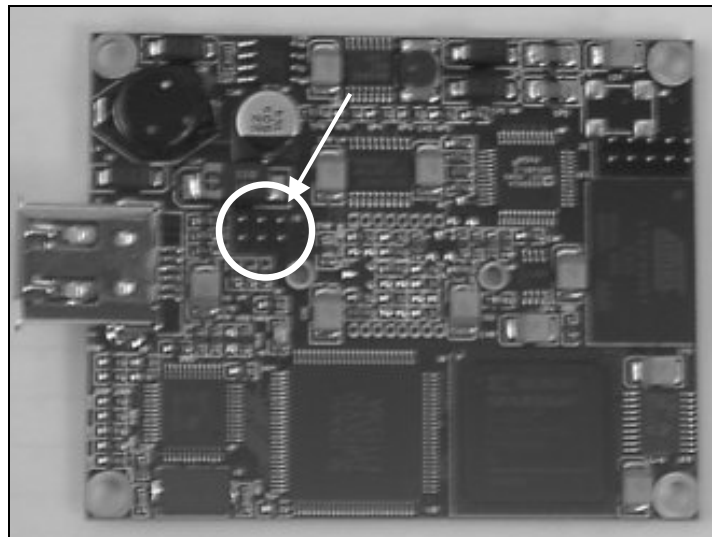


Figure 1: Diagram indicating the location of the GPIO pins

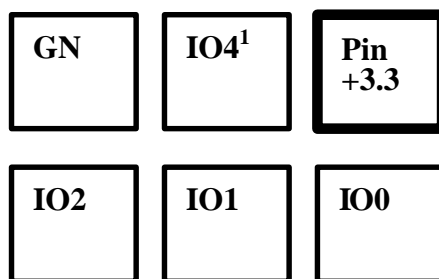


Figure 2: GPIO pin layout.

1.3.1.2. GPIO Electrical Characteristics

The *Dragonfly* GPIO pins are TTL 3.3V pins protected by two diodes to +3.3V and GND in parallel. There is also a 10K resistor in series to limit current. When configured as input, the pins can be directly driven from a 3.3V or 5V logic output. For output, each GPIO pin has almost no drive strength (they are high impedance) and needs to be buffered with a transistor or driver to lower its impedance.

Pin 1 is capable of powering external circuitry up to a total of 50mA. The IO pins are protected from both over and under voltage. It is recommended, however, that they only be connected to 5V or 3.3V digital logic signals. Suitable mating connectors are available from a number of sources. Two examples are parts WM18031 and WM18056 from Digikey (www.digikey.com).

It should be noted that IO2 is different from the other IO pins. IO2 has a weak pull-up resistor. This allows for easy triggering of the camera by simply shorting the pin to ground.

1.3.2. Configuring TRIGGER_MODE Registers

The external synchronization signal may be connected to any of the IO signals; however, by default triggering occurs on IO2 only. It has a weak pull up so a simple external trigger may be implemented by using a push button switch connected between the GND and the IO2 pins. To use IO0 or IO1 as trigger input, the pins should be connected to 5V or 3.3V digital logic signals.

Having connected the physical interface, the TRIGGER_MODE CSR located at offset 830h must be correctly configured. The *Dragonfly* supports Trigger_Mode_0 for external synchronization.

In order to put the camera into the Trigger_Mode_0 with a low active input, the user must set register 830h to 0x82000000. To turn off trigger mode, set register 830h to 0x80000000.