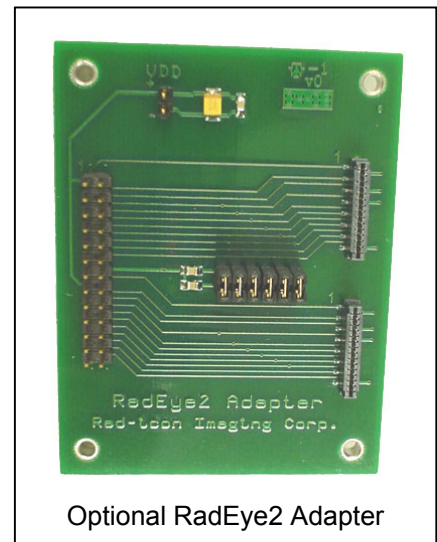
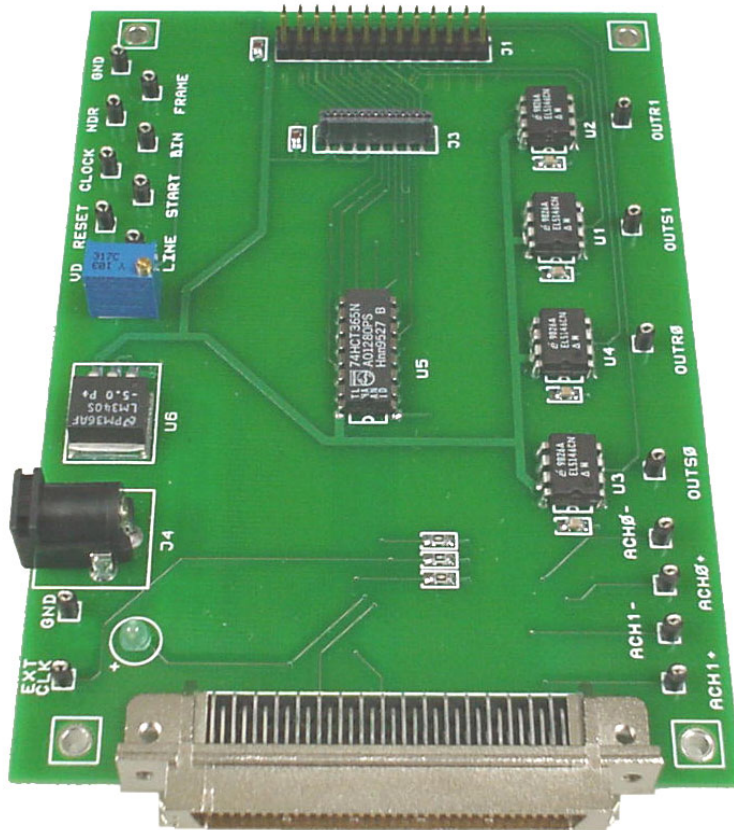


# RadEye™ 1 Evaluation Board



## Key Features:

- Perform bench-top evaluation of RadEye1 image sensor
- Stand-alone operation with external master clock input
- Acquire complete images with National Instruments PCI-611x or E-series data acquisition boards (not included)
- Includes sample LabView programs to control sensor and save images
- Optional adapter board to connect to RadEye2 sensor module
- Power supply included

The RadEye™ 1 evaluation board is designed for bench-top evaluation of the RadEye1 image sensor. As a stand-alone test board, simply connect the power supply and a pulse generator for supplying a master clock, and it generates all the necessary control signals to run the RadEye1 device. Or connect it to a National Instruments PCI-611x or another E-series data acquisition board to create a simple imaging system that gives you full software control over the RadEye1 image sensor and allows you to acquire and save images for further analysis.

## Description:

The RadEye1 Evaluation Board is designed as a test adapter to connect the RadEye1 image sensor to a PCI-611x or E-series data acquisition board from National Instruments. With this connection, the RadEye1 functions can be controlled from a simple LabView program, and images can be acquired and saved on a PC. The evaluation board can also function as a stand-alone test platform if an external master clock is supplied. In this configuration, the RadEye1 sensor will run in its default mode, continuously reading out image data at the frame rate defined by the clock speed. Please refer to the RadEye1 data sheet for more information about the timing modes and control inputs.

The schematic on the next page shows the wiring diagram for the RadEye1 evaluation board. Connector J3 attaches to a 15-conductor flex cable which connects to the RadEye1 image sensor. Power (+5V) is supplied by the regulator U6, and the reference voltage VD is generated from a resistive voltage divider and trim potentiometer R6. The five control inputs to the RadEye1 sensor are generated by the PCI-611x board connected to J2, and buffered by U5. If the PCI-611x board is disconnected, the BIN, RESET and NDR modes are automatically disabled (pulled low). START defaults to a logic HIGH state, which puts the sensor into its continuous readout mode. CLOCK is the only signal that needs to be connected to an external pulse generator.

With the PCI-611x board connected to J2, the BIN, RESET and NDR inputs are controlled through the board's DIO0, DIO1 and DIO2 control lines, respectively. START and CLOCK are connected to the PCI-611x on-board counter/timer circuits, which can be used to program the pixel data rate and frame rate for the RadEye1 sensor. An LED connected to the START signal provides an instant visual check of the sensor frame timing.

The analog output from the RadEye1 sensor is buffered by two EL5146C op-amps. The default signal gain is set to 1. Testpoints before and after the op-amps can be used to monitor the signals from the OUTS and OUTR outputs. If the PCI-611x board is connected, it acquires the video signal through its ACH0+ and ACH0- differential analog input. The video signal is converted using the same counter/timer clock that generates the CLOCK signal. A rising edge on the sensor's FRAME output triggers the data acquisition, which lasts for 549,888 clock cycles (1024 x (512+25)) in order to acquire a full frame.

## Connector Pinout:

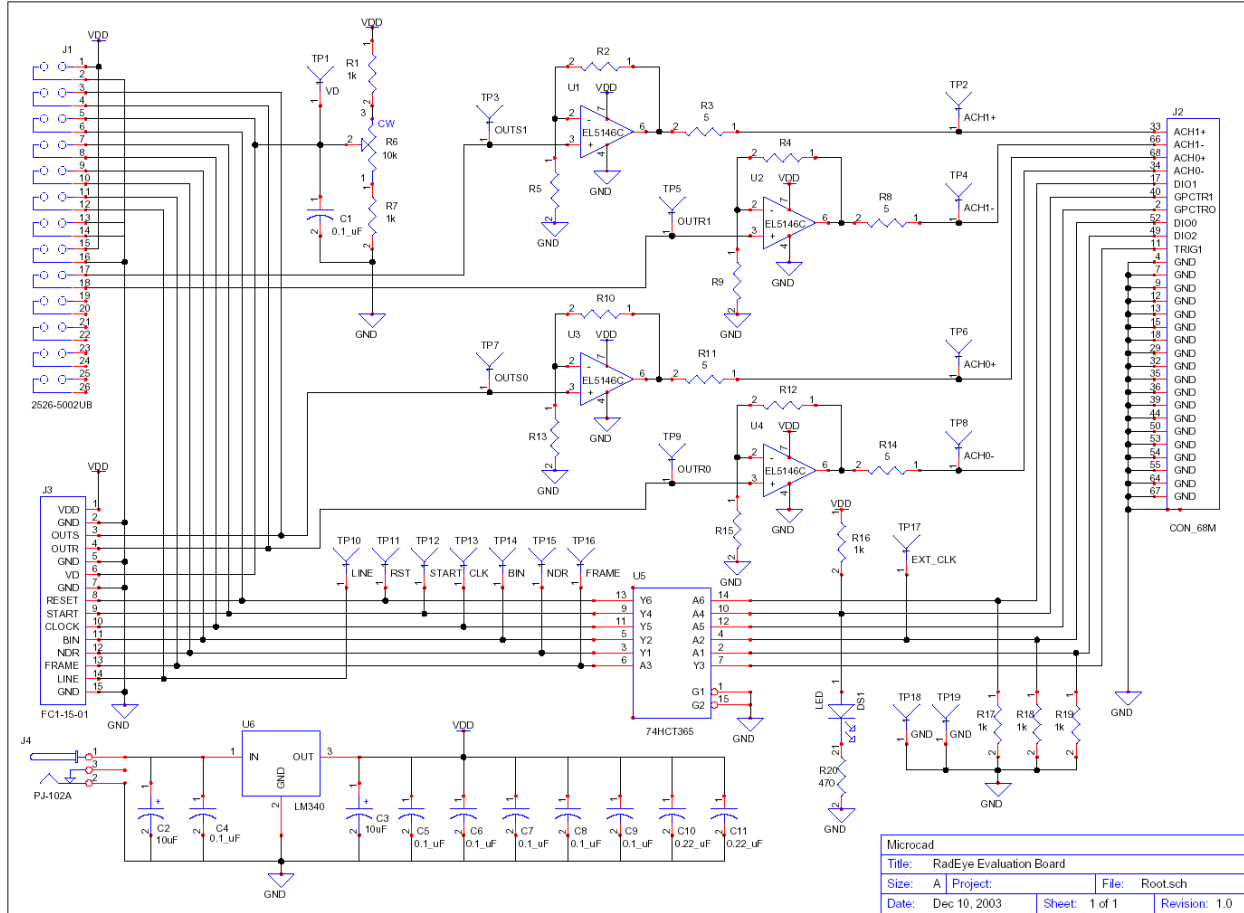
J3 – RadEye1 Sensor

Pin	Signal	Description
1	VDD	Power (+5V)
2	GND	Ground
3	OUTS	Video Output +
4	OUTR	Video Output -
5	GND	Ground
6	VD	Reference In
7	GND	Ground
8	RESET	Array Reset In
9	START	Frame Start In
10	CLOCK	Master Clock In
11	BIN	Binning Select In
12	NDR	NDR Select In
13	FRAME	Frame Sync Out
14	LINE	Line Sync Out
15	GND	Ground

J2 – PCI-611x DAQ Board

Pin	Signal	Description
68	ACH0+	Analog Input Ch. 0+
34	ACH0-	Analog Input Ch. 0-
33	ACH1+	Analog Input Ch. 1+
66	ACH1-	Analog Input Ch. 1-
52	DIO0	Digital I/O Line 0
17	DIO1	Digital I/O Line 1
49	DIO2	Digital I/O Line 2
2	GPCTR0_OUT	Counter 0 Output
40	GPCTR1_OUT	Counter 1 Output
11	PFIO/TRIG1	Digital Trigger Input
4,7,9,12,13,15 18,29,32,35,36 39,44,50,53 54,55,64,67	AGND/DGND	Ground

## Schematic:



## RadEye2 Adapter:

An optional adapter board is available for connecting a RadEye2 sensor module via the J1 connector to the National Instruments data acquisition card. Please note that operation of the RadEye2 module requires the simultaneous sampling capability of the PCI-611x boards. E-series data acquisition boards can only support a data stream from a single sensor channel.

## Ordering Information:

Rad-ikon P/N	Description
1054-01	RadEye1 Evaluation Board
1054-02	RadEye1 Eval. Board with RadEye2 Adapter
1002-01	RadEye1 Image Sensor, Premium Grade
1002-02	RadEye1 Image Sensor, Standard Grade
1002-03	RadEye1 Image Sensor, Engineering Grade
1004-xx	RadEye2 Sensor Module (see data sheet for options)

Please contact National Instruments directly ([www.ni.com](http://www.ni.com)) for pricing and delivery information for data acquisition boards, cables and LabView software.