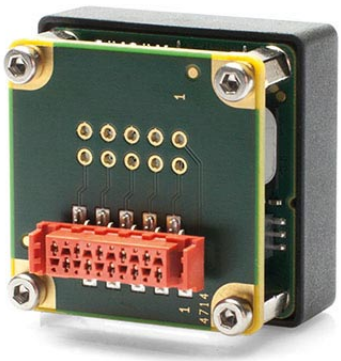
Basler Accessories



Technical Specification

dart I/O BOARD

Order Numbers

106896	**dart I/O Board Starter Kit**
106897	**dart I/O Boards (5 Pieces)**
2000035665	**dart I/O Board Mounting Kit**

Document Number: DG001439
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Product Overview

Order Number	Description
106897	dart I/O board (sold in packets of 5)
106896	dart I/O board starter kit. Contains: ■ 1 x dart I/O board ■ 1 x MicroMatch plug, IDC, 10 pins, 1.27 mm pitch ■ 1 x dart I/O board mounting kit (see below)
2000035665	dart I/O board mounting kit. Contains: ■ 4 x M2 screws (6 mm) ■ 4 x M2 screws (12 mm) ■ 4 x spacers (6 mm)

Table 1: Product Information

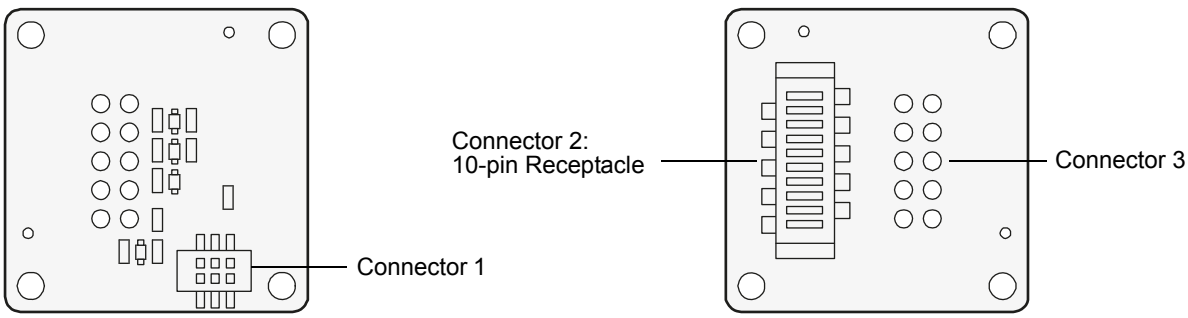


Fig. 1: dart I/O Board Top and Bottom

Key Features

The dart I/O board offers a convenient way to access to the camera's GPIO lines. See below for a list of its key features:

- Variety of connection possibilities

  The board offers three connectors:

  - Connector 1 is located on the top of the board and used to attach the board to the I/O connector of the dart camera.
  - Connector 2 and 3 are located on the underside of the board. Both connectors can be used as inputs to apply external trigger signals to the camera's GPIO lines or they can be used as outputs.

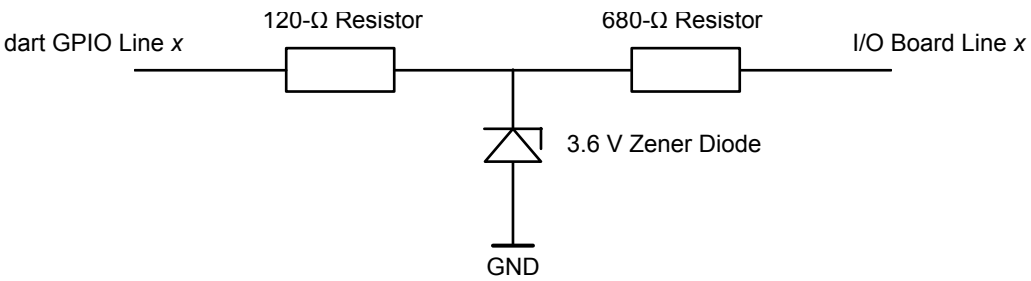
    Connector 2 and 3 have ten identical contacts. See Table 2 and Fig. 2 for the contact assignment and numbering.

    Connector 2 has a receptacle already pre-assembled (10 pin, 1.27 mm pitch).

    Connector 3 can be used for soldering on a ribbon cable or pin-to-hole connector.

- Increased voltage levels

  The I/O board includes a circuit that can transform TTL voltages down to the LVTTL voltages required by the dart GPIO lines. See Fig. 2 for details of the circuit. This capability is available via Connector 2 and 3 when the GPIO lines are set to input.
- Possibility of daisy-chaining I/O boards and cameras to simultaneously trigger several cameras
- Short-circuit protection



x = Line Number

Fig. 2: Adapter Circuit Schematic

Contact Numbering

Contact Number	Name/Function	Connected to dart I/O Connector Pin
1	Spare	Not connected
2	I/O board line 4	Pin 6 (GPIO Line 4 via board circuit; GPIO line 4 not implemented in dart camera yet)
3	Ground	Pin 2 (Ground)
4	I/O board line 3	Pin 5 (GPIO Line 3 via board circuit; GPIO line 3 not implemented in dart camera yet)
5	Ground	Pin 2 (Ground)
6	I/O board line 2	Pin 4 (GPIO Line 2 via board circuit)
7	Ground	Pin 2 (Ground)
8	I/O board line 1	Pin 3 (GPIO Line 1 via board circuit)
9	Ground	Pin 2 (Ground)
10	n/a	Not connected (connection to Pin 1 possible; see "Accessing the 3.3 V of the Camera's I/O Connector" for details)

Table 2: Contact Numbering of Connectors 2 and 3

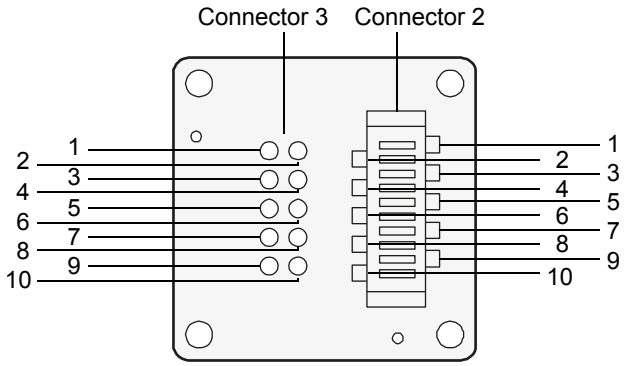


Fig. 3: Contact Numbering

Connecting the I/O Board to the Camera

The I/O board plugs into the dart camera's I/O connector by means of its Connector 1. To ensure proper alignment of the respective pins, line up board and camera on top of each other as shown in Fig. 4.

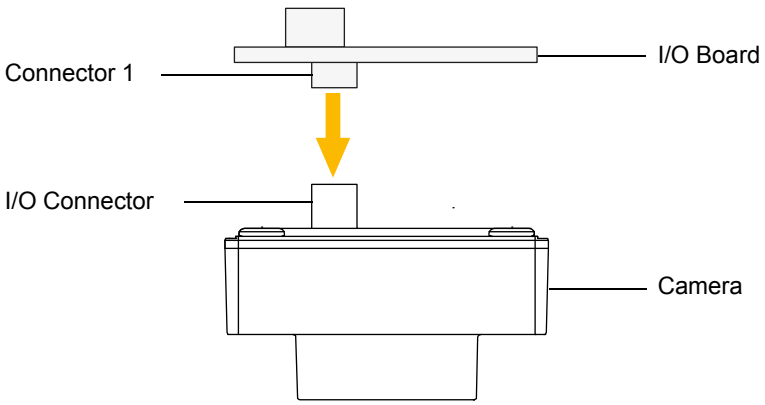


Fig. 4: Connecting I/O Board to Camera

Securing the Board-Camera Assembly

To secure the assembly, it is advisable to use appropriate fastenings. The dart I/O board starter kit includes all items necessary for this. Alternatively, you can use the dart I/O board mounting kit which contains the screws and spacers necessary to secure one I/O board, or you can use your own equipment.

For instructions to secure the board to the camera, see below. The procedure is illustrated in Fig. 5.

To secure the board-camera assembly:

1. Using the 12-mm screws, attach the spacers to the back of the dart camera.
2. Line up the mounting holes of the I/O board above the spacers, taking care that Connector 1 of the board is located above the camera's I/O connector.
3. Plug Connector 1 into the camera's I/O connector.
4. Using the 6-mm screws, secure the board to the camera.

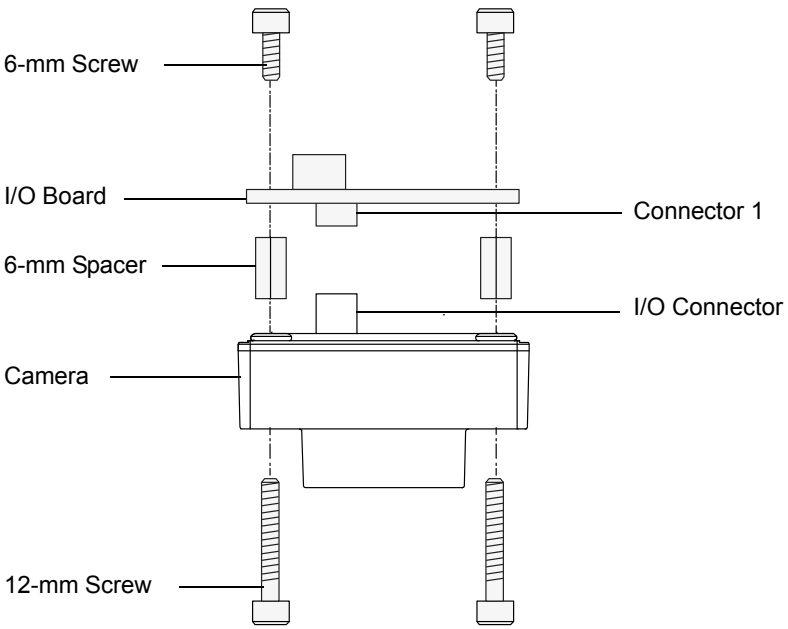


Fig. 5: Securing the Board-Camera Assembly

If you're using your own spacers, make sure that they are 6 mm long and their diameter doesn't exceed 4.62 mm. If the spacers are wider than that or of a different length, there is a risk of touching the board's components or bending the I/O board.

Connecting the I/O Board to an External Trigger Source

Connector 2 and Connector 3 offer several ways of connecting the I/O board and the dart camera. See below for details:

- Via Connector 2

  This connector has a 10-pin receptacle pre-assembled. This can be used to plug in a ribbon cable terminated with a matching IDC plug (10 pin, 1.27 mm pitch). Possible choices of cable and IDC plug would be the 3M 3365-10 ribbon cable (10 way, 28 AWG, 300 V) and the TE Connectivity/AMP 8-215083-0 plug (IDC, wire to board, 1.27 mm pitch, 10 way).

- Via Connector 3

  This connector offers contacts that can be used to solder on a cable directly or to solder on a variety of pin-to-hole connectors (e.g. pin headers or box headers with 10 pins and a 2.54 mm pitch).

- Via Connector 2 or 3

  If you want to trigger several cameras simultaneously, you can use the I/O boards to daisy-chain several cameras together. **The camera's I/O lines have to be set as input lines in this scenario.**

  Fig. 6 shows a sample setup where cameras are daisy-chained using Connector 2. In this example, an external trigger source can trigger 4 dart cameras at the same time. The camera-I/O board assemblies are connected via a ribbon cable that is attached to Connector 2 of each I/O board by an IDC plug.

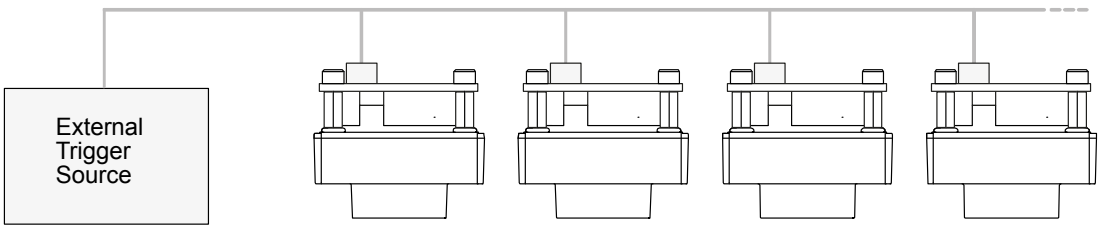


Fig. 6: Daisy-chaining dart Cameras

Accessing the 3.3 V of the Camera's I/O Connector

If your application requires the 3.3 V output that is available from the camera's I/O connector, you can use pin 10 of the board's Connector 2. To achieve this, mount a 0-Ω resistor (size 0603) in the resistor position labeled 3.3 V on the top of the board. See Fig. 7.

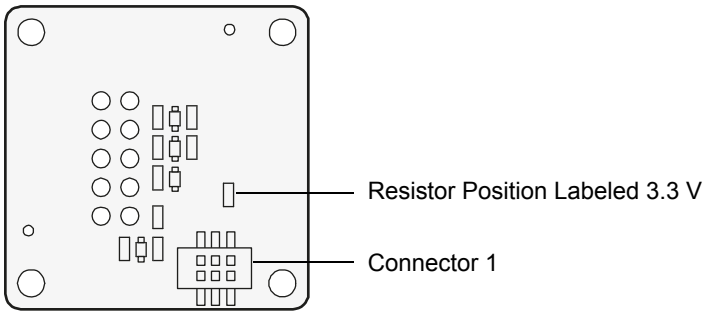


Fig. 7: Accessing the 3.3 V of the Camera's I/O Connector

Recommendations

Cable Lengths

Basler recommends using I/O cables of no more than 0.5 m in length to ensure signal integrity.

Avoiding EMI and ESD

When integrating the I/O board into your application, follow the safety recommendations given in the *Basler dart User's Manual for USB 3.0 Cameras* (AW001305).

You can download the User's Manual and related documents for your camera free of charge from the Basler website: www.baslerweb.com

Using the Camera's I/O Lines as Outputs

When using the camera's I/O lines as outputs via the I/O board, be aware that the voltage on the I/O board pins drops the more current you draw. This is due to the series of resistors in the board circuit. Basler recommends drawing no more than 250 µA when using the camera's I/O lines as outputs via the I/O board.

General Information

RoHS Compliance	Yes
CE Conformity	Yes (RoHS)
UL Conformity	No
Warranty	1 year

Table 3: General Information

Revision History

Doc. ID Number	Date	Changes
DG00143901000	12 Mar 2015	Initial release of this document.

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