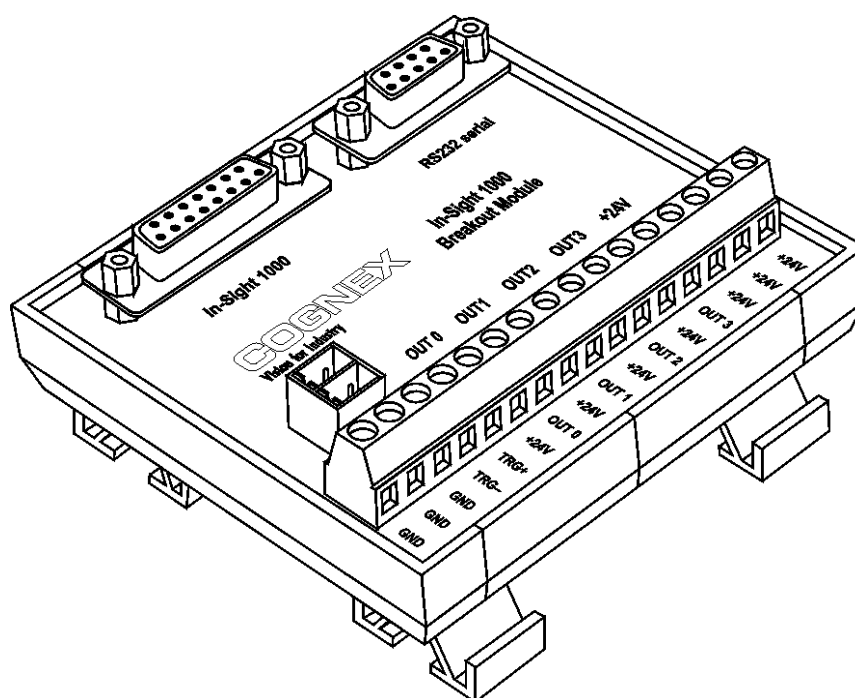


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BREAKOUT MODULE INSTALLATION AND REFERENCE

(IN-SIGHT™ MODELS 1000/1010/1700)





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Cognex P/N 597-0008-01

The hardware described in this document may be covered by one or more of the following U.S. patents. Other U.S. and foreign patents are pending.

In-Sight	Patents pending
Hardware	4,972,359; 5,526,050; 5,657,403; 5,793,899
Vision Tools	5,495,537; 5,548,326; 5,583,954; 5,602,937; 5,640,200; 5,717,785; 5,742,037; 5,751,853; 5,768,443; 5,796,868; 5,818,443; 5,825,483; 5,825,913; 5,845,007; 5,859,466; 5,872,870; 5,909,504

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Introduction

Depending on the model and configuration, an In-Sight 1000 Vision Sensor, 1010 ID Reader, or 1700 Wafer Reader connects to power, an acquisition trigger, outputs, and a serial device through the standard Breakout cable (P/N 300-0340) or through the optional In-Sight Breakout Module. The Breakout Module provides a more convenient method of accessing these connections compared to the standard Breakout cable.

This document provides detailed information on installing and using the In-Sight Breakout module in the following sections:

- ❑ *Breakout Module Kit Contents*
- ❑ *Installing the Breakout Module*
- ❑ *Specifications*

Breakout Module Kit Contents

The In-Sight Breakout Module kit (P/N CIO-1350-00) contains these items:

- Breakout Module (P/N 800-5743)
- Breakout Module cable, 4.6 m (15 ft.), black (P/N 300-0341-15)

Figure 1 shows the Breakout Module, including the location of the connectors, and the Breakout Module cable.

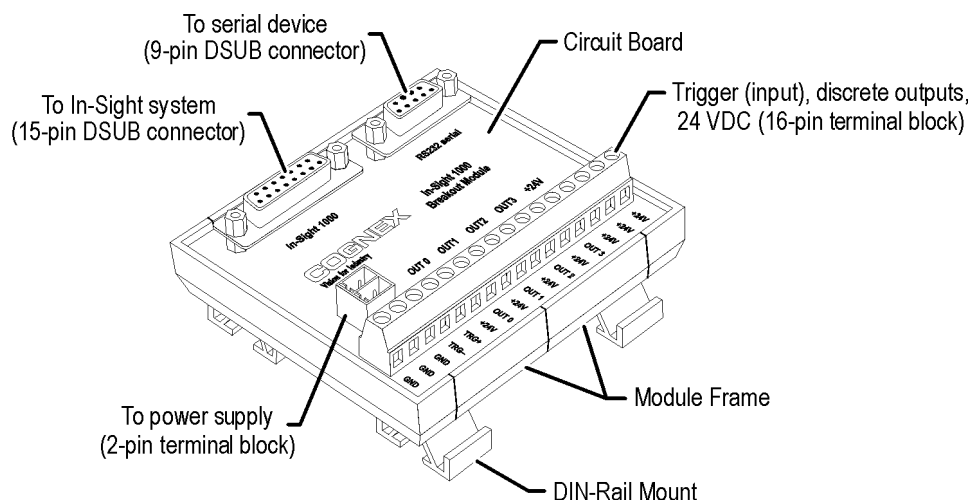


Figure 1. In-Sight Breakout Module

In addition to the components shown in Figure 1, the Breakout Module also features:

- Six status LEDs located above the 16-pin terminal block
- An eight-position DIP switch located on the underside of the circuit board. The switch settings must be adjusted to use the Breakout Module with Output Only and Serial Hardware Handshaking configurations of In-Sight systems, as described in the following pages.



Figure 2 shows the 4.6 m (15 ft.), Breakout Module cable.

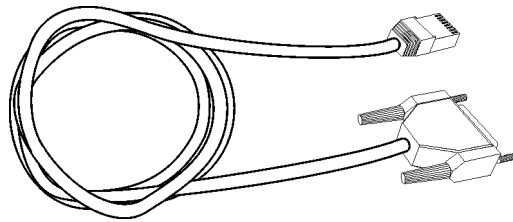


Figure 2. In-Sight Breakout Module Cable



Installing the Breakout Module

Users can configure the Breakout Module to match the configuration of the In-Sight system with which it will be used. Except for changing DIP switch settings, the procedure for connecting the Breakout Module to each In-Sight model/configuration is identical.

The In-Sight 1000 and 1010 are available in three configurations; the In-Sight 1700 is available in only one configuration. These configurations are listed below.

MODEL	CONFIGURATION	PART NUMBER
In-Sight 1000	Standard	800-5740-1
	Output-Only	800-5741-1
	Serial Hardware Handshaking	800-5742-1
In-Sight 1010	Standard	800-5749-1
	Serial Hardware Handshaking	800-5756-1
In-Sight 1700*	Serial Hardware Handshaking	800-5748-XX

* Includes the In-Sight 1711.

The following steps explain how to connect the Breakout Module to the In-Sight 1000/1010/1700, a power supply, an acquisition trigger source, and output devices.

Note: Only perform Step 1 to install the Breakout Module with one of these systems:

- In-Sight 1000 Output-Only or Serial Hardware Handshaking
- In-Sight 1010 Serial Hardware Handshaking
- In-Sight 1700 (or 1711).

To install the Breakout Module with a standard configuration In-Sight 1000 or 1010, begin with Step 2.



1. Adjust the DIP switch settings.

- a. Remove the two halves of the Breakout Module plastic frame by firmly gripping the ends and pulling them apart (Figure 3).

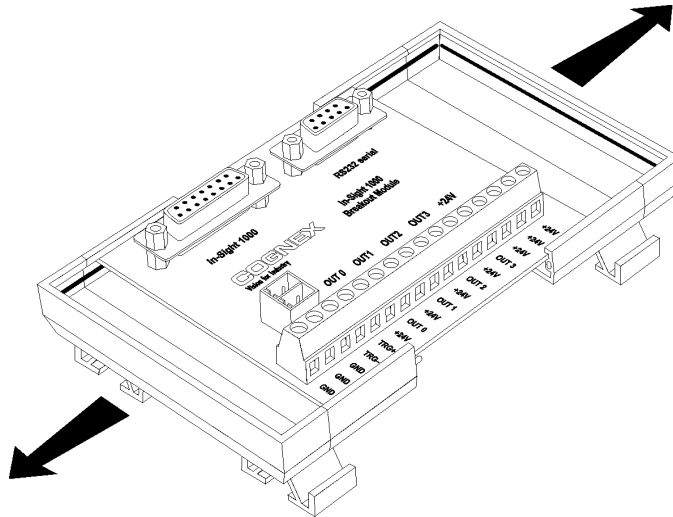


Figure 3. Removing the Breakout Module Frame

- b. Turn the circuit board over and locate the DIP switch. Figure 4 shows a close-up of the default switch settings.

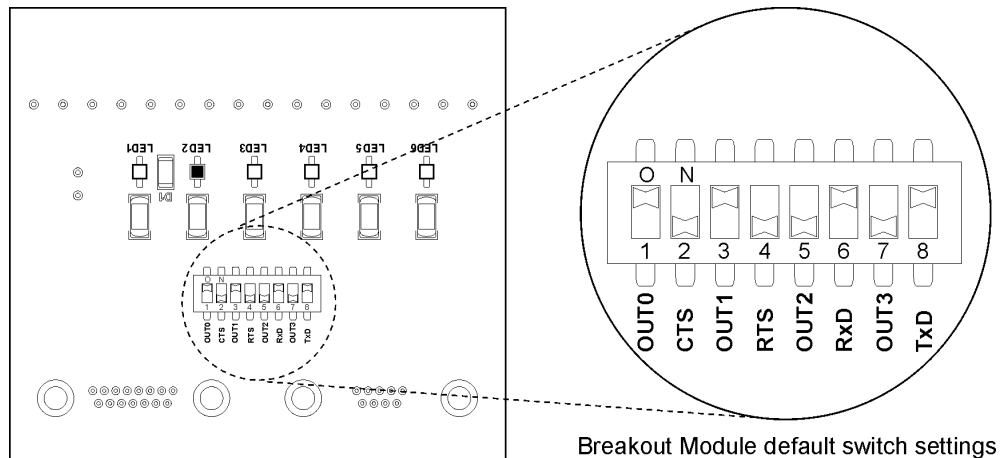


Figure 4. Breakout Module Default DIP Switch Settings



In-Sight 1000/1010/1700 Breakout Module Installation and Reference

- c. Move the switches to the setting for the In-Sight model and configuration you are using. Figure 5 shows the switch settings for the In-Sight 1000 and 1010 Output-only configuration.

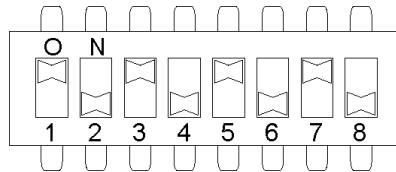


Figure 5. Switch Settings for In-Sight 1000/1010 Output-Only Configuration

Figure 6 shows the switch settings for the In-Sight 1000 and 1010 Serial Hardware Handshaking configuration. The settings shown in Figure 6 are also the only ones appropriate for the In-Sight 1700.

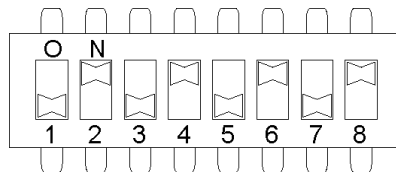


Figure 6. Switch Settings for In-Sight 1000/1010/1700 Serial Hardware Handshaking Configuration

- d. Reassemble the two halves of the Breakout Module plastic frame around the circuit board.



2. Connect the Breakout Module Cable

- a. Insert the end of the Breakout Module cable with the RJ-45 connector into the Breakout receptacle (Figure 7).

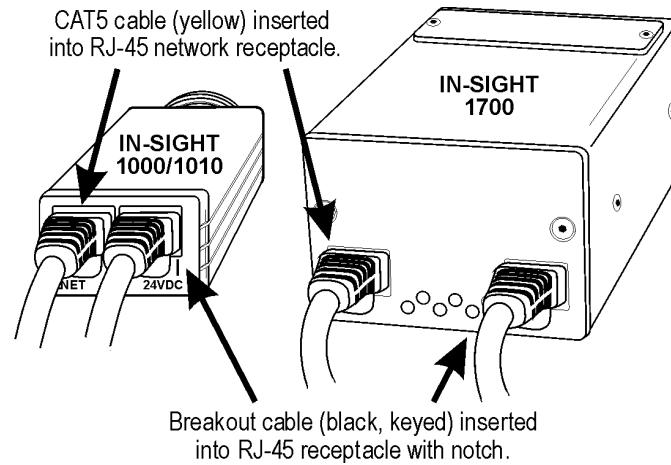


Figure 7. Connecting Cables to In-Sight Systems

- b. Plug the Breakout Module cable's 15-pin DSUB connector (male) into the In-Sight 15-pin DSUB connector (female) on the Breakout Module (Figure 8).

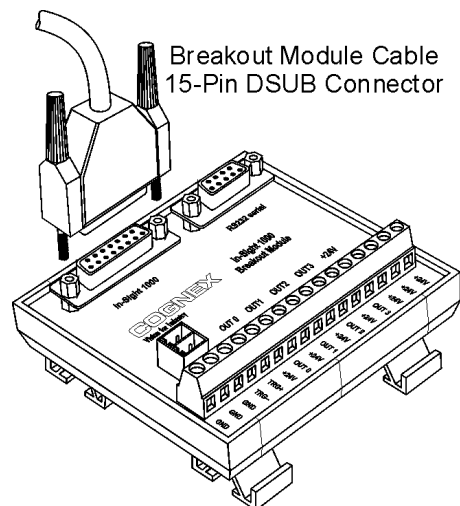


Figure 8. Connecting Breakout Module Cable to 15-Pin DSUB Connector

3. Connect a serial device to the Breakout Module's serial connector (9-pin DSUB) labeled RS232 Serial (Figure 9).

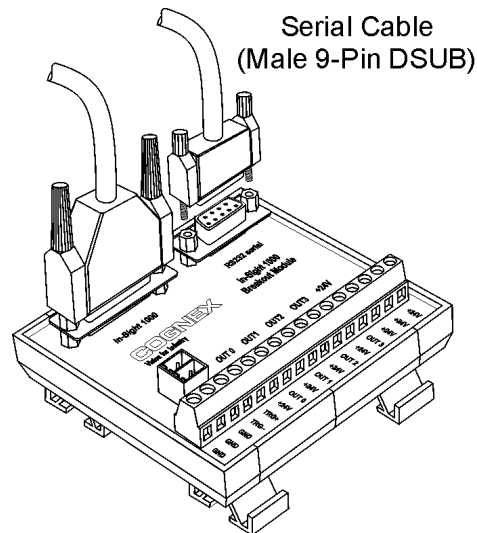


Figure 9. Connecting Serial Cable to 9-Pin Serial Connector



4. Connect leads to the 16-pin Terminal Block (Figure 10).

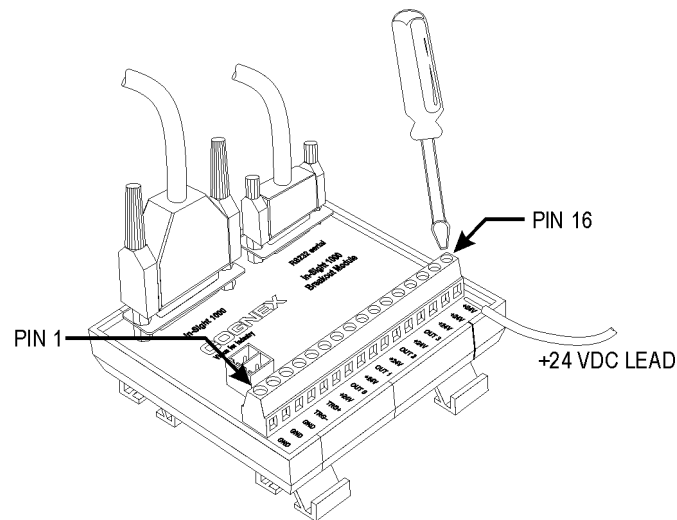


Figure 10. Connecting Leads to the 16-Pin Terminal Block

Use a flat-head screwdriver to loosen the terminal screws. Insert the following leads as appropriate:

- Connect ground leads to terminals 1, 2 or 3 (GND).
- Connect the negative lead from a trigger source to terminal 4 (TRG–) and the positive lead to terminal 5 (TRG+).
- Connect leads from devices requiring power to terminals 6, 8, 10, 12, 14, 15 and 16 (24V).
- For the Standard In-Sight 1000/1010 configuration, connect leads from output devices to terminals 7 (OUT0) and 9 (OUT1). For the Output-Only configuration, you may also connect leads from output devices to terminals 11 (OUT2) and 13 (OUT3). For the Serial Hardware Handshaking configuration, there are no terminals available for connecting output devices.

After inserting each lead, use the screwdriver to tighten the terminal screw.

5. Connect 24 VDC leads to the 2-pin Terminal block (Figure 11).

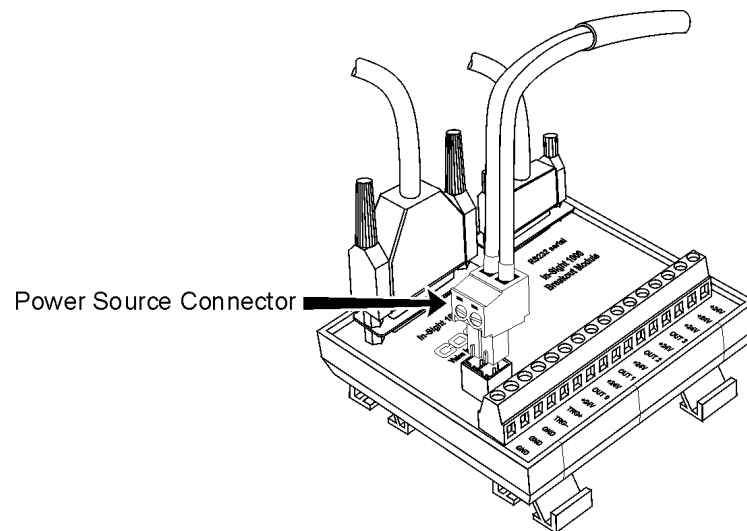


Figure 11. Connecting 24 VDC Leads to the 2-Pin Terminal Block



Specifications

The following sections provide detailed specifications for the In-Sight 1000/1010/1700 Breakout Module.

- ☐ *General Specifications*
- ☐ *Connector Pin Assignments*
- ☐ *Terminal Block Assignments*
- ☐ *LED Assignments*
- ☐ *Circuit Board Diagram*
- ☐ *Mechanical Specifications*



General Specifications

The chart below lists the general features and specifications of the In-Sight 1000/1010/1700 Breakout Module.

FEATURE	DESCRIPTION
Acquisition Trigger	One independent discrete input, optically isolated
Outputs	Two discrete outputs
Operating Voltage (Field Side)	5 VDC to 24 VDC
Power	+24 VDC
Maximum Output Current	200 mA (sink)
ON State Voltage Drop	0.8 VDC @ 10 mA; 2.6 VDC @ 15 mA
OFF State Leakage Current	100 μ A; maximum @ 15 VDC
Output Delay	• ON: 6 μSec • OFF: 130 μSec @ 5 μA; 95 μSec @ 10 mA; 85 μSec @ 15 mA
Trigger Input Resistance	~ 1000 Ohms
Trigger Input State Current	• ON: 3.5 to 15 mA • OFF: 500 μA
Trigger Input Delay	• ON: 30 μSec @ 3.5 mA; 8 μSec @ 15 mA • OFF: 45 μSec @ 3.5 mA; 80 μSec @ 15 mA
Field Wiring Size	26 to 12 AWG
Status LEDs	One each for trigger, Outputs 0-3, and 24 VDC
Terminal Block Torque	Maximum 7 in-lb (0.8 N-M)
Cable	• 4.6 m (15 ft.) supplied
Mechanical	• Dimensions: 120 mm (4.75 in) wide x 60 mm (2.35 in) high x 83 mm (3.25 in) deep • Mounting: #3 DIN-rail (35 mm)
Environmental	• Operating temperature: 0 to 50°C (32 to 122°F) • Operating/Storage humidity: 5 to 95% non-condensing • Storage temperature: -20 to 85°C (-4 to 185°F)

Note: If you are using a Cognex 24 VDC power supply, the maximum power draw is 30 watts minus the power draw of the In-Sight 1000/1010/1700.



Connector Pin Assignments

Figure 12 shows the signal assignments for each pin on the Breakout Module's serial connector. These assignments are listed in the chart below.

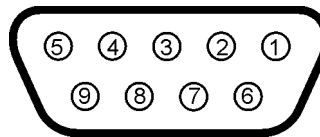


Figure 12. Serial Connector Pin Assignments

PIN #	ASSIGNMENT
1	No Connect
2	TxD
3	RxD
4	No Connect
5	GND

PIN #	ASSIGNMENT
6	No Connect
7	CTS*
8	RTS*
9	No Connect

* Not used for In-Sight 1000/1010 Standard configuration.



In-Sight 1000/1010/1700 Breakout Module Installation and Reference

Figure 13 shows the signal assignments for each pin on the Breakout Module's In-Sight connector. These assignments are listed in the chart below.

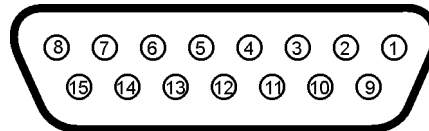


Figure 13. In-Sight Connector Pin Assignments (15-Pin DSUB)

In this chart, STD is Standard configuration, SHH is Serial Hardware Handshaking configuration, and OO is Output Only configuration.

PIN #	1000/1010			1700
	STD	SHH	OO	SHH
1	+24 VDC	+24 VDC	+24 VDC	+24 VDC
2	TRG +	TRG +	TRG +	TRG +
3	TRG –	TRG –	TRG –	TRG –
4	Out 0	CTS	Out 0	CTS
5	Out 1	RTS	Out 1	RTS
6	RxD	RxD	Out 2	RxD
7	TxD	TxD	Out 3	TxD
8	GND	GND	GND	GND
9	GND	GND	GND	GND
10	GND	GND	GND	GND
11	GND	GND	GND	GND
12	GND	GND	GND	GND
13	GND	GND	GND	GND
14	GND	GND	GND	GND
15	GND	GND	GND	GND



Terminal Block Assignments

Figure 14 shows the signal assignments for each terminal on the Breakout Module's 16-pin terminal block. These assignments are listed in the chart below.

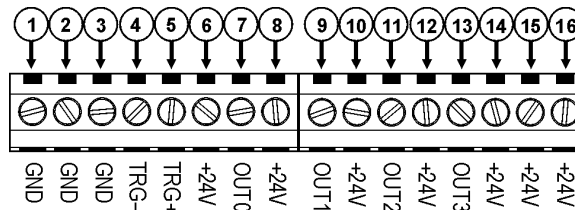


Figure 14. Terminal Assignments for the 16-Pin Terminal Block

PIN #	ASSIGNMENT	PIN #	ASSIGNMENT
1	Ground	9	Output 1
2	Ground	10	+24VDC
3	Ground	11	Output 2
4	Trigger –	12	+24VDC
5	Trigger +	13	Output 3
6	+24VDC	14	+24VDC
7	Output 0	15	+24VDC
8	+24VDC	16	+24VDC

Figure 15 shows the assignment of each pin on the Breakout Module's 2-pin power connector. These assignments are listed in the chart below.

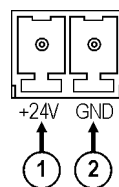


Figure 15. Pin Assignments for the 2-Pin Power Connector

PIN #	ASSIGNMENT
1	+24VDC
2	Ground

LED Assignments

Figure 16 and the following chart show the function of each LED on the Breakout Module.

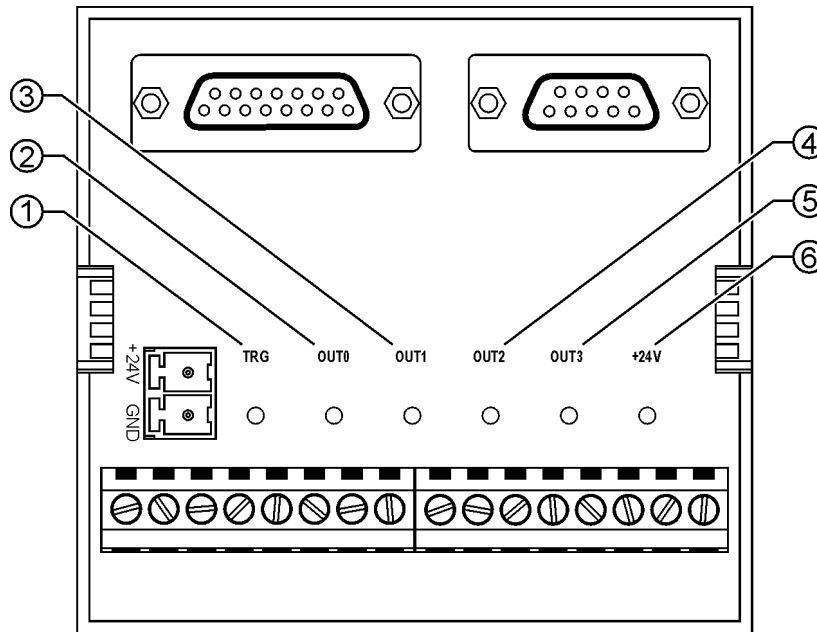


Figure 16. LED Locations and Descriptions

LED	DESCRIPTION
1	Trigger signal
2	Output0 signal*
3	Output1 signal*
4	Output2 signal**
5	Output3 signal**
6	Power

* Illuminates for In-Sight 1000/1010 Standard (P/N 800-5740-1) and Output-Only Configurations (P/N 800-5741-1)

** Illuminates for In-Sight 1000 Output-Only Configuration (P/N 800-5741-1)



Circuit Board Diagram

Figure 17 is a diagram of the Breakout Module Circuit Board.

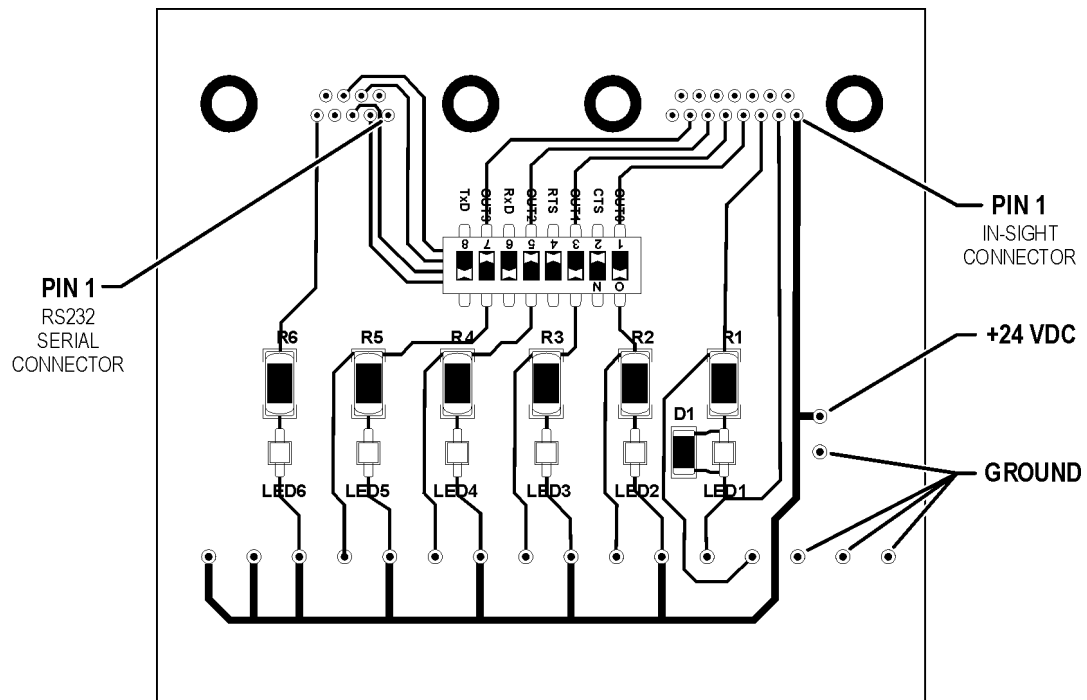


Figure 17. Breakout Module Circuit Board Diagram

Mechanical Specifications

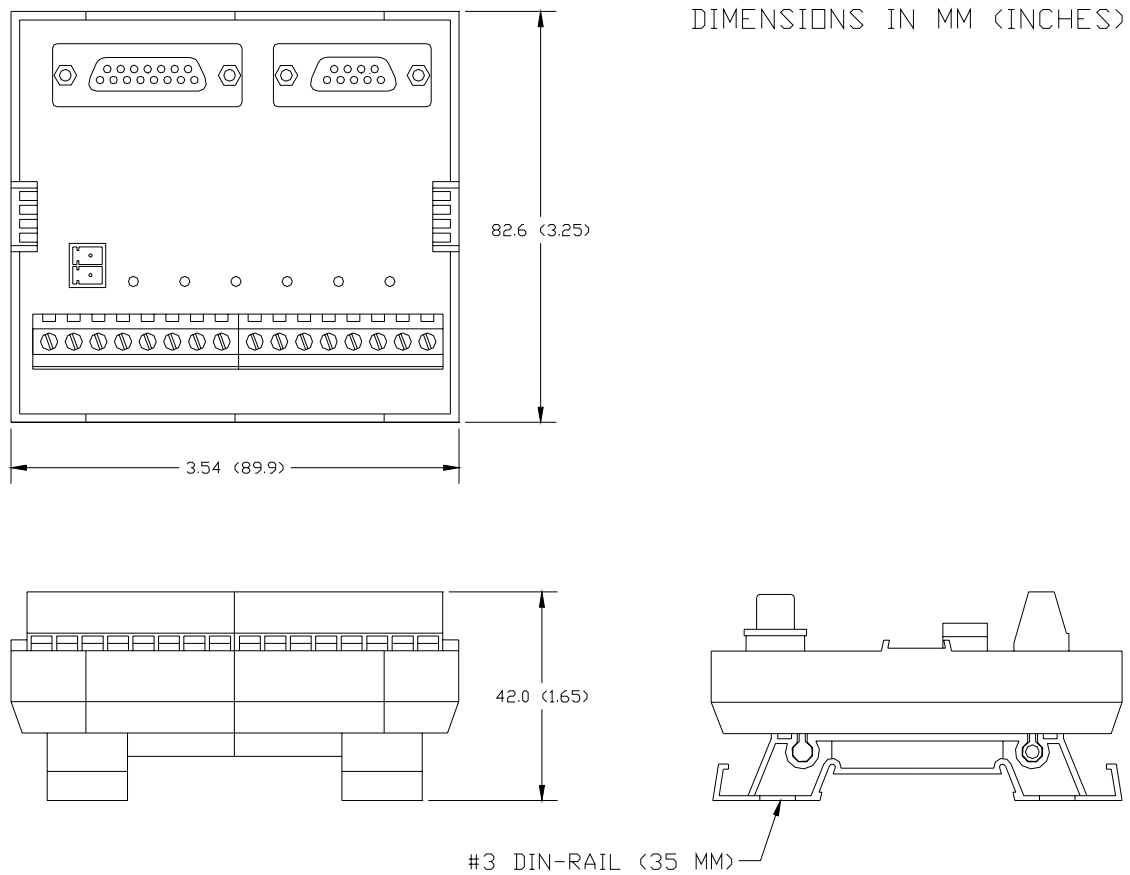


Figure 18. Breakout Module Dimensions



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