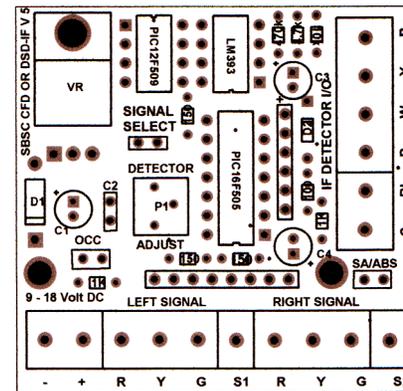


South Bend Signal Company, LLC

"Making Your Railroad Real"

www.sbsignal.com

IF Detector/Signal Driver



DSD-IF (V2)

DSDIF Manual 2010

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Description

The IFDSD is a detector/signal driver providing detection and signaling for searchlight or color light signals with either a **Stand Alone** (yellow automatic but not real-time aspects) or **ABS** (absolute block Signal system with real time aspects).

Specifications

- 12 -18 volt DC operation (unregulated)
- 150 ma power draw per board
- Uses infrared state-of-the-art detection device
- Drives bi-color LEDS (three-wire common ground type)*
- Is capable of all three aspects (green, yellow, and red)
- Bi-directional providing signal control in both directions of travel
- Two detectors one for each end of the signal block
- Compatible with any train control system: DC, DCC Battery, or live steam
- For indoor use. Works in any light conditions
- * will not drive two-wire LEDS

Materials Needed

- small Phillips and slotted screw driver
- 1/8th, 3/16th, and 1/4th drill bits and power drill
- 12-18volt DC power source (**not the throttle supply**)
- Wires cutters and wire strippers
- 2 signals for each block (2 per block for bi-direction plans)
- Soldering iron and rosin core 60/40 solder

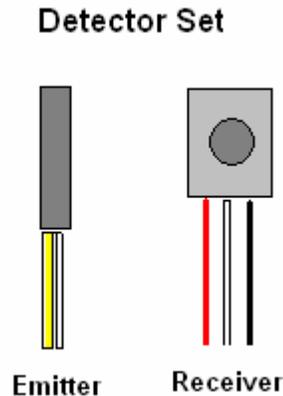
Detector Set Description

Each **DSDIF** comes with 2 detector sets. A set consists of an Emitter and a Receiver. When the signal system is connected to 12-18 volts, the emitter sends out an infrared beam at particular frequency and wave length. The receiver is calibrated to this same frequency and wave length. When the detector set is covered by a locomotive or any piece of rolling stock, the beam from the emitter is bounced off the rolling stock and is recognized by the receiver causing the receiver to transmit a signal to the Relay board microcontroller that a detection has been made. The microcontroller then sets the signals to the proper aspect depending on track conditions signal type, and other relay board inputs.

The emitter has a **YELLOW** and **WHITE** wire connected to it.
The Receiver has **RED**, **WHITE**, and **BLACK** wires connected to it.

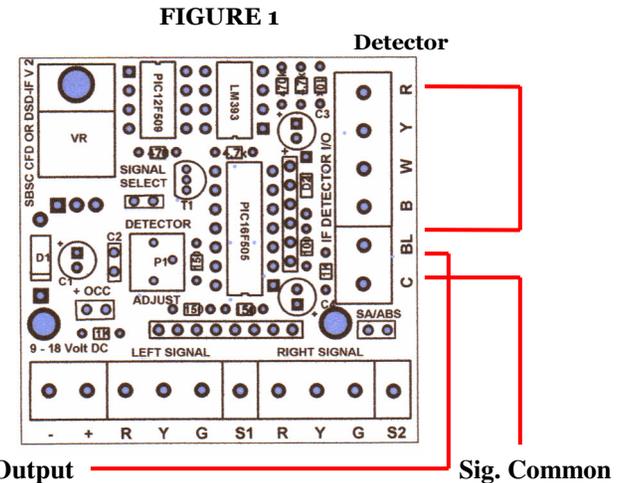
Figure 8 below shows how they look.

Figure 8



DSDIF Terminal Descriptions

Refer to the diagram of the DSDIF board below to become familiar with the terminals and there purpose.



Block Common Output
+ (input) Power wire 12 volt-18 DC *
- (input) ground wire 12 volt-18 DC

Left and Right Block Input/Output Terminals

C (output) common (+) for color light signals
G (output) Green (left & right) for block signal
Y (output) Yellow (left & right) for block signal
R (output) Red (left & right) for block signal
BL (output) block out to next DSD-IF board
S1 (input) Left input from next DSD-IF
S2 (input) Right input from next DSD-IF

Detector Terminals (2 Detector Sets per Block)

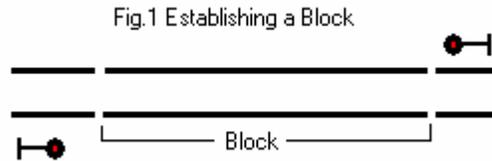
R (input) Red wire: Receiver inputs from detector sets
Y (output) Yellow wire: Emitter output to detector sets
W (output) White wire: common ground to detector sets
B (output) Black wire: positive power to Receiver

Jumper Blocks: **Signal Select** **SA / ABS**

Use a separate DC power supply for this signal system. Do not use power from the rails or other throttle source to power this system. Failure to improperly power this system may damage the board. SBSC will not be responsible for improperly connecting the system to an incorrect power source.

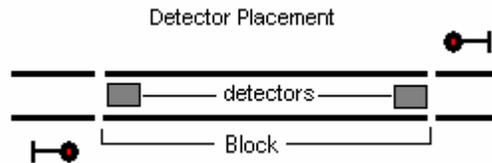
Step [1] Establishing Signal Blocks

The first step if installation is to establish signal blocks. A signal block is a section of track that is protected by signals. Figure 1 below illustrated this.



The detectors are positioned between the rails at the intersections of signal blocks. There is one detector set at each end of the signal block. **IF the block is longer than a typical train for your setup then add an additional detector in the center of the block. (Part# DS)**

Figure 2



For each block you need two or more detector sets. See Figure 3

Figure 3

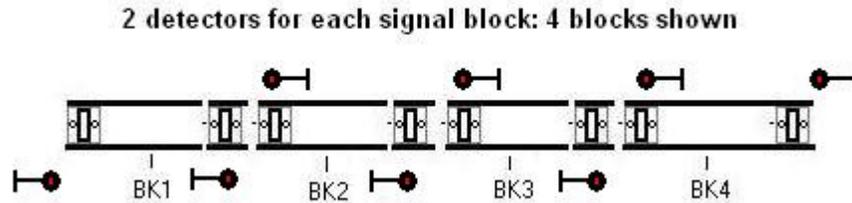


Figure three shows the placement of detector sets to establish four Signal blocks. It is a good idea to draw a track diagram of you railroad to help establish signal blocks.

Step [7] Testing the Signal System

Connect the signal power source to the power bus (**12-18volt DC**). You should have a green signal for all signals. If this is not the case, then go back through the previous steps for the offending signal and check you connections. Check to see that each detector works properly by running a locomotive or car over the detector. Each signal within a block should be red for each detector covered in that block.

For **ABS** configuration: To check for yellow, cover a detector and look at each block to the left or right of the block that is occupied. The signals in those blocks should be yellow. If the signals do not display yellow, then go to **Step [6]** above and make sure that you have made the proper connections between Relay Cards.

For **Stand Alone** configuration: When the block changes from occupied to clear, the signal will change to yellow for 8 seconds and the back to green.

If everything checks out OK then you are finished. Congratulations! You have successfully installed you signal system. The signals will work automatically. Now you can just run trains and enjoy the added realism of a signal system to your railroad.

Again, thanks for the business.

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Step [6] Connecting Blocks Together for ABS Yellow

If you are interested in having a yellow aspect (next block occupied) for the INTERLOCKED version, you must connect the BL and S1 or S2 input/outputs together otherwise you will only have two aspects; green (block clear), and red (block occupied). If you are selecting the STAND Alone version skip this step.

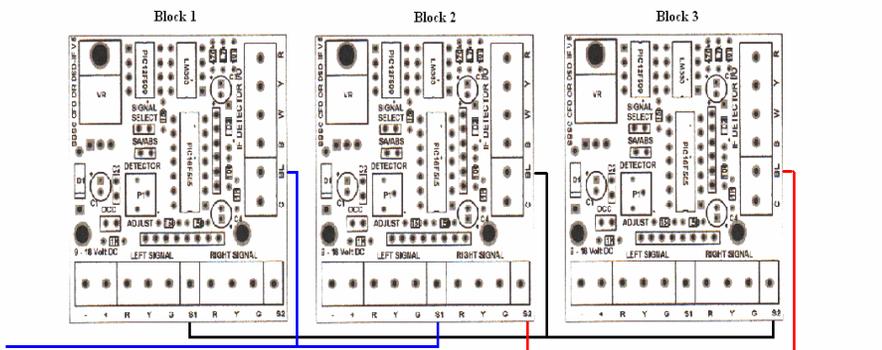
To connect blocks together for the amber (yellow) aspect do the following: (See Fig. 7). Without these connections for the interlocked version you will only have green and red aspects.

[1] Remove the SA/ABS jumper block (red) which located in the lower right of the DSD-IF.

[2] Connect the BL terminal to the S1 terminal to the left DSD-IF and S2 to the right DSD-IF.

[2] Repeat step 1 until all DSD-IF are connected. The last DSD-IF BL is connected to the first DSD-IF S1 and the first DSD-IF is connected to the last DSD-IF S2.

Fig. 7 (3 blocks illustrated)



Step [2] Mounting Detectors

After establishing the signal block for your layout, one detector set (emitter and receiver) is mounted at each end of the block. See Figure 3. To mount the detectors, remove ballast between the ties in the mounting area. Drill a 3/16th inch hole for the emitter and a 1/4th inch hole for the receiver as shown in Figure 4A for O Scale, and Figure 4B for HO or 4C for N Scale.

Fig. 4A

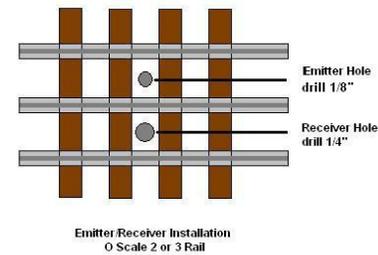


Fig. 4B

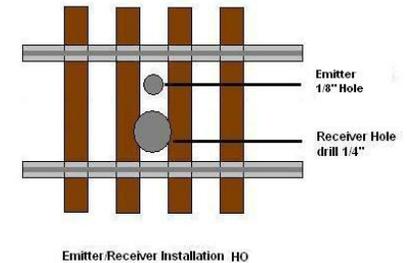


Fig 4 C

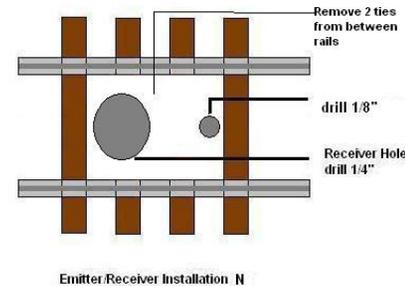
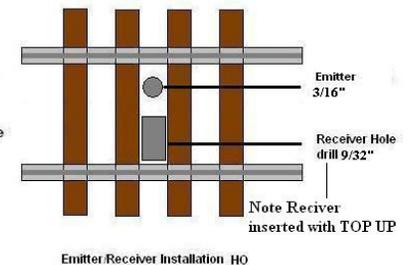


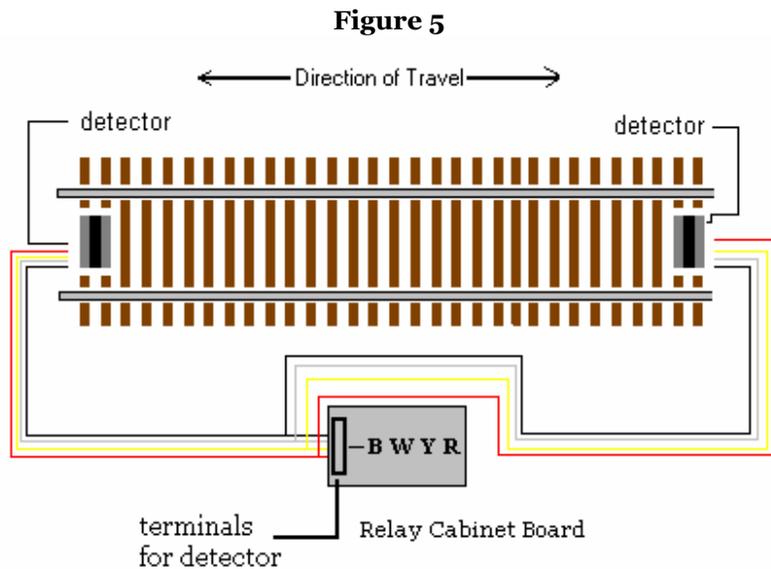
Fig. 4 D



Insert the **Emitter** and **Receiver** from the top. The **Emitter** should be flush with the top of the ties and **Receiver** even with the bottom of the ties. The receiver should be inserted so that the top of the receiver is pacing up. See Fig. 4 D

Step [4] Connecting the Detectors Sets to the DSD-IF Board

After you have determined the locations of the **DSD-IF** boards (1 per block), mount the board between the detectors under the layout. Connect each detector set to the appropriate board. The **white** wires from the detector receiver and emitter should be soldered together and additional wire added to reach the **DSD-IF**. There are four wires for each detector Red, Yellow, White, and Black. Twist and solder lengths of wire from the detector set to the **DSD-IF** board. The wires are then connected to the detector input/output terminals on the right side of the board marked **B W Y R** which correspond to the color wires on the detector sets. See **Figure 5** for details.



Run a power bus (ground and positive at least 22 gauge wire) around the track on the same side as the boards. Connect each board to the power bus using pieces of wire connected to the + and - terminals on the card to the power bus. The power to the boards should be 12-18 volt DC unregulated either from a transformer connected to the house supply or a 12 volt battery. **DO NOT CONNECT THE DSD-IF TO THE TRACK POWER. Doing so may damage the board. SBSC will not be responsible for incorrectly powering the DSD-IF with an inappropriate power source.** Connect the bus to you power source. Check to see if the detected light goes on when each of the detectors in a block are covered.

Step [5] Connecting Signals to the DSD-IF Board

Follow the instructions supplied with the signals to properly install the signals. For Searchlight signals remove the **SIGNAL SELECT** jumper block from the **DSD-IF** board. For Color light signals, leave the **SIGNAL SELECT** jumper block **ON**. For the **ABS** configuration remove the **SA / ABS** jumper block. For the **SIMULATED** configuration leave the **SA / ABS** jumper block **ON**.

Run wire from the signals to the **DSD-IF** board (6 pair phone wire works well). Connect each color wire from the signal to its appropriate terminal on the board marked **R Y G**. Repeat this process for each signal for each end of the block. See Figure 6 A and 6B below. The **C** terminal is for the white wire on SBSC Color Light Signals (common positive).

