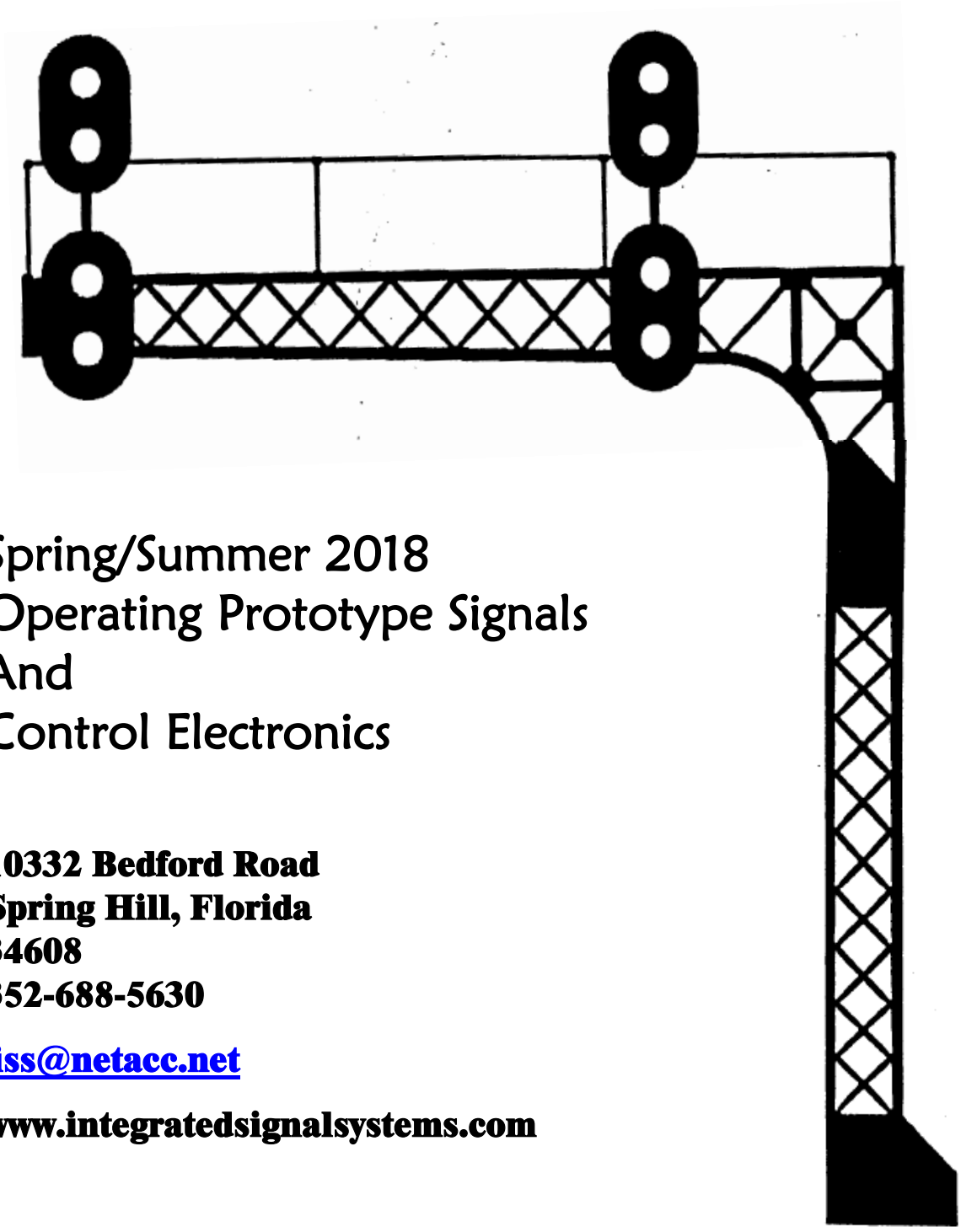
INTEGRATED SIGNAL SYSTEMS



Spring/Summer 2018
Operating Prototype Signals
And
Control Electronics

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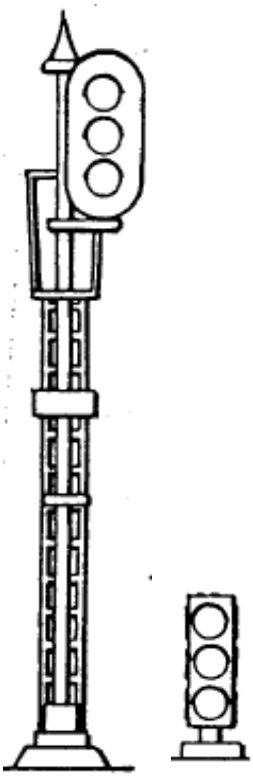


Are you modeling a Class 1 railroad? Then you need prototypical operating signals for your mainline.

Do you need 3 color block signals correctly designed to your railroad preference for realism?

Are operating signals needed to prevent cornfield meets when using the latest Command Control system?

ISS can supply what you need!

We manufacture a variety of rugged brass HO gauge block signals; either assembled, partially assembled or painted kits to your specifications. We have dimensional data for signals used on most North American railroads. The kits cost less, but we drill the holes, solder on the mounting brackets and platforms, so all you do is install the base, the ladder and handrails. We also manufacture and sell separately the electrical/electronic components to detect the presence of a train and correctly operate the LED lamps in the signal heads and on

SIGNAL FEATURES

- Rugged brass construction with lost wax castings, injection molded or brass signal heads and 3/32″ brass tubing for the mast. We manufacture single and multi-head mast signals, bridge signals and dwarfs. Brass cantilevered bridge kits and signal platform kits for double tracks are also available.

- Our design is based on General Railway Signal or Union Switch & Signal company's drawings. Types D, G, SA, B&O and PRR types are available. We can replicate to HO and N scale almost all signals used on US and Canadian railroads.

- No fuss soldering wires to LEDs or sealing the LEDs into the signal heads! Our signal heads come ready for installation, fully assembled and painted with color-correct LED lamps that are installed and sealed in place. Thin, 18 inch long wires extend from the bottom of the signal head and are either concealed inside the mast, or run down a bridge support.

- The mast signals are either painted, ready to install, fully assembled or partially assembled in kits. Except for the heads, both assembled signals and kits will require painting. After painting, the wires from the signal heads are threaded down the center of the mast and the head is inserted into a mounting bracket. We also offer painted and assembled signals.

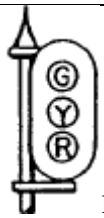
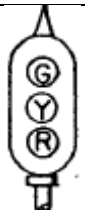
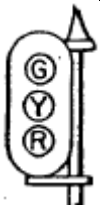
- The signal, mounted or in kit form, will be designed to your specifications as to type of signal, mast height, type of base, style of finial, position of the head on the mast, type of maintenance platform, and, of course, the style an number of heads. (See illustrations)

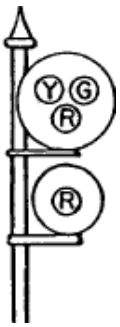
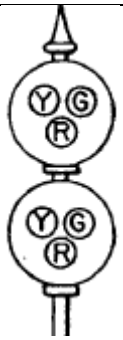
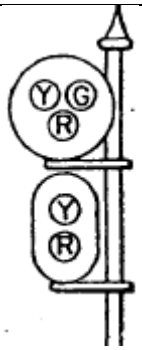
- Our signals are easy to install on your layout. The 3/32″ mast extends about 1-3/4″ below the base. Merely drill a 3/32″ hole through your railroad bed support, drop the signal in place, and connect the wires.

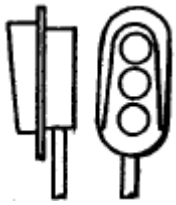
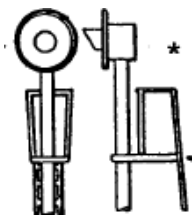
- The ISS system is designed to prototypically signal diverging routes, passing sidings and interlocking situations, and will operate similar to the prototype indicating speed/route.

AVAILABLE SIGNAL TYPES *(HO Scale Only)*

Almost every North American railroad has its own unique design. You may specify what your road requires. As you see below we offer many arrangements. The heads are ***completely*** assembled with imbedded LEDs, a flush back with thin wires out the bottom and painted, ready for installation on a mast or bridge (*see "Bridge Signals" for mounting details*). Heads are sold separately so that any number and arrangement may be used on each signal. Up to three heads can be mounted on one mast and up to 11 wires can be threaded down the inside the mast.

SINGLE HEAD THREE COLOR BRACKET MOUNTING (MOST POPULAR TYPE USED)						
	General Railway Signal Company	**Vertical Type D**			**Round Type G**	
	 Right	 Front	 Left	 Right	 Front	 Left
Catalog #	**3VR(*)**	**3VF (*)**	**3VL(*)**	**3RR(*)**	**3RF(*)**	**3RL(*)**
					Some RRs interchange G & Y. **ISS** can do this also.	

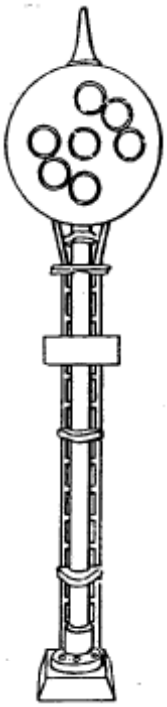
DOUBLE HEAD MOUNTING					
	VERTICAL		ROUND		
Examples of different combinations	 We install red on top for C&O type signals				
Catalog #	**3VR+3VR(*)**	**3VF+2VF (*)**	**3RR+1RR(*)**	**3RF+3RF(*)**	**3RL+2VL(*)**

	UP	**TYPE OF MAST MOUNTING**		**SEARCHLIGHT SIGNAL**
	Sunbonnet Hood	**Vertical**	**Round**	**GRS Type SA**
				 * 3 Color LED in head ← Platform
	Head is placed directly on top of mast eliminating bracket and finial.			Bracket mount also available as above. To control this signal our SCA-4 signal controller must be used.
Catalog #	**3UM(*)**	**3VM (*)**	**3RM(*)**	**TSM(*)**

*** Indicate (K) for kit OR (A) for assembled** **G = green Y = yellow R = red**

Color Position B&O and Position Pennsy Signals

In the 1920's, the Pennsylvania Railroad replaced their semaphore signals with a position light type supplied by Union Switch and Signal Co. Although there were several variations in the basic signal employed seven amber lamps, the center one being "on" for each on the three indications. In the mid 1930's, the B&O decided to replace their semaphore signals with a color position type from General Railway Signal Company. The basic head employed six lamps – two each of red, yellow and green. The B&O system also employed white or yellow marker lights for speed indication.



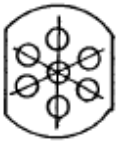
Pennsy

Pennsy and N&W Signals

ISS manufactures the basic seven lamp PRR signal head exactly to HO scale using light yellow 3 mm diameter LEDs. The head can be mast mounted or used on signal bridges. In both cases it was mounted in front of the mast. The ISS signal controller SC-2 will operate these signals using lower value current limiting resistors.

The Pennsy also used lower quadrant (or lower head) signals to indicate various speed and track conditions. ISS has three types of lower quadrant signals available:

1. The vertical and cross arrangement:



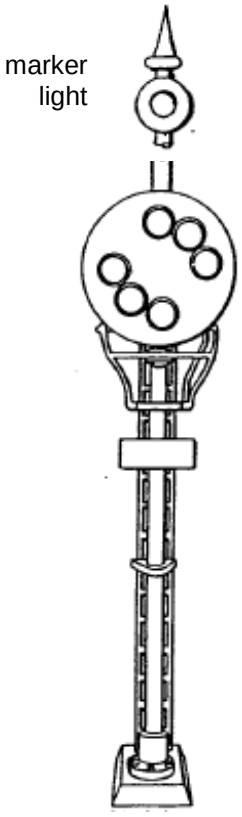
2. The 3 amber lamp vertical:

3. A single amber lamp mounted in the lower quadrant position

B&O Signals

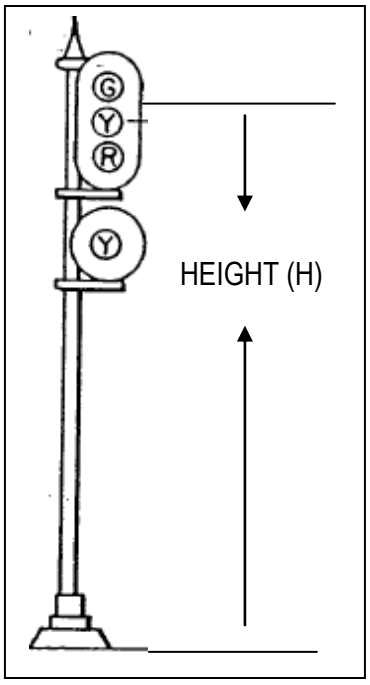
ISS has available in HO scale the basic six lamp color directional signal employed by the B&O. Again, we are using 3mm diameter LEDs. (The correct scale size would be 2.5 mm, but they are not available.) The heads may be mast or bridge mounted, and our SC-4 signal controller will correctly operate the signals using different values for current limiting resistors as two lamps are always "on". B&O heads are always bracket mounted in front of the mast which is how we supply them. The service platform extends ¾ in front of the mast and ¼ to the rear of the mast.

All B&O signals employ white and/or yellow marker lights, either single or in pairs, above and/or below the main head. These lights indicate the recommended speed in conjunction with the main head. We supply a white LED installed in a correctly sized single round head to simulate the marker light.



B & O

Mast heights varied on the prototype railroads from 12 feet to 29 feet. Tell us what height you need. Height is measured from the bottom of the base to the centerline of the top head.

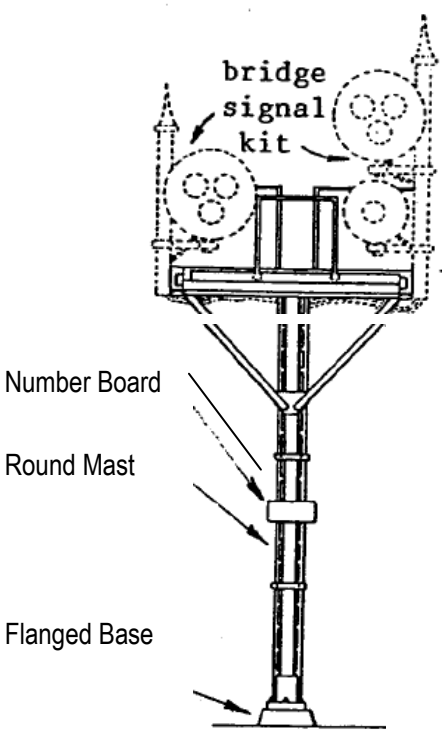


We recommend:

- 16 – 18 feet for mast mounted 3 color or searchlight
- 18 – 20 feet for bracket mount, single head
- 20 – 24 feet for bracket mount, double head

PRR masts were always 24 feet from base to centerline (H – dimension)

B&O masts vary from 15 to 20 feet from base to centerline=e (H – dimension). We supply an "H" dimension of 17 feet unless a taller mast is specified.



Bracket Post (Signal Platform) Kit

(Modeled after B&O prototype but suitable for most roads)

Used for signaling two tracks (right head(s) for right-hand track, left head(s) for left hand track)

Kit is supplied partially assembled:

- Channels are mounted on top of mast
- Hole is drilled in mast for LED wires
- Angle supports and gusset plate are a casting

Number board soldered to mast if specified
Kit is supplied with:

- Diamond plate for signal deck
- Flanged base
- Angle supports
- Correct ladder stock
- Wire for handrails
- Partially assembled parts

Catalog #: BPK (HO Scale)

Signals can be bracket mounted to edge of platform as shown or mounted on the deck as shown in Alt 2 under Gantry Bridge Signal installation on page 7.

Cantilevered Signal Bridge

Union Pacific

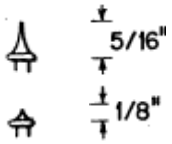
If you require a signal bridge for two tracks located side-by-side, ISS has Union Pacific type cantilevered Signal Bridge kits available. The kits are chemically milled brass stock, with raised rivet heads correctly located. There are several ways of assembling this bridge. We include the necessary parts for each arrangement. You have a choice of two types of bridge walkway - steel grating or wood deck (both etched brass). A step-down platform at the end of he cantilever is included as well as the column mounted platform, both of which may be omitted if the signals are mounted on top of the walkway. Assembly is jn0ot difficult with our instructions, but does require soldering. A pencil iron works well. See page 7 for assembly variations.

While this cantilevered signal bridge is an exact copy of the Union Pacific type, it is typical of what many railroads employed, When signaling double track, or in locations where a mast signal would not fit, railroads were forced to use either a bracket post (see page 5), a gantry bridge (more expensive) or this style of structure. Our bridge will be a real asset to any model railroad. Of course, we also sell the signals for mounting on this bridge. Order separately any type of bridge signal you desire.

Options:

- Service Platforms are either single sided (type S) where the platform is entirely behind the head, or a double (type D) platform like B&O and C&O style. Please specify on the Order Form which style you desire.

- Flanged or relay bases are the same cost, so please specify which base is desired on the Order Form. We offer a double relay base from if one is so needed.



- Two types of finials are available:
  1. Type X – tall, pointed final used by most railroads
  2. Type Y – short, pointed finial used by C&O, B&A and a few others

- The signal controllers can be easily modified for approach lighting of signals, if desired. Instructions are supplied

- Prototypical CTC operation would involve very complex wiring, but a partial CTC operation where all signals in one direction can be locked red between any two passing sidings or terminals is easily wired. Instructions are supplied.

Bridge Signals

Bridge signals are designed for installation on our cantilevered signal bridges, our bracket posts (signal platform) or on any gantry or cantilevered signal bridge that you may have purchased elsewhere. We manufacture signal kits for bridges with the following types of signal heads. All types are supported on a short mast which is mounted on top of the signal:

Type D- one, two or three color
Type SA – searchlight type
Type G – one or three color
B&O and Pennsy types

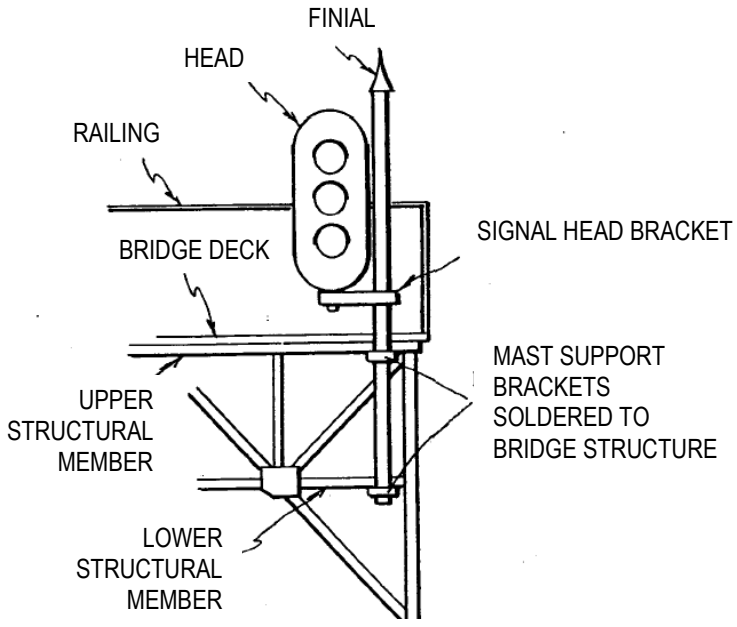
Multiple heads – two or three of the above listed types can be mounted on each mast.

Our bridge kits include:

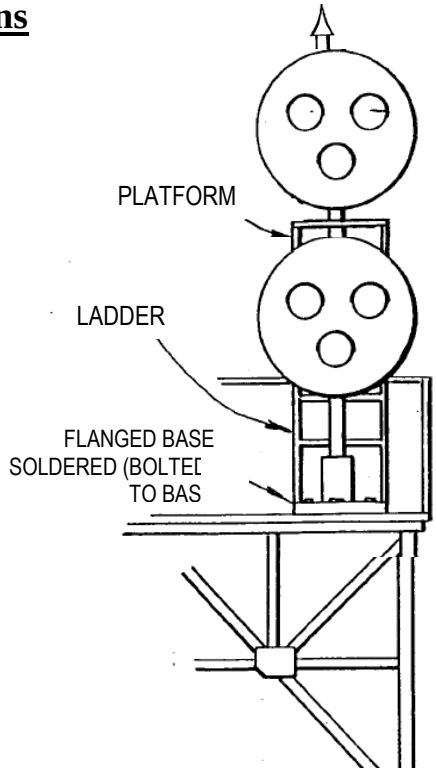
- *The signal head*
- *A short mast*
- *A finial (top cap)*
- *A service platform if more than one head is required*
- *A ladder to the service platform*
- *Brackets for mounting the head to the mast*
- *A pair of brackets or a flanged base to mount the mast to the signal bridge*

We sub-assemble the head mounting bracket to the short mast and drill the hole in the mast for the wires, if the position of the head is specified. The mounting of the short mast to our bridge is left to you, but we supply a pair of brackets and a flanged base. Bridge signals are controlled in the identical manner as out mast signals.

Gantry Bridge Signal Installations



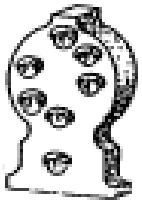
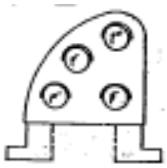
Alt #1 – Mounting off brackets in front of bridge



Alt #2 – Mounting on a flanged base on top of platform deck

Dwarfs

ISS currently manufactures seven different dwarf signals. They are completely assembled, painted and ready for installation. The normal color is solid black, but we can provide them with the back and sides painted aluminum at no additional cost. Please specify on order form.

	 3 color vertical	 2 color vertical	 Searchlight (3 color)
Catalog number	**3DF**	**2DF**	**1TDF**
	 Double Searchlight (each 3 color)	 B&O Dwarf (upper marker light may be added)	 PRR Dwarf (L&R) (all amber)
Catalog number	**2TDF**	**BDF**	**PDF**

The lights are 3mm LEDs except for the B&O and PRR dwarfs which use 1mm LEDs. The B&O dwarf is always supplied with a lower maker light; the lamp is a White, 1mm LED.
In order to obtain a "slow approach" signal on the PRR Dwarf, and use our signal control system, it is necessary to purchase one ISS Interface module. One module will operate 4 PRR dwarfs displaying 3 aspects: stop, slow approach, proceed or one interface module will operate 2 PRR dwarfs displaying all 4 aspects: stop, slow approach, restricted speed, and proceed.

Integrated Signal Systems

DC Block Occupancy Detector (DT*™) Specifications

- Detects presence of train and sends a signal to the Signal Controller. One detector per block is required.
- Printed circuit construction with industrial grade electronic components.
- Operates on principle of detecting a minute flow of current between the rails; will detect a loco or illuminated car, marker lights on a caboose, or conductive paint across axels. To protect the rear of a train, it is necessary to have a device in the rear car which allows a small amount of current to flow between rails.
- The detector will perform equally well on HO, N and scales and also may be used on "O" scale if we substitute two larger diodes ($1.00 added cost). In addition to informing the signal controller that the block is occupied, the detector can be used to illuminate a LED on your panel board to show occupancy.
- The detector requires a +12 volt filtered DC isolated power supply.
- Detectors are available assembled or in kit form, and if more than one kit is ordered, we will assemble one free to use as a model along with our detailed assembly instructions.
- DCC block detectors available from DCC Specialties, NCE, or DCCOD from JLC Enterprises

The Power Supply

We can supply one power unit in a metal case, which will deliver +12 volts DC for the signal controller and for the block detectors. The LEDs are powered from the signal controllers. We have two sizes available. A 3 amp unit will supply 20-25 signal heads. For larger layouts, a 5 amp unit is available.

Signal Controller Specifications

- Each controller operates two signals, one in each direction, or two heads on a multi-headed mast. The system is bi-directional on single track.
- Signals perform exactly like prototype ABS signals (Automatic Block Signal). CTC (Centralized Traffic Control) features may be added. For example, a SPDT switch added to the dispatcher's panel would enable him to set all eastbound signals red between two points during a westbound train movement.
- The signal system is independent of the track power.
- Controllers feature printed circuit boards with industrial grade electronic components. Wires can be attached from either side with screw terminals on our SCA-4's
- Controllers require a Block Occupancy Detector to "notify" the controller if the block is occupied.
- We currently manufacture and sell two different signal controllers:
  1. The MOD-4™ controller is a 12 volt system that will supply two signal heads with up to three LEDs "on" at one time, if they are wired in series, i.e. PRR signals. The values of the current-limiting resistors are changed to accommodate the number of LEDs.
  2. The MOD-5™ Controller is specifically designed for the SA type searchlight signal using a 3 wire bi-color LED. It features trim pots to achieve the color of yellow to suit your taste.
- Both signal controllers provide a positive voltage to the LEDs in our signal heads. The LED cathodes are connected to the common (-) terminal. All signal controllers are available in kit form or assembled.

The Turnout Module

The Turnout Module ™ is used in conjunction with the Signal Controllers, SCA-4™ or SCA-5™ wherever is becomes necessary to signal a diverging route or a siding. A mast signal with two or more heads is normally used in this situation, and some method is needed to "inform" the signal controllers which way the turnout is set. The TM is, in effect, several electronic switches which substitute for a mechanical relay at less cost and more reliability. It requires the same 12 volt DC supply, and one TM is required per diverging route. One contact is needed on the switch machine or the electrical switch controlling the switch machine to ground the TM when the turnout is set for the diverging route. The TM is designed to fit our wiring pattern for very easy installation with no knowledge of electronics needed.

Signal Repeater

The signal repeater module (RSM™) is a device that can be used to repeat the red, yellow or green color of a searchlight signal to a panel board or other location. One module will repeat two separate signals. The input to this module comes from the MOD-5™ searchlight signal controller (from the red and green terminals), and will not affect the operation of the signal. This module is not required for repeating individual red-yellow-green signal heads.

Signal Flasher

The signal flasher module (SFM™) is a device that will flash any of the LEDs in a signal head. Normally the LED will be steadily "on", but if the common return wire from the signal head is connected to the flasher module, the LED will flash when the module receives an input signal from a TM, a signal controller or other device. The rate of flashing is adjustable from 45 to 70 flashes per minute.

B&O Marker Light Controller

The B&O Marker Light Controller module (BMM™) is a device that will turn on any marker light on a B&O signal. It will operate up to four marker lights and control the current to the lights. This module can also be programmed from either a TM, or a signal controller module, adjacent or distant. It can be used with either LED's or bulbs.

Interface Module

The Interface Module (BMM™) is identical to the B&O Marker Light Controller, but configured for different applications. The principle use is to control the PRR dwarf and obtain the "slow approach" indication. It can also be used to operate tinted GOW lamps in a signal head if the lamps draw too much current from the SC-3™ signal controller. By far, we still prefer LEDs to lamps.

Another application of the Interface Module is to control another manufacturer's signal which has anode connected LEDs instead of cathode connected. Our controllers require the latter.

SUGGESTIONS FOR DESIGNING A BLOCK SIGNAL SYSTEM

1. Designation Of Blocks On Your Layout

This is obviously the first step in designing a block signal system. If you are using conventional throttles, you no doubt already have the layout blocked. If your layout uses command control, blocks are not essential, but proper blocking is a must for a good signal system. Here are a few suggestions to follow:

1a. Draw a track diagram (single line) for your entire layout on one or more sheets of paper. Show all sidings, diverging routes, rail crossings (not highway), yard entrances, etc. Part of the track diagram might look like this:

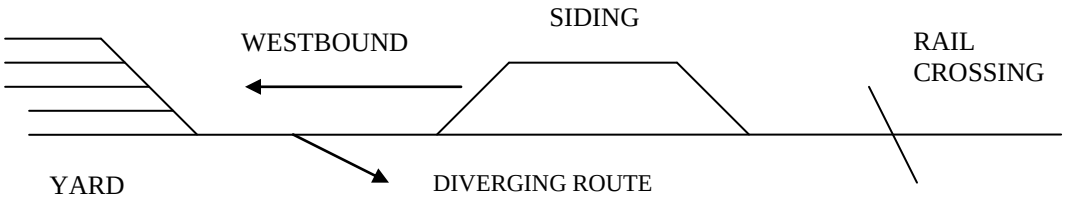


FIGURE 1 – Basic Track Diagram

1b. Next, mark off and number the blocks starting with number one (1) as you leave the yard. Blocks must terminate at passing sidings and at rail crossings. The minimum length of a block should be a foot or more loner than the longest train to be operated on the layout. This is a mater of your preference, of course. On my layout, the blocks are about 1¼ train lengths. Your block diagram should look like this:

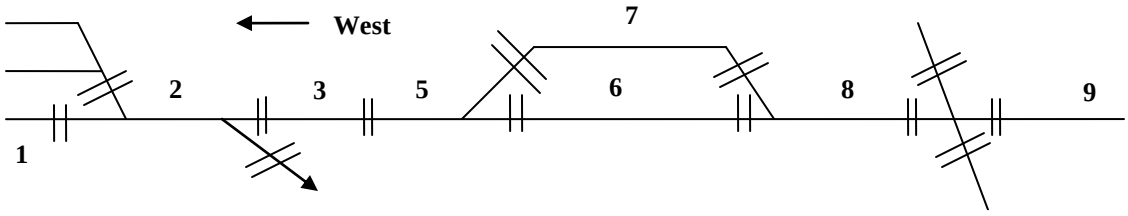


FIGURE 2 – Track Diagram Showing Numbered Blocks

The || indicates the termination of one block and the start of another. Rail gaps can be located in either the "common" or the "hot" rail. Best electrical practice prefers the common rail, but it makes no difference to the ISS detector. Where the gaps are shown on the diagram, they must be made on the actual layout.

2. Selection and Location Of Proper Signals For A Prototype Signaling System

You are now ready to select the signals for your specific application. We offer a full line of signal types which can be customized to your specifications. A prototype can probably be found for any arrangement that you choose.

2a. On a main line a single head 3-color indication (any type) block signals is normally used. They are usually located on opposite sides of the track and point in opposite directions. Double track mains are signaled in one direction only if normal traffic is unidirectional. Where traffic is bi-directional on double track, both directions must be signaled.

2b. At a yard entrance, 2-color (yellow/red) mast or bridge signals are frequently employed since one does not enter a yard at high speed. Dwarf signals are most often used exiting the yard onto a main.

2c. Diverging routes, passing sidings and interlocking situations frequently require double or triple headed signals. B&O is an exception; upper and lower marker lights are used. According to all railroad rule books, multiple heads indicate speed restrictions, but they also tell the engineer much about which route he is to take (unofficially). From a modeler's standpoint, it usually works out that the upper head indicates the status of the main line, while the lower or middle head indicates the status of the diverging route. Thus, if the turnout is set for a diverging route, the upper head should be locked red and the lower head will indicate the condition of the diverging route. A red over green aspect indicates "proceed at medium speed" (into the diverging route). Green over red, on the other hand, indicates "proceed at full allowable speed" (down the main line). It works out that this complies with the railroad rulebooks. The 3-color lower or middle head is normally employed for high speed crossovers, diverging routes and high speed entrances into sidings. The red over green indication tells the engineer that only a minimal slowdown is necessary. When a third head on a signal is employed it is usually involved with an interlocking situation, and in almost all cases the indication is always red. A red over red over red signals an absolute stop – not to proceed until one of the two upper heads is cleared to green or yellow.

2d. Frequently, especially when entering a siding, the lower head is restricted to yellow (no green). In this situation, the lower head would not have a green aspect, and would be 2-color, yellow - red. The red over yellow indication tells the engineer to proceed at slow speed and be prepared to stop at the next signal, In the event that the siding is already occupied, the signal should show a red over red; a stop indication. Likewise, if the turnout is set for the mainline and it is occupied, the signal should be red over red. Very often the exit from a siding is signaled with a dwarf, usually 3-color. The mainline normally is signaled with a mast using a 3-color upper head and a single red only lower head.

2e. Rail crossings where two railroads intersect are always signaled unless barriers were installed requiring the train crew to stop and align the barrier. Most of the time, two-headed signals were used at crossings. The lower head was always red with the upper indicating track conditions ahead. If the crossing was aligned for the opposing route, the red over red indicated an absolute stop. The alignment (direction) must be operator or dispatcher controlled.

2f. A cheap method which a few railroads used to indicate that the train should take a siding employed a single yellow head below the upper head. The lower head remained dark until the turnout was aligned for the siding. Then, when turned on, the red over yellow gave the slow ahead rule. From a modeling standpoint, the cost of this method is not much less than a full 3-color lower signal head.

3. Completing the Track Diagram

After selecting the type and style of signals desired, the next step is to complete the track diagram which we have been developing. Indicate and label the signals on the diagram. Our example would now look as shown below:

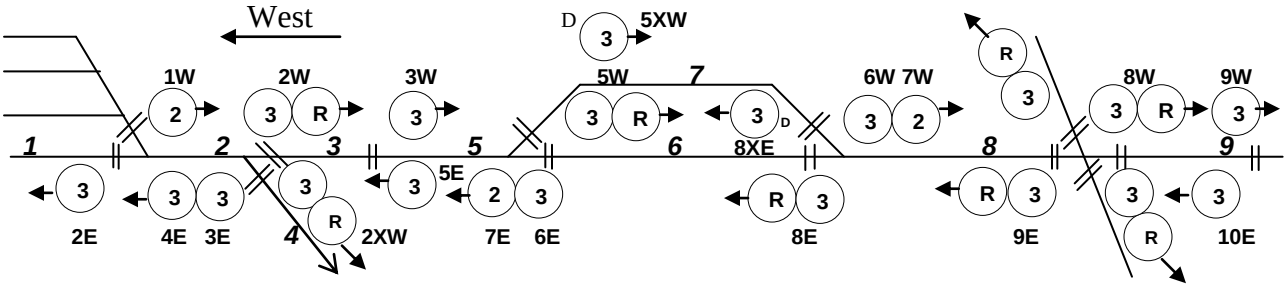
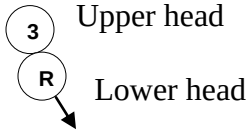
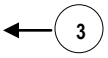


Figure 3 – Track Diagram with Signals Shown and Labeled

KEY



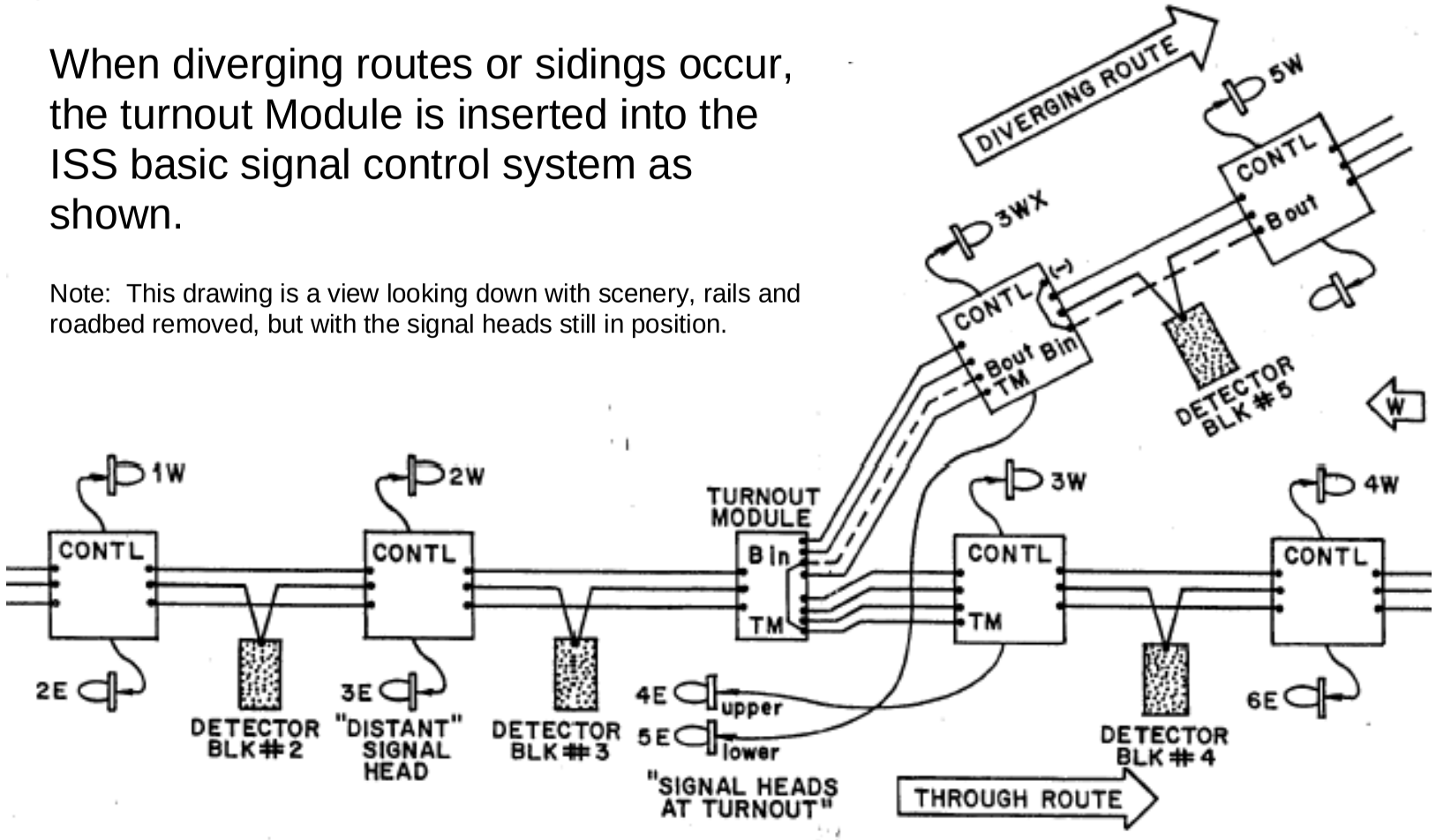
- D = Dwarf signal
- R = Red aspect only
- Number indicates the number of colors
- Arrow indicates direction signal faces
- "8E" is the signal's label
- ‖ indicates the end of one block and the start of another



Note: ***It is important*** to label all signals underneath your layout in accordance with the diagram which you've made. This will eliminate any confusion of not knowing what signal is being connected to which signal controller.

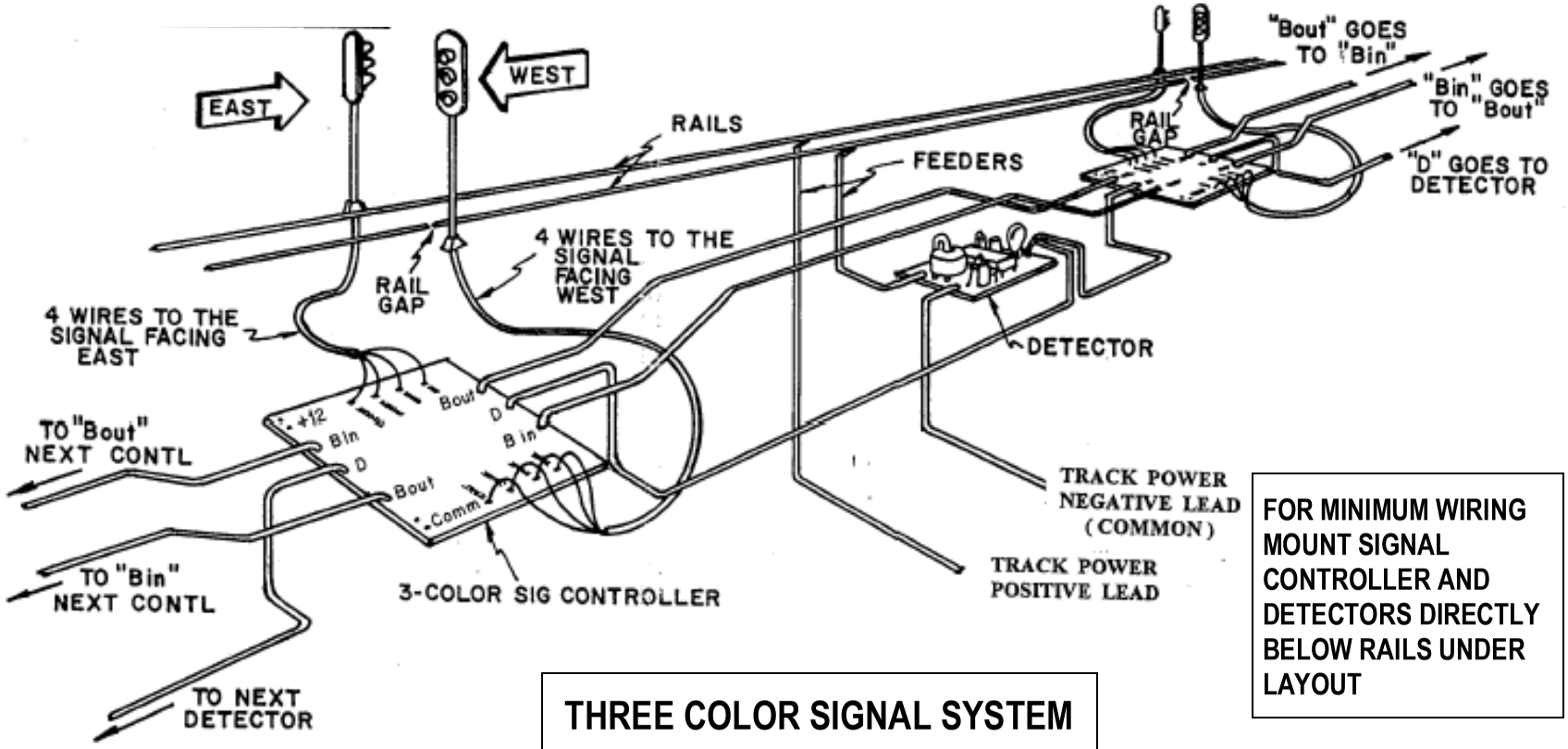
When diverging routes or sidings occur, the turnout Module is inserted into the ISS basic signal control system as shown.

Note: This drawing is a view looking down with scenery, rails and roadbed removed, but with the signal heads still in position.



AS DRAWN, THE P.C. BOARDS ARE MOUNTED WITH THEIR COMPONENT SIDES FACING DOWN (TOWARDS THE FLOOR).

A SINGLE INPUT (I/P) IS REQUIRED TO THE TURNOUT MODULE. IT MUST COME FROM A SWITCH WHICH CONNECTS “I/P” TO COMMON WHEN THE TURNOUT IS SET TO THE DIVERGING ROUTE (OTHERWISE OPEN).

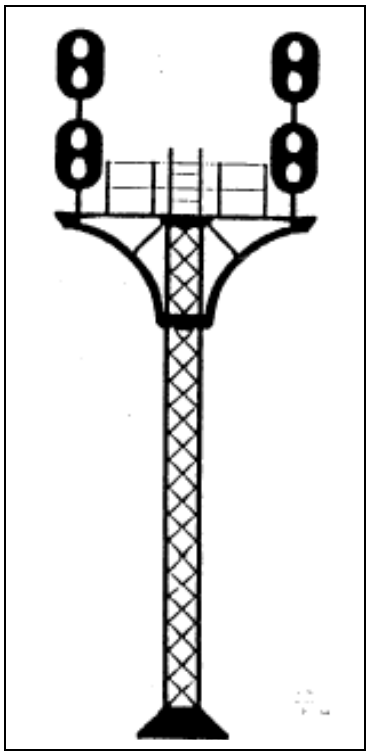


THREE COLOR SIGNAL SYSTEM

FOR MINIMUM WIRING MOUNT SIGNAL CONTROLLER AND DETECTORS DIRECTLY BELOW RAILS UNDER LAYOUT

Notes:

1. The Sig Controller P.C. board is symmetrical, so that when mounted component side down:
- "Bin" comes from "Bout" at the previous controller
- "Bout" goes to "Bin" at the next controller
- "D" comes from the next detector
2. Rotating any P.C. board 180 ° does not change this convention (keep comp side down).
3. The "+12 v" and "Common" (power) are not shown
4. One signal controller operates two heads.
5. One detector is required for each "signal block".
6. A +12 volt DC power supply is required for this system.



Available now are three new bracket posts. The B&O bracket post with a steel pipe supporting the platform, pictured on page 5 of the brochure has been redesigned with improved chemical etched parts. The B&O, as well as the NYC and Big Four, employed this type of post. In addition, we have ready for sale two different bracket posts:

1. A square column with two channel shapes on opposite sides. The remaining two sides have lacing, as shown to the left. The Great Northern, Erie, and Reading used this type.
2. A square column with all four sides constructed with riveted solid metal pates, as used by the D&H.

Some roads used mixtures of all these types. The bracket post was the least expensive method of signaling a double track main line when either track was available to trains running in the same direction.

All three posts are the same price. When ordering, specify which type is needed.

WHY BUY FROM INTEGRATED SIGNAL SYSTEMS?

- We furnish a complete system – signals, signal controllers and block detectors that are all compatible and easy to install. However, all components are also available separately.
- Signals are closer to scale for HO gauge than anything on the market. Compare!
- Brass parts are sharp, lost-wax casting (brass loco quality).
- Color correct LEDs are used for signal lamps.
- Signals can readily be customized for your railroad's needs.
- Prototypical operation is easy to achieve.
- ISS is fully compatible with the most popular command control systems as well as conventional power packs.
- The electrical system is separate from track power. Block occupancy will be detected when no power is on the rails.
- No special knowledge of electronics is needed. Instructions explain how to wire signals to controllers and controllers to detectors. Soldering might required.
- Masts and electrical components are available as kits, pre-assembled, or ready to install. Signal heads are always assembled because of assembly soldering technique.
- Signals and control/detection units may be purchased separately.

NOTE: ISS will assist modelers in designing a signal system for their layout, but due to the time involved, a fee will be charged for this service. Please write, phone or e-mail for details and a quote.

What's New at Integrated Signal Systems?

- ISS is now a dealer for Tomar, NJ International, Model Memories TrainCat Models, and Oregon Rail Supply. If you can't beat them, sell them!
- We offer Tomar Semaphore Signals for those modelers that want to combine lighted signals with semaphores.
- Oregon Rail Supply offers the new Pennsy Gantry Bridge and a C&O Cantilever bridge to use with our signal heads.
- NJ International offers their line of Semaphores along with an I beam Gantry Bridge and Cantilever signal bridges
- Model Memories have the NYC 2 and 4 track Gantry Bridges and a NYC style Cantilever bridge all in brass.
- We also handle all manufactures of Digital Command control through our business partner DigistarDCC.
- We have introduced the Blockwatcher! In concert with DCC Specialties, we have designed a new detector that is DCC only. It functions as a stationary decoder, block detector, and is opto-isolated from the DCC track voltage.
- We now offer design services for hard to get or non-existent signaling parts. We design using 3D software and have new molds made for brass parts.

Integrated Signal Systems
P.O. Box 3337
Spring Hill, Florida
34611 352-688-5630

Price List 1-Jan-13

Brass And Plastic Parts

PART NO.	ITEM	PRICE
B000	Plastic Pins	$0.60
B101	3 Color Vertical Head Wide (P)	$1.20
B102	2 Color Vertical Head Wide (P)	$0.90
B103	Small Searchlight Head	$1.70
B104	3 Color Triangular Head (P)	$1.20
B105	Signal Head Mounting Bracket (S)	$0.90
B105A	Signal Head Mounting Bracket (L)	$1.15
B108	Tall Finial	$2.35
B109	3 Color Dwarf	$3.90
B111	2 Color Dwarf	$3.50
B112	Relay Base (Mast Signal)	$5.10
B114	Service Platform (Single)	$2.10
B116	Service Platform (Double)	$2.40
B117	Ladder Stock (6 Inch)	$2.25
B118	Pennsy Brass Head (Upper)	$4.75
B120	Short Finial	$2,00
B121	Platform Base (B&O or Generic)	$3.00
B123	B&O Marker Light	$1.70
B125	Flanged Base (Mast Signal)	$3.50
B126	Bridge Signal Base	$3.00
B127	Searchlight Dwarf	$4.20
B128, B147	Pennsy Dwarf (R&L)	$4.20
B129	B&O Dwarf	$4.20
B130	B&O Dwarf Upper Marker	$2.40
B131	UP Head with Sunbonnet	$3.50
B134	Pennsy Lower Head	$4.75
B136	Bracket Post Columns (GN or Erie)	$6.30
B137	Bracket Post Platform (GN)	$4.00
B138	Bottom Gusset / Knee Braces (Pair)	$2.00 / $4.20
B139	Knee Braces & Lacing (B&O Pair)	$6.00
B140	Bracket Post Columns Solid	$6.00
B141	Bracket Post Platform (B&O)	$4.75
B142	Brass Double Searchlight Dwarf	$5.50

Note: All parts are sold as raw castings. Any clean-up of the casting is the responsibility of the customers. All casting will be inspected for quality before shipping. (P)=Plastic, (S)=Short (L)= Long

INTEGRATED SIGNAL SYSTEMS
ELECTRICAL COMPONENTS PRICE LIST
SUITABLE FOR ALL GUAGES (EFFECTIVE 01/01/2013)

KIT ITEMS (Not all items may be available)	Catalog Number**	Price
Block Occupancy Detector	DTK	$11.75
Turnout Module	TMK	$7.30
Signal Repeater Module	RSMK	$5.50
Signal Flasher Module	SGMK	$8.90
B&O Marker Light/Interface Module	BMMK	$5.50
ASSEMBLED ITEMS		
Signal Controller MOD-4	SCA4	$22.50
Signal Controller MOD-5	SCA5	$23.50
Block Occupancy Detector (DC Only)	DTA	$16.50
Turnout Module	TMA2	$11.50
5.0 Amp 12V Power Converter	5SPS	$38.75
1.5 Amp 12V Power Converter	1.5SPS	$24.05
Signal Repeater Module	RSMA	$7.55
Signal Flasher Module	SFMA	$11.50
B&O Marker Light/Interface Module	BMMA	$8.10
ADDITIONAL ITEMS		
Printed Circuit Board - Detector	PDC	$6.80
Printed Circuit Board – Turnout Module	PCTM	$6.00
Printed Circuit Board – RSM, SFM, BMM	PCS	$6.20
LED for replacing GOW bulb, specify:		
Red, Yellow or Green	LED-	$0.75
3 Color for Searchlight Signal. Common Anode	LED-	$7.50
Frosted White Marker Light	LED	$1.75

****K=Kit A=Assembled**

Instructions for the signal controller assembly and installation, block detector assembly, bridge signal mounting, bracket post assembly, etc., are supplied at no cost with the first order of these items.

Installation instructions are also available separately at $4.00 each.

INTEGRATED SIGNAL SYSTEMS BRASS SIGNALS PRICE LIST – *HO SCALE ONLY*

EFFECTIVE 1Jan04

	INDIVIDUAL LEDs		SEARCHLIGHT		COLOR POSITION (B&O)		POSITION LIGHT (PRR & N&W)	
KIT ITEMS	**Catalog #**	**Price**	**Catalog #**	**Price**	**Catalog #**	**Price**	**Catalog #**	**Price**
3 Color Signal, Top of Mast	3VMK or 3RMK	$26.00	TSMK	$25.50	—	—	—	—
3 Color Signal, Side/Front Mount	3V*K or 3R*K	$27.00	TF*K	$26.25	BFK	$25.60	PFK	$28.50
2 Color Signal, Top of Mast	2VMK	$26.35	—	—	—	—	—	—
2 Color Signal, Side/Front Mount	2v*k or 2R*K	$26.35	—	—	—	—	—	—
1 Color Signal	1R*K	$24.50	—	—	—	—	—	—
3 Color Bridge Signal	3VBK or 3RBK	$20.35	TBSK	$18.90	BBFK	$21.50	PBFK	$21.50
2 Color Signal Bridge Signal	2VBK	$19.25	—		—	—	—	—
Bracket Post without Signals	BPK	$27.00	→ These two items are for double-track Signaling – add any type bridge kit.			—	—	—
UP Cantilevered Sig Bridge	CBK	$32.00				—	—	—
ASSEMBLED ITEMS								
3 Color Signal, Top of Mast	3VMA or 3RMA	$36.00	TSMA	$34.00	—	—	—	—
3 Color Signal, Side/Front Mount	3V*A or 3R*A	$36.85	TS*A	$35.00	BFA	$35.75	PFA	$35.75
2 Color Signal, Top of Mast	2VMA	$35.25	—	—	—	—	—	—
2 Color Signal, Side/Front Mount	2V*A	$36.85	—	—	—	—	—	—
1 Color Signal, Red only	1R*A	$34.00	—	—	—	—	—	—
3 Color Dwarf Signal	3DF	$17.00	1TDF	$15.00	BDF [++]	$22.85	PDA	$22.85
2 Color Dwarf Signal	2DF	$16.00	—	—	—	—	—	—
ADD-ON ITEMS 2nd or 3rd head for mast or bridge – add "+" to above codes (i.e. 3VFK + 3V) (includes head and bracket)								
3 Color Signal	3V* or 3R*	$13.25	+3TS	$12.00	+B	$15.00	+P	$16.50
2 Color Signal	2V*	$12.60	—	—	—	—	—	—
1 Color Signal	1R*	$11.00	+ITS	$11.00	—	—	+IMP**	$11.00
1 Frosted White Marker Light (B&O)	—	—	—	—	+MBO	$7.65	—	—
1 Lower Quadrant PRR Hd (Cross + Vt)	—	—	—	—	—	—	+5MP	$14.75
3 Vertical Amber Lights (PRR)	—	—	—	—	—	—	+3MP	$13.25

NOTE: **1.** V = Vertical Head; R = Round Head

2. Insert appropriate letter in place of the "*" in the catalog number: R = right mounted, L = left mounted, F = front mounted

3. [++] = Includes lower marker light. Add $4.75 for upper marker light.

4. ** = Amber for PRR

Integrated Signal Systems
P.O. Box 3337
Spring Hill, Florida
34611 352-688-5630

Order Form

Date: _____

Ship to: _____

Address: _____

City, State and Postal Zip Code: _____

Telephone and Area Code: (_____)_____

Email Address_____

		Quantity	Price Each	Total
Signals (Please complete specification form on reverse side)				
Mast:	**Selection #1**	_____	_____	_____
	Selection #2	_____	_____	_____
Bridge:	**Selection #1**	_____	_____	_____
	Selection #2	_____	_____	_____
Dwarf: (check one) **[ ] 3 color, [ ] B&O, [ ] PRR , [ ] 2 color, [ ] Searchlight**		_____	_____	_____
Signal Bracket Post Kit (without signals)		_____	_____	_____
Signal Controllers: **(circle) MOD-2™ or MOD-3™ (circle) Kit of Assembled (circle one) 3 LEDs, B&O, Pennsy, Searchlight**		_____	_____	_____
Detectors (circle) Kit or Assembled		_____	_____	_____
Turnout Module (circle) Kit or Assembled		_____	_____	_____
[ ] Sig. Repeater, [ ] Sig. Flasher, [ ] B&O Marker Lt./ Interface Module (check one of above) (circle) Kit or Assembled		_____	_____	_____
Power Supply (circle) 1.5 Amp 5 Amp		_____	_____	_____
Printed Circuit Board only (check one) [ ] Detector, [ ] Controller, [ ] Turnout Module, [ ] Sig. Repeater, [ ] Sig. Flasher, [ ] B&O Marker Lt.		_____	_____	_____

Total cost (US$) _____

FL Residents add Sales Tax _____

PLEASE ALLOW 6-10 WEEKS DELIVERY

Package and Shipping **$8.00**

Total _____

Remittance _____

SIGNAL SPECIFICATION FORM
Please fill out lines below
MAST SIGNALS BRIDGE SIGNALS

Selection	1	2	3	1	2
Quantity of signals					
Number of head(s) per mast					
Type of upper head: Circle one Vertical (V), Round(R), B&O (B), Pennsy (P) Searchlight (T) UP (U)	V R B P T U	V R B P T U	V R B P T U	V R B P T U	V R B P T U
Number of colors on upper head Indicate for V or R type only					
Type of lower head: Circle one Vertical (V), Round(R), B&O (B), Pennsy (P) Searchlight (T) UP (U)	V R B P T U	V R B P T U	V R B P T U	V R B P T U	V R B P T U
Number of colors on lower head Indicate for V or R type only					
Head position on mast Circle: M-top of mast, L-left, R-right, F-front (for bracket mounting) B&O and Pennsy – Front only	M L R F	M L R F	M L R F	M L R F	M L R F
Height to center of upper head in scale feet				N/A	N/A
Circle: K-Kit or A-Assembled Number Bd. – Yes - No	K A Y N	K A Y N	K A Y N	K Only	K Only
Service (Back of mast, std. (S) Platform (Back and front of mast (D)	S D	S D	S D	S D	S D
Base Circle: F-flanged, R-relay	F R	F R	F R	N/A	N/A
Finial type Circle: X–high, Y-short	X Y	X Y	X Y	X Y	X Y

Unless otherwise specified LEDs are negative connected.

Note;

- Head(s) will be painted <u>BLACK</u> unless <u>ALUMINUM</u> is specified below.
- Red lamp is always on bottom position unless specified as C&O type.
- If third head is required, specify pertinent data below.
- Bridge signals come as a kit for mounting on your own bridge.
- Searchlight signals require controlled DC voltage to a Green/Red LED to obtain a yellow aspect

Indicate any other variations below.

Special
Instructions;_____
_____
_____
_____

;’

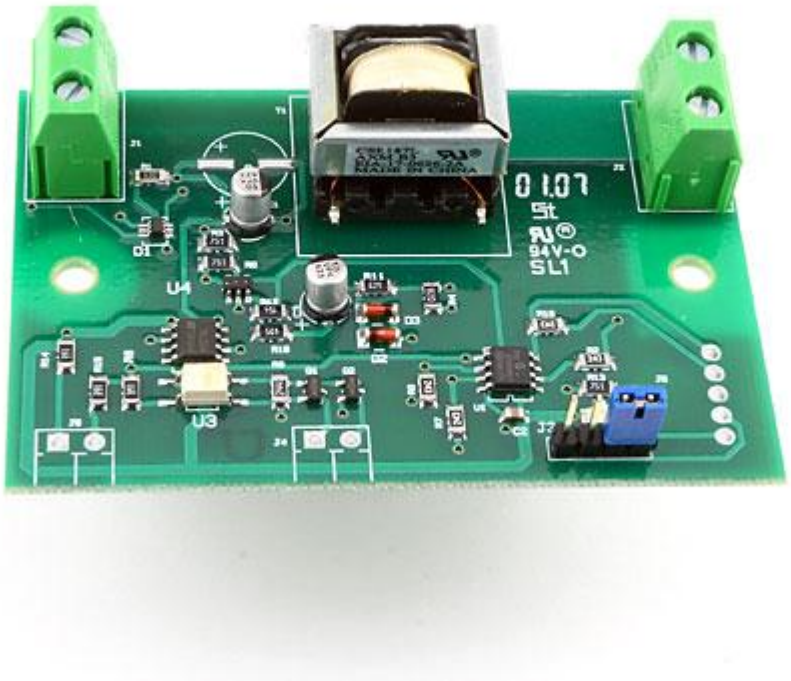
BLOCKWATCHER DCC ONLY DETECTOR

and STATIONARY DECODER

Micro-Processor control gives the Block Watcher unique, exclusive performance.

List: $31.95 ISS Price:$24.95 ea. 10 or more: $22.95 each.

DCC Specialties and Integrated Signal Systems (ISS) collaborated to develop and design the Block Watcher. The need was due to the fact that at the higher amperages required by high density users, most existing products either create a substantial voltage drop or can become unstable.



The Block Watcher™ is a new concept in block detection.

This detector puts the power of a microprocessor to work analyzing the current feed to the rails. This detector has been designed to eliminate many of the installation problems associated with the installation of signal systems. The Block Watcher comes ready to install, all you have to do is to connect it between the DCC booster or circuit breaker and the rails. Then connect the detector output switch to your signal system.

The Block Watcher™ has many uses and applications.

It can not only be used as the basis of signaling systems, but can also be used to indicate occupied blocks or triggers for Stop-On-DCC decoders. The Block Watcher is powered from the DCC input power and eliminates the need for an added external power supply. The output is optically isolated so the signaling system can be separate from the DCC signal and thus minimize the interference with

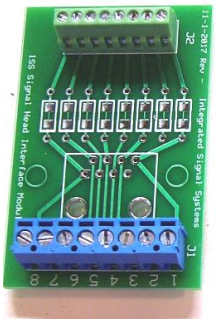
operation of the signal circuits. The detector will handle up to 20 Amps of DCC current. An automatic adjustment for leakage current up to 130 mA is provided. Detection output terminals are available for a switched output and remote LED block detect indication. The bi-polar output can be used with any signaling system using less than 30 Volts and will switch up to 1 A of current.

Here are the special features:

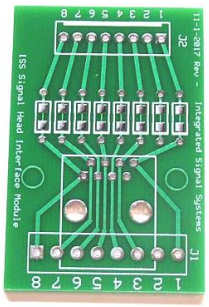
- All Solid State Operation: Fast, all solid-state design with reliable quiet electronics.
- No Power Supply Needed: Develops power from the DCC input connections.
- Very Low Voltage Drop: The resistance is less than 0.060 Ohms, very small voltage drop.
- Adaptive Block Leakage Detection: Electronically determines the amount of leakage current in the block when power is turned on. The current can also be set with a CV value up to about 130 mA.
- Stabilized Setting for Current Trip Level: This prevents the block detection from fluttering on and off when the current is near the trip level.
- Block Detection Option: Block detection can be turned on with an Accessory Command for testing signals even with nothing in the block. This feature can also be used to turn the signals red to protect a crossing.
- Block Detection Output Isolated from Track Power: The output switch is totally isolated from the track power. This eliminates many wiring problems when combining signal circuits and track power.
- Outputs for LED Indicator: A single LED output can be used for a remote location.

Integrated Signal Systems
10332 Bedford Road
Spring Hill, Florida 34608
352-688-5630

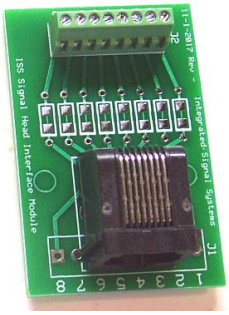
Signal Head Interface Module



$7.95

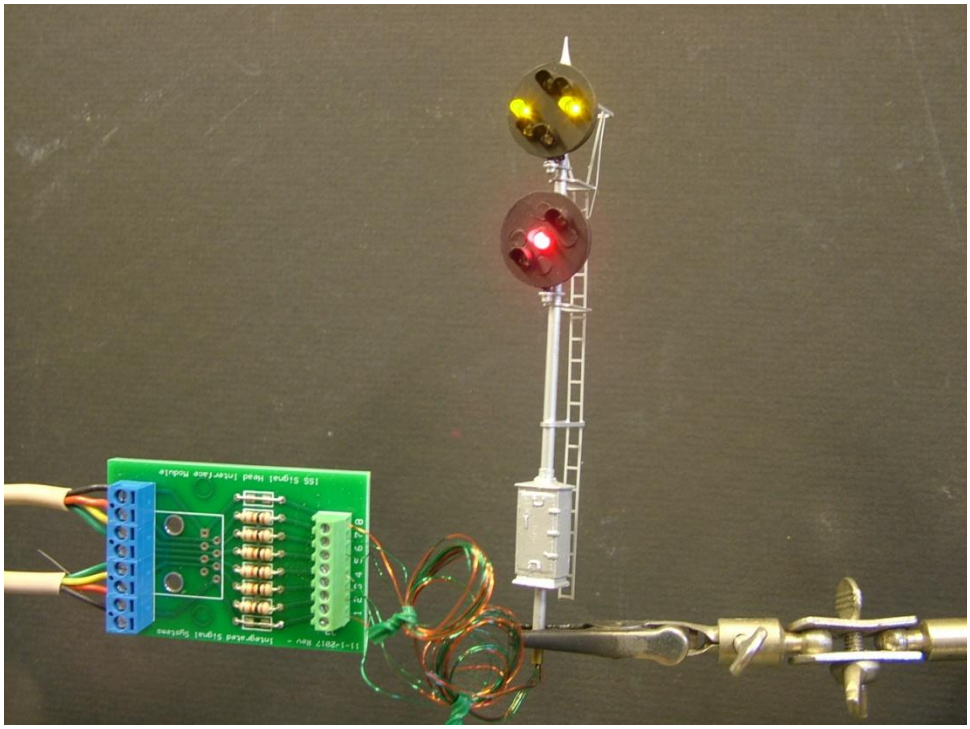


$5.50



$7.95

The ISS SHIM board is used to connect lineside signal head wires to a screw terminal PC board as a bridge to a signal controller or a manual control point. The SHIM board has 3 configurations: Bare Solder Pads Attachment (SHIM-P), Screw Terminal Attachment (SHIM-S), and Screw Terminal/RJ45 Attachment (SHIM-R). The board also has solder pads for surface mount 0805 resistors or ¼ watt leaded resistors. Surface mount and ¼ watt resistors can be purchased or installed for a small fee.



SHIM board with ¼ watt resistor installed.