

# *N, HO, & O Scales*



***Atlas All Scales Signal System™***

***Basic Operation Manual***

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## **INTRODUCING THE ATLAS ALL SCALES SIGNAL SYSTEM**

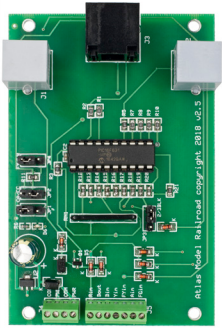
Congratulations on entering the world of Atlas model railroad signaling. The Atlas All Scales Signal System makes it easy for you to start and grow as your needs or prototype demand. This quick start guide will explain basic signaling and help set up a simple signal on your layout. For more advanced options, including linking multiple signals together into “blocks”, please visit the Atlas website at [www.atlasrr.com](http://www.atlasrr.com) to read the Advanced Guide to Atlas All Scales Signals.

On real railroads, signals, along with rule books and timetables, govern how a train moves from place to place. Signals primarily regulate a trains stopping, starting and the the speed at which it can move. They give some indication as to what can be expected up ahead be it another train on the tracks, or a different route to take. Over the years, railroad signals have taken many forms, including those shown in Figure 1. Nowadays, the most common signals look like the traffic lights you see every day, with red, yellow, and green lights illuminated in different ways and patterns which communicate the action an engineer must take. The specific light or pattern of lights is known as the “aspect”, and the actions these communicate are known as the “indication”. For example a red aspect normally indicates a stop, while a yellow aspect indicates approaching at a reduced speed, based on the rulebook.

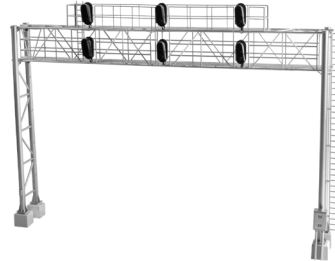
Over the years, different railroads have designed different forms of signal heads, or used different combinations of aspect to indicate situations specific to the operations of their railroads. This is one reason why you will see many different looking signals, but all communicate the same basic information. The Atlas All Scales Signal System is adaptable and expandable to re-create many of the common situations found on real railroads, thus providing enhanced realism of your model railroad layout.

**FIGURE 1**

**EXAMPLES OF SIGNAL PRODUCTS**



**ITEM# 70 000 046**  
**UNIVERSAL SIGNAL CONTROL BOARD**



**ITEM# 70 000 100**  
**HO MODERN SIGNAL BRIDGE, 3 TRACK, SIX HEAD**



**ITEM# 70 000 046**  
**HO HOODED MODERN DOUBLE SIGNAL, LEFT**



**ITEM# 70 000 102**  
**N SINGLE HEAD TYPE G SIGNAL**



**ITEM# 70 000 064**  
**O COLOR POSITION LIGHT SIGNAL, SINGLE HEAD**

## THE BASICS

So let's get started by reviewing the basic Atlas signal system items.

System basics include:

- ATLAS UNIVERSAL SIGNAL CONTROL BOARD (ITEM # 70 000 046)
- ATLAS SIGNAL ATTACHMENT CABLE (ITEM # 70 000 050)
- A SIGNAL (SEE PRODUCT LISTING BY SCALE ON PAGE 16-17)
- A DETECTOR, (i.e. ITEM #215).

The heart of the Atlas system is the Universal Signal Control Board (USCB). See Figure 2 on page 6. This board works for N, HO and O scale, and attaches to any Atlas signal through a common interface plug. You can also connect signals from other manufacturers, and Atlas supplies wiring kits to enable this conversion, item #70 000 051.

## **A CLOSER LOOK AT THE UNIVERSAL SIGNAL CONTROL BOARD**

Before connecting anything let's take a closer look at the USCB.

Careful review of this board reveals four "jumpers" labeled JP1 through JP4. Jumpers are small removable black plastic pieces with metal inside them which cover pins that controls the signal wired to the board.

In general, a jumper makes the board compatible to the signal and enables the operation of the desired option. The new Atlas USCBs, item# 70 000 046, are default set from the factory to provide appropriate stand-alone operation for most cases.

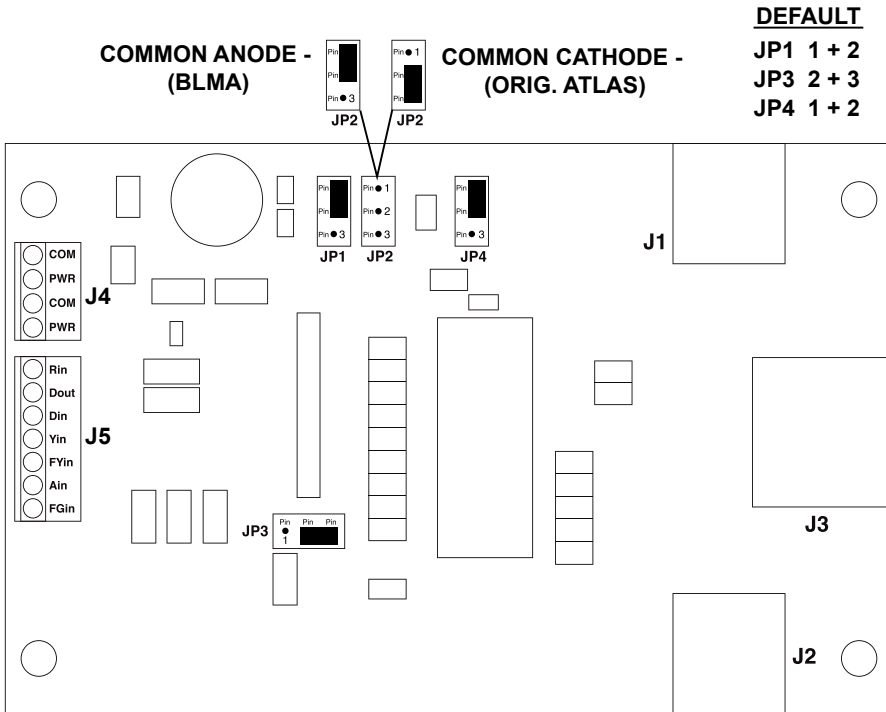
The only exception is JP2 which controls the two ways model railroad signals are usually wired, either common anode or common cathode.

The Atlas USCB allows either anode or cathode to be used by setting the JP2 jumper. Signal manufacturers typically provide this information on their packaging. The chart on page 15 lists the settings you should use for all current Atlas signals. If you are using earlier Atlas signals, those were common cathode. Original BLMA signals were common anode.

If cathode, pins 2 and 3 will be covered by the jumper, if anode pins 1 and 2 should be covered by the jumper. See Figure 2, page 6.

**FIGURE 2**

**UNIVERSAL SIGNAL CONTROL BOARD LAYOUT**



**FACTORY DEFAULT SETTINGS**

## THE BASIC INSTALLATION OF ONE SIGNAL

You are now ready to find a place under your layout table where you want to install your signal.

Mark this spot and drill an appropriately sized hole ( $5/16$ "") nearby for the signal wire to come through from above. Do not attach the connecting cable before routing the wire through so you can make the pass through hole only as large as needed to clear the mini-plug on the end of the signal. By using Atlas Signal Extension Cables (sold in a variety of lengths) you can locate the USCB further away from the actual signal if wanted. See Figure 4, page 9.

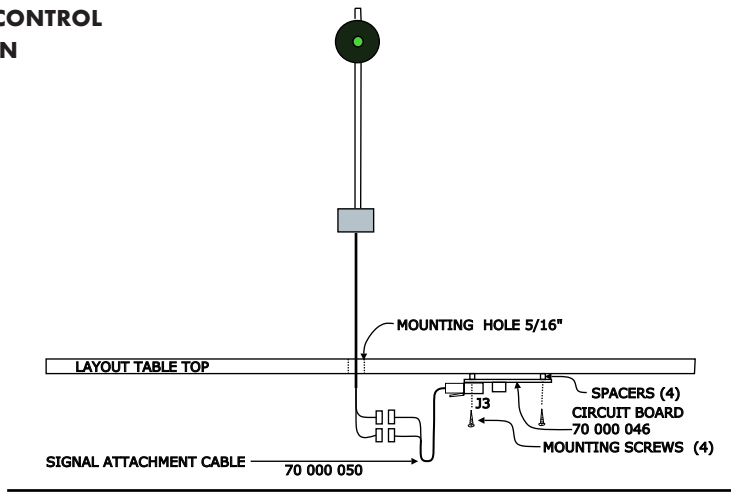
Attach the USCB to the underside of your layout using the included screws and spacers so that the signal extension cable can reach between the board and the mini-plug with some slack once they are connected. Now snap the mini-plug from the signal into the appropriate mating plug on the signal extension cable. For most signal heads, this is plug #1. Plug 1 is the plug with the yellow, green, red, and black colored wires. Plug #2 is only used for a few signal types, and the instructions supplied with those signals will show how to attach them. See Figure 3, page 8.



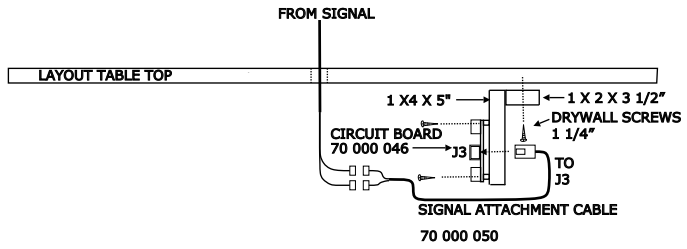
**FIGURE 3**

**UNIVERSAL SIGNAL CONTROL BOARD INSTALLATION**

**BASIC INSTALLATION**



**ALTERNATE INSTALLATION**



## **POWERING THE UNIVERSAL SIGNAL CONTROL BOARD**

Before you attach the signal to the USCB through the black jack labeled J3, you will need to run power and a detection unit, or manual switch to the board.

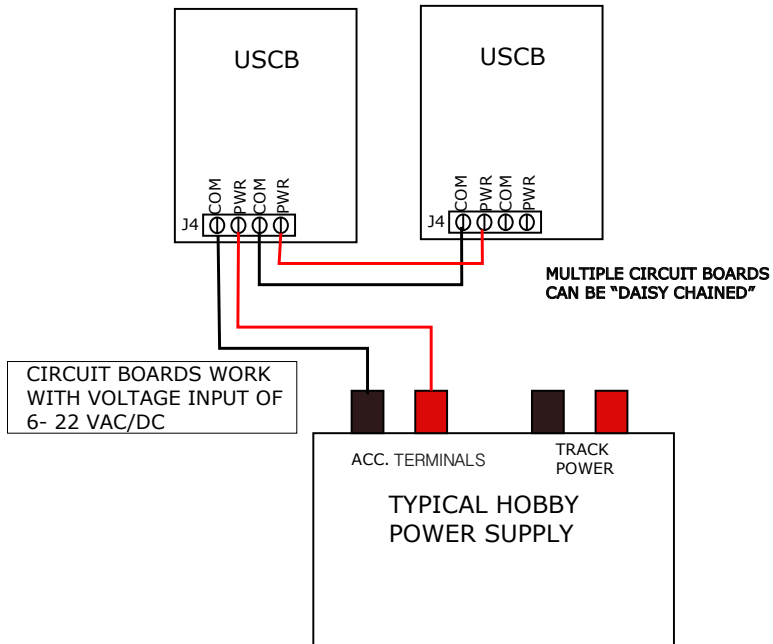
Power is attached by running a pair of wires from the accessory terminals of your power pack or other voltage source to either pair of the terminals labeled PWR and COM on the upper terminal block J4. It is standard practice to run a black wire to COM terminal and a red wire to PWR. Do not turn on power until everything is connected.

See Figure 4, on page 10.

**FIGURE 4**

**CONNECTING POWER TO THE USCB**

INSTALLING POWER TO SIGNAL CONTROL BOARDS



**NOTE: THE ONBOARD LED WILL ILLUMINATE WHEN POWER IS APPLIED CORRECTLY**

## CHANGING ASPECTS

In order to know when a train is nearby which would cause the signal to change aspect, you will need to install a detector.

There are many different types of detectors and detector technology available to today's model railroader. Detectors send out a signal which is used by the USCB to initiate a cycle of the attached head. Atlas does not provide a specific detector, however, we can suggest looking at the NCE BD-20 and other examples as typical to use depending on whether your layout is DC or DCC. The output from whichever detector you use should be routed to the Din pin on terminal block J5. See Figure 5, page 12.

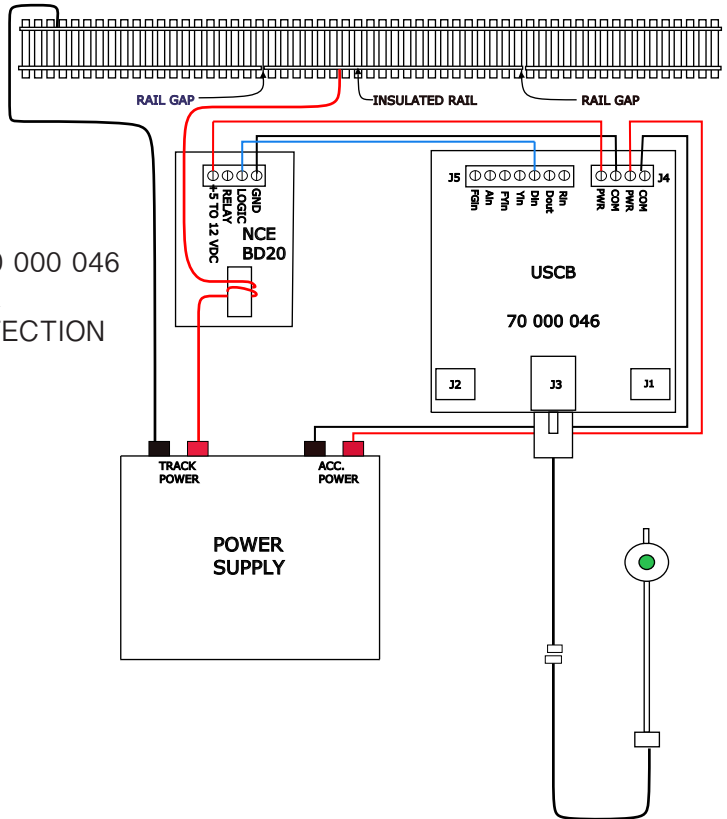
Alternatively, you can attach a switch such as the Atlas Selector, item# 215, directly to the USCB as shown in Figure 6, on page 13. This allows you to manually change the signal when the train is in the right place. If you are an O scale modeler using 3 rail, a simple detection circuit using insulated rail sections is shown in Figure 7, on page 14.

Double check your wiring and connections, and now plug the signal cable into the black jack. Turn on the power and make sure your signal lights up. The aspect should be green. If you manually flip the switch, or have a train actuate the detector, the signal should now show a red aspect. Returning the switch to off (or having the train pass completely through the detector), the signal should turn yellow for about 8 seconds, then return to green-All Clear!

**FIGURE 5**

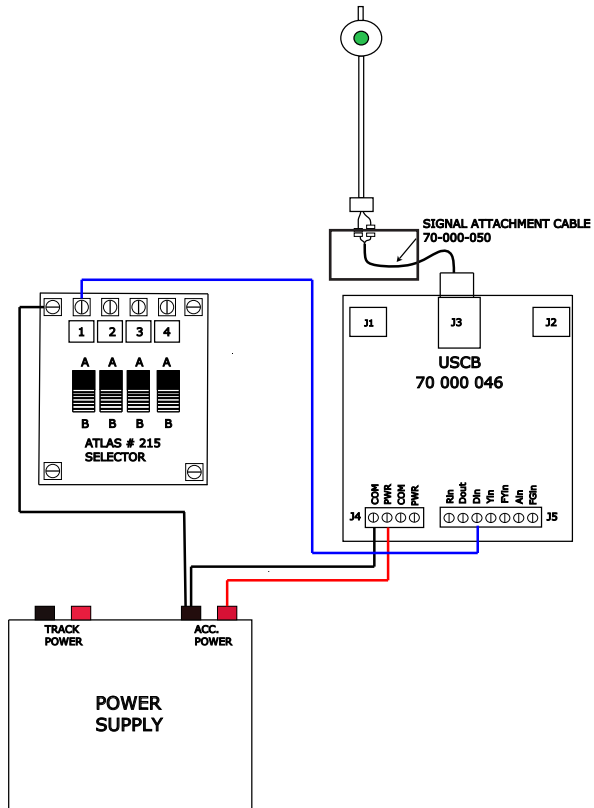
**USING BLOCK DETECTOR  
WITH THE USCB**

WIRING ATLAS USCB 70 000 046  
WITH NCE BD20 BLOCK  
DETECTOR BLOCK DETECTION  
FOR DCC LAYOUTS



**FIGURE 6**

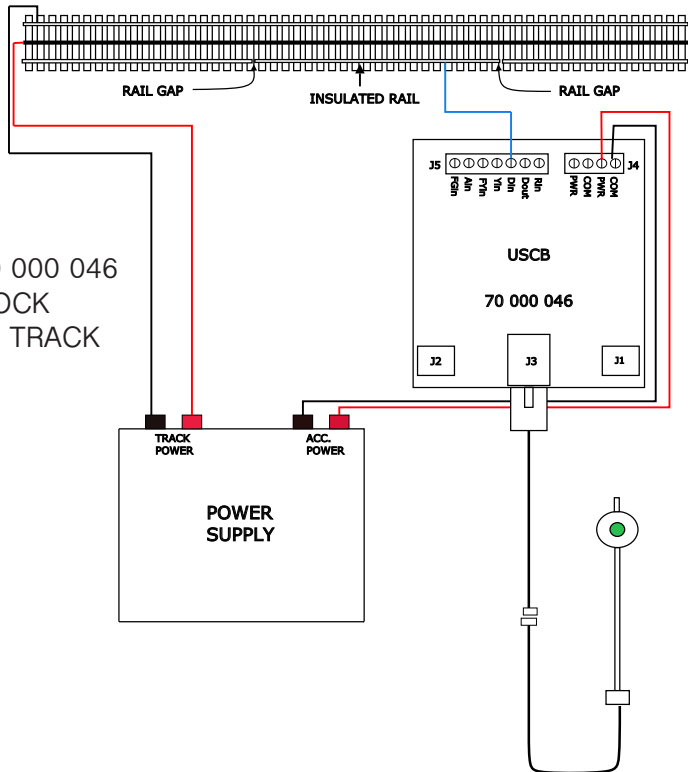
**MANUAL CONTROL OF SIGNALS WITH A SWITCH**



**FIGURE 7**

**DETECTION USING O SCALE 3-RAIL WIRING**

WIRING ATLAS USCB 70 000 046  
WITH 3 RAIL TRACK BLOCK  
DETECTION FOR 3 RAIL TRACK  
SYSTEMS

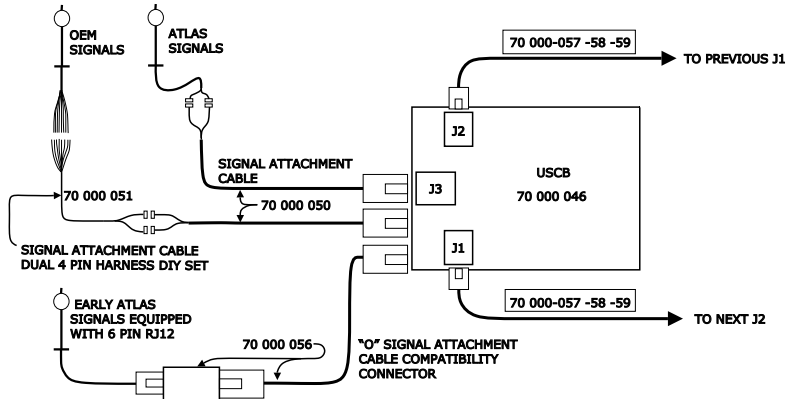


### CHART LISTING POLARITY FOR ATLAS SIGNAL HEADS

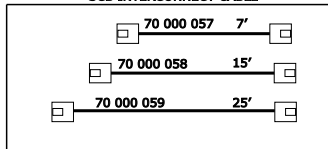
Signal Part Number	Description	Wiring
70 000 064	O Signal, Color Position Light, Single Head	Common Cathode
70 000 066	O Signal, PRR Position Light, Single Head	Common Cathode
70 000 068	O Signal, Type G, Single Head	Common Cathode
70 000 070	O Signal, Type SA, Single Head	Common Cathode
70 000 076	HO Signal, Type G, Single Head	Common Cathode
70 000 077	HO Signal, Type G, Double Head	Common Cathode
70 000 078	HO Signal, Type G, Bidirectional	Common Cathode
70 000 102	N Signal, Type G, Single Head	Common Cathode
70 000 103	N Signal, Type G, Double Head	Common Cathode
70 000 104	N Signal, Type G, Bidirectional	Common Cathode
70 000 094	HO Signal, Hooded Modern, Single Head, LH	Common Anode
70 000 095	HO Signal, Hooded Modern, Single Head, RH	Common Anode
70 000 096	HO Signal, Hooded Modern, Double Head, LH	Common Anode
70 000 097	HO Signal, Hooded Modern, Double Head, RH	Common Anode
70 000 098	HO Signal, Modern Cantilever Bridge, 2 Track, 4 Head, LH	Common Anode
70 000 099	HO Signal, Modern Cantilever Bridge, 2 Track, 4 Head, RH	Common Anode
70 000 100	HO Signal, Modern Bridge, 3 Track, 6 Head	Common Anode
70 000 101	HO Signal, Hooded Modern, Head Only (pr)	Common Anode



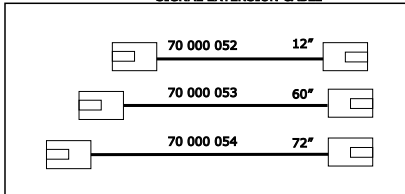
# OVERVIEW DIAGRAM OF THE ATLAS ALL SCALES SIGNAL SYSTEM



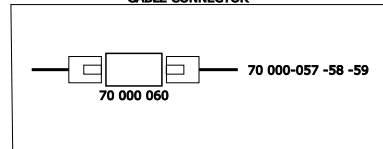
**SCB INTERCONNECT CABLE**



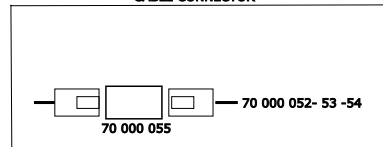
**SIGNAL EXTENSION CABLE**



**SCB INTERCONNECT  
CABLE CONNECTOR**



**SIGNAL ATTACHMENT  
CABLE CONNECTOR**



## ALL SCALES SIGNAL SYSTEM PRODUCT LISTING

ITEM#	DESCRIPTION
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### ALL SCALE SIGNAL BOARDS & ACCESSORIES

70 000 046	Universal Signal Control Board (USCB)
70 000 047	Interlock Control Module - Coming Late 2019
70 000 050	Signal Attachment Cable
70 000 051	Signal Attachment Cable, dual 4-pin harness DIY set
70 000 052	Signal Extension Cable, short (12" long)
70 000 053	Signal Extension Cable, medium (60" long)
70 000 054	Signal Extension Cable, long (72" long)
70 000 055	Signal Attachment Cable Connector
70 000 057	SCB Interconnect Cable, short (7' long)
70 000 058	SCB Interconnect Cable, medium (15' long)
70 000 059	SCB Interconnect Cable, long (25' long)
70 000 060	SCB Interconnect Cable Connector

### N SCALE SIGNALS

70 000 143	N Starter Set (incl. 1- 70 000 102, 1- 70 000 046, 1- 70 000 050)
70 000 102	N Signal, Type G, Single Head
70 000 103	N Signal, Type G, Double Head
70 000 104	N Signal, Type G, Bidirectional

## ALL SCALES SIGNAL SYSTEM PRODUCT LISTING

ITEM#	DESCRIPTION
<b>HO SCALE SIGNALS</b>	
70 000 142	HO Starter Set (incl. 1- 70 000 076, 1- 70 000 046, 1- 70 000 050)
70 000 076	HO Signal, Type G, Single Head
70 000 077	HO Signal, Type G, Double Head
70 000 078	HO Signal, Type G, Bidirectional
70 000 094	HO Signal, Hooded Modern, Single Head, LH
70 000 095	HO Signal, Hooded Modern, Single Head, RH
70 000 096	HO Signal, Hooded Modern, Double Head, LH
70 000 097	HO Signal, Hooded Modern, Double Head, RH
70 000 098	HO Signal, Modern Cantilever Bridge, 2 Track, 4 Head, LH
70 000 099	HO Signal, Modern Cantilever Bridge, 2 Track, 4 Head, RH
70 000 100	HO Signal, Modern Bridge, 3 Track, 6 Head
70 000 101	HO Signal, Hooded Modern, Head Only (pr)
<b>O SCALE SIGNALS</b>	
70 000 141	O Scale Starter Set (incl. 1- 70 000 068, 1- 70 000 046, 1- 70 000 050)
70 000 056	O Signal Attachment Cable Compatibility Connector
70 000 064	O Signal, Color Position Light, Single Head
70 000 066	O Signal, PRR Position Light, Single Head
70 000 068	O Signal, Type G, Single Head
70 000 070	O Signal, Type SA, Single Head
70 000 072	O Signal, Dwarf / Turnout Indicator

# WARRANTY

For warranty information visit <http://warranty.atlasrr.com>

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## CAUTION

To ensure proper operation and prevent potential damage to the Universal Signal Control Board, your layout, or yourself, you should follow a few common sense steps to protect you and the system against electrical shock when working with these components:

- 1) Always make sure your power source is turned OFF when handling, installing, and wiring or attaching cables or signals into the Universal Signal Control Board.
- 2) Do not apply excessive force when connecting or disconnecting cables, and make sure to leave some slack in the wiring so that strain is not placed on the connections, as wires may pull loose from the plugs and cause intermittent failures.
- 3) Ensure that your power source is properly grounded. Attach all ground connections to components before attaching the positive power leads.
- 4) Make sure that the power supply does not exceed 22V AC or DC.
- 5) Ensure that all wires are properly insulated, and that all connections are secure.
- 6) Before handling any circuit board, discharge any static electricity you may have accumulated by touching a grounded metal surface, such as a cold water pipe. This will reduce the chance of damaging the integrated circuit components on the board through an electrostatic "shock".
- 7) When working with the circuit board, keep it in its electrostatic bag until you are ready to install it, and then hold it by the edges, not the electronic components!
- 8) Always remember to turn the power OFF when you are not using the system.



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