

# SMARTFLASH



## SmartFlash Arrowboard Controller Installation & Operation Manual



**INDUSTRIES, INC.**

81 Texaco Road  
Mechanicsburg, PA 17050  
717-691-8007  
717-697-0813 FAX  
[www.trafcon.com](http://www.trafcon.com)

07/00

## The Basics

There are two variations of the SmartFlash controller. Vehicle mounted units consist of two parts, the remote control head, which includes a keypad mounted within a black enclosure and is equipped with a mounting bracket. The second part, the controller, is a plain gray box, with mounting ears, and equipped with four receptacles. The controller also houses most of the electronics.

Trailer mounted units consist of a controller unit with the keypad mounted within.

## Main Features

Features common to both controllers include the following:

- Solid state circuitry
- Short circuit protected output circuitry
- Polarity protected circuitry
- Keypad operation with back lighting
- Ability to "hot-swap" controls and plugs
- Intensity and battery monitoring
- Automatic dimming
- Manual dimming (special option)
- Automatic raise/lower operation (optional)
- Support for electric and hydraulic actuators
- Low battery warning (LED display alternates between mode and "LB")
- Audible confirmation of keyboard operation
- Text and graphic markings

## Installation of Trailer Mounted Controllers

1. Locate a suitable mounting location for the main controller/keypad unit.
2. The controller should be mounted so that the four receptacles on the bottom of the controller are facing downward at all times.
3. Connect the four plugs from the arrowboard harness as shown in the attached diagrams.
4. Connect the two 12 gauge wires and one 16 gauge wire to the positive terminal of the battery. Do NOT use a smaller wire gauge. It is permissible to connect the 16 gauge wire to one of the 12 gauge wires.

Alternatively, connecting the 16 gauge wire to the ignition switch will only enable arrowboard operation when the ignition is on. This configuration is not normally used.

5. Connect the two 12 gauge black wires to the negative terminal of the battery or a suitable ground connection. Do NOT use a smaller wire gauge.

Installation is now complete. See Operating Instructions section. Test all mode and arrowboard functions thoroughly before use.

## Installation of Vehicle Mounted Controllers

1. Locate a suitable mounting location for the main controller unit.
2. The controller should be mounted so that the four receptacles on the bottom of the controller are facing downward at all times.
3. Connect the four plugs from the arrowboard harness as shown in the attached diagrams.
4. Connect the two 12 gauge wires and one 16 gauge wire to the positive terminal of the battery. Do NOT use a smaller wire gauge. It is permissible to connect the 16 gauge wire to one of the 12 gauge wires.

Alternatively, connecting the 16 gauge wire to the ignition switch will only enable arrowboard operation when the ignition is on. This configuration is not normally used.

5. Connect the two 12 gauge black wires to the negative terminal of the battery or a suitable ground connection. Do NOT use a smaller wire gauge.
6. Mount the remote control head in a convenient location within the vehicle cab.
7. Route the gray four-conductor cable from the controller to the remote control head and connect.

Installation is now complete. See Operating Instructions section. Test all mode and arrowboard functions thoroughly before use.

## Installation for Power Tilt Operation

Units designed with the power tilt option will have two additional wires to connect and may have one of two configurations.

If the first two wires of the top plug are Green/Yellow and Black/Yellow, they will be routed in the wire loom to the arrowboard, and connected internally to a black 16/2 cable which exits the arrowboard at another location and contains the white and black actuator wires.

If the first two wires in the top plug are white and black and are connected to a length of black 16/2 cable, route the wire to the actuator externally.

1. Connect the white wire to the red actuator motor lead (positive).
2. Connect the black wire to the black actuator motor lead (negative).
3. Test actuator operation.

## **Installation for Wireless Option for Remote Control Head and Arrowboard Panel**

1. Locate suitable mounting location for Internal RF module. Must be close enough to allow 4-way plug to connect to Remote Control Head.
2. After mounting is complete, connect 4way plug to the Remote Control Head and connect the 5-way plug to the Internal RF module.
3. The power wire can be located coming from the 4-way plug that connects to the Remote Control Head. The power wire is a black cord that contains a 20 gauge red wire and a 20 gauge black wire.
4. Connect the 20 gauge red wire to a point that is connected to the positive terminal of a 12volt DC battery.

Alternatively, connecting the 20gauge red wire to the ignition switch will only enable arrowboard operation when the ignition is on. This configuration is not normally used.

5. Connect the 20 gauge black wire to a point that is connected to the negative terminal of a 12volt DC battery.

Installation is now complete of the Internal RF module to the Remote Control Head. If your arrowboard panel does not have a factory-installed External RF module, proceed to the next set of installation steps.

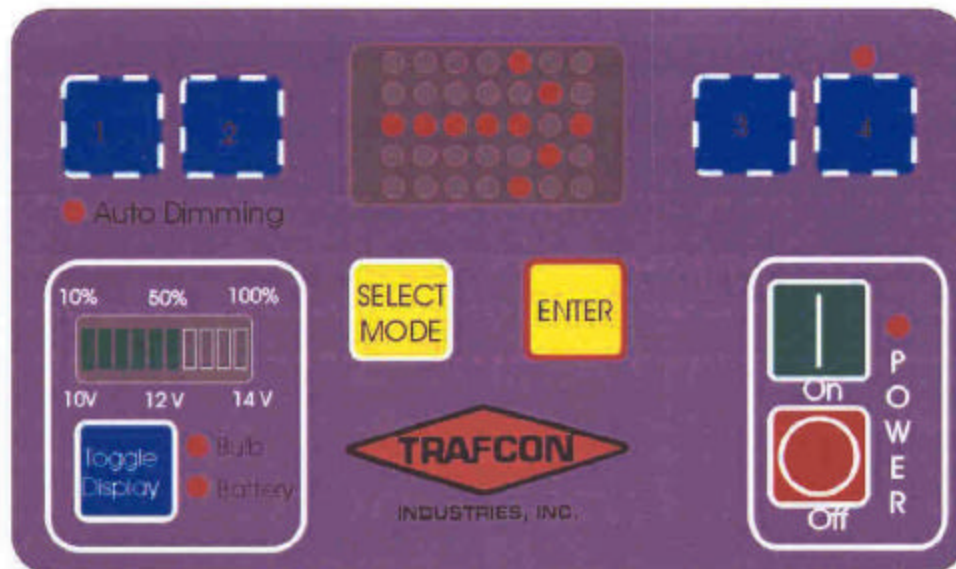
6. Locate a suitable mounting location for the External RF module on the arrowboard back panel. Must be close enough to the 4-way receptacle to allow the 4-way plug from the External RF module to connect.
7. After mounting is complete, connect 5-way plug to External RF module and connect the opposite end with the 4-way plug to the 4-way receptacle located on the arrowboard.
8. This completes installation of the External RF module.
9. Turn power on at Remote Control Head and test all modes. If unit tests ok it is now ready to be put in service.

### ***AGENCY NOTICE***

***Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.***

# Operating Instructions

## Controller Layout



## The “On and Off” Buttons

The ON and OFF buttons work as expected, when the Arrowboard is turned off the main positive (common) feed to the Arrowboard is turned off and the current draw of the system is about 10mA.

There is also a power LED that is on when the Arrowboard is turned on.

## Lamp Sequence Control Buttons

**SELECT  
MODE**

The “Select Mode” button is used to scroll through the selectable sequences. Each time this button is pressed the LED display on the controller or remote will scroll to the next sequence. When in this mode the display will flash rapidly.

**ENTER**

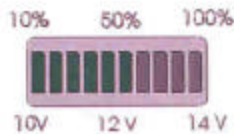
The “Enter” button is used to set the “new” sequence as the displayed sequence. Once this button has been pressed the sequence on the Arrowboard will change to the ‘new’ sequence.

## Other Buttons



"Toggle Display" button.

This button is used to change the "bulb brightness and battery level display" between its two modes. Each time it is pressed it toggles to the other mode.



Bulb brightness and Battery level Display.

This display gives accurate readings of both bulb brightness and battery voltage levels.

MODE 1      Bulb Brightness.

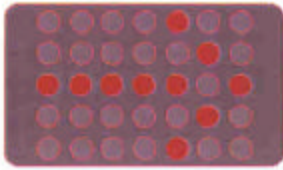
This mode displays the level of brightness that the bulbs on the Arrowboard are illuminated too. The scale is from 10% to 100% and is marked above the display.

MODE 2      Battery Voltage.

This mode displays the voltage level of the power source. The scale is from 10 to 14 volts and is displayed underneath the display.

The two readings are displayed independently; the operator can alternate between the two by pressing the "Toggle display" button. The current mode of the display is shown by the display indication LEDs; these are located to the right of the "Toggle Display" button.

## Display Features



The “Arrowboard Sequence Display” is the main display on the controller.

The primary purpose of this display is to show a flashing sequence that is identical to that on the arrowboard, this is the “real” sequence.

Once the “Select Mode” button has been pressed the flashing “real” sequence disappears and a “new” sequence will appear on the display, this sequence flashes at twice the rate of the “real” sequence.

Once a “new” sequence is shown on the display it will remain there until one of the following occurs:

- 1) The “Select Mode” button is pressed again, in this case the “new” sequence will scroll to the next “new” sequence
- 2) The “Enter” button is pressed, in this case the controller sends a change sequence request to the “arrowboard driver” which then changes the sequence, which is displayed on the arrowboard. At this point the “new” sequence on the controller display will begin to flash slower and become the “real” sequence.

If no buttons are pressed for a time period of 5 seconds the “new” sequence will disappear and the “real” sequence will be displayed

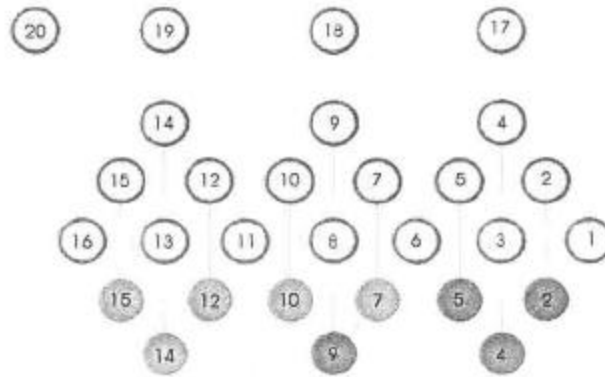
### The “Auto Dimming” LED:

This is located just above the “Bulb brightness and battery level” display. Its purpose is to alert the operator when the Arrowboard is set in auto-dimming mode.

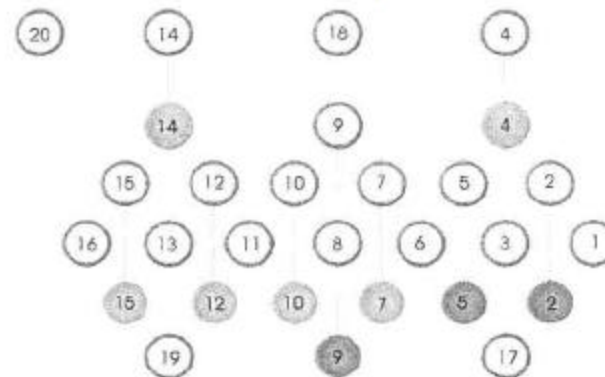
### The “Sign Up” LED:

This is located above option button four. It is on when the Arrowboard is in the UP position.

# Pin to Bulb connections for standard setup ('non-wig-wag')



## Pin to Bulb connections for 'wig-wag' setup



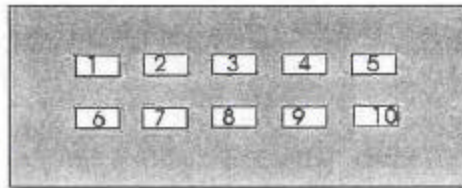
20way D-3100 plug from wire side

11	16	9	2	7	19	6	10	4	12
5	18	17	13		20	3	14	8	15

## Lamp Wiring Circuits

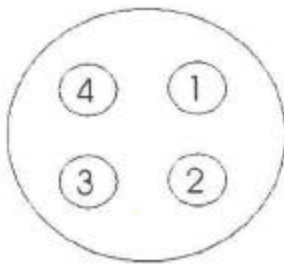
Circuit	Wire Color	Gauge	Function	Application
1	Brown	18	Lamp circuit	All
2	Red	18	Lamp circuit	All
3	Yellow	18	Lamp circuit	15,25
4	Green	18	Lamp circuit	All
5	Blue	18	Lamp circuit	25
6	White	18	Lamp circuit	All
7	Gray	18	Lamp circuit	25
8	Black	18	Lamp circuit	All
9	Brown/White	18	Lamp circuit	25
10	Red/White	18	Lamp circuit	25
11	Yellow/White	18	Lamp circuit	All
12	Green/White	18	Lamp circuit	25
13	Blue/White	18	Lamp circuit	15,25
14	White/Black	18	Lamp circuit	All
15	Gray/White	18	Lamp circuit	All
16	Black/White	18	Lamp circuit	All
17	Red/Black	18	Mode lamp	All except some minibboards
18	Tan	18	Mode lamp	All except some minibboards
19	Purple	18	Mode lamp	All except some minibboards
20	Pink	18	Low battery lamp	Solar models

### 10way D-3100 plug from wire side



- Pin 1 = +12 Volts from Battery.
- Pin 2 = External Controller power (+12 volts).
- Pin 3 = External Controller Data A.
- Pin 4 = Light sensor (+ve).
- Pin 5 = 'Sign up' position switch (+ve).
- Pin 6 = Not Connected.
- Pin 7 = External Controller Gnd.
- Pin 8 = External Controller Data B.
- Pin 9 = Light sensor (Gnd).
- Pin 10 = 'Sign up' position switch (Gnd).

### 4way plug from wire side



- Pin 1 = +12 Volts from Driver.
- Pin 2 = Gnd from Driver.
- Pin 3 = Controller Data A from Driver.
- Pin 4 = Controller Data B from Driver.

### D-3100 Plug Wiring

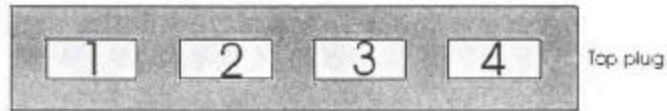
Circuit	Wire Color	Gauge
1	Red	16
2	Red	18
3	White	18
4	White/Red	22
5	Option	
6	NC	
7	Black	18
8	Green	18
9	White/Green	22
10	Option	

### 4 Way Plug Wiring

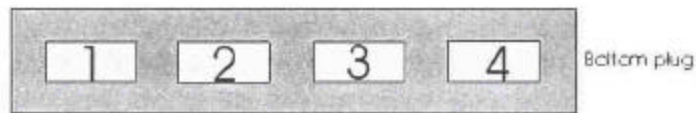
Circuit	Wire Color	Gauge
1	Red	18
2	Black	18
3	White	18
4	Green	18

**NOTE:** Use only shielded cable.

### 4 way D-5200 plugs from wire side



- Pin 1 = Sign movement control (+ve).
- Pin 2 = Sign movement control (-ve).
- Pin 3 = 12 Volts from Battery.
- Pin 4 = 12 volt common to bulbs.



- Pin 1 = Gnd from Battery.
- Pin 2 = Gnd from Battery.
- Pin 3 = 12 Volts from Battery.
- Pin 4 = 12 volt common to bulbs.

### Top Plug

Pin	Wire Color	Gauge	Function
1	Green/Yellow	16	Actuator – Positive
	or White	16	
2	Black/Yellow	16	Actuator - Negative
	or Black	16	
3	Red	14	Power – Positive
4	Orange	14	Common to Lamps

### Bottom Plug

Pin	Wire Color	Gauge	Function
1	Black	14	Ground - Negative
2	Black	14	Ground - Negative
3	Red	14	Power - Positive
4	Orange	14	Common to Lamps

## Troubleshooting

Symptom	Possible cause
No display – No backlight	Dead battery Plug(s) not connected Defective controller
No display – Backlight works	No mode selected Plug(s) not connected Defective controller
No dimming	Defective photocell Shorted photocell wires Defective controller
Lamps stay dim	Defective photocell Broken photocell wire Defective controller
Some lamps do not light	Defective lamp(s) Short at lamp Broken wire(s) Defective controller
Power tilt does not work	Broken wire(s) Defective actuator or control Defective controller

E1 Fault

Communications Error

- Power down Remote to Reset,  
If this doesn't work unplug  
4 Pin Plug Data Cable and wait  
5 seconds and plug back to  
receptacle on Remote. Unit  
should Reset.