



PAVO-32 CONTROLLER

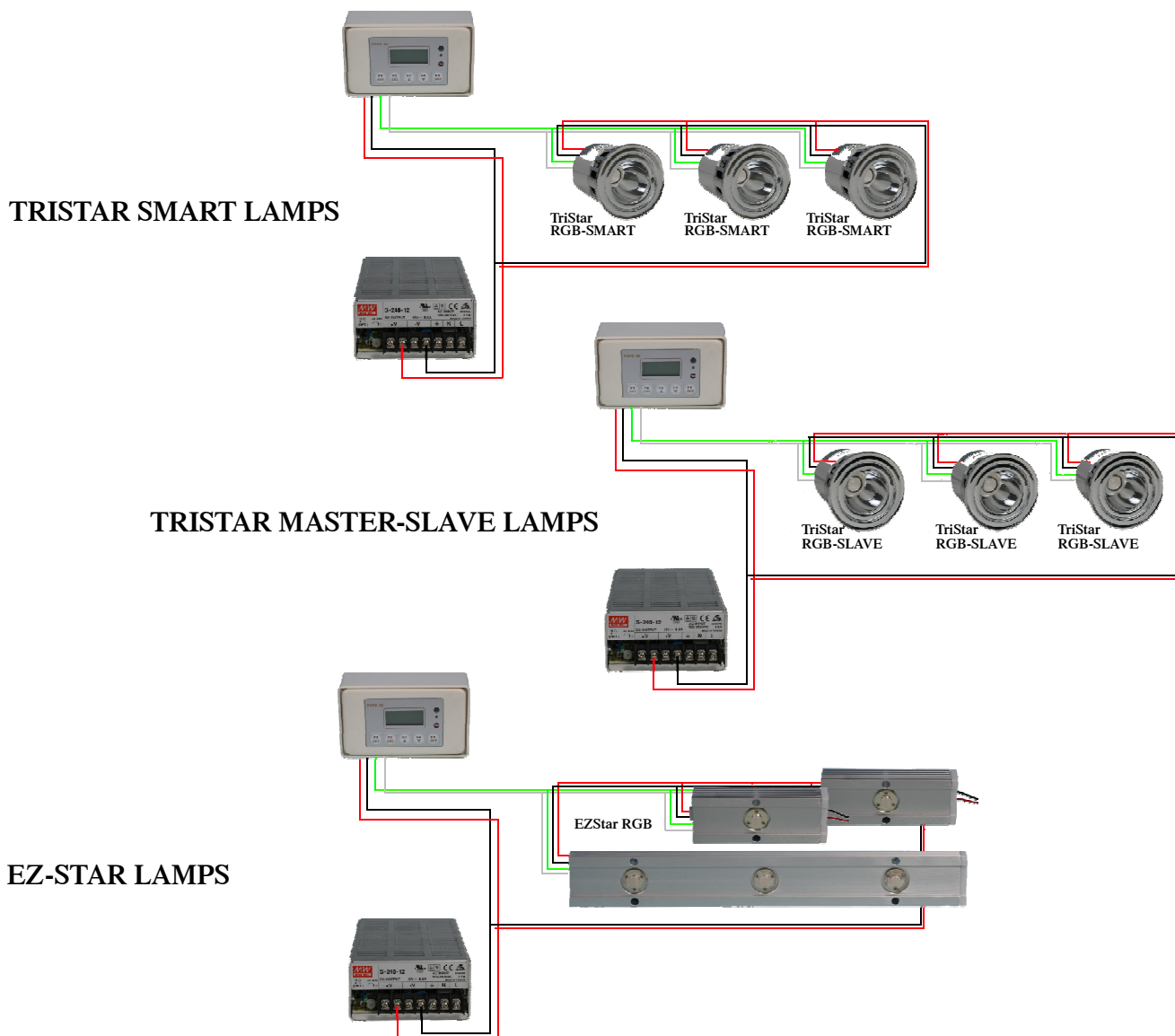
User's Guide



1. PAVO-32 Getting Started!

The PAVO-32 Controller is a powerful and easy to use device for the selection and replay of color changing effects for TRISTAR-RGB lamps designed by Color Stars, Inc.

The following TRISTAR-RGB lamps can be used with the PAVO Controller:



1. PAVO-32 Getting Started! - Product Features

Product features of the PAVO-32 Controller include:

1. 6 push buttons and an LCD display for the interface.
2. A maximum of 20 color changing programs can be built in. 8 color changing programs are factory set.
3. 5 color changing programs are assigned to buttons F1~F5 for quick selection.
4. Power input: 10~17VDC or VAC.
5. Each PAVO-32 Controller can control up to 32 TRISTAR-RGB-SLAVE lamps, 32 TRISTAR-RGB-SMART lamps or 32 EZStar RGB lamps.
6. Each PAVO-64 Controller can control up to 64 TRISTAR-RGB-SLAVE lamps, 64 TRISTAR-RGB-SMART lamps or 64 EZStar RGB lamps.
7. Each PAVO-96 Controller can control up to 96 TRISTAR-RGB-SLAVE lamps, 96 TRISTAR-RGB-SMART lamps or 96 EZStar RGB lamps.
8. Each TRISTAR-RGB lamp requires 10~17VAC/DC power input from a power supply (transformer) and D+/D- signal input from the PAVO-32 Controller.

2. PAVO-32 Specifications

Description	Specifications	Unit	Remarks
Functional Specifications			
User Interface	6 Keys + 8*2 Text LCD, IrDA Remote Control		
Input Interface	Half-Duplex RS485 port (Default) * 1		
Output Interface	Half-Duplex RS485 port * 1		
Driving Capacity	32 RGB Lamps		
Wiring Distance	300 Meters Maximum	m	
Expansion	Cascading to other PAVO-32s		Cascading to other PAVO-32s
Built-in Programs	8 sets as default		Maximum of 20 programs
Power Input			
Standard Input Voltage	10~17Volt, AC or DC	V	Over voltage may damage the controller.
Maximum Input Voltage	24 Vdc or 20 Vac	V	
Maximum Current	<100mA	mA	
Power Consumption	< 1W	W	
Environments			
Working Ambient Temp.	0~50	°C	Non-Condensing
Storage Temp.	-20~60	°C	
Working Humidity	10~90	%	
Dimensions			
Size	126.3 x 76.2 x 40	mm	
Weight	<0.5	Kg	
Other Models			
PAVO-64, PAVO-96	For controlling 64 and 96 RGB lamps		



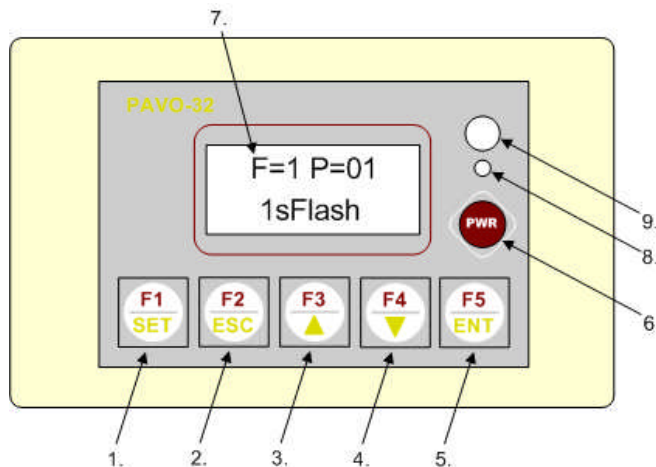
3. Precautions for Installation

This device consists of a micro-processor and electronic parts. Please follow these safety precautions during installation to avoid any damages or injuries:

1. This device is designed for constant use and there is no power switch for it. Please make sure that the Power Source is OFF during installation. Only turn the Power Source ON when the installation and wiring are complete.
2. Please make sure the Input Voltage power supply is within the specified range (10-17VDC or 9-15VAC). Over voltage power supply may damage this device and cause a malfunction.
3. Avoid touching the electronic parts of this device as the static electric voltage in the human body may damage the device.
4. RS-485 Control Protocol has good signal carrying capacity, long distance transmission and immunity to interference noises. Please note the limitation of maximum lamp connections and wiring distance.
5. Please follow this instruction manual for troubleshooting or consult with local distributors or authorized technical advisers in case of any technical problems.

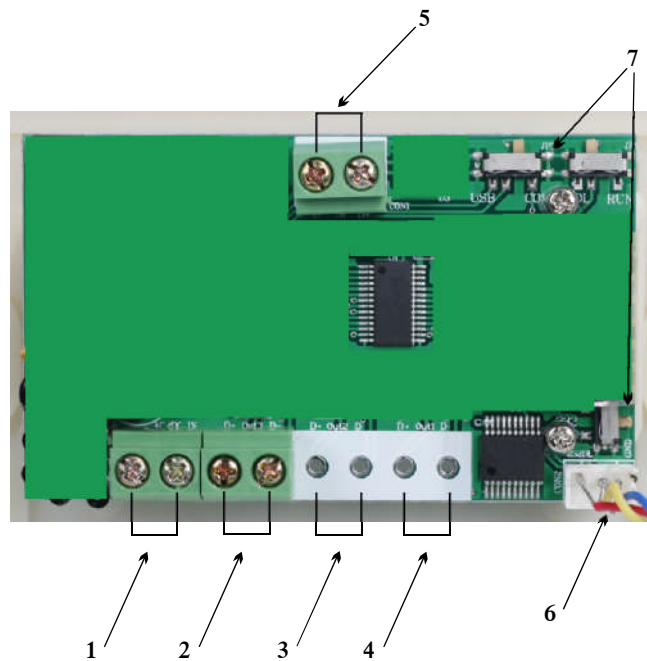
4. PAVO-32 Control Panel and Function Keys

4-1. Front Panel Layout



No.	Keys	Mode	Function Description
1	F1/Set	Normal	F1 - 1st Light Effect
		Setup	Press down 2 seconds for SETUP Mode
2	F2/ESC	Normal	F2 - 2nd Light Effect
		Setup	Escape/Cancel from SETUP Mode
3	F3/Up	Normal	F3 - 3rd Light Effect
		Setup	Move Up (selection)
4	F4/Down	Normal	F4 - 4th Light Effect
		Setup	Move Down (selection)
5	F5/ENT	Normal	F5 - 5th Light Effect
		Setup	Enter / OK
6	PWR	ON/OFF	Switch for all of the connected lamps
7	LCD Display	LCD Display	Control interface
8	POWER Indication LED	ON	All lamps are OFF
		OFF	All lamps are ON
9	IR Receiver	IR Receiver for TS-1627R Remote Controller	

4-2. Back-view and Connection Terminals



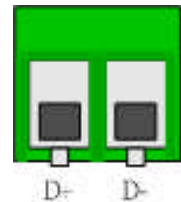
No.	Description	Function	Remarks
1	Power Input Terminal	Power Supply to PAVO-32 Controller	10~17V (AC/DC)
2	RS485 Output #1	Drive up to 32 RGB lamps	D+ / D- (PAVO-32)
3	RS485 Output #2	Drive up to 32 RGB lamps	D+ / D- (PAVO-64)
4	RS485 Output #3	Drive up to 32 RGB lamps	D+ / D- (PAVO-96)
5	RS485 Input Port	For Expansion by Cascading	D+ / D-
6	Programming Port	For Program Download/Update	Factory Use Only
7	Programming Latch	For Program Download/Update	Factory Use Only



* Terminal (1) is for Power Input. There is no polarity requirement. For both AC and DC input, either side is OK.

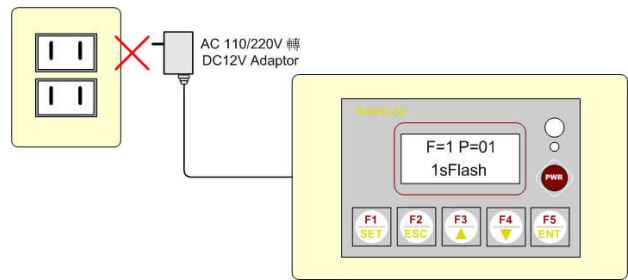
* Note the polarity (D+), (D-) of the Signal Terminals (2), (3), (4), (5):
 The left side is (D+) and the right side is (D-).
 Connect the (D+) to the green wire of the RGB lamps.
 Connect the (D-) to the white wire of the RGB lamps.
The polarity must be strictly followed for signal wiring.

* DO NOT use the Programming Port and Latch (6) (7).

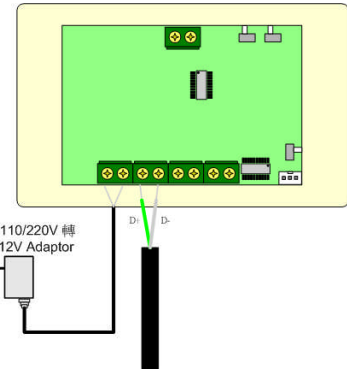


4-3. PAVO-32 Installation Procedures

1. Turn OFF (Disconnect) the power supply to the PAVO-32 (12VAC/DC).

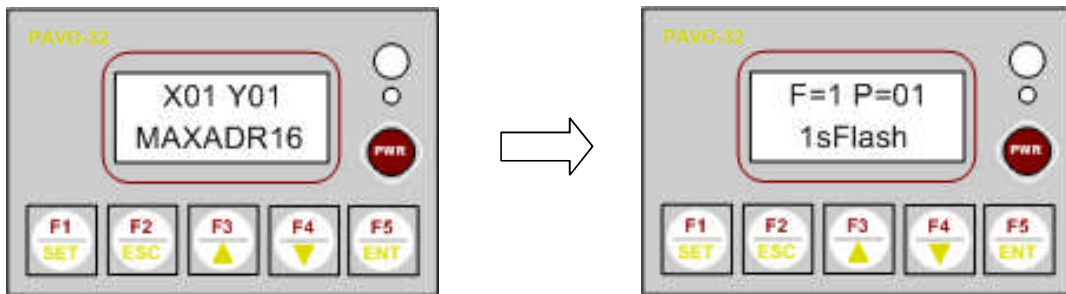




2. Attach the power lines and RS485 signal lines (D+: Green / D-: White) to the corresponding terminal blocks on the back of the PAVO-32.



3. Turn ON (connect) the power supply of the PAVO-32.

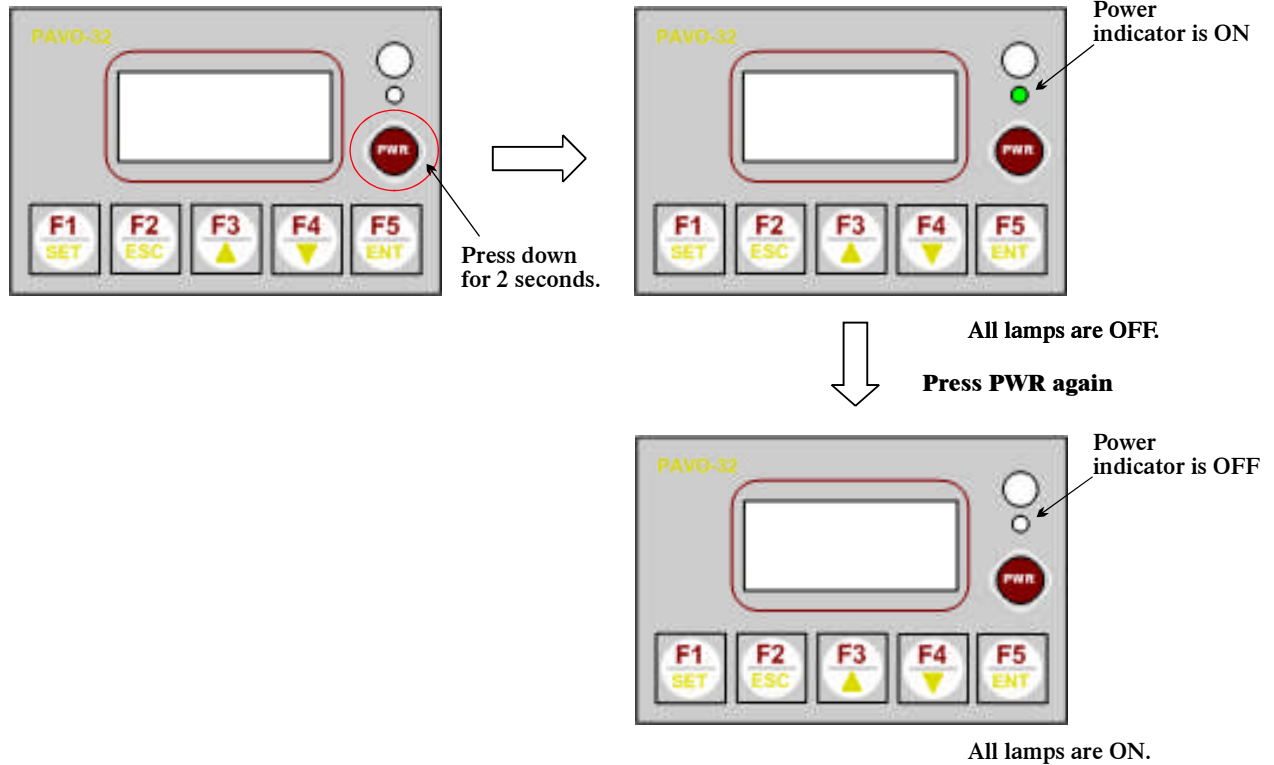
4. Initial display when power is turned ON.



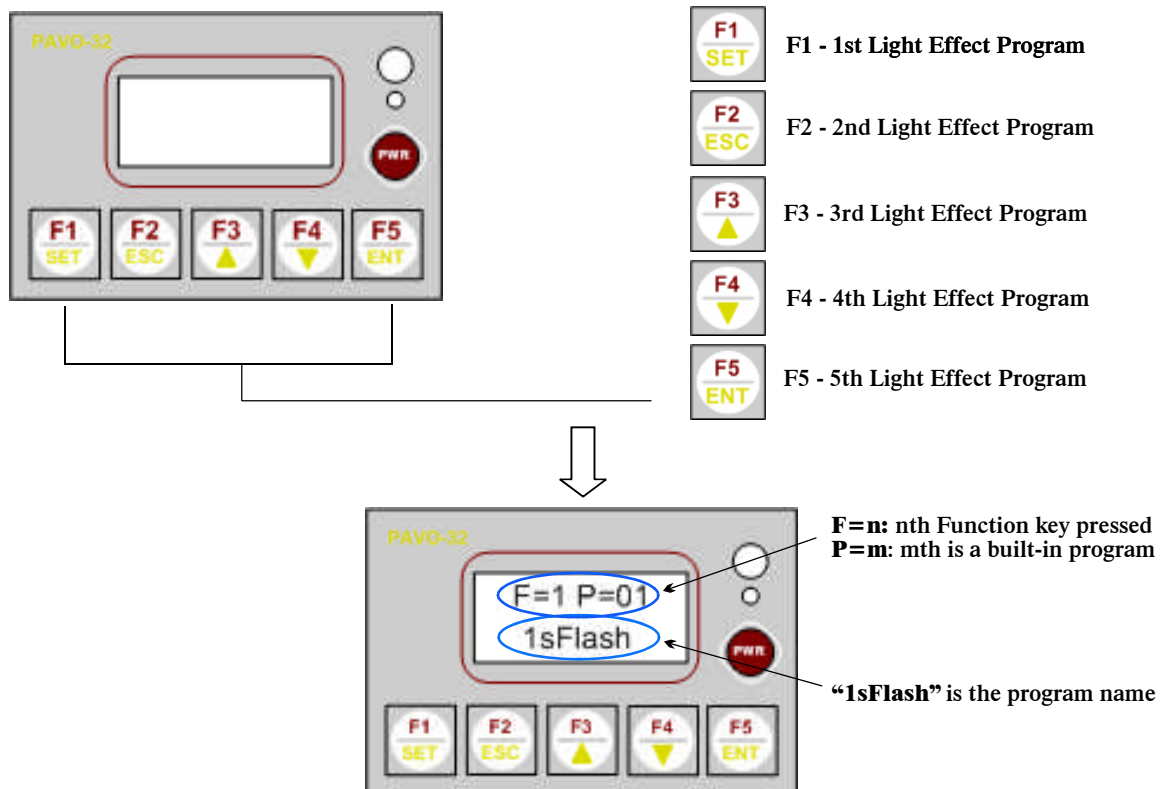
5. Press down  for 2 seconds to turn OFF all of the RGB lamps, and then Press  again to turn ON all of the RGB lamps, as a test.

5. Operating Instructions


5-1. Power Switch (On/Off)

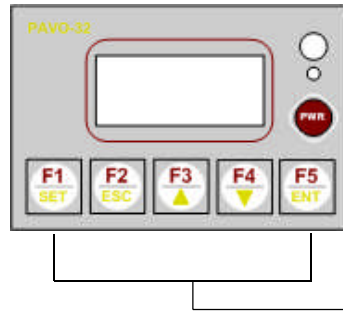


5-2. Selection of Pre-Stored Programs

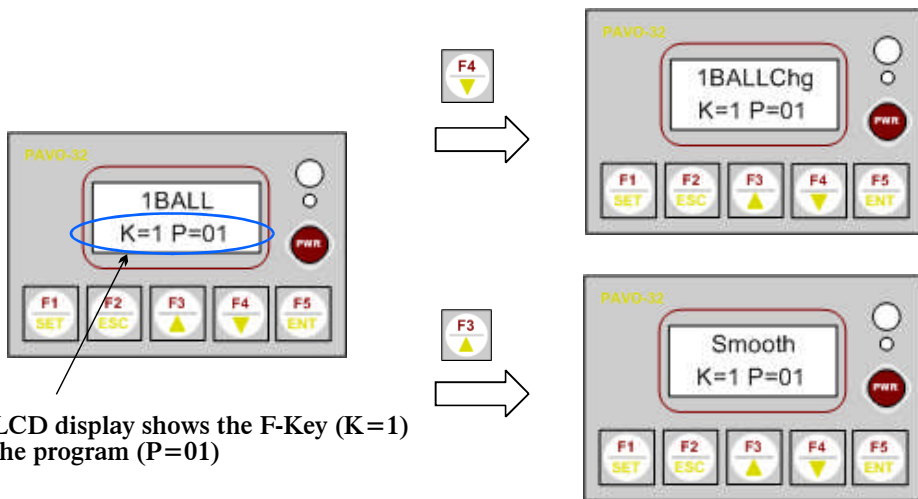


5-3. Assigning a Program to the Function Keys

1. Choose the Function Key  to which you would like to assign a program and press it down for two (2) seconds for the setup mode:

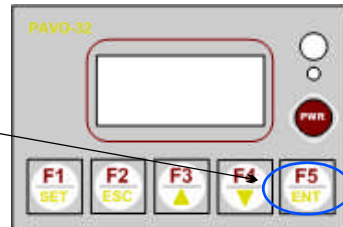


2. Press UP/DOWN (F3, F4) to choose the programs preset in the controller. The lamps will replay the program chosen.



The LCD display shows the F-Key (K=1) and the program (P=01)

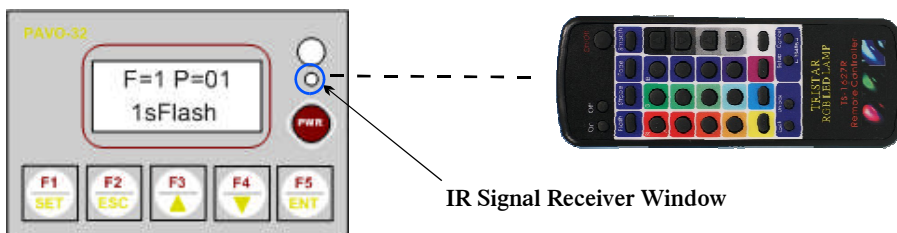
3. Press ENT (F5) when done. This confirms the F-key and its assigned program.



5-4. Using the TS-1627R IR Remote Controller

The PAVO-32 can be controlled by the TS-1627R Remote Controller for synchronized color changing of all the RGB lamps on line.

Point the TS-1627R Remote Controller to the IR Receiver Window on the PAVO-32 Controller for color changing selection.



IR Signal Receiver Window

6. Setting Addresses of TRISTAR SMART Lamps

6-1. Setting Addresses (ID) of TRISTAR SMART Lamps

PAVO-32

A. Purpose and Extended Functions:

When TRISTAR SMART lamps are assigned addresses (ID numbers), they will do *independent* color changing and replay the pre-set programs in the PAVO-32 Controller. In other words, the color changing patterns will take place with the SMART lamp with ID No. 1 changing first, the SMART lamp with ID No. 2 changing second, the SMART lamp with ID No. 3 changing third, etc.






All SMART lamps have a default address (ID Number) of “1”.

B. Procedures for Setting the Addresses of the TRISTAR SMART lamps:

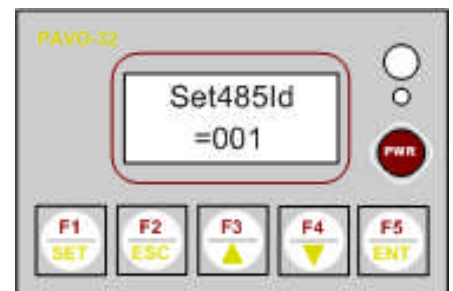
1. Connect each SMART lamp to the PAVO-32 according to the PAVO-32 wiring instructions.
2. Connect only one (1) SMART lamp at a time and give it an address before connecting any other lamps. (After the SMART lamp is given the address, it should be disconnected and marked with its ID No. before another lamp is connected. *If multiple SMART lamps are connected at the same time, all of the SMART lamps will be set to the same address, or ID number.*)



All the SMART lamps connected will be set to the same Address (ID#).

3. Turn on the PAVO-32: press **F1/Set**  for two (2) seconds to enter the Setup Mode.
4. Press **F1/Set**  once again to enter the RS485 ID Setup Mode.
5. “Set485Id” will be shown with a flashing ID number “=01”, where 001 is the ID number.
6. Use the UP/DOWN (F3/F4) keys to set the ID number.
7. Press **F5/Enter**  to confirm and finish.

Remember to disconnect the lamp after setting the ID number and mark it with its ID number before connecting the next lamp.



6-2. Specifying Maximum Addresses (ID Numbers) for TRISTAR SMART Lamps

A. Purpose and Extended Functions:

In order to properly replay the pre-set programs in the PAVO-32 Controller, the maximum number of addresses must be specified and stored in the PAVO-32 Controller. With the maximum addresses specified for the PAVO-32, it will automatically adjust the color changing sequence and replay properly.




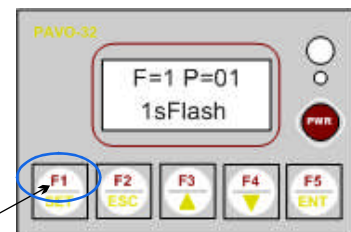
1. The default number of addresses (ID number) is set for 16.
2. If the maximum ID number is not properly set, some color changing sequences will not repeat or stop at the right sequence.







The maximum ID number does not necessarily mean the total number of lamps connected to the PAVO-32. Sometimes the same address (ID number) can be assigned to different SMART lamps.

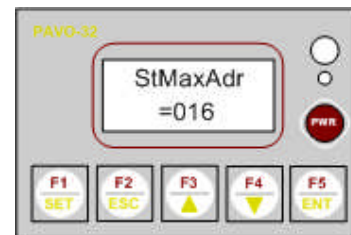
B. Maximum Address Setting Procedures:

1. Press **F1/Set**  for two (2) seconds to enter the Setup mode:



2. Press **F1/Set**  two times to enter the **StMaxAdr** Setup mode:

3. Use the UP/DOWN keys (**F3/F4**)   to select the right number of assigned addresses and press **F5/Ent**  when done.



6-3. Setting X-Y ID Coordinates for PAVO-32

A. Purpose and Extended Functions:

For large scale installations, when many TRISTAR lamps are required for more sophisticated color changing effects, many PAVO-32 controllers can be connected together and each can be set with X-Y coordinates for identification.

The maximum number of X-Y coordinates are (X=126, Y=126). As each PAVO-32 can control up to 32 TRISTAR lamps, with proper setting of X-Y coordinates of multiple PAVO-32 controllers, the maximum number of TRISTAR lamps in a system can be:

$$126 * 126 * 32 = 508,032 \text{ TRISTAR lamps}$$



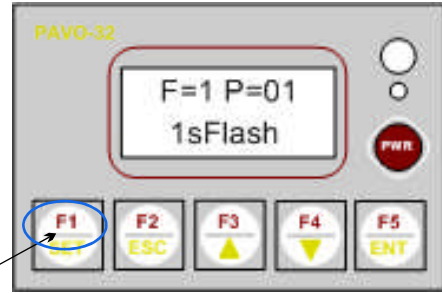
Default X-Y coordinates for PAVO-32 (X=1, Y=1).



X-Y coordinates only work for multiple PAVO-32 systems. They have no effect when only one (1) PAVO-32 controller is used.

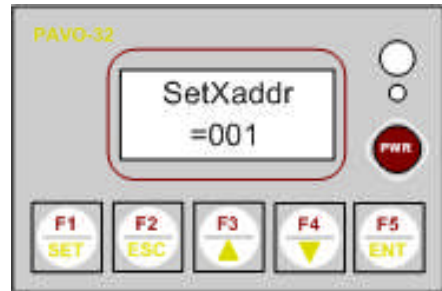
B. X Setting Procedures:

1. Press **F1/Set**  for two (2) seconds to enter the Setup Mode:



2. Press **F1/Set**  three (3) times to enter **SetXaddr**, the X coordinate Setup Mode.

3. Use the **UP/DOWN** keys   to set the X-coordinate.



4. Press **F1/Set**  one more time to enter **SetYaddr**, the Y coordinate Setup Mode.

5. Press **F5/Enter**  when done.

