Dakota Digital

ARC-1000 rev. A

Air Bag Control System

Introduction

This control system can be connected to a remote transmitter system to allow individual remote control of the air bag system. The functions include individual corner up/down, all up/down, front up/down, rear up/down, and timed dump all.

This control system can also be connected to a display module and pressure senders to allow monitoring and control of all four corners and optional monitoring of the tank pressure. The functions include four different height presets for automatic up/down control, manual up/down control, and a pressure controlled bag dump. The bag senders can be either 150 psi units or 400 psi units for high pressure systems. The tank sender is always the 400 psi unit.

IMPORTANT: *Make sure to always disconnect the negative cable from the battery if you are going to be working on or under the vehicle. Failure to do so can result in serious injury if the system is accidentally activated.*

Wiring

Main connector

RED	constant 12V power
BLACK	ground
YELLOW	accessory power
WHITE/GREEN	right rear down solenoid (not used for FRONT/REAR setup)
GREEN	right rear up solenoid (not used for FRONT/REAR setup)
WHITE/PURPLE	left rear down solenoid
PURPLE	left rear up solenoid
WHTE/ORANGE	right front down solenoid (not used for FRONT/REAR setup)
ORANGE	right front up solenoid (not used for FRONT/REAR setup)
WHITE/BROWN	left front down solenoid
BROWN	left front up solenoid

Display/sender connector

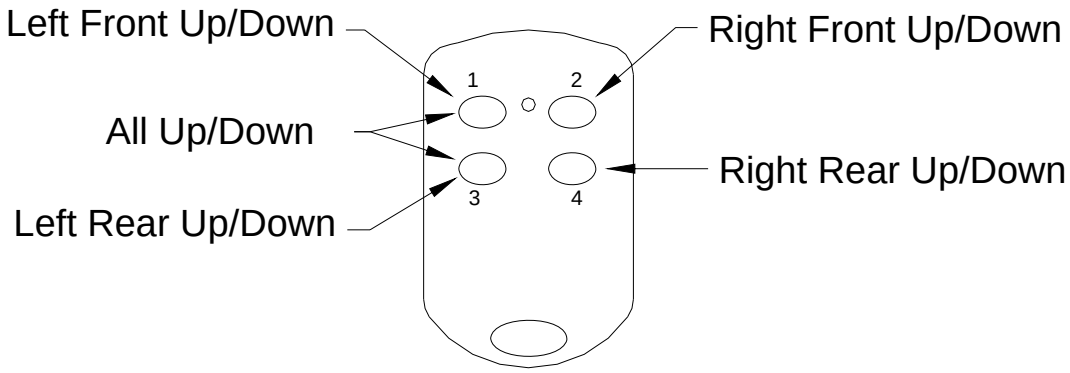
GREEN	right rear pressure sender (not used for FRONT/REAR setup)
PURPLE	left rear pressure sender (rear sender for FRONT/REAR setup)
ORANGE	right front pressure sender (not used for FRONT/REAR setup)
BROWN	left front pressure sender (front sender for FRONT/REAR setup)
GRAY	tank pressure sender
GRAY CABLE, RED	to display PWR terminal
GRAY CABLE, BLACK	to display GND terminal
GRAY CABLE, bare wire	to display GND terminal (cable shield)
GRAY CABLE, WHITE	to display WHT terminal
GRAY CABLE, GREEN	to display GRN terminal
BLUE	external remote input

Remote receiver connector

Mates to ARR-1000 module harness connector

OPERATION AS REMOTE CONTROL SYSTEM

The remote system is active when the large red power wire has power and the accessory power wire does not. This prevents accidental operation using the remote system while the vehicle is being driven. When the remote system is ready and waiting to operate the green light by the programming switches will be flashing slowly. If a display module is also connected, then when a transmitter button is activated the display will come on and show what the current control operation is.
There are two modes of operation for the transmitter.

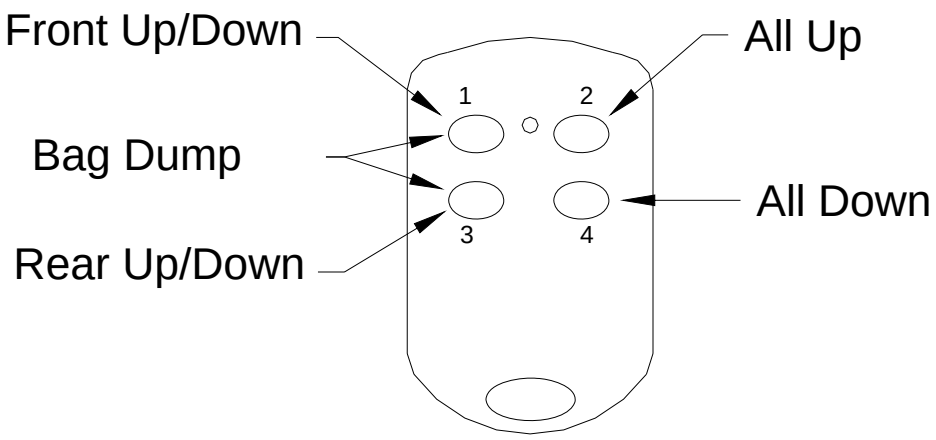


OPERATION FOR MODE 1, DIP switch #2 OFF

The key chain transmitter has four buttons. They are referred to below as button 1, 2, 3, and 4. Buttons 1 and 2 are on the top, to the right and left of the green light. Buttons 3 and 4 are below.

Button 1 controls the left front bag. The first time it is pressed it will release air from the bag until the button is released. The next time it is pressed it add air into the bag until it is released. Button 2 controls the right front bag, button 3 controls the left rear bag, and button 4 controls the right rear bag. They works the same as button 1, reversing the bag direction each time it is pressed.

Button 1 and 3 pressed at the same time will controls all four bags at the same time. The first time the button is pressed it will lower all of the bags until it is released. The next time it is pressed it will raise all of the bags until it is released.



OPERATION FOR MODE 2, DIP switch #2 ON

The key chain transmitter has four buttons. They are referred to below as button 1, 2, 3, and 4. Buttons 1 and 2 are on the top, to the right and left of the green light. Buttons 3 and 4 are below them.

Button 1 controls the front two bags together. The first time it is pressed it will release air from the bags until the button is released. The next time it is pressed it adds air into the bags until it is released. Button 3 controls the rear two bags in the same way. Button 2 will add air to all four bags at the same time until the button is released. Button 4 will release air from all of the bags at the same time until the button is released.

Button 1 and 3 pressed at the same time will activate the timed bag dump feature. These will lower all four bags for either 15 seconds or 30 seconds depending on the position of programming switch #3. Pressing any of the buttons after the bag dump has started will cancel it and turn all of the solenoids off.

PROGRAMMING SWITCHES

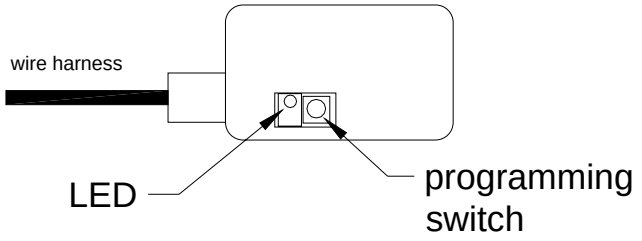
There are four programming switches located next to the main harness connector. They are used to set up the operation of the remote system.

Switch #1 Select sender type (not used for remote system)
Switch #2 Select operation mode.
Switch #3 Select bag dump time.
Switch #4 Enter display test mode (not used for remote system).

TRANSMITTER PROGRAMMING

All of the transmitters to be programmed into the system should be available. This sequence will erase any previously programmed transmitters. If a transmitter is lost or stolen, go through the programming sequence with the remaining transmitters and the lost one will be erased. The programming light (LED) is located on the side opposite the antenna, next to the programming switch.

1. Press and release the programming switch 3 times. The LED should come on and remain on steady.
2. Press button 1 on the first remote. The LED should go out and then come back on steady.
3. Press button 1 on the second remote. The LED should go out and then come back on steady.
4. Repeat this for up to 4 remotes total.
5. When all of the remotes have been programmed in, wait for the LED to go out. The system will now operate normally with all of the remotes.



BATTERY REPLACEMENT

Should the transmitter function become weak or erratic, the battery in the key chain transmitter may be weak. An indication of a weak battery is that the red indicator may have a dim glow to it when either button is pressed. If this occurs, first check the system by using the second transmitter provided. If the second transmitter functions properly, replace the battery in the defective transmitter by the following method:

A. Use a small, flat screw driver or knife to pry the case apart next to the chain.
B. Carefully separate the two case halves.
C. Remove the battery noting the (+) and (-) position.
D. Replace the battery with a new 12 volt type GP23A battery which is available at most electronic stores (Radio Shack, etc.).
E. Carefully replace the top cover snap it into place.
F. Check transmitter function.

TROUBLE SHOOTING GUIDE

IMPORTANT: *Make sure to always disconnect the negative cable from the battery if you are going to be working on or under the vehicle. Failure to do so can result in serious injury if the system is accidentally activated.*

Symptom	Possible Problem	Solution
System will not operate any of the solenoids.	Receiver is not getting power.	Check 12 volt connection. Check ground connection. Check fuses.
	Ignition key is on.	Turn off ignition.
	Accessory input is powered	Check connection to Acc. wire.
	Remote module is not plugged in.	Connect connections.
	System is in display test mode	Check Switch #4
Air solenoids 'jump' or 'chatter'.	Weak or poor 12 volt connection.	Check 12 volt connection. Move to new terminal point.
Bags change direction in mid-travel.	Over loaded 12 volt power circuit.	Place receiver and windows on separate circuits. Check for loose connections. Increase wire size on power.
	Weak car battery.	Recharge or replace car battery.
	Transmitter signal is being disrupted.	Move antenna away from power wires.
Transmitter has very short range on all functions.	Transmitter battery is weak.	See Battery Replacement.
	Antenna needs repositioning	Move antenna out away from any high current wires.

When the system is ready to receive a transmitter signal, the green light should be flashing slowly. If it is not, begin checking the power and ground connections.
If none of these solutions solve the problem, or the problem occurring is not listed here, please call the Dakota Digital technical assistance line at (605) 332-6513 for further assistance or email to dakotasupport@dakotadigital.com.

Dakota Digital
4510 W. 61st St. N.
Sioux Falls, SD 57107
Phone: (605) 332-6513
FAX: (605) 339-4106

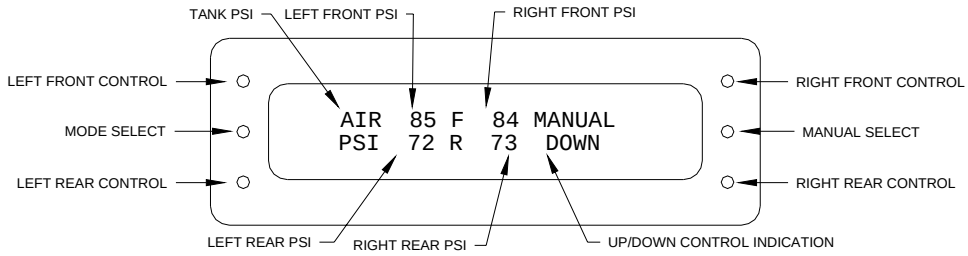
OPERATION AS AUTO HEIGHT CONTROL SYSTEM

The auto height control system is active when both the large red power wire and the accessory power wire are on. When the accessory power is off the display and height control will shut down to prevent draining the battery down. One exception is that if the bag dump is active and the ignition is turned off, the control system will continue to operate until the bag dump is completed and will then shut down.

The display unit has a 2 line, full character display with three switches on each side. The display unit communicates to the control system through two wires. The center left switch selects the different functions and toggles the display screens. The center right switch acts as the manual up/down selector. The four corner switches operate the four corner bags in manual or programming modes and also operate as menu selection in other modes. Each of the operating modes will be discussed in detail.

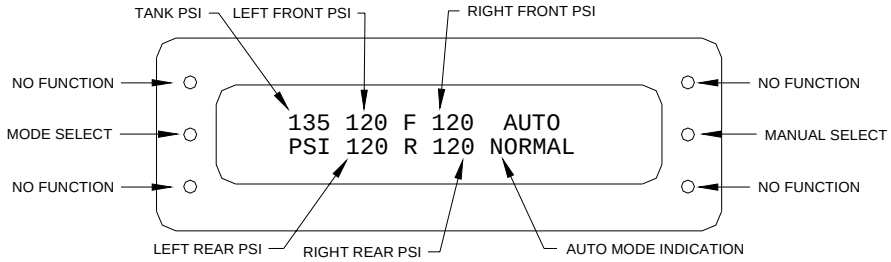
Manual control:

The tank pressure area will display “AIR” if a tank pressure sender is not connected. Pressing the up/down select switch will change the operation of the four corner switches. When “MANUAL UP” is displayed the corner switches will raise their respective bags for as long as the button is held. When “MANUAL DOWN” is displayed the corner switches will lower the bags. More than one switch can be held at a time.

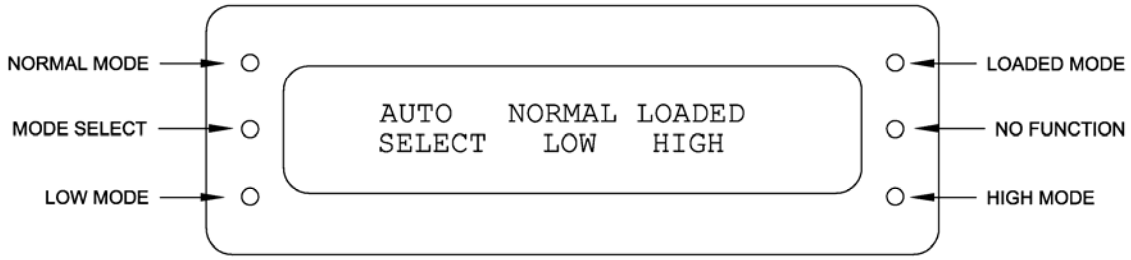


Auto control:

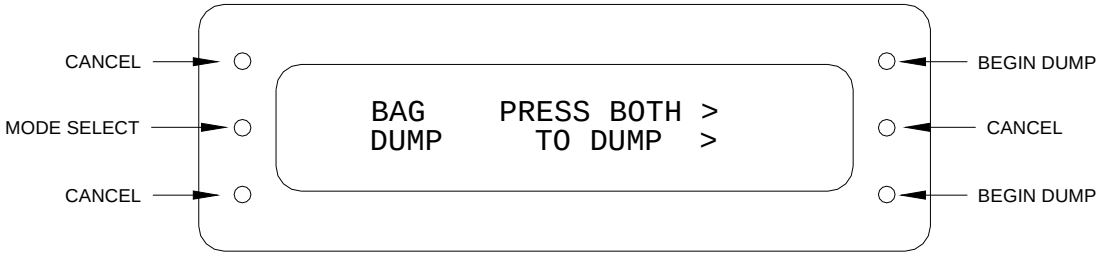
The tank pressure area will display “AIR” if a tank pressure sender is not connected. Pressing the manual select button will switch to manual mode. To change to a different auto height control mode, press the mode select button once and then use the corner switches to select the desired mode as shown on the display screen.



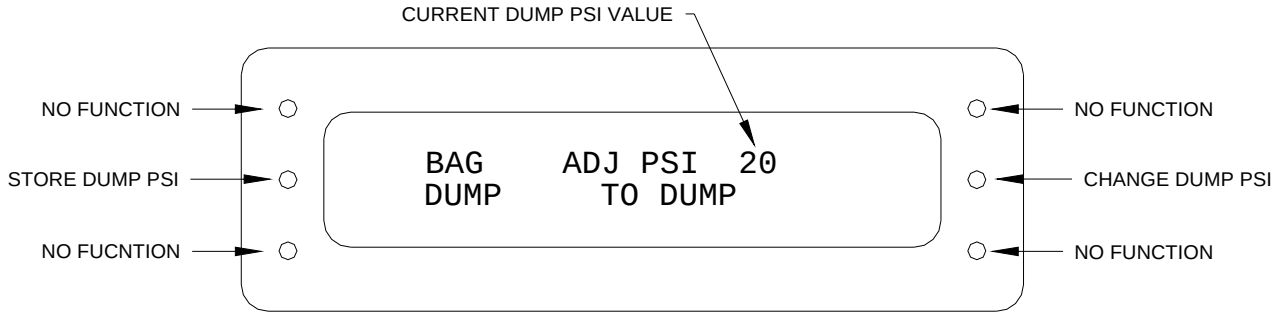
Auto select:
Press one of the corner buttons to select the auto height mode you want. Press the mode select button to go on to the bag dump or auto program screens.



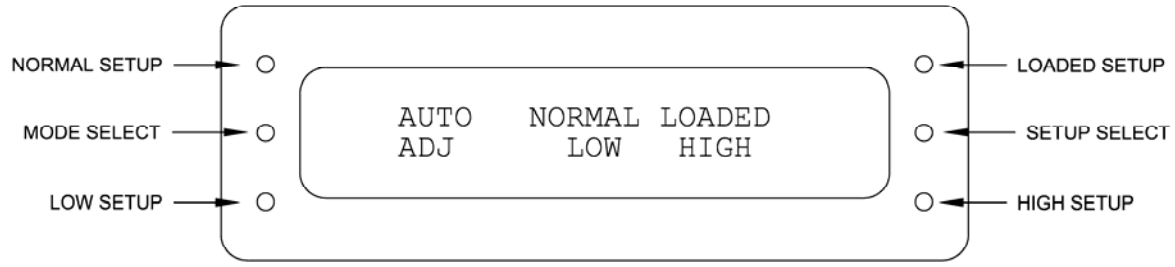
Bag Dump:
Press the top right and bottom right switches at the same time to start the bag dump. Press the mode select switch to go on to the auto program or auto/manual screens.



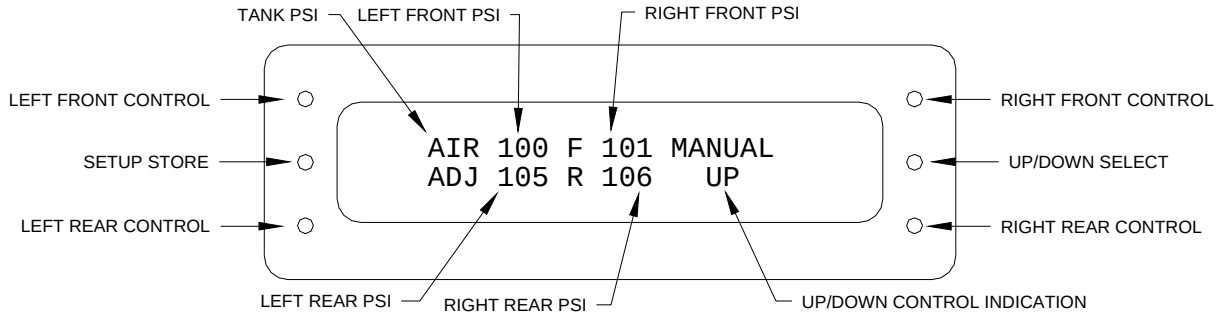
Once the bag dump has begun, pressing any switch will cancel the bag dump. The bag dump will stop automatically once the bag pressure is below the dump psi value. The dump psi value defaults to 20 psi, but is adjustable from 5-35 (10-70 for 400 psi senders).
Once the bag dump has started, you can turn the key off and the unit will continue lowering the bags until it reaches its set point. The next time the key is turned on the unit will bring all of the bags up to the most recently selected auto setting.
To adjust the dump psi value, press and hold the right, center switch, then press and hold the right center switch. Once the 'ADJ PSI xxx' display is shown, the current dump value will be displayed. Press the right, center switch to change the value and press the left, center switch to save the new dump psi value.



Auto program:
To enter the setup mode for one of the height settings press the setup select switch and the appropriate corner switch at the same time. Press the mode select switch to go to the auto/manual or auto select screens.



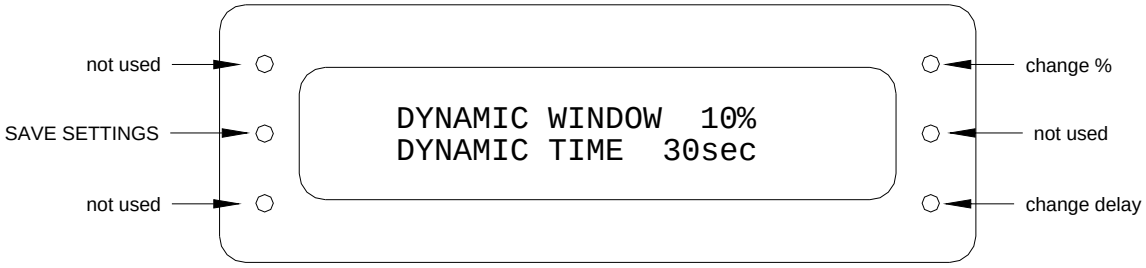
Use the up/down select and the corner switches to adjust the vehicle to the desired ride height. Once the desired height is set, press the setup store switch to save the settings and return to the auto control mode.



Senders:
This system can be used with 2 senders (front/rear), 3 senders (front/rear & tank), 4 senders (4 corners), or 5 senders (4 corners & tank). The bag senders can be either Dakota Digital SEN-03-1, 150 psi senders or Dakota Digital SEN-03-5, 400 psi senders. The tank sender is always a SEN-03-5, 400 psi sender. Programming switch #1 is used to indicate which sender is being used with the system. Place the switch on for 150 psi or off for 400 psi. The gauge resolution will be 1 psi for 150 range and 2 psi for the 400 range.
The 150 psi senders have one terminal for connection to the controller. They need to be grounded through their mounting threads. They either need to be screwed directly into a metal fitting that is grounded or a ground wire needs to be clamped to the sender case. The ground should be connected back to the same ground used for the main controller harness.
The 400 psi senders have two terminals. One terminal should be connected to the main controller ground and the other terminal connected to the appropriate sender wire from the harness. It does not matter which terminal is used for the ground.

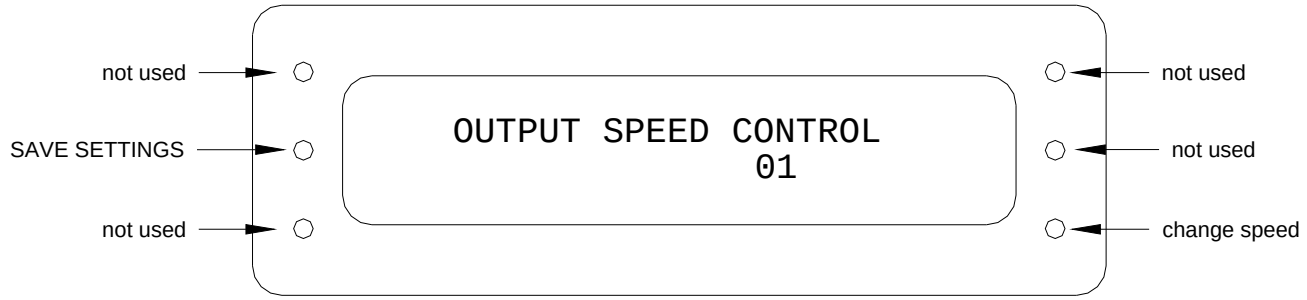
Advanced Setup:

The system is designed to bring each of the individual bags to their set points when the key is turned on or when a new mode is selected. When the key is turned on there is a 2 second delay before it begins making adjustments to allow everything to power up first. Once the system is done adjusting the bag pressures and the system has stabilized it will begin taking a longer averaged reading from the bags to ignore fluctuations due to hitting bumps, turning corners, and sudden braking or acceleration.
The settings used in this long average mode are user adjustable, but have been preset to typical starting values. One setting is the % variation allowed once the system has been stabilized for a period of time. This prevents nuisance adjustments that are not necessary. The default value is 10% and it is adjustable from 5% - 19%. The other setting is the time delay before adjustments are made when the variation appears to be caused by turning sharply or suddenly braking. The default value is 30 seconds and it is adjustable from 16 – 46 seconds.
To enter the setup mode to make adjustments to these values, press and hold the left, center switch while you are turning the key on. The display will show the Dakota Digital startup message. Release the switch. The settings will be displayed as shown below.



Press the top, right switch to change the window %.
Press the bottom, right switch to change the delay time.
Press the left, center switch to save the new settings and go on to the next setup menu.

In order to compensate for different air system speeds, the output can be varied with 8 different settings. Speed setting 1 is the default setting and will work with most systems. The faster your bag system, the higher the setting number that should be used.
Press the bottom, right switch to change the speed setting.
Press the left, center switch to save the new settings and return to normal operation.



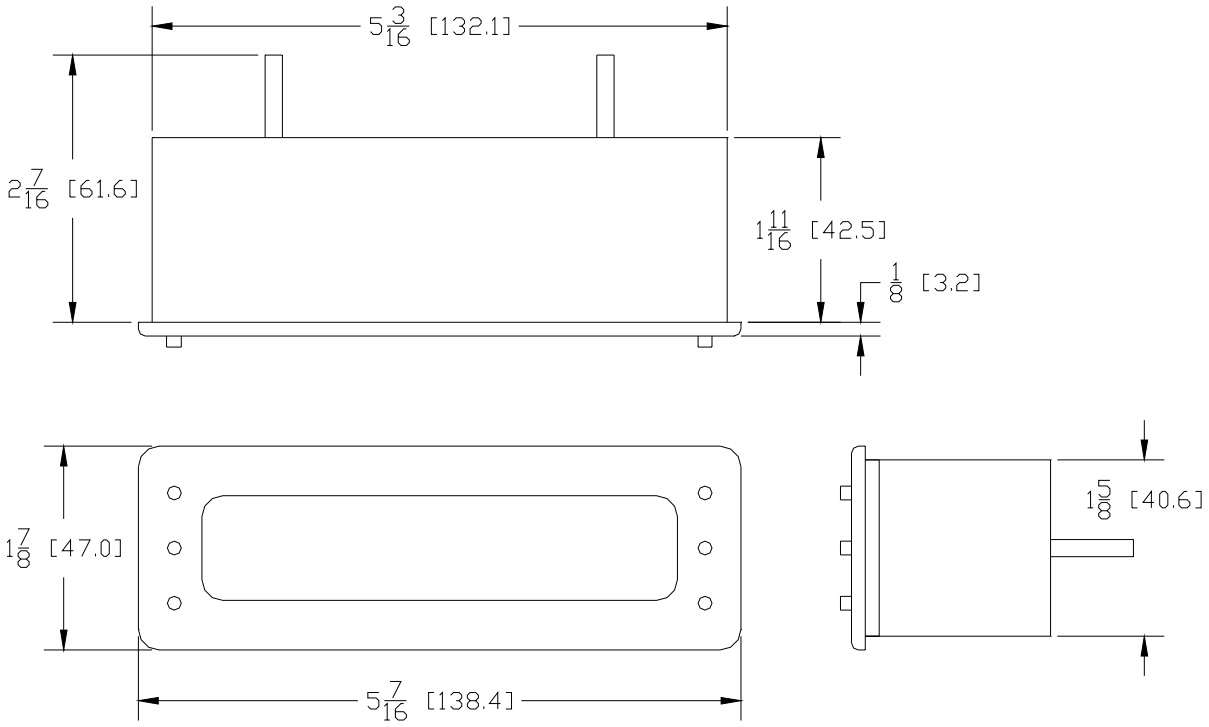
PROGRAMMING SWITCHES

There are four programming switches located next to the main harness connector. They are used to set up the operation of the remote system.

Switch #1 Select sender type
Switch #2 Select operation mode. (not used for control system)
Switch #3 Select bag dump time. (not used for control system)
Switch #4 Enter display test mode.

Display Mounting:

The display will require a rectangular cutout in 5-3/16” wide and 1-5/8” high. Insert the display module into the opening from the front and place the two clamps provided onto the back side to secure it into your dash.



Troubleshooting guide.

IMPORTANT: *Make sure to always disconnect the negative cable from the battery if you are going to be working on or under the vehicle. Failure to do so can result in serious injury if the system is accidentally activated.*

Problem	Possible cause	Solution
Display will not light up, green light is off.	PWR terminal does not have power.	Check connections to control system.
	GND terminal is not getting a good ground.	Connect ground to a different location.
	Ground wire on control system is not connected properly	Connect ground to a different location.
	Power wire on control system is not powered.	Connect the large red wire to a constant 12V power source. (do not use a battery charger)
	Ignition key is off.	Turn key on.
	Accessory wire is not getting power.	Connect the red/white wire to power with the key on.
Display will not light up, green light is on.	Loose wire.	Check connections to display.
	Display is damaged.	Return display for repair. (see instructions)
Display lights up, but displays “EE”.	Sender is not connected to controller.	Connect wires from controller to sender terminals.
	Wire between controller and sender is broken.	Test and replace wire.
	Sender is not grounding properly.	Sender grounds through it’s mounting threads. Make sure the threads are clean. **Do Not Use Tape or Sealant on Sender Threads.**
	Controller is damaged.	Return controller for repair. (contact factory)
	Sender is damaged.	Return for replacement. (see instructions)
Display lights up, but displays “--”.	Sender wire is shorted to ground.	Check wire for damaged insulation, replace if necessary.
	Controller is damaged.	Return controller for repair. (contact factory)
Display lights up, but does not read correctly.	Loose connection on power wire.	Reconnect wire going to PWR terminal.
	Poor sender ground.	Make sure sender case is getting a solid ground.
	Poor ground connection.	Move ground to different location
	Incorrect sender type.	Make sure sender has been replaced with the correct type (SEN-03-1 or -5).
	Gauge is set for the wrong sender type.	Reset the sender type (switch #1).
Display flashes constantly.	System is not able to bring the bags up to the set pressure.	Check auto presets and air lines.
	Tank has improper air pressure.	Check air level and air pump.
Display will not dim.	DIM terminal is not connected correctly.	Check wiring connections.
	Gauge is damaged.	Return gauge for repair. (contact factory)
Display remains dim at all times.	DIM terminal is getting power all of the time.	Connect DIM terminal to location that only has power when the headlights are on.
	Battery is very low.	Recharge or replace vehicle battery.
	Gauge is damaged.	Return gauge for repair. (contact factory)
Switches will not operate any of the solenoids.	10A fuse is blown.	Replace fuse.

Dakota Digital
4510 W. 61ST St. N., Sioux Falls, SD 57107
Phone: (605) 332-6513 FAX: (605) 339-4106
www.dakotadigital.com
dakotasupport@dakotadigital.com