GENERAL INSTALLATION & OPERATION PROCEDURES

INDUSTRIAL REMOTE CONTROL SYSTEM

Multi-Channel Systems
ASK200-800 Series

FCC ID: N8K J8T6J11
IC: 6657A-J8T6J11

ASK 200-800

FCC AND IC DECLARATION OF CONFORMITY

Compliance Information Statement

Name: Remote Valve Control Receiver
Model: ASK200-800
FCC ID: N8K J8T6J11
IC: 6657A-J8T6J11

Manufacturer:
Base Engineering Inc.
600 Rothesay Ave.
Saint John, New Brunswick
Canada, E2H 2H1
Phone (506) 635-2280
Fax (506) 635-2281

Testing Laboratory:
Solectron Inc
21 Richardson Side Road
Kanata, Ontario
Canada, K2K 2C1
Phone (613) 271-5322
Fax (613) 271-2581
Solectron Report No.: KP000938-CR-RAD-84-01

FCC Compliance Statement:

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

IC Compliance Statement:

"Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device."

NOTE ON FCC PART 15.203:

The Tx antenna is permanently attached and is not user replaceable.

NOTE:

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

ASK200-800 Series Multi-Function System Overview

These systems have been engineered to provide multi-channel/multi-function controls for bulk fuel delivery operations. The most common applications are for Clutch/PTO, Hose Reel, Throttle, Emergency Stop and “Query” control. Systems can be ordered with any combination of the following functions:

PTO control can be through an air actuator attached to the truck clutch pedal or in the case of a “hot shift” PTO, directly in line between the PTO switch and transmission. The normally open side of the electronic receiver relay provides 12V to an air solenoid valve allowing air supply to pass through when the “PTO” button is pressed. The normally closed side of this relay removes this 12V signal and causes the solenoid to exhaust all air pressure up-stream. For clutch pedal operation air should be supplied from the PTO air line between the PTO switch and transmission. This will ensure that the system is operable only when the PTO is engaged. The operator depresses the clutch, engages the PTO, and presses the “PTO” or “CLUTCH” button on the transmitter. This will supply air to the clutch piston and maintain the disengaged clutch. Pressing the transmitter button again will engage the Clutch/PTO and pumping begins.

Hose Reel unwind and rewind are available if both directions are specified. The normally open sides of the electronic receiver relays energize an “A” and “B” motor reverser circuit contained in the externally mounted solenoid box. The receiver and reverser box are pre-wired through a four conductor umbilical cable with plug. Installation is a matter of connecting battery power and ground and hose reel motor leads.

Note: Systems using only one direction control (unwind) operate on one channel only. The normally closed side of this channel is used to power a conventional truck mounted rewind button. This configuration prevents the possibility of a dead short through the hose reel motor in the event both the transmitter “UNWIND” button and truck mounted “REWIND” buttons are pressed at the same time.

Throttle Up/Down control is provided by the normally open side of the selected receiver relay. Pressing the “THROTTLE” transmitter button switches 12V to the closed side of any truck mounted fast idle switch. Engines with Electronic Control Modules (ECM) may require the use of additional external relays where “PTO Enable” is required for stationary fast idle control. Common engine wiring schematics are available from ***BASE*** and are included in the Dealer Information Binder. Throttle control may also be through use of an electric or air actuated under hood piston, (an air solenoid valve will be required for pneumatic throttle control).

Note: Systems can be ordered that provide a momentary or latched contact of two wires as is the case of GM gasoline/propane powered engines. Pressing the “THROTTLE” button will “join” two wires supplied in the harness. This application typically provides a ground signal to the trucks ECM. Add the suffix “**C**” after the model number when ordering.

Query operation is used to stop the delivery operation if the operator fails to “tell” the truck that he is paying attention. Once the delivery operation begins the operator must press the transmitter “QUERY” button within 5 minutes to keep the truck pumping. Pressing this button restarts the 5-minute system timer. Failure to press this button will result in an audible 30 second warning, through the trucks back-up alarm, prior to shut down. Pressing the “QUERY” button will stop the alarm and restart the timer. Failure to press the button during the alarm warning will cause the Emergency Stop function to automatically activate. This feature is pre-programmed by the factory and requires a wire connection be made to the trucks back up alarm. A wiring diagram is provided when this feature is ordered. The suffix “Q” after the model number signifies a Query function.

Print function enables the operator to PRINT the customer’s ticket immediately after the delivery, from the end of the hose. This function helps save time for the driver by having the ticket already printed when arriving back at the register.

Emergency Stop for Engine and Internal Valve

An ignition relay is provided to be installed in-line with the ignition “hot” wire. This is a wire that when disconnected will cause the engine to stop. Check with the truck dealer service department to determine the correct wire for your particular type of engine. The normally open side of the selected receiver relay is activated by the “EMERGENCY STOP” button sending 12V to the magnetic coil of this relay “interrupting” the ignition circuit.

With “Flomatic” internal valve

This is the same as engine kill system above. Cargo pump stops with engine stop. “Flomatic” internal valve closes with loss of pump differential pressure.

With AIR operated internal valves

The normally closed side of the receiver relay sends 12V to an air solenoid valve whenever the system is “armed”. This signal opens the solenoid valve allowing air to supply the internal valve if the manual air switch is opened. At the same time the engine kill relay is activated, the 12V signal to the internal valve air solenoid is dropped causing the solenoid to exhaust all air up-stream, closing the internal valve.

With CABLE operated internal valves

Same as above but an auxiliary cable actuator is added to “pull” the emergency trip cable when the “EMERGENCY STOP” button is pressed. This actuator can be AIR operated if the truck has available air, or ELECTRICALLY operated if the truck has no available air. Add the suffix “ACS”, or “ECS” for AIR, or ELECTRIC CABLE SYSTEM hardware.

Note: The system **cannot** be reset from the transmitter. To reset the system simply turn the ignition key off and on again when re-starting the truck. This requirement has been deliberately programmed into the receiver software for maximum safety.

For applications not discussed above such as PTO 5-second **Time Delay**, please contact the factory technical support group at **1-800-924-1010**.

ASK200-800 Series Components

Each system includes one of each of the following:

1. Aluminum electronic receiver unit
2. Multi-function transmitter with leather pouch
3. Air solenoid/reverser box enclosure (depending on system)
4. Antenna and antenna extension cable
5. In-cab wiring harness
6. Normally closed/energized open ignition relay
7. Operating instructions

ASK200-800 Series Installation Procedures

Much of the installation wiring has been completed by ***BASE*** Engineering during assembly. All remaining wires are clearly labeled for easy hook up. All air-line connections are made with quick connect fittings supplied.

Receiver Unit Installation

1. Locate the ***BASE*** receiver unit in the truck cab so that it can be easily wired to a “switched” 12V-power supply. The power supply used should only be active during pumping operations (see below). This will ensure that the unit is not “armed” during normal highway driving. The system location should also allow easy access to the unit for potential fuse replacement. Mounting holes are located in opposite corners of the receiver enclosure. These are accessed by removing the six stainless screws and receiver cover. Industrial Velcro has also been attached to back of the receiver to allow easy mounting in any location.

2. This receiver unit has quick-connect electrical plugs located at the bottom of the receiver for the “in-cab” wiring and umbilical connection to the solenoid enclosure. A fifteen foot long “in-cab wiring” harness is included. Make electrical connections to this cable as follows: (refer to electrical schematic supplied with the system as ordered).

   2.1 Connect red wire (labeled 12V) to truck 12V positive “fused and switched”.

Note: For the 12 Volt Power Connection, it is strongly **recommended** that the power to “arm” any ***BASE*** system be taken from a source that is energized only during pumping operations. Examples of this source would be an internal valve “open” indicator lamp, a PTO or park brake indicator lamp, or by installing a 12V low air (normally closed) pressure switch in the air line supplying park brake air dump valve.

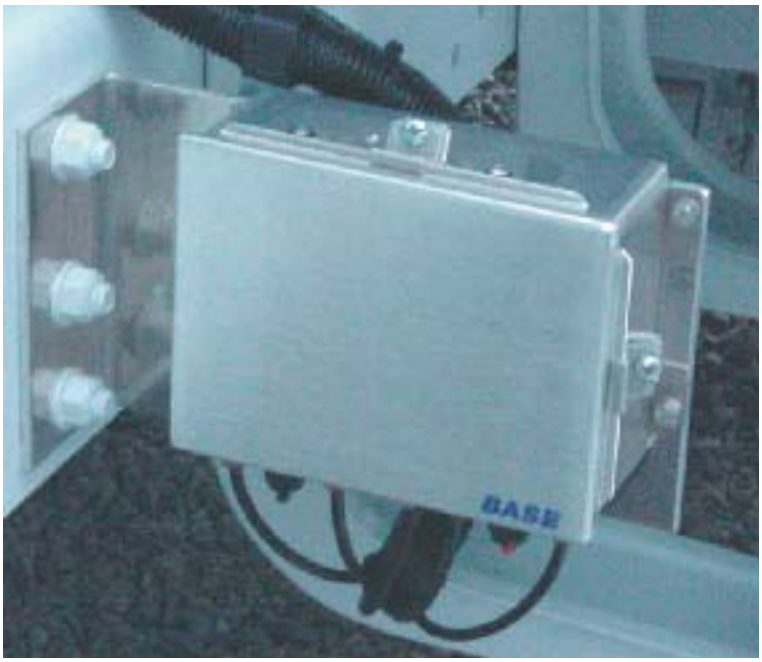
   2.2 Connect black wire (labeled GND) to a good chassis ground.

Note: For Negative or Ground Connection, it is **not** recommended to connect the PTO indicator lamp ground wire directly to the ***BASE*** system ground wire in order to have the PTO act as a switch. The ***BASE*** system receiver unit will ground to the chassis if fastened through metal. PTO or Emergency Brake ground wires can be used to ground an auxiliary relay, switching 12 Volts power to the ***BASE*** system.

Solenoid / Relay Unit Installation

1. Determine the location of the air solenoid/reverser box enclosure. This can be in the truck cab if space is available or can be directly behind the truck cab on the frame between the tank and cab. Note that air lines and battery cables feed in through the bottom of the enclosure. Mounting tabs are located at the top and bottom of the enclosure.

2. The solenoid enclosure has been pre-wired with a **10'** cable to connect with the receiver. Feed this cable up into the truck cab and connect it to the corresponding plug in the bottom of the receiver.



Antenna Installation

All ***BASE*** RF systems come with a standard 30ft coaxial antenna and flexible external antenna. The best location for the antenna is as **High** and to the **Rear** of the truck as possible. This will offer optimum range performance in conditions where obstructions block the “line of sight” to the antenna. Antennas mounted so that the truck’s tank is located between the operator and antenna will usually not perform to maximum range. Each ***BASE*** system is factory tested in excess of 300ft prior to packaging.

1. Install the antenna mounting bracket (supplied) to the rear gauge shield, clearance light bar, or meter cabinet. Feed the TNC male antenna fitting up through the bracket and secure in place with the retainer nut supplied. Thread the flexible antenna securely into position.

2. Route the antenna coaxial cable up to the cab of the truck and connect the TNC female end securely to the receiver unit previously installed. Recheck all antenna connections.

Note: Custom length antenna cables are available on request for applications such as cab-over, and tandem chassis.

PTO Control

1. **Clutch Piston:** "T" into the air supply leading from the PTO switch to the transmission mounted PTO. Run a ¼ inch air line from this "T" to the "inlet" side of the PTO air solenoid mounted in the ***BASE*** solenoid enclosure. Run a ¼ inch air line extension from the "outlet" side of the PTO air solenoid back to a clutch mounted air piston. Note that the solenoid air line connections require only a "push in and tug" to seat the plastic air lines in their fittings. Pushing the "PTO" button will energize the air solenoid causing the clutch actuator to extend, disengaging the clutch, transmission, PTO, and cargo pump. Pressing the "PTO" button a second time will release the clutch pedal engaging the clutch, transmission, PTO, and pump.

2. **Hot Shift**: If a "hot shift" PTO is used simply extend the existing PTO air-line into and out of the PTO air solenoid mounted in the ***BASE*** solenoid enclosure, placing the solenoid in-line with the existing air supply to the PTO. Pressing the "PTO" button will energize and de-energize the air solenoid valve supplying air to the PTO.

Note: Utilize the PTO manufactures supplied electric switch and air solenoid to "enable" the remote PTO control air supply.

3. **Electric PTO Control**: Where a chassis supplied air solenoid is used or a true electric PTO control exists simply connect the ***BASE*** supplied wire labeled "PTO" to the existing air solenoid or electric PTO switch. Pressing the "PTO" button will energize and de-energize this wire controlling the PTO. No other 12V supply to the PTO switch should be used.

Hose Reel Control

1. After the solenoid/relay enclosure has been mounted, connect battery and hose reel motor leads to the following terminals:
    - Connect 12V truck battery power to the circuit breaker
    - Connect truck battery ground to "Batt-" on R1
    - Connect Hose reel motor lead to "Stud 1" on R2
    - Connect Hose reel motor lead to "Rev Stud" on R1

2. If a truck mounted rewind button is to be used then obtain power for the rewind button from the position marked rewind on the terminal strip. This interlocks the motor control to only one direction at a time through the receiver otherwise a dead short can be created when depressing the transmitter button and rewind button at the same time.

Note: A diagram is provided when this feature is ordered showing proper relay wiring and identification.

Throttle Control

1. **12 Volt Positive Switched**

1.1 Locate the black and white wires leading from the receiver wiring harness labeled “Throttle 12V” and “Throttle Aux”.

1.2 The black “Throttle 12V” wire provides 12V when the transmitter button is activated. Connect black wire (labeled Throttle 12V) to the closed side an existing fast idle switch, relay, actuator, or ECM connection requiring +12 Volts.

1.3 Pressing the “Throttle” button will energize and de-energize the black wire electronically by remote control.

Note: The white “Throttle Aux” wire is only used on a computerized engine where a Negative or Ground signal is required to set the engine ECM to fast idle. If an electronically controlled (ECM) engine is being outfitted please consult with the engine manufacturer’s wiring requirements for auxiliary throttle control.

2. **12 Volt Negative Switched**

For these “grounded throttle” applications ***BASE*** systems should be ordered with the suffix “C” at the end of the model number. Hook up as follows:

2.1 Connect black wire (labeled Throttle N/O) to the engine ECM throttle wiring.
2.2 Connect white wire (labeled Throttle Aux) to the ECM throttle wiring.

Pressing the “THROTTLE” button will now connect the two wires electronically.

Emergency Stop Control

1. Locate the small part labeled “ignition relay”. Install this relay either under the hood or under the dash where it can be easily reached. Find the engine “hot” wire which will stop the engine when disconnected. Cut this wire and secure one side to pin # 30 on the relay and the other side to pin 87A. The relay should now be in series with the ignition wire. Secure a good chassis ground wire to pin 86 on the ignition relay. Locate the red wire labeled “ignition” leading from the receiver unit and secure it to pin 85 on the ignition relay. This will supply 12V to the relay when the transmitter button **Emergency Stop** is pressed, interrupting the trucks ignition circuit.

2. Locate the air line supplying air to the tank internal valve. Disconnect the air line *between the existing manual internal valve air switch and the internal valve. Re-route the supply side to the inlet of the air solenoid used to control the internal valve. Run an air line from the outlet side of the air solenoid back to the tank internal valve.

Note: The air solenoid can be installed either before or after the existing manual internal valve switch depending on customer preference. In either case the internal valve will close when the truck is driven away if the operator fails to first close the manual switch. Operators should **always** close the manual internal valve air switch following activation of the **Emergency Stop** function and at the end of each delivery. This will ensure that the valve does not re-open when the system is rearmed.

“H” Systems

1. Bolt the solenoid enclosure to the truck.

2. After the solenoid/relay enclosure has been mounted, connect battery and hose reel motor leads to the following terminals:
   - Connect 12V truck battery power to the circuit breaker.
   - Connect truck battery ground to “Batt-” on R1
   - Connect Hose reel motor lead to “Stud 1” on R2
   - Connect Hose reel motor lead to “Rev Stud” on R1

3. If a truck mounted rewind button is to be used then obtain power for the rewind button from the position marked “Rewind” on the terminal strip. This interlocks the motor control to only one direction at a time through the receiver otherwise a dead short can be created when depressing the transmitter button and rewind button at the same time.

Note: A diagram is provided when this feature is ordered showing proper relay wiring and identification.

“PUP” Systems

Systems can be ordered to supply separate internal valve controls for Tag-Along, Pups, or Transport Tanks requiring a Radio Remote Shut Down. These units plug into the cab mounted primary unit through a conventional tractor-trailer electrical plug. Truck engine kill is maintained in the cab while an auxiliary air solenoid enclosure is trailer mounted. Pressing the Emergency Stop button exhausts air from all solenoid enclosures and activates the Engine Kill relay. This feature must be requested at time of system ordering. Advise ***BASE*** if the unit is for a Tag-Along, Pup Trailer, or a conventional Tractor-Trailer.

Mount the auxiliary solenoid enclosure so as to have access to the trailer electrical plug (an unused pin **must** be used) and the internal valve(s) air supply. Interrupt the air supply to the internal valve and reconnect it to the “in” DOT air line fitting on the aluminum solenoid enclosure. Run an air line from the “out” DOT air line fitting back to the internal valve. A twenty foot wire has been provided to reach the trailer electrical plug. This may be shortened or extended as required. Connect this wire to an unused pin in the multi-pin trailer electrical plug.

Connect the In-Cab harness wire labeled “Aux Solenoid” to the corresponding tractor electrical plug pin. The trailer unit installation is now complete.

System Testing

The system is now installed and ready to test as follows:

1. Start the truck and allow air pressure/vacuum to build up.
2. Activate power to the unit through the switched power supply.
3. Make sure the trucks internal valve is open using the manual control.
4. Check the operation of PTO, THROTTLE, and HOSE REEL functions if applicable. **Be careful when testing hose reel operations making certain the remote control winds the hoss reel in the desired direction.**
5. Press the transmitter “stop” button and you should hear the internal valve close as the truck’s engine stops.
6. Turning the truck ignition all the way off before restart will re-arm the system and re-enable the tank internal valve.

Note: The transmitter **cannot** be used to re-open the tank internal valve. This has been designed into the system software to prevent accidental re-opening in a panic situation. Pressing the transmitter repeatedly will send the same “stop” message.

Battery Testing and Replacement

Transmitter battery life will vary depending on usage. Battery replacement is required when the transmitter low battery indicator LED **continually** flashes while pressing and holding the transmitter button down. The transmitter microprocessor watches the battery voltage and trips the LED located at the top of the transmitter when the voltage falls below a preset value. This is set to happen well in advance of battery failure but replacement should be a priority.

Note: A low battery test along with a complete system shut down test is recommended as part of a daily vehicle pre-check procedure.

System Troubleshooting

Little system maintenance is required. Care should be taken to provide clean air to the system through regular air tank draining and compressor maintenance. Heavy-duty truck and industrial Grade components have been used throughout the ***BASE*** system to provide maximum operating life. In the unlikely event of a component failure perform the following steps with the system energized:

1. Check transmitter battery condition. The **transmitter** LED should flash only for a brief instant during the pushing of the stop button.

2. Ensure that the **receiver** “power on” LED flashes briefly when power is switched to the system. This LED is located in the upper right of the receiver cover.

3. If this indicator lamp fails to blink when the system is energized the unit has lost its power or ground.

4. Remove the clamps from the aluminum solenoid valve enclosure (if equipped) and move the cover to one side. Check all terminal block screws, soldered connections, and ground lug connections for tightness.

5. Using a test lamp or multi meter check red wires and terminal connections for 12V power and the black wires and terminal connections for ground.

6. The air solenoid valve(s) should make an audible “click” when 12V is applied and removed from the positive connection.

7. An ohmmeter placed across pin numbers 30 and 87A on the ignition relay should indicate resistance until the transmitter stop button is pressed. If the relay is working properly the relay contact will “break” the ignition circuit when the transmitter is used.

Beyond these basic wiring checks it may be much more productive to simply unplug the system and replace the unit. Disconnect the quick connect plugs at the base of the receiver then disconnect the antenna located at the top of the unit. Contact your nearest distributor or the factory at **1-800-924-1010** for immediate shipment of a replacement unit. Return the inoperative unit to the distributor or factory for evaluation and repair.

Programming and Set Up Options

Standard Operating Modes

Each channel of the receiver can be programmed to operate in one of six standard modes:

1. Momentary
2. Latched
3. Safety Latched
4. Query
5. Boom
6. Enable

Note: Systems ordered with ”QUERY” or “DELAY” programming options are pre-wired and pre-programmed by the factory and are channel specific.

Momentary
A channel programmed for **Momentary** is activated ONLY when the corresponding transmitter button is depressed. This operation is similar to a momentary push-button; push to activate, release to de-activate.

Latched
A channel programmed for **Latched** is changed from deactivated to activated when the corresponding button is pressed on the transmitter. Once the transmitter button is released, the channel remains activated on the receiver. Pressing the button a second time and releasing it on the transmitter causes the receiver channel to change from activated to de-activated. This operation is similar to a push-on, push off switch. Push once to activate, push again to deactivate.

Safety Latched
A channel programmed for **Safety Latched** is changed from deactivated to activated when the “Emergency Stop” button on the transmitter is pressed. Pressing the button on the transmitter repeatedly will have no effect – this channel on the receiver will remain “latched”. The only way to “reset” a channel programmed for safety latched is to cycle the system power off and on. This is usually done with the trucks ignition key.

Query
A channel programmed for **Query** is used to stop the delivery operation if the operator fails to “tell” the truck that he is paying attention. Once the delivery operation begins the operator must press the transmitter “QUERY” button within 5 minutes to keep the truck pumping. Pressing this button restarts the 5-minute system timer. Failure to press this button will result in an audible 30 second warning, through the trucks back-up alarm, prior to shut down. Pressing the “QUERY” button will stop the alarm and restart the timer. Failure to press the button during the alarm warning will cause the Emergency Stop function to automatically activate. This feature is pre-programmed by the factory and requires a wire connection be made to the trucks back up alarm. A wiring diagram is provided when this feature is ordered. The suffix “Q” after the model number signifies a Query function.

Boom
A channel programmed for **Boom** allows the operation of various boom controls, such as up, down, left, right, etc. In addition this function has a three speed control allowing the operator to move the boom at a slow, medium, and high speed.

Enable
This feature, which applies to channel 7 only, is a safety function which is mandatory if any of the first six channels are programmed for Boom functions. This requires the operator to press the Enable button prior to operating any of the Boom controls to ensure that the intended operation is clear and safe. Note that there is no relay outputs when channel 7 is programmed as Enable.

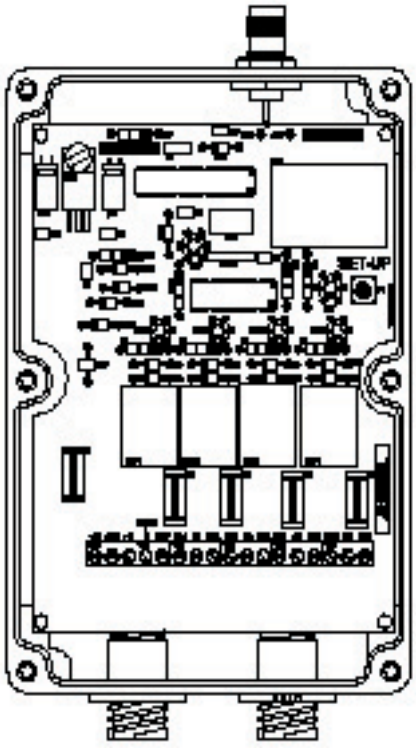
Note: The key/power must be turned completely off to allow reset. This feature prevents undesired re-opening of valves in the event of a panic situation where the transmitter is repeatedly pressed.

Re-programming or Changing Channel Operation Modes

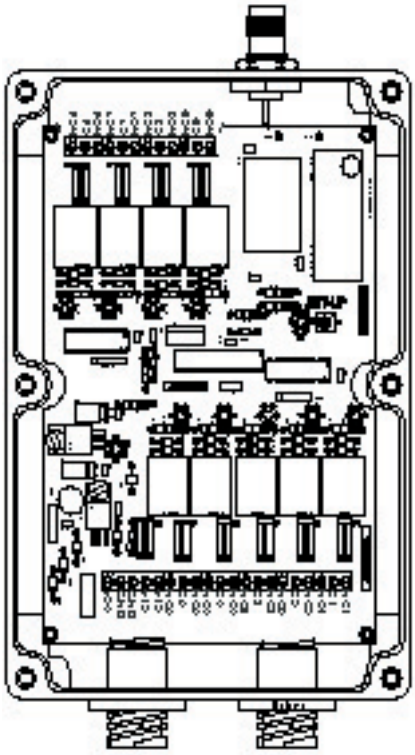
Each channel can be individually set to operate in one of the six modes described earlier. The programming operation involves removing the cover on the receiver unit and pressing a set-up button on the internal circuit board several times while watching the red led indicator.

Note: Channel numbers run from top to bottom on the transmitter unit, and from lower right to lower left on the receiver unit.

One to Four Channel System



Five to Eight Channel System



Steps to program each channel:

1. Turn power off to the receiver unit.

2. Remove the cover of the receiver unit and locate the set-up push button on the internal circuit board as well as the indicator LED beside it. This button is used to program all internal settings in the receiver.

3. Turn power on to the receiver unit – watch that the indicator led blinks once – this indicates that the receiver is functioning properly. Once you have started the programming operation if you lose track of your place in the sequence, turn the power off and then on again to start the operation over.

4. Press the set-up button 10 times in a row – quite quickly – about 2-3 times a second. Once the button has been pressed 10. Verify the LED indicator blinks 10 times. The receiver is now in "**learning mode**".

5. Once the led has blinked 10 times, the receiver unit is waiting for the "**channel number**". Press the button the number of times corresponding to the channel you wish to set. For example, one press for channel 1, two presses for channel 2.

6. The led will blink the number of times to verify that you have selected the correct channel. If you have not selected the proper channel or lose track of how many times you have pressed the button, turn the power off and then on again and start from the first step above.

7. Now that the channel has been selected, the "**operating mode**" for this channel must be set. Press the button the number of times below for the mode of operation desired for the channel – see elsewhere in the manual for a description of these modes of operation:

1 Press	-Channel will be **momentary** operation
2 Presses	-Channel will be **latched** operation
3 Presses	-Channel will be **safety-latched** operation
4 Presses	-Channel will be **query** operation
5 Presses	-Channel will be **boom** operation
6 Presses	-Channel will be **enable** operation

8. The led will blink the number of times you have pressed the button and then will go out. The programming of the channel operation mode is now complete.

Note: Programmed settings are not lost when the power is turned off to the unit and will be active the next time the receiver is powered up again.

Clearing All Programmed Settings to Momentary Settings

To clear all programmed settings in the receiver to the default momentary values, proceed as follows:

1. While pressing and holding the button down, turn the power to the receiver unit on.
2. Wait until the red LED on the circuit board blinks 3 times and then release the button.
3. The receiver settings have now been erased and replaced with the factory values.

ID Codes

There are no switches in either the receiver or transmitter units that are used to set an “ID” code between the pair. All transmitters have a unique signature code of ID that is factory set and cannot be changed. In order for a transmitter to operate a receiver, the receiver has to “learn” the proper code of the transmitter. It is also possible to clear the ID code in the receiver so that any transmitter will operate the receiver.

Teaching the Receiver a new Transmitter ID Code

Each transmitter unit contains a unique serial number or “ID Code” that is set at the factory and cannot be altered in the field. In order that a transmitter can operate a particular receiver unit, the receiver unit must first “learn” the transmitter’s ID Code so that it will respond to commands from that transmitter.

All complete BASE systems are factory “paired” prior to shipping.

If a transmitter is used that has not been “learned” by the receiver, the receiver will not function with that transmitter. To teach a receiver the new ID code of a transmitter, follow the steps below:

1. Turn power off to the receiver.

2. Remove the cover of the receiver unit and locate the set-up pushbutton on the internal circuit board as well as the indicator led (D2) beside it. This button is used to program all internal settings in the receiver.

3. Turn power on to the receiver – watch that the indicator led blinks once – this indicates that the receiver is functioning properly.

4. Press the set-up button 5 times in a row – quite quickly – about 2-3 times a second. Once the button has been pressed 5 times in a row – watch the led indicator. It should blink 5 times to indicate it is now waiting for a transmitter to learn.

5. Take the replacement transmitter that is to be used with this receiver and press any button on it for 2 seconds or more.

6. This completes the learning process. The ID of this transmitter is stored in memory in the receiver and will not be lost when the power is turned off. The above process can be repeated whenever a new or different transmitter is to be used with the receiver. Only one transmitter at a time can be used with the receiver.

Clearing ID Setting In Receiver

Once the receiver has learned the transmitter, it will not operate with any other transmitters. It is possible to set the receiver to recognize ALL transmitters by clearing the ID settings that has been programmed into it. To clear the ID setting in the receiver:

1. Turn power off to the receiver.

2. Remove the cover of the receiver unit and locate the set-up pushbutton on the internal circuit board as well as the indicator led (D2) beside it. This button is used to program all internal settings in the receiver.

3. Turn the power on to the receiver – watch that the indicator led blinks once- this indicates that the receiver is functioning properly.

4. Press the set-up push button 15 times in a row – not too slow – about 2 times a second. Once the button has been pressed 15 times in a row – watch the led indicator. It should blink 15 times to confirm that it is clearing the ID in memory.

5. This completes the clearing ID process – all transmitters will now operate this receiver.

Default Settings

One to 4 channel Systems

Channel 1 - Momentary
Channel 2 - Momentary
Channel 3 - Momentary
Channel 4 - Momentary

Five to 8 channel Systems

Channel 1 - Boom
Channel 2 - Boom
Channel 3 - Boom
Channel 4 - Boom
Channel 5 - Momentary
Channel 6 - Momentary
Channel 7 - Enable
Channel 8 - Safety - Latched

ID - All transmitters will operate this receiver

Programming Operation Summary

Learn New Transmitter ID: Push 5X - Wait 5 blinks Press Transmitter for 2 Seconds	**Clear ID Setting:** Push 15X - Wait 15 blinks Receiver Accepts All Transmitters
Set Channel Operation Mode: Push 10X - Wait 10 Blinks Push Channel # - Wait # Blinks Push Mode # - Wait # Blinks Mode 1 = Momentary Mode 2 = Latched Mode 3 = Safety Latched Mode 4 = Query Mode 5 = Boom Mode 6 = Enable	**Reset To Factory Settings:** Turn Power Off Press & Hold Learn Button Turn Power On - Wait 3 blinks Release Learn Button ID = is now Cleared Channels 1 through 8 are now Momentary

Receiver Unit Electrical Connection Details

Channel Output Description

Each channel output is a dry-relay contact capable of 10 amps maximum. The **recommended** maximum steady state current for each channel outpost is **7.5 amps**. Connections provided to the relay on a three position terminal block for each of the four channels. One connection is the common terminal, the other two are normally closed and normally open – these are indicated on the circuit board beside each terminal block.

Note: The maximum cumulative load of all 8 channels is 10 amps.

Channel Fusing

Each relay output channel has a fuse position for a standard “auto-fuse” to be inserted. Provide a fuse for each channel based on the current expected to operate the devise connected to the relay but – DO NOT EXCEED 10 AMPs ON ANY CHANNEL.

Receiver Power Supply

The power supply connections are provided on a two position terminal block shown in the diagram. Note +12 and GND carefully – a power supply switch if required must be provided external from the receiver unit.

Receiver Power Supply Fusing

A standard “autofuse” fuse is located on the circuit board for the power that is routed to the electronics (power through the relays is fused separately – see earlier description). This fuse is to be 2 Amp – DO NOT EXCEED THIS VALUE OF FUSE FOR THE POWER SUPPLY.

Information on Fuses

Fuses used in the receiver are standard “Auto-Fuse” type, commonly available at many auto/truck supply centers.

Example: Manufacturer: **Littlefuse**
Type: **Low Voltage Autofuse Fuse Fast Acting Type ATO 257**
Example P/N: **257 010 (Type 257 Fuse – 10 Amp Rating)**

Fuse Sizes

There are up to five fuse sockets on the receiver circuit board – one for each of the output circuits of the relays plus one socket for the fuse that protects the electronic circuits.

Electronic Circuits on Receiver Circuit Board: **2 AMP**
Relay Output Circuits Connected to External Equipment: **10 Amp Maximum**

Note: The size of fuse that will be used in these depends on what is being controlled by the relay contacts. Under NO circumstances EXCEED 10 AMPS PER RELAY CONTACT CIRCUIT.

For complete factory technical support call **1-800-924-1010**.

12 Volt Power Supply Options

Pressure Switch Installation

The preferred method of “arming” a ***BASE*** system is through a normally closed “low-air” pressure switch installed in the Park Brake air **exhaust** line. This is the plastic tubing connected to the dash mounted parking brake “Pull” switch. Pulling the switch will exhaust air to the spring brakes while switching 12V power to the ***BASE*** system. Run a keyed and fused 12 volt 10 amp supply to one terminal on the pressure switch. Connect the “12V Power” wire from the ***BASE*** system to the other terminal (N/C). This method ensures that the system is not armed while the truck is in motion.

PTO or Park Brake Ground Activation

Trucks with or without air brakes can use an alternative method to safely “arm” a ***BASE*** system. Using a common 5 pin relay similar to an Ignition Relay, a negative or ground connection to the PTO or Park Brake indicator lamp is used to activate the relay. Connect a keyed and fused 12V positive supply to pin 85 on the relay. Make a jumper wire from pin 85 to pin 30 of the relay. Connect the “12V Power” wire from the ***BASE*** system to pin 87 on the relay. Connect your ground wire from the PTO or Park Brake indicator lamp to pin 86 on the relay. Engaging the PTO or Park Brake will now supply a ground to the relay “arming” the ***BASE*** system. **Please refer to drawing number 00242 for additional information.**

Note: The chassis ground wire included in the ***BASE*** system should always be securely grounded to the chassis. Using this wire to switch the ***BASE*** system ON and OFF will **not** work as the system’s aluminum enclosure and antenna may also supply a ground turning the system ON when not required.

Special Function Installation Procedure

Time Delay

The Time Delay option on the 4 channel systems allows for a programmable time delay between the pressing of the channel 1 transmitter button and the activation of the channel 4 relay output. A common application of this feature is when a time delay is required between the opening of the internal valve and the engagement of the PTO. The Time Delay feature is programmable for delay times of 1 to 15 seconds. Please note that this feature must be specified at the time the system is purchased.

To Program a *BASE* System for Time Delay Operation

1. Press the “set-up” button on the receiver 12 times and wait for the 12 flashes of Led D2.

2. Press the “set-up” button the number of times corresponding to the desired number of seconds of delay (i.e. 5 presses for 5 seconds delay).

Radio Remote Controls Special Feature Operation

Query Mode Operation

Query Mode of operation requires that the operator press the appropriate transmitter button on a regular basis to reinitialize the internal BASE system timer thus preventing a time-out condition and the associated channel activation. There are two types of query modes, Basic and Query with Enable Channel.

Basic Query Operation

During normal operation, if the receiver unit does not receive a transmission from the corresponding button on the hand-held transmitter for 5 minutes, the query channel will be activated. The timing for the query begins as soon as the power is applied to the BASE receiver, which is normally when the park brake is set. Pressing the button on the transmitter after the system has timed out will have no effect. To clear the activated channel, the operator must press the reset button on the receiver OR turn the power off, then wait a few seconds and then on again.

A channel is deemed activated when the relay is energized for that channel and the associated led on the receiver circuit board is lit. In other words, an active relay is one that has the common and normally open contacts connected together.

Query with Enable Channel Operation

The Query with Enable Channel operates as in the basic mode but with the added feature that the query mode will only be operational when a specified channel is “activated”. The timing for the query function will begin only when the Enable Channel is activated and not when the system is powered up.

When the channel that has been identified as a query enable channel is inactive, the query mode is not operational and the operator does not have to query the receiver within a 5 minute time period. When a query enable channel has been switched from inactive to active, the 5 minute timer is re-loaded with a full 5 minutes time again and the query mode becomes operational again.

Note: The query enable channel can be operated in any of the modes possible (momentary, latched, emergency latched or query), but the only mode that is useful for this feature is latched mode. Latched mode is where the channel can be activated and left in the active state for a period of time as in the PTO operation.

The most common use of the query enable channel operation is one where the enable channel is the PTO channel. When the PTO is engaged and pumping is taking place, the query mode is “live” and the operator must query the receiver every 5 minutes. When the PTO is disengaged, the query mode is not operational and the operator could for example, leave the truck idling outside during the winter months for a period of time without having the truck automatically shut down after 5 minutes.

To program the *BASE* system for Basic Query operation:

1. Press the “set-up” button on the receiver 10 times, and then wait for 10 flashes of led D2.
2. Press the “set-up” button the number of times for which channel is to be the query channel, (1,2,3,4,5,6,7 or 8), and wait for the proper number of flashes (1,2,3,4,5,6,7 or 8).
3. Press the button four times to indicate mode 4 (Query Mode), and wait for four flashes.

To program the *BASE* system for Query with Enable Channel operation:

1. Program the ***BASE*** system for Basic query using the steps above.
2. Press the “set-up” button on the receiver 7 times.
3. Wait for the led, D2 to blink seven times.
4. Press the “set-up” button on the receiver the number of times to identify which channel is to be the query enable channel (i.e. 1,2,3,4,5,6,7 or 8 presses).

To Clear the Query Enable Channel (Basic Query – No Enable Channel Used):

1. Press the “set-up” button on the receiver 12 times.
2. Wait for the led, D2 to blink 12 times.