

WIRELESS REMOTE CONTROLS & INTEGRATED FUEL DELIVERY SYSTEMS



2020 Rev. A

Contents

INTRODUCTION	3
WHO WE ARE	4 - 5
FACILITY	6 - 7
PROCONTROL3 INTEGRATED FUEL DELIVERY SYSTEM	8 - 13
BASESTATION AUTOMATION SUITE	14 - 17
ASKW E-STOP	18 - 22
ASKF BULK PLANT E-STOP	23 -25
ASKR RANGER	26 -27
LDS LEAK DETECTION SYSTEM	28 -29
DEADMAN	30 -31
EXPLOSION PROOF ENCLOSURE	32
DAS DRIVER AUTHORIZATION SYSTEM	33
MORE INFO	34
MEC WITH THE POWER OF BASE	35
GET IN TOUCH	36

Introduction

BASE ENGINEERING IS A WORLD LEADER IN DEVELOPING WIRELESS CONTROL TECHNOLOGY FOR THE OIL & GAS INDUSTRY. SINCE 1996 OVER 100,000 BASE SYSTEMS HAVE BEEN DEPLOYED AROUND THE GLOBE.



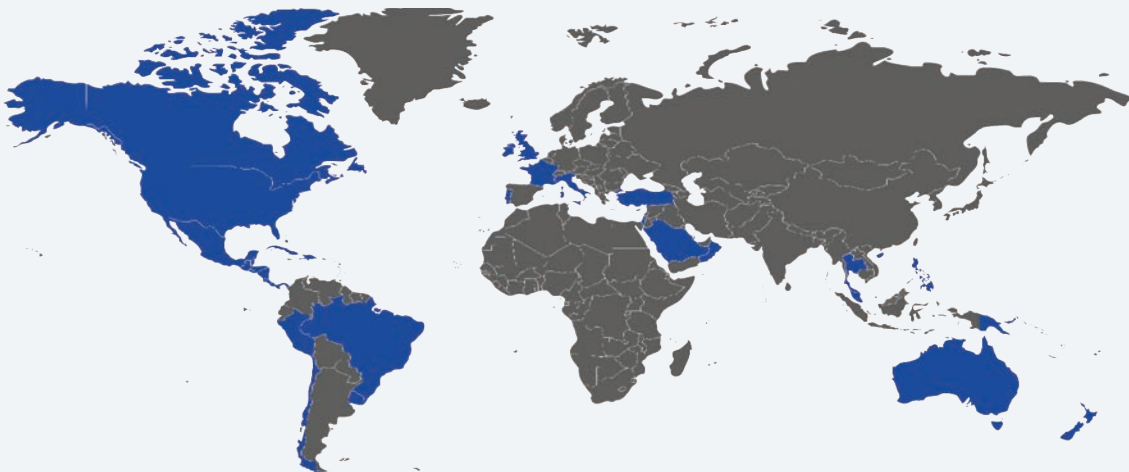
A LETTER FROM OUR PRESIDENT

“We Speak Truck” is a term we use to describe who we are as a company. Our crew is made up of Oil & Gas industry experts. We have fleet managers, tank-truck builders, specialists in explosion proof electronic design, fuel delivery measurement, and back office software people who have driven tank trucks, pulled hoses, and delivered everything from jet fuel to propane. Together we’ve been managing, designing, building, and supporting these activities for the Oil & Gas industry for many years - our passion and capabilities run as deep as these three words imply.

It’s an honor and privilege to serve our industry.

Steve Belyea
President
BASE Engineering Inc.

OUR GLOBAL REACH



Who We Are

WE SPEAK TRUCK

BASE systems can be found in propane, petrochemical, aviation, construction, refined fuels and military service. We specialize in systems for extreme conditions and are experts at hazardous location solutions. We thoroughly understand the special requirements of the Oil & Gas industry and our systems provide safe, reliable wireless control, data aggregation, reporting and transmission.

VALUES

CUSTOMER FOCUS

We foster commitment by driving passion, innovation, and a customer-focused approach throughout our organization.

CUSTOMER SERVICE

We provide outstanding products & unsurpassed service to our customers. We want our customers to measure the results we produce.

CUSTOMER NEEDS

We crave knowledge of our customers emerging needs and adapt our products and services to meet them.



We are a close knit team that revels in the positive experience of our customers while exceeding their expectations

DNA

● 1980 - 1995

Steve Belyea operated an Aircraft Refueler truck in Calgary, Alberta. He was the Fleet manager for Irving Oil where he developed the Oil & Gas Industry's first 'Smart Truck' with wireless reporting to the back office.

● 1996 - 1997

BASE Engineering was founded in 1996 with the first wireless handheld controller developed in 1997 specifically for fuel delivery.

● 1998 - 2002

The first Leak Detection System (LDS), and Driver Authorization System (DAS) were developed in 2001, followed by our first Remote Meter Readout system in 2002.

● 2003 - 2012

First milestone of 50,000 BASE systems were sold and deployed around the globe. We received Global safety approvals for our hazardous location wireless technology.

● 2013 - 2016

BASE completed its 20th year with over 80,000 systems deployed worldwide. Global ATEX certification was received, and the BASEstation Automation System launched.

● 2017 - 2020

In 2017 Marshall Excelsior Company and BASE Engineering join forces. BASE launched the ProControl3 Universal Remote.

Facility

**HEADQUARTERED IN SAINT JOHN NB, CANADA,
BASE ENGINEERING EMPLOYS 48 PEOPLE IN ITS
OWN FULLY RESTORED 22,000 SQ.FT, 100 YEAR
OLD VINTAGE AUTOMOBILE FACTORY**



Front Lobby



Production Floor



Shipping & Receiving



Training Mezzanine



BASE ENGINEERING INC.

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ProControl³

FUEL DELIVERY SYSTEM

1

**ADDITIONAL
DELIVERY PER ROUTE**

275

**ADDITIONAL
GALLONS DELIVERED
PER ROUTE**

\$495

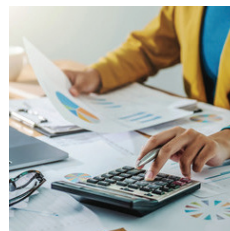
**ADDITIONAL
REVENUE GENERATED
PER ROUTE**



Via increased operator efficiency, as reported by current customer base.



Based on 500 gallon residential tank, filling at 1/4 full to 80 percent.



https://www.eia.gov/dnav/pet/pet_pri_wfr_a_EPLL-PA_PRS_dpgal_w.htm

Universal Remote Control

ProControl3 - BASE Engineering's newly designed handheld control center - is the first and only all-in-one wireless solution for the Oil & Gas Industry

Complete delivery management

Monitor & control all key system functions

Automate processes to increase efficiency

Wirelessly, from the end of the hose

Designed specifically for the fuel industry by the company with over 100,000 systems on fuel trucks around the world, this universal remote can significantly improve delivery efficiency and reduce costly fueling mistakes.

This system is easily retrofitted to existing trucks or installed on new equipment.



NEW



MEC Smart Interlock Integration

The Base ProControl3 Universal remote is now compatible with all MEC Smart Interlock devices for increased safety and efficiency of LPG trucks.

- MEC Interlocks prevent delivery trucks from operating under unsafe conditions by responding to the presence or absence of other devices, such as a door being latched, or a hose nozzle being seated in its storage housing.
- The PC3 receiver reads the interlock sensor signal and transmits them to the handheld for display. The user simply enters the MAIN MENU and selects the INTERLOCK STATUS icon to view a list of the interlocks and their state.
- This upgrade allows for the connection of up to 5 smart interlocks to be integrated with the PC3 handheld for fast & easy visual indication of truck interlock status.
- Not only does this function add a layer of safety, it also increases reliability by allowing for rapid and accurate real time troubleshooting of interlocks while the truck is on route.



ProControl3 Barcode Scanner

Coupled with the ProControl3 RFID reader is the new Barcode Scanning feature. This option allows the fleet manager the flexibility of choosing between our rugged RFID tags or inexpensive universal barcodes for asset identification.

Whether a residential, commercial or fleet fueling delivery; the barcode and RFID features eliminate the need for your operator to manually identify the fill point. The scanner on the PC3 illuminates and reads the barcode or RFID tag for identification of each account, vehicle or piece of equipment. With an OBC storing the customer asset data, the ProControl3 begins the delivery process from the end of the hose capturing the volume delivered for each piece of equipment. Eliminating the need to return to the cab of the truck for manual data entry or delivery ticket manipulation, streamlining your process.



Lube Truck Application

The ProControl3 Lube Truck feature enables complete delivery control of both tank truck and box truck lube delivery systems.

With its sophisticated logic, PC3 can control up to 8 meters, 15 totes or compartments, and multiple pumps.

The fully automated system allows for the inter-connection of product, compartment, meter, pump and purge functionality. When combined with our application specific design, the PC3 sets the industry standard in cross contamination prevention and operator efficiency.

ProControl3 Enhanced Point of Sale



Full Point of Sale

An easy to use delivery setup menu controls all available delivery pricing parameters including price per unit, taxes, discounts, miscellaneous charges and presets, for single or multi-meter applications, all extending to the ticket, creating a customer invoice at the time of delivery.

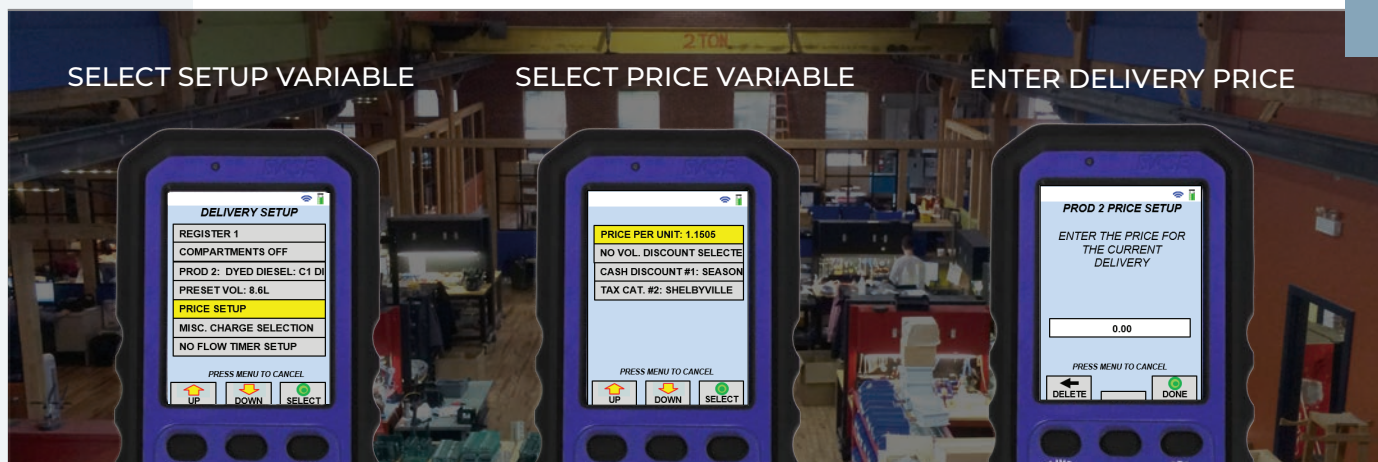
Enhanced Security

The PC3 Point of Sale improves delivery system security with administrative level settings that are password protected. Managers are able to access register setup, product codes/details and register diagnostics; enabling and disabling delivery parameters. Operators have access to the appropriate delivery functions, preventing costly mistakes.

Increased Efficiency

The sophisticated logic of the PC3 allows for the inter-linking of product, compartment, meter, pump and hose reel functionality. Automating your delivery process, without the need for additional hardware.

OPERATION OVERVIEW



When connected to any LCR register with pricing enabled, the PC3 allows for full point of sale functionality; pricing, tax, discounts, miscellaneous charges, etc. which will extend wirelessly to the delivery ticket - straight from the palm of your hand!

The intuitive simple to use menu allows the operator to press the delivery setup button on the handheld which brings them to the delivery setup menu. Next the operator is presented with the delivery options that are available to customize as was predefined per delivery. Once the desired parameter to be adjusted is selected the PC3 moves through the subsequent screen flows thus, customizing only those delivery parameters required.

Features

ENTRY POINT TO A FULL AUTOMATION DELIVERY SYSTEM



- Brilliant 3/5" color back-lit display with heater for optimal performance regardless of climate
- Shock, weather, explosion proof and fully submersible IP67 design
- Alpha-numeric keypad for enhanced control, including hose-end data entry
- Radio signal strength and low battery indicator
- Vibration and audible alarm feedback and messaging
- Standard in-cab charging cradle facilitates field software updates and includes an optional interlock to prevent 'drive aways' without remote
- Operator control of up to 8 custom remote functions, complimented by customizable delivery screens specific to your operation
- Works with all types of electronic and mechanical registers, including multi-meter configurations
- Real-time meter volume display to 1/10th of a unit, with Product, Preset, Start, Stop and Print control along with electronic register status
- Intuitive menu driven user interface includes simple to use diagnostic and dedication wizards
- Full suite of payload function controls and status indicators including PTO, Throttle, Interlock status, Product, Meter, and Compartment
- Direct control of all delivery functions from the end of the hose making for an ideal 'will call' management system



**PROCONTROL3
PRODUCT VIDEO**

SCAN ME

Complete Control

- Hose Reel remote control allows operator to unwind or rewind delivery hose, reducing the hose wear and tear; and injury claims
- Tank valves can be opened with automatic 'delay' feature to engage PTO/cargo pumps. Allows piping to charge preventing internal valve slugging which reduces pump wear by engaging pump only when the product line is charged and nozzle is connected to tank
- Engine RPM can be remotely controlled to increase or decrease pump volume
- Emergency Stop feature closes all tank valves and stops the truck engine
- Available with optional 5-minute 'Query' automatic emergency shut-down feature
- Designed to work seamlessly with the BASEstation On-Board Computer and other industry leading automation systems
- Perform pre-trip truck inspections and produce a printed report (requires on-board computer interface)
- RFID and Barcode 'Scan & Pump' technology helps prevent theft, tracks tank assets, and ensures the appropriate product is delivered and the right customer gets invoiced (requires on-board computer interface)
- New Smart Receiver allows for future expandability of I/O for engine, tank equipment, chassis, and automation needs
- Designed and built in-house at BASE Engineering



BASEstation

TRUCK MOUNTED ON-BOARD COMPUTER

Taking a step beyond the capabilities of a stand-alone ProControl3 system, at the center of BASE's Automation platform, the BASEstation HUB does all of the heavy lifting for the fully automated truck. The HUB communicates with the ProControl3, the BASEstation Android Tablet and other third-party devices. It connects the chassis, the tank, the pumps, the valves, the meter, the gauges and the engine to get a thorough understanding of what's happening on the truck. All data collected and stored in the HUB can be transmitted real-time to the back office through a variety of methods including cellular, WiFi, and USB sticks.



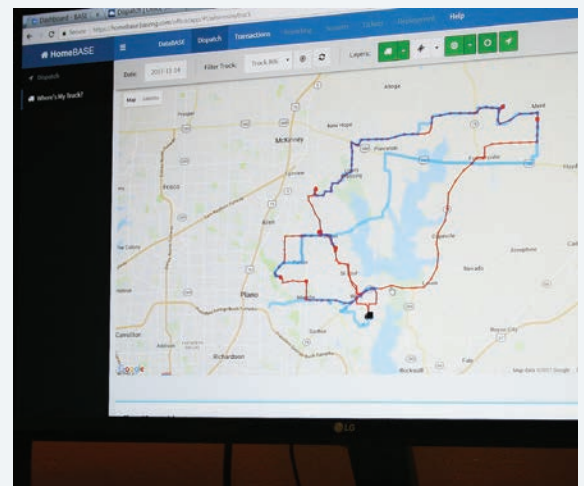
HUB

- Mounts in-cab like standard BASE receivers
- Two-way data communication to back office using our secure and 99.99% uptime cloud service or directly using our cellular, WiFi, or USB connections
- Maintains detailed customer database, and optimized route
- Sends, receives, updates, and stores delivery data until signal available or USB download
- Connects to all industry standard electronic registers; integrating with each register manufacturer's file-formats
- I/O to connect to in-cab printers, truck gauges, tank valves, flow meters, PTO, hose reel, engine, and other accessories
- Connects via Wi-Fi or Ethernet to optional rugged BASEstation Android tablet and other wireless devices

HOMEbase

The HomeBASE, office control center pulls delivery data from your back office, optimizes and dispatches routes, then synchronizes with your trucks via USB, WiFi, or real-time cellular.

- Route Optimization - Dispatch
- Where's My Truck
- Viewing Customer DataBase
- Verify transactions
- Reporting



Configurations



HUB & PROCONTROL3

- All PC3 standard functionality, plus complete BASEstation system control in the palm of your hand
- Customized data entry and display screens, configured to match the “day in the life” of a truck driver
- Perform, record & print DOT pre-trip inspections with handheld
- Captures and displays inventory levels on truck - both initial loading and post delivery
- Displays optimized customer delivery list, will calls and remaining deliveries
- Built-in GPS brings up customer account details automatically when in proximity
- Search by customer name, location or address, or use the built-in RFID or barcode scanner to pull up detailed account information to scan, pump, and invoice automatically
- Flow rate display, payload control and system status
- In addition to register's Weights & Measures block, system prints customer invoice details
- Scans RFID or Barcode tags for customer asset identification
- Account for non-metered transactions, such as miscellaneous charges and packaged goods
- Produces detailed 'end of shift' reconciliation report

HUB & TABLET

- Ruggedized touchscreen tablet design ideally suited for intuitive in-cab control center
- Show customized data entry and display screens, configured to match the “day in the life” of a truck driver
- Wi-Fi or Ethernet connection to BASEstation HUB
- Touchscreen captures driver input, such as log-in details, signature capture, inventory, percentage full and payments received
- Perform, record, and print DOT pre-trip truck inspections - includes built-in camera, allowing for photos
- Captures and displays inventory levels on truck - both initial loading and post delivery
- Displays optimized customer delivery list, will calls, and remaining deliveries
- Turn by turn map navigation to customer location
- Built-in GPS brings up customer account details automatically when in proximity
- Search by customer name, location, or address
- Complete measurement system control and real-time status indication
- Portable for customer signature if required

Fleet Fueling

PROCONTROL3 WITH RFID AND BARCODE



Asset Identification

Rugged RFID tags or inexpensive Barcodes are affixed to each vehicle or piece of equipment. The fuel truck operator reads the ID with a simple button push on the BASE handheld which records the vehicle ID and identifies the appropriate product. The operator then uses the same remote control to start the pump, increase the flow if needed, monitor the volume of fuel delivered, and shut down the pumping operation in the event of an emergency. The handheld captures the exact volume delivered to each piece of equipment without returning to the truck for manual data entry.

Customer Tank Interlock

Prevents unintended tank filling. When the fuel truck operator scans either the RFID tag or barcode on his/her ProControl3, the ID information and product for this specific tank is transmitted back to the BASEstation Hub on the truck. If the tank ID corresponds to an authorized customer delivery then the system automatically authorizes the correct meter and opens the corresponding product compartment. Pushing "PTO" or "Pump" button on the remote will start the delivery process. If no signal is received the pump will not operate. Unauthorized, accidental, or incompatible product deliveries cannot be made without the deliberate multi-step bypass sequence that is "red-flagged" to management.

Asset Tracking

Tank location is confirmed with each delivery and fed daily to the back-office database. A report is generated showing the location of all "active" tanks and the last known location of all "inactive" tanks.

Tanks that are exchanged in the field will show the new ID, date, and location of subsequent fills. Tanks that are taken out of service for repair/testing will be logged as such when the new ID is assigned. This helps to manage tank inventory and track asset location.

*RFID and barcode option requires an interface to an on-board computer database.



PROCONTROL3 HANDHELD SPECIFICATIONS

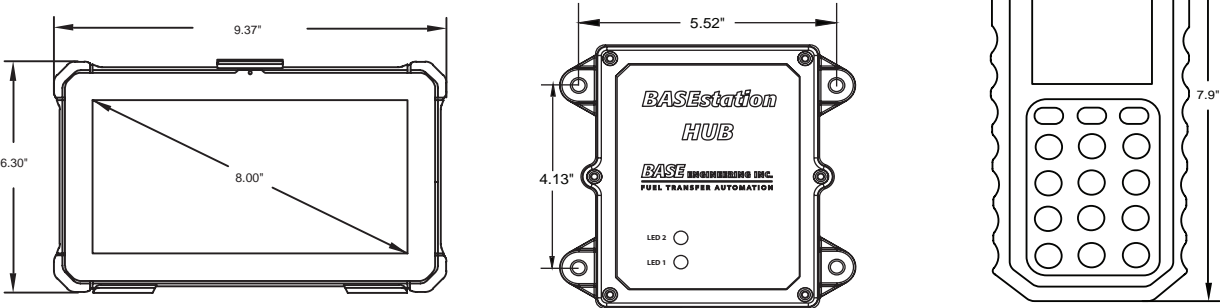
SCREEN	3.5" color LCD, 240 x 320 (QVGA)
FREQUENCY OF OPERATION	2.4 GHz DSS or 900MHz FHS
TRANSMITTER POWER	Up to 60mW
METHOD OF TRANSMISSION	56 bit DES encryption key
ANTENNA	Internal (no visible antenna to damage)
NORMAL RANGE	1000 ft (300m)
CONSTRUCTION	Designed to IP67 and explosion-proof standards
TEMPERATURE SPECIFICATION	Minus 20°F to 125°F
BATTERY LIFE	Up to 12 hours of continuous transmission, with low battery indicator
BATTERY TYPE	Rechargeable Lithium Ion supplied with 12/24VDC charging cradle
ROHS LEAD-FREE COMPLIANT FCC	Approved system meets US and Canadian DOT requirements for "Off Truck" remote controls

BASESTATION HUB SPECIFICATIONS

FREQUENCY OF OPERATION	WiFi: Dual frequency 2.4GHz/5GHz GPS: 1575.42MHz with PC3 RX: 2.4GHz
POWER SUPPLY	12/24VDC
CURRENT LOAD	Up to 3A without RX power Upt to 13A with PC3 RX
CONSTRUCTION	Dust-proof plastic enclosure
ANTENNA	External combo antenna included
WIRING CONNECTIONS	Pre-wired to meet customer requirements, quick connect fittings supplied
TOTAL SYSTEM WEIGHT	2.2lbs, 4.2lbs with PC3 TX

BASESTATION ANDROID TABLET SPECIFICATIONS

FREQUENCY OF OPERATION	WiFi: Dual frequency 2.4GHz/5GHz GPS: 1575.42MHz with PC3 RX: 2.4GHz
POWER SUPPLY	5V USB
CURRENT LOAD	1.5A when charging
CONSTRUCTION	IP65 rated, ruggedized, 8" TFT LCD touch screen
ANTENNA	Internal antenna
WIRING CONNECTIONS	USB Type A charging and comm, RS232 serial, Ethernet
TOTAL SYSTEM WEIGHT	1.25 lbs
ROHS LEAD-FREE COMPLIANT	



ASKW E-Stop

WIRELESS EMERGENCY STOP SYSTEMS - PORTABLE TRANSMITTERS

The ASKW Emergency Stop handheld is rugged, weather-proof and reliable, even in the most hazardous environments. Providing a mobile, out of cab safety solution, this handheld is the result of over 20 years' worth of industry expertise and real world experience.

CERTIFICATIONS



- FCC Approval #N8KJ8T6JII (Non-licensed)
- ATEX/IECEx Explosion-proof
- Complies with US DOT 49CFR requirements for "Off Truck Remote Shut-Off"
- US Patent Number RE39,249



- US DOT and Transport Canada Compliant
- Compact polycarbonate receiver units are easily installed using pre-wired electrical harness (supplied)
- Max operating range of 1000ft
- Runs for 300 hours of continuous operation and warns you when batteries are low
- Uses state of the art encryption technology to ensure an interference free, fail-safe signal
- Lightning fast response time - everything stops so you stay safe
- Receivers are energized only during operation and have built-in fail-safe feature, activating E-Stop with any loss of receiver power

Available Channel Modes: E-Stop

The channel is initially turned off and when the button is pressed, the channel is turned on and all other channels are turned off. This channel remains active and other channels inactive until receiver is manually reset.

E-Stop

The channel is initially turned on and when the button is pressed, the channel turned off and all other channels are turned off. This channel remains inactive and other channels inactive until receiver is manually reset.

Query

This feature requires that the operator periodically press a 'query' button on the remote control to keep the pumping system active. If the operator fails to press the query button within a factory specified time, an audible warning is first sounded followed by activation of the truck's Emergency Stop system. The operator must press the 'query' button during the delivery or audible warning period to reset the timer.

SafeLink Operation

During normal operation, the handheld will communicate continuously with the receiver. If the handheld goes out of range or the signal is lost for any reason SafeLink will cause the equipment to shutdown. If the operator experiences a shutdown triggered by SafeLink, he can resume operation by moving back within range and pressing "ON" button again. The system will return to normal operation. This safety feature prevents the operator from losing contact with the receiver and being unable to activate E-Stop.

Multi - Function

WIRELESS CONTROL SYSTEM

UP TO EIGHT BUTTON



Our popular LPG and Refined Fuels remote control systems offer unrestricted hose-end control, greatly increasing productivity and improving safety over conventional truck mounted manual controls. These explosion-proof remote controls provide technology developed specifically for fuel delivery truck applications in a rugged, compact package. The ASKW system is available with one to eight control buttons, with user definable button functionality and labeling.

The cast aluminum handheld transmitter is water-proof and extremely durable. Up to eight transmitter buttons are custom labeled in any language. Transmitters will operate up to 300 hours continuously and have built-in low battery warning LEDs.

- Compact polycarbonate receiver units are easily installed using pre-wired electrical harness (supplied)
- External antenna/coax provides up to 1000 ft (300m) operating range with enough power to punch through brick, concrete, and metal walls
- A small external 'learn' button allows for easy transmitter (remote) replacement. Systems are factory married with unique 32 bit ID codes ensuring the receiver will only work with its paired transmitter
- Internal diagnostic LEDs monitor battery levels, signal connection, and wiring faults for easy troubleshooting
- Receivers are energized only during pumping operations and have built-in 'fail-safe' feature closing all tank valves with any power loss or truck movement



Configurations

- **EMERGENCY STOP**

EMERGENCY STOP feature closes all tank valves, and kills the truck engine and pump. BASE's 'safety latched' signal causes the tank valve and pump to remain inoperative until a manual system reset is performed. This system meets international regulatory requirements and is available for all types of pneumatic, cable operated or "Flowmatic" type tank valves, and all truck engines.

- **QUERY**

QUERY option is required on LPG delivery vehicles in some countries and is available on all ASKW systems. This feature requires that the operator periodically press a 'QUERY' button on the remote control to keep the pumping system active. If the operator fails to press the QUERY button within a factory specified time, an audible warning is first sounded followed by activation of the truck's Emergency Stop system. The operator must press the 'QUERY' button during the delivery or audible warning period to reset the timer.

- **PTO**

PTO or PUMP option extends pump life and increases safety by allowing operator to engage and disengage the PTO and PUMP from hose end at the customer's storage tank. Truck PTO shaft is not turning, pump is not running in bypass, and hose is not charged unless connected to the customers tank. PTO connection can be electric, pneumatic, "hot shift" or "clutch shift". Remote PTO DELAY option automatically opens the tank internal valve 5 seconds prior to engaging PTO, allowing pump and product lines to equalize pressure. This feature prevents an excess flow 'slug' situation which starves the pump of product and may lead to pump failure.



ASKW SYSTEMS ARE AVAILABLE FOR ALL MAKES OF TRUCKS, TANKS AND CHASSIS MOUNTED PUMPING SYSTEMS

● HOSE REEL

HOSE REEL(s) option allows remote unwind and/or rewind control, greatly reducing effort required to pull the hose off the reel or replace it at the end of the delivery. Potential injury is reduced and productivity is increased through easier hose handling. Easy to install pre-wired hose reel motor solenoid and 70Amp breaker included with this option. System design prevents unwind and rewind circuits from being energized at the same time.

● THROTTLE

Engine RPM or THROTTLE option allows operator to increase/decrease truck engine RPM and corresponding pump volume from hose end at customer's storage tank. Operator can begin delivery process, ensure product is flowing safely, then increase pump speed until tank is nearly full. Connections are available for any electronic or mechanical engine control system.

● ENABLE

Enable option can be specified to create a 'two-step' process for activating certain buttons to further prevent unintended button operation.

*Create your own handheld allows for the complete customization for end user application, including custom company logos.



HOSE REEL CONTROL UNIT

Quick-connect remote wire harness can be factory ordered and pre-installed as an option from most major truck manufacturers. 12/24VDC, and RS232, interface connections are also available. All systems use state of the art encryption technology to ensure an interference-free, fail safe signal.

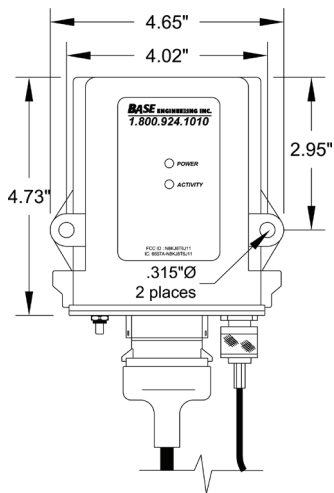
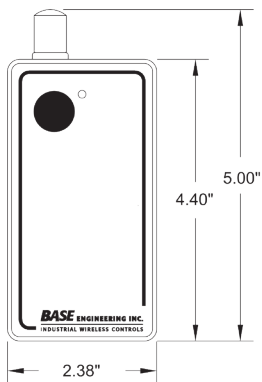
BASE Engineering designs and manufactures its own proprietary radio modules to ensure quality control and optimize performance. Systems are FCC, CE, and ATEX/IECEX approved for use in Zone 0 Hazardous locations (global equivalent to Class I, Div 1). Systems comply to USA DOT 49CFR, Canadian CSA B620-14, and International standards for "off truck" remote controls or up-fit new chassis and tanks. Modular components allow for easy installation and field replacement. Air solenoids are extremely rugged and can be direct mounted to chassis allowing hose-end PTO, tank valve, and cargo pump interlock.

HANDHELD TRANSMITTER SPECIFICATIONS

FREQUENCY OF OPERATION	433.92MHz
METHOD OF TRANSMISSION	56 bit DES encryption key
CONSTRUCTION	Rugged weather-proof aluminum enclosure
ANTENNA	Externally mounted helical
NORMAL RANGE	Up to 1000ft (higher gain available)
TEMPERATURE SPECIFICATION	Minus 20F to 185 F
BATTERY LIFE	300 hours of continuous use w/flashing Low Battery LED indicator
DIAGNOSTICS	RF Activity LED and Low Battery indicator
CERTIFICATIONS	Intrinsically Safe EX Rated: ATEX: EX II 1G SIRA IIATEX2317X IECEX: EX ia IIC T4 Ga SIR II.0148X

TRUCK MOUNTED RECEIVER SPECIFICATIONS

POWER SUPPLY	12/24VDC (Optional 110-250 VAC systems available)
CURRENT LOAD	Up to 4 Amps @ VDC per channel or 8 Amps total
CONSTRUCTION	Rugged weather-proof polymer enclosure
ANTENNA	Externally mounted to receiver (optional coax and remote mount antenna available)
WIRING CONNECTIONS	Pre-wired to OEM requirements, quick connect fittings supplied
DIAGNOSTICS	RF activity LED and Power On indication
PROGRAMMING MODES	RF Activity LED and Low Battery indicator



Bulk Plant E-Stop

WIRELESS CONTROL SYSTEM



Fixed Mount E-Stop Transmitter

Pressing the Emergency Stop button causes the receiver/controller unit to trigger a shut down. The system cannot be rebooted until the E-Stop button is pulled out and a manual receiver/controller reset is performed. E-Stop buttons are dual contact - dual channel, and comply with global E-Stop switch requirements. Systems will fail safe, triggering an automatic E-Stop with any loss of main line electrical power supply to the receiver/controller unit.

Fixed frequency remote E-Stop switch operates at 433 MHz using two double "A" batteries. The transmitter is energized only when E-Stop switch is activated. Battery Test button shows a "low battery" flashing LED on the E-Stop switch as well as on the receiver/controller unit. A "low battery" alarm or indicator lamp output is supplied for auxiliary low battery warning. Typical battery life is one to two years, but routine battery testing and replacement is recommended. Typical operating range up to 1000ft.

- Emergency Stop transmitter units can be strategically located on or near fuel transfer equipment within a 1000ft radius
- 300 hour battery life
- Intrinsically Safe Zone 0 Rated global equivalent to class I div 1

Our fixed wireless E-Stop systems were developed to eliminate costly hard wiring of typical fixed location Emergency Stop switches and to provide operators with radio remote E-Stop mobility. Any number of wireless remote E-Stop switches can be installed within the facility and communicate with one or more receiver/controller units.

These wireless Emergency Stop systems will work in conjunction with all existing, hard wired, manual E-Stop Systems in worldwide fuel transfer service.

- Designed specifically for bulk storage and off-loading facilities by the world leading experts in Hazardous Location Wireless Emergency Stop Systems.
- Eliminates expensive explosion-proof hard wiring and conduit.
- ATEX and IECEx approved for use in Hazardous Environments.
- Combination of fixed mounted wireless E-Stop switches and portable hand-held switches.

CERTIFICATIONS



- FCC Approval #N8KJ8T6JII (Non-licensed)
- ATEX/IECEx Explosion-proof
- Complies with US DOT 49CFR requirements for "Off Truck Remote Shut-Off"

E-Stop Receiver / Controller

Easily interfaced with electrical, pneumatic, hydraulic, nitrogen, or mechanical plant shut-off equipment. Systems will operate with 12/24VDC or 120/240VAC power supplies.

Receiver/Controller outputs can be specified as 12/24VDC, 120/240VAC, dry contact or Rs232. BASE Engineering can also supply electric/pneumatic interface solenoids on request.

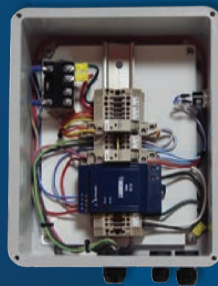
Transmitter E-Stop switches ARE rated for use in hazardous location but standard receiver/controller units are NOT rated explosion-proof, and are typically hard wired by an electrician in a non-hazardous electrical control area. Receiver/controller units come pre-wired and ready for power supply and E-Stop connection.

Antenna and coax cable are also provided for outside antenna mounting allowing maximum operating range. Explosion-proof receiver controller electrical enclosures are available on request.

Please contact BASE Engineering's Customer Service team for add-on information and pricing.



Low Battery Indicator



Modular DIN Rail receiver components for easy installation



Explosion-proof receiver/controller option

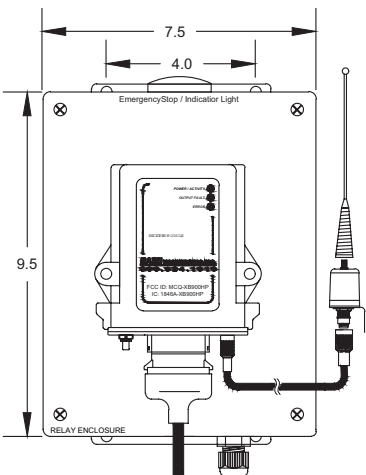
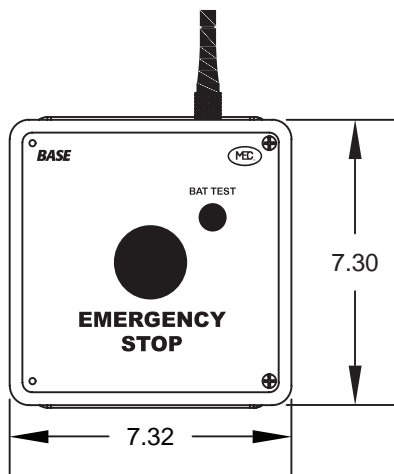


REMOTE EMERGENCY STOP SWITCH SPECIFICATIONS

FREQUENCY OF OPERATION	433.92MHz
METHOD OF TRANSMISSION	56 bit DES encryption key
CONSTRUCTION	Rugged weather-proof aluminum enclosure
ANTENNA	Externally mounted helical
NORMAL RANGE	Up to 1000ft (higher gain available)
TEMPERATURE SPECIFICATION	Minus 20F to 185 F
BATTERY LIFE	300 hours of continuous use w/flashing Low Battery LED indicator
DIAGNOSTICS	RF Activity LED and Low Battery indicator
CERTIFICATIONS	Intrinsically Safe EX Rated: ATEX: EX II 1G SIRA 11ATEX2317X IECEX: EX ia IIC T4 Ga SIR 11.0148X

RECEIVER CONTROLLER SPECIFICATIONS

FREQUENCY OF OPERATION	433.92MHz
METHOD OF TRANSMISSION	56 bit DES encryption key
CONSTRUCTION	Rugged weather-proof aluminum enclosure
ANTENNA	Externally mounted helical
NORMAL RANGE	Up to 1000ft (higher gain available)
TEMPERATURE SPECIFICATION	Minus 20F to 185 F
BATTERY LIFE	300 hours of continuous use w/flashing Low Battery LED indicator
DIAGNOSTICS	RF Activity LED and Low Battery indicator



RANGER

UP TO TWELVE BUTTON WIRELESS CONTROL SYSTEM

"Big Brother" to the ASKW, the ASKR allows for up to 12 custom functions including Emergency Stop capability. The tough polymer enclosure makes this handheld durable and well-equipped for any challenge.

The ability to control a crane or other industrial equipment from outside of the cab eliminates the need for most 2-man teams. The operator has the freedom to move around the work site, controlling the vehicle with precision from a safe distance while getting the best vantage point.

- 30 hour continuous use rechargeable battery, with low battery indicator
- Receiver output can be selectively interlocked to other operations for safety reasons
- Optional external receiver antenna extends range from 100 ft. to up to 1000 ft.
- Modular components and external set-up button on receiver allow for easy installation and field replacement
- Transmitter and receiver units operate on a 56 bit digital code eliminating accidental operation



Modes of operation include, but are not limited to:

Momentary - While button is pressed, channel is active. When button is released, channel is deactivated. If communication is lost with handheld for more than 500 milliseconds, the channel will deactivate.

Latched - When button is pressed, the channel will turn on and remain on after button is released. The next button press will then turn off the channel.

Emergency Latched - When button is pressed, channel will activate or deactivate and remain in this state until the receiver power is reset. E-Stop will remain latched even if Safelink timer expires.

Query - Channel will activate after 5 minutes if the Query button is not pressed. After the first 4.5 minutes, the alarm will sound for the remaining 30 seconds. If there is a Query Enable channel set up, the Query timer will not run unless the enabled channel (PTO for example) is first turned on.

Enable - Used in association with other operations where the Enable button must be pressed first. After the Enable button is pressed, the other associated channel button can then be pressed for the desired operation (available with Momentary or Latched operations).

Time Delay - Associated with a latched channel. When a latched channel is activated after a specified amount of time, the Time Delay channel will automatically activate. The Time Delay channel will turn off when the associated channel is turned off.

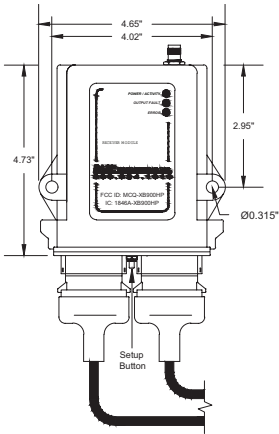
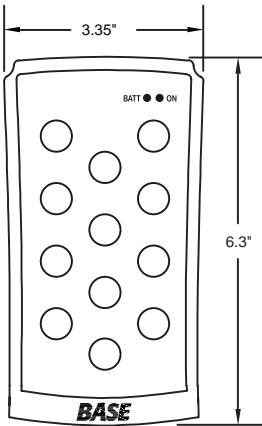


HANDHELD TRANSMITTER SPECIFICATIONS

FREQUENCY OF OPERATION	902-928MHz FHSS (433.92, 869.7 and 2.4 GHz available)
TRANSMITTER POWER	100mW
METHOD OF TRANSMISSION	56 bit DES encryption key
CONSTRUCTION	Rugged weather-proof polymer enclosure
ANTENNA	Internal 'on card' PCB mount (no visible antennas to damage)
NORMAL RANGE	500ft. (up to 2000ft. available with external antenna)
TEMPERATURE SPECIFICATION	Minus 20F to 185 F
BATTERY LIFE	30 hours of continuous use with audible low battery warning/flashing indicator
BATTERY TYPE	Rechargeable lithium ion included with 12/24VDC charger
ROHS LEAD-FREE COMPLIANT	

RECEIVER SPECIFICATIONS

FREQUENCY OF OPERATION	902-928MHz FHSS (433.92, 869.7 and 2.4GHz (available)
POWER SUPPLY	12/24VDC (Optional 120VAC systems available)
CONSTRUCTION	Rugged weather-proof polymer enclosure
ANTENNA	Internally protected and encased (optional external antenna/coax available)
CURRENT LOAD	Up to 4 Amps @ 12VDC per channel or 8 Amps DC per system total
WIRING CONNECTIONS	Pre-wired to meet OEM requirements, quick connect fittings supplied
PROGRAMMING MODES	Up to 12 programmable channels including: Latched, Momentary, Enable, and INTERLOCK
TOTAL SYSTEM WEIGHT	2 lbs
ROHS LEAD-FREE COMPLIANT	



LDS

TRANSPORT LEAK DETECTION SYSTEMS



Designed specifically for propane, anhydrous ammonia and butane transports. DCE certified to meet or exceed all US DOT CFR49 and Transport Canada B620-14 regulations. These systems continually monitor the off-loading process, looking for a rapid change in discharge pressure. These systems detect a separated hose or failed connection and close the tank internal valve within 1/2 second.

Auxiliary control panel available for LDS100 and LDS200 systems to allow driver's side unloading control. Multiple configuration options available for Canadian operations requiring "off truck remote" functionality, optional handheld remote with Query and Emergency Stop.

● LDS60

This system has been designed & tested by Design Certified Engineers to meet the compliance requirements of US DOT 49CFR. The low powered control unit continually monitors piping and hose assemblies during the off-loading process. A failed pipe or hose separation will cause the tanks internal valve to close instantly and sound an audible alarm. A simple "reset" button returns the unit to the monitoring state.

● LDS60-RF

Configured specifically to comply with Transport Canada B620-14 regulation. This system combines the functionality of the LDS60 with the remote shutdown capabilities of BASE Engineering's trusted ASK series of remote controls. Please contact factory for more details.

● LDS100

This low powered unit continually monitors the off-loading process for "rate of change" parameters, signifying broken or damaged hoses, fittings, and piping. A leak instantly detected and stopped by the closure of the tank internal valve(s). The truck's engine can also be stopped and PTO disengaged if desired. This system automatically activates at the end of each load. This ensures that system is fully operational and helps reduce the possibility of a damaged cargo pump due to product run out. This unit also "fails-safe" and closes the internal valve with a loss of power or the release of the trailer parking brakes. Designed to meet requirements of US DOT CFR49.

● LDS200-AQRF

Designed to comply with DOT requirements for transport with both 'metered' and 'bulk discharge' capability. Combines all of the features described above for the LDS100 but includes an ASK handheld with 'Query' and 'Emergency Stop' buttons. For full remote and function description see page 20. Additionally, the remote 'E-Stop' button gives the operator the ability to activate the passive shutdown at any time during the off-loading process.

LDS60 TECHNICAL SPECIFICATIONS

SYSTEM TYPE	Low powered micro-computer controlled leak detection and shut down
INSTALLATION	"Plug & Play" components (2 hrs)
POWER/GROUND CONNECTIONS	12 volts DC
SYSTEM ACTIVATION	Air supply to internal valve
LEAK DETECTION METHOD	Intrinsically safe pressure transducer
PROBE LOCATION	1/4" NPT coupling in pump discharge pipe
DETECTION CAPABILITY	Partial and complete hose/pipe
RESPONSE TIME	One half (.5) seconds
EMERGENCY STOP METHOD	Closes any tank or all tank internal valves (cable or air)
CALIBRATION	None required
CALIBRATION SELF TEST	Included
OPERATOR SET UP	None required
SELF TEST FEATURE	Included
CONSTRUCTION	Non-sparking, waterproof
WEIGHT	10 lbs

LDS100 TECHNICAL SPECIFICATIONS

SYSTEM TYPE	Low powered micro-computer controlled leak detection and shut down
INSTALLATION	"Plug & Play" components (2 hrs)
POWER/GROUND CONNECTIONS	12 volts DC
SYSTEM ACTIVATION	Air switch brake interlock
LEAK DETECTION METHOD	Intrinsically safe pressure transducer
PROBE LOCATION	1/4" NPT coupling in pump discharge pipe
DETECTION CAPABILITY	Partial and complete hose/pipe
RESPONSE TIME	One half (.5) seconds
EMERGENCY STOP METHOD	Closes any tank or all tank internal valves (cable or air)
CALIBRATION	None required
CALIBRATION SELF TEST	Included
OPERATOR SET UP	None required
SELF TEST FEATURE	Included
MANUAL STOP FEATURE	Included
POWER OFF	Automatic with loss of air
CONSTRUCTION	Non-sparking, fiberglass weather-proof
WEIGHT	10.5 lbs



Deadman Series

Developed specifically for industrial applications requiring positive operator-to-machine contact. A wireless trigger-switch is used to send RF command signal to the pump. Operator is unencumbered by cable and wires normally used in 'deadman' fueling operation. The system incorporates a secure frequency hopping, spread-spectrum radio link that is virtually immune to outside electrical or RF interference. Operations fail-safe (shutdown) with any loss of signal from the transmitter. Rechargeable transmitter delivers 30 hours of continuous use between charges (12/24VDC charger supplied).

'Safety Timer' software available to limit switch closure duration prior to automatic shut-off. This feature requires periodic trigger pulse by operator to maintain receiver 'on' condition.

- Up to 11 other command functions available per customer requirements
- Modular quick-connect components allow for easy installation and field service
- Pre-wired solenoids are available for Pneumatic, Hydraulic, or Hose Reel control interface

TRIGGER SWITCH RADIO REMOTE CONTROLS



**120/240VAC FUELING
CABINET SYSTEMS**



**120/240VAC DIN RAIL
COMPONENTS**

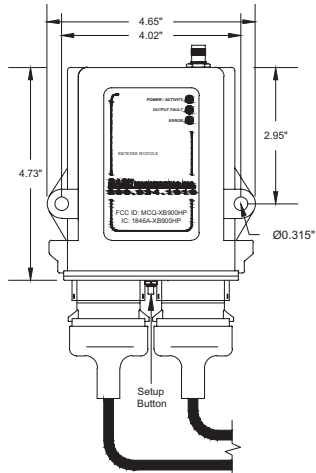
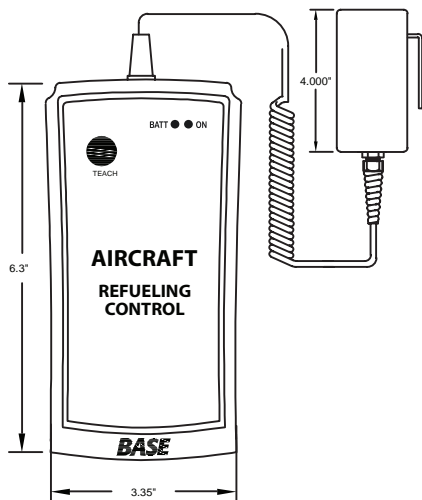


HANDHELD TRANSMITTER SPECIFICATIONS

FREQUENCY OF OPERATION	902-928MHz FHSS (433.92, 869.7 and 2.4 GHz available)
TRANSMITTER POWER	100mW
METHOD OF TRANSMISSION	56 bit DES encryption key
CONSTRUCTION	Rugged weather-proof polymer enclosure
ANTENNA	Internal 'on card' PCB mount (no visible antennas to damage)
NORMAL RANGE	500ft. (higher power available)
TEMPERATURE SPECIFICATION	Minus 20F to 185 F
BATTERY LIFE	30 hours of continuous use with audible low battery warning/flashing indicator
BATTERY TYPE	Rechargeable lithium ion included with 12/24VDC charger
ROHS LEAD-FREE COMPLIANT	

RECEIVER SPECIFICATIONS

POWER SUPPLY	12/24VDC (Optional 120VAC systems available)
CONSTRUCTION	Rugged weather-proof polymer enclosure
ANTENNA	Internally protected and encased (optional external antenna/coax available)
CURRENT LOAD	Up to 4 Amps per channel or 10 Amps total
WIRING CONNECTIONS	Pre-wired to meet OEM requirements, quick connect fittings supplied
PROGRAMMING MODES	Up to 12 programmable channels including: Latched, Momentary, Safety Latched, and *SAFETY TIMER programming modes (custom programming available)
ROHS LEAD-FREE COMPLIANT	



Explosion-Proof

RECEIVER/CONTROLLER ENCLOSURE

FOR CLASS 1, DIV 1, GROUP “D” ATEX/IECEX ZONE 1 LOCATIONS



Any BASE system may be specified to include an EX d explosion-proof electrical enclosure for the receiver unit, assorted relays, and AC power supply if required. EX d option includes explosion-proof antenna fitting and indicator lamp. Rigid conduit or armored cable fittings are specified by customer.

BASE EX d series enclosures are furnished with or without drilled and tapped openings. Drilling and tapping of conduit openings and device openings on the cover are subject to the limitations of maximum size and number of openings as well as spacings. All machining must be done prior to installation.

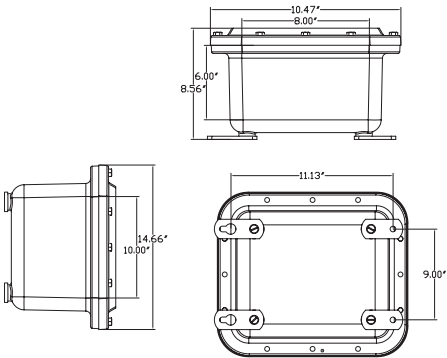
CERTIFICATIONS



- Class I, Division 1 & 2, Groups “B, C,D”
- Class II, Division 1 & 2, Groups “E,F,G”
- Class III
- UL Standard 1203 · cUL to CSA C22.2 No.30, No.25
- NEMA Type 3, 3R, 4, 7BCD, 9EFG
- Enclosure Type 4X* requires selecting 4X option
- ATEX/IECEX Zone 1 Explosion-proof

STANDARD MATERIALS

BODY AND COVER	COPPER FREE ALUMINUM
GASKET	NEOPRENE
COVER BOLTS	GALVANIZED STEEL
HINGES	ALUMINUM (if equipped)



110-250 VDC Enclosure Size

DAS

DRIVER AUTHORIZATION SYSTEM

The Driver Authorization System (DAS) protects vehicles and machinery from unauthorized engine start or movement, depending on the customer's application. Any attempt to tamper with, disconnect, or damage the system results in the shutdown activation.

DAS1000 Systems available to

- Prevent truck engine start
- Allow engine run, but prevent vehicle movement
- Automatically armed by truck parking brake application
- Also available for tractor-trailer with dual parking brakes

System Includes

- Keypad unit with hidden enclosure screws
- Sealed parking brake low pressure switch w/DOT quick connect T fitting
- Sealed engine kill relay
- Installation guide
- Components are pre-wired, quick connect electrical, air line fittings supplied

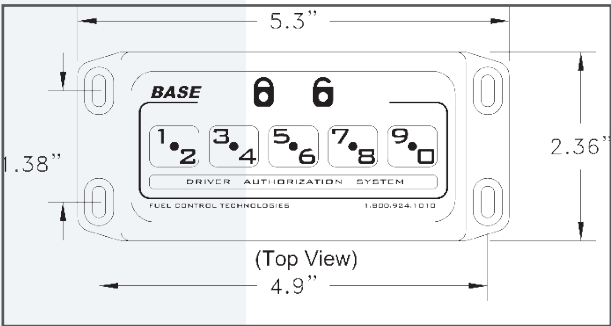


The DAS system is disarmed by entering a three to nine digit ID code into the keypad. This code is selected by the truck owner and is programmed into the unit using a 'master code' assigned to the truck owner. Entry of a master code is required to change the driver's authorization code. A typical organization will provide these master codes to key management as required. Each level of master code erases the ID code directly below it and sets the device into a 'learning state' where it is waiting for a new code to be entered.

If an incorrect ID code is entered more than five times the system will automatically 'lock out' for ten minutes before allowing additional code entry. LED indicators show red for system armed, green for system disarmed, flashing red for auto shutdown, flashing green for changing ID codes, and alternating green and red flashing for system lock out due to multiple incorrect code entry.

DAS1000 TECHNICAL SPECIFICATIONS

SYSTEM TYPE	Low powered microcomputer controlled ignition lock-out system
CONSTRUCTION	Sealed cast aluminum enclosure, stainless mounting hardware
INSTALLATION	30 minute 'Plug and Play' components
POWER CONNECTIONS	12V and Ground
SYSTEM ACTIVATION	Air switch park brake interlock
LOCK-OUT METHOD	Truck engine kill with park brake release
KEYPAD LOCATION	Compact unit can be installed anywhere for daily use
OPERATOR SETUP	Programmable authorization code (3-9 digits)
INDICATOR LIGHTS	RED armed indicator and Green disarmed indicator



More Info

QA PROCESS & ORDER REVIEW

Every BASE system is subject to a rigorous QA checklist, ensuring that your handheld is tough, reliable and held to the highest quality standards. This testing includes, but is not limited to: drawing and customer order review, visual inspection, and range/operational testing. We stand by all of our products with an unparalleled warranty and expert technical support.

FACTORY TRAINING

For distributors, BASE Engineering offers BASEcamp - in-house product training at our head office in Saint John, NB, Canada. BASEcamp training time varies depending on the products being covered and amount of training required. Distributors will have access to a factory tour where they will see product design, development and testing, and will be trained by certified BASE technical experts.

ON-SITE TRAINING

In certain cases, a BASE product expert may be able to visit your facility and provide thorough training on BASE products, their application, installation and deployment. Please contact us to discuss your specific requirements and any associated costs.

CUSTOMER SERVICE

BASE Engineering's unparalleled customer support team is ready to assist with pricing, purchasing and technical support. Available Monday to Friday, from 7 am - 5 pm Eastern Standard Time, these experts are ready to help make your BASE experience the best it can be.

TRADE SHOW/OPEN HOUSE SUPPORT

BASE Engineering is pleased to offer an additional discount on the purchase of any system to be used as a demonstration unit at recognized industry trade shows, conventions or events. Multiple systems may be purchased provided that each system is displayed. Contact the factory with as much advance notice as possible and provide details of the upcoming event. Should a distributor wish to have a BASE representative at their trade show booth, this can typically be arranged with notice. The distributor will be responsible for arranging their access if necessary.

CO-OP ADVERTISING

BASE Engineering will periodically contribute to the cost of pre-approved advertisement where the company's logo, name or products are promoted. Co-op amount is determined with the advertiser based on promotion focus. Please contact the factory and provide advance details of advertisement/promotion. A proof may be required. Co-op payment will be forwarded upon confirmation of advertisement.





with the POWER of

BASE
ENGINEERING INC.

BASE Engineering is very proud to be part of the MEC Group of Companies specializing in highly engineered products used in the transportation, transfer, storage and consumption of compressed and liquefied gases.

Our combined expertise allows us to provide customers with exceptional application depth and collaborative solutions for today and tomorrow's Oil & Gas industry.

For over 42 years Marshall Excelsior Company has been a progressive manufacturer of top quality and competitively priced LPG & NH₃ equipment that is leading the industry in innovation and low emission products. They offer a full range of products that support the LPG & NH₃, Bulk Plant, Transport, Delivery/Dispensing, and Domestic Applications.

MEC equipment is the perfect complement to BASE's innovative fuel delivery automation. In this partnership we share a passion for all things tank and truck related, as well as a strong dedication to exceed our customer's expectations.



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GET IN TOUCH

BASE ENGINEERING INC.

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NORTH AMERICA TOLL FREE - 1.800.924.1010 |
INTERNATIONAL - 01.506.635.2280 | FAX - 506.635.2281
SALES@BASENG.COM | SUPPORT@BASENG.COM

BASE Engineering offers a four year, no hassle, replacement warranty on every product we manufacture, and one year warranty on products that are not manufactured at BASE Engineering. Our Technical Support group is available Monday to Friday from 7 am through 5 pm EST to assist with warranty, service, or installation questions.

BASEng.com