SureDrop™

Reliable, affordable, and easy to use system prevents cross drops during petroleum delivery

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The Dixon® SureDrop™ System

    The Dixon® SureDrop™ system was designed and tested with both the driver and fleet manager in mind to provide a reliable, affordable, and easy to use system to prevent cross drops during petroleum delivery. It requires the driver to perform the product drop tasks in a specific sequence every time, and tag scanning and confirmation are aligned with the normal product delivery procedure.

The Dixon® SureDrop™ cross drop prevention system consists of several components:

- **RFID Product Grade Tags** - attached to the underground storage tanks
- **RFID Scanning Wand**- reads the tags and communicates to the system
- **Compartment Indicators** - displays product/compartment matching status, confirms compartment used and logs event data
- **Internal Valve Controller (IVC)** - locks out the internal valves for any non-matching products and compartments
- **CDM Wireless Communication Module** - downloads up to 30,000 individual events
- **SureDrop™ Cloud Application** – event data download to spreadsheet reporting

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Theory of Operation

The Dixon® SureDrop™ system is developed for the petroleum delivery industry to provide indication of product matching between a known customer storage tank and the product in the delivery tank compartment. This matching assumes the underground storage tank has the correct product RFID tag and the product loaded to the tanker compartment is as intended.

The Basic SureDrop™ system assists the driver by acting as a guide for proper selection and matching of product to storage tank, providing a visual and audio matching signal. It also records and timestamps all load and drop events. Use of the IVC Internal Valve Controller adds an additional layer of matching and protection by only allowing matching compartments to open the internal valve.

The IVC internal valve controller system provides overrides and bypass systems to allow product delivery to untagged customer tanks as required. **Using the override/bypass inactivates the cross drop prevention system. In bypass mode operation, the operator must rely on proper product matching procedures to assure correct product delivery. ALWAYS Follow all fleet safety and loading and unloading procedures.** ⚠

The SureDrop™ Load/Unload Process

Prior to use, RFID product tags are installed in the station underground storage tanks (UST) which are scanned and wirelessly transmit the tank contents to the system. The driver is required to follow a set sequence of operations to assure correct product delivery:

1) LOAD - Assign Product

Prior to loading, the driver assigns the product grade to the tanker compartment with the scanning wand.

2) SCAN - RFID Scanning Wand

The driver scans the UST product tag and the drop elbow tag to assign the elbow and hose assembly to the UST/product. Product matching is wirelessly transmitted to the compartment indicator.

3) CONFIRM - Product Matching

The compartment indicator lights green for matching product and red for non-matches. The delivery hose is attached to the matching API valve, and is confirmed by pressing the indicator button.

4) DROP - Indicate Completion

The driver delivers the product. To indicate the drop is complete, the compartment indicator button lights blue when pressed, signifying the compartment is empty.

5. REPORT - Data Logging

All events are recorded in detail and timestamped for future reference. Data downloads can display performance by driver, trailer, or store to evaluate fleet performance.

Trailer ▲			
Date Time ▲	Action ▼	Compartment	Product
4/18/2017 2:52:43 PM	Product Loaded	1	REGULAR
4/18/2017 2:52:43 PM	Product Loaded	2	PREMIUM
4/18/2017 2:52:43 PM	Product Loaded	3	DIESEL
4/18/2017 2:52:51 PM	UST Tag Scanned		DIESEL
4/18/2017 2:52:57 PM	Elbow Tag Scanned		
4/18/2017 2:53:08 PM	Drop Started	3	DIESEL

SureDrop™ Basic System

System Components:
- RF scanning wand
- charging cradle
- compartment indicators
- wiring harness
- trailer tags

Features:
- compatible with existing tank trailer components (API's, elbows, and internal valves)
- wireless RFID product matching technology
- event logging and wireless data reporting
- upgradeable system components for additional functions

COMPATIBLE WITH EXISTING TANK TRAILER COMPONENTS

Part Number	Description
XD100-01	SureDrop™ Basic Cross Drop Prevention System – 1 Compartment
XD100-02	SureDrop™ Basic Cross Drop Prevention System – 2 Compartments
XD100-03	SureDrop™ Basic Cross Drop Prevention System – 3 Compartments
XD100-04	SureDrop™ Basic Cross Drop Prevention System – 4 Compartments
XD100-05	SureDrop™ Basic Cross Drop Prevention System – 5 Compartments

Internal Valve Controller

The SureDrop™ IVC Internal Valve Controller wirelessly communicates with system components to lock out non-matching compartment internal valves.

Product Matching Permit - If the product is matched, the permitted compartment lights green above the air distributor toggle lever and product is dropped as usual.

Compartment Lock-Out - Non-permitted compartments are lighted red. Actuating a toggle lever on a non-permitted compartment results in master air shutdown, closing all internal valves. Function is restored by cycling all compartments closed, then opening only permitted compartments.

Security - For additional security and load integrity, the IVC allows an internal valve to open only under the following conditions:

1. Loading - Load tag scanned and rack cord connected

2. Drop – UST product tag scanned, elbow tag scanned and product match confirmed

Bypass - There are 2 bypass modes available to assure product is always available for delivery:

1. Tag bypass - If a storage tank is not tagged, the bypass tag can be scanned and product is manually selected from the available compartments.

2. System bypass - A key turns the system off, allowing the air distributor to function normally, even if no electric power is available. All events are logged in bypass mode.

Part Number	Description
XD4000	IVC Internal Valve Controller w/ integrated Betts Air Distributor 1-5 Compartments
XD100-01VC	SureDrop™ System with XD4000 Valve Controller - 1 Compartment
XD100-02VC	SureDrop™ System with XD4000 Valve Controller - 2 Compartments
XD100-03VC	SureDrop™ System with XD4000 Valve Controller - 3 Compartments
XD100-04VC	SureDrop™ System with XD4000 Valve Controller - 4 Compartments
XD100-05VC	SureDrop™ System with XD4000 Valve Controller - 5 Compartments

Reporting

The SureDrop™ XD5000 CDM module allows logged event data to be uploaded to a cloud application.

*   **Trailer mounting –** Wireless communication to SureDrop™ system components. Only requires 12V DC connection.

*   **Fixed station mounting –** The CDM can be used in a fixed location such as a fleet yard and automatically downloads data from any SureDrop™ system within range.

All event data is date and time-stamped and can be sorted by driver, trailer, or station to evaluate fleet performance.

Date Time	Action	Compartment	Product	Store	Driver
4/18/2017 2:52:43 PM	Product Loaded	1	REGULAR		Driver B
4/18/2017 2:52:43 PM	Product Loaded	2	PREMIUM		Driver B
4/18/2017 2:52:43 PM	Product Loaded	3	DIESEL		Driver B
4/18/2017 2:52:51 PM	UST Tag Scanned		DIESEL	Store 301	Driver B
4/18/2017 2:52:57 PM	Elbow Tag Scanned			Store 301	Driver B
4/18/2017 2:53:08 PM	Drop Started	3	DIESEL	Store 301	Driver B
4/18/2017 2:53:12 PM	Load Valve Open	3	DIESEL	Store 301	Driver B
4/18/2017 2:53:54 PM	UST Tag Scanned		REGULAR	Store 301	Driver B
4/18/2017 2:54:00 PM	Elbow Tag Scanned			Store 301	Driver B
4/18/2017 2:54:04 PM	Drop Started	1	REGULAR	Store 301	Driver B
4/18/2017 2:54:09 PM	Load Valve Open	1	REGULAR	Store 301	Driver B
4/18/2017 2:54:15 PM	Load Valve Closed	3	DIESEL	Store 301	Driver B
4/18/2017 2:54:15 PM	Drop Complete	3	DIESEL	Store 301	Driver B
4/18/2017 2:54:17 PM	Load Valve Closed	1	REGULAR	Store 301	Driver B
4/18/2017 2:54:17 PM	Drop Complete	1	REGULAR	Store 301	Driver B
4/18/2017 2:54:18 PM	Wrong Valve Switched	2	PREMIUM		Driver B
4/18/2017 2:54:25 PM	UST Tag Scanned		PREMIUM	Store 301	Driver B
4/18/2017 2:54:30 PM	Elbow Tag Scanned			Store 301	Driver B
4/18/2017 2:54:34 PM	Drop Started	2	PREMIUM	Store 301	Driver B
4/18/2017 2:54:37 PM	Load Valve Open	2	PREMIUM	Store 301	Driver B
4/18/2017 2:54:45 PM	Load Valve Closed	2	PREMIUM	Store 301	Driver B
4/18/2017 2:54:45 PM	Drop Complete	2	PREMIUM	Store 301	Driver B
4/18/2017 2:55:11 PM	Product Loaded	1	REGULAR		Driver B
4/18/2017 2:55:11 PM	Product Loaded	2	PREMIUM		Driver B
4/18/2017 2:55:11 PM	Product Loaded	3	DIESEL		Driver B
4/18/2017 2:55:17 PM	UST Tag Scanned		DIESEL	Store 301	Driver B
4/18/2017 2:55:22 PM	Elbow Tag Scanned			Store 301	Driver B
4/18/2017 2:55:26 PM	Drop Started	3	DIESEL	Store 301	Driver B
4/18/2017 2:55:28 PM	Load Valve Open	3	DIESEL	Store 301	Driver B
4/18/2017 2:55:38 PM	UST Tag Scanned		REGULAR	Store 301	Driver B

SureDrop™ Accessories

Part Number	Accessory	Pkg Qty
XD5000	Communication Module - Downloads timestamped event data to PC.	1
XD282	API Adapter Mounting Bracket - Mount the compartment indicator on the API Adapter	1
XD281	UST RFID Tag Mounting Bracket - Mounts the RFID tag on the diameter of the spill bucket for easy scanning.	1
XD280	RFID Tag Mounting Cable - Vinyl coated stainless steel RFID tag attachment cables. Crimp connection.	100
XD28-REG-25	RFID product grade tags for storage tanks - Regular	25
XD28-MID-25	RFID product grade tags for storage tanks - Mid-Grade	25
XD28-PRE-25	RFID product grade tags for storage tanks - Premium	25
XD28-DSL-25	RFID product grade tags for storage tanks - Diesel	25
XD28-DYE-25	RFID product grade tags for storage tanks - Dyed Diesel	25
XD28-E85-25	RFID product grade tags for storage tanks - E-85	25
XD28-ETH-25	RFID product grade tags for storage tanks - Ethanol	25
XD28-BIO-25	RFID product grade tags for storage tanks - Bio-Diesel	25
XD28-LOA	RFID Utility tag for system function - Load	1
XD28-RST	RFID Utility tag for system function - Reset	1
XD28-BYP	RFID Utility tag for system function - Bypass	1
XD28-ELB	RFID Utility tag for system function - Elbow	1

Dixon®, founded in 1916, is a premier manufacturer and supplier of hose couplings, valves, dry-disconnects, swivels, and other fluid transfer and control products. The company's global reach includes a wide range of products for numerous industries including petroleum exploration, refining, transportation, chemical processing, food & beverage, steel, fire protection, construction, mining and manufacturing. Dixon®'s strategic objective is to create solutions that make products safer, leak-free, longer lasting, and always available.

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Dixon Bayco

Chestertown, MD 21620
ph 513.874.8499
fx 800.283.4966