

**IMPORTANT NOTE:**

Please read first the HID ProxPoint Plus card reader information on the end of this manual referring to the programming method that is required to get the system up and running.

**RFID Proximity Card Reader**

# Installation & Calibration Manual



## IM3-RFID Defender

Lift Truck On-board Impact Monitor, USB Port and RFID Card Reader for Authorized Operator Vehicle Access Control



IM3-RFID V1.14



## General Installation Guide

This **IM3-RFID, ED3-RFID and ED4-RFID SkidWeigh Plus V1.14** Series installation & calibration guide describes how to install, calibrate, test and use your on-board check weighing unit. Following the instructions in the **ADMINISTRATION MENU** guide will enable you to get the system set up and weighing calibration function operating quickly. In the event that you require additional assistance, please contact customer support via e-mail at [support@skidweigh.com](mailto:support@skidweigh.com) , visit [www.skidweigh.com](http://www.skidweigh.com) or contact us at the address or contact number below:

### **Integrated Visual Data Technology Inc.**

3439 Whilabout Terrace, Oakville, ON, Canada, L6L 0A7 Phone: 905-469-0985

## Safety

Always disconnect the vehicle battery while installing SkidWeigh system or any other electronic product.

Make sure that unit, pressure transducer and any other associated cables are securely mounted and do not impede any of the vehicle's controls. Use care when routing the components cables. Route the cables where they will be protected.

Use commonly accepted install practices for after market industrial vehicle electronic devices.

The installation of the SkidWeigh systems should only be performed by an acknowledged lift truck dealer technician or end user electro and hydraulic technical installer.

Here are two acceptable methods of making a wire connections:

- \* Soldering your connections (recommended)
- \* Crimp connectors ( with the use of the proper crimping tool)

Regardless of the method you choose, ensure that the connection is mechanically sound and properly insulated. Use high quality electrical tape and shrink tubing where necessary. This product is connected directly to the vehicle's ignition switch, 12 to 55 VDC. There is no on-off switch on the unit.

## Electro-Magnetic Compatibility

CE conformity to EC directive 89/336 (EMC) by application of harmonized standards: Interference stability EN 61000-6-2 and EN 61326-1 interference emit EN 61000-6-3, EN 61326-1 for the pressure transducer.

## ED3-RFID SkidWeigh Plus Series

Our policy is one of continuous improvement and the information in this document is subject to change without notice. The software version is displayed on the LCD display once the power is turned on to the system.

## Overview of components

The standard ED3-RFID SkidWeigh Plus check weighing system consist of two main components:

- \* Digital indicator with integrated RFID operator access reader with wiring harness, mounting bracket
- \* Hydraulic pressure transducer with 3 wires cable
- \* Installation & calibration manual and operator usage instruction
- \* One Master RFID card is included

*(Master card to be used by the end user to program valid operators RFID cards. All programming can be done with ED3-RFID / ED4-RFID mobile units. There is no need for external programming device )*

## Operational principal (N/A)

The ED3-RFID SkidWeigh Plus series operational principal is based on the hydraulic pressure transducer mounted in the vehicle lifting hydraulic circuit that will automatically activate the “weighing cycle / specific algorithm ” every time a skid load is lifted just above the ground. The increase in pressure is converted in an electronic signal at the sample rate of 16000 readings which is converted into a load weight reading. The valid RFID operator card is required to operate vehicle.

## Pressure transducer installation (N/A)

The pressure transducer must be installed in the lifting hydraulic line **between the lift control valve and lift cylinder(s)**. Mount a T-piece in hydraulic line. In some cases you can install the pressure transducer in the flow divider, drilling and tapping for 1/4”-18 NPT male in spare plug (if only single or double mast configuration) or in the body of the flow divider. Also, you can drill and tap on any “larger elbow” that might be available in the hydraulic lifting circuit found in vehicles with larger hoses to accommodate larger vehicle lifting capacities.



## Pressure transducer installation precautions (N/A)

Before installation of the pressure transducer the hydraulic lift circuit must be pressure free.

### There are two ways to do that:

1. Place the forks on the ground in their lowest position and make the hydraulic system pressure free by tilting the mast forward. The chain(s) should be slack.
2. Lift the forks and position them on the top of a supporting fixture. Start

lowering the lifting cylinder into its lowest position. Be sure that chain(s) are slack.

Make sure that that installed pressure transducer will not touch any moving parts or assembly of the vehicle while in normal operation. Pressure transducer has 1/4”-18 NPT male thread. Use thread seal to ensure tight fit.

## Selecting the mounting location for digital indicator

Use the mounting bracket with the anti vibration mount and fasten digital indicator on the vehicle dashboard, side railing on the right hand side or preferably on the overhead guard. There are many examples of mounting locations that will depend on the vehicle model. However, additional mounting items such as a flat brackets may be needed to help secure the unit to upper right corner of the guard or side railing.

Choose the correct location and make sure that:

- Indicator is visible and within reach of the operator
- Location so that operator has a clear unobstructed view of the working environment



## Electrical connections



transducer cable

## Internal relay connections to be used to enable vehicle usage

(Dry contacts, Maximum current 2A)

- Green Wire Common
- Yellow Wire N.C.
- Blue Wire N.O.

## Pressure transducer cable (N/A)



- White Wire, signal 0 to 2,5 V
- Black Wire, signal negative
- Red Wire, power supply + 11 V DC

Male port 1/4"-18 NPT

## Compact size

All of the SkidWeigh systems are compact, housing dimension of only 120 x 80 x 55 mm is ideal for the installations to material handling vehicles of all kinds.

All SkidWeigh RFID equipped systems operate from 12 to 55 VDC.

*Digital indicator with eight wires single cable*

- Orange Wire (+) Ignition switch On position
- Brown Wire (-) Battery negative
- (N/A) - Red Wire, connect to RED wire of the pressure transducer cable
- (N/A) - Black Wire, connect to BLACK wire of the pressure transducer cable
- (N/A) - White Wire, connect to WHITE wire of the pressure

All SkidWeigh systems are **internally short circuit protected with resettable fuse**. There is no need to install external inline fuse in orange wire that is connected to the ignition switch.

## IMPORTANT

**For all SkidWeigh Plus Systems equipped with RFID card reader you MUST HAVE AT LEAST ONE VALID OPERATOR CARD in order to access the administration menu to set up and calibrate the weighing function of the system!**

### “Quick test to determine if electrical connections are done right”

**Note 1:** *SkidWeigh weighing calibration function is not done yet at this stage. This procedure is only to test if electrical connections of the system installation into the vehicle is done properly!*

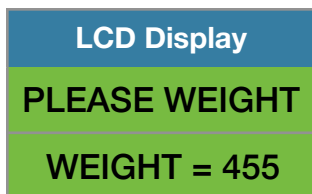
After you have connected electrical power and pressure transducer cable you can “quickly” check the system operation.

- Turn On ignition switch
- Digital LCD display will be activated, showing software version and serial number
- With LCD display indicating “**IVDT Scan Card**” scan valid RFID card and system will advance showing date / time.

When the LCD display is showing time /data lower the loaded forks to the ground .



**(N/A)** If the loaded forks are lifted above the ground LCD digital display will show “**PLEASE WAIT**” and within few seconds display will show “some” load weight . *(Example: 455, not calibrated load weight at this stage)*



If the above test is valid than the system electrical connections are done right.

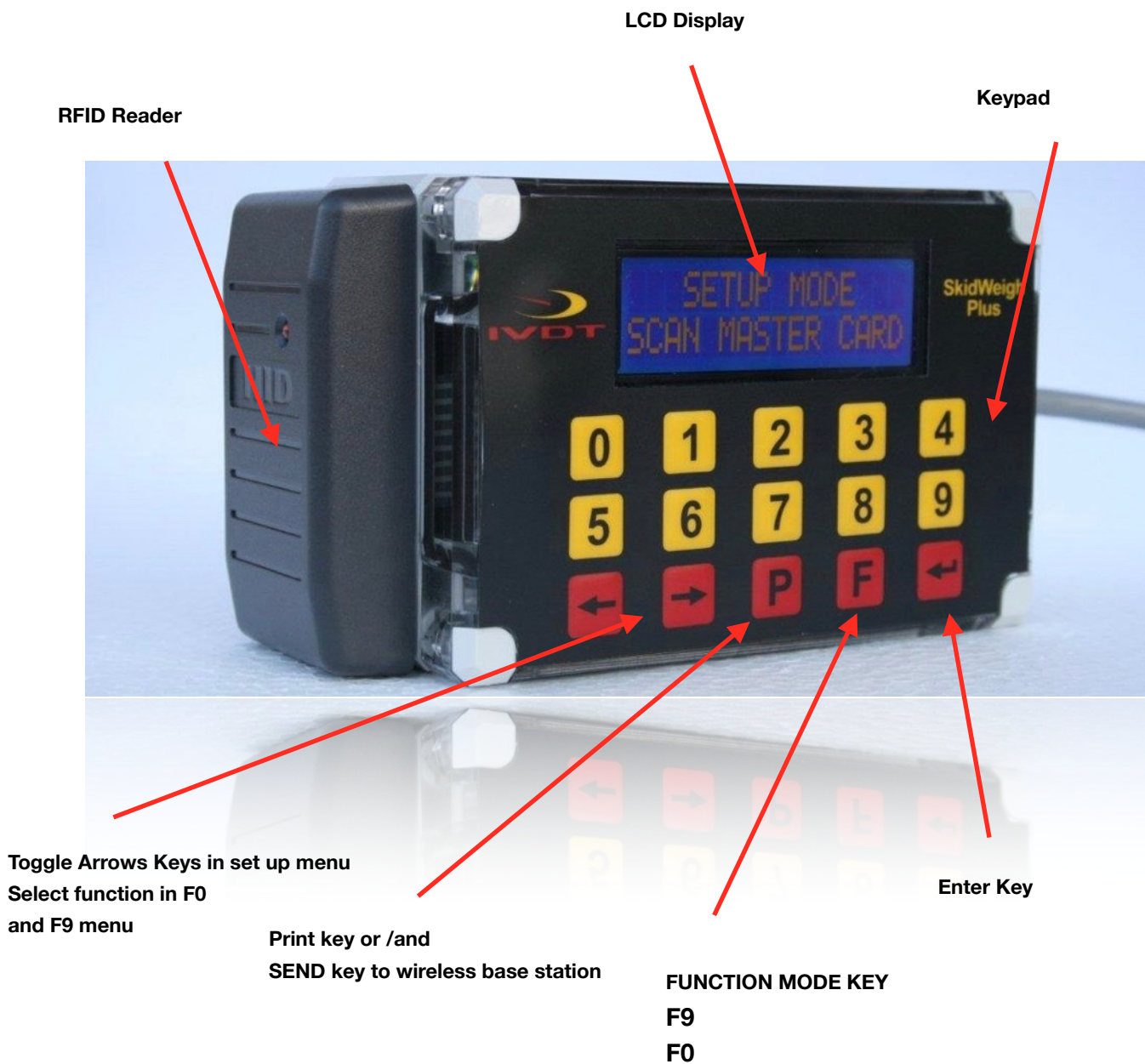
The next procedure will be to log in into **ADMINISTRATION MENU** to calibrate the weighing function.



## Lift truck equipped with hydraulic accumulators (N/A)

If the standard SkidWeigh system is installed on the lift trucks equipped with hydraulic accumulators, please contact us to provide you with different digital indicator having specific software algorithm to obtain load weight accuracy within +/- 1% of vehicle maximum lifting capacity.

## SkidWeigh Plus series ED3-RFID



## Administration Menu Instructions

### *(Weight scale function calibration, time/date, vehicle ID#)*

To enter into the **Administration Menu**, press **F9** and input password \_\_\_\_\_  
Use left and right arrow keys to scroll and follow the LCD instructions.

LCD Display
MENU
PASSWORD = _
LCD Display
<> KEY to SCROLL
F KEY TO EXIT

### Date / Time Set Up

LCD Display
SET CLOCK
ENTER TO SELECT
LCD Display
SET CLOCK
AUTO _

Use left ◀ and right ▶ arrow key (*bottom left side of the keypad*) to change from AUTO to MANUAL date/time set up.

**Note:** AUTO set up refers to system utilizing a wireless RF platform with automatic date /time update from IVDT Base Station communication and programming hub.

**For the applications without Base Station, select MANUAL \_ set clock and follow the LCD instructions.**

LCD Display
SET CLOCK
MANUAL _

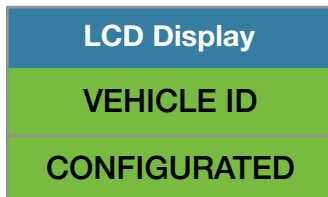
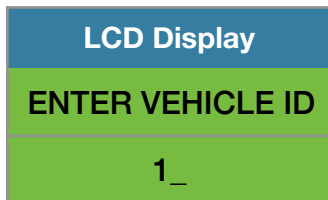
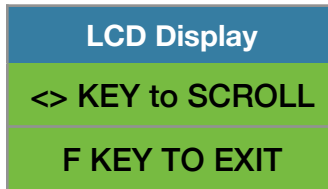


Press **“Enter key”** ↵ to confirm the setting. The cursor will automatically move to the next item to be changed ( Month, Day, Year, Hours, Minutes, Seconds). On the last correction, seconds item press **“Enter key”** ↵ to confirm new date / time set up.

## Set vehicle ID

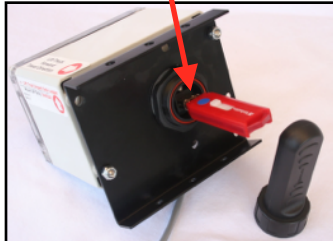
Maximum input number for vehicle ID is 4 digits.

**Note:** For system used with RFID card reader maximum input number for vehicle ID is 5 digits.





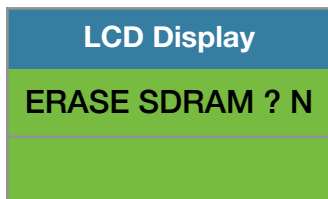
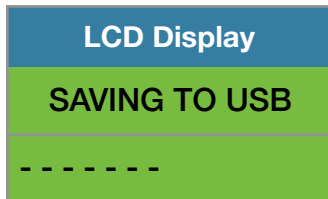
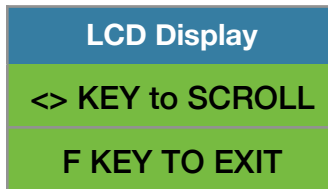
USB port



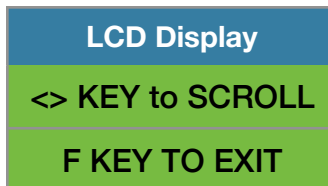
## Save data to USB

The SkidWeigh Plus system will allow you to download all recorded data onto a USB drive. **Follow instructions shown on the LCD display**

This function is located in **Supervisor Menu** to protect the integrity of the information.



When the system has finished uploading the data to the USB memory stick the LCD display will prompt you to erase the SDRAM , all files contained on the SKidWeigh Plus ED3-IM . Once you have made your selection **Y** or **N** the system will automatically bring you back to the main screen in the supervisor menu.





## Weighing scale function calibration (N/A)

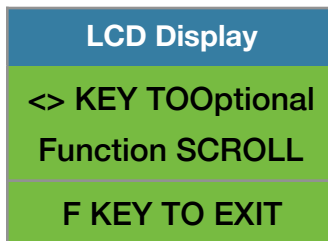
The **ED3-AT SkidWeigh Plus** calibration is automatic and is done by lifting empty and loaded forks (or any other attachment such as paper clamp) **just above the ground**. MAKE SURE THAT YOU HAVE A KNOWN LOAD WEIGHT AND KEEP IT NEARBY TO COMPLETE THE CALIBRATION.

For the best results use at least minimum calibration load test weight of 30 to 50% of maximum lifting capacity of the lift truck. Use customer floor scale or find a known skid load weight within the operational facility.

### Important:

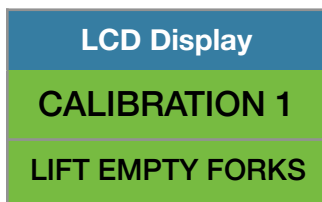
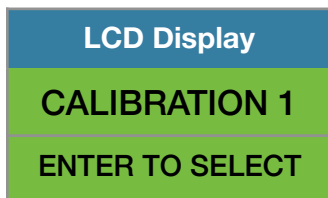
**If you want the system to show load weight in pounds, use the known load weight in pounds and enter that value accordingly. The same would apply if you want the system to show load weight in kilograms. Use the known load weight in kilograms and enter that value into the system accordingly.**

## Calibration starting point



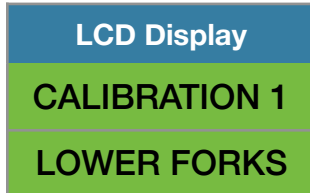
Lower the empty forks to the ground. There should be no hydraulic pressure in lift hydraulic circuit.

**Follow instructions shown on the LCD display**

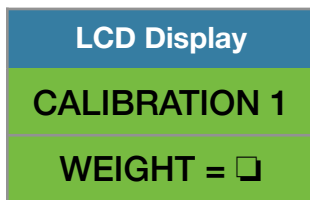


You must activate lift control valve and lift the empty forks just above the ground the same way that you would normally do when lifting loads. Do not slow down this lifting operational cycle, do not tilt the load, do not lift to different heights or move vehicle. **Lift empty forks just above the ground .**

After few seconds the LCD display will show

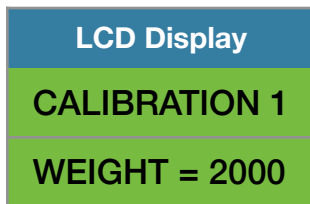


At this point you must lower the empty forks to the ground. The LCD display prompt you to input known calibration load weight.



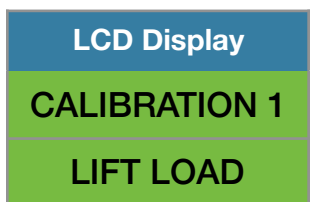
Pick up a known load weigh and **lower the loaded forks to the ground.**

*(Our example of the known load weight is 2000 kg)*

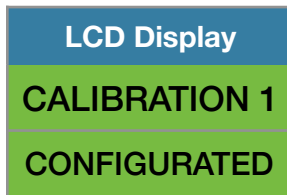
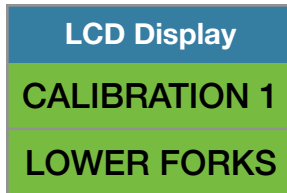


Input into the system the known load weight of 2000 into the LCD display and press **“Enter key”** ↵.

The LCD display will show



**Lift loaded forks just above the ground.** After few seconds the calibrated load weight value of of 2000 will be stored in the system memory. The LCD display will prompt you to lower **“LOWER FORKS”**.

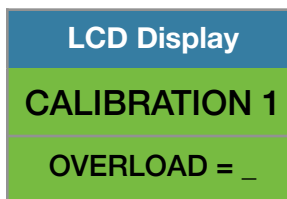


As soon the loaded forks are lowered to the ground LCD will show data / time. **System is ready to be used!**



### System with optional overload warning function *(Additional step)* **(N/A)**

As soon as the loaded forks are lowered to the ground the LCD will prompt you to input the overload value for your vehicle operational application.



Input the overload value and press **“Enter key”** ←.

**Calibration of the ED3-AT system weighing function is finished.**

## Supervisor Menu Instructions

*(Set Impacts, saving data to USB, other applicable functions)*

Low impacts

High impacts

Audible buzzer warning for low and high impacts

Audible buzzer warning time from 1 to 60 seconds

Continuous audible buzzer warning

To enter into the Supervisor Menu, press **F9**. Input password \_\_\_\_\_

**Follow instructions shown on the LCD display**

LCD Display  
MENU  
PASSWORD = \_

LCD Display  
SET IMPACTS  
ENTER TO SELECT

LCD Display  
ENTER LOW IMPACT  
4.0 G \_

LCD Display  
ENTER HI IMPACT  
8.0 G \_

LCD Display  
ENTER HI IMPACT  
8.0 G \_



LCD Display  
ENTER HI IMPACT  
CONTINUOUS ? Y

LCD Display  
ENTER HI IMPACT  
CONTINUOUS ? Y

LCD Display  
IMPACT  
CONFIGURATED

## Lift Truck Operator Menu Instructions (N/A)

### (Bluetooth, TARE set up, Parts count functions)

The SkidWeigh Plus system allows lift truck operator to pair Bluetooth additional devices such as onboard printers or barcode scanners or set TARE, Parts count.

To enter into the lift truck operator menu, press **F0**.

Follow instructions shown on the LCD display

LCD Display  
BLUETOOTH  
ENTER TO SELECT

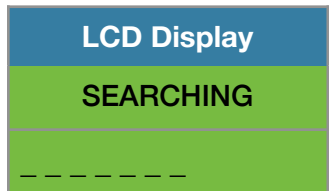
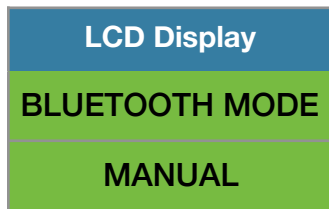
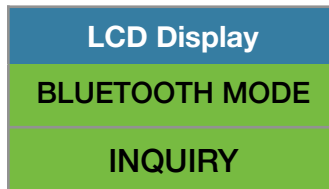
LCD Display  
BLUETOOTH MODE  
AUTO \_

**Note:** Use left ◀ and right ▶ arrow key (bottom left side of the keypad) to choose MANUAL, INQUIRY or AUTO.



**Note:** For the majority of the Bluetooth pairing applications use **AUTO** mode.

Make sure that you follow pairing instructions for each Bluetooth device.

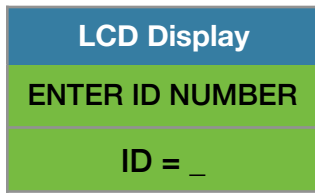


Bluetooth pairing options are

- **AUTO**
- **MANUAL**
- **INQUIRY**

## Operator Reference / Usage Guide

- Turn ignition switch
- Scan RFID card or input an operator ID# and press **“Enter key”** ↵ **if applicable.**



**(N/A)** - Insert the forks into the pallet or under the product to be weighed.

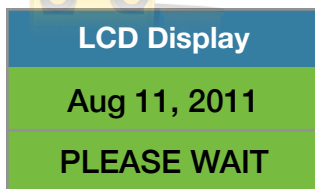
- Lower the forks to the ground.

**LCD display must show date and time in order to initiate weighing function.**



Activate lift control valve and lift loaded forks just above the ground.

Do not manipulate the tilt, side shift or move the vehicle.



LCD will display **“PLEASE WAIT”** and after few seconds a load weight will be shown

Example: Lifted load weight of 300



This load weight will be shown on LCD display until next time the forks are lowered to ground.

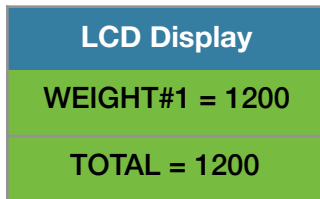
**Note:** When vehicle in motion the LCD might show some random load weight. This is due to the hydraulic spikes and this does not represents any actual load weight value. To initiate the **“weighing cycle”** you must lower the loaded forks to the ground and lift loaded forks just above the ground.

**Accumulative Load Weight Total (N/A)**

To add loads weight press **“Enter key”** ↵ after each load weight is shown on LCD display.



When **“Enter key”** ↵ is pressed LCD display will show a load weight of the first load and total load weight.



After each new load weight shown on LCD display and pressing **“Enter key”** ↵ system will be updated showing the latest current load weight total, number of loads and total load weight of all loads.

To reset current individual load weight or totalizing session press **“P” key** and session will be RESET.

**Note:** If the onboard printer is connected to the system by pressing **“P” key** after individual or total load weight you will get a printout ticket. If the system is utilizing RF communication data will be send to base station.

## TARE Function Input (N/A)

To set up TARE value into the system press **F0** key.

LCD Display
Aug 11, 2011
WEIGHT = 1200
LCD Display
<> KEY to SCROLL
F KEY TO EXIT

Scroll to get to the TARE value set up.

LCD Display
TARE
ENTER TO SELECT
LCD Display
TARE ADJUSTMENT
TR = 00 Select
LCD Display
TARE
CONFIGURATED

To reset or change TARE value press **F0** key and set to 0 to reset current TARE value.

To change to the new TARE value, input another TARE value and press **“Enter key”** ↵ .



## Digital indicator will show load weight with TARE indicating on the LCD display

LCD Display
Aug 11, 2011
TARE = 1250

All of the following load weight measurements will be displayed with TARE sign shown on LCD display.

**Important:**

To reset TARE you must press **“F” key** , input number **0** and press **“Enter key”** ↵.

LCD Display
<> KEY TO SCROLL
F KEY TO EXIT

LCD Display
TARE
ENTER TO SELECT

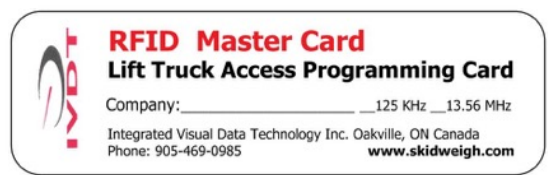
If the current value is 500 as of example, than input 0 value and **“Enter key”** ↵.

LCD Display
TARE ADJUSTMENT
TR = 500 Select

TARE will be reset to zero. All load weights shown on LCD display will be showing actual load weight.



When power is applied to the system HID reader LED will flash green 3 times while the beeper beeps simultaneously. The LED will then turn red. This indicates that the HID reader is operating properly.



**Make sure that you  
DO NOT MISPLACE RFID MASTER CARD**

All SkidWeigh products equipped with HID RFID card reader **MUST** be activated with valid operator access card in order to initiate system set up, calibration and enable vehicle normal usage by authorized operator. Every system shipped out to the customer includes a **RFID MASTER CARD to be used by the end user to program any number of valid lift truck operator's HID cards.**

***Integrated Visual Data Technology Inc. DOES NOT supply valid operator card to access the system or supply any programming of the HID cards.***

It is a customer responsibility to have at **least one VALID HID RFID operator card available** that can be automatically programmed into the any SkidWeigh product utilizing the enclosed **RFID MASTER CARD.**

## Technology

The RFID operator access HID card reader is integrated into digital indicator housing with SkidWeigh system proprietary software that allows self programming, deleting and management of authorized vehicles operators on the any of the Skidweigh products equipped with RFID card readers. There is no need for any additional programming devices!

System application to operate on any material handling vehicle having electrical power supply from 12 to 55 VDC.



## Starting point to program valid operator(s) cards

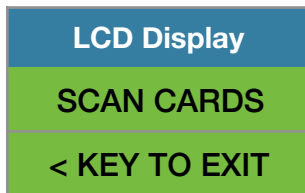


Turn ignition switch to on position

The LCD display will indicate to “SCAN CARD” (as shown below on the picture)

### Scan RFID MASTER CARD

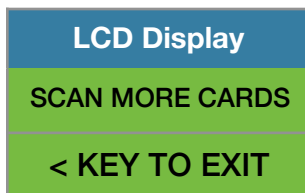
LCD display will show



### Scan first valid HID operator card.

The LCD display will show for the moment the value of the inputted card.

The LCD display will indicate that “CARD ADDED OK “and short beep once



### Scan second valid HID operator card.

Follow instructions shown on LCD display.

Keep adding the valid cards to vehicle. When all cards inputted into the system press **< KEY TO EXIT**

Lift Truck SkidWeigh RFID Authorized Operator Access System has a capability to add up to 250 valid operator cards.

**Note: Proceed with programming valid operator cards for each vehicle in your fleet.**

## Starting point to delete operator(s) cards already on the system

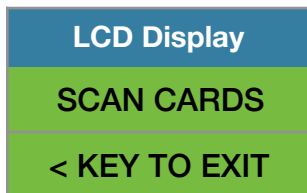


Turn ignition switch to on position

The LCD display will indicate to "SCAN CARD" (as shown on the picture)

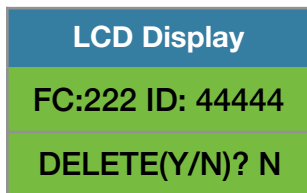
### Scan RFID MASTER CARD

LCD display will show



### Scan first valid operator CARD that you want to delete from the system

LCD display will show the card ID# . Use left ◀ and right ▶ arrow key to change to **Y**.



The current card ID# 44444 will be deleted from the system. LCD display will automatically show



### Scan next valid operator CARD that you want to delete from the system

Follow instructions shown on LCD display.

Keep adding cards to be deleted. When all cards inputted into the system press **< KEY TO EXIT** **Note:** In the case that you need replacement of RFID MASTER CARD, please call us at 905-469-0985



## How to disable RFID reader

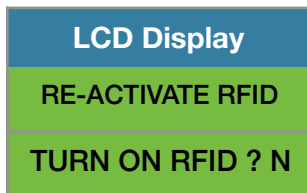
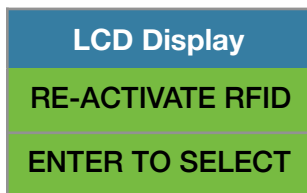
Vehicle access enable function in case of lost HID master card, valid card(s) or reader malfunction

- With digital indicator showing “ IVDT SCAN CARD” press and hold **F** key for 5 seconds
- LCD display will show PASSWORD =\_
- Input \_\_\_\_\_ and RFID reader will be disabled. Vehicle will be operational without RFID operator card input.

## How to enable RFID reader

With digital indicator showing date / time press **F 9**.

- LCD display will show PASSWORD =\_
- Input \_\_\_\_\_
- < KEY TO SCROLL and follow instructions



## ProxPoint Plus RFID Card Reader / SkidWeigh Technology

Read Range Typical 3”

Operating Voltage 12 to 55 VDC

Operating Temperature (-35 C to 65C)

Operating Humidity 5-95% non-condensing

Transmit Frequency 125 kHz

Card Compatibility All 125 kHz HID Proximity cards, long and short formats, as well as Corporate 1000 cards formats

LED Type Bicolored (green and red)

Transient Surge and Reverse Voltage Protection

Extra Security, Recognizes card formats up to 85 bits with over 137 billion unique codes

Application for all kinds of lift trucks regardless of the vehicle make, type ,model or operating voltage

Self programming, no additional devices required to add or delete cards from the system

Memory capacity to up to 250 operators ID#

FCC Compliance, part 15 of the FCC rules