



Installation, Calibration, Set Up & Operation Manual



General Installation Guide

This ED3/ED4 SkidWeigh Plus, Defender V143 Series guide describes how to install, calibrate, set up and use your onboard systems. Following the instructions in the **ADMINISTRATION MENU** you will be able to get the system set up, calibrate quickly. In the event that you require additional assistance, please contact customer support via e-mail at support@skidweigh.com , visit 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 Plus / Defender system or any other electronic product. Make sure that main electrical cable, 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 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.

SkidWeigh Plus / Defender 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.

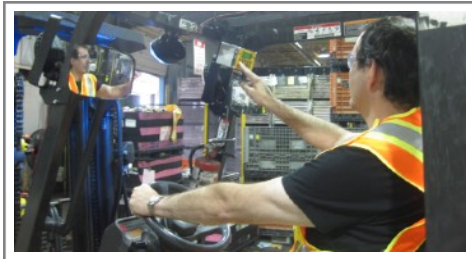
Overview of components

The standard ED3 / ED4 SkidWeigh Plus / Defender system consist of two main components:

- **Digital indicator** ** with wiring harness, mounting bracket
- Hydraulic pressure transducer with 3 wires cable (*Systems with onboard weighing scale function*)
- Installation & calibration manual and operator usage instruction

**** The ED3/ED4 and Defender Series configuration might consist of additional hardware.**

Depending on the system application the additional hardware such as USB port, operator keypad access control RFID card reader, impact module, Bluetooth module, strobe alert modules, RF module, etc., might be included in the indicator.

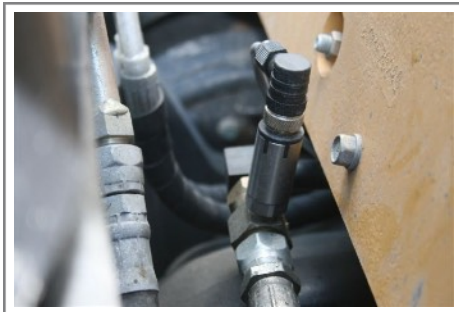


Load weighing operational principal

The load weight 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 per measurement session which is converted into a load weight reading.

Pressure transducer installation

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 lift 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

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) is slack.

Make sure that that installed pressure transducer will not touch any moving assemblies of the vehicle while in the 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

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 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. Depending on the system application the main wiring harness from indicator might have 2, 4, 5 or 7 wires.

Example: *Two wires harness for customized systems without vehicle disable function. (Impact, OSHA safety check, external audio / visual alert for operator access control verification)*

Electrical connections

All SkidWeigh / Defender systems operate from 12 to 55 VDC.

POWER CONNECTION

Orange Wire (+) Ignition switch On position

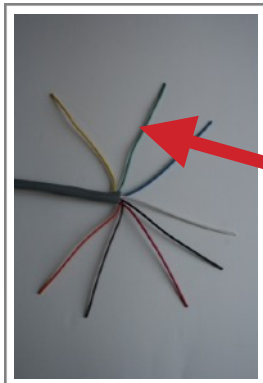
Brown Wire (-) Battery negative

PRESSURE TRANSDUCER CONNECTION

- **Red Wire**, connect to **RED** wire of the pressure transducer cable

- **Black Wire**, connect to **BLACK** wire of the pressure transducer cable

- **White Wire**, connect to **WHITE** wire of the pressure transducer cable



- **BLUE** Wire
- **GREEN** Wire

The application where operator access control to operate the vehicle via keypad or RFID card reader is required use two wires **BLUE** and **GREEN** to interface with vehicle seat switch. Connect **BLUE** and **GREEN** wire in **series** with **one of the wire** connected to the seat switch. The indicator internal relay contacts SPST are normally open and connected to **BLUE** and **GREEN** wires.

When valid operator keypad ID# or RFID card is inputted into the system the internal relay will be activated, contact will close and stay closed until the ignition switch is turned OFF.

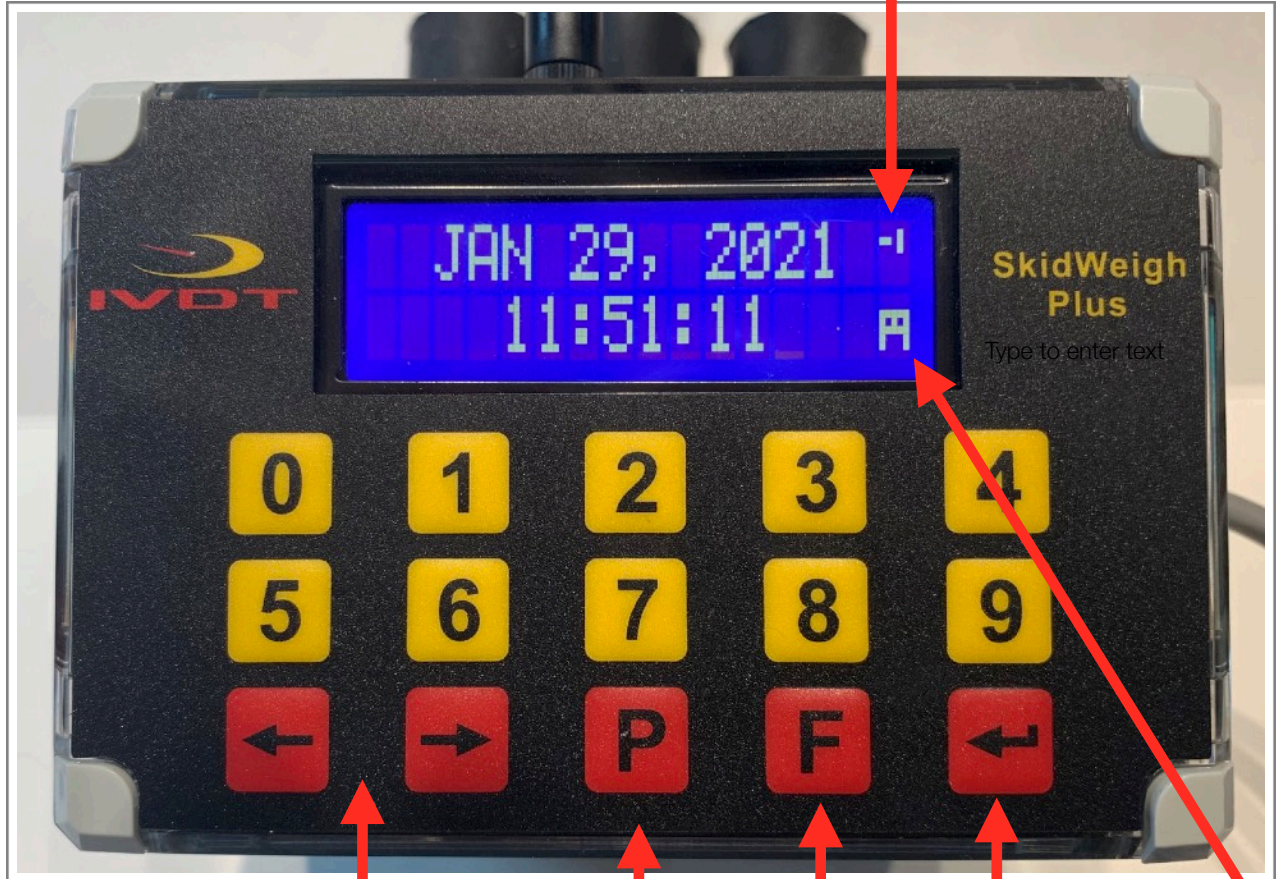
Vehicle Disable Function (If applicable)



Pressure transducer cable

- White Wire, pressure transducer signal 0 to 2,5 VDC
- Black Wire, signal negative
- Red Wire, power supply + 11 VDC

Impact Module Icon



Scroll Keys

Print, save data to
USB port and send to the base
station

"Enter key" ↵

Bluetooth Icon

F 9 Administrative Menu
F 0 Operator Menu

Note:

The keypad operator access control has a capability for input of 150 valid operators ID's, up to 3 digits maximum, valid range from 1 to 999.

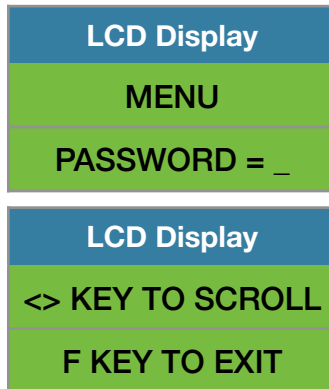
- All new systems are supplied with default operator ID# 111.
- All new systems with RFID reader are supplied with one valid operator RFID card.

Administration Menu Instructions

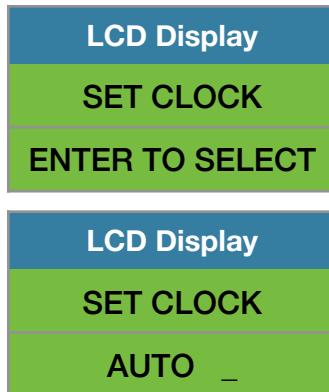
(Set up for Time/Date, Vehicle ID#, Impacts Setup, OSHA Safety, USB Data Upload, Weight Scale Calibration)

To enter into the Administration Menu the LCD Display must show Data / Time. Press **F** key and then number **9** and input the password **521**.

Use < > keys to scroll the menu. Follow the LCD instructions.



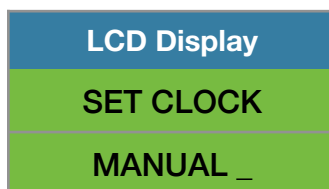
Date / Time Set Up



Use left ◀ and right ▶ arrow key 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.

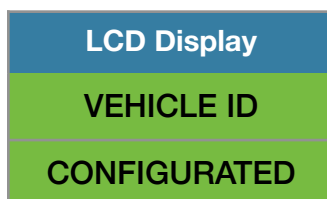
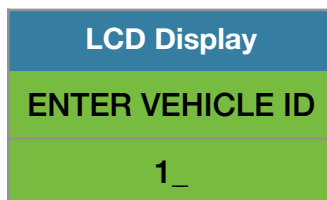
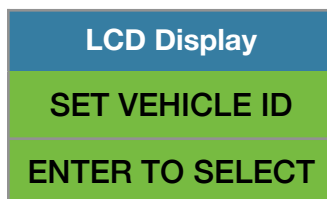
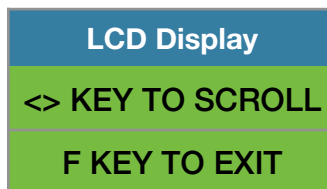


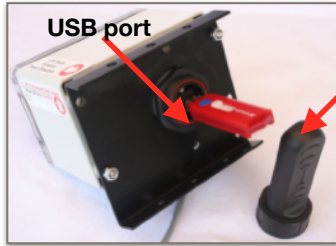


Press “**Enter key**” **↵** to confirm the setting. The cursor will automatically move to the next item to be changed (Month, Day, Year, Hours, Minutes, Seconds). On the last correction, seconds item press **Enter key** **↵** to confirm new date / time set up.

Set vehicle ID#

- Maximum input number for vehicle ID# is 3 digits.



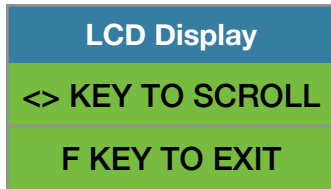


USB Port Protective Cover

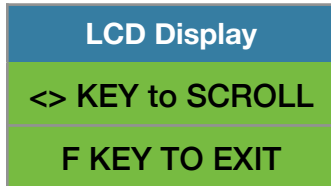
Saving data to USB memory stick

- Insert memory stick into USB port
- With LCD display showing date /time press **F** key and then number **9** and input password **521**.

Follow instructions shown on the LCD display.



When the system has finished uploading the data to the USB memory stick the LCD display will prompt you to erase the SDRAM. 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 (When applicable)

The ED3 /ED4 and Defender system 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:

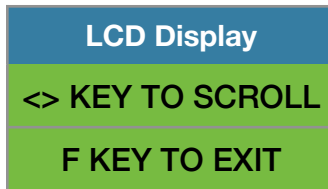
The weighing calibration must be done with known load weight in pounds.

Note:

With the system calibrated in pounds the end user can change load weight display from pounds to kg by pressing **F** key and number **0**. Use **< >** key to WEIGHT DISPLAY, select kg and press “**Enter key**” ↵.

Calibration

With LCD display showing date /time, press **F** key and then number **9** key. Input password **521** and scroll to “**Calibration1**” shown on LCD display and press “**Enter key**” ↵.



Lower the empty forks to the ground. There should be no hydraulic pressure in lift hydraulic circuit. Follow instructions shown on the LCD display



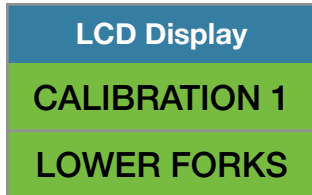
Press “**Enter key**” ↵ .



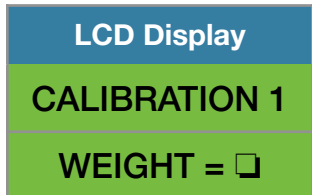
Lift empty forks just above the ground the same way that you would normally do when lifting loads. Do not slow down

this lifting operational cycle, do not tilt the load, do not lift to different forks heights or move vehicle.
Lift empty forks just above the ground.

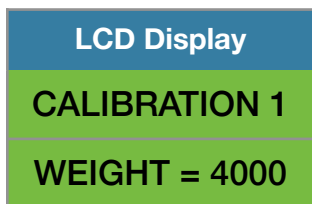
After few seconds the LCD display will show “Lower Forks”.



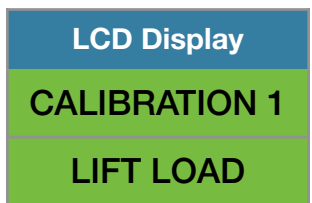
Lower the empty forks to the ground. The LCD display prompt you to input known calibration load weight.



Pick up a known load weigh and **lower the loaded forks to the ground.**
(Our example of the known load weight is 4000)

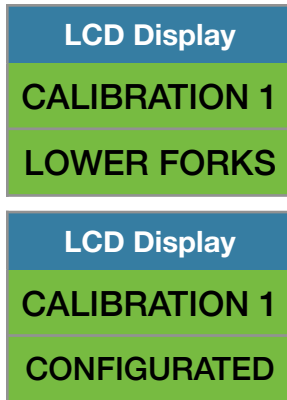


Input into the system the known load weight of 4000 into the LCD display and press “Enter key” ↵.



Lift loaded forks just above the ground. After few seconds the calibrated load weight value of 4000 will be shown on LCD display and will be stored in the system memory. The LCD display will prompt you to lower “**LOWER FORKS**”.





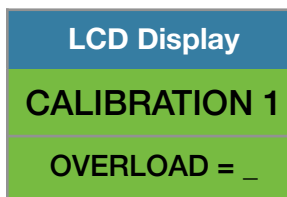
As soon the loaded forks are lowered to the ground LCD will show Data / Time.

System is ready to be used!



Overload warning alert (When applicable)

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



Input the overload value for your vehicle application and press **“Enter key”** ↵.

The LCD display will go back to default Data / Time display.

The load weight calibration and overload set up function is finished

Supervisor Menu Instructions

Set Vehicles Impacts (When applicable)

Low impacts, default value set to 6G

High impacts , default value set to 12G

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 **F** key and than number **9** key and input the password **521**.

Use left ◀ and right ▶ arrow key (bottom left side of the keypad) to change G's value.

LCD Display
MENU
PASSWORD = _

LCD Display
SET IMPACTS
ENTER TO SELECT

LCD Display
ENTER LOW IMPACT
6.0 G _

LCD Display
ENTER HI IMPACT
6.0 G _

LCD Display
ENTER HI IMPACT
12.0 G _

LCD Display
ENTER HI IMPACT
CONTINUOUS ? Y

LCD Display
IMPACT
CONFIGURATED

How to program keypad operator vehicle access ID#'s (When applicable)

- With power turned on to the system the LCD display will indicate to “ENTER ID NUMBER”

LCD Display
ENTER ID NUMBER
ID =

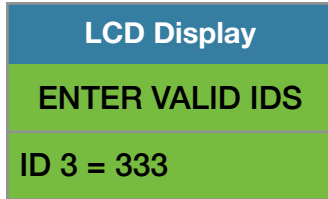
- Input code **742F** . The LCD display will prompt you to input first valid operator ID#. (Any number in range from 1 to 999) and press “Enter key” ↵.

LCD Display
ENTER VALID IDS
ID 1 = 111

- LCD display will advance and prompt you to input second valid operator ID# and press “Enter key” ↵.

LCD Display
ENTER VALID IDS
ID 2 = 222

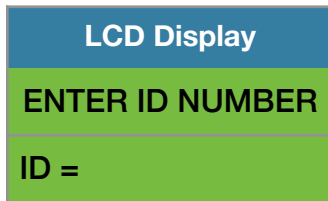
- LCD display will advance and prompt you to input third valid operator ID# and so on.



* Above example showing operators ID# 111, 222 and 333.

On the last valid operator ID number that you have inputed into the system you must press “**Enter key**” ↵ and then press **F** key.

At any time if you want to look at the current operators ID numbers already in the system, change or delate them you must input password **742F** while LCD display is showing “Enter ID Number”.



- Factory default keypad operator access ID# is 111.



OPTIONAL
Audio / Visual Alert for
High Impact
Overload
Idling
Downtime Event

How to program operator(s) RFID access cards (When applicable)

The RFID operator access HID card reader is integrated into digital indicator housing with SkidWeigh Plus / Defender system having 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.

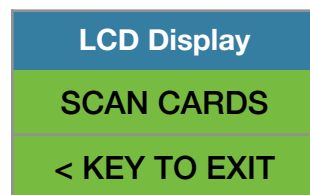
There is no need for any additional programming devices!

- Turn ignition switch to on position
- The LCD display will indicate to “SCAN CARD”



1. Scan RFID MASTER CARD

LCD display will show



2. 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



LCD Display

< KEY TO EXIT

3. 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.*

How to delete operator(s) RFID cards already in 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

LCD Display

SCAN CARDS

< KEY TO EXIT

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.

LCD Display

FC:222 ID: 44444

DELETE(Y/N)? N

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

LCD Display

SCAN MORE CARDS

< KEY TO EXIT

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 **521** and RFID reader will be disabled. Vehicle will be operational without RFID operator card.

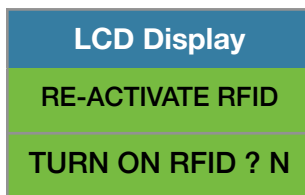
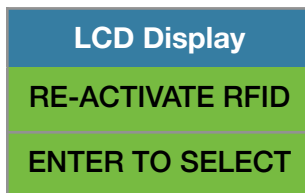
How to enable RFID reader

With digital indicator showing date / time press **F** key and than input number **9**.

- LCD display will show PASSWORD =_

- Input **521**

< 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

Lift Truck Operator Usage Guide

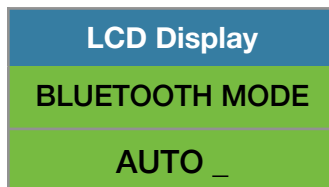


(Bluetooth, TARE set up, Parts count functions)

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

To enter into the lift truck operator menu, press **F** key and then number **0**.

Follow instructions shown on the LCD display



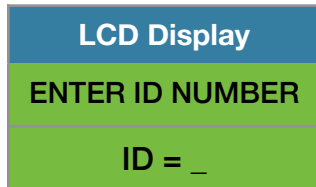
Note: Use left ◀ and right ▶ arrow key (bottom left side of the keypad) to choose MANUAL, INQUIRY or AUTO.

(Suggestion: For Bluetooth pairing use INQUIRY function)

Operator Usage Guide

- Turn ignition switch
- Scan valid operator RFID card if applicable.

Note: Input an operator ID# and press “**Enter key**” ↵ if keypad operator access control is used. *If applicable complete OSHA safety check procedure.*



- Insert the forks into the pallet or under the product to be weighed.
- Lower the loaded 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 display will show “PLEASE WAIT” . After few seconds a load weight will be shown on LCD display

Accumulative Load Weight Total (When applicable)

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

LCD Display
Aug 11, 2011
WEIGHT = 1200

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

LCD Display
WEIGHT#1 = 1200
TOTAL = 1200

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 the base station.**

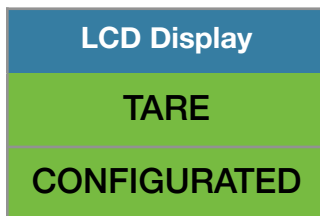
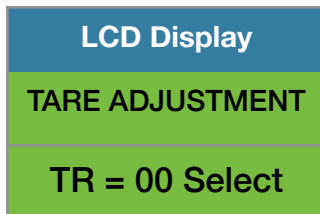
TARE Function —

To set up TARE value into the system press **F** key and then **0** key.

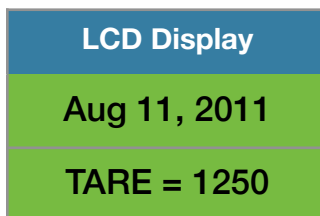
LCD Display
Aug 11, 2011
WEIGHT = 1200

LCD Display
<> KEY to SCROLL
F KEY TO EXIT

Scroll to get to the TARE value set up.



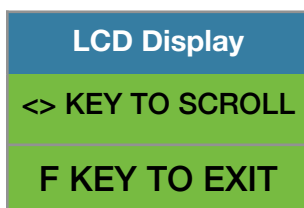
To reset or change TARE value press **F** key and then **0** key and set to **0** to reset current TARE value. To change to the new TARE value, input another TARE value and press “**Enter key**” ↵ .



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

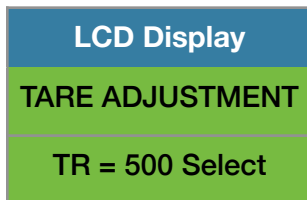
Important:

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





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



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

OSHA / Pre-shift Safety Check (When applicable)



The OSHA safety check will be automatically initiated every 8, 12 hours or daily.

Default value shown on LCD display is (F) representing “fail”.

Use < > key to change. Follow the LCD messages menu and press “Enter key” ↵ after choosing F or P

F = Fail and (P)= Pass