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# Installation & Calibration Manual

# SkidWeigh ED2-EP System

**Hydraulic Pressure Transducer**

Electric Pallet Truck On-board Check Weighing Systems

ED2-EP V1600

Integrated Visual Data Technology Inc.  3439 Whilabout Terrace, Oakville, Ontario, Canada  L6L 0A7

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# General Installation Guide

This **ED2-EP / EPT SkidWeigh Series V1600** systems installation & calibration guide describes how to install, calibrate, test and use your electric pallet truck on-board weighing system. Following the instructions in this guide will enable you to get your system operating quickly and easily. In the event that you require additional assistance, please contact customer support via e-mail to support@skidweigh.com, visit www.skidweigh.com or contact us at the address or contact number below:

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## Safety

Always disconnect the vehicle battery while installing SkidWeigh system or any other electronic product.
Make sure that indicator, 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 ED2-EP 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. The system is connected directly to the vehicle's power on switch. The system operating voltage is from 12 to 55 VDC.

## 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.

## ED2-EP SkidWeigh Series

Our policy is one of continuous improvement and the information in this document is subject to change without notice. Check that software version displayed on LED is the one applicable for your application.

## Overview of components

The standard ED2-EP SkidWeigh Series check weighing system consist of the following components:
* Digital LED indicator, with master power on/ off switch, wiring harness, mounting bracket with anti-vibration mount
* Hydraulic pressure transducer with 3 wires cable
* Installation & calibration manual and operator usage instruction

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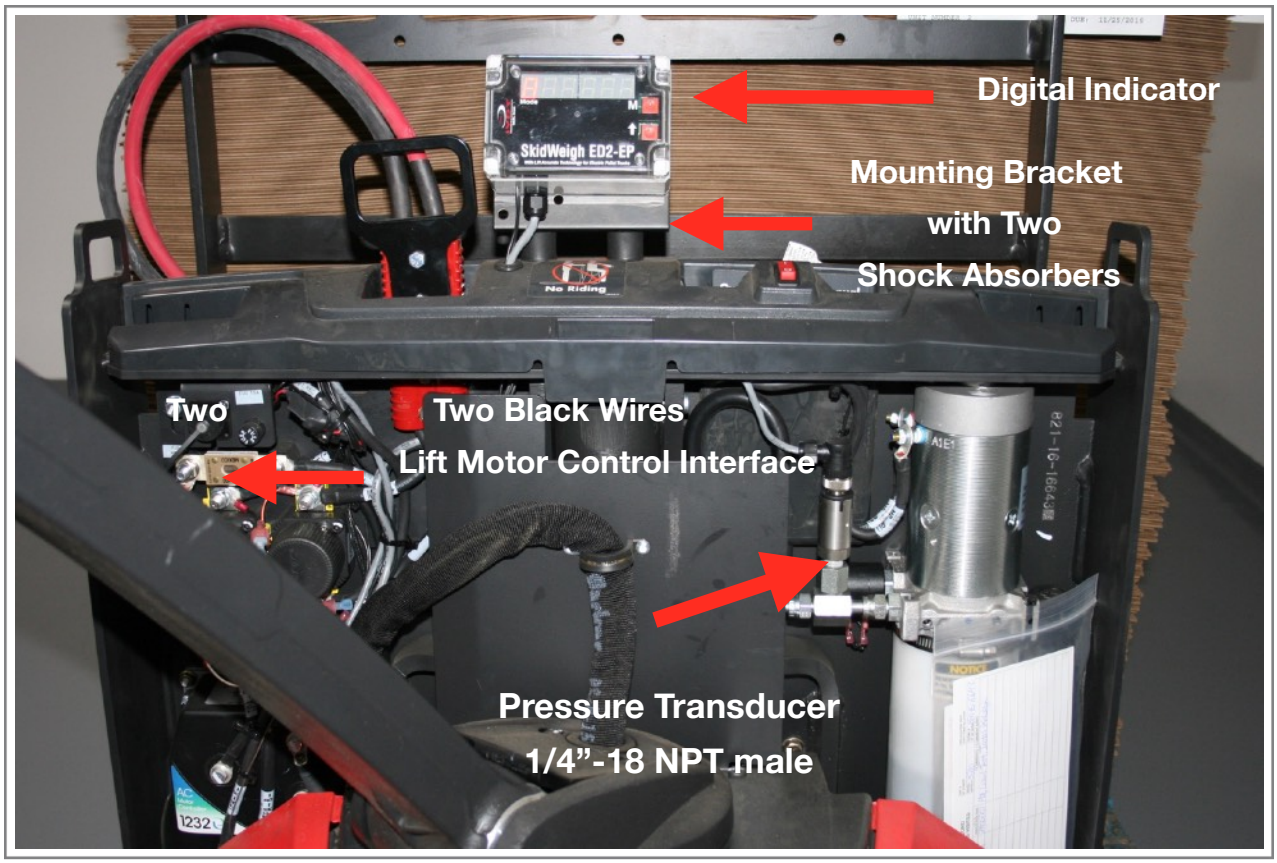


## Operational principal

The ED2-EP SkidWeigh system operation is based on the hydraulic pressure transducer mounted in the vehicle lifting hydraulic circuit. The load should be placed all the way in towards the load back guard. With the load lowered to the ground the LED display will show **Mode 8 w**hich is a starting point to initiate a load weight procedure. The increase in the hydraulic pressure will activate the specific "weighing cycle" measurement algorithm for activation of the lift accurate technology process to automatically stop the lifted forks at predetermined height.

## Operational Cycle

**Operator must activate lift control switch and hold it until the loaded forks are automatically stopped at the measurement height calculated by the pressure transducer input signal**. The increase in the hydraulic pressure signal will initiate specific "weighing cycle" measurement algorithm for activation of the lift accurate technology process that will automatically stop lifted forks at predetermined height.
As soon the loaded forks are stopped the system will take a series of measurements and within 3-4 seconds the load weight will be shown on LED display.
With  the load weight is shown on LED display the system lift motor travel control will be disabled.

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## Pressure transducer installation

The pressure transducer, **1/4”-18 NPT male thread** must be installed in the lifting hydraulic line between the lift control valve and lift cylinder.

Install a T-piece in hydraulic line for the mounting of the pressure transducer.

# Automatic lift motor travel de-activation methods during the load weighing cycle

Two BLACK wires are connected to the internal relay located in the ED2-EP digital indicator (SPST dry contacts)
This internal relay is controlled by the software and activate only during the load weighing cycle.

### Method A.

Electric pallet trucks with CANbus controllers
Use two BLACK wires and “splice” them in series with the operator activated lift control switch and electronic controller terminal.
The predetermined motion of the lifting cylinder and the load weight measurement “weighing cycle” will be initiated and controlled automatically by the software algorithm based on the input from the pressure transducer signal. Once the load weight is shown on the LED display internal relay will be de-activated and the lift motion control event will be automatically enable. (With vehicle stationary and during the lifting cycle diagnostic display on some vehicles might show “ No power to lift motor” or audio signal might be activated for short time period.)

Consult vehicle CANbus controller wiring diagram or contact the OEM for the proper interface of two black wires to control lift pump motor travel

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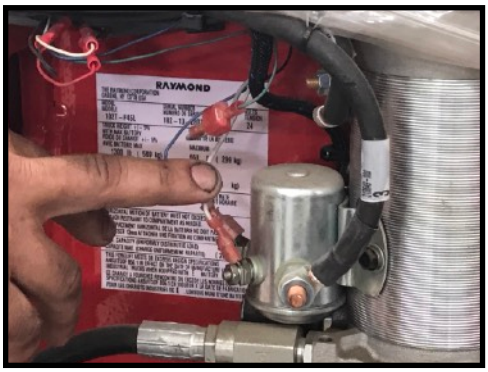
## Method B.

Electric pallet trucks with stand alone pump solenoid

Use two Black wires and connect them in series with one of the lift solenoid coil terminal wires activating the lift motor.

Disconnect one of the original solenoid coil wire ( From either positive or negative terminal of the solenoid coil) and splice two BLACK wires in series to disconnected wire of the solenoid terminal.



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(With vehicle stationary and during the lifting cycle diagnostic display on some vehicles might show “ No power to lift motor” or audio signal might be activated for short time period)

**Note:**

When unloaded vehicle is in motion the hydraulic “spikes from pressure transducer signal” might be seen by the vehicle controller as start of the “weighing cycle”. Short interruption of the power to the lift solenoid coil on “some controllers” is seen as a “fault” and power to the vehicle will be cut.

## Solution:

When moving unloaded vehicle turn ED2-EP indicator power switch to OFF POSITION.

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## Pressure transducer installation precautions

Before installation of the pressure transducer the hydraulic lift circuit should be pressure free.
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, load backrest or any other convenient place on the electric pallet truck dashboard body 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.

## Electrical Connections

All ED2-EP Series SkidWeigh systems operate from 12 to 55 VDC.

**Orange Wire (+) Vehicle power on / Ignition switch On position**

**Brown Wire (-) Battery negative**

**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**

**NOTE:**
Two BLACK wires are connected to the internal relay, dry contacts located in the ED2-EP digital indicator. The internal relay is controlled by the microprocessor and will be activate only during the load weighing cycle. There is no power connected to these two BLACK wires.

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## Verification of the electrical connections done properly

- Turn master On /Off switch to On position. The LED display will show the software version. - Lower forks to the ground. The LED display should show Mode 8.
- Activate lift control switch and hold it. Forks will be lifted and automatically stop at height predetermined by the input signal from pressure transducer. - The LED display will show some random load weight. System electrical connections are done right. - Next step will be to calibrate the system with known load weight.

## Electrical power short circuit protection

- All of the SkidWeigh systems are internally short circuit protected with resettable fuse. There is no need to install external inline fuse in the orange wire connected to the vehicle power on / ignition switch.
- Automotive 60 V load dump protection
- Reversal power supply protection

Note: Any external devices connected to the SkidWeigh system, such as non standard onboard printer might require external fuse.

## Weighing functions calibration procedure

MAKE SURE THAT YOU HAVE A KNOWN LOAD WEIGHT AND KEEP IT NEARBY TO COMPLETE THE SYSTEM WEIGHT FUNCTION CALIBRATION.

ED2-EP Series (Bleck dial)

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**Important Note**

If you want the system to show load weight in pounds, use the known load weight in pounds and enter that value accordingly into the system. 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.

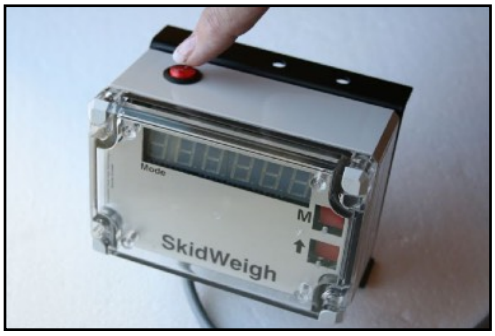
## Two Buttons Weighing Scale Calibration Procedure

The ED2-EP SkidWeigh system is using two buttons to calibrate the weighing scale function. The calibration procedure for the ED2-EP SkidWeigh series is fully automatic and is done by lifting empty and loaded forks by holding the lift control valve until the forks are automatically stopped and the session measurements are taken. For the best results use at least minimum calibration load test weight of 50% to 80% of maximum lifting capacity of the electric pallet truck.
Use customer floor scale or find a known skid load weight within the operational facility.

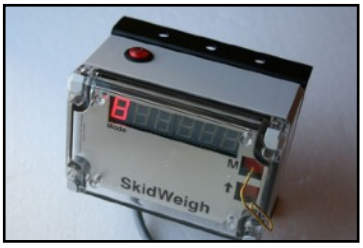
## Calibration starting point for weighing function

**Lower the empty forks to the ground.**

There should be no hydraulic pressure in lift hydraulic circuit.




Turn vehicle power switch to on position.




The LED display will show software version for the moment. ( Example software version 30075, 1600, etc.). After few seconds LED Mode window will show number 8.

**System is ready to be calibrated.**

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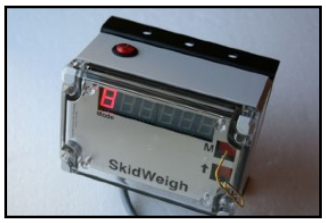
## Calibration of empty forks being lifted

With lowered empty forks on the ground the **Mode 8** will be shown on LED display.

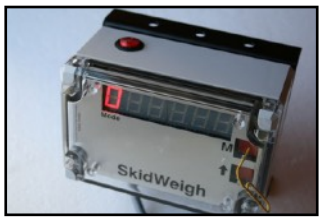
To initiate calibration of the empty forks, press the **"M"** button and hold it down for approx. 5 seconds.




**Use paper clip**
**to activate calibration buttons**

After approx. 5 seconds the **Mode 8** digit will change to **Mode 0**.

To initiate calibration of empty forks, **activate and hold lift control switch until pump motor stops automatically.**



- The pressure transducer readings and specific algorithm calculations will stop the lift cylinder automatically at predetermined forks height.
  - The LED display will go blank for the moment and within few seconds will show **"0"** value in furthest right digit display.

-

## Automatic zero weight function is finished

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## Calibration of loaded forks with known calibration load weight

Position your electric pallet truck into the skid load with **known calibration load weight**.
**Lower the loaded forks to the ground.**
(In our example we will use the known calibration load weight of 4000 pounds)

- Start entering a known load weight into digital indicator by pressing **arrow up** button (increments from 0 to 9) with wrap around function. Start with first least significant digit of your known load weight.

- Use the **"M"** button to increment to next digit on the LED display

| First least significant digit "0" | Second least significant digit "0" | Third least significant digit "0" | Forth least significant digit "4" | Fifth least digit you must enter "0" |
|---|---|---|---|---|
| | | | | |

- Repeat this procedure until the forth least significant digit display is shown. Use arrow up to input number **4**.
  **Caution:** In our example known calibration load weight of 4000 pounds has only four digits. Make sure that the 5th digit has **"0"** value entered into the calibration system. Next step is to press "M" button to advance to **Mode 6** which is the last mode in order to calibrate the system.
  With loaded forks on the ground and digital LED display showing **Mode 6** activate and hold lift control valve until loaded forks are automatically stopped. The LED display will go blank for the moment and within few seconds display will show the calibrated known load weight. (In our example LED display will show 4000)

## The ED2-EP system weighing calibration function is finished

If you lower the loaded forks to the ground the **Mode 8** digit will be shown on LED display. System is ready for electric pallet truck check weighing function

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## Optional

### Accumulative load weight total (Optional)

- Black button accumulative load weight
- Red button accumulative load weight total / reset and print

### On board dot matrix mobile printer

- RS232 interface

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# Operator Proper Weighing Procedure

The starting point to initiate a weighing cycle is:

- System power switch must be turned on
- Loaded forks must be lowered to ground
- LED display must show Mode 8
- Operator must activate lift control with and hold it until loaded forks are stopped automatically
- Within few seconds LED display will show the load weight
- Load weight will be shown on LED display until next time forks are lowered to the ground

**Note:** When unloaded vehicle is in motion the hydraulic “spikes from pressure transducer signal” might be seen by the vehicle controller as start of the “weighing cycle”. Short interruption of the power to the lift solenoid coil on “some controllers” will be seen as a “fault” and power to the vehicle will be cut.

**Solution**
When the system weighing function is not utilized or you are moving unloaded vehicle turn ED2-EP indicator power switch to OFF POSITION.