



K-Tech International, Inc.

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K-Weigh™
INTELLIGENT
Load Weighing System



INSTRUCTION MANUAL

Models:

LW4201LV

LW4202LV



K-Tech International, Inc.

56 Ella Grasso Avenue
Torrington, Connecticut 06790 USA

1-800-993-9399

(860) 489-9399

IX Service & Warranty Agreement

To Order:

- Mail your Purchase Order to:
K-Tech International, Inc.
P.O. Box 1025
Torrington, CT 06790
- Fax your Purchase Order to K-Tech International, Inc. at (860) 489-4399.
- Call in your order to 1-800-993-9399 or (860) 489-9399

Customer Service:

Please call Customer Service at 1-800-993-9399 or (860) 489-9399 for any questions regarding equipment, product literature, request for quote, or for the status of any order placed.

Technical Support:

Please call Technical Support at 1-800-993-9399 or (860) 489-9399 or for any technical assistance you may require regarding K-Tech equipment.

Payment:

- NET 30 DAYS with credit approval (request a credit application)
- C.O.D.
- Major Credit Card
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1. All Continental U.S. orders are shipped via UPS-Ground service unless otherwise specified. Alternate shipping methods are billed accordingly.
2. Outside Continental U.S.-request details.
3. Shipping Terms: FOB Origin/Prepaid & Added.

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K-Tech International, Inc. warrants equipment of its own manufacture to be free from defects in material and workmanship for a period of one year from date of shipment from factory or appointed distributor to original user.

This warranty does not apply to any products which have been damaged, neglected, altered, abused, used for a purpose other than the one for which they were manufactured, repaired by the customer or any party without K-Tech's authorization, or used in any manner inconsistent with K-Tech's instructions.

K-Tech's entire obligation under this warranty shall be limited (at K-Tech's option) to repair or replacement of any parts which prove to be defective within the warranty period. Defective products must be returned by customer to K-Tech's factory in its original, unaltered form, transportation prepaid.

Prices may be changed and product may be

modified or discontinued at any time without notice. K-Tech will not be liable for any costs incurred by its customers in removal or replacement of defective products.

K-Tech International, Inc.'s liability under this warranty, or any other warranty, whether expressed or implied in law or fact, shall be limited to the repair or replacement of defective material or workmanship, and in no event shall be liable for consequential or indirect damages. No representative or person is authorized to assume for us any of the liability in connection with the sale of our products.

Repair Policy:

K-Tech International, Inc. customer repair policy requires that all customer repairs have a pre-assigned Return Authorization (RA) number. This system assists us in better serving our customers by ensuring accurate identification and prompt turnaround for returned product. If you need to return a product for repair, please contact our Customer Service Department at 1-800-993-9399 or (860) 489-9399 for a Repair Authorization (RA) number. Please have the following information available when requesting authorization:

1. Bill To and Ship To addresses
2. Name and telephone number of contact person for this Repair Authorization (RA)
3. Purchase Order # for this Repair Authorization (RA)
4. Job site name
5. Quantity, model number(s), and serial number(s)
6. Brief description of problem experienced with the unit(s)

Shipping:

Please reference the Repair Authorization (RA) number on the outside of all cartons and on all paperwork enclosed with the product. Undocumented returns run the risk of being lost and are untraceable. All material must be shipped on a Freight Prepaid basis. Collect shipments will be refused.

Credit Policy:

Only "unopened" product which is returned within **30 days** from the original ship date will be accepted for credit. All products returned will be subject to a minimum 15% restocking charge.

All returns must have prior authorization. Call 1-800-993-9399 or (860) 489-9399.

Prices may be changed and product may be modified or discontinued at any time without notice.

VIII Specifications

Enclosure:	steel NEMA Type 1 (standard) 8 1/4"H x 14"W x 3"D (21 cm x 36 cm x 7.6 cm) 8 1/4"H x 15 1/2"W x 3"D (21 cm x 39 cm x 7.6 cm) with flange
Sensor(s):	1"H x 7"W x 1/4"D (26 mm x 178 mm x 6.4 mm) bar; 8' (2.4 m) cable
Power Input:	100 - 240 VAC, 47 - 63 Hz; 0.6 A @ 115 VAC; 0.45 A @ 240 VAC
Output:	0.5 - 3.25 VDC (standard)
Resolution:	< 50 lbs (< 23 kg) or 2% (typical installation)
Repeatability:	< 2%
Temperature:	0 to 100°F (-18 to 38°C)
Humidity:	20 - 85% non-condensing
Drift/°F:	0.3% FS (typical, without auto zero)
Zero Reset:	< 1%
Correction:	+/- 40% offset (~ 1.3VDC)
Input:	120 VAC ground (pull-down)
Approvals:	ETL (UL, CSA) Safety: 9800547 Conforms to ASME Std. A17.5-1996 Certified to CAN/CSA Std. B44.1-96

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I Introduction

Thank you for purchasing the K-Weigh Intelligent Load Weighing system by K-Tech International, Inc. The K-Weigh is the cost effective, easy to install, low maintenance elevator load weighing solution. It is effective for both modernization and new construction of traction elevators with both isolated and non-isolated platforms.

The K-Weigh is available in models to interface with virtually any controller, providing the information necessary to optimize elevator traffic flow and improve passenger safety and comfort. This includes software-based controllers that require a continuous voltage signal, and relay-based controllers that require discrete "dry contact" signals.

The K-Weigh system uses a cross-head mounted deflection sensor. As weight is added to the car, the system senses the bending of the cross-head. This is converted to a load signal and sent to the controller.

If at any time of this installation you have any questions, please feel free to contact our Customer Service Department at 1-800-993-9399, or send e-mail to support@ktechonline.com.

* * * * *

Estimated Installation Time

The times listed below are based on an installation performed by a two person team. Times will vary depending on site circumstances and installation crew experience.

Sensor and Box Installation	1.5 hours
AC and Signal Wiring	1 hour
Setup and Adjustments	1.5 hours

* * * * *

Output peaks below the highest landing:

Occasionally, structural factors will cause the output voltage to be highest at a floor lower than the top floor. Many times this is not a problem, since the controller learns the values for each floor, and will take this into account.

If the controller shows a significantly higher weight percentage at a lower floor than at the top floor, you will need to:

1. Find the floor where the highest reading occurs.
2. Follow the steps for Full Car adjustment (page 17) at this floor (rather than the highest landing).
3. Set up the controller (refer to controller manual).

Reset relay does not activate:

- Check that controller is generating the Auto Reset signal properly.
- Check wiring to be sure the Auto Reset signal is reaching the relay from the controller (or pushbutton).

Red *RE-CALIBRATE* LED is lit:

- If the system goes out of calibration by more than 1.3 VDC in one direction, the RED "RE-CALIBRATE" LED will light. You will need to re-zero the amplifier(s).
- Simply bring the empty elevator to the lowest landing and follow the directions under Adjustments, Empty Car (page 15). You do not need to readjust the Full Car setting.

NOTE: *Weights are not needed for this procedure.*

VII Troubleshooting

Below are some tips for troubleshooting some common problems. If you are unable to find a solution here, please contact:

K-Tech International, Inc. Technical Support

1-800-993-9399

support@ktechonline.com

Cannot Set Empty Car with COARSE adjustment:

- Check that Sensor is properly connected to the amplifier board.
- Using a Digital Multimeter (DMM) set to read 10-20 VDC, measure the voltage at T1 or T3 and observe voltage as you turn the COARSE adjustment. It should change.

LED's did not cycle when power turned on:

- Check power supply for +12 VDC and -12 VDC (± 0.5 VDC).
- Check power connection to amplifier board.

Output is not the sum of Channel A and Channel B:

- Check that jumper is correctly installed in position 2.

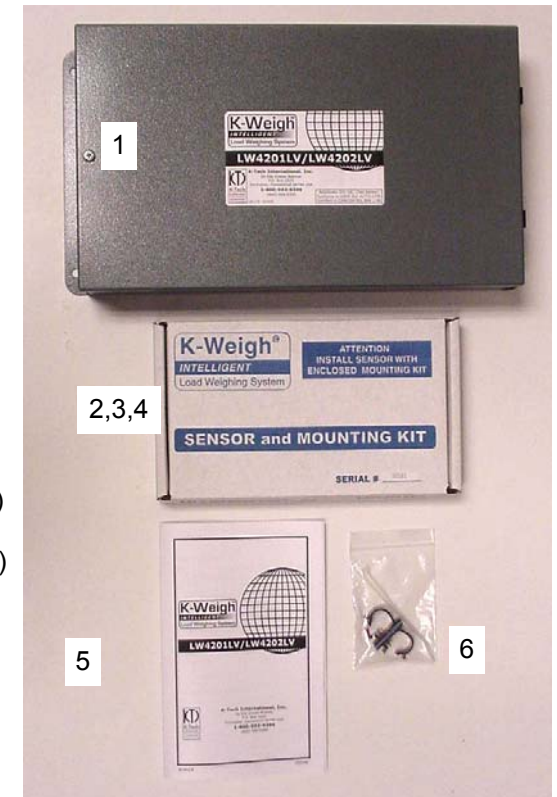
Output seems to be drifting:

- Drift of around 0.1 VDC is not unusual. Adjacent car can cause some local drift through structural effects.
 - If this occurs immediately after installing system, sensor may still be settling mechanically. Wait 1-2 hours and check settings.
 - Sensor(s) may not be mounted properly. Be sure ALL debris is cleaned from between the sensor and the C channel and that the sensor is flat and flush to the channel surface (a flashlight shone from behind the sensor can be helpful).
-

Parts List

Check that the following parts are included:

1. Electronics Enclosure (Gray Box)
(includes power supply and amplifier circuit board)
2. One or Two Sensors with Mounting Hardware:
 - bolts (2)
 - tapered washers (2)
 - flat washers (4)
 - nuts (2)
 - Nylok nuts (2)
3. Drill Guide/Sensor Cover with Mounting Hardware
4. Quick Start Card for Sensor Installation
5. Installation Manual
6. Bag containing Hardware:
 - wire ties (2)
 - rubber grommets (2)
 - cable clamps (adhesive mount) (2)
 - fork terminal (1)



* * * * *

II Installation

Mounting the Sensor(s)

1. Bring empty elevator to the lowest landing.
2. Identify the proper mounting location for the sensor(s). Sensor placement will vary depending on the roping configuration of the elevator.

Most common are:

Single Sheave/ Center Hitch Plate (Fig 2.1)

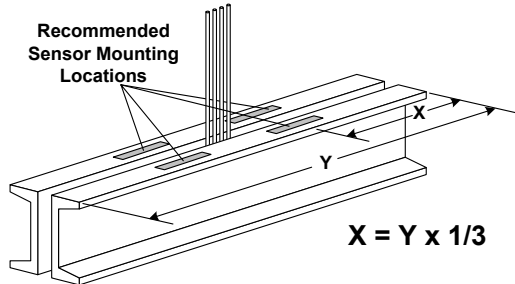


Fig 2.1 Single Sheave/Center Hitch Plate

Dual Sheave (Fig 2.2)

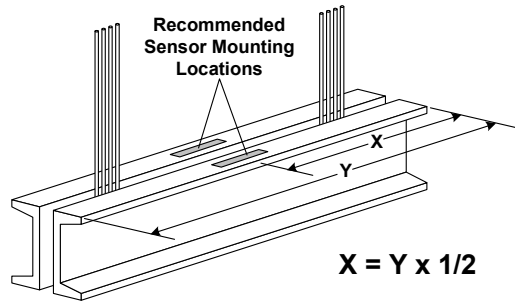


Fig 2.2 Dual Sheave

3. Prepare the C channel surface by removing any paint, coatings, or bumps in the mounting area. Use a belt sander if necessary.
4. Place the drill guide/sensor cover on the C channel **against** the open side and C-clamp it in place. (Fig 2.3)



Fig 2.3 Drill guide in place

VI Maintenance

Reset Function (Manual)

1. Bring empty elevator to the lowest landing.
2. With a Digital Multimeter (DMM) set to 10-20 VDC scale, measure the voltage LW+ to LW- at the controller, or read the output counts.
3. If this voltage is less than 0.0 VDC or more than 1.0 VDC, or the equivalent in counts, momentarily press the pushbutton.

NOTE: If the system goes out of calibration by more than 4 VDC in one direction, the RED RE-CALIBRATE LED will light. You will need to re-zero the amplifier(s).

Simply bring the empty elevator to the lowest landing and follow the directions under Adjustments, Empty Car (page 15). You do NOT need to readjust the Full Car GAIN setting.

NOTE: Weights are not needed for this procedure.

* * * * *

V Controller Setup

Please refer to the Controller Manual for specific instructions. Below is a summary of the steps for your information.

1. Remove the weight from the elevator; run it up and down the hoistway a few times.
2. Bring empty car to the lowest landing.
3. With a DMM, check the voltage (at the controller) between LW+ and LW-. If it is 0.5 ± 0.2 VDC, skip Step 4; OR, check the controller load weigher reading in counts. It should be within $\pm 20\%$ of your preferred setting. If it is, skip Step 4.
4. Manually initiate an Auto Reset signal.
Repeat Step 3.
5. If the controller has cable weight compensation, follow the procedure given for setting this up.
6. Set percentages and operational parameters needed for the installation (e.g. dispatch, bypass, pre-torque, overload, etc.).
7. Follow any checking procedures given in the controller manual.
8. Complete setting up any other controller motor parameters as described in the controller manual.

* * * * *

5. Holding drill vertically, drill two holes through the guide and C channel using a 3/8" bit. (Fig 2.4)

NOTE: Be sure to hold drill perpendicular to the top of the C channel surface.



Fig 2.4 Drill holes

6. Clean up ALL debris. (Fig 2.5)



Fig 2.5 Clean up ALL debris

7. File any edges off the drilled holes to assure flatness. (Fig 2.6)



Fig 2.6 File hole edges

8. Install the sensor using the hardware provided (Fig 2.7):
 - a. Place a flat washer and a tapered washer on the bolt.
 - b. Insert through holes in crosshead and sensor from the underside.
 - c. Place flat washer and nut on top of bolt.
 - d. Tighten to 20-30 ft-lb.

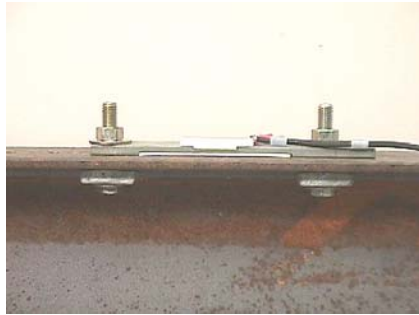


Fig 2.7 Hardware installed

NOTE: Tapered washer must be oriented correctly: wide side out and parallel to the open side of the C channel.

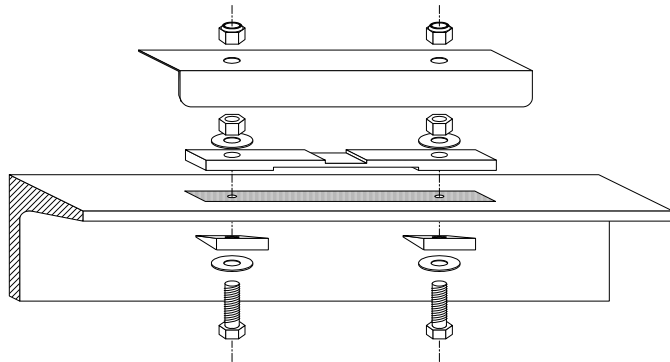


Fig 2.8 Sensor hardware order

9. Place the drill guide/sensor cover on the exposed bolt threads and secure in place with the Nylok nuts supplied. Snug each Nylok nut down, then back off 1/8-1/4 turn. The cover should feel **slightly** loose.
10. The sensor cable can exit out of either side. Be sure to secure the cable between the sensor and the electronics box close to the C channel using plastic wire ties or other non-invasive means.



Fig 2.9 Installed sensor and cover

NOTE: After mounting the sensor(s), allow at least 30 minutes for them to mechanically settle.

* * * * *

4. Set DMM to read mVDC; connect RED (positive) lead to T5(A) and BLACK (negative) lead to Ground (next to black DC power input connector). (Fig 4.3)
5. Adjust the COARSE and FINE pot's until you read 0 ± 20 mVDC.

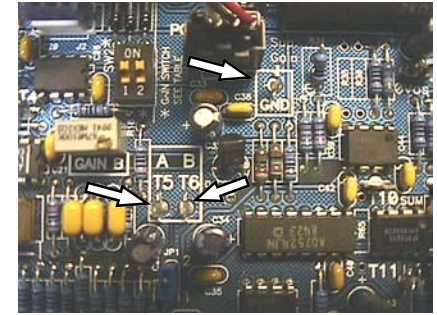


Fig 4.3 Ground and Test points T5(A) and T6(B),

This is a sensitive reading - you may see the yellow LED's flicker once set. This is OK.

6. If using two sensors, move RED (positive) lead to T6(B) and repeat steps 3 - 5 for Channel B; reference switch SW4 for step 3.
7. Press the RESET button (located below the LED's, next to the relay). This sets the system output to $+0.5$ VDC ± 20 mVDC. To check, connect the RED (positive) DMM lead to LW+ next to the output connector.

* * * * *

Full Car

1. Add the **full car weight** and bring full elevator to **the highest landing**. Be sure the load is **evenly distributed**.
2. Set DMM to read VDC and connect RED (positive) lead to T5(A) and BLACK (negative) lead to Ground (next to black DC power input connector). (Fig 4.3)
3. Adjust the GAIN pot for Channel A until you read **positive or negative** 1 ± 0.03 VDC.

NOTE: If you are unable to reach 1 VDC, set SW1 for the next higher gain and repeat from Empty Car Step 4 (see GAIN Table printed on board to left of SW1).

4. If the reading is -1 VDC, set switch SW3 to minus (-) position (if the reading is $+1$ VDC do nothing).
5. If using two sensors, move RED (positive) lead to T6(B) and repeat steps 3 and 4 for the Channel B; reference switch SW4 for step 4.
6. To check your setup, move RED (positive) lead to LW+ test point next to the output connector. You should read 3.25 ± 0.1 VDC.

* * * * *

Full Car

1. Add the **full car weight** and bring full elevator to **the highest landing**. Be sure the load is **evenly distributed**.

2. While at the top floor with full weight in the car, adjust the GAIN pot for Channel A until **either** of the YELLOW LED's comes on and the GREEN LED **just shuts off**. Then, back off **slowly** until the GREEN LED **just turns back on**. Turning the pot clockwise will increase the setting, counterclockwise decreases. (Fig 4.2)

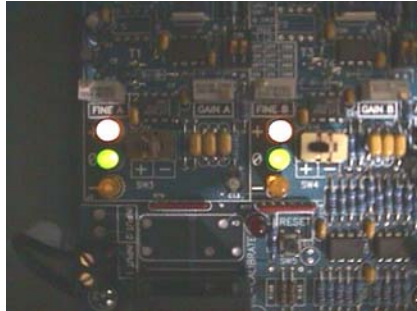


Fig 4.2 YELLOW and GREEN LED's are on. GREEN LED's should turn off within 1/4 turn.

NOTE: If you are unable to have either YELLOW LED turn on and have the GREEN LED turn off, set SW1 for the next higher gain and repeat from Empty Car Step 4 (see GAIN Table printed on board to left of SW1).

4. If the (-) YELLOW LED is lit, set switch SW3 to minus (-) position (if the (+) YELLOW LED is lit, do nothing).
5. If using two sensors, repeat steps 3 and 4 for the Channel B; reference switch SW4 for step 4.

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Adjusting Using a Digital Multimeter

If you would prefer to use a Digital Multimeter (DMM) for the adjustment and calibration of the K-Weigh system, follow the instructions below.

Empty Car

1. Turn on AC power to the system and **allow to sit for 30 minutes**. (the LED's will cycle for a few seconds).
2. **Bring empty elevator to the lowest landing.**
3. Set switch SW3 to plus (+) position.

Mounting the Electronics Box

Locate a suitable mounting location for the Electronics Box. It should be close to the sensor(s), and allow 14" (36 cm) clearance for the cover to open fully.

Be sure you will be able to get into the box to make adjustments.



Fig 2.10 Electronics box mounted

The Electronics Box has four mounting holes through the bottom flanges, located in a rectangular pattern 14.75" X 6.75" (37.5 cm X 17.1 cm). Mount the enclosure using at least two of these mounting holes (If unable to mount as pictured in Fig 2.10, use angle brackets or similar method).

NOTE: If you find it necessary to drill any holes in the box, BE VERY CAREFUL to vacuum up ALL the filings. Any filings on the electronics will cause erratic operation and/or failure.

* * * * *

III Wiring

AC Input Wiring

The K-Weigh is equipped with a universal input power supply that will accept from 100 to 240 VAC input.

1. Remove the cover screw and open the cover of the Electronics Box.
2. Pick out one of the knockout holes and bring AC wires through **conduit as required by local codes**.
3. Route AC HOT, AC RETURN, and Ground through the knockout hole.

NOTE: Rubber grommets are shipped for low voltage signal wires only. DO NOT use for AC input wiring.

4. Strip 0.25" insulation off the end of your wires.
5. Connect as follows (Fig 3.1):

AC HOT (black): connect to screw terminal nearest the wall.

AC RETURN (white): connect to screw terminal farthest from the wall.

GROUND (green): use fork terminal supplied; insert under Chassis Ground screw on the power supply; tighten screw.

The center terminal is pre-wired to one side of the relay on the electronics board.

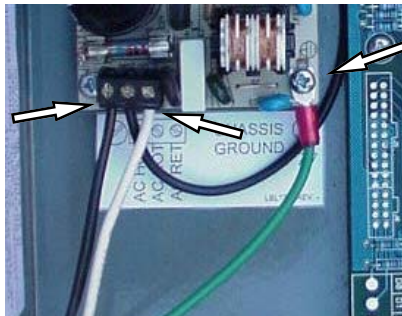


Fig 3.1 AC Wiring Close-up

NOTE: Be sure AC HOT and AC RETURN are correctly wired!!! If not, the operation of the load weighing system will be affected.

NOTE: If the AC input to the power supply is higher than 125 VAC, then you must disconnect the black wire connecting AC HOT to the relay INPUT. Provide 120 VAC to the relay connector separately to utilize the Auto Reset function.

(See Auto Reset Function Wiring on page 12 - 13)

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IV Adjustments

The K-Weigh amplifier board is designed with LED indicators to guide the adjustment and calibration. A Digital Multimeter (DMM) is not necessary for a standard setup.

If you would prefer to use a DMM for the calibration of the system, the procedure is included on page 16.

NOTE: When making ALL adjustments, be sure to stand in the SAME POSITION on the car top EACH TIME. If possible, make the adjustments from off the car top (in the hallway).

Empty Car

1. Turn on AC power to the system and **allow to sit for 30 minutes**. (the LED's will cycle for a few seconds).
2. **Bring empty elevator to the lowest landing.**
3. Set switch SW3 to plus (+) position.
4. Adjust the COARSE and FINE pots for Channel A until **only** the GREEN LED's are lit. The (+) and (-) LED's indicate which way the setting is off from Zero. Turning the pots clockwise increases the setting; counterclockwise decreases. (Fig 4.1)

This is a sensitive reading - you may see the yellow LED's flicker once set. This is OK.

5. If using two sensors, repeat steps 3 and 4 for Channel B; reference switch SW4 for step 3.
6. Press the RESET button (at arrow). This will set the output to 0.5 VDC (± 20 mV) for the empty car.

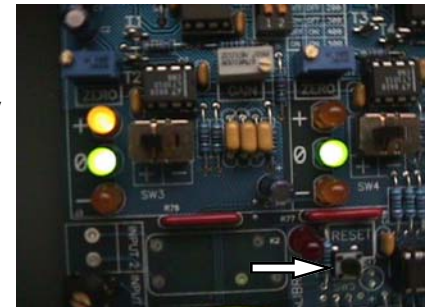


Fig 4.1 LED indicators: left amplifier is adjusted high; right is set correctly; arrow is reset button

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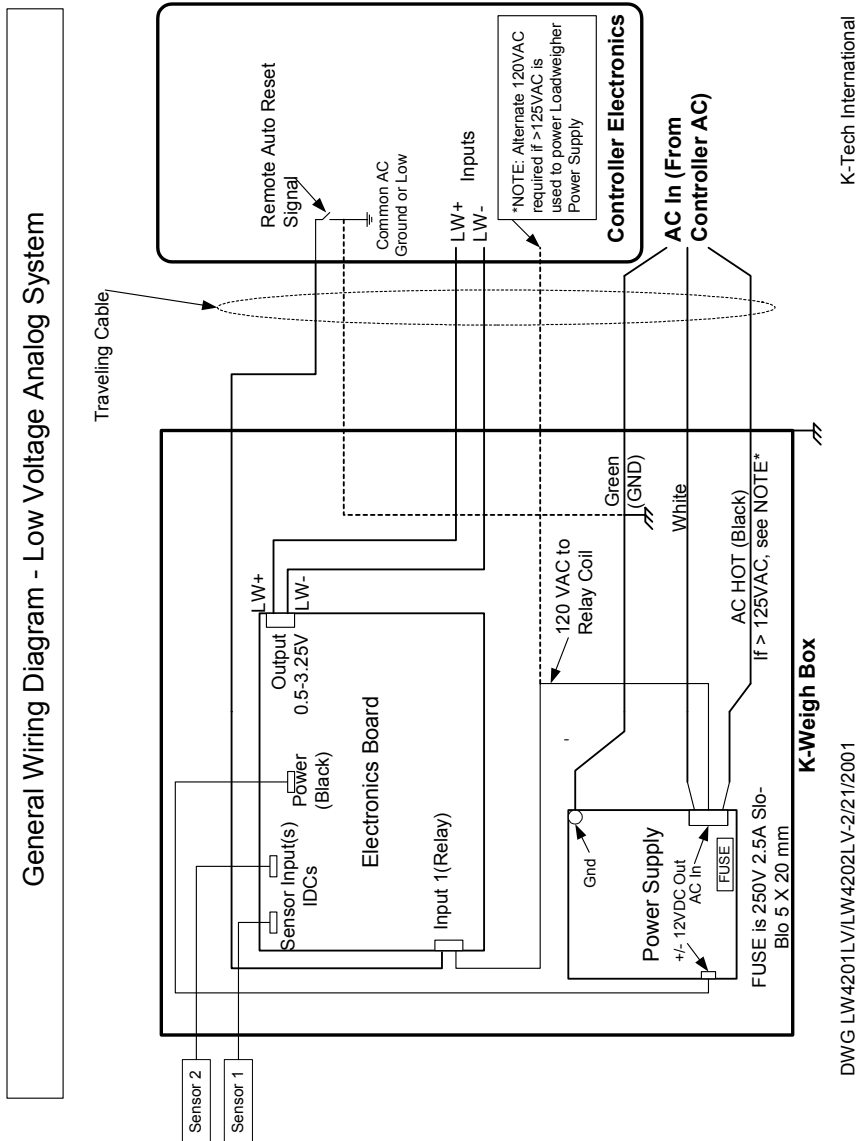


Fig 3.6 Wiring diagram

K-Tech International

DWG LW4201LV/LW4202LV-2/21/2001

Sensor Input Wiring

1. Remove the threaded ring from each sensor cable by **carefully** pushing the connector through it.
2. Route the cable through the knockout from the outside of the Electronics Box and insert the threaded part of the sensor cable strain relief into the knockout.
3. **Carefully** push the cable connector **thin side first**, back through the removed threaded ring, dimple side first. Slide the threaded ring up to the box and tighten on the threads protruding through. (Fig 3.2)
4. Loosen the flexible part of the sensor cable strain relief. (Fig 3.3)
5. Pull any excess cable into the box, and roll it up into a 3" - 4" diameter coil and insert it into the clamp inside, tie-wrap or wire tie it as shown in Figure 3.5 leaving enough (about 1 ft.) on the free end to connect to the circuit board.
6. Carefully insert the connector on the sensor cable into the appropriate header in the upper left-hand corner of the circuit board as shown noting that wires exit towards the wall of the box nearby. (Fig 3.4)
7. Hand tighten flexible part of the sensor cable strain relief against nut on the outside of the box. This clamps the cable in place.

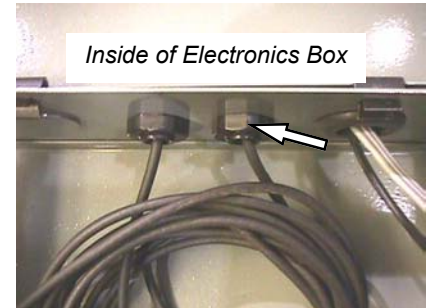


Fig 3.2 Threaded rings for sensor cable (dimples to wall).

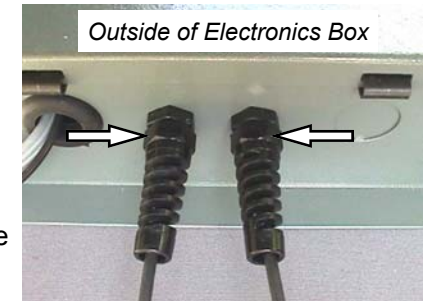


Fig 3.3 Strain relief for sensor cable (turn at arrow to loosen/tighten on cable)

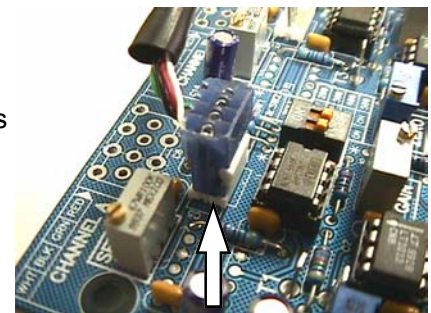


Fig 3.4 Sensor plugged into connector

NOTE: If two sensors are supplied, repeat steps 1-7.

8. When you have completed the AC and Sensor wiring, your unit should look like Fig 3.6.

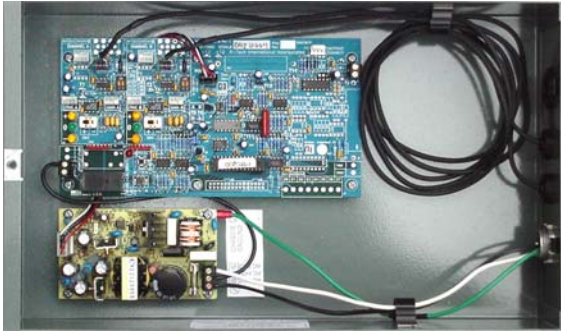


Fig 3.5 AC Wiring and Sensor Wiring

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Auto Reset Function Wiring (Automatic)

The Auto Reset function will operate with any controller equipped with an Auto Reset signal output. This software-driven signal activates a contact closure to ground triggered when the elevator is empty at the lowest landing for a set period of time.

1. Connect one terminal of INPUT 1 to 120 VAC (AC HOT).

NOTE: This is pre-wired from the factory. Connect to separate 120 VAC source only if the AC supply for the system is greater than 125 VAC.

(see Note under AC Input Wiring on bottom of page 10)

2. Connect the other terminal of INPUT 1 to the Auto Reset signal wire (from the traveler).
3. At the Controller I/O panel, connect the Auto Reset signal wire (from the traveler) to the reset output. See controller manual for details.

* * * * *

Auto Reset Function Wiring (Manual)

If the controller does not provide an Auto Reset signal, you can wire a remote pushbutton to trigger the function manually.

1. Connect one terminal of INPUT 1 to 120 VAC (AC HOT).

NOTE: This is pre-wired from the factory. Connect separately if the AC supply for the system is greater than 125 VAC. (see Note under AC Input Wiring on bottom of page 10)

2. Connect the other terminal of INPUT 1 to the Reset signal wire (from the traveler).
3. Connect a NO momentary dry contact pushbutton between the Reset signal wire (from the traveler) and Ground.

See Maintenance on page 19 for instructions for use.

* * * * *

Output to Controller Wiring

1. Route the controller LW+ and LW- inputs through the traveler to the K-Weigh Electronics Box.
2. Connect the LW+ wire to LW+ output on the amplifier board. (Fig 3.6)
3. Connect the LW- wire to LW- output on the amplifier board. (Fig 3.6)

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