LOADMASTER FT2-PV Installation Guide

GENERAL

This scale system must be installed on a firm and level surface. Particular attention should be paid to the load bearing points at the end of each module. Note that if the area between the ends of the scale is too high it will cause weight errors by deflecting the sub-frame up into the bridge creating a bind. The same condition can be created if surface settling occurs, the center of the frame will not compress the surface at the same rate as the load bearing ends. This will create the same bind as the unlevel surface described above.

INSTALLATION STEPS

1. Site preparation. You should have a firm and level surface area that is at least one (1) foot wider and five (5) feet longer than the overall dimensions of the scale. For a temporary installation compressed stone is adequate. For any installation over 6 months it is recommended that concrete footers be poured below frost level.

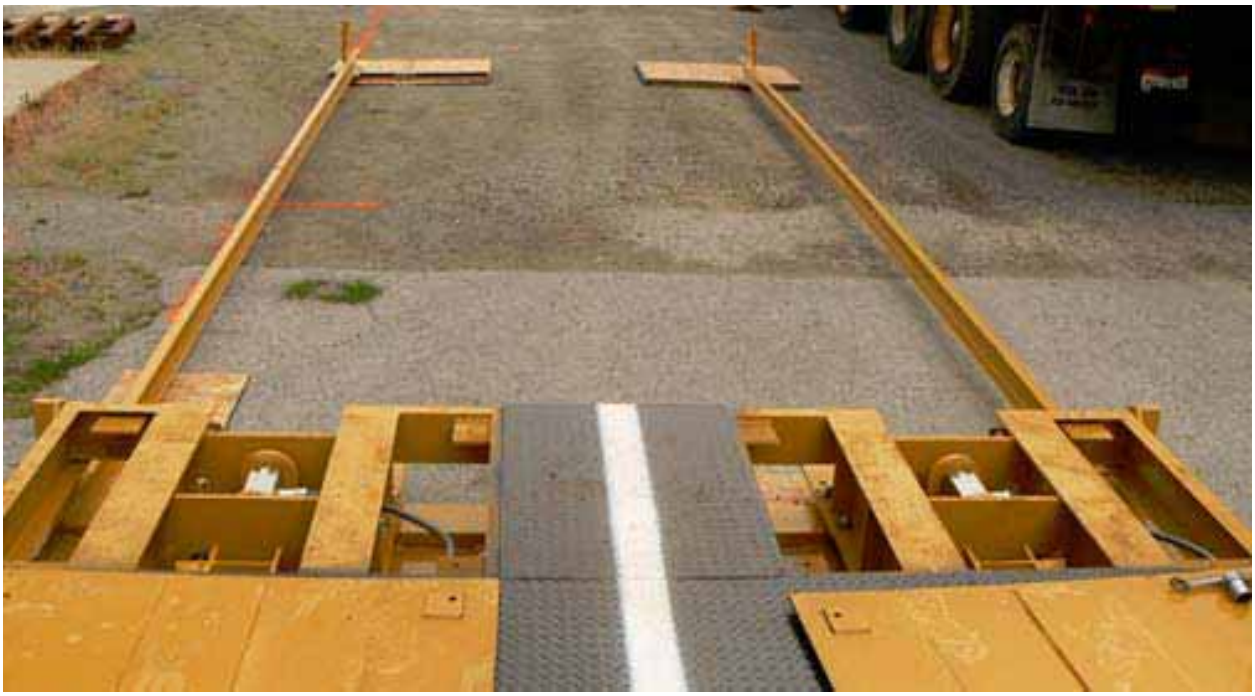
2. Determine where your indicator will be installed and arrange the scale so the J-Box is located on the same side. Note that the J-Box is located behind an access plate just to the left of the welded FT2 nameplate and serial tag.

3. Set the first module. It's important that you remove each access plate and hook your chains to the structural beams, DO NOT lift the scale by hooking on to the deck, side channel iron skirts, or smaller 3" I-beam stringers found under the manhole covers. Approx weight for the lift is as follows:

    a. 10' (x10') module is 5,900 lb.
    b. 15' module is 8,000 lb
    c. 17'6" module is 9,100 lb
    d. 20' module is 10,200 lb
    e. 23'4" module is 11,600 lb
    f. 25' module is 12,300 lb

4. Skip this step if this is NOT a three (3) bridge system with a center “dead” section.

   Install module separators on to the end of the frame. By bolting with four ¾” x 2 ¼” bolts supplied. (Two each side)



5. Place end module in place and bolt to the either the separator channels (3 bridge system) or the other module (2 bridge system). Using four ¾” x 2 ¼” bolts supplied. (Two each side)

6. Skip this step if this is NOT a three (3) bridge system with a center “dead” section. Lower center bridge section between the two end scale sections.

7. Install splice bolts on all 4 corners of the center section. Using the 56 ¾” x 2 ¼” bolts supplied. (14 per corner)

8. Bolt the bulkheads to each end of the scale. Using four ¾” x 2-¼” bolts per end.

9. The optional steel ramps attach to the bulkheads, if you have ramps install them now. If you will be using a stone approach, build your approach now.

10. Remove the four shipping bolts. One located at each corner of the two end scale sections. It is suggested that you store them inside the scale so they are available when moving the scale.

11. Adjust the Bumper bolts to minimum of 1/8” and a maximum of 1/4” on all four corners of the scale sections. Total of eight bumpers per section.

12. All load cells should now be supporting some weight (check the tension on suspension links). If the installation surface is not perfectly level it may be necessary to do some shimming. Depending on the firmness of your installation surface it may be necessary to re-shim after some traffic has gone over the scale. To prevent overloading a corner (and for optimum accuracy), it's important that EACH load cell be supporting some weight without a load on the scale.

13. Each module is pre-wired internally to the junction box located under the center access plate found close to the center of the scale. Under that access plate you should also find the main cable coiled up for shipping. The main cable from one module is wired into the junction box of the next module and the main cable from that module is run to the digital indicator. Refer to drawing 241-1102-2 located at the end of this manual.

14. Your digital indicator (and printer if supplied) must be located inside a weather-proof building. This equipment is NOT weather-proof and must have a power source (110 VAC, portable generator or battery pack with inverter). Plug in your indicator and apply a concentrated weight to each load cell (human body is sufficient at this point). Each corner should read a weight within a graduation (20 lbs normally) of each other. If you see an error check your wiring – DO NOT ADJUST - look for broken wires or shorts caused by removing too much insulation at the terminal block. Once you have each corner weighing within a graduation THEN your scale is ready for calibration by a local scale servicing company.

15. Install deck cover plates AFTER simple corner check described above. Your scale is now ready for calibration with certified test weights.

CALIBRATION GUIDE

1. Do NOT attempt to make any calibrations until all corners are weighing within a single graduation as described in the above section. Keep in mind that any adjustments should be minimal and doing it before the scale is properly setup will make things much more difficult.

2. Adjust sections. The goal is to apply a concentrated load over each section of the scale (or end of each module) and adjust them to indicate the same weight. The higher the weight the better. Once all the sections indicate the same weight then the overall calibration (see below) will be made to give you an accurate weight.

    a. It's important to note that the load cells in each section are adjusted as a pair and that on a standard installation there is not an adjustment for individual load cells.
    b. The section adjust pots are located in the summing box (by the indicator). Note that this is NOT the junction box found under the manhole in the scale.
    c. If this is a "multi-module" installation it's important <u>while adjusting sections</u> to keep your concentrated load on a single module.

3. Overall calibration. Once all the sections have been adjusted and indicating within tolerance you will make an overall calibration in the digital indicator. This process varies greatly depending upon your make and model of indicator. If we supplied your indicator you should find an operators manual for that indictor included with this manual. Look up the section for calibration and follow those instructions.

LOADMASTER FT2-PV Preparation for Transport

1. Remove all access covers, including the corners and the junction box cover.

2. **IMPORTANT** – disconnect the main cables, coil them up and store them BEHIND the junction box access plate. The access plate for the junction boxes can be put back in place now.

3. Adjust bumper bolts (see illustration provided in the installation section of this manual) back into shipping position to stop deck movement.

4. Install shipping bolts (see illustration provided in the installation section of this manual).

5. Remove splice bolts from the center bridge section (see illustration provided in the installation section of this manual).

6. Remove center dead bridge (if applicable) and SET TO THE SIDE. This dead section should be loaded on the truck last and ON TOP of the live weigh modules. If the center bridge is shorter than the live modules the self-contained frame will be WILL BE DAMAGED.

7. Remove spacer channels (if applicable) and place them on top of the center dead bridge.

8. Remove the approaches, steel or stone. Unbolt the bulkheads and place them on top of the center dead section.

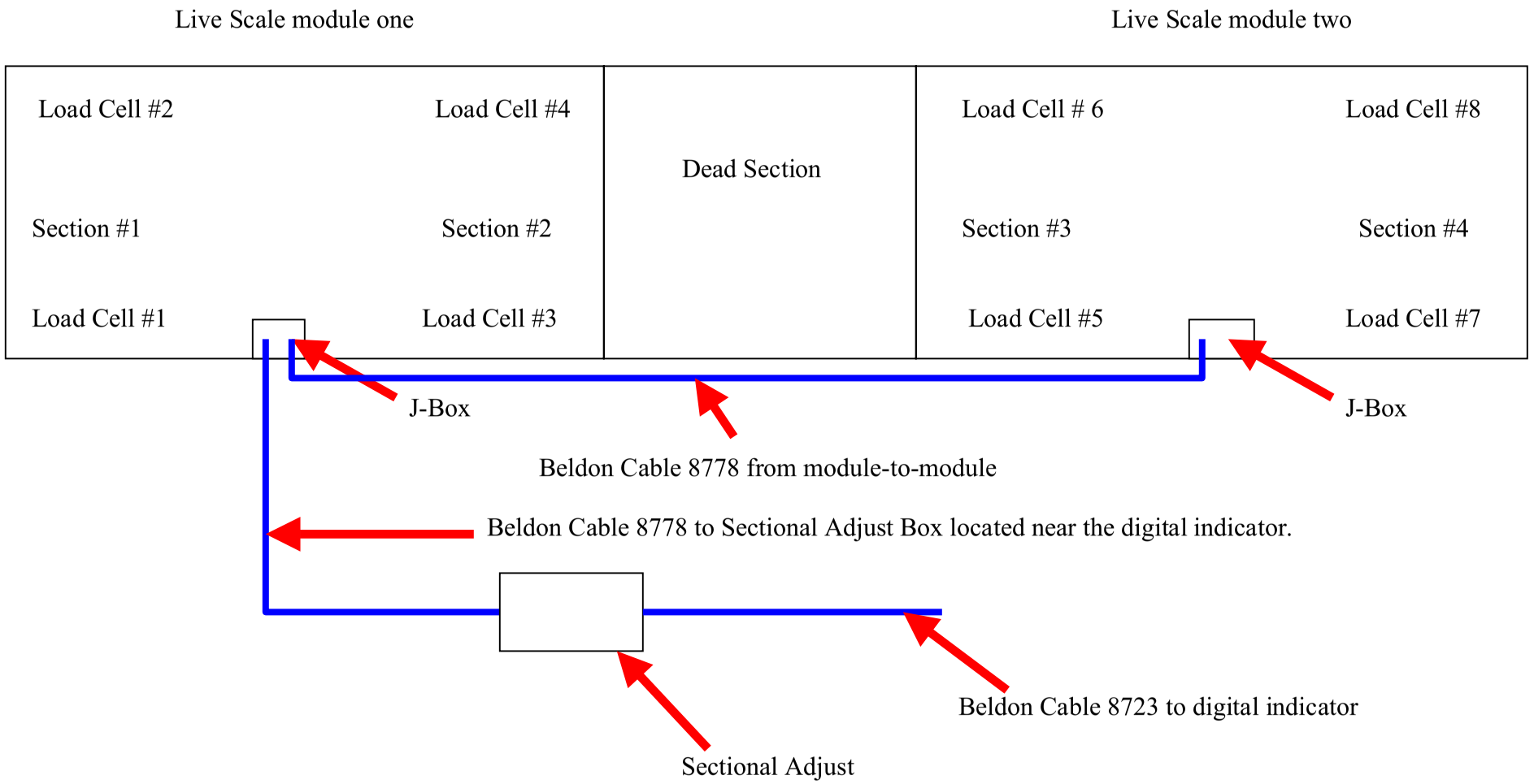
9. Hook your chains to the main structural beams found under the manhole covers and load the modules on the trailer for shipment. DO NOT hook onto the smaller 3” I-beam stringers, the deck plate or side channel iron skirts. Replace the manhole covers BEFORE stacking the next module.

10. Load the center dead section ON TOP of the live weigh modules. The spacer bars and bulkheads should be loaded on top of the center section.

11. Box up the indicator (and printer) and place in the cab of the truck. This equipment MUST be kept dry.

Sectional numbering and layout for FT2 Portable trucks.

Note: Each module is wired the same and has approximately 50 foot of cable coming from the J-box.
You will need to run one of these cables to the other module. The other modules cable will be run to the location of the digital indicator.



Individual module wiring FT2 Portable.

Each Live scale module will have a fiberglass J-box. Inside the box you will find a summation board similar to the picture below.

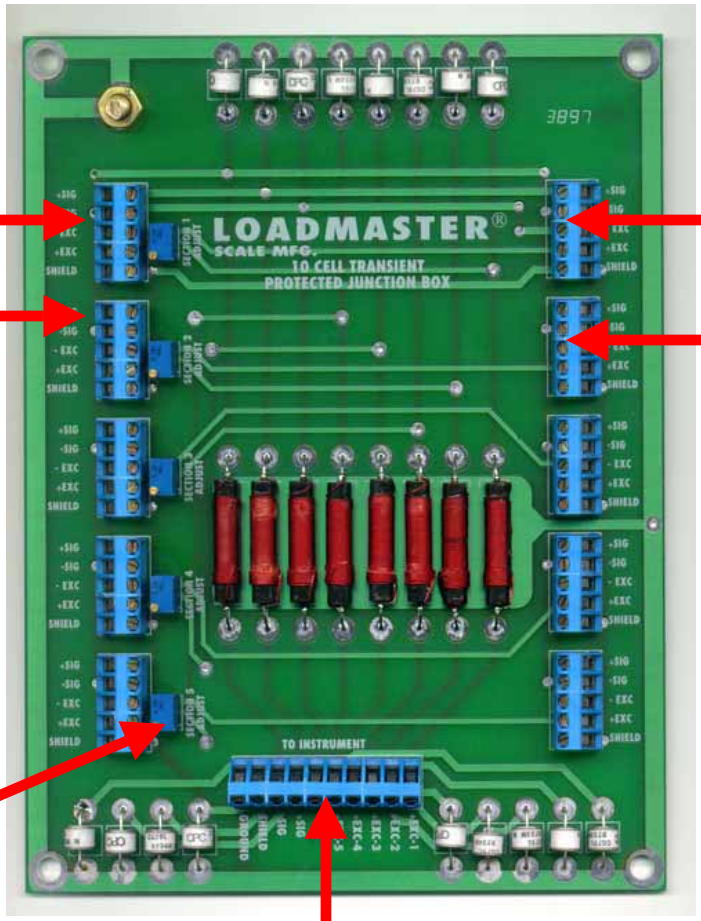
Load Cell #1

Load Cell #3

Individual Load Cell Wiring using the Artech 80210 or Equivalent cells.

Green Wire +Sig
White Wire –Sig
Black Wire –Exc
Red Wire + Exc

Optional side to side Adjustment pots (Install if needed)



Load Cell #2

Load Cell #4

Main Cable Beldon Cable #8778
Wiring of individual live modules
Black/Green pair use **Green** for **+EXC-1**
Black/Yellow pair use **Yellow** for **+EXC-2**
Black /Blue pair use **Blue** for **+EXC-3**
Green/Black pair use **Black** for **+EXC-4**
Skip EXC-5
Yellow/Black pair use **Black** for **–EXC**
Black/White pair use **White** for **+Sig**
Black/Red pair use **Red** for **-Sig**

If you are only using just one live module then go to the section adjust wiring page. If you are using two live modules go to the Module-to-Module wiring.

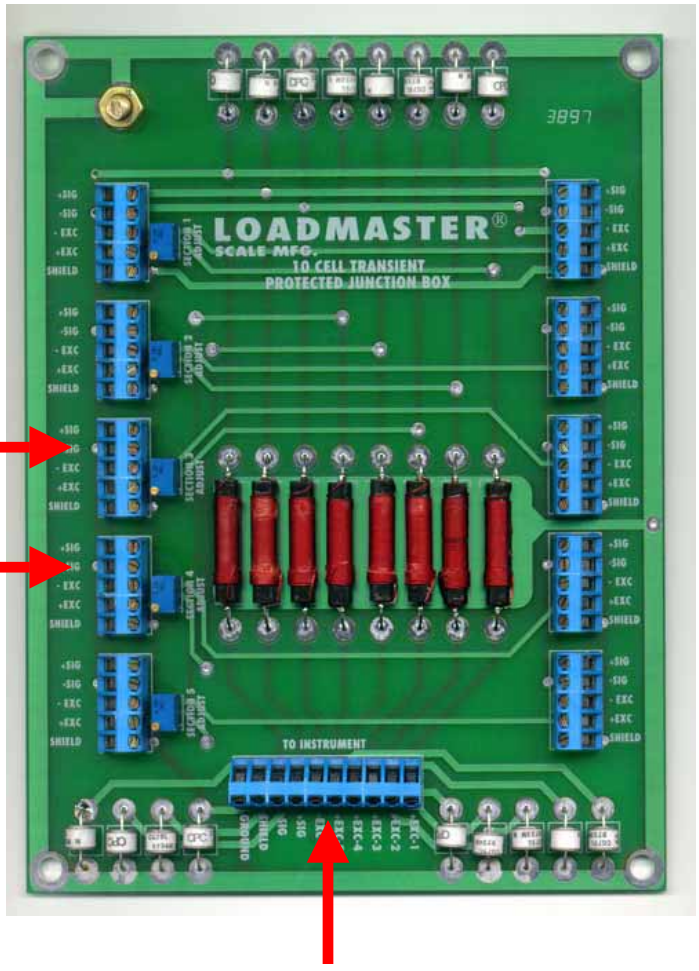
Module-to Module FT2 Portable wiring second module

Each Live scale module will have a fiberglass J-box. Inside the box you will find a summation board similar to the picture below.

Main Cable Beldon Cable #8778
Coming from the other module
Black/Green pair use **Green** for **+EXC-1**
Black/Yellow pair use **Yellow** for **+EXC-2**
Black /Blue pair use **Blue** for **+EXC-3**
Green/Black pair use **Black** for **+EXC-4**
Skip EXC-5
Yellow/Black pair use **Black** for **–EXC**
Black/White pair use **White** for **+Sig**
Black/Red pair use **Red** for **-Sig**

When connecting the second live module run one of the cables along the inside edge of the scale frame to the other module. Wire it into the other scales fiberglass J-box as follows.
Green wire from other module Beldon Cable 8778 Connect to **+Exc**

Yellow wire from other module connect to **+EXC**
Red wire connect to **–Sig**
White wire connect to **+ Sig**
Black wire from Yellow/Black pair connect to **-EXC**



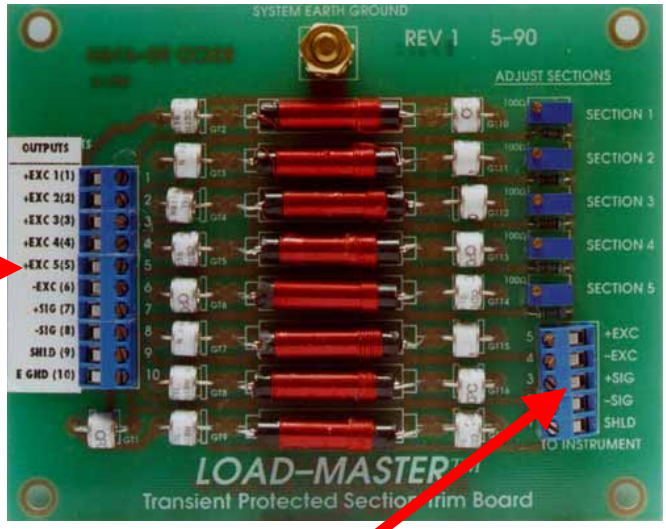
Cable from this module to run to the digital location and should be wired as shown at the top of the page.

Go to the section adjust wiring page.

Section adjust wiring FT2 Portable

The scale will come with a section adjust box with a board similar to the one pictured below.

Main Cable Beldon Cable #8778
Coming from one of the scale modules.
Black/Green pair use **Green** for **+EXC-1**
Black/Yellow pair use **Yellow** for **+EXC-2**
Black /Blue pair use **Blue** for **+EXC-3**
Green/Black pair use **Black** for **+EXC-4**
Skip EXC-5
Yellow/Black pair use **Black** for **–EXC**
Black/White pair use **White** for **+Sig**
Black/Red pair use **Red** for **-Sig**



Cable to digital indicator see indicator wiring for color code.

+Exc to indictor +Exc or output
-Exc to indicator –Exc or output
+Sig to indicator +Sig or input
-Sig to indicator –Sig or input

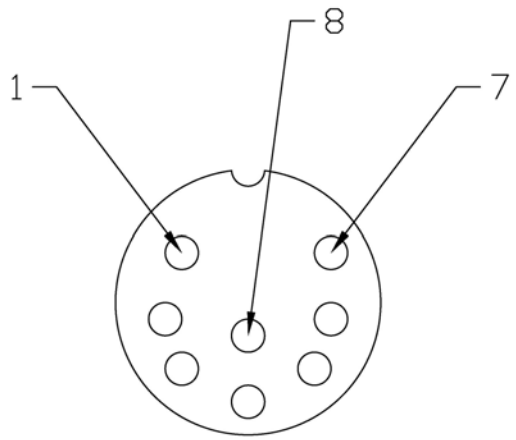
Optional Quick Connect Cables

Kit P/N 491-1010-0

53’ Cable wiring Module to Module

This cable is used to go from Module to Module p/n 492-1006-0

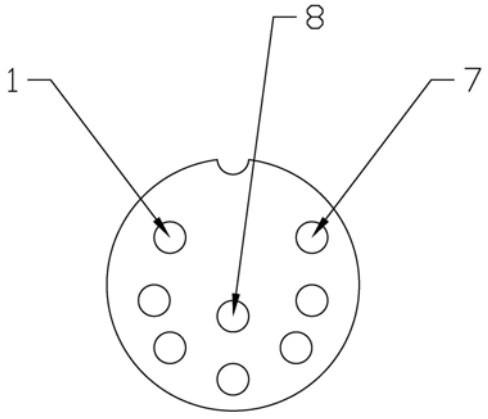
Connector
3282-8SG-3XX
Female Connector
Pin 1 Red
Pin 2 Black
Pin 3 White
Pin 4 Green
Pin 5 Yellow
Pin 6 Blue
Pin 7 Brown
Pin 8 Bare Shield



Pin numbering from the Solder side of the Connector notch shown for reference only. Use Beldon cable number 9538 or equivalent for color codes. Typical both ends of the cable.

J-Box 2’ Cable wiring Module to J-box

This cable connects to Summation board in J-box P/n 492-1007-0 4-section scale

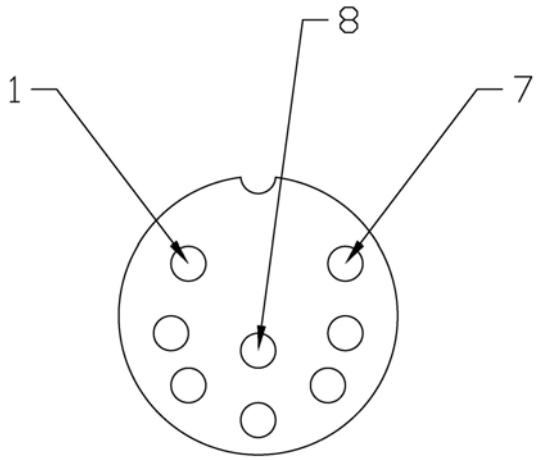


Connector
5282-8PG-3XX
Male Connector
On J-box
Pin 7 Red
Pin 6 Black
Pin 5 White
Pin 4 Blue
Pin 3 Brown
Pin 8 Bare Shield
Pin numbering from the Solder side of the Connector notch shown for reference only. Use Beldon cable number 9538 or equivalent for color codes.

Main 2’ Cable wiring Scale to Section Adjust

Connects to Summation board at J-Box P/n 492-1008-0

Connector
5282-8SG-3XX
Female Connector
On Metal Section
Adjust Box and
Fiberglass



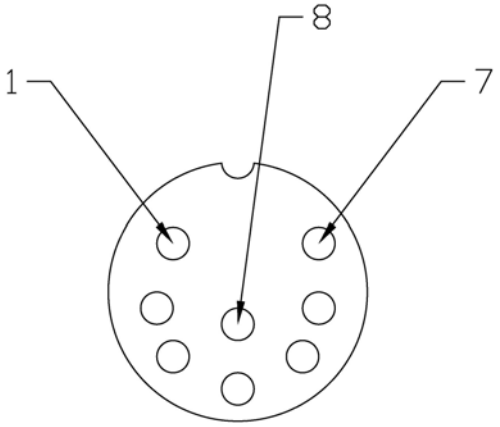
Pin 1 Red
Pin 2 Black
Pin 3 White
Pin 4 Green
Pin 5 Yellow
Pin 6 Blue
Pin 7 Brown
Pin 8 Bare Shield

Pin numbering from the Solder side of the Connector notch shown for reference only. Use Beldon cable number 9538 or equivalent for color codes.

50’ Main Cable wiring Scale to Section Adjust

Runs from Scale J-box to Section adjust box in office P/n 492-1009-0

Connector
3282-8PG-3XX
Male Connector
Pin 7 Red
Pin 6 Black
Pin 5 White
Pin 4 Green
Pin 3 Yellow
Pin 2 Blue
Pin 1 Brown
Pin 8 Bare Shield

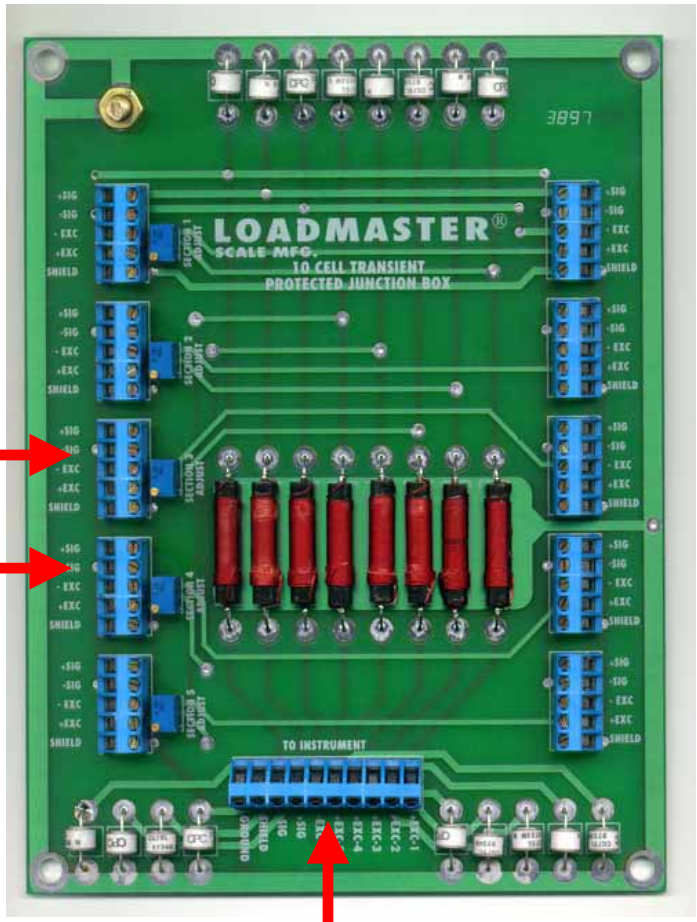


Pin numbering from the Solder side of the Connector notch shown for reference only. Use Beldon cable number 9538 or equivalent for color codes. Typical both ends of the cable.

Module-to Module FT2 Portable wiring Left module

Each Live scale module will have a fiberglass J-box. Inside the box you will find a summation board similar to the picture below.
This will be scale sections 3 and 4

Pig Tail wiring Loadmaster P/n 492-1007



Blue wire from 492-1007-0
Connect to **+Exc**

Brown wire from other module connect to **+EXC**
Red wire connect to **–Sig**
White wire connect to **+ Sig**
Black wire from Yellow/Black pair connect to **-EXC**

Pigtail P/n 492-1008 wires into here as follows
Red + Sig , White – Sig, Black -Exc, Grn +Exc1, Yellow +Exc 2, Blue +Exc 3, Brwn +Exc 4Shield Bare

Go to the section adjust wiring page.

Module-to Module FT2 Portable wiring Right module

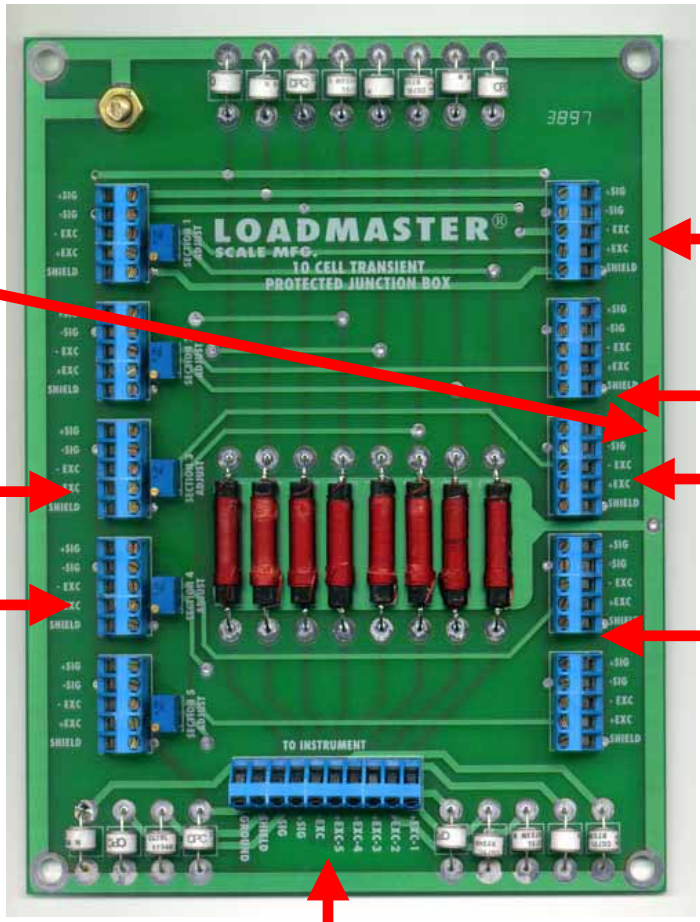
Each Live scale module will have a fiberglass J-box. Inside the box you will find a summation board similar to the picture below.
This will be scale sections 3 and 4

Pig Tail wiring Loadmaster P/n 492-1007

Install Jumper from +Exc to +Exc

Blue wire from 492-1007-0
Connect to **+Exc**

Brown wire from other module connect to **+EXC**
Red wire connect to **–Sig**
White wire connect to **+ Sig**
Black wire from Yellow/Black pair connect to **-EXC**



Pigtail P/n 492-1008 wires into here as follows
Red + Sig , White – Sig, Black -Exc, Grn +Exc1, Yellow +Exc 2, Blue +Exc 3, Brwn +Exc 4Shield Bare

Go to the section adjust wiring page.

FT2 PORTABLE VEHICLE SCALE

GENERAL

The LOADMASTER FT2 Portable Vehicle Scale is simply the standard FT2 with a self contained frame. Installation is a matter of placing on a smooth level surface, piling up stone for approaches and plugging in. That is it! (Note: Concrete footers recommended for any installation over 3 Months)

CONFIGURATION

Standard module lengths are available as well as custom sizes. Each module is completely self supporting with 4 load cells. Modules can be placed end to end (or side by side) and summed electrically for an unlimited combination of sizes and capacities.

FEATURES

- Only 15½" tall (less than half of most portable vehicle scales)
- Same free floating deck as every other FT2 Motor Truck Scale
- Top access to all Load Cells and Junction Boxes
- Fully concealed and conduited wiring within the structure
- All Junction Boxes are fiberglass with NEMA 4X rating

PART NUMBER	#OF SECTIONS	CAPACITY (Tons) GROSS	CLC	PLATFORM LENGTH	SHIPPING 10' WIDE	11' WIDE
156-3251-x	(2)	40	40	10'	6,300#	6,800#
-3255-x				12'	6,800	7,045
-3252-x				15'	7,900	8,200
-3253-x				17.5'	8,700	8,950
-3254-x				20'	10,050	10,375

156-xxxx-0	Primed and Finish Painted Steel (Standard)
-xxxx-2	Hot Dip Galvanized (Optional)
-xxxx-3	2-Part Epoxy Paint Finish (Optional)
-xxxx-4	11' Wide

Part Number Example:

156-3252-2 is a 15' x 20', 40 Ton "FT2" Portable Vehicle Scale with Hot Dip Galvanized Finish.

NOTES:
1. Custom sizes are available and in most cases carry no additional engineering charges.
2. Accuracy will be as set forth in NBS Handbook 44. Class III L.
3. All Loadmaster FT2 products are warranted against manufacturing defects for a period of two (2) years.
4. Lightning protection kit included.

LOADMASTER®
SCALE MFG.
420 E. Lincoln Street • Findlay, Ohio 45840 • 419/422-4779
Division of: Holtgreven Scale & Electronics Corp.

ARTECH INDUSTRIES INC.

"a preferred name in load cell technology"

Model 80210

Double Ended Shear Beam Load Cell

FEATURES:

- 20k to 200k pounds capacities
- Low profile design
- Nickel/Chrome plated high alloy tool steel
- Complete environmental protection
- NTEP Certified versions available for Class III L 10,000 divisions
- Factory Mutual (F.M.) Approved †

NTEP C.O.C. #90-083A2

DESCRIPTION:

The Model 80210, a double ended shear beam load cell, is ideally suited for tough environments associated with truck scales. Its construction of high alloy tool steel provides optimum protection under impact loading and adverse conditions. The cell is environmentally protected with two waterproof seals and nickel/chrome plating to assure resistance against corrosion.

PERFORMANCE SPECIFICATIONS

Standard Capacities (lbs.):	20K, 30K, 40K, 50K, 60K, 65K, 75K, 100K, 150K, 200K
Excitation Voltage:	10VDC - Maximum 15VDC
Rated Output:	3.0 mv/v ± .1%
Non-Linearity:	< 0.03% FSO (Full Scale Output)
Hysteresis:	< 0.02% FSO
Non-Repeatability:	< 0.01% FSO
Zero Balance:	±1.0% FSO
Bridge Resistance:	700 ± 7.0 ohms
Safe Overload:	150% of Rated Capacity
Side Load Discrimination:	500:1
Temperature:	
Compensated Range:	0 - 150 deg. F
Effect on Output:	< 0.0008% FSO/deg. F
Effect on Zero:	< 0.0011% FSO/deg. F
Finish:	Electroless Nickel/Chrome Plated

NATIONAL CONFERENCE ON WEIGHTS AND MEASURES NTEP

FM APPROVED

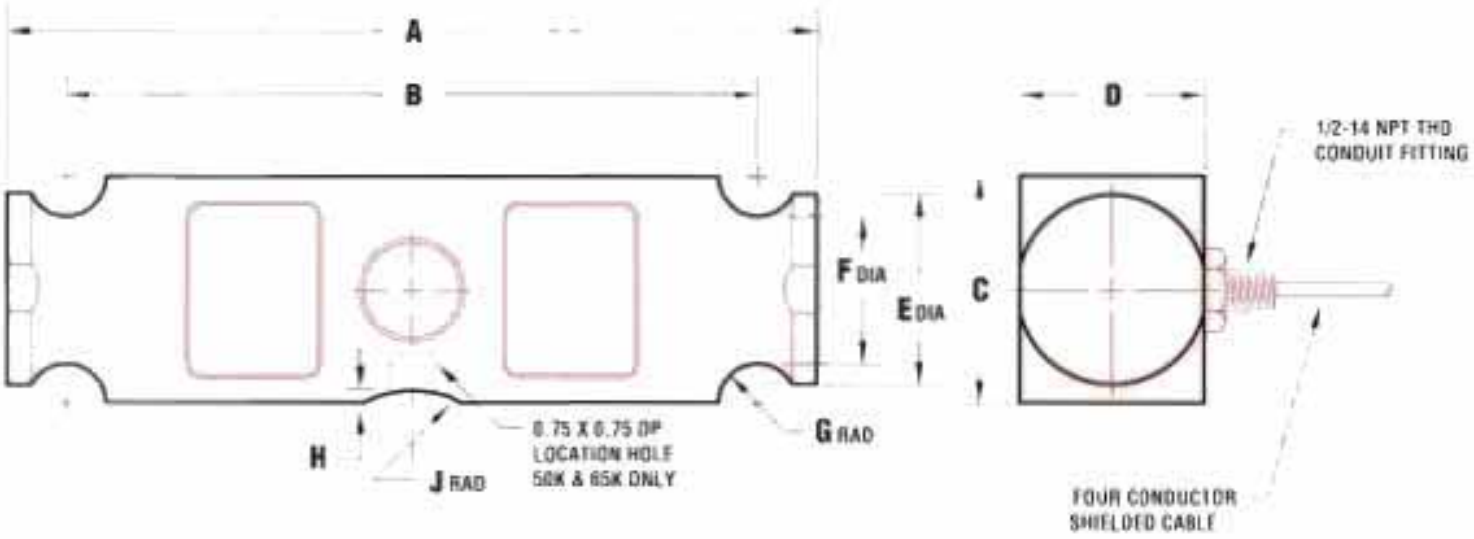
Model 80210

CAPACITY LBS.	A	B	C	D	E	F	G	H	J
20K - 40K	8.25	7.25	2.44	1.94	2.00	1.63	0.50	.25	.50
50K - 150K	10.25	8.50	2.90	2.90	2.40	2.05	1.00	.25	1.00
200K	11.50	10.00	3.40	3.40	2.75	2.35	1.50	.40	1.50

WIRING

INPUT		OUTPUT	SHIELD
RED	(+)	GREEN (+)	
BLACK	(-)	WHITE (-)	

COMPRESSION POSITIVE



* NOTE 20K - 40K 40 FT CABLE, 50K - 200K, 60 FT CABLE

† Factory Mutual Systems approved as intrinsically safe when installed per F.M. approved installation drawing. Contact ARTECH sales department for details

Represented by:

ARTECH INDUSTRIES INC.

1966 Keats Drive, Riverside, CA 92501