



# ***ExpressCube™ Model 480R User Guide***

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# **Important**

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# 1. **General**

## 1.1. **Introduction**

The ExpressCube™ 480R manual conveyor dimensioning unit will quickly (~ 5 sec) and accurately dimension and weigh cuboidal packages. The ExpressCube 480R unit will calculate dimensional weight based on the acquired measurements and preprogrammed factors. The user can pre-program four factors that can be selected to calculate dimensional weight.

The ExpressCube 480R unit can record package details using an optional handheld scanner. The measurements, dimensional weight, and, packaged details recorded from the hand scanner can be printed, read by user software for instant processing or sent to a central server for further processing.

## 1.2. **Specifications**

<b>MODEL</b>	<b>EC-480R</b>
<b>Physical Characteristics</b>	
Dimensions: (Inches)	55.5 x 36 x 73 [L x W x H]
(Centimeters)	140 x 91 x 185 [L x W x H]
Weight : (lbs)/(kg)	<b>500 lbs/ 227 kg</b>
Adjustable Platform Height to Match Conveyor : (in)/(cm)	30 in - 40 in 75 cm – 100 cm
Operating Environment	14 to 104F (-10 to 40C)
<b>Imperial Measurements</b>	
Max Dimensional Capacity (in)	48.4 x 32 x 37 [L x W x H]
Resolution/Min Dimensional (in)	0.2 / L,W=3;H=2.4
Maximum Weight (lb)	<b>300</b>
Weight Resolution (lb)	0.1
<b>Metric Measurements</b>	
Max Dimensional Capacity (cm)	124 x 81.5 x 94 [L x W x H]
Resolution/Min Dimensional (cm)	0.5 / L,W=8;H=6
Maximum Weight (kg)	136
Weight Resolution (kg)	0.05
<b>Features</b>	
Printer Port (RS-232) <sup>1</sup>	Standard
Hand Scanner Port (RS-232) <sup>2</sup>	Standard
USB Computer Port <sup>3</sup>	Standard
Sizelt Software	Optional
ExpressCube LCD Controller	Optional
ExpressCube Customer Display	Optional

Feature Notes: <sup>1</sup> Printer not included; <sup>2</sup> Hand Scanner not included; <sup>3</sup> Computer not included

## **2. Equipment Setup**

### ***2.1. General Information***

The ExpressCube 480R is preassembled, calibrated and thoroughly tested before the system is partially disassembled for packaging & shipment. The shipping includes special long bolts that fix the platform to the base to prevent any vibration of the load cells during shipment.

The ExpressCube 480R is shipped in three major sections:

- 1) The main conveyor platform containing the length & width dimensioning arrays, load sensors, the active network hub and the main CPU board.
- 2) The height dimensioning assembly containing the height dimensioning bank and LED Status indicator.
- 3) The adjustable legs.

A parts box is included containing miscellaneous hardware, power adapter and LCD Controller (if ordered)

### ***2.2. Site Preparation***

The ExpressCube 480R uses a 120-240 50-60Hz 15 Watt AC adapter. While it is possible to run several machines off one multiple power outlet, consult a licensed electrician to provide power that meets local electrical regulations.

The ExpressCube 480R is a manually operated unit that must measure items one at a time. Items delivered by conveyor can have the rate of delivery regulated by the operator by having a foot pedal switch operating the electric conveyor rollers or a simple brake that stops parcels from entering the dimensioning platform area. A well paced delivery system can allow the operator to process 350 – 450 parcels per hour.

The legs of the ExpressCube 480R are adjustable and allow the machine to level to conveyor systems that are 30" – 40" ( 75cm – 100 cm) in height.

It is important that the conveyor system and the ExpressCube 480 does not have any physical contact with each other. This is to prevent vibrations from affecting the weight measurement process.

The first conveyor rollers either side of the ExpressCube 480R are adjustable rollers that are part of the main frame of the 480R system and not connected to the measuring platform. They are factory adjusted slightly higher than the measuring platform conveyor rollers. When a large heavy parcel is delivered to the platform, these rollers are meant to absorb horizontal forces that may create unusual stress in the load sensors. The parcel is raised slightly and dropped down onto the measuring platform. The adjustable roller that the parcel rolls off after measurement can be adjusted to the same level as the measuring platform for the parcel to easily roll off the platform.

### 2.3. Opening the ExpressCube 480R Shipping Container

The ExpressCube 480R unit is shipped in custom designed wooden crate. The installation procedure has been simplified to permit the use of either a forklift truck or forklift hand cart to be used to assemble the machine. The electronics have been recessed to permit a forklift to hold the entire assembly without contacting the electronic components.

After placing the box in an area close to the installation with easy maneuvering room for a lifting device, remove the Phillips screws securing the cover from the platform

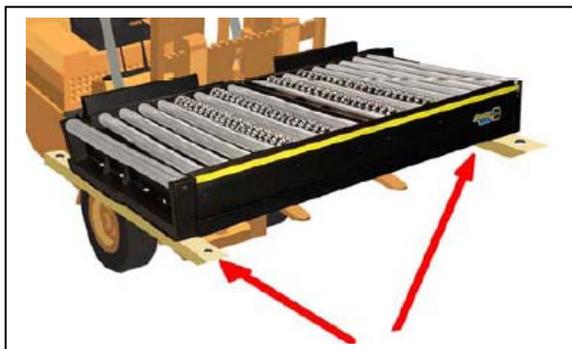


### 2.4. Removing the Main System From the Shipping Container

The height dimensioning assembly and the parts box is strapped to the top of the measuring platform. Cut the straps securing this equipment and place aside until required.

The ExpressCube 480R is secured to two wooden struts that are fastened to the shipping container with a lag bolt in the end of each strut. Remove these four lag bolts.

Watching the legs stored underneath the assembly, carefully move the tines of the forklift under the assembly and gently lift straight up as illustrated.



While the platform assembly is suspended by the forklift, remove the four bolts connecting the studs to the platform. Keep the hardware to attach the legs.

Remove the 4" bolts that lock the top of the platform to the base. Discard the bolts.



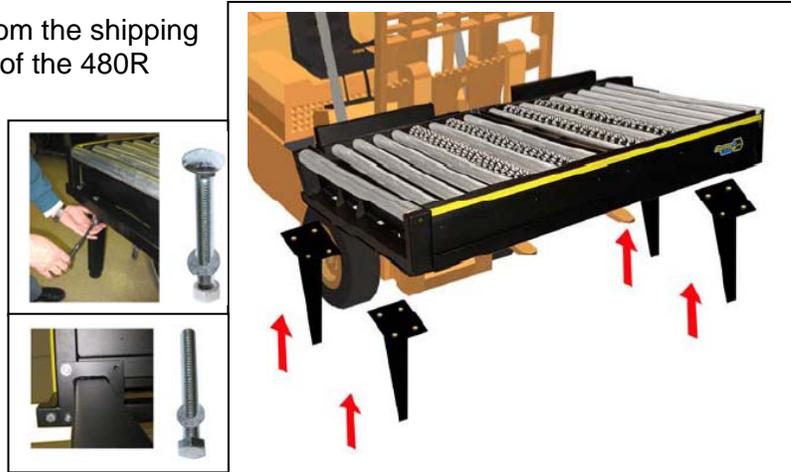
**Do not reuse 4" bolts to assemble legs. Load sensors will not work!**

## 2.5. Installation of the Legs

Remove the four adjustable legs from the shipping container and attach to the bottom of the 480R assembly as illustrated.

Mount the legs using two carriage bolts through the top of the main frame as indicated.

Use two provided bolts to fasten the inside legs to the bottom of the 480R base.

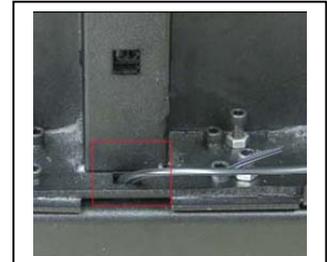


 **The use of any longer bolts than those provided for fastening the bottom of the legs to the platform will cause interference with the weight sensors operation.**

## 2.6. Installation of the Height Assembly

Remove wrapping material and then remove the back panel of the height assembly.

As the height assembly is placed on the top of the measurement platform, carefully feed the two cables through the access hole as illustrated. As the height assembly is placed on the platform, keep the cables clear of any objects that could pinch them.

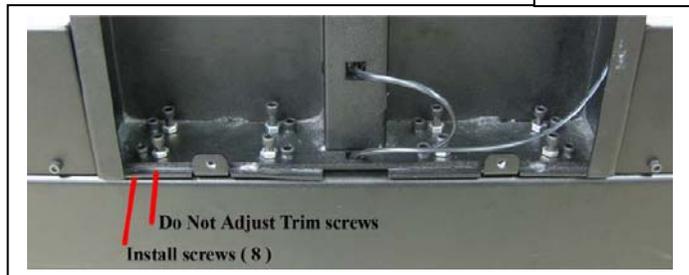


 **The height assembly comes with preset adjustable trim screws as illustrated right. These are factory set and should not require adjustment.**



Align the mounting holes by giving a gentle tap to line up the holes. Screw the bolts in snug until all the bolts are in place.

Check the 90° angle of the height with a carpenter's square and then tighten the bolts in a diagonal pattern.



Install the shorter length of the two cables into height dimensional array connector as illustrated. >



Install the longer cable into the LED Status board located at the top of the height assembly. >

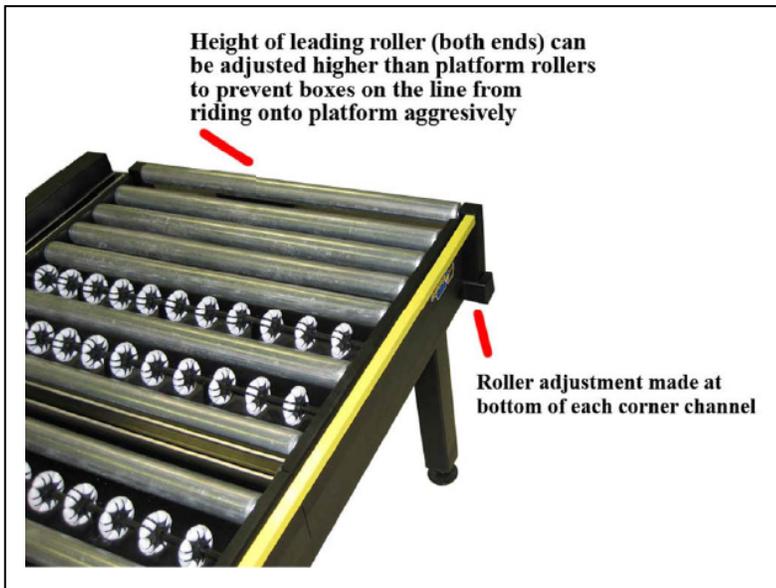


Slide the back cover into the slots and move the cover up to match up to the cover screw holes. Verify as the cover is placed that it is not pinching the cables in the height assembly. Secure the panel with the two small bolts as provided.

## 2.7. Placement and Adjustments

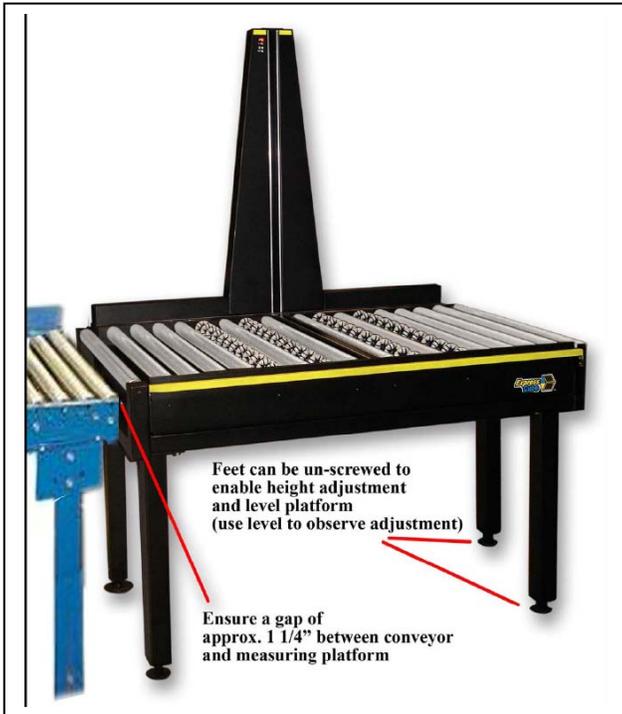
Place the chrome caps over the four holes located on each of the four corners of the measurement table under the conveyor rollers.

These holes were used to secure the table during shipping and should be covered to prevent dust and other debris from falling into the area containing the load cells and the electronics.



If the direction of the movement of cartons is known prior to the final placement, the lagging (last) fixed roller can be lowered slightly to facilitate moving items off the 480R.

It is recommended to maintain at least a 1/8" (3mm) higher lead conveyor roller that the incoming cartons will ride onto as the enter the 480R platform for a measurement.

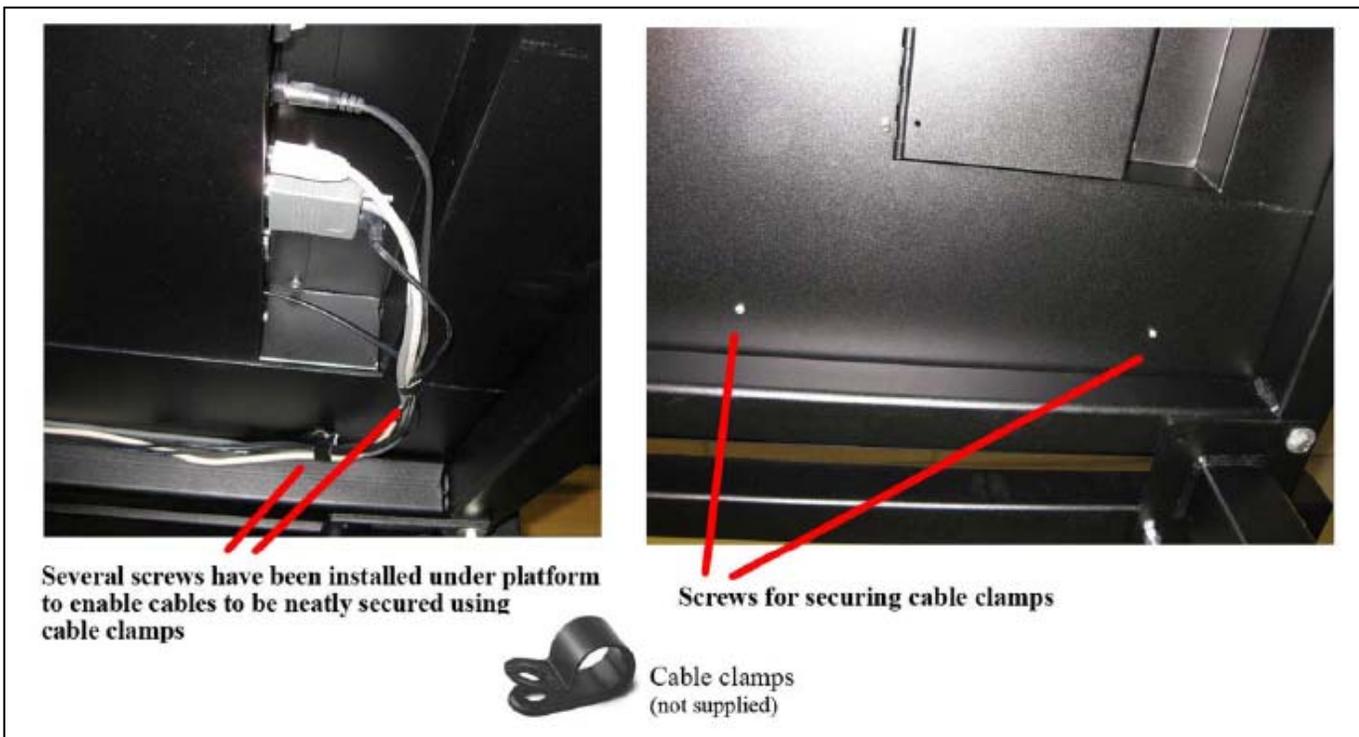


When setting the ExpressCube 480R in place, maintain a minimum space of 1 ¼ " ( 3cm) between the 480R and the feeder conveyor rollers. This space is designed to isolate the 480R frame from vibrations that could travel on the metal and affect the normal function of the load sensors.

The top platform is a sensitive weighing scale so it must be checked that there are no objects such as cables, walls, etc that could rub against the unit and affect weight measurements.

Adequate space should be provided around the table for personnel to work at the table without the need to push against the guard bar continuously.

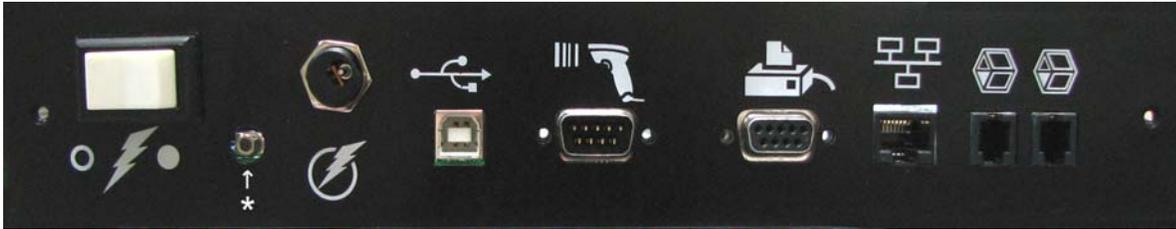
## 2.8. Cable Layout



The power switch and all cable connections are located in a recessed area located under the table on the operator's right, near the front of the dimensioning and weighing platform. Screws are supplied to secure cable clamps/ harnesses to keep the cable runs neat and out of sight.

### 3. Electrical Connections

#### 3.1. Rear Connecting Panel Layout Summary



Symbol	Function	Description
	<b>Power Switch</b>	Switches ExpressCube unit ON / OFF
* (unmarked)	<b>Calibration</b>	<b>*Authorized Personnel Only*</b> Removal or damage to the calibration seal voids certification approvals
	<b>Power Adapter</b>	The ExpressCube™ universal power adapter includes 4 power connections and has the following world safety approvals: UL / ULC, CE, PSE, BS, GS, FCC, SAA
	<b>USB</b>	This USB port can be used by a local PC to Operate and collect data from the ExpressCube™ unit.
	<b>Hand Scanner</b>	Connect to handheld scanner (not supplied). The port is a male RS-232 serial interface.
	<b>Printer</b>	RS-232 male port provides ASCII data output for either a printer or direct data logging onto a hard drive via a local PC application (not supplied).
	<b>LAN</b>	<u>Not Equipped</u>
	<b>External Devices</b>	These connectors are used to connect ExpressCube™ external devices such as the LCD customer display or LCD Controller.

**Connect all the appropriate connectors prior to connecting the power adapter and activating the device.**

**The ExpressCube™ 480R unit is designed such that there are screws for cable clips to attach and run the cables to the rear of the dimensioning system. It is recommended to use these anchoring spots to keep cables off the floor and neat.**

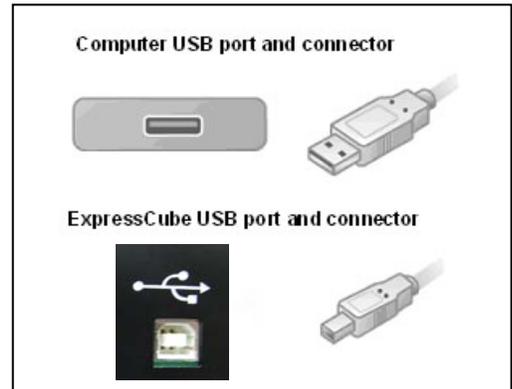
### 3.2. USB Connection

The ExpressCube™ 480R series of dimensioning devices are equipped with a USB connection to interface to a local computer. The USB connection allows the computer to control and capture data from the dimensioning device. The USB is fully compatible with USB 2.0 computer ports.

Connect the cable as indicated in the diagram.



**For ExpressCube™ Sizelt™, software must be installed in the computer before the USB interface can be used. Refer to the ExpressCube™ Sizelt™ installation section for more details.**



### 3.3. Connection of a Handheld Bar Code Scanner

The ExpressCube™ 480R unit has a dedicated male RS-232 serial port for use with a handheld bar code scanner. [Handheld scanner not supplied] The RS-232 connector should be securely connected to the appropriate connector on the ExpressCube™ 480R.



**There are two RS-232 connectors on the connector panel but each one serves different purposes. Be sure to use the connector identified for the hand scanner.**



**The ExpressCube™ 480R unit has programming options that can utilize the trigger of the handheld scanner to activate data collection and processing. Refer to the Operators Program Menu for more details.**

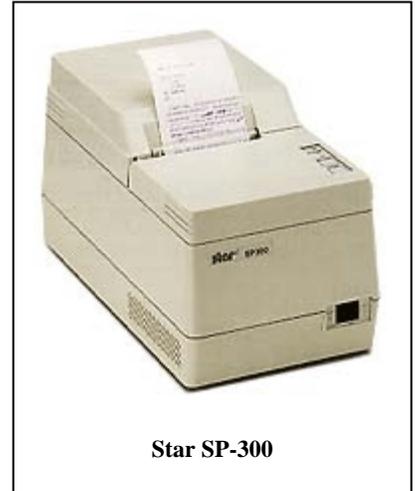
### 3.4. Connection settings for hand scanners:

- 1) Connection port – RS-232
- 2) Baud rate - 9600
- 3) Parity – none
- 4) Data bits – 8
- 5) Stop bit – 1 and additionally a suffix of a CR LF (Carriage Return Line Feed)

### 3.5. **Printer Connection**

The ExpressCube™ 480R unit is equipped with a female RS-232 serial printer port. The port is activated when the ExpressCube™ 480R unit has acquired data through a successful measurement. Upon receiving a 'Print' command, the printer port will deliver the data in an ASCII format that is terminated with a line feed and carriage return. The RS-232 connector should be securely connected to the appropriate connector on the ExpressCube™ 480R.

ExpressCube provides free software (Data Logger) that records the data from the ExpressCube™ 480R in a comma delineated file format that can be imported in to other software programs.



***The ExpressCube 480R unit has been specifically set up using the Star SP-300 Series ASCII model. While most ASCII RS-232 printers follow virtually identical data formats, the user is responsible to assure their selected printer is compatible to the Star-300 series format.***



***Dual head modem cables are available that merge the hand scanner port and the printer port into one RS-232 cable. Many software vendors use this device to generate a trigger from their software (simulated hand scanner output) to activate and gather the dimensions directly into their software. Contact your ExpressCube vendor for more details.***

### 3.6. **Ethernet LAN (Not Available)**

### 3.7. ExpressCube™ External Device Ports

The ExpressCube™ external ports are high-speed data and power ports that are used to connect to optional ExpressCube™ equipment. There are two external device ports on the rear connector panel. The two ExpressCube™ external devices supported by these ports are the control unit and the customer display unit as illustrated below.



The ExpressCube™ Controller has a reversible mounting plate that allows the controller to be converted from a desk mount (as shipped) to a wall mount. To change the configuration, remove the four screws holding the bracket. Rotate the mounting bracket 180° and secure with the same four screws.

The ExpressCube™ external device ports use RJ-11 four wire connectors. Place or mount the device to be connected in the location that it will be used. Insert the RJ connector until an audible click is heard. Carefully route the cable and insert the RJ-11 connector into either one of the two ExpressCube™ external device ports.

 **The RJ-11 is a popular jack used by manufacturers for a variety of different devices and purposes. DO NOT INSERT ANY OTHER MANUFACTURED DEVICE EQUIPPED WITH A RJ-11 INTO THE EXPRESSCUBE DEVICE PORT. The attempted use of this RJ-11 port for any device other than an ExpressCube™ device can cause internal damage and void the warranty.**

 **The ExpressCube™ external device ports provide low voltage power to operate the circuits and backlit LCD displays of the external devices. Care should be taken to ensure that no foreign objects are inserted into these ports.**

### **3.8. Power Adapter Connection**

After connecting the appropriate connectors as detailed in Sections 3.1 to 3.7, insert the power adapter plug into the ExpressCube 480R rear connector panel.

The adapter has a variety of snap in power connectors to match electrical outlets around the world. The adapter requires 110V-240V / 50-60 HZ.

The cable from the rear of the unit to the adapter should be free from obstruction and located to prevent accidental removal from ExpressCube or the outlet. Securely connect the power plug into an electrical outlet.



 ***Use only ExpressCube power adapters with the ExpressCube 480R unit.***

 ***The power adapter must have unrestricted airflow around it. Do not wrap or enclose the power adapter.***

## 4. **User Control for the ExpressCube™ 480R System**

The ExpressCube™ 480R system must have an operator controller to perform the measurement functions. The ExpressCube™ 480R system can be controlled either by a desktop computer using the USB interface or by using the ExpressCube™ LCD Controller.

### 4.1. **ExpressCube™ LCD Controller**

The use of the ExpressCube™ LCD Controller only requires the appropriate electrical connection as described in the section above. The installation of the Sizelt™ software is not required. Proceed to the power-up section of this user guide.

 ***When the ExpressCube™ LCD Controller is used to control the ExpressCube™ 480R system, the USB port cannot be connected. In the event that the USB port is connected to a computer, the LCD Controller will deactivate the keyboard and display the measurements and activity of the 480R only.***

 ***If an ExpressCube™ LCD Controller accompanies the 480R but is not used to control the 480R, keep the controller readily available as it contains diagnostic software for troubleshooting 480R electronic circuitry.***

### 4.2. **Computer Control**

The use of a computer to control the ExpressCube™ 480R system will require the installation and use of the Sizelt™ software or other ExpressCube compatible software. Connect the USB cable as previously described and follow the instructions outlined in the ExpressCube™ Sizelt™ Software Installation section of this guide or the software instructions accompanying your ExpressCube compatible software.

 ***In this User Guide, the term 'control panel' [underlined] will reference the device used to control the ExpressCube™ 480R System. ( i.e. ExpressCube™ LCD Controller or local computer running Sizelt™ software / other USB controlling software )***

 ***When the ExpressCube™ LCD Controller is used to troubleshoot or verify the computer software operation, the USB port must be disconnected from the 480R system [computer].***

## 5. **ExpressCube™ Sizelt™ Software Installation**

### 5.1. **Summary**

The ExpressCube™ Sizelt™ software allows a local computer to operate and gather data from the ExpressCube™ 480R unit with the USB port. This software must be installed and the USB connected prior to powering-up the ExpressCube™ 480R unit. The software is not required if the ExpressCube™ controller is used to control the 480R unit or an alternative ExpressCube™ compatible software is used.

ExpressCube Data Logger software is available for free and can be used to collect and file data with the RS-232 printer port.

### 5.2. **Minimum Computer Requirements**

- Minimum 512 meg of available RAM
- Pentium IV or better @ 2.0 GHz or better
- Windows XP operating system
- CD-ROM drive
- Java version 1.5.0\_06 or later

### 5.3. **Software Installation**

1. Close down all applications currently running on the PC.
2. Insert the CD program disk into the CD-ROM drive of the computer.
3. Click the Windows 'START' button and select 'RUN'
4. Use the browse key to locate and select the 'set-up' file on the CD-ROM drive
5. Run the selected file.

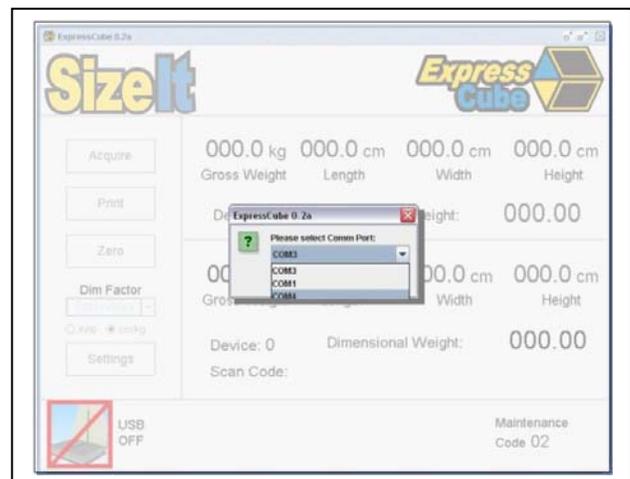
**Note** - if you encounter recurring problems with the operation of the program, un-install Size-It and re-install the software.

 **The person installing the software should have the appropriate system permissions to install the software, this will vary for the system & location, and this can be especially critical for Windows XP.**

### 5.4. **Running the Software**

Use either the Start / Program or Desktop menus to begin the Sizelt™ program. The program will open the control page as illustrated to the right. Select the highest "com number" on the drop menu to engage the USB (choice shown as 'com 7' in example at right).

The USB port will remain off when the ExpressCube™ 480R unit is not powered. The 'Set-up' key will not work until communications is established on the USB link.



## 6. **ExpressCube™ 480R Power-up**

### 6.1. *Power-up*

Locate and activate the power switch located on the connector panel located under the 480R machine. Almost instantly, the power [RED] indicator LED will begin to flash and then remain lit. During the brief time that the LED is flashing, power has been applied to the main computer and it has started its program initiation. Various LEDs will flash during the initialization process. The steady LED indicates that the power is on, the sensors are calibrated and the main computer is operating properly.

 ***The four indicator LEDs on the front of the ExpressCube 480R unit are intended to give the user a quick summary of the current operation of the unit. These LEDs are controlled by the measuring device and are not affected by the controller ( including third party software ). Always refer to the control panel display for detailed operational status.***

### 6.2. *Initial Power-up System Check*

The motherboard enters a self-diagnostic routine in which errors are reported in a diagnostic log. The results of the diagnostic routine contain a summary of the polling the different subsystems of the ExpressCube™

This section just briefly describes the system checks carried out by the motherboard as it is powered up. It is carried out almost instantly and has no visible effect on the operation of the unit.

**1) SYSTEM CHECK** – The system verifies the proper operation of on-board components. There are 25 microprocessors distributed through the 480R system. The various flashes of the status LEDs at the beginning of the power up cycle reflect the different microprocessors checks.

**2) CONFIGURATION** – Each power up cycle, the motherboard polls and assigns addresses to each of the Integrated Transceiver Arrays that performs the package measurements.

**3) WEIGHT CIRCUITRY** – The motherboard verifies the operation of the load cells and programs the filters used in the four channel load cell digital interface.

Any irregularities are recorded as maintenance codes and can only be accessed by a qualified ExpressCube technician.

 ***The control panel will be ready for operation after the system check is performed within a few seconds of power-up. If the display or system does not appear to be functioning, please refer to the troubleshooting section. DO NOT ATTEMPT TO OPEN THE SYSTEM.***

 ***The status lights can facilitate a faster operation for the operator. After placing the carton on the machine for measurement, wait for the weight (green) & dimensioning (yellow) to light and then immediately acquire/ scan to record dimensions.***

## 7. User Programming

### 7.1. Summary

The ExpressCube™ 480R has a simple programming menu that allows the user to program the following characteristics:

- Program dimensional weight factors.
- Handheld bar code scanner Acquire & Print synchronization.
- Adjust audible (beep) warning characteristics [not available on 480R].
- Set device number.

Generally the user programming is set once and rarely requires adjustment. All programmed selections are stored and will remain until changed through the user programming.

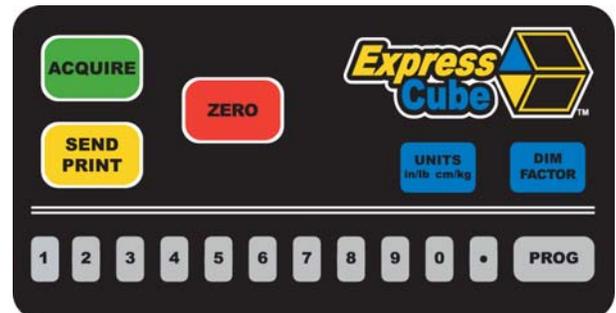


***User programmed features and data is stored on non-volatile memory and will be retained even if the ExpressCube 480R system is not powered.***

### 7.2. Using the ExpressCube™ Controller Keypad for Programming

The ExpressCube™ Controller keypad has been designed to easily make adjustments using the user-programming feature. Respond on the numeric keys as directed by the display to make a menu selection.

Use the **UNITS** key to toggle between in/lb and cm/kg. Use the **ACQUIRE** button to enter a typed numerical value.



### 7.3. Using the PC running ExpressCube™ Sizelt™ for Programming

The programming menu can be easily accessed from the PC running Sizelt™ software program by clicking the Settings [Prog] key using the mouse cursor. All menu selections can be selected by the mouse and normal PC keyboard functions can be used to edit data entries.

## 7.4. Main Programming Menu

### 7.4.1. Alter Dimensional Weight [DIM] Factors

Selecting this menu allows the user to review or change any of the four dimensional factors used by the ExpressCube™ 480R computer to calculate dimensional weight.

Sub-menu:

1. (Dim Factor) [Units]
2. (Dim Factor) [Units]
3. (Dim Factor) [Units]
4. (Dim Factor) [Units]
5. BACK

Select the dim (dimensional weight) factor that you wish to change and verify the correct units before entering the new value.

 ***The dimensional weight factors can only have four digits with the last digit representing units or tenths. (e.g. 000.0 to 9999) Any entry of four or less digits will be assumed whole numbers unless a decimal is used. The maximum dim factor setting is 276 in<sup>3</sup>/lb***

 ***The Dim Factors are displayed in the units that they were originally input but the ExpressCube™ 480R computer will convert the dimensional weight factors to match the units that are used. The dimensional factor displayed and output from the unit will always match the units that the measurements were taken.***

## 7.4.2. Manual / Automatic Operation

This selection provides an option for an automatic recording of the measurement data after the data is collected. The automatic operation can significantly speed the measurement process and is used when there is no requirement to review acquired measurements before recording them.

Manual Operation: If the ExpressCube™ is in a ready state to record the measurement, the user will press the Acquire key or (if equipped) the trigger of the handheld scanner. The acquired measurement data will be displayed but the user must activate the **SEND / PRINT** key to record the data. Removal of the package from the platform will clear any acquired measurements and prepare the device for a new measurement sequence.

Automatic Operation: If the ExpressCube™ is in a ready state to record the measurement, the user will press the Acquire key or the trigger of the handheld scanner (if equipped). The ExpressCube™ will record the measurements and automatically send the acquired data with the bar code as if the **SEND** button had been pushed. All acquired data will remain in the display until the parcel is removed from the ExpressCube™ platform.

Sub-menu:

### MANUAL / AUTOMATIC OPERATION

1. MANUAL <SELECTED>
2. AUTOMATIC
3. GO BACK
4. EXIT

Press the appropriate number to select the desired operation mode. The current selection will be indicated by the <SELECTED> beside it. After verifying the correct selection, use EXIT function to return to the main menu.

## 7.4.3. Adjust Beep Duration [Not Activated in 480R]

This selection will permit the user to adjust or turn off the warning beep tone.

Sub-menu

SELECT 0-9

CURRENT SELECTION 6

Enter a digit from 0 (off) to 9 to set the audible tone. The current selection will be updated and the selection confirmed in large format. After the confirmation, the program will exit to the main menu.

#### 7.4.4. Set Device Number

This selection allows the user to set a device number for the ExpressCube™ 480R unit. The device number is sent with each data message of acquired data. This device number can be used to track a box through a facility.

Sub-menu

CURRENT DEVICE NUM XXX (000-999)

If device number requires change from the current number, type in the three-digit new device number. When the new device number is confirmed on the display, the program will automatically exit to the main menu.

Pressing the PROG key will exit the menu without changing the device number.

## 8. Operation

### 8.1. Summary

The ExpressCube™ 480R is a very accurate MDMD (Multi-Dimensional Measuring Device) that is capable of measuring cuboidal (rectangular/square) boxes with great precision. The ExpressCube™ 480R has built in controls to prevent erroneous readings. Even with these built in controls, the user must exercise care to follow these guidelines:

- Boxes cannot exceed the dimension and weight listed in the specifications.
- Boxes must be cuboidal ( i.e. rectangular or square).
- Severely damaged packages or packages covered by excessive mud or ice can cause errors for both dimensions and weight.
- Both the platform and the package being measured must be free from physical contact with surrounding objects.
- Place objects on the platform – do not drop packages onto the platform.

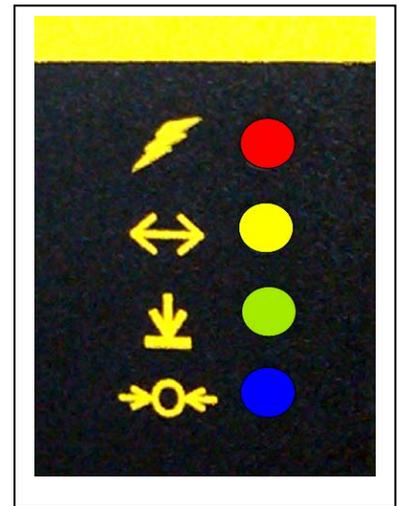


**Keep the sensors clean of dust build up to ensure optimum operating performance.**

### 8.2. Main unit LED indicators

The main unit LED indicators are a set of four LEDs mounted on the top of the height panel on the rear of the ExpressCube™ 480R. They give an accurate status of the ExpressCube™ 480R main computer and are unaffected by third party software.

- Red – Power  – A steady illumination indicates that the unit has power.
- Yellow – Valid Dimension  – A steady illumination indicates that the ExpressCube™ 480R has measured a parcel placed on the platform.
- Green – Valid Weight  – A steady illumination indicates that the ExpressCube™ 480R has weighed a parcel placed on the platform.
- Blue – Zero  – A steady illumination indicates that the ExpressCube™ 480R is in a zero (no-load) condition.



**The ExpressCube™ 480R will not attempt any new measurement until the unit detects the removal of the previous package. .**



**Operator can optimize processing speed by using the status indicators as a quick reference for triggering measurements.**

### 8.3. Preparation for Measurements

The ExpressCube™ 480R unit should be powered up and the ExpressCube™ control panel display finished the initial system check. Prior to starting measurements, it is recommended that the platform and sensors be wiped with a damp rag to remove any accumulated dirt and/or debris.

Select the units and dimensional factor (if used) for measuring the parcel.

### 8.4. Zeroing the ExpressCube 480R

The ExpressCube 480R will not record any accurate measurements unless the platform has a the Zero condition (weight of the platform in an idle condition) prior to a package being placed on the platform. To set Zero, verify that the measurement platform is empty then press the 'ZERO' function button on the ExpressCube™ control panel.

The Blue LED under the platform will light and a zero condition will be indicated by the word 'ZERO' on the display of the ExpressCube™ control panel. The Zero condition display for both of the ExpressCube™ control panels is illustrated below:



ExpressCube™ Controller Display



ExpressCube™ SizeIt™ Display

### 8.5. Placement of the Box for Measurement

Place the box to be measured flush against the back of the ExpressCube™ 480R such that one side of the box is in contact with the rear face. The orientation of the box is arbitrary as long as it:

- Sits over the center array
- Is flush (contact) to the back
- Sits within the outside guide rollers
- **The user stays behind the guard bar during the entire measurement and must not touch the platform or the box.**

This illustration shows an example of a box ready for measurement and indicates the orientation that the dimensions will be recorded.



## 8.6. Verifying That the Parcel is Ready to Measure

Once the box is in place, the ExpressCube 480R unit will resolve the weight and dimensions. A successful measurement is indicated by the steady illumination of the yellow LED (valid dimension) and the green LED (valid weight) on the front of the platform. The ExpressCube control panel will also have valid measurement indicators with the actual measurements displayed.

If the weight has not been resolved, the problem could be caused by:

- The box weight exceeds specifications. Weight will read '**OVER**'
- The ExpressCube 480R was not in a zero condition prior to the box placement on the platform.
- The ExpressCube 480R is undergoing vibrations or movement that prevent weight resolution.

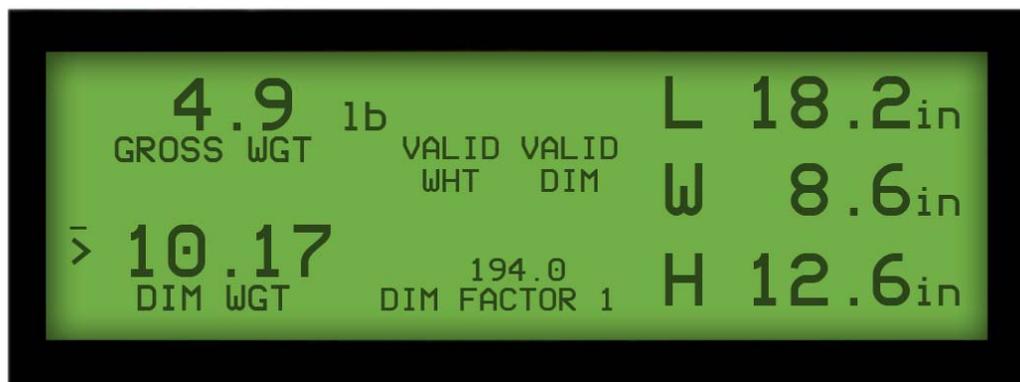
If the any dimensions cannot be resolved, these dimensions will read '**N / A**'. If a cuboidal package is placed within the yellow guidelines and there is not a valid dimension obtained, the problem could be caused by:

- The box dimension does not fall between the minimum and maximum the specifications.
- The box is not flush against all three dimensional arrays.
- There is excessive dirt or an object blocking the measuring arrays.

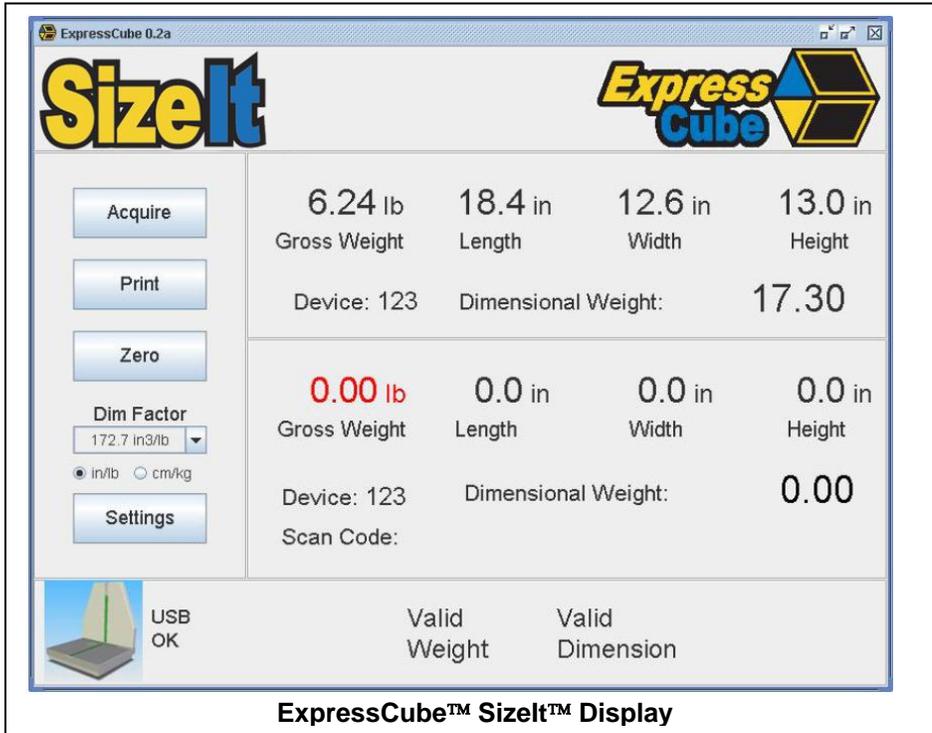


***If the ExpressCube™ 480R is unable to resolve a valid dimension, it will behave as a weigh scale. In this condition, acquiring a measurement will only record the weight and a scan code (hand scanner optional).***

The ready to acquire condition (valid measurements) display for both of the ExpressCube™ control panels is illustrated below:



ExpressCube™ Controller Display



### 8.7. Dimensional Weight and The Greater Weight Indicator

The ExpressCube™ 480R equipped with the capability to measure both dimensions and weight will use these measurements to calculate Dimensional Weight based on the user selected Dim Factor. It is important to realize that Dimensional Weight is meaningless unless the Dim Factor used to obtain it is known. For this reason, Dimensional Weight that is acquired will be recorded with the Dim Factor used to calculate it. Similarly, the Dimensional Weight and Dim Factor will be sent in the data that accompanies the measured data and scan code (optional). **Since Dimensional Weight is a calculated weight; units are not displayed to prevent confusion with actual weight. Dimensional Weight is always the same units as actual weight. [For more detailed information, refer to Appendix 2 in the back of this guide]**

The greater weight indicator on the ExpressCube™ control panel is a visual aid to the user to quickly identify the greater of measured or calculated Dimensional Weight. The indicator is not sent with the acquired data.

The greater weight indicator for each of the ExpressCube™ control panel is illustrated below:





### **8.9. SEND/PRINT the Acquired Measurement Data (Manual Operation)**

The acquired measurement data can be sent to the printer and any other devices or ports connected to the ExpressCube™ 480R by activating the SEND/PRINT button on the ExpressCube™ control panel. The **SEND / PRINT** button will only respond once for every measurement taken.

The ExpressCube™ 480R will attempt to send the acquired measurement data through the various data ports until the ExpressCube™ 480R returns to a zero condition. Any measurement data that has not been sent or printed will be cleared from the transmission buffer when the ExpressCube™ 480R detects the object measured is being removed/moved.

 **The ExpressCube™ control panel display will continue to hold the acquired data until the box is removed.**

### **8.10. Automatic (ACQUIRE & SEND / PRINT) Operation**

This feature can be used when the AUTOMATIC OPERATION option is selected in the user program (Section 7.5.2). The ExpressCube 480R must be ready for acquiring a measurement (as described in Section 8.6.). To acquire and record the measurement of the box on the ExpressCube™ 480R, the handheld scanner will activate the Acquire and **SEND / PRINT** sequence while reading the bar code on the package. The ExpressCube 480R will receive the data from the handheld scanner and append it with the acquired measurement data. The acquired data will be displayed on the ExpressCube™ control panel display.

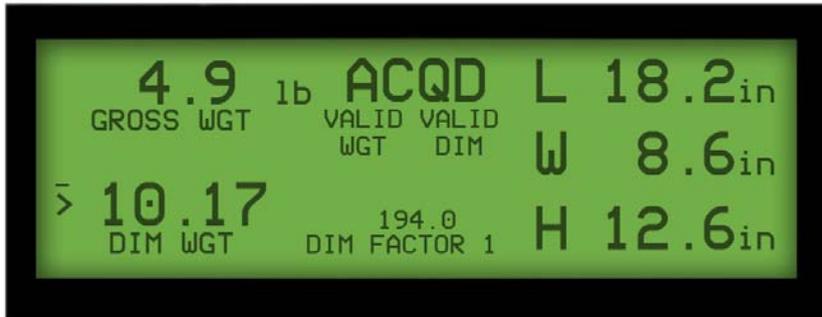
The ExpressCube™ 480R will attempt to successfully send the acquired measurement data through the various data ports until the ExpressCube™ 480R returns to a zero condition. Any measurement data that has not been sent or printed will be cleared from the transmission buffer when the ExpressCube™ 480R returns to a zero condition.

If the measurement data is not acquired, an audible beep will be heard. The user should refer to Section 8.6. and verify that the box is properly positioned for measurement.

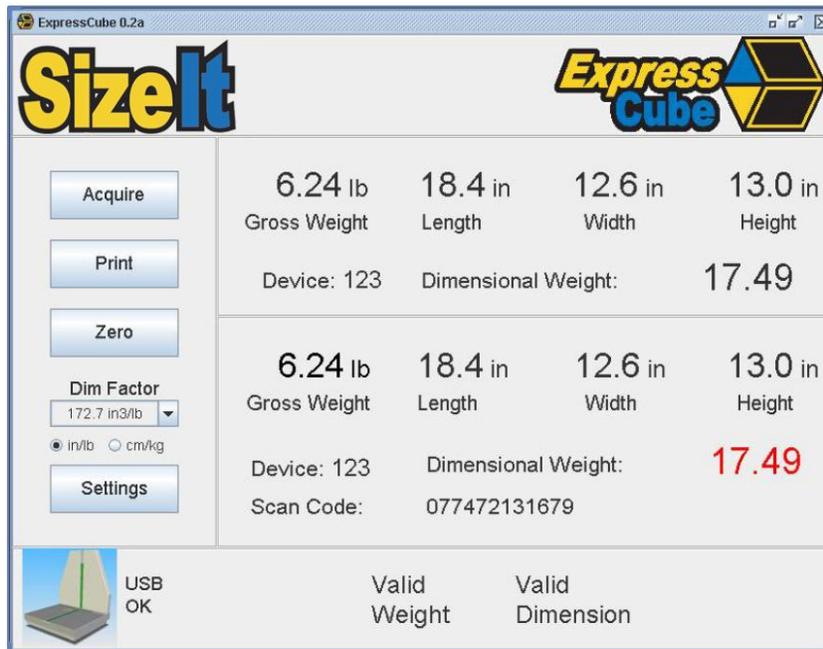
 **The ExpressCube™ control panel display will continue to hold the acquired data until the box is removed.**

 **After a successful measurement is acquired and sent, the valid measurement indicators both on the front panel of the main unit and the ExpressCube™ control panel are held until a new measurement procedure is started.**

The successful acquired and sent measurement display for both of the ExpressCube™ control panels is illustrated below:



ExpressCube™ Controller Display



ExpressCube™ SizeIt™ Display

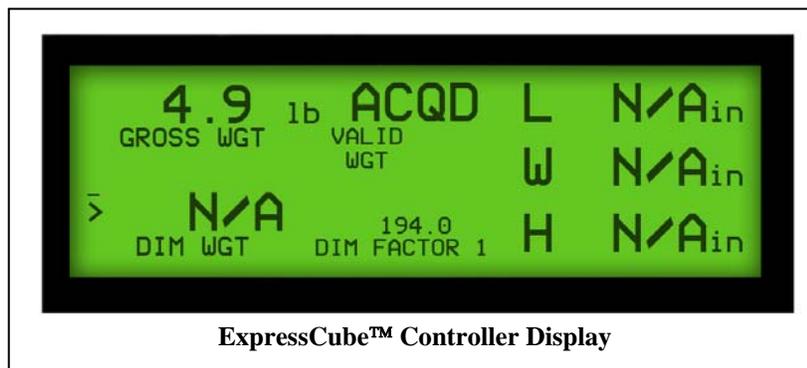
### 8.11. Using the ExpressCube™ 480R as a Weigh Scale Only

The ExpressCube™ 480R can be used to measure the weight of non-cuboidal objects or cuboidal objects that physically exceed the dimensioning specifications of the machine. This feature allows the user to determine weight on courier documentation packs, odd package shapes including shipping cylinders, etc.

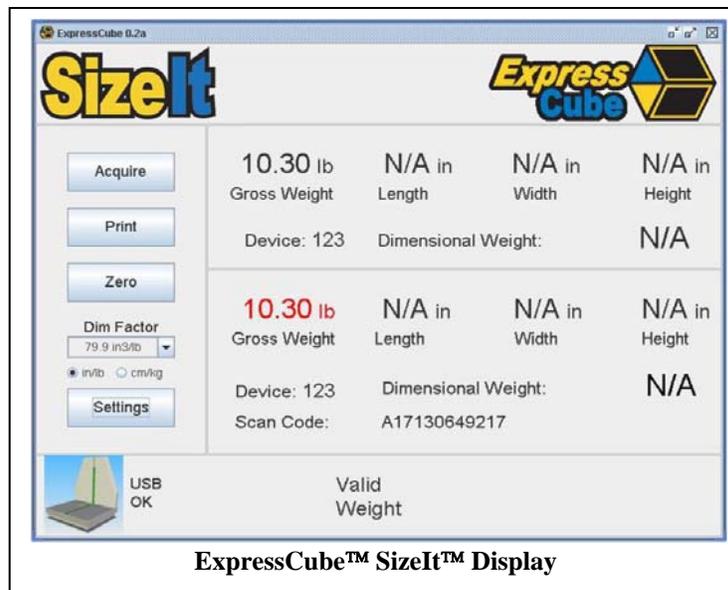
Place the package on the ExpressCube™ 480R platform to physically limit as much package overhang as possible. The ExpressCube™ 480R will automatically reconfigure itself as a weigh scale when an object is detected on the platform that cannot be accurately dimensioned.

The ExpressCube™ 480R unit acting as a weigh scale will indicate 'N/A' on all measurements and calculations based on dimensional measurements. (See illustrations below). Only the device number, weight and scan code (optional) are recorded during the Acquire sequence.

To acquire and record a weight, use the same procedure and options as described in the previous sections for obtaining and recording dimensions.



ExpressCube™ Controller Display



ExpressCube™ SizeIt™ Display

## 9. **Maintenance**

### 9.1. **General**

The ExpressCube™ 480R unit is a sealed certified device that does not require any internal periodic maintenance. In the event that the unit has incurred physical damage that may affect the operation of the unit, an authorized service technician should be contacted for repair and re-calibration.

### 9.2. **Cleaning (Excluding the Sensor Lenses)**

To maintain the optimum performance of the ExpressCube™ 480R, the unit should be periodically cleaned to remove any build-up of dust and dirt. The black metal areas should be cleaned separately from the sensing strips. Use a damp cloth with a mild detergent and rinse with a clean damp cloth. Hand pumped sprayers can be used. Apply a non-corrosive cleaner to stubborn areas but care should be exercised to keep spray from the sensor strips.

 ***Do not use any volatile liquids to clean the surface. This is an electronic device and trapped fumes in the enclosure could be ignited by the electronic circuitry.***

 ***Do not use any pressurized liquid source (e.g. water hose, steam jet, etc) to clean the unit.***

### 9.3. **Cleaning the Sensor Lens**

It is important to keep the sensor lenses clean and free from any debris that may obscure the package from sensors. Use a soft clean cloth with commercial glass cleaner to clean the surface of the lens.

 ***Do not use abrasive or dry cleaners on the lens.***

### 9.4. **Performing Lens Calibration**

Wipe dust and any debris from empty platform before proceeding.

- Press **“PROG”**
- Press menu 5 button **“CALIBRATE DIMENSIONAL BANKS”**
- Press 1 button **“CALIBRATE DIMENSIONAL BANKS”** to start procedure.
- Wait until calibration is complete (~ 50 seconds) when LED's stop flashing.
- When finished – Press 6 **“EXIT”** or **“PROG”** to return to the idle display.

 ***For dimensioning peak efficiency, it is recommended that the platform is cleaned and a lens calibration procedure is performed as part of a daily routine.***

## 10. **Troubleshooting**

### 10.1. *Summary*

The ExpressCube™ 480R is a multi-dimensional precision instrument designed to work in a variety of working environments. The internal assembly is sealed to preserve the integrity of this measuring instrument. There are a number of problems that may arise that can be addressed without tampering with the seals which are reviewed in this section along with problems involving possible parts replacement.

 ***This section addresses problems that are occurring in lieu of the device being properly installed, cleaned and operated as per the above sections.***

 ***Only authorized technicians may break the seals to perform repairs on the ExpressCube 480R unit. Unauthorized personnel breaking the seals for any reason will void the government certification and possibly void the warranty on the unit.***

### 10.2. ***ExpressCube™ 480R will not power up***

Symptom: The unit is connected to the power supply that is connected to power but the operation of the OFF-ON switch has no affect. The red LED on the front of the platform is off.

Check (in numerical sequence):

1. Physically verify the connections of the power adapter to the power outlet and the ExpressCube™ 480R power connector.
2. Verify the power outlet by connecting a lamp or other known operational device.
3. (Technician only) Remove the power adapter from the ExpressCube™ 480R unit and verify that the voltage to the ExpressCube™ 480R is present [15 VDC]. If the voltage is not present, contact your sales representative for a new power adapter.
4. Contact your service center to arrange repair by a qualified service representative.

### 10.3. ***ExpressCube™ 480R Controller LCD display is not working***

Symptom: The LCD display on the Controller either does not display any intelligent characters or cannot control the ExpressCube™ 480R.

Check (in numerical sequence):

1. Check that the red LED on the front panel of the ExpressCube™ 480R is steady. If not steady, turn off the unit and remove power cord for 30 seconds. Reconnect the power and turn the power ON. If LED continues to flash, contact your service center to arrange repair by a qualified service representative.
2. Physically check the cable (authentic ExpressCube™ part) and the connections to both the ExpressCube™ 480R connector panel and the Controller.

3. Switch the connecting cable to the alternative external connector on the ExpressCube™ 480R connector panel.
4. (Technician only) Use an Ohm meter to verify the cable conductivity and visually inspect the RJ connectors for physical damage.
5. Contact your service center to arrange repair by a qualified service representative.

#### **10.4. ExpressCube™ 480R PC Controller Sizelt is not working**

Symptom: The Sizelt software program running on the PC is not communicating with the ExpressCube™ 480R.

Check (in numerical sequence):

1. Check that the red LED on the front panel of the ExpressCube™ 480R is steady. If not steady, turn off the unit and remove power cord for 30 seconds. Reconnect the power and turn the power ON. If LED continues to flash, contact your service center to arrange repair by a qualified service representative.
2. Turn off the program in the computer and remove the USB cable until a tone is heard from the computer. Put in the USB and wait for a computer tone again. Restart the Sizelt software.
3. If the Sizelt program is still indicating that there is not USB connection; physically check the USB cable connections to both the ExpressCube™ 480R connector panel and the Controller.
4. If the Sizelt program is still indicating that there is not a USB connection, replace the USB cable.
5. (IT Technician only) Verify proper hardware and software operation of personal computer (PC). The physical connection of the USB port can be verified by accessing Windows Device Manager; the ExpressCube port should be marked under the serial port list.
6. ExpressCube™ warranty only relates to the ExpressCube™ provided products as outlined in the Warranty in Appendix 1. ExpressCube does not provide warranty for third party software products.
7. Contact your service center to arrange repair by a qualified service representative.



## **11. Appendix 1 : ExpressCube™ Warranty**

### **GLOBAL SENSOR SYSTEMS INC. NEW PRODUCT LIMITED WARRANTY**

#### **11.1. *Statement of Warranty.***

Subject and according to the Terms and Conditions set forth below, Global Sensor Systems Inc. warrants to the Buyer that the new ExpressCube 480R multi-dimensioning device (the “Product”) is in accordance with the manufacturer’s published specifications at the time of sale and that such Product shall be free from manufacturing defects in material and workmanship for a period of **one year** from, as applicable: the date of sale or the Commencement Date of use when installed by an authorized service representative (the “Warranty Period”). For purposes of this warranty, the term “Buyer” shall mean and refer only to the party which originally – whether from Global Sensor Systems Inc. directly, or from a distributor, agent or reseller authorized by Global Sensor Systems Inc. – purchases the Product as the end user which is the subject of this warranty.

#### **11.2. *Terms and Conditions of Warranty.***

This warranty is applicable exclusively to the original Product and components (if any) delivered with the Product as part thereof which were acquired from the manufacturer and resold by Global Sensor Systems Inc. Except as specifically warranted herein, Global Sensor Systems Inc. does not warrant, for any purpose, any part or component manufactured by another manufacturer. This warranty does not apply to any part or component which is used or rebuilt. Global Sensor Systems Inc. obligation and liability under this warranty is expressly limited to repair or replacement (at its option) of the warranted equipment or components within the Warranty Period. A purchase by Buyer of equipment first leased or rented from an authorized Global Sensor Systems Inc. agent shall not start a new Warranty Period.

In the event of the occurrence of a claim under this warranty, the Buyer shall have a duty to promptly notify Global Sensor Systems Inc. in writing of the nature and specifics of the claimed defect. Failure to so notify shall void this warranty. Any claim of a warranted defect is subject to inspection and analysis by Global Sensor Systems Inc. to conclusively identify or confirm the nature and cause of failure and application of this warranty. Any defective components, mechanical or electrical, will be repaired or replaced, at the discretion and authorization of Global Sensor Systems Inc., at Global Sensor Systems Inc.’s facilities in Mississauga, Ontario, Canada or at an authorized agent facility. It shall be the Buyer’s responsibility to return the faulty equipment or components to Global Sensor Systems Inc. at Buyer’s expense. Global Sensor Systems Inc. obligation shall not include transportation charges, nor labour, material, or service charges involved in the removal, return or installation of equipment or components.

Except as provided herein, Global Sensor Systems Inc. shall have no other obligation or liability due to defective equipment or components. Accordingly, but without limitation, Global Sensor Systems Inc. shall not be liable for: losses, injury or damage caused to persons or property by Global Sensor Systems Inc. products or their failure; indirect, special or consequential damages of any nature including but not limited to loss of profit, delays or expenses, such as those arising from the use of or inability to use the products; nor any incidence of personal injury or property damage arising from the negligence or willful act of anyone.

Global Sensor Systems Inc., for itself and the manufacturer, reserves the right to incorporate improvements in material and design applicable to the type or model of products to which the covered Product relates without notice and without any obligation or duty, whatsoever, to incorporate the same improvements in equipment previously manufactured.

### **11.3. Conditions Which Void Warranty.**

This agreement shall not apply to equipment or components which has/have:

- A. Been the subject of repairs or modifications not authorized by Global Sensor Systems Inc.
- B. Not been operated under normal use and service according to that for which it was intended.
- C. Not been operated or maintained in accordance with printed instructions.
- D. Been subject to misuse, damaged, negligent handling, improper installation, accident, damage by fire, submersion, or act of God.
- E. Had serial numbers altered, defaced or removed.
- F. Been sold, loaned, leased, subleased or in any other way transferred to or placed within the control of any party other than the Buyer.
- G. Been operated beyond capacity.

THE FOREGOING IS IN LIEU OF ALL OTHER REMEDIES, GUARANTEES, LIABILITIES OR WARRANTIES. GLOBAL SENSOR SYSTEMS INC. MAKES NO OTHER WARRANTY, EXPRESS OR IMPLIED, AND MAKES NO WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE.

This statement sets forth the full extent of Global Sensor Systems Inc. liability for breach of any warranty or deficiency in connection with the sale or use of the Product. No employee or representative of Global Sensor Systems Inc. is authorized to change this warranty in any way or grant any other warranty.

## 12. **Appendix 2: Dimensional Weight & DIM FACTOR**

### ***12.1. The Importance of Volume and Weight of Cargo for Transportation***

All cargo space involved in transporting goods has physical limits based on the volume of the cargo and the weight. Once a cargo has reached a limit in either volume or weight – the container (trailer, train, plane or shipping container) is transported. Weight has traditionally been the measurement which the transportation costs of individual packaged freight has been calculated.

The difference in weight and volume costs can be appreciated if one considered the expense of transporting a large volume with little weight (e.g. large boxes of Styrofoam drinking cups). Transportation companies have recognized these variables and most have allocated a volume per weight standard in their billing to capture cargo of light density.

### ***12.2. Dimensional (Volume) Weight***

The dimensional weight (also known as volume weight) is the minimum weight that a package a given size may have that is handled by a carrier. A carrier may state that any package of one cubic foot (12"x12"x12") will have a minimum weight allowance of 10 pounds. If the cubic foot package actually weighs 8 pounds – it will be invoiced for 10 pounds. This is a ***minimum*** weight allowance – if the cubic foot package weighs 12 pounds – the charges will be based on 12 pounds.

 ***There are no international or domestic standards concerning values of dimensional weight. A significant number of courier companies use the dimensional weight standard set by the International Air Transport Association (IATA) but many define their own dimensional weights.***

The value of dimensional weights will probably change as the nature of shipments change over time. Organizations such as the International Air Transport Association (IATA) have produced studies that suggest the density of packaging is changing as the commodities become more high tech. As a result the IATA itself has already passed a resolution (Resolution 501) to change the IATA dimensional weight.

### 12.3. DIM Factor (Dimensional Weight Factor)

The DIM factor is a mathematical factor used to calculate the dimensional weight of an object. The DIM factor represents the volume of a package allowed per unit of weight. Although mathematically related, the DIM factor is different for measurements in units of inches/pounds and for measurements in centimeters/ kilograms.

All major courier companies now apply the DIM Factor to every cuboidal (rectangular/ square) parcel that they handle to determine the dimensional weight. They then adjust customer invoicing to reflect charges based on the greater weight between actual weight and dimensional weight.

#### Finding a DIM Factor using in/lb

Find the DIM factor if each cubic foot (12"x12"x12") has a minimum weight allowance of 10 pounds:

$$\frac{1 \text{ cu ft}}{10 \text{ lbs}} \quad \frac{12'' \times 12'' \times 12''}{10 \text{ lbs}} \quad \frac{1728 \text{ in}^3}{10 \text{ lbs}} \quad \boxed{172.8 \text{ in}^3/\text{lb}}$$

#### Finding a DIM Factor using cm/kg

Find DIM factor if each cubic meter (100cm x 100cm x 100cm) has a minimum weight allowance of 200 kg:

$$\frac{1 \text{ m}^3}{200 \text{ kg}} \quad \frac{100\text{cm} \times 100\text{cm} \times 100\text{cm}}{200 \text{ kg}} \quad \frac{1000000 \text{ cm}^3}{200 \text{ kg}} \quad \boxed{5000 \text{ cm}^3/\text{kg}}$$

### 12.4. Using DIM Factor (Dimensional Weight Factor)

The DIM Factor provides a quick determination of the dimensional weight of any cuboidal package. The best way to describe this application is by an example of the application and use of the DIM Factor by a courier company:

What is the billing rate of a 10"x 12"x 14" package that weighs 8 lbs by a courier that has a minimum dimensional weight of 10 lbs per cubic foot (i.e.: DIM Factor = 172.8 in<sup>3</sup>/lb) ?

$$\frac{\text{Volume}}{\text{DIM Factor}} \quad \frac{\text{Volume}}{\text{Volume / lb}} \quad \frac{10 \times 12 \times 14 \text{ in}^3}{172.8 \text{ in}^3/\text{lb}} \quad \frac{1680 \text{ in}^3 \text{ lb}}{172.8 \text{ in}^3} \quad \boxed{9.7 \text{ lb}}$$

The courier company will invoice based on 9.7 lbs – the dimensional weight.



***This is an example. Some courier companies always round dimensional weight up to the next pound, which in this sample would make the billing weight 10lbs.***

### 12.5. Dim Factor Conversion Between in<sup>3</sup>/lb and cm<sup>3</sup>/kg

The ExpressCube 480R will automatically adjust the selected DIM Factor to correspond to the units selected by the user. The mathematical relationship between DIM Factors can be expressed as follows:

$$\text{Dim Factor [cm}^3\text{/kg]} = \text{Dim Factor [in}^3\text{/lb]} \times 36.12728079$$

$$\text{Dim Factor [in}^3\text{/lb]} = \text{Dim Factor [cm}^3\text{/kg]} \times 0.027679913$$



***Some DIM Factors maybe provided in both units such as the IATA value of Dim Factor 166 in<sup>3</sup>/lb or Dim Factor 6000 cm<sup>3</sup>/kg. These have been slightly modified for ease of application. The ExpressCube 480R will correctly convert a user-selected input of Dim Factor 166 in<sup>3</sup>/lb to Dim Factor 5997 cm<sup>3</sup>/kg. This 0.05% difference is not large enough to affect dimensional weight readings. The user can input another DIM Factor of 6000 cm<sup>3</sup>/kg if desired and choose from two different Dim Factor selections depending on the units selected.***