

The Checkweigher 16 Mar. '15

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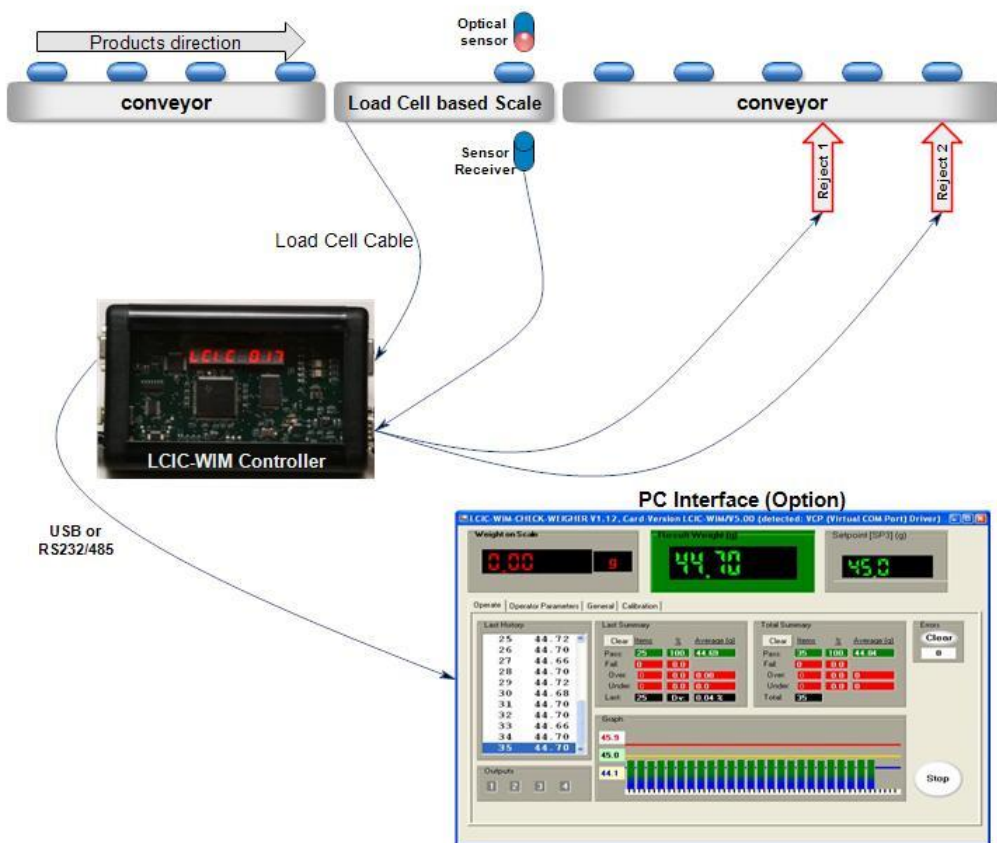
1. General Description

1.1 Introduction

The **LCIC-WIM** with the embedded Checkweigher application, was designed to function as a **Universal High- speed In-Motion Checkweigher controller**. It will work as a stand-alone controller or, might be connected to a PC running our Checkweigher Monitoring program that provides the user with much more details like: statistics, histogram, history etc.
The controller can be easily used for a new Checkweigher or, to retrofit old systems that are mechanically serviceable but, either have a non-functioning controller, or customer is seeking for better performances and accuracy.

Main features:

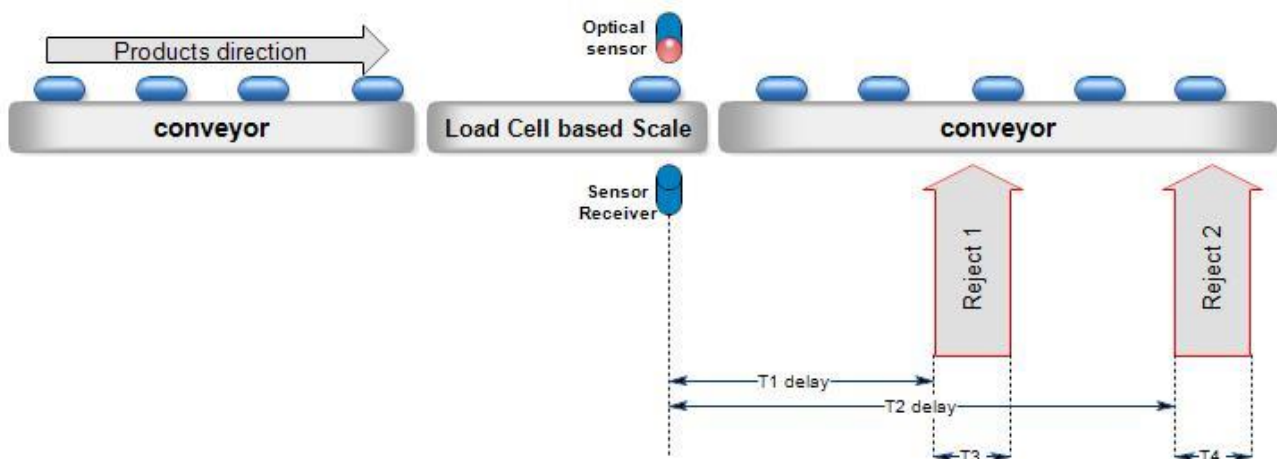
- * High-speed; Checkweigher can handle even 10 parts per second
- * On board programmable rejection output
- * Easy to program and enter set points from any notebook
- * Keeps in memory 3 different products for easy change
- * Shows results on board's display, allowing it without a PC
- * USB / RS232 communication port
- * User friendly PC monitoring application



The LCIC-WIM/CHECK-WEIGHER board is one of the LCIC-WIM 'family' of boards. Its uniqueness is that it manages the checkweigher process. The system includes a load cell and an optical sensor, both connected to the LCIC-WIM board. The optical sensor is located in front of the **end** of the load cell and reports to the board when an item starts **leaving** the load cell. The board samples items in motion, weighs them and checks whether their weight is within a desired range. The board is connected to a PC, which runs an application that communicates with the board and reports its findings. The results are reported on the screen and determine outputs that the board activates, as well as available by a remote computer. The goal is to have the LCIC-WIM work as a **stand-alone** checkweigher being independent of a PC. The Checkweigher has all required capabilities to function as a full checkweigher, including:

- * 2 outputs for rejecting overweight and underweight items.
(Alternately, if the direction of the exception (over- or under-) has no importance, the user may choose to use only **one** output for 'out of range'.)
- * Input to detect items leaving the scale.
- * Ability to store required setpoints (up to 3 setpoints are available).
- * Ability to support two packages on the scale at the same time (subject to the rules in section 4.2.3).
- * Communicating with a PC to enter the setup parameters, setpoints and sending back to the PC data about the results.

1.2 The Rejection Mechanism



The customer knows that it takes, say, 350 ms (T1) for the part to arrive the rejecting area and a pulse of, say, 200 ms (T3) will be required for rejecting – so he enters those parameters and the board will do the reject **starting** at the required time (leaving time + 350 ms) and **during** the required time (200 ms). In case that **two** separate rejections are required (for over-weight and for under-weight), the user will specify two pairs of those parameters (T1 and T3, T2 and T4). (“Leaving time” is the time that the **front** edge of the item arrived the optical sensor, indicating that the item **starts** leaving the scale.)

1.3 Starting the CheckWeigher-mode

There are two ways how to start the CheckWeigher-mode:

- * By a communication command
- * Automatically upon board reset (optional)

1.4 Communication

Usually, the board does not initiate communication – it just answers to a data request that the PC sends. The answer includes the following:

1. Serial no. of last result
2. Weight of last result
3. Degree of last result (Under/ In Range / Over)
4. Current weight
5. Current SP
6. Current error code
7. Current input
8. Current output

1.5 Error Status

There are cases that cause an error status. In these cases the Error box in the PC is red and the error code is displayed on board's LED. You may stop the error status by clicking 'Clear' in the Error box in the PC, or pressing input #1 (IN1).

Refer also to appendix B – Error Codes.

The error status does not stop the CheckWeigher from running.

1.6 Requirements/Limitations

1. PC Operating System: Windows XP Pro.
2. Checkweigher is running at the same speed all the time.

2. Zeroing

The actual zero of your scale may creep due to environmental conditions or temperature changes. For example, dust is accumulated on the scale. To tackle this creeping, there are the Auto Zero and the Manual Zero. These functions zero your scale, either automatically or manually.

2.1 Auto Zero

If the current weight is within the 'Auto Zero' range for a certain amount of time (user-defined, refer to section 4.3.4), then the software will auto zero.

2.2 Manual Zero

The Manual Zero function **supplements** the Auto Zero operation (previous section). Use it when scale's zero crept too far away to be caught by the Auto Zero mechanism. The Manual Zero is an explicit request to zero the scale, just for this case.

→ **It is user responsibility to activate the Manual Zero properly, as, unlike the Auto Zero, there is no range limitation for the Manual Zero.**

The Manual Zero Function is available by two ways:

- * A **digital input**, as described below.
- * A **command** – refer to the commands 'z' and 'Z' (section D.1).

The steps required in order to activate the manual zero by a **digital input** are:

1. Press input3 continuously during 5 second¹.
 2. The board gives you two options:
 - 2.1 For 2 second, the LED shows "2Ero On" (stands for "Zero On").
If you release input3 during these 2 seconds,
then a 'manual zero' is applied².
 - 2.2 For the next 2 second, the LED shows "2Ero OFF" (stands for "Zero Off").
If you release input3 during these 2 seconds,
then the board returns to the original (calibration) zero.
- These two options are displayed alternately on the LED until input3 is released, then the selected option is applied.

Notes

1. The '5 second' duration of step 1 is the default value. In order to change it, please refer to LCIC-WIM.pdf, section H.1 / Manual Zero / Long Activation (parameter #305; may be used also to **disable** the 'Manual Zero' option).
2. When a 'manual zero' is applied (step 2.1 or 'z' command), it averages the readings during 500 ms in order to produce the new zero. However, the '500 ms' is the **default** value – you may change it to any integer value between 1 and 10000 ms by writing to parameter #303.
(Parameter #303 is accessible for the user by the 'R' and 'W' commands – refer to LCIC-WIM.pdf, section 4.1, square 'a' in the table.)
3. The 'manual zero' request is available both in the CheckWeigher mode and in the general mode.
4. The effect of the 'manual zero' is both in the CheckWeigher mode and in the general mode. In other words, the zero point is always the same in these two modes.
5. The 'manual zero' may be requested even if the 'auto-zero' option is not active.

3. Digital I/O

(Refer also to appendix A – I/O Wiring.)

The board handles the following inputs and outputs:

Inputs	
#	Description
1	Stop error.
2	Change setpoint.
3	Manual Zero.
4	"On Sensor" indication produced by an optical sensor (or any similar device) mounted in front of the point where the item starts leaving the scale.

Outputs (With <u>one</u> rejection)	
#	Description
1	"Out of Range" indication.
2	"In Range" indication.
3	Not in use.
4	"Error" – indicates that although the system is running, some error condition has occurred. Human intervention may be required.

Outputs (With <u>two</u> rejections)	
#	Description
1	"Under Range" indication.
2	"In Range" indication.
3	"Over Range" indication.
4	"Error" – indicates that although the system is running, some error condition has occurred. Human intervention may be required.

4. The CHECK-WEIGHER Application

The top part of the screen includes two parts:

1. A common display of the **Weight on Scale**.
2. An additional display which depends on the tab selected, as described below.

The large box includes four tabs:

1. "Operate"
2. "Operator Parameters"
3. "General"
4. "Advanced"

Built-in Virtual Keyboard

While being in tab 2, 3 or 4, there is an additional field on the top part:

The **"Built-in Virtual Keyboard"** option box.

Select this option when there is no physical keyboard.

4.1 Operate

The top part of the screen shows

- * the **Weight on Scale**
- * the last **Result Weight**
- and
- * the current **Setpoint**.

REPORT

A report about the items recognized is supplied on the PC display by the following means:

1. The Result Weight box shows the weight of the last item.
2. The last result weights are shown in the Last History box.
3. The last result weights are represented also on a graph.
4. Some elementary statistics are shown to enable the user watch the course of the process.

STATISTICS

The boxes of "Total" and "Last" summaries supply some statistical information about:

- * **All** the results in current "Operate" session (the "Total Summary").
- * The **last** "n" results (the "Last Summary").
"n" is the Volume parameter in "Last Summary Limits" box of the "Operator Parameters" Screen (Section 4.2.4).

4.2 Operator Parameters

This is the main parameters display. It shows the various **Operator** parameters. That is, the parameters that refer directly to the CheckWeigher mode. Some additional parameters – normally defined only once – are displayed in the **General** tab – refer to section 4.3.

The parameters may be edited only when the process is stopped (that is, 'Stop' was clicked in the Operate tab). However, the various parameters are **visible** also when the process is running.

Library

The system includes a **library** that lets you quickly and reliably restore a past set of parameters. Two functions are available:

- * **Add/replace** a library file.

This is done automatically when saving the parameters in the board.

The name of the library file is the Product Name plus a '.txt' suffix.

- * **Draw** a library file.

This is done using the button 'Get a Library File'.

Both operations are described below.

In order to **edit** the parameters, first make sure that 'Stop' was clicked in the Operate tab (that is, the Start/Stop button on the right side – below the 'Clear' button – shows 'Start'). Then you have two options how to edit the parameters:

- * Manual editing.

- * Drawing a file from the library: Click 'Get a Library File' and select a file.

(As a matter of fact, you may also combine the two options. That is, draw a library file and then change it manually. That way you use the library file only as a base for your parameters definition.)

In either case, the parameters that were changed are marked by a dark background. Note that, at this stage, the new values are still not stored in the board! Put the cursor on a darkened displayed value and a tip will show you the board's value. You have now two options using the two buttons that became active on the top part of the display:

- * Click **Save to Board** in order to **validate** all the new values, that is, store them in the board.

- * Click **Undo All Changes** in order to **ignore** all the changes and display again board's original parameters.

Note that clicking **Save to Board** automatically saves the parameters also in a **library file**. The file is named the same as the **Product Name** parameter plus a '.txt' suffix.

Notes

* The **Product Name** parameter is an up to 10 characters string of digits and/or English letters.

* In case that a library file with the same name already exists, the application gives a proper warning and lets you either override (replace) the existing library file or select another **Product Name**.

4.2.1 Setpoints

4.2.1.1 Setpoints Values

(Up to three setpoints are available.)

SP1

Value of setpoint #1.

SP2

Value of setpoint #2.

SP3

Value of setpoint #3.

Range of SP1, SP2 & SP3: 0 → MAC.

(MAC = Maximum Applied Capacity, as defined during the calibration.)

4.2.1.2 Setpoints Limits

Low Limit

The low limit of the valid range, in percent of the active setpoint.

For your convenience, the value of the low limit of the selected SP is displayed also in weighing units.

Default: 80

Range: 0 → 100

High Limit

The high limit of the valid range, in percent of the active setpoint.

For your convenience, the value of the high limit of the selected SP is displayed also in weighing units.

Default: 120

Range: 100 → 999

4.2.2 Outputs Timing

The Reject system has two different operation modes:

One Reject Option

There is only **One** rejection mechanism that makes no difference between rejections caused due to over-weight and those caused due to under-weight.

Two Reject Options

There are **Two** separate rejection mechanisms, one for over-weight, another for under-weight.

The range of the *Delay* & *Duration* parameters

The range of all Delay & Duration parameters (below) is the same:
0 → 100000 ms.

4.2.2.1 When **One Reject Option is selected**

Out of Range (Output1)

Delay

The time that should pass **from** start leaving the scale **to** turning on the output.

Duration

The time that the output should be 'on'.

In Range (Output2)

Delay

The time that should pass **from** start leaving the scale **to** turning on the output.

Duration

The time that the output should be 'on'.

4.2.2.2 When Two Rejects Option is selected (the default)

Under (Output1)

Delay

The time that should pass **from** start leaving the scale **to** turning on the output.

Duration

The time that the output should be 'on'.

In Range (Output2)

Delay

The time that should pass **from** start leaving the scale **to** turning on the output.

Duration

The time that the output should be 'on'.

Over (Output3)

Delay

The time that should pass **from** start leaving the scale **to** turning on the output.

Duration

The time that the output should be 'on'.

4.2.3 Scale Timing

The system has the advantage that it may support also the case that two packages are *simultaneously* on the scale – provided that there is enough time in which a package is **completely and uniquely** on the scale. The role of the following TOS & PSIT parameters is to pre-define the character of this case.

Time on Scale (TOS)

If there are **never** two packages on the scale at the same time:

Set TOS to the minimal time interval prior to the "On Sensor" indication (input #4) during which a package is **completely** on the scale. That is, the board may be sure that during all the TOS interval the package was **completely** on the scale.

If there **are** cases where two packages are simultaneously on the scale:

Set TOS to the minimal time interval prior to the beginning of the PSIT interval during which a package is **completely and uniquely** on the scale. That is, the board may be sure that during all the TOS interval the package was **completely and uniquely** on the scale.

Default: 80 ms

Range: 0 → 1000 ms

→ See note on the next page.

Pre-Sensor Ignore Time (PSIT)

If there are never two packages on the scale at the same time: Set PSIT to 0.

If there **are** cases where two packages are simultaneously on the scale:

Set PSIT to the maximal time interval prior to the "On Sensor" indication (input #4) during which two packages may be **simultaneously** on the scale, guiding the board to ignore the readings during that interval. That is, the board may be sure that prior to the beginning of the PSIT interval there was only one package on the scale.

Default: 0 ms

Range: 0 → 1000 ms

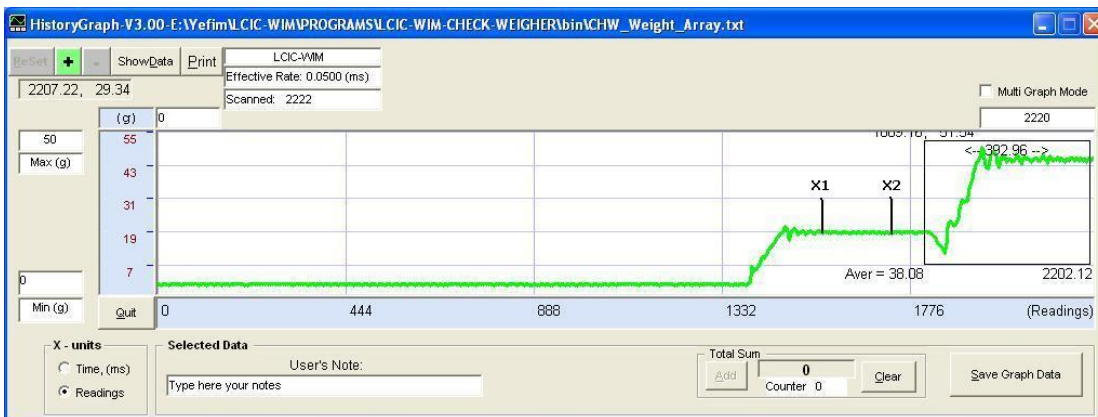
→ See note on the next page.

Note on the PSIT & TOS Parameters

The proper definition of these two parameters is very important.

Therefore, they should include some spare time, although it would be on account of the amount of readings according which the weight is calculated. Click the 'Show Details' to produce a graph as shown below.

In the example below PSIT could theoretically be set to ~393 ms. However, we should make sure that PSIT implies a point which is certainly **still** during the 'one package' time, say X2 in the graph below. So, PSIT should be set to, say, 470 ms rather than 393 ms. Similarly, TOS should imply a point in which the package is for sure **already** completely on the scale, say X1 in the graph. In this example TOS should be set to X2-X1. Note that both X1 and X2 were kept away from the edges of the relevant range (where the first package is completely and uniquely on the scale) so that PSIT & TOS will include some spare time.



Example

In the example below there are two parameters defined incorrectly: PSIT was set to 45 ms although there are never two packages on the scale at the same time and PSIT should have been set to zero. Consequently, relevant readings of those 45 ms were unjustly ignored. Moreover, as the interval of the readings assumed to be relevant was shifted leftward, it started too early causing irrelevant readings (where the item was not yet completely on the scale) to be classified as 'relevant', therefore taken in account in the average calculation and spoil the result. Note that TOS was set to 120 ms which is (after setting PSIT to 0) still good for this running, but does not take spare time, so it should be decreased to, say, 100 ms.



Correction:

1. Set PSIT to 0.
2. Reduce TOS to, say, 100ms.

Sensor Timeout

The maximal permissible interval that the "On Sensor" indication (input #4) may be 'on'. When a longer interval is detected, the program assumes that there is some fault, so an error indication is supplied.

Range: 40 → 100000 ms

4.2.4 Last Summary Limits

Volume

Determines the volume (how many items included) of the Last Summary.
Refer to Section 4.1.

Default: 5

Range: 1 → 200

Fail Limit

Determines the maximal permissible % of failures in the Last Summary box. If the Fail Percent is higher, an error indication is supplied, since a human intervention may be required. The Fail Percent box in the Last Summary report flashes and shakes to explain the reason for the error.

The mechanism starts working only after the quantity of items in the Last Summary report reached the value specified in the Volume parameter. For example, if Volume = 10, in the beginning of the process an error indication will never be supplied before there are 10 items in the Last Summary report.

Default: 15%

Range: 0.001 → 100%

4.2.5 Correction Factor

The Correction Factor is the ratio between **static** weight and **dynamic** weight. For example, if item's static weight is 100 g and its dynamic weight (during motion) is 97 g, then the Correction Factor should be 1.031. The default value of the Correction Factor is 1.

Note that the "Weight on Scale" box shows static weight, hence it is **not** affected by the Correction Factor.

→ Refer also to section 4.4.

Default: 1

Range: 0.9 → 1.1

4.2.6 Tare

(With board version V5.20 and up.)

Sometimes the weighed material has a package whose weight should be ignored. In this case, specify the weight of the empty package in the Tare parameter. Otherwise, set Tare to 0 (the default).

Default: 0

Range: 0 → MAC

(MAC = Maximum Applied Capacity, as defined during the calibration.)

4.3 General

This display shows some more parameters – normally defined only once – in addition to the main parameters shown in the **Operator Parameters** tab. The introduction to the **Operator Parameters** description (section 4.2) is relevant here either. Note that the 'Get a Library File' button is accessible only in the **Operator Parameters** display, which is the main parameters display.

4.3.1 Communication

4.3.1.1 Port (Read-Only)

Shows the COM number through which the board is connected to the PC.

4.3.1.2 Baud Rate (Read-Only)

Shows the Baud Rate in which the board and the PC communicate.

4.3.1.3 RS485 Address

This is the RS485 address (1 through 64) when the PC communicates the board via RS485.

* When using RS232, the RS485 address should be 0 (the default).

* When using USB, the RS485 address is irrelevant.

→ **The address setting takes effect only upon board reset.**

(For additional description about the RS485 please refer to LCIC-WIM.pdf, section D.5.)

4.3.2 Sensor Polarity

This parameter tells the board the hardware behavior of user's sensor:

Option 1 (the default):

Normally Open: Hardware sensor indication is on change from **Low** to **High** (Free Sensor = Off).

Option 2:

Normally Close: Hardware sensor indication is on change from **High** to **Low** (Free Sensor = On).

Note

If this parameter is not as the real polarity, the board will supply error #517.

4.3.3 Filtering

For details about the following three filtering parameters, please refer to section 3.3.2.4 in LCIC-WIM.pdf.

* Filter1

Default: 256

Range: 2 → 256

* Filter2

Default: 256

Range: 2 → 100

* Decimator

Default: 50

Range: 2 → 1000

4.3.4 Auto Zero

(Refer to sections 2 & 2.1.)

Activate

Specifies whether the 'Auto Zero' option is active or not:

* Checked: Active.

* Unchecked: Not Active (the default).

Max. Zero

Defines the maximum weight where the "Auto Zero" operation is enabled.

Default: 1% of MAC*

Range: 0 → MAC*

Min. Zero

Defines the minimum weight where the "Auto Zero" operation is enabled.

Default: -1% of MAC*

Range: -MAC* → 0

*** MAC is the Maximum Applied Capacity, as defined during the calibration.**

Time Limit

Defines the amount of time (in seconds) that the system requires the weight to be within the Min./Max. limits in order to apply the "Auto Zero" operation.

Suppose that:

Min. Zero = -1 kg.

Max. Zero = 2 kg.

Time Limit = 3 sec.

Then, the system will apply the "Auto Zero" operation after 3 **successive** seconds in which the weight was between -1 kg and 2 kg **always referring to the original (calibration) zero**.

For example:

Stage 1

The weight was stable 1.5 kg more than the calibration zero – the Auto Zero was applied and the display shows 0.

Stage 2

The weight is now stable 1 kg higher than before. The display shows 1 kg, but the Auto Zero does **not** work because the weight is far away from the calibration zero by **2.5** kg, which is more than the Max. Zero limit (2 kg).

Default: 5 sec.

Range: 2 → 1000 sec.

4.3.5 CheckWeigher-mode starts automatically upon card reset

- * When checked: After board reset, the board enters into the CheckWeigher-mode.
- * When not checked: After board reset, the board enters into the General-mode (the default).

4.4 Advanced

In the 'Advanced' tab you may find out the value of the Correction Factor (refer to section 4.2.5).

1. Take an item whose weight is known.
2. Click the 'Start Statistics' button.

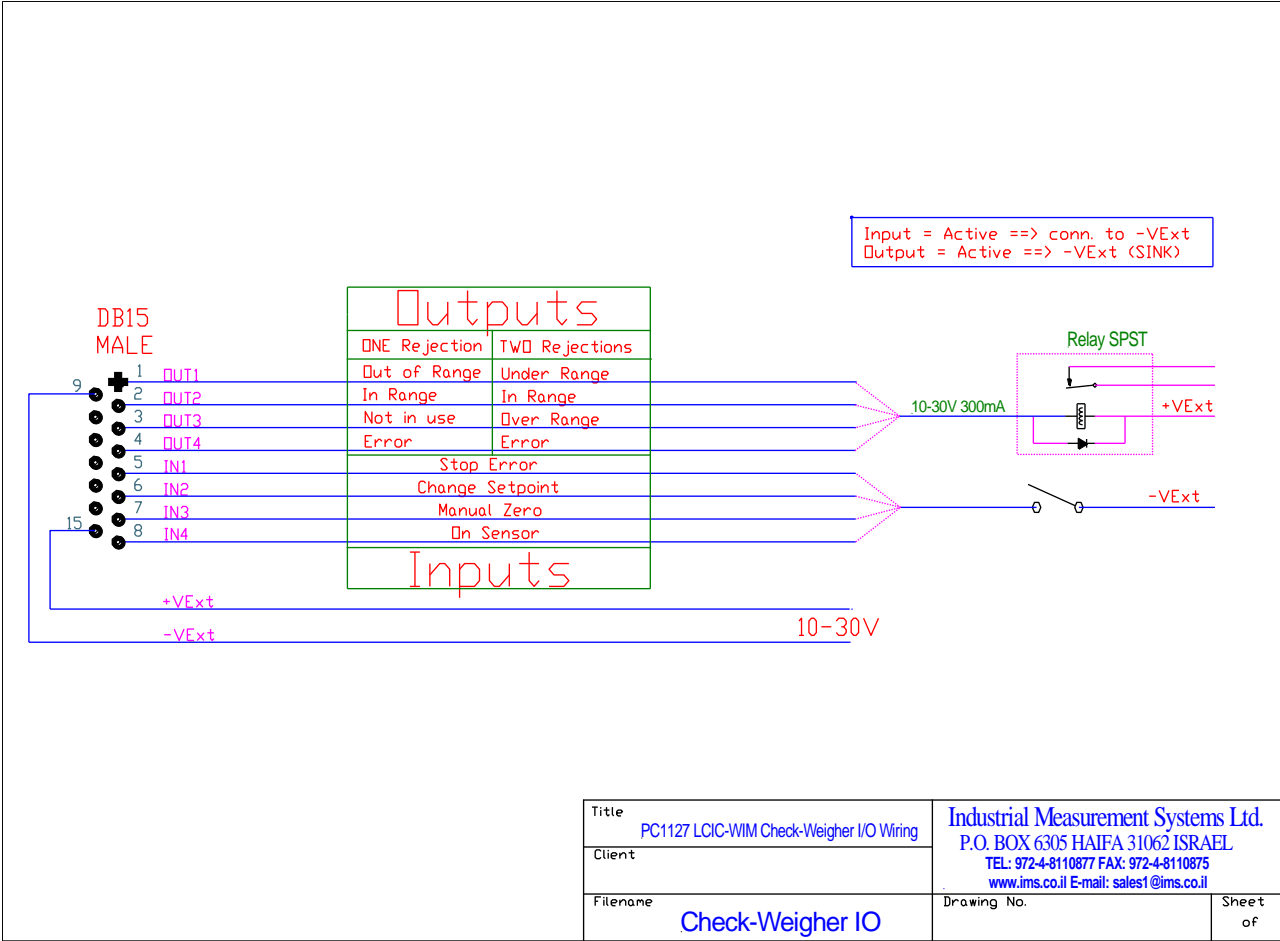
Note that the running of the Operate tab is now suspended.

It will be resumed only when you click 'Stop Statistics' or 'Save' (step 7).

3. The program sets the Static Weight box to the current setpoint.
If item's weight is different, correct the Static Weight box accordingly.
4. Let the item pass many times in the CheckWeigher.
5. You may watch the following information:
 - * No. of tests done.
 - * Weight accepted in the last test.
 - * Average Weight
 - * Standard Deviation
 - * Over Counter (No. of over-weight tests)
 - * Under Counter (No. of under-weight tests)
6. The program suggests a new Correction Factor which equals
 $(\text{Old Correction Factor}) * [(\text{Static Weight}) / (\text{Average Weight})]$.
7. The suggested new Correction Factor is **not** saved automatically:
If you are satisfied with the results and like to confirm the suggested new Correction Factor, click 'Save'. This will stop the statistics and save the new Correction Factor in the board (provided that its value is in the range 0.9→1.1). If you are not satisfied with the results, click Stop Statistics and the old Correction Factor will remain valid (the new Correction Factor will **not** be saved in the board).

Make sure to run many tests before you make a decision. Only if most (say, 70% or more) of the results have the same trend (too high or too low), change the Correction Factor. Inspect the 'Over/Under Counter' reports in order to find out whether the results indeed have some trend.

Appendix A: I/O Wiring



Appendix B: Error Codes

501 - Copyright error: This board is not licensed

503 - Percent of 'Fail' (out of range items) is more than the 'Fail Limit' parameter

517 - Sensor Timeout

Possibility #1: An object did not leave the sensor within the time specified in the Sensor Timeout parameter (in the 'Operator Parameters' tab).

Possibility #2: The Sensor Polarity parameter (in the 'General' tab) is not defined well.

525 - A/D Underflow

527 - A/D Overflow

529 - Initial weight is outside the Auto Zero limits

531 – Packages are too close (too small time between)

533 – In Range Queue Overflow

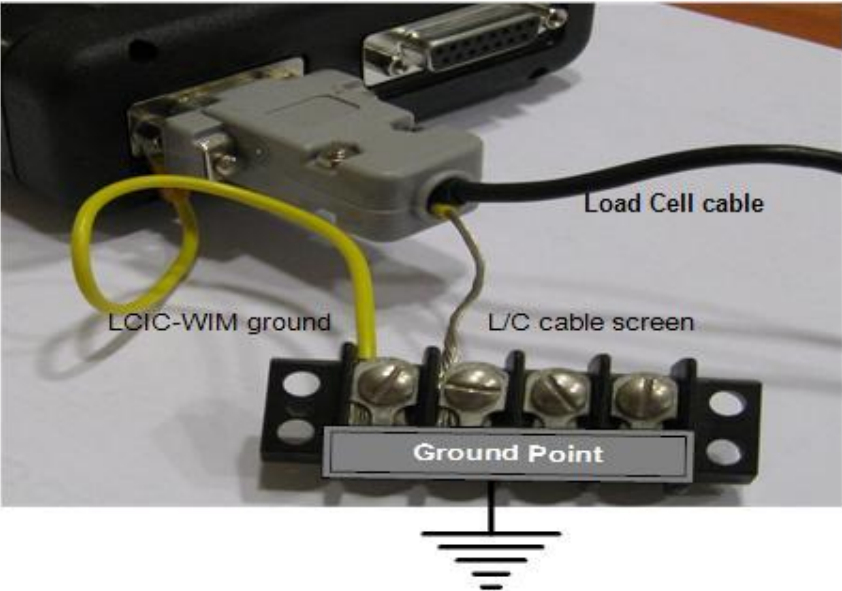
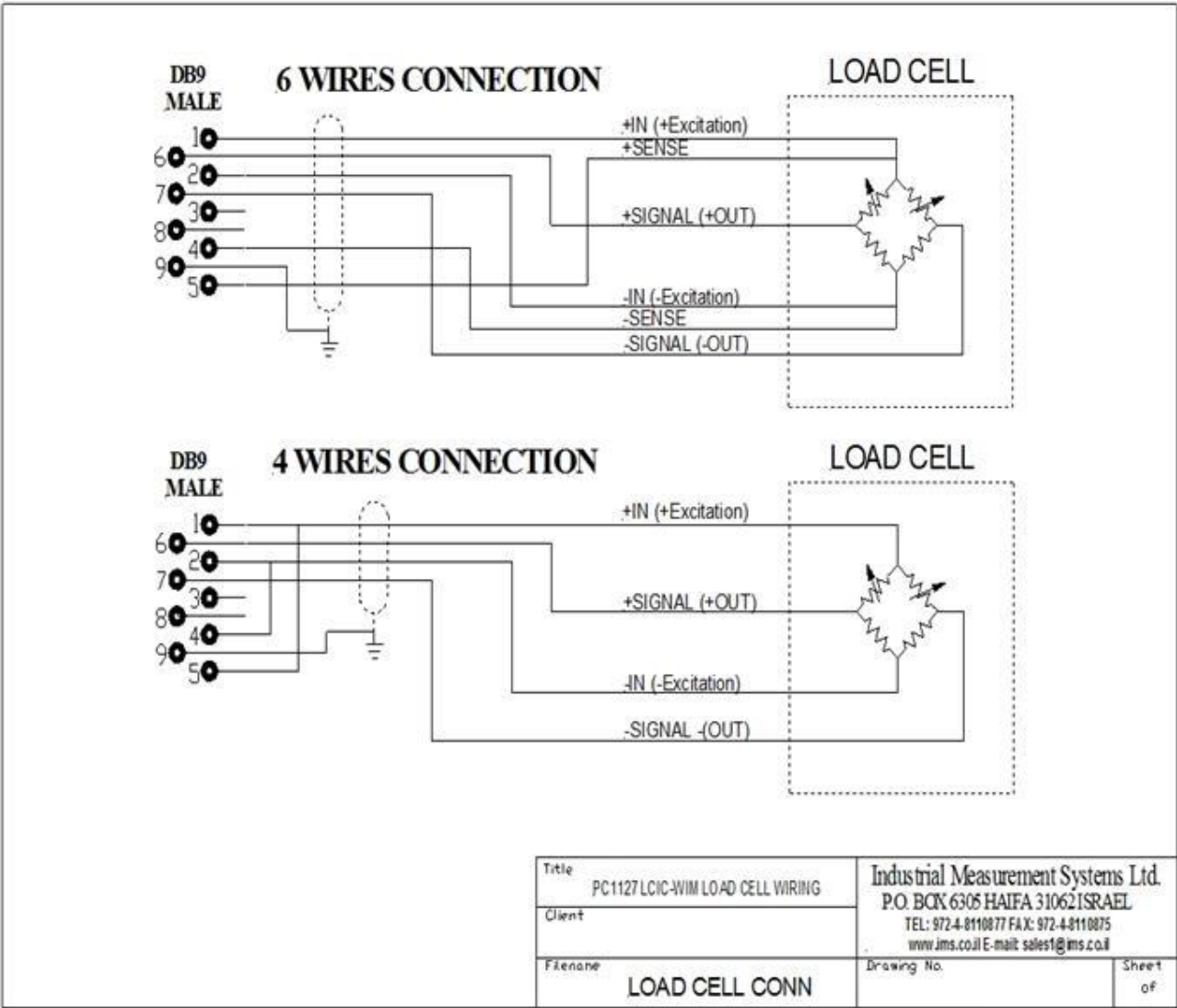
535 – Out of Range Queue Overflow

537 – Under Range Queue Overflow

539 – Over Range Queue Overflow

Appendix C: Load Cell Wiring

LCIC-WIM Load Cell wiring



Appendix D: Programming your application

D.1 Commands

'V': Mode echo. Response: "CHW-mode".

'x': Exit to general mode. Response: 'x'.

'?': Get current reading. For example:
50.000

'Q': Get the Current setpoint. For example:
SP= 100.00

'e': Clear error. Response: 'CHW_ErrorNumber = 0'.
Note: If the reason for the error still exists, the error will occur again.

'r': Read last n results.
'n' is the Volume of Last Summary Limits (section 4.2.4)

'Y': Clear Total Readings. Response: 'Y'+C/R.

'y': Clear Last Readings. Response: 'y'+C/R.

'G': Simulate sensor input. No response.

'l' (Small L): Get Weight Counters. For example:
2 0 0 2
(Total, Over, Normal, Under)

'L': Get Last Results. For example:

2 0 1 0 1 0 0000 0000

These 8 values are:

1. Serial no. of last result (0=no result yet)
2. Weight of last result (0=no result yet)
3. Degree of last result (0=no result yet, 1=Under, 2=In Range, 3=Over)
4. Current weight
5. Index of current SP (1=SP1, 2=SP2, 3=SP3)
6. Current error code
7. Current input

Format: 'dcba'. a=IN1, b=IN2., c=IN3, d=IN4

For example '0101'

IN1 = on

IN2 = off

IN3 = on

IN4 = off

8. Current output

Format: 'dcba'. a=OUT1, b=OUT2., c=OUT3, d=OUT4

For example '0101'

OUT1 = on

OUT2 = off

OUT3 = on

OUT4 = off

Notes

1. The values are separated by one tab.
2. The string is followed by a C/R.
3. There is no other C/R in the string.

'a': Turn on Output1 if Manual (No response)

'b': Turn on Output2 if Manual (No response)

'c': Turn on Output3 if Manual (No response)

'd': Turn on Output4 if Manual (No response)

'A': Turn off Output1 if Manual (No response)

'B': Turn off Output2 if Manual (No response)

'C': Turn off Output3 if Manual (No response)

'D': Turn off Output4 if Manual (No response)

'O' (upper case o): Get outputs.

The same as the 'O' command in the general mode (LCIC-WIM.PDF, section 4.1/f):

Card returns a string of the form "nnnn"<cr> where n is either "1" or "0" representing the status of the 4 output opto relays OUT4,OUT3,OUT2,OUT1 respectively.

For example: 0101 (OUT4=0,OUT3=1,OUT2=0,OUT1=1).

'I' (upper case i): Get inputs.

The same as the 'I' command in the general mode (LCIC-WIM.PDF, section 4.1/g):

Card returns a string of the form "nnnn"<cr> where n is either "1" or "0" representing the digital input status of IN4,IN3,IN2,IN1 respectively.

For example: 1010 (IN4=1,IN3=0,IN2=1,IN1=0).

'z' (lower case z): Manually zero the gross weight. The effect of this function is temporary — it expires upon card reset.

Response: 'z'<c/r>.

'Z' (Upper case Z) Cancel the manual zero operation (the lower case 'z').

That is, return to the original calibration zero.

Response: 'Z'<c/r>.

D.2 Parameters Addressing

The parameters are accessible by the 'R' and 'W' commands
(refer to LCIC-WIM.pdf, section 4.1, square 'a' in the table; the parameter # is the **Address** in the table below).

→ MAC is the Maximum Applied Capacity, as defined during the calibration.

Parameter Described in Section ...	Parameter Name	Min.	Max.	Default	Address	Notes
4.2.1.1	Active SP	1	3	1	504	1=SP1 2=SP2 3=SP3
4.2.1.1	SP1	0	MAC	0	501	
4.2.1.1	SP2	0	MAC	0	502	
4.2.1.1	SP3	0	MAC	0	503	
4.2.1.2	SP Low Limit	0	100	80	510	
4.2.1.2	SP High Limit	100	999	120	512	
4.2.2	Rejects Option	1	2	2	507	1 = One Reject 2 = Two Rejects
4.2.2	Under Range (with two rejects) Out of Range (with one reject) Delay (Output1)	0	100000	1513	513	Units: ms
4.2.2	Under Range (with two rejects) Out of Range (with one reject) Duration (Output1)	0	100000	1514	514	Units: ms
4.2.2	In Range Delay (Output2)	0	100000	2515	515	Units: ms
4.2.2	In Range Duration (Output2)	0	100000	2516	516	Units: ms
4.2.2	Over Range Delay (Output3)	0	100000	3517	517	Units: ms
4.2.2	Over Range Duration (Output3)	0	100000	3518	518	Units: ms
4.2.3	Time on Scale (TOS)	0	1000	80	506	Units: ms
4.2.3	Pre-Sensor Ignore Time (PSIT)	0	1000	0	526	Units: ms
4.2.3	Sensor Timeout	40	100000	12345	524	Units: ms
4.2.4	Volume	1	200	5	525	
4.2.4	Fail Limit	0.001	100	15	521	Units: %
4.2.5	Correction Factor	0.9	1.1	1	508	
4.2.6	Tare	0	MAC	0	533	

→ MAC is the Maximum Applied Capacity, as defined during the calibration.

Parameter Described in Section ...	Parameter Name	Min.	Max.	Default	Address	Notes
4.3.1.3	RS485 Address	0	64	0	301	→ The address setting takes effect only upon board reset. Refer to LCIC-WIM.pdf, section D.5.
4.3.2	Sensor Polarity	0	1	1	528	0 = Normally Close 1 = Normally Open
4.3.3	Filter1	2	256	256	23	
4.3.3	Filter2	2	256	100	24	
4.3.3	Decimator	2	1000	50	25	
4.3.4	Auto Zero - Activate	0	1	0	1047	1 = Active 0 = Not Active
4.3.4	Auto Zero - Max. Zero	0	MAC	MAC/100	1049	
4.3.4	Auto Zero - Min. Zero	-MAC	0	-MAC/100	1048	
4.3.4	Auto Zero - Time Limit	2	1000	5	1050	Units: S
4.3.5	CheckWeigher-mode starts automatically upon card reset	0	1	0	1074	1 = Active 0 = Not Active