Innovative Measurement Electronics

...better value by design!

PT Ltd.

PT111LC,
PT112LC

Load Cell
Weight Transmitter

Instruction Manual **Rev. 20200130**

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www.ptglobal.com

1 SAFETY

Safety Statement

CAUTION! READ THIS MANUAL BEFORE OPERATING OR SERVICING THIS EQUIPMENT. FOLLOW THESE INSTRUCTIONS CAREFULLY. SAVE THIS MANUAL FOR FUTURE REFERENCE. DO NOT ALLOW UNTRAINED PERSONNEL TO OPERATE, CLEAN, INSPECT, MAINTAIN, SERVICE, OR TAMPER WITH THIS EQUIPMENT. ALWAYS DISCONNECT THIS EQUIPMENT FROM THE POWER SOURCE BEFORE CLEANING OR PERFORMING MAINTENANCE. CALL PT LTD. FOR PARTS, INFORMATION, AND SERVICE.

WARNING! ONLY PERMIT QUALIFIED PERSONNEL TO SERVICE THIS EQUIPMENT. EXERCISE CARE WHEN MAKING CHECKS, TESTS AND ADJUSTMENTS THAT MUST BE MADE WITH POWER ON. FAILING TO OBSERVE THESE PRECAUTIONS CAN RESULT IN BODILY HARM.

WARNING! FOR CONTINUED PROTECTION AGAINST SHOCK HAZARD CONNECT TO PROPERLY GROUNDED OUTLET ONLY. DO NOT REMOVE THE GROUND PRONG.
WARNING! DISCONNECT ALL POWER TO THIS UNIT BEFORE REMOVING ANY CONNECTION, OPENING THE ENCLOSURE OR SERVICING.

WARNING! BEFORE CONNECTING/DISCONNECTING ANY INTERNAL ELECTRONIC COMPONENTS OR INTERCONNECTING WIRING BETWEEN ELECTRONIC EQUIPMENT ALWAYS REMOVE POWER AND WAIT AT LEAST THIRTY (30) SECONDS BEFORE ANY CONNECTIONS OR DISCONNECTIONS ARE MADE. FAILURE TO OBSERVE THESE PRECAUTIONS COULD RESULT IN DAMAGE TO OR DESTRUCTION OF THE EQUIPMENT OR BODILY HARM.

CAUTION! OBSERVE PRECAUTIONS FOR HANDLING ELECTROSTATIC SENSITIVE DEVICES.

Rights and Liabilities

2 DESCRIPTION

2.1 INTRODUCTION

The PT111LC and PT112LC are DIN rail mounted micro-controller based analogue load cell transmitter with 2 setpoint relays, more analogue output options and programming by serial RS-232C. They have very high accuracy and long term stability with their high-tech design.
The PT112LC with it's fast response, higher stability, remote zero and 6 wire input for up to 8x 350Ω load cells is a higher performing version of the PT111LC.

Using an up to-date delta-sigma ADC and 16 bit DAC to achieve a higher speed and accuracy this instrument gives the system designers a lot of advantages for increasing system reliability and reducing installation and service times. All instruments' analogue outputs are matched during production to simplify calibration with a PLC and to simplify exchanging the instrument without recalibration in service when initial adjustment has been performed in the PLC.

There are 8 position rotary switches and annunciator LEDs on the front panel of the instrument. The upper rotary switch is for making adjustments and the lower rotary switch selects the parameter for adjustment.

2.2 DEFINITIONS

ADC:
Analogue to digital converter, converts the analogue signal into a digital signal.
DAC:
Digital to analogue converter, converts the digital signal to an analogue signal, usually after some digital signal processing.

Dead weight:
Dead weight is the self weight of the platform or scale load carrying structure on the load cells without the contents or items to be weighed. The output voltage of the load cell in response to the weight of the platform is usually the zero offset. The zero offset must be within the range of the instrument adjustment for correct operation.

Live weight:
The weight that is applied to the scale and shown on the indicator.

Excitation voltage:
The voltage that is supplied by the indicator to the load cell.

Load cell:
Load cell is a device that converts force to electronic voltage. A load cell consists of two parts. The first part is a sensor that can be linearly distorted according to the force applied to it. The second part is the strain gauge element which changes its resistance according to the distortion of the sensor.

Load cell rated output:
The output voltage from the load cell divided by the excitation voltage at load cell rated capacity. This is usually expressed in mV/V.

Input range:
The maximum range of input that the device can accept. This is usually stated in mV and for a full load cell system is calculated from the number of load cells (Lcn), mV/V (LCmv) and capacity (LCcap) and also the maximum total load (TL) (including dead load) on the load cells and the excitation voltage (EV).

$$\text{Input Range (mV)} = TL / (LCn * LCcap) * LCmv * EV$$

Note: A summing box with corner adjustment will reduce this value slightly.

FSO:
Full scale output. Errors may be presented as a % of the full output range after calibration.

2.3 FEATURES

- Minimized zero and span drifts due to use of microcontroller technology.
- High accuracy, very low temperature drift 24 bit ADC and 16 bit DAC converters.
- Compact DIN rail mounting, size is only 22.5mm × 99mm from the front.
- Long term stability and low temperature drifts eliminate the need for the frequent readjustment.
- Adjustable digital adaptive anti-vibration filter to minimize environmental vibrations.
- All instrument have outputs pre-calibrated to 0–10 V, 0-5V, 0-20mA and to 4–20mA analogue output ranges for 0–2mV/V load cell signal range as a factory default.
- Factory matching facilitates enable swap out without PLC readjustment.
- VCal, calibration without calibration weights (using load cell mV/V entry).
- Programmable with PC, PLC and AzCom software via RS-232C.
- 2 free relay contact outputs for setpoints.

3 SPECIFICATIONS

3.1 GENERAL

1. Power supply	: 12-28VDC, 200mA
2. Span stability	: <0.007% FSO/ºC (PT112LC <0.005% FSO/ºC)
3. Non-linearity	: <0.01% FSO/ºC
4. Response speed	: PT111LC 500ms typical, PT112LC 25ms fastest
5. Isolation (Input to Output)	: Common ground connection (VDC, GND).
6. EMC Immunity	: Class E2
7. Operating temperature	: -10ºC to 45ºC (14ºF to 113ºF)
8. Relative Humidity	: 85% RH max. (non-condensing)
9. Enclosure	: Polyamide, DIN-rail mount, IP20
10. Dimensions (mm)	: Front Width:22.5 x Height: 99, Depth:114.5
11. Mounting	: DIN rail 35 mm x 7.5 mm, DIN 46277-3
12. Weight	: Approx 0.45 kg

3.2 DIGITAL SECTION

1. Analogue to digital converter	: Ratiometric 24 bit delta sigma ADC with integral analogue and digital filters
2. Digital to analogue converter	: 16 bit low drift DAC
3. Internal resolution	: 16000000
4. External Resolution	: 65000
5. Annunciators	: Run, Current/voltage, Error
6. Digital Filter	: PT111LC, 3 settings, PT112LC 9 settings. adjusted via PC, PLC and with AzCom

3.3 ANALOGUE INPUT

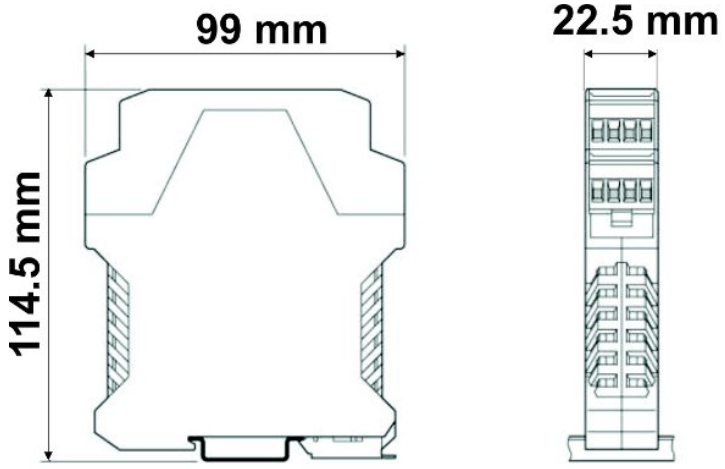
1. Load cell type	: All strain gauge load cells and transducers
2. Load cell supply (excitation)	: 5VDC, 60mA
3. Number of load cells	: PT111LC 4x 350Ω, 8x 700Ω (minimum 85Ω) : PT112LC 8x 350Ω,16x 700Ω (minimum 43Ω)
4. Analogue input range	: 0 to 20mV
5. Zero point adjustment	: -19mV to +19mV (PT112LC -18mV to +18mV)
6. Span (gain) adjustment for full output	: PT111LC From 0.2mV/V to 4mV/V load cell input PT112LC From 0.16mV/V to 3.6mV/V input

3.4 OUTPUTS/INPUTS

1. Analogue Output format	: Select from 4-20mA, 0-20mA, 0-10V, 0-5V
2. Maximum load resistance (4 to 20mA)	: 500Ω
3. Maximum cable length	: 300m (site dependent)
4. Digital Setpoints	: 2 free contact relay outputs. 230VAC, 30VDC, 1A
5. Digital inputs	: PT112LC has 1 opto-isolated input for zeroing

3.5 SETUP AND CALIBRATION

1. Setup	: Front panel controls and with PC, PLC and AzCom software
2. Calibration	: Performed with rotary switches on the front of the instrument. With PC, PLC or AzCom, can be performed without calibration weights.



4 INSTALLATION

4.1 GENERAL RULES

Warning: Please take care to note the following warnings for design of the control cabinet to maximise system reliability.

The control cabinet should be designed so that the instrument can operate safely. The panel should be placed in a clean area, away from direct sun light if possible, with a temperature between -10 ºC and +40 ºC, humidity not exceeding 85% RH non-condensing. All external cables should be installed safely to avoid mechanical damage.

The PT111LC and PT112LC instruments are very low level signal measuring instruments. To avoid electrical noise, the transmitters should be separated from any equipment that produces electrical noise. It is preferable use a metal cabinet to protect against radio frequency interference and the cabinet must be connected to ground to protect against electromagnetic disturbances. Load cell cable and analogue output cable trays must be separated from other cables, if possible. If there is noise-generating equipment such as heavy load switches, motor control equipment, inductive loads etc., please be careful to protect against EMC interference in the cabinet. Connect parallel reverse diodes to the DC inductive loads like relays, solenoids etc. to minimize voltage peaks on the DC power lines.

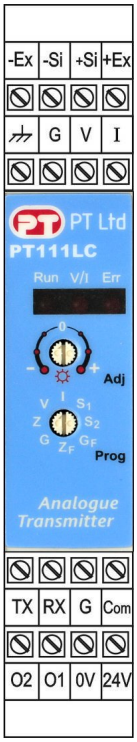
All load cell and analogue output cables coming into and out of the control cabinet must be shielded.

Warning: Control cabinet design and proper installation increases reliability and performance of the instrument. Please do not forget that the instrument must be powered off before inserting or removing any peripheral connector or cables.

Follow the installation and commissioning steps described below carefully to prevent unwanted results after installation.

4.2 INSTALLATION AND CONTROLS

Install the PT111LC or PT112LC in a clean dry location, preferably in a cabinet and away from direct sunlight if possible. The temperature should be between -10ºC and +40ºC with 85% RH maximum, non-condensing. Install the instrument on the DIN rail in the cabinet taking note of the general rules above. The instrument dimensions are as above, connections are as shown below.



Connections

Pin Name	*Definition*
LOAD CELL CONNECTION	
- Ex	- Excitation
+ Ex	+ Excitation
- Si	- Signal
+ Si	+ Signal
+Se	+ Sense (PT112LC only)
-Se	+ Sense (PT112LC only)
ANALOGUE OUTPUT	
I	4 - 20mA output
V	0 - 10V output
G	GND
⏚	Shield and Protective ground
RS-232C SERIAL CONNECTION	
Tx	Transmit data, analogue type
Rx	Receive data, analogue type
G	Serial ground
SETPOINT CONNECTION	
O1	Setpoint relay Output 1
O2	Setpoint relay Output 2
Com	Setpoint relay common
DIGITAL INPUT (PT112LC only)	
+InZ	+Input for remote zeroing
-InZ	-Input for remote zeroing
POWER SUPPLY	
24V	+12-28VDC
0V	0VDC

Programming Switch

Switch position	*Function*
V	Select voltage output mode4.5
I	Select current output mode4.5
S1	Setpoint 1 adjustment4.8
S2	Setpoint 2 adjustment4.8
Z	Zero adjustment4.7.1
G	Gain (span) adjustment4.7.1
ZF	Fast zero adjustment4.7.2
GF	Fast gain setting with 20% load4.7.2

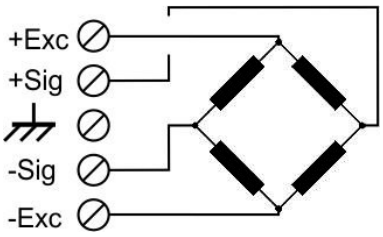
4.3 CONNECTING THE LOAD CELL

The load cell wiring should be installed carefully before energizing to avoid damage to the instrument and load cells. The input resistance of the load cells that you want to connect should be more than the specification minimum. Do not bind the load cell cables together with other cables as it could result in cross-talk interference. Please also keep them well away from the AC power cables.

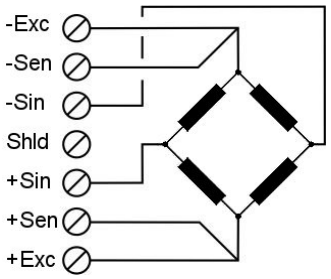
Connect the load cell wires to the terminals as shown below;
for the PT111LC, if the cable has 6 wires including sense wires then connect the +SENSE to the +EXCITATION and the -SENSE to the -EXCITATION.
For the PT112LC, if the cable has 4 wires (no sense wires) then connect -Exc to -Sen and +Exe to +Sen at the PT112LC terminals as shown below. If a junction box is used with load cells with 4 wires best accuracy is achieved with a 6 wire cable connecting the junction box to the PT112LC.

Pin Name	Load Cell Cable
+Ex	+ Excitation
-Ex	- Excitation
+Si	+ Signal
-Si	- Signal
+Se	+ Sense
-Se	- Sense
⏚	Shield

PT111LC Load Cell connection



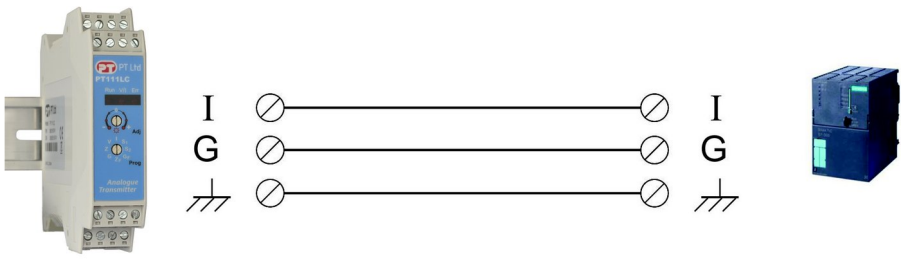
PT112LC wire Load Cell connection



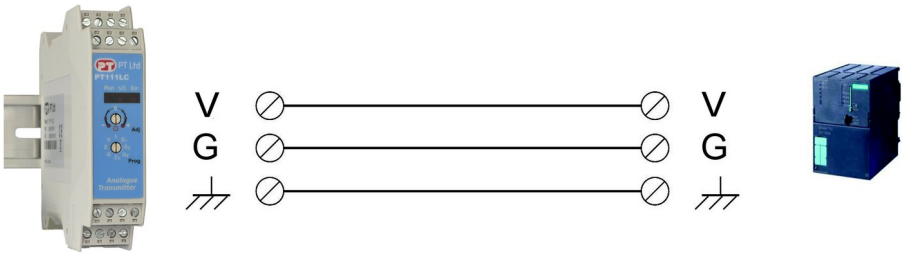
4.4 CONNECTING THE ANALOGUE OUTPUT

Only one of the analogue output types can be used at time and has to be selected in the setup. Install the analogue output measuring instrument for adjustment, if need be.

Pin Name	Definition
I	Current Output
V	Voltage Output
G	GND (for V or I)
⏚	Shield



Current output connection.



Voltage output connection

4.5 SETTING ANALOUGUE OUTPUT TYPE

The PT111LC and PT112LC check the Tx and Rx pins for a connection as below and sets its analogue output according to the table at power on. To change the analogue output mode short circuit or open circuit the Tx and Rx pins of the instrument before connecting power.

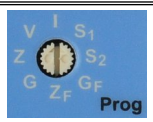
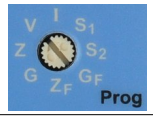
Analogue Output Mode	Program Switch Position	TXD & RXD pins	V/I LED
4 - 20 mA		Open circuited	On
0 - 20 mA		Short circuited	Off
0 - 10 VDC		Open circuited	Flash
0 - 5 VDC		Short circuited	Blinking

Table 1: Annunciator and jumper status during operation.

After power on, the analogue output mode can be changed as follows.

- Turn the lower programming switch to the desired analogue type (V or I).
- Connect or disconnect Tx and Rx according to the above table.
- Turn the top adjusting rotary switch to the ☼ position, wait 2 seconds, and turn it back to “0”.

The analogue output mode can easily be identified by observing the V/I led as in the table above. After setting your analogue output type you are ready to power on the instrument.

4.6 ENERGISING THE INSTRUMENT

The PT111LC amd PT112LC should be connected to a stable DC power source of 12 to 28VDC, preferably try to avoid electrical noise from switching or motors and check the followings before energising the instrument.

- Mechanical installation, grounding, load cell connection and power supply connection.
- The Tx and Rx pins on the instrument have been set to specify the analogue output at power on to be of type V or I as above.
- The analogue output cabling has been installed to suit the analogue output type.
- The adjustment rotary switches have been set at the “ 0 “ position at power on.

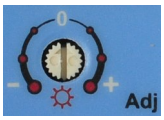
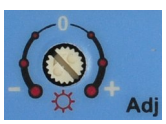
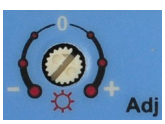
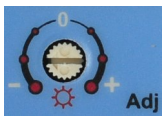
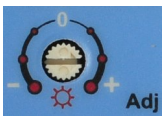
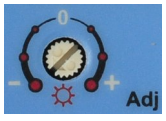
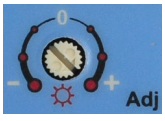
If everything is correct energise the instrument.
Warning: If the voltage/current mode is changed, turn the instrument off and on again.

4.7 ZERO AND SPAN (GAIN) ADJUSTMENT

There are two methods of performing zero and span adjustment, either in the transmitter or in the PLC or instrument to which it is connected. *Warning: Setting Zero and Span will fail if the ERR LED is on.*

4.7.1 Adjusting with rotary switches.

Zero and Gain adjustment rotary switches are used to adjust zero and gain (span) of the analogue output. Both switches must be at the “ 0 “ position when the adjustment starts.
Adjustment is performed by turning the adjustment switch as described in the table below.

Rotary switch position	Rotary switch description	Run LED
	Normal operation, No change occurs	On
 	Decrease (-) / Increase (+) in slow steps	Flashing
 	Decrease (-) / Increase (+) in medium steps	Flashing
 	Decrease (-) / Increase (+) in large steps	Flashing

The RUN LED flashes to indicate the instrument is in adjustment mode.

Zero Adjustment

- Connect the measurement instrument to the analogue output.
- Unload the scale.
- Turn the lower programming switch to the Z position from the previously selected analogue output type (V or I).
- Increase or decrease the analogue output with the top zero adjustment rotary switch. Never bring the adjustment switch to the ☼ position during zero adjustment.
- Set the top zero adjustment rotary switch to be at the “0“ position at the end of the adjustment.
- Set the lower programming switch to the G position to adjust the gain calibration or set back to the output type (V or I) for operation.

Gain Adjustment

- Connect the measurement instrument to the analogue output.
- Load the scale with the test load.
- Calculate the analogue output value that should be output by the transmitter for the applied load.
  - The analogue output value at any loading is calculated by;
    voltage output = test load / full output load * full output voltage
    current output = 4mA + test load / full output load * (full output current – 4mA)
  - Example you want a full scale capacity of 100kg and 10V output. Your calibration load is 25kg. The PT111LC gain is adjusted until;
    voltage output = 25/100*10 = 2.5V
  - Example you want a full scale capacity of 200kg and 16mA output (so you can have some overload allowance before reaching 20mA). Your calibration load is 25kg. The transmitter gain is adjusted until;
    current output = 4 + 25 / 200 * (16 – 4) = 5.5mA
- Turn the lower programming switch to the G position from the previously selected analogue output type (V or I).
- Increase or decrease the analogue output by adjusting the gain with the top adjustment rotary switch and measure the output until you get the calculated output value above. Never bring the adjustment switch to the ☼ position during span adjustment.
- After adjustment set the gain adjustment rotary switch to the “ 0 “ position
- After gain or zero adjustment re-check the zero and output under load and make adjustments as needed.

Warning: The instrument saves 4 different adjustments in its memory for the voltage and current outputs and their associated ranges. Changing the analogue output type automatically selects any adjustments previously made for that output range.

4.7.2 Fast adjustment to the nominal range.

If setting zero and gain to nominal ranges suits your application fast adjustment can be performed.

Fast Zero Adjustment

- Unload the scale.
- Turn the lower programming switch to the ZF position from the previously selected analogue output type (V or I).
- Turn the top adjusting rotary switch to the ☼ position, wait 2 seconds, and turn it back to “0”.
- Set the lower programming switch to the G position to adjust the gain calibration or set back to the output type (V or I) for operation. For V output this will set the output for the empty scale to 0V, for I output it will be 4mA or 0mA depending upon the output selected.

Fast Gain Adjustment

- Load the scale to 20% of the capacity for which you wish to have full output.
- Turn the lower programming switch to the GF position.
- Turn the top adjusting rotary switch to the ☼ position, wait 2 seconds, and it turn back to “0”.
- Set th lower switch back to the output type (V or I) for operation. For V output this will set the output for the scale at 100% load to 5 or 10V (depending on configured range), for I output it will be 20mA.

Example: set the PT111LC or PT112LC for output 4-20mA for 0 to 100kg load.
Configure the PT111LC or PT112LC for 4-20mA output (see4.5), empty the scale, perform fast zero, place 20kg on the scale and perform fast gain adjustment.

4.7.3 Adjustment at the PLC

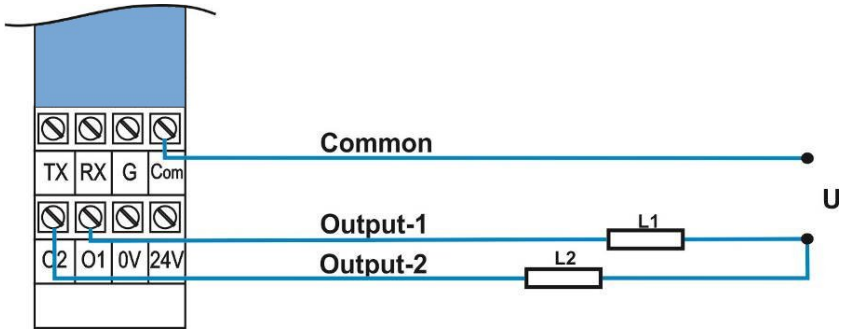
All PT111LC and PT112LC instruments are adjusted during production to operate by default to achieve the selected analogue output range for an input between 0 mV and 10 mV (2mV/V load cell signal).

For example if the instrument is at factory default values and programmed to operate in the 4 – 20 mA output mode, the output will be 4 mA at 0 mV/V load cell signal and will be 20 mA at 2 mV/V load cell signal.

If you need to exchange the transmitter for any reason, recalibration is not required because of instrument matching during production.

4.8 SET POINT CONFIGURATION

The PT111LC and PT112LC have 2 relay contact set points. The relays are rated 240VAC/30VDC, 1A maximum. Reverse diodes are recommended across the contacts for DC loads to increase relay contact life and suppress arcing. Setpoint connection is as below for the PT111LC, the PT112LC is similar.



Adjust setpoint to the load on the scale.

- Load the scale with the load at which you wish the setpoint to switch.
- Turn the lower programming switch to the S1 (or S2) position from the previously selected analogue output type (V or I).
- Turn the top adjusting rotary switch to the ☼ position, wait 2 seconds, and turn it back to “0”.
- Set the lower programming switch back to the output type (V or I) for operation.

Adjust setpoint by output measurement.

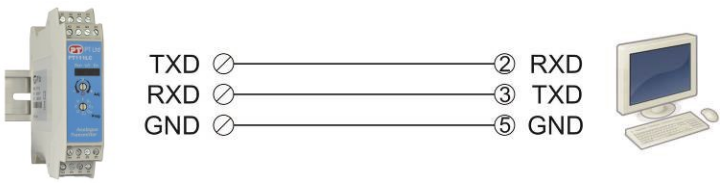
- Connect the measuring instrument (volt or amp meter as appropriate) to the analogue output.
- Turn the lower programming switch to the S1 (or S2) position from the previously selected analogue output type (V or I).
- Increase or decrease the analogue output with the top adjustment rotary switch. Never bring the adjustment switch to the ☼ position during adjustment. The switch should be at “0” when the output is at the value you want the setpoint to switch.
- Set the lower programming switch back to the output type (V or I) for operation.

4.9 DIGITAL INPUT for ZEROING (PT112LC only)

The PT112LC has a digital input to enable convenient zeroing of the instrument. The input terminal connections are shown in 4.2 INSTALLATION AND CONTROLS. The input is opto-isolated, accepting 12-28VDC. A simple push button can be implemented by connection -InZ to the power (0V) terminal and +InZ to the Power (24V) terminal via a normally open push button switch.

4.10 CONFIGURATION BY RS-232C

The PT111LC and PT112LC can be configured by PC or PLC over the RS-232C port. Connection is 3 wire serial and should be set to 9600 baud, 8 data bits, no parity and 1 stop bit (8N1). Standard software such as Windows Hyperterminal, Mac OSX Screen and telnet can be used with serial and USB cables from PT.



The structure of the commands and replies are as follows. All characters are the ASCII keyboard characters except the <CR>. @ character followed by 18 characters followed by 2 characters

checksum followed by <CR> or <CR><LF>. The 4 characters before the checksum represent the hexadecimal value of any value to be entered, without decimal point. i.e. 4E2F = 2.0015 mV/V

COMMANDS:	**Descriptions**

1. Analog output type setting:

a) 4 - 20 mA setting:

Command :	@01100000000102000BE1	Set to 4-20 mA range
Response :	@011000000001EE	ACK

b) 0 - 20 mA setting:

Command :	@011000000001020014D8	Set to 0-20 mA range
Response :	@011000000001EE	ACK

c) 0 - 10 VDC setting :

Command :	@01100000000102000AE2	Set to 0-10 VDC range
Response :	@011000000001EE	ACK

d) 0 - 5 VDC setting :

Command:	@011000000001020013D9	Set to 0-5 VDC range
Response:	@011000000001EE	ACK

2. vCal procedure steps:

a) Step 1. START vCal

Command :	@011000000001020001EB	Start the vCal process.
Response :	@011000000001EE	ACK

b) Step 2. Total Load cell Emax entry

Command :	@01100003000204000001F4F1	Total LC is 500 kg.
Response :	@011000030002EA	ACK

c) Step 3. Average Load cell mV/V entry

Command :	@01100005000204000004E2F67	LC sensitivity is 2.0015 mV/V.
Response :	@011000050002E8	ACK

d) Step 4. Estimated Dead load entry

Command :	@01100007000204000000000E2	Dead load is 0 kg.
Response :	@011000070002E6	ACK

e) Step 5. Scale Capacity entry

Command :	@01100009000204000000FAE6	Scale capacity is 250 kg.
Response :	@011000090002E4	ACK

f) Step 6. SAVE with estimated dead load value

Command :	@011000000001020007E5	Save the vCal values.
Response :	@011000000001EE	ACK

Or SAVE with automatic zero adjustment.
Unload the scale and send the command below to start the zero adjustment.

Command :	@011000000001020015D7	Save the vCal with Zero Adj.
Response :	@011000000001EE	ACK

g) Step 7. APPLY

Command :	@011000000001020009E3	Apply the calibration.
Response :	@011000000001EE	ACK

h) Step 8. STOP vCal

Command :	@011000000001020002EA	Stop the vCal process
Response :	@011000000001EE	ACK

3. Digital Filter Setting:

Command :	@011000220001020000CA	Set the Fast filter
Command :	@011000220001020001C9	Set to Medium filter
Command :	@011000220001020002C8	Set to Slow filter
Response:	@011000220001CC	ACK

4. Load Factory Defaults:

Command : @011000240001025AA5C9 Set to factory default settings.
Response: @011000240001CA ACK

CHECKSUM CALCULATION:

CSUM = 0 – (Slave_Add + Function + … + Last_data)
(STX and CSUM are neglected while calculating CSUM, calculations in Hexadecimal)

Example
For Medium (1) filter: @011000220001020001XX

CSUM = 0 – (01+10+00+22+00+01+02+00+01)
= 0 – 37 = C9

Command is @011000220001020001C9 <CR>

Warning: After configuration by RS-232C ensure that the switches and jumpers are set as in Table 1: Annunciator and jumper status during operation. to ensure that the PT111LC starts in the correct mode the next time it is powered on.

4.11 CONFIGURATION WITH AzCom

The PT111LC and PT112LC have an RS-232C serial interface to perform vCal electronic calibration, to adjust filter and setpoint values and to monitor status by with the use of AzCom software installed on a PC.

Note: There are 2 versions of the software, AzComT is required for transmitters and should be installed before following these instructions.

For programming the instrument via AzCom please follow the instructions below;

1. Power off the instrument.
2. Connect the instrument to a PC as shown above in 4.10 to use the AzCom software, then run AzComT and select the PT111LC or PT112LC and press the “OK” button. If you have a PT112LC and AzComT shows only a PT111LC option, select that option.
3. Select the analogue output type required if the default is not suitable.
4. Adjust the filter value if necessary.
5. For vCal, enter total load cell capacity, scale capacity and estimated dead load (alternatively for a more accurate zero calibration perform fast zero adjustment by clicking the button on the PC screen while the scale is empty).
6. Press the “Write vCal Data to Transmitter” button on the screen to perform vCal.
7. Unload the scale and Press “ vCal with Zero Adjustment “ button on the PC screen if you wish to perform zero adjustment from the load cell signal when the scale is unloaded.
8. Power off the instrument, disconnect the PC and bring the lower programming switch to the analogue output type position (V or I) as require and insert the connecting jumper between TXD and RXD pins as described in the table in 4.5, Table 1: Annunciator and jumper status during operation. to set the analogue output type.
9. Turn the top adjustment switch position to the “0“ position.
10. Power the instrument on for operation.

After performing vCal, check the performance of your system.

You can reset to factory defaults with AzCom if it is necessary to restart from the beginning.

4.12 TESTING PERFORMANCE

Check the scale performance by testing the scale eccentricity, scale linearity with loading up to the maximum loading value, repeatability, etc. before putting the scale into use.

5 OPERATION

There are 3 LEDs and 2 adjustment rotary switches on the front panel of the PT111LC and PT112LC. The rotary switches should be at the " 0 " position for operation.

In operation rotary switch positions, Tx and Rx pin connections, and LED indication should be as in Table 1 Annunciator and jumper status during operation.

Refer to the Section TROUBLE SHOOTING in the event the Err LED is on.

The analogue output signal also gives information about the status of the system and the weighing process and can be interpreted by a PLC to signal an alarm or a need for service as follows;

Condition	**Current output**	**Voltage output**
During Operation	As calibrated	As calibrated
During Programming	As calibrated	As calibrated
The weight is more than the maximum range (Over range signal to the PLC)	24 mA	11 V
The weight is less than the zero range (Under range signal to the PLC)	0 mA	-4.0 V
"Error" all signal to the PLC is stopped	0 mA	0 V
"ADC is out of operating range" error to the PLC	24 mA	11 V

6 TROUBLE SHOOTING

The PT111LC and PT112LC transmitters hav been designed as a very reliable and virtually error free instruments. However if an error occurs, do not attempt to repair the equipment before you understand what caused the error. Note the status of the front panel LEDs, and try to find the problem with the help of the table given below. Don't let unauthorised people interfere with the instrument.

Front Panel LEDs			**STATUS INDICATION**
Run	**V/I**	**Err**	
Off	Off	Off	• No power • Board failure
On	On	Off	• Operation in 4 – 20 mA output mode.
On	Flashing	Off	• Operation in 0 – 10 VDC output mode.
On	On or Flashing	On	(For output modes 4–20mA and 0–10VDC) • Input signal is out of range. Check load cells and wiring, The error light will be on if the load cell connection is incorrect, i.e. the PT112LC sense wires are not connected. Check the installation. • Check output circuit and cabling. The error light will be on if the transmitter is powered on in current mode without a current loop connection. • Board failure • Calibration needed. Re-calibrate.

The analogue output also gives additional information about the weighing system as described in OPERATION.

7 CONFORMITY

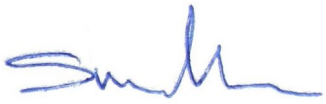
We;
PT Limited

7 Marken Place, Auckland, New Zealand

Declare under our sole responsibility that the product; **PT111LC, PT112LC**
to which this declaration relates, is in conformity with the following standard(s) or other normative document(s).

EC Directive:	Applicable Standards:
Low Voltage Directive (LVD): (2006/95/EC)	EN 60950-1
Electromagnetic Compatibility (EMC): (2004/108/EC)	EN 61326-1

PT Limited, September 2015
S M Edmonds



Technical Director