ELECTRONIC WEIGHING TERMINAL

LD 5218

USER MANUAL

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Table of Contents

ANNEX A containing installation schematic drawings and connector pin outs comprises of 12 pages.

1 INTRODUCTION

The electronic weighing terminal model LD5218 is a compact microcontroller based unit specifically designed for use on systems utilising strain gauge load cells. It offers excellent weighing performance, protocol printouts with administrative data handling.

The standard configuration includes:

1. High accuracy analogue to digital converter (max 550.000 internal counts).
2. Front panel with 16 character (14.5mm height) LCD display module for weight indication and operator dialogues, 27 membrane type keyboard with tactile feedback.
3. 32 Kbytes flash RAM, real time clock and non-volatile memory for system parameters and calibration data.
4. Flash memory for storage of 10.000 weights (Electronic tally roll or Alibi memory).
5. 2 serial ports RS232C / RS485A for connection to printers, computers, remote displays.
6. 2 setpoints 24VDC/100mA optoisolated and 1 optoisolated input.
7. The microcontroller technology allows the instrument to perform in software all measuring functions, operator input-output, automatic controls and sequences necessary for the operation of weighing systems.
8. The unit incorporates internal diagnostics, which alarm hardware failures operational data corruption, and programming errors. During entry all system and operational variables are validity checked with appropriate error indication. During operation these values are continuously being checked. The type of error is indicated on the display.
9. Administrative data maybe programmed to be included in the weighing dialogue.
   Four programmable print formats are available selectable in set up, user programmed or default.
10. The standard software enables weighing ticket protocols to be processed utilising The weighing file stores up to 250 mixed first weighing or fixed tare weights, date/time print serial no and 2 reference codes.
11. A piece count facility with selectable sample size is included in the standard software.
12. The unit may be connected to a printer to produce reports of weighing protocols and data files.
    The protocols printed may also be transmitted to a host computer. Both printer and host interface can be active at the same time.

OPTIONS

a. 2nd Analogue load cell input board (PCB 765).
b. Analogue output 0/4 - 20mA or 0-10V, 16 bits resolution (PCB 761) remotely powered.

EXTENT OF SUPPLY

A. The standard supply includes:
- The connection plugs for the load cell cable and peripherals.
- 230VAC to 9VDC/700mA, mains power adapter.
- This manual.

B. Prior to unpacking the equipment, examine the carton for exterior shipping damage and if any notify the carrier immediately. Remove the equipment from the carton and plastic bag.
Inspect extent of supply for any sign of damage. Save packaging material.

2 INSTALLATION

2.1 Mounting

The mounting location must be such that the instrument is not subject to excessive vibrations, heat or humidity. Avoid direct sunlight on the front of the instrument. The unit has to be installed at the right height to allow an easy reading of the display and keyboard operation.

2.2 Wiring

Use load cell cable 6 x 0,5 mm^2 shielded for the sensor. Use 3 x 0,34 mm^2 shielded for RS232C connection and 2x0,34 mm^2 twisted pair and shielded for RS485 connection.

Table top

All connections to the instrument are made through the rear panel connectors. Strain reliefs are supplied with the connectors. The shield should be connected to the metal frame of the connector.

Stainless steel

- Remove the rear panel and lift it carefully.
- Insert cables via the cable glands. Strip and connect cables according to connector diagram in Annex A.
- Connect the shields of the cables between the plastic part and metal case of cable glands or on screws supporting the pcb's.
- Re-install the rear panel.

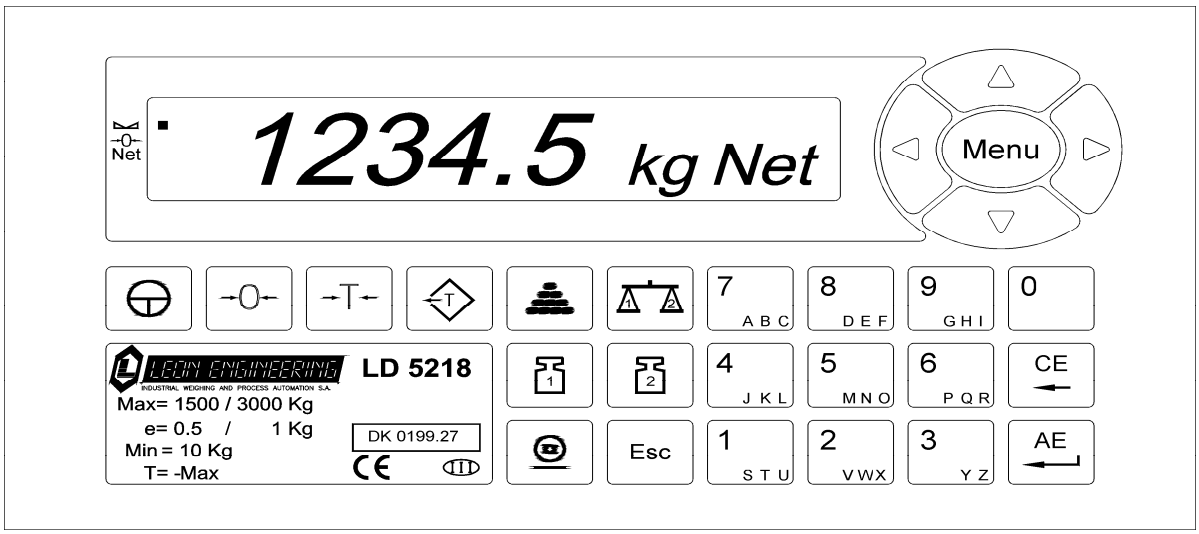
2.3 Power

The instrument is powered from external power supply (9-15VDC/500mA) or battery.
As the instrument is computer controlled it requires clean power for reliable operation.
Power supplied should come from a source that is isolated from other process equipment.
A mains adapter 9VDC/700mA is recommended for operation.

2.4 Environmental And Electrical Considerations

AMBIENT TEMPERATURE	:	Storage -10 to +70 ^{0}C. Operating -10 to +40 ^{0}C.
HUMIDITY	:	40 to 90% RH (non condensing).
VIBRATION	:	Severe vibration can affect the accuracy of weighing and damage electric / electronic components.
AIR	:	The surrounding air should be dust free and not contain any corrosive gasses or materials which could adversely affect the equipment.
PROTECTION	:	IP40 for table top or IP65 for stainless steel.
ELECTROMAGNETIC FIELDS	:	Heavy electrical equipment should not be installed close to the weighing equipment.
INCOMING AND OUTGOING SIGNALS	:	Relays and contactors connected to the equipment must have reliable and effective interference suppression. This also applies to other equipment located within a distance of 3m from out equipment. Cabling must be performed according to normal practice.
NOTES	:	- WELDING on or in the vicinity of the equipment is strictly prohibited. - STATIC loads, caused by thunderstorms, have to be prevented from developing by use of reliable lightning conductors. - ENSURE that the cooling of the equipment is not obstructed.

3 FRONT PANEL DESCRIPTION



3.1 WEIGHT AND OPERATOR DIALOGUE DISPLAY

- When the indicator is in the STAND BY mode it displays the weight on the scale.
- To enter the menu press Menu while the terminal is in the standby mode. To select menu items use the arrow keys and press Menu or AE to activate the blinking item. To exit the menu or return to previous menu press Esc.
- During a weighing operation, process data, status and warnings or errors are dynamically displayed.
- When the scale is not in motion a dot is displayed next to the ⏤ symbol.
- When scale weight is within 1/4 of scale division a dot is displayed next to the **->0<-** symbol.
- When scale is in the net weight mode a dot is displayed next to the **Net** symbol.
- If a 2nd analogue input is installed, characters “s1” , “s2” or “s0” appear at the right position of the LCD display , indicating scale 1 or scale 2 or SUM (scale 1 + scale 2) weights respectively (2 scales connected).

3.2 KEYBOARD DESCRIPTION

POWER ON-OFF

- Turns the unit on and initiates power on self-test.
- Turns the unit off. It must be kept depressed for 3 sec.

MANUAL ZERO

Resets the weight display to zero, provided that the scale is stable and the weight indicator is in gross weight display mode. Zeroing range is limited to ± 2% of scale capacity. The Zero value acquired with this key will be in effect until a new zeroing operation or power down.

MANUAL TARE

Tares the scale. It operates if the indication is positive and stable. The indicated weight is stored in the tare memory and the display is reset to zero. From then on the indication will show the difference between the weight on the scale and the weight stored in the tare memory (net).
When the key is depressed for a second time it clears the Tare Memory, cancels net weight display mode and returns to gross weight indication. The tare memory is lost in power down.

TARE RECALL / MANUAL PRESET TARE
It operates in the weight display mode only. In Net mode it displays the tare value in use for a brief period of time. In Gross mode it is used to enter a tare value directly from the keyboard.
The display shows P.TARE: 00000. Key in the desired tare and press "AE" to proceed or press "Esc" to abort. When "AE" is pressed the tare keyed in will be automatically in effect and the weight display will turn to Net mode. To be accepted the tare value must be within the weighing range.
The pre-set tare will be lost in power down.

PIECE COUNTING
Toggles between weight mode or piece counting mode.

PRINT WEIGHT
Initiates printouts. In stand by mode the indicated weight and date time will be printed.

SELECT SCALE
- When the 2nd analogue input is installed the key switches between scale 1 or scale 2 or SUM (scale 1 + scale 2).
- The indicator may display the SUM of the two scales provided that the decimal point and display step of the two scales are the same.

1st WEIGHING
Initiates the 1st weighing dialogue.

2nd WEIGHING
Initiates the 2nd weighing dialogue.

Menu **ENTRY TO MENU**
When the terminal is in the weight display mode pressing this key will enter the menu mode. While in the menu the key may be used as "AE".

CURSOR UP / PREVIOUS RECORD

CURSOR DOWN / NEXT RECORD
When the terminal is in the STAND BY mode, keys ▲, ▼ are used for LCD backlight adjustment.

CURSOR LEFT / NEXT FIELD DOWN

CURSOR RIGHT / NEXT FIELD UP

Esc **ESCAPE / ABORT**
The key is used to exit from data input-output routines or to abort an operation.

CE **CLEAR ENTRY**
Deletes / clears displayed data during data entry routines.
File data is not affected unless an "AE" is pressed after "CE".

ACCEPT ENTRY
Accepts displayed data and proceeds to next step when pressed during data entry and / or activates the blinking item in menu mode.

0 - 9 NUMERIC KEYS
To enter alphanumeric characters, press the key repeatedly until the desired character is selected. When key is not pressed the displayed character is entered and cursor moves to the next position.

3.3 MENU STRUCTURE

System operator interface is based on a structured menu system, realised on the front panel display.
Access to menu system items may be subjected to password entry (if activated), in order to avoid accidental data changes. To select menu items use the ▲ or ▼ arrow keys and press Menu or AE→| to activate the displayed item. To enter the menu press Menu while in weight display mode. To exit the menu press Esc.
The contents of the menu system is listed below:

WEIGH	- PCS CNT	Piece count.
	- SETP	Setpoint inspect / modify.
	- COPY	Copy last weighing ticket.
	- ALIBI	(VIEW, PRINT, CSUM) Alibi memory.
VFILE	- PRINT	(TARE, FIRST, ALL, SELECT) submenu.
	- EDIT TARE	Edit tare weighing memory.
	- CSUM	File verification.
	- DEL	(TARE, FIRST, ALL, SELECT) submenu delete.
	- SIZE	File information of occupied and available records.
TFILE	- STOT	Subtotal of net weights. Press ◎ to print, CE to reset.
	- TOTAL	Total of net weights. Press ◎ to print, CE to reset.
MISC	- INFO	Indicator model and serial number.
	- 1OIML	Display Audit Trail Counter, W&M Seal status channel 1.
	- 2OIML	Display Audit Trail Counter, W&M Seal status channel 2.
	- BATTERY	Display remaining battery capacity (% of max capacity).
	- HIGH RES.	Increases the weight display resolution 10 times.
SYSTEM	- DATE	Edit date - time and serial print number (User password protected).
	- PIN	(PIN SYS, PIN OPER) Software lock handling (Personal Identification Number).
	- PRP	Weighing process parameters inspect/ modify.
	- 1CAL	PAR, ZERO, SPAN, INIT, WRITE calibration menu for input 1.
	- 2CAL	PAR, ZERO, SPAN, INIT, WRITE calibration menu for input 2.
	- D/A CAL	0-20mA,0-10V analogue output calibration.
	- SET	Operational setup submenus.
	- TEST	Hardware and software service aids.

SYSTEM OPERATIONS MAY BE USER (PIN OPER) OR SERVICE (PIN SYS) PASSWORD PROTECTED. PASSWORDS ARE ACTIVATED FROM SYSTEM/ PIN MENU.
PAR & 1CAL,2CAL MENUS ARE HARDWARE PROTECTED BY CALIBRATION SEAL.
DELETE OPERATIONS ARE USER PASSWORD PROTECTED.

4 WEIGHING OPERATIONS (WEIGHBRIDGE)

This section contains information on operating procedures for the LD 5218 controller, equipped with software for weighbridge application.
The weighing operations are performed via weighing dialogues that involve identification of the weighing, administrative data related to the weighing, and printing of the weighing protocol. The terminal's software is based on a "First" and "Second" weighing principle. Known vehicles with a fixed tare weight for which there is a need for second weighing only maybe programmed in the system via the VFILE menu.
For a weight transfer to occur from the scale to memory or printer the terminal checks that the no-motion condition is satisfied. If it takes too long the terminal will ask whether to retry or abort.
If enabled in set-up the terminal may check that the weight on the scale is greater than the minimum weighing capacity of the indicator.

4.1 FIRST WEIGHING

When a vehicle enters the weighbridge for the first time it undergoes a First Weighing, where by the vehicle id, product or customer related data relevant to the weighing are typed in the terminal.

The first weighing dialogue maybe initiated by pressing key 1 when the terminal is in the standby mode.

1. Wait until no-motion indicator is on, then press 1 key.
2. The displays shows "VEHICLE:" briefly, and the cursor blinks. Enter the vehicle plate number (max 16 alphanumeric characters).
3. The displays shows "CLIENT:" briefly, and the cursor blinks. Enter the relevant data (max 16 alphanumeric characters).
4. The displays shows "PRODUCT:" briefly, and the cursor blinks. Enter the relevant data (max 16 alphanumeric characters).
5. Proceed with entry of reference codes if any.
6. When all entries are completed a first weighing record is constructed including the weight and is stored in the vehicle file. A weighing ticket may optionally be printed, and/or the record may be transmitted to a host computer. An example of the default ticket is shown below:

```
DATE:16-05-00  15:46   N:00125

1st  WEIGHT :<15000>kg

VEHICLE   : AB1234        MF:054
CLIENT    : SMITH
PRODUCT   : SAND BB
```

The weight value appearing in brackets is the actual measured weight.
MF is the key to the memory location where the weight is stored and can be used to retrieve the first weight during a second weighing. Display returns to weight indication.

NOTE : 1. While printing of weighing ticket the message "PRINT" appears on the display. If "E 20:PRN NOT RDY" is displayed check that the printer is ON-LINE. Pressing CE the message "RETRY? AE=Y CE=N" is displayed. Press AE key to retry or CE to abort.
2. If more reference codes have been programmed they will be printed below PRODUCT.

Errors relevant to 1st weighing

E40:OUT OF MEM. W	Weighing memory full	Clear some unused space and repeat operation.
E41:INVALID I.D.	Invalid or no ID entry	Enter 1st weighing data.
E42:V/CLE IN W.F.	A first weighing has already been made for this vehicle	Retry entry or carry out a 2nd weighing or delete the 1st weighing from memory.
E43:SCALE TARED	Scale is tared	Turn to gross and repeat operation.
E44:NEG. WEIGHT	Negative weight	Check scale, repeat operation.
E45:SCALE MOT.	Scale in motion	Wait for the scale to stabilise and repeat operation.

Press CE to acknowledge errors.

4.2 SECOND WEIGHING

When a vehicle returns to the weighbridge it is completely weighed with the second weighing procedure. Data entries are completed and the net weight is calculated. Normally the first weighing is recalled from the vehicle file. In cases where the vehicle is unknown to the terminal a first weighing must be entered from the keyboard to enable net weight calculation. The second weighing dialogue is always terminated by the printout of the weighing protocol, which may also be transmitted to a host computer if enabled in set-up.
The net weight may also be totalised in a total and subtotal register.

The second weighing dialogue maybe initiated by pressing key 2 when the terminal is in the standby mode.

1. Wait until no-motion indication is on, then press 2 key .
2. Display shows "VEHICLE:" briefly, and the cursor blinks. The vehicle's first weighing (MF) or fixed tare (MT) may be retrieved from the vehicle file with either two ways:
   A. Key in the digits of the memory key (MF or MT) followed by 1 or
   B. Key in the vehicle plate number followed by AE. If it is in the weighing memory the first weighing is recalled and the program proceeds to step 4.
3. Display shows P.TARE : 000000. The operator is asked to enter the preset tare of the vehicle to be used as first weighing.
4. The displays shows "CLIENT:" . Accept the retrieved data or enter new.
5. The displays shows "PRODUCT:". Accept the retrieved data or enter new.
6. Proceed with entry of reference codes if any.
7. Weight ticket is printed. An example of the 2nd weighing default ticket is shown below:

```
DATE:16-05-00  16:00   N:00126

1st WEIGHT :15000 kg  16-05-00 15:46

2nd WEIGHT :<32000>kg  16-05-00
NET WEIGHT: 17000  kg

VEHICLE   : AB1234        MF:054
CLIENT    : SMITH
PRODUCT  : SAND BB
```

The weight value appearing in brackets is the actual measured weight. Display returns to weight indication.

NOTE : 1. While printing of weighing ticket the message "PRINT" appears on the display. If "E 20:PRN NOT RDY" is displayed check that the printer is ON-LINE. Pressing CE the message "RETRY? AE=Y CE=N" is displayed. Press AE key to retry or CE to abort.

2. If more reference codes have been programmed they will be printed below PRODUCT.
3. If the totalising memory is enabled the net weight will be added to the totalisers. They may be viewed, printed or reset via TFILE submenu (enabled by setting TOTALISING M : YES).

Errors relevant to 2nd weighing

E41:INVALID I.D.	Invalid or no ID entry	Enter 1st weighing data.
E43:SCALE TARED	Scale is tared	Turn to gross and repeat operation.
E44:NEG. WEIGHT	Negative weight	Check scale, repeat operation.
E45:SCALE MOT.	Scale in motion	Wait for the scale to stabilise and repeat operation.

Press CE to acknowledge errors.

4.3 PIECE COUNTING

Press key or select the WEIGH \ PCS CNT submenu. Display shows the number of pieces on the scale calculated using the average piece weight already stored in memory. The piece count symbol is illuminated.

Press to tare the scale

or press to enter a manual tare

or press to print weight and pieces.

PIECE COUNT USING SAMPLE

Press key 1 while in piece count.
Display shows PIECES XX. Add the sample on the scale, key in the sample size and press "AE".

PIECE COUNT USING AVERAGE PIECE WEIGHT

Press key 2 while in piece count.
Display shows APW XXXXX. Key in the average piece weight and press "AE".

4.4 EDIT SETPOINTS

Selected via the WEIGH \ SETP submenu.

Display shows SETP 1: XXXXXX the existing setpoint value. Key in the desired value and press "AE".

Display shows SETP 2: XXXXXX the existing setpoint value. Key in the desired value and press "AE".

The setpoints are saved in EEPROM. Program returns to main menu.

4.5 COPY WEIGHING TICKET

Selected via the WEIGH \ COPY submenu.
A reprint of the previous ticket is produced if no other action has taken place in the meantime.

4.6 ALIBI MEMORY

The purpose of the Alibi memory is to produce an accurate non modifiable record of each weight transmission to a host computer so that the weight may be printed via the computer.
Alibi operation are selected via the WEIGH \ ALIBI submenu and contains 3 options :

VIEW
The display shows SERIAL NUM: 1 2 3 4 where 1234 is the serial number of the last record.
Key in the 4 digit serial number desired and press AE .The display shows the weight of this record (N:1234 12.3456kg). Only gross weights are stored. Press ▲ ▼ to view previous / next memory locations.
Press ◎ to print the serial number displayed plus the next nine locations.

PRINT
Automatically prints a list of the contents of the Alibi memory. The printer must be capable of printing on 80 columns paper compressed mode.
Empty locations are printed - - - - - - .
Corrupted locations are printed * * * * * * .
The program exits when the printout is completed or Esc pressed.

CSUM
A checksum is performed on each Alibi memory record. If an error is found “E57:ALIBI CSUM” is displayed.
Press Esc to exit. If all is OK, PASS is displayed briefly.

5 VEHICLE FILE OPERATIONS (VFILE)

The vehicle file stores the first weighings as well as fixed tare weighings of known vehicles.
It has a capacity of 250 records shared between first and fixed tare weighings in any analogy.
Each record consists of the following fields:

MEM	Status and number of memory location. (MF: first weighing, MT: fixed tare, M@ : free location.
CODE 0	Max 16 characters, the vehicle description (e.g. vehicle plate).
Weight	First weighing or Preset tare of the vehicle.
CODE 1	Max 16 characters, description 1 (default: PRODUCT).
CODE 2	Max 16 characters, description 2 (default: CLIENT).
Date / time	Date / time of the weighing .
N.W.	Serial number of the weighing.

Vehicle file operations are performed via the VFILE menu, which contains 5 options :
PRINT EDIT TARE CSUM DEL SIZE

PRINT SUBMENU
Allows the printing of the vehicle file contents.
Select TARE to print all fixed tare weighings.
Select FIRST to print all first weighings.
Select ALL to print all records of the file.
Select SELECT and key in the memory location (MF or MT) and "AE" to print the displayed record.
The program exits when the printout is completed or Esc pressed.

EDIT TARE OPERATION
Allows preprogramming of known vehicles with fixed tare weight.
To edit a new record, key in the vehicle description (e.g. vehicle plate).
Then the fixed tare of the vehicle and data are linked to the weighing. By default the displayed weight will be transferred to the preset tare field. Proceed with relative descriptions (e.g. client, product).
If the code is already in the memory the display shows "E42: V/CLE IN W.F."
It is not possible to correct a record. It should be first deleted via the VFILE \ DELETE \ SELECT submenu using the memory location (MT) of the record.

CHECKSUM VEHICLE FILE
It performs a checksum on the vehicle file memory to verify that the memory is intact.
Display shows ' WAIT….'.
If the memory is correct CHECKSUM OK is displayed briefly.
If the memory is not correct E77 : WM CHECKSUM is displayed.
Press Esc to acknowledge the error. The display will prompt you to correct the file or not. Press AE to correct or CE to leave it as it is.
The file should be printed first to see whether the stored data is correct. If the data seems incorrect the whole file should be deleted.

DELETE SUBMENU
The utility allows the user to delete vehicle file entries.
The display shows PIN OPER : ..... Enter the user password to proceed or press "Esc" to exit.
Select TARE to delete all fixed tare weighings.
Select FIRST to delete all first weighings.
Select ALL to delete the entire file.
Select SELECT to delete specific vehicle's weighing.

Before deleting, the terminal will remind the operator of the delete memory operation.
If an operator Personal Identification Number has not been activated the PIN OPER: .. step is bypassed.

SIZE
It displays relevant file information.
USED: xxx refers to the number of records of this file.
FREE: xxx refers to the total remaining number of records.
Press any key to return to the menu.

6 TOTALISERS (TFILE)

Contains the sum of the Net weights obtained in the 2nd weighing dialogue.
It is selected via the TFILE submenu and contains 2 totalisers.

- STOT Subtotal of net weights. Press ◎ to print, CE to reset.
- TOTAL Total of net weights. Press ◎ to print, CE to reset.

Press Esc to exit.

7 MISCELLANEOUS (MISC)

Contains information for Weights & Measures Authorities or Service personnel.

- INFO : Displays the model and serial number of the indicator.
- 1OIML : Verification of calibration data for scale 1. The display shows 'SEALED' briefly if "CAL LOCK" jumper is inserted. Then the display shows A.T. CNT xxxxxx. A.T.CNT (Audit Trail Counter) is provided for Weights & Measures Authorities to check if any calibration attempt has been made since the last inspection. The A.T.CNT (6 digits) is incremented when a weight parameter is changed, or a scale calibration is attempted, regardless if the changes are saved in EEPROM or not.
  Press AE . Display shows 1CAL/SETUP: xx.yy where xx the checksum of calibration parameters and yy the checksum of SETUP parameters.
- 2OIML : Verification of calibration data for scale 2 (if installed). Identical with 1OIML submenu.
- BATTERY : The battery charge will be displayed as a percentage of the remaining capacity (battery models only).
- HIGH RES. : The weight display accuracy will be increased 10 times. While in high resolution mode the display will flash and printing is inhibited.
  The display accuracy will return to normal resolution when the Esc is pressed.

8 SYSTEM OPERATIONS

Calibration of the scale, hardware and software configuration and settings of the A/D converters is done through the SYSTEM submenu. Access to system menu items may be subject to password entry.

8.1 DATE-TIME-SERIAL PRINT NUMBER EDIT (DATE)

This is performed in the SYSTEM \ DATE menu.
The display shows PASSWORD:..... in the SYSTEM menu if password is activated.
Key in the user or the service password to proceed. Select DATE submenu.
Key in the new date, time and print serial number.
If a field should not be changed then just press "AE" to go to the next field.
The default date format is Day - Month - Year. The time format is Hours: Minutes: Seconds.

8.2 PIN - PASSWORD PROTECTION SYSTEM (PIN)

To safeguard against accidental system parameter alteration and/or operational data erasure, a two level password system has been implemented.
A system password (PIN SYS) that allows entry to all protected operations (SYSTEM submenu) and a user password that allows delete and date edit operations.
LD 5218 units are shipped with both password not active i.e. 000000. Once initialised, the password will be required before entry to protected operations is permitted.
To activate / change the passwords use the menu SYSTEM \ PIN. Select PIN SYS for the service password, or PIN OPER for the user password. The PIN SYS is of higher order and must be activated before the OPERATOR PIN.

PASSWORD CHANGE / INITIALISATION
The display shows NEW CODE : . Key in the new password followed by “AE”.
The display shows CONFIRM : . Key in the same password followed by “AE”.
The new pin is stored and the display shows PASS briefly.
If the two entries are not the same, FAIL is displayed briefly and the program returns with the old pin remaining in memory.

The password is saved and activated.

PASSWORD DEACTIVATION
Entering zero’s will deactivate the password.
The display shows NEW CODE : _ . Press 000000 followed by “AE”.
The display shows CONFIRM : _ . Press 000000 followed by “AE”.

WARNING:
Make sure you do not loose the code entered. If the code is lost the unit must be returned to the factory to initialise the passwords and a fee will be charged.

8.3 PROCESS PARAMETERS (PRP)

These are operational and process parameters that allow configuration of the terminal in the working process environment. Press ▲ ▼ to scroll trough the parameters.

S.EMPTY : 5.0kg Enter the weight that may remain on the scale and still be considered empty.

8.4 TEST UTILITIES (TEST)

Contains software utilities to assist service personnel in pinpointing hardware / software failures.
The tests may be activated from the SYSTEM \ TEST submenu. A short description of the available functions follows below. It is assumed however that service personnel are familiar with microprocessor controlled weighing electronics.
If password is activated, PIN SYS is required to enter the test menu.
Use the ▲ or ▼ arrow keys to select the test item and press AE.

A / D : Displays the analog to digital converter internal counts. Press Esc to exit.

CVM : The actual mV/V output of the scale sensors is displayed. To act as a mV/V meter the unit loads default calibration data. The decimal point is not displayed.
Axxxxx corresponds to scale 1, Bxxxxx to scale 2 . Press Esc to end. The unit restarts.

D/A : Key in a value from 0-65535 corresponding to 0-24mA or 0-10V. Press Esc to end.

I / O : The display shows (INP:0 OUT:00) the state of the system inputs or outputs represented by 0 or 1. Press 1 or 2 to toggle outputs 1 or 2 respectively. Press Esc to exit.

KBD : Display blanks. When a key is pressed the corresponding two digit – code appears on 2 rightmost digits of display. Press Esc to exit.

LCD : Displays the character set in sequence.

MEM : Memory test submenu.
A validity check is performed on system ROM and RAM.
Err 01 will be displayed if ROM data is corrupted.
Err 02 will be displayed if RAM data is corrupted.
If all memory is OK the display returns to MEM mode.

PORT : Any character received by COM 1 will be echoed and displayed in ASCII HEX at Rx1--.
Any character received by COM 2 will be echoed and displayed in ASCII HEX at Rx2--.
Note: Set ERROR CTRL=NO at SYSTEM\SET\1COM submenu to perform this test with a PC.

SUBMENUS 1CAL, 2CAL, D/A CAL, SET ARE DESCRIBED IN “LD5218 TECHNICAL MANUAL”.

9 COMMUNICATION PORTS

The instrument is equipped with two communication channels, for connection to serial peripheral devices such as printers, remote displays, host computers.

9.1 SERIAL COMMUNICATION PORT 1. (RS232C)

TYPE	Asynchronous serial ASCII, full duplex.
PROTOCOL	2400 baud, 1 start, 7 data/even parity or 8 data/no parity (set up selectable), 1 stop bit.
HANDSHAKE	DTR BUSY per character for fanfold printers or REQUEST PAPER END STATUS for EPSON TM-295 slip printer.
CONNECTION	DB9 male on rear panel. (J1). Tx = Pin 3 Rx/DTR = Pin 2 GND = Pin 5 SHIELD = Metal case of D-Type connector Cable: 3 conductor shielded max distance 15m.

OPERATION — Software operation and printer interface of serial port 1 is selectable in SYSTEM \ SET \ 1COM, and maybe one of the following modes:

- TICK 3. Printer mode.
  Prints the 1st weighing, 2nd weighing and simple weighing protocols.
  The printer driver and error control maybe selected in
  SYSTEM \ SET \ 1COM \ PRN TYPE and maybe one of EP-FX
  (Epson Fx mode) or TM-295 (Epson TM295 slip printer).
- W.OUT. Continuous weight output mode. The weight is being transmitted continuously.
  The data format is defined in § 9.2.1.
- ALIBI. Demand mode .
  When a demand character is received the unit saves the weight in its Alibi flash and then transmits the Alibi number and the weight.
  i.e. 1234 _ 012340kg G CR LF
  The demand character may be programmed in
  SYSTEM \ SET \ 1COM \ ADDRESS:ALIBI.A where A (41h) will generate and transmit a new Alibi number and a(61h) will repeat the last Alibi number (in case the message was not received properly).
- NONE. The port is inactive.

9.2 SERIAL COMMUNICATIONS PORT 2 (RS485)

TYPE	Asynchronous serial ASCII, half duplex.
PROTOCOL	2400 to 57600 baud, 1 start, 7 or 8 data, 1 Even parity, 1 stop bit.
CONNECTION	DB9 female on rear panel. (J3). A = Pin 6 B = Pin 7 SHIELD = Metal case of D-Type connector A termination resistor 120R may be connected by shorting pins 8 and 9. Cable: 2 conductor twisted pair and shielded max distance 1000m.
OPERATION	Software operation of the port is selectable in SYSTEM \ SET \ 2COM menu.
- W.OUT.	(continuous weight output).
- M/S A.	MASTER / SLAVE protocol (A = network address).
- EDP.	Protocol output.
- R. PRN.	Remote printer.

9.2.1 WEIGHT OUTPUT

A data block is output continuously from Tx terminals containing weight and status information.
The output may be programmed in SYSTEM \ SET\ 1COM or 2COM to be directed to any of serial ports 1 or 2 .
It is possible to output simultaneously to both ports.

DATA BLOCK COMPOSITION
STATUS, POLARITY, WEIGHT, SYNC (P+123.45CR)

BYTE	NAME	DESCRIPTION
1	WEIGHT STATUS	Bit0 0=NORMAL 1=NO WEIGHT DISPLAY Bit1 0=GROSS 1=NET Bit2 0= 1=AUTO ZERO Bit3 0=WITHIN RANGE 1=OUT OF RANGE Bit4 0=NO STANDSTILL 1=STANDSTILL Bit5 0=NORMAL 1=UNDER MIN. WEIGHING RANGE Bit6 ALWAYS 1 TO OBTAIN PRINTABLE CHARACTERS Bit7 ZERO OR PARITY
2	POLARITY	"+" OR "-"
3-8	WEIGHT DIGITS	6 DIGITS DEPENDING ON LD5218 SET UP INCLUDING DECIMAL POINT IF ANY
9	SYNC	CR (0d hex) FOR SYNCHRONISATION

9.2.2 REMOTE PRINTER MODE (R. PRN)

Transmits the data printed on the local printer to a remote printer. No handshake is required.

9.2.3 EDP PROTOCOL OUTPUT (EDP)

This mode is used to transmit the data printed to a host computer. Transmission will begin after completion of printing. ACK / NAK handshake or no handshake may be used.
The host must reply with ACK (06 h) if it received the data correctly or NAK (15 h) to enable retransmissions.

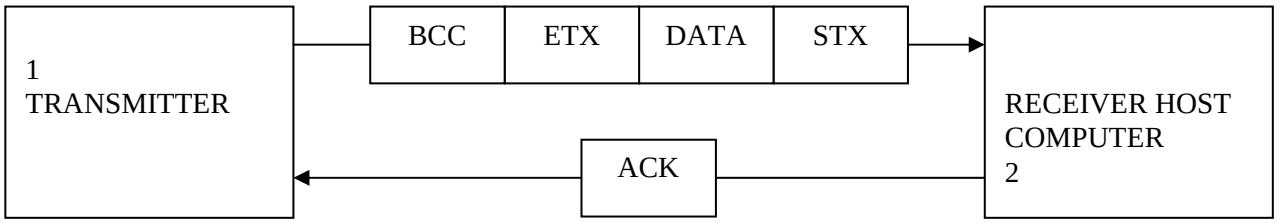
DATA BLOCK COMPOSITION	:	STX	= (02 h) = start of text character.
		DATA	= Printable ASCII data identical to the data printed.
		ETX	= (03 h) = End of text character.
		BCC	= Block check character.(XORSUM of all data characters STX, ETX inclusive).
HANDSHAKE	:		ENQ (05 h) from host within 5 sec of protocol initialisation. ACK (06 h) from host within 5 sec after the end of transmission
	or		NAK (15 h) from host within 5 sec after the end of transmission to enable retransmissions of the block. The number of repeats is unlimited.
ERRORS	:	Err 30	: Host not ready
		Err 33	: Host not Acknowledge

Refer to Error chapter for details on error response.

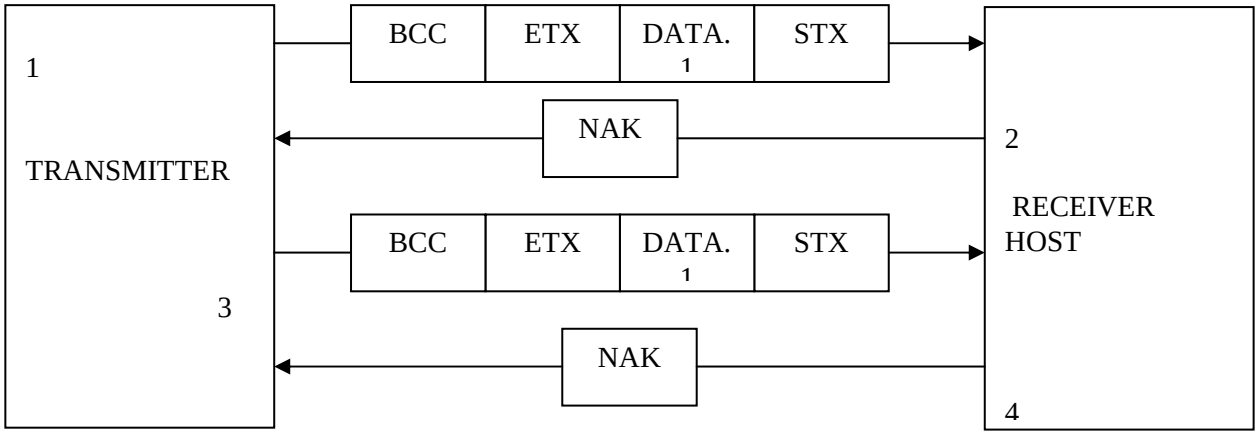
SETUP REQUIREMENTS : 2COM = EDP

ERROR CTRL	No / Yes
PROTO A/N	No / Yes
DIS. PROTO	No / Yes
HOST ENQ.	No / Yes

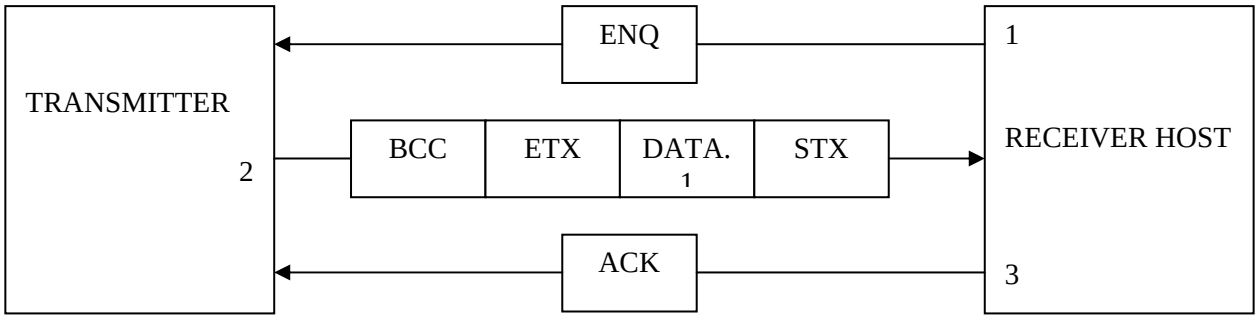
ERROR CTRL	:	The LD5218 checks the on line status of the interface and reports an error if failure is detected.
PROTO A/N	:	The LD5218 will check for reception of ACK / NAK character after transmission.
DIS. PROTO	:	The operator will be prompted to disable further transmission(s) if an error occurs, if DIS. PROTO = YES. Transmission will be enabled again after a power on reset. If DIS. PROTO = NO only the current transmission will be aborted.
HOST ENQ.	:	The LD5218 waits for ENQ (05h) character before it begins transmission.



EXAMPLE : CORRECT TRANSMISSION TO HOST



EXAMPLE : REPEATED TRANSMISSION TO HOST



EXAMPLE : CORRECT TRANSMISSION TO HOST WITH ENQUIRY CONTROL

9.2.4 MASTER / SLAVE NETWORK

A number of LD 5218 units maybe connected as slaves in a network. The master controlling the network maybe a Personal computer with RS485 adapter.
In this manner all units may have access to weighing data in the Master's memory or storage device.
When connected in network the following modes of operation maybe selected according to setup, SYSTEM \ SET \ 2COM.

SET UP PARAMETER	SLAVE	SLAVE WITH LOCAL WEIGHING MEMORY	SLAVE WITH REMOTE WEIGHING MEMORY	SLAVE WITH LOCAL & REMOTE WEIGHING MEMORY
TYPE / SLAVE ADDRESS	(65-89) A - Y	(65-89) A - Y	(65-89) A - Y	(65-89) A - Y
ERROR CTRL	YES/NO	YES/NO	YES/NO	YES/NO
RETRY	YES/NO	YES/NO	YES	YES/NO
DIS. PROTO	YES/NO	YES/NO	YES	YES/NO
X/MIT RESULT	YES/NO	YES/NO	YES/NO	YES/NO

REFER TO "LEON ENGINEERING SERIAL INTERFACE PROTOCOL" (LESIP) FOR DETAILS OF HARDWARE CONNECTION, FILE TYPES AND NETWORK OPERATION.

SLAVE Returns status and weighing results.

Address of slave (A - Y) for MASTER / SLAVE protocol.
Error control on communication sessions.
Operator response to communication errors (Retry or Abort).
ACK / NAK handshake is mandatory during file transfer except for keyboard commands.

Setup parameters not mentioned above should be set to NO.

10 ERRORS

If an error occurs during operation, it will be displayed in the form Err xx , where xx is the Error code followed by a brief mnemonic.

Press Esc or CE momentarily to acknowledge the error and proceed as indicated in the error operator response.

Errors may occur during set up, programming, power up and during operation. All errors are being displayed until acknowledged. In case of critical errors operation is halted and all outputs disabled.

The errors are subdivided as follows :

10.1 ERRORS DUE TO HARDWARE

ERROR DISPLAY	POSSIBLE CAUSE	ACTION TO BE TAKEN
E01: ROM	SYSTEM ROM : Faulty ROM chip	Contact service.
E02: RAM	DATA RAM : Faulty FLASH RAM	Contact service.
E04: EEPROM	CALIBRATION DATA : Faulty EEPROM	Contact service.
E05: SC-A/D s1 s2	SCALE EXTREMELY OUT OF RANGE	Check scale, cable, connectors, LC excitation, A/D converter. Contact service.
E06: LOW VOLT.	LOW INPUT VOLTAGE	Check power supplied to the instrument

10.2 OPERATIONAL DATA ERRORS

ERROR DISPLAY	POSSIBLE CAUSE	ACTION TO BE TAKEN
E15: PWRUP ZERO	System has been initialised due to power failure or soft reset.	Zero scale.
E16: W DATE TIME	Not initialised or backup battery failure.	Enter new date – time, replace battery.

10.3 PRINTER - PROTOCOL ERRORS

ERROR DISPLAY	POSSIBLE CAUSE	ACTION TO BE TAKEN
E20 :PRN NOT RDY	PRINTER IS NOT ON-LINE. Either not connected or out of paper or failed.	Check printer, cables.
E26:NO PAPER	No paper for EPSON TM295 printer.	Supply with paper.
E30:HOST NOT RDY	HOST NOT ON-LINE. Computer not connected or communication link failed.	Check computer, cables. Retry.
E33:HOST NOT ACK	Host not Acknowledge. No correct response has been received from host computer.	The same action as with E30.

10.4 WEIGHING-PIECE COUNT-ALIBI MEMORY ERRORS

ERROR DISPLAY	POSSIBLE CAUSE	ACTION TO BE TAKEN
E40:OUT OF MEM. W	Weighing memory full.	Delete unused records or CSUM vehicle file.
E41:INVALID I.D.	No entry of data during 1st weighing.	Enter 1st weighing data.
E42:V/CLE IN W.F.	A first weighing has already been made for this vehicle.	Retry entry or carry out a 2nd weighing or delete the 1st weighing from memory.
E43:SCALE TARED	1^{st} or 2^{nd} weighing can not be performed if the scale has been tarred.	GROSS must be activated.
E44:NEG. WEIGHT	Negative weights can not be printed.	Retry or abort.
E45:SCALE MOT.	Non stable weights can not be processed.	Wait until no motion indication is on, retry.
E47:OUT OF LIMIT	Weight is out of limits.	Retry.
E50:SAMPLE CNT	Small sample count.	Retry.
E51:SAMPLE WEIGH	Small sample weight.	Retry.
E55:ALIBI FULL	Alibi memory full.	Acknowledge the error. The unique identification number will reset to 0000.
E56:NO ALIBI	No Alibi memory in NET mode (only gross).	Printout aborted.
E57:ALIBI CSUM	Alibi memory corrupted.	The Alibi memory can not be cleared but next records will be corrected.
E67:TM CHECKSUM	Corrupted totaliser.	Clear totalising memory. (TFIlE submenu)
E69:TM OVERFLOW	TOTALISER OVERFLOW. Because totalisers have not been cleared for long time.	Print / clear totaliser. Overflow is not critical, but remember that 1 total capacity must be added to the indication, each time an overflow occurs.
E77:WM CHECKSUM	Corrupted weighing memory.	Use DELETE menu in the VFILE to clear weighing memory.

To exit from error display press Esc ***or*** CE***.***

11 MAINTENANCE

The unit does not require any routine maintenance. It may be necessary to perform periodic checks of the calibration of the scale due to mechanical reasons. The frequency of the calibration checks depends on the application condition and on the required measuring accuracy. It may happen that, in exceptional conditions, the unit locks on a wrong memory location and it is not possible to restart because the keyboard is not operative. To restart is necessary to switch the power OFF then ON again.

11.1 SERVICE

- There are no serviceable parts. The unit must be serviced by trained personnel only. The user may check loadcell connection and power supply.

- LOAD CELLS
  Load cells are reliable and very rarely present errors. Check input and output resistance, and resistance between any terminal and shield. Check Load cell connection and cable.

- POWER SUPPLY
  Check 9-15VDC power supply & resettable fuse F4 on PCB 801.

- SETPOINT OUTPUTS
  Check 24VDC power supply & resettable fuse F3 on PCB 801.

LEON ENGINEERING maintains a fully trained staff of field service engineers who provide:
- Technical assistance by telephone.
- Application assistance on-site or by telephone.
- Trouble shooting on-site.
- Warranty (replacement) or spare parts assistance.
- Training on-site or at out service centre.
- Equipment updates to our latest configuration.

Our engineers will check repair, mechanical, electrical, electronic, wiring and calibration errors.

12 APPENDIX A

INSTALLATION SET UP & CALIBRATION RECORD

Service code (PIN SYS) :…….
User code (PIN OPER):…….

	2ND SCALE	DISP. DIGITS	DEC. POINT	SCALE DIV	WEIGH. RANGE	DIG. FILTER	CONV. RATE	MOTION SAMPLES	AUTO Z TRACK	INIT ZERO	DUAL FILTER	A/D AUTO CONV	BATTERY	LEAD Z BLANK
1CAL														
2CAL	S1+S2 ENABLE													
	A/D GAIN	AC EXC	ZERO RANGE	DUAL RANGE	PR BELOW MIN	CAL MODE								
1CAL														
2CAL														

CALIBRATION			
DEAD LOAD S1 C_P =	SPAN S1 C_M =	DEAD LOAD S2 C_P =	SPAN S2 C_M =

	TOTALISING M	WEIGHING MEM	REFR CODE	CODE MEM	WAIT UNLOAD	1ST W PRINT	USER FORMS	KEY IN TIME	BRIGHTNESS	DATE FORMA	AUTO PWR OFF
SET\ OPER											

	PARITY/ DATA	OPERATION	PRN TYPE	ERROR CONTROL	
SET\ 1COM					

	BAUD RATE	PARITY/ DATA	OPERATION	**M/S A-Y** ERROR CTRL	RETRY	DIS. PROTO	X-MIT RESULT	KBD COM/DS	**EDP** ERROR CTRL	PROTO A/N	DIS. PROTO	HOST ENQ.
SET\ 2COM												

REFERENCE CODES (REFR) CODE 0:……. CODE 1:…….
CODE 2:……. CODE 3:……. CODE 4:…….

TILT DELAY (TILT): ……

SETPOINTS (SETP): SETP GROSS:…… SETP NC:……

	CALIBRATION	SCALE ERROR	OUTPUT	MODE	CURRENT	RESOLUT.	OPERATION	
D/A CAL								

GUARANTEE CERTIFICATE

We guarantee the proper operation and either cover free restoration of any probable malfunction of the electronic indicator at our premises or replace of the electronic indicator (according to our company's judgement) for the period of __ months from the delivery day of the scale, provided that:

1. The damage did not occur from the buyer's fault or from not following the instructions.

2. No intervention of non-authorised by LEON ENGINEERING S.A. personnel has taken place for checking or repairing the equipment.

3. The WARRANTY RETURN CARD has been returned to LEON ENGINEERING.

In case of fault the unit should be returned to LEON ENGINEERING at the buyer's expenses.

E Q U I P M E N T M O D E L : LD 5218

S E R I A L N U M B E R : .....

Warranty Return Card

Please complete and return this card to LEON ENGINEERING S.A. in order to have your new Indicator registered for warranty. Please keep Guarantee Certificate for your records.

Model _____ Serial Number _____ Date Received _____ P.O. Number
Dealer from which this scale was purchased ?

Individual responsible for this purchase
Your Company's Name
Address
City _____ State _____ Postal Code _____ Country
Telephone _____ Fax
Where did you hear of LEON ENGINEERING's products?

__ Local Dealer __ Magazine Add __ Direct Mail __ Exhibition __ Other

How many additional scales of this type will you require ?

Will you be purchasing any of the below in	One month	Three months	Six months	Over six months
Weighbridges	___	___	___	___
Platform Scales	___	___	___	
Batching systems	___	___	___	
Weighing machines	___	___	___	
Computer based weighing systems	___	___	___	