DILLON

FI-521
Indicator Series

User Instructions

Table of Contents

1 General Information and Warnings

1.1 About this Manual

This manual is divided into chapters by the chapter number and the large text at the top of a page. Subsections are labeled as shown by the 1 and 1.1 headings shown above. The names of the chapter and the next subsection level appear at the top of alternating pages of the manual to remind you of where you are in the manual. The manual name and page numbers appear at the bottom of the pages.

1.1.1 Text Conventions

The keys used to interface with the FI-521 are located on the front panel of the indicator. The keystrokes are shown in **BOLD** in cased between brackets. (e.g. **[ZERO]**)

Displayed messages appear in *bold italic* type and reflect the case of the displayed message.

1.1.2 Special Messages

Examples of special messages you will see in this manual are defined below. The signal words have specific meanings to alert you to additional information or the relative level of hazard.

CAUTION!
This is a Caution symbol.
Cautions give information about procedures that, if not observed, could result in damage to equipment or corruption to and loss of data.

ELECTRICAL WARNING!
THIS IS AN ELECTRICAL WARNING SYMBOL.
ELECTRICAL WARNINGS MEAN THAT FAILURE TO FOLLOW SPECIFIC PRACTICES OR PROCEDURES MAY RESULT IN ELECTROCUTION, ARC BURNS, EXPLOSIONS OR OTHER HAZARDS THAT MAY CAUSE INJURY OR DEATH.

NOTE: This is a Note symbol. Notes give additional and important information, hints and tips that help you to use your product.

1.2   Warnings

Avoid lengthy exposure to extreme heat or cold. Your scale works best when operated at normal room temperature. Always allow the scale to acclimate to a normal room temperature before use.

CAUTION!
THE EQUIPMENT CONTAINS NO USER SERVICEABLE COMPONENTS.

Installation and maintenance of the equipment must only be carried out by trained and authorised personnel.

1.2.1   Electrical Installation

The mains lead must be connected to a supply outlet with a protective earth contact. The electrical supply at the socket outlet must provide over current protection of an appropriate rating.

For your protection all mains (110V or 230V) equipment used out of doors or in wet or damp conditions should be supplied from a correctly fused source and protected by an approved ground fault protection device (RCD, GFCI etc.)

IF IN DOUBT SEEK ADVICE FROM A QUALIFIED ELECTRICIAN.

1.2.2   Routine Maintenance

IMPORTANT: This equipment must be routinely checked for proper operation and calibration.
Application and usage will determine the frequency of calibration required for safe operation.

ELECTRICAL WARNING!
TO AVOID THE POSSIBILITY OF ELECTRIC SHOCK OR DAMAGE TO THE MACHINE, ALWAYS SWITCH OFF THE MACHINE AND ISOLATE FROM THE POWER SUPPLY BEFORE CARRYING OUT ANY ROUTINE MAINTENANCE.

TO AVOID THE RISK OF THE MACHINE FALLING, WHERE APPLICABLE, ENSURE THAT IT IS PLACED SECURELY ON A FLAT AND LEVEL SURFACE.

1.3   Safe Use

Do not use sharp objects such as screwdrivers or long fingernails to operate the keys.

1.3.1   Cleaning the Indicator

Harsh abrasives, solvents, scouring cleaners and alkaline cleaning solutions, such as washing soda, should not be used especially on the display windows. **Under no circumstances should you attempt to wipe the inside of the indicator.**

The outside of standard products may be wiped down with a clean cloth, moistened with water containing a small amount of washing up liquid.

The outside of products waterproofed to IP65, IP66 and IP67 may be washed down with water containing a small amount of proprietary detergent.

1.3.2   Training

Do not attempt to carry out any procedure on a machine unless you have received the appropriate training or read the Instruction Manual.

1.3.3   EMC Compliance

Do not attempt to carry out any procedure on a machine unless you have received the appropriate training or read the Instruction Manual.

WARNING!
This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

1.4 Declaration of Compliance

CE

EN — Declaration of Conformity

Model / Type: FI-521

Name and address of the manufacturer:
Avery Weigh-Tronix[1]
Foundry Lane
Smethwick
West Midlands
B66 2LP
ENGLAND

This declaration of conformity is issued under the sole responsibility of the manufacturer

Object of the declaration:
Dillon[2]
FI-521 LED
Dillon[3]
FI-521 LCD

The object of the declaration described above is in conformity with the relevant Union harmonisation legislation:

Applicable Directives	Harmonised standards or other technical specifications
2014/30/EU Electromagnetic Compatibility	EN 55024:2010 +A1:2015 EN 55032:2015 EN 61000-3-2:2014 EN 61000-3-3:2013
2014/35/EU Electrical equipment designed for use within certain voltage limits	EN 60950-1:2006 +A11:2009 +A1:2010 +A12:2011
2011/65/EU Restriction of the use of certain hazardous substances in electrical and electronic equipment	EN 50581:2012

Additional information:
Note[1]:
ITW Ltd trading as Avery Weigh-Tronix
Reg. Office: Nexus House, Station Road, Egham, Surrey, TW20 9LB, England
Note[2]:
Dillon is part of Avery Weigh-Tronix

Signed for and on behalf of:
Avery Weigh-Tronix
at
1000 Armstrong Drive, Fairmont, MN, 56031-1439,
USA
on
2017-07-20

K.Detert
Innovations/Marketing Director

DE — EU-Konformitätserklärung

Modell / Typen: FI-521

Name und Anschrift des Herstellers:
Avery Weigh-Tronix[1]
Foundry Lane
Smethwick
West Midlands
B66 2LP
ENGLAND

Die alleinige Verantwortung für die Ausstellung dieser Konformitätserklärung trägt der Hersteller

Gegenstand der Erklärung:
Dillon[2]
FI-521 LED
Dillon[3]
FI-521 LCD

Der oben beschriebene Gegenstand der Erklärung erfüllt die einschlägigen Harmonisierungsrechtsvorschriften der Union:

Angewandte Richtlinien	Harmonisierte Normen oder sonstigen technischen Spezifikationen
2014/30/EU Elektromagnetische Verträglichkeit	EN 55024:2010 +A1:2015 EN 55032:2015 EN 61000-3-2:2014 EN 61000-3-3:2013
2014/35/EU Elektrischer Betriebsmittel zur Verwendung innerhalb bestimmter Spanungsgrenzen	EN 60950-1:2006 +A11:2009 +A1:2010 +A12:2011
2011/65/EU Beschränkung der Verwendung bestimmter gefährlicher Stoffe in Elektro- und Elektronikgeräten	EN 50581:2012

Zusatzangaben:
Anmerkung[1]:
ITW Ltd Handel als Avery Weigh-Tronix
Sitz: Nexus House, Station Road, Egham, Surrey, TW20 9LB, England
Anmerkung[2]:
Dillon ist ein Teil von Avery Weigh-Tronix

Unterzeichnet für und im Namen von:
Avery Weigh-Tronix
bei
1000 Armstrong Drive, Fairmont, MN, 56031-1439,
USA
am
2017-07-20

K.Detert
Innovationen / Marketingdirektor

FR — Déclaration UE de Conformité

Modèle / Type: FI-521

Nom et adresse du fabricant:
Avery Weigh-Tronix[1]
Foundry Lane
Smethwick
West Midlands
B66 2LP
ANGLETERRE

La présente déclaration de conformité est établie sous la seule responsabilité du fabricant.

Objet de la déclaration:
Dillon[2]
FI-521 LED
Dillon[3]
FI-521 LCD

L'objet de la déclaration décrit ci-dessus est conforme à la législation d'harmonisation de l'Union applicable:

Les directives en vigueur	Les normes harmonisées ou d'autres spécifications techniques
2014/30/UE Compatibilité Electromagnétique	EN 55024:2010 +A1:2015 EN 55032:2015 EN 61000-3-2:2014 EN 61000-3-3:2013
2014/35/UE Matériel électrique destiné à être employé dans certaines limites de tension	EN 60950-1:2006 +A11:2009 +A1:2010 +A12:2011
2011/65/UE La limitation de l'utilisation de certaines substances dangereuses dans les équipements électriques et électroniques	EN 50581:2012

Informations complémentaires:
Nota[1]:
ITW Ltd exerçant également sous le nom de Avery Weigh-Tronix
Siège social: Nexus House, Station Road, Egham, Surrey, TW20 9LB, Angleterre
Nota[2]:
Dillon fait partie d'Avery Weigh-Tronix

Signé par et au nom de:
Avery Weigh-Tronix
à
1000 Armstrong Drive, Fairmont, MN, 56031-1439,
USA
le
2017-07-20

K.Detert
Innovations / Directeur Marketing

NL — EU-Conformiteitsverklaring

Model / Type: FI-521

Naam en adres van de fabricant:
Avery Weigh-Tronix[1]
Foundry Lane
Smethwick
West Midlands
B66 2LP
ENGELAND

Deze conformiteitsverklaring wordt verstrekt onder volledige verantwoordelijkheid van de fabrikant.

Voorwerp van de verklaring:
Dillon[2]
FI-521 LED
Dillon[3]
FI-521 LCD

Het hierboven beschreven voorwerp is in overeenstemming met de desbetreffende harmonisatiewetgeving van de Unie:

Toepasselijke richtlijnen	Geharmoniseerde standaarden of andere technische specificaties
2014/30/EU Elektromagnetische compatibiliteit	EN 55024:2010 +A1:2015 EN 55032:2015 EN 61000-3-2:2014 EN 61000-3-3:2013
2014/35/EU Elektrisch materiaal bestemd voor gebruik binnen bepaalde spanningsgrenzen	EN 60950-1:2006 +A11:2009 +A1:2010 +A12:2011
2011/65/EU Beperking van het gebruik van bepaalde gevaarlijke stoffen in elektrische en elektronische apparatuur	EN 50581:2012

Aanvullende informatie:
Noot[1]:
ITW Ltd trading als Avery Weigh-Tronix
Zetel: Nexus House, Station Road, Egham, Surrey, TW20 9LB, England
Noot[2]:
Dillon is een onderdeel van Avery Weigh-Tronix

Ondertekend voor en namens:
Avery Weigh-Tronix
bij
1000 Armstrong Drive, Fairmont, MN, 56031-1439,
VS
op
2017-07-20

K.Detert
Innovaties / Marketing Director

IT — Dichiarazione di Conformità UE

Modello / Tipo: FI-521

Nome e indirizzo del fabbricante:
Avery Weigh-Tronix[1]
Foundry Lane
Smethwick
West Midlands
B66 2LP
INGHILTERRA

La presente dichiarazione di conformità è rilasciata sotto la responsabilità esclusiva del fabbricante.

Oggetto della dichiarazione:
Dillon[2]
FI-521 LED
Dillon[3]
FI-521 LCD

L'oggetto della dichiarazione di cui sopra è conforme alla pertinente normativa di armonizzazione dell'Unione:

Direttive applicabili	Armonizzato standard o altre specificazioni tecniche
2014/30/UE Compatibilità elettromagnetica	EN 55024:2010 +A1:2015 EN 55032:2015 EN 61000-3-2:2014 EN 61000-3-3:2013
2014/35/UE Materiale elettrico destinato a essere adoperato entro taluni limiti di tensione	EN 60950-1:2006 +A11:2009 +A1:2010 +A12:2011
2011/65/UE Restrizione dell'uso di determinate sostanze pericolose nelle apparecchiature elettriche ed elettroniche	EN 50581:2012

Informazioni supplementari:
Nota[1]:
ITW Ltd trading come Avery Weigh-Tronix
Sede dell'ufficio: Nexus House, Station Road, Egham, Surrey, TW20 9LB, England
Nota[2]:
Dillon è parte di Avery Weigh-Tronix

Firmato a nome e per conto di:
Avery Weigh-Tronix
a
1000 Armstrong Drive, Fairmont, MN, 56031-1439,
U.S.A.
su
2017-07-20

K.Detert
Innovations / Direttore Marketing

ES — Declaración UE de Conformidad

Modelo / Tipo: FI-521

Nombre y dirección del fabricante:
Avery Weigh-Tronix[1]
Foundry Lane
Smethwick
West Midlands
B66 2LP
INGLATERRA

La presente declaración de conformidad se expide bajo la exclusiva responsabilidad del fabricante.

Objeto de la declaración:
Dillon[2]
FI-521 LED
Dillon[3]
FI-521 LCD

El objeto de la declaración descrita anteriormente es conforme con la legislación de armonización pertinente de la Unión:

Directivas aplicables	Normas armonizadas u otras especificaciones técnicas
2014/30/UE Compatibilidad electromagnética	EN 55024:2010 +A1:2015 EN 55032:2015 EN 61000-3-2:2014 EN 61000-3-3:2013
2014/35/UE Material eléctrico destinado a utilizarse con determinados límites de tensión	EN 60950-1:2006 +A11:2009 +A1:2010 +A12:2011
2011/65/UE Restricciones a la utilización de determinadas sustancias peligrosas en aparatos eléctricos y electrónicos	EN 50581:2012

Información adicional:
Nota[1]:
ITW Ltd trading as Avery Weigh-Tronix
Oficina registrada: Nexus House, Station Road, Egham, Surrey, TW20 9LB, Angleterre
Nota[2]:
Dillon es parte de Avery Weigh-Tronix

Firmado en nombre de:
Avery Weigh-Tronix
en
1000 Armstrong Drive, Fairmont, MN, 56031-1439,
EE.UU
el
2017-07-20

K.Detert
Innovaciones / Director de Marketing

76501-557 Issue 2

2   Specifications

2.1   FI-521 Series Models

Model	Description
FI-521E	LED Version, no battery
FI-521EB	LED Version, 6V lead-acid rechargeable battery is installed

2.2   Housing and Outline Dimension

2.2.1   Housing

IP65 wash-down stainless steel housing with rotary bracket.

2.2.2   Outline Dimension

- With bracket: 10.3" x 8.5" x 3.8" (262mm x 215mm x 96mm)
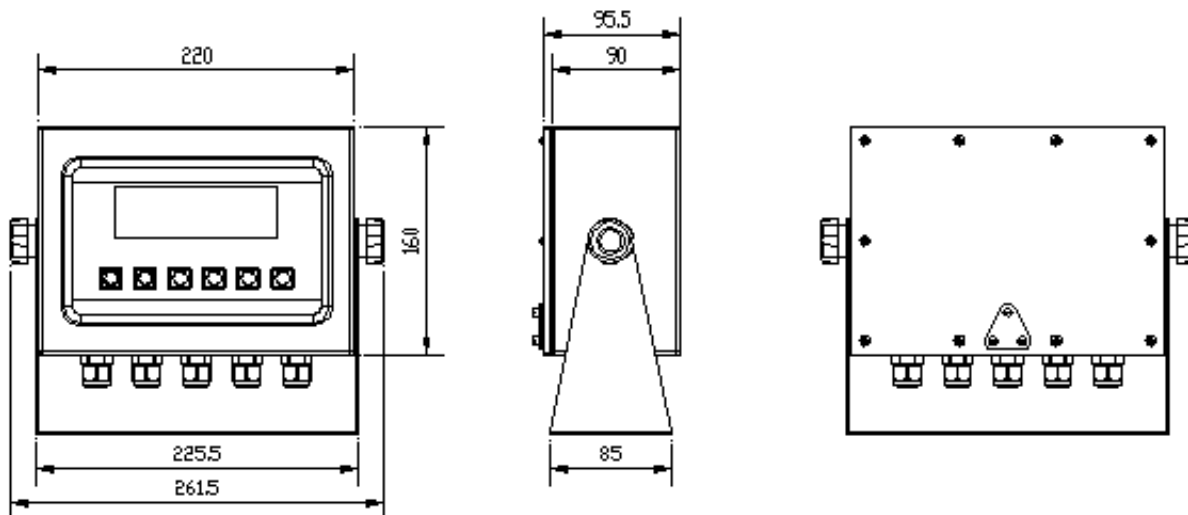- Without bracket: 8.9" x 6.3" x 3.8" (225mm x 160mm x 96mm)

Figure 2.1   FI-521 Outline Drawing

2.3   Power Supply

- AC Adapter: 12 VDC / min. 500mA output with central positive
  - Working Current: ≤135mA, adapter used, no load-cell, no battery, LED.BRT is set to 2
- Battery (Optional): 6V2.8-4AH lead acid rechargeable battery
  - Working Current: ≤100mA, battery used, no load-cell, no adapter, LED.BRT is set to 2
  - Battery Charging Circuit: built in

2.4   Display

- 7-digits,7-segment, 0.7" (17mm) ultra brightness LEDs with 14 annunciators

2.4.1   Keypad

- 6 push buttons
  - SELECT, CELL, PRINT, UNIT, ZERO, ON/OFF

2.4.2   Environment

Working temperature	-10°C to 40°C
Storage temperature	-20°C to 70°C
Humidity	10 to 90% RH without condensation
Protection	IP65

2.4.3   Loadcell Excitation

Voltage	5VDC
Max. Current	120mA (power up to 8-350Ω bridge)
Signal connection	4 or 6 lead with sense leads
Max Sensitivity	-3mV/V to +3mV/V

2.5 Communication

Serial port1	Full-duplex RS-232
Serial port2	Full-duplex RS-232 or half-duplex RS-485
Baud Rate	Selectable: 1200-2400-4800-9600-19200-22800/38400-57600 bps
Data Output Format	8N1, 7O1, 7E1
Protocol	selectable

2.6 Analog Circuitry

- 24-bit A/D converter
- Conversion Speed: 80Hz
- Input range: -15mV to +15mV
- Output code:1mV input between S+ and S- of loadcell connector will output about 100,000 raw counts
- Hardware low pass filter and 2 programmable digital low pass filters

2.7 Capacity and Division

- Maximum display range: -999,999 to 999,999
- Division Number Range for Primary Unit: 100-100,000
- Division Number Range for Second Unit: 100-125,000
- Division Number Range for Newton Unit: 100-125,000
- Recommended Display Sensitivity >0.5uV/ display division

2.8 Accuracy

≤0.01%

2.9 Real Clock

- Built-in nonvolatile real time & date

2.10 Remote Digital Input

- External Inputs: 4, Select, Cell, Unit, Zero

2.11 Digital Output (Setpoint Output)

- Outputs 2 configurable

● Each digital output combined with a digital comparator: if current force is over or less than the set force point, the corresponding output will change output electronic state according to the pre-configuration.

2.12   Analog Voltage Output

● Output Voltage: 0-2.5V, the output current should be limited 5mA by external circuit
● Accuracy: About 0.01% after calibration

2.13   Other Main Functions

● Programmable zero range
● Programmable automatic zero point tracking
● Programmable motion detection window
● Programmable auto-power off time, adjustable LED brightness
● Available units of measure: kgf, lbf, Newton
● Battery voltage display and charge indication
● Programmable serial output content
● Two set point outputs with two data comparison points

3 Introduction

To set up the indicator, you must first enter the appropriate menu mode. The front panel keys become directional navigators to move around in the menus. See Table 3.2 for details.

3.1 Front Panel

The front panel incorporates the display and keypad.
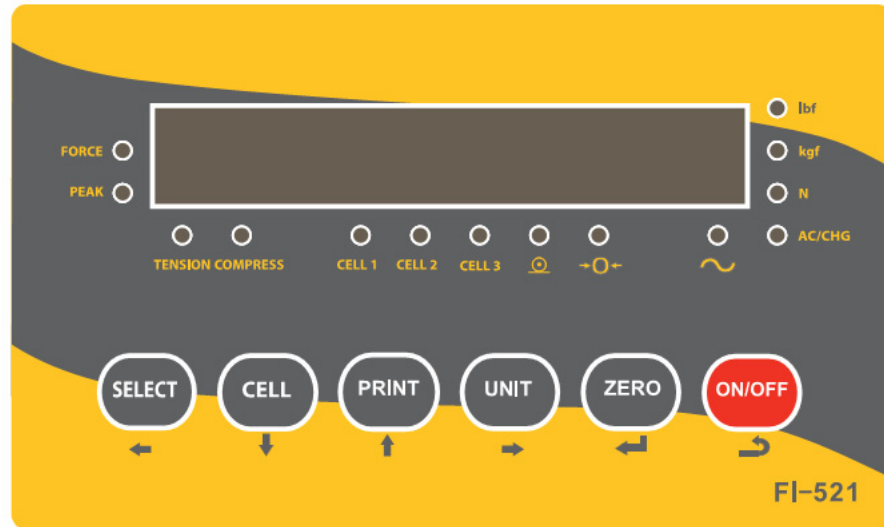
3.2 Display

A 7-digit LED display providing the weight and system information.

The annunciators used with the LCD model are incorporated in the display. The annunciator will be lit went the mode is active.
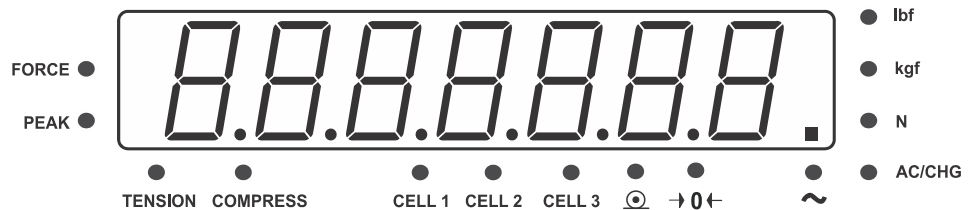
Figure 3.1 LED Display

Table 3.1 Display Annunciators and Definitions

LCD Annunciator	Description
FORCE	Illuminates when indicator is in force display mode.
PEAK	Illuminates when the indicator is in peak display mode. When the annunciator is flashing, the displayed number is live force. When the annunciator is steady, the number is peak force.
TENSION	Indicates the type of force being measured.
COMPRESS	
CELL 1	Indicates which loadcell is being used
CELL 2	
CELL 3	
⊙	Data send. Illuminates when the indicator is transmitting data.
→0←	Better known as the "Center of Zero" annunciator. It is lit whenever the displayed weight is within ± 0.25 divisions of true zero.
~	Illuminates when weight is within motion band.
lbf	lb force. Illuminates if the active unit of measure.
kgf	kg force. Illuminates if the active unit of measure.
N	Newton Meters. Illuminates if the active unit of measure.
AC/CHG	Red when battery is being charged. Green when battery is full or not installed

3.3 Keyboard

The keyboard consists of six keys, some of which have multiple functions. Refer to Table 3.2 for key functions.
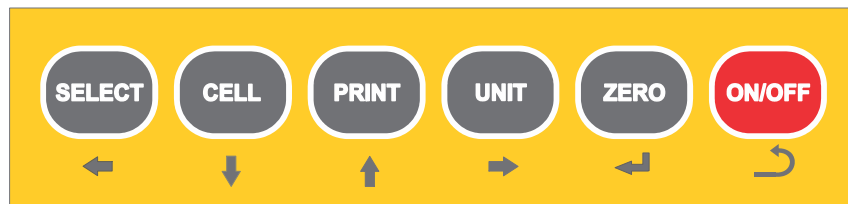
Figure 3.2 FI-521 Keypad

Table 3.2 Function of the Keys

Key	Mode	Condition	Function
SELECT ←	Weighing	Press for less than 3 seconds	To select displayed content type: Force or Peak
	Weighing	Press for more than 3 seconds	Enter Config mode
	Input data mode	Press for less than 3 seconds	Return to sub menu
	Menu selection mode		
CELL ↓	Weighing	Press for less than 3 seconds	To select Cell 1 - 3
	Input data mode	Press to enter data	One will be subtracted from the flashing digit
	Menu selection mode	Press	Next item of current menu
PRINT ↑	Weighing	Press	Output data to serial Com port
	Input data mode	Press to enter data	One will be added to the flashing digit
	Menu selection mode	Press	To last item of current menu
	Display ADC code mode	Press	Select ADC code from no-filter, filter1, filter2
UNIT →	Weighing	Press for less than 3 seconds	Change weigh units: lbf, kgf, N
	Display date or time	Press for more than 3 seconds	To set current date or time
	Display voltage mode	Press for more than 3 seconds	To calibrate input voltage value
	Display ADC mode	Press for less than 3 seconds	Display ADC code or input signal in mV/V
	Display ADC mode	Press for more than 3 seconds	To calibrate input signal in mV/V
	Input data mode	Press	Rotate the flashing digit from left to right
ZERO ↵	Weighing	Press for less than 3 seconds	Zero function
	Input data mode	Input data or select menu	Confirm input data or current item selection and go to next item of current menu or next operation
	Menu selection mode		
	Display ADC code	Press	Set or clear reference Zero code
ON/OFF ↩	Power off mode	Press	Power on
	Weighing	Press for more than 3 seconds	Power off
	Input data mode	Press	Ignore modification
	Menu selection mode	Press	Prepare to exit from current working mode

3.4   Navigating the Normal Force Mode

3.4.1   Power on Indicator

When the indicator is off, press the **[ON/OFF]** key to turn on the indicator.

3.4.2   Power off Indicator

When the indicator is on, press the **[ON/OFF]** key for more then 3 seconds to turn off the indicator.

3.4.3   Zero

When the weight is stable and within the zero range, press the **[ZERO]** key to set a new zero point. Zero range is determined by the setting in the CONFIG>ZRO.PNT>SAZSM parameter. Refer to the Configuration section of this manual for instructions on making changes to the Configuration menu.

3.4.4   Print Data

To send data out the RS-232 or RS-485 press the **[PRINT]** key when weight is stable.

3.4.5   Change Measure Unit

Press the **[UNIT]** key to select kgf, lbf or N. Note: under some conditions, some measure units are not available.

3.4.6   Select Loadcell

Press the **[CELL]** key to select. The indicator will display the new loadcell capacity and related configuration parameters.

3.4.7 Display Force or Captured Peak Data

Press the **[SELECT]** key in Peak display mode. The type of peak displayed is determined by the setting in the USER>PEAK>DISPLAY parameter. Refer to the Configuration section of this manual for instructions on making changes to the User menu.
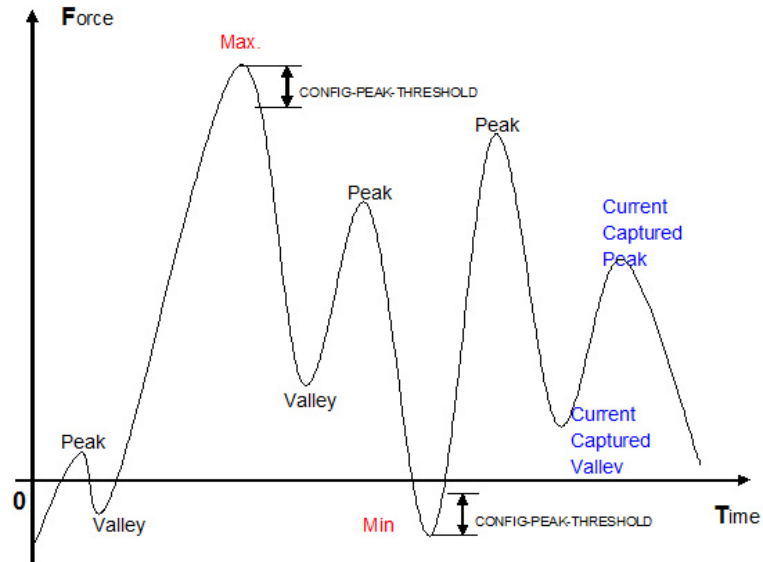
Figure 3.3 Force and Peak Diagram

Table 3.3 Use kgf as Primary Unit

Calibration Division Value	Display Division Value		
	kgf	lbf	Newton
0.0001kgf	0.0001	0.0002	0.001
0.001kgf	0.001	0.002	0.01
0.01kgf	0.01	0.02	0.1
0.1kgf	0.1k	0.2	1
1kgf	1	2	10
10kgf	10	20	Not available
0.0002kgf	0.0002	0.0005	0.002
0.002kgf	0.002	0.005	0.02
0.02kgf	0.02	0.05	0.2
0.2kgf	0.2	0.5	2
2kgf	2	5	20
20kgf	20	50	Not available
0.0005kgf	0.0005	0.001	0.005

Calibration Division Value	Display Division Value		
	kgf	lbf	Newton
0.005kgf	0.005	0.01	0.05
0.05kgf	0.05	0.1	0.5
0.5kgf	0.5	1	5
5kgf	5	10	50
50kgf	50	Not available	Not available

Table 3.4 Use lbf as Primary Unit

Calibration Division Value	Display Division Value		
	kgf	lbf	Newton
0.0001 lbf	Not available	0.0001lb	Not available
0.001 lbf	0.0005	0.001	0.005
0.01 lbf	0.005	0.01	0.05
0.1 lbf	0.05	0.1	0.5
1 lbf	0.5	1	5
10 lbf	5	10	50
0.0002 lbf	0.0001	0.0002	0.001
0.002 lbf	0.001	0.002	0.01
0.02 lbf	0.01	0.02	0.1
0.2 lbf	0.1	0.2	1
2 lbf	1	2	10
20 lbf	10	20	Not available
0.0005 lbf	0.0002	0.0005	0.002
0.005 lbf	0.002	0.005	0.02
0.05 lbf	0.02	0.05	0.2
0.5 lbf	0.2	0.5	2
5 lbf	2	5	20
50 lbf	20	50	Not available

4 Configuration

The Configuration Menu consists of seven different sub-menus. Within each sub-menu are different menu options.

The config/cal switch must be set in the ON position in order to make changes to specific parameters.

NOTE:

- Each loadcell has its own CONFIG, CAL, IN.OUT parameters. Before entering the Setup mode, select the loadcell to be configured with the **[CELL]** key.

- The parameters of USER, MISC, and TEST are the same for all loadcells.

- When "*Lo.VoL*" or "*Lo.BAT*" is displayed (the voltage to PCB is low), CONFIG, USER, CAL, IN.OUT menus can't be entered and edited.

4.1 Entering the Setup Mode

1. Power on the indicator by pressing the **[ON/OFF]** key.

2. Press the **[SELECT]** key for 3 seconds. The indicator shows "*Config*" to indicate that you are in Configuration Menu mode.

4.2 Navigating the Main Menu

| CONFIG | ⟷ | USER | ⟷ | CAL | ⟷ | IN.OUT | ⟷ | CELL | ⟷ | MISC | ⟷ | TEST |

1. Once in the "*Config*" menu, use the **[PRINT]** (up arrow) or **[CELL]** (down arrow) key to move to the next available menu in the Configuration Menu.

2. Use the **[ZERO]** key to access the desired menu.

3. Use the **[PRINT]** (up arrow) or **[CELL]** (down arrow) key to choose a sub-menu (parameter).

4. Use the **[ZERO]** key to select the options within the sub-menu.

5. Use the **[PRINT]** (up arrow) or **[CELL]** (down arrow) key to make a change. Press the up or down arrow until the desired choice is on the display.

6. Press the **[ZERO]** key to select the choice.

Table 4.1   Key Navigation

[SELECT] ←	Access the Configuration Menu.
[CELL] ↓	Scroll through available menus.
	Choose a sub-menu
	Make a change within the sub-menu
[PRINT] ↑	Scroll through available menus.
	Choose a sub-menu
	Make a change within the sub-menu
[UNIT] →	Choose a sub-menu
[ZERO] ↵	Make a change within the sub-menu
[ON/OFF] ↶	Exit the setup mode

4.3 Configuration Menu Parameters

This section provides more detailed descriptions of the selections found in the Configuration Menu.

The menu charts show the flow of the parameters and also provide a quick reference to the parameters withing the menu.

The menu tables show the submenus, options and default parameter in LED display format to coincide with the actual display.

4.3.1 Config Menu
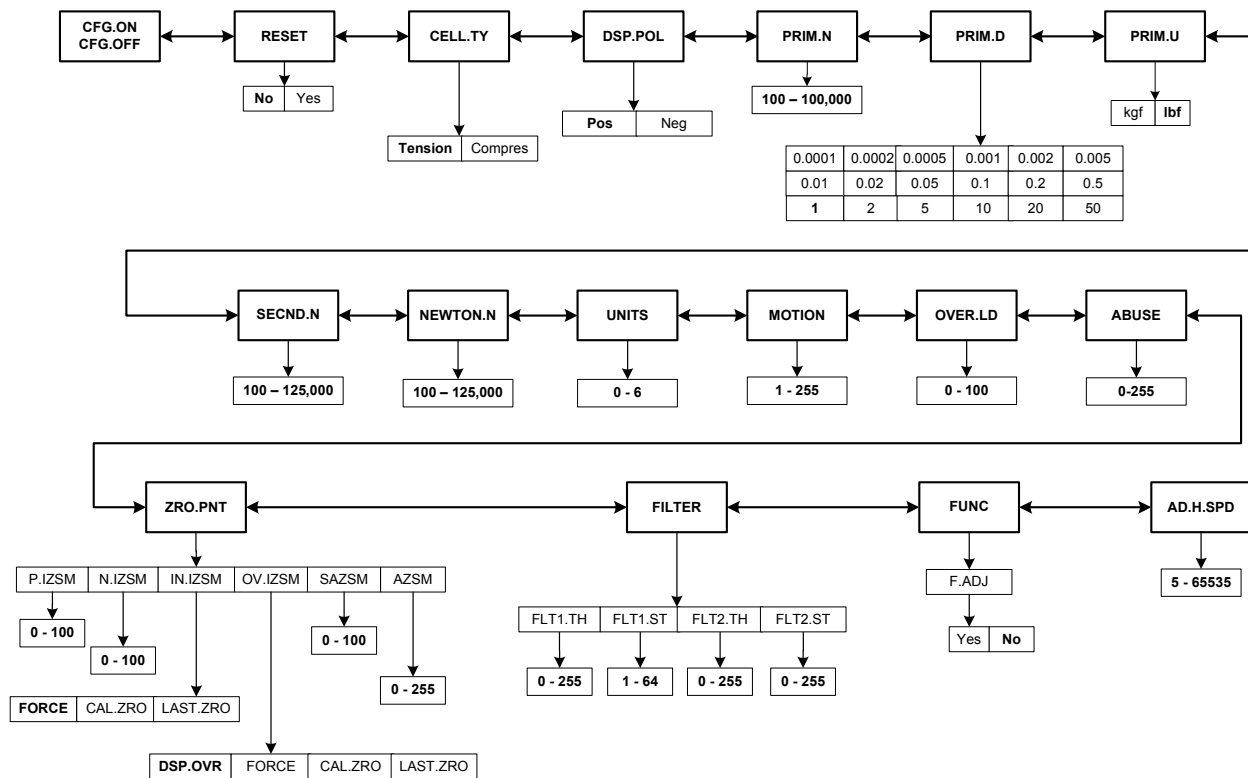
Figure 4.1 CONFIG Menu Chart

The figure above is an illustration of the available menus with the **Config** menu and the choices within those menus. Refer to Table 4.2 for explanations of the menu choices.

Table 4.2 CONFIG Menu Choices and Explanations

CONFIG					
SubMenu1	**SubMenu2**	**Option**	**Default**	**Parameter Description**	**Comment**
CFG.on *CFG.oFF*				Seal switch position	The display will show whether the seal switch is in the ON or OFF position. This parameter can't be changed within the software.
rESEt		*No*	*No*	Reset **Config** menu parameters to default setting	
		YES			
CELL.tY		*tENSion*	*tENSion*	Select whether the connected loadcell is used for tension or compression force	
		ConPrES			
dSP.PoL		*PoS*	*PoS*	When CELL.TY= Compres and calibrated in negative direction	If DSP.POL=Pos, then reading will be displayed in Positive. If DSP.POL=Neg, then the reading will be displayed in Negative
		NEG			
PriM.N		*100 - 100=000*	*10000*	Primary full scale capacity	
PriM.d		*0.0001*	*1*	The division value under primary unit	The division value under second unit is automatically determined by the indicator according to the division value under primary unit.
		0.0002			
		0.0005			
		0.001			
		0.002			
		0.005			
		0.01			
		0.02			
		0.05			
		0.1			
		0.2			
		0.5			
		1			
		2			
		5			
		10			
		20			
		50			

CONFIG					
SubMenu1	SubMenu2	Option	Default	Parameter Description	Comment
Pr im̄.U		*PGF* *LbF*	*LbF*	Primary unit	Select the primary unit from kgf or lbf. The second unit is lbf if kgf is selected as the primary unit. ***The calibration standard weight must be in primary unit!**
SECN̄d.N		*100- 125=000*	*10000*	Second scale full scale value	The division number under second unit. The maximum is 1.25*(PRIM.N).
NEYtoN.N		*100- 125=000*	*10000*	Newton unit	The division number under Newton unit. The maximum is 1.25*(PRIM.N).
UN itS		*0-6*	*6*	Units key	0=kgf 1=lbf 2=N 3= kgf,lbf 4=kgf,N 5=lbf,N 6=kgf,lbf,N
m̄ot ioN		*1-255*	*4*	Motion window	1-255 = ±0.25d *(1-255)
oūEr.Ld		*0- 100*	*0*	Overload display limitation	0=FS+9d 1-100=101%FS -200%FS.
AbUSE		*0-255*	*20*	Set loadcell abuse level	FS+(0%FS to 255%FS) If the force has exceed this level, it's considered to be abusive to the loadcell

CONFIG					
SubMenu1	**SubMenu2**	**Option**	**Default**	**Parameter Description**	**Comment**
ʒro.PΠŁ	P.ιʒ5ñ	0-100	10	Initial zero (power on zero) point range	0=no limitation 1-100= (calibration zero point) ±1%FS - (calibration zero point) ±100%FS
	Π.ιʒ5ñ	0-100	10	Initial zero (power on zero) point range	0=no limitation 1-100= (calibration zero point) ±1%FS - (calibration zero point) ±100%FS
	ιΠ.ιʒ5ñ	ForCE	ForCE	Choose which force as current initial zero point when current weight is in IZSM range	FORCE= current force
		CAL.ʒro			CAL.ZRO= calibration zero
		LA5Ł.ʒ.Ł			LAST.Z.T=switch-off zero and tare
	oū.ιʒ5ñ	d5P.oūr	d5P.oūr	Choose which force as current initial zero point when current force is over IZSM range	DSP.OVR=display initial zero is over
		ForCE			FORCE= current force
		CAL.ʒro			CAL.ZRO= calibration zero
		LA5Ł.ʒro			LAST.ZRO=switch-off zero force
	5Aʒ5ñ	0-100	2	Zero key range	0=no limitation 1-100= (initial zero point) ±1%FS - (initial zero point) ±100%FS
	Aʒ5ñ	0-255	2	Zero tracking window	0=0d, no tracking 1-255=±(0.25*(1-255))
FιLŁEr	FLŁ1.ŁH	0-255	160	Digital filter1 threshold:	0=no filter1 1-254=filter1 used only when vibration in ±0.5d*(1-254) 255= filter1 be always used
	FLŁ1.5Ł	1-64	32	Digital filter1 intensity	1-64 ADC's data will be averaged
	FLŁ2.ŁH	0-255	80	Digital filter2 threshold	0=no filter2 1-254=filter2 used only when vibration in ±0.25d*(1-254) 255= filter2 be always used
	FLŁ2.5Ł	0-255	192	Digital filter2 intensity	0-255=weak to strong
FUΠC	F.AdJ	YE5	Πo	Enable or disable fine adjust force number in normal force measure mode	YES NO
		Πo			
PEAʞ	ŁHrE5Hd	5-65535	10	5-65335d, When reverse varying (Threshold) of force is over this value, one peak is occurred and will be captured.	

4.3.2 User Menu

Figure 4.2 USER Menu Chart

The figure above is an illustration of the available menus with the USER menu and the choices within those menus. Refer to Table 4.3 for explanations of the menu choices.

Table 4.3 User Menu Choices and Explanations

USER					
SubMenu1	SubMenu2	Option	Default	Parameter Description	Comment
rESEt	*No*	*No*		Reset *User* menu parameters to default setting	
	YES				
Com1	*bAUd.rt*	*1200*	*9600*	Select COM1 baud rate	
		2400			
		4800			
		9600			
		19200			
		38400			
		57600			
	bYt.Fmt	*8N1*	*8N1*	Select COM1 byte format	(1)8N1=8 data bits, No parity check bit, 1 stop bit
		7o1			(2)7O1=7 data bits, 1 Odd parity check bit, 1 stop bit
		7E1			(3)7E1=7 data bits, 1 Even parity check bit, 1 stop bit
	oUt.mod	*NoNE*	*Prt.Cmd*	Select COM1 output mode	(1)NONE = COM 1 disabled
		CoNt			(2)CONT=continuously output
		PrINt			(3)PRINT=output after [PRINT] key is pressed
		Cmd			(4)CMD=output after a request command is received
		Prt.Cmd			(5)PRT.CMD= output after [PRINT] key is pressed or request command received
		StAbLE			(6)STABLE=output after scale is stable; Note: use PRINT or CMD to output data, the scale must be stable
	LAYoUt	*mULtPL*	*mULtPL*	Set COM1 content and format	(1)MULTPL= the following selected item in OUT1 will be output use defined format
		SiNGLE			(2)SINGLE= only displayed content and current status will be output, it's compatible with NCI-SCP01
		EdII			(3)EDX= only displayed content and current status will be output. Compatible with EDX

USER					
SubMenu1	SubMenu2	Option	Default	Parameter Description	Comment
oUt 1	t itLE	YES	No	Enable or disable output prompt of every output line	
		No			
	iNd.id	YES	No	Enable or disable output indicator ID number	Prompt is "IND.ID"
		No			
	CELL.No	YES	No	Enable or disable output loadcell ID number	Prompt is "CELL.No"
		No			
	CELL.tYP	YES	No	Enable or disable output loadcell type	Prompt is "CELL.TYP"
		No			
	mEAS.tY	YES	No	Enable or disable output loadcell measure type	Prompt is "MEAS.TYPE"
		No			
	ForCE	YES	YES	Enable or disable output force	Prompt is "FORCE"
		No			
	PEt.ūLY	YES	No	Enable or disable output current captured peak value and valley value	Prompt is "PEAK and VALLEY"
		No			
	mAII.m iN	YES	No	Enable or disable output max peak and valley value	Prompt is "MAX"/"MIN"
		No			
	dAtE	YES	No	Enable or disable output date	Prompt is "DATE"
		No			
	t imE	YES	No	Enable or disable output time	Prompt is "TIME"
		No			
	Ad.CodE	YES	No	Enable or disable output ADC code	Prompt is "A/D CODE"
		No			
	iN.mūΞū	YES	No	Enable or disable output input signal in mV/V unit	Prompt is "INPUT"
		No			
	bAt.ūoL	YES	No	Enable or disable whether to display the battery voltage	Prompt is "VOLTAGE"
		No			
	StAtUS	YES	No	Enable or disable scale status	Prompt is "STATUS"
		No			
	b.L iNE	NoNE	L iNE 1	How many blank lines after strings output	NONE=no blank line
		L iNE 1 - 9			LINE1 - 9=there are 0 - 9 blank lines after strings.

USER					
SubMenu1	SubMenu2	Option	Default	Parameter Description	Comment
Com2	*bAUd.rt*	*1200*	*9600*	Select COM2 baud rate	
		2400			
		4800			
		9600			
		19200			
		28800			
		57600			
	bYt.Fmt	*8N1*	*8N1*	Select COM2 byte format	(1)8N1=8 data bits, No parity check bit, 1 stop bit
		7o1			(2)7O1=7 data bits, 1 Odd parity check bit, 1 stop bit
		7E1			(3)7E1=7 data bits, 1 Even parity check bit, 1 stop bit
	oUt.mod	*NoNY*	*NoNE*	Select COM2 output mode	(1)NONE = COM2 disabled
		Cont			(1)CONT=continuously output
		Print			(2)PRINT=output after PRINT key pressed
		Cmd			(3)CMD=output after a request command is received
		Prt.Cmd			(4)PRT.CMD= output after PRINT key pressed or request command received
		StAbLE			(5)STABLE=output after scale is stable; Note: use PRINT or CMD to output data, the scale must be stable
	LAYoUt	*mULtPL*	*mULtPL*	Set COM2 content and format	(1)MULTPL= the following selected item in OUT2 will be output use defined format
		SiNGLE			(2)SINGLE= only displayed content and current status will be output, it's compatible with NCI-SCP01
		EdII			(3)EDX= only displayed content and current status will be output. Compatible with EDX
	LC.Addr	*00-99*	*01*	Local address for COM2	
	EN.Addr	*No*	*No*	Enable or disable COM2 local address in output or input strings	
		YES			

USER					
SubMenu1	SubMenu2	Option	Default	Parameter Description	Comment
oUt2	tıtLE	YES	No	Enable or disable output prompt of every output line	
		No			
	ıNd.ıd	YES	No	Enable or disable output indicator ID number	Prompt is "IND.ID"
		No			
	CELL.No	YES	No	Enable or disable output loadcell ID number	Prompt is "CELL.No"
		No			
	CELL.tYP	YES	No	Enable or disable output loadcell type	Prompt is "CELL.TYP"
		No			
	mEAS.tY	YES	No	Enable or disable output loadcell measure type	Prompt is "MEAS.TYPE"
		No			
	ForCE	YES	YES	Enable or disable output force	Prompt is "FORCE"
		No			
	PEk.uLY	YES	No	Enable or disable output current captured peak value and valley value	Prompt is "PEAK and VALLEY"
		No			
	mAll.mıN	YES	No	Enable or disable output max peak and valley value	Prompt is "MAX"/"MIN"
		No			
	dAtE	YES	No	Enable or disable output date	Prompt is "DATE"
		No			
	tımE	YES	No	Enable or disable output time	Prompt is "TIME"
		No			
	Ad.CodE	YES	No	Enable or disable output ADC code	Prompt is "A/D CODE"
		No			
	ıN.muuu	YES	No	Enable or disable output input signal in mV/V unit	Prompt is "INPUT"
		No			
	bAt.uoL	YES	No	Enable or disable whether to display the battery voltage	Prompt is "VOLTAGE"
		No			
	StAtUS	YES	No	Enable or disable scale status	Prompt is "STATUS"
		No			
	b.LıNE	NoNE	LıNE 1	How many blank lines after strings output	NONE=no blank line
		LıNE 1 - 9			LINE1 - 9=there are 0 - 9 blank lines after strings.
bEEP	kEY	YES	YES	Enable or disable beep after a key is pressed.	
		No			

USER					
SubMenu1	SubMenu2	Option	Default	Parameter Description	Comment
PEAƲ	*d₁SPLAY*	*ⁿAⁱⁱ*	*ⁿAⁱⁱ*	Select what is displayed in Peak mode	MAX= Max. Force value MIN= Min. Force value PEAK= current captured peak value VALLEY= current captured valley value
		ⁿ₁ⁿ			
		PEAƲ			
		ⁿALLEY			
otHEr	*ⁿLd.rⁿG*	*1-255*	*10*		1-255=the range of weight is 1-255d. When current weight is less than this value, the scale can be regarded as empty, or the load on scale is removed. **It must be bigger than (CONFI.MOTION).**
	Cⁿd.5rC	*NoNE*	*Coⁿ.1*	Source of the executed command selection	(1)NONE=no any command will be executed
		Coⁿ.1			(2)COM.1= command from COM1 will be executed
		Coⁿ.2			(3)COM.2= command from COM2 will be executed
		Coⁿ1-2			(4)COM.1.2= command from COM1 or COM2 will be executed
	A.oFF.t	*0-255*	*0*	Auto off time	0=not auto power off 1-255=auto power off after 1-255 minutes. In this period, no operation or no weight change
	A.oFF.ⁿd	*oFF*	*oFF*	Auto off mode	(1)OFF=turn off indicator
		d5P.t₁ⁿ			(2)DSP.TIM= display time
		d5P.dAt			(3)DSP.DAT=display date
		AC.t₁ⁿE			(4)AC.TIME=turn off when only battery is used. Display time when AC adaptor is used
		AC.dAtE			(5)AC.DATE=turn off when only battery is used. Display date when AC adaptor is used
	LEd.brt	*brt 1-2-3-4-5*	*brt4*	LED brightness level set	BRT1-BRT5 =low - high
	₁Nd.₁d	*000000-999999*	*123456*	Indicator ID number: 000000-999999	

NOTE: If AD.FROM = COM2, COM2 and OUT2 will be disabled.

4.3.3 Misc Menu

| CODE | ⟷ | VOL | ⟷ | DATE | ⟷ | TIME | ⟷ | VER | ⟷ | COM2.TY | ⟷ | ABUS.CNT | ⟷ | ZERO.OFS |
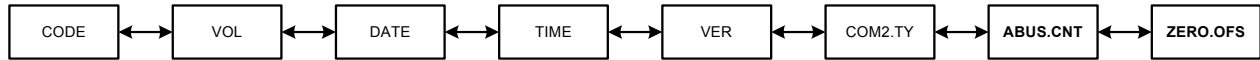
Figure 4.3 MISC Menu Chart

The figure above is an illustration of the available menus with the **MISC** menu. There are no programming choices within this menu. Refer to Table 4.4 for explanations of the menu choices.

Table 4.4 MISC Menu Choices and Explanations

MISC	
Submenu1	**Remark**
CodE	Display ADC's code, this code can be after no-filter, filter1 or filter2
uoL	Display voltage; calibrate voltage; set full charged voltage and low battery voltage
dAtE	Display date and set date
tinE	Display time and set time
uEr	Display firmware version
Con2.tY	Display interface type of COM2
AbUS.CNt	View how many times abuse have occurred on the selected cell
ZEro.oFS	Zero offest. Current zero - calibration zero

4.3.4 Test Menu

| DISP | ⟷ | COM1.RD | ⟷ | COM1.TD | ⟷ | COM2.RD | ⟷ | COM2.TD | ⟷ | KEY.tst | ⟷ | INPUT | ⟷ | OUTPUT |
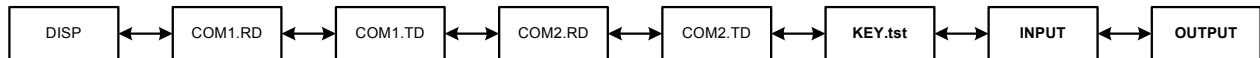
Figure 4.4 TEST Menu Chart

The figure above is an illustration of the available menus with the TEST menu. There are no programming choices within this menu. Refer to Table 4.5 for explanations of the menu choices.

Table 4.5 TEST Menu Choices and Explanations

TEST	
Submenu1	**Remark**
diSP	Test LED display
Con1.rd	Test COM1 receiving
Con1.td	Test COM1 transmitting
Con2.rd	Test COM2 receiving
Con2.td	Test COM2 transmitting
KEY.tSt	Test keys and buzzer
inPUt	View the level of input lines
oUtPUt	Set and check output level of output lines

4.3.5 IN.OUT Menu
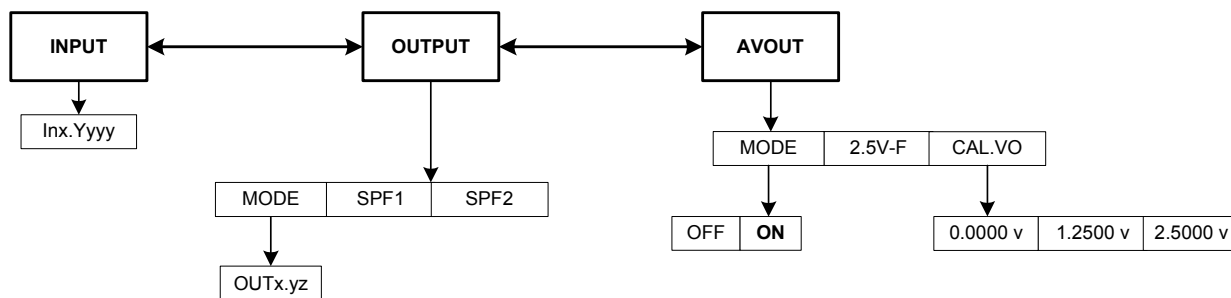
The figure above is an illustration of the available menus with the IN.OUT menu and the choices within those menus. Refer to Table 4.4 for explanations of the menu choices.

Table 4.6 IN.OUT Menu Choices and Explanations

IN.OUT				
Submenu1	Submenu2	Submenu3	Parameter Description	Comment
iNPUt	*iNii.yyyy*		Select function (yyy) of each remote input (x)	X=1-4 yyyy=SELE (select)/ CELL (cell)/ PRNT (print)/ UNIT (unit)/ ZERO (zero)/ OFF/ NONE (none) Normally, one remote input is low (0), that means one external switch is closed
oUtPUt	* modE*	*oUtii.yz*	Select output (x) level after power on (y) and after an event trigger (z)	x=1-2, y=0-1, z=0-1 Normally, y/z=0 will make external relay closed and y/z=1 make the relay open
	SPF 1			Select the force unit of OUTPUT1 Reference kgf, lbf, N and input the force number of OUTPUT1 Reference: 0 to FS
	SPF2			Select the force unit of OUTPUT2 Reference kgf, lbf, N and input the force number of OUTPUT2 Reference: 0 to FS
AuoUt	*modE*	*oFF*	OFF/ON	Analog voltage output is off/on
		oN		
	2.5u-F		Select the controlling force unit of 2.5V	Reference kgf, lbf, N and input the force value of capacity Reference: 10%FS to 120%FS
	CAL.uo	*0.0000u*	Set and check the output voltage	0.0000 VDC 1.2500 VDC 2.500 VDC None
		1.2500u		
		2.500u		
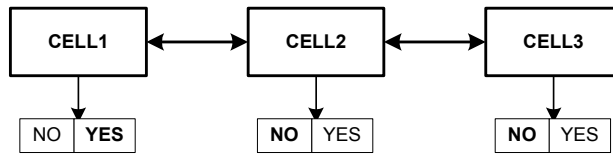
4.3.6 CELL Menu

The figure above is an illustration of the available menus with the CELL menu and the choices within those menus. Refer to Table 4.4 for explanations of the menu choices.

Table 4.7 CELL Menu Choices and Explanations

IN.OUT				
Submenu1	**Submenu2**	**Option**	**Parameter Description**	**Comment**
CELL 1	*No*	*YES*	YES/NO	If "Yes" the CELL key can select CELL1.
	YES			
CELL2	*No*	*No*	YES/NO	If "Yes" the CELL key can select CELL2.
	YES			
CELL3	*No*	*No*	YES/NO	If "Yes" the CELL key can select CELL3.
	YES			

NOTE: When CELL1, CELL2 and CELL3 are all set to NO, CELL1 will be forced to YES.

4.4 Exit the Setup Menu

1. Power off the indicator by pressing and holding the **[ON/OFF]** key.

2. Move the slide switch on the rear cover back to the left and replace the metal protective plate. Refer to section 4.2 for location.

3. Turn the indicator back on by pressing the **[ON/OFF]** key. The display will go through a digit check, then settle into Normal Operating mode. All front panel keys will now return to their normal mode of operation.

4.5 Display and Set Time

1. Enter the Setup Mode by pressing the **[SELECT]** key more than 3 seconds.

2. Use the **[PRINT]** or **[CELL]** key to select the MISC>TIME menu.

3. Press **[ZERO]** to select display the current time.

4. Press the **[PRINT]** key to scroll to the TIME parameter.

4a. Time display Format is: txx.xx.xx(hh-mm-ss) 24h format.

5. Press the **[UNIT]** key for 3 seconds. The first digit of the time will flash.

6. Use the **[PRINT]** or **[CELL]** key to enter the first digit.

    If time of no operation is more than 5s, it will automatically exit modification mode.

7. Use the **[UNIT]** key to move to the next digit.

8. Use the **[PRINT]** or **[CELL]** key to enter the next digit. Repeat steps 6 - 8 until the date is entered.

9. Press the **[SELECT]** key to return to the last menu item.

10. Press the **[ON/OFF]** key to exit the date entry mode.

4.6 Display and Set Date

1. Enter the Setup Mode by pressing the **[SELECT]** key more than 3 seconds.

2. Use the **[PRINT]** or **[CELL]** key to select the MISC>DATE menu.

3. Press **[ZERO]** to display the current date.

    Date display format is dxx.xx.xx (yy-mm-dd)

4. Press the **[UNIT]** key for 3 seconds. The first digit of the date will flash.

5. Use the **[PRINT]** or **[CELL]** key to enter the first digit.

    If no key presses are within 5s, modification mode will automatically be exited.

6. Use the **[UNIT]** key to move to the next digit.

7. Use the **[PRINT]** or **[CELL]** key to enter the next digit. Repeat steps 5 - 7 until the date is entered.

8. Press the **[SELECT]** key to return to the last menu item.

9. Press the **[ON/OFF]** key to exit the date entry mode.

4.7 Display Firmware Version

1. Enter the Setup Mode by pressing the **[SELECT]** key more than 3 seconds.

2. Use the **[PRINT]** or **[CELL]** key to select the MISC>VER menu.

3. Press **[ZERO]** to display current version.

    Firmware Version display Format is Vxx.yy. xx is hardware version, yy is software version.

4. Press the **[SELECT]** key to return to last menu item.

5. Press the **[ON/OFF]** key to exit this mode.

4.8   Display Interface Type of COM2

This function is used only to check whether the hardware and software about COM2 are matched.

1.   Enter the Setup Mode by pressing the **[SELECT]** key more than 3 seconds.

2.   Use the **[PRINT]** or **[CELL]** key to select the MISC>COM2.TY menu.

3.   Press **[ZERO]** to display interface type of COM2 (485, 232, None).

4.   Press the **[N/G]** key for more than 3 seconds to display corresponding number of COM2 hardware type setting.

5.   Use the **[PRINT]** or **[CELL]** key to select the desired choice.

6.   Press the **[SELECT]** key to return to last menu item.

7.   Press the **[ON/OFF]** key to exit this mode.

4.9   Display Test

1.   Press the **[SELECT]** key more than 3 seconds to enter the SETUP mode.

2.   Use the **[PRINT]** or **[CELL]** key to select TEST>DISP menu.

3.   Press **[ZERO]** to enter the test display mode and all segments will light at first.

3a.   In this mode, every press of the **[CELL]** key will light the next segment. Every press of the **[UNIT]** key will light the next digit.

3b.   Press the **[ZERO]** key to automatically light all segments and all digits.

4.   Press the **[SETUP]** key to return to last menu item.

5.   Press the **[ON/OFF]** key to exit this mode.

4.10   Keyboard and Buzzer Test

1.   Press the **[SELECT]** key more than 3 seconds to enter the SETUP mode.

2.   Use the **[PRINT]** or **[CELL]** key to select TEST>KEY menu.

3.   Press **[ZERO]** to enter the test keypad mode. *Key* will be displayed.

   In this mode, press a key. The value of the key will be displayed and the buzzer will beep.

4.   Press the **[SETUP]** key to return to last menu item.

5.   Press the **[ON/OFF]** key to exit this mode.

4.10.1   Input Test

1.   Press the **[SELECT]** key more than 3 seconds to enter the SETUP mode.

2.   Use the **[PRINT]** or **[CELL]** key to select MISC>INPUT menu.

3.   Press **[ZERO]** to show the level of input line 1. *INP1.0/1* will be displayed.

4. Use the **[PRINT]** or **[CELL]** key to view the level of the other input lines (1-4).

5. Press the **[SETUP]** key to return to last menu item.

6. Press the **[ON/OFF]** key to exit this mode.

4.10.2 Output Test

1. Press the **[SELECT]** key more than 3 seconds to enter the SETUP mode.

2. Use the **[PRINT]** or **[CELL]** key to select MISC>OUTPUT menu.

3. Press **[ZERO]** to output 0/1 on output line 1. *OUT1.0/1* will be displayed.

4. Use the **[CELL]** key to select output 0 or 1 on output line.

5. Use the **[PRINT]** key to select test output line 1 or line 2.

6. Press the **[SETUP]** key to return to last menu item.

7. Press the **[ON/OFF]** key to exit this mode.

4.11 Serial Port1/2 (COM1/2) Receiving Test

Before testing the receiving function of COM1 or COM2, a cable is need to connect a computer to the indicator. A terminal program such as Hyper Terminal is also needed for testing.

Note: Baud rate is selected by USER>COM1/2>BAUDRT, 8N1 byte format is fixed, Hex data (0x00 - 0xff) are used.

1. Enter the Setup Mode by pressing the **[SELECT]** key more than 3 seconds.

2. Use the **[PRINT]** or **[CELL]** key to select TEST>COM1.RD or TEST>COM2.RD menu.

3. Press **[ZERO]** to enter test COM1/2 receiving function and *rd1.--* or *rd2.--* will be displayed first.

   In this mode, received hex data (0x00 - 0xff) will be displayed on -- position.

4. Press the **[SELECT]** key to return to last menu item.

5. Press the **[ON/OFF]** key to exit this mode.

4.12 Serial Port1/2(COM1/2) Transmitting Test

Before testing the transmitting function of COM1 or COM2, a cable is need to connect a computer to the indicator. A terminal program such as Hyper Terminal is also needed for testing.

Note: baud rate is selected by USER>COM1/2-BAUDRT, 8N1 byte format is fixed, Hex data (0x00 - 0xff) are used.

1. Enter the Setup Mode by pressing the **[SELECT]** key more than 3 seconds.

2. Use the **[PRINT]** or **[CELL]** key to select TEST>COM1.TD or TEST>COM2.TD menu.

3.   Press **[ZERO]** to enter test COM1/2 receiving function and *td1.--* or *td2.--* will be displayed first.

> In this mode, transmitted hex data (0x00 - 0xff) will be displayed on -- position, and **[PRINT]**, **[CELL]**, **[UNIT]** and **[ZERO]** keys can be used to modify transmitted data.

4.   Press the **[SELECT]** key to return to last menu item.

5.   Press the **[ON/OFF]** key to exit this mode.

4.12.1 Output Setting

1. Enter the Setup Mode by pressing the **[SELECT]** key more than 3 seconds.

2. Use the **[PRINT]** or **[CELL]** key to select IN.OUT>OUTPUT menu.

3. Press **[ZERO]** to enter setting mode.

4. Use the **[PRINT]** or **[CELL]** key to select MODE (setting output mode) or SPF1 or SPF2 (setpoint force) to set the corresponding data of the output.

5. Press the **[ZERO]** key to confirm the choice.

   ● When OUTx.yz is displayed, use the **[CELL]** key to change the output line number(x).

      ❍ Use the **[PRINT]** key to change level after power on (y) and after an event trigger (z); x=1-2, y=0-1, z=0-1.

         Normally, y/z=0 will make external relay close and y/z=1 will make the relay open.

         Y=0/1 means after the indicator power on, the output level is 0/1

         z=0/1 means if current display force is over the setting data (SPF1/2), the output level is 0/1.

      ❍ Press the **[ZERO]** key to confirm the change.

   ● When SPF1/2 is displayed, use the **[ZERO]** key to enter set-point1/2 data mode.

   ● When "UNIT.kgf/lbf/n" is displayed, use the **[CELL]**, **[PRINT]**, or **[UNIT]** key to select unit of input force number.

6. Next, use the **[CELL]**, **[PRINT]**, or **[UNIT]** key to input force number.

7. Use the **[ZERO]** key to confirm and save the changes.

8. In normal force measure mode, if SPF1 or SPF2 is set larger than 0, the electronic level on output line will change according to the setting of OUTx.yz.

9. Press the **[SELECT]** key to return to the last menu item.

10. Press the **[ON/OFF]** key to exit this mode.

4.12.2   Remote Input Selection

1. Enter the Setup Mode by pressing the **[SELECT]** key more than 3 seconds.

2. Use the **[PRINT]** or **[CELL]** key to select IN.OUT>INPUT menu.

3. Press **[ZERO]** to display original function of input line 1. Displayed as INx.yyy.

    x = number of input lines (1 - 4)

    yyyy = is the function of the input line x. Every input line is defined to a key (SELECT, CELL, PRINT, UNIT, ZERO or OFF)

4. Use the **[CELL]** key to change the input line. Use the **[PRINT]** key to select the function of the line.

5. Press the **[ZERO]** key to confirm and save the changes.

6. Press the **[SELECT]** key to return to the last menu item.

7. Press the **[ON/OFF]** key to exit this mode.

4.12.3   Analog Voltage Output

Note: The current draw from analog voltage output should be less than 2.5mA. The resistor added on the output connector should more than 1KΩ.

1. Enter the Setup Mode by pressing the **[SELECT]** key more than 3 seconds.

2. Use the **[PRINT]** or **[CELL]** key to select IN.OUT>OUTPUT>AVOUT menu.

3. Press **[ZERO]** to enter setting mode.

4. Use the **[PRINT]** or **[CELL]** key to select MODE (set analog voltage enable or disable) or 2.V-F (set the force number of 2.5V output) to set the corresponding data of the output.

MODE Menu

1. When in the MODE menu, use the **[PRINT]** or **[CELL]** key to enable or disable output analog voltage.

2. Use the **[ZERO]** key to confirm.

2.5V-F Menu

1. When in the 2.5V-F menu, UNIT.kgf/lbf/n will be displayed. Use the **[CELL]**, **[PRINT]** or **[UNIT]** key to select the unit of input force number.

2. Next, use the **[CELL]**, **[PRINT]** or **[UNIT]** key to input force number that corresponds to the 2.5V analog voltage output.

3. Use the **[ZERO]** key to confirm.

4.

5   Connections and Jumpers

5.1   RS-485 Serial Port Connections and Jumpers

The FI-521 indicator comes standard with one RS-485 network port designed for local networks and multi-drop communication links. Refer to Table 5.1.

Figure 5.1 RS-485 Connection

Table 5.1 RS-485 Port Connections

Designation	Description	Pin	Electrical Level
A	RS-485 signal A	1	0 - 5 VDC
B	RS-485 signal B	2	0 - 5 VDC
GND	ground/common	3	0 VDC

Table 5.2 Termination Resistor Jumper (JP4)

Connected Pins	Function
1-2	RS485 terminal 120ohm resistor on board is disabled
2-3	RS485 terminal 120ohm resistor on board is enabled

5.2   Communication Jumpers

Jumpers on JP8.

RXD2 and TXD2 will need to be set to the desired configuration.

Table 5.3 RXD2 and TXD2 Jumper Connectors

Connected Pins		Function
TXD2	**RXD2**	
		COM2 is not used
		COM2 is used as RS-232
		COM2 is used RS-485

Table 5.4 JP8 Connector

Connected Pins	Function
	COM2 is used as RS-232
	COM2 is used as RS-485
	COM2 is not used
	COM2 is not used

6 Serial Communication

6.1 Com Port 1

COM1 is a RS-232 bi-directional port. See the service manual for connection details.

6.2 Com Port 2

COM2 can be RS-232 or RS-485. See the service manual for connection details.

6.3 Protocol

The baud rate and byte format is set by USER>COM1/2>BAUD.RT and USER>COM1/2>BYT.FMT.

Responses to serial commands will be immediate or within one force measure cycle of the indicator. One second should be adequate for use as a time-out value by a remote (controlling) device.

6.4 Transaction String

The length of each item in a transition string:

● Reading data --- 6 bytes

● Data polarity ----1 byte: "-" for negative, and followed the first digit; " " for positive.

● Decimal point ---1 byte: "."

● Measure unit ----1-3 bytes:" lbf"," kgf","N". Units are always lower case and left aligned

● Current status-- 4 bytes

  ❍ If the force is over capacity, the indicator will return eight "^" characters (the field of polarity, decimal point, force data is filled by "^").

  ❍ If the force is under capacity, the indicator will return eight "_" characters (the field of polarity, decimal point, and weight data is filled by "_").

  ❍ If the zero point is error, it will return eight "-" characters (the field of polarity, decimal point, and weight data is filled by "-").

Useless leading 0 before digits is suppressed, reading force is right aligned.

Table 6.1 Symbols Used

<LF>	Line Feed character (hex 0AH)
<CR>	Carriage Return character (hex 0DH)
<ETX>	End of Text character (hex 03H)
<SP>	Space (hex 20H)
$H_1 H_2 H_3 H_4$	Four current status bytes

<P>	Polarity character: "-" or " "
W 1---W6	Reading data, 1-6 bytes (six digits)
<DP>	Decimal point
U_1U_2 $U_3U_4U_5$	Measure units, kgf, lbf, N
<Add>	Address for indicator: 2 bytes (00-99)
<Prompt>	Prompt characters of output content; max

Table 6.2 Bit Definition of $H_1H_2H_3$ H_4

Bit	Byte 1 (H_1)	Byte 2 (H_2)	Byte 3 (H_3)	Byte 4 (H_4)
0	0 = stable	0 = not under capacity	0 = output 1 is set low	0 = input 1 level is low
	1 = not stable	1 = under capacity	1 = output 1 is set high	1 = input 1 level is high
1	0 = not at zero point	0 = not over capacity	0 = output 2 is set low	0 = input 2 level is low
	1 = at zero point	1 = over capacity	1 = output 2 is set high	1 = input 2 level is high
2	0 = RAM ok	0 = ROM ok	0 = force mode	0 = input 3 level is low
	1 = RAM error	1 = ROM error	1 = peak mode	1 = input 3 level is high
3	0 = eeprom OK	0 = calibration ok	0 = initial zero ok	0 = input 4 level is low
	1 = eeprom error	1 =calibration error	1 = initial zero error	1 = input 4 level is high
4	always 1	always 1	always 1	always 1
5	always 1	always 1	always 1	always 1
6	always 0	always 1	always 1	always 0
7	parity	Parity	parity	Parity

6.5 Commands and Response

Set the USER>COM 1/2>LAYOUT parameter

6.5.1 Single

Command: W<CR> (57h 0dh), request current reading

Response
<LF>^^^^^^^^U_1U_2 U_3<CR><LF> $H_1H_2H_3$ H_4<CR><ETX>---over capacity
<LF>_ _ _ _ _ _ _ _U_1U_2 U_3<CR><LF> $H_1H_2H_3$ H_4<CR><ETX>---under capacity
<LF> - - - - - - - - U_1U_2 U_3<CR><LF> $H_1H_2H_3$ H_4<CR><ETX>---zero-point error
Note: U_1U_2 U_3 is 1 or 3 bytes according to current unit: kgf, lbf,N
<LF><P>$W_1W_2W_3W_4W_5$<DP>W_6 U_1U_2 U_3<CR><LF> $H_1H_2H_3$ H_4 <CR><ETX>---normal data
Note: (1) The decimal point position is determined by CONFIG-PRIM.D

Command: S<CR> (53h 0dh), request current status

Response
<LF> $H_1H_2H_3$ H_4<CR><ETX>

Command: Z<CR> (5ah 0dh)

Response
Zero function is activated (simulate ZERO key) and it returns to current scale status.
<LF> $H_1H_2H_3H_4$<CR><ETX>

If ZERO function cannot be activated, it will return to current scale status.

Command: U<CR> (55h 0dh)

Response
Changes units of measure (simulate [UNIT] key) and return scale status with new units, The new measure unit should be allowed to use
<LF> U_1U_2 U_3<CR><LF> $H_1H_2H_3$ H_4<CR><ETX>

Command: L<CR> (4ch 0dh)

Response
Select next loadcell to work (simulate [CELL] key), and returns indicator status.
<LF> $H_1H_2H_3H_4$<CR><ETX>

Command: X<CR> (58h 0dh)

Response
Power off the indicator, just like press down the [ON/OFF] key.

Command: all others

Response
Unrecognized command
<LF>? <CR><ETX>

Table 6.3 Summary of Command and Response:

Command		Response
ASCII	HEX	
W<CR>	57 0d	Read indicator force: <LF>^^^^^^^^U1U2 U3<CR><LF> H1H2H3 H4<CR><ETX>---over capacity <LF>_____U1U2U3<CR><LF> H1H2H3 H4<CR><ETX>---under capacity <LF>-------- U1U2 U3<CR><LF> H1H2H3 H4<CR><ETX>---zero-point error <LF><p>W1W2W3W4W5<dp>W6U1U2U3<CR><LF>H1H2H3H4<CR><ETX>---normal data
S<CR>	53 0d	<LF> H1H2H3H4<CR><ETX>; read indicator status
Z<CR>	5a 0d	<LF> H1H2H3H4<CR><ETX>; simulate [ZERO] key
U<CR>	55 0d	<LF> U1U2 U3<CR><LF> H1H2H3H4<CR><ETX>; simulate [UNIT] key
L<CR>	4c 0d	<LF> H1H2H3H4<CR><ETX>; simulate [CELL] key
X<CR>	58 0d	power off the indicator, simulate [ON/OFF] key
others		<LF>? <CR><ETX>

6.5.2 Multiple

Output string frame
\<LF>\<Add>\<Prompt>\<p>$W_1W_2W_3W_4W_5$\<Dp>W_6 U_1U_2 U_3\<CR>
---- Line number and content are determined by setting of USER-OUT1/2-xxxx
\<LF>\<Add>\<Prompt>$H_1H_2H_3$ H_4\<CR> ---- USER-OUT1/2-STATUS is set to YES
\<LF>\<Add>\<CR> --- USER-OUT1/2-LINE is set to LINE1 - 9
---The number of blank lines is determined by USER-OUT1/2-LINE setting
\<ETX> --- Last byte of string frame

Caution

● The decimal point position is determined by the CONFIG>PRIM.D parameter.

● The unit position and bytes is determined by which current unit is used.

● The details of \<Prompt> refer to the content in USER Submenu.

● If USER>COM2>EN.ADDR is set to NO, no \<Add> will be output.

● In continuous output mode, if USER>COM1/2>LAYOUT is set to MULTIPLE and many transmissions are selected to output, the output contents from COM1 or COM2 may not catch up with the data processed in the indicator. For real time data, you need to select fewer output transmissions and set higher baud rate for COM1 or 2.

Example Layouts

When USER-OUT1/2-xxxx is set to YES:

INDICATOR ID:	123456
CELL NUMBER:	1
CELL TYPE:	COMPRESS
MESUREMENT TYPE:	FORCE
FORCE:	123.34 lbf
PEAK	150.60 lbf
VALLEY	10.78 lbf
MAX.	192.24 lbf
MIN.	1.56 lbf
DATE:	2016-06-12
TIME:	12:34:56
A/D CODE:	982463
INPUT	1.23034 mV/V
VOLTAGE:	6.7V
STATUS:	bpq2

The broadcast rate of com1 or com2 is determined by following factors:

- The A/D speed which is 80Hz - Once a new conversion ends and new data is received, the MCU (Micro-Control Unit) will prepare the new data for COM1 or COM2. But if last data is not sent out completely, it will wait, and the broadcast rate will be slowed down.

- The contents chosen to output in USER>OUT1/2 - The more contents, the more time will be take to output them.

- One COM or two COMs are used - If two COMs are used, the broadcast rate is determined by the one that takes more time for transmitting and receiving.

- The baud rate - The higher baud rate, the less time taken by the transceiver and a higher broadcast rate is possible.

- Output mode - Only USER>COM1/2>OUT.MOD = CONT/PRT.CMD.

- The time spent on calculation force, preparing output contents and received command (if USER>COM1/2>OUT.MOD=CMD) processing, the more time it takes and the broadcast rate is slower.

The highest rate is 80Hz, even if the highest baud rate, the least output contents and one COM are selected.

6.5.3   EDX

Output string frame
<sp>$W_1W_2W_3W_4$<sp> U_1U_2 U_3<CR><LF>
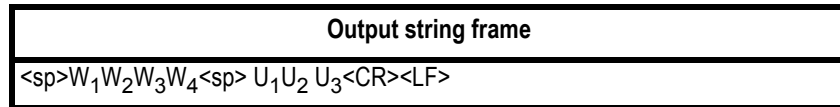
7 Troubleshooting

This chapter gives explanations on commonly seen errors, display characters and display symbols.

7.1 Display Characters

ASCII	LCD/LED	ASCII	LCD/LED	ASCII	LCD/LED
0		A		N	
1		B		O	
2		C		P	
3		D		Q	
4		E		R	
5		F		S	
6		G		T	
7		H		U	
8		I		V	
9		J		W	
		K		X	
		L		Y	
		M		Z	

7.2 Display Symbols

Symbol	Description
$0------$	Zero is over the setting range
$0_____$	Zero point is below the setting range
$Ad------$	Signal to ADC is over maximum range
$Ad_____$	Signal to ADC is below minimum range
$--------$	Weight is over upper limitation or display data is over limitation
$_____$	Weight is below lower limitation
EEP.E1	CONFIG or CAL parameters are not correctly set
EEP.E2	USER parameter is not correctly set
Lo.bAt	Battery voltage is lower than setting
CAP.- - -	Next displaying content is capacity
CAP.Er	Parameters about Capacity is not correct
CAL.P1	Calibration on point (x)
CAL.oFF	Calibration seal switch is on OFF position
CAL.oN	Calibration seal switch is on ON position
CAL.Er	Calibration error, maybe input data or loaded weight is incorrect, unstable, non-linear
CAL.ENd	End calibration
oFF	Power OFF the indicator

7.3 Error Messages and Troubleshooting

Symptom	Probable Cause	Remedy
Ad------ *Ad_____*	Loadcell wires to indicator are incorrectly connected, shorted, opened. ADC or loadcell(s) are damaged.	Make sure wires are ok and correctly connected. Replace loadcell or ADC chip. Service required.
0------	Weight reading exceeds Power On Zero limit.	Make sure no force is applied. Perform zero calibration.
0_____	Weight reading below Power On Zero limit.	Install loadcell. Perform zero calibration.
--------	Weight reading exceeds Overload limit or the weight value cannot be displayed in the current unit of measure because it exceeds 6 digits.	Reduce load on cell until force value can be displayed. Use a more appropriate unit of measure. Reset some parameters of CONFIG or USER.
_____	Weight reading below Under load limit.	Install loadcell.Perform zero calibration.
EEP.E1	CONFIG or CAL parameters are not correctly set.	Reset items in CONFIG menu and recalibrate.
EEP.E2	USER parameter is not correctly set.	Reset items in USER menu.
CAP.Er	Set capacity is over display range.	Set PRIM.N or PRIM.d to make sure capacity is not more than 6 digit.
CAL.Er	Calibration error. Input data or loaded weight is too small, too big, unstable, non-linear.	Input correct data, load correct weight onto platform, Service required.
Will not turn on.	Power cord is not plugged in or properly connected. Power outlet is not supplying electricity. Battery discharged. Other failure.	Check power cord connections. Make sure power cord is plugged into the power outlet. Check power source. Replace batteries. Service required.
Cannot zero the display or will not zero when turned on.	Load on cell exceeds allowable limits. Load on cell is not stable. Loadcell damage.	Remove load on cell. Wait for load to become stable. Service required.
Cannot display weight in desired weighing unit.	Unit not set to enable	Enable unit in CONFIG>UNITS.
Battery symbol is empty or Lo.bAt is shown	Batteries are discharged.	Charge batteries.

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