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1. Introduction

Count Scale

1.1. Overview

The countR scale is a factory configured bench scale completely setup for parts counting, printing & check weighing. It can have up to 250 different products stored in permanent memory. It uses K402 firmware along with the XG line of precision stainless steel scale platforms. It comes in the CR3030 or CR3040 sizes which are 300 x 300mm (12 in x 12 in) or 300 x 400mm (12 in x 16 in).

It may be operated on AC power (110 - 240 VAC). Accessories may include but are not limited to: Remote Display, Serial Printer, RYG-Stack light, DSD Module (Internal CSV Records) & more.

Optical communications (rin-link port) fitted standard and allows for a temporary isolated communications link to be established with a PC. Software upgrades, the use of computerised setup and calibration can then be done using a PC.



The instrument provides zero, tare and gross/net on the fixed keys and supports 3 function keys: counting, unit switching, printing.

The RS-232 communications port can be used for printer driving, connection to a remote display or PC. The transmit only RS-485 communications port can be used for remote displays. There is a built-in clock for date-stamping printed outputs.

The instrument can support different external items such as: stack light, remote IO & relays. This manual covers the K402 counting software.

1.2. Connections



Figure 1: Cable Connections

1.3. Auxiliary Connections

This section provides diagrams to illustrate the communication connections.

1.3.1. RS-232 Serial

• Direct PC Link (RX, TX, GND)



Figure 2: RS-232 - Instrument to PC using COM Port (DB9)

• Printer Connections (TX, DTR and GND)



Figure 3: RS-232 – Instrument to Printer (DB25)

1.3.2. Stack Light





Figure 4: A11018 RYG stack light wiring for directly driving lights via M4301 IO Card

1.4. Optical Communications

A temporary infrared communications link can be established between the instrument and a PC using an optional cable. This connection can be used to transfer setup and calibration information from a PC or to download software upgrades.

The PC end of the cable is a standard USB connector. The instrument end of the cable attaches to the left side of the instrument display. Example shown below.

WARNING

The optical coupling head contains a strong magnet and should not be placed near any magnetic storage media (eg. credit cards, HDD, etc.) Please keep Magnetic Service cable away from loose metal shavings and this will inhibit the operation of the cable.



Figure 5: Optical Communications attachment

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1.5. Accessory Slots

Up to 3 accessory modules can be plugged into the rear of the instrument. There are many types of modules which can be used. These modules provide additional features such as:

Count Count

- communications ports, e.g. Ethernet or RS485 networking
- analogue outputs, e.g. 4-20mA or 0-10V
- digital inputs and digital outputs, e.g. external buttons or setpoint outputs
- DSD functionality, (internal CSV storage).

Caution: Instrument must be switched off before connecting or disconnecting accessory modules.

Each module will come with a manual which explains the features, installation and use of the module.

After connection, the module may need to be configured using the instrument setup menus.

The details of the accessories can be viewed using the Acc key (long press of the 0 key)



The onboard serial Port (Comms) allows for 2 serial devices to be connected:

RS-232 Serial

Printer (TXD, GND) (Ser1A)

Refer to documentation supplied with the Printer for connection details. Connect TX on the R423 to RX on Printer. Connect the RS232 GND signals together.

RS-485 Serial

Remote Display (TA, TB) (Ser1B)

RS485 is recommended for communicating over distances longer than a few metres. Connect TA to RA and TB to RB on the remote display.

2. Setup Menus

Count **Scale**

Throughout the setup menus different data entry methods are used. Each method is described below.

2.1. Accessing Setup Menus

There are two methods to access the Setup area:

 The Full Setup method provides access to all functions in Setup, including legal for trade and calibration sensitive settings. Changes in Full Setup mode may result in the calibration counter being incremented. If an attempt is made to enter Full Setup using the incorrect passcode, the instrument will respond with the message ENTRY DENIED.



2.1.1. Setup Display Prompts

When accessing **Full** or **Safe Setup** the instrument will beep twice and enter the Setup Menus. If a passcode has been configured, the **P.CODE** prompt will display and the correct passcode must be entered to continue.

If access is granted the following is displayed:

FULL (SAFE) \rightarrow SETUP \rightarrow Software Version (eg. V1.0) \rightarrow Serial Number \rightarrow Calibration Counter (eg. C.00010).

2.2. Exiting Full or Safe Setup

To save settings, exit setup and return to the normal weighing mode use one of the following methods:

Method 1: Press and hold both the **<POWER>** and **<F3>** keys together for two seconds.

Method 2: Press the <ZERO> key repeatedly. When End displays press <TARE>.

Method 3: Short Press the **<POWER>** key.

The instrument will beep and then display the following:

Software Version (eg. V1.0) \rightarrow Calibration Counter (eg. C.00010).

Warning: If the power is interrupted while in setup (i.e. by disconnecting the power cable), unsaved settings will be lost.

2.3. Menu Navigation

The setup menus are a normal menu tree structure. The current level is shown in the auxiliary display in the top right corner of the LCD.

To access a lower level menu, use the key to the right of your current key. To return to the upper levels, use the keys to the left of your current key.

2.4. Changing Data

Menu items containing data are shown along with their data (strings may show the first few characters only). This data can be changed by using the editing keys. When editing is finished, press the OK key to accept the new data. If the new data is unwanted, press the cancel key (Sometimes several presses are required). While editing, the type of data being edited is shown in the top right corner of the LCD.

Setup Menu Quick Reference

Note:

 Read-only Safe Setup. Changing this setting will increment the Calibration Counter.
 Read-only Safe Setup. Changing this setting will not increment the Calibration Counter.

Count

L1	L2	L3 L4	Item	
GEN.OPT	LANG		Operator language	
	P.T.SCP		Preset fare scope (K402 and K491 only)	
	DATE.F		Date Format	
	P.CODE	SAFE.PC	Safe setup passcode	
	-	FULL.PC	Full setup passcode	
		OP.PC	Operator passcode	
	KEY.LOC	Р	Power key lock	
		ZERO, TARE, GR.NET	Fixed Function Keys	
		F1,F2,F3	Programmable Function Keys	
		CLOCK, VIEW etc	Operator Functions	
	DISP	B.LIGHT	Backlight operation	
		FREQ	Display update frequency	
		AUX.DSP	Auxiliary display function	
		VIEW	Default View	
	ID.NAME	NAME.1 NAME.5	Names for the five User ID strings	
	POWER	AUT.OFF	Auto-off	
		START	Pause on Start-Up	
	STR.EDT		String editor mode	
	USR.DEF		User defaults (all items except scale menu items)	
H.WARE	LC.HW	MVV	mV/V test	
		OL.CNT	Overload count	
		OL.CLR	Clear overload count	
	SER1.HW,	BAUD, PARITY, etc	Settings for serial port 1 (SER1.HW) and the optional serial	
	SER2.HW		port 2 (SER2.HW).	
	ETH.HW	DHCP, IP, G.WAY	IP Configuration settings for the M4221 Ethernet module	
		ETH.DEF	Reset the M4221 Ethernet module to defaults	
	10.184		Prepare module for reflashing	
	IO.HW	FRC.OUT	Force outputs test	
			Check inputs test	
		DB.1.8 - DBNC.1.	Debounce settings for inputs	
		DB.25.32 DBNC.32		
	ANL.HW		Voltage of current selection	
			Output clip enable	
			Adjust to output (4mA or 0)()	
		ANL.CAL ADJ.LO	Adjust to output (411A of 0°)	
			Automatically overwrite eldest records when DSD full	
	030.000	DSD STR	Custom string to store with DSD records	
	ти т нw	ANGLE	Displays current X X angles	
	(K491	FACTOR	Displays current compensation factor	
	only)	ZERO	Sets the user zero of the tilt sensor	
		F ZERO	Restores the factory zero of the tilt sensor	
SCALE	BUILD	TYPE	Range type	
00/122		CABLE	6-WIRF or 4-WIRF	
		DP	Decimal Point position	
		CAP1	Capacity of Scale / Range 1 / Interval 1	
		E1	Resolution of Scale / Range 1 / Interval 1	
		CAP2	Capacity of Scale / Range 2 / Interval 2	
		E2	Resolution of Scale / Range 2 / Interval 2	
		UNITS	Scale Units	
		HI.RES	x10 Expanded mode	
		MAX.XY	Maximum XY Tilt setting (K491 only)	
		MAX.X	Maximum X Tilt setting (K491 only)	
		MAX.Y	Maximum Y Tilt setting (K491 only)	
	OPTION	USE	Trade Use	
		FILTER	Averaging	
		MOTION	Motion Detection	
		Z.RANGE	Range of Zero (%)	
		Z.TRACK	Zero Tracking	
		Z.INIT	Zero on Startup	
		Z.BAND	Band of Zero	
		EXT.EX	External excitation	
		R.ENTRY	Full access via rear button only	
		TOT.OPT	Weight type for totalising	
	CAL	ZERO	Calibrate Zero	
		SPAN	Calibrate Span	



L1	L2	L3 L4 ED.LIN		L4	Item
					Set Linearisation
		CLR.L	IN		Clear Linearisation
		DIR.ZER DIR.SPN TILT A TILT B			Direct mV/V Zero Calibration
					Direct mV/V Span Calibration
					Tilt Compensation Factor A (K491 only)
					Tilt Compensation Factor C (K491 only)
		TILT D LC.ZERO			Tilt Compensation Factor D (K491 only)
					Loadcell zero offset (K491 only)
		DEF.C	AL		Default Calibration (all scale settings to defaults)
	QA	QA.OP	Τ		QA Enable
		QA.YEAR, QA.MONTH		QA.MONTH	QA Expiry Date
FUNC	NUM	QA.DA			Number of special functions
	SF1 – SF8	ТҮРЕ			Туре
		KEY			Key assignment (Not for Thumbwheel)
		PRT.O	UT		Print: printout
		TOTAL	-		Print: totalising
			SK		Print: Confirm clear
			<u> </u>		Print: Automatic
			<u> </u>		Print: Interlock type
		SCOP	È		Counting, Units: Scope
		MODE	_		Units: Mode
		UNIT			Units: Alternative unit
		U.STR			Units: Alternative unit string
		EDT.W	<u>IGT</u>		Counting: Edit weight
					Counting: Maximum adjustment % for resample
					Counting: Eail count Single: Auto Output to use
		BLANK IO.BAND			Blank: Blanking function
					Thumb: Inputs connected to thumbwheel
		FUNC			Remote Key: Function to trigger
		CLR.TOT			Report print clear totals
		THRES	SH		Auto-tare: Weight threshold before taring
	4000	ZER.D	LY		Auto-tare: Delay before switching to gross in zero band
SER.NET					Network address
	STRT CH				Start char for Lua buffer protocol
	END.CH.1			End char for Lua buffer protocol	
	END.CH.2				End char for Lua buffer protocol
	NET.1 – NET	T.n TY		E	Protocol type
			SER		Serial port
			RES	P	Respond with OK for simple protocol commands
		SOURCE		IRCE	Source for barcode protocol
JER.AUI				Frequency	
	AUTO.n	SERIAL FORMAT SOURCE			Serial port
					Format
					Weight type
		EV.AUTO			Custom format string
PRINT	NUM				Number of printouts
	HEADER				Header
	PAGE	WIDTL			Footer Page width
	PAGE				Page Height
		PG.EN	D		Page End String
	SPACE	TOP			Blank lines at the top
		LEFT			Blank characters on the left
	BOTTOM			Blank lines at the bottom	
	PRINT.1 –	- TYPE FORMAT			Printout type
	PRINT.N				Format
			L		Serial polit
		CUST	DM	REC.PRN	Custom string for record printout
			- 111	DOC.PRN	Custom string for docket printout
				EV.D.NEW	Custom string for new docket
			EV.D.END	Custom string for end of docket	
				EV.P.NEW	Custom string for new product

Count

L1	L2	L3	L4	Item
			EV.P.END	Custom string for end of product
			REP.ST	Custom string for start of report
			REP.PR	Custom string for each product in a report
			REP.END	Custom string for end of report
SETP	NUM			Number of Setpoints
	SETP1	TYPE		Type of setpoint
	SETP16	OUTPUT		Output to use
		LOGIC		Active High or Active Low logic control
		ALARM		Setpoint Alarm
		SOURCE		Target value source
		SCOPE		Product or global targets
		HYS		Hysteresis
		MASK		Logic setpoint mask
		DELAY		Pulse timing delay
		ON		Pulse timing duration
		RDY.TIM		Scale ready setpoint wait time
		REG		Register to use as source
		TIMING		Setpoint timing option
		RESET		Input to use for reset
		PLS.NUM		Number of pulses for pulse timing
		RST.LGC		Active high or active low for reset input
		NAME		Name of the setpoint
ANL.OUT	ABS	S		Use absolute weight
SOURCE RANGE			Weight type	
			Weight range	
	WGT.LO			Weight for low transmission
	WGT.HI	WGT.HI		Weight for high transmission
End	End			Save and Close

Table 1: Menus

3. Basic Operation

Count

3.1. Keypad





Code	Description	
1	Numeric Button	0-9
2	White Characters	Hold 2 seconds
3	Orange Characters	(Alpha and Symbols)
C	Cancel	Undo last command; step backwards (including in setup menus).
	Up	Move cursor backwards; previous option
\bigcirc	Down	Move cursor forwards; next option
OK	ОК	Accept this choice
0	Decimal Point	Place decimal point
€	+/- alibi	Change to negative or positive number; Change Editing VIEW (eg ASCII vs string)

ZERO

When an empty scale has drifted away from a true zero reading, this key is used to perform a zero adjustment on the scale display. The zero adjustment is stored when power is removed and is re-used when next powered up.

The amount of weight that may be cancelled by the **<ZERO>** key is limited by the Z.RANGE setting.

Short Press



3.3. Tare Key



This key is used to temporarily set the scale to zero (such as cancelling the weight of a carton before performing a filling operation). The display will show the Net weight and the NET annunciator will be lit.

The weight tared is deducted from the allowable range of the scale, reducing the maximum weight that can be displayed.

Preset Tare: Preset Tare values are entered using the Numeric Keys followed by the TARE key. (E.g. to enter 1.5kg as a preset tare, press <1> <.> <5> <TARE>)

The tare adjustment is stored when power is removed and is re-used when next powered up.



• Short Press





Count

• Displaying Preset Tare



3.4. Gross/Net Key (Select Key)

This key toggles the weight display between the Gross weight and the Net weight (provided that a Tare has previously been acquired using the **<TARE>** key).



If a pre-set Tare has been entered, the value of the pre-set Tare will be temporarily displayed when switching from Gross to Net display.

Short Press



3.5. Function Keys



3.6. Up, Down & OK keys: Products (K402)



These keys are used to control the products. A short press of <UP> and <DOWN> keys is used to select products. A long press of the <UP> key will add new products. A long press of the <DOWN> key will delete products. A long press of the <OK> key will edit the name of the current product. Tare weights, Piece Weights and Setpoint (over/under) values can be stored to each product.

• Short Press of Up and Down keys

A short press of these keys will allow the user to select the desired product from a list of the 10 most recently used. The keypad can be used to enter the first letter of the product name. This narrows down the search to a specific range. The <UP> and <DOWN> keys will then step through the list of product starting with the entered letter.

Count



• Long Press of the Up Key (Add)

A long press of this key allows the user to create a new product. The name of the new product must be specified.



• Long Press of the Down Key (Del)

A long press of this key will prompt the user to delete all products, if the user presses the cancel key it will then prompt the user to delete the current product. Products can only be deleted if the total weight is 0. Product totals can be cleared using a long press of the 4 key (Total).



• Long Press of the OK Key (Edit)

A long press of this key allows the user to change the name of the current product.

Count



3.7. Clock

A long press of the 1 key (Clock) allows the system time and date to be viewed and changed



3.8. View

A long press of the 2 key (View) allows the display function to be changed.



 For Counting Scale PRODUCT is the desired display mode. DUAL can be used for showing Gross/Tare/Net Values however the current product will not be displayed in this mode.

3.9. Targets (Stack-light Config)

A long press of the 7 key (Target) allows over/under setpoint targets to be viewed and changed.



After Long pressing #7 then RED.HI will be displayed – enter the over count for the pieces for current product using number pad and then press "OK" key. This output corresponds to RED stack light output.



Once over value has been entered use Up/Down Arrow keys to navigate to YEL.LO setting for under target vale and key in low Piece count for Yellow stack light output.



See Section 1.22 for wiring of Stack light to M4301 IO Card.

4. Calibration

The calibration of the indicator is fully digital. The calibration results are stored in permanent memory for use each time the instrument is powered up.

To perform a calibration, when in Full Setup select the **SCALE:CAL** menu.

The calibration programming will automatically prevent the instrument from being calibrated into an application outside of its specification. If an attempt is made to calibrate outside of the permitted range, an error message will display and the calibration will be abandoned.

4.1. Performing a Digital Calibration with Test Weights

The Zero setting (SCALE:CAL:ZERO) specifies a gross zero point for the scale. The Span setting (SCALE:CAL:SPAN) specifies a second point (preferably close to full scale) used to convert the A/D readings into weighing units (eg. kg).

Notes:

- 1. Calibration points (Zero, Span and Linearisation) must be spaced by at least 2% of Full scale from each other.
- 2. First span point must be 10% of full scale or greater for successful calibration.

4.2. ZERO (Zero Calibration Routine)







Count

5. Function Keys

5.1. Introduction



The instrument has 3 special function keys on the front panel. The function of these keys can be configured to any of the key functions detailed below.

FUNCTION> keys have no primary function pre-programmed. Each primary function has an associated overlay sticker (supplied) that should be applied to the function key to label the function. Ensure the keypad is clean and dry before affixing the sticker.

5.2. Key Functions

5.2.1. F2 PRINT KEY

F2 print key can be used to trigger any of the configured printouts. It can also add to totals or undo the last add. When docket printing, a long press ends the docket.

Short press



Ticket Example:



5.2.2. F1 COUNT KEY

F1 counting key is used to convert weight to number of items (pieces) on the scale.

Short press

A short press switches the display between weight and pieces.



Long press

A long press allows the sample size and weight to be changed.



If EDT.CNT is set to OFF then the quantity entry step shown above will be skipped and a quantity of 100 will be used. If EDT.WGT is set to RESAMP then you can add more pieces and the indicator will adjust the piece weight as long as the change is less than the MAX.ADJ setting. If the resample was successful then the indicator will beep twice and store the new value, otherwise a long beep will sound and the new value will be discarded.

5.2.3. F3 UNITS Key

The F3 units key is used to convert primary (calibrated) units to alternative units. LB/KG or KG/LB

Short press

A short press switches between primary and alternative units.

Long press

A long press allows the units conversion factor to be entered. If lb/kg switching is chosen, this will be unavailable.







5.2.4. Optional: SEMI.P.T

A short press of the semi-auto preset tare button will set the preset tare to the current gross weight.

Count



5.2.5. Optional: A.TARE

A short press of the auto tare button will enable or disable the auto tare feature, a capital A will be seen at the top left of the display when auto tare is enabled.



6. Setpoints

6.1. Overview

The indicator supports up to 8 separate set points. Three of which are preconfigured to drive an optional High Low Go stack light. See Section 1.3.2 for wiring info.

IO1=Red light

IO2=Yellow light

IO3=Green light

Black Wire to COM -

Part number: A11018

A set point target is set by the operator using the Target Key(#7 long press) on the front panel or via Viewer using the Operator Menu. Refer to section 4.2.0



7. Automatic Weight Output

7.1. Overview

The automatic output is normally used to drive remote displays, a dedicated computer, or PLC communications. It is configured using the **SER.AUT** menu. The RS-232 or the RS-485 port can be used.

The rate of transmission is set by the TYPE setting. AUTO.LO and AUTO.HI send unsolicited messages at 10Hz and 25Hz respectively. SINGLE only sends messages when a SINGLE input is received from an external input. This enables external systems like PLCs to synchronise the AUTO output to their requirements. AUT.TRC sends a message for every traceable weight and is usually combined with FMT.TRC to provide a tally roll printer log.

7.2. Auto Weight Format String

The weight format string may be set to the following formats:

Format	Description
FMT.A	<stx> <sign> <weight(7)> <status> <etx></etx></status></weight(7)></sign></stx>
FMT.B	<stx> <s0> <sign> <weight(7)> <units(3)> <etx></etx></units(3)></weight(7)></sign></s0></stx>
FMT.C	<stx> <sign> <weight(7)> <s1> <s2> <s3> <s4> <units(3)> <etx></etx></units(3)></s4></s3></s2></s1></weight(7)></sign></stx>
FMT.D	<stx> <sign> <weight(7)> <etx></etx></weight(7)></sign></stx>
FMT.E	<stx> <sign> <weight(7)> <s5> <units(3)> <mode(4)> <etx></etx></mode(4)></units(3)></s5></weight(7)></sign></stx>
FMT.REG	ADDR CMD REG : DATA
FMT.TRC	CONSEC SP DATE SP TIME SP TRACE <cr><lf></lf></cr>
CUSTOM	As per contends of the EV.AUTO token string.
FMT.F	<stx> <sign> <weight(7)> <units> <s1> <s2> <cr> <lf></lf></cr></s2></s1></units></weight(7)></sign></stx>
FMT.G	<stx> <sign> <weight(7)> <s1> <s2> <s3> <s4> <units(3)> <etx></etx></units(3)></s4></s3></s2></s1></weight(7)></sign></stx>

Where

- STX: Start of transmission character (ASCII 02).
- ETX: End of transmission character (ASCII 03).
- SIGN: The sign of the weight reading (space for positive, dash (-) for negative).

7.3. Custom Printing

A print docket is built up from multiple print passes. Each of the print passes is defined by a specific configuration string. Print passes are triggered by operator events – these include short and long press of the Print key and actions like changing products.

The content of the configuration string for each event includes direct text (the word "Weight" to be placed near the current weight for example) and control characters called 'Tokens'. Tokens are used to specify where the instrument data fields are to be inserted.

Tokens are characters outside the normal printable range. Each token character is represented by a three character escape sequence consisting of a '\' followed by two hex characters or by a three digit decimal ASCII number. When entering tokens via the instrument keys the decimal ASCII code is used. When entering tokens using the viewer software the escape sequence is used.

D7 (ASCII 215) = current displayed weight **BF** (ASCII 191) = date **C0** (ASCII 192) = time

A simple custom format string might be:

Weight: \D7\C1

To produce: Weight: 30.0kg when the print key is pressed.

7.4. Tokens - what is a token?

Tokens are special ASCII characters outside the normal printing range. These characters are used to specify where instrument data fields like 'Current Weight' are to be inserted into custom format strings. For complete Token list refer to K401/K402 reference manual.

7.4.1. Non-paged generic tokens

Code		Token
128	(80 _H)	ASCII NULL (send an ASCII 00H character)
191	(BF _H)	Date
192	(C0 _H)	Time (24H format)
193	(C1 _H)	Newline
194	(C2 _H)	Left spaces
195	(C3 _H)	Top blank lines
196	(C4 _H)	Bottom blank lines
197	(C5 _н)	Unique consecutive print ID
198	(C6 _H)	Header
199	(C7 _H)	Footer
200	(C8 _H)	Page end string
201	(C9 _H)	User String Data 1
202	(CA _H)	User String Data 2
203	(CB _H)	User String Data 3
204	(CC _H)	User String Data 4
205	(CD _H)	User String Data 5
206	(CE _H)	User String Name 1
207	(CF _H)	User String Name 2
208	(D0 _H)	User String Name 3
209	(D1 _H)	User String Name 4
210	(D2 _H)	User String Name 5
211	(D3 _H)	Time (12H format)
213	(D5 _H)	Settable consecutive print ID
214	(D6 _H)	Reset to 1 the settable consecutive print ID

 Table 2: Print tokens: generic

7.4.2. Page 0 (BE_H), tokens: Weight Information

These pages hold weight information.

Code		Token
215	(D7 _H)	Displayed reading (gross or net)
216	(D8 _H)	Gross reading
216	(D9 _H)	Net reading
218	(DA _H)	Piece reading
219	(DB _H)	Alternative displayed reading (gross or net)
220	(DC _H)	Alternative gross reading
221	(DD _H)	Alternative net reading
222	(DE _H)	mV/V value
223	(DF _H)	Absolute gross peak reading
224	(E0 _H)	Preset tare value
225	(E1 _H)	Tare value (tare or preset tare)
226	(E2 _H)	Tare label (T or PT)
227	(E3 _H)	Unit ID

Count

7.4.3. Format tokens

Format tokens define the behaviour of all subsequent tokens in a string.

Code	Format Tokens			
149 (95 _н)	5 character weight string, decrementing to 3 with wrapping (5,4,3,5)			
150 (96 _н)	6 character weight string			
151 (97 _н)	7 character weight string			
152 (98 _н)	8 character weight string			
153 (99 _H)	9 character weight string			
154 (9A _н)	10 character weight string			
155 (9B _н)	No sign characters			
156 (9C _н)	Sign is ' ' for positive and '-' for negative			
157 (9D _н)	Sign is '0' for positive and '-' for negative			
158 (9E _н)	Sign is '+' for positive and '-' for negative			
159 (9F _н)	No decimal point			
160 (А0 _н)	Decimal point is '.'			
161 (А1 _н)	Decimal point is ','			
162 (А2 _н)	Weight send without leading characters			
163 (АЗ _Н)	Weight sent with ' ' for leading characters			
164 (А4 _н)	Weight sent with '0' for leading characters			
165 (А5 _н)	Show weight on error			
166 (А6 _н)	Show dashes instead of weight on error			
167 (А7 _н)	Show spaces instead of weight on error			
168 (A8 _H)	Use uppercase status characters			
169 (A9 _H)	Use lowercase status characters			
170 (AA _H)	Hide units			
171 (АВ _н)	Show decimal point even if it is at the end of a number			
172 (АС _н)	Turn page and line tracking off			
173 (AD _H)	Toggle space between weight and units			
174 (АЕ _н)	Increment the length or print IDs with wrapping from 6 to 9			
175 (AF _н)	Don't show weight			
178 (B2 _H)	Add D840 traffic light status to sign chars			

8. Appendix 2: Error Messages

8.1. Overview

A number of error messages may be displayed to warn of operation outside of the acceptable limits. These messages may appear on either the primary or the secondary display. Short messages (XXXXXX) will appear as a single message. Longer messages (XXXXXX) (YYYYYY) will appear on the display in two parts, first the (XXXXXX) part, then the (YYYYYY) part.

Count Scale

8.2. Weighing Errors

These messages show status messages or errors that may occur during normal weighing operation.

Error	Description	Resolution
(U.LOAD)	The weight is below the minimum allowable weight reading.	Increase the weight or decrease the minimum allowable weight reading.
(O.LOAD)	The weight is above the maximum allowable weight reading. Warning - overloading may damage mechanical scale elements.	Check the condition of load cell connections. Check for damaged load cell.
(ERROR) (RANGE)	The weight reading is beyond the limit set for Zero operation. The operation of the <zero></zero> key is limited in the setup during installation. The indicator cannot be Zeroed at this weight.	Increase the Zero Range (Z.RANGE) or use the <tare></tare> key instead.
(ERROR) (MOTION)	Scale motion has prevented a <zero></zero> or <tare></tare> operation from occurring on command.	Try the operation again once the scale is stable.
(ERROR) (ADC)	An error with the ADC has prevented a <zero> or <tare> operation from occurring</tare></zero>	Ensure loadcell cabling is correct.

Table 3: Errors: weighing

8.3. Setup Errors

These messages show status messages or errors that may occur during the instrument setup.

Error	Description	Resolution
(ENTRY)	When accessing setup, more	Turn the instrument off. When
(DENIED)	than three attempts have	the instrument is turned back
	been made with the incorrect	on, enter the correct passcode
	passcode.	to access setup.
(WR DENIED)	The instrument may be in	Access Full Setup to access this
(RD DENIED)	Safe Setup and an item that	item.
	needs Full Setup has been	
	selected for editing.	

Table 4: Errors: setup

8.4. Diagnostic Errors

The instrument continually monitors the condition of the internal circuits. Any faults or out-of-tolerance conditions are shown on the display as an **E** type error message.

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In the table below the following terms are used:

- **Check**: This item can be checked on site by service personnel.
- **Return for Service**: The instrument must be returned for factory service.

Error	Description	Resolution
(E0001)	The power supply voltage is too low.	Check supply
(E0002)	The power supply voltage is too high.	Check scale / cables
(E0004)	Positive sense voltage out or range.	Check scale connections and SCALE:BUILD:CABLE setting.
(E0008)	Negative sense voltage out or range.	Check scale connections and SCALE:BUILD:CABLE setting.
(E0010)	Temperature is outside of allowable limits	Check location
(E0020)	Module Error	Replace Module
(E0040)	Data not received from Tilt Sensor	Check Tilt Sensor
(E0200)	The calibration information has been lost.	Re-calibrate
(E0400)	The factory information has been lost.	Return for Service
(E0800)	Application settings have been set to defaults.	Check and re-enter application settings
(E2000)	ADC Out of Range Error. This may be caused from a broken load cell cable.	Check BUILD:CABLE setting. Check load cell cable, wiring, etc.
(E4000)	The runtime information has been lost.	Check Zero and tare settings.

Table 5: Errors: diagnostic

The **E** type error messages are additive. For example if instrument is running off batteries and the temperature drops, the battery voltage may be too low. The resulting error messages will be **E 0011** (0001 + 0010). The numbers add in hexadecimal as follows:

1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9 - A - B - C - D - E - F (For example, 2 + 4 = 6, or 4 + 8 = C)