SMART WEIGHING SOLUTIONS

5230 Digital Indicator (Truck Weigher) Reference Manual

For use with Software Versions 2.0 and above

5200-600-240

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SPECIAL NOTE
Trade Use of the Rinstrum 5230

This manual may occasionally make reference to Trade Use settings of the **5230.** Only properly marked Trade Certified versions of the **5230** can be used in **Legal for Trade** applications. Trade Certification is available only on **5230** units with software Versions 2.0 and above.

Some individual settings may not be legal for trade use. Please check regulations with the appropriate Weights and Measures Authority.

"Everything should be made as simple as possible, but not simpler."

- Albert Einstein -

Table of Contents

1. Introduction

The **Rinstrum 5230** is a precision digital indicator using the latest Sigma-Delta A/D converter to ensure extremely fast and accurate weight readings.

The setup and calibration are digital, with a non-volatile security store for all setup parameters. There is an NVRAM store to ensure day-to-day operating settings are retained when power is removed. There is a built-in clock for date-stamping printed outputs.

Two optional expansion cards are available for the **5230**. The first is the Setpoint card, which provides four opto-isolated open-collector output drive transistors and four opto-isolated inputs. The second is the Combo card that combines the analog and setpoint functions to provide one opto-isolated input and two opto-isolated open-collector outputs, along with a –10 to 10V or 4-20 mA analog output.

The communications ports provide two serial outputs. These allow communication with external computers, PLCs, printers and remote displays. Serial 1 provides both RS-232 and full duplex RS–485 drivers whilst Serial 2 provides RS-232 only. An optional RS-232 to Current Loop converter is also available which converts the RS-232 output to a passive 20mA current loop transmitter.

The **5230** has been optimised for truck weighing applications and is capable of storing information on up to 200 truck/product/destination IDs. Truck, Product and Destination IDs may be entered as six character strings or six digit numbers

Figure 1: Rinstrum 5230 Digital Indicator

1.1.

The Manuals

This Reference Manual is part of a set of manuals covering the setup and operation of the Rinstrum **5230**. The set includes the following:

- **Reference Manual** (this book) - Contains detailed information on the calibration and setup of the **5230**. This manual is intended for use by Scale Technicians who are installing the instrument.
- **Operator Manual** - Aimed at the operation of the **5230**, and covers the day to day operation of the unit. This includes details of the operation of the front panel and external key functions.
- **Quick Start Manual** - Intended for Scale Technicians who are familiar with the **5230** and simply need a quick reference to menu options and connection diagrams, etc.
- **Applications Manual** - Contains descriptions of commonly used functions and their associated settings.
- **Communications Manuals** - Contain details on the extended networking capabilities of the **5230**.

1.2. Document Conventions

The following document conventions are used throughout this Reference Manual.

Bold Text	Bold text denotes words and phrases to note.
<Key>	**<Key>** denotes a Keypad key. **Note:** In the Specifications section the **<** symbol means **less than** and the **>** symbol means **greater than**.
Item vs Field	Item and Field are interchangeable however Item is generally used to describe settings in the keypad, whereas Field is generally used to describe settings in the Viewer.
…	Ellipses indicate an incomplete listing. For space considerations in this Reference Manual complete listings may not be shown.
^	This symbol denotes one space (used in Weight Formats - Auto A to Auto E page 102).
Ä	Items marked with Ä indicate that the setting is available only in Full Setup and is trade critical. When trade critical settings are changed the trade counter will be incremented.
®	Indicates functions are only suitable for remote inputs.

2. Specifications

Performance	
Display	Backlit LCD with 20mm, 6 digit primary display
Display Resolution	Up to 100,000 divisions, minimum of 0.15 µV/division (Trade 6000 divisions at 0.5µV/division)
Count-by	1, 2, 5, 10, 20, 50, 100 (Entered in Displayed Weight)
Operating Modes	Single Range, Dual Interval and Dual Range
Zero Cancellation	+ / – 2.0mV/V
Span Adjustment	0.1mV/V to 3.0mV/V full scale
Stability/Drift	Zero: < 0.1uV/°C, Span < 10ppm/°C, Linearity: < 20ppm, Noise: < 0.05µV p-p
Operating Environment	Temperature –10 to +50°C, humidity < 90% non condensing
Digital	
Setup and Calibration	Full digital with visual prompting in plain messages
Memory Retention	Full non-volatile operation
Digital Filter	Averaging from 1 to 200 consecutive readings
Zero Range	Adjustable from 4% to 100% of full capacity
A/D Converter	
Type	24 bit Sigma Delta
Resolution	8,388,608 internal counts
A/D Sync Filter	Adjustable, 12.5 to 60 cycles / second, FIR filter > 80dB
Load Cells	
Excitation	8 volts for up to 12 x 350 ohm load cells
Load Cell Connection	6 wire + shield
Serial Comms	
Serial Outputs	Dual RS-232, plus RS-485
Capabilities	Automatic transmit, network or printer drive
Clock	Battery backed clock and calendar fitted
Power Supply	
DC	12/24VDC 10VA
AC	86 - 260VAC 48 - 62Hz 10VA
Dimensions	
Body Size	135mm wide x 65mm high x 105mm deep
Front Bezel	179mm wide x 82mm high (Overhang is 20mm on left and 23mm on right of Bezel)
Panel cutout	DIN 43 700 -137(+1)mm wide x 68(+1)mm high
Options	
Setpoint Option Card	4 x isolated 50volt, 500mA open collector transistor drives and 4 x isolated digital inputs (5V to 28V)
Combo Option Card	–10 to 10V or 4-20mA opto-isolated analog output, two outputs and one input as per the setpoint option card
No. of Option Slots	One standard
Features	
	C-tick approved. CE, OIML and NSC Approved
	Five point linearity correction
	Adjustable anti-vibration filter

3. Overview

The **5230** Truck Weighing indicator is specifically designed for easy operation of weighbridge printouts and simple totalising. The **5230** dedicated keypad helps with the logical steps to perform the functions required in most sites.

Storing or printing first weights, full docket printouts with Truck, Product and Destination IDs makes this the ideal indicator for weighbridge controls. Programming the information into the **5230** has also been made easier by an optional viewer package.

The unit is capable of a one only weighing or can accommodate up to 10 axle weighings. An option is also available to allow for weighings where the number of axles in the first weighing differs from the second weighing. An automatic weighing function has also been included in the **5230** to allow axle weighing to be performed with only one visit to the indicator.

The following provides a brief overview of some of the most used functions of a weighbridge operation. Refer to the **5230 (Truck Weigher) Applications Manual** for information on settings for these sample functions.

3.1. Single Weight Ticketing (One Pass Only)

With **Single Weight Ticketing** the gross weight of a truck is printed but not stored.

An option is available to allow for a user defined ID to be entered for each weighing. Fixed printouts are available to give details of the transaction (including ID if entered). This function does not allow for Product or Destination.

3.2. Single Weighing (In-Out)

A **Single Weighing** allows a vehicle to be weighed and the weight stored as a first weight. This first weight can be printed if required. When the second weight is performed, the difference between the first and second weight is registered as the net weight. The vehicle can be either fully loaded or empty on the first weighing.

Fixed printouts are available to give all details of the transaction. As well as logging the Truck ID, a Product ID and Destination ID can also be logged on the printout. The Totals for Truck, Product and Destination IDs are available on the front display and also through the printer port.

3.3. Single Weighing with Preset Tare (In-Out)

A **Single Weighing with Preset Tare** allows the weight of a vehicle to be entered via the keypad. The weight is stored as a first weight preset tare and can be set to expire after a selectable time frame (eg. immediately, 7 days, 14 days or never). Only a second weighing is now required with the loaded vehicle.

Fixed printouts are available to give all details of the transaction. As well as logging the Truck ID, a Product ID, Destination ID and Preset Tare can also be logged on the printout. The Totals for Truck, Product and Destination IDs are available on the front display and also through the printer port.

3.4. Batch Single Weighing (In-Out)

With **Batch Single Weighing** the batching is performed directly on the weighbridge. The operation allows a truck to be tared off and, via the optional outputs, a silo can be controlled to dump a specified amount of product into a truck while it's still on the weighbridge.

Fixed printouts are available to give all details of the transaction. As well as logging the Truck ID, a Product ID and Destination ID can also be logged on the printout. The Totals for Truck, Product and Destination IDs are available on the front display and also through the printer port.

3.5. Multiple Axle Weighing (In-Out)

A **Multiple Axle Weighing** allows up to 10 axles of a vehicle to be weighed and the weights stored as a first weight. These weights can be printed if required. With the first and second weighings, the number axles on the vehicle must be the same. When the second weighing is performed, the difference between the first and second weight is registered as the net weight. The vehicle can be either fully loaded or empty on the first weighing.

Fixed printouts are available to give all details of the transaction. As well as logging the Truck ID, a Product ID, Destination ID and axle weights can also be logged on the printout. The Totals for Truck, Product and Destination IDs are available on the front display and also through the printer port.

3.6. Variable Axle Weighing (In-Out)

A **Variable Axle Weighing** allows up to 10 axles of a vehicle to be weighed and the weights stored as a first weight. These weights can be printed if required. With the first and second weighings, the number axles on the vehicle may be different (eg. due to retractable axles, or in the case of logging industries, where the boggy is carried on the back of the prime mover when not loaded). When the second weighing is performed, the difference between the first and second weight is registered as the net weight. The vehicle can be either fully loaded or empty on the first weighing.

Fixed printouts are available to give all details of the transaction. As well as logging the Truck ID, a Product ID, Destination ID and axle weights can also be logged on the printout. The Totals for Truck, Product and Destination IDs are available on the front display and also through the printer port.

3.7. Automatic Multiple Axle Weighing (In-Out)

An **Automatic Multiple Axle Weighing** allows up to 10 axles of a vehicle to be weighed and stored automatically with only one visit to the indicator at the axle scales. Either an alarm or an alphanumeric remote display is required to indicate to the driver that the print has been accepted and to move forward to the next axle. (The **6500** is the most appropriate remote display unit when the **5230** is in automatic weight accept mode.) When the second weighing is performed, the difference between the first and second weight is registered as the net weight. The vehicle can be either fully loaded or empty on the first weighing.

Fixed printouts are available to give all details of the transaction. As well as logging the Truck ID, a Product ID, Destination ID and axle weights can also be logged on the printout.

The Totals for Truck, Product and Destination IDs are available on the front display and also through the printer port.

4. Installation

4.1. Introduction

The **Rinstrum 5230** can be used as either a desktop or panel-mount instrument. It contains precision electronics and must not be subject to shock, excessive vibration or extremes of temperature, either before or after installation.

The inputs of the **5230** are protected against electrical interference, but excessive levels of electro-magnetic radiation and RFI may affect the accuracy and stability of the instruments. The **5230** should be installed away from any sources of electrical noise. The load cell cable is particularly sensitive to electrical noise and should be located well away from any power or switching circuits. To ensure EMC or for RFI immunity, termination of the load cell shield at the **5230** end is important (ie. with a sound physical and electrical connection to the **5230** case via the DB9 backshell).

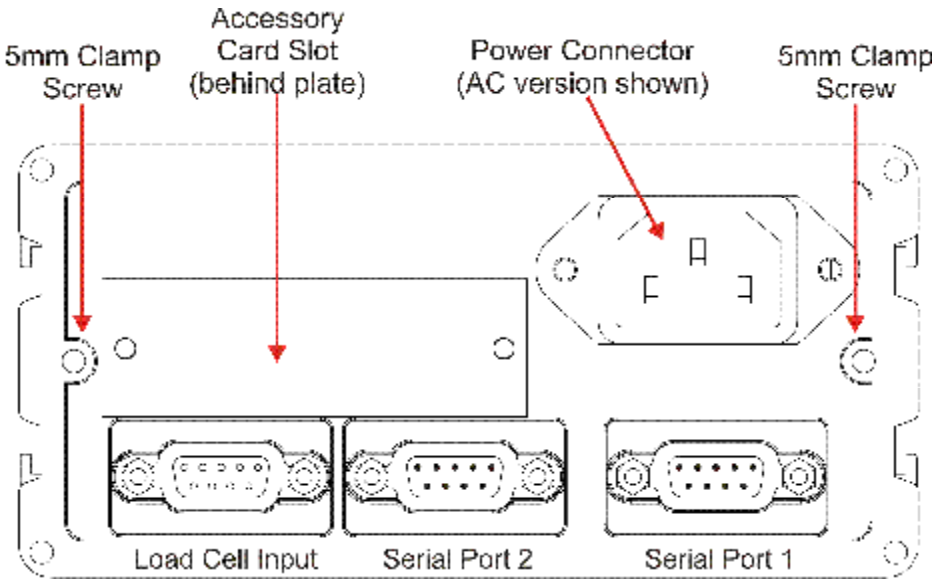


Figure 2: Rinstrum 5230 Rear Plate

4.2. Electrical Safety

For your protection all mains electrical hardware must be rated to the environmental conditions of use.

The mains electrical outlet must be of protection earth contact.

Pluggable equipment must be installed near an easily accessible power socket outlet. A permanently connected supply must have a readily accessible disconnect device.

To avoid the possibility of electric shock or damage to the instrument, always switch off or isolate the instrument from the power supply before maintenance is carried out.

4.3. Panel Mounting

Panel mounting requires the optional mounting kit, consisting of a pair of clamp slides.

Remove the two 5mm screws attaching the side clamp slides to the rear of the case. Remove the slides to the rear. Fit the case into the panel from the front. Replace the slides into the slots. Replace the two 5mm clamp screws. Do not over-tighten the screws as this could damage the case.

4.4. DC Power Supply

The DC supply need not be regulated, provided that it is free of excessive electrical noise and sudden transients. The **5230** can be operated from high quality plug-packs assuming there is sufficient capacity to drive both the instrument and the load cells. Voltages outside the 12-24 VDC range may cause improper operation or damage

Figure 3: Power Connection

4.5. AC Power Supply

The AC power supply for the **5230** can operate over a wide range of AC voltages. This power supply automatically adjusts to the incoming voltage. This means that the **5230** is extremely tolerant of voltage dips and brown out conditions, especially when running off 220 or 240VAC mains.

The **5230** uses a standard IEC power inlet.

4.6. Load Cell Signals and Scale Build

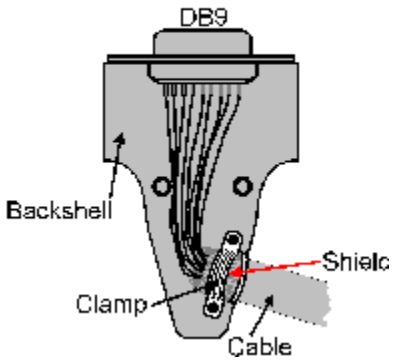
Very low output scale bases can be used with the **5230**, but may induce some instability in the weight readings when used with higher resolutions. Generally speaking, the higher the output or the lower the number of divisions, the greater the display stability and accuracy.

The **5230** has a milliVolt-per-Volt meter test mode that can be used to check scale base signal output levels. Refer to SCALE (Scale Base Test Display) page 68.

4.7. Connecting Shields

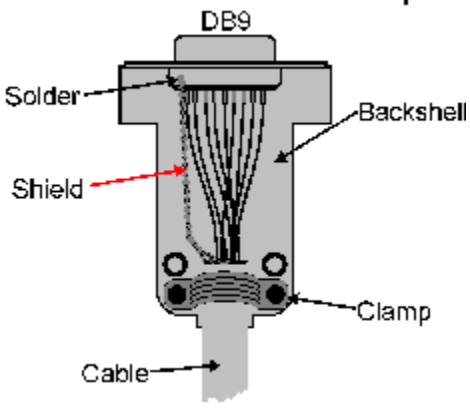
To obtain full EMC or for RFI immunity with the **5230**, the load cell shield MUST be connected electrically to the metal shell of the DB9 connector. Refer to diagrams below or to instructions supplied with connector.

Backshell with Shield Clamp
(Preferred for Load Cells)



The easiest way to connect the cable shield to the DB9 backshell is to fold the shield wires back over the outside of the cable insulation so the cable clamp of the backshell makes good electrical contact with the shield when installed.

Backshell without Shield Clamp



A method for connecting the cable shield to the DB9 is to twist the shield wires together and solder the ends to the DB9 casing.

Figure 4: Cable Shield Connection

4.7.1. Cable Shield Connection and Earthing

- Care should be taken when connecting shields to maximise RFI immunity and minimise earth loops and cross-talk (interference) between instruments.
- For RFI immunity, termination of the load cell shield at the **5230** end is important (ie. with connection to the **5230** case via the shield connection).
- The **5230** enclosure is directly connected to the shield connections on the cables.
- The **5230** should be connected to earth via a single reliable link to avoid earth loops.
- Where each instrument is separately earthed, interconnecting cable shields should be connected at one end only.
- **Caution:** Some load cells connect the cable shield directly to the load cell (and therefore the scale base). Connection of the shield in this situation may be site specific.
- The unit complies with relevant EMC standards, and will carry full CE approval **provided** case ground connection is correctly made. Resistance measured between **5230** case and nearest earth point should be less than 2 ohms.

4.8. Unused Pins

It is important to note that unused pins must not be connected. The reason being that the functions of the pins may not be compatible with equipment at the other end (eg. connecting output pins to a PC communications port may affect the operation of the PC). Consequently many commercial communications cables are not suitable for use.

4.9. Load Cell Connection

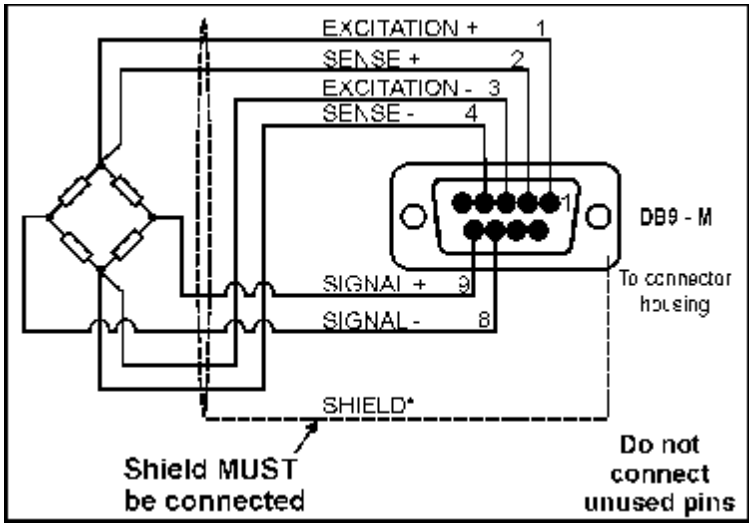
The following provides information on 6-wire and 4-wire connections.

4.9.1. 6-Wire Connection

The connection is made using a standard DB9 male plug that is supplied with the indicator. The load cell is wired for a 6-wire system as follows:

Pin	Function
1	Positive Excitation
2*****	Positive Sense
3	Negative Excitation
4*****	Negative Sense
8	Negative Signal
9	Positive Signal
5,6,7	Not connected
***** Sense lines MUST be connected.	

Table 1: 6-Wire Connections



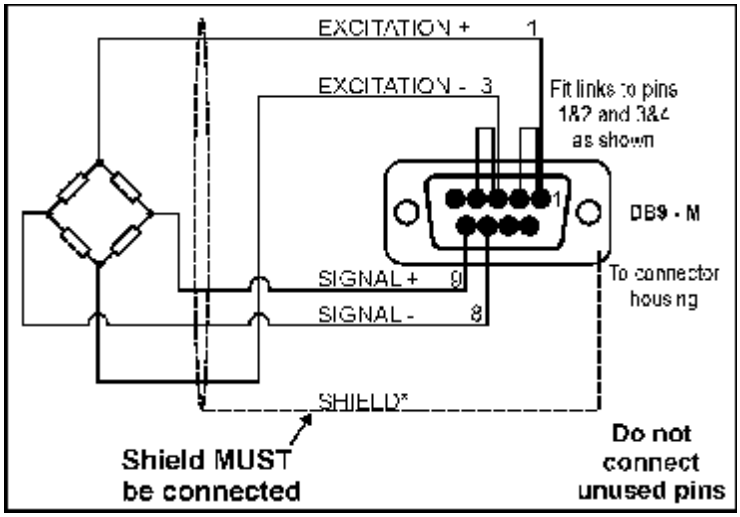
* For more information on Connecting Shields refer to page 14.

Figure 5: 6-Wire Connection

When wiring load cells, use only high quality shielded multi-core cable. The cable should be run as far away from any other cabling as possible (minimum separation distance 150mm).

4.9.2. 4-Wire Connection

When a 4-wire load cell system is connected, pins 1 & 2, and pins 3 & 4 must be joined by solder bridge or wire bridge. This is to ensure that the excitation voltages are fed into the sense inputs (pins 2 and 4). Failure to do this will result in the incorrect operation of the unit.



* For more information on Connecting Shields refer to page 14.

Figure 6: 4-Wire Connection

4.9.3. Serial Ports

- **Serial 1: Networking Port**

  All connections for this port are via the Serial 1 connector. This is a standard DB9 socket requiring a female DB9 plug. The RS-232 and RS-485 interfaces are connected in parallel within the **5230**, and both output exactly the same message. Note that the **5230** only supports 4-wire full duplex RS-485.

  The connections for the outputs are shown below:

Pin No	Function	Description	Connect to
1	PWR	12VDC out	Do not connect
2	RXD	RS-232 Receive Line	External Device Transmitter (Usually Pin 3)
3	TXD	RS-232 Transmit Line	External Device Receiver (Usually Pin 2)
5	GND	RS-232 Digital Ground	External Device Digital Ground (Usually Pin 5)
Backshell	Shield		Cable Shield

Table 2: Serial 1: RS-232 - Networking Port - Connection Outputs

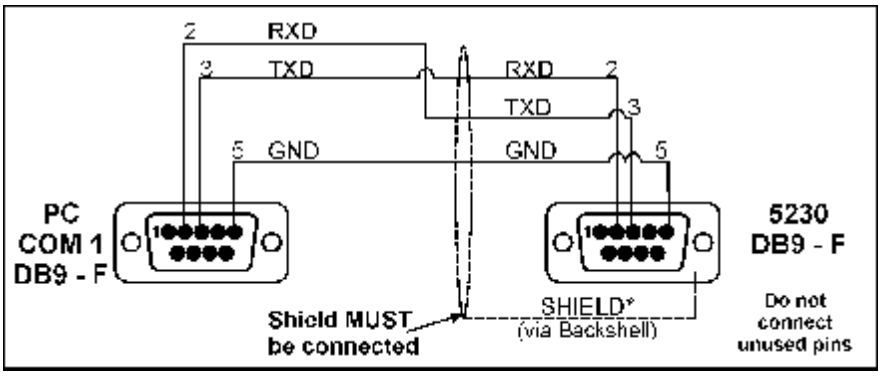


Figure 7: RS-232 - Networking Connection

Pin No	Function	Description	Connect to
6	RA(-)	RS-485 Receive A (-)	External Network
7	RB(+)	RS-485 Receive B (+)	External Network
8	TA(-)	RS-485 Transmit A (-)	External Network
9	TB(+)	RS-485 Transmit B (+)	External Network
Backshell	Shield		Cable Shield

Table 3: Serial 1: RS-485 - Networking Port - Connection Outputs

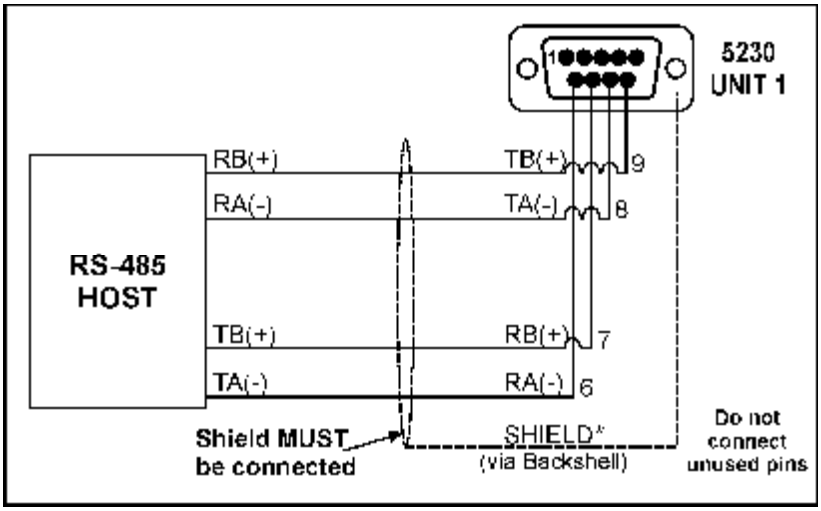


Figure 8: RS-485 – Networking Connection

- **Multi-Drop Networking**

The following table shows how to connect a number of instruments in an RS-485 4-wire multi-drop network:

Cable 1			Cable 2			
Network Master	**5230 Unit 1 – Serial 1**		**5230 Unit 1 – Serial 2**		**5230 Unit 2 – Serial 1**	
Function	Function	Pin	Function	Pin	Function	Pin
TA(-)	RA(-)	6	RA(-)	6	RA(-)	6
TB(+)	RB(+)	7	RB(+)	7	RB(+)	7
RA(-)	TA(-)	8	TA(-)	8	TA(-)	8
RB(+)	TB(+)	9	TB(+)	9	TB(+)	9

Table 4: Multi-Drop Networking Connections

Note: For more than two units, duplicate Cable 2 between each new unit and the network.

The end devices in a multi-drop RS-485 network may need to be provided with termination resistors to terminate the network. These resistors are built into the **5230** and they can be enabled or disabled using the digital setup. Refer to Serial Outputs page 101 for more information.

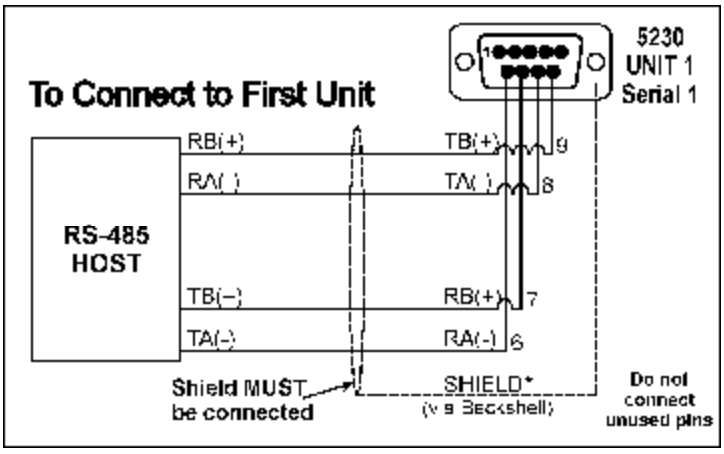


Figure 9: Multi-Drop Networking Connections - Connecting to First Unit

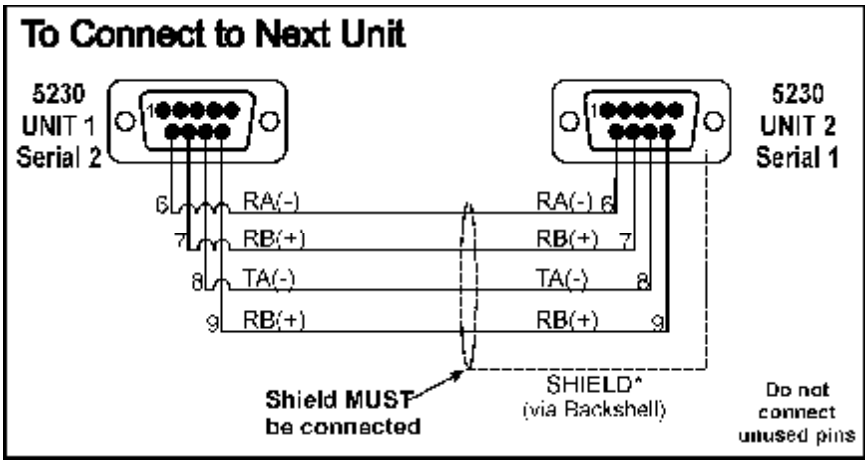


Figure 10: Multi-Drop Networking Connections - Connecting to Next Unit

- **Serial 2: Printer Port**

  All connections for this port are via the Serial 2 connector. This is a standard DB9 socket requiring a female DB9 plug. The RS-232 interface is the only output from the Serial 2 connector. The connections for this are shown below.

  Note 1: Pins 6, 7, 8 and 9 on the Serial 2 connector are connected directly to pins 6, 7, 8 and 9, respectively on the Serial 1 connector. This provides for convenient implementation of multi-drop RS-485 communications.

  Note 2: DTR (pin 4) and RXD (pin 2) are connected together internally. This means that it is possible to use the DTR line for printer paper detect or the RXD line for PC communications but not both simultaneously. **Do not connect both wires.**

Pin No.	Function	Description	Connect To
1	PWR	12VDC out	Do not connect
2**	RXD	RS-232 Receive Line	External Device Transmitter (Usually Pin 3 on PC)
3	TXD	RS-232 Transmit Line	External Device Receiver (Usually Pin 3 on printer or Pin 2 on PC)
4**	DTR	DTR Handshake Line	External Device Busy Line (Usually Pin 20 on printer)
5	GND	Digital Ground	External Device Digital Ground (Usually Pin 7 on printer)
6*	RA(-)	RS-485 Receive A (-)	External Network
7*	RB(+)	RS-485 Receive B (+)	External Network
8*	TA(-)	RS-485 Transmit A (-)	External Network
9*	TB(+)	RS-485 Transmit B (+)	External Network
Backshell	Shield		Cable Shield
* See **Note 1**.			
** See **Note 2**.			

Table 5: Serial 2: Printer Port

5. Configuration Issues

5.1. General Setup Information

The **5230** configuration and calibration may be performed by using both the front panel keypad and the **5230** Viewer. Some settings are available only via the keypad. Most settings are available via both the keypad and viewer. Refer to Keypad and Viewer Settings (Availability) page 122 for complete listing.

5.2. Basic Weighing Terminology

The following terms are used throughout the setup procedure. Knowledge of these basic weighing terms is beneficial in setting up and calibrating the **5230**.

Note: Detailed descriptions of these and other terms used in this Reference Manual are described in the Glossary Terms page 127.

Term	Definition
Units	Units of measurement (kilograms, tonnes, pounds, etc.).
Range	Total change in weight between zero gross load and full capacity gross load
Resolution or Count-by	Smallest change in weight units that the display can show.
Graduations	Maximum number of display steps between zero gross load and full capacity gross load. It is equal to the range divided by the count-by.
Division	A single graduation.

Example

A 10,000kg 2.0mV/V load cell is used in an application requiring a 5000kg range, with weight displayed in 5kg increments.

The values are:

- Units = kg
- Range = 5000
- Count-by = 5

Calculating the graduations:	$\text{Graduations} = \frac{\text{Range}}{\text{Count-by}} = \frac{5000}{5} = 1000 \text{ divisions}$
Signal voltages can be calculated as follows:	
Calculating the full scale signal (load cell):	$\text{Full Scale Signal} = \frac{\text{Range}}{\text{Load Cell Capacity}} = \frac{5000}{10000} \times 2.0\text{mV/V} = 1.0\text{mV/V}$
Since the 5230 uses 8V load cell excitation, the absolute signal voltage is:	Absolute Signal Voltage = Excitation Voltage x Full Scale Signal = 8V x 1.0mV/V = 8.0mV
Calculating the signal resolution:	$\text{Signal Resolution} = \frac{\text{Absolute Signal Voltage}}{\text{Number of Graduations}} = \frac{8.0\text{mV}}{1000 \text{ divisions}} = 0.008\text{mV / division} = 8\mu\text{V / division}$

5.3. Dual Interval and Dual Range Operation

The **5230** provides both Dual Interval and Dual Range modes of operation as well as the traditional single range setting. In non-trade operation, up to 100,000 divisions are available. It is rare for the precision of the displayed reading to be a problem. However, in Trade applications, where the number of divisions that can be legally displayed is limited, the use of Dual Interval or Dual Range operation allows greater precision in the displayed readings without exceeding the maximum number of graduations available in the certification of the load cell.

Both of these modes of operation allow for the **5230** to operate with two count-by settings. This makes it possible to weigh using fine increments for a low weight range and coarse increments in a high range. For example, the **5230** could be configured to weigh up to 2kg in 1g increments and from 2kg up to 5kg using 2g increments.

Dual Interval and Dual Range are identical in many respects and can be treated the same for the purposes of setup and calibration. The difference between the two comes about in the operation of the scale.

Dual Range Operation: With Dual Range operation the range is determined based on the gross weight. Once the scale changes from low range to high range it may not change back to low range again until the scale is returned to a stable zero reading.

Dual Interval Operation: Dual Interval operation is based on the net weight and no restrictions are placed on the change from the high interval to the low interval. With Dual Interval operation it is therefore possible to weigh in the low interval with high tare weights.

The **5230** is equally accurate in either mode. However, due to tolerance (hysteresis) effects in many load cells, it may not be possible for them to operate accurately in Dual Interval mode. In these cases, Dual Range mode ensures that the weight readings taken from the load cell are accurately displayed during loading and unloading operations.

5.4. Direct mV/V Calibration

It is possible to calibrate the **5230** without test weights if the output capacity of the load cell is known. Where it is impractical to use test weights (eg. for some weigh bridges), this mode of operation allows the mV/V signal strength at no load as well as the mV/V signal strength of the span to be entered directly. This type of calibration is only as accurate as the load cell output figures but for many applications this is more than adequate.

5.5. Filtering Techniques

The **5230** includes advanced filtering options, which allow it to be optimised to produce the most accurate readings possible in the shortest time. There is a trade-off between noise filtering and the step response time of the system. The step response is defined as the time between placing a weight on the scale and the correct stable weight reading being displayed. This does not affect the number of readings per second that are taken. It simply defines the amount of time that is required to determine a final weight reading.

5.5.1. FIR (Finite Impulse Response) Filter

The first level of filtering provided is a FIR filter that is linked to the measurement rate. The measurement rate is set with the **Synch Filter** field. Refer to Build: Synch Filter (BUILD:SYNC) (A/D Synchronisation Frequency) ⊗ page 72. This filter is a very high performance tuned filter that provides up to 180dB of attenuation at multiples of the sync filter frequency and broadband filtering of between 40 and 80dB. For example, setting the sync filter frequency to 25Hz would provide 180dB of noise rejection at frequencies of 25, 50, 60 … Hz.

Changes to the sync filter setting effect the calibration of the system, so it is wise to determine the primary noise frequency of the system prior to calibration. Often the primary noise source is the mains power so the sync filter is usually set to 50 or 60Hz, depending on mains frequency. However, for applications with high levels of mechanical noise, it is better to tune this filter to the natural frequency of the scale.

The FIR filter introduces a delay of three samples to the step response. Therefore, at a sync frequency of 50Hz, where readings are taken every 20 milliseconds, a delay of 60 milliseconds is introduced between a weight change and the final weight reading.

5.5.2. Digital Averaging

In addition to the FIR filter the **5230** has two levels of digital averaging. The first level is a fixed length sliding window average. Here, a buffer of readings, of a length specified by the **Filter** field is averaged. As each new reading is taken the oldest reading is discarded and a new average is calculated. The length of the window can be configured in steps from one reading to 200 readings. It is set using the **Filter** field. Refer to General: Filtering (FILTER) (Reading Average) page 73**.** Each reading in the average adds a delay to the step response equal to the measurement period. For example, an average of 10 readings with a **Sync Filter** frequency of 50Hz, results in the following total step response:

(10 + 3) samples x 20 milliseconds = 260 milliseconds

The second level of averaging is similar to the first except it has a variable length window that grows from one reading up to a maximum of 10 readings. If a disturbance on the scale is detected, the old readings are discarded and a new average starts all over again. Each of the 10 readings is calculated over the window length of the fixed average. In this way very long-term averages are calculated without introducing any delays. The amount of fluctuation that causes the averaging to be restarted can be set to Off, Fine or Coarse in the **Anti-Jitter** field. Refer to General: Anti-Jitter (JITTER) (Weight Stabilisation) page 73. The **Coarse** setting is more tolerant of weight change than the **Fine** setting, and the **Off** setting disables this level of filtering.

5.6. Trade vs Industrial Mode

The **5230** may be operated in Trade or Industrial mode. The following table lists the operational differences for each of the two modes:

Element	Trade	Industrial
Underload	–1% or –2% of fullscale depending on zero range setting	–105% of fullscale
Overload	Fullscale +9 divisions	105% of fullscale
Tare	Tare values must be > 0	No restrictions on Tare
De-Zero	Not available	Clear the zero setting with a 2 second press of the Zero Key
Test Modes	Limited to 5 seconds	Unlimited time allowed

Table 6: Trade vs Industrial Mode

5.7. Setup Counter

Within Digital Setup there are a number of critical steps that can affect the calibration and/or trade performance of the **5230**. If any of these steps are altered, the trade certification of the scale could be voided.

The **5230** provides a built in Setup Counter to monitor the number of times the critical steps are altered. The value of this counter is stored within the unit and can only be reset at the factory. Each time a critical step is altered, the counter will increase by one. Whenever the **5230** is powered up, or setup mode is entered, the current value in the counter is displayed briefly (eg. C00010).

The value of this counter is written on the tamperproof trade label on the front of the indicator for trade-certified applications and functions as an electronic seal. If any trade critical settings are changed on the instrument, the current value of the trade counter will be different from the recorded value and the seal is broken. In this manual, items marked with Ä indicate that the setting is trade critical.

5.8. Passcodes

The **5230** has three levels of passcodes to provide a security lock on accessing Setup via the keypad.

- Full Setup Passcode: Level 1 (highest)
- Safe Setup Passcode: Level 2
- Operator Passcode: Level 3 (lowest)

The higher levels passcodes can be used on lower levels. For example, the Full Setup passcode could be used for all levels of passcode and the Safe Setup passcode could be used for either Safe Setup or Operator passcodes.

Note: When accessing Setup via the Viewer, the passcode is prompted if Write Settings function is chosen.

5.8.1. Operator Passcode

Setting an Operator Passcode prevents access to the enabled Security Settings choices via the keypad. Refer to for more information.

5.8.2. Safe Setup Passcode

Setting a passcode for Safe Setup prevents access to Safe Setup functions via the Keypad. Refer to Keypad Setup page 53 and Security Settings (PASSCD): Set Safe Setup Passcode page 77.

5.8.3. Full Setup Passcode

Setting a passcode for Full Setup prevents any access to Full Setup via the Keypad and Viewer. Refer to Keypad Setup page 53 and Security Settings (PASSCD): Set Full Setup Passcode page 77.

5.9. Data Entry

Throughout the **5230** operator interface and setup, various data entry methods are used. Both the viewer and the keypad are used to enter data. Each method is described in the following sections. Refer to Basic Operation page 35 for detailed descriptions of each key.

5.9.1. Viewer

Operation Interface: When using the **5230 Viewer** for normal operation, click the mouse on keypad keys to initiate the feature.

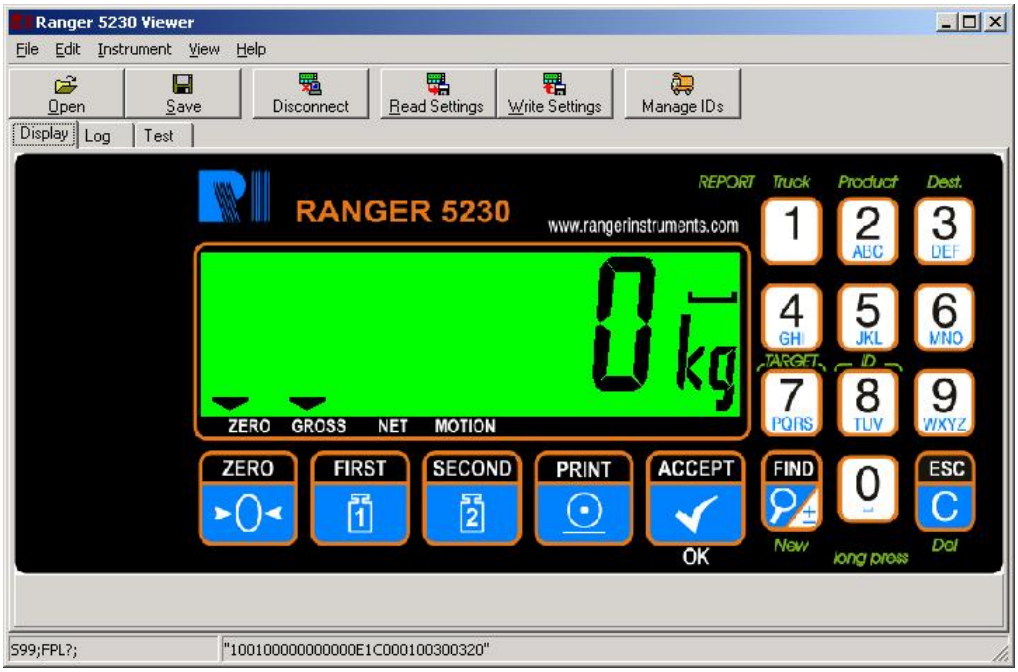


Figure 11: 5230 Viewer

Setup: The **5230 Viewer** uses standard Windows methods for changing settings and entering data. Figure 12 identifies the various types of settings used in the viewer. Refer to your Microsoft Windows manual for more detailed instructions on Windows methods.

Figure 12 displays a portion of the viewer for the **5230**.

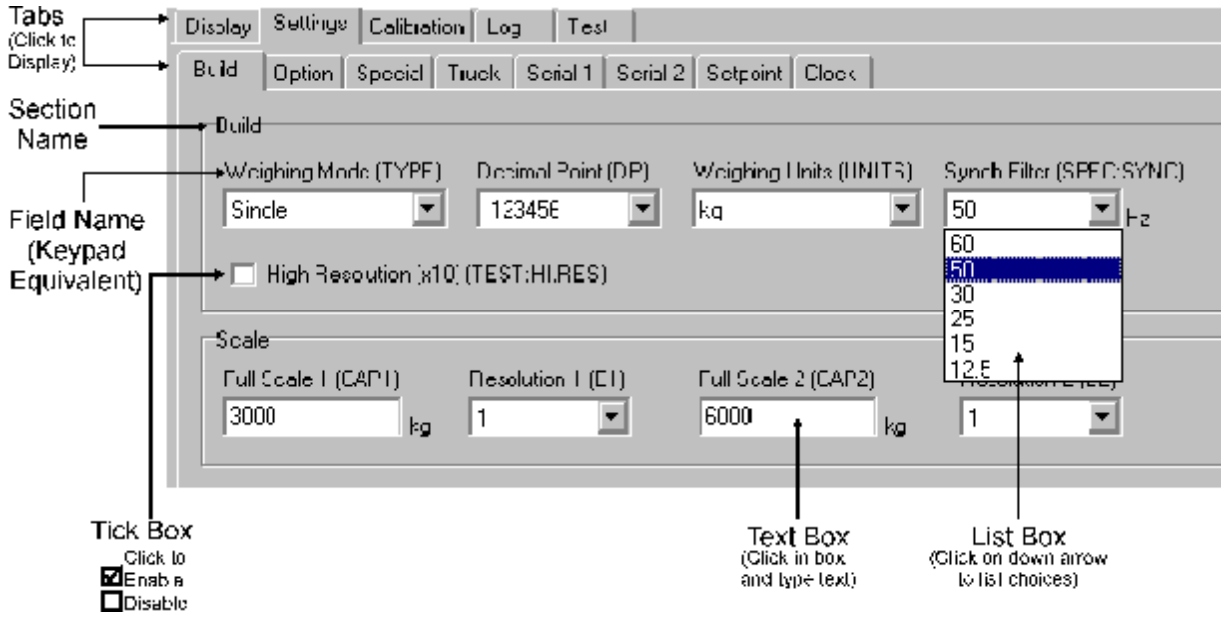


Figure 12: 5230 Viewer - Data Entry

5.9.2. Keypad

Operation Interface: When using the **5230 Keypad** for normal operation, press the key on keypad to initiate the feature.

Setup: When in Setup the **5230 Keypad** displays editing annunciators depending on the keypad key being pressed. Figure 13 identifies each of the editing annunciators. When in Setup, press the corresponding blue keypad key (below the annunciator) to choose **GRP** (Group), **ITM** (Item), **SEL** (Select), **EDT** (Edit) or **OK**. Refer to **Editing Annunciators** page 37 for more information on using editing annunciators.

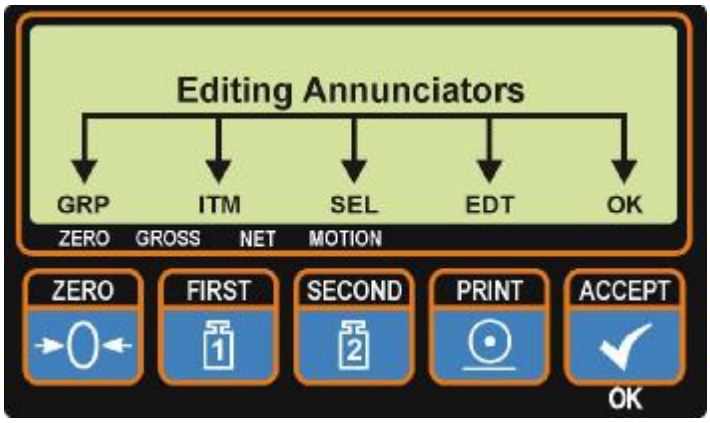


Figure 13: Rinstrum 5230 Keypad - Editing Annunciators

- **5230 Keypad: Numeric Entry**

  A numeric entry allows the input of numbers. When entering a number the display will show digits with the number of digits to be entered flashing. The numeric keypad keys (0 to 9) are pressed to enter a digit from the right, moving all existing digits left one place. To delete a single digit, the **<ESC/C>** key can be used. Pressing and holding the **<ESC/C>** key for two seconds will cancel the entire entry. The **<OK>** key will accept the number that has been entered.

  Upper and lower limits are placed on some entries and an entry outside this range will cause the **5230** to display dashes (ie. - - - - - -), and then revert to the previous correct value.

  Note: For some Setup choices in the **5230**, the alphanumeric keypad is disabled, (ie. some settings use only the **<SEL>** and **<EDT>** keys to alter choices). Refer to the example in the section **Items with Multiple Options** page 27.

  Example: When in Setup follow the steps below to set Clock, Time.

• Press **<GRP>** repeatedly to display the **CLOC** group.
• Press **<ITM>** repeatedly to display the **TIME** item.
• Press **<SEL>** to select **TIME** and display the current setting (eg. 09.55).
• The number of digits to be entered will be flashing. Using a 24-hour clock format enter (via the alphanumeric keypad) the digits for the new time (eg. 13.55).
• When the correct digits are flashing press **<OK>** to accept all digits and re-display the item name.

- **5230 Keypad: Selections and Options**

  Items with Single Options: Some items allow the selection of an option for a single setting. When a Group and Item have been chosen, the **<SEL>** key is used to display the current setting for that item. The **<EDT>** key can be used to cycle through the options for that item. Refer to Selection Methods (below) for more information. When the desired option is displayed the **<OK>** key can be pressed to accept the displayed option and re-display the item name. Pressing and holding the **<ESC/C>** key for two seconds will abort the selection and revert to the original setting.

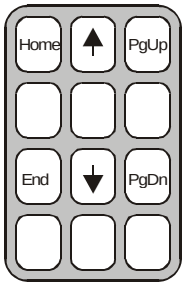
  Example: When in Setup follow the steps below to set Serial 1, Baud.

• Press **<GRP>** repeatedly to display the **SER.P1** group.
• Press **<ITM>** repeatedly to display the **BAUD** item.
• Press **<SEL>** to select **BAUD** and display the current setting.
• Press **<EDT>** to cycle through the options.
• When the desired option is displayed press **<OK>** to accept the setting and re-display the item name.

Selection Methods

When in Setup a selection entry requires the choice of a single item from a list of options. For the currently displayed item, the **<EDT>** key can be used to cycle through the available options. To cycle through items in the reverse order press the **<ESC/C>** key. Pressing the **<OK>** key will select the current item. Pressing and holding the **<ESC/C>** key for two seconds will abort the selection and revert to the original setting.

Due to the large number of options available within some selection entries, the keypad can be used to provide alternate methods for navigating through the entries. Similar to a standard computer keyboard, the keypad keys have been assigned the following functions:



Key	Function
Home / End	First/Last item in list
↑ / ↓	Up/Down one item in list
PgUp / PgDn	Up/Down five items in list

Items with Multiple Options: Some items allow the selection of an option for multiple settings. When a Group and Item have been chosen, the **<SEL>** key is used to display the current settings for that item. For example the **SER.P1**, **BITS** item displays **n81-4**. Each of the five character positions allows for different options to be set. The **<SEL>** key is pressed to select a digit to change. When the digit is selected (flashing) the **<EDT>** key is pressed to cycle through the options for that digit. When the desired choices are displayed the **<OK>** key can be pressed to accept the choices and re-display the item name. Pressing and holding the **<ESC/C>** key for two seconds will abort all of the choices and revert to the original settings.

Example: When in Setup follow the steps below to set Serial 1, Bits. Note: the alphanumeric keypad is disabled for this setting.

• Press **<GRP>** repeatedly to display the **SER.P1** group.
• Press **<ITM>** repeatedly to display the **BITS** item.
• Press **<SEL>** to select **BITS** and display the current setting (eg. n81-4).
• The currently chosen digit will be flashing. Press **<SEL>** to advance to the next digit.
• When the digit to be set is flashing press **<EDT>** to cycle through the options for that digit.
• When the desired digit option is flashing press **<OK>** to accept the setting and re-display the item name.

- **5230 Keypad: Alphanumeric Keypad Entry**

  An alphanumeric entry allows the input of a string of up to six characters. The **5230** will display the active character flashing. An example of this style of entry is **ABC 12**. The keypad keys are used to enter a specific character. For example, to display the letter **L**, press the **5** key three times.

  The **<FIND>** key is used to enter spaces. Refer to FIND Key page 40 for more information.

  Note: If successive characters are to be entered from the same keypad button, you must wait (approximately two seconds) for the next active character position to flash before entering the next character. The **<FIND>** key can be pressed between each character to eliminate this wait. This wait is not necessary if successive characters are entered from different keypad buttons.

  At any time the **<ACCEPT/OK>** key can be pressed to accept the currently displayed string of characters. Pressing the **<ESC/C>** key will remove the last entered character. Pressing and holding the **<ESC/C>** key for two seconds will cancel the string entry.

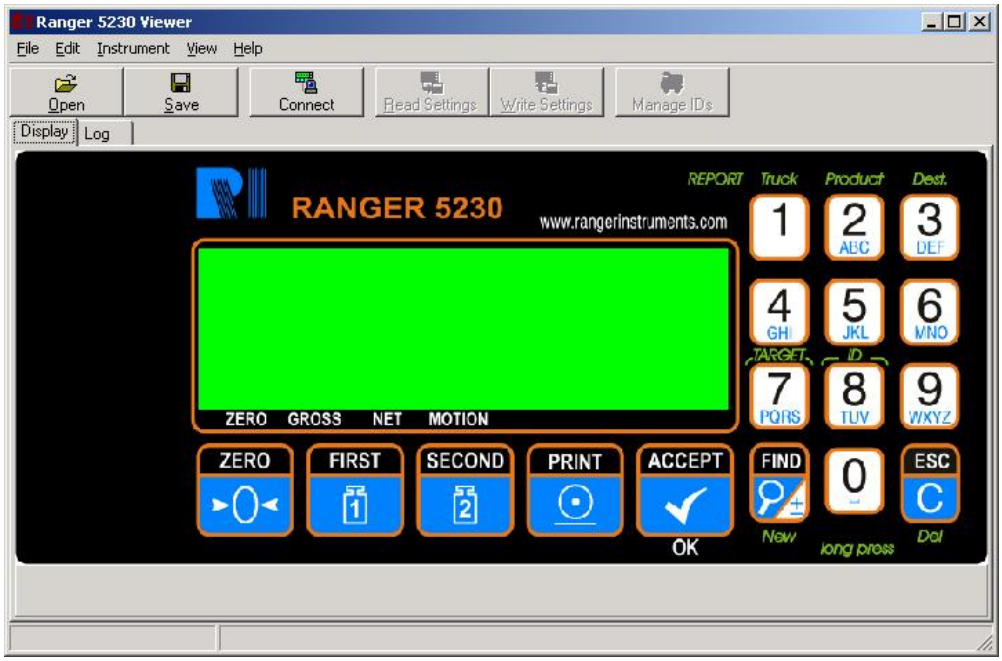
6. Managing the 5230 Viewer

The **5230 Viewer** is used to set up some aspects of the instrument and can also be used during normal weighing operations.

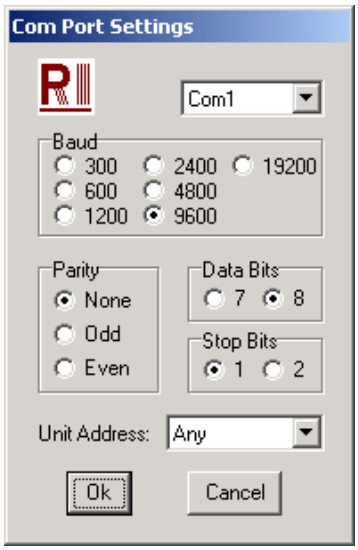
Note: The **5230 Viewer** uses standard Windows methods for changing settings and entering data. Refer to your Microsoft Windows manual for more detailed instructions.

6.1. Connecting Viewer to Instrument

- Before you begin:
  -Ensure the following are connected: Power supply, Serial cable to the PC and Load cell.
  -Ensure the **SERIAL 1** settings (available via the keypad keys) have been completed. Refer to SER.P1 (Serial 1 Communications Options) page 60 for more information.
- Run the viewer application file (provided with the indicator). The **Rinstrum 5230 Viewer** displays as shown below.

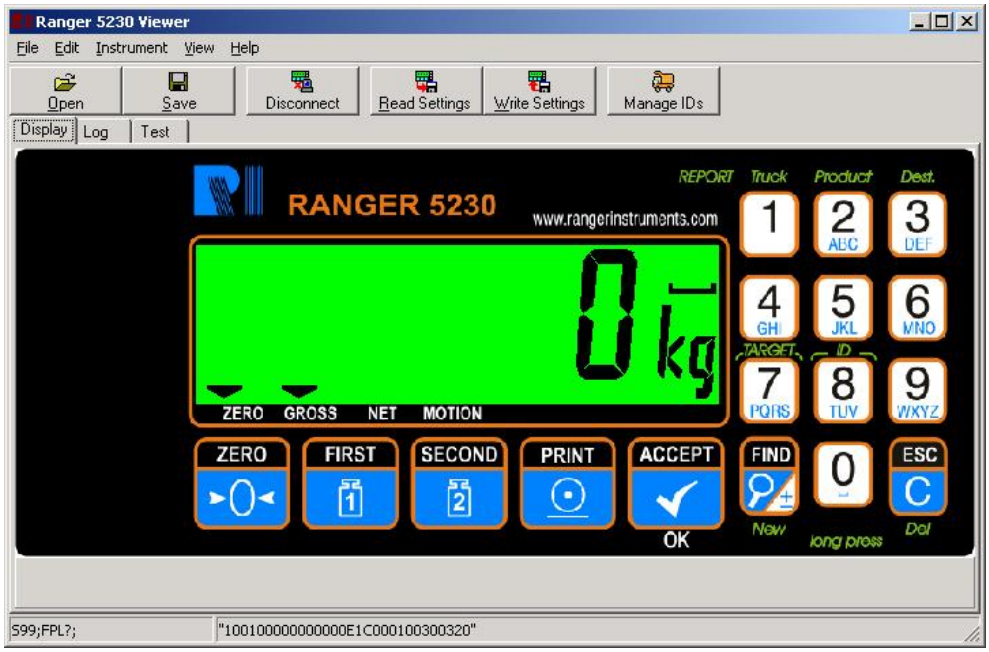


- Click the **Connect** button in the toolbar. The **Com Port Settings** dialog box displays. Choose settings to **exactly match** the **SERIAL 1** settings made via the instrument keypad.



- **COM:** Choose the Com port (eg. COM1) on the PC to which the instrument is connected.
- **Baud:** Choose the Baud setting (eg. 9600).
- **Parity:** Choose the Parity setting (eg. None).
- **Data Bits:** Choose the Data Bits setting (eg. 8)
- **Stop Bits:** Choose the Stop Bits setting (eg. 1).
- **Unit Address:** Choose the Unit Address (eg. Any, 31, etc.).
  -The Unit Address is initially set on each instrument via the keypad. Refer to ADDRES (Serial Address) page 60 for more information.
  -When only a **single instrument** is in use, the **Any** setting can be used.
  -When **multiple instruments** on a RS-485 network are in use, the drop-down list must be used to choose the specific Unit Address.

- Choose **OK** when complete. The **5230 Viewer** will then mimic the actual display on the instrument.



- The **Display Tab** on the Viewer (or the keypad on the instrument) can now be used for normal weighing operations. Refer to Basic Operation page 35 for information on normal weighing operations.
- The **Log Tab** and **Test Tab** also display. Refer to LOG TAB page 93 and TEST TAB page 95 for more information.

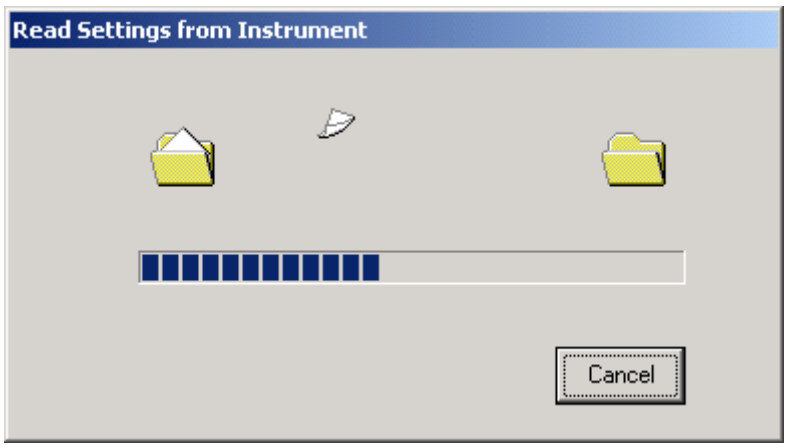
6.2. Disconnecting Viewer from Instrument

- Click the **Disconnect** button in the toolbar. After a few seconds the Viewer display will go blank.

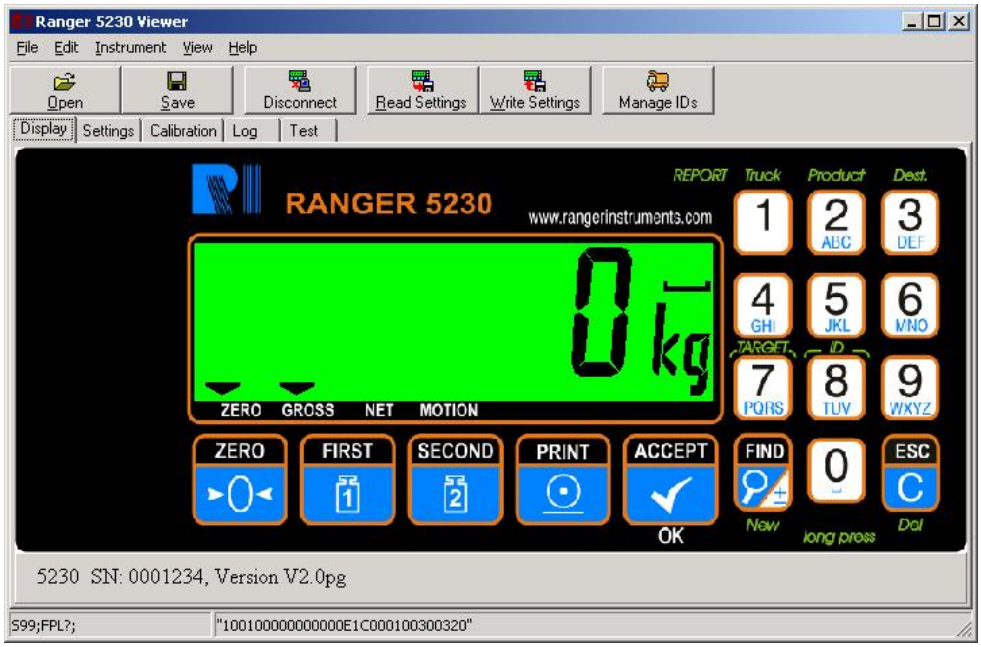
6.3. Reading Instrument Settings into Viewer

To configure the instrument, its settings must first be read into the Viewer.

- Before you begin:
  -Ensure all steps in Section 6.1 page 29 have been completed.
- Click the **Read Settings** button in the toolbar. The **Read Settings from Instrument** dialog box displays. Wait…



- After the settings have been read completely the **5230 Viewer** will reflect the actual display on the instrument as well as showing extra Tabs for changing settings.



- The Viewer (or the keypad) can now be used for normal weighing operations.
- The Tabs for Settings, Calibration, Log and Test can be used to change settings, view results or test the instrument.

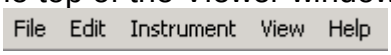
Refer to Basic Operation page 35 for information on normal weighing operations. Refer to Keypad Setup page 53 for information on setup.

6.4. Exiting (Closing) the Viewer

Settings should be saved and/or written to the instrument before exiting. Refer to Save and Restore Viewer Settings and Log Data page 33. To exit the Viewer choose File | Exit.

6.5. Tour of the Viewer

6.5.1. Menu

The Menu is across the top of the Viewer window and provides access to the choices listed in the following table. 

Menu	Choices	Description
File	**Open** Refer to Section 6.5.3 page 33.	Open a previously saved instrument settings or log data file. • Same as Open toolbar button. • File Types are: -RI Settings (*.RIS) -RI Log (*.LOG)
	Save Refer to Section 6.5.3 page 33.	Save the current instrument settings or log data to a file. • Same as Save toolbar button. • File Types are: -RI Settings (*.RIS) -RI Log (*.LOG)
	Connect or Disconnect Refer to Section 6.1 page 29 and 6.2 page 30.	Connect or Disconnect to an instrument. • Same as Connect or Disconnect toolbar buttons.
	Print Refer to Section 7.4.5 page 38.	Print out the settings/logged data to the connected printer.
	Exit Refer to Section 6.4 page 31.	Exit the program.
Edit	**Setup Chart**	Used to configure the log view. • Refer to LOG TAB page 93 for more information.
Instrument	**Read Settings** Refer to Section 6.5.3 page 33.	Read the current settings from the indicator. • Same as Read Settings toolbar button. • Dialog box appears to display progress.
	Write Settings Refer to Section 6.5.3 page 33.	Write the current settings to the indicator. • Same as Write Settings toolbar button. • Dialog box appears to display progress.
	Manage IDs Refer to Section 7.5 page 40.	Manage the Truck IDs, Product IDs and Destination IDs. • Same as Manage IDs toolbar button.
View	**View Printed Output** Refer to Section 7.7 page 52.	View the printed output buffer of the connected instrument.
Help	**Help**	Displays this **5230 Digital Indicator (Truck Weigher) Reference Manual**.
	About	Display the Help “About” information.

6.5.2. Toolbar

The toolbar is the set of buttons positioned under the Menu. It provides an alternative to using the Menu for the more commonly used functions.

Refer to Menu page 32 for more information on the toolbar buttons.

Button	Description
Open	Open a previously saved instrument settings or log data file. • Same as File | Open.
Save	Save the current instrument settings or log data to file. • Same as File | Save.
Connect or Disconnect	Connect or Disconnect to an instrument. • Same as File | Connect or File | Disconnect.
Read Settings	Read the settings from the indicator. • Unavailable if disconnected. • Same as Instrument | Read Settings.
Write Settings	Write the current settings to the indicator. • Unavailable if disconnected. • Same as Instrument | Write Settings.
Manage IDs	Manage the Truck IDs, Product IDs and Destination IDs. • Unavailable if disconnected. • Same as Instrument | Manage IDs.

6.5.3. Save and Restore Viewer Settings and Log Data

Viewer settings can be read from an instrument, changed and written back to an instrument. These settings can be saved to a file for use at a later date. They can then be opened for use on the same or a different instrument (of the same type).

Log data can also be saved and then opened at a later time using the Viewer or any text editor.

- **Read Settings from Instrument**

• Connect to instrument.
• Choose Read Settings.
• A dialog box displays the progress. Wait…
• Refer to Reading Instrument Settings into Viewer page 30 for more information.

- **Write Settings to Instrument**

• Connect to instrument.
• Either read settings from instrument or open settings from a file.
• Edit the settings if required.
• Choose Write Settings. Note that if the instrument model/serial number doesn't match, you will be prompted if you want to continue. Also if a Full Setup Passcode has been configured you will be prompted for the passcode.
• A dialog box displays the progress. Wait…

- **Open Settings from a File**

• Settings that have been previously saved to file can be opened (loaded) by choosing Open. This function can be performed whether the instrument is connected or disconnected.
• Choose the file type **RI Settings (*.RIS)**, select the directory/filename and choose Open.

- **Save Settings to a File**

• After settings have been opened (loaded) from a file or read from the instrument they can be saved to a file by choosing Save. This function can be performed whether the instrument is connected or disconnected.
• Edit the settings if required.
• Choose the file type **RI Settings (*.RIS)**, select the directory, enter the filename and choose Save.

- **Open Log File Data from a File**

• Log file data that has been previously saved to file can be opened (loaded) by choosing Open.
• Choose the file type **RI Log (*.LOG)**, select the directory/filename and choose Open.

- **Save Log File Data to a File**

• After log file data has been opened (loaded) from a file or read from the instrument it can be saved to a file by choosing Save.
• Edit the settings if required.
• Choose the file type **RI Log (*.LOG)**, select the directory, enter the filename and choose Save.

6.6. The Viewer Tabs

The Viewer **Display Tab** is explained in the Display and Controls section beginning on page 35. The remaining **5230 Viewer** Tabs (Settings, Calibration, Log and Test) are displayed and explained in the Viewer Setup section beginning on page 70.

7. Basic Operation

In its most basic configuration, the **5230** provides a simple weight readout with optional printing and serial output capability. More advanced configurations allow for truck weighing and batch control. With truck weighing, the weights are recorded against Truck IDs, allowing totals for trucks, products and destinations to be kept.

7.1. Basic Weighing Terminology

Truck IDs are identifiers used to store weight information about individual trucks. Tickets can be printed containing the stored weight information.

Products IDs are identifiers used to keep track of the amount of a particular product that has been used.

Destination IDs are identifiers used to keep track of the amount of a particular product that is at a particular destination.

Setpoints are outputs that are activated when certain conditions are met. Setpoints can be weight dependent (eg. material setpoint and active setpoint). Setpoints can also control sequences (eg. slow fill setpoint) or can provide status outputs (eg. zero setpoint).

7.2. Display and Controls

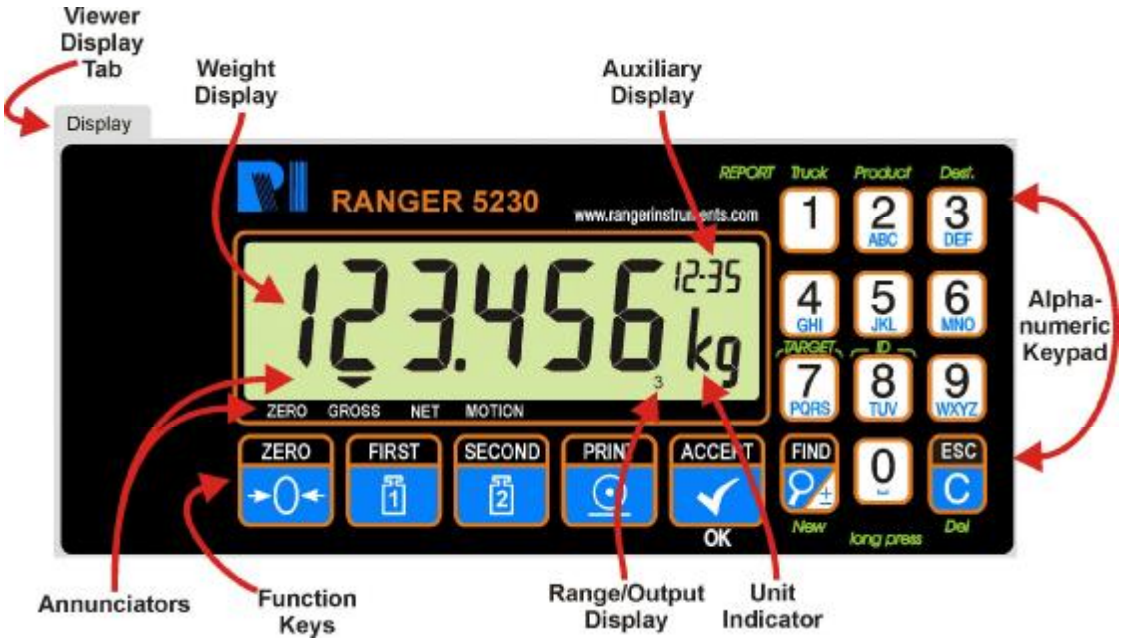


Figure 14: 5230 - Display and Controls Illustration

7.2.1. Keypad vs Viewer (Keystroke Equivalents)

The **5230 Keypad** and **Viewer** can both be used for basic operation. The Keypad and Viewer also share some configuration settings. The following table defines the equivalent methods for using the Keyboard vs Viewer.

Keypad	Mouse
Press a key	Click a key
Press and Hold a key for two seconds	Shift + Click a key
Press two keys together (eg. <ZERO> + <FIND>)	Not available in Viewer

Table 7: Keypad vs Viewer (Keystroke Equivalents)

7.2.2. Front Panel: Visual Display

The front panel of the **5230** has a six-digit LCD display. The **5230** also has a full numeric 17 key keypad. Figure 14 shows the main elements of the front panel.

The **5230** has various main display sections for the visual output of weight information. Each display section is described below:

- **Weight Display**

  The Weight Display indicates the weight readings, setup information, errors and warnings.

- **Auxiliary Display**

  This Auxiliary Display is used to provide additional information related to the task currently being performed. For example, during batching, this can show the percentage completed. It may also be configured to show other information when not in use (eg. current time). Refer to Display Settings: Auxiliary Display (AUX.DSP) page 76.

Auxiliary Display Code	Description
⌊‾‾‾⌋	Zero Band: Lit when the displayed weight is within the zero dead band setting.
1ST	First Weigh
2ND	Second Weigh
AXL	Axles: Lit when setting the number of axles. Example: If 2 axles are set, the auxiliary display will show 1-2 (when weighing axle 1 of 2) or 2-2 (when weighing axle 2 of 2).
DST	Destination ID
ID	Ref.ID and Seq.ID
LIN	Linearisation Point
PRO	Product ID
SPN	Span Calibration or Direct mV/V Span Calibration
TGT	Target
TOT	Total
TRK	Truck ID
ZER	Zero Calibration or Direct mV/V Zero

- **Alphanumeric Keypad**

  The alphanumeric keypad on the **5230** is similar to a standard computer keyboard. Refer to Data Entry page 24 for methods.

  Escape/Clear Key: Press the **<ESC/C>** key (Escape/Clear) to clear individual keypad entries. Press and hold the **<ESC/C>** key for two seconds to clear all of the current keypad entries and revert to normal operation. When in setup the **<ESC/C>** key can be used to cycle through choices in the reverse direction. For additional uses for this key refer also to ESC/C Key page 40.

- **Unit Indicator**

  The Unit Indicator displays the units of the weight reading as either grams (g), kilograms (kg), pounds (lb), tonnes (t) or none ( ).

- **Range / Output Display**

  When the indicator is in **Dual Range** or **Dual Interval** mode, the current range in use is shown (eg. R1). If the indicator is in a single range mode, the output status of the four setpoints is shown (eg. 3)

- **Annunciators**

  There are two groups of annunciators.

  Status Annunciators: Status Annunciators are a number of small triangles that show the status of the displayed reading.

Annunciator	Meaning
ZERO	Lit when the displayed reading is within ± ¼ of a division of true zero.
GROSS	Lit when the display reading represents GROSS weight.
NET	Not used in the **5230**.
MOTION	Lit when the displayed reading is not stable.

  Editing Annunciators: Editing Annunciators are used during Setup menu operations to show the available keys and the current menu level. Refer to Figure 13 page 25.

Annunciator	Meaning
GRP	Lit when in the main GROUP menu.
ITM	Lit when in the ITEMS menus.
SEL	Lit when the **<SECOND>** key is active for editing.
EDT	Lit when the **<PRINT>** key is active for editing.
OK	Lit when the **<ACCEPT/OK>** key is available for use.

7.3. Function Keys

The **5230** has the following function keys:

ZERO **FIRST** **SECOND** **PRINT** **ACCEPT/OK**

These function keys have two functions.

- **Primary Function:** Available during normal weighing. This function is indicated by the symbol on the key.
- **Editing Function**: Available during digital setup and calibration. This function is displayed using the editing annunciators above each key.

7.4. Primary Functions

A single press of each function key triggers the weighing operation printed on it. If the key beeps normally, but does not appear to trigger the desired action it is probably waiting for the weight reading to settle before the action can proceed.

7.4.1. Stability Considerations

Once a key is pressed the unit waits for a stable valid reading before performing the associated operation. If the weight readings remain unstable or invalid due to some diagnostic error for longer than 10 seconds the operation is cancelled and the **STABLE ERROR** message is displayed. Refer to Error Messages page 124

To improve the stability of the weight reading, increase the filtering or relax the motion detection criteria. Refer to General: Filtering (FILTER) (Reading Average) page 73 and General: Motion Detection (MOTION) ⊗ page 74.

7.4.2. ZERO Key

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 by the **5230** 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 via a setting in the Setup of the unit. Refer to Zeroing: Zero Range (Z.RANGE) (Allowable Zero Operating Range) ⊗ page 74 for more information.

De-Zero: A two second press of the **<ZERO>** key clears the zero setting. This function is not available in Trade mode.

7.4.3. FIRST Key

This key is used to store the first truck weight. An existing Truck ID can be selected or a new Truck ID created during this procedure. When a first weight has been successfully stored the instrument displays the **FIRST STORED** message and then alternates the weight and the **DRIVE OFF** message. The weight must go below the truck minimum weight before any further operation can be performed.

If another first weigh is attempted on a Truck ID (prior to the second weigh), the message **FIRST EXISTS** will display and then **CONT N**. Use the **<FIND>** key to switch between **N** (No) and **Y** (Yes). Press the **<ACCEPT/OK>** key to accept your choice.

7.4.4. SECOND Key

After the first weight is stored this key is used to store the second truck weight. The first truck weight is subtracted from the second truck weight. During the procedure for storing a second truck weight the instrument may also prompt for a Product ID and Destination ID. An existing Product ID or Destination ID can be selected or a new Product ID or Destination ID created during this procedure.

Preset Tare Weight: The **<Second>** key can also be used to set a Preset Tare weight. When the **<Second>** key is pressed without previously storing a first weight, the instrument will prompt for a Preset Tare weight. The Preset Tare weight is manually entered via the numeric keypad and will take the place of a stored first weight.

7.4.5. PRINT Key

If a printer or computer has been attached to the **5230** and the manual print function selected, the **<PRINT>** key will trigger an output of the current weight reading. Refer to View Printed Output page 52 for more information.

7.4.6. ACCEPT/OK Key

The **<ACCEPT/OK>** key is used to accept commands and continue to the next step. It is also used in Setup Mode to accept a setting.

7.4.7. REPORT Truck, Product or Dest. Keys

Key	
Short Press(s)	Where data entry is required, short press(s) of these keys will cycle through the alphanumeric characters on the key (eg. A, B, C, 2).
Long Press	A long press of any of these keys will report the Total data on that key (eg. Total (TOT) of the current Truck (TRK), Product (PRO) or Destination (DST)). The display will alternate between the specific ID and the Total (TOT) for that ID. **Note:** When the **Products** or **Destinations** fields have been set to **Not Stored**, a long press of the Product or Dest keys will result in the message **NO PROD** or **NO DEST**. Refer to TRUCK (Truck Weighing Settings) page 59 or SETTINGS / TRUCK page 78

Refer to Managing Trucks, Products and Destinations page 40 for more information.

7.4.8. TARGET Key

Where data entry is required, a short press of this key will cycle through the alphanumeric characters on the key. A long press of this key is used to adjust setpoint targets. Refer to Target page 114. For information on **LIM.1** to **LIM.4** refer to Active page 111. For information on **PRE.MED** and **PRE.FST** refer to Fill Material Setpoints: Slow, Medium, Fast, Finish page 111.

7.4.9. ID Key

Where data entry is required, a short press of this key will cycle through the alphanumeric characters on the key. A long press of the this key will access the **REF.ID** (Reference ID) and **SEQ.ID** (Sequence ID) settings. Pressing the **<FIND>** key will switch between **REF.ID** and **SEQ.ID**. In each setting the display will alternate with the current setting.

- **REF.ID (Reference ID)**

The **Reference ID** can contain up to six numeric characters and can be used to identify a series of printouts if a Fixed 1, 2 or 3 type has been configured. Refer to Printer Output Formats page 104 for examples and more information.

The Reference ID can be altered by entering a new number on the numeric keypad and then pressing the **<ACCEPT/OK>** key accept your choice. Press the **<ESC/C>** to return to normal operation.

- **SEQ.ID (Sequence ID)**

The **Sequence ID** can contain up to six numeric characters and is a sequential counter that is incremented with every printout up to a maximum of 999999 (after which the counter cycles back to zero). The **SEQ.ID** can only be viewed (not changed) using the **<ID>** key. The **SEQ.ID** can only be changed in full setup. Refer to SEQ.ID (Sequence Identifier) page 69 for more information.

7.4.10. FIND Key

This key is used in conjunction with other keys to find and/or create Truck IDs, Product IDs and Destination IDs. Refer to Managing Trucks, Products and Destinations page 40 for more information.

When entering alphanumeric characters (eg. creating Truck IDs) this key can also be used to insert a space (eg. TRK 1).

When entering text during setup (eg. header, footer, etc.) this key can be used to toggle the display to show the ASCII value or the character (eg. ASCII **120** = Character **X**).

7.4.11. ESC/C Key

This key is used in conjunction with other keys to clear entries or totals and/or delete Truck IDs, Product IDs and Destination IDs. Refer to Managing Trucks, Products and Destinations page 40 for more information. It is also used during setup, (refer to Clear / Abort Function page 53). For additional uses for this key refer also to Alphanumeric Keypad page 36.

7.5. Managing Trucks, Products and Destinations

7.5.1. Manage IDs - Using the Keypad

This section of the manual describes the **Keypad** procedures to be used for managing all types of IDs (ie. Truck IDs, Product IDs and Destination IDs). Many of the procedures below are also available via the Viewer. Refer to Manage IDs - Using the Viewer page 43 for more information.

The procedures for all IDs are essentially the same except for the key pressed to instigate the procedure. For the purposes of readability in this section of the manual, unless otherwise noted, Truck IDs, Product IDs and Destination IDs will be referred to in the singular as **Truck/Product/Dest ID**.

Note: Depending on the desired procedure to be performed, where **<TRUCK, PRODUCT or DEST>** occurs in this section, it refers to either the **<TRUCK/1>** key, the **<PRODUCT/2>** key or the **<DEST/3>** key.

- **Print Currently Displayed Weight**

• The truck drives on the scale.
• Press the **<PRINT>** key.
• Depending on the setup, the unit may prompt with **ENTER ID**. If prompted, enter a user defined ID from the alphanumeric keypad.
• Press the **<ACCEPT/OK>** key to accept your choice and return to normal operation

- **Display Total for Most Recent Truck/Product/Dest ID**

• Press and hold the **<TRUCK, PRODUCT or DEST>** key for two seconds. The most recent Truck/Product/Dest ID and the current total weight reading will display alternately.
• Press **<ACCEPT/OK>** to return to the normal display.

- **Search for Existing Truck/Product/Dest ID and Display Total**

Search Most Recent Truck/Product/Dest ID: This method cycles through the 10 most recent Truck/Product/Dest IDs.

• Press and hold the **<TRUCK, PRODUCT or DEST>** key for two seconds. The most recent Truck/Product/Dest ID and the current total weight reading will display alternately.
• Press the **<FIND>** key to step through the 10 most recent Truck/Product/Dest IDs.
• When the desired Truck/Product/Dest ID is located, press the **<ACCEPT/OK>** key to select it. The Truck/Product/Dest ID and the current total weight reading will display alternately.
• Press **<ACCEPT/OK>** to return to the normal display.

Search All Truck/Product/Dest IDs: This method searches through all of the Truck/Product/Dest IDs.

• Press and hold the **<TRUCK, PRODUCT or DEST>** key for two seconds. The most recent Truck/Product/Dest ID and the current total weight reading will display alternately.
• Press the **<FIND>** key.
• Enter the first character of the Truck/Product/Dest ID to find. If there are no IDs beginning with the character entered, the display will show the character followed by dashes (eg. **A - - - - -**).
• Press the **<FIND>** key to step through all IDs starting with that character.
• When the desired Truck/Product/Dest ID is located, press the **<ACCEPT/OK>** key to select it. The Truck/Product/Dest ID and the current total weight reading will display alternately.
• Press **<ACCEPT/OK>** to return to the normal display.

- **Print and/or Clear Truck/Product/Dest ID Information and Totals**

Print All Truck/Product/Dest ID Totals:

• Press and hold the **<TRUCK, PRODUCT or DEST>** key for two seconds. The most recent Truck/Product/Dest ID and the current total weight reading will display alternately.
• Press the **<PRINT>** key. Totals for all Truck/Product/Dest ID s will print.

Print and Clear All Truck/Product/Dest ID Totals:

• Press and hold the **<TRUCK, PRODUCT or DEST>** key for two seconds. The most recent Truck/Product/Dest ID and the current total weight reading will display alternately.
• Press and hold the **<PRINT>** key for two seconds. Totals for all Truck/Product/Dest IDs will print.
• The unit will prompt to clear the totals with **CLR N.** Use the **<FIND>** key to switch between **N** (No) and **Y** (Yes).
• Press the **<ACCEPT/OK>** key to accept your choice and return to normal operation.

- **Create New Truck/Product/Dest ID**

• Press and hold the **<TRUCK, PRODUCT or DEST>** key for two seconds. The most recent Truck/Product/Dest ID and the current total weight reading will display alternately.
• Press and hold the **<FIND>** key for two seconds.
• Enter the Truck/Product/Dest ID name. Valid names can include up to six alphanumeric characters and spaces. The ID must be unique to other IDs in the ID type (eg. two trucks can not have the same ID but a truck, product and destination could have the same ID). An attempt to duplicate an ID in an ID type will result in the **ID EXISTS** error message.
• Press the **<ACCEPT/OK>** key to create the Truck/Product/Dest ID. The Truck/Product/Dest ID and the current total weight reading (zero) will display alternately.
• Press **<ACCEPT/OK>** to return to the normal display.

- **Delete Truck/Product/Dest ID**

A Truck ID can only be deleted if the total is zero. Refer to Print and Clear All Truck/Product/Dest ID Totals page 41. The error message **NOT CLEAR** will display if an attempt is made to delete a Truck/Product/Dest ID where the total is not zero.

• Press and hold the **<TRUCK, PRODUCT or DEST>** key for two seconds. The most recent Truck/Product/Dest ID and the current total weight reading will display alternately.
• Use a Search method noted previously to display the Truck/Product/Dest ID to be deleted.
• Press and hold the **<ESC/C>** key for two seconds.
• The unit will prompt to delete the ID with **DEL N**. Use the **<FIND>** key to switch between **N** (No) and **Y** (Yes).
• Press the **<ACCEPT/OK>** key to delete the Truck/Product/Dest ID. The unit will display dashes (ie. - - - - - -).
• Press the **<ACCEPT/OK>** key to return to normal operation.

- **Rename Truck/Product/Dest ID**

Refer to Manage IDs - Using the Viewer page 43.

7.5.2. Manage IDs - Using the Viewer

This section of the manual describes the **Viewer** procedures to be used for viewing and managing all types of IDs (ie. Truck IDs, Product IDs and Destination IDs). Many of the procedures below are also available via the Keypad. Refer to Manage IDs - Using the Keypad page 40 for more information.

The **Manage IDs** window can be displayed by either choosing **Instruments | Manage IDs** from the Menu or by clicking the **Manage IDs** button in the Viewer toolbar.

Initially when the Manage IDs window is opened there are no IDs displayed as illustrated in Figure 15. IDs can be created in the instrument and then read into the viewer or created in the viewer and written to the instrument. The IDs can be saved to a file for use at a later date and can then be opened for use on the same or a different instrument (of the same type).

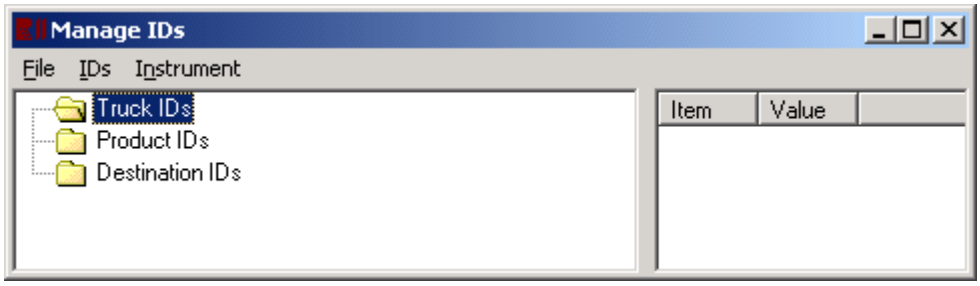


Figure 15: 5230 Viewer - Manage IDs Window

Figure 16 identifies the various areas of the Manage IDs window.

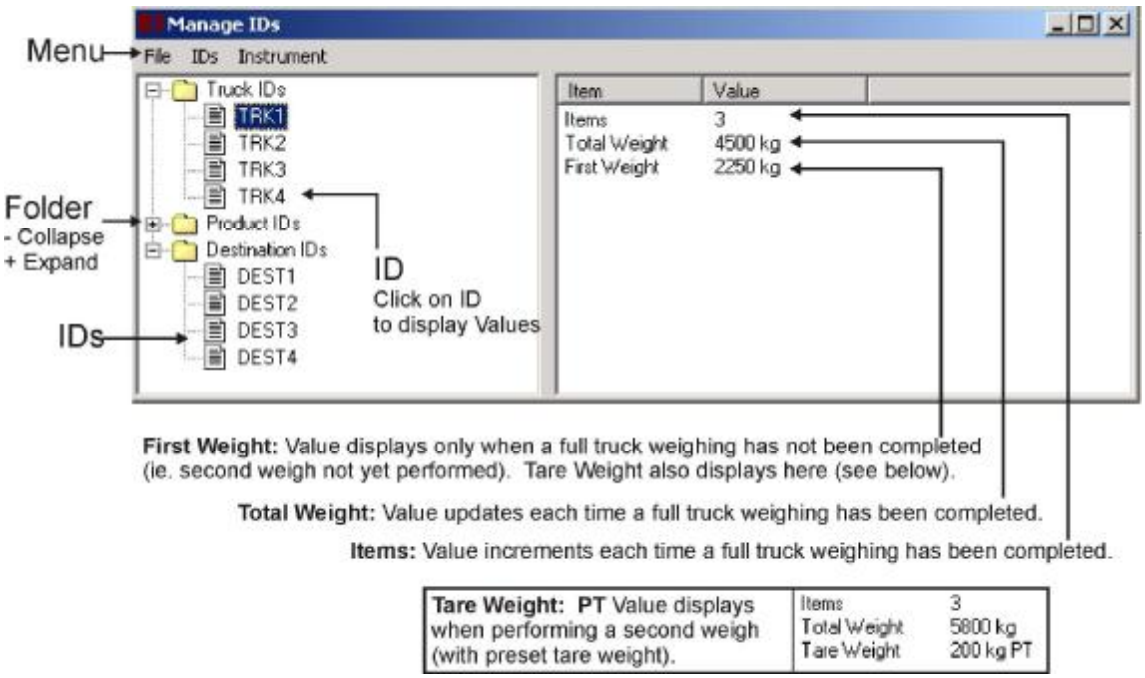


Figure 16: Manage IDs - Tour of Window

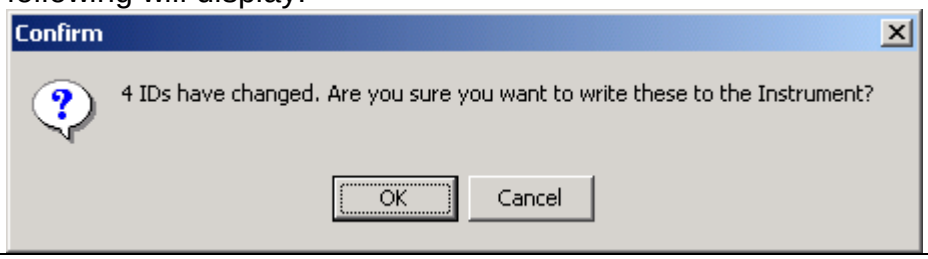
For the procedures in this section, it is assumed that the Viewer and Instrument are connected and the Manage IDs window is displaying. Refer to Connecting Viewer to Instrument page 29.

- **Read All IDs from Instrument to Viewer**

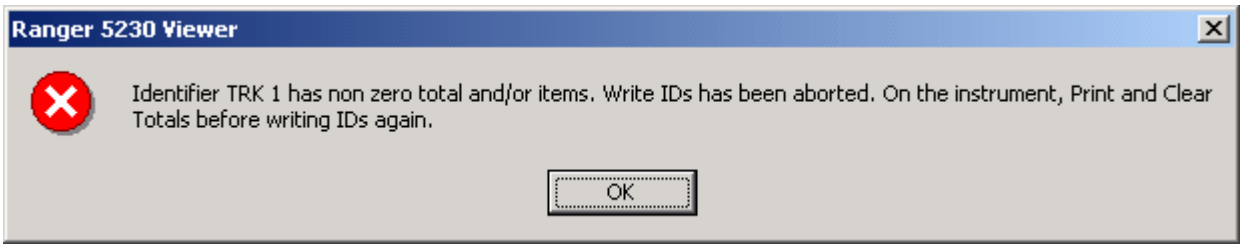
• Choose Instrument | Read All IDs from the menu.
• A dialog box displays the progress. Wait…
• The Truck IDs, Product IDs and Destination IDs folders display.

- **Write All IDs from Viewer to Instrument**

The **Write All IDs** function first reads the instrument IDs. It then compares the instrument IDs to the Viewer IDs and checks that ID totals are zero (see **Zero Total Note** page 44 for more information). It finally writes the IDs to the instrument with a message dialog warning of the number of IDs that will be changed.

• Choose Instrument | Write All IDs from the menu.
• A dialog box displays the progress. Wait…
• If changes have been made to the IDs a message dialog warning similar to the following will display. 
• Choose **OK** to accept the changes or **Cancel** to abort the Write procedure.

Zero Total Note: If ID(s) do not have zero totals the following error message will display.



Refer to Print and/or Clear Truck/Product/Dest ID Information and Totals page 41.

- **Clear All IDs from Viewer**

The **Clear All IDs** function clears all IDs from the Viewer (regardless of whether there are weights stored for the IDs). This function does not clear IDs from the Indicator, however writing this back to the instrument will result in the error shown above.

• Choose **IDs | Clear All IDs** from the menu.

- **Open ID File**

• IDs that have been previously saved to file can be opened (loaded) by choosing **File | Open**.
• Choose the file type ID Files (*.RID), select the directory/filename and choose Open.

- **Save ID File**

• IDs in the Viewer can be saved to a file by choosing **File | Save**.
• Choose the file type ID Files (*.RID), select the directory, enter the filename and choose Save.

- **Print ID File**

• IDs can be printed by choosing **File | Print**.
• The standard Windows Print dialog box will display. The following is a sample of a Manage IDs printout.

Truck IDs
ID Name: TRK1, Items: 7, Total Weight: 3965 kg
ID Name: TRK2, Items: 1, Total Weight: 1487 kg, First Weight: 2478 kg
ID Name: TRK3, Items: 6, Total Weight: 3472 kg
ID Name: TRK4, Items: 2, Total Weight: 6440 kg, First Weight: 3470 kg

Product IDs
ID Name: PROD1, Items: 31, Total Weight: 26926 kg
ID Name: PROD2, Items: 1, Total Weight: 992 kg
ID Name: PROD3, Items: 1, Total Weight: 992 kg
ID Name: PROD4, Items: 1, Total Weight: 0 kg

Destination IDs
ID Name: DEST1, Items: 31, Total Weight: 26926 kg
ID Name: DEST2, Items: 1, Total Weight: 992 kg
ID Name: DEST3, Items: 1, Total Weight: 0 kg
ID Name: DEST4, Items: 1, Total Weight: 992 kg

- **Expand / Collapse Folders**

• To expand or collapse a specific folder click on the **+** or **–** symbol beside the folder. An alternate method is to click the right mouse button on the folder and choose **Expand** or **Collapse**.
• To expand or collapse all folders click the right mouse button on any folder or ID and choose **Expand All** or **Collapse All**.

- **View ID Values**

• Expand the ID folder to view the IDs.
• Click on the ID to view the values in the right side of the window.

1. Before any weighing

Item	Value
Items	0
Total Weight	0.0 g

2. After first weigh

Item	Value
Items	0
Total Weight	0.0 g
First Weight	49.6 g

3. After second weigh

Item	Value
Items	1
Total Weight	49.6 g

4. After preset tare

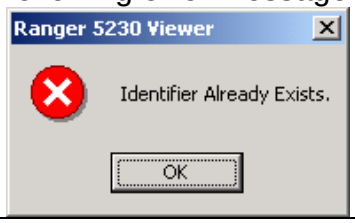
Item	Value
Items	2
Total Weight	79.2 g
Tare Weight	20.0 g PT

5. After another preset tare and another first weigh

Item	Value
Items	3
Total Weight	132.9 g
Tare Weight	45.5 g PT
First Weight	148.7 g

Figure 17: ID Values (Examples)

- **Create New ID**

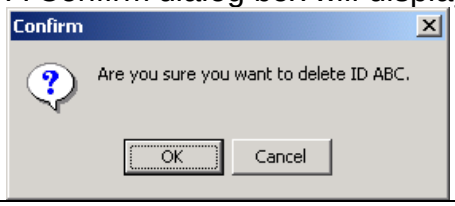
• Click the right mouse button on any folder or ID and choose **New ID**.
• An ID will be created with the “temporary” name **NEW ID**.
• Overtype the temporary name with a name of your choice. **Valid ID names** can include up to six alphanumeric characters and spaces. The ID must be unique to other IDs in the folder. An attempt to duplicate an ID in a folder will result in the following error message. 
• Press the **<Enter>** key to accept the name. If mixed case was entered, the name will automatically be converted to Uppercase.

- **Rename ID**

• Click the right mouse button on any ID and choose **Rename ID** or click ID and press **F2** to edit.
• Overtype the name with a name of your choice. Refer to Create New ID for information in valid ID names.

- **Delete ID**

IDs can only be deleted if the total is zero. Refer to Print and Clear All Truck/Product/Dest ID Totals page 41

• Click the right mouse button on any ID and choose **Delete ID** or click ID and press the **<Delete>** key on the PC keyboard.
• A Confirm dialog box will display. 
• Choose **OK** to continue with the deletion or **Cancel** to abort the Delete procedure.

7.6. Truck ID Operations

In the most basic form, trucks totals are derived by finding the difference between a first and a second weight reading. Totals can also be derived by finding the difference in a manually entered weight (preset tare) and second weight reading. Advanced options allow multiple axes to be weighed to make up the first and second weights.

Settings chosen during setup can alter the responses from the unit. The procedures below describe operations in their basic form and assume the instrument defaults are set and a Fixed printer setting type has been configured. Refer to Keypad Setup page 53 for more information.

Manual or Automatic Axle Weighing: The **Axle Weighing** setting determines whether weighings will be manually accepted by the operator or be automatically accepted after a period of no motion. Refer to OPER (Truck Weighing Operations Setup) page 59 or Operation Settings (OPER): Axle Weighing page 78. The following procedures describe **manual** weighings.

For **automatic** weighings the procedures below would be basically the same except that the weights would be automatically accepted after a period of no motion and there would be no prompt to PRINT.? or STORE.? (ie. printing would be automatic). Although the following procedures describe manual weighings, the steps marked with ****** signify where a weight or print would be automatically accepted.

7.6.1. Single Axle Weighing

- **First Weigh (Single Axle)**

• Press the **<FIRST>** key.
• Use a search method noted previously to display the Truck ID.
• Press the **<ACCEPT/OK>** key to accept the displayed Truck ID.
• The unit displays **TRUCK** and the accepted **Truck ID**.
• The unit then displays the current weight and **DRIVE ON** alternately. The auxiliary display shows **1ST**.
• The truck drives on the scale.
• When the weight is stable, press the **<ACCEPT/OK>** key to accept the first weight. (******For automatic weighings the weight would be accepted automatically after a period of no motion.)
• With a **fixed** printer settings type configured, the unit will alternate the prompts **PRINT.?** and **STORE.?**. Press the **<PRINT>** key to store and print the result. Press the **<ACCEPT/OK>** key to only store the result. The unit will display either **PRINT** or **FIRST STORED**, depending on the operation selected. (****** For automatic weighings the unit will briefly display **PRINT**.)
• The unit then displays the current weight and **DRIVE OFF** alternately. The auxiliary display shows **1ST**. The weight must go below the truck minimum weight before any further operation can be performed.
• The truck drives off the scale.

Note: (Additional First Weigh) When an additional first weigh is attempted (prior to a second weigh) the unit displays **FIRST EXISTS** and then the **CONT N** message. Use the **<FIND>** key to switch between **N** (No) and **Y** (Yes). Choosing **N** returns the operator to select another Truck ID. Choosing **Y** displays **DRIVE ON**. Subsequent steps can now be performed, as described previously. The original first weight will be replaced. The procedure can be aborted at any stage by pressing **<ESC/C>**.

- **Second Weigh (Single Axle)**

• Press the **<SECOND>** key.
• Use a Search method noted previously to display the Truck ID.
• Press the **<ACCEPT/OK>** key to accept the displayed Truck ID.
• The unit then prompts for a Product ID. Use a Search method noted previously to display the Product ID.
• Press the **<ACCEPT/OK>** key to accept the displayed Product ID.
• The unit then prompts for a Destination ID. Use a Search method noted previously to display the Destination ID.
• Press the **<ACCEPT/OK>** key to accept the displayed Destination ID.
• The unit displays **TRUCK** and the accepted **Truck ID**.
• The unit then displays the current weight and **DRIVE ON** alternately. The auxiliary display shows **2ND**.
• The truck drives on the scale.
• When the weight is stable, press the **<ACCEPT/OK>** key to accept the second weight. (******For automatic weighings the weight would be accepted automatically after a period of no motion.)
• With a **fixed** printer settings type configured, the unit will display **PRINT** and then print and store the result.
• The unit then displays the current weight and **DRIVE OFF** alternately. The auxiliary display shows **2ND**. The weight must go below the truck minimum weight before any further operation can be performed.
• The truck drives off the scale.

- **Preset Tare Truck Weigh (Single Axle)**

• Press the **<SECOND>** key.
• Select a truck ID with no current first weight.
• Use a Search method noted previously to display the Truck ID.
• Press the **<ACCEPT/OK>** key to accept the displayed Truck ID.
• The unit then prompts for a Product ID. Use a Search method noted previously to display the Product ID.
• Press the **<ACCEPT/OK>** key to accept the displayed Product ID.
• The unit then prompts for a Destination ID. Use a Search method noted previously to display the Destination ID.
• Press the **<ACCEPT/OK>** key to accept the displayed Destination ID.
• The unit then displays six digits where the preset tare weight can be entered. The auxiliary display shows **PT**. Enter the weight to be used for the preset tare.
• Press the **<ACCEPT/OK>** key to accept the preset tare weight. Refer to General: Preset Tare Expiry (TAR.EXP) page 80 for more information.
• The unit displays **TRUCK** and the accepted **Truck ID**.
• The unit then displays the current weight and **DRIVE ON** alternately. The auxiliary display shows **2ND**.
• The truck drives on the scale.
• When the weight is stable, press the **<ACCEPT/OK>** key to accept the second weight. (******For automatic weighings the weight would be accepted automatically after a period of no motion.)
• With a **fixed** printer settings type configured, the unit will display **PRINT** and then print and store the result. (****** For automatic weighings the unit will briefly display **PRINT**.)
• The unit then displays the current weight and **DRIVE OFF** alternately. The auxiliary display shows **2ND**. The weight must go below the truck minimum weight before any further operation can be performed.
• The truck drives off the scale.

7.6.2. Multiple or Variable Axle Weighing

- **First Weigh (Multiple / Variable Axles)**

  This example uses two Axles.

• Press the **<FIRST>** key.
• Use a Search method noted previously to display the Truck ID.
• Press the **<ACCEPT/OK>** key to accept the displayed Truck ID.
• The auxiliary display will show **AXL** to signify the numbers of axles for the truck are to be entered. Enter the number of axles (maximum 10) from the numeric keypad. In this example the number of axles will be set to 2.
• Press the **<ACCEPT/OK>** key to accept the displayed number of axles.
• The unit displays **TRUCK** and the accepted **Truck ID**.
• The unit then displays the current weight and **AXLE 1** alternately. The auxiliary display shows **1-2** (indicating axle 1 of 2).
• The truck drives on the scale to the first axle.
• When the weight is stable, press the **<ACCEPT/OK>** key to accept the first axle weight. (******For automatic weighings the weight would be accepted automatically after a period of no motion.)
• The unit then displays the current weight and **AXLE 2** alternately. The auxiliary display shows **2-2** (indicating axle 2 of 2).
• The truck drives on the scale to the second axle.
• When the weight is stable, press the **<ACCEPT/OK>** key to accept the second axle weight. (******For automatic weighings the weight would be accepted automatically after a period of no motion.)
• With a **fixed** printer settings type configured, the unit will alternate the prompts **PRINT.?** and **STORE.?**. Press the **<PRINT>** key to store and print the result. Press the **<ACCEPT/OK>** key to only store the result. The unit will display either **PRINT** or **FIRST STORED**, depending on the operation selected. (****** For automatic weighings the unit will briefly display **PRINT**.)
• The unit then displays the current weight and **DRIVE OFF** alternately. The weight must go below the truck minimum weight before any further operation can be performed.
• The truck drives off the scale.

Note: When an additional first weigh is attempted (prior to a second weigh) the unit displays the **FIRST EXISTS** message. Refer to Note: (Additional First Weigh) page 47 for more information.

- **Second Weigh (Multiple / Variable Axles)**

  Where **multiple** axles have been configured in setup, the number of axles in the second weigh is the same as in the first weigh (ie. the unit will **not** prompt for the number of axles during the second weighing).

  This example uses two Axles.

• Press the **<SECOND>** key.
• Use a Search method noted previously to display the Truck ID.
• Press the **<ACCEPT/OK>** key to accept the displayed Truck ID.
• The unit then prompts for a Product ID. Use a Search method noted previously to display the Product ID.
• Press the **<ACCEPT/OK>** key to accept the displayed Product ID.
• The unit then prompts for a Destination ID. Use a Search method noted previously to display the Destination ID.
• Press the **<ACCEPT/OK>** key to accept the displayed Destination ID.
• **Note:** For variable axles refer to the note on Variable Axles page 50.
• The unit displays **TRUCK** and the accepted **Truck ID**.
• The unit then displays the current weight and **AXLE 1** alternately. The auxiliary display shows **1-2**.
• The truck drives on the scale to the first axle.
• When the weight is stable, press the **<ACCEPT/OK>** key to accept the first axle weight. (******For automatic weighings the weight would be accepted automatically after a period of no motion.)
• The unit then displays the current weight and **AXLE 2** alternately. The auxiliary display shows **2-2**.
• The truck drives on the scale to the second axle.
• When the weight is stable, press the **<ACCEPT/OK>** key to accept the second axle weight. (******For automatic weighings the weight would be accepted automatically after a period of no motion.)
• With a **fixed** printer settings type configured, the unit will display **PRINT** and then print and store the result.
• The unit then displays the current weight and **DRIVE OFF** alternately. The weight must go below the truck minimum weight before any further operation can be performed.
• The truck drives off the scale.

Note: (Variable Axles) If the variable axle setting has been configured in setup, the unit will now prompt for the number of axles in the second weigh. The number of axles set in the first weigh will display and the auxiliary display will show **AXL**. Enter the number of axles (maximum 10) for the second weigh from the numeric keypad. The **<ACCEPT/OK>** key is then pressed to accept the displayed number of axles. The procedure would then continue as described above, altering the number of axles to weigh accordingly.

7.6.3. Batching Process (Remote Fill)

This menu provides access to the batching commands and settings. The Target settings are accessed with a long press of the **<TARGET>** key.

Items including **PRE.MED** (preliminary target for material medium speed fill) and **PRE.FST** (preliminary target for the fast fill) may be present. Also **LIM1** to **LIM4** may be present if an active setpoint is defined.

When a target weight is being displayed, **TGT** is shown on the auxiliary display. Instrument configuration must include a **FILL** setting in one of the Remote Key Setting (refer to Remote Key Settings (FUNCTN): Remote 1, 2, 3 and 4 (REM 1, 2, 3 and 4) page 75). The relevant settings for the Setpoint(s) must also be configured (refer to SET.PTS page 64 and SETTINGS / SETPOINT TAB page 86). Refer to Basic Setpoint Operation page 110 and Function Keys, External Keys and Interlock page 117 for more information about Batching Settings.

- **Batch Process**

• The truck should be on the scale.
• Press the **<REMOTE>** key (previously defined as a **FILL** input) .
• Accept the correct Truck and also Product and Destination (if applicable).
• Enter the target weight for the current truck using the numeric keypad. This is the slow fill target for Setpoint 1.
• Press the **<ACCEPT/OK>** key to accept the target weight.
• The **FILL** prompt will flash on the display, alternating with the current weight.
• Press the **<REMOTE>** key (previously defined as a **FILL** input) again. This starts the fill process, assuming interlocks are in place and the minimum weight is on the scale.
• The message **FIRST STORED** displays to indicate the truck weight has been stored. The accepted IDs will then flash on the display, alternating with the current weight.
• The filling procedure runs and the Range/Output Display will reflect the current configuration. Refer to Range / Output Display page 37.
• To pause the batch operation press the **<REMOTE>** key (previously defined as a **FILL** input). The message **PAUSE OPER** displays alternately with the last accepted ID and the current weight. Another press of the same **<REMOTE>** key will restart the operation.
• To abort the batch operation press the **<ESC/C>** key for two seconds.

7.7. View Printed Output

Up to two kilobytes of printer data is buffered in the instrument. This can be viewed in the **Printed Output** window at a later time.

• Choose **View | Printed Output** from the menu.
• The **Clear** button clears the printed output from the window.
• The **Save** button is used to save the printed output to a text file (Text Files (*.txt)).
• The **OK** button closes the printed output window.

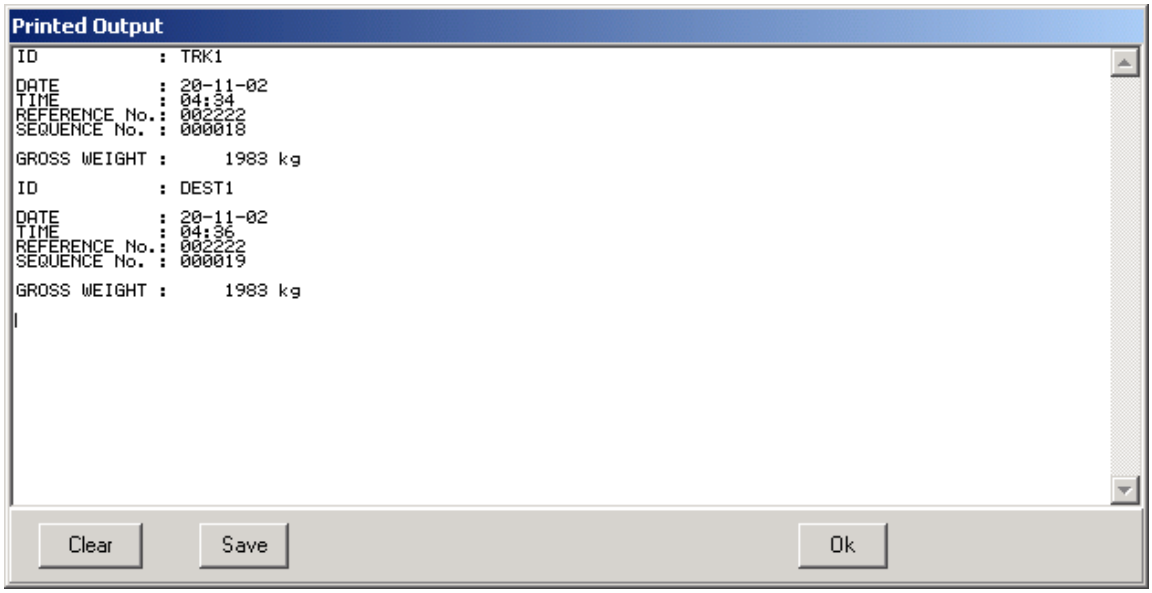


Figure 18: Printed Output Window

7.8. Maintenance

To clean the instrument, never use harsh abrasive cleaners or solvents on the keyboard. Wipe the instrument with a soft cloth slightly dampened with either methylated spirits or warm soapy water.

8. Keypad Setup

The **5230** digital setup facilities provide the means to configure and calibrate the instrument. The configuration and calibration are performed by using both the front panel keypad and also the Viewer. For information on Viewer Setup refer to page 70.

Note: In this manual where settings can be configured by using either the instrument keypad or the viewer, the Viewer Setup section will contain the bulk of the details.

The **5230** provides two methods to access the Setup area. The **Full Setup** method provides access to all functions in Setup. The **Safe Setup** method restricts access to the Trade Critical Settings. In this manual, items marked with Ä indicate that the setting is trade critical. If an attempt is made to alter a trade critical setting while in Safe Setup, the instrument will respond with the **ACCESS DENIED** message.

8.1. General Information

8.1.1. Accessing Setup

Full Setup	Safe Setup
	
To access **Full Setup**, first ensure the instrument is on. Then press and hold both the **<ZERO>** and **<FIND>** keys together for two seconds.	To access **Safe Setup**, first ensure the instrument is on. Then press and hold both the **<SECOND>** and **<FIND>** keys together for two seconds.

The **5230** will beep twice and then display the following:

• Full or Safe
• Setup
• Software Version (eg. V2.0)
• Setup Access Count (eg. C 00010)
• If a passcode has been configured, this passcode must be entered to gain access. Refer to Security Settings (PASSCD): Set Full Setup Passcode page 77 or Security Settings (PASSCD): Set Safe Setup Passcode page 77 for more information.
• The first item in the Group list (ie. **BUILD**) will then display.

8.1.2. Clear / Abort Function

The **<ESC/C>** key is used as an undo key during editing. At any point in the process the **<ESC/C>** key will cancel the last operation. Use this key to reverse direction when selecting any items from lists or to perform a **backspace** function when entering numbers. Press and hold the **<ESC/C>** key for two seconds to ABORT an operation and return to the menu without making any changes.

8.1.3. Data Entry

Refer to Data Entry page 24.

8.1.4. Groups and Items

All keypad setup options in the **5230** are organised in a tree structure made up of **Groups** and **Items**. To simplify this document, Groups and Items will be notated as follows (Keypad Group:Item). Refer to Keypad and Viewer Settings (Availability) page 122 for a list of the Groups and Items.

- **GRP (Groups)**

  Keypad setup is divided into a series of **Groups**. Each group has a distinctive group title. All options in any one group have related functions. The **<GRP>** key can be used to cycle through the available groups. The **<ESC/C>** key can be used to cycle through groups in the reverse direction.

- **ITM (Items)**

  Each group is divided into individual **Items**. Each item represents a parameter that can be changed. Pressing the **<ITM>** key will enter the displayed group, allowing access to the items within the group. The **<SEL>** key can be used to cycle through the available items. The **<EDT>** key is then used to edit the item. The **<ESC/C>** key can be used to cycle through items in the reverse direction.

8.1.5. Using the Editing Key Functions

The role of each of the primary keys during editing is displayed on the editing annunciator above each of the keys. Refer to Keypad page 25 for more information on editing annunciators. When in Setup, a single press of each key triggers the editing annunciator function. These functions are as follows:

Annunciator	Key Name	Description
GRP	ZERO	Steps through the list of Groups.
ITM	FIRST	Steps through the list of items.
SEL	SECOND	Moves the editing cursor in some editing modes.
EDT	PRINT	Steps through the available options when editing a particular item.
OK	ACCEPT	Press this key to edit an item or to save changes and return to the menus.

8.1.6. Exiting Setup

There are three methods for exiting Full or Safe Setup and returning to the Operator Interface.

Method 1	Press and hold both the **<ZERO>** and **<FIND>** keys together for two seconds.
Method 2	Press and hold both the **<SECOND>** and **<FIND>** keys together for two seconds.
Method 3	Press the **<GRP>** key repeatedly. When **- End -** displays press **<OK>**.

The **5230** will beep and then display the following:

- Saving
- Software Version (eg. 2.0)
- Setup Access Count (eg. C 00010)

- The current weight will then display.

8.2. Menus and Parameters

The following sections describe the setup parameters of each of the Groups and Items in the keypad setup.

8.2.1. BUILD (Scale Build)

Settings in this group configure the indicator to suit the current application. It is important to fully set the options within this group before calibration is attempted. Later changes to items within this group may invalidate the current calibration data. Items marked with Ä indicate that the setting is trade critical and the trade counter will be incremented if this setting is changed. Trade critical settings can only be altered from Full Setup.

- **TYPE (Display Type)** Ä

  Sets the type of display to suit the application. Refer to Build: Weighing Mode (TYPE) (Display Type) ⊗ page 71 for more information on this setting.

  Options are:
  - SINGLE:
  - DUAL R: Dual Range (Refer to Dual Interval and Dual Range Operation page 21.)
  - DUAL I: Dual Interval (Refer to Dual Interval and Dual Range Operation page 21.)
  - Default: SINGLE

- **DP (Decimal Point Position)** Ä

  Sets the location of the decimal point on the display. To avoid confusion, set this parameter first so that all other weight related values are displayed with the decimal point in the correct position. Refer to Build: Decimal Point (DP) (Position) ⊗ page 71 for more information.
  - Can be set from 000000 (none) to 0.00000
  - Default: 000000

- **CAP1 (Full Scale 1 - Max Capacity 1 (Lower Range))** Ä

  Refer to Scale: Full Scale 1 (CAP1) (Max Capacity 1 (Lower Range)) ⊗ page 72 for information on this setting.

- **E1 (Resolution 1 - Count-By 1 (Lower Range))** Ä

  Refer to Scale: Resolution 1 (E1) (Count-By 1 (Lower Range)) ⊗ page 72 for information on this setting.

- **CAP2 (Full Scale 2 - Max Capacity 2 (Upper Range))** Ä

  Refer to Scale: Full Scale 2 (CAP2) (Max Capacity 2 (Upper Range)) ⊗ page 72 for information on this setting.

- **E2 (Resolution 2 - Count-by 2 (Upper Range))** Ä

  Refer to Scale: Resolution 2 (E2) (Count-by 2 (Upper Range)) ⊗ page 72 for information on this setting.

- **UNITS (Weighing Units - Units of Measure)** Ä

  Refer to Build: Weighing Units (UNITS) (Units of Measure) ⊗ page 71 for information on this setting.

- **SYNC (Synch Filter) (A/D Synchronisation Frequency)** Ä

  Refer to Build: Synch Filter (BUILD:SYNC) (A/D Synchronisation Frequency) ⊗ page 72 for more information on this setting.

8.2.2. OPTION (Scale Options)

Settings in this group configure the operating parameters of the scale. Only **some** of these settings may be changed after calibration without affecting the calibration accuracy. Items marked with Ä indicate that the setting is trade critical and the trade counter will be incremented if this setting is changed.

- **USE (Scale Usage)** Ä

  The basic use of the scale must be set here. Refer to General: Usage (USE) (Scale Use) ⊗ page 73 for more information on this setting.
  - Options are: TRADE and INDUST (Industrial)
  - Default: INDUST

- **FILTER (Filtering - Reading Average)**

  Refer to General: Filtering (FILTER) (Reading Average) page 73 for information on this setting.

- **JITTER (Anti-Jitter - Weight Stabilisation)**

  Refer to General: Anti-Jitter (JITTER) (Weight Stabilisation) page 73 for more information on this setting.

- **MOTION (Motion Detection)** Ä

  Sets how much weight variation over a defined time period is allowed before the displayed weight is deemed to be unstable. This value is displayed in weight change (0.5, 1.0, 2.0 or 5.0 divisions (graduations)) per time period (1.0, 0.5 or 0.2 seconds). When set to **OFF** the motion detection is ignored and the **ZERO** and **PRINT** actions are instantaneous.
  - Options are: (displayed as divisions - seconds)

Off		
0.5 - 1.0 (fine)	0.5 - 0.5	0.5 - 0.2
1.0 - 1.0	1.0 - 0.5	1.0 - 0.2
2.0 - 1.0	2.0 - 0.5	2.0 - 0.2
5.0 - 1.0	5.0 - 0.5	5.0 - 0.2 (coarse)

  - Default: 1.0 - 1.0 (1.0 division per 1.0 second)

- **INIT.Z (Initial Zero)**

  Refer to Zeroing: Initial Zero (INIT.Z) page 74 for more information on this setting.

- **Z.TRAC (Zero Tracking Sensitivity)** Ä

  Zero tracking allows the display to adjust for minor changes in the zero balance of the scale. The zero track limit sets the fastest rate of change that is allowed to be compensated automatically. This value is displayed in the number of divisions (0.5, 1.0, 2.0 or 5.0 divisions (graduations)) per time period (1.0, 0.5 or 0.2 seconds). When set to **OFF** the Zero Tracking facility is disabled.

  - Options are: (displayed as divisions - seconds)

Off		
0.5 - 1.0 (fine)	0.5 - 0.5	0.5 - 0.2
1.0 - 1.0	1.0 - 0.5	1.0 - 0.2
2.0 - 1.0	2.0 - 0.5	2.0 - 0.2
5.0 - 1.0	5.0 - 0.5	5.0 - 0.2 (coarse)

  - Default: Off

- **Z.RANGE (Zero Range - Allowable Zero Operating Range)** Ä

  This setting restricts the range over which the Zero functions can operate.
  - Options are: 02-02, 01-03, 20-20, 100-100.
  - Default: 02-02 (–2% to +2%)

- **Z.BAND (Zero Band)** Ä

  Refer to Zeroing: Zero Band (Z.BAND) ⊗ page 74 for more information on this setting.

8.2.3. CAL (Scale Calibration)

Items within this group perform various calibration routines. For detailed scale calibration procedures refer to Calibration page 96. Certain items in Scale Build, Special and Options can affect the calibration of the scale. Always check that these sections are correctly configured to suit the current application before attempting to calibrate the scale. Items marked with Ä indicate that the setting is trade critical and the trade counter will be incremented if this setting is changed. When in Safe Setup, attempting to alter the trade critical settings will result in the **ACCESS DENIED** message displaying.

- **ZERO (Zero Calibration)** Ä

  Refer to Calibration (CAL): Zero Calibration (ZERO) ⊗ page 91 for more information on this setting.

- **SPAN (Span Calibration)** Ä

  Refer to Calibration (CAL): Span Calibration (SPAN) ⊗ page 91 for more information on this setting.

- **ED.LIN (Edit Linearisation Points)** Ä

  Refer to Set or Edit Linearisation Points page 99 for more information on this setting.

- **CLR.LIN (Clear Linearisation Points)** Ä

  Refer to Clear Linearisation Points page 100 for more information on this setting.

- **DIR.ZER (Direct mV/V Calibration - Zero Calibration Routine)** Ä

  Refer to Direct mV/V Calibration (Zero Calibration Routine) page 98 for more information on this setting.

- **DIR.SPN (Direct mV/V Calibration - Span Calibration Routine)** Ä

  Refer to Direct mV/V Calibration (Span Calibration Routine) page 98 for more information on this setting.

- **FAC.CAL (Restore Default Factory Calibration)** Ä

  Select this choice to restore default factory calibration.

  When this function is chosen the indicator will prompt to continue with **CONT N**. Use the **<PRINT>** key to switch between **N** (No) and **Y** (Yes). The **<ACCEPT/OK>** key is used to accept your choice (DONE will flash briefly) and return to the **FAC.CAL** item.

8.2.4. SPEC (Special Settings Menu)

Settings in this group control features including passcodes, key locking, remote functions and display settings.

- **PASSCD (Passcode)**

  The functions in this section allow access to setting three levels of passcodes and also to enabling or disabling operator access to specific functions.

- **PASSCD:FULL.PC (Set Full Setup Passcode)**

  Refer to Security Settings (PASSCD): Set Full Setup Passcode (FULL.PC) page 77 for more information on this setting.
  - Default: 000000

- **PASSCD:SAFE.PC (Set Safe Setup Passcode)**

  Refer to Security Settings (PASSCD): Set Safe Setup Passcode (SAFE.PC) page 77 for more information on this setting.
  - Default: 000000

- **PASSCD:OPER.PC (Set Operator Passcode)**

  Refer to Security Settings (PASSCD): Set Operator Passcode (OPER.PC) page 76 for more information on this setting.
  - Default: 000000

- **PASSCD:OP.ACC (Operator Access - Security Settings)**

  The Operator Access options work in conjunction with the Operator Passcode. If a function has been **disabled** but an Operator Passcode **has** been set, the function can be performed only after the Operator Passcode has been entered. The display will show the current setting (**STCDN**) where each character has a meaning as shown below. Refer to Security Settings (PASSCD): Tick Boxes page 76 for more information.

  Options are:
  - T or -: Allow Setting (T) Targets enabled or disabled (preliminary and active)
  - C or -: Allow IDs to be (C) Cleared enabled or disabled
  - D or -: Allow IDs to be (D) Deleted enabled or disabled
  - N or -: Allow (N) New IDs to be Created enabled or disabled
  - Default: TCDN

- **FUNCTN (Remote Key Functions)**

  The choices in this section allow access to setting the functions of up to four remote keys.

- **FUNCTN:REM 1, 2, 3 and 4 (Remote Key Settings)**

  Refer to Remote Key Settings (FUNCTN): Remote 1, 2, 3 and 4 (REM 1, 2, 3 and 4) page 75 for more information on these settings.

  Note: INT.LOC = Interlock

- **B.LIGHT (Backlight)**

  Refer to Display Settings: Backlight (B.LIGHT) page 76 for more information on this setting.

- **AUX.DSP (Auxiliary Display)**

  Refer to Display Settings: Auxiliary Display (AUX.DSP) page 76 for more information on this setting.

  Note: FILL.PC = Fill Percentage

8.2.5. TRUCK (Truck Weighing Settings)

Settings in this group control features that affect truck weighing operations.

- **OPER (Truck Weighing Operations Setup)**

  The settings available in the OPER menu decide the prompts the operator will encounter during normal operation and whether weights will be read automatically or must be accepted by the user.

  Options are:
  - N or A: (N) Normal or (A) Automatic weighing. Refer to Operation Settings (OPER): Axle Weighing page 78 for more information on this setting.
  - I or -: The (I) ID setting will prompt for a Print ID during normal weighing. The dash (-) setting will not prompt for Print ID. Refer to Operation Settings (OPER): Prompt Print ID page 79 for more information on this setting.
  - S or M or V: Use (S) Single, (M) Multiple or (V) Variable axle weighing. Refer to Operation Settings (OPER): Multi-Axle page 79 for more information on this setting.
  - D or -: The (D) Destination setting will require that a Destination ID be entered when performing the Second Weigh or with a Preset Tare Truck Weigh. The dash (-) setting will not prompt for the Destination ID. Refer to Operation Settings (OPER): Destinations page 79 for more information on this setting.
  - P or -: The (P) Product setting will require that a Product ID be entered when performing the Second Weigh or with a Preset Tare Truck Weigh. The dash (-) setting will not prompt for the Product ID. Refer to Operation Settings (OPER): Products page 79 for more information on this setting.
  - Default: NISDP

- **TAR.EXP (Preset Tare Expiry)**

  Refer to General: Preset Tare Expiry (TAR.EXP) page 80 for more information on this setting.

- **UNIT.ID (Unit Identifier)**

  Refer to General: Unit Identifier (UNIT.ID) page 80 for more information on this setting.

  Options are:
  - 00 to 99
  - Default: 00

- **DSTURB (Required Weight Disturbance)**

  Refer to Limits: Required Weight Disturbance (DSTURB) page 80 for more information on this setting.

- **TRK.MIN (Minimum Weigh Weight)**

  Refer to Limits: Minimum Weigh Weight (TRK.MIN) page 80 for more information on this setting.

8.2.6. SER.P1 (Serial 1 Communications Options)

Settings in this group configure the first serial port communications options for auto outputs and networking. Refer to Serial Outputs page 101 for more information.

- **TYPE (Serial 1 Output)**

  Sets the function of the first serial output.

  Options are:
  - OFF: Disables the output.
  - AUTO.LO: Enable automatic weight transmission at 10Hz.
  - NET: Sets the unit to function as a network device.
  - Default: NET

- **ADDRES (Serial Address)**

  Note: This option appears only where the **TYPE** has been set to **NET**.

  This is the address of the **5230** (used in network applications).
  - Range: 00 to 31
  - Default: 31

- **AUT.OPT (Automatic Transmission Options)**

  Note: This option appears only where the **TYPE** has been set to **AUTO.LO**.

  The automatic transmission options subgroup configures items concerned with serial transmission of weight data.

- **AUT.OPT:AUT.TYP (Auto Output Format Type)**

  Sets the format for automatically transmitted data. Refer to Auto Weight Format String page 102 for a detailed description of these formats.

  Options are:
  - AUTO.A: Format A - Standard Ranger output format
  - AUTO.B to AUTO.E: Formats B through E
  - CUSTOM: User programmable custom output format
  - Default: AUTO.A

- **AUT.OPT:SRC (Auto Output Source)**

  Select the weight source for the automatically transmitted data.

  Available options are:
  - DISP: Displayed reading
  - FULL: All data displayed is transmitted (including prompts and messages)
  - Default: DISP

- **AUT.OPT:AUT.FMT (Auto Output Format)**

  Note: This option appears only where the **AUT.TYP** has been set to **CUSTOM**.

  Up to 50 literal characters and special tokens can be entered to define the details of the serial output format. Refer to Auto Transmit Tokens page 103.

  The display will show the row (1) and the column (1 to 50) in the format 1.01. to 1.50. The first number (eg. 1. indicates the row number. The second number (eg. 01. to 50.) indicates the column (character) number. The **<SEL>** key is used to display the next column number. The **<EDT>** key or the alphanumeric keypad is used to enter the desired character.
  - Default: (No format specified)

- **BAUD (Serial Baud Rate)**

  The baud rate item determines the serial data transmission speed for serial port 1.
  - Options are: 300, 600, 1200, 2400, 4800, 9600 and 19200
  - Default: 9600

- **BITS (Serial Format Options)**

  The bits options allow the data transmission bit pattern and interface to be changed. The display will show the current setting in the following form (n81-4)

  Each character has a meaning as shown below.

  Options are:
  - N or O or E: Parity bit: (N) None, (O) Odd, (E) Even
  - 8 or 7: Number of data bits
  - 1 or 2: Number of stop bits
  - - or T: Termination resistors: (-) None, (T) Termination resistors present
  - 2 or 4: Interface: (2) RS-232 or (4) RS-485.
  - Default: n81-4. For most applications the default setting is applicable.

8.2.7. SER.P2 (Serial 2 Communications Options)

Settings in this group configure the second serial port for automatic outputs and printing. Refer to Serial Outputs page 101 for more information.

- **TYPE (Serial 2 Output)**

  Refer to Serial 2 Operation (TYPE) (Serial 2 Output) page 83 for more information on this setting.

  Note: AUTO.LO = Auto

- **PRN.OPT (Printer Options)**

  Note: This option appears only where the **TYPE** has been set to **PRINT**.

  The print options subgroup contains all items associated with printing.

- **PRN.OPT:PRN.TYP (Printer Output Ticket Type)**

  Refer to Printer Settings (PRN.OPT): Type (Printer Output Ticket Type) page 83 for more information on this setting.

- **PRN.OPT:HEADER (Print Header/Footer)**

  The text for the header and/or footer are entered here. The text entered here will print when the Print Settings Type is set to **Fixed** or **Custom**. The display will show the row (1 to 6) and the column (1 to 30) in the format 1.01. to 6.30. The first number (eg. 1. to 6. indicates the row number. The second number (eg. 01. to 30.) indicates the column (character) number. The **<SEL>** key is used to display the next column number. When the column number reaches 30, the next row number will display. The **<EDT>** key or the alphanumeric keypad is used to enter the desired character.
  - Default: (No entry specified)

- **PRN.OPT:HDR.FMT (Header Format)**

  When **Fixed** printing is used, this field defines a custom header for the printed ticket. When **Custom** printing is used, this field defines the first section of the custom ticket format. The Printer Settings (PRN.OPT): Footer Format defines the second section. Refer to Printer Output Formats page 104 for information regarding custom headers and ticket formats. Tokens can be used here for special fields in the printout (eg. date). Refer to Printer Tokens page 108.

  The display will show the row (1) and the column (1 to 100) in the format 1.01. to 1.100. The first number (eg. 1. indicates the row number. The second number (eg. 01. to 100.) indicates the column (character) number. The **<SEL>** key is used to display the next column number. The **<EDT>** key or the alphanumeric keypad is used to enter the desired character.
  - Default: (No entry specified)

- **PRN.OPT:FTR.FMT (Footer Format)**

  When **Fixed** printing is used, this field defines a custom footer for the printed ticket. When **Custom** printing is used, this field defines the first section of the custom ticket format. The Printer Settings (PRN.OPT): Header Format defines the first section. Refer to Printer Output Formats page 104 for information regarding custom headers and ticket formats. Tokens can be used here for special fields in the printout (eg. date). Refer to Printer Tokens page 108.

  The display will show the row (1) and the column (1 to 100) in the format 1.01. to 1.100. The first number (eg. 1. indicates the row number. The second number (eg. 01. to 100.) indicates the column (character) number. The **<SEL>** key is used to display the next column number. The **<EDT>** key or the alphanumeric keypad is used to enter the desired character.
  - Default: (No entry specified)

- **PRN.OPT:SPACE (Margin Space)**

  The margin space item allows for the number of columns of blank space and the blank rows to be entered. The format to enter the settings is CC.R1 where CC represents the number of blank columns to appear on the left margin and R1 represents the number of blank rows to leave before the 1st printout row. For example, 10.04 would leave 10 blank columns to the left of the print and 4 blank rows for normal tickets and first weighing tickets. After the columns and rows have been entered for row 1 (CC.R1), the prompt **ROWS 2** displays. The setting for **ROWS 2** specifies the number of rows of blank space for the second weighing ticket. **2nd Rows** allow a 2nd weight ticket to be printed on the same piece of paper after the first weight ticket.
  - Default: 00.00

- **AUT.OPT (Automatic Transmission Options)**

  Note: This option appears only where the **TYPE** has been set to **AUTO.LO**.

  The automatic transmission options subgroup configures items concerned with serial transmission of weight data.

- **AUT.OPT:AUT.TYP (Auto Output Format Type)**

  Sets the format for automatically transmitted data. Refer to Auto Weight Format String page 102 for a detailed description of these formats.

  Options are:
  - AUTO.A: Format A - Standard Ranger output format
  - AUTO.B to AUTO.E: Formats B through E
  - CUSTOM: User programmable custom output format
  - Default: AUTO.A

- **AUT.OPT:SRC (Auto Output Source)**

  Select the weight source for the automatically transmitted data.

  Available options are:
  - DISP: Displayed reading
  - FULL: All data displayed is transmitted (including prompts and messages)
  - Default: DISP

- **AUT.OPT:AUT.FMT (Auto Output Format)**

  Note: This option appears only where the **AUT.TYP** has been set to **CUSTOM**.

  Up to 50 literal characters and special tokens can be entered to define the details of the serial output format. Refer to Auto Transmit Tokens page 103.
  - Default: (No format specified)

- **BAUD (Serial Baud Rate)**

  The baud rate item determines the serial data transmission speed for serial port 2.
  - Options are: 300, 600, 1200, 2400, 4800, 9600 and 19200.
  - Default: 9600

- **BITS (Serial Format Options)**

  The bits options allow the data transmission bit pattern and interface to be changed. The display will show the current setting in the following form (n81-)

  Each character has a meaning as shown below.

  Options are:
  - N or O or E: Parity bit: (N) None, (O) Odd, (E) Even
  - 8 or 7: Number of data bits
  - 1 or 2: Number of stop bits
  - - or D: DTR Handshake: (-) None, (D) DTR present
  - Default: n81- For most applications the default setting is applicable.

8.2.8. SET.PTS (Setpoints)

Settings in this group configure the operational logic of the setpoint system. Refer to Setpoints page 110 for a detailed explanation of the items in this group, batching and setpoints.

- **SET.TYP (Setpoint Type)**

  The information in this section is valid for Setpoint 1, 2, 3 and 4 (SETP 1, 2, 3 and 4).

  This item sets the type and options for each setpoint. The Setpoint Type determines which other setpoint choices will be available for configuration. Options displayed as an underscore (ie. _) **are not** available. Options displayed as a dash (ie. **–**) **are** available for configuration.

Position	Configuration Setting	For more information refer to:
First	Source	Source page 86
Second	Direction	Direction page 87
Third	Logic	Logic page 87
Fourth	Alarm	Alarm page 87
Fifth	Correction	Correction page 87

  For example if **SETP 1** is set to **SLOW** the default format is (**n** _ _ **– –**). In this example the **n** in the first position indicates that the Source defaults to NET. The second and third positions (displayed as underscores _ _) **are not** available. The fourth and fifth positions (displayed as dashes **– –**) **are** available for configuration of the Alarm and Correction.

Pressing **<OK>** after selecting a setpoint will display the setpoint options.

- Options are: NONE, ACTIVE, Material Fills (SLOW, MEDIUM, FAST or FINISH), TOL, RUN, PAUSE, ERROR, MOTION, ZERO and AXLE.
- Default: NONE

- **GEN.OPT (General Options)**

  This setting contains items for general batching operations including automatic in-flight adjustments and tolerances. Refer to General Options (GEN.OPT) page 115 for more information on these settings.

- **GEN.OPT:OPTION (Operating Options)**

  Options are:
  - E or -: Pause on (E) Error enabled or disabled.
  - D or -: (D) Delay before Fill enabled or disabled.
  - F or -: One (F) Feeder only enabled or disabled.
  - Default: ED-

- **GEN.OPT:TOL.ACT (Tolerance Action)**

  Refer to Tolerance Action page 115 for more information on this setting.

- **IN.FLT (In-flight Settings)**

  This item sets the in-flight weight for the setpoint. The information in this section is valid for Setpoint 1, 2, 3 and 4 (IN.FLT 1, 2, 3 and 4). Refer to In-flight page 114 for more information on this setting.
  - Default: 000000

- **TOL (Tolerance)**

  This item sets the tolerance (hysteresis) for the setpoint. The information in this section is valid for Setpoint 1, 2, 3 and 4 (TOL 1, 2, 3 and 4). Refer to Tolerance (TOL) (Hysteresis) page 114 for more information on this setting.
  - Default: 000000

- **DELAY (Delay Options)**

  Refer to Delay Options (DELAY) page 116 for more information on these settings.

  Note:
  - FIN.DLY = Finish Pulse
  - BLOCK = Blockage Delay

- **JOG (Jogging Options)**

  Refer to Jogging Options (JOG) page 116 for more information on these settings.

  Note:
  - JOG.ON = Jog On Time
  - JOG.OFF = Jog Off Time
  - JOG.SET = Jogging Sets

8.2.9. ANALOG (Analog Settings)

Items within this group set the options for the optional analog output and combo cards.

- **TYPE (Analog Output Type)**

  Selects a range of voltage or current outputs.

  Options are:
  - OFF: Analog output disabled
  - VOLT: Voltage Output (-10v to 10v, 0v at 0 weight)
  - CUR: 4-20 mA current output
  - ABS.CUR: Absolute weight reading, output as 4-20mA current output
  - Default: OFF

- **CAL.LO (Calibrate Zero Output)**

  This allows a fine calibration of the analog output corresponding to zero weight at either 4mA or 0V, depending on the Analog Output Type.

  Options are:
  - UP: Up (Increase output level)
  - UP.FST: Up Fast (Increase output level at higher rate)
  - DN: Down (Decrease output level)
  - DN.FST: Down Fast (Decrease output level at higher rate)

  Note: When **UP** or **DN** is displayed, the **<EDT>** key is used to adjust the output in **small** increments. When **UP.FST** or **DN.FST** is displayed, the **<EDT>** key is used to adjust the output in **large** increments.

- **CAL.HI (Calibrate Fullscale Output)**

  This allows a fine calibration of the analog output corresponding to fullscale weight at either 20mA or 10V, depending on the analog output type.

  Note: The range of adjustment in Zero and Fullscale is around 9mA or 7VDC that allows for a complete range of voltage or current outputs. For example, it is possible to setup the voltage output to operate from 2 to 10V, 1 to 5V, 0 to 10V, etc., by changing the Zero and Fullscale analog calibrations.

  Options are:
  - UP: Up (Increase output level)
  - UP.FST: Up Fast (Increase output level at higher rate)
  - DN: Down (Decrease output level)
  - DN.FST: Down Fast (Decrease output level at higher rate)

  Note: When **UP** or **DN** is displayed, the **<EDT>** key is used to adjust the output in **small** increments. When **UP.FST** or **DN.FST** is displayed, the **<EDT>** key is used to adjust the output in **large** increments.

- **FRC.AN1 (Force Analog Output)**

  Test the analog output. This function toggles the analog output between low (0V or 4mA) and high (10V or 20mA), to allow the analog output function to be tested independent of the weight readings.

  Options are:
  - LO: Low (Analog output set to low output level)
  - HI: High (Analog output set to high output level)
  - Default: Not applicable

8.2.10. CLOC (Clock Options)

Items within this group set time and date related functions.

- **TIME (Set Time)**

  The correct time may be entered in this item. The time is entered in the format (00.HH.MM), where HH is the hours in 24-hour format (00-23) and MM is the minutes (00-59). The time can also be set with the Viewer. Refer to Current Time and Date: Time (TIME) (24 hour) (hh:mm:ss) page 90.

- **DATE (Set Date)**

  The current date may be entered in this item. The date is entered in European format (DD.MM.YYYY), where DD is the day of the month (01 – 31), MM is the month of year (01 – 12) and YYYY is the year (1998 – 2097). The **5230** requests the day and month first, followed by the year. The date can also be set with the Viewer. Refer to Current Time and Date: Date (DATE) (dd/mm/yyyy) page 90.

- **QA.OPT (Enable Quality Assurance Option)** Ä

  Refer to Quality Assurance: Enable QA Option (QA.OPT) ⊗ page 90 for more information on this setting.

- **QA.DATE (Next Quality Assurance Due Date)** Ä

  The date when the next calibration check is due may be entered in this item. The date is entered in European format (DD.MM.YYYY), where DD is the day of the month (01 – 31), MM is the month of year (01 – 12) and YYYY is the year (1998 – 2097). The **5230** requests the day and month first, followed by the year. The date can also be set with the Viewer. Refer to Quality Assurance: Next QA Due Date (QA.DATE) (dd/mm/yyyy) ⊗ page 90.
  - Default: 1/01/1999

- **DTE.FMT (Date Format)**

  Sets the format in which dates are printed.

  Options are:

DD.MM.Y2: Standard format (eg. 30.08.02)	MM.DD.Y4: American format (eg. 08.30.2002)
DD.MM.Y4: Standard format (eg. 30.08.2002)	Y2.MM.DD: International format (eg. 02.08.30)
MM.DD.Y2: American format (eg. 08.30.02)	Y4.MM.DD: International format (eg. 2002.08.30)

  - Default: DD.MM.Y2

- **TME.FMT (Time Format)**

  Refer to Time and Date Format: Time Format (TME.FMT) page 89 for more information on this setting.

- **DTE.SEP (Date Separator)**

  Refer to Time and Date Format: Date Separator (DTE.SEP) page 90 for more information on this setting.

- **TME.SEP (Time Separator)**

  Refer to Time and Date Format: Time Separator (TME.SEP) page 89 for more information on this setting.

8.2.11. TEST (Special Test Functions)

Items within this group allow access to the testing routines for the **5230**. With these routines the scale base output can be monitored and the optional accessory cards can be tested.

- **SCALE (Scale Base Test Display)**

  Used to test the scale base for load cell or connection errors. It sets up the **5230** as a simple test meter to measure the load cell input. Display reads in milliVolts-per-Volt, factory calibrated to 0.1% worst case. In TRADE mode this display is only active for five seconds before returning to the menu.

- **HI.RES (High Resolution Display for Scale Testing)**

  Allows the high resolution (x10) display mode to be turned **On** or **Off**. Once enabled, the **5230** will remain in high resolution mode until switched back to normal weighing in this step. In safe setup mode the (x10) weight reading is displayed for five seconds before returning to the menu.

  This option can also be changed via the viewer. Refer to Build: High Resolution (x10) page 72.
  - Options are: ON or OFF
  - Default: OFF

- **FRC.OUT (Force Outputs of Setpoint Card)**

  Forces each of the output drivers of the Setpoint card in turn. All outputs turn OFF when leaving this step. Pressing the **<EDT>** key will advance through each output. Pressing the **<OK>** key will turn all outputs off and exit the test.

  Note: On a setpoint card, all four outputs are present. On a combo card, only outputs 1 and 2 are available.

  Options are:
  - OFF: All outputs off.
  - ON1: Output 1 on.
  - ON2: Output 2 on.
  - ON3: Output 3 on.
  - ON4: Output 4 on.
  - Default: Not applicable

- **TST.INP (Test Inputs of Setpoint Card)**

  The input test allows each of the inputs from the setpoint or combo card to be tested. All four external inputs are displayed at the same time. The status of each input is changed as contact closures are detected. A dash (**-**) indicates an input is not present. A number (1 to 4) indicates a particular input is active. For example, **- - 3 -** would indicate that input number three is active.

  Note: On a setpoint card, all four inputs are available. On a combo card, only input 1 is available.

- **O.LOAD (Overload Counter)**

  This menu item records the number of times the scale has been overloaded. An overload condition is defined as 135% of fullscale.

8.2.12. FACTRY (Factory Adjustment Menu)

- **CLR.1ST (Clear All First Weights)**

  This setting clears all first weights to zero.

  When this function is chosen the indicator will prompt to continue with **CONT N**. Use the **<PRINT>** key to switch between **N** (No) and **Y** (Yes). The **<ACCEPT/OK>** key is used to accept your choice (DONE will flash briefly) and return to the **CLR.1ST** item.

- **CLR.IDS (Clear All IDs from Indicator)**

  This setting clears all IDs from the indicator (regardless of whether there are weights stored for the IDs). This function does not clear IDs from the Viewer.

  When this function is chosen the indicator will prompt to continue with **CONT N**. Use the **<PRINT>** key to switch between **N** (No) and **Y** (Yes). The **<ACCEPT/OK>** key is used to accept your choice (DONE will flash briefly) and return to the **CLR.IDS** item.

- **SEQ.ID (Sequence Identifier)** Ä

  This setting is used to set the **Sequence Identifier** number. This number is a sequential counter that is incremented with every printout. This counter is stored in battery-backed memory. If the **SEQ.ID** number is set to **0** then the first printout Sequence Number (using a Fixed Format) will start with the **1**. Refer to Printer Output Formats page 104 for examples and more information.

- **DEFLT (Restore Factory Defaults)** Ä

  This setting restores the digital setup of the **5230** back to the original “new” settings installed at the factory. The main use of this routine is to completely reset a **5230** that is being installed on a different scale. Restoring the factory defaults does not affect the calibration. To reset the calibration to factory condition, refer to FAC.CAL (Restore Default Factory Calibration) ⊗ page 58.

  When this function is chosen the indicator will prompt to continue with **CONT N**. Use the **<PRINT>** key to switch between **N** (No) and **Y** (Yes). The **<ACCEPT/OK>** key is used to accept your choice (DONE will flash briefly) and return to the **DEFLT** item.

8.2.13. -End- (Leaving Setup)

Refer to Exiting Setup page 54.

9. Viewer Setup

The **5230** viewer setup facilities provide the means to configure and calibrate the instrument. The configuration and calibration are performed by using both the Viewer and the front panel keypad. For information on Keypad Setup refer to page 53.

It is recommended that the Full Setup Passcode be set to avoid unauthorised or accidental tampering while using the **5230** Viewer. Refer to PASSCD:FULL.PC (Set Full Setup Passcode) page 58 and Security Settings (PASSCD): Set Full Setup Passcode (FULL.PC) page 77

9.1. General Information

9.1.1. Managing the 5230 Viewer

Refer to Managing the 5230 Viewer page 29.

9.1.2. Tabs, Sections and Fields

All viewer setup options in the **5230** are organised in a structure made up of **Tabs**, **Sections** and **Fields**. The **Settings** tab also contains **Sub-Tabs**. To simplify this document Tabs, Sub-Tabs, Sections and Fields will be notated as follows (Viewer Tab/Sub-Tab:Section:Field). Refer to Keypad and Viewer Settings (Availability) page 122 for a list of Tabs, Sections and Fields. Refer to Figure 12 page 25 for illustration.

- **TAB / SUB-TABS**

  Viewer setup is divided into a series of **Tabs** (and **Sub-Tabs**). Each tab has a distinctive title. All options in any one tab have related functions.

- **SECTION**

  Most viewer tabs are divided into individual **Sections**. All options in any one section have related functions. Where required, the equivalent keypad setting will be identified in brackets (eg. Printer Settings (PRN.OPT)).

- **FIELD**

  Each section is divided into individual **Fields**. Each field represents a parameter that can be changed. Where required, the equivalent keypad setting will be identified in brackets (eg. Margin Space (SPACE)).

9.1.3. Data Entry

Refer to Data Entry page 24.

9.2. Tabs and Parameters

The following sections describe the setup parameters of each of the Groups and Items in the keypad setup.

9.2.1. DISPLAY TAB

Refer to Display and Controls page 35 for information on the Display Tab.

9.2.2. SETTINGS / BUILD TAB

Items in the **BUILD** tab are used to configure the indicator to suit the current application. It is important to fully set the options within BUILD before calibration is attempted. Later changes to items within this group may invalidate the current calibration data. Items marked with Ä indicate that the setting is trade critical and the trade counter will be incremented if this setting is changed.

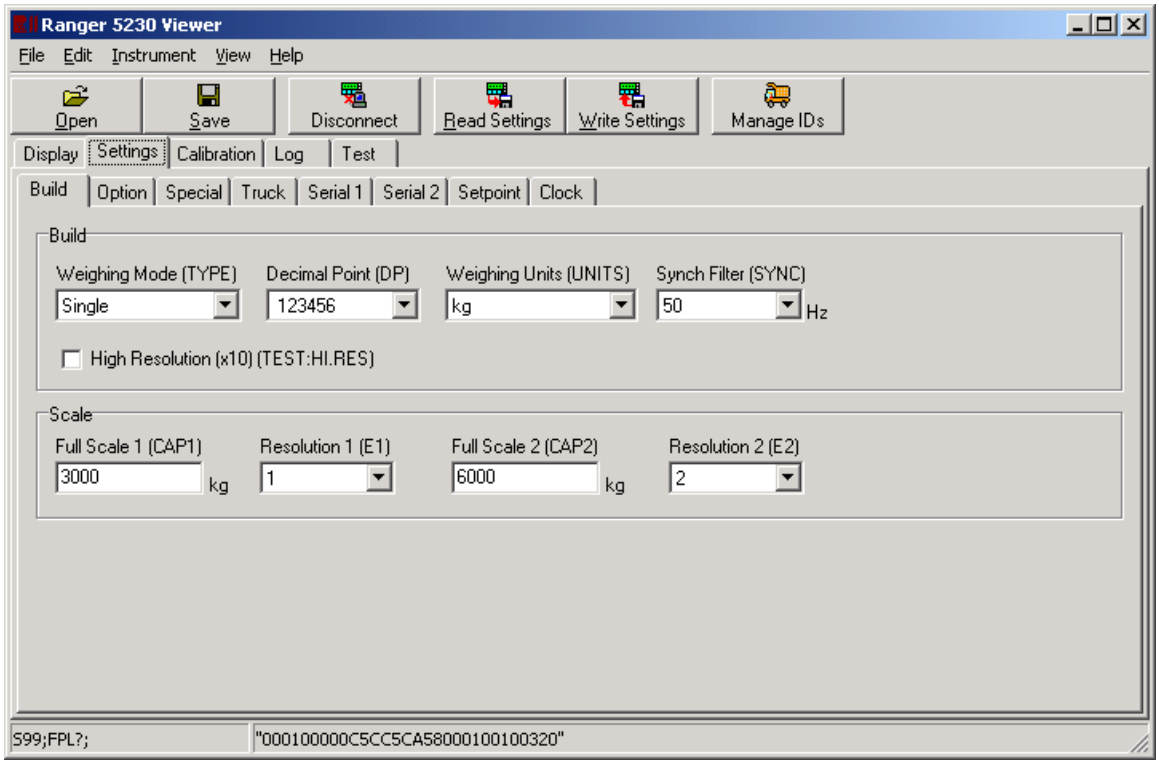


Figure 19: Viewer - Settings / Build Tab

- **Build: Weighing Mode (TYPE) (Display Type)** Ä

  Selects the type of display to suit the application.

  Options are:
  - Single
  - Dual Range (Refer to Dual Interval and Dual Range Operation page 21.)
  - Dual Interval (Refer to Dual Interval and Dual Range Operation page 21.)
  - Default: Single

- **Build: Decimal Point (DP) (Position)** Ä

  Sets the location of the decimal point on the display. To avoid confusion, set this parameter first so that all other weight related values are displayed with the decimal point in the correct position.
  - Can be set from 123456 (none) to 1.23456
  - Default: 123456

- **Build: Weighing Units (UNITS) (Units of Measure)** Ä

  Sets the units of measure for display and printing.
  - Options are: (g) grams, (kg) kilograms, (lb) pounds, (t) tonnes, (none) other units.
  - Default: kg

- **Build: Synch Filter (BUILD:SYNC) (A/D Synchronisation Frequency)** Ä

  The A/D Synchronisation Frequency Filter sets the primary anti-noise filter of the **5230**. It will deliver optimum stability in a 50Hz environment when set to 12.5, 25 or 50Hz. This setting sets the number of readings taken per second. For example, a setting of 50 means that the unit will take 50 readings per second.
  - Options are: 12.5, 15, 25, 30, 50 and 60 (setting steps)
  - Default: 50

- **Build: High Resolution (x10) (TEST:HI.RES) (High Resolution Display for Scale Testing)**

  Allows the high resolution (x10) display mode to be turned On or Off. Once enabled, the **5230** will remain in high resolution mode until switched back to normal weighing in this step.
  - Options are: On or Off
  - Default: Off

- **Scale: Full Scale 1 (CAP1) (Max Capacity 1 (Lower Range))** Ä

  Sets the nominal maximum capacity (or Range) of the scale in Single Range mode, or sets the maximum value of the lower range in Dual Range or Dual Interval mode. Refer to Build: Weighing Mode (TYPE) (Display Type) ⊗ page 71. This is set in weighing units (eg. kg, t, etc.), with the decimal point in place. For example, if a scale is to weigh 500.0kg in 0.5kg increments, then set Full Scale 1 to 500.0 and set Resolution 1 to 0.5.
  - Default: 3000

- **Scale: Resolution 1 (E1) (Count-By 1 (Lower Range))** Ä

  Sets the resolution (or Count-by) of the display for single range, or sets the resolution of the lower range in dual mode. The resolution is the number by which the indicator will count-by. This is set in weighing units with the decimal point in place.
  - Options are: 1, 2, 5, 10, 20, 50 or 100
  - Default: 1

- **Scale: Full Scale 2 (CAP2) (Max Capacity 2 (Upper Range))** Ä

  Sets the maximum capacity of the upper range in Dual Range and Dual Interval modes. This defines the maximum capacity of the scale in Dual Range or Dual Interval mode. This setting is ignored in Single range mode. For example, if a scale is to weigh in 0.05kg to 100.00kg and then in 0.10kg to 300.00kg then set Full Scale 2 to 300.00, Resolution 2 to 0.10, Full Scale 1 to 100.00 and Resolution 1 to 0.05.
  - Default: 6000

- **Scale: Resolution 2 (E2) (Count-by 2 (Upper Range))** Ä

  Sets the resolution (or Count-by) of the upper range in Dual Range mode. This is set in weighing units with the decimal point in place.
  - Options are: 1, 2, 5, 10, 20, 50 or 100
  - Default: 2

9.2.3. SETTINGS / OPTION TAB

Fields within this Tab are used to configure the operating parameters of the scale. Only **some** of these fields may be changed after calibration without affecting the calibration accuracy. Fields marked with Ä indicate that the setting is trade critical and the trade counter will be incremented if this setting is changed.

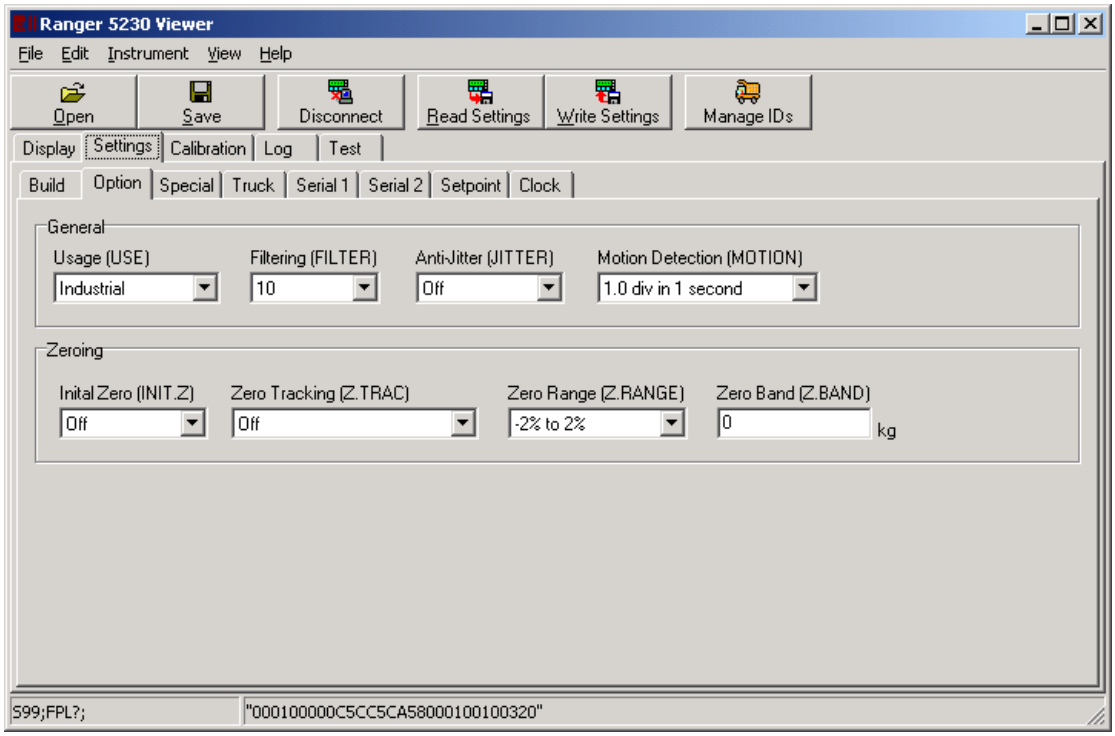


Figure 20: Viewer - Settings / Option Tab

- **General: Usage (USE) (Scale Use)** Ä

  The basic use of the scale must be set here. This setting configures the **5230** for either Industrial or Trade operation. Trade configuration will limit the operation of the unit to comply with OIML provisions. Industrial configuration removes all restrictions on operation. Refer to Trade vs Industrial Mode page 23 for more information.
  - Options are: Industrial or Trade
  - Default: Industrial

- **General: Filtering (FILTER) (Reading Average)**

  The **5230** can average a number of sequential readings when calculating the displayed weight. This is used to dampen unwanted weight fluctuations caused by vibrations or dynamic forces. High settings will stabilise the display at the expense of rapid response to sudden weight changes.
  - Options are: 1 to 10, 25, 50, 75, 100, 200
  - Default: 10

- **General: Anti-Jitter (JITTER) (Weight Stabilisation)**

  This feature can automatically damp out small weight fluctuations without affecting the speed of response to rapid weight changes (separate to averaging). Useful for stabilising minor changes in weight readings.
  - Options are: Off, Fine or Coarse
  - Default: Off

- **General: Motion Detection (MOTION)** Ä

  Sets how much weight variation over a defined time period is allowed before the displayed weight is deemed to be unstable. This value is displayed in weight change (0.5, 1.0, 2.0 or 5.0 divisions (graduations)) per time period (1.0, 0.5 or 0.2 seconds). When set to **Off** the motion detection is ignored and the **ZERO** and **PRINT** actions are instantaneous.

  - Options are:

Off		
0.5 div in 1 second (fine)	0.5 div in 0.5 seconds	0.5 div in 0.2 seconds
1.0 div in 1 second	1.0 div in 0.5 seconds	1.0 div in 0.2 seconds
2.0 div in 1 second	2.0 div in 0.5 seconds	2.0 div in 0.2 seconds
5.0 div in 1 second	5.0 div in 0.5 seconds	5.0 div in 0.2 seconds (coarse)

  - Default: 1.0 div in 1 second

- **Zeroing: Initial Zero (INIT.Z)**

  This function can be used to automatically zero the indicator during power-up. The amount of weight that can be zeroed is limited to +/– 10% of Range. If the weight is outside this range on power-up, the unit displays **ZERO ERROR** until the weight returns to the acceptable range.

  - Options are: On or Off
  - Default: Off

- **Zeroing: Zero Tracking Sensitivity (Z.TRAC)** Ä

  Zero tracking allows the display to adjust for minor changes in the zero balance of the scale. The zero track limit sets the fastest rate of change that is allowed to be compensated automatically. This value is displayed in the number of divisions (0.5, 1.0, 2.0 or 5.0) per time period (1.0, 0.5 or 0.2 seconds). When set to Off the Zero Tracking facility is disabled.

  - Options are:

Off		
0.5 div in 1 second (fine)	0.5 div in 0.5 seconds	0.5 div in 0.2 seconds
1.0 div in 1 second	1.0 div in 0.5 seconds	1.0 div in 0.2 seconds
2.0 div in 1 second	2.0 div in 0.5 seconds	2.0 div in 0.2 seconds
5.0 div in 1 second	5.0 div in 0.5 seconds	5.0 div in 0.2 seconds (coarse)

  - Default: Off

- **Zeroing: Zero Range (Z.RANGE) (Allowable Zero Operating Range)** Ä

  This setting restricts the range over which the Zero functions can operate.

  - Options are: –20% to 20%, –100% to 100%, –2% to 2% or –1% to 3%
  - Default: –2% to 2%

- **Zeroing: Zero Band (Z.BAND)** Ä

  This is an adjustable margin either side of true zero that defines the Zero 'Dead' Band. The Zero Band is used by the automated functions of the **5230** to determine Zero Load. For example, a setting of 4 specifies that readings between -4.5 and 4.5 are considered to be zero.

  - Settable over the full weight range. Always enter a number in multiples of display units. Refer to Scale: Full Scale 1 (CAP1) (Max Capacity 1 (Lower Range)) ⊗ page 72
  - Default: 0 (ie. –0.5 to 0.5 graduations)

9.2.4. SETTINGS / SPECIAL TAB

Fields in this Tab control features including passcodes, remote key settings, security settings and display settings.

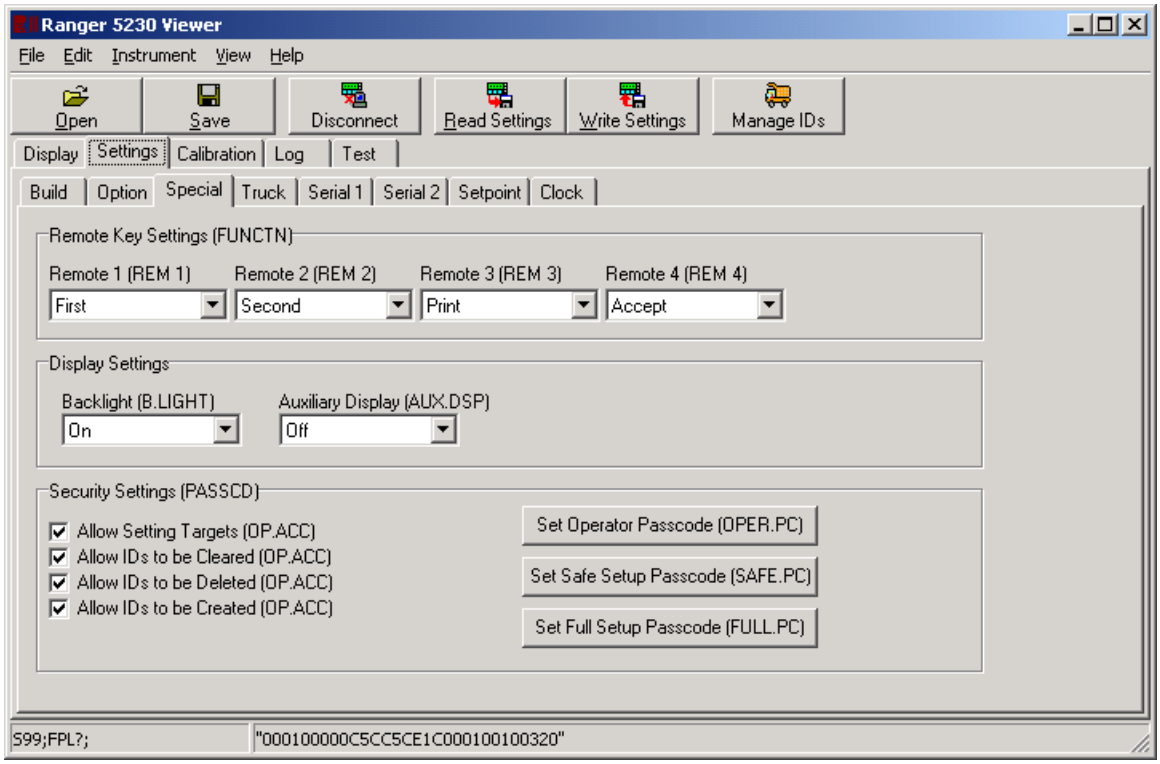


Figure 21: Viewer - Settings / Special Tab

- **Remote Key Settings (FUNCTN): Remote 1, 2, 3 and 4 (REM 1, 2, 3 and 4)**

  The Remote Key Settings section configures the four remote (external) keys. These fields set the functions of the external inputs on the setpoint or combo card. Either the setpoint or combo cards can be inserted. The setpoint card allows Remote Keys 1 to 4. The combo card allows Remote Key 1 only. Refer to Function Keys, External Keys and Interlock page 117 for a description of each of the functions.
  - Options are: None, Zero, First, Second, Print, Accept, Blank, Lock, Fill, Pause, Interlock
  - Default: Remote 1 = First, Remote 2 = Second, Remote 3 = Print, Remote 4 = Accept

- **Display Settings: Backlight (B.LIGHT)**

  Sets the operation of the backlight.

  Options are:
  - Off: Backlight is off
  - On: Backlight is always on
  - Default: On

- **Display Settings: Auxiliary Display (AUX.DSP)**

  This sets the function of the auxiliary display.

  Options are:
  - Off: Blank
  - Time: Displays the current time in 12 hour format
  - Fill Percentage: Shows the percentage completion of each material fill during batching
  - Default: Off

- **Security Settings (PASSCD): Tick Boxes**

  The Security Settings tick box options work in conjunction with the Operator Passcode. The tick box choices are described in the following table. If a function has been **disabled** and an Operator Passcode **has** been set, the function can be performed only after the Operator Passcode has been entered.

  þ=On (enabled) **o**= Off (disabled)

Security Setting	Description
Allow Setting Targets (OP.ACC)	Enables or disables the setting of (T) targets via the keypad. Refer to TARGET Key page 39.
Allow IDs to be Cleared (OP.ACC)	Enables or disables the (C) clearing of IDs (Truck, Product or Destination) via the keypad.
Allow IDs to be Deleted (OP.ACC)	Enables or disables the (D) deletion of IDs (Truck, Product or Destination) via the keypad.
Allow IDs to be Created (OP.ACC)	Enables or disables the creation of (N) new IDs (Truck, Product or Destination) via the keypad.

  - Default: All tick boxes are enabled.

- **Security Settings (PASSCD): Set Operator Passcode (OPER.PC)**

  The Operator Passcode prevents access to the enabled tick box Security Settings choices via the keypad. The default passcode setting is **0** (allows free access). Any other number will enable the passcode functions and restrict access. Numeric characters only are allowable for passcodes.
  - Range: 0 to 999999
  - Default: 0

- **Security Settings (PASSCD): Set Safe Setup Passcode (SAFE.PC)**

  The passcode for Safe Setup prevents access to all Trade Critical setup functions via the keypad. When the Safe Setup Passcode is set the Full Setup Passcode should also be set. In this manual, items marked with Ä indicate that the setting is trade critical. The default passcode setting is **0** (allows free access). Any other number will enable the passcode functions and restrict access to Trade Critical functions. Numeric characters only are allowable for passcodes.
  - Range: 0 to 999999
  - Default: 0

- **Security Settings (PASSCD): Set Full Setup Passcode (FULL.PC)**

  The passcode for Full Setup prevents any access to Full Setup via the **keypad and viewer**. This code is used to prevent any unauthorised or accidental tampering in the instrument setup. When altering settings using the **5230** Viewer, it is especially important that this passcode be set thereby protecting the trade critical settings (indicated in this manual with Ä).

  The default passcode setting is **0** (allows free access). Any other number will restrict access. Numeric characters only are allowable for passcodes.
  - Range: 0 to 999999
  - Default: 0

  When writing settings to the instrument that have been changed via the Viewer the following prompt appears requesting the passcode.

It is important to note that when restricting access via the Full Setup Passcode, the code must not be forgotten. It is only possible to circumvent the code at the factory. Care must be taken to ensure that the instrument does not become permanently locked.

9.2.5. SETTINGS / TRUCK

Settings in this Tab control features that affect truck weighing operations.

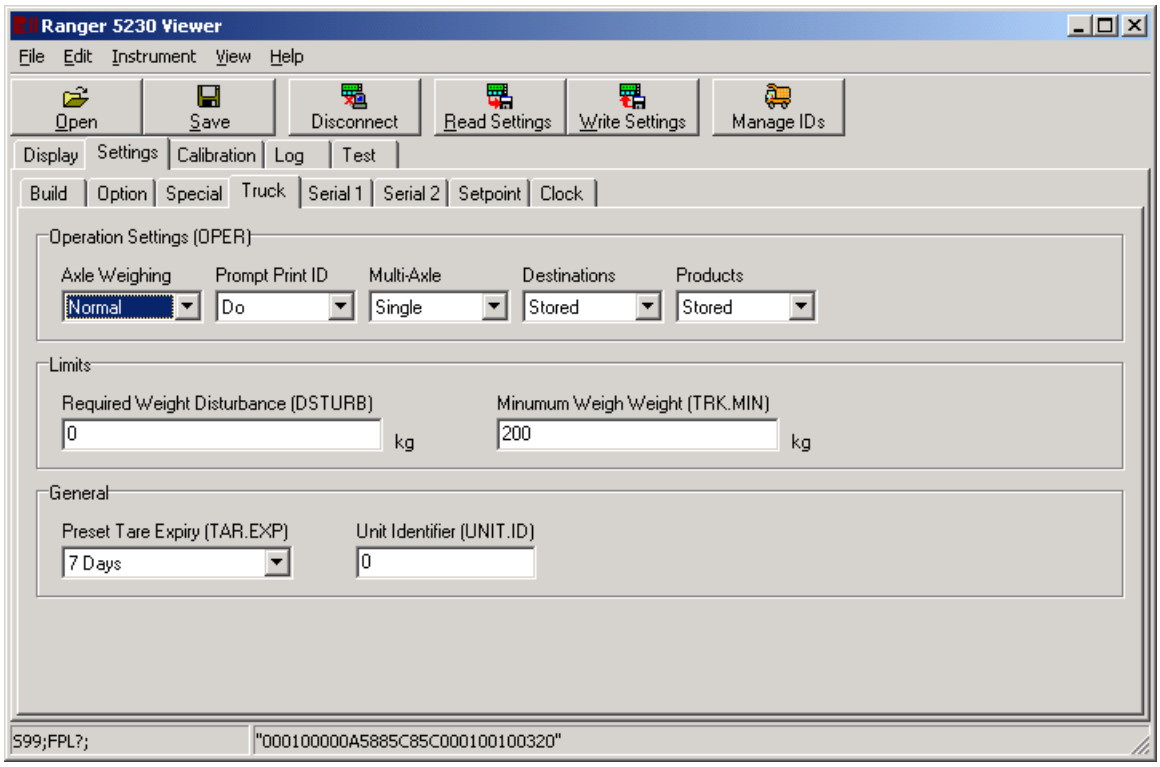


Figure 22: Viewer - Settings / Truck Tab

- **Operation Settings (OPER): Axle Weighing**

  This setting is used to configure how each axle weight reading is to be accepted. The weight reading can be accepted either by the operator or taken automatically when a period of no motion occurs. Refer to General: Motion Detection (MOTION) ⊗ page 56. The weight on the scale must also be equal to or greater than the amount specified in the **Minimum Weigh Weight** field and a weight disturbance must have occurred as specified in the **Required Weight Disturbance** field.

  Options are:
  - Normal: Operator must manually accept the weight reading
  - Automatic: Instrument accepts weight when no motion is detected.
  - Default: Normal

- **Operation Settings (OPER): Prompt Print ID**

Sets whether the operator will be prompted with **ENTER ID** when current weight is printed by pressing the **<PRINT>** key. The ID is user defined and unrelated to Truck, Product and Destination IDs. It can contain up to six alphanumeric characters and spaces. The ID does not print when Printer Settings Type is set to **Tally**.

Prompt Print ID: Do
ID : ABC123
DATE : 25-11-02
TIME : 22:13
REFERENCE No.: 004444
SEQUENCE No. : 000013
GROSS WEIGHT : 496 kg

Options are:
- Don't: Don't prompt for a Print ID.
- Do: Do prompt for a Print ID with the message **ENTER ID**. After an ID has been entered (max. six characters), the **<ACCEPT>** key is pressed to print. The example displays a printout using the Print ID **ABC123**.
- Default: Do

- **Operation Settings (OPER): Multi-Axle**

This field sets whether trucks will be weighed with one or more axles.

Options are:
- Single: There is a single weighing per truck.
- Multiple: The Operator sets the number of axles for each truck at the time of first weighing. The second weighing will require the same number of axles to be weighed as for the first weighing.
- Variable: The Operator is prompted to set the number of axles for each truck at both the first and second weighing. The number of axles can vary from first to second weighing.
- Default: Single

- **Operation Settings (OPER): Destinations**

This setting determines if destination IDs and totals are to be stored. If stored, the instrument will require a Destination ID (DST) when performing the second weigh or with a preset tare truck weigh and the Destination totals menu will be available.

Options are:
- Stored: The Destination ID is required.
- Not Stored: The Destination ID is not required. (A long press of the REPORT Dest key will respond with NO DEST). Refer to REPORT Truck, Product or Dest. Keys page 39.
- Default: Stored

- **Operation Settings (OPER): Products**

This setting determines if product IDs and totals are to be stored. If stored, the instrument will require a Product ID (PRO) when performing the second weigh or with a preset tare truck weigh and the Product totals menu will be available.

Options are:
- Stored: The Product ID is required.
- Not Stored: The Product ID is not required. (A long press of the REPORT Product key will respond with NO PROD). Refer to REPORT Truck, Product or Dest. Keys page 39.
- Default: Stored

- **Limits: Required Weight Disturbance (DSTURB)**

  When multiple or variable axle weighing is in use, this sets the amount of weight disturbance required on the scale before the instrument will progress onto the next axle.
  - Default: 0

- **Limits: Minimum Weigh Weight (TRK.MIN)**

  Sets the minimum amount of weight that must be present on the scale for a weighing to be performed.
  - Default: 0

- **General: Preset Tare Expiry (TAR.EXP)**

  This sets the expiry period for all truck preset tares. If the timeout period elapses since the preset tare was entered, the instrument resets the preset tare to zero. The preset tare must then be re-entered the next time the truck is weighed. Refer to Preset Tare Truck Weigh page 48 for more information.
  - Options are: Never, 7 Days, 14 Days and Immediate
  - Default: 7 Days

- **General: Unit Identifier (UNIT.ID)**

  The unit identifier is a number that appears on printed tickets used to identify a unit. If set to **0**, the identifier is not printed. The Unit ID does not print when Printer Settings Type is set to **Tally**. The example displays a **Fixed** printout using the ID **25**.
  - Range: 0 to 99
  - Default: 0

Prompt Print ID: Do

UNIT ID : 25
ID : AAA123

DATE : 26-11-02
TIME : 15:42
REFERENCE No.: 004444
SEQUENCE No. : 000019

GROSS WEIGHT : 992 kg

9.2.6. SETTINGS / SERIAL 1 TAB

Settings in this Tab configure the first serial port communications options for auto outputs and networking. Refer to Serial Outputs page 101 for more information.

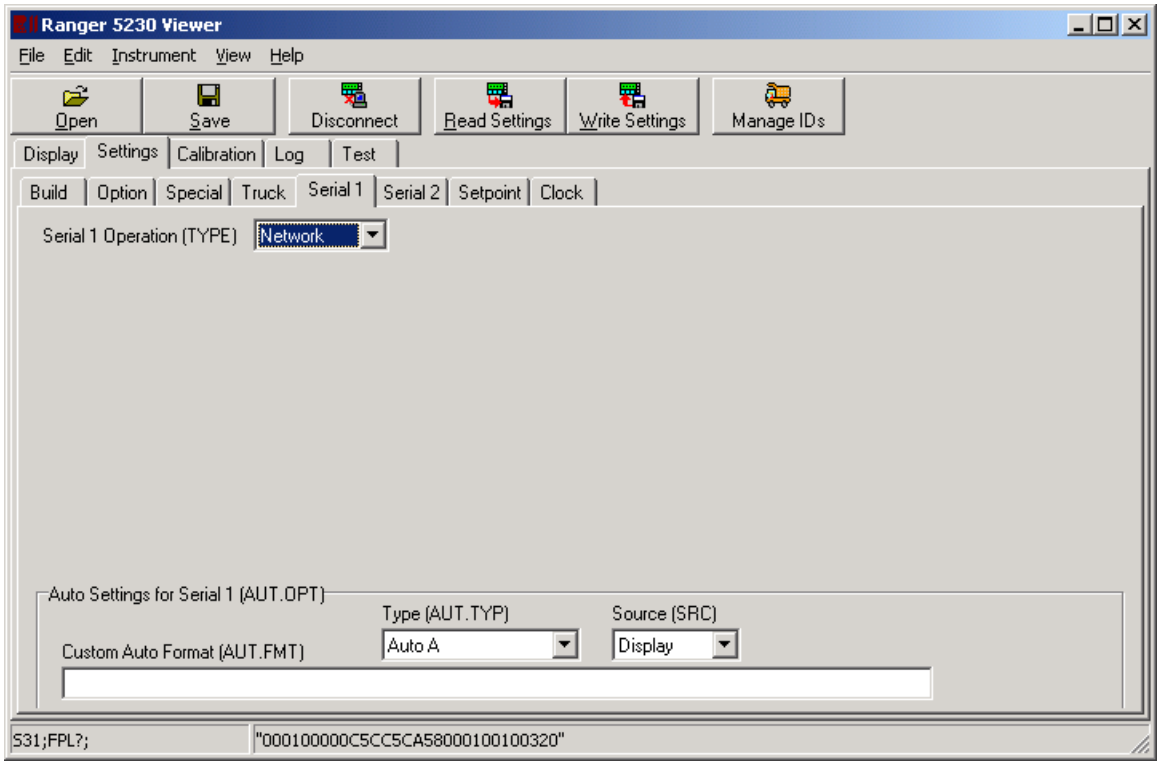


Figure 23: Viewer - Settings / Serial 1 Tab

- **Serial 1 Operation (TYPE) (Serial 1 Output)**

  Sets the function of the first serial output.

  Options are:
  - Off: Disables the output.
  - Auto: Enable automatic weight transmission at 10Hz.
  - (Not Available): Printer driving not available on Serial 1.
  - Network: Sets the unit to function as a network device.
  - Default: Net

- **Auto Settings for Serial 1 (AUT.OPT): Type (AUT.TYP)**

  The automatic transmission options section configures fields concerned with serial transmission of weight data.

  This field sets the format for automatically transmitted data. Refer to Automatic Weight Output page 101 for a detailed description of these formats.

  Options are:
  - Auto A: Format A - Standard Ranger output format
  - Auto B to Auto E: Formats B through E
  - Custom: User programmable custom output format
  - Default: Auto A

- **Auto Settings for Serial 1 (AUT.OPT): Source (SRC)**

  This field sets the weight source for the automatically transmitted data.

  Options are:
  - Display: Displayed reading
  - Full: All data displayed is transmitted (including prompts and messages)
  - Default: Display

- **Auto Settings for Serial 1 (AUT.OPT): Custom Auto Format (AUT.FMT)**

  This custom auto format is programmed when using the **Custom** auto settings type. Up to 50 literal characters and special tokens can be entered to define the details of the serial output format. Refer to Auto Transmit Tokens page 103.
  - Default: (No format specified)

9.2.7. SETTINGS / SERIAL 2 TAB

Fields in the Serial 2 Tab set the serial and printing outputs. Refer to Serial Outputs page 101 for more information on Serial configuration.

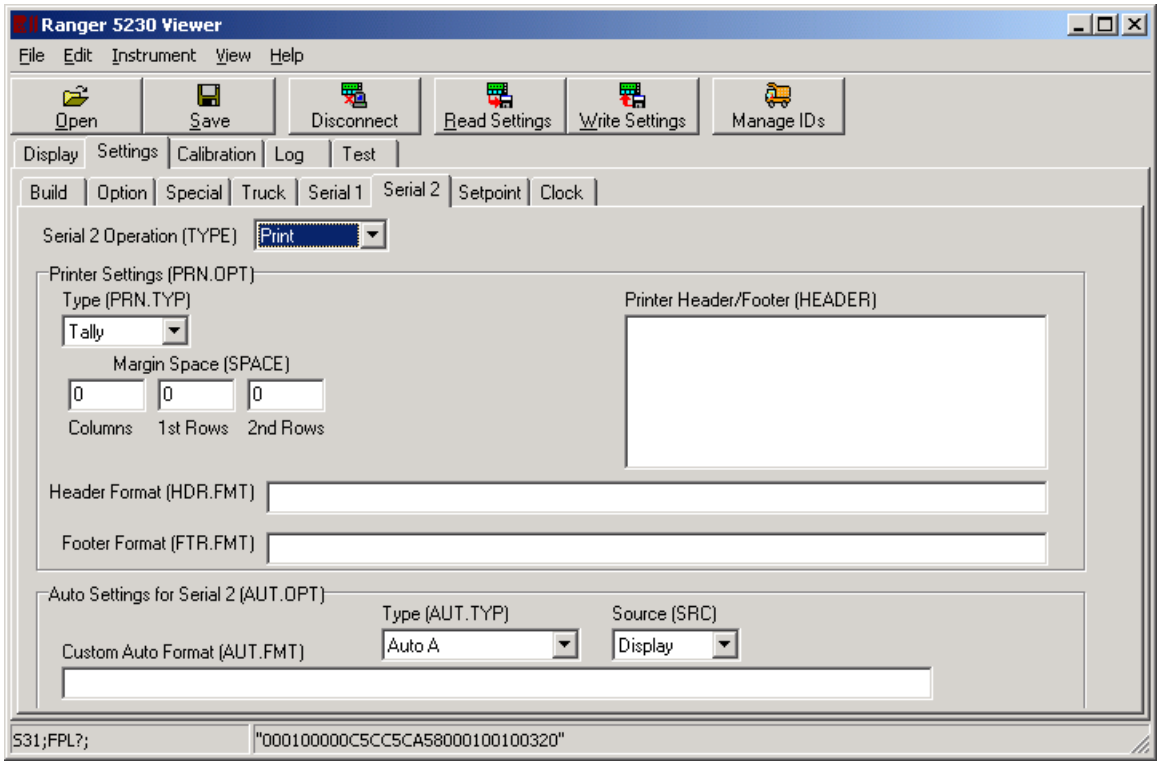


Figure 24: Viewer - Settings / Serial Tab

- **Serial 2 Operation (TYPE) (Serial 2 Output)**

  Sets the function of the second serial output. The port can be disabled or set to run as an automatic output or printer driver with DTR handshaking.

  Options are:
  - Off: Disables the output.
  - Auto: Enable Auto transmit at 10Hz.
  - Print: Enable the output for printer driving.
  - Default: Print

- **Printer Settings (PRN.OPT): Type (Printer Output Ticket Type)**

  Sets the type of printout sent via a serial port configured for printing when the **<PRINT>** key is pressed. Refer to Printer Output Formats page 104 for detailed descriptions of each printout.

  Options are:
  - Fixed 1, 2 and 3: Prints a fixed format ticket containing header, footer, Unit ID, ID, date/time, weighing information and other fields. This setting is required to print tickets for truck weighing. Refer to Fixed Printout page 105.
  - Tally: Prints a single line containing date, time, unit ID, sequence number and gross weight.
  - Custom: Prints a custom ticket as defined by Printer Settings (PRN.OPT): Print Header/Footer page 84.
  - Default: Tally

- **Printer Settings (PRN.OPT): Margin Space (SPACE)**

  The space field allows the number of rows and columns of space to leave for both the first and second printout to be entered. The setting for **Columns** specifies the number of columns of blank space (on the left side). The setting for **1st Rows** specifies the number of rows of blank space for normal tickets and first weighing tickets. The setting for **2nd Rows** specifies the number of rows of blank space for the second weighing ticket. **2nd Rows** allow a 2nd weight ticket to be printed on the same piece of paper after the first weight ticket.
  - Default: Columns = 0, 1st Rows = 0 and 2nd Rows = 0

- **Printer Settings (PRN.OPT): Print Header/Footer (HEADER)**

  Custom ticket header and footer text can be entered here. The header consists of the first three lines and the footer consists of the last three lines.
  - Default: (Blank)

- **Printer Settings (PRN.OPT): Header Format (HDR.FMT)**

  When **Fixed** printing is used, this field defines a custom header for the printed ticket. When **Custom** printing is used, this field defines the first section of the custom ticket format. The Printer Settings (PRN.OPT): Footer Format defines the second section. Refer to Printer Output Formats page 104 for information regarding custom headers and ticket formats. Tokens can be used here for special fields in the printout (eg. date). Refer to Printer Tokens page 108.
  - Default: (Blank)

- **Printer Settings (PRN.OPT): Footer Format (FTR.FMT)**

  When **Fixed** printing is used, this field defines a custom footer for the printed ticket. When **Custom** printing is used, this field defines the first section of the custom ticket format. The Printer Settings (PRN.OPT): Header Format defines the first section. Refer to Printer Output Formats page 104 for information regarding custom headers and ticket formats. Tokens can be used here for special fields in the printout (eg. date). Refer to Printer Tokens page 108.
  - Default: (Blank)

- **Auto Settings for Serial 2 (AUT.OPT): Type (AUT.TYP)**

  The automatic transmission options section configures fields concerned with serial transmission of weight data.

  This field sets the format for automatically transmitted data. Refer to Automatic Weight Output page 101 for a detailed description of these formats.

  Options are:
  - Auto A: Format A - Standard Ranger output format
  - Auto B to Auto E: Formats B through E
  - Custom: User programmable custom output format
  - Default: Auto A

- **Auto Settings for Serial 2 (AUT.OPT): Source (SRC)**

  This field sets the weight source for the automatically transmitted data.

  Options are:
  - Display: Displayed reading
  - Full: All data displayed is transmitted (including prompts and messages)
  - Default: Display

- **Auto Settings for Serial 2 (AUT.OPT): Custom Auto Format (AUT.FMT)**

  This custom auto format is programmed when using the Custom auto settings type. Up to 50 literal characters and special tokens can be entered to define the details of the serial output format. Refer to Auto Transmit Tokens page 103.
  - Default: (No format specified)

9.2.8. SETTINGS / SETPOINT TAB

Fields within this Tab configure the operational logic of the setpoint system. Refer to Setpoints page 110 for a detailed explanation of the fields in this Tab, batching and setpoints.

The information in this section is valid for Setpoint Tabs 1, 2, 3 and 4.

The **Setpoint Type** field determines which fields display in the Setpoint Tab. Figure 25 is using the **Active** Setpoint Type and therefore displays the valid fields for that type.

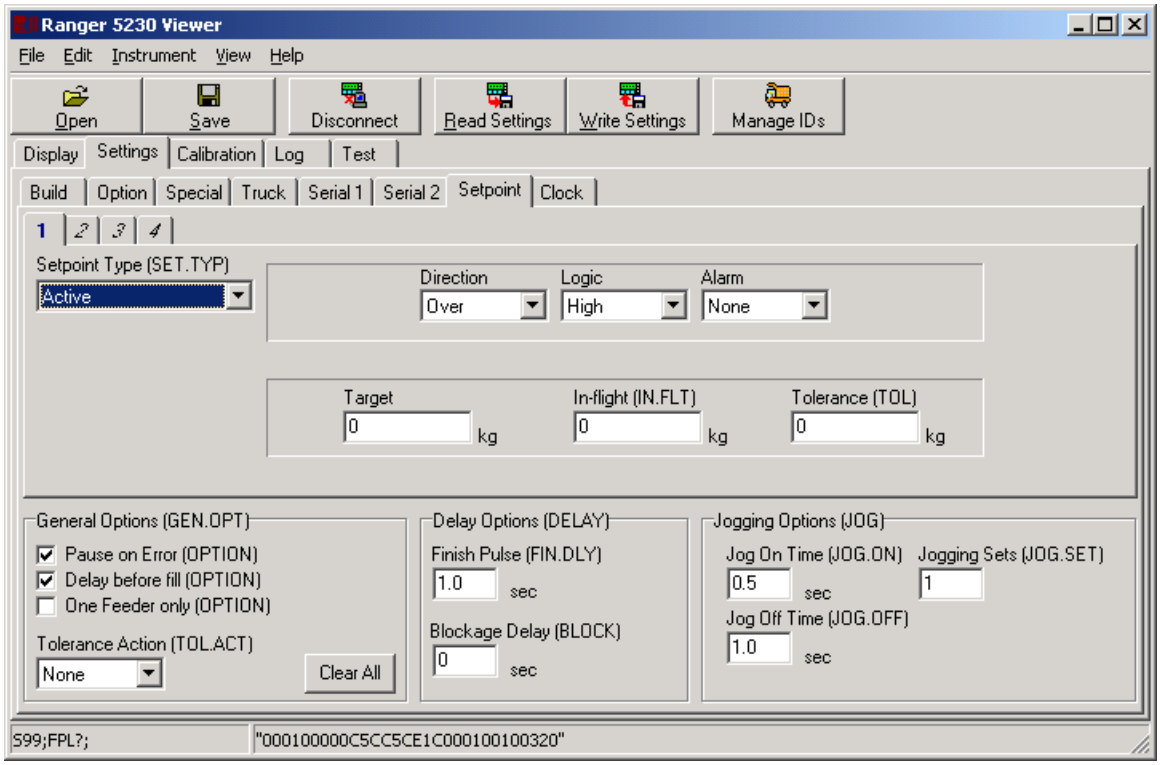


Figure 25: Viewer - Settings / Setpoint Tab

- **Setpoint Type (SET.TYP)**

  Each of the four setpoints must be assigned a specific type. Refer to Setpoint Types page 111 for details of each.
  - Options are: None, Active, Material Fills (Slow Fill, Medium Fill, Fast Fill or Finish), Tolerance, Run, Pause, Error, Motion, Zero and Axle.
  - Default: None

- **Source**

  This field sets the source of the weight for the setpoint and displays only when the Setpoint 1 Setpoint Type field is set to Slow fill. Refer to Source (Gross, Net) page 113 for details.
  - Options are: Gross and Net
  - Default: Net

- **Direction**

  This field sets the direction for the setpoint. Refer to Direction (Over, Under) page 113.
  - Options are: Over and Under
  - Default: Over

- **Logic**

  This field sets the logic level for the setpoint. Refer to Logic (High, Low) page 113 for details.
  - Options are: High and Low
  - Default: High

- **Alarm**

  This field determines whether an alarm will sound while a setpoint is active. Refer to Alarm (None, Single, Double) page 113.
  - Options are: None, Single, Double
  - Default: None

- **Correction**

  This field is used to set the number of automatic corrections to be made at the end of the material fill. Refer to Correction (None, Auto Jogging) page 114 for details.
  - Options are: None, Auto Jogging
  - Default: None

- **Target**

  This option sets the target weight for the setpoint.
  - Default: 0

- **In-flight (IN.FLT)**

  This field sets the in-flight weight for the setpoint. Refer to In-flight page 114 for details.
  - Default: 0

- **Tolerance (TOL)**

  This field sets the tolerance (hysteresis) for the setpoint. Refer to Tolerance (TOL) (Hysteresis) page 114 for details.
  - Default: 0

- **General Options (GEN.OPT)**

  This section contains fields for general batching operations. Refer to General Options page 115 for details on the following fields:

  Pause On Error, Delay Before Fill and One Feeder Only.

- **Tolerance Action (TOL.ACT)**

  This field sets the response to an out of tolerance condition. Refer to Tolerance Action page 115 for details.
  - Options are: None, Beep and Pause
  - Default: None

- **Clear All**

  The Clear All button sets the **Setpoint Type** field to **None**.

- **Delay Options (DELAY)**

  Refer to Delay Options (DELAY) page 116 for details on the following fields: Finish Pulse and Blockage Delay

- **Jogging Options**

  Refer to Jogging Options (JOG) page 116 for details on the following fields: Jog On Time, Jog Off Time, and Jogging Sets

9.2.9. SETTINGS / CLOCK TAB

Fields within this Tab set time and date related functions. Fields marked with Ä indicate that the setting is trade critical and the trade counter will be incremented if this setting is changed.

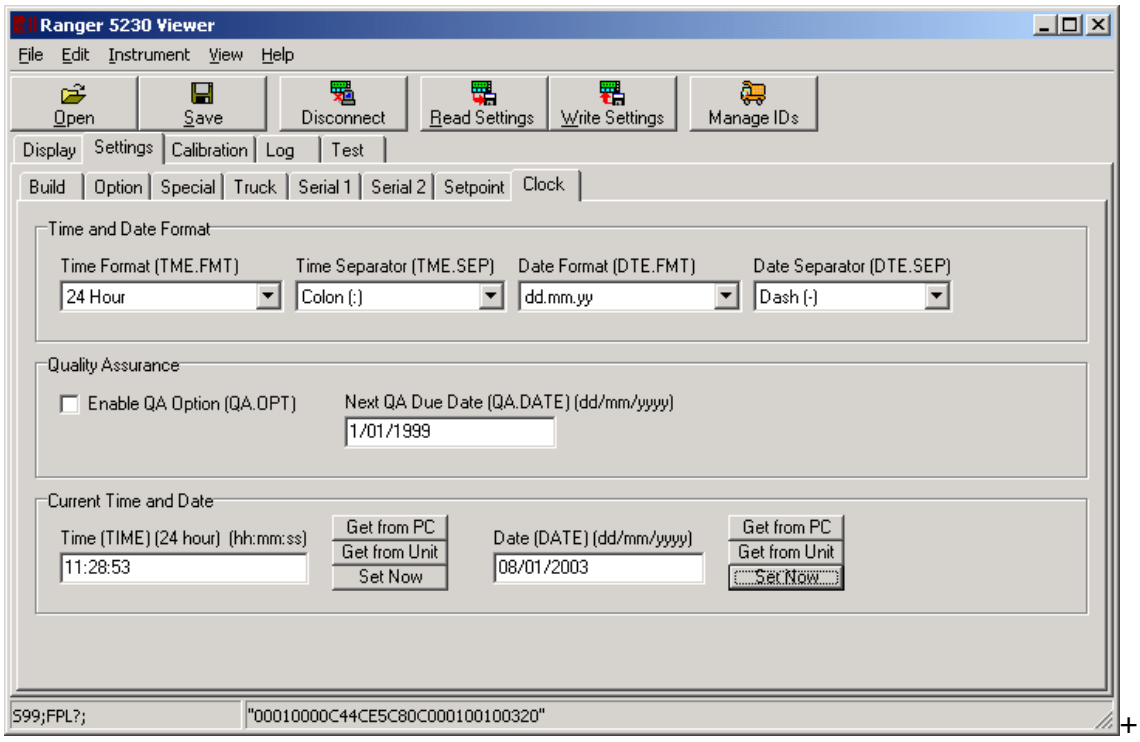


Figure 26: Viewer - Settings / Clock Tab

- **Time and Date Format: Time Format (TME.FMT)**

  Sets the format in which time is printed.

  Options are:
  - 12 Hour: Use 12 hour time format (with AM and PM) (eg. 05:37PM)
  - 24 Hour: Use 24 hour time format (eg. 17:37)
  - Default: 24 Hour

- **Time and Date Format: Time Separator (TME.SEP)**

  Sets the separator to be used for time printing.

  Options are:
  - Colon (**:**) (eg. 17**:**37)
  - Dot (**.**) (eg. 17**.**37)
  - Default: Colon (**:**)

- **Time and Date Format: Date Format (DTE.FMT)**

  Sets the format in which dates are printed.

  Options are:

dd.mm.yy Standard format (eg. 30.08.02)	mm.dd.yyyy American format (eg. 08.30.2002)
dd.mm.yyyy Standard format (eg. 30.08.2002)	yy.mm.dd International format (eg. 02.08.30)
mm.dd.yy American format (eg. 08.30.02)	yyyy.mm.dd International format (eg. 2002.08.30)

  - Default: dd.mm.yy

- **Time and Date Format: Date Separator (DTE.SEP)**

  Sets the separator to be used for date printing.

  Options are:
  - Slash (/) (eg. 30/08/2002)
  - Dash (-) (eg. 30-08-2002)
  - Dot (.) (eg. 30.08.2002)
  - Default: Dash (-)

- **Quality Assurance: Enable QA Option (QA.OPT)** Ä

  Allows the quality assurance calibration due alarm to be turned **On** or **Off**. When enabled the **5230** will display **QA DUE**, from the day after the date set in the **Next QA Due Date** field.

  Options are: Off or On
  - Default: Off

- **Quality Assurance: Next QA Due Date (QA.DATE) (dd/mm/yyyy)** Ä

  The date when the next calibration check is due may be entered in this field. The date is entered in the format **dd/mm/yyyy**, where **dd** is the day of the month (01-31), **mm** is the month of year (01-12) and **yyyy** is the year (1998-2097).
  - Default: 1/01/0099

- **Current Time and Date: Time (TIME) (24 hour) (hh:mm:ss)**

  The time can be entered in this field. The time is entered in the format **hh:mm:ss**, where **hh** is the hours, **mm** is the minutes and **ss** is the seconds. The time can be entered in either a 24 or 12-hour format. The time can be entered manually or can be set using the **<Get from PC>** or the **<Get from Unit>** buttons. Using either of these buttons automatically enters the time in a 12-hour format (using AM and PM). The **<Set Now>** button is clicked to set the time in the instrument.

  Note: The unit will display only a 12-hour format but a printout will show the format specified by **Time Format** field.

  The time can also be set from the keypad. Refer to TIME (Set Time) page 67 for more information.

- **Current Time and Date: Date (DATE) (dd/mm/yyyy)**

  This field is used to set the date. The date can be entered in the format **dd/mm/yyyy**, where **dd** is the day of the month (01-31), **mm** is the month of the year (01-12), and **yyyy** is the year (1998-2097). The date can be entered manually or can be set using the **<Get from PC>** or the **<Get from Unit>** buttons. The **<Set Now>** button is clicked to set the date in the instrument.

  The date can also be set from the keypad. Refer to DATE (Set Date) page 67 for more information.

9.2.10. CALIBRATION TAB

Fields in this Tab perform various calibration routines. For scale calibration procedures refer to Calibration page 96. Certain items in the Build, Option and Special Tabs can effect the calibration of the scale. Always check that these Tabs are correctly configured to suit the current application before attempting to calibrate the scale. Fields marked with Ä indicate that the setting is trade critical and the trade counter will be incremented if this setting is changed.

Note: Changes to settings in the Calibration Tab must be saved to the instrument (using **Write Settings**) to ensure calibration results are available for use each time the unit is powered up. Refer to Write Settings to Instrument page 33 for more information.

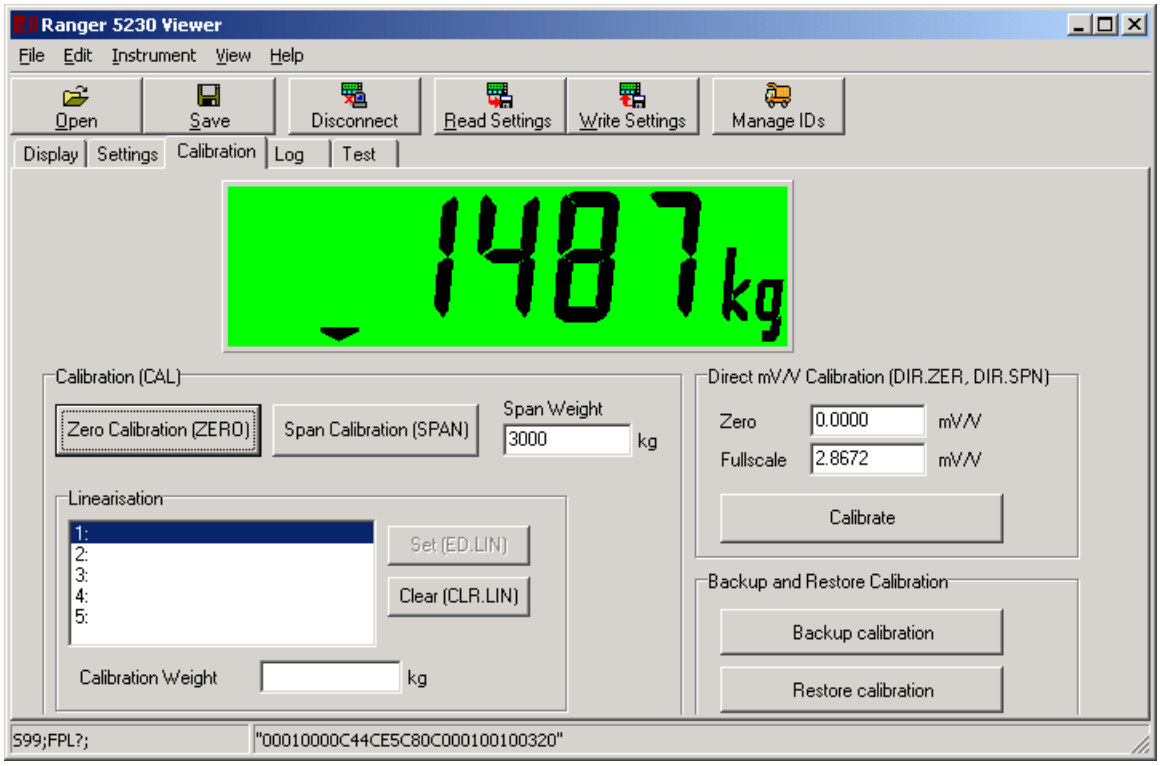


Figure 27: Viewer - Calibration Tab

- **Calibration (CAL): Zero Calibration (ZERO)** Ä

  Select to start a Zero Calibration. While the zeroing is in progress the instrument display will show **Z.in.P**. For a detailed description on the zeroing and calibration procedures, refer to ZERO (Zero Calibration Routine) page 97.

- **Calibration (CAL): Span Calibration (SPAN)** Ä

  After the span weight has been entered select this button to start a Span Calibration. While the span calculation is in progress the keypad display will show **S.in.P**. For a detailed description on the span and calibration procedures, refer to SPAN (Span Calibration Routine) page 97.

- **Calibration (CAL): Span weight**

  This field is used in conjunction with the **Span Calibration** button and is used to enter the span weight. Refer to refer to SPAN (Span Calibration Routine) page 97 for more information.

- **Linearisation: Set (ED.LIN)**

  This button is used to set the selected linearisation point as defined in the **Calibration Weight** field. Refer to Set or Edit Linearisation Points page 99 for more information.

- **Linearisation: Clear (CLR.LIN)**

  This button is used to clear the selected linearisation point as defined in the **Calibration Weight** field. Refer to Clear Linearisation Points page 100 for more information.

- **Linearisation: Calibration Weight**

  The **Calibration Weight** field is used to enter the weight to be used when setting a linearisation point.

- **Direct mV/V Calibration (DIR.ZER; DIR.SPN): Zero**

  The **Zero mV/V** field is used to enter the zero value for Direct mV/V Calibration. Refer to Direct mV/V page 21 and Direct mV/V Calibration page 98 for more information.

- **Direct mV/V Calibration (DIR.ZER; DIR.SPN): Fullscale**

  The **Fullscale mV/V** field is used to enter the fullscale value for Direct mV/V Calibration. Refer to Direct mV/V page 21 and Direct mV/V Calibration page 98 for more information.

- **Direct mV/V Calibration (DIR.ZER; DIR.SPN): Calibrate**

  The **Calibrate** button is used to utilise the setting in the **Zero mV/V** field and **Fullscale mV/V** field for Direct mV/V Calibration. Refer to Direct mV/V page 21 for more information.

- **Backup and Restore Calibration: Backup Calibration**

  The **Backup Calibration** button allows the calibration details to be backed up to a file. The **Save File As Type** field should be set to Calibration Files (*.cal).

- **Backup and Restore Calibration: Restore Calibration**

  The **Restore Calibration** button allows the calibration details to be restored from a previously backed up file. The **Files of Type** field should be set to Calibration Files (*.cal).

9.2.11. LOG TAB

The Log Tab is used to create a chart of the activity in the instrument. Refer to Save and Restore Viewer Settings and Log Data page 33 for information saving and opening log files.

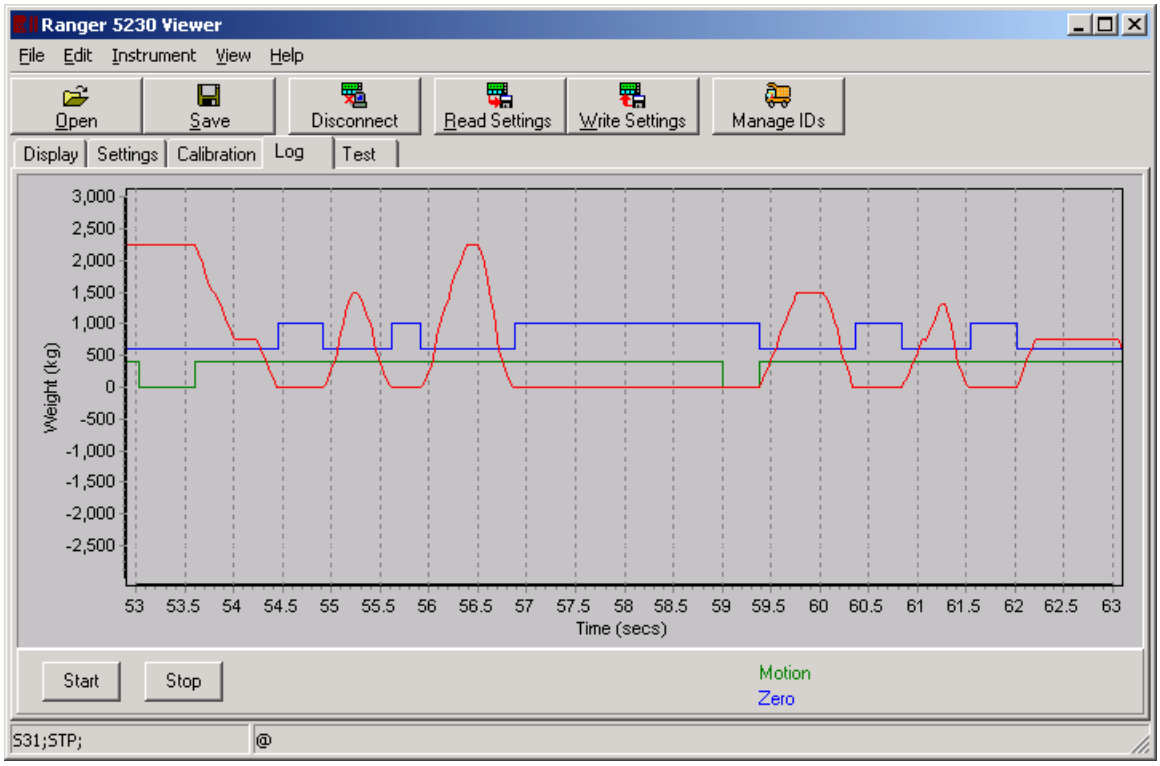
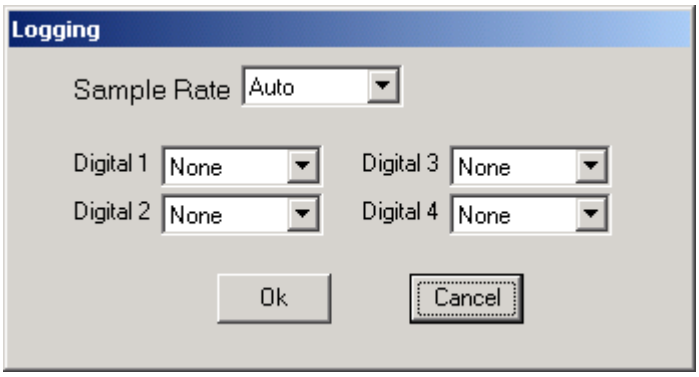


Figure 28: Viewer - Log Tab

- **Start**

The **Start** button is used to begin logging activity. The **Logging** dialog displays to set specifics of activity to be logged.



Sample Rate: This field determines the rate at which samples will be logged.

Options are:

- Auto: Automatically logs all changes in activity.
- 10 Hz: Ten samples every second.
- 1 Hz: One sample every second.
- 1/10 secs: One sample every 10 seconds.
- Default: Auto

Digital 1, 2, 3 and 4: The settings in these fields determine the type(s) of activity to be logged.

Options are:

- None: Logs the weight reading only.
- Motion: Logs changes in the motion annunciator.
- Zero: Logs changes in the Zero annunciator.
- Input 1, 2, 3 or 4: Logs changes from Input 1 to 4.
- Output 1, 2, 3 or 4: Logs changes from Output 1 to 4.
- Default: None (for Digital 1 to 4)

- **Stop**

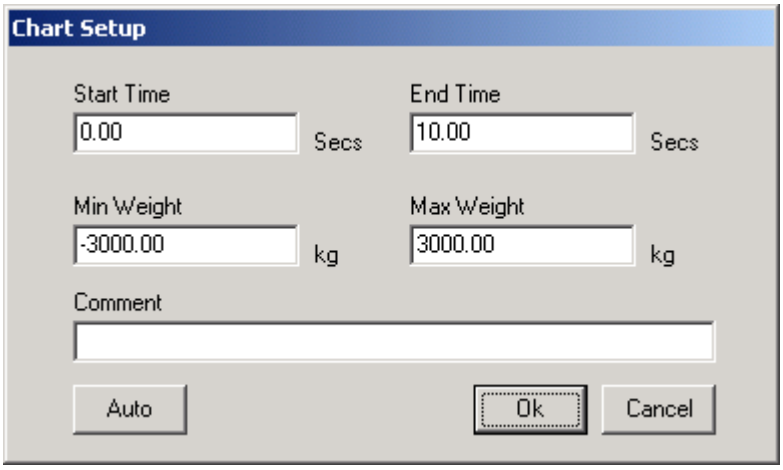
Use this button to stop logging activity.

- **Moving Around Logs**

Use Left / Right Arrows	To scroll left / right
Use Up / Down Arrows	To scroll up / down

- **Log Chart Setup**

The Log Chart Setup window is opened using the **Setup Chart** option in the **Edit** menu. This window enables the manual setting of zoom. It also gives an automatic **best fit** option.



The five parameters that can be set in this window are:

Parameter	Description
Start Time	The minimum value to display on the time axis.
End Time	The maximum value to display on the time axis.
Min Weight	The minimum value to display on the weight axis.
Max Weight	The maximum value to display on the weight axis.
Comment	A line of text that appears at the bottom of the chart and on the printout.

The **Auto** button scales the chart to show all data points as large as possible (best fit).

9.2.12. TEST TAB

The Test Tab is used to send commands to the unit and to view responses. The output printed from the unit can also be viewed here.

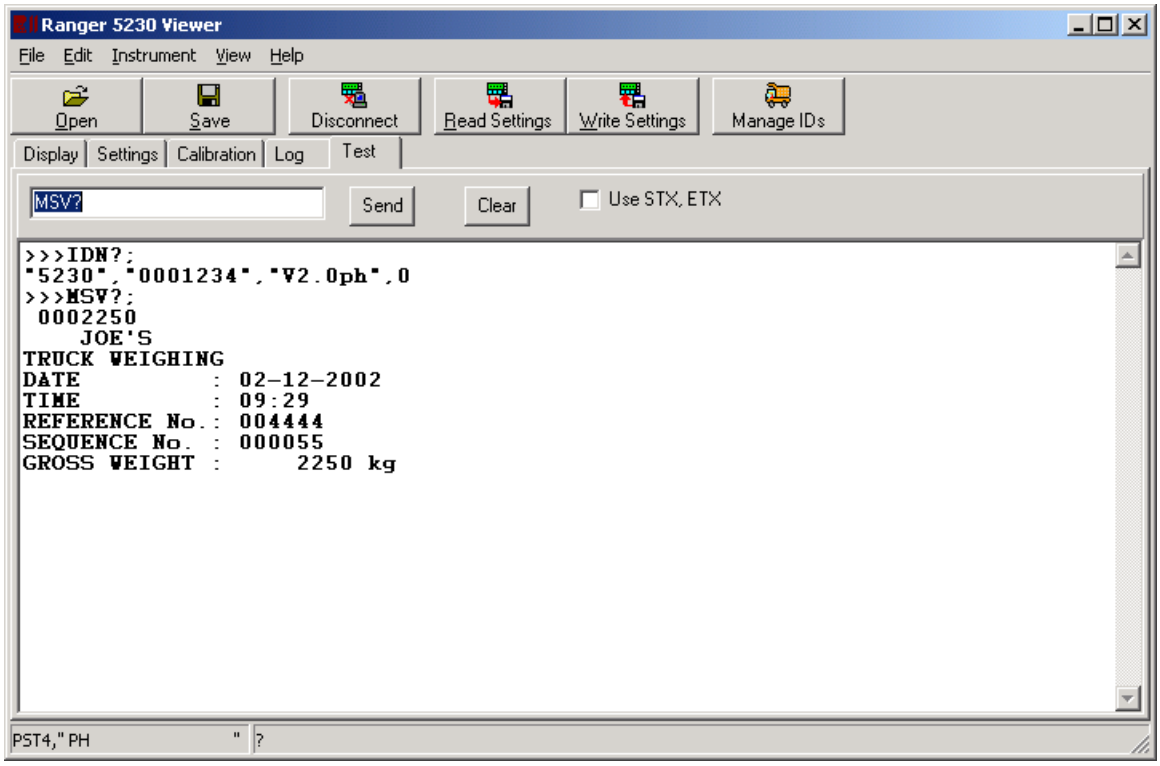


Figure 29: Viewer - Test Tab

- **Send**

  Sends the entered command to the instrument.

- **Clear**

  Clears all data from the Test Tab display area.

- **Use STX, ETX**

  When this field is enabled (ticked) the commands sent are enclosed with STX (ASCII 02) and ETX (ASCII 03) characters.

10. Calibration

The calibration of the **5230** indicator is fully digital. The calibration results are stored in permanent memory for use each time the unit is powered up.

Note: Some of the digital setup steps can affect calibration. The BUILD and OPTION settings MUST be configured before calibration is attempted. Most importantly, the Weighing Mode (TYPE) setting must not be changed after calibration.

To perform a calibration, select the **Calibration** Tab in the **Viewer** or the **CAL** Group in the **Indicator Setup**.

Note: Due to restrictions in Trade Use applications, the calibration routines are not available in Safe setup. Trade critical calibration can be accessed only through Full Setup.

The calibration programme will automatically prevent the **5230** from being calibrated into an application outside of its specification. If an attempt is made to calibrate the **5230** outside of the permitted range, an error message will display and the calibration will be abandoned. Refer to Error Messages page 124.

The **5230** has a wide-range amplifier. The non-trade calibration range of the instrument extends well beyond the Trade approved range.

Note: It should not be assumed that just because the 5230 has successfully calibrated a scale, that the scale is correct for trade use. Always check the scale build against the approval specification.

10.1. Write Settings to Instrument / Read Settings from Instrument

- Changes to settings in the Calibration Tab must be saved to the instrument to ensure the changes are available for use each time the unit is powered up. Refer to Write Settings to Instrument page 33 for more information.
- Changes to settings in the CAL group in the indicator Full Setup must be read into the Viewer to ensure the changes are available for use each time the Viewer is used. Refer to Read Settings from Instrument page 33.

10.2. Performing a Digital Calibration with Test Weights

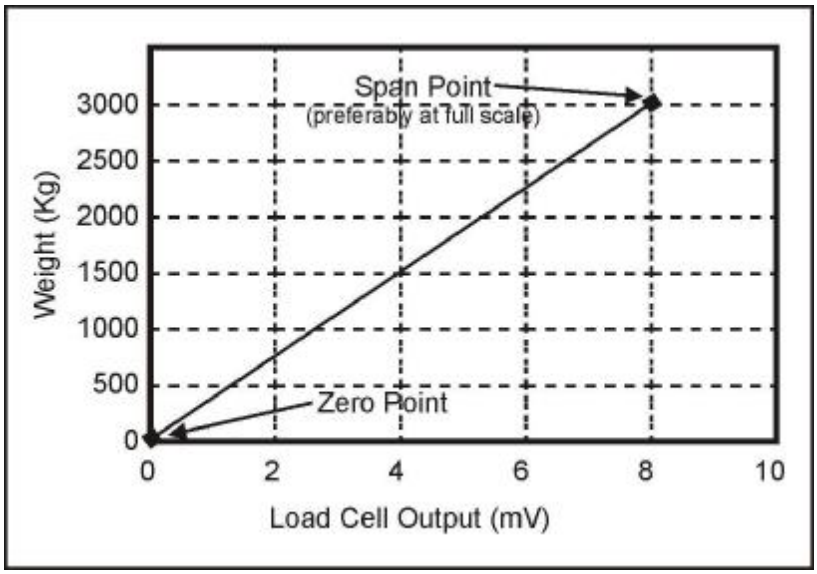


Figure 30: Chart - Zero and Span Points to Interpolate Weight from Load Cell

This type of calibration is used for single range as well as dual range and dual interval modes of operation. The **ZERO** setting specifies a gross zero point for the scale. The **SPAN** setting specifies a second point (preferably close to fullscale) used to convert the A/D readings into human readable units (eg. kg). It is important that an initial zero calibration is performed before any span calibrations. The chart shown here demonstrates how the **5230** uses the zero and span points to interpolate a weight reading from the load cell reading.

10.2.1. ZERO (Zero Calibration Routine)

- **Viewer Method**

  Set from the Viewer **CALIBRATION** Tab.

• Remove all weight from the scale structure.
• Click the **<ZERO>** button to perform the Zeroing routine. The viewer display will show the current weight. The instrument display will show **Z.in.P** to indicate that zeroing is in progress. When the process is complete the viewer and keypad display will return to the weight to allow the zero to be checked.

- **Keypad Method**

  Set from the Indicator keypad using the **CAL:ZERO** item.

• Press the **<OK>** key to perform the Zeroing routine. The display will show the current weight. Remove all weight from the scale structure.
• Press the **<OK>** key again to execute a Zero Calibration. The display will show **Z.in.P** to indicate that zeroing is in progress. When the process is complete the display will return to weight to allow the zero to be checked.
• Press the **<ITM>** key to leave the Zeroing routine or **<OK>** to repeat the operation.

10.2.2. SPAN (Span Calibration Routine)

- **Viewer Method**

  Set from the Viewer **CALIBRATION** Tab.

• Add the calibration test mass to the scale. The minimum acceptable span calibration weight is 2% of the scale range. A weight this small may limit the calibration accuracy. The closer the test weight is to full range the better the accuracy.
• Enter the span weight in the **Span Weight** field.
• Click the **<SPAN>** button to perform the Span setting routine. The viewer display will show the current weight on the scale. The instrument will show **S.in.P** to show that spanning is in progress. When the process is complete the display will return to the weight to allow the new weight reading to be checked.

- **Keypad Method**

  Set from the Indicator keypad using the **CAL:SPAN** item.

• Press the **<OK>** key to perform the Span setting routine. The display will show the current weight on the scale.
• Add the calibration test mass to the scale. The minimum acceptable span calibration weight is 2% of the scale range. A weight this small may limit the

calibration accuracy. The closer the test weight is to full range the better the accuracy.
• Press the **<OK>** key to show the calibration weight value. Change this to the correct calibration weight using the **<SEL>** and **<EDT>** keys.
• Press the **<OK>** key to trigger the Span Calibration routine. The display will show **S.in.P** to show that spanning is in progress. When the process is complete the display will return to weight to allow the new weight reading to be checked.
• When the Span Calibration is complete, press the **<ITM>** key to leave the Spanning routine or press **<OK>** to repeat the operation.

10.3. Direct mV/V Calibration (Zero Calibration Routine)

- **Viewer Method**

  Set from the Viewer **CALIBRATION** Tab.

• The **Zero mV/V** field is used to enter the zero value for Direct mV/V Calibration.

- **Keypad Method**

  Set from the Indicator keypad using the **CAL:DIR.ZER** item. This function uses the current zero calibration mV/V value.

• Press the **<OK>** key to start the zero routine running. The display will show the current weight.
• Press the **<OK>** key. The display will show the current weight as mV/V.
• Enter the mV/V signal strength reading for zero load. The mV/V signal for the weight on the scale at this time is used as the default. If there is no load on the scale then use the mV/V setting as is, otherwise enter the correct mV/V reading for zero weight by using the numeric keys.
• Press the **<OK>** key to accept this setting as the zero calibration
• Press the **<ITM>** key to return to the **DIR.ZER** item.

10.4. Direct mV/V Calibration (Span Calibration Routine)

- **Viewer Method**

  Set from the Viewer **CALIBRATION** Tab.

• The **Fullscale mV/V** field is used to enter the fullscale (span) value for Direct mV/V Calibration.

- **Keypad Method**

  Set from the Indicator keypad using the **CAL:DIR.SPN** item.

• Press the **<OK>** key to start the Span setting routine. The display will show the current weight.
• Press the **<OK>** key. The display will show the current weight as mV/V.
• Enter the mV/V reading to equal the calculated span mV/V for the scale. The span mV/V is the calculated difference in signal between zero weight and fullscale weight on the scale base.
• Press the **<OK>** button to accept this setting as the span calibration.
• Press the **<ITM>** key to return to the **DIR.SPN** item.

10.5. Using Linearisation

This section provides instructions on the use of the linearisation. Linearisation may be applied to any type of scale weighing mode. Linearisation is used to approximate the weight output to a non-linear scale. The chart below shows a non-linear characteristic for the load cell output. From the chart, it can be seen that the trace with no linearisation applied is a poor approximation to the real characteristic. By applying one or more linearisation points, more accurate weight readings can be achieved.

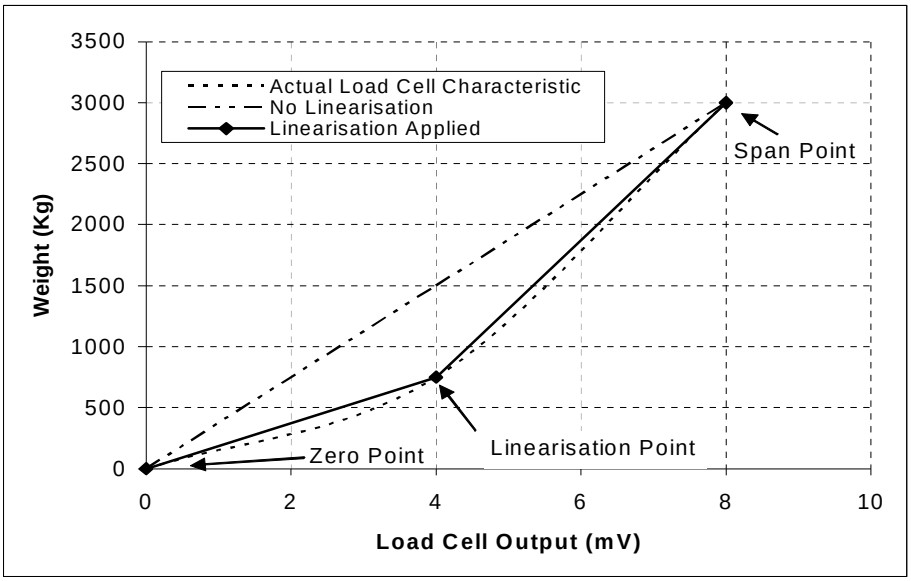


Figure 31: Chart - Non-Linear Characteristic for Load Cell Output

To perform a linearisation, a calibration of the zero and span points must have been performed. Both the zero and span calibration points are used in the linearisation of the scale base. These two points are assumed to be accurately set and thus have no linearisation error. Note that the linearisation points are not restricted to lie between the zero and span points. They may also be placed above the span point, and below the zero point.

A maximum of five linearisation points can be set independently anywhere in the operating range of the scale. Unused or unwanted points may be also cleared.

10.5.1. Set or Edit Linearisation Points

- **Viewer Method**

  Set from the Viewer **CALIBRATION** Tab.

• Add the test weight to the scale.
• Enter the calibration weight
• Click to select one of the five linearisation points.
• Click the **<SET>** button.

- **Keypad Method**

  Set from the Indicator keypad using the **CAL:ED.LIN** item.

• Press the **<OK>** key to view the list of linearisation points currently in use.
• Press the **<SEL>** key to step through the list of points. Each point is shown as **Ln.ppp** where **n** is the point number (1 to 5), and **ppp** is the approximate percentage of full scale where the linearisation is applied. For example, **L1.050** indicates that linearisation point one is active and was entered at about 50% of full scale. Unused linearisation points are shown with a row of dashes (eg. L2.---).
• Press **<OK>** to change the linearisation point selected or press **<ITM>** to exit without making any changes.
• After pressing **<OK>**, the current weight reading is displayed. Add the calibration test mass to the scale. The closer the test mass is to the point of maximum error in linearity the more effective will be the correction. Press **<OK>** to enter a corrected weight value for this point or **<ITM>** to exit without making changes.
• Enter the new weight from the keypad.
• Press the **<OK>** key to trigger the Linearisation routine. When the process is complete the display will show the weight to allow the new weight reading to be checked before returning to the menus. Press **<ITM>** to leave the routine or **<OK>** to repeat the operation.

10.5.2. Clear Linearisation Points

- **Viewer Method**

  Cleared from the Viewer **CALIBRATION** Tab.

• Click to select one of the five linearisation points.
• Click the **<CLEAR>** button.

- **Keypad Method**

  Cleared from the Indicator keypad using the **CAL:CLR.LIN** item.

• Press the **<OK>** key to view the list of linearisation points currently in use.
• Press the **<SEL>** key to step through the list of points. Each point is shown as **Ln.ppp** where **n** is the point number (1 to 5), and **ppp** is the approximate percentage of full scale where the linearisation is applied. For example, **L1.050** designates that linearisation point one is active and was entered at about 50% of full scale. Unused linearisation points are shown with a row of dashes (eg. L2. ---).
• Press **<OK>** to clear the linearisation point selected or press **<ITM>** to exit without making any changes.
• Once **<OK>** has been pressed, the linearisation point will be cleared, and the display will return to **CLR.LIN**.

Note: All linearisation points are cleared by restoring the default calibration of the instrument. The zero and span settings are also cleared by this process.

10.6. Restore Factory Calibration

This option is available only through Full Setup on the indicator. Refer to FAC.CAL (Restore Default Factory Calibration) ⊗ page 58 for more information.

11. Serial Outputs

The **5230** provides a number of serial output options allowing communications with external devices such as printers, computers, PLCs or remote displays.

Two serial outputs are available, each on a separate DB9 connector socket. For wiring connections and pinouts, refer to Serial Ports page 17. The **5230** requires an external converter to transmit in TTY Current Loop (20mA).

Serial Port 1 is bi-directional (in both RS-232 and RS-485). The functions available for serial port 1 include:

- Automatic Weight Output
- Networked Communications

Serial Port 2 provides RS-232 reception and transmission (with DTR handshake, and can be configured to perform the following functions:

- Automatic Weight Output
- Weight Printing

All printer and serial output options are enabled and configured using the Serial Communications Options in the keypad digital setup procedure and in the Viewer Settings Serial Tab.

Note: Each serial port can set individual baud rate and format. The baud rate and bit settings can be changed from Full or Safe Setup on the keypad only (SER.P1:BAUD, SER.P1:BITS and SER.P2:BAUD, SER.P2:BITS).

Computer communications can range from simple automatic streamed output, through to multi-drop networked systems. The **5230** can be programmed and calibrated via the network. The setup counter is incremented when the calibration related steps are accessed via the serial port. This means that calibration via the serial port cannot be carried out without effecting the certification of a trade installation.

Printer driving allows for three basic printer outputs. The format of the printer ticket may be changed to suit any application by entering special characters into the custom ticket format definition string. An automatic print mode is available where the **5230** automatically generates printouts at the appropriate time in the weighing process.

11.1. Automatic Weight Output

The automatic output is normally used to drive remote displays, a dedicated computer or PLC communications. The output generates a simple, configurable weight message at 10Hz / 10 times per second. The Automatic facility is available from both serial ports and both ports offer the same number of automatic options. The format for automatic outputs is set by Auto Settings Type. Refer to Auto Settings for Serial 1 (AUT.OPT): Type (AUT.TYP) page 81 and Auto Settings for Serial 2 (AUT.OPT): Type (AUT.TYP) page 84.

11.1.1. Auto Weight Format String

The **5230** auto weight string can be one of five standard strings (Auto A to Auto E), or a user programmable string (Custom). In a standard weight format string (Auto A to Auto E), the weight reading is selected according to the weight source. In the Keypad the settings are in the **SER.P1** or **SER.P2** group, **AUT.OPT:SRC** item. In the Viewer the settings are in the Tab **Settings**, Sub-Tab **Serial 1** or **2**, Section **Auto Settings for Serial 1** or **2**, Field **Source**. The start and end characters are included in the format. In a user programmable weight format string (Custom), the weight source is selected via codes in the string and the start and end characters must be entered manually.

- **Weight Formats - Auto A to Auto E**

  These five standard weight formats are detailed below.

Format	Description
Auto A	**<STX> <SIGN> <WEIGHTA(7)> <STATUS> <ETX>**
Auto B	**<STX> <STATUS> <SIGN> <WEIGHTA(7)> <UNITS(3)> <ETX>**
Auto C	**<STX> <SIGN> <WEIGHTA(7)> <S1> <S2> <S3> <S4> <UNITS(3)> <ETX>**
Auto D	**<STX> <SIGN> <WEIGHTA(7)> <ETX>**
Auto E	**<STX> <SIGN> <WEIGHTB(7)> <S5> <UNITS(3)> <MODE(4)> <ETX>**

  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).
  - **WEIGHTA(7):** A seven character string containing the current weight including the decimal point. If there is no decimal point, then the first character is a space. Leading zero blanking applies.
  - **WEIGHTB(7):** A seven character string containing the current weight including the decimal point. If no decimal point is used a decimal point follows the 6 digits of weight data. Leading zeros are shown.
  - **STATUS:** Provides information on the weight reading. The characters G/N/U/O/M/E represent Gross / Net / Underload / Overload / Motion / Error, respectively.
  - **UNITS(3):** A three character string, the first character being a space, followed by the actual units (eg. ^kg or ^^t). If the weight reading is not stable, the units string is sent as ^^^.
  - **S1:** Displays G/N/U/O/E representing Gross / Net / Underload / Overload / Error, respectively.
  - **S2:** Displays M/^ representing motion / stable, respectively.
  - **S3:** Displays Z/^ representing centre of zero / non-zero, respectively.
  - **S4:** Displays 1/2/- representing range 1/2 in dual-interval and dual range mode and a dash (-) otherwise.
  - **S5:** Displays ^/m/c representing stable / motion / over or under capacity, respectively.
  - **MODE:** Four characters ^g^^ or ^n^^ for gross or net weight.

- **Weight Format - Custom**

  The programmable string is entered in the **Custom Auto Format** field. Ensure **Custom** in the **Auto Settings for Serial 2 Type** field is chosen.

  Example:

STX	7 Characters	Leading Zeros	Displayed Weight	Units	G or N Weight Status	ETX
002	172	187	201	210	213	003

  The **Custom Auto Format** setting programs the format transmitted when the Auto Settings Type is set to Custom. A string of up to 50 characters can be entered. Each ASCII character is either a literal ASCII printed character (eg. ASCII 065 - A) or a special token character (eg. 202 - ^^123.4) which sends the gross weight. ASCII 0 - NULL is used to mark the end of the format string. To send an ASCII 0, insert an ASCII 128.

  Qualifiers are tokens that do not cause any characters to be transmitted but setup the format of other tokens to follow.

- **Auto Transmit Tokens**

  Following is a table of all of the format tokens.

Qualifier Tokens		
ASCII	**Token**	**Comment**
170	5 character field	
171	6 character field	
172	7 character field	
173	8 character field	Default
174	9 character field	
179	No fixed length field for weight data	
180	No sign character sent	
181	Sign character send as ‘ ‘ for positive and ‘-‘ for negative	Default
182	Sign character send as ‘+‘ for positive and ‘-‘ for negative	
183	Sign character send as ‘0‘ for positive and ‘-‘ for negative	
184	No decimal point sent	
185	DP sent as ‘.’	Default
186	DP sent as ‘,’	
187	Weight sent with leading zeros, eg. ‘000123’	
188	Weight sent without leading zeros eg. ‘ 123’	Default
189	Weight readings sent regardless of overload or error status	Default
190	Weight data blanked on error	
191	Weight data send as ‘- - -‘ on error	
192	Status characters are upper case	Default
193	Status characters are lower case	

Tokens For Weight Data Transmission		
ASCII	**Token**	**Comment**
200	Selected Weight (SRC)	
201	Displayed Weight	
206	Displayed String including user prompts, etc.	
207	Number of Pieces in counting mode	

Tokens For Weight Status		
ASCII	**Token**	**Comment**
210	Units	‘kg’, ’lb’, ’ t’, ’ g’
211	G,N,E,O,U,M	Standard Ranger status
212	G,N,E,O,U	Ranger status without motion
213	G,N	Gross, Net only
214	M,’ ‘	Motion or ‘ ‘ for stable
215	M,S	Motion or stable
216	‘ ‘, or units	‘ ‘ for motion or weight units
217	M,C,’ ‘	Motion, over-capacity or valid weight
218	M,I,O,’ ‘	Motion, invalid, over-capacity, or valid weight
219	I,O,U	In-scale, overload, underload
220	Z,’ ‘	Centre of Zero
221	‘ ‘,1,2	Single range or range/interval 1 or 2
222	ST,US,OL	Stable, unstable, overload
223	GS,NT	Gross, Net
230	Send time	hh:mm:ss
231	Send Date	dd/mm/yyyy

11.2. Networking the 5230

The **5230** supports a serial communication protocol to control and query the instrument. Refer to the **5230 Communications Manual** for a list of the supported commands.

RS-485 Termination Resistors

The termination resistors required by RS-485 networks are built into the **5230**. The resistors are used to terminate the ends of the network to provide a balanced loading. The termination resistors in the **5230** are enabled by the Serial 1 BITS settings (Keypad SER.P1:BITS) in the keypad setup.

11.3. Printer Output Formats

A range of printer formats can be selected from the **Printer Settings Type** field in the viewer or the **SER.P2:PRN.OPT:PRN.TYP** in keypad setup. For Truck Weighing applications, the Fixed format must be defined if a printout is required. The following table provides descriptions of the available formats.

- **Fixed Printout**

The fixed printout formats are as shown below. In each instance the Axles were set to **2**.

	Fixed 1 **Axles not printed**	**Fixed 2** **Axles printed in 1st and 2nd weigh**	**Fixed 3** **Axles printed in 1st weigh**
First Weigh	**<Programmable Header Info>** **HEADER LINE 1** **HEADER LINE 2** **HEADER LINE 3** TRUCK : TRK 1 DATE : 09-12-02 TIME : 10:13 REFERENCE No.: 004444 SEQUENCE No. : 000024 1ST WEIGHT : 1272 kg **FOOTER LINE 1** **FOOTER LINE 2** **FOOTER LINE 3** **<Programmable Footer Info>**	**<Programmable Header Info>** **HEADER LINE 1** **HEADER LINE 2** **HEADER LINE 3** TRUCK : TRK 1 DATE : 09-12-02 TIME : 10:24 REFERENCE No.: 004444 SEQUENCE No. : 000031 AXLE 1 : 636 kg AXLE 2 : 1272 kg 1ST WEIGHT : 1908 kg **FOOTER LINE 1** **FOOTER LINE 2** **FOOTER LINE 3** **<Programmable Footer Info>**	**<Programmable Header Info>** **HEADER LINE 1** **HEADER LINE 2** **HEADER LINE 3** TRUCK : TRK 1 DATE : 09-12-02 TIME : 10:27 REFERENCE No.: 004444 SEQUENCE No. : 000034 AXLE 1 : 636 kg AXLE 2 : 1272 kg 1ST WEIGHT : 1908 kg **FOOTER LINE 1** **FOOTER LINE 2** **FOOTER LINE 3** **<Programmable Footer Info>**
Second Weigh	**<Programmable Header Info>** **HEADER LINE 1** **HEADER LINE 2** **HEADER LINE 3** TRUCK : TRK 1 PRODUCT : PRO 1 DESTINATION : DST 1 DATE : 09-12-02 TIME : 10:13 REFERENCE No.: 004444 SEQUENCE No. : 000025 1ST WEIGHT : 1272 kg 2ND WEIGHT : 1907 kg NET WEIGHT : 635 kg **FOOTER LINE 1** **FOOTER LINE 2** **FOOTER LINE 3** **<Programmable Footer Info>**	**<Programmable Header Info>** **HEADER LINE 1** **HEADER LINE 2** **HEADER LINE 3** TRUCK : TRK 1 PRODUCT : PRO 1 DESTINATION : DST 1 DATE : 09-12-02 TIME : 10:24 REFERENCE No.: 004444 SEQUENCE No. : 000032 AXLE 1 : 1272 kg AXLE 2 : 1907 kg 1ST WEIGHT : 1908 kg 2ND WEIGHT : 3179 kg NET WEIGHT : 1271 kg **FOOTER LINE 1** **FOOTER LINE 2** **FOOTER LINE 3** **<Programmable Footer Info>**	**<Programmable Header Info>** **HEADER LINE 1** **HEADER LINE 2** **HEADER LINE 3** TRUCK : TRK 1 PRODUCT : PRO 1 DESTINATION : DST 1 DATE : 09-12-02 TIME : 10:27 REFERENCE No.: 004444 SEQUENCE No. : 000035 1ST WEIGHT : 1908 kg 2ND WEIGHT : 3179 kg NET WEIGHT : 1271 kg **FOOTER LINE 1** **FOOTER LINE 2** **FOOTER LINE 3** **<Programmable Footer Info>**
Preset Tare Weigh	**<Programmable Header Info>** **HEADER LINE 1** **HEADER LINE 2** **HEADER LINE 3** TRUCK : TRK 1 PRODUCT : PRO 1 DESTINATION : DST 1 DATE : 09-12-02 TIME : 10:11 REFERENCE No.: 004444 SEQUENCE No. : 000023 GROSS WEIGHT : 1272 kg TARE WEIGHT : 200 kg PT NET WEIGHT : 1072 kg **FOOTER LINE 1** **FOOTER LINE 2** **FOOTER LINE 3** **<Programmable Footer Info>**	**<Programmable Header Info>** **HEADER LINE 1** **HEADER LINE 2** **HEADER LINE 3** TRUCK : TRK 1 PRODUCT : PRO 1 DESTINATION : DST 1 DATE : 09-12-02 TIME : 10:25 REFERENCE No.: 004444 SEQUENCE No. : 000033 GROSS WEIGHT : 2542 kg TARE WEIGHT : 200 kg PT NET WEIGHT : 2342 kg **FOOTER LINE 1** **FOOTER LINE 2** **FOOTER LINE 3** **<Programmable Footer Info>**	**<Programmable Header Info>** **HEADER LINE 1** **HEADER LINE 2** **HEADER LINE 3** TRUCK : TRK 1 PRODUCT : PRO 1 DESTINATION : DST 1 DATE : 09-12-02 TIME : 10:27 REFERENCE No.: 004444 SEQUENCE No. : 000036 GROSS WEIGHT : 2542 kg TARE WEIGHT : 200 kg PT NET WEIGHT : 2342 kg **FOOTER LINE 1** **FOOTER LINE 2** **FOOTER LINE 3** **<Programmable Footer Info>**

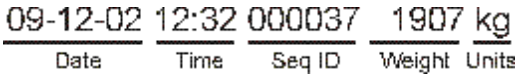
The fields within the printout are as follows:

- **Programmable Header Info:** This is a programmable string that may contain formatting codes to display items such as weight. The formatting codes are the same as used for the Custom Ticket (refer to Custom Ticket page 106). The header format is set from the viewer or the keypad. Refer to Printer Settings (PRN.OPT): Header Format (HDR.FMT) page 84 or PRN.OPT:HDR.FMT (Header Format) page 62).
- **Header Text:** Header Line 1, 2 and 3 are lines of ASCII printable text, entered from the viewer or the keypad. Refer to Printer Settings (PRN.OPT): Print Header/Footer (HEADER) page 84 or PRN.OPT:HEADER (Print Header/Footer) page 62).
- **Fixed Ticket Text:** This is the main body of the printout, is not programmable and contains details depending on the type of Fixed format and also the type of Weigh. In the previous examples the fixed ticket text is formatted as **bold** text. Note that the Axle portion of the print is the main difference between Fixed 1, 2 and 3 (in the previous examples, formatted as **bold / underlined** text).
- **Footer Text:** Footer Line 1, 2 and 3 are lines of ASCII printable text, entered from the viewer or the keypad. Refer to Printer Settings (PRN.OPT): Print Header/Footer (HEADER) page 84 or PRN.OPT:HEADER (Print Header/Footer) page 62).
- **Programmable Footer Info:** This is a programmable string that may contain formatting codes to display items such as weight. The formatting codes are the same as used for the Custom Ticket (refer to Custom Ticket page 106). The footer format is set from the viewer or the keypad. Refer to Printer Settings (PRN.OPT): Footer Format (FTR.FMT) page 84 or PRN.OPT:FTR.FMT (Footer Format) page 63).

- **Tally Printout**

  A Tally printout is intended to produce the most compact printout. The printout type is disabled for truck weighing. If a Tally printer setting type is configured, the First weigh will store the weight, display **FIRST STORED** and return to normal operation. The second weigh will store the weight, display **WEIGHT STORED** and return to normal operation.

  The Tally type will produce a printout during normal weighing by pressing the **<PRINT>** key. The printout is shown in the example below:

  Each item is described below:

  - **Date:** Current date.
  - **Time:** Current time.
  - **Seq.ID:** Refer to ID Key page 39.
  - **Weight:** The gross weight.
  - **Units**: The units of measure set in the scale build.

- **Custom Ticket**

  The Custom Ticket produces a user configurable printout, with facilities to include all weight parameters, date and time and identification fields. The **Header Format** and **Footer Format** fields are used to enter the custom ticket format. These are printed with the header first, followed by the footer. The formatting codes and an example are covered in Custom Header, Footer and Ticket Formatting page 108.

11.3.2. Printer Space

It is possible to specify the number of columns and rows of space to leave around both the first and second printout when truck weighing. The number of columns is common to both printouts, however the number of rows may be set for each printout. This allows a ticket to be re-entered into the printer after the first printout and the second printout offset so it prints below the first.

The printer space can be set from the viewer or the keypad. Refer to Printer Settings (PRN.OPT): Margin Space (SPACE) page 84 or PRN.OPT:SPACE (Margin Space) page 63).

11.3.3. Header and Footer Text

The **5230** provides a facility to append custom headers and footers to printed tickets (Fixed and Custom only). The header and footer consist of three lines of 50 characters each. These can be edited from the viewer or the keypad. Refer to Printer Settings (PRN.OPT): Print Header/Footer (HEADER) page 84) or PRN.OPT:HEADER (Print Header/Footer) page 62). The first three lines of this item are the header, and the last three items are the footer. The header and footer may be edited to include unchanging items such as company names and phone numbers.

Example: The following table shows the coded entry for a header and footer. An example printout using this header and footer follows. Note that only 20 of the 50 possible characters per line are shown.

	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20
1								**J**	**O**	**E**	**‘**	**S**								
	32	32	32	32	32	32	32	74	79	69	39	83	32	32	32	32	32	32	32	32
2			**T**	**R**	**U**	**C**	**K**		**W**	**E**	**I**	**G**	**H**	**I**	**N**	**G**				
	32	32	84	82	85	67	75	32	87	69	73	71	72	73	78	71	32	32	32	32
3																				
	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
4				**P**	**H**		**3**	**2**	**1**	**6**	**7**	**1**	**6**	**6**						
	32	32	32	80	72	32	51	50	49	54	55	49	54	54	32	32	32	32	32	32
5																				
	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
6																				
	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32

Example Printout:

```
       JOE'S
  TRUCK WEIGHING
TRUCK         : TRK 1
PRODUCT       : PRO 1
DESTINATION   : DST 1

DATE          : 09-12-02
TIME          : 10:13
REFERENCE No.: 004444
SEQUENCE No.  : 000025

1ST WEIGHT    :     1272 kg

2ND WEIGHT    :     1907 kg

NET WEIGHT    :      635 kg

   PH 32167166
```

11.3.4. Custom Header, Footer and Ticket Formatting

Up to 50 characters of ticket format information can be entered to define the exact style of ticket printout. When Fixed or Custom tickets are used the header and footer can be configured from the viewer or the keypad. Refer to Printer Settings (PRN.OPT): Header Format (HDR.FMT) page 84 and Printer Settings (PRN.OPT): Footer Format (FTR.FMT) page 84 or PRN.OPT:HDR.FMT (Header Format) page 62 and PRN.OPT:FTR.FMT (Footer Format) page 63).

Each format character can be a literal ASCII code (eg. 065 for A) or a special format character (eg. 132 for \D for a time/date field).

The following table shows the available format characters. These same format characters may be sent in a temporary weight string via the network communications to define the format of a single printout.

- **Printer Tokens**

ASCII Code	Escape Sequence	Effect
128	\.	Print a literal NULL character (NULL can't be entered as 00 as this is used to identify the end of the format string)
129	\A	Print custom header (first 3 lines) only. No CRLF is printed.
130	\B	Print custom footer (last 3 lines) only. No CRLF is printed.
131	\C	Print the number of Columns of SPACE specified by the Printer Space settings.
132	\D	Print Date Time field as specified by setup options.
133	\E	Print End of Line : literally prints CRLF (ASCII 013, 010)
134	\F	Same as "\E\C". End of line followed by column space for next line.
135	\G	Print Gross Weight : "weight(7) units(3) G"
136	\H	Print Custom Ticket Header and Footer (6 Lines)
137	\I	Print ID number
142	\N	Print Net Weight : "weight(7) units(3) N"
146	\R	Print the number of Rows of SPACE specified by the Printer Space settings.
148	\T	Print TARE weight: "weight(7) units(3) T (or PT if pre-set Tare active)
149	\U	Print units
151	\W	Print displayed weight. "weight(7) units(3) G (or N)

Example: The following table shows the coded entry for a custom ticket. The header is the same as the example custom ticket header entered above.

No.	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
Code	**\A**	**I**	**D**	**:**	**\I**	**\E**	**W**	**E**	**I**	**G**	**H**	**T**	**:**	**\G**	**\E**	**\B**	***End***
ASCII	129	073	068	058	137	133	087	069	073	071	072	084	058	135	133	130	000

The printout from this configuration is shown below:

```
JOE'S
    TRUCK WEIGHING
ID:A000044
WEIGHT:   1056 kg G
     PH 32167166
```

- **ASCII Codes**

  The following table lists the ASCII codes for control and printable characters.

Code	Char	Code	Char	Code	Char	Code	Char	Code	Char
000	NULL	026	SUB	052	‘4’	078	‘N’	104	‘h’
001	SOH	027	ESC	053	‘5’	079	‘O’	105	‘i’
002	STX	028	FS	054	‘6’	080	‘P’	106	‘j’
003	ETX	029	GS	055	‘7’	081	‘Q’	107	‘k’
004	EOT	030	RS	056	‘8’	082	‘R’	108	‘l’
005	ENQ	031	US	057	‘9’	083	‘S’	109	‘m’
006	ACK	032	‘ ‘ (space)	058	‘:’	084	‘T’	110	‘n’
007	BEL	033	‘!’	059	‘;’	085	‘U’	111	‘o’
008	BS	034	‘”’	060	‘<’	086	‘V’	112	‘p’
009	HT	035	‘#’	061	‘=’	087	‘W’	113	‘q’
010	LF	036	‘$’	062	‘>’	088	‘X’	114	‘r’
011	VT	037	‘%’	063	‘?’	089	‘Y’	115	‘s’
012	FF	038	‘&’	064	‘@’	090	‘Z’	116	‘t’
013	CR	039	‘’’	065	‘A’	091	‘[‘	117	‘u’
014	SO	040	‘(‘	066	‘B’	092	‘\’	118	‘v’
015	SI	041	‘)’	067	‘C’	093	‘]’	119	‘w’
016	DLE	042	‘*’	068	‘D’	094	‘^’	120	‘x’
017	DC1	043	‘+’	069	‘E’	095	‘_’	121	‘y’
018	DC2	044	‘,’	070	‘F’	096	‘`’	122	‘z’
019	DC3	045	‘-‘	071	‘G’	097	‘a’	123	‘{‘
020	DC4	046	‘.’	072	‘H’	098	‘b’	124	‘|’
021	NAK	047	‘/’	073	‘I’	099	‘c’	125	‘}’
022	SYN	048	‘0’	074	‘J’	100	‘d’	126	‘~’
023	ETB	049	‘1’	075	‘K’	101	‘e’	127	DEL
024	CAN	050	‘2’	076	‘L’	102	‘f’		
025	EM	051	‘3’	077	‘M’	103	‘g’		

- **Printer Control**

  Most printers use embedded control characters to specify different fonts, colours and paper cutting. Consult your printer manual for details of these control characters. Enter the control characters directly into the printer ticket format string to create the desired printing effects.

12. Setpoints

The **5230** is capable of working with four internal setpoints. The status of the setpoints is displayed on the LCD. Each setpoint can be configured to perform a particular function and may be associated with a physical output driver. The **5230** can drive two or four outputs, depending on which option card is fitted.

The operating parameters for the batching process are available from the front panel, and may be altered while a batch is running without interfering with the current batch.

12.1. Connection

Refer to Accessories and Options page 119 for the method of connection of the external output drivers.

12.2. Basic Setpoint Operation

In order to use a batching system, it must first be configured from the viewer (refer to SETTINGS / SETPOINT TAB page 86) or the keypad (refer to SET.PTS page 64). Once the configuration has been performed, targets can be entered directly from the keypad without requiring access to the setup menus. Refer to TARGET Key page 39 and Batching Process (Remote Fill) page 51 for more information.

The following sections describe each of the available setpoint settings.

12.2.1. Configuring a Setpoint

Setpoints define logical outputs that are activated when certain conditions are met. The setpoint type defines the conditions to be met to activate the output. Material (Slow, Medium and Fast Fill) and Active setpoints are based on weight. Other setpoint types are used to control sequences and indicate conditions within the **5230** (eg. overload).

An active setpoint operates at all times, whereas fill setpoints are active only at specific times during a batch sequence. The operation of active weight setpoints is demonstrated in Figure 32. Also illustrated are the roles of target, in-flight and hysteresis settings. The operation of targets for filling, etc., are very similar to that of active setpoints.

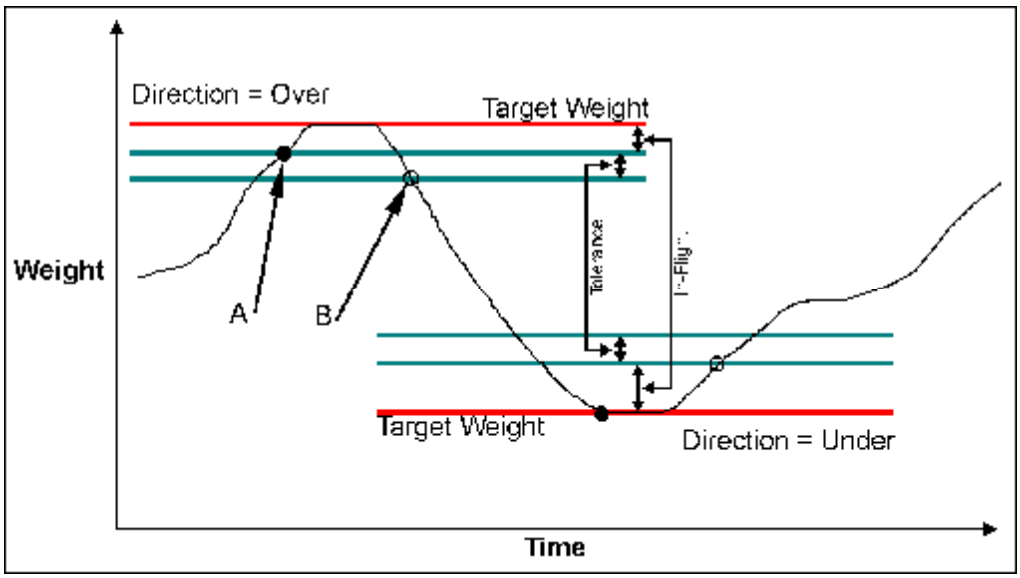


Figure 32: Setpoint Operation – Over vs Under

- **Active Setpoints:** Note the difference between **Over** and **Under** directions.
- If the Logic is set to **High** the output is turned on at point **A** and off again at point **B**. If the Logic is set to **Low** the output is turned off at point **A** and on again at point **B**.
- For **Over** setpoints, the switch point is the target weight minus the in-flight. With **Under** setpoints, the switch point is the target weight plus the in-flight. Similar differences apply to the role of the tolerance setting.

12.3. Setpoint Types

Each of the four setpoints is assigned a specific type and a number of options. Not all options are available with every type. Below is a list of all of the different setpoint types along with the options available for each.

12.3.1. None

This is the default setting and disables the setpoint when not in use. These setpoints may be driven directly via serial networking commands.

12.3.2. Active

Setpoints of this type are always active regardless of whether a batch is running or not. Active setpoints are applicable to level control and overload alarms, etc. The target for an active setpoint can be set from the **LIM1, LIM2, LIM3** and **LIM4** item(s), which appear by pressing the **<TARGET>** key. Refer to TARGET Key page 39.

The options applicable to active setpoints are as follows:

- Direction
- Logic
- Alarm

12.3.3. Fill Material Setpoints: Slow, Medium, Fast, Finish

These are the material fill setpoints. Each setpoint controls a single output. For a single speed filling, simply configure a Slow Fill setpoint (Setpoint 1). In order to implement multi speed filling, configure the Slow Fill (Setpoint 1), Medium Fill setpoint (Setpoint 2) and Fast Fill (Setpoint 3). The targets for the Medium and Fast Fill setpoints can be set from the **PRE.MED** and **PRE.FST** item(s), which appear which appear by pressing the **<TARGET>** key. Refer to TARGET Key page 39. The target for the Slow Fill is set when the batch is performed. Refer to Batching Process (Remote Fill) page 51.

- **Slow Fill (Setpoint 1 Only)**

  The options applicable to this setpoint are as follows:
  - Source
  - Alarm
  - Correction

  Note: The target weight for a Slow Fill is set during the batching process. Refer to Batch Process page 51.

- **Medium Fill (Setpoint 2 Only)**

  The options applicable to this setpoint are as follows:
  - Alarm

- **Fast Fill (Setpoint 3 Only)**

  The options applicable to this setpoint are as follows:
  - Alarm

- **Finish (Setpoint 4 Only)**

  This setpoint will be energised for the time entered in the viewer or keypad. Refer to Delay Options (DELAY) page 116. This finish pulse is generated after all the material filling and delay sequences have finished. The **Finish** setpoint is used for external system synchronisation. After the finish pulse has completed and the output has turned off, this sequence waits for no motion and for the interlock signal to be energised (if used).

  If the source option is set to **Gross** the **5230** is returned to gross mode at the end of the batch, otherwise the **5230** remains unchanged.

  The options applicable to this setpoint are as follows:
  - Alarm

12.3.4. Tolerance

This is a status output that is cleared at the beginning of a batch and is energised if an **out of tolerance** condition is detected for any material filling operation. The tolerances for each material can be set from the viewer and the keypad. Refer to Tolerance (TOL) (Hysteresis) page 114 or TOL (Tolerance) page 65).

Note: The **PAUSE TOL** error will display when trying to start a batch if the weight on the scale is below the OIML Min. The weight must be above the Min before a batch is allowed to be started. Min equates to 20 divisions.

12.3.5. Run

This is a status output that is energised whenever the **5230** is running a batch. It is off if the batch is paused.

12.3.6. Pause

This is a status output that is energised whenever the **5230** is paused. The output is energised for 0.5 seconds every 5 seconds to allow an external siren to be connected to warn the operator that the unit is paused.

12.3.7. Error

This is a status output that is normally energised and is turned off when the **5230** detects an operation error (eg. broken load cell cable).

12.3.8. Motion

This is a status output that is energised whenever the **5230** detects motion in the weight reading.

12.3.9. Zero

This is a status output that is energised whenever the weight reading is within the zero band. If the **5230** is operating in Trade Mode, and the zero band is set to zero, then this output follows the **Centre of Zero** annunciator.

12.3.10. Axle

This is a status output that is energised during the First or Second weighings when the **5230** has accepted an axle weight. It can be used to drive a light to signal a driver to drive forward to the next axle.

12.4. Setpoint Options

To increase flexibility of the setpointing system, options are available for each type of setpoint. After selecting the setpoint type, the options available for the particular setpoint are displayed and can be configured. Description of each option follows.

Note: Not all options are available for all setpoints types. Refer to Setpoint Types page 111.

12.4.1. Source (Gross, Net)

Select whether this setpoint uses gross weight or net weight. Use **Gross** Source to fill to a gross weight target. As the **5230** does not have a tare device, with the **Net** Source the indicator adds the setpoint target weight to the current weight on the scale to determine the final target weight.

12.4.2. Direction (Over, Under)

Use **Over** if weight increases towards the setpoint target. Use **Under** for a reduction in weight toward the setpoint. Note that an Under setpoint with a net source requires a negative net weight target to be entered in the operator menus.

12.4.3. Logic (High, Low)

This logic level determines the logical sense of the output. Logic **High** is the normal operation of the output. Consider the example of an overload alarm where the output is ON for weights over the target value and OFF otherwise. This corresponds to Logic High operation. Logic **Low** reverses the operation of the output so it would be ON below the target and OFF above it. Logic selection is only available with the **Active** setpoint type. Other setpoint types have the logic determined automatically.

12.4.4. Alarm (None, Single, Double)

The alarm setting is used to configure an alarm to activate while a setpoint is active. The alarms are in the form of beeps emitted by the **5230**.

12.4.5. Correction (None, Auto Jogging)

The Correction field allows auto jogging to be used at the end of a material fill to correct the final weight. The **Auto Jogging** option enables the automatic jog sequence to bring the weight to target slowly for a particular material. **Jog Off Time** and **Jog On Time** can then be configured for the material. Refer to Jog Off Time (JOG.OFF) and Jog On Time (JOG.ON) page 116 for more information.

12.4.6. Target

This is the target weight value. The **5230** calculates a trip point based on the values of target, flight and the direction of operation. For increasing weights (Direction=Over) the trip point is the target value minus the flight compensation. For decreasing weights (Direction=Under) the trip point is the target value plus the flight compensation.

Targets may be entered as positive or negative values. Usually when weighing out of a hopper the targets are set as negative net weights.

The target can be set from the viewer (refer to Target page 87) or the keypad (refer to TARGET Key page 39).

- **Preliminary Targets**

  For applications using multiple speed feeders (PRE.MED or PRE.FST), it is convenient to specify the target values for the fast feeders in terms of the **weight before target** instead of the absolute target weight. For example, to fill 1000kg with 800kg of fast fill, specify the target weight as 1000kg and the preliminary weight as 200kg. This then allows the final target to be changed without the need to change the interim targets.

12.4.7. In-flight (IN.FLT)

In-flight compensation is used in weigh-batching installations to force the feeders to shut off early to allow for the amount of material still in flight between the feeder gate and the surface of material already in the weigh-bin. This value is initially set by the operator.

In addition the **5230** can be configured to automatically jog the weight up to target. The amount of weight left to be jogged is specified by the in-flight setting.

12.4.8. Tolerance (TOL) (Hysteresis)

Sets the hysteresis for the setpoint. The tolerance/hysteresis value forces a preset margin in the trip point. This stops the output from ‘chattering’ due to minor weight fluctuations at the trip point value. For increasing weights (Over) the hysteresis is used below the trip point and for decreasing weights (Under) it is used above the trip point.

This same value is used at the end of a fill sequence to check if the final weight is close enough to target.

12.4.9. General Options (GEN.OPT)

General ‘batching’ options are fields that affect the entire batching process and are not specific to a particular setpoint type. The following describes each of the batching options.

þ =On (enabled) **o** = Off (disabled)

- **Pause On Error (OPTION)**
  - On: Specifies that batching be paused whenever Overload, Underload or Error is detected.
  - Off: Allows the batching process to continue regardless
  - Default: On
- **Delay Before Fill (OPTION)**
  - On: Enables an additional one second delay at the start of the filling process. This enables the operator to easily see final weights and the results of automatic tare operations, etc.
  - Off: Removes the delay and consequently increases batching speed.
  - Default: On
- **One Feeder Only (OPTION)**
  - Off: Allows one feeder at a time to be active for a material fill.
  - On: Allows all the feeders for a material fill to be active at the same time.
  - Default: Off

12.4.10. Tolerance Action (TOL.ACT)

Sets the response to an out of tolerance condition. At the end of a filling sequence the final weight is compared to the original target weight. If the filling error is too great, the batch is marked as out of tolerance. The tolerance setting specifies an action to be taken in this situation.

Options are:

- None: No response other than setting the 'out-of-tolerance' condition for the batch.
- Beep: When the condition occurs the unit sounds a beep and continues.
- Pause: The unit pauses the batching operation.
- Default: None

12.4.11. Delay Options (DELAY)

Delay options are available to control the speed of the batching process. These delays allow for material settling and make it easier to follow the operation of the batching process.

- **Finish Pulse (FIN.DLY) (Finish Delay)**

  Sets the time for the operation of a Finish Relay. Setpoint 4, when defined as a **Finish** activity is energised for the amount of time specified by this setting. The finish delay may be set from 0.0 to 20.0 seconds. This output may be used to trigger external processes or alarms. The finish delay setting is only applicable if Setpoint 4 has been defined as a **Finish** setpoint.
  - Default: 1.0 seconds

- **Blockage Delay (BLOCK)**

  Sets the amount of time to expire with no motion during filling before pausing the batching process. When filling, if no motion is detected for the blockage delay period, the **5230** will pause the batching process and inform the operator. The blockage delay may be set from 0 to 200 seconds. Setting to zero disables this operation.
  - Default: 0 seconds

12.4.12. Jogging Options (JOG)

Materials that do not flow smoothly are difficult to control accurately. With automatic jogging, the material is filled to the target less the in-flight weight and the final target is reached through a series of 'jogs'. The material setpoint output of the **5230** is energised for a set amount of time and is held off for a set amount of time. A number of jog operations are performed in a set before the weight is allowed to stabilise. This process is repeated until the target weight is reached. To enable jogging for a material, the correction must be set to Auto Jogging from the viewer (refer to Correction page 87) or the keypad (SET.TYP (Setpoint Type) page 64). Also the amount of material to be jogged must be set via the in-flight weight. Refer to In-flight (IN.FLT) page 114.

- **Jog On Time (JOG.ON)**

  Sets the on time between each jog in 0.1 second increments. This time delay is set in 0.1 second increments and specifies how long the output is energised during each jog.
  - Default: 0.5 seconds

- **Jog Off Time (JOG.OFF)**

  This field sets the off time between each jog in 0.1 second increments.
  - Default: 1.0 seconds

- **Jogging Sets (JOG.SET)**

  Sets the number of jog cycles to be performed before the **5230** waits for the weight reading to settle (ie. no motion).
  - Default: 1

12.5. Function Keys, External Keys and Interlock

To control the batching process it is necessary to configure some of the external inputs available on the setpoint card to the following functions:

- **None:** No function has been assigned.
- **Zero, First, Second, Print, Accept:** Refer to Extended Function Details page 118 for details.
- **Blank:** Refer to Extended Function Details page 118 for details.
- **Lock:** Refer to Extended Function Details page 118 for details.
- **Fill:** Use this function to combine the Fill/Pause/Abort functions into a single key. A single press will start the batch or pause a running batch. A long press will abort the batch.
- **Pause/Abort:** This key will pause the batching process. A long press of the key will abort the batch completely. To re-start press the Fill key.
- **Interlock:** An interlock input is used to indicate that it is safe to start filling product (eg. when truck is on the scale). If during the filling process, the interlock signal is lost, the batching process is paused and the filling is stopped. Do not allocate any of the inputs to this function if you do not wish to use interlocking.

12.6. Setpoint Messages

A number of messages are used throughout the batching process. These messages are listed below:

Message	Description
PAUSE OPER	This is displayed every 5 seconds to indicate that the batch has been paused by the operator
PAUSE OL, **PAUSE UL,** **PAUSE ER**	This message indicates that the batch has been paused due to overload (OL), underload (UL) or Error (ER) detection.
PAUSE TOL	This message indicates that the batch has been paused because the filling error in the last material filled is outside tolerance. Refer to Tolerance page 112.
PAUSE I.LOC	This message indicates that the batch is paused due to the loss of the interlock signal during the filling of a material.
PAUSE PROG	This message indicates that the batch is paused due to a programmed pause step enabled by entering 0.0 seconds for a material delay.
PAUSE BLOCK	This message indicates that the batch is paused due to a blockage in the filling process

13. Extended Functions

13.1. Introduction

The **5230** has up to four independent remote input functions that may be triggered by external keys connected to the optional accessory cards. The function of each of these keys can be configured to any of the options detailed below. Refer to Remote Key Settings (FUNCTN): Remote 1, 2, 3 and 4 page 75 or FUNCTN (Remote Key Functions) page 59 for details on how to configure the remote input functions.

13.2. Extended Function Details

13.2.1. Front Panel Keys: (ZERO, FIRST, SECOND, PRINT, ACCEPT)

The function of each of the front panel keys may be implemented with the remote keys.

13.2.2. Blank®

This function allocates the selected input as a blanking input. When active this input causes the front display to be blanked to (- - - - - -) and blocks the operation of the front keys. This function is intended for use with tilt sensors on mobile weighing platforms to block operation of the weight indicator if the scale is not level.

13.2.3. Lock®

This function allocates the selected input as a locking input. When active, all keys, including the remote keys are blocked. This may be used with a keylock switch to lock the instrument when not in use.

13.2.4. Extended Setpointing Batch Control®

Refer to Function Keys, External Keys and Interlock page 117 for information on the extended batching control functions.

14. Accessories and Options

14.1. Introduction

The **5230** can be expanded by the installation of optional accessory cards. Two different cards are available for the **5230** - the setpoint card and the combo card.

14.2. Installing Option Cards

• Isolate the **5230** from the power before attempting to install an accessory card.
• Avoid excess handling of the accessory card as each card contains static sensitive devices.
• Hold the card by the edges or mounting plate as much as possible.
• Each option card is installed into a slot in the back panel of the **5230**. The slot is accessed by removing the cover plate at the top left.
• The connector lead is attached to the inside of this plate.
• Separate the lead from the plate, taking care not to lose the lead inside the instrument.
• Discard the plate, but retain the two mounting screws.
• Clean any remnants of tape from the lead connector.
• Plug the lead connector onto the four pin socket on the accessory card. The connector only fits one way around.
• Slide the card into the slot in the back of the instrument (cable end first), until the mounting plate is fitted against the back plate.
• Re-install the two retaining screws.

IMPORTANT NOTE

The RFI immunity of the accessory card depends on a sound electrical connection between the support plate and the case of the instrument. Make sure that this connection is as sound as possible when refitting the two retaining screws.

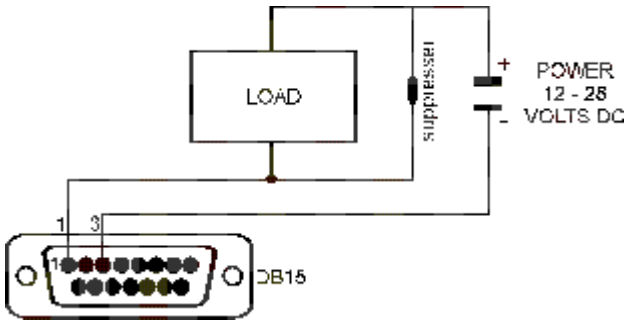
14.3. Setpoint Card

The standard **5230** displays the results of the setpoint functions on the front panel annunciator LEDs only. These signals can be used to drive external devices by installing an output driver card. The card carries four independent opto-isolated open-collector transistor drivers. These can be used to operate external devices such as relays, signal lamps or PLC inputs. The card also has four opto-isolated remote inputs. The function of each input can be selected. Refer to Extended Functions page 118.

14.3.1. Output Drivers

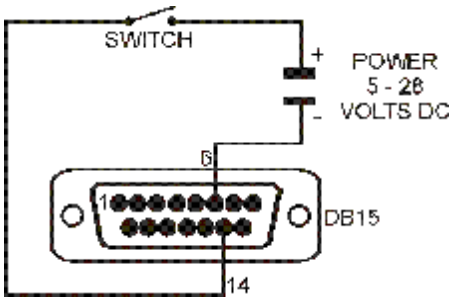
The output stage does not contain a power source and must be powered externally. The external supply should be from 12 to 28 volts DC and the maximum load current must be less than 0.5A

This circuit diagram shows a typical connection for one of the outputs. Each driver is protected against electrical noise, but it is strongly recommended that spark suppressors be fitted across any inductive loads such as relay and solenoid coils.



14.3.2. Remote Inputs

Each input is opto-isolated and requires a voltage input of between 5 and 28 volts DC to trigger. The following diagram shows a typical input circuit.



The following table shows the connections for the I/O card.

Pin No.	Function	Description	Connect To
1	OUT 1	Output 1	Load 1
9	OUT 2	Output 2	Load 2
2	OUT 3	Output 3	Load 3
10	OUT 4	Output 4	Load 4
3	OUTCOM	Output Common	Output Supply Negative
6	INCOM	Input Common	Input Supply Negative
14	IN 1	Remote Function 1	Contacts 1
7	IN 2	Remote Function 2	Contacts 2
15	IN 3	Remote Function 3	Contacts 3
8	IN 4	Remote Function 4	Contacts 4
SHELL	CH.GND	Chassis Ground	Cable Shield

14.4. Combo Card

This card provides either a -10 to 10 Volt analog output or a 4 to 20mA analog output. In addition it also provides two outputs and one input as per the setpoint card. The outputs are isolated from the input and the analog outputs. Refer to Output Drivers and Remote Inputs page 120 for more information

The current loop driver is active and supplies the source of power for the loop. The maximum circuit impedance must not exceed 500 ohms. The range of output is extended to include 0 to 24mA that allows for readings outside 0 to fullscale to be detected.

The Voltage output can drive into loads down to 2,000 ohms. The voltage output can be used with negative as well as positive weights with 0V representing zero weight and 10V representing fullscale weight.

Shielded cable should be used for connecting the analog outputs to external devices.

With the Combo card, either voltage or current output must be selected. It is not possible to drive both simultaneously. Fine adjustment of the analog output is possible using the **CAL.LO** and **CAL.HI** options in the Analog menu. Refer to ANALOG (Analog Settings) page 66.

The following table shows the connections for the Multi card.

Pin No.	Function	Description	Connect To
1	OUT 1	Output 1	Load 1
9	OUT 2	Output 2	Load 2
3	OUTCOM	Output Common	Output Supply Negative
6	INCOM	Input Common	Input Supply Negative
14	IN 1	Remote Function 1	Contacts 1
4	V (+)	Voltage Output Positive	Minimum load 2000 ohms
5	I (+)	Current Loop Output	Maximum load 500 ohms
12	V(-)	Voltage Output Negative	
13	I (-)	Current Loop Return	
SHELL	CH.GND	Chassis Ground	Cable Shield

14.4.1. Fine Adjustment of Analog Outputs

The analog outputs from either the combo card or analog output card are factory calibrated and can be used directly as shipped. In some applications, however, it is necessary to fine-tune the output to achieve maximum performance.

The low (0V or 4mA) outputs and high outputs (10V or 20mA) are calibrated from the keypad. Refer to CAL.LO (Calibrate Zero Output) page 66 and CAL.HI (Calibrate Fullscale Output) page 66 for more information.

Calibrate the low output first followed by the high output. The FRC.AN1 item is used to force the output Lo and Hi as a final check. Refer to FRC.AN1 (Force Analog Output) page 67 for more information.

The fine adjustment procedure is carried out as follows:

- Use an external instrument to measure the analog output.
- Access the keypad setup menu.
- Press **<GRP>** repeatedly to display the **ANALOG** group.
- Press **<ITM>** repeatedly to display the **CAL.LO** or **CAL.HI** item.
- Press **<SEL>** to cycle through the options.
- When the desired option is displayed press **<OK>** to accept the setting and re-display the item name.

15. Appendix

15.1. Keypad and Viewer Settings (Availability)

The following table lists the settings available through the viewer and also the keypad for the **5230**. The settings are in order according to the Viewer. A dash (-) indicates the setting is not available.

Viewer			Keypad
Tab	**Section**	**Field**	**GROUP:ITEM**
Display Tab Settings Tab Build Tab			Instrument Display
	Build	Weighing Mode	BUILD:TYPE
		Decimal Point	BUILD:DP
		Weighing Units	BUILD:UNITS
		Synch Filter	BUILD:SYNC
		High Resolution (x10)	TEST:HI.RES
	Scale	Full Scale 1	BUILD:CAP1
		Resolution 1	BUILD:E1
		Full Scale 2	BUILD:CAP2
		Resolution 2	BUILD:E2
Settings Tab Option Tab	General	Usage	OPTION:USE
		Filtering	OPTION:FILTER
		Anti-Jitter	OPTION:JITTER
		Motion Detection	OPTION:MOTION
	Zeroing	Initial Zero	OPTION:INIT.Z
		Zero Tracking	OPTION:Z.TRAC
		Zero Range	OPTION:Z.RANGE
		Zero Band	OPTION:Z.BAND
Settings Tab Special Tab	Remote Key Settings	Remote 1	SPEC:FUNCTN:REM 1
		Remote 2	SPEC:FUNCTN:REM 2
		Remote 3	SPEC:FUNCTN:REM 3
		Remote 4	SPEC:FUNCTN:REM 4
	Display Settings	Backlight	SPEC:B.LIGHT
		Auxiliary Display	SPEC:AUX.DSP
	Security Settings	Allow Setting Targets	SPEC:PASSCD:OP.ACC (2^{ND} CHAR)
		Allow IDs to be Cleared	SPEC:PASSCD:OP.ACC (3^{RD} CHAR)
		Allow IDs to be Deleted	SPEC:PASSCD:OP.ACC (4^{TH} CHAR)
		Allow IDs to be Created	SPEC:PASSCD:OP.ACC (5^{TH} CHAR)
		Set Operator Passcode	SPEC:PASSCD:OPER.PC
		Set Safe Setup Passcode	SPEC:PASSCD:SAFE.PC
		Set Full Setup Passcode	SPEC:PASSCD:FULL.PC
Settings Tab Truck Tab	Operation Settings	Axle Weighing	TRUCK:OPER (1^{ST} CHAR)
		Prompt Print ID	TRUCK:OPER (2^{ND} CHAR)
		Multi-Axle	TRUCK:OPER (3^{RD} CHAR)
		Destinations	TRUCK:OPER (4^{TH} CHAR)
		Products	TRUCK:OPER (5^{TH} CHAR)
	Limits	Required Weight Disturbance	TRUCK:DSTURB
		Minimum Weigh Weight	TRUCK:TRK.MIN
	General	Preset Tare Expiry	TRUCK:TAR.EXP
		Unit Identifier	TRUCK:UNIT.ID
Settings Tab Serial 1 Tab		Serial 1 Operation	SER.P1:TYPE
	Auto Settings	Custom Auto Format	AUT.OPT:AUT.FMT

Viewer			Keypad
Tab	Section	Field	GROUP:ITEM
	for Serial 1	Type	AUT.OPT:AUT.TYP
		Source	AUT.OPT:SRC
		-	SER.P1:ADDRES
		-	SER.P1:BAUD
		-	SER.P1:BITS
Settings Tab Serial 2 Tab		Serial 2 Operation	SER.P2:TYPE
	Printer Settings	Type	SER.P2:PRN.OPT:PRN.TYP
		Space (Columns, 1st Rows, 2nd Rows)	SER.P2:PRN.OPT:SPACE
		Printer Header/Footer	SER.P2:PRN.OPT:HEADER (includes Footer)
		Header Format	SER.P2:PRN.OPT:HDR.FMT
		Footer Format	SER.P2:PRN.OPT:FTR.FMT
	Auto Settings for Serial 2	Custom Auto Format	SER.P2:AUT.OPT:AUT.FMT
		Type	SER.P2:AUT.OPT:AUT.TYP
		Source	SER.P2:AUT.OPT:SRC
		-	SER.P2:BAUD
		-	SER.P2:BITS
Settings Tab Setpoint Tabs	1, 2, 3 & 4	Setpoint Type	SET.PTS:SET.TYP
		Source	SET.PTS:SET.TYP:SETP 1: *SLOW* (1ST CHAR)
		Direction	SET.PTS:SET.TYP:SETP *ANY*:ACTIVE (2ND CHAR)
		Logic	SET.PTS:SET.TYP:SETP *ANY*:ACTIVE (3RD CHAR)
		Alarm	SET.PTS:SET.TYP:SETP *ANY*:*ANY* (4TH CHAR)
		Correction	SET.PTS:SET.TYP:SETP 1: *SLOW* (5TH CHAR)
		Target	<TARGET> Key
		In-flight	SET.PTS:IN.FLT
		Tolerance	SET.PTS:TOL
	General Options	Pause on Error	SET.PTS:GEN.OPT:OPTION (1ST CHAR)
		Delay Before Fill	SET.PTS:GEN.OPT:OPTION (2ND CHAR)
		One Feed Only	SET.PTS:GEN.OPT:OPTION (3RD CHAR)
		Tolerance Action	SET.PTS:GEN.OPT:TOL.ACT
	Delay Options	Finish Pulse	SET.PTS:DELAY:FIN.DLY
		Blockage Delay	SET.PTS:DELAY:BLOCK
		Clear All	-
	Jogging Options	Jog On Time	SET.PTS:JOG.ON
		Jog Off Time	SET.PTS:JOG:OFF
		Jogging Sets	SET.PTS:JOG.SET
Analog Settings (not available in Viewer)		-	ANALOG:TYPE
		-	ANALOG:CAL.LO
		-	ANALOG:CAL.HI
		-	ANALOG:FRC.AN1
Settings Tab Clock Tab	Time and Date Format	Time Format	CLOC:TME.FMT
		Time Separator	CLOC:TME.SEP
		Date Format	CLOC:DTE.FMT
		Date Separator	CLOC:DTE.SEP
	Quality Assurance	Enable QA Option	CLOC:QA.OPT
		Next QA Due Date	CLOC:QA.DATE
	Current Time and Date	Time	CLOC:TIME
		Get from PC	-

Viewer			Keypad
Tab	Section	Field	GROUP:ITEM
		Get from Unit	-
		Set Now	-
		Date	CLOC:DATE
		Get from PC	-
		Get from Unit	-
		Set Now	-
Calibration Tab	Calibration	Zero Calibration	CAL:ZERO
		Span Calibration	CAL:SPAN
		Span Weight	-
	Linearisation	Set	CAL:ED.LIN
		Clear	CAL:CLR.LIN
		Calibration Weight	-
	Direct mV/V Calibration	Zero	CAL:DIR.ZER
		Fullscale	CAL:DIR.SPN
		Calibrate	-
	Backup and Restore Calibration	Backup calibration	-
		Restore calibration	-
		-	CAL:FAC.CAL
Log Tab		Start	-
		Stop	-
Test Tab (not available in Keypad)		Send	-
		Clear	-
		Use STX, ETX	-
Test Group (not available in Viewer)		-	TEST:SCALE
		-	TEST:HI.RES
		-	TEST:FRC.OUT
		-	TEST:TST.INP
		-	TEST:O.LOAD
Manage IDs Settings Factry Settings		-	FACTRY:CLR.1ST
		IDs| Clear All IDs	FACTRY:CLR.IDS
		-	FACTRY:SEQ.ID
			FACTRY:DEFLT

15.2. Error Messages

A number of error messages may be displayed to warn of operation outside of the acceptable limits. These messages are described below. Short messages (XXXXX) will appear as a single message on the display. Longer messages (XXXXX)(YYYYY) will appear on the display in two parts, first the (XXXXX) part, then the (YYYYY) part.

15.2.1. Weighing Errors

These messages show status messages or errors that have occurred during the normal weighing operation.

Error	Description	Resolution
(U - - - - -)	The weight is below the minimum allowable weight reading.	Increase the weight or decrease the minimum allowable weight reading.
(O - - - - -)	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.
(ZERO)(ERROR)	The weight reading is beyond the limit set for Zero operation. The operation of the **<ZERO>** key is limited in the setup during installation. Zero cannot be performed at this weight.	Increase the Zero Range (Z.RANGE)
(STABLE)(ERROR)	Scale motion has prevented a **<FIRST>, <SECOND>** or **<PRINT>** operation from occurring on command.	Try the operation again once the scale is stable.
(PRINT) (ERROR)	A printer problem has prevented the printout from being completed.	Look for loss of printer power, no paper or cable fault.
(QA)(DUE)	The calibration due date has been set and the current date exceeds this limit.	Press any key to clear the warning for 1 hour. To clear the warning permanently, recalibrate the instrument and set a new QA due date. Refer to Quality Assurance: Next QA Due Date (QA.DATE) (dd/mm/yyyy) ⊗ page 90.

15.2.2. Setup Errors

These messages warn of setup entries that are not acceptable to the **5230** programme.

Error	Description	Resolution
(RES) (LO)	The scale build is configured for less than 100 graduations.	Check the resolution (count-by) and capacity settings.
(RES) (HIGH)	The scale build is configured for more than 100,000 graduations.	Check the resolution (count-by) and Capacity settings.

15.2.3. Calibration Errors

These messages warn of incorrect calibration technique or of attempts to calibrate the **5230** beyond it's specification.

Error	Description	Resolution
(ZERO) (HI)	The load cell output is beyond allowable zero calibration range.	Check for incorrect scale connection. Reduce the dead load, or shunt the load cells.
(ZERO) (LO)	The load cell output is below allowable zero calibration range.	Check for incorrect scale connection. Increase the dead load, or shunt the load cells.
(SPAN) (LO)	The load cell signal range (span) is too small for these settings.	Incorrect span weight entered. Scale wiring incorrect. Wrong load cell capacity (too large). Wrong or no calibration weight added to scale.
(SPAN) (HI)	The load cell signal range (span) is too large for these settings.	Incorrect span weight entered. Scale wiring incorrect. Load cell capacity too small for application.
(NO) (ZERO)	There is no valid zero calibration so the span calibration cannot proceed.	Perform a Zero calibration.

15.3. Diagnostic Errors

The **5230** 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. In the table below the following terms are used:

- Check = this item can be checked on site by service personnel
- Service = the **5230** must be returned for factory service

Error	Description	Resolution
(E 0001)	The power supply voltage is too low.	Check supply
(E 0002)	The power supply voltage is too high.	Check scale / cables
(E 0004)	The load cell excitation voltage is too low.	Check scale / supply
(E 0008)	The load cell excitation voltage is too high.	Check scale / supply
(E 0010)	The temperature is outside of allowable limits.	Check location
(E 0020)	Scale build is incorrect. The number of graduations has been set less than 100 or greater than 100000.	Fix up scale build
(E 0040)	The positive sense line is not connected.	Check connection
(E 0080)	The negative sense line is not connected.	Check connection
(E 00C0)	Neither sense line is connected	Check connection
(E 0100)	The digital setup information has been lost.	Re-enter setup
(E 0200)	The calibration information has been lost.	Re-calibrate

Error	Description	Resolution
(E 0300)	All setup information has been lost	Enter setup and calibrate
(E 0400)	The factory information has been lost.	Service
(E 0800)	The EEPROM memory storage chip has failed	Service
(E 2000)	The Clock calendar chip has failed.	Service
(E 4000)	The battery backed RAM has lost data.	Re-enter setup
(E 8000)	The EPROM memory storage chip has failed.	Service

The **E** type error messages are additive. For example if a condition is detected where the power supply voltage is low, resulting in a reduction of excitation voltage, the resulting Error messages will be **E 0005** (0001 + 0004). 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)

15.4. Glossary Terms

Term	Definition
Count-by	The smallest change in weight units that the display can show. See also Resolution.
Division	A single graduation.
DTR	Data Terminal Ready (an RS-232 flow control signal)
EEPROM	Electrically Erasable Programmable Read-Only Memory
EMC	Electromagnetic Compatibility Regulation
FIR	Finite Impulse Response
Fullscale	The maximum gross weight allowed on the scale. This is used to detect overload and underload conditions, etc.
Graduations	The maximum number of display steps between zero gross load and full capacity gross load. It is equal to the Fullscale divided by the resolution.
IEC	International Electrotechnical Commission
Min	A metrological term. In this instance Min equates to 20 divisions.
OIML	International Organization of Legal Metrolology
PLC	Programmable Logic Controller
Range	Total change in weight between zero gross load and full capacity gross load (ie. the nominated total capacity of the scale). It is always given in displayed weight units.
Resolution	The smallest change in weight units that the display can show. See also Count-by.
RFI	Radio Frequency Interference
RS-232, RS-485	Standard hardware layers for serial communications.
Step Response	The time between placing a weight on the scale and the correct stable weight reading being displayed
SYNC Frequency	The sampling frequency of the analog-to-digital converter. It is selectable at 25/30Hz on the **5230** and defines the FIR filter response.
Transients	A temporary voltage oscillation or spike caused by a sudden change of load (or other external influence).

Units	The actual units of measurement (kilograms, tonnes, pounds, etc.).
Viewer	**5230** Viewer - PC program for configuration and testing of the **5230**.

15.5. List of Figures

15.6. List of Tables

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Notes:

SMART WEIGHING SOLUTIONS