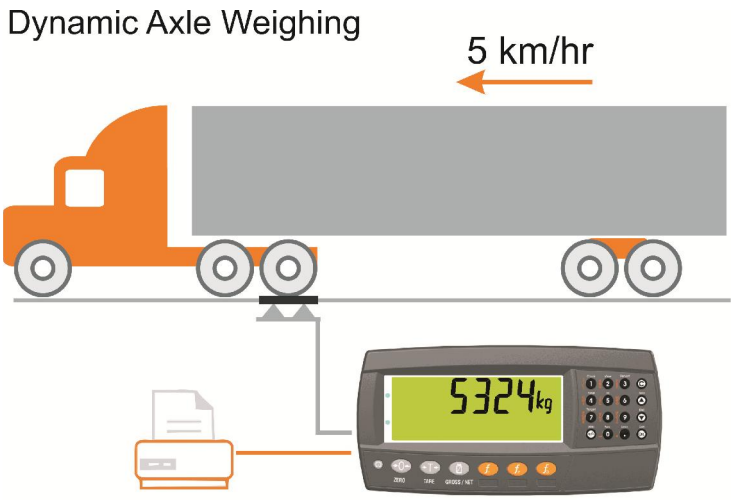
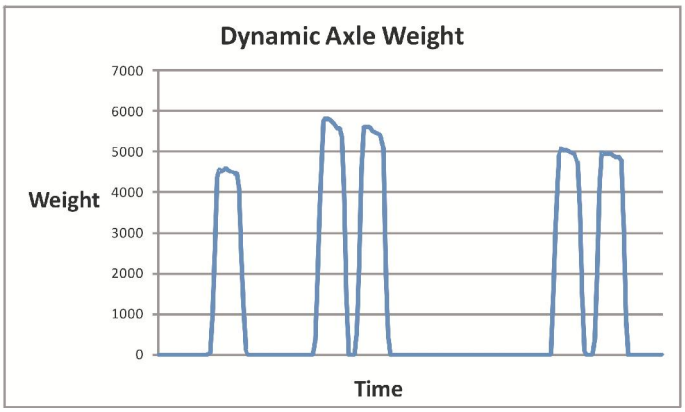
Application Note: R420 K422 Dynamic Axle Weigher

Application:





K422 is a dynamic axle weighing indicator, it retains the weigh in, weigh out or single pass weigh out with PT functionality from K404. For basic setup information please refer to the K404 reference manual.

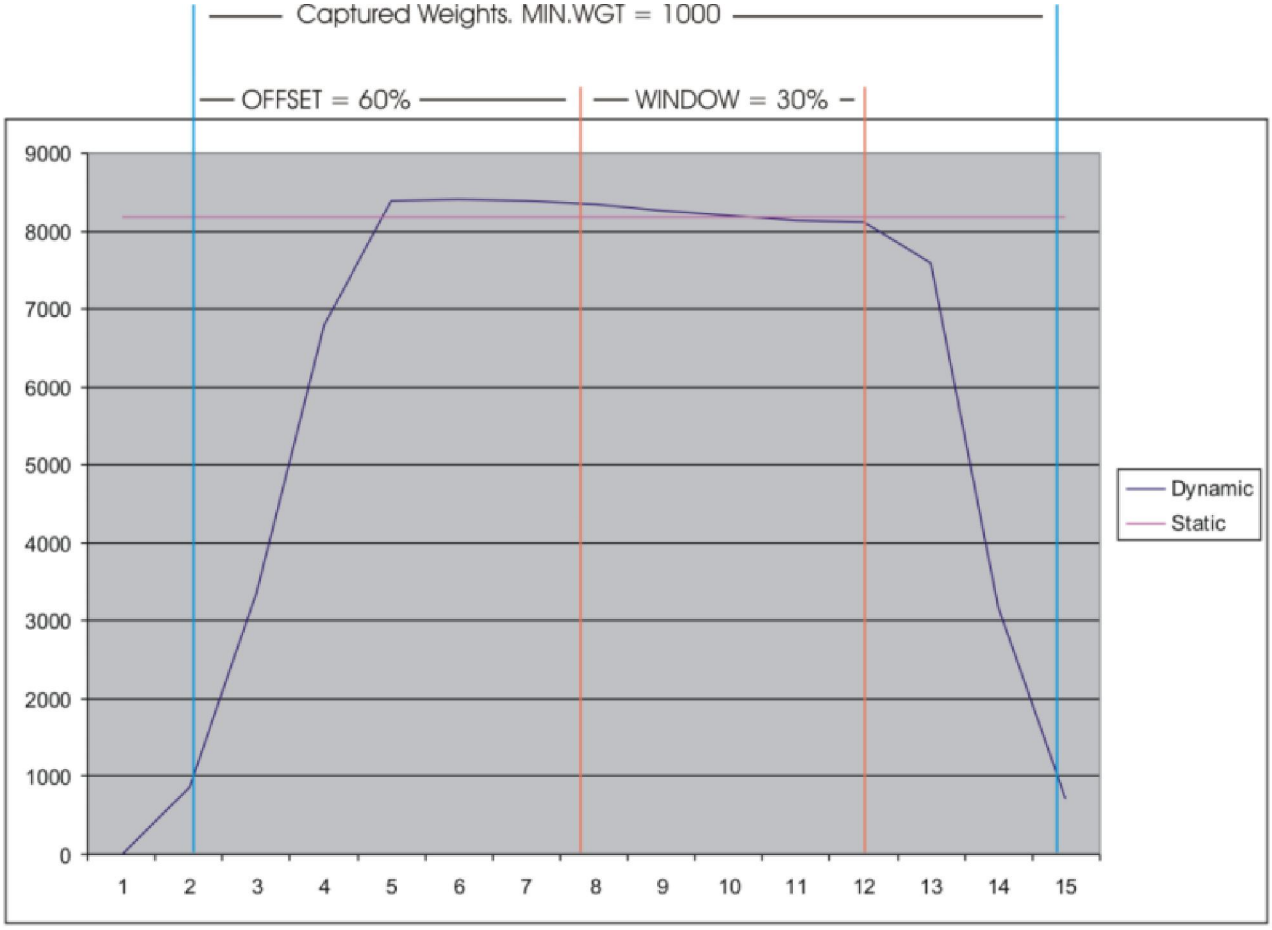
This application note will describe the features and settings not covered in the K404 reference manual.

Configuration:

FULL SETUP

- GEN.OPT
  - LANG — Czech language has been added
  - ID.NAME — NAME.4 and NAME.5 options added
  - STR.EDT — Default mode for string editor, options are AUTO, STRING and NUM
- FUNC
  - SF.n
    - TYPE — new option of MODE, toggles between the options of STATIC and DYNAMIC axle weighing modes
- SER.NET
  - NET.n
    - SOURCE — For barcode networks, options are NAME, B.CODE and ID
- PRINT
  - SPACE
    - W.OUT — If this is not 0 then the header will not be printed in weigh out mode, instead the set number of lines will be skipped. Options are 0 to 50
  - PRINT.n
    - CUSTOM
      - EV.AXLE — String to be printed for each axle
      - ABORT — String to be printed if weighing aborted
      - EV.GRP: — String to be printed for each axle group
- SETP
  - SETP.n
    - TYPE — BUZZER setpoint type added, it is active whenever the buzzer beeps
    - NAME — You can now name your setpoints
    - SOURCE — Extra source options of IO, STATUS, SETP and REG
    - REG — If source of REG is selected then you can set the register number here
- AXLE — New menu for axle weighing settings
  - MIN.WGT — The minimum axle weight
  - HYS — Hysteresis for axle weight
  - WINDOW — Window size to use
  - MIN.TIM — This sets the max speed supported
  - IDLE — How long to wait for next axle
  - OFFSET — Offset for window
  - ED — Count-by setting for dynamic weights
  - MODE — Weighing mode, options are STATIC and DYNAMIC
  - IN.STRT — input for start of axle, if not set then the min weight will be used instead
  - IN.END — input for end of axle, if not set the min weight (minus hysteresis) is used instead
  - GROUP — How long to wait for next axle in group, set to 0 for no groups
  - DYN.SCL — Scaling factor for dynamic weights
  - I.LOCK — Input for interlock, must be high for the entire truck
  - IL.TIME — If set it will limit the time the truck can take

Axle weighing settings:



The image above shows a dynamic capture of an axle and how the settings are applied.

The settings in the axle menu are described below:
MIN.WGT: (Minimum weight) If inputs are not used then the capturing will start when the weight goes above the minimum and continue until the weight drops below the minimum weight less the hysteresis amount.
HYS: (Hysteresis) This is the hysteresis amount mentioned in the MIN.WGT section above.
WINDOW: (Window size) This is the percentage of captured weights to use, shown in the image above.
MIN.TIM: (Minimum time) This is the minimum time that is acceptable for the weight capture, use this to set the maximum speed allowed.
IDLE: (Idle time) This is the maximum amount of time to wait for the next axle. Once this time is exceeded without seeing another axle the truck will be finished.
OFFSET: (Window offset) This is the window offset as shown in the image above.
ED: (Dynamic reading count-by) This is the count-by setting for dynamically captured axle weights
MODE: (Capture mode) This sets if the axles will be measured dynamically or statically.
IN.STRT: (Capture start input) If this input is set then capturing will start when the input goes high rather than by the weight.
IN.END: (end capture input) If this input is set then capturing will end when the input goes high rather than by the weight.
GROUP: (axle group time) If this is set then axle group sub-totals will calculated. This time sets how long to wait for an axle before the group is considered finished.

DYN.SCL: (dynamic reading scaling factor) This value allows you to scale the dynamically captured axle weights if they are consistently reading low (or high) compared to static weights.
I.LOCK: (truck weighing interlock) If set, this input must remain high throughout the entire truck capture. The truck will be finished as soon as the input goes low. If the input goes low during an axle capture then you will get an error.
IL.TIME: (truck weighing interlock time) If this is set then the complete truck weighing must be completed before the time set or you will get an error.

Axle weighing Errors

TOO FAST: The capture was shorter than the time set in MIN.TIM.
TOO SLOW: The capture took too long.
WEIGHT LOW: The captured axle weight was below the value set in MIN.WGT
WRONG WAY: Truck crossed the weigh bridge in the wrong direction (only when using start and end inputs).
ERROR ILOCK: The interlock went low during an axle capture or the interlock time was exceeded.
ERROR Exxxx: Axle weighing will be aborted if an application error occurs during the truck.
ERROR O.LOAD: Axle weighing will be aborted if the scale is overloaded during the truck.
ERROR U.LOAD: Axle weighing will be aborted if the scale is underloaded during the truck.

Setpoints:

Common Settings

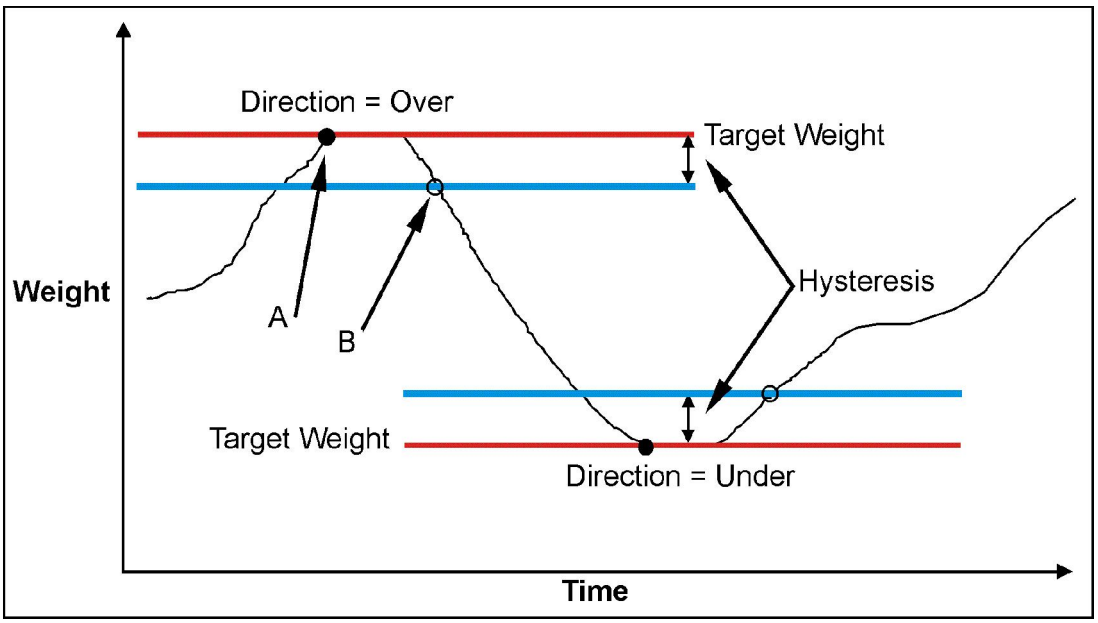
There are a number of settings that are common to all setpoint types. These are as follows:

- **OUTPUT**: Select which IO control point to use. Options are NONE, IO1..IO32. NONE is useful if the setpoint is only being used trigger an alarm.
- **LOGIC**: This setting determines whether the output is normally on or normally off. Logic HIGH means the output follows the activity of the setpoint and is on when the setpoint conditions are met. Logic LOW reverses the operation of the output.

  For example: Consider a Centre-of-Zero status setpoint. This type of setpoint is active when the Centre-of-Zero annunciator is lit. With logic HIGH an output would turn on whenever the Centre-of-Zero annunciator was lit. With logic LOW the output would turn off when the Centre-of-Zero annunciator is lit and remain on otherwise.

  Note that the outputs revert to the off state when the instrument SETUP menus are active.
- **ALARM**: Select what alarm response is triggered when the setpoint is active. SINGLE sounds a single beep every two seconds, DOUBLE sounds a double beep every two seconds and FLASH flashes the instrument display. Note that the Alarm conditions are not influenced by the LOGIC setting, i.e. they follow the activity of the setpoint regardless of the physical state of the output.
- **NAME**: Name the setpoint. This will be shown when editing targets for OVER or UNDER type setpoints.

Weigh in (OVER) Setpoints and Weigh Out (UNDER) Setpoints



LOGIC	Point A	Point B
HIGH	ON	OFF
LOW	OFF	ON

Additional Settings

In addition to the common settings the following settings control the operation of the OVER and UNDER setpoints

- **SOURCE**: Select the weight source for the setpoint to use.

  Options are:

  - GROSS uses gross weight only
  - NET uses net weight only
  - 'GR or NT' uses either gross or net depending on which is currently displayed.
  - ALT.GR uses alternate gross weight only
  - ALT.NET uses alternate net weight only
  - ALT.G or N uses either alternate gross of alternate net depending on which is currently displayed.
  - REG: uses a register value.

- **SCOPE**: GLOBAL means that the same targets are used for every product. PROD lets each product have its own target values for the setpoint.
- **Hysteresis (HYS)**: This setting determines the change in weight required for an active setpoint to become inactive again. A value of zero still leaves 0.5 graduations of hysteresis.
- **REG**: If the source is set to register (REG) then this setting is used to set the register to use. The register must be a number or weight value.

Status Based Setpoint Types

The following setpoint types are all based on the status of the instrument.

- **NONE**: Setpoint is always inactive.
- **ON**: Setpoint is always active. This type of setpoint is useful to show that the instrument is running.
- **Centre of Zero (COZ)**: Setpoint is active when COZ annunciator is lit.
- **ZERO**: Setpoint is active when the weight is within the Zero Band setting.
    - SOURCE: The ZERO setpoint also has a SOURCE setting to determine if the zero condition is based on the gross or net reading. The GR.or.NT option uses the currently selected weight (gross or net).
- **NET**: Setpoint is active when the NET annunciator is lit.
- **MOTION**: Setpoint is active when the MOTION annunciator is lit.
- **ERROR**: Setpoint is active when the instrument detects any error condition signified by the display of Exxxxx on the primary display.
- **BUZZER**: Setpoint is active when the buzzer beeps.

Logic Setpoint Types

The following setpoint types are all based on the status of the inputs and the mask.

- **AND (LGC.AND)**: Setpoint is active when all inputs in the mask are on.
- **OR (LGC.OR)**: Setpoint is active when any inputs in the mask are on.
- **XOR (LGC.XOR)**: Setpoint is active when only one input in the mask is on.

SOURCE: Select the source for the setpoint to use.

Options are:

- **IO** use the external IO
- **Status** use the instrument status
- **SETP** use the setpoint status
- **REG** use a register value

REG: If the source is set to register (REG) then this setting is used to set the register to use. The register must be a number or weight value. The decimal value of the register address should be used.

MASK: A 32 bit number that is use to match against the selected source. If the source is set to IO then IO1 is the least significant (first) bit and IO32 is the most significant (32^{nd}) bit. If the source is set to setpoint (SETP) then setpoint 1 is the least significant (first) bit and setpoint 8 is the eighth bit as shown in the second table below. The instrument status is broken down in the following table. This number should be entered as a decimal value.

Status info	Bit
Unused	Bits 30-32
Interlock error	29
Wrong direction error	28
Captured weight below min error	27
Motion error (static weighing mode)	26
Too slow error	25
Too fast error	24
No dynamic weighing error	23
Waiting state	22
Captured state	21
Sampling state	20
Idle state	19
Above min weight	18
Below min weight	17
No errors	16
Overload	15
Underload	14
Error	13
Preset tare not active	12
Preset tare active	11
High range	10
Low range	9
Stable	8
Motion	7
Not centre-of-zero	6
Centre-of-zero	5
Not Zero	4
Zero	3
Gross	2
Net	1

SETP info	Bit
Unused	Bits 17-32
Not setpoint 8	16
Not setpoint 7	15
Not setpoint 6	14
Not setpoint 5	13
Not setpoint 4	12
Not setpoint 3	11
Not setpoint 2	10
Not setpoint 1	9
Setpoint 8	8
Setpoint 7	7
Setpoint 6	6
Setpoint 5	5
Setpoint 4	4
Setpoint 3	3
Setpoint 2	2
Setpoint 1	1

DLY.ON: delay before setpoint becomes active.

HLD.OFF: delay before setpoint becomes inactive.

Scale Entry/Exit Setpoint Types

The following setpoint types are all based on the status of the indicator.

- **Scale Ready (SC.REDY)**: Setpoint is active when in the zero band and stable for longer than the time set in RDY.TIM.
- **Scale Exit (SC.EXIT)**: Setpoint is active when outside of the zero band and either a print has occurred or the scale exit (SC.EXIT) special function has been triggered.

Ready Time (RDY.TIM): Time in seconds that the scale must be stable in the zero band before the scale is ready.

Print tokens

Tokens

Tokens are special ASCII characters outside the normal printing range. These characters are used to specify where instrument data fields like 'Current Weight' are to be inserted into custom format strings.

Non-paged generic tokens

Code	Token
128 (80_H)	ASCII NULL (send an ASCII 00H character)
191 (BF_H)	Date
192 ($C0_H$)	Time (24H format)
193 ($C1_H$)	Newline
194 ($C2_H$)	Left spaces
195 ($C3_H$)	Top blank lines
196 ($C4_H$)	Bottom blank lines
197 ($C5_H$)	Unique consecutive print ID
198 ($C6_H$)	Header
199 ($C7_H$)	Footer
200 ($C8_H$)	Page end string
201 ($C9_H$)	User String Data 1
202 (CA_H)	User String Data 2
203 (CB_H)	User String Data 3
204 (CC_H)	User String Data 4
205 (CD_H)	User String Data 5
206 (CE_H)	User String Name 1
207 (CF_H)	User String Name 2
208 ($D0_H$)	User String Name 3
209 ($D1_H$)	User String Name 4
210 ($D2_H$)	User String Name 5
211 ($D3_H$)	Time (12H format)
212 ($D4_H$)	Weigh out lines
213 ($D5_H$)	Settable consecutive print ID
214 ($D6_H$)	Reset to 1 the settable consecutive print ID

Page tokens

As there is too much data to represent as individual tokens the tokens are divided up into pages. A page token is used to define the page for all subsequent tokens.

Code	Token
190 (BE_H)	Page 0: Current Weight
189 (BD_H)	Page 1: Held Weight
188 (BC_H)	Page 2: Held or Current Weight
187 (BB_H)	Page 3: Traceable Weight
186 (BA_H)	Page 4: Current Product
185 ($B9_H$)	Page 5: Session Total
184 ($B8_H$)	Page 6: Grand Total
183 ($B7_H$)	Page 7: Register Data
182 ($B6_H$)	Page 8: Miscellaneous weight data
180 ($B4_H$)	Page 10: Default print strings

Page 0, 1, 2, 3, 7 tokens: Weight Information

These pages hold weight information. The same codes are used for each page.

Code	Token	
215 ($D7_H$)	Displayed reading (gross or net)	
216 ($D8_H$)	Gross reading	
217 ($D9_H$)	Net reading	
218 (DA_H)	Piece reading	
219 (DB_H)	Alternative displayed reading (gross or net)	
220 (DC_H)	Alternative gross reading	
221 (DD_H)	Alternative net reading	
222 (DE_H)	mV/V value	
223 (DF_H)	Absolute gross peak reading	
224 ($E0_H$)	Preset tare value	
225 ($E1_H$)	Tare value (tare or preset tare)	
226 ($E2_H$)	Tare label (T or PT)	
227 ($E3_H$)	Unit ID	page 0 only
	Tracable weight date	Page 3 only
	Register Header	Page 7 only
228 ($E4_H$)	Ticket end	page 0 only
	Tracacble weight time	Page 3 only
	Register Footer	Page 7 only
229 ($E5_H$)	Status 0: **E**rror, **O**verload, **U**nderload, **M**otion, **N**et, **G**ross (Uses last weight sent)	page 0 only
230 ($E6_H$)	Status 1: **E**rror, **O**verload, **U**nderload, **N**et, **G**ross (Uses last weight sent)	page 0 only
231 ($E7_H$)	Status 2: **M**otion, ‘ ‘	page 0 only
232 ($E8_H$)	Status 3: Centre of **Z**ero, ‘ ‘	page 0 only
233 ($E9_H$)	Status 4: **-**, Range **1**, Range **2** (Uses last weight sent)	page 0 only
234 (EA_H)	Status 5: **C**, **M**otion, ‘ ‘	page 0 only
235 (EB_H)	Status 6: **_N__** Net, **_G__** Gross (Uses last weight sent)	page 0 only
236 (EC_H)	Status 7: **E**rror, **O**verload, **U**nderload, **M**otion, **N**et, **G**ross (Uses automatic transmission reading)	page 0 only
237 (ED_H)	Automatic transmit reading	page 0 only
238 (EE_H)	Automatic transmit start characters	page 0 only
239 (EF_H)	Automatic transmit end characters	page 0 only
240 ($F0_H$)	Weight units	page 0 only
241 ($F1_H$)	Displayed string (primary display)	page 0 only
242 ($F2_H$)	Displayed unit (primary display)	page 0 only
243 ($F3_H$)	Auto Transmit FMT.REG header	page 0 only
244 ($F4_H$)	Auto Transmit FMT.REG weight	page 0 only
245 ($F5_H$)	Auto Transmit FMT.REG status	page 0 only
246 ($F6_H$)	Auto Transmit FMT.REG footer	page 0 only
247 ($F7_H$)	Alternative Tare value	page 0 only
248 ($F8_H$)	Status 8: **O**verload, **U**nderload, **I**n range	page 0 only
249 ($F9_H$)	Status 9: **M**otion, **S**table	page 0 only
250 (FA_H)	Status 10: **OL** over/underload, **US** unstable, **ST** stable	page 0 only
251 (FB_H)	Status 11: **G**ross, **N**et	page 0 only
252 (FC_H)	IO status	page 0 only
253 (FD_H)	Setpoint status	page 0 only

Page 4, 5, 6 tokens: Product Information:

These pages hold product information where:

Code	Token
215 ($D7_H$)	Product name
216 ($D8_H$)	Barcode
217 ($D9_H$)	Total weight
218 (DA_H)	Total alternative weight
219 (DB_H)	Total pieces
220 (DC_H)	Number of adds
221 (DD_H)	Total docket weight
222 (DE_H)	Total docket alternative weight
223 (DF_H)	Total docket pieces
224 ($E0_H$)	Number of docket adds
225 ($E1_H$)	Preset tare
226 ($E2_H$)	Counting sample weight
227 ($E3_H$)	Counting sample pieces
228 ($E4_H$)	Counting piece weight
229 ($E5_H$)	Alternative weight conversion
233 ($E9_H$)	Last weight added
234 (EA_H)	Last alternative weight added
235 (EB_H)	Last pieces added
236 (EC_H)	Clear docket totals
237 (ED_H)	Reset last product add
238 (EE_H)	Clear totals on all products

Page 8 tokens: Miscellaneous weight data

These tokens hold weight/alternate weight information depending on which is being displayed.

Code		Token
215	($D7_H$)	Displayed reading (gross or net)
216	($D8_H$)	Gross reading
217	($D9_H$)	Net reading
218	(DA_H)	Tare value (tare or preset tare)
219	(DB_H)	Status 12: weight units: **K**g, **L**b, ‘ ‘
220	(DC_H)	Status 13: **G**ross, **N**et
221	(DD_H)	Status 14: **O**verload/underload, **M**otion, ‘ ‘
224	($E0_H$)	Status 15: **GS** (gross), **NT** (net) (uses last weight sent)
244	($F4_H$)	Status 18: **D**ynamic, **S**tatic
245	($F5_H$)	Group number
246	($F6_H$)	Group number of axles
247	($F7_H$)	Group total weight
248	($F8_H$)	Abort reason part A
249	($F9_H$)	Abort reason part B
250	(FA_H)	Status 16: **I**dle, **S**ampling, **C**aptured, **W**aiting
251	(FB_H)	Status 17: too **F**ast, too **S**low, **M**otion, weight **L**ow, wrong **D**irection, **I**nterlock, **A**pplication error, **O**verload, **U**nderload, ' '
252	(FC_H)	Dynamic gross reading with error
253	(FD_H)	Dynamic live reading
254	(FE_H)	Dynamic gross reading

Page 10 tokens: Default print strings:

These pages hold the default print strings, they are translated when the language is switched.

Code	Token
215 ($D7_H$)	Axles
216 ($D8_H$)	Axle
217 ($D9_H$)	Group
218 (DA_H)	Total
219 (DB_H)	Weigh in
220 (DC_H)	Weigh out
221 (DD_H)	Abort
222 (DE_H)	Seq
223 (DF_H)	Truck
224 ($E0_H$)	Net
225 ($E1_H$)	Gross
226 ($E2_H$)	Tare
227 ($E3_H$)	PT

Format tokens

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

Code	Format Tokens
149 (95_H)	5 character weight string, decrementing to 3 with wrapping (5,4,3,5…)
150 (96_H)	6 character weight string
151 (97_H)	7 character weight string
152 (98_H)	8 character weight string
153 (99_H)	9 character weight string
154 ($9A_H$)	10 character weight string
155 ($9B_H$)	No sign characters
156 ($9C_H$)	Sign is ‘ ‘ for positive and ‘-‘ for negative
157 ($9D_H$)	Sign is ‘0‘ for positive and ‘-‘ for negative
158 ($9E_H$)	Sign is ‘+‘ for positive and ‘-‘ for negative
159 ($9F_H$)	No decimal point
160 ($A0_H$)	Decimal point is ‘.’
161 ($A1_H$)	Decimal point is ‘,’
162 ($A2_H$)	Weight send without leading characters
163 ($A3_H$)	Weight sent with ‘ ‘ for leading characters
164 ($A4_H$)	Weight sent with ‘0‘ for leading characters
165 ($A5_H$)	Show weight on error
166 ($A6_H$)	Show dashes instead of weight on error
167 ($A7_H$)	Show spaces instead of weight on error
168 ($A8_H$)	Use uppercase status characters
169 ($A9_H$)	Use lowercase status characters
170 (AA_H)	Hide units
171 (AB_H)	Show decimal point even if it is at the end of a number
172 (AC_H)	Turn page and line tracking off
173 (AD_H)	Toggle space between weight and units
174 (AE_H)	Increment the length or print IDs with wrapping from 6 to 9
175 (AF_H)	Don’t show weight
176 ($B0_H$)	Include truck with first weight (for reports)
177 ($B1_H$)	Place sign adjacent to the weight
178 ($B2_H$)	Reverse direction of the weight string

Printouts have default format tokens of line and page tracking are enabled and:

Weight	Time
• 8 character weight string • Decimal point symbol is ‘.’ • Leading characters are spaces • Weight is sent on error • Positive sign is space, negative sign is ‘-‘ • Weights are displayed with units	• Status characters are uppercase • Date separator is ‘/’ • Time separator is ‘:’ • Date format is the format configured in the setup menu • Time is 24 hour

The Format token must be used before the token that requires the formatting. For example where the current weight is 10kg and a formatted with no units is needed:

`\BE\AA\D7` would be `10`

Whereas if the AA is used after the D7 it has no effect.

`\BE\D7\AA` would be `10kg`

Comms Registers

Register addresses shown in both Hex ($_H$) and decimal ($_d$)

Name	Address	Type	Description
Software Model	0003_H 3_d	String	Returns software loaded (eg K402)
Software Version	0004_H 4_d	String	Returns software version (eg V1.0)
Serial Number	0005_H 5_d	Number	Returns instrument serial number
Key buffer entry	0008_H 8_d	Number	Adds a key to the key buffer. The short press key codes are shown below. For long presses, set the most significant bit to 1. Key codes are: 00_H: 0 : 09_H: 9 $0A_H$: Power $0B_H$: Zero $0C_H$: Tare $0D_H$: G/N $0E_H$: F1 $0F_H$: F2 10_H: F3 11_H: +/- 12_H: DP 13_H: CANCEL 14_H: UP 15_H: DOWN 16_H: OK 17_H: SETUP 20_H: IO1 : $3F_H$: IO32
Secondary Display Left	$000E_H$ 14_d	String	Write to this register to display data on left side of Secondary Display. Note: The display must be in Top mode.
Secondary Display Right	$000F_H$ 15_d	String	Write to this register to display data on left side of Secondary Display. Note: The display must be in Top mode.
Save Settings	0010_H 16_d	Execute	Execute function with no parameters saves any FULL or SAFE setup changes. Operator changes are saved automatically
Enter Full Passcode	0019_H 25_d	Number	Write a Passcode to this register to unlock settings protected by a FULL Passcode If a full passcode has been set, this must be done before any registers (which require a full passcode) are accessed. Example: Sent (passcode 1):20120019; Response: 81120019:0000
Enter Safe Passcode	$001A_H$ 26_d	Number	Write a Passcode to this register to unlock settings protected by a SAFE Passcode
ADC Sample Number	0020_H 32_d	Number	Read current sample number since last power on. (32 bit)
System Status *	0021_H 33_d	Number	This register can be read to obtain the status of the instrument. 32 status bits sent as 8 hex chars, where: 00020000_H: Overload 00010000_H: Underload 00008000_H: Error (see System Error) 00004000_H: SETUP menus active 00002000_H: Calibration in progress 00001000_H: Motion 00000800_H: Centre of Zero

Name	Address	Type	Description
			00000400_H: Zero 00000200_H: Net For calibration, bit 13 (00002000_H) is high when a calibration is taking place. Example: Send (status):20110021; Response (not calibrating): 81110021:00008400 Or Response (calibrating): 81110021:0000A400
System Error	0022_H 34_d	Number	Diagnostic Errors
Absolute mV/V	0023_H 35_d	Number	Absolute mV/V reading where 10000 = 1.0mV/V
Unused	0024_H 36_d	Number	
Gross/Net Weight	0025_H 37_d	Number	These registers return weight data. Read Final: 8 character Hexadecimal number. Example: 00000064 for 100 kg Read Literal: Formatted string including decimal point units and Gross/Net indication. Example: “ 10.0 kg N”
Gross Weight	0026_H 38_d	Number	
Net Weight	0027_H 39_d	Number	
Tare Weight	0028_H 40_d	Number	
Peak Hold	0029_H 41_d	Number	
Manual Hold	$002A_H$ 42_d	Number	
Grand Total	$002B_H$ 43_d	Number	
Alternate Units Gross	$002C_H$ 44_d	Number	
Raw ADC counts	$002D_H$ 45_d	Number	2,560,000 = 1.0mV/V
Alternate Units Net	$002E_H$ 46_d	Number	as above
System Fullscale	$002F_H$ 47_d	Number	Fullscale weight of the instrument.
Traceable weight available flag	0030_H 48_d	Number	0: No traceable weights since start up 1: Traceable weight data is valid
Traceable ID	0031_H 49_d	Number	The unique ID for the traceable weight.
Traceable weight	0032_H 50_d	Number	Traceable weight in primary units
Traceable weight (alt)	0033_H 51_d	Number	Traceable weight in alternate units
Traceable weight (p)	0034_H 52_d	Number	Traceable weight in pieces
Traceable tare weight	0035_H 53_d	Number	Tare weight valid during traceable weight.
Traceable PT flag	0036_H 54_d	Number	0: no preset tare 1: preset tare

Name	Address	Type	Description
Traceable date: year	0037_H 55_d	Number	Date and time that the traceable was acquired.
Traceable date: month	0038_H 56_d	Number	
Traceable date: day	0039_H 57_d	Number	
Traceable date: hour	$003A_H$ 58_d	Number	
Traceable date: minute	$003B_H$ 59_d	Number	
Traceable date: second	$003C_H$ 60_d	Number	
Stream Data	0040_H 64_d	Block	Returns a block of data which is selected in Stream Register 1 .. 5. Use a read command to read a single set of data. Use an execute command (with a parameter of 1) to switch on automatic transmission
Stream Mode	0041_H 65_d	Option	0: Manual - read 'Stream Data' register 1: Auto sync - Data is sent whenever new readings are available. 2: Auto 10Hz – Data is sent at 10Hz 3: Auto 3Hz – Data is sent at 3Hz 4: Auto 1Hz – Data is sent at 1Hz
Stream Register 1..5	0042_H 66_d .. 0046_H 70_d	Option	1..16 selects registers from ADC Sample (0020_H) to System Fullscale ($002F_H$). 17 is IO Status (0051_H)
Print Token String	$004C_H$ 76_d	String	Sends a string to the configured printer port. The string can contain print tokens.
Reply Token String	$004D_H$ 77_d	String	Same as $004C_H$ except that the completed string is returned to the sender.
Reply registers	$004E_H$ 78_d	String	Get the value of multiple number registers in a single read. The register IDs are listed in hexadecimal. All numbers are returned as 32 bit. Example: To get the net and tare weights, send "2012004E:00270028;".
Reply Stream ID	$004F_H$ 79_d		Same as register $004E_H$ except that stream IDs are used. Example: To get the first 3 items of stream data, send "2012004F:010203;".
IO Status	0051_H 81_d	Number	32 bits of IO status sent as 8 hex chars
Piece Weight	0053_H 83_d	Number	The current weight in pieces
Settable Consecutive Print ID	$007A_H$ 122_d	Number	The settable consecutive print ID.

Name	Address	Type	Description
User ID strings 1 .. 5	0090_H 144_d .. 0094_H 148_d	String	These strings are also accessed via the ID function on the keypad.
The following registers relate to calibration (marked with *).			
Calibration weight *	0100_H 256_d	Number	This register is used to set the calibration weight for span and linearity calibrations. Weights are sent in decimal or hexadecimal (depending on command used). They must be in displayed weight without decimal point or units. Example: • 10.00kg → 1000 → 3E8H • 1000kg → 1000 → 3E8H • 0.1000t → 1000 → 3E8H Example: Sent (10.00kg): 20120100:3E8 Response(ok): 81120100:0000
Zero calibration *	0102_H 258_d	Execute	This register is used to perform a zero calibration in the same way as the zero calibration via the menus. The display will change to indicate that a zero calibration is taking place. Example: Sent (calibrate): 20100102 Response (ok): 81110102:00000000 Send (status?): 20110021 Response (calibrating): 81110021:0000A400 Send (status?): 20110021 Response (calibrating): 81110021:0000A400 Send (status?): 20110021 Response (not calibrating): 81110021:00008400
Span calibration *	0103_H 259_d	Execute	This register is used to perform a span calibration in the same way as the span calibration via the menus. The display will change to indicate that a span calibration is taking place. The calibration weight must be entered before a span is executed using register 0100H. Example: Sent (1000kg cal weight): 20120100:3E8 Response(ok): 81120100:0000 Sent (calibrate): 20100103 Response (ok): 81110103:00000000 Send (status?): 20110021 Response (calibrating): 81110021:0000A400 Send (status?): 20110021 Response (calibrating): 81110021:0000A400 Send (status?): 20110021 Response (not calibrating): 81110021:00008400
Linearity calibration *	0104_H 260_d	Execute	This register is used to perform linearity compensation. Up to 10 linearity points can be used [numbered 0 .. 9]. The calibration weight must be entered, using register 0100H, before doing a linearity calibration.

Name	Address	Type	Description
			The display will change to show that a linearisation is taking place. The linearisation point number is sent as a parameter [numbered 0 .. 9]. Example: Sent (5000kg cal weight): 20120100:1388 Response(ok): 81120100:0000 Sent (calibrate 1st point): 20100104:0 Response (ok): 81100103:00000000 Send (status?): 20110021 Response (calibrating): 81110021:0000A400 Send (status?): 20110021 Response (calibrating): 81110021:0000A400 Send (status?): 20110021 Response (not calibrating): 81110021:00008400
Clear Linearity *	0105_H 261_d	Execute	This register clears a previously entered linearisation calibration. There are 10 linearisation points [numbered 0 .. 9] which can be cleared separately. The linearisation point to clear is sent as a parameter. Example: Sent (Clear 1st point): 20100105:0 Response (ok): 81100105:00000000
Direct zero calibration*	0106_H 262_d	Execute	This register is used to perform a direct zero calibration in the same way as the direct zero calibration via the menus. A direct zero calibration is very fast and the display may not change in the same way as a zero calibration. The mV/V value is sent as a parameter. It is sent as mV/V x 10000. Example: • 0.5mV/V → 5000 → 1388H • 1.0mV/V → 10000 → 2710H • 2.5mV/V → 25000 → 61A8H Example: Sent (0.5mV/V): 20100106:1388 Response(ok): 81100106:00000000
Direct span calibration*	0107_H 263_d	Execute	This register is used to perform a direct span calibration in the same way as the direct span calibration via the menus. A direct span calibration is very fast and the display may not change in the same way as a span calibration. The mV/V value OF FULLSCALE is sent as a parameter. It is sent as mV/V x 10000. E.g: • 0.5mV/V → 5000 → 1388H • 1.0mV/V → 10000 → 2710H • 2.5mV/V → 25000 → 61A8H Example use: Sent (1.0mV/V): 20100107:2710 Response(ok): 81100106:00000000
Current Time/Date	0150_H 336_d	String	Read this register to get instrument date/time settings (eg 10/12/2005 18:30:10). (Can be SAFE Passcode protected)
Date Format	0151_H	Option	Write 0 for MMDDYYY or 1 for DDMMYYYY

Name	Address	Type	Description
	337_d		
Day	0152_H 338_d	Number	Read/Write current day (1..31)
Month	0153_H 339_d	Number	Read/Write current month(1..12)
Year	0154_H 340_d	Number	Read/Write current year (2000..2099)
Hour	0155_H 341_d	Number	Read/Write current hour (0..23)
Minute	0156_H 342_d	Number	Read/Write current minute (0..59)
Second	0157_H 343_d	Number	Read/Write current second (0..59)
Session Total Weight	0210_H 528_d	Number	Session total information
Session Total Alt Wgt	0211_H 529_d		
Session Total Pieces	0212_H 530_d		
Session Total Num	0213_H 531_d		
Grand Total Weight	0220_H 544_d	Number	Grand total information
Grand Total Alt Wgt	0221_H 545_d		
Grand Total Pieces	0222_H 546_d		
Grand Total Num	0223_H 547_d		
The following registers relate to the DSD.			
Auto clear DSD	8290_H 33424_d	Option	Auto write over oldest records when full (0..1)
Read DSD Record	8291_H 33425_d	Execute	Reads requested DSD record
Read Next DSD Record	8292_H 33426_d	Execute	Reads next DSD record
Read Prev. DSD Record	8293_H 33427_d	Execute	Reads Previous DSD record
Read Oldest Record	8294_H 33428_d	Execute	Reads Oldest DSD record
Read Newest Record	8295_H 33429_d	Execute	Reads Newest DSD record
Clear DSD	8296_H 33430_d	Execute	Clears all records on DSD
The following registers contain information for axle weighing			
Last axle weight	$A70B_H$ 42763_d	Number	Last axle weight captured
Max axle weight	$A70C_H$ 42764_d	Number	Highest axle weight in a truck
Last truck weight	$A70D_H$ 42765_d	Number	Last truck weighed
Dynamic error	$A70E_H$	Number	Dynamic weighing error

Name	Address	Type	Description
	42766_d		
Dynamic state	$A70F_H$ 42767_d	Number	Dynamic weighing state
Last group weight	$A711_H$ 42769_d	Number	Last group total weight captured
Max group weight	$A712_H$ 42770_d	Number	Highest group total in a truck
The Active Product is the product shown on the instrument display. It is the product which is currently active in the instrument.			
Change Active Product using Product number	$B000_H$ 45056_d	Number	Write number to change the active product. Read to find out active product number.
Clear all Totals	$B002_H$ 45058_d	Execute	Execute to clear All Totals
Clear Session Totals	$B003_H$ 45059_d	Execute	Execute to clear Session Totals only
Clear Docket Totals	$B004_H$ 45060_d	Execute	Execute to clear printing Docket Totals only
Delete all products	$B005_H$ 45061_d	Execute	Execute to delete all of the products
Change Active Product using Product Name	$B006_H$ 45062_d	String	Write name to change the active product. Read to find out name of active product.
All changes to product information are made to the selected product. This product is selected via the comms and is used for network commands only. It may be different to the active product in the instrument.			
Select product by name	$B00F_H$ 45071_d	String	Write name to select product, read to find out selected product name.
Select product by number	$B010_H$ 45072_d	Number	Write number to select product, read to find out selected product number.
The following registers all work with the Selected Product.			
Delete	$B011_H$ 45073_d	Execute	Execute with no parameters to delete the selected product. This can be done only if the product total is zero.
Re-name	$B012_H$ 45074_d	String	Write to change name of selected product.
Name	$B013_H$ 45075_d	String	Read selected product name.
Preset Tare	$B015_H$ 45077_d	Number	Read/Write Preset Tare
Sample Size	$B016_H$ 45078_d	Number	Read/Write Sample Size
Sample Weight	$B017_H$ 45079_d	Number	Read/Write Sample Weight
Piece Weight	$B018_H$ 45080_d	Number	Read/Write Piece Weight
Alternate Unit Conversion Factor	$B019_H$ 45081_d	Number	Read/Write Conversion Factor. 1000000 = 1.0
Target 1 .. Target 8	$B080_H$ 45184_d .. $B087_H$ 45191_d	Number	Setpoint targets for the Selected Product
Total Weight	$B102_H$	Number	Product total information

Name	Address	Type	Description
Total Alternate Wgt Total Pieces Total Num	45314_d .. $B105_H$ 45317_d		
Total Docket Weight Total Docket Alt Wgt Total Docket Pieces Total Docket Num	$B180_H$ 45440_d .. $B183_H$ 45443_d	Number	Product docket total information

Note: The viewer software will show the register address for each setting in the menu structure when they are accessed. Note that register addresses are not guaranteed to remain the same between software types and versions.