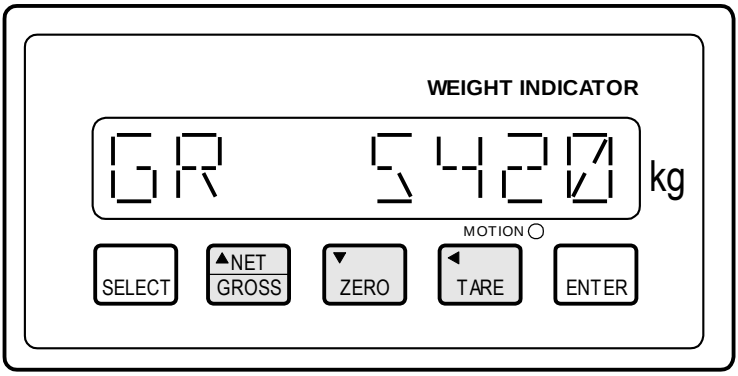
PR430S2 WEIGHT INDICATOR



This document applies to software version 3.3.x

CONTENTS

1 Overview

1.1 Description

The PR430S2 is a micro-processor based amplifier/indicator housed in a standard panel mounting DIN case. It features a sealed tactile push-button panel with an 8 character LED display.

The unit connects with 1-4 standard 350 ohm strain gauge load cells to which it supplies 10VDC excitation. It amplifies and conditions the resultant signal to produce a gross weight value to 16 bit resolution (1 part in 65,536) with negligible drift. The relatively high input resolution enables large standing weights to be accommodated without loss of output resolution.

NET and TARE push-buttons cater for manual (hand-add) applications, including cumulative weighing. Having completed one weighment, operating TARE zeros the NET display ready for a further weighment.

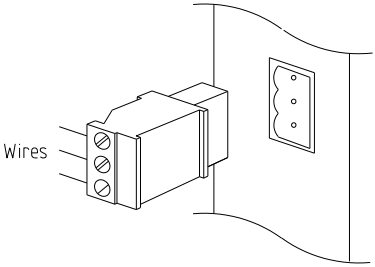
A configurable RS232/RS485 serial link is provided. This allows communications with a host PC or PLC, or continuous transmission of the weight signal to a remote display.

This unit is factory calibrated to have a precise internal input range (PG setting 7 only) so that it may be replaced without the need for vessel emptying or re-calibration.

An internal self-calibration feature effectively removes error due to temperature drift or other causes by reducing them to less than 5ppm/°C.

Being a micro-processor based product the PR430S2 operates from configuration and calibration settings stored in non-volatile memory i.e. protected against loss indefinitely. The configuration and calibration data is entered and adjusted through the front panel. Similarly the weigh scale is calibrated in a single operation, by loading a known weight and by entering its value through the front panel or by entering precise load cell sensitivity and capacity figures.

All connections to the PR430S2 are made by means of pluggable screw terminal blocks.



1.2 Dual Output Trip Levels

Dual trip output relays are available. These present N/O (Normally Open) contacts which open or close depending on the Sense settings (ref S1, S2) when the gross weight goes above the Trip Levels (T1 and T2) and change back when it falls below the Trip Levels minus the Dead Bands (T1-D1 and T2-D2).

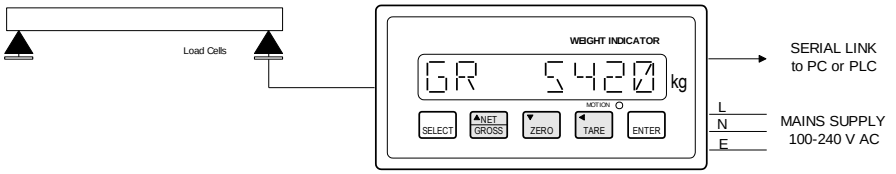
1.3 Model Versions

PR430S2 Indicator Amplifier with Serial Interface and Dual Trips

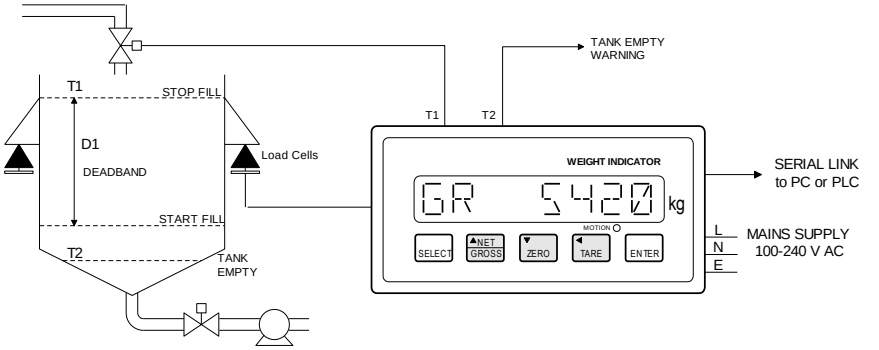
DC powered versions have a suffix 'D', e.g. PR430S2D

An optional IP65 transparent front cover is available by adding suffix '/TC' to model number, e.g. PR430S2/TC.

1.4 Weigh Scale Application

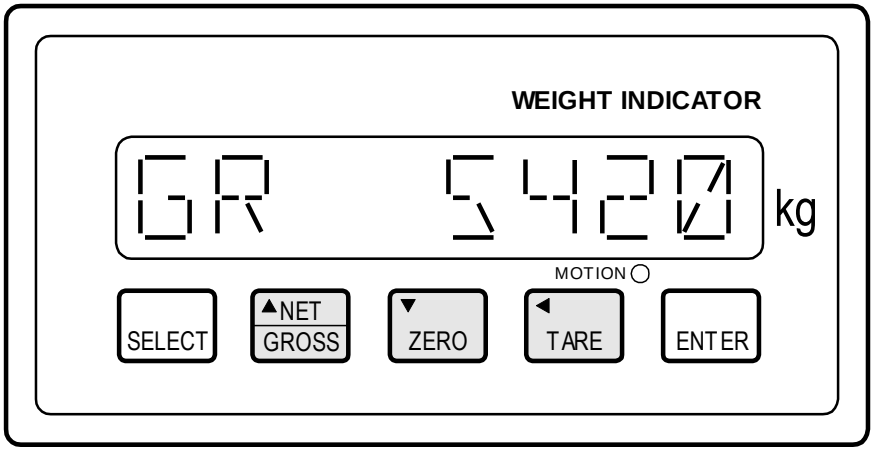


1.5 Process Vessel Application



2 Operation

2.1 Front Panel



The PR430S2 display shows both the parameter type and its value.

The working display lines are listed below:

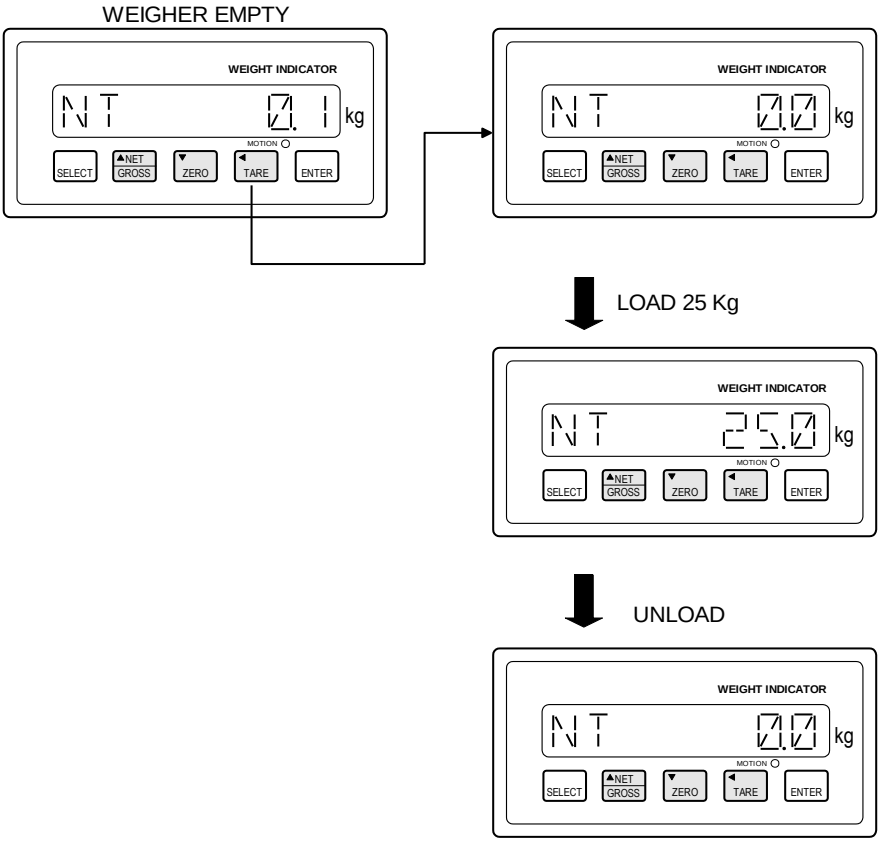
GR xxxxx	Gross Weight
NT xxxxx	Net Weight
PASS xxx	Pass Entry to modify settings

The three centre push-buttons: NET/GROSS, ZERO and TARE control the NT (Net) and GR (Gross) readouts, as shown below:

NET/GROSS	Toggles the display from Net to Gross.
ZERO	Zeroes the Gross if within ±2% of the calibrated zero.
TARE	Tares the Net.

Motion LED
The Motion LED is illuminated whenever the weight display changes by more than two adjacent values within a 5 second period.

2.2 Single Weighments



2.3 Data Entry

To enable stored parameters to be entered and modified, the NET/GROSS, ZERO and TARE keys operate as Raise, Lower and Digit Select keys whenever the display is in the data entry mode, as identified by part or all of the displayed value flashing on/off. To edit a parameter value use one of the following data entry methods depending upon the type of data item you wish to edit. If the value entered is out of range it will be limited accordingly.

2.3.1 Numeric

- Having selected the parameter to be edited, see sec 2.4, operate the ENTER key. The first digit of the parameter data flashes on/off.
- Operate the Raise and Lower keys, either by momentary operation or by holding down the key for more rapid adjustment, until the required setting is obtained. Alternatively, use the Digit Select key to select the digit to be modified and then use the Raise and Lower keys to modify the individual digits until the required value is obtained.
- Operate the ENTER key again, the parameter data will now stop flashing and data entry is complete.

2.3.2 List of Options

Some parameters will have a list of possible options available e.g. YES/NO, the data entry method for these is as follows.

- Having selected the parameter to be edited, see sec 2.4, operate the ENTER key. The parameter data text flashes on/off.
- Operate the Raise and Lower keys to cycle through the list of options and select the required item.
- Operate the ENTER key again, the parameter data text will now stop flashing and data entry is complete.

2.4 Access to Passcode Protected Data

The following data areas are passcode protected.

- Configuration Data
- Calibration Data

The factory default passcodes for these data areas are 1 and 2 respectively. These default passcodes can be changed by the user for additional security.

To gain access to any passcode protected data areas from the working displays operate the SELECT push-button until the indicator shows “PASS 0”. Now enter the required passcode using the numeric data entry method, see section 2.3.1. If the correct passcode was entered the first item of that data area will be displayed.

Use the SELECT push-button to cycle through the list of parameters within the data area.

To exit the data area operate the ENTER push-button at the last parameter i.e. at “EXIT”.

2.4.1 Lost Passcodes: Restore Factory Settings

In the event of the passcodes being lost the original factory default setting of 1 and 2 can be reloaded by holding down the SELECT and ENTER push-buttons for approximately 30 seconds (operate ENTER first). After this time the display changes to read PASS. The passcodes will then have been restored to the values of 1 and 2.

3 Configuration Data (Passcode 1)

The following configuration data is passcode protected. To gain access to this data a valid passcode must be entered, refer to section 2.4 for further details.

Parameter	Range	Definition	Factory Setting
WI	YES/NO	**Weighing In** Determines whether the Net weight increases or decreases as the Gross weight increases. YES – Net increases as Gross increases. NO – Net Decreases as Gross increases.	YES
WK	FREE/ LOCK	**Weigh Keys** Free or locked. When set to LOCK the NET/GROSS, ZERO and TARE buttons are disabled.	FREE
T1	0-99999	**Trip 1 Level** – Kgs The gross weight level at which T1 will switch state, as the gross weight is rising. (Disables T1 when set to 0).	0
D1	0-99999	**Deadband 1** – Kgs The gross weight, below Trip 1 Level, at which T1 will switch state, as the gross weight is falling.	0
S1	0-1	**Sense 1** Determines Trip 1 sense. 0 = OFF above the Trip 1 Level setting 1 = ON above the Trip 1 Level setting	0
T2	0-99999	**Trip 2 Level** – Kgs The gross weight level at which T2 will switch state, as the gross weight is rising. (Disables T2 when set to 0).	0
D2	0-99999	**Deadband 2** – Kgs The gross weight, below Trip 2 Level, at which T2 will switch state, as the gross weight is falling.	0

Parameter	Range	Definition	Factory Setting
S2	0-1	**Sense 2** Determines Trip 2 sense. 0 = OFF above the Trip 2 Level setting 1 = ON above the Trip 2 Level setting	0
BR	1200-19200	**Baud Rate** - bps Serial data transmission speed.	9600
CS	485/232	**Communication Standard** Determines the serial link communication standard i.e. RS485/RS422 or RS232.	485
SM	SABUS / TRANS / ASCII / RTU	**Serial Mode** This allows the serial link to be configured for communication to a PLC/PC (SABUS, ModbusASCII or ModbusRTU) or to periodically transmit the current gross or net weight (TRANS). Refer to section 5 for further details.	SABUS

Parity parameter: shown only when Serial Mode = ASCII or RTU.

Parameter	Range	Definition	Factory Setting
PAR	NONE / EVEN / ODD	**Parity** Sets the serial data parity mode. This only applies to ModbusASCII or ModbusRTU serial modes.	NONE

Address parameter: shown only when Serial Mode = SABUS and Communication Standard = 485, or when Serial Mode = ASCII or RTU.

Parameter	Range	Definition	Factory Setting
ADDR	0-99	**Address** Sets the units address code number.	0

Periodic transmit parameters: shown only when Serial Mode = TRANS

Parameter	Range	Definition	Factory Setting
TX	GR/NT	**Transmit Data Item** Determines which data item will be periodically transmitted via the serial link, when Serial Mode is set to TRANS. The options are: Gross (GR) or Net (NT).	GR
IT	0.1-60.0	**Transmission Interval** - Seconds The time between data transmissions when Serial Mode is set to TRANS.	1.0

Parameter	Range	Definition	Factory Setting
PSET	0-999	**Passcode Set** This determines the passcode for access to the configuration parameters.	1
EXIT		**EXIT** Operate ENTER to return to working displays. Operate SELECT to cycle around to WI again.	

4 Calibration (Passcode 2)

4.1 Calibration Method

Calibration can be achieved in one of two ways:

a) By the normal method of physical loading of the weigher with calibrated weights

Or

b) by entry of the precise sensitivity and capacity figures from the load cells.

The latter method is only recommended when a matched set of high accuracy load cells is used and physical loading is impractical.

The parameter CM (Calibration Method) is used to select one of the two methods defined above.

To re-calibrate an existing installation go to 4.2 below.

To select the weigher range and the scaling factors, prior to calibrating a new installation, go to 4.2.3 below and then to 4.2 below.

4.2 Calibration Procedure

Before attempting to accurately calibrate a weigher first establish:

a) that the weigher is repeatable, both up and down the scale i.e. that it operates freely.

b) that in the case of multiple load cell installations the load cells are correctly rationalised i.e. that they produce the same weight reading to the same weight applied. To do this place a weight in different positions so that each position loads a particular load cell more than the others and verify that each position produces the same reading.

Each unit has a precise internal input range, factory set to 0 - 200,000 for 2mV/V input on the 0 - 20mV range (PG = 7). This provides for replacement of a unit without the need for re-calibration and for calibration without physical loading of weight.

NOTE
To calibrate a new installation go to 4.2.3 below to set the sealing constants before proceeding with calibration.

4.2.1 Calibration with Weights

NOTE: Set scaling constants before proceeding.

Parameter	Range	Definition
CM	WTS / CALC	**Calibration Method** Determines whether calibration is to be achieved by application of weights (WTS) or by calculations based upon precise load cell characteristics (CALC).
ZR		**Zero** - Kgs The display shows the 'live' gross weight. To register the empty weight and thereby establish the gross zero, operate the Enter, at which point the weight will flash, then operate the Down-arrow (display goes to Zero) followed by ENTER again to steady the display.
Z	0-200000	**Zero Coefficient** This shows the value registered in ZR above and can be entered into a replacement unit without the need to empty the weigher.
CA	0-99999	**Calibration** - Kgs The indicator shows the "live" gross weight. It may be modified by entering a different weight value. The calibration procedure is: Load a known test weight. Enter the test weight in Kgs by operating ENTER and using the Raise, Lower and SELECT keys followed by ENTER again to steady the display and to establish the calibration.
G	0-999999	**Gain Coefficient** This shows the value registered in CA above and can be entered into a replacement unit without the need to recalibrate.
CC	0-99999	**Calibration Counter** This shows the number of calibrations to date. It is incremented by 1 max. when any number of changes are made to calibration prior to EXIT.

4.2.2 Calibration by Calculation

NOTE: Set scaling constants before proceeding.

Parameter	Range	Definition
CM	WTS / CALC	**Calibration Method** Determines whether calibration is to be achieved by application of weights (WTS) or by calculations based upon precise load cell characteristics (CALC).
ZR		**Zero** - Kgs The display shows the 'live' gross weight. To register the empty weight and thereby establish the gross zero, operate the Enter, at which point the weight will flash, then operate the Down-arrow (display goes to Zero) followed by ENTER again to steady the display.
Z	0-200000	**Zero Coefficient** This shows the value registered in ZR above and can be entered into a replacement unit without the need to empty the weigher.
LC	0-99999	**Load Cell Capacity** - Kgs Sets the total load capacity of the load cells and provides the means to calculate the calibration in conjunction with SENSITIVITY below.
S	0-9.99999	**Sensitivity** – mv/v Sets the sensitivity to match that of the load cells and provides the means to calculate the calibration in conjunction with the Load Cell Capacity above. (2.00000 Factory Setting)
CC	0-99999	**Calibration Counter** This shows the number of calibrations to date. It is incremented by 1 max. when any number of changes are made to calibration prior to EXIT.

There are two error conditions which may occur specifically at this point in the procedure. These are:

Display shows "OVER SPAN"

Occurs when attempting to enter a test weight value greater than the span setting. i.e. a vetting on the data entry. Either the test weight value or the SPAN setting must be incorrect.

Display shows "RANG SAT" (RANGE SAT)

Occurs if the load cell signal at the time of entering a test weight value indicates that with the current PG (Pre Gain) setting, the input amplifier will saturate (reach its upper limit) before the current SPAN setting is reached. Possible causes are: incorrect SPAN setting, PG setting too high for load cells, load cell faulty.

Other error conditions not specific to calibration i.e. equipment faults are listed under Section 7.

4.2.3 Scaling Constants

Parameter	Range	Definition	Factory Setting
DP	9.9.9.9.9	**Decimal Places** Max of 4 decimal places.	No Decimal Places
SP	0-99999	**Span** - Kgs Set the full scale reading (or deflection, FSD). Used for validation check during calibration.	9
FL	1-100	**Filter** Determines the number of load cell input readings over which the weight is calculated, from a rolling average, each time a reading is taken (every 50ms). 1 Corresponds to no averaging. 100 Corresponds to maximum averaging.	10
IN	0-99999	**Display Increment** – Kgs Determines the minimum value by which the weight displays increment. 0 corresponds to no suppression. Note that this suppression does not apply to calibration.	0

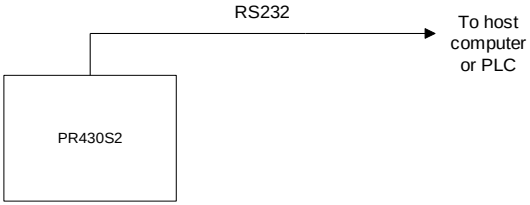
Parameter	Range	Definition	Factory Setting
PG	0-7	**Pre Gain** Determines the load cell amplifier input sensitivity from 0-2.5V to 0-20mV, as follows: Settings — Full Scale Input 0 — 2.56V 1 — 1.28V 2 — 640mV 3 — 320mV 4 — 160mV 5 — 80mV 6 — 40mV 7 — 20mV	7
UP	0-1	**Update Rate** - seconds This determines display update rate in seconds.	0.4
PSET	0-999	**Passcode Set** Determines the passcode for access to calibration parameters	2
EXIT		**Exit** Operate ENTER to return working displays. Operate SELECT to cycle around to CM again.	

5 Serial Link

5.1 Host Communications (Serial Mode = SABUS)

The PR430S2 serial interface can be configured for RS232 communication to provide a point-to-point data link or for RS485 communications in order to provide multidrop bus communication with up to 32 units connected to a host PC or PLC.

5.1.1 Point-to-Point (RS232)



Communication with the host is by ASCII character messages of the following format:

[!] [Command] [Data] [CR]
where CR is the carriage return character.

The ! character is followed by a two character command.

Depending on the command an optional data segment follows and is terminated by a CR.

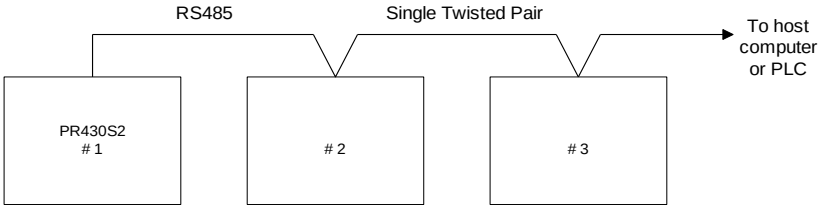
Example of a request by the host for the current gross weight.

Host Sends	PR430S2 Sends
!GR[CR]	!GR12345[CR]

Serial Data Format:

Parity = None Stop Bits = 1 Data Bits = 8

5.1.2 Multidrop Bus (RS485)



Communication with the host is by ASCII character messages of the following format:

[!] [Address] [Command] [Data] [CR]
where CR is the carriage return character.

The ! character is followed by a two character address that specifies the target unit. A two character command follows the address.

Depending on the command an optional data segment follows and is terminated by a CR.

Example of a request by the host for the current gross weight from station 02.

Host Sends	PR430S2 Sends
!02GR[CR]	!02GR12345[CR]

Serial Data Format:

Parity = None Stop Bits = 1 Data Bits = 8

5.1.3 Command Set

Command	Range	Definition
GR	0-99999	**Gross Weight** – Kgs Returns the gross weight, scaled by DP.
NT	0-99999	**Net Weight** – Kgs Returns the net weight, scaled by DP.
RD	0-200000	**Read Raw Data** Returns the factory calibrated load cell input value.
DP	0-4	**Decimal Places** Return the number of decimal places applied to the gross and net weight values.
ZG		**Zero Gross** Sets the gross weight to zero if within ±2% of the calibrated zero.
TN		**Tare Net** Tares the net weight.
ER	0-9999	**Error** Returns the error code as defined by the table in section 7.3.

5.1.4 Command Definitions

The general format of command strings is as follows:

! aa CC nnnnnn [CR]

Where:

!	:	Delimiter character
aa	:	2 digits representing the station address (only present if set to RS485 standard)
CC	:	2 letters representing the command
n to nnnnnn	:	1 to 6 digits representing the value associated with the command. The value is scaled by the appropriate decimal place setting as no decimal place character is transmitted
[CR]	:	Carriage return

Note: the number of digits is fixed for a given command. If an error is present then then the unit will return the error command and data instead of the command and data requested, as below.

5.1.4.1 GR : Gross Weight

Command : Return the Gross Weight

Format : ! aa GR nnnnn[CR]

Example:

HOST SENDS	PR430S2 RETURNS
!02GR[CR]	!02GR00050[CR]
	Station 02 Gross Weight = 50

5.1.4.2 NT : Net Weight

Command : Return the Net Weight

Format : ! aa NT nnnnn[CR]

Example:

HOST SENDS	PR430S2 RETURNS
!02NT[CR]	!02NT00050[CR]
	Station 02 Net Weight = 50

5.1.4.3 RD : Read Raw Data

Command : Return the load cell input value in the range 0 - 200000.

Format : ! aa RD nnnnnn [CR]

Example:

HOST SENDS	PR430S2 RETURNS
!02RD[CR]	!02RD123456[CR]
	Station 02 load cell value = 123456

5.1.4.4 DP : Decimal Places

Command : Return the DP setting which defines the number of decimal places applied to the gross/net weight.

Format : ! aa DP n [CR]

Example:

HOST SENDS	PR430S2 RETURNS
!02DP[CR]	!02DP1[CR]
	Station 02 returns the FDP setting which defines Flow value decimal places

5.1.4.5 ZG : Zero Gross

Command : Zero the gross weight

Format : ! aa ZG [CR]

Example:

HOST SENDS	PR430S2 RETURNS
!02ZG[CR]	!02ZG[CR]

5.1.4.6 TN : Tare Net

Command : Tare the net weight

Format : ! aa TN [CR]

Example:

HOST SENDS	PR430S2 RETURNS
!02TN[CR]	!02TN[CR]

5.1.4.7 ER : Error

Command : Returns the error code as defined by the table in section 7.3.

Format : ! aa ER nnnn [CR]

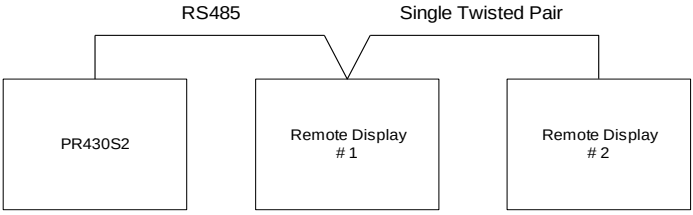
Example:

HOST SENDS	PR430S2 RETURNS
!02ER[CR]	!02ER0000[CR] Station 02 returns no error code

5.2 Remote Display Application (Serial Mode = TRANS)

5.2.1 Overview

It is possible to drive up to 32 remote display units from the RS485 serial interface of the PR430S2, as shown below.



The PR430S2 can transmit the gross or net weight at a transmission interval of between 0.1 and 60.0 seconds. Refer to the Transmit Data Item and Transmission Interval parameters within section 3 for further details.

5.2.2 Data Format

The data item is transmitted as an ASCII string, including decimal place if configured, as follows:

"**[STX]00_ _ _12345[CR]**" no decimal places configured
"**[STX]00_ _ _1234.5[CR]**" one decimal place configured

where _ is a leading space
[STX] is ASCII character code 0x02 (start transmission)
[CR] is a carriage return

5.2.3 Compatible Displays

The following serial display units are compatible with the PR430S2.

- Practicon Ltd – PR330S2.
- London Electronics – Fusion Series.

5.3 Modbus Communications (Serial Mode = ASCII or RTU)

The PR430S2 serial interface can be configured for ModbusASCII or ModbusRTU communication in either RS232 mode to provide a point-to-point data link or in RS485 mode in order to provide multidrop bus communication with up to 32 units connected to a host PC or PLC.

5.3.1 ModbusASCII

ModbusASCII uses the following serial data format:

Data bits: 7
Parity: None, Even or Odd (see section 3)
Stop bits: 2 if parity is set to none,
1 if parity is set to even or odd

With parity checking

Start	1	2	3	4	5	6	7	Parity	Stop

Without parity checking

Start	1	2	3	4	5	6	7	Stop	Stop

5.3.2 ModbusRTU

ModbusRTU uses the following serial data format:

Data bits: 8
Parity: None, Even or Odd (see section 3)
Stop bits: 2 if parity is set to none,
1 if parity is set to even or odd

With parity checking

Start	1	2	3	4	5	6	7	8	Parity	Stop

Without parity checking

Start	1	2	3	4	5	6	7	8	Stop	Stop

5.3.3 Function Codes Supported

Function Code	Description
0x01	**READ COILS** Used to read the status of the 2 trip outputs.
0x03	**READ HOLDING REGISTERS** Used to read the gross & net weights, error code and decimal places setting.
0x05	**WRITE SINGLE COIL** Used to set the "Tare Net", "Zero Gross" or "Switch Display" bits to perform the appropriate action. These flags are auto-cancelling after the action has been performed. NOTE: If the zero gross cannot be performed, the error code will be set to 1814. The error code holding register should therefore be read after the zero gross bit is set to determine if the action was successful.
0x06	**WRITE SINGLE REGISTER** Used to write a single holding register value. This function code is only appropriate for writing to the Sense parameters as all other writable values span multiple registers.
0x10	**WRITE MULTIPLE REGISTERS** Used to write multiple configuration values in one message.
0x2B	**ENCAPSULATED INTERFACE TRANSPORT** Used with MEI Type 14 to read the device identification object.

5.3.4 Bits (coils)

Coil Number	Address	Description
1	0x00	Trip 1. This bit is read-only.
2	0x01	Trip 2. This bit is read-only.
3	0x02	Tare Net. This bit is write-only.
4	0x03	Zero Gross. This bit is write-only.

Coil Number	Address	Description
5	0x04	Switch Display between Gross and Net. This bit is write-only. Set this bit OFF to show the Gross. Set this bit ON to show the Net.

5.3.5 Holding Registers

Register Number	Address	Read / Write	Description
1 – 2	0x00, 0x01	Read only	Gross weight. This value is 32-bits long and therefore register addresses 0x00 and 0x01 together form the gross weight value. Address 0x00 contains the most significant 2 bytes.
3 – 4	0x02, 0x03	Read only	Net weight. This value is 32-bits long and therefore register addresses 0x02 and 0x03 together form the net weight value. Address 0x02 contains the most significant 2 bytes.
5	0x04	Read only	Error code. The current error code will be cleared after this register is read. See section 7.3 for a list of error codes.
6	0x05	Read only	Decimal Places.
7 – 8	0x06, 0x07	Read/ Write	Trip 1 Level. This value is 32-bits long and therefore register addresses 0x06 and 0x07 together form the net weight value. Address 0x06 contains the most significant 2 bytes.
9 – 10	0x08, 0x09	Read/ Write	Trip 2 Level. This value is 32-bits long and therefore register addresses 0x08 and 0x09 together form the net weight value. Address 0x08 contains the most significant 2 bytes.

Register Number	Address	Read / Write	Description
11 – 12	0x10, 0x11	Read/ Write	Trip 1 Deadband. This value is 32-bits long and therefore register addresses 0x10 and 0x11 together form the net weight value. Address 0x10 contains the most significant 2 bytes.
13 – 14	0x12, 0x13	Read/ Write	Trip 2 Deadband. This value is 32-bits long and therefore register addresses 0x02 and 0x03 together form the net weight value. Address 0x02 contains the most significant 2 bytes.
15	0x14	Read/ Write	Trip 1 Sense.
16	0x15	Read/ Write	Trip 2 Sense.

5.3.6 Identification Object

The Basic Device Identification is implemented and is available as a stream and as individual objects.

Object ID	Description
0x00	Vendor name.
0x01	Product code / model number.
0x02	Software revision.

5.3.7 Exception Codes

The follow exception codes may be returned by the PR430S2.

Code	Description
01	Illegal Function. The function code is not supported.
02	Illegal Data Address. The address of the register or the combination of address + number of registers is invalid.
03	Illegal Data Value. The value specified in the request is invalid, e.g. the data length is incorrect.
03	Slave Device Failure. An unrecoverable error occurred, e.g. the configuration value could not be saved.

6 Specification and Installation

6.1 Mains Supply

Supply:	85-264VAC 50-60 Hz, or 10-36VDC
Power consumption:	10VA max.
Internal Fuse:	Wire ended Wickman 1A Anti-Surge type TR5.

6.2 Load Cell Excitation

10V DC @ 125mA max, up to four 350 ohm load cells may be connected in parallel, 4 or 6 wire, remote sensing for volt-drop compensation in long cables.

6.3 Input Characteristics

Range:	0-20mV min, 0-2.5 max.
Filter:	adjustable 0.2 to 20Hz.
Accuracy:	Up to 65,000 divisions with negligible drift due to internal self correction.

6.4 Serial Link

Standard:	The serial link may be configured to RS232 or RS422/485 by means of the Communication Standard (CS) parameter, see section 3.
Speed:	1200-19200bps.

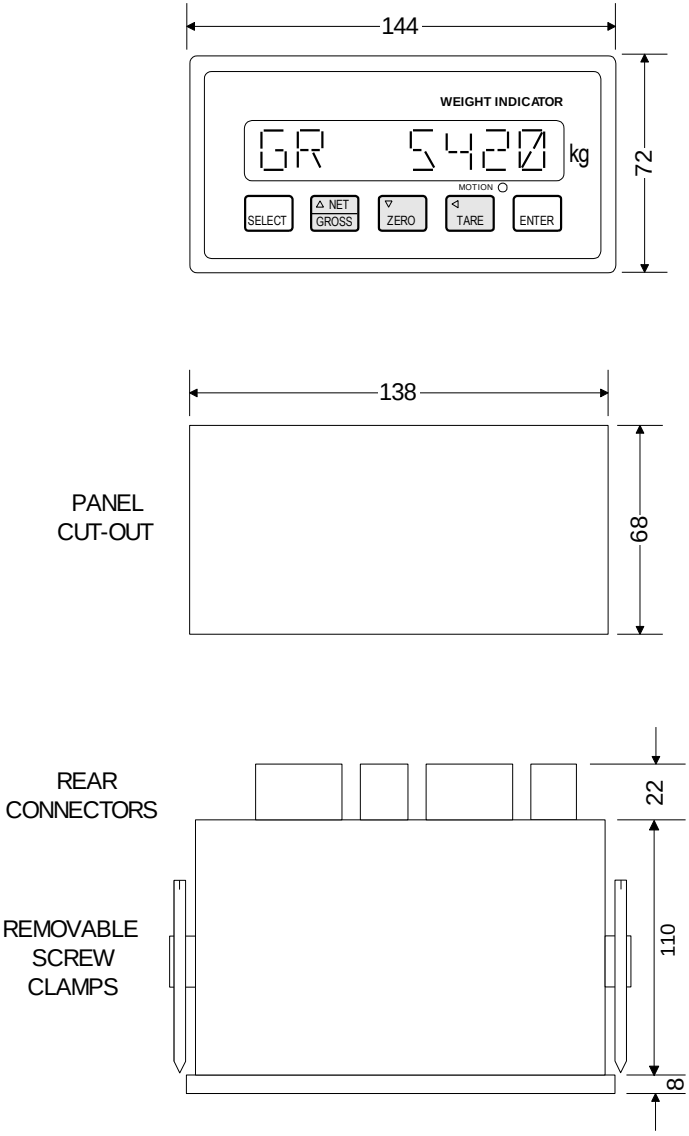
6.5 Trip Outputs

Voltage:	250VAC or 30VDC
Current:	5A
Power:	1250 VA or 150 Watts

6.6 Environment

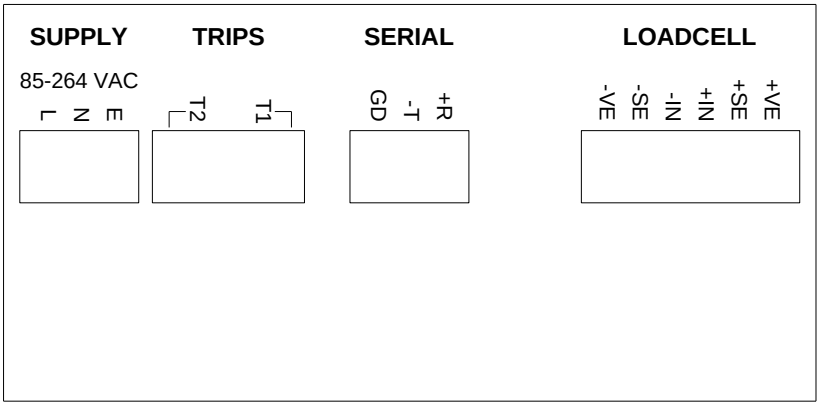
Operating:	0 to +50°C, 20 to 75% RH Non-condensing
Storage:	-20 to +80°C

6.7 Enclosure Dimensions

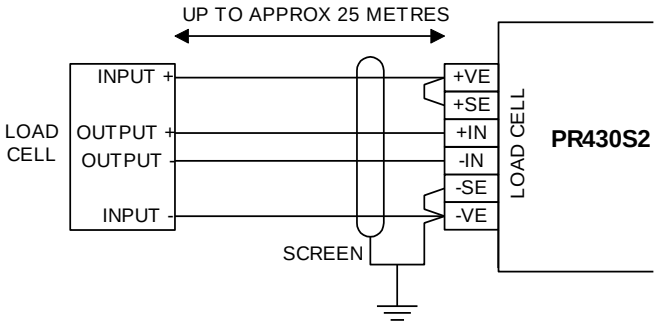


The enclosure is also available with an IP65 transparent front cover. See section 1.3 for model number.

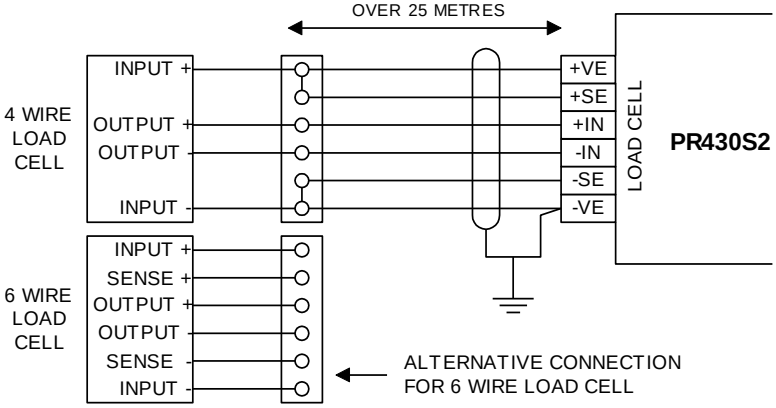
6.8 Wiring Connections



6.9 Wiring Diagram: 4 Wire Load Cell Connection

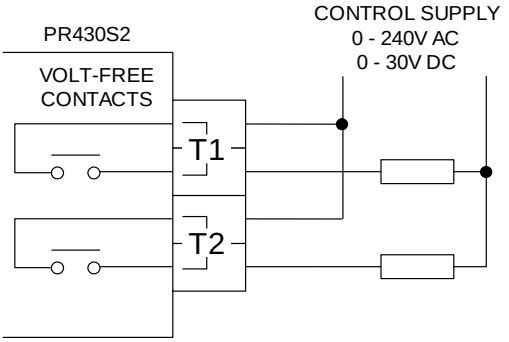


6.10 Wiring Diagram: Remote Load Cell Sensing

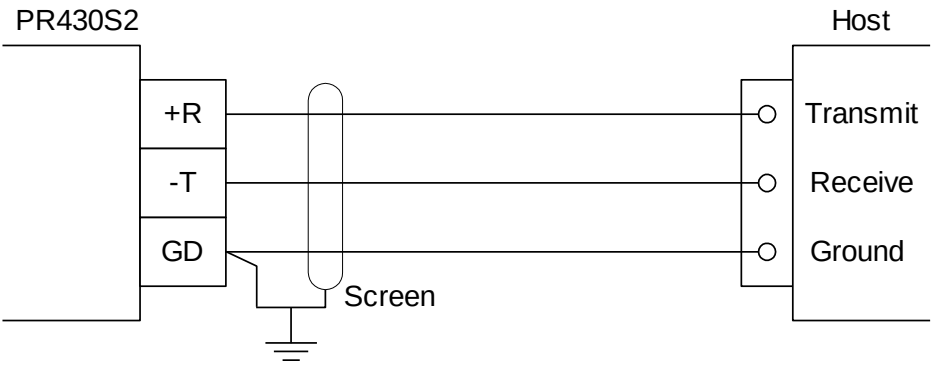


The amplifier provides for remote sensing to compensate for volt-drop in long leads to load cells. It is recommended that remote sensing be adopted for maximum temperature stability where cables longer than 25 metres are to be used.

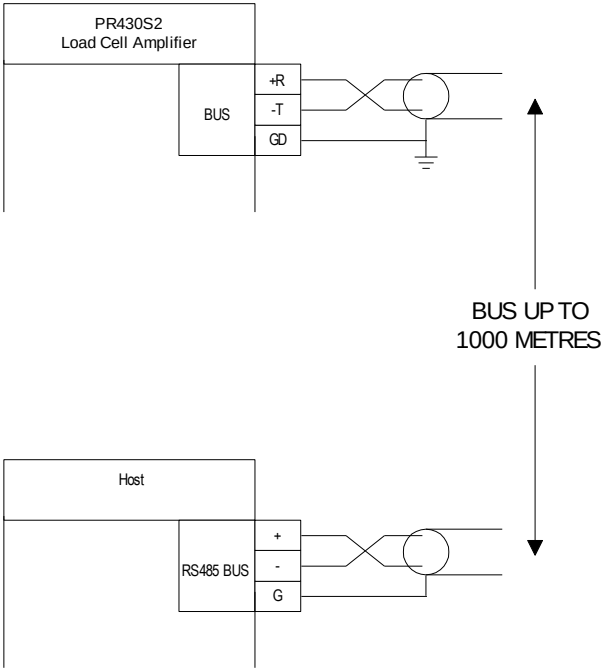
6.11 Wiring Diagram: Relay Outputs



6.12 Wiring Diagram: Serial Link (RS232)



6.13 Wiring Diagram: Serial Link (Multidrop)



Bus Cable Specification:
Single twisted pair screened data transmission cable e.g. Belden 8761 available from Farnell, order code 761278 for 152m reel.

6.14 EMC

The PR430S2 complies with the European EMC directive 2004/108/EC and has been tested to the following standard:

EN 61326-1
Immunity & Emission Standard
Electrical Equipment for Measurement Control and Laboratory Use

7 Equipment Faults

7.1 Out of range

This condition occurs if the load cell input signal is outside the full scale range as defined by the amplifier pre-gain (parameter PG under 4.2.3 above).

Display shows "ADC-SAT+"

Indicates that the input is outside the range in the positive direction. Either the signal is too large due to a load cell fault or the pre-gain (PG) is set too high.

Display shows "ADC SAT-"

Indicates that the input is outside the range in the negative direction, i.e. below zero.

Display shows "SENSE ER"

Indicates that the sense voltage is no longer within 3V of the voltage registered at calibration

7.2 Failures

Although unlikely, the following types of equipment failure are possible. In all cases the unit may be returned to Practicon for repair.

No Response

No indication or response of any kind. Possibly a supply circuit failure.
A soldered-in PCB (Printed Circuit Board) fuse may need replacing as a result. Alternatively the fuse failure could be the only fault.

Display shows "REGFAULT"

This occurs if the internal 10V load cell supply is overloaded i.e. >150mA

Display shows "ERR nnnn" where nnnn Fault Code Number

This indicates that a micro-processor fault has occurred. It may help to report the Fault Code Number to Practicon when returning the unit for repair.

7.3 Error Codes

Error Code	Description
0000	No error
1810	Out of range load cell signal-negative (ADC SAT-)
1811	Out of range load cell signal-positive (ADC SAT +)
1814	Weigher is too loaded to zero the gross (MAX ZERO)
1818	Load cell supply fault (REGFAULT)
1821	Load cell sense voltage fault (SENSE ER)

Note: any other error code would be due to internal errors and should be reported to Practicon.