Gravity

Why Gravity compensation

Earth's gravity is acting on the mass, and a scale measures this gravitational force. So, your mass of say 25 kg, exerts a downward force of 25 x 9.81 Newtons. Gravitational acceleration changes with the geographical location and therefore so does the weight measured of a given mass.

Loganholme AU	27.6806 x 8m	= 9.7915
Troy US	42.556 x 197m	= 9.8034
Langenfield EU	51.12002 x 52m	= 9.8115

Application and Operation

Gravity compensation is a useful feature when a scale is being calibrated in one location and shipped to another location (primarily for trade use). It avoids having to recalibrate at the new location to compensate for the change in gravity.

A scale base with a C3 indicator is calibrated in Sri Lanka (G.FAC 9.810) and shipped to Mexico (9.779) and the gravity compensation will correct the measurement according to the original calibration.

By using the gravity compensation feature in the C3 the final user will be permitted to enter the gravitational acceleration of their location (G. INST) on power up.

The user can enter this setting **once** without affecting the calibration counter.

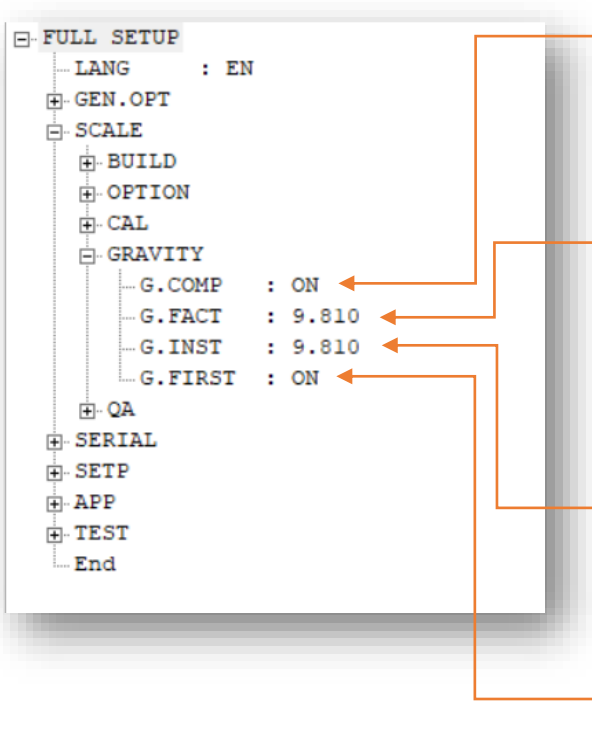
Sri Lanka Gravity Comp: 9.810
Calibrate Scale and switch on G. COMP

Mexico Gravity Comp: 9.779
Enter Gravity compensation on power up for location when prompted.

Without Gravity compensation adjustment, this scale would have read 9.779kg

Set Up

1) Turn on G. COMP



Turn ON the Gravity Compensation.

The factory gravitational acceleration (G.FAC) is set to that of the location the scale is being calibrated at.
E.g.: Sri Lanka is 9.810

As default G.INST will be set to the same as G.FACT. When a Zero or Span calibration is performed the G.INST setting is reset to equal G. FACT.

This enables the user prompt.

2) Perform Zero and Span

Press and hold the <SELECT> key for two seconds.

Press <SELECT> repeatedly until the CAL is displayed and press <OK>

ZERO is displayed.

Press the <OK> key to start - the display will show the current weight.

Remove all weight from the scale structure.

Press <OK> to start a Zero Calibration routine,

Z in P is displayed.

When complete the display shows the current weight.

Press <OK> to return to menu,

Press the <ZERO> key to step to the next menu setting.

SPAN is displayed,

Press <OK> to start. The display will show the current weight.

Add the calibration test mass to the scale where the closer the test weight is to full scale the better the accuracy. (The minimum acceptable span calibration weight is 2% of the scale range but a weight this small may limit calibration accuracy)

Press <OK> to show the calibration weight and enter edit mode.

Use the <ARROW> keys to update the calibration weight.

Press <OK> to start the Span Calibration routine,

S in P is displayed

When complete the display will show the current weight.

Press the <OK> key to leave the routine and return to the menu,

Press <ZERO> to step to the next item,

-End- with be displayed

Press <OK> to exit.

Then the scale can be sent to the installation location. When the indicator is powered up the user will be prompted to enter the gravitational acceleration of their location (G. INST). At this prompt, the user can enter this setting one time only without affecting the calibration counter. Once a valid setting has been entered, the user will not be prompted again.

The G. INST setting can be edited directly in the calibration menu afterwards, but this will result in the calibration counter being incremented.

Acceleration Due to Gravity, g in m/s²

Country	City	G-Constant	Country	City	G-Constant
Argentina	Buenos Aires	9.7979	Mexico	Mexico City	9.7799
Australia	Sydney	9.7979	Morocco	Rabat	9.7964
Austria	Vienna	9.8099	Netherlands	Amsterdam	9.8129
Belgium	Brussels	9.8114	New Zealand	Wellington	9.8039
Belize	Manamah	9.7904	Norway	Oslo	9.8189
Bolivia	La Paz	9.7844	Panama	Panama City	9.7814
Brazil	Brasilia	9.7889	Peru	Lima	9.7829
Canada	Montreal	9.8069	Philippines	Manila	9.7844
	Ottawa	9.8069	Poland	Swider	9.8159
	Toronto	9.8054	Portugal	Lisbon	9.8009
	Vancouver	9.8099	Rumania	Bucharest	9.8054
Czeck Republic	Prague	9.8114	Saudi Arabia	Riyad	9.7904
Chile	Santiago	9.7979	Sweden	Stockholm	9.8189
China	Hong Kong	9.8099	Singapore	Singapore	9.7814
Colombia	Bogota	9.7799	South Africa	Johannesburg	9.7919
Costa Rica	San Jose	9.7829	Spain	Madrid	9.8024
Cypress	Nicosia	9.7979	Switzerland	Bern	9.8084
Denmark	Copenhagen	9.8159	Taiwan	Taipei	9.7904
Ecuador	Quito	9.7724	Tunisia	Tunis	9.7799
Finland	Helsinki	9.8189	Turkey	Ankara	9.8024
Germany	Dusseldorf	9.8129	Uruguay	Montevideo	9.7964
Great Britain	London	9.8144	USA	Anchorage	9.8189
Greece	Athens	9.8009		Atlanta	9.7964
Guatemala	Guatemala City	9.7844		Boston	9.8039
Hungary	Budapest	9.8069		Chicago	9.8024
Indonesia	Djakarta	9.7814		Dallas	9.7949
Iraq	Baghdad	9.7964		Detroit	9.8039
Japan	Mishima	9.7979		Los Angeles	9.7979
Korea	Seoul	9.7994		New York	9.8024
Kuwait	Kuwait	9.7919		Philadelphia	9.8024
Lebanon	Beirut	9.7964		San Francisco	9.7994
Mauritius	Port Louis	9.7859	Venezuela	Caracas	9.7829

https://physics.montana.edu/demonstrations/video/1_mechanics/demos/localgravitychart.html