

COR2 Dinamometer



Fig. 1. COR2 structure.

Use with forza, forza-b and forza-j devices

Forza, Forza-b and Forza-j have been designed to be used as force measurement devices for signal produced by load cells or torquemeters with differential output.

Forza and Forza-b are designed as two accessories of the Quattrocento device, while the Forza-j has been designed as an accessory to the Sessatanquattro device.

In all three cases, the following steps must be followed to use the accessory:

- Connect the dynamometer connector to the forza device using the Load Cell Input.
- Connect the device to an acquisition system using the cable called J-BNC cable or a BNC to BNC cable.
- Adjust the gain of the system using the button/wheel Gain Select.
- Delete the offset using the button Offset or the potentiometer.



Fig. 2. Forzab, forza and forzaj load cell amplifier.

Force and torque estimation

To calculate the force read by the load cell in Volts it is necessary to use the following function:

$$\text{Force [kg]} = \frac{V_{\text{out measured [V]}} * \text{F.S. [kg]}}{\text{Sensitivity [mV/V]} * 5 \text{ [V]} * \text{Gain [V/V]}}$$

Where:

- F.S. : Full-Scale, it is indicated on the load cell;
- Sensitivity: it is indicated on the load cell, usually around 2mV/V
- Gain = it is sets with the Gain button or the gain knob can be 100, 200, 500 or 1000 V/V

When using OT BioLab + it is necessary to provide a scale factor, a factor that regulates the conversion between the input force (or torque, angle, speed ...) and the voltage at the input of the auxiliary input of quattrocento or sessantaquattro. Therefore, for the load cell and its amplifier the scale factor can be estimated as:

$$SCAL_{FACT} = \frac{1000 * LC_{FS}}{LC_{SENS} * LC_{SUP} * FA_{GAIN}}$$

Where:

- 1000 is needed to get the output in V since the input should be expressed in mV and the gain is a pure number
- LC_{FS} = load cell full scale, typically 100 Kg
- LC_{SENS} = load cell sensitivity, typically 2,4 mV/V
- LC_{SUP} = load cell supply, 5 V
- FA_{GAIN} = forza amplifier gain, sets by the user between 100, 200, 500 and 1000

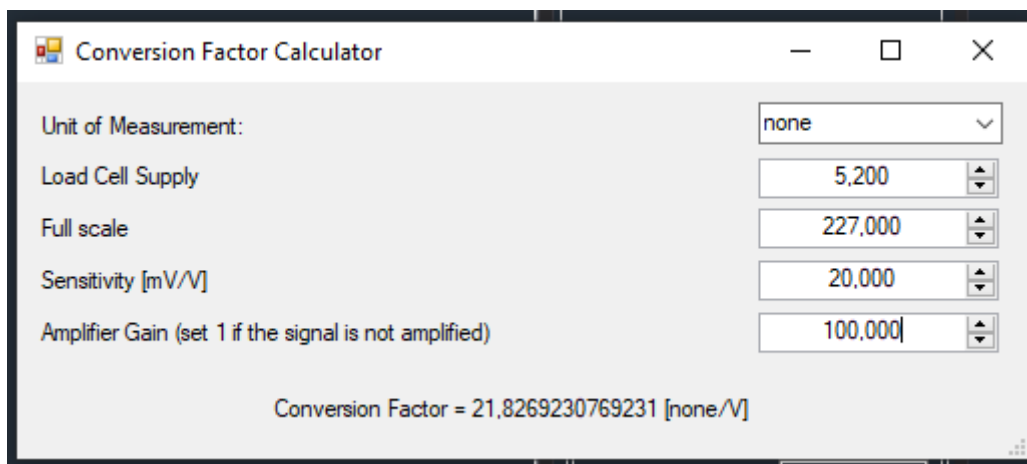


Fig. 3. OT BioLab+ sw conversion factor calculator plug-in with forza-b accessory.

Technical details

In Tab. 1 load cell technical details and mechanical dimensions are reported. Fig. 4 shows the load cell connector pinout.

	Parameter	Value
Type Load Cell	Range	100 kg
	Recommended Supply	5 V
	Non linearity	± 1 % F.S.
	Sensitivity	2.4 mV/V
	Size of the metal structure – sfere circumference	15,5 cm

Tab. 1. Load cell Technical details.

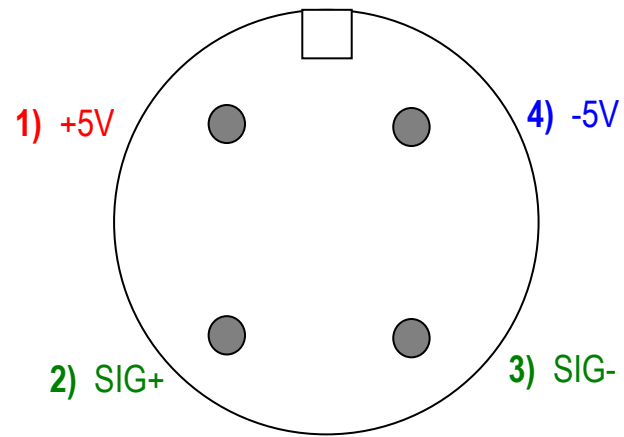


Fig. 4. Load cell pinout. View from pin side.