ENGLISH  ENGLISH  ENGLISH  ENGLISH

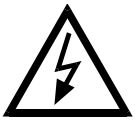
Installation and User Manual

version 1.00

TLC
TLC-I
TLC-V

SYMBOLS

Here are the symbols used in the manual to draw the reader's attention:



Caution! Risk of electric shock.

Caution! This operation must be performed by skilled personnel.

Pay particular attention to the following instructions.

Further information.

WARRANTY

24 months from the date of the delivery note. Warranty covers only failures of defective components (due to construction defects or defects in materials) and includes replacement or repair of the components and related labor costs.
Warranty is automatically forfeited in the event of:
- tampering, deletion, removal of the identification label and/or serial number of the product
- misuse, transformation, alteration, repair of products not carried out by Laumas personnel

Laumas provides a 1-year warranty from the date of the delivery note on defects in material or manufacture of the battery.

GUIDELINES FOR PROPER DISPOSAL

Sealed Lead Acid Battery Must be recycled Properly

This symbol on the product or packaging indicates that:
- This is electrical/electronic equipment and cannot be disposed of as municipal solid waste, but must be delivered to a recycling center
- Improper use or disposal can pollute the environment or damage human health
- Non-compliance with these guidelines will be penalized in accordance with the regulations in force in the country of destination
- It is recommended to dispose of the packing and packaging as required by local regulations

TABLE OF CONTENTS

USER WARNINGS

RECOMMENDATIONS FOR THE PROPER USE OF WEIGHING INSTRUMENT

- Keep away from heat sources and direct sunlight
- Repair the instrument from rain (except special IP versions)
- Do not wash with water jets (except special IP versions)
- Do not dip in water
- Do not spill liquid on the instrument
- Do not use solvents to clean the instrument
- Do not install in areas subject to explosion hazard (except special Atex versions)

RECOMMENDATIONS FOR CORRECT INSTALLATION OF WEIGHING INSTRUMENTS

The terminals indicated on the instrument's wiring diagram to be connected to earth must have the same potential as the weighed structure (same earthing pit or earthing system). If you are unable to ensure this condition, connect with an earthing wire the terminals of the instrument (including the terminal –SUPPLY) to the weighed structure.

The cell cable must be individually led to its panel input and not share a conduit with other cables; connect it directly to the instrument terminal strip without breaking its route with support terminal strips.

Use "RC" filters on the instrument-driven solenoid valve and remote control switch coils.

Avoid inverters in the instrument panel; if inevitable, use special filters for the inverters and separate them with sheet metal partitions.

The panel installer must provide electric protections for the instruments (fuses, door lock switch etc.).

It is advisable to leave the equipment always switched on to prevent the formation of condensation.

MAXIMUM CABLE LENGTHS

- RS485: 1000 metres with AWG24, shielded and twisted cables
- Analog current output: up to 500 metres with 0.5 mm^2 cable
- Analog voltage output: up to 300 metres with 0.5 mm^2 cable

RECOMMENDATIONS FOR CORRECT INSTALLATION OF THE LOAD CELLS

SIZING OF LOAD CELLS CAPACITY

For safety reasons, in case of static weighing, it is advisable to use the load cells at a maximum of 70-80% of its nominal capacity (assuming that the load is uniformly distributed over the entire weighed structure); depending on the handling mode of the load to weigh, consider to further reduce the % of load with respect to the nominal capacity (ex.: forklifts handling, bridge cranes, etc.).

In case of weighing with dynamic loads, the installer has to estimate the thrust speed, the acceleration, the frequency, etc.

INSTALLING LOAD CELLS

The load cells must be placed on rigid, stable in-line structures; it is important to use the mounting modules for load cells to compensate for misalignment of the support surfaces.

CONNECTING SEVERAL CELLS IN PARALLEL

Connect several cells in parallel by using - if necessary - a watertight junction box with terminal box. The cell connection extension cables must be shielded, led individually into their piping or conduit and laid as far as possible from the power cables (in case of 4-wire connections, use cables with 4x1 mm^2 minimum cross-section).

PROTECTION OF THE CELL CABLE

Use water-proof sheaths and joints in order to protect the cables of the cells.

MECHANICAL RESTRAINTS (pipes, etc.)

When pipes are present, we recommend the use of hoses and flexible couplings with open mouthpieces with rubber protection; in case of hard pipes, place the pipe support or anchor bracket as far as possible from the weighed structure (at a distance at least 40 times the diameter of the pipe).

WELDING

Avoid welding with the load cells already installed. If this cannot be avoided, place the welder ground clamp close to the required welding point to prevent sending current through the load cell body.

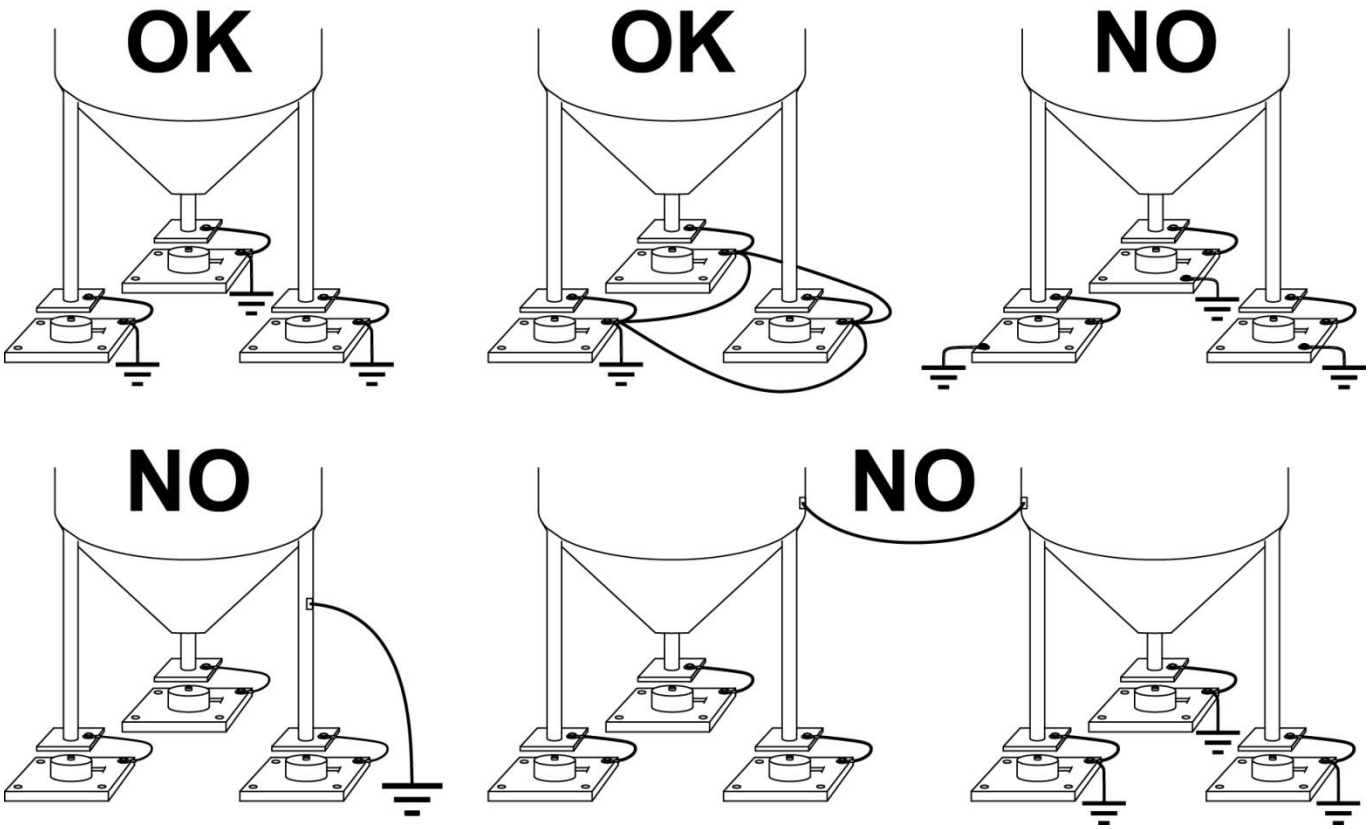
WINDY CONDITIONS - KNOCKS – VIBRATIONS

The use of weigh modules is strongly recommended for all load cells to compensate for misalignment of the support surfaces. The system designer must ensure that the plant is protected against lateral shifting and tipping relating to: shocks and vibration; windy conditions; seismic conditions in the installation setting; stability of the support structure.

EARTHING THE WEIGHED STRUCTURE

By means of a copper wire with suitable cross-section, connect the cell upper support plate with the lower support plate, then connect all the lower plates to a single earthing system. Electrostatic charges accumulated because of the product rubbing against the pipes and the weighed container walls are discharged to the ground without going through or damaging the load cells. Failure to implement a proper earthing system might not affect the operation of the weighing system; this, however, does not rule out the possibility that the cells and connected instrument may become damaged in the future. It is forbidden to ensure earthing system continuity by using metal parts contained in the weighed structure.

FAILURE TO FOLLOW THE INSTALLATION RECOMMENDATIONS WILL BE CONSIDERED A MISUSE OF THE EQUIPMENT



LOAD CELL TESTING

Load cell resistance measurement (use a digital multimeter):

- Turn off the instrument.
- Disconnect the load cells from the instrument and check that there is no moisture in the cell junction box caused by condensation or water infiltration. If so, drain the system or replace it if necessary.
- The value between the positive signal wire and the negative signal wire must be equal or similar to the one indicated in the load cell data sheet (output resistance).
- The value between the positive excitation wire and the negative excitation wire must be equal or similar to the one indicated in the load cell data sheet (input resistance).
- The insulation value between the shield and any other cell wire and between any other cell wire and the body of the load cell must be higher than 20 Mohm.

Load cell voltage measurement (use a digital multimeter):

- Turn on the instrument.
- Take out the load cell to be tested from underneath the container, or alternatively, lift the container support.
- Make sure that the excitation of two wires of the load cell connected to the instrument (or amplifier) is 5 VDC ±3%.
- Measure the response signal between the positive and the negative signal wires by directly connecting them to the tester, and make sure that it is comprised between 0 and ±0.5 mV.
- Apply load to the cell and make sure that there is a signal increment.

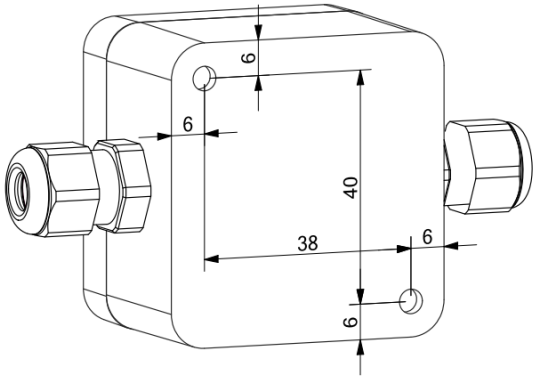
IF ONE OF THE ABOVE CONDITIONS IS NOT MET, PLEASE CONTACT THE TECHNICAL ASSISTANCE SERVICE.

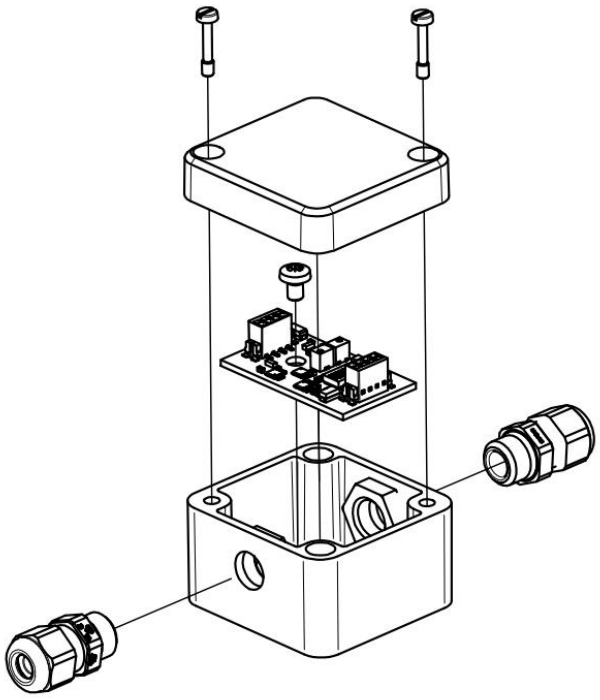
MAIN SPECIFICATIONS OF THE INSTRUMENT

Analog weight transmitter.

TLC

- Selectable output: 4-20 mA or 0-10 V
- Spring terminal blocks
- Rated output and operating mode selection with DIP switches
- Dimensions: 45x26x11 mm; 1 fixing hole Ø 4 mm
- IP67 ABS box (option on request)
  - Protection rating IP67
  - 2 cable glands M12x1.5
  - Dimensions: 94x53x40 mm (including cable glands); 2 fixing holes Ø 4 mm





TLC-I

- Output: 4-20 mA
- Connections to be welded
- Rated output and operating mode selection by changing resistors
- Dimensions: Ø 20 mm; fixing hole Ø 3 mm

TLC-V

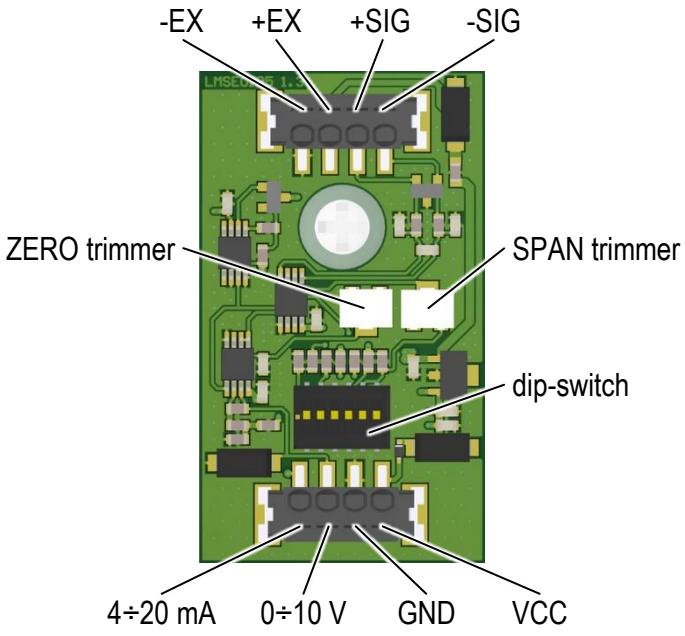
- Output: 0-10 V
- Connections to be welded
- Rated output and operating mode selection by changing resistors
- Dimensions: Ø 20 mm; fixing hole Ø 3 mm

TECHNICAL SPECIFICATIONS

POWER SUPPLY and CONSUMPTION	12/24 VDC ±10%; 2 W
No. OF LOAD CELLS IN PARALLEL and SUPPLY	max 4 (350 ohm); 5 VDC / 60 mA
LINEARITY	< 0.01% F.S.
THERMAL DRIFT	< 0.005% F.S./°C
MEASUREMENT RANGE	1÷-3 mV
HUMIDITY (non condensing)	85%
STORAGE TEMPERATURE	-30°C +80°C
WORKING TEMPERATURE	-20°C +60°C
ANALOG OUTPUT	4÷20 mA (max 300 ohm) 0÷10 V (min 10 kohm)

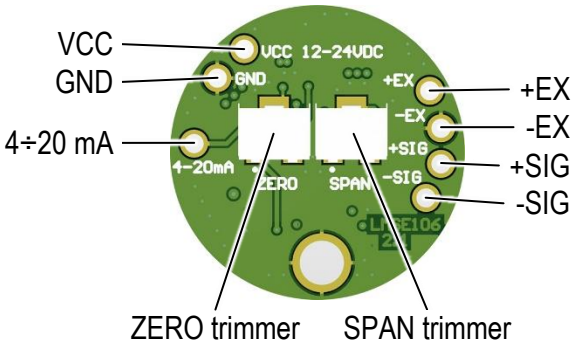
ELECTRICAL CONNECTIONS

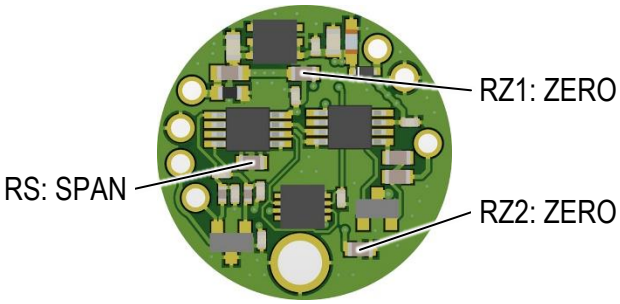
TLC



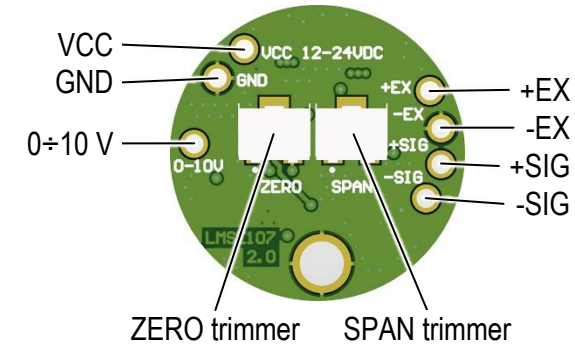
The terminals take cables with a cross-section between 0.2 and 0.5 mm^2.

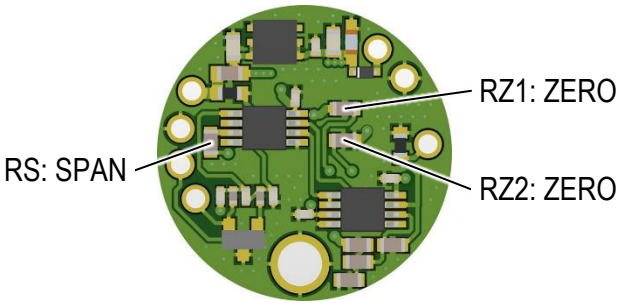
TLC-I





TLC-V

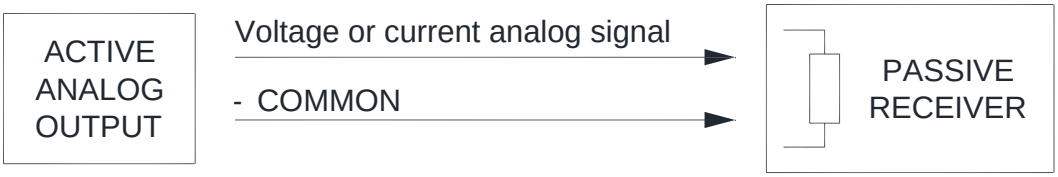




CONNECTION LEGEND

VCC	+SUPPLY (12/24 VDC)
GND	-SUPPLY (12/24 VDC) ANALOG OUTPUT COMMON
4-20 mA	+ANALOG OUTPUT 4÷20 mA
0-10 V	+ANALOG OUTPUT 0÷10 V
-EX	-LOAD CELL EXCITATION
+EX	+LOAD CELL EXCITATION
-SIG	-LOAD CELL SIGNAL
+SIG	+LOAD CELL SIGNAL

All analog outputs of the instrument are ACTIVE and SINGLE ENDED type, therefore they can be connected only to PASSIVE receiver devices. The minimum load allowed for voltage outputs is 10 kohm, the maximum load allowed for current outputs is 300 ohm.



INSTRUMENT COMMISSIONING

The instrument can work in one-way or two-way applications.
In one-way applications, under tension or compression, the minimum output value (4 mA or 0 V) corresponds to the minimum load, and the maximum output value (20 mA or 10 V) corresponds to the maximum load.
In two-way tension/compression applications, the minimum output value (4 mA or 0 V) corresponds to the maximum negative load, and the maximum output value (20 mA or 10 V) corresponds to the maximum positive load.

TLC

Set the DIP switches based on the load cell's rated output and its operating mode

RATED OUTPUT	MODE	SW1	SW2	SW3	SW4	SW5	SW6
1 mV/V	one-way two-way	ON OFF	OFF ON	ON ON	ON OFF	OFF ON	-
2 mV/V	one-way two-way	ON OFF	OFF ON	ON OFF	OFF ON	ON ON	-
3 mV/V	one-way two-way	ON OFF	OFF ON	ON OFF	OFF OFF	OFF ON	-

TLC-I – TLC-V

Weld the required resistors onto the PCB according to the load cell's rated output and its operating mode

RATED OUTPUT	MODE	**RS** [ohm]	**RZ1** [ohm]	**RZ2** [ohm]
1 mV/V	one-way two-way	40.2 78.7	8660 6810	499 2260
2 mV/V	one-way two-way	78.7 162	8660 6810	499 2260
3 mV/V	one-way two-way	118 243	8660 6810	499 2260

ZERO AND FULL SCALE CALIBRATION

TLC: it is possible to calibrate only one output at a time (current or voltage).
The adjustment range offered by the trimmers is approximately 10% of the full-scale value.

To achieve the best possible accuracy, it is advisable to repeat the calibration two or three times.

ONE-WAY APPLICATIONS

Example: 4-20 mA output
- unload the weighing system
- adjust the ZERO trimmer to bring the output value to 4 mA
- load the weighing system with a weight equal to 50% of the full scale
- adjust the SPAN trimmer to bring the output value to 12 mA
- load the weighing system with a weight equal to the full scale
- adjust the SPAN trimmer to bring the output value to 20 mA

TWO-WAY APPLICATIONS

Example: 4-20 mA output
- apply the maximum tensile force to the weighing system
- adjust the ZERO trimmer to bring the output value to 4 mA
- apply the maximum compressive force to the weighing system
- adjust the SPAN trimmer to bring the output value to 20 mA

DECLARATION OF CONFORMITY - EU

LAUMAS
Innovation in Weighing

SISTEMI DI PESATURA INDUSTRIALE - CELLE DI CARICO - BILANCE

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SISTEMA QUALITÀ CERTIFICATO UNI EN ISO 9001 - SISTEMA GESTIONE AMBIENTALE ISO 14001 - MODULO D: GARANZIA DELLA QUALITÀ DEL PROCESSO DI PRODUZIONE

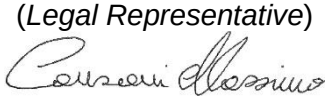
I	Dichiarazione di conformità	Dichiariamo che il prodotto al quale la presente dichiarazione si riferisce è conforme alle norme di seguito citate.
GB	Declaration of conformity	We hereby declare that the product to which this declaration refers conforms with the following standards.
E	Declaración de conformidad	Manifestamos en la presente que el producto al que se refiere esta declaración está de acuerdo con las siguientes normas
D	Konformitäts-erklärung	Wir erklären hiermit, dass das Produkt, auf das sich diese Erklärung bezieht, mit den nachstehenden Normen übereinstimmt.
F	Déclaration de conformité	Nous déclarons avec cela responsabilité que le produit, auquel se rapporte la présente déclaration, est conforme aux normes citées ci-après.
CZ	Prohlášení o shode	Tímto prohlašujeme, že výrobek, kterého se toto prohlášení týká, je v souladu s níže uvedenými normami.
NL	Conformiteit-verklaring	Wij verklaren hiermede dat het product, waarop deze verklaring betrekking heeft, met de hierna vermelde normen overeenstemt.
P	Declaração de conformidade	Declaramos por meio da presente que o produto no qual se refere esta declaração, corresponde às normas seguintes.
PL	Deklaracja zgodności	Niniejszym oświadczamy, że produkt, którego niniejsze oświadczenie dotyczy, jest zgodny z poniższymi normami.
RUS	Заявление о соответствии	Мы заявляем, что продукт, к которому относится данная декларация, соответствует перечисленным ниже нормам.

Models: TLC, TLC-I, TLC-V

Mark Applied	EU Directive	Standards
CE	**2014/35/EU** Low Voltage Directive	*Not Applicable (N/A)* for VDC type EN 61010-1:2010+A1:2019 for 230/115 VAC type
CE	**2014/30/EU** EMC Directive	EN 55011:2016+A1+A11:2020 EN 61000-6-2:2019 EN 61000-6-4:2019

Montechiarugolo (PR), 21/02/2025

LAUMAS Elettronica s.r.l.
M. Consonni
(*Legal Representative*)



DECLARATION OF CONFORMITY - UKCA

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Models: TLC, TLC-I, TLC-V

Mark Applied	UK legislation	Standards
UK CA	**Electrical Equipment (Safety) Regulations 2016**	*Not Applicable (N/A)* for VDC type BS EN 61010-1:2010+A1:2019 for 230/115 VAC type
UK CA	**Electromagnetic Compatibility Regulations 2016**	BS EN 55011:2016+A1+A11:2020 BS EN 61000-6-2:2019 BS EN 61000-6-4:2019

Montechiarugolo (PR), 21/02/2025

LAUMAS Elettronica s.r.l.
M. Consonni
(*Legal Representative*)

On our website www.laumas.com there are videos on the guidelines for correct installation of weighing systems and video tutorials on configuring our transmitters and weight indicators.

All Laumas product manuals are available online. You can download the manuals in PDF format from www.laumas.com by consulting the Products section or the Download Area.
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