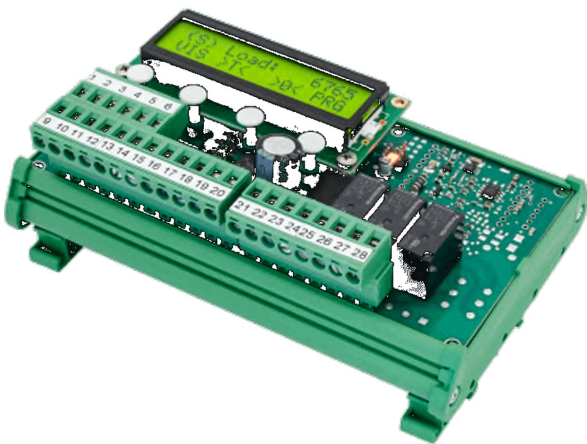
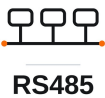


DIGITAL LOAD LIMITER



Type: **ETLD**

- FOR LIFTING SYSTEMS
- UP TO 8 LOAD CELLS
- 3 OR 4 RELAY OUTPUTS
- SAFETY VERSION: PL d



VERSIONS

Single-channel version	one load cell input, 3 relay outputs
Safety version	two independent load cell inputs, 3 relay outputs and one safety relay with guided contacts · category 2 to EN 13849-1, PL d
RF option	integrated radio interface for joining units — single-channel version only, on request
Revisions	Rev 1 and Rev 2 — they differ in the number of terminal contacts and in the relay ratings

Please state version and revision with the order. The IP67 box is listed under accessories.



OVERVIEW

The ETLD is a digital transmitter and load limiter for lifting systems. It reads up to eight load cells of 350 Ω in parallel, shows the load on a backlit LCD of two lines by sixteen characters, and switches three relays when the alarm and pre-alarm thresholds are reached. Four keys and the display do the whole set-up; calibration is theoretical, by keyboard, or real, with sample weights. RS485 and RS232 carry the weight to a PLC, to a PC or to a remote display, and the same RS485 — or the RF option — joins several units into one system of up to four weighing points, so that both the single load and the sum are limited. The safety version adds what a safety chain needs: two independent inputs for a double bridge load cell and a fourth relay with guided contacts, monitored in real time, which makes it category 2 to EN 13849-1, PL d — comparable to SIL 2 of EN 62061. The housing of 140 × 93 × 65 mm sits on an Omega or DIN rail behind the panel, or in an IP67 box.

MEASUREMENT AND LIMITING	OUTPUTS, DEVICE AND SUPPLY
• Up to 8 load cells of 350 Ω, supply 4 V DC • A/D 24 bit, measure range ± 3.9 mV/V • Linearity < 0.01 % of full scale • Thermal drift < 0.002 % of full scale per °C • Digital filter 0.25 ... 3 Hz, 3 conversions/s • Alarm and pre-alarm thresholds, hysteresis • Limiting of single load and of the sum • Up to 4 weighing points by joined units	• 3 changeover relays 30 V DC / 250 V AC • Safety version: 3 changeover + 1 safety relay • 2 optoisolated digital inputs, 12 / 24 V DC • RS485 and RS232, 1200 ... 115200 bit/s • LCD display 2 × 16 characters, 5 mm, 4 keys • Dimensions 140 × 93 × 65 mm, terminals included • Omega or DIN rail, or 4 screws, or IP67 box • Supply 24 ... 48 V DC / AC, 6 VA, class III



TECHNICAL DATA

INPUT AND MEASUREMENT

Number of load cells	up to 8 of 350 Ω in parallel, by junction box
Load cell supply	4 V DC · protected against short circuit
Cell input	single bridge up to 3.9 mV/V — safety version: two independent channels for a double bridge cell
A/D converter	24 bit
Measuring range	± 3.9 mV/V
Conversions per second	3
Digital filter	0.25 ... 3 Hz

PRECISION

Linearity	< 0.01 % of full scale
Thermal drift	< 0.002 % of full scale per °C

ENVIRONMENT AND MECHANICS

Operating temperature	-10 ... +50 °C
Storage temperature	-20 ... +60 °C
Humidity	85 %, no condensation
Insulation	class III
Dimensions	140 × 93 × 65 mm, terminal blocks included
Mounting	Omega or DIN rail behind the panel, 4 screws, or an IP67 box
Terminal contacts	single-channel Rev 1: 28 contacts, pitch 5.08 mm · Rev 2: 29 contacts, pitch 5.00 mm · safety version Rev 1: 31 · Rev 2: 32

FUNCTIONS

Limiting	alarm and pre-alarm thresholds, delay, polarity and hysteresis per output
Alarm	independent general alarm relay · signal on load cell connection failure
Joining units	summing and limiting over RS485, or over the RF option of the single-channel version — 868 MHz, 7 channels, about 50 m
Calibration	theoretical by keyboard, or real with sample weights · linearization
Zero	tare zero setting · automatic zero at power-on · gross weight zero tracking
Counters	lifting operations and operating time, with the SAFETY function switched on
Check	continuous check of the load cell connection integrity

OUTPUTS AND INTERFACES

Relay outputs, single-channel	3 changeover contacts — 30 V DC / 250 V AC, 2 A
Relay outputs, safety version	4 — three changeover contacts and one safety changeover contact, guided and monitored in real time — 30 V DC / 250 V AC, 2 A
Digital inputs	2 optoisolated, 12 / 24 V DC, clean contact · status read over the serial protocols
Serial ports	RS485 and RS232 · ASCII (SLAVE and WEIGHT) and the protocol for remote displays · continuous one way transmission
Baud rate	1200, 2400, 9600, 19200, 38400, 57600, 115200 bit/s
Cable length	5 m on RS232 · 500 m on RS485

DISPLAY AND OPERATION

Display	backlit LCD, 2 lines of 16 characters, 5 mm high · 4 LEDs of 4 × 3 mm · keypad with 4 mechanical keys
Status	one status LED per relay and one for the instrument
Set-up	by 4-key keypad and display, protected by a password
Display increments	0 ... 4 decimals · × 1 × 2 × 5 × 10 × 20 × 50

POWER SUPPLY

Supply voltage	24 ... 48 V DC / AC
Power consumption	6 VA

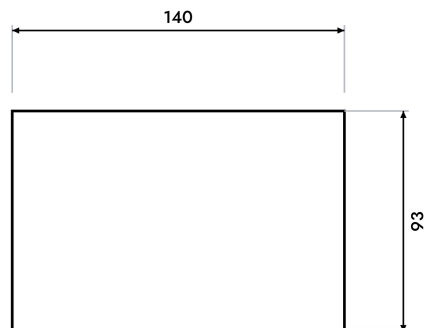


ELECTRICAL CONNECTION

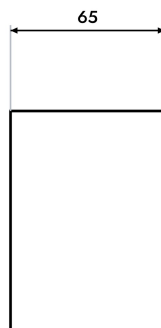
1	-Load cell supply	19	+ / ~ Power supply
2	+Load cell supply	20	- / ~ Power supply
3	+Reference	21	Relay 1 common (alarm)
4	-Reference	22	Relay 1 NC (alarm)
5	-Signal cell 1	23	Relay 1 NO (alarm)
6	+Signal cell 1	24	Relay 2 common
9	COM1 — TX (RS232)	25	Relay 2 NC
10	COM1 — RX (RS232)	26	Relay 2 NO
11	COM1 — GND	27	Relay 3 common
12	COM2 — A + (RS485)	28	Relay 3 NC
13	COM2 — B - (RS485)	29	Relay 3 NO
16	Input 1		
17	Input 2		
18	Input common		

Legend of the single-channel version, Rev 2; terminals 7, 8, 14 and 15 are not used there. For 4-wire cells jumper 1 with 4 and 2 with 3. On the safety version terminals 7 and 8 carry the second cell signal and terminals 30, 31 and 32 the lock relay 4 (common, NC, NO); the rest is the same. Rev 1 has one contact less and relay 1 without an NC contact. Manufacturer types: LCD3 (single-channel version), LCD3PL (safety version).

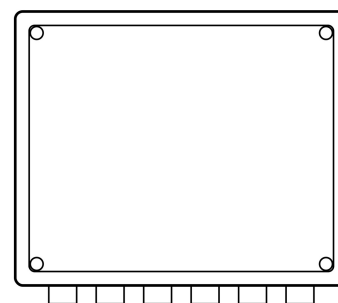
DIMENSIONS (mm)



Top view



Side view



IP67 box · 170 × 140 × 95 mm
4 × Ø 4 mm · 6 cable glands M16 × 1,5

140 × 93 × 65 mm including the terminal blocks; the outline is schematic. Beside it the polycarbonate IP67 box, 170 × 140 × 95 mm.



COMPLIANCE AND CERTIFICATION



EN 13849-1

category 2, PL d — comparable to SIL 2, EN 62061 · safety version

The performance level applies to the safety version with its safety relay only. Single-channel version: equivalent of the CE marking for the United Kingdom.

ACCESSORIES AND OPTIONS

IP67 box, polycarbonate	polycarbonate, 170 × 140 × 95 mm · 4 fixing holes Ø 4 mm, centre distance 152 × 122 mm · transparent cover
Box openings	the same box with 4 + 2 cable glands M16 × 1.5 and plugs, or with 4 + 2 PVC end-fittings for sheath
RF interface	868 MHz, 7 channels, average range 50 m — single-channel version only
Junction box	for connecting up to 8 load cells in parallel

The device itself carries no protection class; it comes from the box or from the panel the device is built into.

