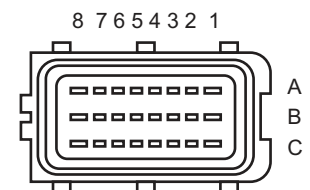


Differential load limiter



Overall dimensions: 138 x 110 (147 with connector) x 38 mm
 Drilling interaxis: 119 x 99 mm (n° 4 screw M5)



Pinout FCI connector (24 ways)

A1 - Power supply	B1 - RX serial comm.	C1 - TX serial comm.
A2 - +V transducer 1 supply	B2 - +V PRG2 supply	C2 - PRG2 ground signal
A3 - +V transducer 2 supply	B3 - ground for 90% signal	C3 - ground for 100% signal
A4 - +V RESET sw. supply	B4 - +ELV1 signal	C4 - not used
A5 - +V DECR. sw. supply	B5 - ELV1 ground	C5 - not used
A6 - input TRANSD. 2 (P)	B6 - input TRANSD. 1 (P)	C6 - input RESET
A7 - DV input	B7 - input DECREMENT	C7 - not used
A8 - Emergency input	B8 - Emergency output	C8 - GND

Features

Power supply range: from 10Vdc, up to 30Vdc.
Connector FCI, 24 ways, IP68, mechanical polarization, easy locking cam.
Maximum output current supply: 3A

In the respect of EN 954-1 the safety features belong to category 2

CLG-D Load Limiter Control Unit has been designed to measure the differential pressure of the hydraulic cylinder of the first boom.

The pressure readen is always the difference between the pressure of the two chambers of the cylinder: the bottom chamber (or cap end) and the piston rod side chamber (or rod end).

To have an accurate pressure measurement it is necessary to know the area ratio of the piston.

The Pressure Transducer no.1 (cable 5) must be installed in the bottom chamber (cap end).

The Pressure Transducer no.2 (cable 6) must be installed in the the piston rod side chamber (rod end).

This is requested for the good working of the CLG-D Load Limiter.

Two different working areas with two different load limits.

Fast and easy programming sequence.

Human machine interface

The green led on the board, in normal operation mode, is lighten to show the power supply.

When faults are present, the green led blinks following a particular sequence related to the fault reasons. (look at the last page for a detailed blinking sequence meaning).

Also, it is present a LED bargraph to show the load percentage in real time, compared to the maximum load. When the load exceeds the 100% of the limit, red LED of the bargraph blinks.

In RESET condition, it is not allowed that the differential pressure increases; if this occurs, the ELV1 output is blocked before the end of the standard RESET time.

This function can be disableb by the crane manufacturer with a PC serial connection software.

Leds placed into the emergency button box (red colour and yellow colour), are lighten in the following situations:

- When emergency button is pressed, the red button and the yellow button blink together.
- When the load exceeds the 90% of the limit, yellow led is ON.
- When the load exceeds the 100% of the limit, red led is ON.

Input

- RESET: That input allows the load limiter to power the valve for a short period, even if the load value exceeds the load limit.
- LIMIT REDUCTION: It is used to set the working area. When it is low value, then the load limiter compare the pressure from the transducer with a reduced threshold.
- 2 PRESSURE transducer inputs: 4÷20 mA.
- INPUT DV: It allows to connect the load limiter to a remote control in a safety way.
- DIFFERENT POWER SUPPLY for logic control unit and powered OUTPUT.

Output

- Powered output to drive bypass valve coil. The board implements a feedback current control on the mentioned output.
- Two powered output to drive external optional lamps. The mentioned outputs are driven as well as the leds into emergency button box (90% and 100%).

Setting parameters by crane manufacturer

The load limiter's thresholds are programmed using an external, little, 4 buttons, keyboard. The keyboard is an optional. Its name is "PRG-CLG". When it is connected the green led blinks four times in a second. In order to set whole the load limiter's parameters and download the working configuration, an optional serial interface can be used to connect the PC to the load limiter. The program interface is named SepSim.

In the CLG-D Load Limiter it also necessary to set (only with SepSim software) the area ratio of the piston, required to calculate the differential pressure.

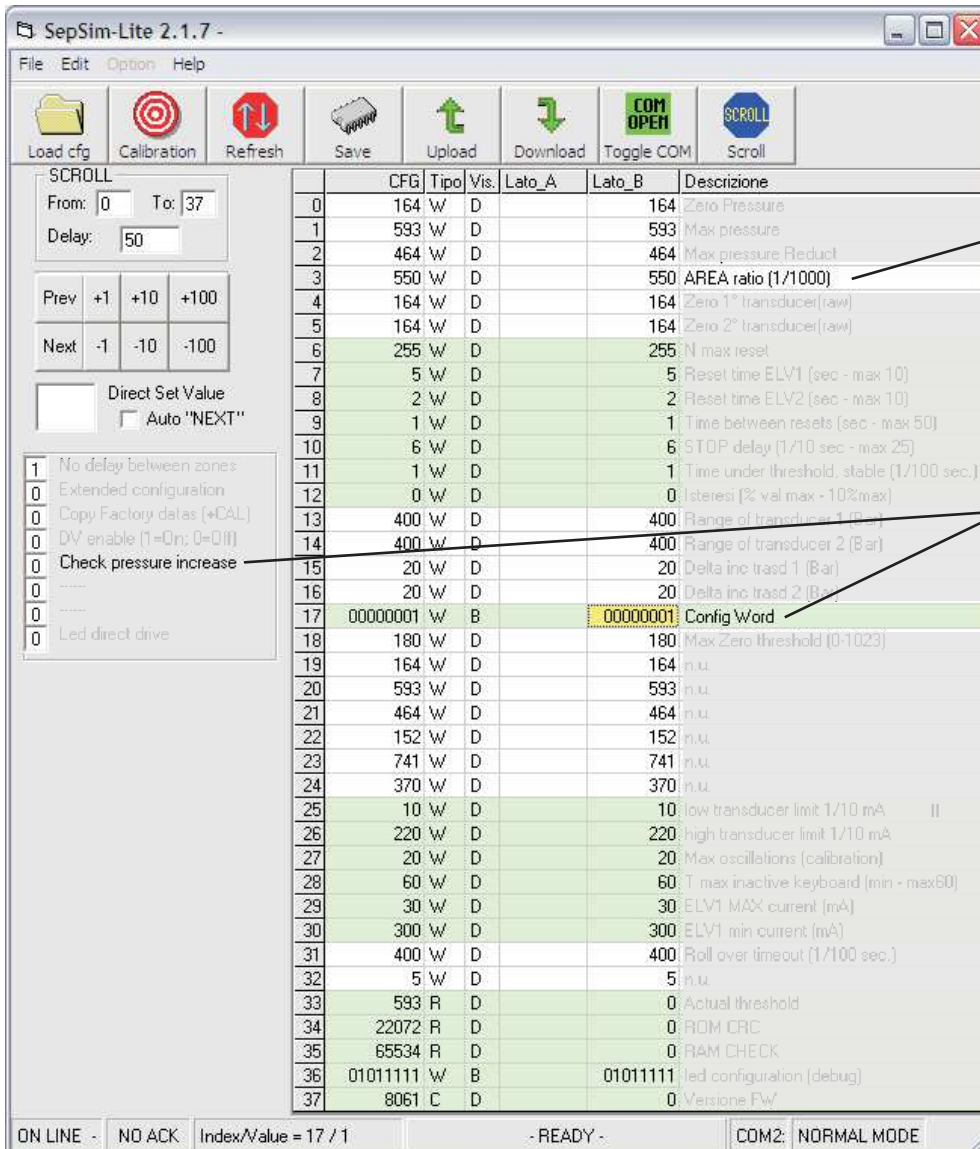
Setting parameters by final user

The final user uses a different programmer "PRG2-DEC", which is only allowed to decrease the manufacturer thresholds. Moreover the programmer is able to recall the manufacturer parameters.

Hardware key to increase the load limit threshold

The PRG2 (either CLG version or DEC version) can be used even to increase the load limit threshold up to 125%, for a brief period of time.

In order to increase the limit: when you connect the PRG2, the "+" button has to be pressed within 5 seconds then kept pressed till the green led blinking will becomes slower.



AREA RATIO

This parameter expresses the ratio of the piston rod side chamber area (rod end area) divided by the area of the bottom chamber (cap end), multiplied by 1000.

CONFIG WORD

Set to 1 the *Check pressure increase* bit to perform this check: in RESET condition, it is not allowed that the differential pressure increases; if this occurs, the ELV1 output is blocked before the end of the standard RESET time. This function can be disabled by the crane manufacturer with this bit.

**ELECTRONIC BOARD
CLG-D**

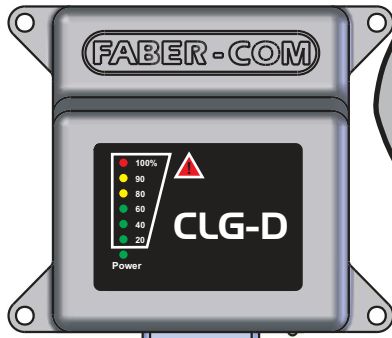
Ordering code PCLDE : Control unit only.
Ordering code PCLDS2 : Control unit + cabling.



+ Battery
90%
100%

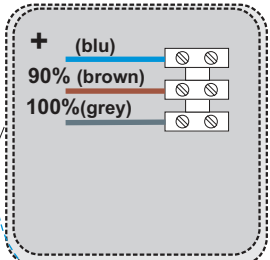
Trasduttori di pressione,
due fili, 4÷20 mA

Not included in the
scope of supply

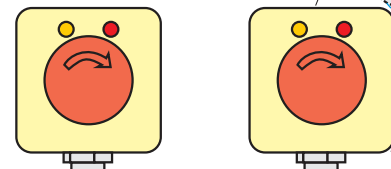


2x0.75 L=5.0m
(protection conduit øext.=11mm)

wire 0,5mm² L.: 30 cm.
to connect the remote control DV
(hidden under the conduit)



EMERGENCY BUTTONS
with LED 90% and 100%



CABLES

Connector to plug
the PRG2_CLG

3x0.75
L=0.25m

2x1+2x0,5
L=1.1m

2x1+2x0,5
L= 2,5 m

3x0,75

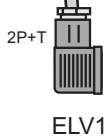
POWER SUPPLY

+ Red
- Black

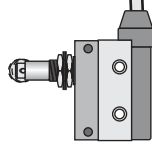


2x1.5
L=1.5m

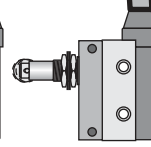
2x1
L=1.0m



2x0.75
L=1.2m



reset

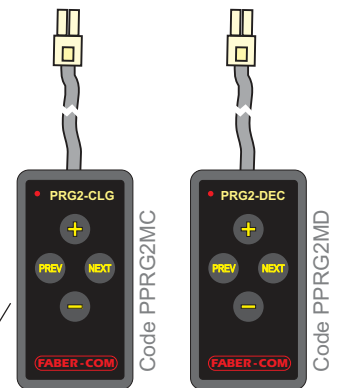


limit reduction

2x0.75 L=2.0m
(protection conduit ø ext.=11 mm)

Programming keyboard PRG2-CLG

Programming keyboard PRG2-DEC



LED BLINKING IN CASE OF ERROR

When an error occurs the green led, near the main connector, start blinking.

Here below you can see a table to summarize the green led blinking and a brief description of the related error.

CLG STATE	BLINKING		DESCRIPTION
	<i>Slow sequence</i>	<i>Fast sequence</i>	
WORKING STATE	1	1	Input from transducer 1 exceeds the maximum working limit.
	1	2	Input from transducer 1 is lower than minimum working value.
	2	1	Input from transducer 2 exceeds the maximum working limit.
	2	2	Input from transducer 2 is lower than minimum working value.
	3	1	The current value on the valve 1 is outside the normal working range.
	3	2	The current value on the valve 2 is outside the normal working range.
	4	2	The input transducer 1 is in protection mode.
	4	3	The input transducer 2 is in protection mode.
	4	4	Relay broken because of the welded contacts.
AUTOTEST	5	1	FLASH MEMORY ERROR.
	5	3	It is not possible to close the relay. The outputs are not powered.
	5	4	There is current flowing on the valve coil even though the CLG is not driving the related output.
	5	5	There is current flowing on the transducer even though the CLG gives no power to it.
	5	7	There is current flowing on switches even though the CLG gives no power to it.

CLG STATE	BLINKING	DESCRIPTION
ANY TIME	LED 100% + LED 90% blinking together	Emergency button pressed