Galcon

L485

Agriculture Control

Kfar-Blum 1215000, Tel. 972-4-690-0222, Fax. 972-4-690-2727
E-Mail: info@galconc.com, www.galconc.com


Galcon

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L485

Communication line amplifier + RS232-RS485 protocol adapter + galvanic isolation surge protection device.

L485 is a combination of 3 functions in one product:

a. RS232 to RS485 (Half duplex) protocol converter and vice versa.

b. Surge and lightning protection from all 3 sides (Line, device and power source)

c. Communication amplifier

The **L485** enables network connection to whatever device with own soft or hard ID. The device were originally designed to provide communication solutions for Galcon products: Agricultural controllers of Galileo and compact family.

Power consumption:

Model	24V
consumption	3.2W
Max operation V	216
Min operation V	21

Ground connection through power socket = 1
Ground connection through box body = 1

Communication specifications:

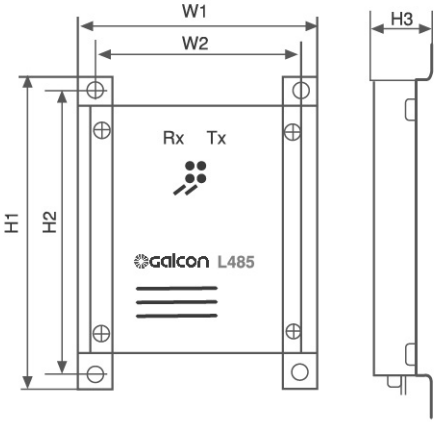
Comm. baud rate	Maximal elapsed distance	remarks
4,800	5,000 m	
9,600	2,500 m	
19,200	2,000 m	

Communication cable(RS485 side):

Minimum size: 2 x 0.5 mm + shield cable.
Maximum size: 2 x 1.5 mm + shield cable.

Dimensions and weight:

W1 = 167mm
W2 = 147mm
H1 = 242mm
H2 = 222mm
H3 = 52mm
Weight = 800gr



Temperature:

Maximum: 45°C 110°F
Minimum: -18°C 0°F

Galileo w:

Galileo card fit into the Galileo w wex box thus there is no need for the external box shown above.

Mounting and placement:

The unit must be mounted in a shaded dry place. If your device is a controller on an Integrated irrigation machine – mount the L485 on the machine frame. If your device is a stand-alone controller – mount the L485 on the wall or on the wooden board next to it. Due to temperature preserve reasons, the L485 is made in a non-waterproof case. Avoid any sprinklers or water splash in its close surrounding. Avoid direct sun-hit.

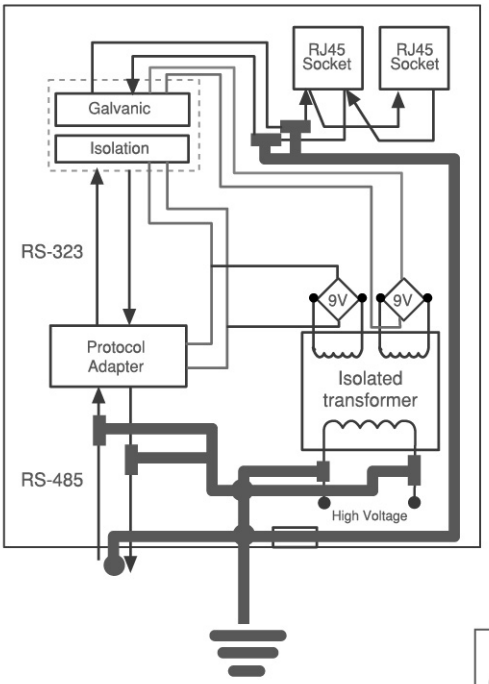
EMC (Electromagnetic compatibility)

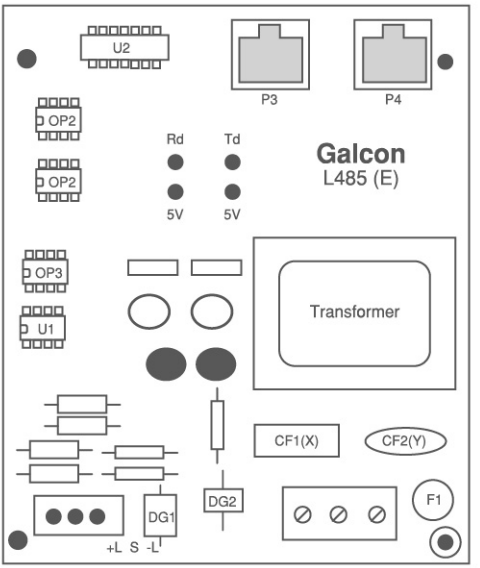
EFT/B spec. references	Test method
EN 50082-2:1995	EN 61000-4-4:1995

IEC (according to components manufacturer)

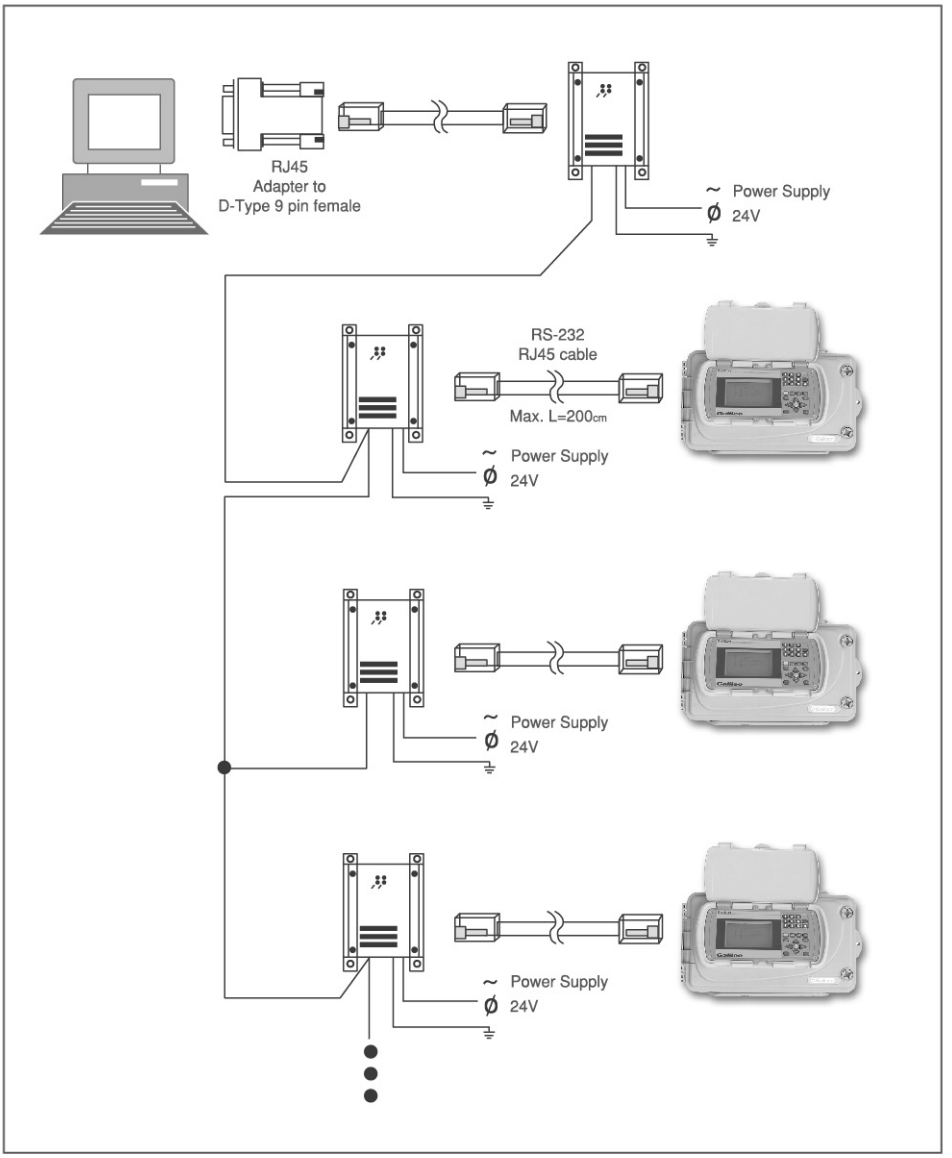
EN 61000-4-5:1995
Line: 8 kV contact discharge
15kV air-gap discharge

Card scheme and operation principle:





Application layout:



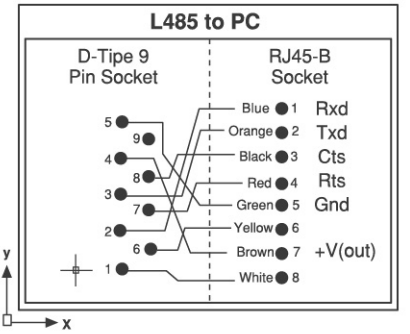
The RS-485 standard is specified for applications with multipoint connections. A network will include a master unit that initiate the call, and a number of self identified units. Only the unit that were referred by the master is permitted to answer the call. The identification may be in the software of the device, or by a switching hardware.

Although the protocol supports either full duplex with 2 pares of wires and Half duplex with just one pare, the L485 is a device for half duplex only. All it needs is a wire with 2 cores and shield. The shield core have to be connected only in one of the units in the whole network. Pick the point with the best grounding in the network and connect the shielding core of the communication cable to the S mark.

Connecting the shielding of the communication cable:
The S mark on the communication cable connection is connected to the ground via the L485 card. In case of a surge hit in the communication cable, it is good to have some shielding conductor that will give an effect of channeling the surge to the ground. However, Connecting the shielding to several remote points is not a good idea: differences in ground potential may cause a fluently current via the communication cable. Choose one node with a good grounding, and connect the shielding cable to the S point only there. The other units will remain unconnected unless the whole ground connection itself is one comprised net.

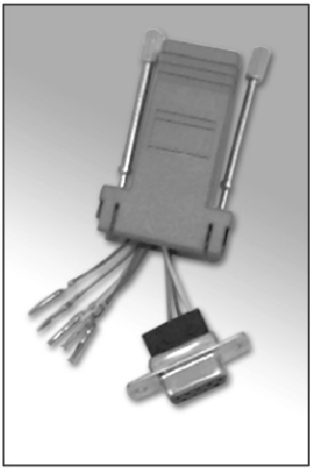
Device side:
Use standard RJ45 cable to connect the controller to either P3 or P4 sockets. A 2m cable comes as part of the product kit. We strongly advise to keep the distance between the device and the L485 as short as possible, for there are usually no farther protection at the device side. A long cable may capture more surge that potentially harm the device and make you lose big part of the benefit of using L485. An application as such may still function up to 50m long or even more (The characteristics of RS232), but yet, the risk is high and there might be warrantee expiration of the protected device

PC adapter plug:
The RS485 adapter plug comes as part of the Galileo PC software kit. In case you purchase the units to a different system then Galileo center – you should also explicitly order the plug. This plug will suit most known PC workstations, where Rd in pin 2 , Td in pin 3, and Gnd in pin 5. if the PC port is not an ordinary one – you can buy an unmade plug and “make” it according to the PC specification.



Device side sockets:
2 RJ45 sockets: (Pin 1 = Left)

The 2 sockets are for easy connection of different kind of devices. Pin 1 and pin 2 are swapped. The bridge between pin 3 and 4 in P3 is actually effect both sockets. Find the suitable functions in your device and use the best connection to your needs.



Galcon's Devices: P3 is suitable to all Galileo family. P4 is suitable to Gal Compact and Compact 2000.

Socket	P3	P4
Pin 1	Rdx	Txd
Pin 2	Tdx	Rxd
Pin 3	Cts	Cts
Pin 4	Rts	Rts
Pin 5	Common	Common
Pin 6		
Pin 7	+V	Common
Pin 8		+V

Communication troubleshoot:

A chain of LEDs (Light Active Diodes) are indicating the communication status. In order to trace the problem you must understand the specific communication hierarchy of the system you apply.

In Galieo or In Galcon's comunication system, the communication always dominated by the PC. Only the PC can call a controller, and a controller can only transmit as answer to a call from the PC.

When the PC calls a controller - You expect to see a blink of the Td (top right) LED in the L485 unit near the PC. In case there isn't:

1. Check if the referred COM port in the application (Elgal server or else) is the one you are really using.
2. Check the RJ45 cable between the L485 and the PC, Verify heaving the correct plug (marked as RS485).
3. Check the power supply as indicated by 2 bottom LEDs.

If the Td LED stay ON it is an indication for short wire in the communication cable, or swapped poles somewhere in the network.
When Td LED blinks as expected – look for the Rd blinks in the L485 unit at the receiving controller.
If the Rd LED in the L485 unit at the receiving controller doesn't blink:

1. Most likely to have a cut in the cable.
2. Check for fluctuating voltage between +L and –L on both sides of the cable
   a) If voltage higher then 1V measured on both sides – Replace the receiving card.
   b) If voltage lower then 1V measured on the transmitting sides – Replace the transmitting card.

If the Rd LED in the L485 unit at the receiving controller blinks well – Go next to the Rd LED in the controller's CPU card.
If the Rd LED in the controller's CPU card doesn't blink:

1. Check the RJ45 cable between the L485 unit and the controller.
2. Replace the L485 card near the controller.

If the Rd LED in the controller's CPU card blinks well, proceed to the Td LED on the controller's CPU card.
If the Td LED on the controller's CPU card doesn't blink**:**

a) Verify that the communication baud-rate is identical both in the controller and the PC.
b) Verify that the controller's number is the one you attempt to communicate.
c) If (a) is positive - The communication port in the controller's CPU card is damaged. Replace the CPU card.

If the Td LED on the controller's CPU card blinks well, proceed to the Td LED on the L485 unit near the controller.

If the Td LED on the L485 unit near the controller blinks well, proceed to the Rd LED on the L485 unit near the PC.

If the Rd LED on the L485 unit near the PC doesn't blink (assuming you have checked the wire before) – Replace the L485 unit.

If the Rd LED near the PC blinks but still no communication:

1. Check the baud speed again, both on the Elgal server and the controller (code 71 #2). They must be identical.
2. The PC communication port might still have a problem in the receiving channel.

Ordering Information:

L485 assembly for 24V:	catalog No. AMCM6L01
L485 card only for 220V:	catalog No. AMCM1L01
L485 assembly for 110V:..	catalog No. AMCM3L01
L485 assembly for Galileo W 24V:	catalog No. AMCM6L11
L485 card only:	catalog No. AMC0903
C485 card only (L485 DC):	catalog No. AMC0933

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