



isel iLC10 Module

Instruction Manual

Hardware Description

Item no. 970321 CD001
Last update: 04/2008

The information, technical data and dimensions contained in this manual correspond to the best available technology at the time of publication. Nevertheless existing misprints and errors cannot be excluded. We are always grateful for improvement suggestions and error hints.

We point out to the fact that software and hardware names of the respective companies that are used in our prints are generally subject to trademark or brand or patent protection.

Alle rights reserved. No part of our prints may either be reproduced in any form (print, photography or another procedure) or processed, copied or published by using electronic systems without written permission of iselautomation GmbH & Co. KG.

Manufacturer: **iselautomation** GmbH & Co. KG
Buergermeister-Ebert-Straße 40
D-36124 Eichenzell

Tel.: +49 (0) 66 59 981-0
Fax: +49 (0) 66 59 981-776
E-Mail: automation@isel.com
Web: <http://www.isel.com>

Table of Content

1	Introduction	1
2	Safety Instructions	2
3	Technical Data	3
4	Module Overview	4
5	Connector Pin Assignment	5
6	Jumper	8
7	Application	9
7.1	Basic Connection	9
7.2	Digital Inputs	9
7.3	Digitale Outputs	10
7.4	Analog Input	10
7.5	Interrupt Inputs	11
7.6	PWM Output	11
7.7	Clock/Direction Outputs	12
8	Diagnostics	12

1 Introduction

The iLC10 module is a powerful PLC controller for decentralized automation. Together with the PLC programming system CoDeSys (IEC61131-3), the module can be used as CANopen master or as slave. Some examples for slave modules:

Positioning modules for numeric axes, e.g. iMD10 from iselautomation, HF frequency converters for work spindles, I/O modules for binary (analog) input and output, e.g. CAN I/O module from iselautomation

The design of the iLC10 of module is in style of the design of the CAN I/O module series from iselautomation.

The implemented PLC programming system CoDeSys from 3S is one of the most powerful programming systems under Windows® for controllers in accordance with IEC61131-3.

All 5 programming languages of this standard are supported. Additionally a graphic editor is available for free programming with functional modules.

Communication between iLC10 and the CoDeSys programming tools takes place by using the integrated RS232 interface.

This also enables "online debugging" as well as visualization.

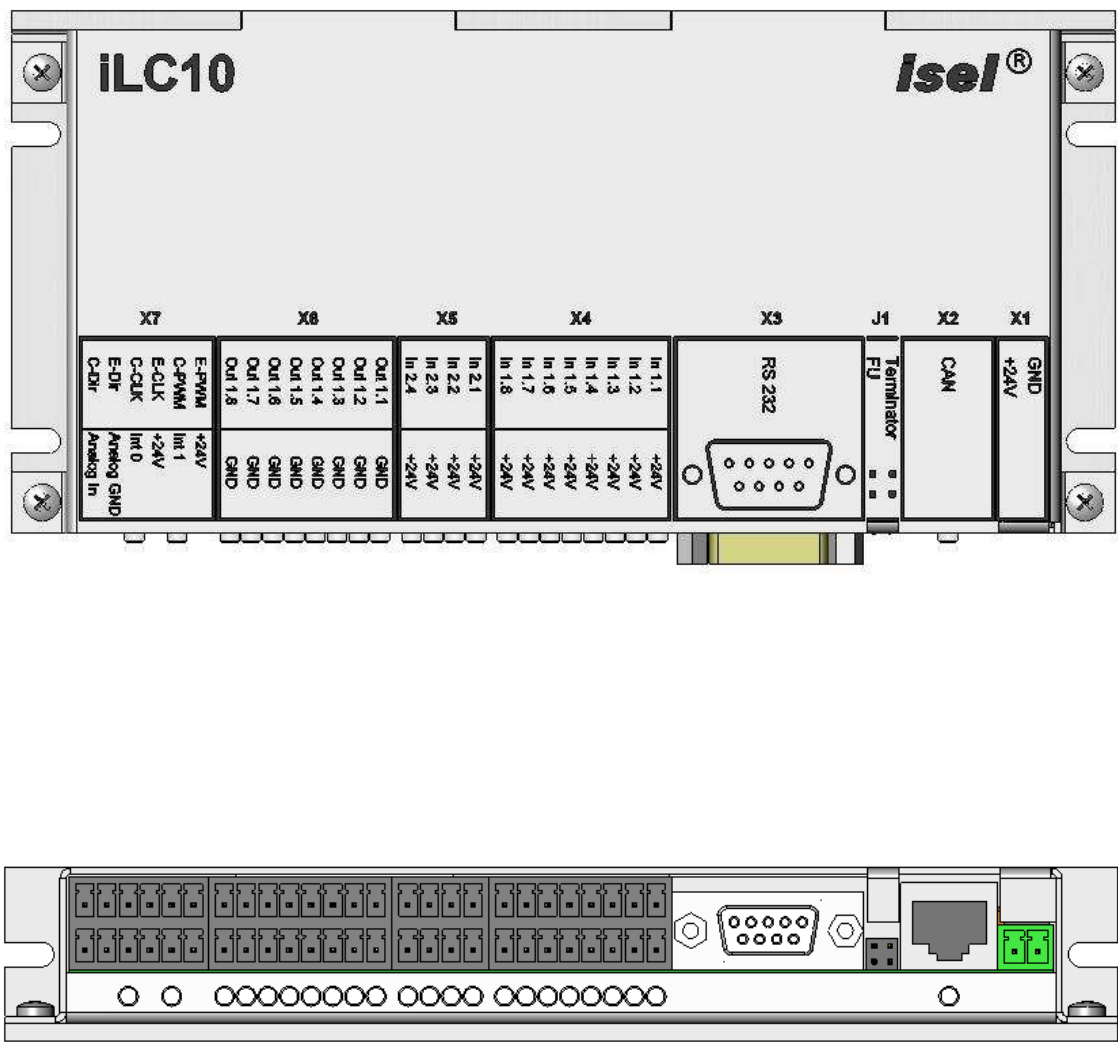
2 Safety Instructions

- The iLC10 module is designed according to the current state of the art and the accepted safety-relevant rules.
- The device may only be actuated in perfect technical condition. Failures are to be eliminated immediately. Children and persons that are not instructed may not put the device into operation.
- The equipment may only be used for the intended purpose.
- All work is to be accomplished exclusively by authorized technical personnel and with consideration of the regulations of the electrical industry as well as the rules for the prevention of accidents.
- Assembly and employment of the equipment is to be accomplished according to the standards of the declaration of conformity. The regulations and limit values kept by the manufacturer do not protect in case of inappropriate use of the equipment.
- The equipment may not be exposed to high air humidity and high vibrations (see technical data).
- Keep this operating instructions in a safe place and commit each user to its observance!
- Non-observance of this instruction manual can result in damages to property, heavy bodily injuries and death.

3 Technical Data

Item no.:	390239 0000
Dimensions:	85 mm (W) x 180 mm (H) x 28 mm (D)
Weight:	320 g
Protection class:	IP20
Supply voltage:	24 VDC (Logic voltage), 24 VDC (Process voltage)
Power consumption:	160 mA (Logic and relay) I_{Load} depends on the external wiring
Ambient temperature:	5°C up to +40°C
Storage temperature:	-25°C up to +70°C
Humidity:	max. 95%
CPU:	16 Bit CPU Kernel
Program memory:	16 KByte
Data memory:	32 KByte
Flash meory:	4K Byte
Cycle time:	250 Instructions/ms
Digital inputs:	12 via optocoupler (input current approx. 8 mA) 11 when using the analog input
Digital outputs:	8 8 x electronic, $I_{max} < 350$ mA (thermal protection, short-circuit protection)
Analog input:	1 0...10 V, 10 Bit resolution ($R_i = 2$ KOhm)
Interrupt inputs:	2
Special I/O's:	- Clock/direction output for connecting a power amplifier with clock/direction inputs - PWM output
Interfaces:	1 RS232 programming and visualizing interface (57600 Baud, 8 DB, no parity, 1 SB) 1 CAN Bus RJ45 (up to 1 MBaud) according to CAN specification V2.0
Fuse:	250 mA / 250 V fast-blow

4 Module Overview



5 Connector Pin Assignment

X1 - Supply Voltage

Phoenix Mini Combicon 2-pole

Connector	Pin	Signal	Description
X1	1	GND	Logic voltage GND
	2	+24V	Logic voltage +24VDC

X2 - CAN

RJ45 Plug connector

Connector	Pin	Signal	Description
X2	1	n.c.	not connected
	2	n.c.	not connected
	3	n.c.	not connected
	4	CAN_H	Signal CAN_high
	5	CAN_L	Signal CAN_low
	6	CAN_GND	GND
	7	n.c.	not connected
	8	n.c.	not connected

X3 - RS232

SubD9 Plug connector

Connector	Pin	Signal	Description
X3	1	n.c.	not connected
	2	RxD	Receive Data
	3	TxD	Transmit Data
	4	n.c.	not connected
	5	GND	GND serial interface
	6	n.c.	not connected
	7	n.c.	not connected
	8	n.c.	not connected

For data transmission, this interface is to be connected to the COM port of the programming computer. This is done by using a standard null modem cable (contained in the scope of supply).

X4 - Input Ports

Phoenix Mini Combicon 8 x 2-pole.

Connector	Bottom pin	Signal	Description
X4	1	+24V	
	2	+24V	
	3	+24V	
	4	+24V	
	5	+24V	
	6	+24V	
	7	+24V	
	8	+24V	
	Top pin		
	9	In 1	Bit 0
	10	In 2	Bit 1
	11	In 3	Bit 2
	12	In 4	Bit 3
	13	In 5	Bit 4
	14	In 6	Bit 5
	15	In 7	Bit 6
	16	In 8	Bit 7

X5 - Input Ports

Phoenix Mini Combicon 4 x 2-pole

Connector	Bottom pin	Signal	Description
X5	1	+24V	
	2	+24V	
	3	+24V	
	4	+24V	
	Top pin		
	5	In 1	Bit 0
	6	In 2	Bit 1
	7	In 3	Bit 2
	8	In 4	Bit 3

X6 - Output Ports

Phoenix Mini Combicon 8 x 2-pole

<i>Connector</i>	<i>Bottom pin</i>	<i>Signal</i>	<i>Description</i>
X6	1	GND	
	2	GND	
	3	GND	
	4	GND	
	5	GND	
	6	GND	
	7	GND	
	8	GND	
	<i>Top pin</i>		
	9	Out 1	Bit 0
	10	Out 2	Bit 1
	11	Out 3	Bit 2
	12	Out 4	Bit 3
	13	Out 5	Bit 4
	14	Out 6	Bit 5
	15	Out 7	Bit 6
	16	Out 8	Bit 7

X7 - Special I/O

Phoenix Mini Combicon 6 x 2-pole

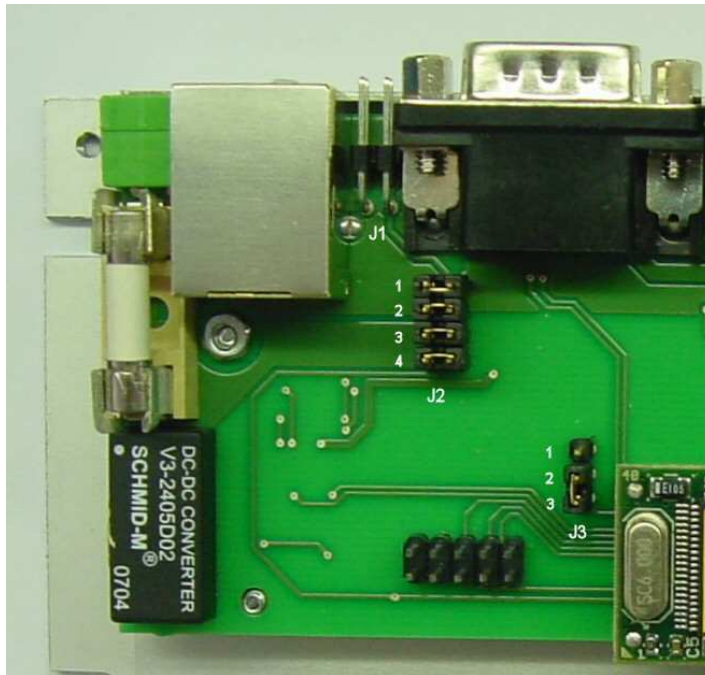
<i>Connector</i>	<i>Bottom pin</i>	<i>Signal</i>	<i>Description</i>
X7	1	+24 V	
	2	Int 1	Input interrupt 1
	3	+24 V	
	4	Int 0	Input interrupt 0
	5	Analog GND	GND for analog input
	6	Analog In	Analog input
	<i>Top pin</i>		
	7	E-PWM	Emitter of the PWM output
	8	C-PWM	Collector of the PWM output
	9	E-CLK	Emitter of the clock output
	10	C-CLK	Collector of the clock output
	11	E-DIR	Emitter of the direction output
	12	C-DIR	Collector of the direction output

6 Jumper

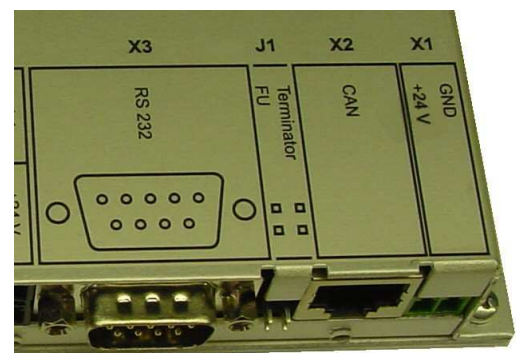
The iLC10 module comes with different internal and external jumpers for the configuration of the module. For changing the configuration of the internal jumpers it is necessary to loosen the four screws of the housing cover and to remove it (Picture 1).

The jumper frame 1 is accessible from outside (Picture 2).

Picture 1



Picture 2



Description:

J1 - Terminator: Terminates the CAN Bus with an 120 Ohm Terminating resistor (if no slave is connected).

FU: Must be bridged, if a firmware update has to be carried out

J2 - If this four-pole jumper is completely bridged, then process voltage and logic voltage are connected and it is possible to work with only one 24 V voltage source. With open jumpers, both voltages are separated potential-free (delivery status).

J3 - Bridge (1 + 2): Input 1.1 works as digital input (delivery status)

Bridge (2 + 3): Input 1.1 works via the terminals X7.Analog GND and X7.Analog In as analog input. Input X4.In1.1 has therefore no function.

7 Application

! Before connecting the iLC10 module, the jumpers should be set according to the requirements (see chapter 6).

7.1 Basic Connection

After the internal jumpers were configured, the module can be installed at its intended place.

The 24VDC supply voltage (logic voltage) is now to be connected with X1 (see connector pin assignment).

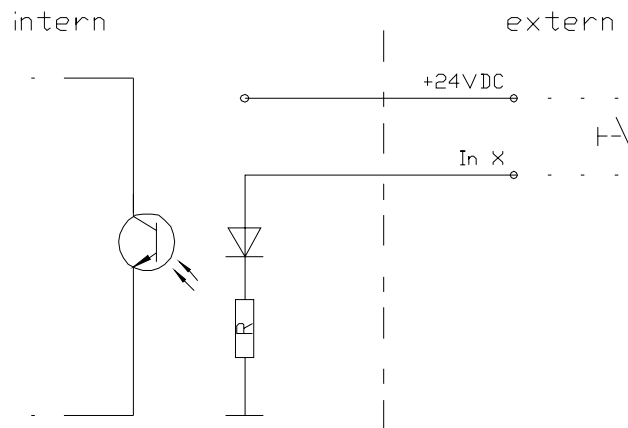
If an additional process voltage is used (J1, 1 to 4 open), then this voltage must also be connected (voltage pins of X4 (X5) and X6).

In case of using an additional CAN slave, this one should now be connected likewise (X2).

! If no additional CAN slave is used, Jumper 1 (terminator) is to be put in place in order to activate the terminal resistance and to thus to terminate the CAN Bus.

7.2 Digital Inputs

The inputs of the iLC10 module are designed in 24VDC technology and can be implemented in your application as follows:

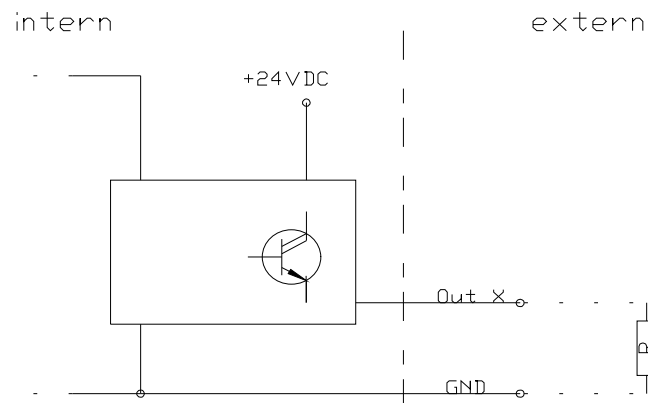


The input load is here approx. 8 mA.

! If the analog input is used (J3 on 2 + 3), In1.1 is not active.

7.3 Digital outputs

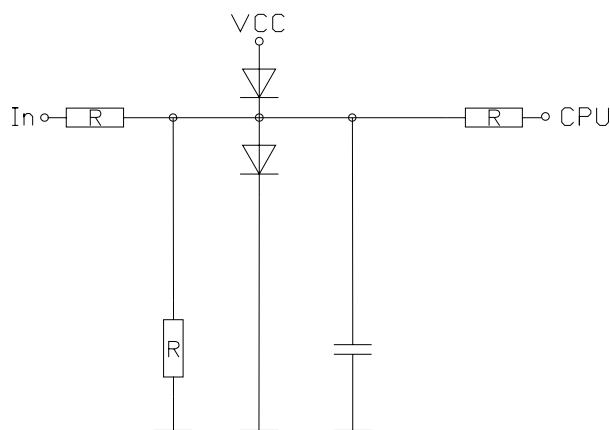
The outputs of the iLC10 module are designed in 24VDC technology and can be implemented in your application as follows:



The switching outputs of both output ports can be loaded with up to 350 mA.

7.4 Analog input

The iLC10-Modul has one analog input for an input voltage range of 0 V...10 V with a resolution of 10 Bit. Here sensors, for example, can directly be connected. The inputs have an input impedance of 2 KOhm and have an RC filter. The transformation time is about 10 μ s, the measured accuracy is 1%. The module can be damaged by applying a voltage ($0V > U > 10V$)..



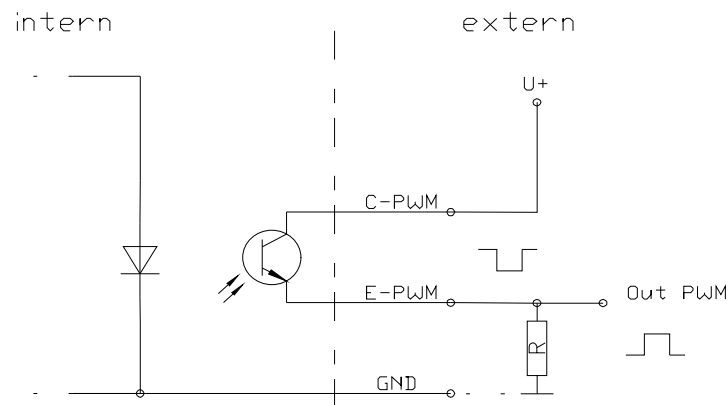
If the analog input is used (J3 to 2+3), In1.1 is inactive. Analog GND and GND don't have the same potential. If they are connected to each others, the galvanic separation of the module is neutralized and the iLC10 module can be damaged. If the connected sensor should be galvanically connected to the process or logic voltage, it is recommendable to use a buffer amplifier!

7.5 Interrupt Inputs

The interrupt inputs are to be wired like the digital inputs. (see 3.5.2)

7.6 PWM Output

The PWM output is used for providing an pulse width modulated signal. The maximum frequency of this signal is 2 KHz. The output is led out by an optocoupler and is thus electrically isolated. For outer wiring however an appropriate working load is to be used according to the selected voltage. This working load is to be dimensioned in such a way that the maximum collector current (50 mA) of the optocoupler is not exceeded.



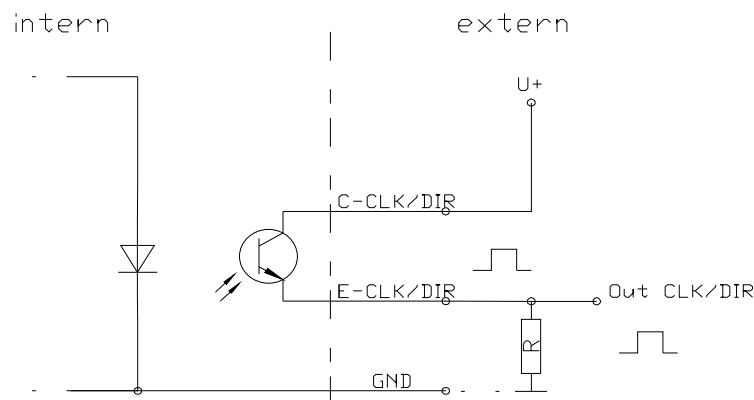
For integration, the library "FBE_Pulse215.lib" is required.

7.7 Clock/Direction Outputs

The outputs for clock and direction signals

X7.E-CLK	Clock output emitter
X7.C-CLK	Clock output collector
X7.E-DIR	Direction output emitter
X7.C-DIR	Direction output collector

are used for connecting a stepper motor or servo motor power amplifier with clock/direction inputs. The outputs are led out by optocouplers and are thus electrically isolated. For outer wiring however an appropriate working load is to be used according to the selected voltage. This working load is to be dimensioned in such a way that the maximum collector current (50 mA) of the optocoupler is not exceeded.



8 Diagnostics

The green diagnosis LED (next to plug X2) provides the following status signals by flashing:

0%	on	-	no supply voltage or Defective fuse or program stop; reset is required
10%	on	-	no PLC program on the controller
50%	on	-	PLC program interrupted / not started
90%	on	-	PLC programm runs