Technical Datasheet - Td0036

ACS-9031-00

Digital LCD/TFT LVDS Adapter Kit

General Features

- The ACS-9031-00 is an adapter kit that has been developed by Eurotech to simplify the interfacing of digital LCD displays with Eurotech CPU modules
- For use with CPU-145x, CPU-146x, CPU-147x, CPU-148x and CPU-185x modules
- RoHS Compliant

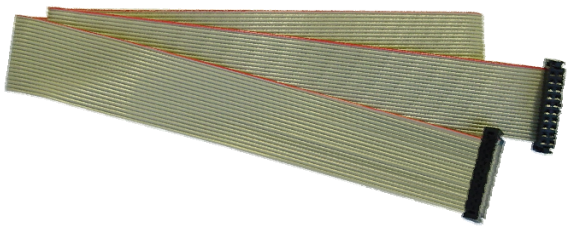
Kit Contents

1x 9C640600S6L: LVDS Receiver

Top

Bottom

1x 7000000145L: LVDS Flat Cable for CPU-185x



1x 9C650600S6L: ZIF Adapter for LCD displays

Top

Bottom

1x 7050000012L: LVDS Receiver to ZIF Adapter connection cable

Flex cable 40-pin (40x1),0.5mm pitch, 80mm length

1x 7030000230L: Power supply cable

1x 7030000235L: Inverter cable

1x 7000000232L: I2C + LVDS connection cable for: CPU-145x, CPU-146x, CPU-147x and CPU-148x

1x 7030000070L: LCD display connection cable

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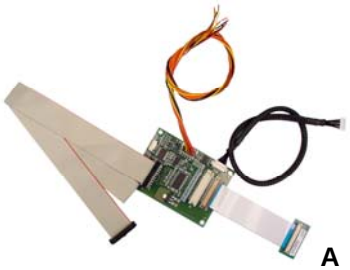
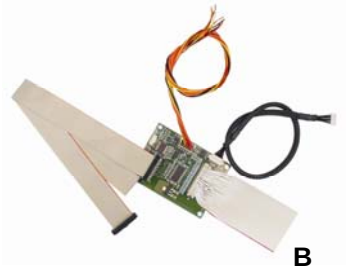
How to interface a display

The ACS-9031-00 adapter kit allows you the following ways to interface a digital LCD display with a Eurotech CPU module.
You have to refer to the display and inverter's documentation to obtain information about pinouts and electrical specifications.
You have to use an appropriate power supply to give power to the ACS-9031-00 adapter kit
Both the CPU module and the power supply **have to be turned off** before performing any connection.

Connecting a digital display to the CPU-185x

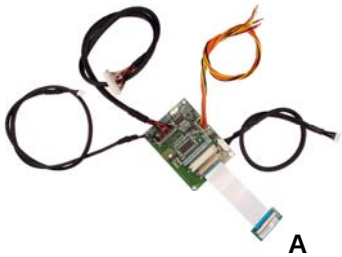
1. Before connecting any LCD display, you need to verify if the J2 pinout and type of the 9C650600S6L ZIF Adapter matches with the display's pinout and type of the digital LCD display port:
   - If yes, using the 7050000012L cable, connect the 9C640600S6L LVDS Receiver (via J4) with the 9C650600S6L ZIF Adapter (via J1). Then, connect J2 of the 9C650600S6L ZIF Adapter to the digital LCD display port (case **A**)
   - If no, connect Cn1 of the 7030000070L LCD display cable to the J6 connector of the 9C640600S6L LVDS Receiver. Use the loose end of the 7030000070L LCD display cable to connect the display (case **B**)
2. Before connecting any LCD display inverter, you need to verify if the J3 pinout and type of the 9C640600S6L LVDS Receiver matches with the display inverter's pinout and type:
   - If yes, connect one end of the 7030000235L Inverter cable with J3 of the 9C640600S6L LVDS Receiver. Connect the other end of the 7030000235L Inverter cable with the inverter port of the digital display.
   - If no, you have to make an appropriate inverter cable
3. Connect one end of the 7000000145L LVDS Flat Cable with J1 of the 9C640600S6L LVDS Receiver.
   Connect the other end with J2 of the CPU-185x
4. Connect Cn1 of the 7030000230L Power supply cable with J3 of the 9C640600S6L LVDS Receiver.
   Connect the other end (loose wires) to an appropriate power supply respecting the correct pinout, voltage and current
5. Turn on both the power supply and the CPU-185x


A


B

Connecting a digital display to the CPU-145x, CPU-146x, CPU-147x or CPU-148x

1. Before connecting any LCD display you need to verify if the J2 pinout and type of the 9C650600S6L ZIF Adapter matches with the display's pinout and type of the digital LCD display port:
   - If yes, using the 7050000012L cable, connect the 9C640600S6L LVDS Receiver (via J4) with the 9C650600S6L ZIF Adapter (via J1). Then, connect J2 of the 9C650600S6L ZIF Adapter to the digital LCD display port (case **A**)
   - If no, connect Cn1 of the 7030000070L LCD display cable to the J6 connector of the 9C640600S6L LVDS Receiver. Use the loose end of the 7030000070L LCD display cable to connect the display (case **B**)
2. Before connecting any LCD display inverter, you need to verify if the J3 pinout and type of the 9C640600S6L LVDS Receiver matches with the display inverter's pinout and type:
   - If yes, connect one end of the 7030000235L Inverter cable with J3 of the 9C640600S6L LVDS Receiver. Connect the other end of the 7030000235L Inverter cable with the inverter port of the digital display.
   - If no, you have to make an appropriate inverter cable
3. Using the 7000000232L I2C & LVDS cable:
   - Connect Cn1 with J8 of the 9C640600S6L LVDS Receiver
   - Connect Cn2 with J5 of the CPU module
   - Connect Cn3 with J6 of the CPU module
4. Connect Cn1 of the 7030000230L Power supply cable with J3 of the 9C640600S6L LVDS Receiver.
   Connect the other end (loose wires) to an appropriate power supply respecting the correct pinout, voltage and current
5. Turn on both the power supply and the CPU module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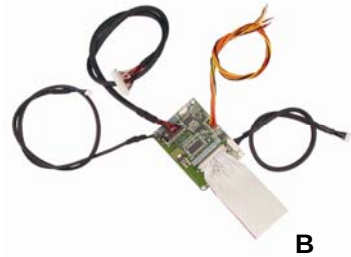
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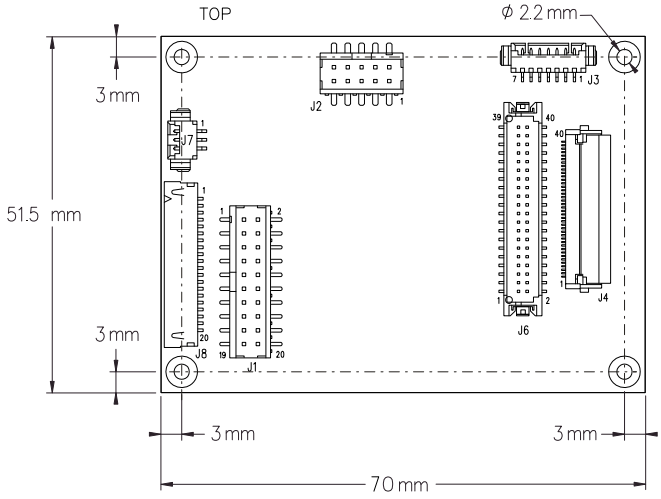
9C640600S6L: LVDS Receiver



J1 Connector

- Usage: LVDS, Power ctrl & I2C (DVO) inputs from CPU modules
- Type: Male 20-pin (10x2), 2.00mm pitch, Minitek connector
- P/N: FCI 98424-G52-20ALF

Pin #	Usage	Pin #	Usage
1	Ground	**2**	LVDS_CLK1P
3	LVDS_CLK1M	**4**	Ground
5	LVDS_A0P	**6**	LVDS_A0M
7	Ground	**8**	LVDS_A1P
9	LVDS_A1M	**10**	Ground
11	LVDS_A2P	**12**	LVDS_A2M
13	Ground	**14**	LVDS_A3P
15	LVDS_A3M	**16**	LVDS-ON
17	DVO_SDAT	**18**	DVO_SCLK
19	Ground	**20**	Not Connected

J2 Connector

- Usage: Power supply
- Type: Male 10-pin (5x2), 2.00mm pitch, Minitek connector
- P/N: FCI 98424-G52-10ALF

Pin #	Usage	Pin #	Usage
1	+5 V In	**2**	+5 V In
3	Power LCD In	**4**	Power LCD In
5	+3.3 V Out	**6**	+3.3 V Out
7	Power Backlight In	**8**	Power Backlight In
9	Ground	**10**	Ground

WARNING:
The “Power LCD In” pins (3 & 4) must be connected either to the “+5 V In” pins (1 & 2) or to the “+3.3 V Out” pins (5 & 6) generated onboard (max 500 mA) depending on the voltage rating of the LCD display.
The “Power Backlight In” must be connected to a power source supplying the voltage required by the backlight inverter (typically +5V or +12V)

J3 Connector

- Usage: LCD Backlight Inverter power supply output
- Type: Male SIL 7-pin (7x2), 1.25mm pitch connector
- P/N: Molex 53261-0771

Pin #	Usage
1	Vcc Backlight Out
2	Vcc Backlight Out
3	Ground
4	Ground
5	+5 V Out
6	+5 V Out
7	Backlight VBR

9C640600S6L LVDS Receiver power supply specifications

Parameter	Value
Voltage	5 V dc
Current	500 mA

J4 & J6 Connectors

- Usage: Digital LCD Display output

J4: Type: ZIF 40-pin (20x2), 0.5mm pitch, bottom contact connector
P/N: AVX 04 6240 040 003 800

J6: Type: Male 40-pin (20x2), 1.25mm pitch connector
P/N: Hirose DF13-40DP-1.25V (56)

Pin #	Usage	Pin #	Usage
1	Ground	**21**	G4
2	Clock	**22**	Not Connected
3	Ground	**23**	G5
4	H-Sync	**24**	G6
5	V-Sync	**25**	G7
6	Ground	**26**	Not Connected
7	R0	**27**	B0
8	R1	**28**	B1
9	R2	**29**	B2
10	R3	**30**	B3
11	R4	**31**	B4
12	Ground	**32**	Ground
13	R5	**33**	B5
14	R6	**34**	B6
15	R7	**35**	B7
16	Not Connected	**36**	DE
17	G0	**37**	GP0
18	G1	**38**	Vcc LCD 1
19	G2	**39**	Vcc LCD 2
20	G3	**40**	GP1

J7 Connector

- Usage: I2C (DVO) Input from CPU-145x, CPU-146x, CPU-147x and CPU-148x
- Type: Male SIL 3-pin (3x1), 1.25mm pitch connector
- P/N: Molex 53261-0371

Pin #	Usage
1	DVO_SCLK
2	DVO_SDAT
3	Ground

J8 Connector

- Usage: LVDS and power ctrl input from CPU-145x, CPU-146x, CPU-147x and CPU-148x
- Type: Male SIL 20-pin (20x1), 1.00mm pitch, DF19 connector
- P/N: Hirose DF19G-20P-1H (56)

Pin #	Usage
1	Power Enable
2	Power Enable
3	Ground
4	Ground
5	A0M
6	A0P
7	Ground
8	A1M
9	A1P
10	Ground
11	A2M
12	A2P
13	Ground
14	CLK1M
15	CLK1P
16	Ground
17	A3M
18	A3P
19	Ground
20	Not Connected
21	Ground
22	Ground

NOTE:
J7 and J8 can be used together as an alternative to J1 for the connection to the CPU-145x, 146x, 147x and 148x modules.

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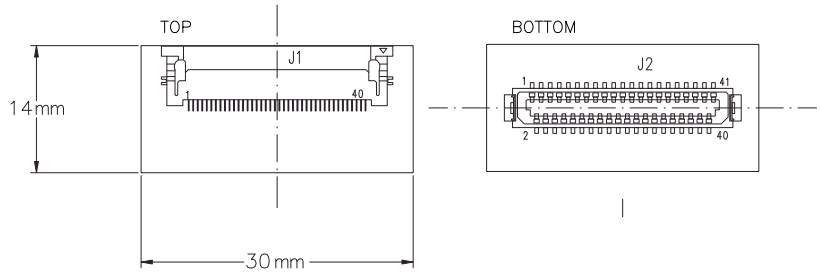
9C650600S6L: ZIF Adapter for LCD displays



WARNING:
Before connecting any LCD display you need to verify if the J2 pinout and type matches with the display's pinout and type:

- If yes, connect J2 of the 9C650600S6L ZIF Adapter to the digital LCD display port.
- If no, you have to connect the 7030000070L cable to the J6 connector of the 9C640600S6L LVDS Receiver using the loose end to connect the display.

J1 Connector

- Connect to the 9C640600S6L LVDS Receiver (J4)
- ZIF 40-pin (20x2), 0.5mm pitch, bottom contact connector
- P/N: AVX 04 6240 040 003 800

Pin #	Usage	Pin #	Usage
1	Ground	**21**	G2
2	Clock	**22**	Not Connected
3	Ground	**23**	G3
4	H-Sync	**24**	G4
5	V-Sync	**25**	G5
6	Ground	**26**	Not Connected
7	Not Connected	**27**	Not Connected
8	Not Connected	**28**	Not Connected
9	R0	**29**	B0
10	R1	**30**	B1
11	R2	**31**	B2
12	Ground	**32**	Ground
13	R3	**33**	B3
14	R4	**34**	B4
15	R5	**35**	B5
16	Not Connected	**36**	DE
17	Not Connected	**37**	GP0
18	Not Connected	**38**	Vcc LCD 1
19	G0	**39**	Vcc LCD 2
20	G1	**40**	GP1

J2Connector

- Connect to LCD display
- DF9 41-pin, 1.0mm pitch connector
- P/N: Hirose DF9B-41S-1V(69)

Pin #	Usage	Pin #	Usage
1	Ground	**2**	Clock
3	Ground	**4**	H-Sync
5	V-Sync	**6**	Ground
7	Ground	**8**	Ground
9	R0	**10**	R1
11	R2	**12**	Ground
13	R3	**14**	R4
15	R5	**16**	Ground
17	Ground	**18**	Ground
19	G0	**20**	G1
21	G2	**22**	Ground
23	G3	**24**	G4
25	G5	**26**	Ground
27	Ground	**28**	Ground
29	B0	**30**	B1
31	B2	**32**	Ground
33	B3	**34**	B4
35	B5	**36**	Ground
37	DE	**38**	TFT GP1 / LR
39	Vcc	**40**	Vcc
41	TFT GP0 / UD		

NOTE:
When the 9C640600S6L LVDS Receiver and the 9C650600S6L ZIF Adapter are connected together using a 40-pin flex cable (i.e. the 7050000012L) the R0 ~ R5 signals on the 9C640600S6L module are mapped to R2 ~ R7 signals respectively on the 9C650600S6L module; this means that the R0 and R1 signals on the 9C650600S6L module are discarded. The same applies to G0 ~ G5 (mapped to G2 ~ G7) and to B0 ~ B5 (mapped to B2 ~ B7).

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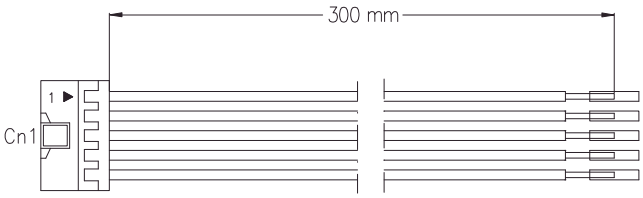
7030000230L: Power supply cable

Cn1 Connector

- Usage: connect to the 9C640600S6L LVDS Receiver (J2)
- Type: Housing 10-pin (5x2), 2.00mm pitch, Minitek IDC connector
- P/N: FCI 90311-010FL

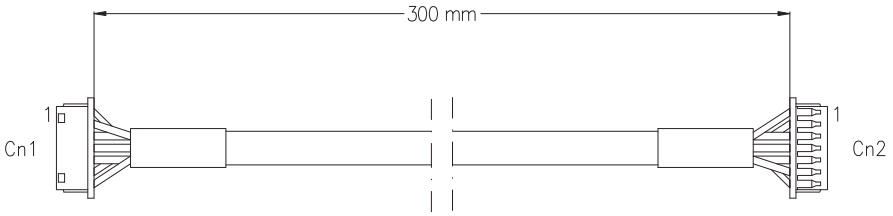


Pin Cn1 #	Connection	Pin Termination
1	Red wire	Loose
2	Red wire	Loose
3	Purple wire	Loose
4	Purple wire	Loose
5	Orange wire	Loose
6	Orange wire	Loose
7	Yellow wire	Loose
8	Yellow wire	Loose
9	Black wire	Loose
10	Black wire	Loose

7030000235L: Inverter cable

Cn1 & Cn2 connectors

- Usage: connect to one end to the 9C640600S6L LVDS Receiver (J3), and the other end to the LCD display
- Type: 2x Housing SIL 7-pin (7x1), 1.25mm pitch connector
- P/N: Molex 51021-0700
- Pinout: One-to-one

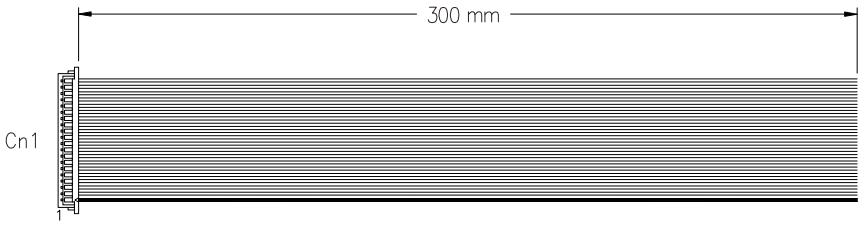


WARNING:
Before connecting any LCD display inverter with this cable you need to verify if the J3 pinout and type of the 9C640600S6L LVDS Receiver matches with the display inverter's pinout and type.
If not you have to make an appropriate inverter cable.

7030000070L: LCD display connection cable

Cn1connector

- Usage: connect a LCD display to the J6 connector of the 9C640600S6L LVDS Receiver if you can't use the 9C650600S6L ZIF Adapter
- Type: Housing 20-pin (10x2), 1.25mm pitch connector
- P/N: Hirose DF13-40DS-1.25C



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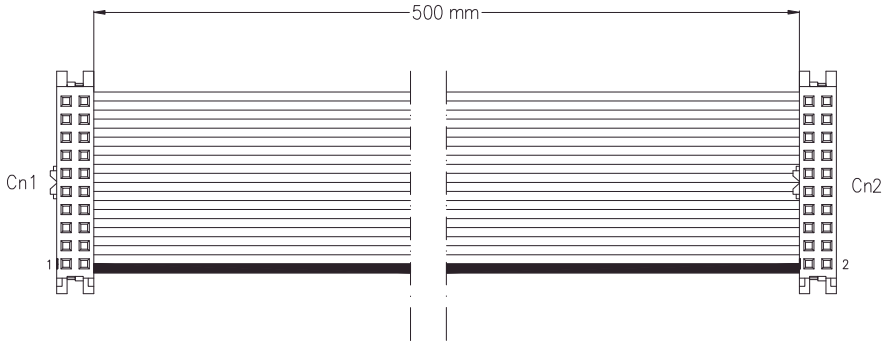
7000000145L: LVDS Flat Cable for CPU-185x

Cn1 & Cn2 connectors

- Usage: Connect one end to the 9C640600S6L LVDS Receiver (J1), and the other end to the CPU-185x (J2)
- Type: 2x Female 20-pin (10x2), 2.00mm pitch, Minitek IDC connector
- P/N: FCI 89361-720LF
- Pinout: One-to-One



7000000232L: I2C + LVDS connection cable for: CPU-145x, 146x, 147x & 148x

Cn1 connectors

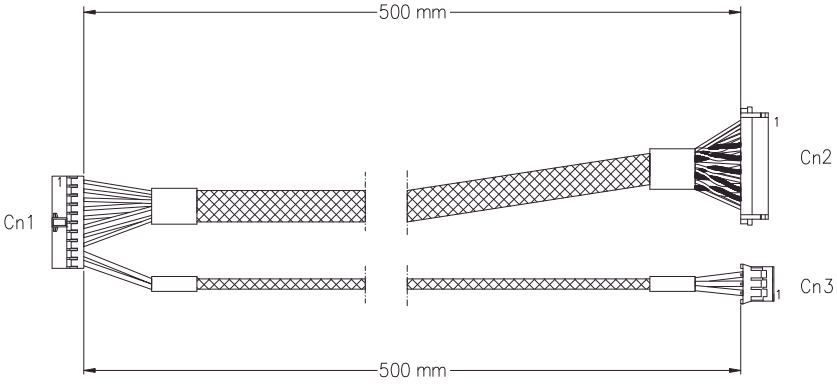
- Usage: Connect to the 9C640600S6L LVDS Receiver (J1)
- Type: Minitek Housing 20-pin (10x2), 2.00mm pitch connector
- P/N: FCI 90311-020LF

Cn2 connectors

- Usage: Connect to the LVDS output of the CPU Module (J5)
- Type: Df19 Housing 20-pin (20x1), 1.00mm pitch connector
- P/N: Hirose DF19G-20S-1C(05)

Cn3 connectors

- Usage: Connect to the backlight output of the CPU Module (J6)
- Type: Housing F SIL 3-pin (3x1), 2.00mm pitch connector
- P/N: JST PHR-3



Start Conn.		End Conn.		Signal
Ref	Pin #	Ref	Pin #	
Cn1	1	Cn2	3	GND
		Cn2	4	GND
Cn1	2	Cn2	15	LVDS-CLK1P
Cn1	3	Cn2	14	LVDS-CLK1M
Cn1	4	Cn2	7	GND
		Cn2	10	GND
Cn1	5	Cn2	6	LVDS-A0P
Cn1	6	Cn2	5	LVDS-A0M
Cn1	7	Cn2	13	GND
Cn1	8	Cn2	9	LVDS-A1P
Cn1	9	Cn2	8	LVDS-A1M
Cn1	10	Cn2	16	GND
Cn1	11	Cn2	12	LVDS-A2P
Cn1	12	Cn2	11	LVDS-A2M
Cn1	13	Cn2	19	GND
Cn1	14	Cn2	18	LVDS-A3P
Cn1	15	Cn2	17	LVDS-A3M
Cn1	16	Cn2	1	LVDS-ON
		Cn2	2	LVDS-ON
Cn1	17	Cn3	2	DVO-SDAT
Cn1	18	Cn3	1	DVO-SCLK
Cn1	19	Cn3	3	GND
Cn1	20	-	-	N.C.

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