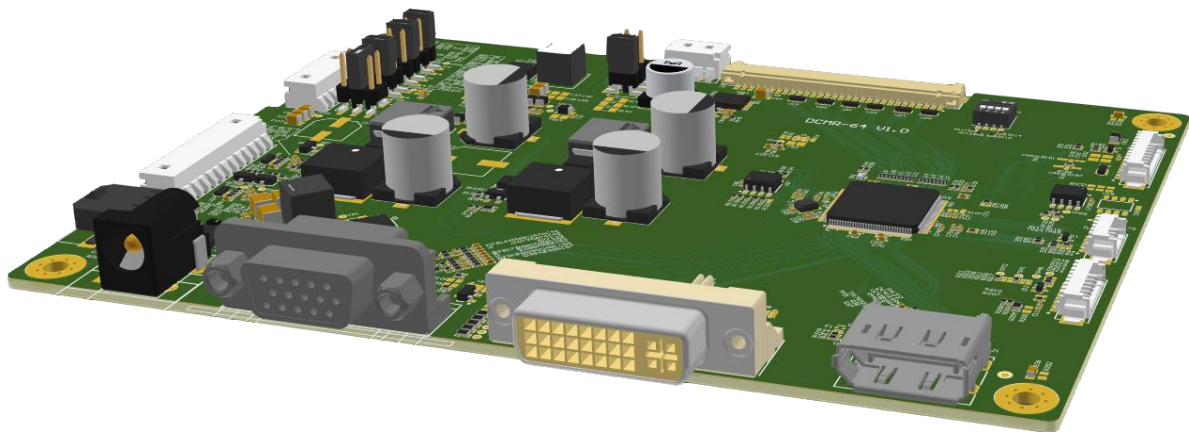**distronik**

DCMR-64

(DisplayPort, DVI-I and RGB TFT-LCD Controller)

User's Manual

Document Status
- ○ Preliminary
- ✓ Final

This document is subject to legal disclaimers.

1 General Information

1.1 Introduction

This manual provides general information, hardware preparation information, installation instructions and hardware description for the DCMR-64 var. STD (hereafter also referred to as board).

1.2 Features

DCMR-64 var. STD features include:

- Adjustable display resolution/timings (output)
- Adjustable EDID (input)
- Adjustable display supply voltage
- Adjustable backlight supply voltage
- Adjustable backlight control
    o Dimming type
    o Voltages

1.3 Specifications

Interfaces

INPUT

- DisplayPort 1.2 interface up to HBR2(5.4Gbit/s)
- DVI-I interface
- Analog RGB interface

OUTPUT

- Dual-LVDS 24-bit output
- PCLK <= 186MHz

BIDIRECTIONAL

- I²C Master/Slave

Dimensions

150mm x 110mm

Electrical characteristics

- V_{DD} = 12V..32V
- VPanel = 3.3V / 5V / 12V

Resolution

Max. 1920 x 1200 Pixels (WUXGA) @ 60Hz

Features

- Spread-Spectrum DPLL
- Supports MCCS VCP codes via DDC/CI
- User-friendly OSD menu

1.4 General description

DCMR-64 is a DisplayPort, DVI-I and analog RGB to LVDS converter board which accepts common video signals. The board provides a 2-channel LVDS output interface to drive displays with up to 8 bits per color (24 bits per pixel).

The board can be configured by the user to match different displays, when having obtained the assembly variant "STD". On the contrary the board "Lite" does not offer that flexibility to the user.

The board allows the user to configure the correct display settings without any tools or software by switch/jumper modification. The available panels, timings and EDID are already preset and only need to be selected by the user. All preset timings are selected out of a set of widely tested timings. Where possible, VESA standards were followed. The standard configuration table is described in *Table 3. Switches configuration table.* In case customized settings, different resolution, long-cable supportable, bar-type display support, or others is requested, contact your sales partner.

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The board requires additional equipment as described in section 1.6.1.

Additional equipment may be desired to operate the board with a more extensive demonstration.

1.5   Typical application

The following figure shows the components of a typical application. In Figure 1 essential components have a red frame around them.
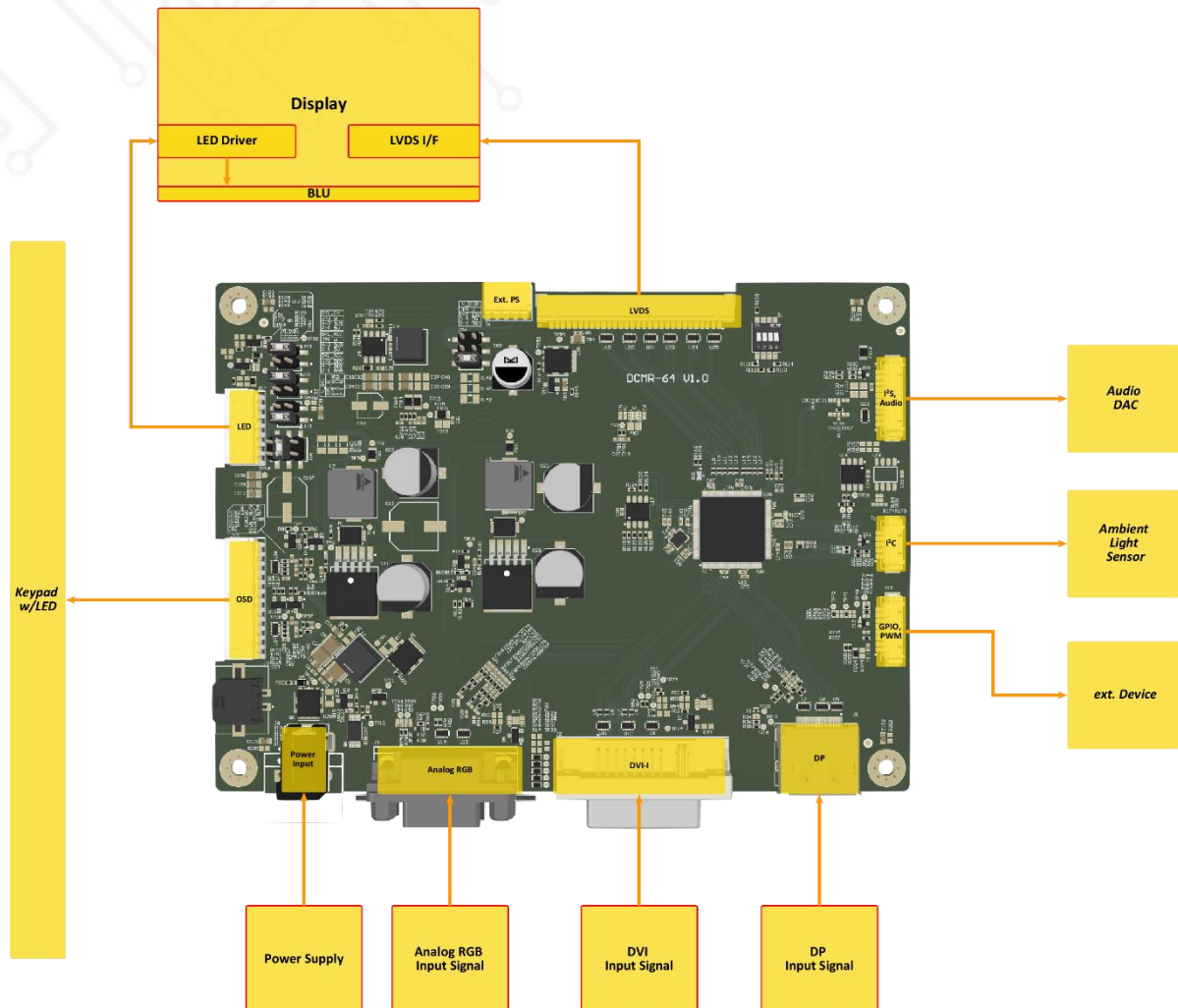

Figure 1. Typical application

1.6   Equipment

1.6.1   Required equipment

The following equipment is required to operate DCMR-64 var. STD in a simple demonstration.

- -   DC power supply, 12V to 32V at 3A
- -   Display video cable (LVDS)
- -   Display backlight cable
- -   Display
- -   Video cable (DisplayPort, DVI or VGA)
- -   Video source

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1.6.2 Ordering information

For complete ordering information, check section "ordering information" in the product's specification or ask your local sales partner for assistance.

Table 1. Ordering information

Part number	Description	Note
188-00200	DCMR-64, var. STD	Panel and voltages adjustable
188-*	DCMR-64, var. Lite (12V)	Panel and voltages not adjustable
188-*	DCMR-64, var. Lite (24V)	Panel and voltages not adjustable
187-*	TFT LCD	-
188-*	LVDS cable	-
188-*	Backlight cable	-
188-02352	Keypad w/LEDs	-
188-02274	Keypad cable	-
188-02338	12V power supply (60W)	-

2 Configuration

2.1 Before you begin

Ensure the desired display does not exceed the maximum ratings of the board.

The following warnings and cautions are noted for the safety of anyone using or working close to the board. Observe all safety precautions.

2.2 Safety instructions

⚠️	Caution: Hot surface. To minimize risk of burns, do not touch.
⚠️	Warning: Observe handling precautions. Electrostatic sensitive devices.

2.3 Board overview

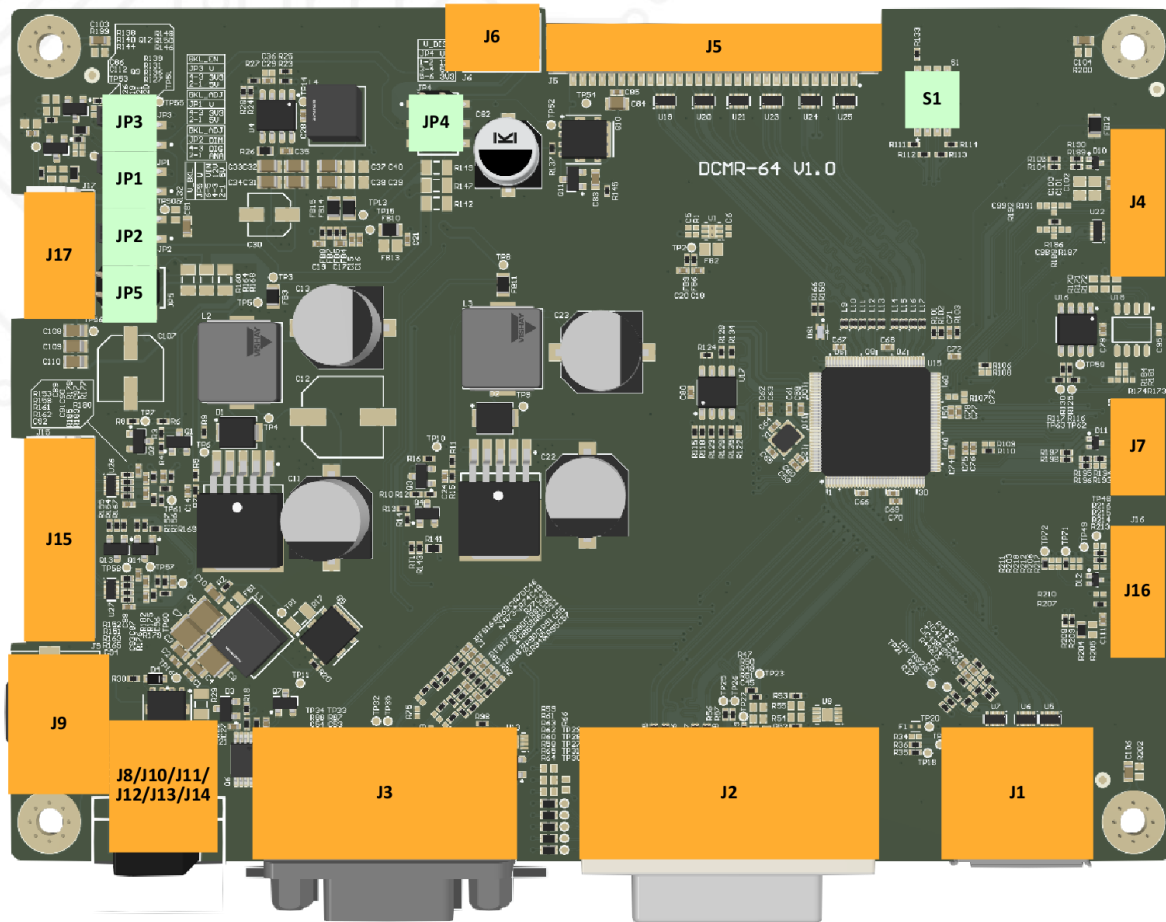The configurable parts (jumper/switches) can be found in the board overview.

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Figure 2. Board overview

2.4 Jumper configuration

The board's jumpers JP1…JP5 can be configured as described in the table below.

Table 2. Jumper configuration table

Jumper	Position	Function	Detail
JP1	1-2	V_{BKL_ADJ}	5.0V
JP1	3-4	V_{BKL_ADJ}	3.3V
JP2	1-2	BKL dimming type	digital
JP2	3-4	BKL dimming type	analog
JP3	1-2	V_{BKL_EN}	5.0V
JP3	3-4	V_{BKL_EN}	3.3V
JP4	1-2	V_{DISP}	12.0V
JP4	3-4	V_{DISP}	5.0V
JP4	5-6	V_{DISP}	3.3V
JP5	1-2	V_{BKL}	V_{IN}
JP5	3-4	V_{BKL}	12.0V
JP5	5-6	V_{BKL}	5.0V

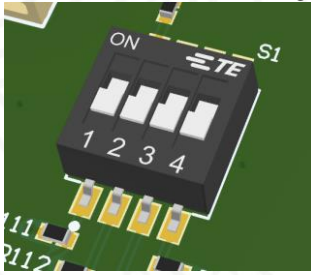## 2.5 Switch configuration

Figure 3. S1 3D view

The board's switches of S1 can be configured as described in the table below.

Table 3. Switches configuration table

PNL_ID0	PNL_ID1	PNL_ID2	BKL_INV	Setting	Details
Pos1	Pos2	Pos3	Pos4	-	-
0	0	0	X	800x480	1CH LVDS, 8bpc, VESA, f_{PWM}=200Hz, D_{min}=10%
1	0	0	X	1024x768	1CH LVDS, 8bpc, VESA, f_{PWM}=200Hz, D_{min}=5%
0	1	0	X	1280x800	1CH LVDS, 8bpc, VESA, f_{PWM}=200Hz, D_{min}=5%
1	1	0	X	1280x1024	2CH LVDS, 8bpc, VESA, f_{PWM}=200Hz, D_{min}=10%
0	0	1	X	1366x768	1CH LVDS, 8bpc, VESA, f_{PWM}=200Hz, D_{min}=10%
1	0	1	X	1920x1080	2CH LVDS, 8bpc, VESA, f_{PWM}=20kHz, D_{min}=10%
0	1	1	X	1920x1200	2CH LVDS, 8bpc, VESA, f_{PWM}=200Hz, D_{min}=10%
1	1	1	X	n.d.	n.d.
X	X	X	0	DIM normal	Backlight dimming normal
X	X	X	1	DIM inverse	Backlight dimming inverted

Note: 1, which represents "ON"-state is marked on the switch (s. Figure 3).

2.6 Example configuration

An example configuration for a typical 21.5" Full-HD display is described below.

2.6.1 Voltages

If e.g. the following data can be found in the data sheet:

Table 4. Example display specification (voltages)

Item	Specification
Logic / LCD drive voltage	5V (typ.)
VLED	12V (typ.)
Backlight on - control voltage	5V (typ.)
Backlight dimming - high voltage	5V (typ.)
Backlight dimming	PWM dimming

Configure jumpers as below.

1) Set display supply voltage: JP4 to 5V (3-4)
2) Set backlight supply voltage: JP5 to 12V (3-4)
3) Set backlight EN voltage level: JP3 to 5V (1-2)
4) Set backlight ADJ voltage level: JP1 to 5V (1-2) and S1-4 to pos. 0.
5) Set backlight ADJ dimming type: JP2 to "DIG" (1-2)

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2.6.2 Timing/Resolution

If e.g. the following data can be found in the data sheet:

Table 5. Example display specification (LVDS and PWM)

Item	Specification
Pixels H x V	1920 x 1080
Electrical interface	Dual channel LVDS
Support color	16.7M colors (RGB 8 bits)
PWM dimming	200Hz…20kHz
Dimming duty cycle	5%...100%

Configure S1 as below.

Table 6. Example S1 configuration

PNL_ID0	PNL_ID1	PNL_ID2	BKL_INV	Setting	Details
Pos1	Pos2	Pos3	Pos4	-	-
1	0	1	X	1920x1080	2CH LVDS, 8bpc, VESA, fPWM=20kHz, Dmin=5%

Note: Pos4 has been set in section 2.6.1

3 Related Documents

The following documents are available at www.distronik.de

1.   DCMR-64 Product Specification

4 Troubleshooting

This board has an on-board LED which can be used to check the board's status without a display attached. More detailed information will be printed as on-screen-message on the display (if attached). LED colors and their meanings are described in the table below.

Table 7. On-board LED status table

LED Color	Represents	User Actions
Off	Incorrect power supply	Check power supply
Green	Normal state	n/a
Red	Input signal/cable error	Check cable and input signal

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5 Revision History

Table 8. Revision History

Rev.	Date	Section	Specification Status	Description
-	Jun 30th, 2022	All	Final	Initial release

6 Legal Information

6.1 Disclaimers

6.1.1 Limited warranty and liability

Information in this document is believed to be accurate and reliable. However, distronik GmbH does not give any representations or warranties, expressed or implied, as to the accuracy or completeness of such information.

Unless distronik has explicitly designated an individual product as meeting the requirements of a particular industry standard, distronik is not responsible for any failure to meet such industry standard requirements.

Buyers should obtain the latest relevant information before placing orders and should verify that such information is current and complete.

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6.1.3 Applications

Applications that are described herein are for illustrative purposes only. distronik GmbH makes no representation or warranty that such applications will be suitable for the specified use without further testing or modification.

The customer is responsible for the design and operation of his application. It is the customer's responsibility to determine whether this product is suitable for his applications and products.

6.1.4 Limiting values

Stress above one or more limiting values (as defined in section Absolute maximum ratings) may cause permanent damage and irreversibly affect the quality and reliability of the device.

6.1.5 Safety-related warnings and restrictions

DCMR-series products are intended solely for use by technically qualified, professional electronics experts who are familiar with the dangers and application risks associated with handling electrical mechanical components, systems, and subsystems.

Users shall operate the board withing distronik's recommended guidelines and any applicable legal or environmental requirements as well as reasonable and customary safeguards. Failure to set up and/or operate the board within distronik's recommended guidelines may result in personal injury or death or property damage. Proper set up entails following distronik's instructions for electrical ratings of interface circuits such as input, output and electrical loads.

6.2 Trademarks

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10 Contact Information

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