*opto*LVDS

Type:

Manual

Digital optical transmitter
for LVDS signals

mk messtechnik
EMC Test and Measuring Systems

Distributed by: Reliant EMC LLC, 3311 Lewis Ave, Signal Hill CA 90755, 408-916-5750, www.reliantemc.com

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Table of contents

1 Box contents

Quantity	Description
1	Transmitter *opto*LVDS
1	Receiver *opto*LVDS
1	Multimode optical fiber 62.5 / 125µm (simplex or duplex, depending on the delivered link)
2	Chargers
1	Manual (English)
2	External battery packs (optional)

The shipment includes charged batteries. However, due to the self-discharging of NiMH batteries they should be recharged again before use.

Read chap. 4 before charging!

Read chap.4(Maintenance) before charging the devices!

2 Characteristics

The digital optical system ***opto*LVDS** can be used to optically transmit single-channel LVDS signals with data rates of up to 2500Mbit/s, depending on the chipset being used. Because of the optical transmission, the system is very robust against EMS (electromagnetic susceptibility). It can withstand high electric and magnetic fields, like they appear in EMC tests. Extremely high differences in ground potential between the source and the receiver of the LVDS transmission can also be handled. The system also is optimized for low noise emission.

Power is supplied by internal NiMH batteries which make the system easy to use. The ***opto*LVDS** is prepared for the use of external batteries (with optional battery pack).

3 Field of application

- Transmission of LVDS signals during EMC tests
- Transmission of LVDS signals over long distances without signal loss (up to 100m or more, depending on timing requirements)
- Handle ground potential problems

4 Maintenance

Recharge batteries after use with the enclosed charger. To prevent a lazy battery effect, discharge the devices every 5 times completely by using the automatic switch off (Leave the system on, until it turns off automatically). Afterwards, charge the devices as usual.

Maximum charging current is 1 A

The devices have to be turned off before connecting to the charger. If this is disregarded, the system might get damaged!

Devices must be turned off before connecting to charger, or else the system might get damaged!

4.1 shows the pinning of the charge connector. Chargers have to be connected to pin 2 (+) and pin 4 (GND). An external supply (5…7V, 0.5A) can be connected to pin 3 (+) and pin 4 (GND). **Use only power supplies which are certified by mk-messtechnik.**

Pinning of charge- / buffer connector

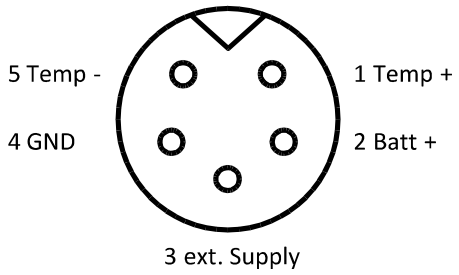

Fig. 4.1: Pinning of charge- / buffer connector

The included chargers are not meant to power the transceivers during operation. The transceiver outside the shielded room can be run with an external power supply (optional). The internal transceiver can be run with an external battery, if needed (optional). Do not use the external power supply or charger to power the transceiver inside the shielded room while EMI tests are running. This might damage the transceiver!

Do not use charger or power supply during EMI-test!

Due to self-discharge issues with NiMH batteries, recharge batteries before use, if the system has not been used for a longer time.

Do not use cleaning agents or solvents to clean the devices, only use a slightly moistened, soft cloth.

Do not open the devices, as there are no parts inside which have to be maintained. The opened housing can pose a fire hazard through short-circuit currents! Please contact your distributor or the manufacturer if you

Do not open the devices!
Short cut / fire hazard!

have any problems. Send in the complete system (both transceivers), if a problem cannot be solved by turning the devices off and on again or by checking the positions of the switches. Please contact us in any case before sending in the devices.

5 Trouble shooting

The following trouble shooting list is provided to assist you while having problems. It might let you use the system again without a long down time:

Error:	Possible reasons:	Solution:
No or erroneous transmission	Receiver does not receive an optical signal	Check optical fibers and connections, change fibers if necessary
	Cables damaged or not attached properly	Connectors and cables regarding damages
	Wrong optical fibers (diameter)	Use fiber with 62,5/125µm
	Low battery	Charge batteries
	System turned off	Turn on all devices
	Wrong power up sequence (depends on chipset)	Check documentation of hardware and position of switches
No transmission, noise at output	Low battery	Charge batteries
	No optical signal at receiver	Check for light at optical output. Replace optical fiber
	System turned off	Turn on all devices
Device cannot be turned on, cannot be charged	Batteries damaged	Send device to us
	Internal fuse is broke	Send device to us
	Charger or cable damaged	Check / replace charger and charging cable
	Batteries over discharged	Charge batteries, maybe use other charger (4 battery cells)
Common problems	Defective optical or	Check connectors, fibers

Error:	Possible reasons:	Solution:
	electrical cables or connectors	and cables. Test with other ones. Replace cables

6 Accessories / Options

Part	Order number	Comment
Optical fiber	Ask (simplex or duplex required)	
External batteries	BP-48	4.8V/4Ah
Connector cable for BP-48	SC-30-5m5m	Length approx. 30cm
Charger with connector plugs	CH-1-5m	Standard charger
Manual	MA-*opto*LVDS	German or english

Appendix: Details and operation

The following chapter is used to describe special details of the ***opto*LVDS-1-DS-241/124** system.

a) Housing and connectors / switches

Fig. a.1 shows the front sides of transmitter (left) and receiver (right) with connectors

Front sides with connectors and switches

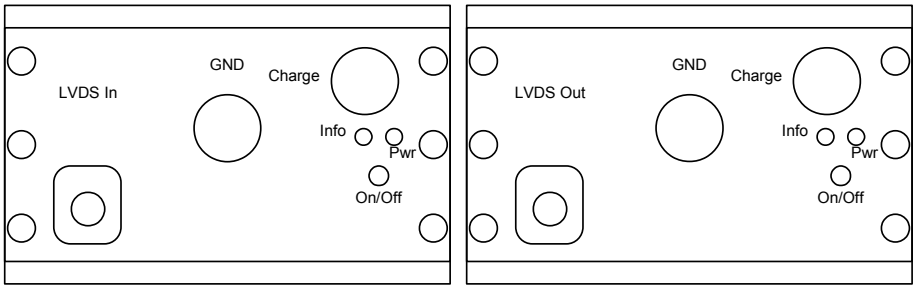

Fig. a.1: Front side of the devices with connectors and switches

- power push button with control LED (*Pwr On/Off*)
- battery information LED (*Info*)
- charge plug (*Charge*)
- Mini-USB or Rosenberger HSD LVDS-In and Out connectors
- *GND* plug to connect housing to ground plane (if wanted)

The pinning of the *LVDS In* and *Out* -connectors on transmitter and receiver side are printed on the housings.

Pinning of the LVDS connectors

Rear sides with connectors and switches

Fig. a.2 shows the rear sides of transmitter(left) and receiver (right) with connectors and switches:

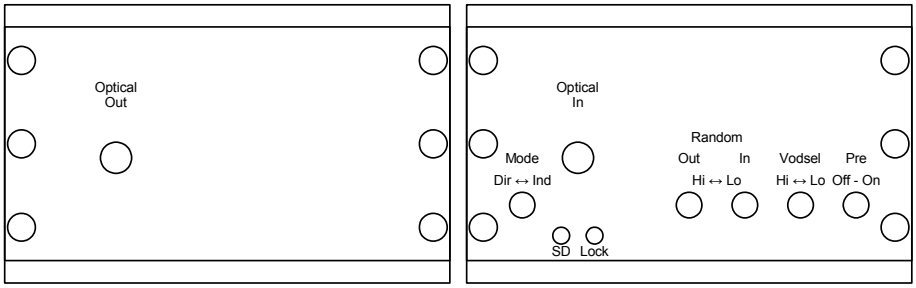

Fig. a.2: Rear side of the devices with connectors and switches

- optical connector FSMA(*Optical Out* at transmitter) (*Optical In* at receiver)

At receiver side:

- *Mode Dir – Ind* selection switch to set LVDS mode to direct (not using the chipsets) or indirect (using chipset 241/124)
- *Random Out* and *In* selection switches to add additional randomization to the chipset (see Table a.1 for functions)
- *Lock* and *SD*-LEDs on receiver side to show LVDS parameters
- *Vodsel* and *Pre* switches on receiver side to set LVDS parameters (see Table a.1 for functions)

Table a.1 shows the function and description of the parameters to be set.

Label	**Function / description**
Vodsel	Amplitude of the output signal in single-channel mode, **Lo** approx. +/-350 mV, **Hi** approx. +/-700 mV
Pre	Pre-emphasis **On / Off**
Mode	**Dir**ect or **Ind**irect transmission of the signal. Direct transmission does not use any chipsets, in indirect mode, the optoLVDS uses the internal chipsets to transmit the data.
Lock LED	Is switched on as soon as the chipset receives „valid“ signals (only in case of switch *Mode* position **Ind**)
SD LED	Signal Detect is switched on as soon as an optical input signal is detected.
Random Out	additional randomization On / Off (output signal at the LVDS-output, electrical)
Random In	additional randomization On / Off (input signal, optical)

Table a.1: Function and description of the LVDS parameters to be set

LVDS parameters

See datasheet of chipset to get more information

b) Operation and handling of the *opto*LVDS-1-DS-241/124

- Connect the optical fiber
- Connect the electric cables for LVDS transmission
- Choose and set the LVDS mode correctly (see chap.a)), according to your application
- Turn on all devices (power push button, see Fig. a.1)
  There is no power up sequence to be regarded for the ***opto*LVDS**.
  This might not apply, if your hardware needs a special sequence for powering up. If so, please recognize the advices of your hardware documentation.
- The transmission starts automatically
- Check info LED if transmission stops suddenly!

Check info LED if transmission stops suddenly!

If the transmission suddenly stops after a long duration of measurement, check the *Info* LED of the transmitter (see Figure a.1). If the battery power falls below 4,3V, the *Info LED* is switched on. The system should be reloaded soon. Below 3,8V, the system is turned off automatically.

The measurements can be extended by using the optional battery pack (BP-48) with connector cable or a power supply certified by mk-messtechnik. The external supply can be connected to the system any time (parallel). The connection to the internal battery is decoupled with a diode.

Only use battery packs and connector cables provided from mk-messtechnik. Other modules influence EMS-performance and might damage the opto-system!

Only use the battery pack and connector cables from mk-messtechnik! Others might lead to a damage of the system!