

HALdrive X20 XY3-100 to Analogue Converter

Users Manual

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1 Copyright

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3 Safety

The hardware described here is an electrostatic sensitive device. This means it can be damaged by common static charges which build up on people, tools and other non-conductors or semiconductors. To avoid such a damage, it has to be handled with care and including all relevant procedures (like proper grounding of people handling the devices, shielding/covering to not to let a person touch the device unwanted, proper packaging in ESD-bags, ...). For more information please refer to related regulations and standards regarding handling of ESD devices.

The hardware described here is a component which is intended to be used as part of a larger device, e.g. for integration in a machine with own housing.

This document describes the HALdrive digital XY3-100 to analogue converter hardware but may contain errors or may be changed without further notice.

4 Overview

This document describes the HALdrive X20 converter board, its electrical characteristics and usage. This board is designed to receive digital XY3-100 scanner controller signals and to convert them to 2x synchronous analogue output signals. So it acts as some kind of converter between two different signal types for controlling scanning systems/scanheads.

This board is not a ready-to-use device but a component which is intended to be integrated in larger devices or to be operated with an own housing.

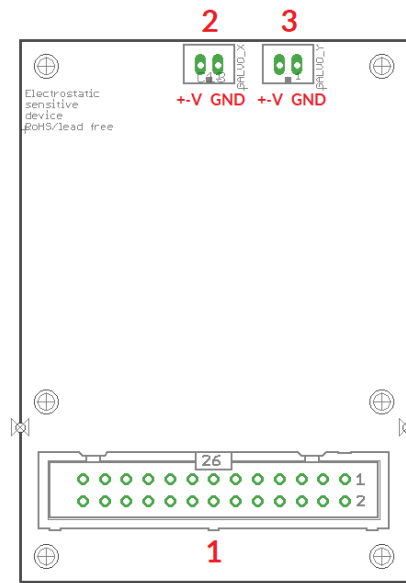
4.1 Features

The HALdrive converter board provides the following features:

- accepts 2D input signals in XY3-100 format (X and Y position data, Z is ignored if available)
- synchronous output of analogue X and Y position data in -5V..5V voltage range
- 20 bit output resolution
- 100 kHz sampling/output frequency
- wide range power supply from +-10V to +- 24V
- instant-on, so there is no boot-up time until the device is available

5 Board And Connectors

The board provides the following connectors:



1. XY3-100 interface for power supply and scanner input signals (as described below)
2. Galvo-X analogue output with +-5V and GND pin
3. Galvo-Y analogue output with +-5V and GND pin

5.1 Scanner Signals

The white 26 pin connector expects the XY3-100 position signals and the power supply for the HALdrive board:

Upper Row Of Pins	Signal	Voltage	Remarks	Lower Row Of Pins	Signal	Voltage	Remarks
1	A-		XY3-100-compatible signals	2	A+		XY3-100-compatible signals
3	B-			4	B+		
5	C-			6	C+		
7	D-			8	D+		
9				10			
11				12			
13				14			
15				16			
17	+V	+10..24V	Power supply from scanner card	18	+V	+10..24V	Power supply from scanner card
19	+V	+10..24V		20	GND	GND	
21	GND	GND		22	GND	GND	
23	-V	-10..24V		24	-V	-10..24V	
25	-V	-10..24V		26			

When the HALdrive is used together with the E1803D scanner controller card, a direct 1:1 connection can be established between the white, 26 pin scanner signal connector of the E1803D controller and this connector. Then power has to be supplied via the three screw-connectors of the E1803D (for details please refer to manual of [E1803D scanner controller card](#)).

5.2 Galvo X Signals

5.3 Galvo Y Signals

These connectors are male 2 mm, 2 pin JST connectors of type B2B-PH-K-S which can be used together with female connectors of type JST PH2P BU. They provide analogue signals synchronous to the XY3-100 position signals.

Pin 1 works in range -5V .. +5V. Pin 2 is connected to GND.

6 Initial Operation

After the HALdrive does not have a nameable boot-up time, putting it into operation consists of a few steps only:

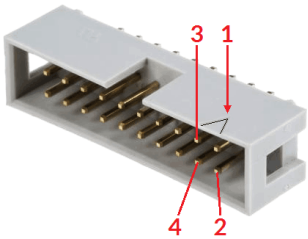
1. power up HALdrive and if necessary the connected scanner controller card
2. power-up connected galvo drivers (can be done together with powering the HALdrive)
3. start sending data from the scanner controller card to the HALdrive board

For security reasons it is recommended to not to send any data to the HALdrive while it is still turned off, so that it may start up in the middle of an already running data transmission. This may lead to a situation where the first valid position command received is at an extreme and unexpected position causing damage to the connected scanhead as it jumps to this extreme position too fast.

For the same reason also the galvo driver should be powered and be ready to use before the scanner controller sends any data, elsewhere when the connected galvos jump to an extreme position immediately, this may cause damage to the galvos and/or mirrors.

APPENDIX A – IDC connector pin numbering

Pin numbering of the white, 26 pin IDC connector (according to pinout-tables shown in hardware description sections above) can be seen in below image:



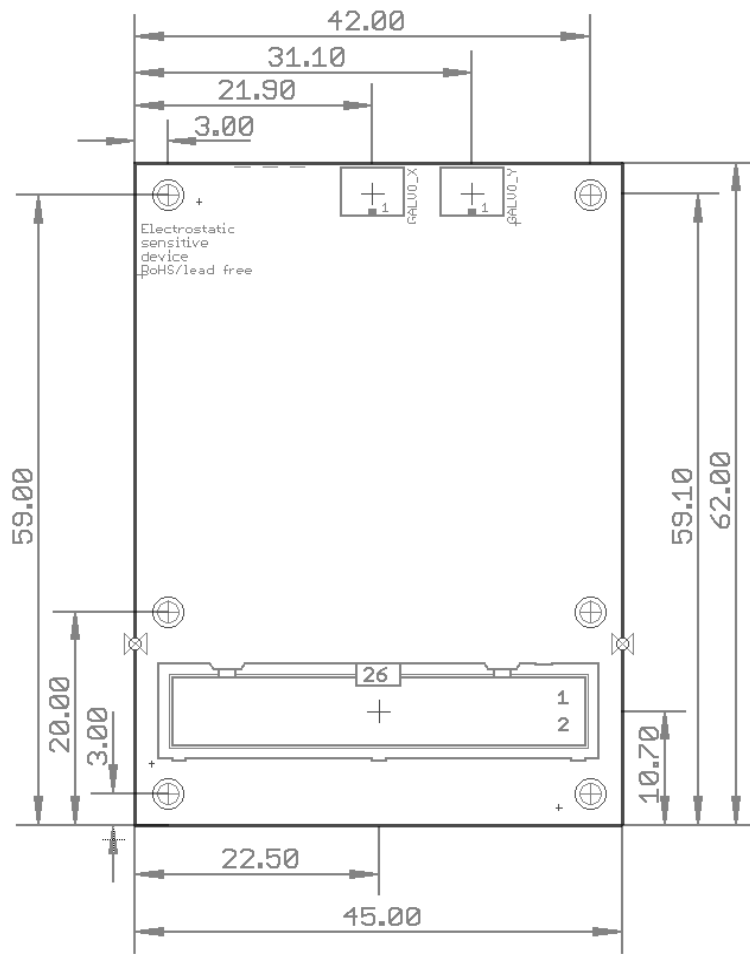
The first pin is marked by a small arrow in connector. Second pin is below of it, counting continues column-wise.

APPENDIX B – XY3-100 protocol description

For details about the XY3-100 protocol, please contact HALaser Systems

APPENDIX C – Board dimensions

Board dimension drawing, all values are given in unit mm.



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