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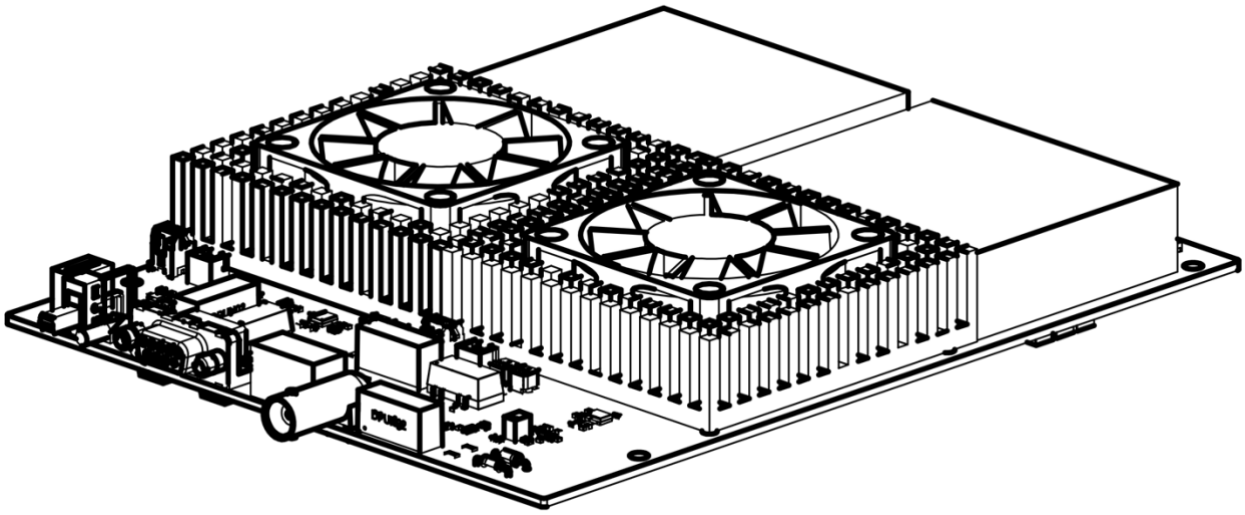
QBX-16 Pockels cell driver

User manual



Warning! This equipment produces high voltages that can be very dangerous.
Please read user manual before starting operations.

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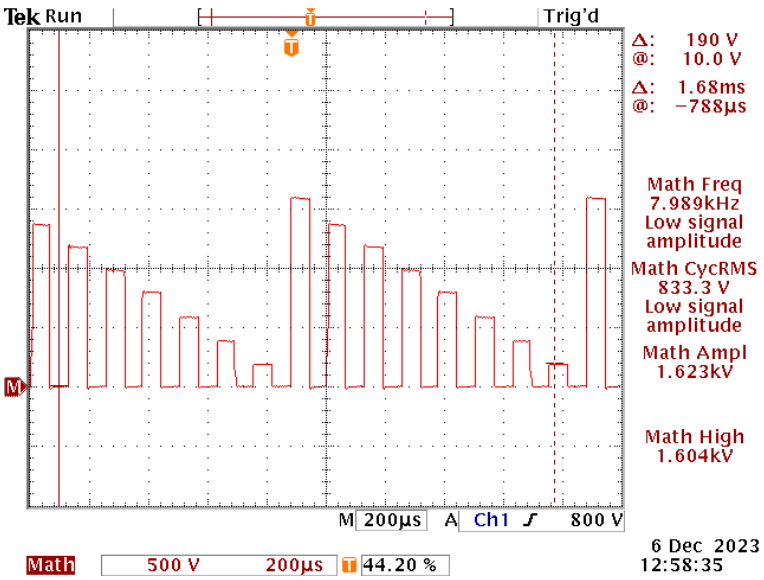
Overview

QBX-16 is a dedicated Pockels cell driver designed for applications where the voltage on a Pockels cell should be continuously adjustable. The driver is based on voltage amplifier schematics, the maximum output voltage is 1600V, the amplification factor is 300:1.

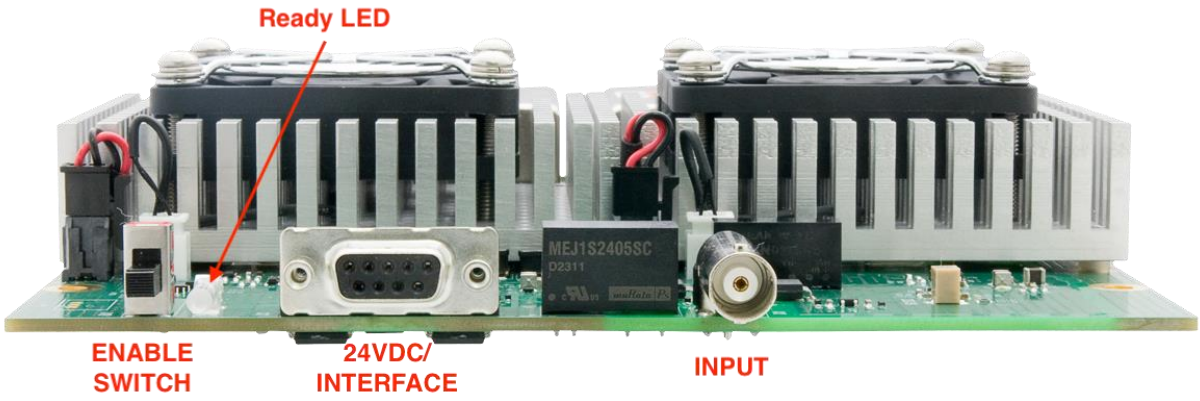
Driver is air-cooled with built-in fans. Driver is available in PCB version only.



Appearance



Connections, signals, signal descriptions

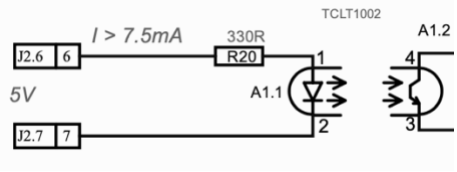


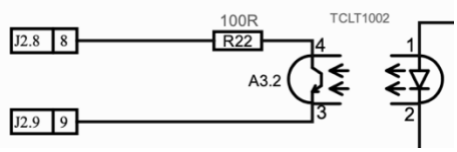
INPUT: BNC

Analog signal of 0-5.33V amplitude applied to this connector is amplified with 300:1 factor and delivered to the high voltage output of QBX-16 Pockels cell driver.

Input impedance is 50 Ohm.

24VDC/INTERFACE: D-SUB 9 PIN, FEMALE

PIN (color)	DESIGNATION	DESCRIPTION
1, 2 (black)	**24VDC RETURN**	+24VDC power supply to be connected here. Power consumption 3.5A max. We recommend using +24VDC power supply with isolated output and non-grounded return.
3, 4 (red)	**+24VDC**	
5	**N/C**	-
6	**Enable**	5V TTL signal to be applied here to enable the high voltage output. Enable signal could be used instead of Enable switch and they shouldn't be used at the same time.  In the case of the Fault, the driver should be disabled and enabled again to resume the operations.
7	**Enable return**	

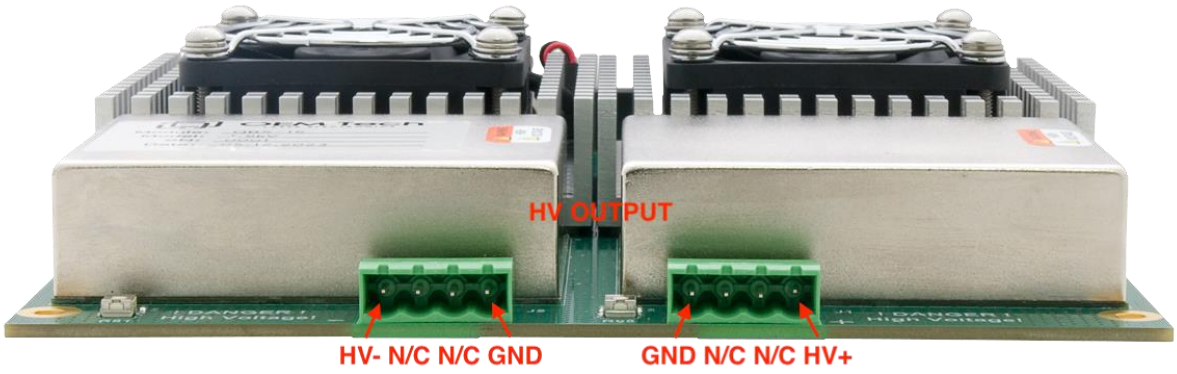
8	**Ready**	Exactly as Ready LED, indicates the Pockels cell driver is enabled and ready to work. 
9	**Ready return**	

ENABLE SWITCH

UPPER POSITION	**ON**	Enable switch turned to ON position enables the high voltage output. Enable switch could be used instead of Enable signal of interface and they shouldn't be used at the same time. In the case of the Fault, the driver should be disabled and enabled again to resume the operations.
BOTTOM POSITION	**OFF**	

LEDs

There is a Ready LED onboard indication the driver is ON and ready to work.



HV OUTPUT: Phoenix Contact 1757268 (2pcs)

J2 (Left connector on the picture above):

PIN (color)	DESIGNATION	DESCRIPTION
1	**HV OUTPUT NEGATIVE (HV-)**	High voltage output (negative swing) of the QBX-16 driver. Positive and negative parts can be used independently.
4	**GND**	
2, 3	**N/C**	-

J1 (Right connector on the picture above):

PIN (color)	DESIGNATION	DESCRIPTION
1	**GND**	High voltage output (positive swing) of the QBX-16 driver. Positive and negative parts can be used independently.
4	**HV OUTPUT POSITIVE (HV+)**	
2, 3	**N/C**	-

Mating part (Phoenix Contact 1758377) is supplied together with the driver.

GROUNDING AND MOUNTING

Grounding policy
24VDC, INPUT, HV OUTPUT, Enable, and Ready circuits are fully isolated from each other.

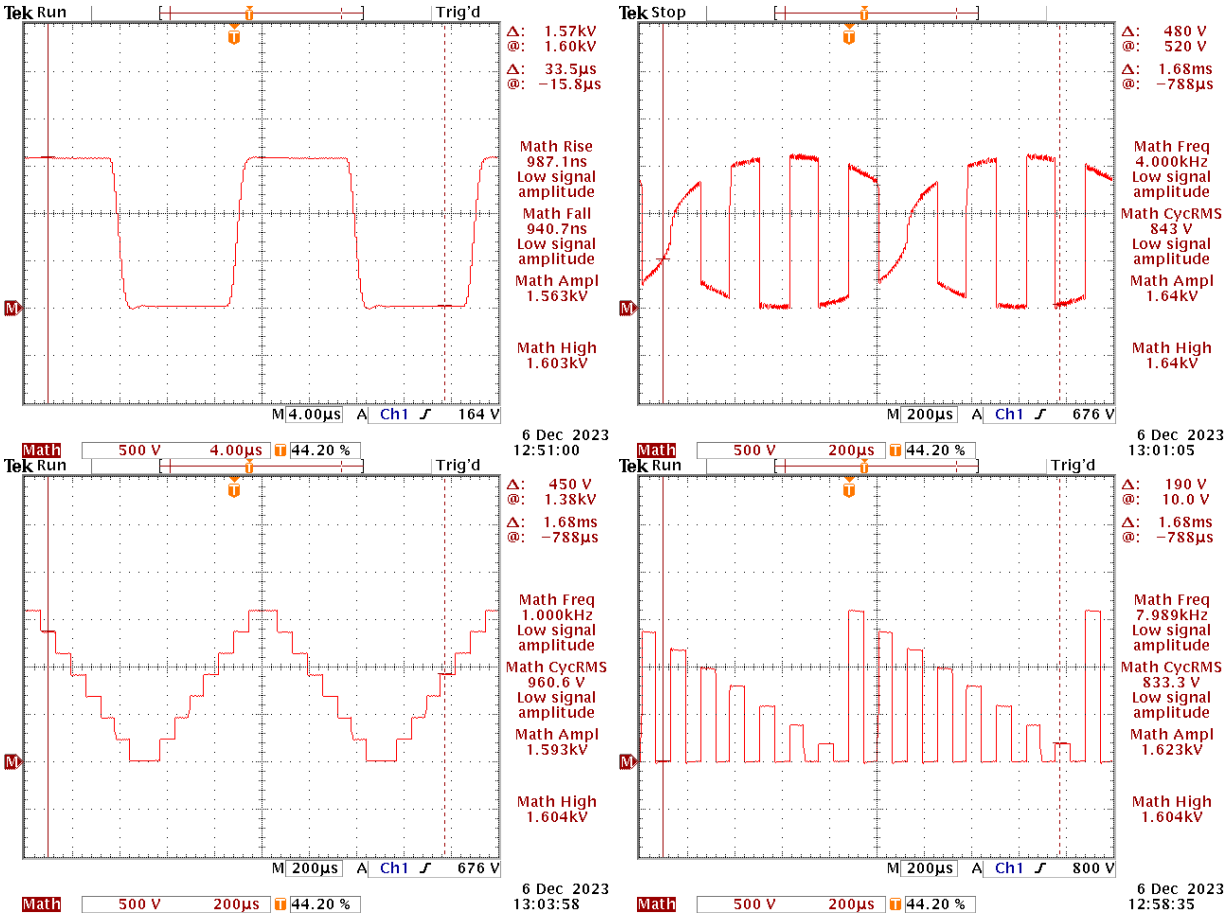
Driver is to be mounted with four M4 screws.

Operations

1. Connect *+24VDC* power supply, waveform generator and Pockels cell
2. Turn on *+24VDC* power supply
3. Turn *ENABLE SWITCH* in *ON* position or apply *ENABLE* signal
4. Turn on waveform generator and apply desired waveform to *INPUT*

Typical output

Examples of waveforms:



Specifications

ELECTRICAL SPECIFICATION

Input	
Power	24VDC, 3.5A typ.
Signal	Analog signal 5.33V, input impedance 50 Ohm
HV Output	
Output type	High voltage signal repeats the shape of low voltage input signal
Output polarity	Differential (positive and negative)
Amplitude	0-1600V (300:1 amplification)
Bandwidth (sine wave)	>300kHz for 60pF load capacitance
Repetition rate	Nominal performance: 50kHz @ 1600V and 60pF Maximum repetition rate: Up to 300kHz (at smaller loads and voltages). Average power limitation: Performance is also limited as $f_{MAX}*C*U^2=8W$, for example: ~50kHz @ 1600V and 60pF ~130kHz @ 1000V and 60pF
Rise/fall time (full slope)	<1us (1 microsecond)
Delay time	<1.5us
Load requirements	
Load type	Capacitive (other on request)
Load capacitance	<60pF (other on request)
Cooling	Forced air cooling with integrated fan
Protections	Overheating protection
Environmental	
Operating temperature	+10…+40℃

MECHANICAL SPECIFICATION

Size (LxWxH)	220x170x45 mm (see also the dimensional drawing below)
Weight	Approx. 1.2 kg

Dimensional drawing

