

QBX-16 Pockels cell driver

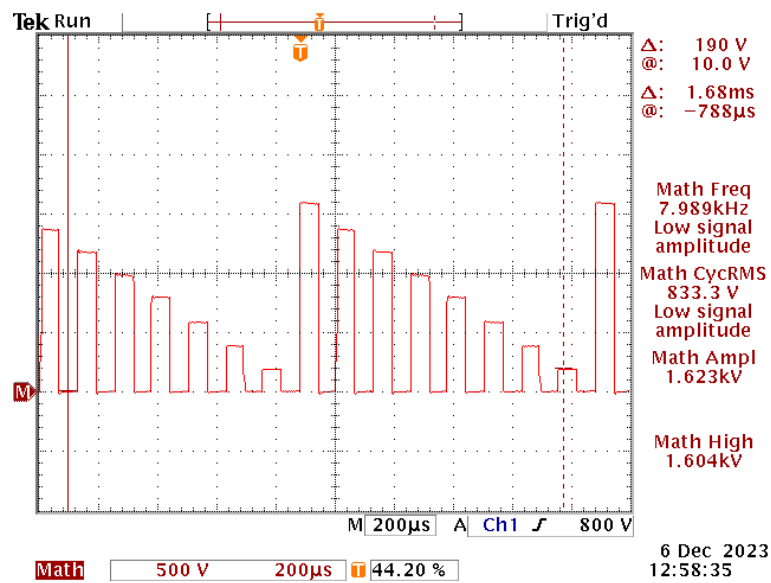
User manual

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

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.

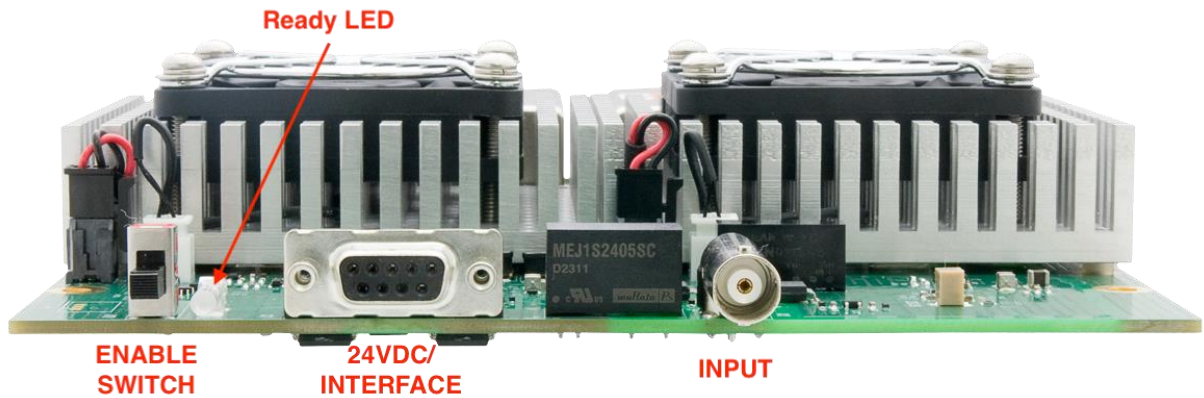
Driver is air-cooled with built-in fans. Driver is available in PCB version only.



Appearance



Connections, signals, signal descriptions

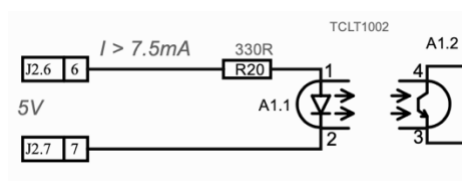


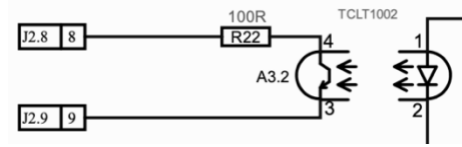
INPUT: BNC

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.
3, 4 (red)	+24VDC	We recommend to use +24VDC power supply with isolated output and non-grounded return.
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.
7	Enable return	 <p>In the case of the Fault, the driver should be disabled and enabled again to resume the operations.</p>

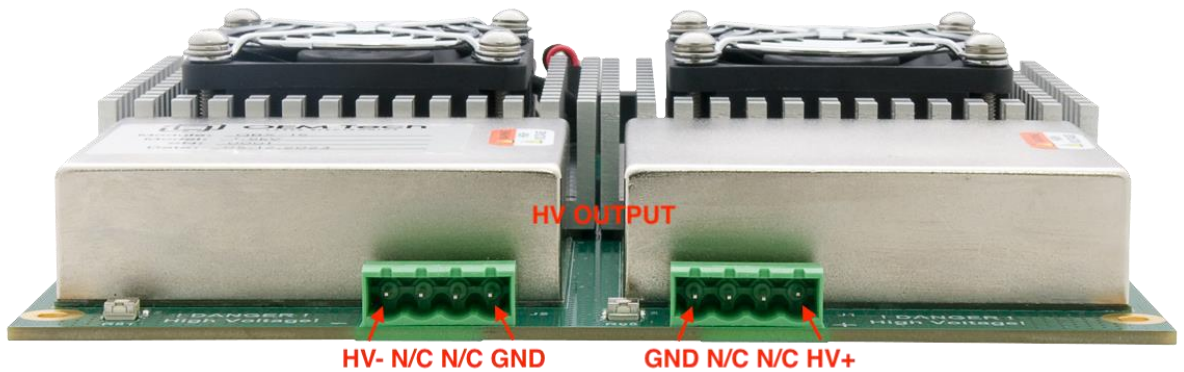
8	Ready	Exactly as Ready LED, indicates the Pockels cell driver is enabled and ready to work.
9	Ready return	

ENABLE SWITCH

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

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.
4	GND	Positive and negative parts can be used independently.
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.
4	HV OUTPUT POSITIVE (HV+)	Positive and negative parts can be used independently.
2, 3	N/C	-

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

Grounding and mounting

Grounding policy

By default, INPUT is galvanically isolated from HV OUTPUT. HV OUTPUT GND and 24VDC return (via filtering choke) are interconnected to each other and to chassis ground (through the mounting pads).

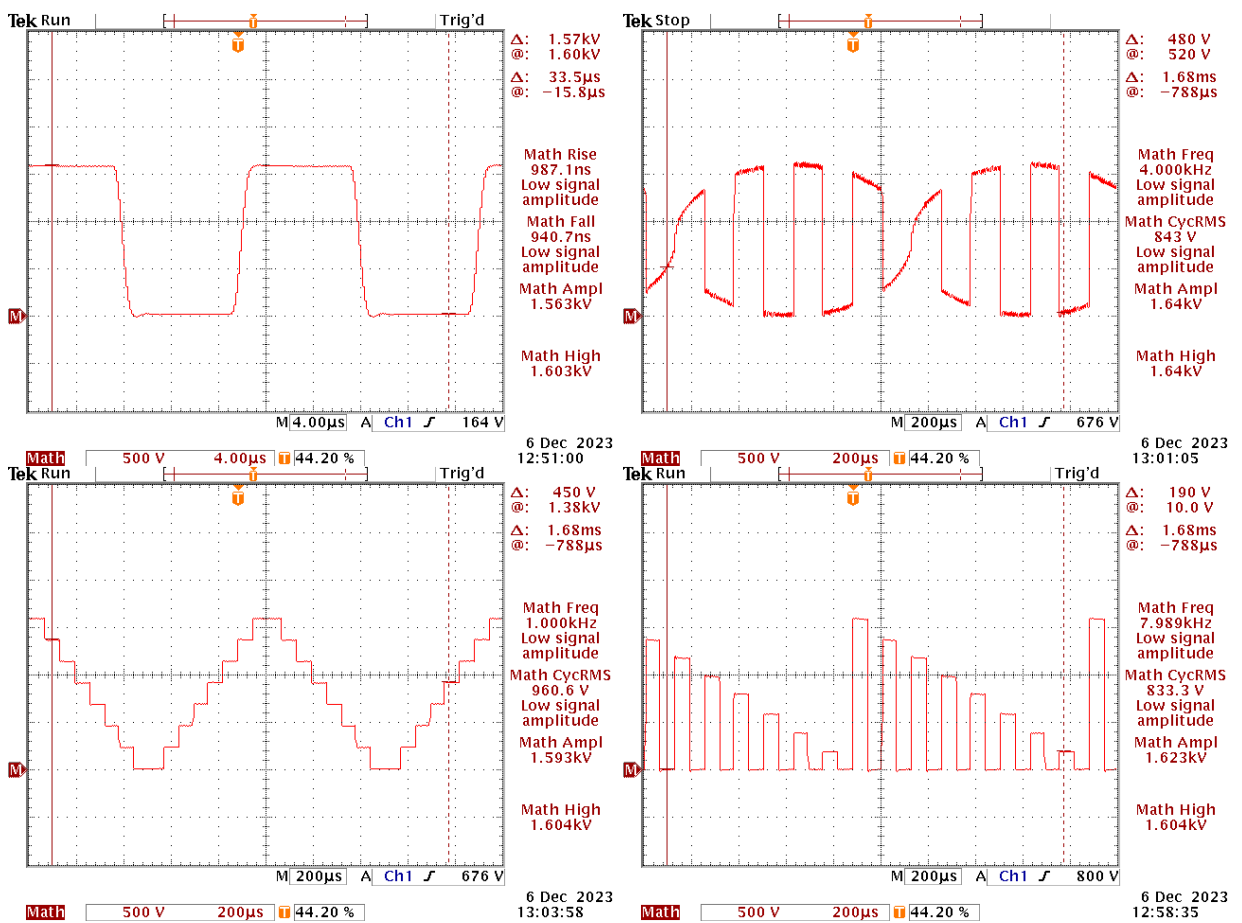
Driver is to be mounted with four M4 screws.

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 50Ohm
HV Output	
Output type	High voltage signal repeats the shape of low voltage input signal
Output polarity	Bipolar
Amplitude	0-1600V (300:1 amplification)
Repetition rate	<u>Nominal performance:</u> 50kHz @ 1600V and 60pF <u>Maximum repetition rate:</u> Up to 300kHz (at smaller loads and voltages). <u>Average power limitation:</u> 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 °C

MECHANICAL SPECIFICATION

Size (LxWxH)	220x170x45 mm ³ (see also the dimensional drawing below)
Weight	Approx. 1.2 kg

Dimensions

