Product specification

Product：Time-to-Digital Converter

Model：TQ2STLXXC-G0X-V1

Revision Date：2025.6.20

Vision：V2.1

Introduction

TuringQ's time-to-digital converter is the TimeLink series. With its outstanding performance and parameters, the system meets the strict requirements of high-precision time measurement and high-speed data processing. It delivers a minimum time resolution of 1 ps and a dead time of 2 ns. With USB 3.0 and 10 Gbps optical network interfaces inside, it supports event transfer rates of up to 280 Mcps.

Features

- High-precision time resolution
- High-speed data transfer interfaces
- High instantaneous count rate
- Up to 64 counting channels

Operating Environment

- Operating temperature：
- 0~70°C（commercial grade）
- -40~85°C（industrial grade）

Application Scenarios

- LiDAR
- Quantum optics
- Bio-fluorescence
- Mass spectrometer
- Microscopy imaging
- Particle physics

Key Specifications

Channel Characteristics			
channel	Number of counting channels	-	1-64
	Input level range	V	-2.5~+2.5
	Trigger edge	-	Rising or falling edge
	Input pulse width	ns	> 0.1
TDC Characteristics			
TDC	Minimum time	ps	1

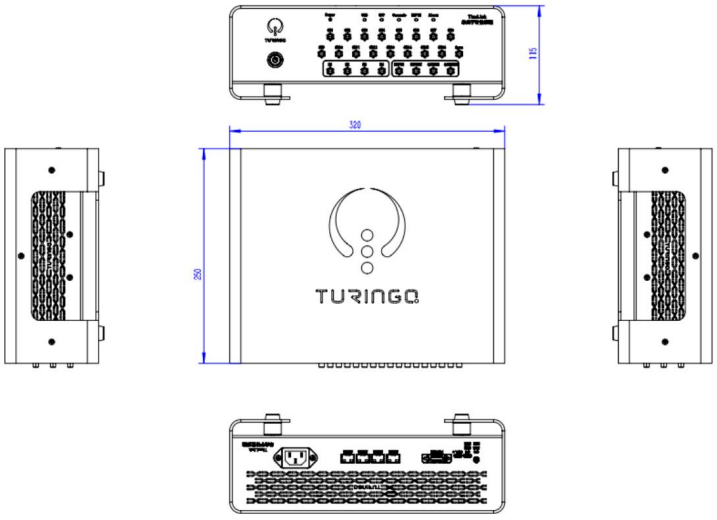
	resolution		
	Timing accuracy	ps rms	< 30
	Dead time	ns	≤2
	Time delay adjustment range	ns	-1000.000~+1000.000
Histogram Characteristics			
Histogram	Maximum count depth	bit	32（4,294,967,295 counts）
	Maximum time bin width	ps	1048576
	Maximum range	-	1.04us~1s
TTTR Characteristics			
TTTR	T2 time resolution	ps	1
	T3 time resolution	ps	1,2,4,…,1048576
	Data buffer depth	Gb	32
FPGA Data Bus Characteristics			
FPGA Data Bus	Maximum time transfer rate	Mcps	< 280
	Maximum instantaneous count rate	Mcps	500
	T2 mode latency	us	4.5~5.0
	T3 mode latency	us	4.5~5.0
Chassis Characteristics			
Chassis	Chassis dimensions (H × W × D)	mm	105*307*260
	Chassis power supply	V	220
	Data interfaces	-	USB 3.0 (optional), 10 Gbps optical port

Control Software

Software functions:

- Device parameter configuration
- Count detection
- Time tagging
- Histogram

Mechanical Dimensions



Ordering Information

No.	Model	Description
1	TQ2STL16C-G01-V1	16 channels, base model, commercial grade
2	TQ2STL32C-G01-V1	32 channels, base model, commercial grade
3	TQ2STL64C-G01-V1	64 channels, base model, commercial grade
4	TQ2STL16C-G02-V1	16 channels, base model, industrial grade
5	TQ2STL32C-G02-V1	32 channels, base model, industrial grade
6	TQ2STL64C-G02-V1	64 channels, base model, industrial grade

Revision History

No.	Version	Date	Description
1	V1.0	2024.5.23	this document
2	V1.1	2024.7.8	some technical parameters
3	V2.0	2024.8.15	Added channel-count options
4	V2.1	2025.6.20	Updated product model numbers