

# Precision Calibrator QC2



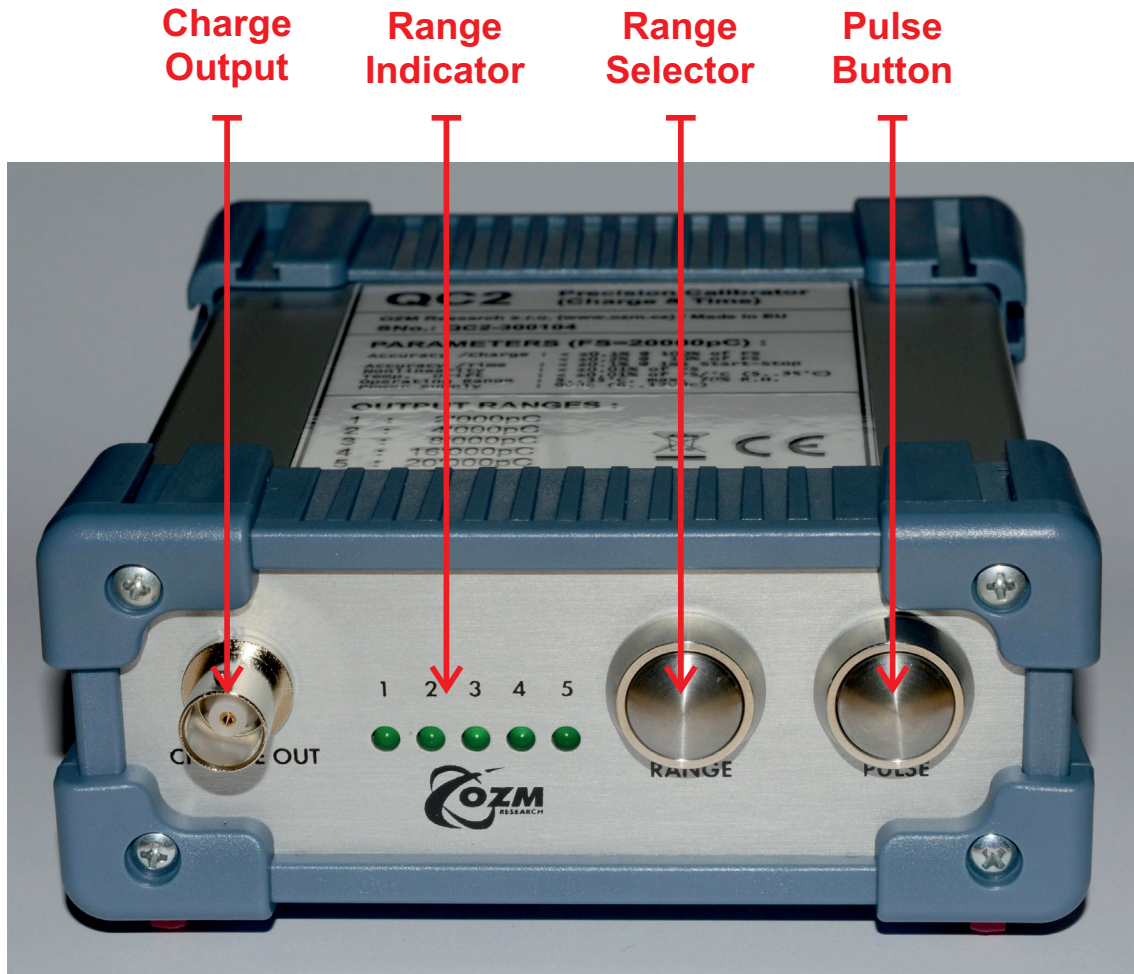
Precision Charge & Time Calibrator  
for BA04S, S2, SE, BA06S, TR2519A and BA08M.

## Description of QC2 Calibrator

### Features of the Precision Charge & Time Calibrator QC2 :

*Precision Charge & Time Calibrator QC2 is determined for calibration and checking of function and accuracy of Ballistic Analyzer or Transient Recorder (BA04S,S2,SE, BA06S, TR2519A, BA08M) - charge and velocity channels.*

*This instrument can be used for testing of any charge amplifier, piezocable, influence of long cable to accuracy etc.*



#### **Charge Output**

- BNC charge output for connection to charge amplifier input.

#### **Range Indicator**

- indication of selected charge range (see table on top of calibrator).

#### **Range Selector**

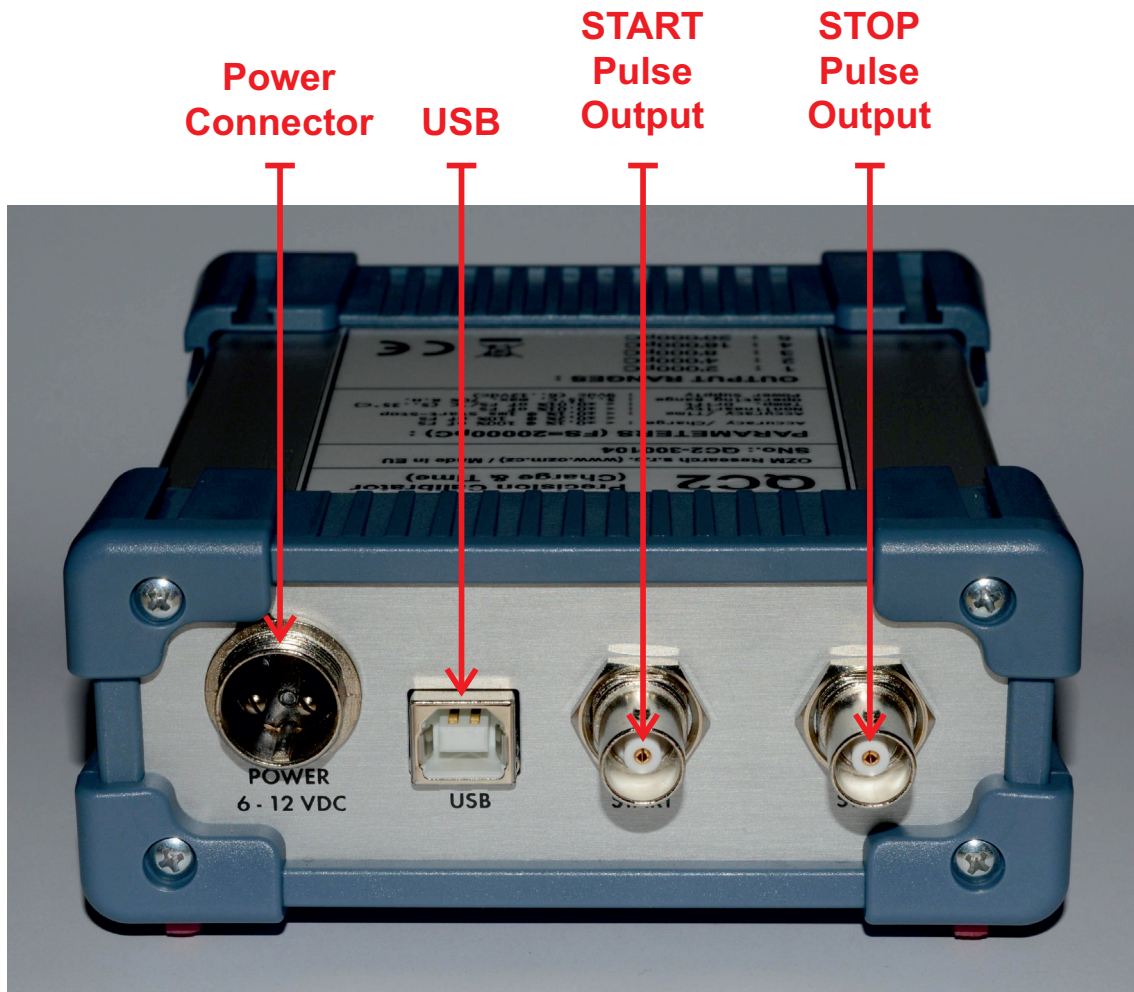
- press this button for selection of next range (1→2→3→4→5→1→2→ etc).

#### **Pulse Button**

- press shortly this button for generation of one pulse (short beep)

- press this button for approx. 3 seconds - the calibrator is switched to automatic mode (long beep) and every 6 seconds will be generated one pulse (press this button shortly to stop automatic mode).





#### **Power Connector**

- 6..12Vdc (use delivered power supply only).

#### **USB**

- this connector is for service only, do not use it.

#### **START Pulse Output**

- connect this output to Ballistic Analyzer / Transient Recorder voltage input used for Light Screen Start pulse (pulse amplitude is 5V, i.e. use 10V range).

#### **STOP Pulse Output**

- connect this output to Ballistic Analyzer / Transient Recorder voltage input used for Light Screen Stop pulse (pulse amplitude is 5V, i.e. use 10V range).

**Connect QC2 Calibrator with short coaxial cables (length max. 1.0m) directly to BA/TR instrument for calibration or verification of accuracy.**

**For checking of coaxial cables between shooting range and measuring room place QC2 Calibrator to shooting range instead of pressure sensor and velocity light screen. Then accomplish simulated measurement and check the results.**

## Technical Parameters of QC2 Calibrator

Accuracy /Charge	< $\pm 0,1\%$ @ 100% of FS < $\pm 0,2\%$ @ 10% of FS (FS = Full Scale 20'000pC)
Accuracy /Time	< $\pm 0,1\%$ @ 1ms Start-Stop
Charge Pulse	- amplitude depends on Range - maximum amplitude 20'000pC - compatible with BA/TR inverting charge amplifiers - pulse width 5ms - almost rectangle shape
Default Charge Ranges	1 - 2'000pC 2 - 4'000pC 3 - 8'000pC 4 - 16'000pC 5 - 20'000pC
START/STOP Pulse	- positive amplitude +5V - rectangle shape - rise/fall edge < $0,1\mu\text{s}$ - pulse width 0.01ms (10 $\mu\text{s}$ ) - START pulse delay approx. 25ms - START-STOP distance 1ms $\pm 0,1\%$
Nonlinearity	< $\pm 0,01\%$ of FS
Temperature Drift	< $\pm 0,01\%$ of FS/ $^{\circ}\text{C}$ (5..35 $^{\circ}\text{C}$ )
Time Drift	< $\pm 0,01\%$ of FS/year
Operating Range	5..35 $^{\circ}\text{C}$ , max. 70% R.H.
Power Supply	9Vdc (6..12Vdc)

### **IMPORTANT NOTE :**

**”START-STOP distance 1ms  $\pm 0,1\%$ ” is distance between**

**START Rising Edge and STOP Rising Edge or**

**START Falling Edge and STOP Falling Edge**

## Connection of QC2 Calibrator to Ballistic Analyzer

Connect to BA/TR velocity input STOP (e.g. CH5/F)

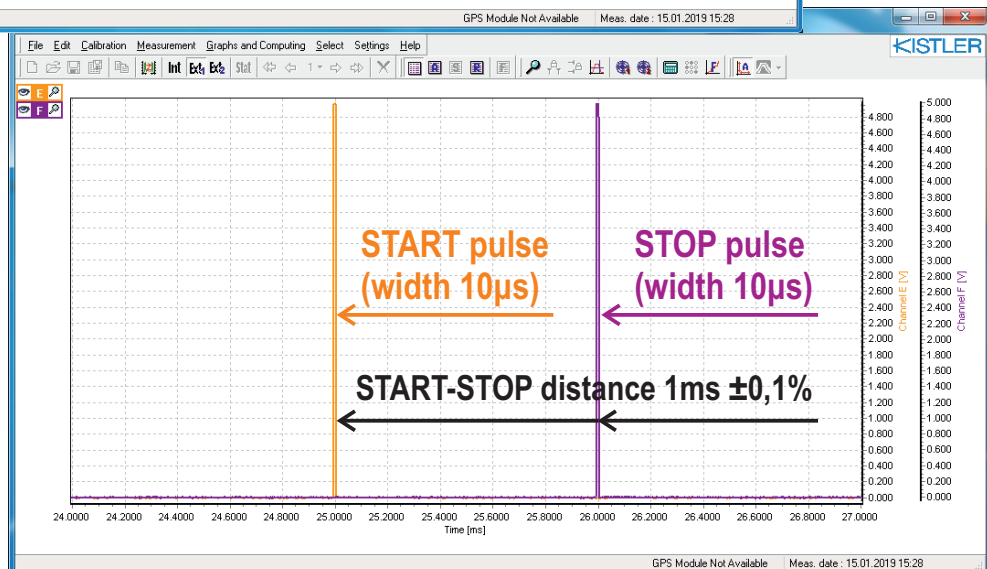
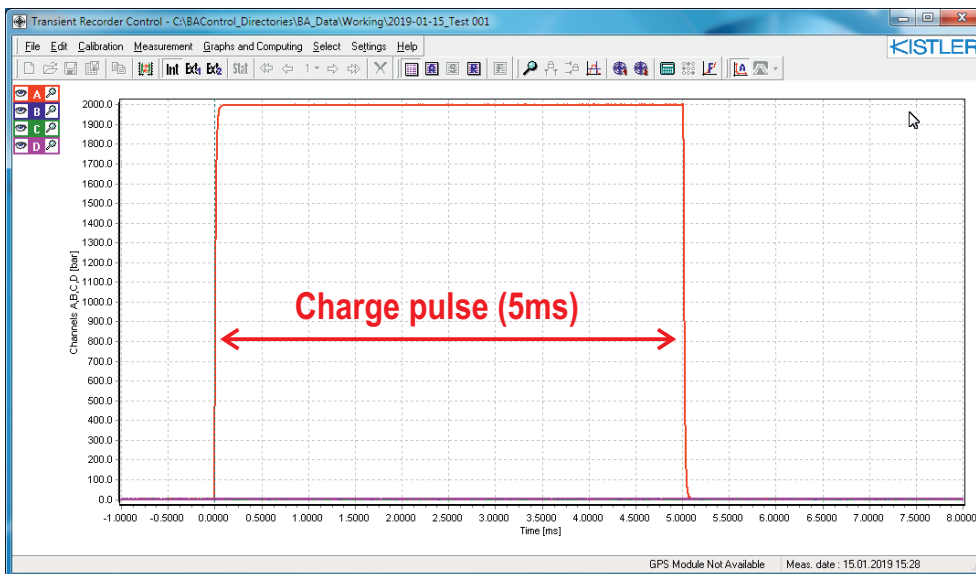
Connect to BA/TR velocity input START (e.g. CH4/E)



Connect to BA/TR charge input (e.g. CH0/A)

# Example of Data Evaluation

(Ballistic Analyzer BA08M and QC2 Calibrator)



Row	Type	Start Stop	Edge Min. width	Description	Results	Extended values and results	Limits Max	Limits Min	C.I.P.: (Avg+K*SD) NATO coeff.
1	<input checked="" type="checkbox"/>	<b>A</b> Start OK <b>A</b> Interval OK	% 1 us 1	Charge A	4.7083 ms 1999.5 bar	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	C <input type="checkbox"/> N <input type="checkbox"/>
2	<input checked="" type="checkbox"/>	<b>E</b> Start OK <b>F</b> Stop OK	% 1 us 1 us	Time EF	1.0000 ms	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	C <input type="checkbox"/> N <input type="checkbox"/>

**Data Evaluation window**

