

SHOT ✓ CHEK

Model IV

Current Pulse Monitor
U.S. Patent #4,502,004

Operation Manual

V1.3

Inspection Research division of
 **RG NDT** International, Inc.
Oilfield Pipe Inspection Equipment & Supplies

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Basic Operation

The ShotChek® IV equipment consists of a digital display unit, a current sensing probe, a BNC to BNC connecting cable, a Wall Charger 5 VDC 2A (min) USB Output, and a USB 2.0 A (Male) to USB 2.0 B (Male) cable.

1. Connect the current probe to the ShotChek® IV unit. Attach one end of the BNC connecting cable to the current probe output jack and the other end to the jack marked INPUT on the rear panel of the ShotChek® IV. To achieve maximum accuracy levels, the current probe must be connected before turning on the device.
2. Move the POWER switch to the ON position. Wait for the system to complete the setup process; once finished, the Status message on line 1 of the LCD will change from “Wait” to “Ready”. For best results, reset the device each time you plug in or unplug the charger.
3. Insert the current carrying conductor(s) through the center (ID) of the current probe. For best accuracy, the cables connected to the negative leads should be run through the current probe with the RG NDT logo facing toward the shooting system enclosure.
4. Fire the shooting system (which may be either a capacitor discharge unit or battery-pack). The peak current (in kiloamps) and pulse duration (in milliseconds) of the newest shot will be displayed on the bottom line. Information pertaining to the previous shot is moved to the top line. The device will display these readings indefinitely, or until the device is powered off.
5. Wait until the Status message changes from “Wait” to “Ready”. Once the device is in the ready state, steps 3 through 5 can be repeated.

WARNING

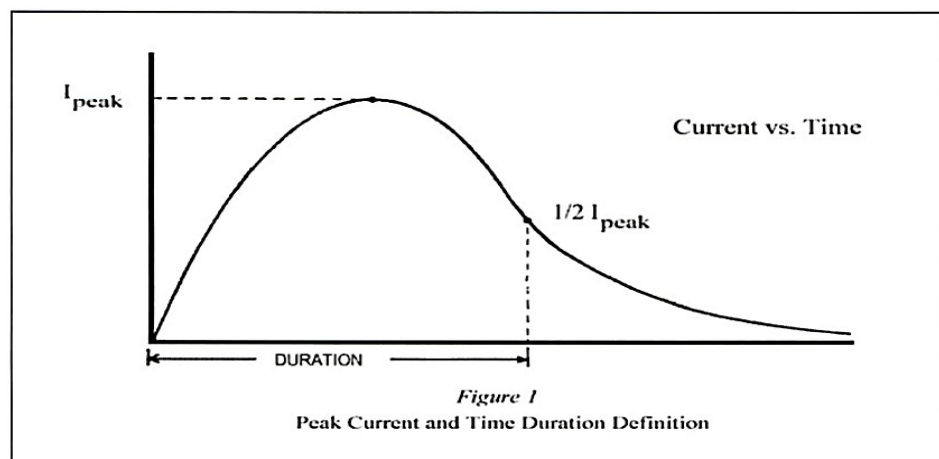
Exposing current probe or display unit to excessive heat may cause irreparable damage. (e.g., vehicle dashboard, exposure to direct sunlight, etc.).

Do NOT swap current probes between devices. Inaccurate readings and irreparable damage may occur.

Operation Notes

1. The conductors carrying the current to be measured are passed once through the center (ID) of the current probe. No electrical connection to the current source is required.
2. Any number or type of conductors (cables, rods, bus bars, etc.) which will fit through the ID of the current probe may be used. In a system with multiple conductors connected in parallel, ALL CONDUCTORS MUST PASS THROUGH THE CURRENT PROBE TO MEASURE THE TOTAL CURRENT.
3. The current probe may be positioned anywhere along the current path since the current is the same at all points on the path (Kirchhoff's Current Law). In other words, the same current measurement will be obtained whether the current probe is located on the rod or the cables, near the current source or far away, etc.
4. The size and shape of the current conductor does not affect the accuracy of the measurement. The relative position of the current probe with respect to the conductor does not affect the accuracy of the measurement (Ampere's Circuital Law). In other words, the conductor does not have to be centered in the ID of the current probe, nor does the current probe have to be perpendicular to the flow of current. To achieve maximum accuracy, the cables connected to the negative leads should be run through the current probe with the RG NDT logo facing toward the shooting system enclosure.
5. Each ShotChek® unit and current probe is calibrated as a pair. Although it is possible for the display units and current probes to be physically interchanged, this is NOT RECOMMENDED because the specified accuracy cannot be assured if this is done. Each unit and probe are assigned a serial number in order to maintain the proper match. On the display, unit this number is stamped on the bottom of the cabinet. On the current probe, the number is stamped on the front.
6. Pulse width is defined as the time elapsed from the beginning of the pulse to the point at which the current has decayed to 50% of its peak value.

Figure 1



Description of Rear Panel

Refer to *Figure 2* for the following discussion of the features of the rear panel of the ShotChek® unit.

Display Light

This push-button toggles the backlight on the display. Extensive usage of the LCD backlight will reduce operating time.

Power

This switch turns the ShotChek® unit on or off. It is recommended to restart the device each time the charger is connected or disconnected.

Charger

This jack is for connection of the charger for the internal Lithium Ion batteries which supply power for the operation of the ShotChek® unit. Any standard Wall Charger 5 VDC 2A (min) USB Output used with a USB 2.0 A (Male) to USB 2.0 B (Male) cable can be used to charge the unit. The standard charge for a completely discharged unit is 8 hours. Neither benefit nor damage occurs from extended charging. A standard charge will provide at least 10 hours of continuous operation. Extensive usage of the backlight will reduce operating time. Operation of the unit during charging will increase the amount of time required for a full charge.

Input

This jack is for connection of the current probe. Any standard BNC to BNC cable may be used to connect the current probe to the ShotChek® unit. Using a different cable than the one used to calibrate the device may affect accuracy; for best results, use the same cable. **CAUTION: Never connect anything other than the ShotChek Current Probe to the input jack, otherwise the unit may be damaged and any warranty will be void.**



Figure 2 ~ REAR PANEL

Specifications

Peak Current

Range	1.00 to 30.00 kiloamps
Resolution	00.08 kiloamps
Repeatability	within 00.08 kiloamp
Accuracy	± 00.08 kiloamps (00.30% of current range)

Duration

Range	01.00 to 40.00 milliseconds
Resolution	00.01 milliseconds
Repeatability	00.01 milliseconds
Accuracy	± 00.05 milliseconds

Dimensions

Current probe	3-11/16" ID toroid
Display unit	8" x 8-1/2" x 3"

Display

Type	Liquid Crystal Display (LCD)
Backlighting	LED

Other

Charger	5VDC @ 2.0A (min)
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RG NDT International, Inc. reserves the right to change specifications at any time without incurring any obligation to incorporate those changes into products previously sold.

Servicing & Calibration

To guarantee conformance to published specifications, servicing and/or calibration must be performed by RG NDT International, Inc. or its authorized agent. There are no user serviceable parts within the unit. Unauthorized opening of the cabinet or other disassembly of any part(s) of the unit will void the warranty.

As with all electronic instrumentation, periodic calibration should be performed. The recommended calibration period for the ShotChek® IV unit is one (1) year.

If servicing or calibration is required, contact:

RG NDT International, Inc.
165 Oates Rd, Houston, TX 77013

Telephone: (713) 675-5928
Email: shotchek@rgndt.com
Web: <http://www.rgndt.com>

Troubleshooting

Suspected Unreliable Results

If at any point in time, the user suspects that the readings of the ShotChek® IV are unreliable or inaccurate, restart the device following the steps outlined in **Operation Notes**; a change in environment may have caused a need for the device to complete its auto zero process again.

If the problem persists after a power cycle, use a volt meter or scope with a shunt to verify the readings of the ShotChek® IV.

Error 101 – Input Signals Are Inconsistent

Usually caused by excessive noise in the atmosphere. To test: Temporarily remove the device from the inspection area and cycle the power. If the error code does not reappear, then the problem is likely to be noise in the inspection area.

Error 102 – Cannot Remove Drift From Input Line

Usually caused by extreme humidity. To test: Temporarily take the device to a dry area (preferably indoors), power it down, and let it sit for ten (10) minutes. If the error reappears, try letting the device sit for another ten (10) minutes. If the error does not reappear while in the dry area, humidity was the problem.

Error 103 – Cannot Get Input Signal to Zero

Usually caused by extreme humidity. To test: Temporarily take the device to a dry area (preferably indoors), power it down, and let it sit for ten (10) minutes. If the error reappears, try letting the device sit for another ten (10) minutes. If the error does not reappear while in the dry area, humidity was the problem.

If further assistance is needed, contact:

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Warranty

RG NDT International, Inc. warrants that a new ShotChek® IV will be free from defects in materials and workmanship under normal use and service for ninety (90) days from the date of delivery to the customer.

RG NDT International, Inc. warrants that a repaired ShotChek® IV unit will be free from defects in materials and workmanship under normal use and service for thirty (30) days from the date of delivery to the customer.

RG NDT International, Inc. will replace or repair, at its option, any equipment or accessories which may be found to be defective under this warranty. This warranty does not cover any damage caused by negligence, abuse, or tampering with the product. Opening of the cabinet or other disassembly and/or modification of any part(s) of the unit will void this warranty.

To obtain service under this warranty, all products to be repaired must be returned to RG NDT International, Inc. or its authorized agent.

This express warranty is in lieu of all other warranties, expressed or implied. RG NDT International, Inc.'s liability shall be limited to replacement cost of its own product in question. In no event, and under no circumstances, shall RG NDT International, Inc. be liable for any indirect, incidental, or consequential loss or damage arising from the use or failure of its equipment or from breach of this warranty. No representation or other affirmation of fact, including but not limited to statements regarding suitability for use, or performance of the equipment, shall be or be deemed to be a warranty by RG NDT International, Inc. for any purpose, nor give rise to any liability or obligation of RG NDT International, Inc. No agent, distributor, salesman, wholesale or retail dealer has the authority to bind RG NDT International, Inc. to any other affirmation, representation, or warranty concerning these goods.

The terms of this warranty constitute the buyer's sole and exclusive remedy.