

### 5.10. Setting WBC amplifier gain

If the WBC diagram is shifted too far on left or right in WBC histogram the amplifier gain of WBC measurement could be increased or decreased by approx.  $\pm 10\%$ . Please be advised that changing this value requires to recalibrate the device to get proper results! The settings are under **Settings**→**Measurement**→**Settings**→**Calibration**.

## 6. CHECKING THE PROPER OPERATION

### 6.1. Self Test

There is a built-in Self test and Service menu in each model. Self test can be used to check the operation of the instrument.

The test results can be printed or saved to USB flash disk. With the Retry button the self test is repeated.

#### 6.1.1. Self Test Screens

Every measured value has a check mark if it is in the acceptable range, or a X and a minus or plus sign if it is below or above the normal range.

Self test		16:51
HGB	0 / 5526	✓
Electrode voltage	50.2 V	✓
Electrode offset	-0.4 mV	✓
Electrode current	871 $\mu$ A	✓
Noise test	0 pls/5sec	✓
Amplifier test	19999 pls	✓
Peak	1290 mV	✓
Deviance	45 mV	✓
Vacuum	492.7 mBar	✓
Drift	5.4 mBar/10s	✓
Fast blank meas	93	✓
Fast blank probe min	299	✓
Fast blank probe max	300	✓

Save Print Retry Back

**HGB** measured impulses per second  
Measuring **Electrode voltage, current** and **offset**.

**Amplifier Noise** test during a 5-second period.

**Amplifier** transfer by generating 20000 **test** pulses, incl. gain related **peak** value, noise related **deviation**.

**Vacuum** reports pump operation (vacuum made by the pump in a 10-second period of time).

**Drift** represents pressure loss of vacuum measured in a 10-second period of time.

**Fast blank meas**, the device performs a fast blank measurement. This number is the PLT count. **Probe min, probe max** probe voltage are relative numbers during fast blank measurement.

#### 6.1.2. Normal range of Self Test parameters

Parameter	Unit	Lower bound	Upper bound
HGB light	count	3000	60000
Electrode voltage	V	45	55
Current	$\mu$ A	830	930
Offset	mV	-5.0	5.0
Amplifier test	count	19990	20050
Peak of test pulses	mV	1300	1700
deviation (noise)	mV	0	100

## CHECKING THE PROPER OPERATION

Noise test	pls/5sec	0	50
Vacuum	mBar	300	600
Drift	mBar/10sec	0	10
Fast blank meas	count	0	100
Fast blank probe min	-	280	360
Fast blank probe max	-	280	360

### 6.1.3. Troubleshooting Guide for Self test

Parameter	Mark	Possible reason	Remedy
HGB dark	<i>HIGH</i>	Instrument door open	Close instrument door
HGB light	<i>LOW</i>	HGB head not connected or HGB LED out of order	Check HGB head connections check HGB LED during measurement
	<i>HIGH</i>	Instrument door open or HGB LED too bright	Close door or replace HGB LED resistor on amplifier board
Electrode voltage	<i>LOW</i> or <i>HIGH</i>	Fault on MAIN or Amplifier board	Check measuring voltage (50V) on High voltage and Amplifier boards
Current	<i>LOW</i> or <i>HIGH</i>	Fault on Amplifier board	Check current generator, and test generator FET on Amplifier board
Offset	<i>LOW</i> or <i>HIGH</i>	Fault on Amplifier board	Check the offset potentiometer on Amplifier board
Amplifier test	<i>LOW</i>	Amplifier Boards is not connected to main board	Check cables and connectors coming from the Amplifier
	<i>HIGH</i>	Instrument not grounded	Check mains ground lead
Peak of pulses	<i>LOW</i> or <i>HIGH</i>	Fault on Amplifier board	Check current generator, and test generator FET on Amplifier board
Dev. (noise)	<i>HIGH</i>	Instrument not grounded	Check mains ground lead
Noise	<i>HIGH</i>	Instrument not grounded	Check mains ground lead
Vacuum	<i>LOW</i>	Peristaltic pump failure	Check peristaltic pump
Drift	<i>HIGH</i>	Leakage in pneumatics	Check tubing in pneumatics
Fast Blank meas	<i>HIGH</i>	Contaminated system	Run cleaning cycle
Fast Blank probe min	<i>HIGH</i> or <i>LOW</i>	Fault on MAIN or Amplifier board	Check measuring voltage (50V) on MAIN and Amplifier boards
Fast Blank probe max	<i>HIGH</i> or <i>LOW</i>	Fault on MAIN or Amplifier board	Check measuring voltage (50V) on MAIN and Amplifier boards