

CASTLE GROUP LIMITED

POPULAR RANGE

GA208, GA214 AND GA255

USER MANUAL

COMPANY INTRODUCTION

Thank you for buying a Castle product, we are sure you will find both the goods and the service to be of the highest quality but if not, then please feel free to write to us so that we can deal with any concerns you may have.

This manual is designed to show you the operation of the goods you have purchased . If you would like to become a competent person, then you may like to know more about our Competent Persons training course for the Noise at Work Regulations.

It is our aim for Castle Group Ltd to provide a complete range of Noise and Vibration products and Services of the highest standard. If you would like to know more about any of our other products and services then please complete the reply paid card in this manual and return it to us for prompt action or telephone on: +44(0)1723 584250.

Simon Bull

A handwritten signature in black ink, appearing to be 'S Bull', written over a circular scribble.

Sales and Marketing Director

Precautions

Operate the unit only as described in this manual.

- The Popular Range of instrument are precision sound level meters. Protect the instrument from shocks and vibrations.
- Use only the microphone/preamplifier as supplied with the unit. Take special care not to touch the microphone top as it can easily be damaged.
- Ambient conditions for operation of the unit are as follows :
temperature range - 10 to +50 - C, relative humidity 30 to 90%.
- Protect the unit from water, dust, extreme temperatures, humidity, and direct sunlight during storage and use. Also keep the unit away from air with high salt or sulphur content, gases, and stored chemicals.
- Always turn the unit off after use. Remove the batteries from the unit if it is not to be used for a long time (a week or more) .
- Clean the unit only by wiping it with a soft, dry cloth or, when necessary, with a cloth lightly moistened with water. Do not use any solvents, cleaning alcohol or chemical cleaning agents.
- Take care that no conductive objects such as wire, metal scraps, conductive plastics etc. can get into the unit.
- Do not try to disassemble or alter the unit. Otherwise type certification will become invalid. In case of an apparent malfunction, do not attempt any repairs. Note the condition of the unit clearly and contact the supplier or Castle Group direct.

CONTENTS

TITLE	PAGE NO.
INTRODUCTION	1
USING THE MANUAL	1
BATTERY INSTALLATION	2
SWITCHING ON AND OFF	3
ACTIVATING FUNCTIONS	4
CALIBRATION	4
DISPLAYING PARAMETERS	6
LOCKING THE INSTRUMENT	8
PAUSE AND HOLD	8
RESETTING PARAMETERS	9
INSTRUMENT STATUS	10
CHANGING RANGE	10
TIME WEIGHTING	11
CRITERION AND EXCHANGE	11
TECHNICAL INFORMATION/ INSTRUMENT SPECIFICATION	12
WARRANTY AND AFTER SALES SERVICE	15

INTRODUCTION

The Castle GA208, GA214 and GA255 are part of Castle's Popular range and have been designed to meet the requirements of noise measurement to type two standards. They may be used in industry or for general purpose measurement to ascertain noise levels accurately yet economically.

This manual contains complete operating instructions for the above named instruments, read it carefully and you will quickly become familiar with your instrument. If you have problems with the operation of the instrument please call our Technical help line on +44 0990 133 048 or fax +44 (0)1723 583728.

USING THE MANUAL

In the course of this manual a named button written in **BOLD** means press that button. E.g. **ENTER** means press the ENTER button.

Since this manual covers the operating instructions for three instruments the shaded areas of the title serves to inform the user which functions are present on your instrument.

E.g. The following title informs you that this function is only applicable to the GA208/214

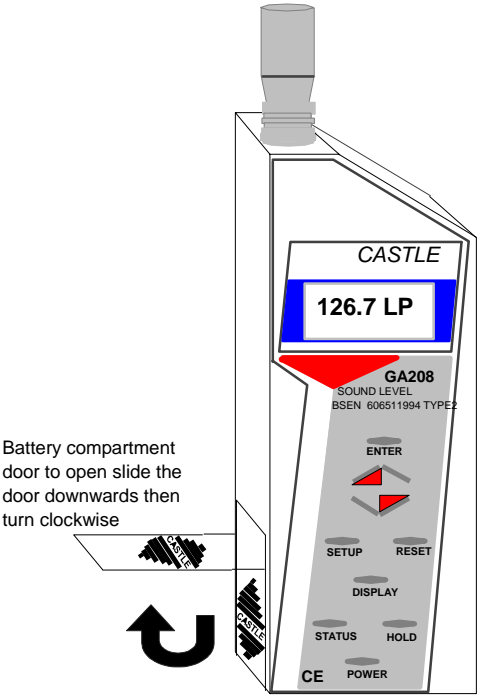
CHANGE RANGE	GA208/214
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BATTERY INSTALLATION	ALL
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To prepare the equipment for use a heavy duty battery type 6LR61 should be fitted, such as Ever Ready 6LF22 Gold Seal, Duracell MN1604 or Kodak U9VL.

Open the battery door cover by sliding the cover downward towards the bottom of the instrument. The cover will now swing open exposing the battery compartment. Insert the battery observing the correct polarity as marked on the case wall.

Close the battery compartment door. The instrument is now ready for calibration and use.



SWITCHING ON AND OFF	ALL
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Press and hold the **POWER** button until the instrument name appears, then release the button. Allow the instrument to scroll through its start-up sequence before pressing any other button, this will take approximately 3 seconds.

WARNING: DO NOT PRESS ANY BUTTONS DURING START UP SEQUENCE

Inadvertent power down while the instrument is being used can be prevented by selecting the **LOCK** mode (except GA208), refer to the **LOCKING THE INSTRUMENT** section.

When switching the instrument on the instrument selects the appropriate range for the sound environment. During this time a downrange message may appear. On the GA214 all previous settings are restored, this includes range, filter and time constant.

To switch off, press and hold the **POWER** button until the display goes blank, then release the button.

THE MICROPHONE	ALL
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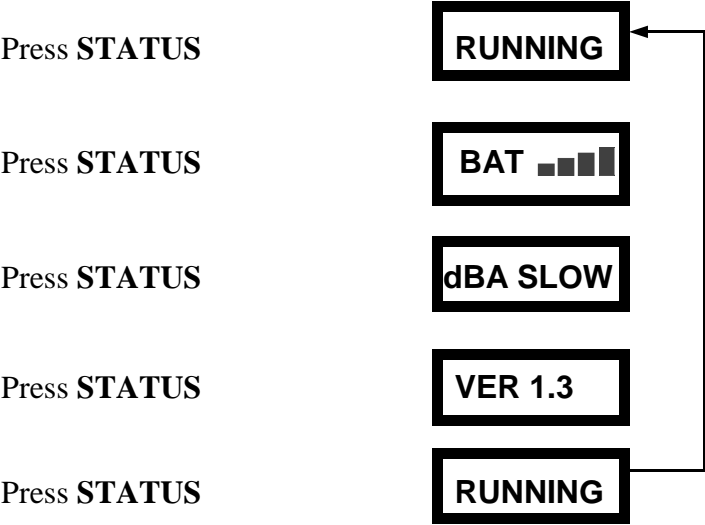
The microphone fitted to your instrument is a type 2 instrumentation grade 1/2 inch pre-polarised condenser microphone. The microphone is not removable. The GA255 is fitted with a DOSE meter microphone in order that it can be attached on the collar of a noise exposed worker.

WARNING: DO NOT TWIST THE MICROPHONE

ACTIVATING FUNCTIONS	ALL
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Castle instruments operate with an intuitive menu system. The menu is selected by using the dedicated buttons on the keypad. A scrolling menu exists within this function holding the button down will allow you to scroll through the menu.

In the example below the displayed messages may vary due to different instrument functions and configurations.



The status menu is therefore circular and can be easily scrolled through by successively pressing the **STATUS** button.

This format is repeated for the other functional buttons on your instrument. It should be noted that the colour matched buttons are used with the **ENTER** button to change an operating mode.

CALIBRATION	ALL
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<p>WARNING: ENSURE A SUITABLE CALIBRATOR IS ATTACHED AND WORKING BEFORE COMMENCING CALIBRATION ROUTINE</p>
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The calibrators recommended for use are the Castle GA601/607 calibrators, which supply 94dB (relative to 20µPa pressure) at a frequency of 1KHz.

Turn the instrument on by pressing the **POWER** button.

Press **STATUS** until a good battery condition is shown. Replace the battery if the indication is low i.e. one or two bars remaining.

Press **SETUP**

CAL <ENT

Note for GA208/214.: Select the 40dB range if calibrating to 94dB or 60 range if calibrating to 104dB by pressing the ▼ or ▲ button until the appropriate range is displayed, if required refer to the CHANGING RANGE section. Press the **ENTER** button.

Press **ENTER** and the instrument will now display >94.0. The calibration will be performed at a default of 94.0dB but may be changed using the UP/DOWN arrow buttons. Position the calibrator firmly over the microphone. Turn the calibrator on to the 94dB (or 104dB) setting.

Press **ENTER** after deciding on the calibration level of 94.0 dB or 104.0 dB.

Press **ENTER** and the instrument will calibrate to the level of the calibrator. The displayed number may change from a higher or lower value as the instrument calibrates to the chosen level. Press **ENTER** and the display will return to SPL for the GA208 and GA214, and DOSE for the GA255.

If the input level is not within 3dB of the chosen reference level then the display will show CAL.NOW. Check to make sure the calibrator is switched on and emitting the correct level before proceeding as indicated above.

The instrument is now calibrated.

Reset the instrument by pressing the **RESET button** until 'ALL' is displayed then press **ENTER** twice. This will clear readings due to calibration.

The instrument is now ready to take measurements.

DISPLAYING PARAMETERS	DISPLAY
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Displays the parameters that are being measured. Repeated presses of the **DISPLAY** button scroll round the parameters listed in the table shown below.

The display will also show the following message when appropriate:

- ** **UR** ** when the instrument is Under-range
- ** **OR** ** when the instrument is Over-range.
(Except GA255 since no range change facility.)

The display will flash when the instrument is Under-range, Over-range or the Crest factor is being exceeded, indicated by **OVERLOAD**.

You may leave the display menu by pressing any other menu button.

The table shown below lists the display parameters available on each of the Popular Range units as they appear by repeat pressing the **DISPLAY** button.

GA208	GA214	GA255
SPL	SPL	DOSE
MAX	LEQ	PROJ
LP	Run Time	L _{EP}
Run Time	MAX	PLE
Overload	LP	Run Time
	L _{EP}	LP
	115 Indicator	115 Indicator
	Overload	115 Time
		Pa ²
		Overload

The table on the following page is a breakdown of the display parameters and is accompanied by an explanation of each one.

DISPLAYING PARAMETERS	DISPLAY
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DISPLAY	DESCRIPTION	INSTRUMENT
103.7dBC	Sound Pressure Level SPL A or C weighted	GA208/214
00:01:33	Run time duration	ALL
LEQ 93.2	Displays the LEQ	GA214
94.4 MAX	Maximum SPL	GA208/214
PROJ	Displays the projected DOSE assuming an 8 hour shift	GA255
L _{EP}	Displays the L _{ep'd} only valid when worn for the full shift	GA214/255
PLE	Displays the projected L _{ep'd} assuming an 8 hour shift	GA255
Pa ²	Indicates the energy that has been received in Pa ² hours	GA255
LESS115	Indicates whether the 115dBA flag has been exceeded	GA255
OVER115 time	Indicates if the 115dBA flag has been exceeded followed by TIME when last exceeded	
123.6 LP	Linear Peak	ALL
Overload	Indicates when an OVERLOAD has occurred	ALL
DOSE 67	Dose (dependent on exchange and criterion)	GA255

LOCKING THE INSTRUMENT	GA214/255
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The **LOCK** button is used to lock the instrument keypad. All functions are therefore disabled including the **POWER** button. The function is often used to avoid inadvertent operation or tampering while the instrument is being used.

Press **SETUP**





To **LOCK** the instrument, press **SETUP** until the instrument displays then **LOCK** then press **ENTER**. The status of the Battery will be displayed while the instrument is locked. To **UNLOCK** the instrument. Press **RESET**, **ENTER** then **RESET** respectively.

PAUSING/PLAYING	GA214/255
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Press 



All functions can be held so that they do not update by pressing the  button. Once **PAUSED**, the display may be read as normal allowing the user to take note of any required readings.

For normal operation of the instrument to continue press the  button once more.

HOLD	GA208
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Press **HOLD**



All functions can be held so that they do not update by pressing the **HOLD** button. Once **PAUSED**, the display may be read as normal allowing the user to take note of any required readings.

For normal operation of the instrument to continue press the **HOLD** button once more.

RESETTING PARAMETERS	RESET
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Used to **RESET** data.

Press **RESET**

ALL

Repeated presses of the **RESET** button will display the parameters below.

MAX	Only resets the maximum RMS SPL	ALL
L PEAK	Only resets the PEAK	ALL
OVER 115	Only resets the 115dB(A) flag	GA255
ALL	Will reset all data MAX, L PEAK and RUN	ALL

To reset simply scroll round the options until the desired function is found then press the **ENTER** button.

The following message will be displayed:

CONFIRM?

Press **ENTER** to reset the chosen data or another button to decline the RESET.

By pressing **ENTER** you will note that the SPL is then displayed.

<p>WARNING: USE THE RESET BUTTON WITH GREAT CARE AS PREVIOUSLY ACCUMULATED DATA MAY BE LOST.</p>





INSTRUMENT STATUS	ALL
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The status of the instrument can be ascertained by the use of the **STATUS** button.

Press **STATUS**



Repeated presses of the **STATUS** button will display the parameters listed below depending on the instrument type.

dBA SLOW	Indicates the current time and frequency weighting.	GA208/214
RUNNING	Indicates the instrument is running.	ALL
PAUSED	Indicates the unit is not updating any Parameters.	ALL
BAT  BAT  BAT  BAT 	>70% battery capacity remaining. >50% battery capacity remaining. >30% battery capacity remaining. Battery needs replacing.	ALL
90/3	Indicates the current Exchange and Criterion level.	GA255
VER1.3	Indicates the software version number.	ALL

CHANGING RANGE	GA208/214
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A range change can be performed by the use of the **UP/DOWN** arrow buttons while in the DISPLAY mode (instrument displaying SPL(dBA)/LP etc.

Press **▼▲** repeatedly until the required range comes into view, press **ENTER**.

The instrument will return to the SPL.

You will notice that the symbol **➤** indicates the current selection as you move around the range options.

TIME WEIGHTING

GA208/214

A weighting change can be performed by the use of the **SETUP** button.

Press **SETUP**

WTG

Press **SETUP** until WTG<Ent is displayed.

Press **ENTER** and the instrument will display the current WTG SETUP.

To change WTG use either the up arrow or down arrow button. Pressing these two buttons allows you to scroll through the four available weighting choices, A SLOW, A FAST, C SLOW or C FAST. A weighted Impulse and C weighted Impulse available on the GA214.

You will notice that the symbol ➤ indicates the current selection as you move around the range options.

CRITERION / EXCHANGE

GA255

The Criterion and Exchange level can be changed by the use of the **SETUP** button.

Press **SETUP**

CRIT/EXC

Press **SETUP** until CRIT/EXC is displayed.

Press **ENTER** and the instrument will display the current CRIT/EXC SETUP.

To change the CRIT/EXC use either the up arrow or down arrow button. Pressing these two buttons allows you to scroll through the four available criterion and exchange choice, 90/3, 85/3, 90/5, or 85/5.

You will notice that the symbol ➤ indicates the current selection as you move around the range options.

TECHNICAL INFORMATION INSTRUMENT SPECIFICATION	ALL
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The individual characteristic applies to each instrument unless specifically worded otherwise.

Measuring Range: 40 – 140 dB (GA214/208)
30 - 130 dB (GA214 Impulse)

Each range has a primary indication of 60dB:

40 – 100, 60 – 120 and 80 – 140.

For the Impulse meter: 30 – 90, 60 – 120 and 80 – 130

Detector Characteristics: RMS + Peak

Frequency Weighting: GA208/214 'A + C weighted ' to IEC651
Type 2
GA255 'A weighted ' to IEC651 Type 2

Time Weighting: GA208/214 Slow 1S, Fast 125mS to IEC651
Type 2 (and Impulse on the GA214)
GA255 Slow (1S), to IEC651 Type2

DOSE Exchange Rate: GA255 3dB/5dB

Criterion Level: GA255 90dBA for 8 hours = 100% DOSE
selectable
GA255 85dBA for 8 hours = 100% DOSE
selectable

Peak: 90 - 140dB 200Pa Linear Frequency
Weighted

Overload: Positive overload condition shown when
Crest Factor is exceeded.

Display: Digital 1 x 8 alphanumeric
Digit size 7mm x 5mm.

Microphone/Preamp:	Pre-polarised 1/2" (12.7mm) Condenser
Microphone/Preamp:	Microphone Sensitivity 12mV/Pa Capacitance 15pF Preamp output impedance 550R
Calibration:	Instrument acoustically calibrated using GA602 at 94dB or 104dB at 1KHz. Digital adjustment.
Batteries:	Type: IEC No 6LR61 Life: Duracell MN1604 >40 hrs continuous Ever Ready 6LF22 >20 hrs continuous
Temperature:	Operating range: -10 to +50°C Storage without batteries: -20 to +70°C Effect of temperature: < 0.5dB from -10 to +50°C
Effect of Humidity:	< 0.5dB from 30%RH to 90%RH
Vibration:	A 40Hz 1m/s vibrating force produces no noticeable effect.
Magnetic Field:	No noticeable effect.

DISPLAYED PARAMETERS:

Parameter	Displayed Range	Instrument
SPL	30 – 130dB(A)	GA208/214
EXPOSURE TIME	0 – 72hours	*ALL
Leq	30 – 130dB(A)	GA214
MAX	30 – 130dB(A)	GA208/214
DOSE	0 –9999%	GA255
L _{ep} 'd	0 – 140dB(A)	GA214/255
PLE	0 – 140dB(A)	GA255
Pa hr	0 – 320Pa hr	GA255
PROJ DOSE 8HR	0 – 9999%	GA255
PEAK	90 – 140 dBlin	ALL

*** Note that the maximum continuous integration time is 24 hours.**

Standards:

BS6402 1994 Personal Sound Exposure Meters	GA255
BS EN 60651 1994 Sound Level Meters Type 2	GA208/214
BS EN6698 (IEC804) Type 2 Integrating Averaging Sound Level Meters	GA214

Overall Dimensions: 150 x 60 x 29mm

Weight: 220g with batteries

Accessories Available: GA601 Single level 94dB acoustic calibrator
GA602 Dual level acoustic calibrator
94/104dB.
10 X 9V Batteries

WARRANTY AND AFTER SALES SERVICE	ALL
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Castle Group design and manufacture precision instruments, which if treated with reasonable care and attention should provide many years of trouble free service.

In the event of a fault occurring, during the warranty period, the instrument should be returned to Castle Group Ltd., in its original packaging, or to an authorised agent. Please enclose a clear description of the fault or symptom.

Details of the warranty cover are available from Castle Group Ltd or an authorised agent.

All instruments are designed to meet rigid British and International Standards. An annual calibration is recommended to ensure that these high standards are maintained, particularly when the instrument readings are to be used in litigation or compliance work.

For warranty and service return to:

The Service Department
 Castle Group Ltd.
 Salter Road
 Cayton Low Road Industrial Estate
 Scarborough
 North Yorkshire
 YO11 3UZ

Telephone UK: (01723) 584250
 INT: 44 1723 584250

Fax UK: (01723) 583728
 INT: 44 1723 583728

E-MAIL: sales@castlegroup.co.uk

Internet: <http://www.castlegroup.co.uk>

Any misuse or unauthorised repairs will invalidate the warranty.
 Damage caused by faulty or leaking batteries is not covered by the warranty.

NOTES

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