TYPE 6226

Integrating Sound Level Meter

Instruction Manual

(Version 1.5PA)

www.castlegroup.co.uk

Thank you for buying a Castle product, I am 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 me personally and I will ensure that your needs are dealt with immediately.

This manual is designed to show you the operation of the goods you have purchased and a very brief insight into acoustics itself.   If you would like to become a competent person in the eyes of the law, then you may like to know more about our Competent Persons training course for the Noise at Work Regulations.

It is my intention 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 telephone on +44(0)1723 584250.

Simon Bull
Managing Director

Copyright

Precautions

- Only operate the instrument as described in this manual.
- These are precision instruments, protect from shocks and vibrations.
- Take special care with the microphone. The diaphragm is made from a very thin metal and is easily damaged.
- Ambient conditions for the operation of the unit are as follows:-

    Temperature   0°C to +50°C
    Relative Humidity   25 to 90%
- Protect the unit from extremes of temperature and humidity, direct sunlight and air with a high salt or sulphur content.
- Always turn the unit off after use.   Remove the batteries from the instrument when not in use.
- Do not use any solvents or cleaning agents on the instrument.   Use only a soft dry cloth or a soft cloth lightly moistened with water when necessary.
- Do not let any conductive objects, such as wire or metal scraps get into the unit.
- Do not try to disassemble the instrument or attempt any repairs as this will invalidate your warranty.   Take a note of the condition of the instrument and contact your authorised Castle service station.
- To ensure continued precision performance of your instrument have it checked and serviced at regular intervals.

Contacting Castle Group

This manual contains complete operating instructions for the Castle 6226 Integrating Sound Level Meter, read it carefully and you will quickly become familiar with your instrument and its operation.

If you do encounter problems with the operation of your instrument please feel free to contact customer support with your enquiry on: -

    techsupport@castlegroup.co.uk

For all other enquires please contact us on either: -

+44 (0)1723 584250   Telephone
+44 (0)1723 583728   Fax
www.castlegroup.co.uk   Web Site

Introduction

１．Overview

The Castle 6226 (Class 2) Integrating Sound Level Meter is ideally equipped for carrying out Noise at Work Risk Assessments, as well as the majority of environmental survey work. The range of parameters measured, the wide measuring capability of the meter and the ease of use, mean that this equipment is suitable for anything from aircraft noise to lawnmower design, and from construction sites to laboratories.

The Castle 6226 has an easy to follow menu system and clearly marked keys, all designed to make the meter simple-to-use. The back-lit LCD display is also very clear with large figures and a quasi-analogue display bar to show the changes in sound level as they happen.

２．Features

- Equivalent continuous level (Leq)
- 5 user selectable percentile values (Ln)
- Wide Linearity range of 90dB
- RS232 for data output to optional software
- Memory storage for 10,000 data-points

３．Configuration

(1) Integrating Sound Level Meter	TYPE 6226	1
(2) 1/2"electret condenser microphone	TYPE 7052N	1
(3) Windshield (⌀50)		1
(4) Screwdriver		1
(5) Wrist strap		1
(6) Carrying case		1
(7) Instruction manual		1
(8) Optional extras		

- AC adaptor   PSU4
- Extension cable(2m, 5M. 10m)   ZL0046-02, 05, 10
- Interface cable   ZL0026
- Output cable(BNC pin cord)(2m)   ZL0071
- Data management software   PCO226-4
  (with Interface Cablel)

Contents

Section 1   Setting up

1 . **Locations and their functions**

Microphone

Preamplifier

Threaded retaining ring

INTEGRATING
SOUND LEVEL
METER
TYPE 6226

Front panel

Display

Tripod Bush

Battery cover

Side panel

Wrist Strap Bush

Side panel

I/O   DC6V   POWER   OUT   CAL

OFF ON   DC   AC

Calibration potentiometer

AC OUT connector

DC OUT connector

POWER switch

AC power adaptor connector

External Input/Output connector

２．Battery installation

When the display indicates low battery, install new batteries.
For long-term measurement, install new batteries in advance.
The following diagrams indicate the battery condition.

Full   Low   Replace batteries.

To install new batteries:

１）Turn off the POWER switch.
２）Push the Battery cover gently where it says 'OPEN' and slide it to the right.
３）Insert the new batteries according to the diagram inside the battery compartment and replace the cover.

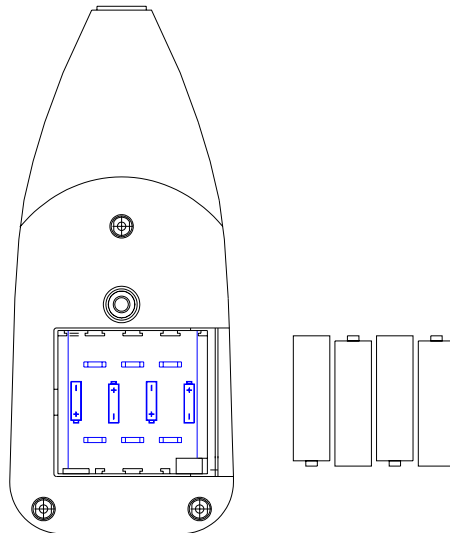| **CAUTION** |
|---|
| Place each individual battery with the positive terminal to the positive markings on the case. All four batteries should be replaced at the same time. |

・Battery life is approximately:

> 20 hours (Alkaline batteries, continuous operation)
> 10 hours (Manganese batteries, continuous operation)

・Use of the LCD backlight shortens the life of the batteries (approximately 1/3).

３．AC power adaptor

１）Turn off the POWER switch.
２）Connect the optional AC power adaptor to the AC power adaptor connector.
３）Place the AC plug in the AC 240V outlet.

CAUTION
The use of an AC power adaptor other than the one recommended may cause damage to the instrument.

AC power adaptor connector
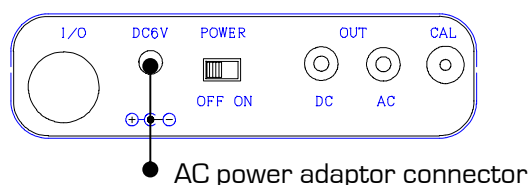
4．**LCD adjustment**

The LCD contrast can be adjusted when the batteries are low or when new batteries are installed.
The procedure is as follows.
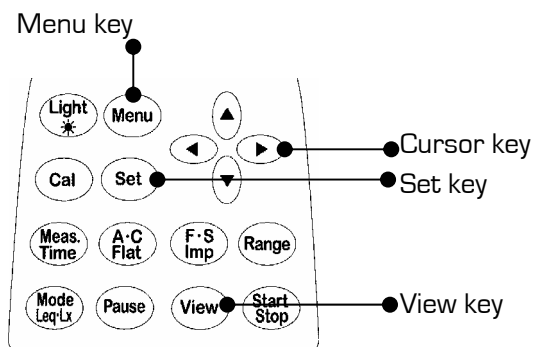
Menu key

Cursor key
Set key

View key

1）When you press the **Menu** key, the following screen appears.

```
<menu>                          1/2
Meas Mode          : Manu
Interval           : Single
I/O                : OFF
Data delet         : OFF
LCD cont           : * * * * *
date y/m/d         : 00/01/01
time               : 00:00:00
```

2）Select **LCD cont** with **Cursor** key ▼, then move the cursor to the right with ▶ key.

3）Adjust the LCD contrast with ▲ ▼ key, then press **Set** key to save the setting.
   Asterisks indicate the degree of contrast.
   After pressing **Set** key, the cursor moves to the left.

4）To go back to measurement mode, press the **View** key.

5．**Calendar adjustment**

To adjust the calendar (time), operate as follows.
The calendar can be adjusted in the Menu mode in the same way as the LCD adjustment.

Menu key

Cursor key

Set key

View key

１）When you press the **Menu** key, the
following screen appears.

```
<menu>                      1/2
  Meas Mode      : Manu
  Interval       : Single
  I/O            : OFF
  Data delet     : OFF
  LCD cont       : * * * * *
  date y/m/d     : 00/01/01
  time           :00:00:00
```

Date
adjustment

Time adjustment

【Calendar adjustment】
　１）Select **date y/m/d** with **Cursor** key ▼, then move the cursor to the right with ▶ key.
　２）Set the year/month/day with ▲ ▼ key, then press **Set** key to save the setting.
　　　After pressing **Set** key, the cursor moves to the left.
　３）To return to the measurement mode, press **View** key.

【Time adjustment】
　１）Select **time** with **Cursor** key ▼, then move the cursor to the right with ▶ key.
　２）Set the hour:minute:second with ▲ ▼ key, then press **Set** key to save the setting.
　　　After pressing **Set** key, the cursor moves to the left.
　３）To return to the measurement mode, press **View** key.

【Caution】
　　Be sure to enter the date (date y/m/d) in the order of "year → month → day."
　　Input any figure of; y(year): 00 – 99, m(month): 01 – 12, and d(day): 01 – 31.
　　　　e.g.: - For November 30, 2003 input 03/11/30

　　Be sure to enter the time in the order of "hour → minute → second."
　　Input any figure of; h(hour): 00 – 24, m(minute): 00 – 59, s(secOond) 00 – 59.
　　　　e.g.: - For 23:58:32 input 23/58/32

　<Entry of incorrect date and time>
　　The instrument has a function for outputting measured data to a personal computer.
　　During transfer of data, if an incorrect date and time are entered, an error message "**Econver
　　Error**" is displayed on the screen and data transfer cannot be carried out.

６．**LCD backlight**

Your Castle 6226 is equipped with a backlight on the display.
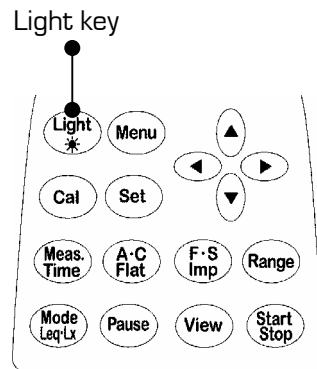
Light key

１）Press the **Light** key and the LCD backlight illuminates.

２）Pressing the **Light** key again turns the backlight off.
The backlight automatically turns off after approximately 30 seconds.

３）When the batteries are low the LCD backlight will dim.

CAUTION
Use of the LCD backlight shortens the life of the batteries.

Section 2　　Basic Operation

1．Changing The Display mode

1－1　How to change the display mode

The display has three modes (Normal, Magnified and List Mode).

They can be changed with the **View** key.

The **View** key can be used to go back to this display mode from any other menu screen.

View key

Normal Display Mode

```
→
FAST            00h   000h00m00s
LA  130.0 dB
┌──────────────────────────────┐
│                              │
└──────────────────────────────┘
40                          130
┌──┐ Manu
└──┘
```

Magnified Display Mode

```
→    E        00h   000h00m00s
FAST
LA 130.0
┌──┐ Manu                    dB
└──┘
```

List Display Mode

```
→  E
FAST

Lap  : 140.0dB      La05:140.0dB
Laeq : 140.0dB      La10:140.0dB
Lae  : 140.0dB      La50:140.0dB
LMin : 140.0dB      La90:140.0dB
LMax : 140.0dB      La95:140.0dB
┌──┐ Manu                    dB
└──┘
```

1 － 2　Normal Display Mode

→ : Operation indicator
　→ blinking : in operation (by pressing **Start** key)
　■ : Pause (by pressing **Pause** key).
　　When Data deletion mode is set, this symbol does not appear.

E : Data deletion mode
　E appears when **Data delet** was selected in **Menu**.
　When **Meas Time** is 1, 3 or 5s, E does not appear.

00h : Measurement time:
　Shows the time set with **Meas Time**.

000h 00m 00s : Time counter
　This counter starts by pressing **Start** key.

```
→ E        00h   000h00m00s
FAST
L A 130.0 dB
[                    ]
40                    130
[ ] Manu    Un    Ov
```

Digital display:
Shows the present value.

Bar display
Shows the instantaneous value on the bar graph.

Range:
Shows the range selected with **Range** key.

Time weighting:
Shows time weighting (FAST, SLOW or Imp).

Frequency weighting:
Shows frequency weighting (A, C, or FLAT).

Mode of Measurement
Shows the selected mode (Leq) with **Mode** key.

Mode:
　Manu : normal measurement mode　**Cal** : calibration mode

Battery condition:
　Shows a four level display of the battery condition.

・ When the input signal level is lower (-0.6dB) than the limited scale of the selected range,
　Un appears.
・ When the input signal level is higher (+3dB) than the limited scale of the selected range,
　Ov aqqears.
・ The digital display shows the time-weighted or frequency-weighted value.
・ The digital display is updated once per second.
・ The bar display is updated 10 times per second.

1－3　Magnified Display Mode

In magnified display mode, the bar graph does not appear and the numerical characters are magnified in the digital display.

In the magnified display mode it is possible to change between A-weighted sound pressure level, sound pressure level, equivalent continuous A-weighted sound pressure level, or percentile level measurement using the **Mode** key.

The other functions in this mode are the same as in the normal display mode.

```
┌──────────────────────────────────┐
│  →  E          00h   000h00m00s   │
│ FAST                              │
│  L_A 130.0                        │  ●——————— Magnified display
│  ▭ Manu              dB           │
└──────────────────────────────────┘
```

Note: The value of percentile level shown on the Normal or Magnified display is selected on the <Mode Set> page 2/2 of <menu> pages.

1－4　List Display Mode

All the measured data is shown in the list mode.

```
┌──────────────────────────────────┐
│  →   E         00h   000h00m00s   │
│ FAST                              │
│ Lap  : 140.0dB      La05:140.0dB  │
│ Laeq : 140.0dB      La10:140.0dB  │  ●——————— Data display
│ Lae  : 140.0dB      La50:140.0dB  │
│ LMin : 140.0dB      La90:140.0dB  │
│ LMax : 140.0dB      La95:140.0dB  │
│  ▭  Manu               dB         │
└──────────────────────────────────┘
```
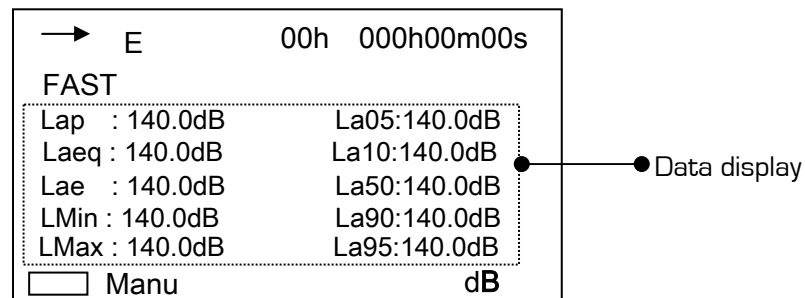
2. Operation of panel switches and their function
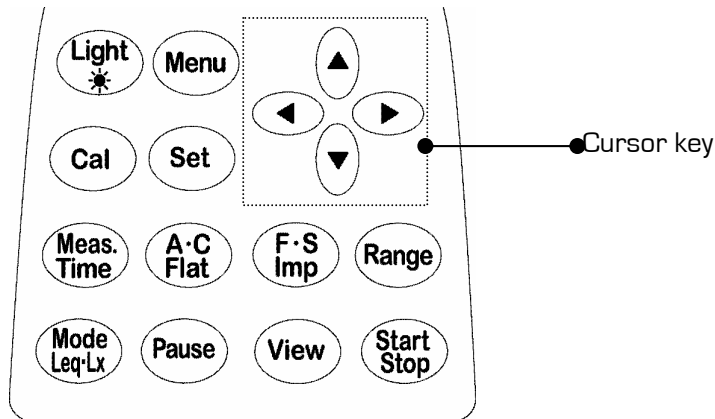
- **Light**   : LCD backlight key
                         See "LCD adjustment".
- **Menu**   : Menu key
                         See "Menu".
- **Set**   : Set key
                         Saves the settings of the menu screen or resets Max Hold value.
- **Cursor** key   : is used to move a cursor to select an item.
- **Cal**   : Calibration key
                         See "Calibration".
- **Meas. Time**   : Measurement time selection key
                         See "Measurement Procedure".
- **A・C・Flat**   : Frequency Weighting Key
                         See "Measurement Procedure".
- **F・S・Imp**   : Time Weighting Key
                         See "Measurement Procedure".
- **Range**   : Range selection key
                         See "Measurement Procedure".
- **Mode**   : Mode selection key
                         See "Measurement Procedure".
- **Pause**   : Pause key
                         See "Measurement Procedure".
- **View**   : Display mode key
                         See "Changing Display mode".
- **Start Stop**   : Start and Stop key
   See "Measurement Procedure".

３．Calibration

It is recommended that the instrument's calibration is checked and adjusted where necessary with a Castle GA601, Class 2 calibrator before readings are taken.   The calibration should be re-checked after taking readings to confirm the validity of the results.

There are two types of calibration:

1] Using the recommended Castle GA601, which supplies typically 94dB (relative to 20μPa pressure) at a frequency of 1kHz.

2] Using the internal calibration mode. The internal calibration should only be used as a general system check e.g. for a broken or damaged microphone or for electrical calibration by a calibration house, it should not be used for field calibration.   To maintain Class 2 accuracy the Castle GA601 must be used.
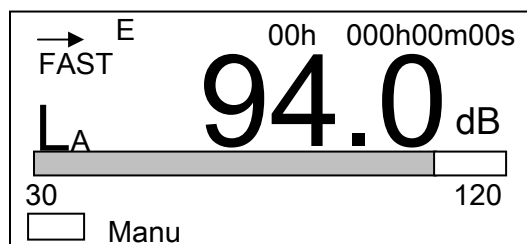
３－1　Calibration using the Castle GA601
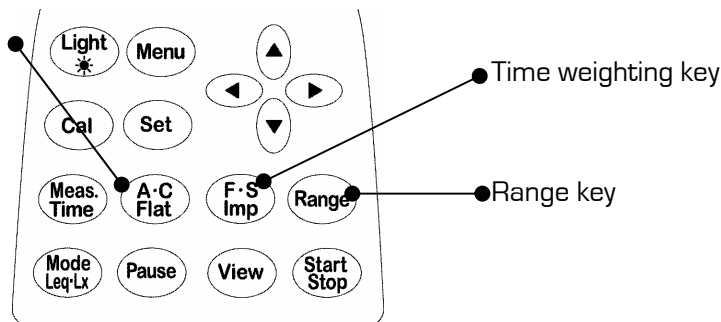
1 ）Turn on the POWER switch.
2 ）Set the frequency weighting to **A** with **Frequency weighting** key.
3 ）Set the time weighting to **Fast** with **Time weighting** key.
4 ）Set the range to **30～120dB** with **Range** key.
5 ）Ensure the calibrator is attached to the microphone by gently inserting the microphone into the cavity of the calibrator.   A certain amount of resistance should be felt whilst inserting the microphone as the o-ring seal on the calibrator forms a seal around the microphone.   Ensure that the calibrator is switched on and set to the chosen level and all correction factors for atmospheric pressure and microphone type have been accounted for, please refer to your Castle Calibrator Manual for more detail.
6 ）Adjust the calibration potentiometer on the side panel until the display shows the output level of the GA601 (standard value is 94.0dB).
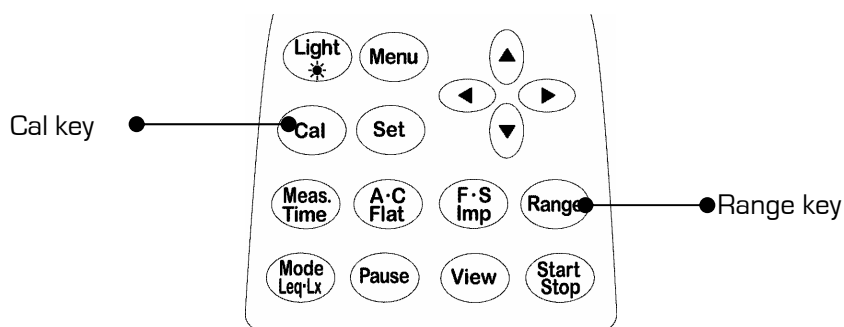
Please note that the calibrator automatically turns OFF after approximately one minute.
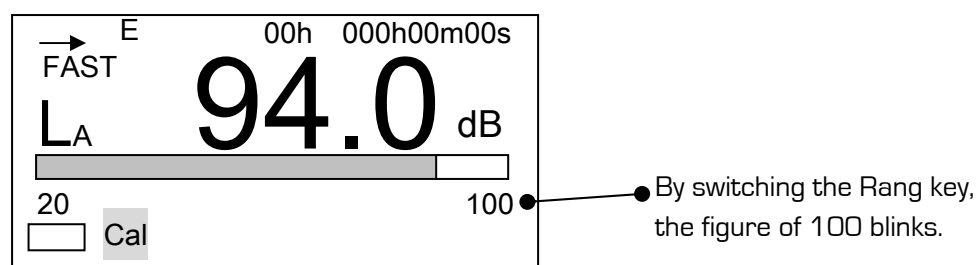
< Calibration display ＞

3－2 Calibration using internal calibration mode

The instrument can be calibrated using the internal generator (1kHz, sine wave)
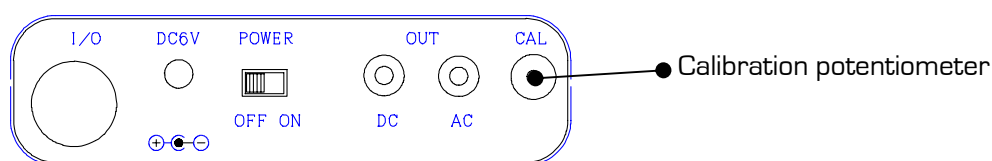
Cal key ●—————

Range key

1） Turn on the POWER switch.
2） Press the **Cal** key.
3） Press the **Range** key, and choose '100dB' using the cursor keys ▲ ▼ and press the **Range** key again to confirm.
4） Adjust the calibration potentiometer on the side panel until the display shows 94dB.
5） Press the **Cal** key once again to complete the calibration.

＜ **Calibration display** ＞

E 00h 000h00m00s
FAST
L_A **94.0** dB
20 100 ●————— By switching the Rang key,
Cal the figure of 100 blinks.

＜ **Side panel** ＞

Calibration potentiometer

＜ **Reference ＞** Full scale range and Cal (the display shows)

Full scale Range (dB)	CAL (dB)	OUTPUT VOLTAGE（V）	
		AC OUT	DC OUT
80	74.0	0.500	2,350
90	84.0	0.500	2,350
100	94.0	0.500	2,350
110	104.0	0.500	2,350
120	114.0	0.500	2,350
130	124.0	0.500	2,350

＜Reference＞ Relation between the display value of each range, and output voltage

DISPLAY VALUE（dB）						OUTPUT VOLTAGE（V）	
RANGE						AC OUT	DC OUT
40～130	30～120	20～110	20～100	20～90	20～80		
130	120	110	100	90	80	1.00000	2.50000
120	110	100	90	80	70	0.31623	2.25000
110	100	90	80	70	60	0.10000	2.00000
100	90	80	70	60	50	0.03162	1.75000
90	80	70	60	50	40	0.01000	1.50000
80	70	60	50	40	30	0.00316	1.25000
70	60	50	40	30	20	0.00100	1.00000
60	50	40	30	20	—	0.00032	0.75000
50	40	30	20	—	—	0.00010	0.50000
40	30	20	—	—	—	0.00003	0.25000

Section 3   Measuring Procedure

1.   **A-weighted sound pressure level (L$_A$) measurement**
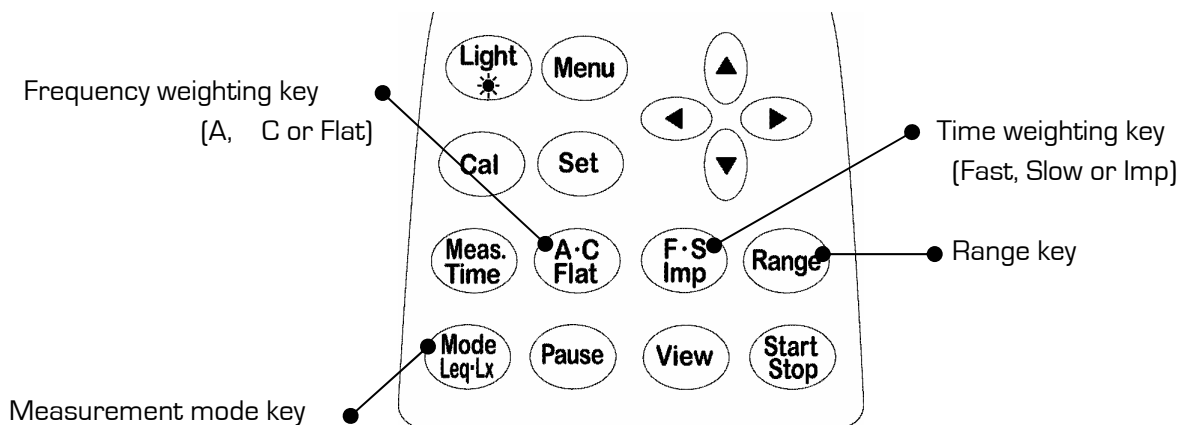
Frequency weighting key
    (A,   C or Flat)

Time weighting key
    (Fast, Slow or Imp)

Range key

Measurement mode key

< Parameter setting >

Range key	: Select a range where the Bar display indicates approximately 2/3 of the full scale.
Time weighting key	: Fast or Slow
Frequency weighting key	: A
Measurement mode key	: L$_A$

< Display >

Indicates **Time weighting**.
(Fast or Slow)

E   00h   000h00m00s

FAST

66.0 dB

L$_A$

30   120

Manu

Digital display
Bar display
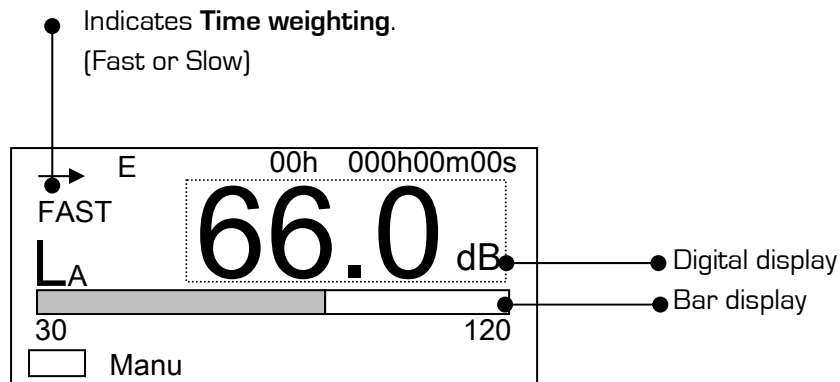
· The displayed L$_A$ level is updated once per second.
· The bar display is updated 10 times per second.
· There is no need to press the **Start** key.

２．Sound pressure level (Lc/Lf) measurement

(Sound pressure level measurements except A-weighted sound pressure level.)

Frequency weighting key
(A, C or Flat)

Time weighting key
(Fast, Slow or Imp)

Range key

Measurement mode key

< Parameter setting >

Range key	: Select a range where the Bar display indicates approximately 2/3 of the full scale.
Time weighting key	: Fast or Slow
Frequency weighting key	: C or F
Measurement mode key	: Lc or Lf

< Display >

Indicates **Frequency weighting**.
(Lc : frequency weighting is **C** ; Lf : frequency weighting is **F**.)

```
      E       00h   000h00m00s
FAST
 ╷
L⋮C  66.0 dB
 ▐▐▐▐▐▐▐▐▐▐▐▐▐▐▐▐
30                      120
☐  Manu
```
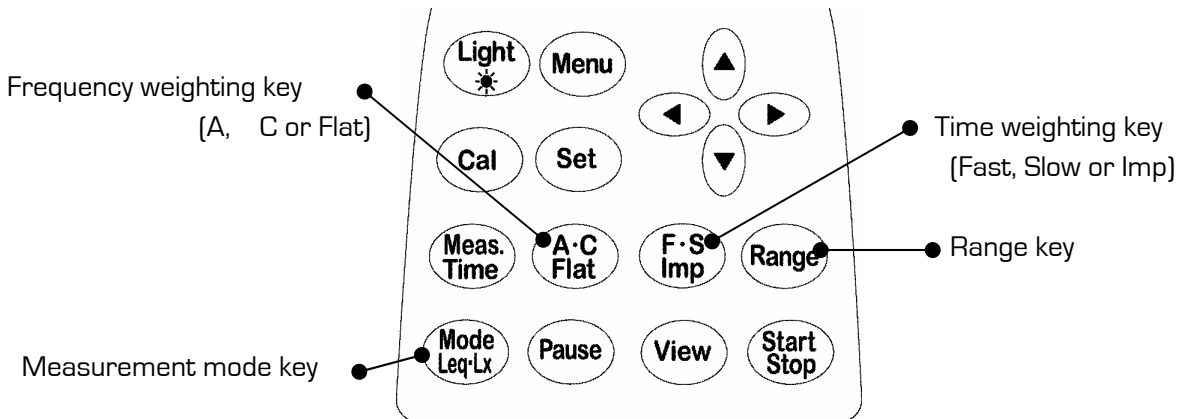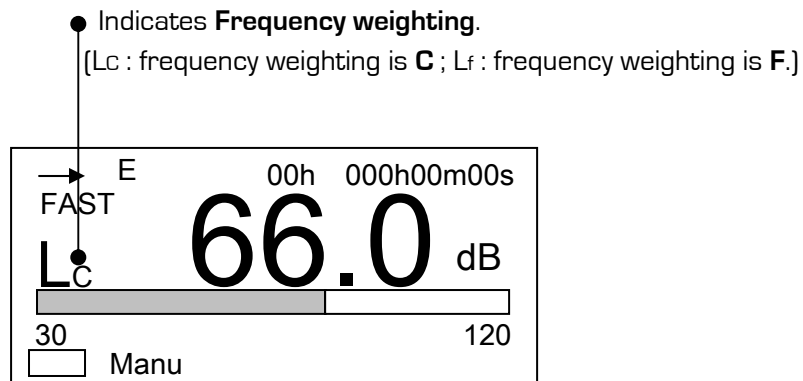
· The displayed level is updated once per second.
· The bar display is updated 10 times per second.
· There is no need to press the **Start** key.

３．Equivalent continuous A-weighted sound pressure level (Lᴀeq) measurement

Frequency weighting key
(A , C or Flat)

Measurement time

Time weighting key
(Fast, Slow or Imp)

Range key

Measurement mode key
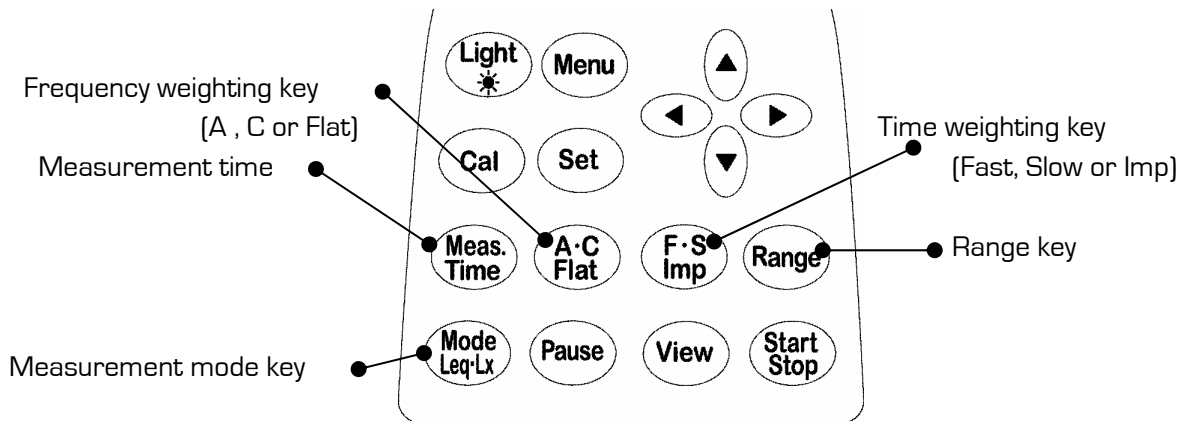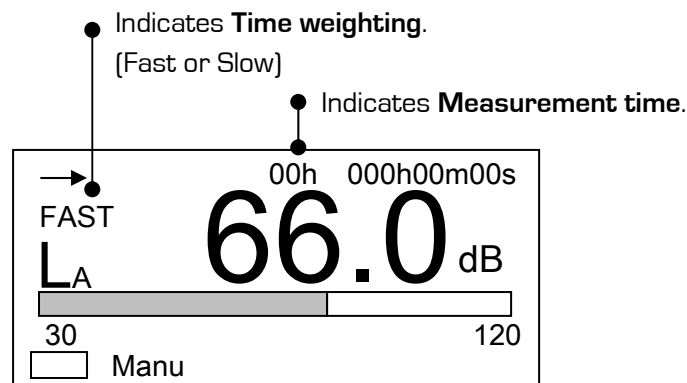
< **Parameter setting** >

Range key	: Select a range where the Bar display indicates approximately 2/3 of the full scale.
Time weighting key	: Fast or Slow
Frequency weighting key	: A
Measurement time key	: 1s, 3s, 5s, 10s, 1m, 5m, 10m, 15m, 30m, 1h, 8h, 24 h and ＊＊＊. (＊＊＊: the measurement continues until the **Stop** key is pressed.)
Measurement mode key	: Lᴀeq

< **Display** >

Indicates **Time weighting**.
(Fast or Slow)

Indicates **Measurement time**.

```
            00h    000h00m00s
FAST
L    66.0 dB
 A
     ├──────────────┤
   30              120
   ☐  Manu
```

- Measurement starts by pressing the **Start** key, and automatically stops at the **Measurement time**. The digital display indicates the calculated data at that time.
  If the **Stop** key is pressed during measurement, the digital display indicates the calculated data at that time. When the **Interval** is set to **repeat** in the **Menu** display, the measurement is repeated in every **Meas Time.** (This function is useful for printouts and data transfer to a computer.)
- If the **Pause** key is pressed during measurement, then the display indicates the calculated data from the start point to the current time less 3 or 5 seconds, whichever is selected for 'Data delet' in the Menu. To set this function, See **Menu**.
- When ＊ ＊ ＊ is selected, the display indicates the calculated data at the time the **Stop** key is pressed. If the **Stop** key is not pressed, the measurement continues for 199 hours 59 minutes 59 seconds.

4．Single event sound exposure level (L$_{Ae}$) and Percentile level (Lx) measurement

When measuring L$_{Aeq}$ or L$_{Ae}$, the following automatically starts by pressing the **Start** key.

- Equivalent continuous A-weighted sound pressure level   : L$_{Aeq}$
- Single event sound exposure level   : L$_{Ae}$
- Percentile level   : L$_{05}$, L$_{10}$, L$_{50}$, L$_{90}$, L$_{95}$, Lmin or Lmax

L$_{Aeq}$ can be displayed in **Normal display mode**, but L$_{Ae}$ or Lx are displayed only in **List display mode**.

```
┌─────────────────────────────────────┐
│ ──→   E          00h   000h00m00s    │
│ FAST                                 │
│ ┌─────────────────────────────────┐  │
│ │ Lap  : 140.0dB      La05:140.0dB │  │
│ │ Laeq : 140.0dB      La10:140.0dB │  │
│ │ Lae  : 140.0dB      La50:140.0dB │  │
│ │ LMin : 140.0dB      La90:140.0dB │  │
│ │ LMax : 140.0dB      La95:140.0dB │  │
│ └─────────────────────────────────┘  │
│ ☐    Manu                     dB     │
└─────────────────────────────────────┘
```
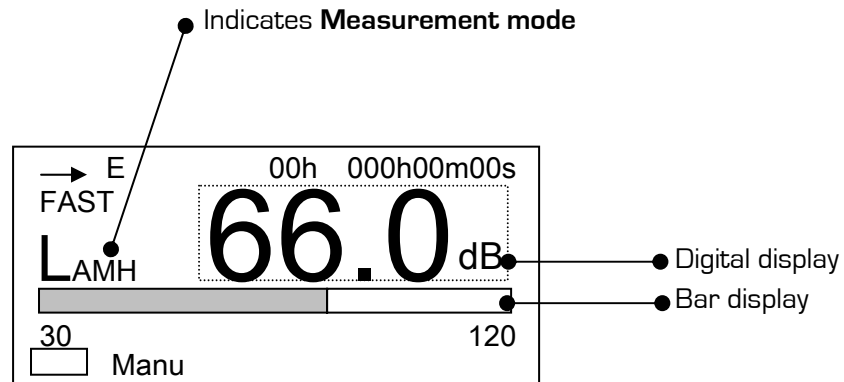
5．Max Hold Measurement
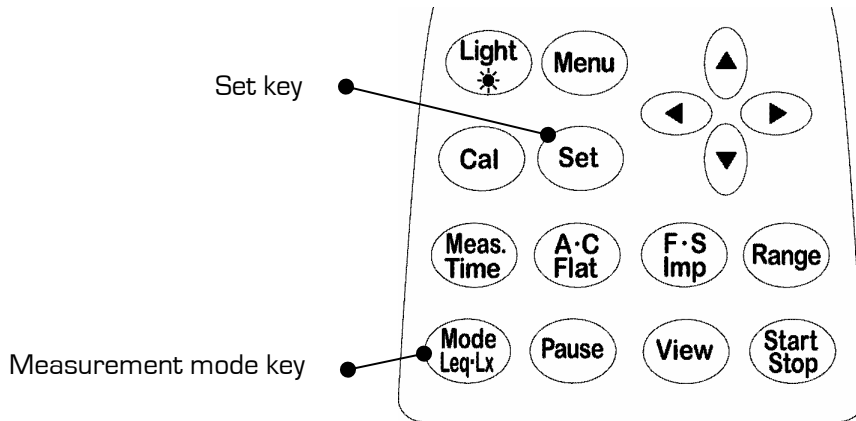
< Parameter settings >

    Measurement mode key   :   MH

< Display >

- After pressing the **Set** key, the digital display holds its maximum value and is only updated when a new maximum value is measured.
- Pressing the **Set** key resets the MH value.
- The bar display does not hold its value, but shows an instantaneous value updated every 0.1 seconds.

6. C-weighted waveform peak hold measurement (L_{CPeak})

Lcpeak is measured on "Peak measurement" setting.

Change the basic setting from Manu (default) to Peak.

(1) Press Menu key once to call <Menu>1/2 screen and check the cursor is on the top line of "Meas Mode".
(2) Move to the right column with ▶ key.
(3) Change "Manu" to "Peak" with ▲ key and press the **SET** key to enter.
(4) Return to the normal display from <Menu> screen by pressing the **View** key and check the display shows Peak under the figures.

< Parameter setting >

Range key: Select a range that Bar display indicates approximately 2/3 of the full scale.
Time weighting key: N/A
Frequency weighting key: C
Measurement time key: 1s, 3s, 5s, 10s, 1m, 5m, 10m, 15m, 30m, 1h, 8h, 24h, and ***.

(***: Measurement continues until **Stop** key is pressed.)
Measurement mode key: N/A (fixed to L_{Cpk})

< Display >

<Mode Set> screen (for example)

```
<menu>                          1/2        ③
    Meas Mode        : Peak
    Interval         : Single
    I/O              : Off
    Data delet       : Off
    LCD cont         : ****
    date   y/m/d     : 02/04/19
    time             : 11: 16: 58
```
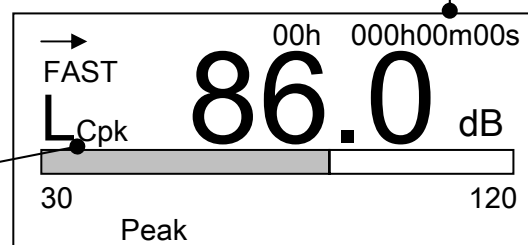
Normal display mode screen

Indicates **Measurement time**

By pressing **Measurement mode** key, toggles:
A→C→F→A→···

```
→                 00h    000h00m00s
FAST
L_Cpk      86.0      dB
30                          120
        Peak
```

- Measurement starts by pressing the **Start** key and automatically stops in the measurement time (→ is displayed during measurement).   The display indicates the calculated data at that time.
- If the **Stop** key is pressed during measurement, the display indicates the calculated data at that time.
- When *** is selected, the display indicates the calculated data at the time the Stop key is pressed. If the Stop key is not pressed, the measurement continues for 199 hours 59 minutes 59 seconds.

Section 4 Menu

1. How to use Menu

To open the Menu display press the **Menu** key.
Return to the measurement display by pressing the **View** key.

Menu key

Set key

Cursor key
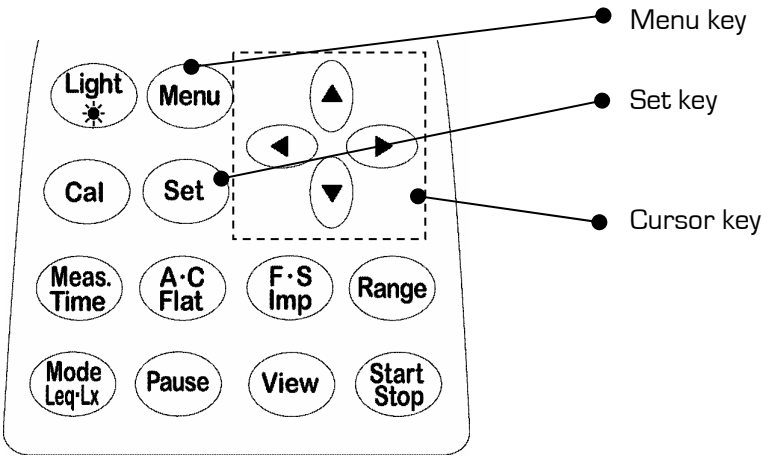
Every time the **Menu** key is pressed, <menu> and <Mode Set> pages are alternated.
Select an item with ▲ ▼ key and complete the selection with ▶ key, then change the parameters with ▲ key.

```
<menu>                    1/2
Meas Mode        : Manu
Interval         : Single
I/O              : OFF
Data delet       : OFF
LCD cont         : * * * * *
date y/m/d       : 00/01/01
time             : 00:00:00
```

Basic setting for Calendar,
LCD contrast etc.

```
<Mode Set>                2/2
Range            : 130dB
Dyn cher         : FAST
Freq corr        : A
Meas time        : 1s
View             : L05
baud rate        : 9600
```

Setting for measurement modes.

２．Menu (1/2)

```
┌──────────────────────────────────┐
│ <menu>                    1/2 ●───●Page of Menu
│ Meas Mode        : Manu          │
│ Interval         : Single        │
│ I/O              : OFF           │
│ Data delet       : OFF           │
│ LCD cont         : *****         │
│ date y/m/d       : 00/01/01      │
│ time             : 00:00:00      │
└──────────────────────────────────┘
```

Items	Initial value	Explanation

- **Meas Mode** : **Manu** : Measurement mode
    - **Manu** : Normal measurement mode
- **Interval** : **Single** : Measuring interval
    - **OFF** : Continuous data output mode.
    - **Single** : Completes one measurement in **Meas Time** by pressing **Start** key.
    - **Repeat** : Repeats measurement in every **Meas Time** by pressing **Start** key. Measurement is repeated until **Stop** key is pressed.
- **I/O** : **OFF** : External equipment connection setting
    - **OFF** : No external equipment.
    - **Print** : Enables an external printer to be used.
    - **PC** : Enables a personal computer to be used.
- **Data delet** : **OFF** : Data deletion mode setting
    - **OFF** : No Data deletion mode
    - **3sec** : deletes preceding 3 sec. data when **Pause** key is pressed.
    - **5sec** : deletes preceding 5 sec. data when **Pause** key is pressed.
    - When **Meas Time** is 1, 3 or 5s, this function does not work.
- **LCD cont** : **** : LCD contrast adjustment. See "LCD adjustment".
- **date y/m/d** : **00/01/01** : Calendar setting (indicates year/month/day) See "Calendar adjustment".
- **time** : **00:00:00** : Time setting See "Calendar adjustment".

3．Mode Set (2/2)

```
<Mode Set>                    2/2
Range              : 130dB
Dyn char           : FAST
Freq corr          : A
Meas time          : 1s
View               : L05
baud rate          : 9600

```

- Range   : 130dB   : Shows a range value set with the **Range** key.
- Dyn char   : FAST   : FAST , SLOW or Imp

   Shows Time weighting set with the **F ・ S ・ Imp** key.

- Freq corr   : A   : Shows Frequency weighting set with the **A ・ C ・ Flat** key.

- Meas time   : 1s   : Shows Measurement time set with the **Meas time** key.
- View   : L05   : Mode setting in Normal and Magnified display mode.
   Sets the value displayed in Normal and Magnified screen.
- baud rate   : 9600   : Baud rate setting
   4800, 9600 or 19200.

- The contents are updated every time the settings are changed.
- The Range etc. can be changed in this menu.

Section 5　AC, DC Output

１．**AC Output**

The AC Output is the frequency-weighted signal.
Output: 1Vrms (Full Scale), Output impedance: 600Ω, Load impedance > 10kΩ

２．**DC Output**

The DC Output is a frequency weighted, root mean squared, and then logarithmically converted signal.
Output: 2.5V (Full Scale), 0.25V／10dB, Output impedance: 50Ω, Load impedance > 10kΩ

Section 6　　Printing

After measurement is completed, the results can be printed with an optional printer.
（Results can not be printed during measurement.）

```
<menu>                          1/2
Meas Mode          : Manu
Interval           : Single
I/O                : OFF
Data delet         : OFF
LCD cont           : *****
date y/m/d         : 00/01/01
time               : 00:00:00
```

The procedure is as follows.

1） Turn off the POWER switch.
2） Connect to a printer and turn on the POWER switch.　The version is automatically printed when powered on.
3） Ensure the Baud Rate is set the same on the 6226 as the printer (See section 4, No 3. Mode Set 2/2 on page 24).　See separate Printer manual for setting the baud rate of the printer.
4） Select **I/O** in Menu display.
5） Select **Print**, then press the **Set** key.

The display shows as follows:

```
             Print
        Start/Stop key
```

6） All data is printed by pressing the **Start** key.
　　Printing is stopped by pressing the **Stop** key.
7） After completion of the data transfer to a printer, the display returns to **Menu** automatically.

＜Printout form＞

Example	Explanation
00/01/05 2:15:16 F 130dB	Starting date and time, Time weighting and Range
000h00ｍ10s	Measurement time
Laeq : 130.0　La05 : 130.0	data
Lae　: 130.0　La10 : 130.0	〃
La50 : 130.0	〃
LMin : 130.0　La90 : 130.0	〃
LMax : 130.0　La95 : 130.0	〃

Starting date and time, Time weighting and Range are printed on the first line.
Measurement time is printed on the second line.
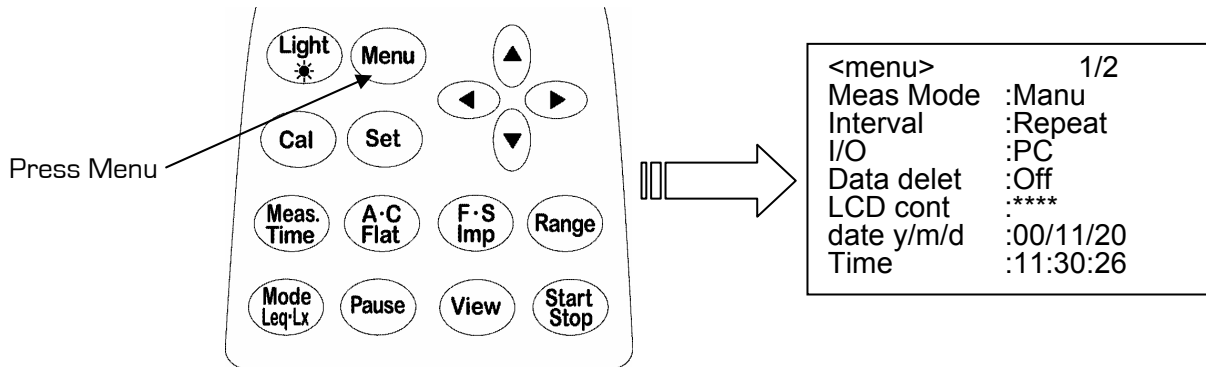Data is printed on the third to seventh line.
When the **Interval** is set to **Repeat** in the **Menu** display, the results of every **MeasTime** are printed in the above form.
Measurement is stopped by pressing the **Stop** key, data is printed as ＊＊＊.

Section 7　Data Transfer to a Personal Computer

After or during measurement, the data can be transferred to a personal computer.

1) Data transfer after measurement

Press Menu

```
<menu>           1/2
Meas Mode  :Manu
Interval   :Repeat
I/O        :PC
Data delet :Off
LCD cont   :****
date y/m/d :00/11/20
Time       :11:30:26
```

The procedure is as follows.

    8）Turn off the POWER switch.

    9）Connect to a PC using the cable and turn on the POWER switch.

    1 0）　Press the **Menu** key and select **I/O** in the Menu display.

    1 1）　Select **PC**, then press the **Set** key.

The display shows as follows:
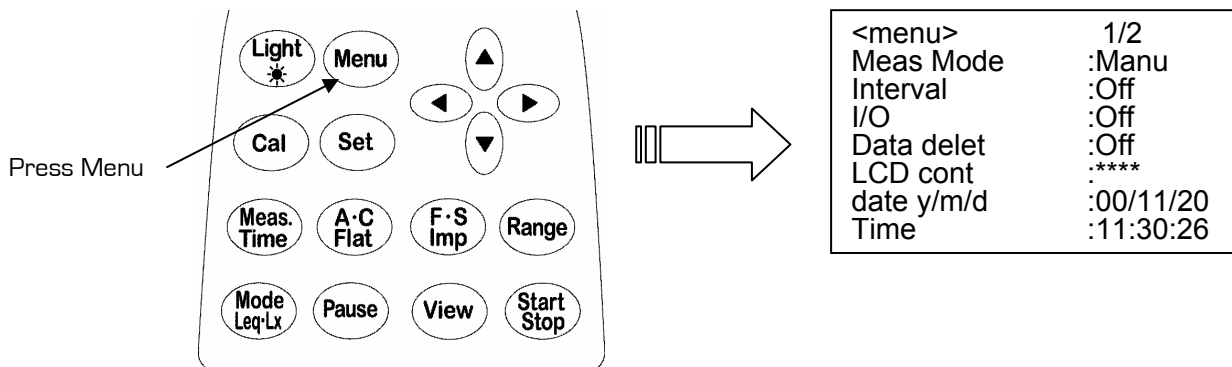
```
            PC
       Start/Stop key
```
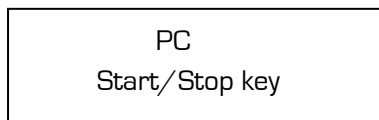
    1 2）　All data is transferred by pressing the **Start** key.
        Data transfer is stopped by pressing the **Stop** key.

    6）After completion of the data transfer, the display returns to
   **Menu** automatically.

The data is saved in .csv format so it can be opened directly with spreadsheet software e.g. Microsoft Excel.

2) Data transfer during measurement

Data can be transferred to a PC during measurement in real-time by taking the following steps. Please note that in this mode the data can not be saved to memory in the instrument and should instead be saved on the PC as described later in this manual.


Press Menu

```
<menu>        1/2
Meas Mode    :Manu
Interval     :Off
I/O          :Off
Data delet   :Off
LCD cont     :****
date y/m/d   :00/11/20
Time         :11:30:26
```

1) Turn off the POWER switch.
2) Connect to a PC using the cable and turn on the POWER switch.
3) Press the **Menu** key and select **Interval** in the Menu display.
4) Select **Off**.
5) Still in the Menu display, select **I/O**.
6) Select **Off**, then press the **Set** key.
7) Press View, and the measurements screen appears


```
                    00h   000h00m00s
FAST
LA        74.6    dB
20                          100
[  ]  Manu
```
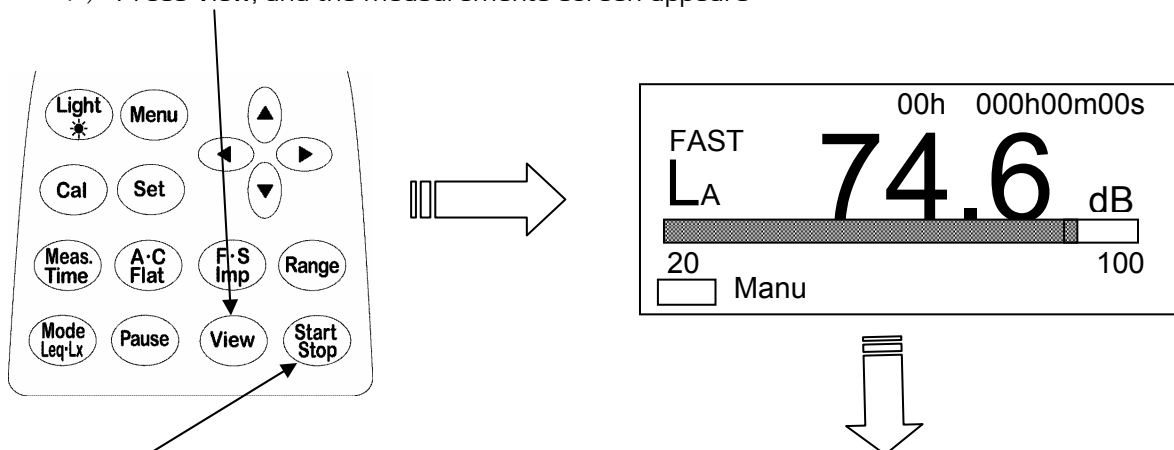
6) Press Start/Stop, measurements begin and data is transmitted for each measurement interval. The data is appended to data displayed on the PC screen.

7) Press Start/Stop again to stop measurements and transmission.

Remember: Transmitted data is not stored in the memory of the sound-level meter. After transmission be sure to save it on the PC as described on page 21.
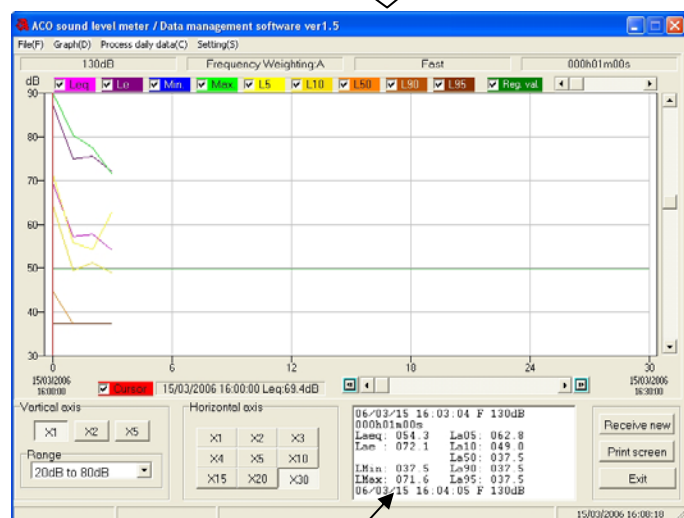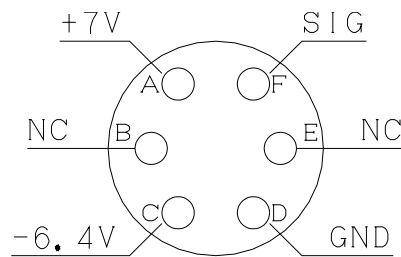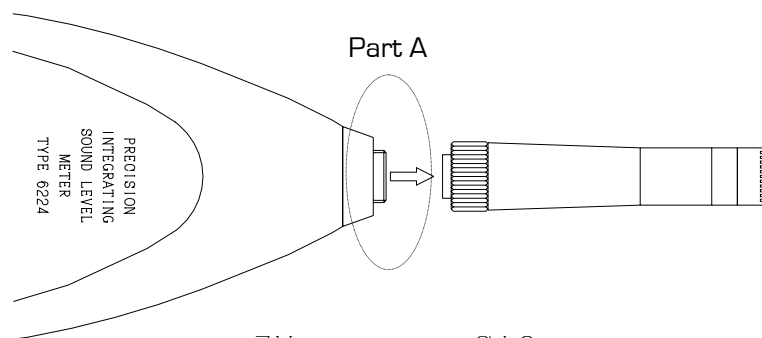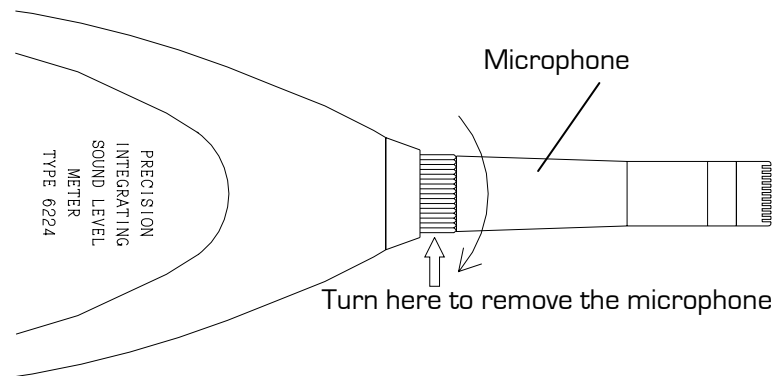

Received data is displayed in this window.

Section 8   Specifications

Model	Castle 6226
Description	Integrating Sound Level Meter
Standards	Conforms with IEC 61672-1:2002, Class 2, IEC 60651:1979 and IEC 60804:2000 Type 2
Measuring ranges	28 – 130dB(A), 33 – 130dB(C), 38 – 130dB(F)
Frequency range	20Hz – 8kHz
Microphone	7052N 1/2" electret condenser microphone
Time weighting	FAST, SLOW
Peak range	50 – 133dB(A), 60 – 133dB(C), 70 – 133dB(F)
Level range	Six ranges: 20 – 80dB, 20 – 90dB, 20 – 100dB, 20 – 110dB, 30 – 120dB, 40 – 130dB
Linearity range	90dB
Frequency weighting	A, C, FLAT (Z)
Measurement items	Lp, LMH, Leq, LAe, Lmax, Lmin, Lx (L5, L10, L50, L90, L95), Peak.
Measurement time	1s, 3s, 5s, 10s, 1min, 5min, 10min, 15min, 30min, 1h, 8h, 24h manual (max: 199h 59m 59s)
Sampling interval	20.8µs (Leq), 10ms (Lmax, Lmin)
Lx Sampling interval	100ms
Display	LCD with backlight (128×64 dots)
Digital display	Four line, resolution 0.1dB (display update 1s)
Bar display	Display update: 0.1s
Warning	Over range: +3dB from upper limited scale
	Under range: -0.6dB from lower limited scale
Battery display	Four level display of battery condition
Built-in memory	Approximately 10, 000 samples: 1, 000 sets of results
Built-in calendar	Year/month/day/ hour : minute : second
Pause	Pause and a function that deletes preceding 3 or 5 sec. data
Calibration signal	Internal generator (1 kHz sine wave)
AC output	1Vrms (FS), output impedance: 600Ω, load impedance > 10kΩ
DC output	2.5V (FS), 0.25V/10dB, output impedance: 50Ω, load impedance > 10kΩ
RS232 interface	RS-232C (asynchronous)
	data bits : 8 bits
	stop bit : 1 bit
	parity : none
	baud rate : 4800, 9600, 19200 bps
Power supply	Four 1.5V size-AA batteries or AC adapter
Battery life	Alkaline batteries: 20 hours continuous operation. Use of LCD backlight will shorten battery life (approximately 1/3).
Operating temperature	0 to +40°C
Humidity	25% to 90% (without condensation)
Size	85(W) × 287(H) × 46(D) mm
Weight	370g (including batteries)

Pin Connections and How to Connect the Extension cable

1. Detach the microphone from the body of the meter.

Microphone

Turn here to remove the microphone

PRECISION
INTEGRATING
SOUND LEVEL
METER
TYPE 6224

Part A

PRECISION
INTEGRATING
SOUND LEVEL
METER
TYPE 6224

+7V   SIG

A   F

NC   B   E   NC

C   D

-6.4V   GND

Pin connections of Part A

2. Attach the microphone to the female connector of the extension cable.

3. Plug the male connector of the extension cable into the connector on the body of the instrument.