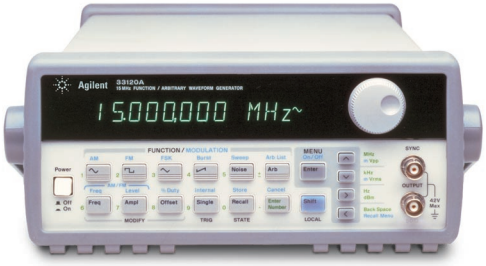
# Know Your Function/Arbitrary Waveform Generator



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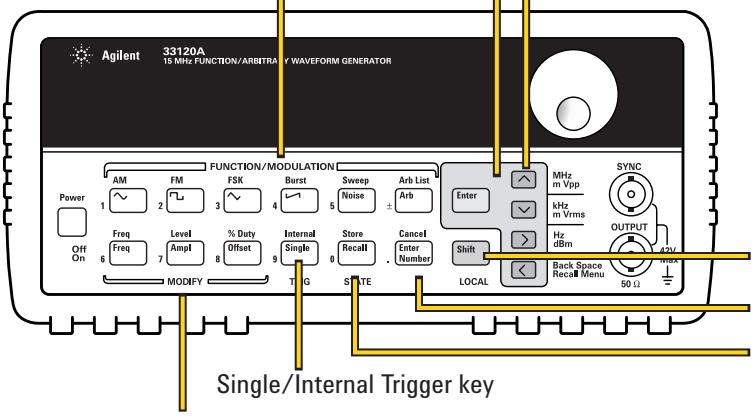
# Overview

## Front Panel




Function/Modulation keys

Menu Operation keys

Enter Number "units" keys

**Use the front panel Input/Output Menu to:**

- Select the GPIB or RS-232 interface
- Set the GPIB bus address
- Set the RS-232 baud rate and parity

Shift/Local key

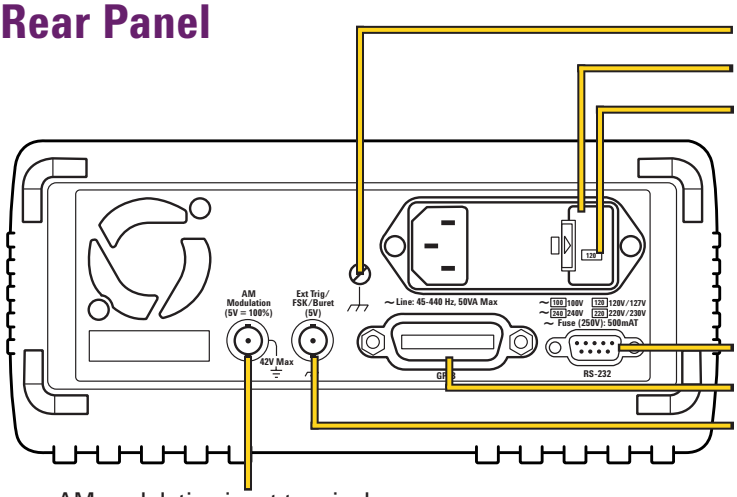
Enter Number key

Recall/Store instrument state key

Single/Internal Trigger key

Waveform Modify keys

## Rear Panel




Chassis Ground

Power-line fuse-holder assembly

Power-line voltage setting

RS-232 interface connector

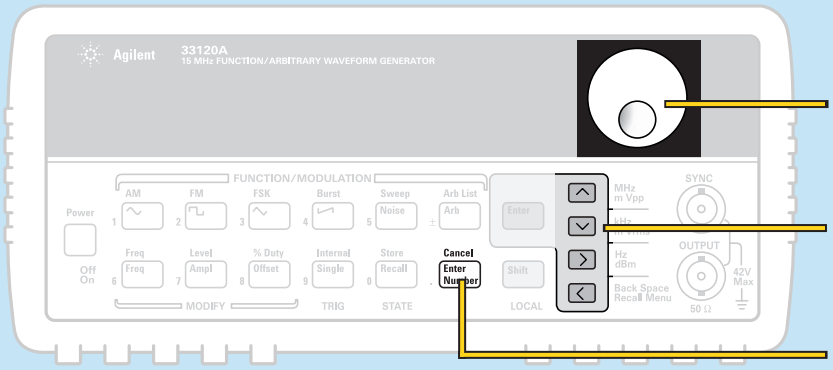
GPIB (IEEE-488) interface connector

External Trigger / FSK / Burst modulation input terminal

AM modulation input terminal

**Agilent Technologies**

# Front Panel Number Entry




**You can enter numbers from the front panel using one of three methods.**

Use the knob and the arrow keys to modify the displayed number.

Use the arrow keys to edit individual digits.

Use the "Enter Number" mode to enter a number with the appropriate units.

# The Front Panel at a glance

## A: MODulation Menu

1: AM SHAPE → 2: AM SOURCE → 3: FM SHAPE → 4: BURST CNT → 5: BURST RATE

→ 6: BURST PHAS → 7: BURST SRC → 8: FSK FREQ → 9: FSK RATE → 10: FSK SRC

## B: SWP (Sweep) MENU

1: START F → 2: STOP F → 3: SWP TIME → 4: SWP MODE

## C: EDIT MENU*

1: NEW ARB → [ 2: POINTS ] → [ 3: LINE EDIT ] → [ 4: POINT EDIT ] → [ 5: INVERT ]

→ [ 6: SAVE AS ] → 7: DELETE

* The commands enclosed in square brackets ( [ ] ) are "hidden" until you make a selection from the NEW ARB command to initiate a new edit session.

## D: SYStem MENU

1: OUT TERM → 2: POWER ON → 3: ERROR → 4: TEST → 5: COMMA → 6: REVISION

## E: Input/Output MENU

1: HPIB ADDR → 2: INTERFACE → 3: BAUD RATE → 4: PARITY → 5: LANGUAGE

## F: CALibration MENU*

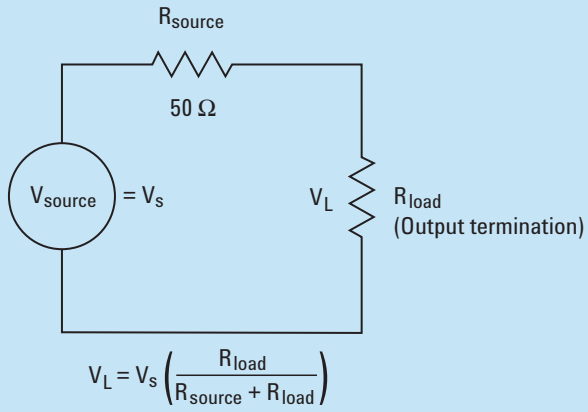
1: SECURED → [ 1: UNSECURED ] → [ 2: CALIBRATE ] → 3: CAL COUNT → 4: MESSAGE

* The commands enclosed in square brackets ( [ ] ) are "hidden" unless the function generator is UNSECURED for calibration.

*(continued)*

# The Front Panel at a glance *(continued)*

## Agilent 33120A Equivalent Output Circuit




$$V_L = V_s \left( \frac{R_{load}}{R_{source} + R_{load}} \right)$$

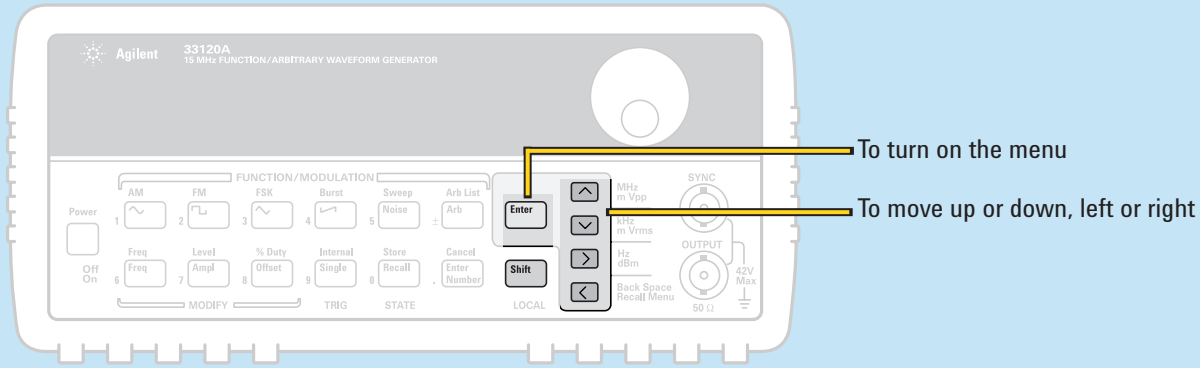
If $R_{load} = 50\Omega$, then $V_L = \frac{1}{2} V_s$

If $R_{load}$ is open circuit, then $V_L = V_s$

The output impedance ($R_{source}$) for the 33120A is always 50 ohms. In the System Menu under 1:OUT TERM, you can select either 50 OHM or HIGH Z. Changing this menu setting from 50 OHM to HIGH Z does not change the 33120A's output impedance. It changes the reading on the 33120A's display to what the voltage will be when a high impedance load is connected to the generator's output. When the menu is set to 50 OHM, the 33120A display will read the correct voltage that will appear across a 50 ohm load connected to the generator's output. Note that if the menu is set to 50 OHM and the actual load is a high impedance, the voltage that appears across the high impedance load will be 2 times the voltage shown on the display.

# Front Panel Menu Reference

**The menu is organized in a top-down tree structure with three levels.**




**A: MOD MENU** → **B: SWP MENU** → **C: EDIT MENU** → **D: SYS MENU** → **E: 1/0 MENU** → **F: CAL MENU**

- **A: MOD MENU** → 1 AM SHAPE → 2 AM SOURCE →
- **B: SWP MENU** → 1 START F →
- **C: EDIT MENU** → 1 NEW ARB →
- **D: SYS MENU** → 1 OUT TERM →
- **E: 1/0 MENU** → 1 HPIB ADDR →
- **F: CAL MENU** → 1 SECURED →

**To enter command, press "Enter".**

## A: MODulation Menu

| | |
|---|---|
| **1: AM SHAPE** | Selects the shape of the AM modulating waveform. |
| **2: AM SOURCE** | Enables or disables the internal AM modulating source. |
| **3: FM SHAPE** | Selects the shape of the FM modulating waveform. |
| **4: BURST CNT** | Sets the number of cycles per burst (1 to 50,000 cycles). |
| **5: BURST RATE** | Sets the burst rate in Hz for an internal burst source. |
| **6: BURST PHAS** | Sets the starting phase angle of a burst (-360 to +360 degrees). |
| **7: BURST SRC** | Selects an internal or external gate source for burst modulation. |
| **8: FSK FREQ** | Sets the FSK "hop" frequency. |
| **9: FSK RATE** | Selects the internal FSK rate between the carrier and FSK frequency. |
| **10: FSK SRC** | Selects an internal or external source for the FSK rate. |

*(continued)*

# Front Panel Menu Reference *(continued)*

## B: SWP (Sweep) MENU

| | |
|---|---|
| **1: START F** | Sets the start frequency in Hz for sweeping. |
| **2: STOP F** | Sets the stop frequency in Hz for sweeping. |
| **3: SWP TIME** | Sets the repetition rate in seconds for sweeping. |
| **4: SWP MODE** | Selects linear or logarithmic sweeping. |

## C: EDIT MENU*

| | |
|---|---|
| **1: NEW ARB** | Initiates a new arb waveform or loads the selected arb waveform. |
| **2: POINTS** | Sets the number of points in a new arb waveform (8 to 16,000 points). |
| **3: LINE EDIT** | Performs a linear interpolation between two points in the arb waveform. |
| **4: POINT EDIT** | Edits the individual points of the selected arb waveform. |
| **5: INVERT** | Inverts the selected arb waveform by changing the sign of each point. |
| **6: SAVE AS** | Saves the current arb waveform in non-volatile memory. |
| **7: DELETE** | Deletes the selected arb waveform from non-volatile memory. |

* The commands enclosed in square brackets ( [ ] ) are "hidden" until you make a selection from the NEW ARB command to initiate a new edit session.

## D: SYStem MENU

| | |
|---|---|
| **1: OUT TERM** | Selects the output termination (50Ω or high impedance). |
| **2: POWER ON** | Enables or disables automatic recall of the power-down state. |
| **3: ERROR** | Retrieves errors from the error queue (up to 20 errors). |
| **4: TEST** | Performs a complete self-test. |
| **5: COMMA** | Enables or disables a comma separator between digits on the display. |
| **6: REVISION** | Displays the function generator's firmware revision codes. |

## E: Input/Output MENU

| | |
|---|---|
| **1: HPIB ADDR** | Sets the GPIB bus address (0 to 30). |
| **2: INTERFACE** | Selects the GPIB or RS-232 interface. |
| **3: BAUD RATE** | Selects the baud rate for RS-232 operation. |
| **4: PARITY** | Selects even, odd, or no parity for RS-232 operation. |
| **5: LANGUAGE** | Verifies the interface language: SCPI. |

## F: CALibration MENU*

| | |
|---|---|
| **1: SECURED** | The function generator is secured against calibration; enter code to unsecure. |
| **1: UNSECURED** | The function generator is unsecured for calibration; enter code to secure. |
| **2: CALIBRATE** | Performs individual calibrations; must be UNSECURED. |
| **3: CAL COUNT** | Reads the total number of times the function generator has been calibrated. |
| **4: MESSAGE** | Reads the calibration string (up to 11 characters) entered from remote. |

* The commands enclosed in square brackets ( [ ] ) are "hidden" unless the function generator is UNSECURED for calibration.