

Sync-One2[®] v2

API reference

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Issue 18.07

FW 2.0.0

General information

Notes / Tips provide helpful information on a particular item

Warnings are to ensure correct operation of equipment and prevent damage

Formats used within this document

Commands and responses all terminate with a Carriage Return shown as ↵
This is ASCII code 13 or 0x0D

Commands and responses are shown in the fonts as below;

Command 0123↵

+00, 0, 0, S, 0↵

Commands and data are not case sensitive unless otherwise stated.

Command compatibility

The details within this document are with reference to the firmware version shown on the front page and footer of this document.

Should a command be unavailable, please check the firmware version installed in your product and upgrade as required.

Connection

Connection to a host is via a USB Mini-B port located on the left-hand side of the unit. This supplies power and disables the auto shutoff timer when in use.

A USB cable of 2m or less is recommended

When connected this presents as a USB Serial port and should be detected and installed without the need for additional drivers on Windows, Apple, or Linux computers.

Communication parameters for the port are;

Baud rate	115,200
Data bits	8
Parity	None
Stop bits	1
Flow Control	None

Command Format

Commands issued are not echoed back to the sender, but confirmed with either an OK↵ returned value or an error message.

For example;

Command

API ↵

Reply

OK↵

If there is an error the reply will always start ERR then contain text to help identify the problem.

ERR *error description*↵

Generic non-command specific errors returned are

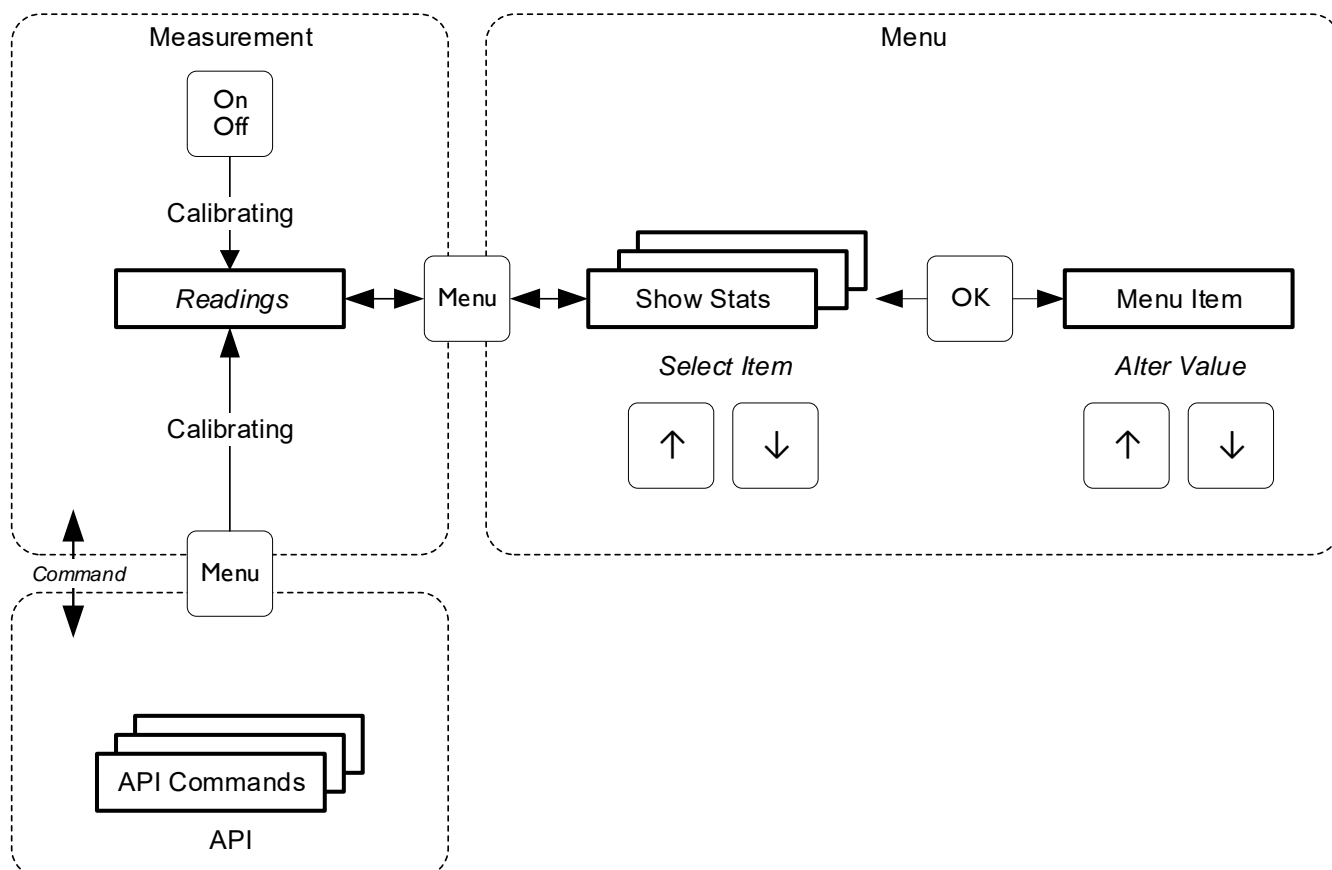
ERR unknown command↵	The command entered is unknown
ERR parameter count↵	The command entered is expecting a specific number of parameters. Check for closing “ in text messages etc.
ERR parameter value↵	The parameter entered does not match the type expected, for example a number was expected but a letter was received
ERR not in API mode↵	A valid command name was received but API mode has not been entered.


The use of a simple ASCII human readable API enables the end user to easily automate tasks using a language such Python. Where multiple items of data are returned they are done so as CSV data for easier onward processing.

Operating Modes


Sync-One2 runs in three distinct modes;

- Measurement mode, where the actual readings are taken and displayed in real time
- Menu mode, to display statistics and set various system options
- API mode, where Sync-One2 comes under remote control



Moving between Measurement mode and Menu mode is via the  button.

API mode is activated once a command is received and the display will show `API Control`

To exit API mode, issue the exit command, press the  button, or disconnect the USB Mini-B cable.

The Auto Off feature is automatically disabled in API mode

Data logging

Sync-One2 v2 will automatically log measurements taken in real time to the host whilst in Measurement mode.

When entering Measurement mode Sync-One2 v2 sends

START↵

When a reading is taken, this is sent in milliseconds as displayed on the main display

+010↵

-005↵

When exiting Measurement mode Sync-One2 sends

STOP↵

Activate API mode

When connected to the host computer Sync-One2 v2 will automatically switch on and enter Measurement mode. The initial character of the first command received will transfer from Measurement mode into API mode, this is to ensure readings taken are not interrupted by processing incoming commands.

Once in API mode the display will then show `API Control`

When commands are issued the display will act as normal for that option but remains under API control.

Commands

The following commands are available, each is covered in more detail later in this document.

ADUIO IN	Returns the current audio input selection setting
API	Enter API mode
CALIBRATE	Runs a sensor calibration
CLEAR STATS	Clears the measurement memory buffer
CUSTOM SPLASH 1	Set or clear a custom splash screen, line 1
CUSTOM SPLASH 2	Set or clear a custom splash screen, line 1
EXIT	Exits API mode
FEATURE CODE	To enable additional features or perform specific actions
FRAME RATE	Returns the current frame rate set
MASK LEN	Returns the current Mask Time setting
OFFSET	Returns the current manual offset value
SET AUDIO IN	Sets the audio input selection
SET FRAME RATE	Sets the frame rate
SET MASK LEN	Sets the Mack Time value
SET OFFSET	Sets the manual offset value
SET SPEAKER DIST	Sets the speaker distance
SETTINGS	Displays the system serial number and settings
SPEAKER DIST	Returns the current speaker distance set
START	Starts to take measurements, with or without calibration
STATS	Returns all the data in the measurement memory buffer
STOP	Return from Measurement mode to the API

Details of each command

API	Enters API mode, commands will not be accepted if not in API mode. Command API ↵ Reply OK ↵
AUDIO IN	To obtain the current audio input selection setting Command AUDI O I N ↵ Possible replies AUTO ↵ EXTERNAL ↵ I NTERNAL ↵
CALIBRATE	Performs a sensor calibration. <div data-bbox="406 1218 1474 1361" style="border: 1px solid blue; padding: 5px; text-align: center;">If the local environment (light or audio levels) have changed and measurements are being taken with the NOCAL option, it is recommended to run a calibration.</div> Command CALI BRATE ↵ Reply OK ↵

CLEAR STATS	Clears the measurement memory buffer. Command CLEAR STATS↵ Reply OK↵
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CUSTOM SPLASH *n*

To create a custom splash message shown during system start-up, for example a company name or ownership information. The message is shown after the serial number and on the `System Info` menu option.

The text used for the splash screen is taken, verbatim, from the text in quotes. Up to 16 characters are permitted. Where *n* determines the line of the display the text is shown.

- 1 Top line of display
- 2 Bottom line of display

Command

```
CUSTOM SPLASH 1 " Property of" ↵  
CUSTOM SPLASH 2 "Harkwood Svs Ltd" ↵
```

Would result in a start-up splash screen of



Text may be cleared with the following command, where *n* determines the line of text to be cleared.

```
CUSTOM SPLASH n " " ↵
```

Use spaces within the quoted text to position the text within the 16 character long line, as in the example above.

Reply

If successful



```
OK ↵
```

If the message is too long

```
ERR text too long ↵
```

If a permanent splash screen has been set at the time of order, this may not be overridden, and an error is returned.

```
ERR permanent splash set ↵
```

<p>EXIT</p>	<p>Returns from API control into Measurement mode</p> <p>Command</p> <p style="padding-left: 40px;">EXIT↵</p> <p>Reply</p> <p style="padding-left: 40px;">OK↵</p> <p style="text-align: center;">  </p> <p>To exit manually from API control the  can also be used.</p>
<p>FEATURE CODE</p>	<p>To enable additional features or perform specific actions</p> <p>In order to enable an additional feature or perform a specific custom specific action a unique code may be issued for any specific unit serial number.</p> <p>Command</p> <p style="padding-left: 40px;">FEATURE CODE <i>AABBCCDD 11223344</i>↵</p> <p>The <i>AABBCCDD 11223344</i> is a unique code used to unlock a specific feature or perform a specific custom action tied to a specific unit serial number.</p> <p>Reply</p> <p style="padding-left: 40px;">If the command is accepted</p> <p style="padding-left: 80px;">OK↵</p> <p style="padding-left: 40px;">If the code is not for the correct serial number</p> <p style="padding-left: 80px;">ERR i nval i d feature code</p> <p style="padding-left: 40px;">If the code is valid for the serial number, but the action requested is unknown.</p> <p style="padding-left: 80px;">ERR unknown feature code</p> <div style="border: 1px solid blue; padding: 5px; margin-top: 10px;"> <p style="text-align: center;">If a supplied code for any given serial number generates this error, then it is likely that a firmware update will be required to action the feature code.</p> </div>

FRAME RATE	<p>To obtain the current frame rate set</p> <p>Command</p> <p style="text-align: center;">FRAME RATE↵</p> <p>Reply</p> <p style="text-align: center;">29↵</p> <p>The returned value is the frame rate, in this case 29.</p>
MASK LEN	<p>To obtain the current Mask Time</p> <p>Command</p> <p style="text-align: center;">MASK LEN↵</p> <p>Reply</p> <p style="text-align: center;">150↵</p> <p>The returned value is the Mask Time set, the value is in milliseconds.</p>
OFFSET	<p>To obtain the current manual offset set.</p> <p>Command</p> <p style="text-align: center;">OFFSET↵</p> <p>Reply</p> <p style="text-align: center;">+10↵</p> <p>The returned value is the offset set, in this case +10.</p>

<p>SET AUDIO IN</p>	<p>To set the current audio input selection</p> <p>Command</p> <p style="padding-left: 40px;">AUDI O I N <i>val ue</i>↵</p> <p style="padding-left: 40px;"><i>val ue</i> can be AUTO, I NTERNAL, or EXTERNAL</p> <p>If the command is accepted</p> <p style="padding-left: 40px;">OK↵</p> <p>If the value entered does not match the commands above</p> <p style="padding-left: 40px;">ERR parameter <i>val ue</i>↵</p> <div style="border: 2px solid red; padding: 5px; margin: 10px auto; width: fit-content;"> <p style="text-align: center;">To ensure correct operation, perform a calibration after swapping to an alternative audio source.</p> </div>
<p>SET FRAME RATE</p>	<p>To set frame rate used in the display and statistics calculations to also show errors in frames.</p> <p>The frame rate may be between 0 and 99, in effect 0 turns off frame rate calculations and displays.</p> <p>Command</p> <p style="padding-left: 40px;">SET FRAME RATE 29↵</p> <p style="padding-left: 40px;">Will set a frame rate of 29 fps.</p> <p>Reply</p> <p style="padding-left: 40px;">If the command is accepted</p> <p style="padding-left: 80px;">OK↵</p> <p style="padding-left: 40px;">If the value entered it too large or small</p> <p style="padding-left: 80px;">ERR <i>val ue</i> out of bounds↵</p> <p style="padding-left: 40px;">If the value entered is not numeric</p> <p style="padding-left: 80px;">ERR parameter <i>val ue</i>↵</p>

<p>SET MASK LEN</p>	<p>To set a Mask Time</p> <p>The Mask Time can be set to 150, 300, 450, 600, 750, or 900.</p> <p>Command</p> <p style="padding-left: 40px;">SET MASK TIME 300↵</p> <p style="padding-left: 40px;">Will set a Mask Time of 300 milliseconds</p> <p>Reply</p> <p style="padding-left: 40px;">If the command is accepted</p> <p style="padding-left: 80px;">OK↵</p> <p style="padding-left: 40px;">If the value entered is not a permitted value</p> <p style="padding-left: 80px;">ERR val ue out of bounds↵</p> <p style="padding-left: 40px;">If the value entered is not numeric</p> <p style="padding-left: 80px;">ERR parameter val ue↵</p>
<p>SET OFFSET</p>	<p>To set a manual offset applied to subsequent readings taken</p> <p>The offset may be between -99 and +99 and is in milliseconds</p> <p>Command</p> <p style="padding-left: 40px;">SET OFFSET +10↵</p> <p style="padding-left: 40px;">Will set an offset of +10 milliseconds</p> <p>Reply</p> <p style="padding-left: 40px;">If the command is accepted</p> <p style="padding-left: 80px;">OK↵</p> <p style="padding-left: 40px;">If the value entered it too large or small</p> <p style="padding-left: 80px;">ERR val ue out of bounds↵</p> <p style="padding-left: 40px;">If the value entered is not numeric</p> <p style="padding-left: 80px;">ERR parameter val ue↵</p>

<p>SET SPEAKER DIST</p>	<p>To set a speaker distance applied to subsequent readings taken</p> <p>The distance may be between 0 and 20 in 0.5 increments, the value is in always in meters.</p> <p>Command</p> <p style="padding-left: 40px;">SET SPEAKER DIST 5.0↵</p> <p>Will set a distance of 5.0 meters</p> <p>Reply</p> <p>If the command is accepted</p> <p style="padding-left: 40px;">OK↵</p> <p>If the value entered it too large or small</p> <p style="padding-left: 40px;">ERR value out of bounds↵</p> <p>If the value entered is not numeric</p> <p style="padding-left: 40px;">ERR parameter value↵</p>																
<p>SETTINGS</p>	<p>Displays the serial number and various system parameters</p> <p>Command</p> <p style="padding-left: 40px;">SETTINGS↵</p> <p>Replies with data in the following CSV format</p> <p style="padding-left: 40px;">A20001, v2. 0. 0, 00, +00, 0. 0, 150, auto, 15↵</p> <p>The fields returned are;</p> <table style="margin-left: 40px;"> <tr> <td>A20001</td> <td>Serial Number</td> </tr> <tr> <td>v2. 0. 0</td> <td>Firmware Version Number</td> </tr> <tr> <td>00</td> <td>Frame rate set (0 – 99)</td> </tr> <tr> <td>+00</td> <td>Manual offset setting (-99 to +99)</td> </tr> <tr> <td>0. 0</td> <td>speaker distance setting (in Meters)</td> </tr> <tr> <td>150</td> <td>mask time (in milliseconds)</td> </tr> <tr> <td>auto</td> <td>audio input (auto, i nternal , or external)</td> </tr> <tr> <td>15</td> <td>auto off time (in minutes)</td> </tr> </table>	A20001	Serial Number	v2. 0. 0	Firmware Version Number	00	Frame rate set (0 – 99)	+00	Manual offset setting (-99 to +99)	0. 0	speaker distance setting (in Meters)	150	mask time (in milliseconds)	auto	audio input (auto, i nternal , or external)	15	auto off time (in minutes)
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SPEAKER DIST	<p>To obtain the current speaker distance set</p> <p>Command</p> <p style="text-align: center;">SPEAKER DIST↵</p> <p>Reply</p> <p style="text-align: center;">5.0, 16, 4↵</p> <p>The returned value is the speaker distance, in meters, feet, inches In this case 5.0m, 16feet, 4 inches.</p>
START	<p>Enters Measurement mode under API control, to begin taking readings. If the local environment has not changed, the sensor calibration may be omitted with an additional parameter.</p> <p>Command (with calibration)</p> <p style="text-align: center;">START↵</p> <p>Command (without calibration)</p> <p style="text-align: center;">START NOCAL↵</p> <p>Reply</p> <p style="text-align: center;">OK↵</p> <div style="border: 1px solid blue; padding: 5px; margin-top: 10px;"> <p>When in Measurement mode readings are reported in real time, the reply of</p> <p style="text-align: center;">START↵</p> <p>Indicates data logging is running</p> </div>

<p>STATS</p>	<p>Displays the contents on the memory buffer, these are displayed as the most recent reading first going back to the oldest.</p> <p>Command</p> <p style="text-align: center;">STATS↵</p> <p>Replies with data in the following CSV format</p> <pre style="text-align: center;">+000, +0. 00, +020, +0. 00, 0090, 00. 0, E, S, 0↵ +000, +0. 00, +020, +0. 00, 0090, 00. 0, , S, 0↵ +000, +0. 00, +020, +0. 00, 0090, 00. 0, , , 0↵ +090, +0. 00, +020, +0. 00, 0090, 00. 0, , , ↵ +000, +0. 00, +020, +0. 00, 0090, 00. 0, , , ↵ +073, +0. 00, +020, +0. 00, 0090, 00. 0, , , ↵ +000, +0. 00, +020, +0. 00, 0090, 00. 0, , , ↵ +000, +0. 00, +020, +0. 00, 0090, 00. 0, , , ↵</pre> <p>The fields returned are;</p> <table style="margin-left: auto; margin-right: auto;"> <tr> <td style="padding-right: 20px;">+000</td> <td>Reading in milliseconds</td> </tr> <tr> <td>+0. 00</td> <td>Reading in frames</td> </tr> <tr> <td>+020</td> <td>Average of whole buffer in milliseconds</td> </tr> <tr> <td>+0. 00</td> <td>Average of whole buffer in frames</td> </tr> <tr> <td>0090</td> <td>Span on the whole buffer</td> </tr> <tr> <td>00. 0</td> <td>Span on the whole buffer in frames</td> </tr> </table> <p>The remaining items are flags, if the letter is shown the flag is set for that reading in the memory buffer to indicate the setting incorporates the adjustment</p> <table style="margin-left: auto; margin-right: auto;"> <tr> <td style="padding-right: 20px;">E</td> <td>External audio port was used</td> </tr> <tr> <td>S</td> <td>Speaker distance set</td> </tr> <tr> <td>O</td> <td>Manual Offset set</td> </tr> </table> <p>If the memory buffer is empty the command will return</p> <p style="text-align: center;">ERR no stats recorded↵</p>	+000	Reading in milliseconds	+0. 00	Reading in frames	+020	Average of whole buffer in milliseconds	+0. 00	Average of whole buffer in frames	0090	Span on the whole buffer	00. 0	Span on the whole buffer in frames	E	External audio port was used	S	Speaker distance set	O	Manual Offset set
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O	Manual Offset set																		
<p>STOP</p>	<p>Return from Measurement mode to API mode</p> <p>Command</p> <p style="text-align: center;">STOP↵</p> <p>Reply</p> <p style="text-align: center;">OK↵</p>																		

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For additional support or information please visit the website, or e-mail sync-one2@harkwood.co.uk

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