Kraftor Robovox MIDI

Media

View this post on Instagram

View this post on Instagram

see also : Robovox

User Manual

Version 1.4

The Kraftor Robovox MIDI is a MIDI-controlled interface for the Votrax SC-02 speech synthesizer chip. It allows you to trigger phonemes and control various speech parameters via MIDI.

Version History

- **v1.4** (2026-04-02) : fixed a pitch issue
- **v1.3** (2026-01-27): Added Channel 2 pitch control for singing mode, improved SC-02 initialization for external inflection mode
- **v1.2** (2026-01-27): Added Serial MIDI support (USB + DIN MIDI simultaneously)
- **v1.1** (2025-07-20): Initial release

MIDI Channel Configuration

The base MIDI channel is set via the 4 DIP switches on the hardware. The channel is read as a **binary number** (0-15).

DIP Switch Settings

The rightmost switch (DIP4) is the least significant bit (value 1). Switches are ON when in the DOWN position.

Channel	DIP1 (8)	DIP2 (4)	DIP3 (2)	DIP4 (1)
0	OFF	OFF	OFF	OFF
1	OFF	OFF	OFF	ON

2	OFF	OFF	ON	OFF
3	OFF	OFF	ON	ON
4	OFF	ON	OFF	OFF
5	OFF	ON	OFF	ON
6	OFF	ON	ON	OFF
7	OFF	ON	ON	ON
8	ON	OFF	OFF	OFF
9	ON	OFF	OFF	ON
10	ON	OFF	ON	OFF
11	ON	OFF	ON	ON
12	ON	ON	OFF	OFF
13	ON	ON	OFF	ON
14	ON	ON	ON	OFF
15	ON	ON	ON	ON

Two-Channel Operation

The device uses **two consecutive channels**:

Channel	Function
Channel N (SetChannel)	Phoneme triggering
Channel N+1	Pitch control (for singing)

For example, if DIP switches are set to channel 1 (only DIP4 ON):

- Channel 1 = Phonemes

- Channel 2 = Pitch

MIDI Messages

Note On/Off (Channel N) – Phoneme Control

MIDI notes trigger the SC-02's phonemes. The mapping covers notes **36 to 103** (C2 to G7).

This code allows you to play all SC-02 phonemes; note that the original Robovox had a limited set of the first 93.

MIDI Note	Phoneme
36	U
37	:UH
38	IU
39	:U
40	O
41	OO
42	:OH
43	AW
44	:OH
45	AH
46	A
47	ER

48	E2
49	EH
50	I
51	E
52	IE
53	YI
54	NG
55	M
56	L
57	N
58	R2
59	HF
60	HFC
61	J
62	SCH
63	Z
64	S
65	F
66	V
67	HF
68	B
69	P

70	D
71	T
72	K
73	KV
74	PA0
75	OU
76	UH
77	AE
78	:A
79	AY
80	Y
81	HV
82	HVC
83	HN
84	LF
85	L1
86	LB
87	TH
88	THV
89	R
90	R1
91	W

92	KV
93	HVC
94	E1
95	AI
96	EH1
97	AE1
98	AH1
99	IU1
100	U1
101	UH1
102	UH2
103	UH3

- **Note On**: Triggers the phoneme with the specified velocity
- **Note Off**: Triggers PA0 (silence/pause) phoneme

Note On (Channel N+1) – Pitch Control (NEW in v1.3)

Send MIDI notes on the **second channel** to control the pitch of the voice for “singing” mode.

- **Range**: MIDI notes 36-120 (C2 to C9)
- Uses a pre-calculated pitch lookup table for accurate musical notes
- Send pitch notes **before or during** phoneme playback to set the singing pitch

This precalculated lookup table comes from the original Robovox firmware

Usage Example:

1. Send Note 60 (C4) on Channel 2 → Sets pitch to middle C
2. Send Note 46 (A) on Channel 1 → Voice sings “A” phoneme at C4 pitch

Note: Pitch control only works with the internal carrier. When using an external carrier (CC64 > 63), the pitch comes from the external audio source.

Velocity (7-bit value)

The velocity of Note On messages controls the **amplitude/volume** of the phoneme.

Velocity	Effect
0	Silent
1-127	Increasing volume (scaled to SC-02’s 4-bit amplitude: 0-15)

Pitch Bend – Coarse Pitch Control (14-bit value)

The pitch bend wheel provides **coarse pitch control** by adjusting the LTC6903 master clock frequency.

Pitch Bend Value	Effect
-8192	Lowest pitch

0	Center (default pitch)
+8191	Highest pitch

This affects the overall clock rate of the SC-02, providing a wide pitch range.

CC2 – Fine Pitch / Inflection (7-bit value)

Control Change 2 (Breath Controller) provides **fine pitch control** by directly
writing to the SC-02's inflection register.

CC2 Value	Effect
0	Lowest inflection
127	Highest inflection

Use this for subtle pitch variations, vibrato, or pitch modulation effects.

CC1 – Mod Wheel / Filter (7-bit value)

Control Change 1 (Modulation Wheel) controls the SC-02's **vocal tract filter
frequency**.

CC1 Value	Effect
0	Filter at 200
127	Filter at 251

This changes the “timbre” or formant characteristics of the voice.

CC3 – Speech Rate (7-bit value)

Control Change 3 controls the **speech rate** (speed of phoneme articulation).

CC3 Value	Effect
0	Slowest rate
127	Fastest rate

CC64 – Sustain / Carrier Select (7-bit value)

Control Change 64 (Sustain Pedal) switches between **internal and external carrier**.

CC64 Value	Effect
0-63	Internal carrier (OFF)
64-127	External carrier (ON)

When using an external carrier, you can feed audio into the SC-02 for vocoder-like effects.

Quick Reference Table

MIDI Message	CC#	Function	Range
Note On/Off (Ch N)	–	Phoneme trigger	Notes 36-103
Note On (Ch N+1)	–	Pitch control	Notes 36-120
Velocity	–	Volume	0-127 → 0-15
Pitch Bend	–	Coarse pitch (clock)	-8192 to +8191
CC1	1	Filter frequency	0-127
CC2	2	Fine pitch (inflection)	0-127
CC3	3	Speech rate	0-127
CC64	64	Carrier select	0-63=Int, 64-127=Ext

Connections

The Robovox MIDI accepts MIDI via:

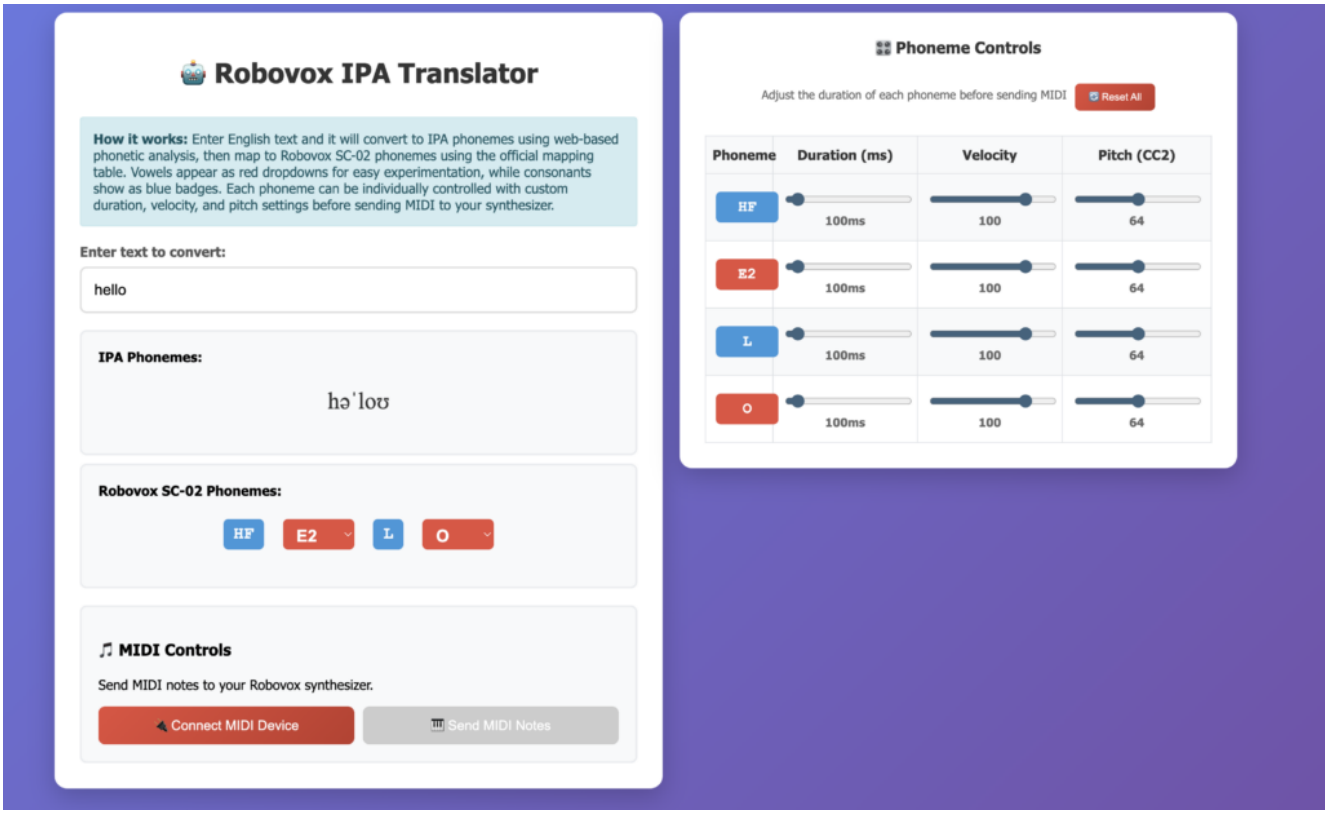
- **USB MIDI** (primary)
- **Serial MIDI** on Serial MIDI TRS type B

Both inputs are active simultaneously and are handled by the same handlers.

Tools

Robovox Translator

This tool helps sequence text into phonemes, while also allowing duration and pitch adjustment. Test the sequence by connecting the page to Robovox. It also allows you to save the sequence as a MIDI clip.



Robovox translator
Github code
You can also run it directly from this url

: https://deladriere.github.io/Robovox_translator/

Firmware

Do not use this firmware for Emy or Emy Terminal.

How to install the firmware on Kraftor

Robovox MIDI for Kraftor

1 file(s) 121.50 KB
Login is required to access this page
Login