

# Documentation USB Interface for Tuning-Set CTS-7-CE for programmers

The inbuilt USB-RS232-converter is a FR232RL – Chip  
(driver support on [www.ftdichip.com](http://www.ftdichip.com)).

## 1. Protocol

Baudrate: 19200,  
Databits: 7,  
Parity: Ungerade,  
Stopbit: 1,  
Protocol: XON/XOFF.

Each message to CTS-7 have to be closed with <CR> (13).

CTS-7 will close each message with < CR(13) + LF(10) >.

CTS-7 will answer with “Q” when a message is received successfully, if you can find no other statement in this manual.

If there is an error CTS-7 will send „E“ + <CR + LF>.

## 2. Dialog

### Status call

Call device type:

?D

Answer:  
CTS-7

Getting general state of device:

?P

Answer:

TUNE_PROG__ =	4	<i>number of instrument program</i>
NAME_____ =	HARPSICORD	<i>name of instrument program</i>
TEMP_HIST__ =	5	<i>number of historical temperament</i>
NAME_____ =	BRUDER/P.VIER____	<i>name of historical temperament</i>
CENTRELAT__ =	0	<i>cent relation note 0 = A, 1 = B, etc.</i>
TRANSPOSER_ =	0	<i>transposer 0 = off, 1 = a-&gt;b, etc.</i>
CELSI/CENT_ =	0	<i>cent per °C (thermosensor connected only.)</i>
CELSI/OFFS_ =	200	<i>thermosensor offset (thermosensor connected only)</i>

Getting synthesizer state:

?S

Answer:

SN	57	<i>note number (1...116)</i>
SP	44000	<i>concert pitch (22000 ... 88000 *0.01 Hz)</i>
SC	0	<i>cent adjustment (-999 ... +999 * 0.1 Cent)</i>
ST	1	<i>partial adjustment ( 1 ... 8)</i>
SI	0	<i>interval adjustment (0 ... 4)</i>
SS	167	<i>thermosensor temperature * 0.1/ °C thermosensor connected only)</i>
SR	0	<i>thermosensor cents for correction</i>

## 2.1. Getting Data from the Tuning Set

Send all data

DA

Answer:

```
=====
NV_DATA
TUNE_PROGR = 1          curent instrument program
CELSI_OFFS = 0          calibration of thermosensor
END_SECTION
=====
Data of the historical temperaments 2 ... 80
=====
TEMP_NUMBER = 2          number of temperament
NAME = BACH/BARNES      name of temperament
CENTS
;  A   Bb   B   C   C#   D   D#   E   F   F#   G   G#
  0,  60,  0,  60,  0,  20,  40, -20,  80, -20,  40,  20,
END_SECTION
=====
Data of instrument-programs 2...60
=====
TUNE_PROG = 2          number of instrument program
NAME = PIANO_STRETCH 1 name of instrument program
PITCH = 44000          concert pitch
TEMP_HIST = 0          number of historical temperament
CENTRELAT = 0          cent relation for historical temperament
TRANSPOSER = 0          transposer for historical temperament
CELSI/CENT = 0          cents per °C for thermosensor
CELSI/OFFS = 200        offset for thermosensor (* 0.1 °C)
=====
CENTS                  cents for the stretching (* 0,1 Cent)
;  C   C#   D   D#   E   F   F#   G   G#   A   Bb   B
-500, -500, -500, -500, -500, -500, -500, -500, -500, -440, -340, -280,
-240, -200, -170, -150, -135, -120, -105, -95, -80, -110, -100, -90,
-80, -75, -65, -55, -50, -45, -35, -30, -25, -60, -50, -45,
-40, -36, -28, -25, -22, -20, -18, -16, -14, -12, -11, -10,
-9, -8, -7, -6, -5, -4, -3, -2, -1, 0, 0, 0,
0, 0, 0, 0, 0, 1, 2, 3, 4, 5, 6, 7,
8, 9, 10, 12, 15, 18, 22, 26, 30, 35, 40, 45,
55, 65, 75, 90, 105, 120, 140, 170, 200, 235, 295, 345,
500, 630, 680, 710, 740, 770, 800, 830, 860, 900, 999, 0,
0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
=====
PARTIALS              partial adjustment („0“ = note Stepp over, „-1“ jump to next, „-1“)
;  C   C#   D   D#   E   F   F#   G   G#   A   Bb   B
  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,  4,
  4,  4,  4,  4,  4,  4,  4,  4,  4,  2,  2,  2,
  2,  2,  2,  2,  2,  2,  2,  2,  2,  1,  1,  1,
  1,  1,  1,  1,  1,  1,  1,  1,  1,  1,  1,  1,
  1,  1,  1,  1,  1,  1,  1,  1,  1,  1,  1,  1,
  1,  1,  1,  1,  1,  1,  1,  1,  1,  1,  1,  1,
  1,  1,  1,  1,  1,  1,  1,  1,  1,  1,  1,  1,
  1,  1,  1,  1,  1,  1,  1,  1,  1,  1,  1,  1,
  1,  1,  1,  1,  1,  1,  1,  1,  1,  1,  1,  1,
=====
END_SECTION
=====
Closing the file.
=====
END_____
```

## 2.2. Selective data access.

Send data of all instrument programs:	DI
Send data not volatile:	DD
Send data of current instrument program:	DS
Send data of all historical temperaments:	DT

## 2.3. Storing of data into the Tuning Set

Start tuning set for data receive:	DE
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Afterwards send the text-file with your stored data to the set. You may send data of single instruments. The data for transmission should be closed like this:

```
;=====
END_____
```

## 2.4. Statements for synthesizer control

Set current note number (XXX = 1...116):	CN XXX
Set current concert pitch (XXX = 38000 ...+88000 *0.01 Hz):	CP XXXXX
Set current cent adjustment (XXX = -999 ...+999 *0.1 Cent):	CC XXX
Current partial adjustment (1...8):	CT X
Current interval adjustment (0...4):	CN X

## 2.5. Other statements to adjust the device

Enter in tune mode:	FE
Leave tune mode:	FX
Set number of instrument program:	P XX (XX = 1...60)
Factory reset:	DU
Audible tone volume 1:	S1
Audible tone volume 2:	S2
Audible tone off:	S0