



## **Tuning-Set CTS-32-C RS232 protocol for programmers**

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

### **Initialisation:**

Baud: 115200  
Data-bits: 7  
Parity: Odd  
Stop-bits: 2  
Handshake: Xon-Xoff

### **Protocol:**

: = all commands must be finished with <10>,<13> (CR LF)  
If the command was ok, Tuning Set prompts 'Q' if not 'E'

'R': Restarts the Tuning Set. When Tuning Set is ready it will  
send name and firmware version 'CTS-32-C V 1.00'(no 'Q')

'PE': Enter in mode for receiving CTS-32-C text files.  
(after this commands you can send the text files)

'P xx': Set number of instrument program. (xx = number 0...99)

'?D': Send name and firmware version of device connected  
'CTS-32-C V 1.00'.

'?P': Send adjustment information of active instrument program.

'?S': Send adjustment of the tuning set synthesizer.

```
"SN <note number>"  
"SP <pitch Hertz * 100>"  
"SC <cents * 10>"  
"ST <partial>"  
"SI <interval>"  
"SW <beats Hertz * 100>"  
"SH <16th half tone steps>"
```

If thermosensor connected:

```
"SS " degree Celsius * 10  
"SR " thermosensor cents * 10
```

```
'TA': Remote control key T01  
'TB': Remote control key T02  
'TC': Remote control key T03  
'TD': Remote control key T04  
'TE': Remote control key T05  
'TF': Remote control key T06  
'TG': Remote control key T07  
'TH': Remote control key T08  
'TI': Remote control key T09  
'TJ': Remote control key T10
```

'TK': Remote control key T11  
'TL': Remote control key T12  
'TM': Remote control key T13

'SA': Remote control key TS01  
'SB': Remote control key TS02  
'SC': Remote control key TS03  
'SD': Remote control key TS04  
'SE': Remote control key TS05  
'SF': Remote control key TS06  
'SG': Remote control key TS07  
'SH': Remote control key TS08  
'SI': Remote control key TS09  
'SJ': Remote control key TS10  
'SK': Remote control key TS11  
'SL': Remote control key TS12  
'SM': Remote control key TS13

'S0': speaker off  
'S1': loudness 1  
'S2': loudness 2  
'S3': loudness 3  
'S4': loudness 4  
'S5': loudness 5  
'S6': loudness 6  
'S7': loudness 7

'AA': Automatic function <A> on  
'AB': Automatic function <B> on

'CC xxx': set cents xx = -150 ... +150  
'CN xxx': set note number xxx = 0 ... 116  
'CP xxxxx': set pitch xxxxx = 22000 ... 88000 in 100<sup>th</sup> hertz  
'CT xx': set partial xx = 1...16  
'CI x': set interval x = 0...4

'XA': send device status continuous = on  
'XB': send device status continuous = off

'XC': send true frequency continuous = on  
'XD': send true frequency continuous = off

'XE': send true cents continuous = on  
'XF': send true cents continuous = off

'DE': starts data transfer of a text-file into the tuning set.

'DA': starts output data transfer of all data as text-file.

'DF': starts output data transfer of all fixed instruments as text-file.

'DI': starts output data transfer of all instrument data as text-file.

'DD': starts output data transfer of adjustment data as text-file.

'DT': starts output data transfer of all historical temperament data as text-file.

'DT': starts output data transfer active instrument as text-file.

'DU': reset the tuning-set into mode of delivery.

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