Ira/Tira RS-232 protocol.

Protocol parameters	
Byte Length	8 bits
Stop Bits	1
Parity Bits	None
Baud rate	9600 (57600 in timing mode)
Flow control, Ira	None
Flow control, Tira	CTS/RTS

Ira/Tira can operate in two modes, “six bytes” and “timing”.

Six bytes

In this mode the IR data is represented by a six bytes word. The encoding algorithm used by Ira/Tira is designed to produce unique words for most common IR codes, including NEC and RC-5. This mode is very convenient for applications there exact information about IR data is not required and it is only necessary to distinguish codes corresponding to different buttons on the remote control.

Timing

In this mode Ira/Tira returns complete timing information about received IR data. It does not return modulation frequency, however. The information returned by Ira/Tira in timing mode has the following format:

$P_0\ S_0\ P_1\ S_1\ \ldots\ P_n$ 0x00 0x00 0x65 0xB2

The P fields represent length of pulses, and S fields represent length of spaces.
Each of the P and S fields consists of two bytes:

$P_i = H_i\ L_i$

The time represented by this field is calculated as following:

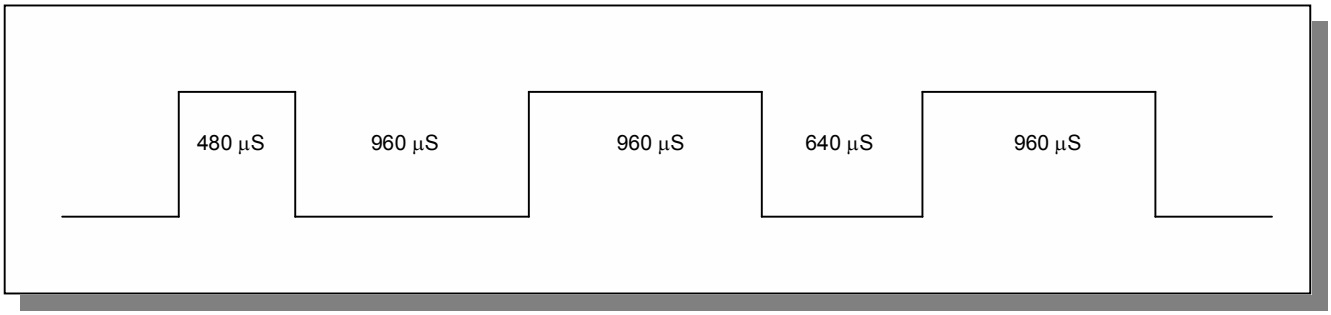
$$T_i = (H_i * 255 + L_i) * 32\mu S$$

Note that in the Timing mode Ira will transmit data at 57600 baud, but always receives data at 9600 baud.

When you use Tira, the baud rate must be set at either 9600 or 57600.

Command ASCII	Command HEX	Action	Support
“IR”	49 52	This command switches Ira/Tira into “Six bytes” mode. Ira/Tira will respond with “OK” (4F 4B). This command can be used to verify basic operation of Ira/Tira.	Ira, Ira-2, Tira-1
“IP”	49 50	This command switches Ira/Tira to “Timing” mode. Ira/Tira will respond with the following 5 byte long string (hex) 4F 49 50 **XX YY** **XX** is a calibration value, which can be safely ignored in most cases. **YY** is version word, which has the following format: YY[0] This bit is set if the device supports transmiting IR codes YY[1] This bit is set if the device supports remote wake up (“IW” command). YY[2:3] These two bits are reserved. YY[4:7] Firmware version After switching into Timing mode Ira-2 will also change its transmission baud rate to 57600. Therefore right after issuing “IP” command the host must switch to 57600 baud too. Ira will for 8mS before sending response to allow host to change the baud rate.	Ira-2 Tira-1
“IW”	49 57 WW(6)	This command sets the value for remote wake up feature (RW0). When Tira is in “Six bytes” mode before sending data to the PC it is compared to the value of RW0. If there is a match, Tira triggers “remote wake up”. USB bases devices wakes up a PC by means of the USB protocol, while RS-232 based devices wakes up a PC by triggering WOL or similar input. Tira responds to to this command with “OIW” (4F 49 57)	Tira-1

"IT"	49 54 FS(2) PSA(16) DATA(N)		Tira
		This command transmits IR code. **FS**: two bytes field **FS[0:2]** Frequency select 0 30.3kHz 1 32.2kHz 2 33.3kHz 3 35.7kHz 4 37.0kHz 5 38.4kHz 6 40.0kHz 7 55.5kHz This field specifies the modulation frequency used for IR transmission. **FS[3:15]** reserved. These bits must be cleared. **PSA**, 16 bytes, Pulse, Space Array T_0 T_1 T_2 T_3 T_4 T_5 T_6 T_7 Although the IR data may be arbitrarily long, it can only consist of up to eight different periods of time. Each period is specified with two bytes: T_i = $Byte0_i$ $Byte1_i$ The time can be specified with 32μS resolution. Here is how to calculate Byte0 and Byte1: BYTE1 = ((TIME-16) DIV 32) DIV 255 BYTE0 = 255-((TIME-16) DIV 32) MOD 255 DATA must contain even number of bytes: P_0 S_0 P_1 S_1 …… P_n S_n Note that unlike the data received in Timing mode, the P and S fields are not times, but indexes of values in PSA. For example, if PSA contains values (for demonstration purposes these values are not encoded) 480 960 640 0 0 0 0 0 and the DATA is 0 1 1 2 1 8 Tira will generate the following IR signal:	



"IT"		Note that the last index is 8. It indicates that it is end of the sequence. Last index must have the 3rd bit set. Bits 4..7 must be cleared in all entries. Tira responds with "OIT" to this command. Please note that the command "IT" destroys value stored in RW0. Therefore, if you are using the remote wake up feature, each "IT" command must be followed by "IW", in order to restore the value of RW0.	