

Zign Track PRO

TCP/IP real-time motion data protocol

Protocol version 1.0 - January 2011

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Protocol version 1

The Zign Track Pro TCP/IP real-time motion capture protocol version 1 is very simple but contains all data you should need.

The data exists of a header with time stamp, number of markers and number of bones, followed by the marker coordinates and bone rotations. The data ends with an end-of-data sign.

BYTE	HEADER
0 - 3	4-byte version sign. For protocol version 1.0 this is: "ZT2S"
4 - 11	64-bit time stamp (8 bytes). Sample time in microseconds.
12	1 byte specifies number of markers (N_M)
13	1 byte specifies number of bones (N_B)

For each marker and bone the ID/name is given in 4 bytes.

For each marker the translation data is given in 3 dimensions (X, Y, Z), with 4 bytes for each value.

For each bone the rotation data is given in 3 dimensions (X, Y, Z), with 4 bytes for each value.

The translation and rotation values are given as signed 32 bit integers. The original floating point values from Zign Track Pro have been multiplied by 1000 to keep enough accuracy in the integers. For getting back the original values, the retrieved values should be divided by 1000.

The length of the data sample (L_D) is calculated as follows: $L_D = 18 + (N_M * 16) + (N_B * 16)$.

Translation data block (starts with offset from byte 14 and recurs after every 16th byte for N_M times):

BYTE	TRANSLATION DATA
0 - 3	4-byte marker ID
4 - 7	32-bit signed integer: X translation
8 - 11	32-bit signed integer: Y translation
12-15	32-bit signed integer: Z translation

Rotation data block (starts with offset from byte 14 + ($N_M * 16$) and recurs after every 16th byte for N_B times):

BYTE	ROTATION DATA
0 - 3	4-byte bone ID
4 - 7	32-bit signed integer: X rotation
8 - 11	32-bit signed integer: Y rotation
12-15	32-bit signed integer: Z rotation

End of data sign:

BYTE	END OF DATA
$L_D - 4 - L_D - 1$	4-byte end of data sign. For protocol version 1.0 this is: "ZTSE"

Marker / bone ID

Each marker and bone gets its own unique ID. For the facial markers and bones the ID is based on the area of the face (i.e. cheek, brow) and contains an 'L' (left side) or an 'R' (right side) when its a symmetrical placed marker or bone, followed by a number if the marker or bone is part of a facial area when multiple markers are allowed. Markers or bones near the center of the face will have lower numbers and the numbers increase for markers and bones further to the left and right side of the face.

For example, a marker ID for one of the cheek markers could be "CHL2". Although 4 bytes are reserved for each ID some IDs will need only 3 characters (like the jaw). These IDs will have only 3 characters, followed by a space character. For displaying purposes trailing spaces should be ignored.

For a detailed overview of all possible IDs see the table below.

AREA	ID	SYMMETRICAL	COUNT MULTIPLE
Neck	NECK	No	No
Head	HEAD	No	No
Jaw	JAW	Yes	No
Nose	NOSE	No	No
Nose bridge	NOBR	No	No
Ear	EAR	Yes	No
Rigid forehead	RF	Yes	Yes
Pupil	PUP	Yes	No
Lower eyelid	EYL	Yes	No
Upper eyelid	EYH	Yes	No
Lower lip	LL	Possible	Yes
Upper lip	LU	Possible	Yes
Mouth corner	MOC	Yes	No
Lip curl	LC	Possible	Yes
Cheek	CH	Yes	Yes
Squint	SQ	Yes	Yes
Nose wrinkle	NOW	Yes	No
Nostril	NOS	Yes	No
Eyebrow	BR	Possible	Yes
Eye corner	EYC	Yes	No
Chin	CHIN	No	No
Chin side	JAW	Yes	No