

Sensor Data Packet Definitions

All fields are ASCII. Packets end with CRC-8 (2 hex) and terminator 'D'.

Live Packet (L) — ~1s interval

#	Field	Width	Source	Description
1	Packet Type	1	"L"	Identifies Live (real-time) data packet.
2	Pod / Player ID	2	pot_id	Unique pod ID (01–26).
3	GPS Time	6	GPS_TIME_BUF	Current UTC time (HHMMSS).
4	GPS Fix	1	GPS_FIX_DATA_BUF	'0' = no GPS fix, '1' = fixed position.
5	Latitude	10	latString	Current latitude (e.g., 4901.52321 N).
6	Previous Latitude (t-1)	4	p_latPrv	Last 4 digits of previous latitude.
7	Previous Latitude (t-2)	4	p_latPrv_2	Two samples before latitude fragment.
8	Longitude	11	lonString	Current longitude (e.g., 12305.823 W).
9	Previous Longitude (t-1)	4	p_lonPrv	Last 4 digits of previous longitude.
10	Previous Longitude (t-2)	4	p_lonPrv_2	Two samples before longitude fragment.
11	Velocity (knots)	5	GPS_VELOCITY_BUF	Current ground speed (knots × 1.852 = km/h).
12	Previous Velocity (t-1)	5	p_velPrv	Speed one second earlier.
13	Previous Velocity (t-2)	5	p_velPrv_2	Speed two seconds earlier.
14	Heart Rate (BPM)	3	BUF_HEARTRATE	Real-time heart rate from HR belt.
15	Metabolic Power (W/kg)	5	METABOLIC_POWER	Instant metabolic power (1-decimal precision).
16	CRC-8	2	crc8(...)	Packet checksum (2-digit hexadecimal).
17	Terminator	1	"D"	Marks end of packet.

Total Packet (T) — ~2s interval

#	Field	Width	Source	Description
1	Packet Type	1	"T"	Identifies Total data packet.
2	Pod ID	2	pot_id	Player/sensor identifier.
3	GPS Time	6	GPS_TIME_BUF	Timestamp label.
4	GPS Fix	1	GPS_FIX_DATA_BUF	'0' = no fix, '1' = fixed.
5	Player Load	5	PLAYER_LOAD	Cumulative movement load (Δ acceleration sum/100).
6	Total Distance (m)	5	BUF_TOTAL_DISTANCE	Total distance covered.
7	HMDL Distance (m)	5	BUF_HMDL_DISTANCE	High-metabolic-demand-load distance.
8	Z6 Distance (m)	4	BUF_Z6_DISTANCE	Distance > 7 m/s (sprint zone 6).
9	Z5 Distance (m)	4	BUF_Z5_DISTANCE	Distance 5–7 m/s (zone 5).
10	Z4 Distance (m)	4	BUF_Z4_DISTANCE	Distance 3–5 m/s (zone 4).
11	Z6 Count	2	TOTAL_Z6_SPEED_COUNT	Number of Z6 entries (sprints).
12	Z5 Count	3	TOTAL_Z5_SPEED_COUNT	Number of Z5 speed entries.
13	Z4 Count	3	TOTAL_Z4_SPEED_COUNT	Number of Z4 speed entries.
14	Total Accelerations	3	TOTAL_ACC_COUNT	Number of acceleration events.
15	Total Decelerations	3	TOTAL_DEACC_COUNT	Number of deceleration events.
16	Total Impacts	2	TOTAL_IMPACT_COUNT	Number of body impact events.
17	Step Balance Side	1	STEP_BALANCE_VALUE	1 = left-dominant leg, 0 = right-dominant.
18	Step Balance Value	4	fabs(STEP_BALANCE_VALUE)	Magnitude of step asymmetry (%).
19	Max Speed (km/h)	4	BUF_MAX_SPEED	Overall maximum speed (1 decimal).
20	Last Minute Max Speed (km/h)	4	BUF_LAST_MINUTE_MAX_SPEED	Highest speed in last minute.
21	RR Average (ms)	3	BUF_RR_AVG_HEARTRATE	Mean RR-interval (heartbeat period).
22	Max Heart Rate (BPM)	3	BUF_MAX_HEARTRATE	Peak heart rate recorded.
23	CRC-8	2	crc8(...)	Packet checksum (hex).
24	Terminator	1	"D"	End of packet.

Status Packet (S) — ~60s interval (when GPS fixed)

#	Field	Width	Source	Description
1	Packet Type	1	"S"	Identifies Status packet.
2	Pod ID	2	pot_id	Device/player number.
3	GPS Date	6	GPS_DATE_BUF	Date (YYMMDD).
4	GPS Time	6	GPS_TIME_BUF	Time (HHMMSS).
5	Reserved Field	12	"000000000000"	Reserved for battery, diagnostics, HW version, reset reason.
6	CRC-8	2	crc8(...)	Packet checksum.
7	Terminator	1	"D"	End marker.

Summary

Packet	Interval	Purpose
Live (L)	~1 s	Real-time GPS, speed, heart rate, metabolic power
Total (T)	~2 s	Cumulative distance, load, speed-zone stats, HR metrics
Status (S)	~60 s (when GPS fixed)	Date/time and reserved diagnostic/device info