

## AX100 telemetry decoder cheat sheet

After the AX.25 header, you have the CSP header, which will be 4 bytes long. However, this also must abide by the KISS format, so if part of the header includes DB DC, this translates to C0. The CSP header is followed by the telemetry from the ax100, which is shown below. The table highlights the parameter, the number of bits that encompass that data, an example value, and a parameter description.

Table 5.5: Parameter table 4: System Telemetry

Addr	Name	Type	Default Value	Comment
0x0000	temp_brd	I16 R	0	Board temperature (near MCU)
0x0002	temp_pa	I16 R	0	PA temperature (near PA)
0x0004	last_rssi	I16 R	0	Last received RSSI
0x0006	last_rferr	I16 R	0	Last received RF error
0x0008	tx_count	U32 R	0	Number of tx packets since reboot
0x000C	rx_count	U32 R	0	Number of rx packets since reboot
0x0010	tx_bytes	U32 R	0	Number of tx bytes since reboot
0x0014	rx_bytes	U32 R	0	Number of rx bytes since reboot
0x0018	active_conf	U8 R	0	The currently active system configuration (table 0)
0x0020	boot_count	U16 R	0	The number of reboots
0x0024	boot_cause	X32 R	0	The cause of the reboot (see AVR32 boot cause register)
0x0028	last_contact	U32 R	0	The timestamp of the last valid packet (required a CSP timesync to work)
0x002C	bgnd_rssi	I16 R	-120	The current background RSSI level (Exponential moving average, see bgndrssi_ema parameter in table 0)
0x002E	tx_duty	U8 R	0	Total TX duty time since reboot
0x0030	tot_tx_count	U32 RP	0	Number of tx packets (total)
0x0034	tot_rx_count	U32 RP	0	Number of rx packets (total)
0x0038	tot_tx_bytes	U32 RP	0	Number of tx bytes (total)
0x003C	tot_rx_bytes	U32 RP	0	Number of rx bytes (total)

To decode the packet data, divide up the hex bytes according to what is specified in the image above, and then convert the hex values to decimal values.

### An example of a decoded packet is below.

PHOENIX RAW Telemetry, Interval 30 sec:

```
2020-03-29 12:56:19.260 UTC: [78 Bytes KISS Frame (without CRC)]
1 > C0 00 57 4A 32 58 4F 59 00 4B 49 4F 4F 37 59 00 03 00 CA A7
21 > DB DC 00 FF E0 FF E1 00 00 00 00 00 00 00 04 00 00 00 16 00
41 > 00 00 E8 00 00 01 46 02 C3 21 00 00 00 01 B9 FC BB D2 FF 8C
61 > 00 00 01 C5 FC 00 04 EE B6 00 35 75 B0 00 55 B6 85 C0
A.WJ2XOY.KIOO7Y...КЫЬ.аяяб...и...F.Г!..№ь>Тря_...Еь...о.5u°.U:A
```

Removing the AX.25 header and the KISS wrapping, this packet is decoded as follows:

**CSP Header: CA A7 DB DC 00 --> actually CA A7 C0 00** due to KISS framing protocol

Decoding the CSP header tells us this packet comes from node 5, port 0 - ax100 control port, which is also used for sending out telemetry packets.

**Data portion:**

FF E0 - board temp = 65504 --> 65.504 degC (note: at our AFT range, expected from models max allowable temp = 85C)

FF E1 - PA temp = 65504 --> 65.505 degC

00 00 - last rssi = 0 (common value)

00 00 - last rferr = 0 (common value)

00 00 00 04 - tx\_count = 4 (count since reboot)

00 00 00 16 - rx\_count = 22

00 00 00 E8 - tx\_bytes = 232

00 00 01 46 - rx\_bytes = 326

02 - active\_conf = 2

C3 21 - boot\_count = 49953 (lol)

00 00 00 01 - boot cause = 1

B9 FC BB D2 - last\_contact = 3120348114 (timestamp of last valid packet)

FF 8C = bgnd\_rssi = -116 (using 2's complement, common value)

00 = tx\_duty = 0 (total tx duty time since reboot, common)

00 01 C5 FC - tot\_tx\_count = 116220 (expect to be high)

00 04 EE B6 - tot\_rx\_count = 323254

00 35 75 B0 - tot\_tx\_bytes = 3503536

00 55 B6 85 - tot\_rx\_bytes = 5617285