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ADC and DAC Channel Usage for SQZ

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# Purpose

This document lists the specific ADC and DAC channels used within the SQZ I/O expansion chassis. In the following tables, the entries given in the ‘Signal’ column are *not* meant to be the exact DAQ channel name for that signal (though they may be); rather the entries are intended as descriptors to identify the actual hardware channel that is connected to a given ADC/DAC channel.

The reference document for the actual DAQ channel names is [T1000264](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=11847), *List of ISC Photodetectors in Advanced LIGO.*

# SQZ-IO I/O Chassis

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Card | AA/AI conn. | ADC/DAC Chns. | Signal | |
| ADC 0 | DB9\_1 | 1-4 | SQZ TT1 | Tip-Tilt BOSEM sensor signals |
| DB9\_2 | 5-8 | SQZ TT2 |
| DB9\_3 | 9-12 | SQZ TT1 | Tip-Tilt Coil driver readbacks |
| DB9\_4 | 13-16 | SQZ TT1 |
| DB9\_5 | 17-20 | VOPO SUS | AOSEM |
| DB9\_6 | 21-22 |
| 23 | Unused | |
| 24 | Unused | |
| DB9\_7 | 25-28 | VOPO SUS | Coil driver readbacks |
| DB9\_8 | 29-30 |
| 31 | Duotone (DAC) | |
| 32 | Duotone | |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Card | AA/AI conn. | ADC/DAC Chns. | Signal | | |
| ADC 1 | DB9\_1 | 1 | SQZ-WFS\_A\_RF | Seg 1 | Q-phase |
| 2 | I-phase |
| 3 | Seg 2 | Q-phase |
| 4 | I-phase |
| DB9\_2 | 5 | Seg 3 | Q-phase |
| 6 | I-phase |
| 7 | Seg 4 | Q-phase |
| 8 | I-phase |
| DB9\_3 | 9 | SQZ-WFS\_B\_RF | Seg 1 | Q-phase |
| 10 | I-phase |
| 11 | Seg 2 | Q-phase |
| 12 | I-phase |
| DB9\_4 | 13 | Seg 3 | Q-phase |
| 14 | I-phase |
| 15 | Seg 4 | Q-phase |
| 16 | I-phase |
| DB9\_5 | 17-20 | Unused | | |
| DB9\_6 | 21-24 | Unused | | |
| DB9\_7 | 25 | Unused | | |
| 26 | Unused | | |
| 27 | Unused | | |
| 28 | Unused | | |
| DB9\_8 | 29 | Unused | | |
| 30 | Unused | | |
| 31 | Unused | | |
| 32 | Unused | | |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Card | AA/AI conn. | ADC/DAC Chns. | Signal | | |
| ADC 2 | DB9\_1 | 1 | SQZ-HD\_A\_DC | | |
| 2 | SQZ-HD\_B\_DC | | |
| 3 | SQZ-HD\_DIFF\_DC | | |
| 4 | Unused | | |
| DB9\_2 | 5 | SQZ-HD\_DIFF | RF3 | Q-phase |
| 6 | I-phase |
| 7 | SQZ-OMC\_TRANS | RF3 | Q-phase |
| 8 | I-phase |
| DB9\_3 | 9 | SQZ-SHG\_TRANS | RF35 | Q-phase |
| 10 | I-phase |
| 11 | SQZ-OPO\_REFL | RF80 | Q-phase |
| 12 | I-phase |
| DB9\_4 | 13 | SQZ-CLF\_REFL | RF6 | Q-phase |
| 14 | I-phase |
| 15 | Unused |  | Q-phase |
| 16 | I-phase |
| DB9\_5 | 17 | SQZ-OPO\_SERVO\_ERR, CM Servo, I monitor | | |
| 18 | SQZ-OPO\_SERVO\_CTRL, CM Servo, Fast monitor | | |
| 19 | SQZ-OPO\_SERVO\_SLOW, CM Servo, Slow monitor | | |
| 20 | Unused | | |
| DB9\_6 | 21 | SQZ-SHG\_SERVO\_ERR, CM Servo, I monitor | | |
| 22 | SQZ-SHG\_SERVO\_CTRL, CM Servo, Fast monitor | | |
| 23 | SQZ-SHG\_SERVO\_SLOW, CM Servo, Slow monitor | | |
| 24 | Unused | | |
| DB9\_7 | 25 | SQZ-LO\_SERVO\_ERR, CM Servo, I monitor | | |
| 26 | SQZ-LO\_SERVO\_CTRL, CM Servo, Fast monitor | | |
| 27 | SQZ-LO\_SERVO\_SLOW, CM Servo, Slow monitor | | |
| 28 | Unused | | |
| DB9\_8 | 29 | SQZ-CLF\_SERVO\_ERR, CM Servo, I monitor | | |
| 30 | SQZ-CLF\_SERVO\_CTRL, CM Servo, Fast monitor | | |
| 31 | SQZ-CLF\_SERVO\_SLOW, CM Servo, Slow monitor | | |
| 32 | Unused | | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Card | AA/AI conn. | ADC/DAC Chns. | Signal | |
| ADC 3 | DB9\_1 | 1 | SQZ-LL\_MIXER | |
| 2 | SQZ-LL\_PZT | |
| 3 | SQZ-LL\_EOMRMS | |
| 4 | SQZ-LL\_SLOW | |
| DB9\_2 | 5 | SQZ-LL\_PD\_LF | 4 ch Generic PD interface: ISCT6 |
| 6 | SQZ-SHG\_TRANS\_LF |
| 7 | Unused |
| 8 | Unused |
| DB9\_3 | 9 | SQZ-CLF\_REFL\_LF | DC Outputs |
| 10 | SQZ-OPO\_REFL\_LF |
| 11 | Unused |
| 12 | Unused |
| DB9\_4 | 13 | SQZ-LL\_FIBR\_REJECTED\_LF | DC Monitors |
| 14 | SQZ-LL\_FIBR\_TRANS \_LF |
| 15 | SQZ-LASER\_IR\_LF |
| 16 | SQZ-SHG\_LAUNCH\_LF |
| DB9\_5 | 17 | SQZ-CLF\_LAUNCH\_LF | DC Monitors |
| 18 | SQZ-SEED\_LAUNCH\_LF |
| 19 | SQZ-LO\_LAUNCH\_LF |
| 20 | SQZ-OPO\_TRANS\_LF |
| DB9\_6 | 21 | SQZ-CLF\_FIBR\_TRANS\_LF | DC Monitors |
| 22 | SQZ-SHG\_FIBR\_TRANS\_LF |
| 23 | Unused |
| 24 | Unused |
| DB9\_7 | 25 | SQZ-EXTRA\_AI\_1 | |
| 26 | SQZ-EXTRA\_AI\_2 | |
| 27 | SQZ-EXTRA\_AI\_3 | |
| 28 | SQZ-EXTRA\_AI\_4 | |
| DB9\_8 | 29 |  | |
| 30 |  | |
| 31 |  | |
| 32 |  | |

|  |  |  |  |
| --- | --- | --- | --- |
| Card | AA/AI conn. | ADC/DAC Chs. | Signal |
| DAC 0 | DB9\_1 | 1-4 | SQZ TT1 Coil drives (UL, LL, UR, LR) |
| DB9\_2 | 5-8 | SQZ TT2 Coil drives (UL, LL, UR, LR) |
| DB9\_3 | 9-12 | VOPO SUS coil drivers  (H1, H2, H3, V1, V2, V3) |
| DB9\_4 | 13-14 |
| 15 | Unused |
| 16 | Duotone |

|  |  |  |  |
| --- | --- | --- | --- |
| Card | AA/AI conn. | ADC/DAC Chs. | Signal |
| DAC 1 | DB9\_1 | 1 | SQZ-EXTRA\_AO\_1 |
| 2 | SQZ-EXTRA\_AO\_2 |
| 3 | SQZ-EXTRA\_AO\_3 |
| 4 | SQZ-OPO-PZT |
| DB9\_2 | 5 | SQZ-OPO\_SERVO\_EXC |
| 6 | SQZ-SHG\_SERVO\_EXC |
| 7 | SQZ-LO\_SERVO\_EXC |
| 8 | SQZ-CLF\_SERVO\_EXC |
| DB9\_3 | 9-12 | Unused |
| DB9\_4 | 13-14 | Unused |
| 15 | Unused |
| 16 | Unused |

# Summary

Below is a summary of the number of I/O cards, unused channels, and available I/O slots for the SQZ I/O Expansion Chassis. This assumes there are a total of 10 slots available in the I/O chassis for ADC and/or DAC cards. For the unused ADC channel column, the number in parentheses is the subset of these channels that are available Anti-Alias (AA) chassis on free DB9 connectors; the other channels are found on AA DB9 connectors which are only partially used.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **I/O Chassis** | **# ADC cards** | **# DAC cards** | **Unused ADC chans** | **Unused DAC chans** | **Available I/O slots** |
| Vertex: SQZ | 2 | 1 |  |  |  |
| Totals | 2 | 1 |  |  |  |