*LIGO Laboratory / LIGO Scientific Collaboration*

LIGO-T1600606-v3 Advanced LIGO April 3, 2017

ADC and DAC Channel Usage for SQZ

Rich Abbott, Peter Fritschel, Lisa Barsotti, Daniel Sigg

Distribution of this document:

LIGO Scientific Collaboration

This is an internal working note

of the LIGO Laboratory.

|  |  |
| --- | --- |
| **California Institute of Technology**  **LIGO Project – MS 18-34**  **1200 E. California Blvd.**  **Pasadena, CA 91125**  Phone (626) 395-2129  Fax (626) 304-9834  E-mail: info@ligo.caltech.edu | **Massachusetts Institute of Technology**  **LIGO Project – NW22-295**  **185 Albany St**  **Cambridge, MA 02139**  Phone (617) 253-4824  Fax (617) 253-7014  E-mail: info@ligo.mit.edu |
| **LIGO Hanford Observatory**  **P.O. Box 159**  **Richland WA 99352**  Phone 509-372-8106  Fax 509-372-8137 | **LIGO Livingston Observatory**  **P.O. Box 940**  **Livingston, LA 70754**  Phone 225-686-3100  Fax 225-686-7189 |

http://www.ligo.caltech.edu/

# 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.

# SUSH56 I/O Chassis

|  |  |  |  |
| --- | --- | --- | --- |
| Card | AA/AI conn. | ADC/DAC Chs. | Signal |
| DAC 5 | 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 | Unused |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Card | AA/AI conn. | ADC/DAC Chns. | Signal | |
| ADC 2 | 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 | Unused | |
| 32 | Unused | |

# SQZ-IO I/O Chassis

|  |  |  |  |
| --- | --- | --- | --- |
| Card | AA/AI conn. | ADC/DAC Chs. | Signal |
| DAC 0 | 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 | Duotone |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Card | AA/AI conn. | ADC/DAC Chns. | Signal | | |
| ADC 0 | 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 | SQZ-LL\_MIXER | | |
| 18 | SQZ-LL\_PZT | | |
| 19 | SQZ-LL\_EOMRMS | | |
| 20 | SQZ-LL\_SLOW | | |
| DB9\_6 | 21 | SQZ-HD\_DIFF | RF3 | Q-phase |
| 22 | I-phase |
| 23 | SQZ-OMC\_TRANS | RF3 | Q-phase |
| 24 | I-phase |
| DB9\_7 | 25 | SQZ-SHG\_TRANS | RF35 | Q-phase |
| 26 | I-phase |
| 27 | SQZ-OPO\_REFL | RF80 | Q-phase |
| 28 | I-phase |
| DB9\_8 | 29 | SQZ-CLF\_REFL | RF6 | Q-phase |
| 30 | I-phase |
| 31 | Duotone (DAC) | | |
| 32 | Duotone | | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Card | AA/AI conn. | ADC/DAC Chns. | Signal | |
| ADC 1 | DB9\_1 | 1 | SQZ-OPO\_SERVO\_ERR, CM Servo, I monitor | |
| 2 | SQZ-OPO\_SERVO\_CTRL, CM Servo, Fast monitor | |
| 3 | SQZ-OPO\_SERVO\_SLOW, CM Servo, Slow monitor | |
| 4 | Unused | |
| DB9\_2 | 5 | SQZ-SHG\_SERVO\_ERR, CM Servo, I monitor | |
| 6 | SQZ-SHG\_SERVO\_CTRL, CM Servo, Fast monitor | |
| 7 | SQZ-SHG\_SERVO\_SLOW, CM Servo, Slow monitor | |
| 8 | Unused | |
| DB9\_3 | 9 | SQZ-LO\_SERVO\_ERR, CM Servo, I monitor | |
| 10 | SQZ-LO\_SERVO\_CTRL, CM Servo, Fast monitor | |
| 11 | SQZ-LO\_SERVO\_SLOW, CM Servo, Slow monitor | |
| 12 | Unused | |
| DB9\_4 | 13 | SQZ-CLF\_SERVO\_ERR, CM Servo, I monitor | |
| 14 | SQZ-CLF\_SERVO\_CTRL, CM Servo, Fast monitor | |
| 15 | SQZ-CLF\_SERVO\_SLOW, CM Servo, Slow monitor | |
| 16 | Unused | |
| DB9\_5 | 17 | SQZ-EXTRA\_AI\_1 | |
| 18 | SQZ-EXTRA\_AI\_2 | |
| 19 | SQZ-EXTRA\_AI\_3 | |
| 20 | SQZ-HD\_DIFF\_DC | |
| DB9\_6 | 21 | SQZ-CLF\_REFL\_LF | DC Outputs |
| 22 | SQZ-OPO\_REFL\_LF |
| 23 | SQZ-HD\_A\_DC |
| 24 | SQZ-HD\_B\_DC |
| DB9\_7 | 25 | SQZ-SHG\_FIBR\_TRANS\_LF | DC Outputs |
| 26 | SQZ-CLF\_FIBR\_TRANS\_LF |
| 27 | SQZ-OPO\_TRANS\_LF |
| 28 | SQZ-LL\_IR\_LF |
| DB9\_8 | 29 | SQZ-LL\_PD\_LF | 4 ch Generic PD interface: ISCT6 |
| 30 | SQZ-SHG\_TRANS\_LF |
| 31 | SQZ-LASER\_IR\_LF |
| 32 | SQZ-SHG\_GR\_LF |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Card | AA/AI conn. | ADC/DAC Chns. | Signal | |
| ADC 2 | DB9\_1 | 1 | Unused | |
| 2 | Unused | |
| 3 | Unused | |
| 4 | Unused | |
| DB9\_2 | 5 | Unused | 4 ch Generic PD interface: SQZT6 |
| 6 | Unused |
| 7 | Unused |
| 8 | Unused |
| DB9\_3 | 9 | SQZ-LL\_FIBR\_REJECTED\_LF | DC Monitors |
| 10 | SQZ-LL\_FIBR\_TRANS \_LF |
| 11 | SQZ-SHG\_LAUNCH\_LF |
| 12 | SQZ-CLF\_LAUNCH\_LF |
| DB9\_4 | 13 | SQZ-SEED\_LAUNCH\_LF | DC Monitors |
| 14 | SQZ-LO\_LAUNCH\_LF |
| 15 | Unused |
| 16 | OPO\_REFL\_REJECTED\_LF |
| DB9\_5 | 17 | SQZ-SHG\_FIBR\_REJECTED\_LF | DC Monitors |
| 18 | SQZ-CLF\_FIBR\_ REJECTED \_LF |
| 19 | SQZ-CLF\_REJECTED\_LF |
| 20 | SQZ-SHG\_REJECTED\_LF |
| DB9\_6 | 21 | Unused | |
| 22 | Unused | |
| 23 | Unused | |
| 24 | Unused | |
| DB9\_7 | 25 | Unused | |
| 26 | Unused | |
| 27 | Unused | |
| 28 | Unused | |
| DB9\_8 | 29 | Unused | |
| 30 | Unused | |
| 31 | Unused | |
| 32 | 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** |
| SQZ/LSC | 3 | 1 |  |  |  |
| SUSHAM56 | 1 | 1 |  |  |  |
| Totals | 4 | 2 |  |  |  |