A9-WCNTL

DDR5 Wide Controller User Manual

Version: **August 30, 2021**
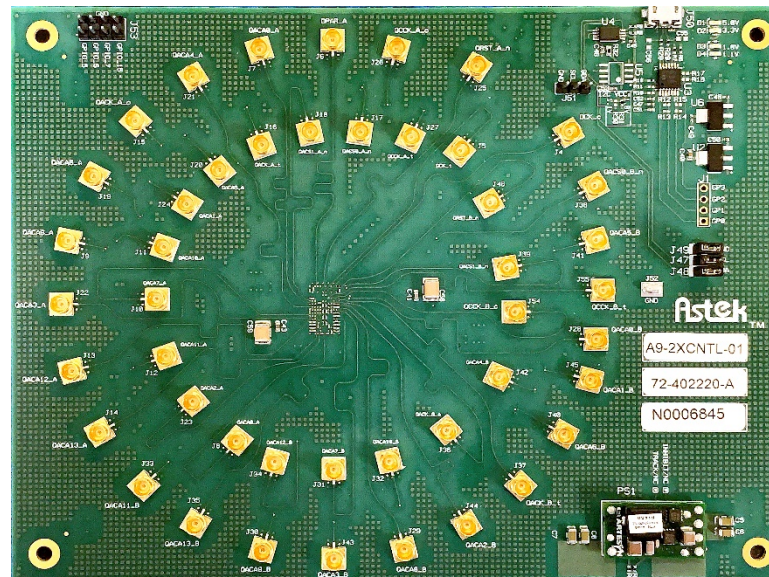
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TRADEMARK ACKNOWLEDGMENT

1 Introduction / Overview

This document outlines the features and use model of Astek's DDR5 Wide Controller (WCNTL). The WCNTL provides an RCD based interface to DRAMs and UDIMMs under test. Controller Software scripts and commands program the RCD over I2C to perform operations such as RCD register read/write, DRAM mode register read/write and multi-purpose commands.

Each signal is 50-Ohms, and all signals are matched to within +/- 1mil tolerance. RCD signals are brought out to SMP connectors.
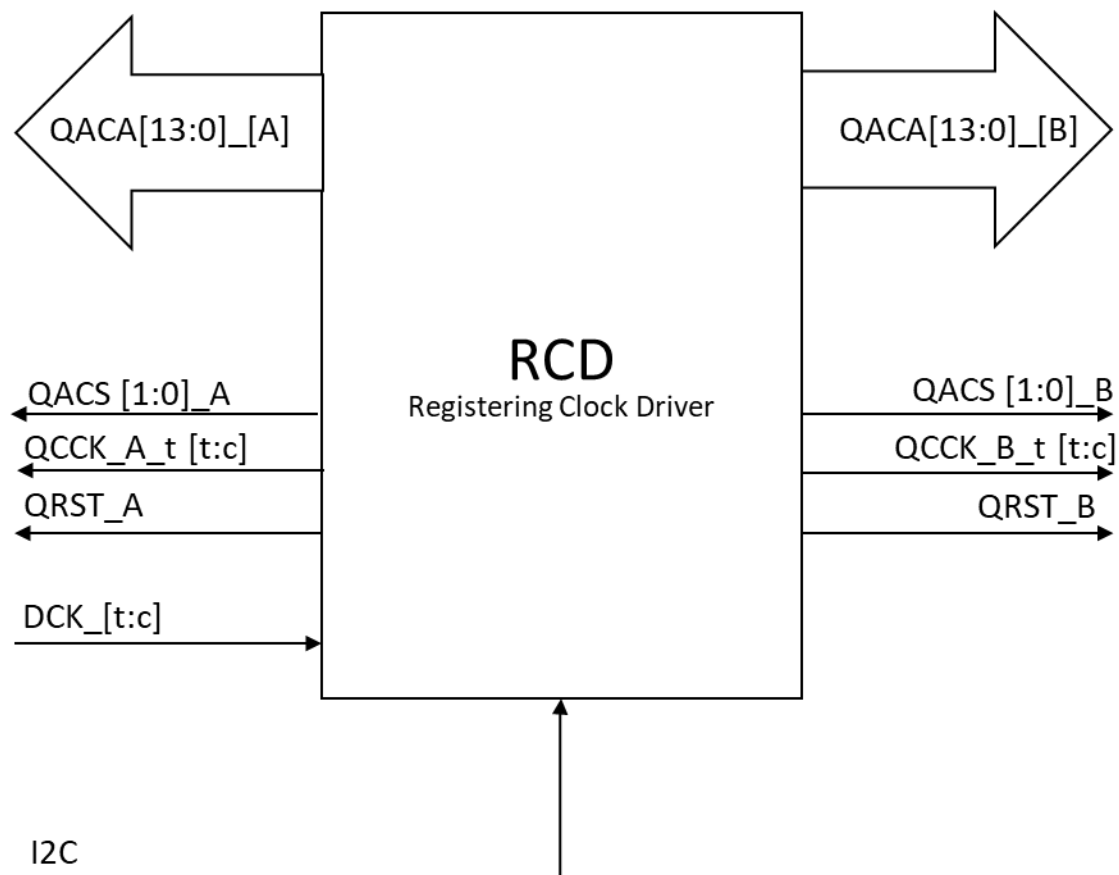
Wide Controller Block Diagram
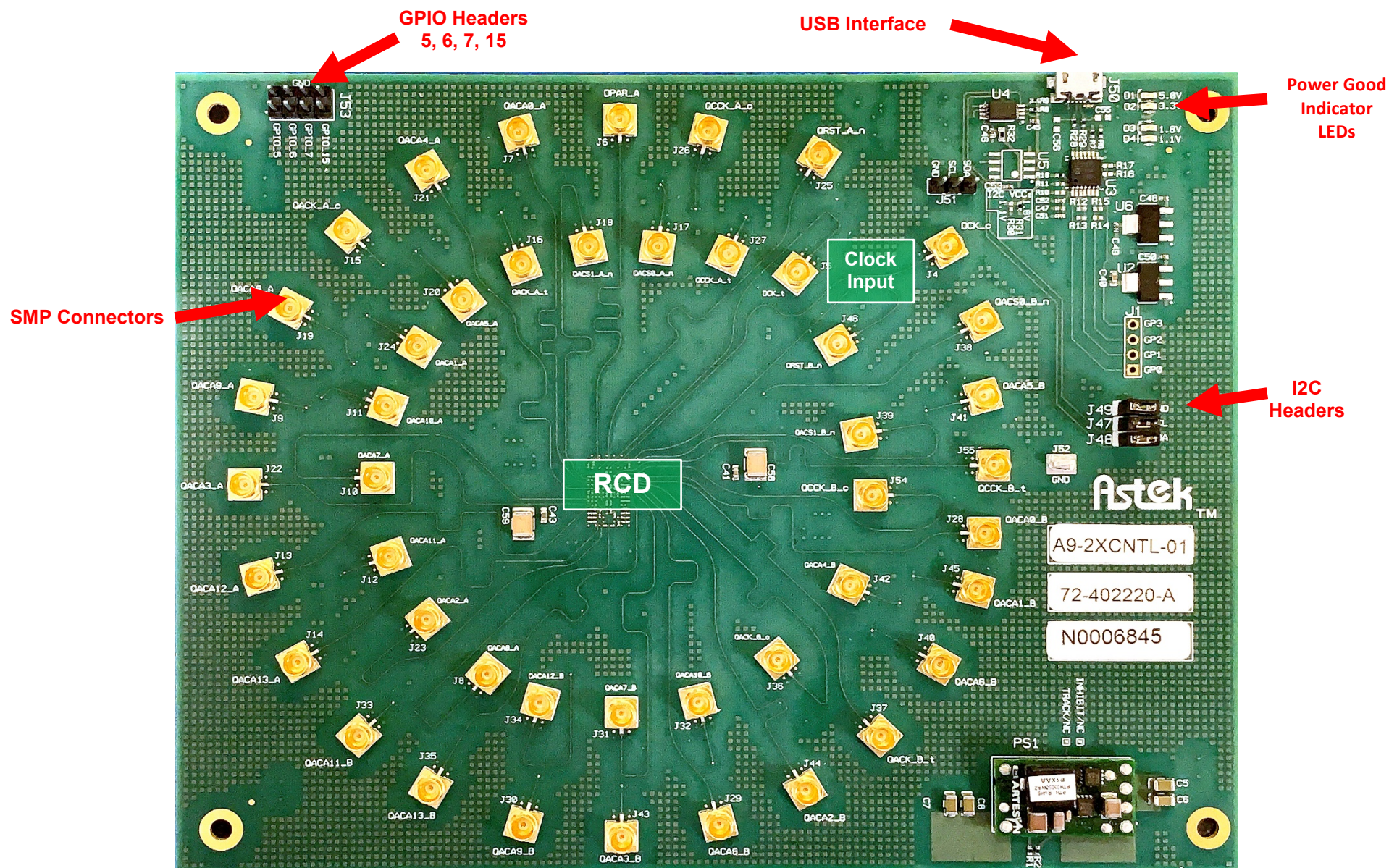
Wide Controller Board

2 Optional Equipment

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Astek CTC2 Channel Test Card
Astek offers a DDR5 Channel Test Card that provides an interface between a Bit Error Rate Tester (BERT), an Oscilloscopes, the WCNTL and the DIMM card under test.

Astek UDIMM Riser Board
Astek provides a DDR5 UDIMM Riser that maps the CTC2 RDIMM 288 pin test connector to the UDIMM card interface.

Micro USB cable
A micro-USB cable is used to connect the WCNTL to a host PC. The USB interface provides a method of configuring a WCNTL card during characterization testing.

I2C host
A host PC controls the WCNTL's RCD over I2C, using Astek's Controller Software, available for download at www.astekcorp.com.

SMP cabling
SMP cables are needed to connect the WCNTL and CTC2 as well as other test hardware. Depending on the equipment and connectivity needs, either SMP to SMP cables or SMP to SMA cables are needed.

Power Supply
The WCNTL is powered from the host PC's USB interface.

Test equipment
Depending on the characterization needs, various test equipment such as oscilloscopes, bit-error rate testers (BERTs), and pattern generators are used to drive stimulus and monitor the output of devices under test.

Contact your Astek representative for information and quotations for the optional equipment listed above.

3 Powering the WCNTL

The WCNTL is powered from the host PC's USB interface. Power Good indicator LEDs (1.1 V, 1.8 V, 3.3 V and 5.0V) located near the micro-USB connector monitor power supply status.

Power Good Indicators

4 Signals

WCNTL's RCD signal to SMP connector map.

SIGNAL	GRID	DDR5 RCD PIN	SIGNAL	GRID	DDR5 RCD PIN
DCK_c	A3	T8	QACA10_A	B1	J12
DCK_t	A3	T7	QACA10_B	D2	J14
DPAR_A	A2	V5	QACA11_A	C1	G1
QACA0_A	A2	M3	QACA11_B	D1	G14
QACA0_B	C3	M12	QACA12_A	C1	H3
QACA1_A	B1	L1	QACA12_B	D2	H12
QACA1_B	C3	L14	QACA13_A	C1	G3
QACA2_A	C1	L5	QACA13_B	D1	G12
QACA2_B	D3	L10	QACK_A_c	A1	M5
QACA3_A	B1	J3	QACK_A_t	A2	M6
QACA3_B	D2	J12	QACK_B_c	C3	M10
QACA4_A	A1	L3	QACK_B_t	D3	M9
QACA4_B	C3	L12	QACS0_A_n	A2	N1
QACA5_A	B1	M12	QACS1_A_n	A2	N3
QACA5_B	B3	M14	QACS1_B_n	B3	N14
QACA6_A	B1	K1	QASC0_B_n	B3	N12
QACA6_B	C3	K14	QCCK_A_c	A2	P5
QACA7_A	B1-C1	K3	QCCK_A_t	A2	P6
QACA7_B	D2	K12	QCCK_B_c	B3-C3	P10
QACA8_A	C1-C2	L6	QCCK_B_t	B3	P9
QACA8_B	D2	L9	QRST_A_n	A3	T5
QACA9_A	B1	L1	QRST_B_n	B3	T10
QACA9_B	D2	L14			

5 I2C

I2C Circuitry

Block Diagram of the I2C circuitry on the WCNTL is shown below.
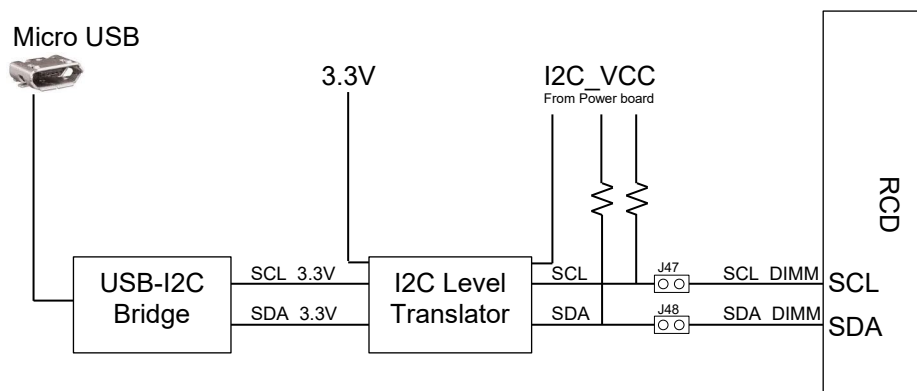
USB transactions are translated to I2C protocol, then level translated to RCD compatible voltage levels.

The location of the USB Micro B connector and I2C support circuitry is shown below.
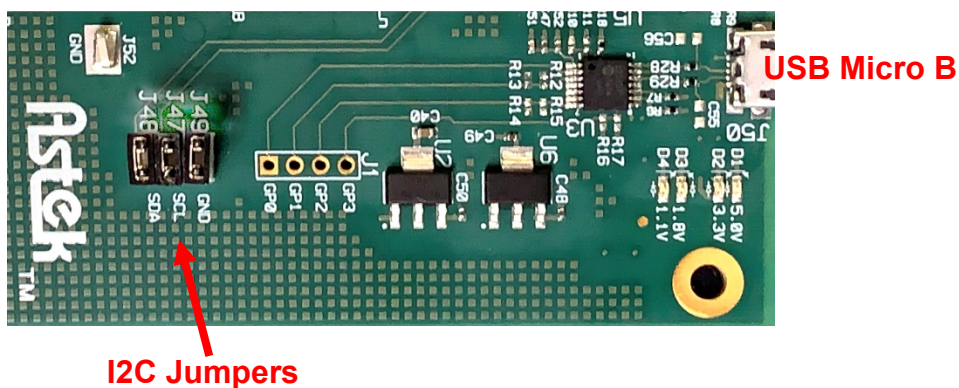
I2C Interface

By default, the jumpers J47 and J48 are installed. When J47 and J48 are installed, the I2C bus is driven via the USB-to-I2C bridge.

6 GPIO

The WCNTL has four 1.1 Volt output ports (header J53, near QACK_A_c SMP connector) are controlled over I2C. Controller Software command SETGPIO is used to set each GPIO output independently.

SETGPIO 5 on/off
SETGPIO 6 on/off
SETGPIO 7 on/off
SETGPIO 15 on/off
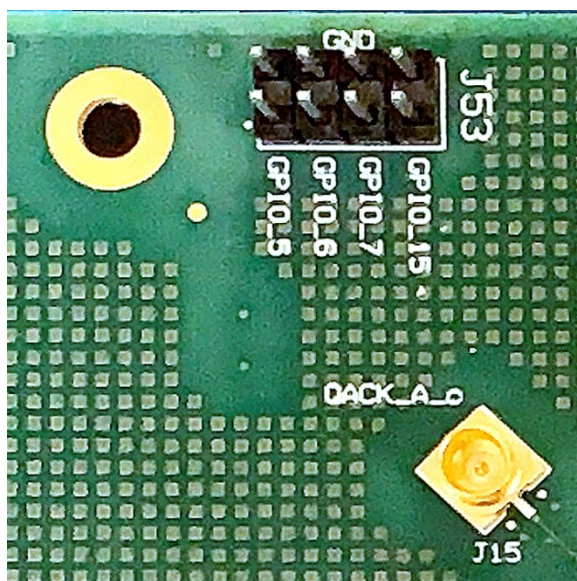
GPIO Header

7 Ordering Information

The following part numbers may be ordered from Astek. Contact Astek representative for quoting and availability.

Wide Controller

Part Number	Description
A9-WCNTL-01	DDR5 Wide Controller

CTC2 Configurations

Part Number	Description
A9-CTC2 -01	DDR5 CTC2 with high-performance socket installed
A9-CTC2 -02	DDR5 CTC2 with standard socket installed
A9-CTC2 -03	DDR5 CTC2 with NO socket installed
A9-AUTO-01	Reset Automation Kit. Includes GPIO cable

Additional products related to the DDR5 Test products available from Astek.

Part Number	Description
A9-DIMM-01	DDR5 Parametric Test Card
A9-CNTL-01	DDR5 Controller Board w/ RCD and Reset Automation
A9-DBVC-01	DDR5 Data Buffer (DB) Test Card
A9-RCD-01	DDR5 Registering Clock Driver (RCD) Test Card
A9-CMBO-01	DDR5 Combination Test Card
A9-X16 CMBO-01	DDR5 X16 Combo Card
A9-UDIMM-01	DDR5 UDIMM Riser
A9-RPLC-01	RDIMM/UDIMM Replica Channel
A9-A2PCBL-1000	SMA to SMP cable, 1.0m
A9-A2PCBL-1000P	SMA to SMP cable, 1.0m, matched pair
A9-A2PCBL-0500	SMP to SMP cable, 0.5m
A9-A2PCBL-0500P	SMP to SMP cable, 0.5m, matched pair

8 How to Contact Astek Corporation

Astek Corporation may be contacted by the following methods:

PHONE: (719) 260-1625 (USA)

FAX: (719) 260-1668 (USA)

EMAIL: support@astekcorp.com

WEBSITE: www.astekcorp.com