Plexim RT Box controlCARD Interface User Manual

Contents

Plexim RT Box controlCARD Interface

Introduction

The PLECS RT Box is a powerful real-time simulator based on a Xilinx Zynq system on a chip (SOC). With its digital and analog I/O signals, the RT Box is well-equipped for hardware-in-the-loop (HIL) testing as well as rapid control prototyping (RCP).
If employed for HIL testing, the RT Box typically emulates the power stage of a power electronic system. The power stage could be a simple DC/DC converter, an AC drive system or a complex multi-level inverter system. The device under test (DUT) is the control hardware connected to the RT Box. In such a setup, the complete controller can be tested without the real power stage.

To simplify the connection of external hardware and to provide convenient ac-cess to the RT Box inputs and outputs, Plexim offers a set of RT Box accessories.

The **RT Box controlCARD I**nterface described in this document has two con-trolCARD slots which facilitate a simple connection of the RT Box with the 100-pin and 180-pin controlCARD modules from Texas Instruments (TI). It enables users to test control algorithms implemented on C2000 MCUs without devel-oping their own interface hardware. The pinout of the controlCARD Interface board has been optimized for the following development kits

- Piccolo controlCARDs (280049, 28027, 28035, 28075, 28069)
- Delfino controlCARDs (28335, 2837xD)
- Concerto controlCARDs (F28M35, F28M36)

The controlCARD Interface may also be used with other development boards compliant with the controlCARD pinout.

Interface Board Overview

The interface board provides a 100-pin socket for the older 100-pin control-CARDs, as well as a 180-pin socket for the newer modules. Fig. 2.1 shows the top view of the controlCARD interface board.

All RT Box output signals are buffered to protect the MCU from overvoltage, and local opamps provide a low-impedance source for the MCUs ADC inputs. The board provides access to three analog outputs labeled AOUT-13 . . . 15 via BNC connectors. For status communication with the RT Box, the board features four sliding switches and four LEDs labeled DIO-28 . . . DIO-31.

Additionally, external JTAG adapters can be connected to the MCUs by means of two 14-pin headers labeled JTAG-100, JTAG-180. Each controlCARD is wired to an isolated CAN driver, allowing communication among the control-CARDs as well as external equipment. The board also provides a 64 kbit Serial Electrically Erasable PROM for user specific purposes.

A 6-pin unshrouded connector labeled SCI for FTDI cable is provided to com-municate with older 100-pin controlCARDs which do not support serial interface.

ControlCARD Socket Pins

Tables 2.1 and 2.2 list the pin assignments of 100-pin and 180-pin controlCARD sockets and the RT Box signals.

A more detailed table, including the available processor functions at each pin for the supported controlCARDs, can be found in the Appendix.

RT Box	**100-pin**		**RT Box**
	1	**51**	

	2	**52**	
	3	**53**	
	4	**54**	
	5	**55**	
	6	**56**	
AO14	**7**	**57**	AO15
	8	**58**	
AO12	**9**	**59**	AO13
	10	**60**	
AO10	**11**	**61**	AO11
	12	**62**	
AO8	**13**	**63**	AO9
	14	**64**	
AO6	**15**	**65**	AO7
	16	**66**	
AO4	**17**	**67**	AO5
	18	**68**	
AO2	**19**	**69**	AO3
	20	**70**	
AO0	**21**	**71**	AO1
	22	**72**	
DI23	**26**	**76**	DI22
	27	**77**	
DI25	**28**	**78**	DI24
DI27	**29**	**79**	DI26
DI29	**30**	**80**	DI28
	31	**81**	
	32	**82**	
	33	**83**	DO0
	34	**84**	DO5
DO6	**35**	**85**	DO7
DO4	**36**	**86**	
	37	**87**	

	38	**88**	
	39	**89**	
DO2	**40**	**90**	DO3
	41	**91**	DO1
	42	**92**	
	43	**93**	
	44	**94**	
DI31	**45**	**95**	DI30
	46	**96**	
	47	**97**	
	48	**98**	
	49	**99**	
	50	**100**	

Table 2.1: 100-pin controlCARD socket

RT Box	180-pin		RT Box
	1	**2**	
	3	**4**	
	5	**6**	
	7	**8**	
AO15	**9**	**10**	
AO13	**11**	**12**	AO14
	13	**14**	AO12
AO11	**15**	**16**	
AO9	**17**	**18**	AO10
	19	**20**	AO8
AO7	**21**	**22**	
AO5	**23**	**24**	AO6
AO3	**25**	**26**	AO4
AO1	**27**	**28**	AO2
	29	**30**	AO0
	31	**32**	
NC	**33 . . . 46**		NC
	47	**48**	
DI0	**49**	**50**	DI4
DI1	**51**	**52**	DI5
DI2	**53**	**54**	DI6
DI3	**55**	**56**	DI7
DI8	**57**	**58**	DI12
DI9	**59**	**60**	DI13
DI10	**61**	**62**	DO11
DI11	**63**	**64**	DO12

RT Box	180-pin		RT Box
	65	**66**	
	67	**68**	DO13
	69	**70**	DO14
	71	**72**	DO27
	73	**74**	DO26
DO25	**75**	**76**	
DO24	**77**	**78**	
DO23	**79**	**80**	
DO22	**81**	**82**	
	83	**84**	
	85	**86**	
	87	**88**	DI14
DO21	**89**	**90**	DI15
DO20	**91**	**92**	
	93	**94**	
	95	**96**	
	97	**98**	
	99	**100**	DO19
	101	**102**	DO18
	103	**104**	DO17
	105	**106**	DO16
	107	**108**	
NC	**109 . . . 118**		NC
	119	**120**	*RESET* (DO15)
	121	**122**	
NC	**123 . . . 180**		NC

Table 2.2: 180-pin controlCARD socket

Interface Board Overview

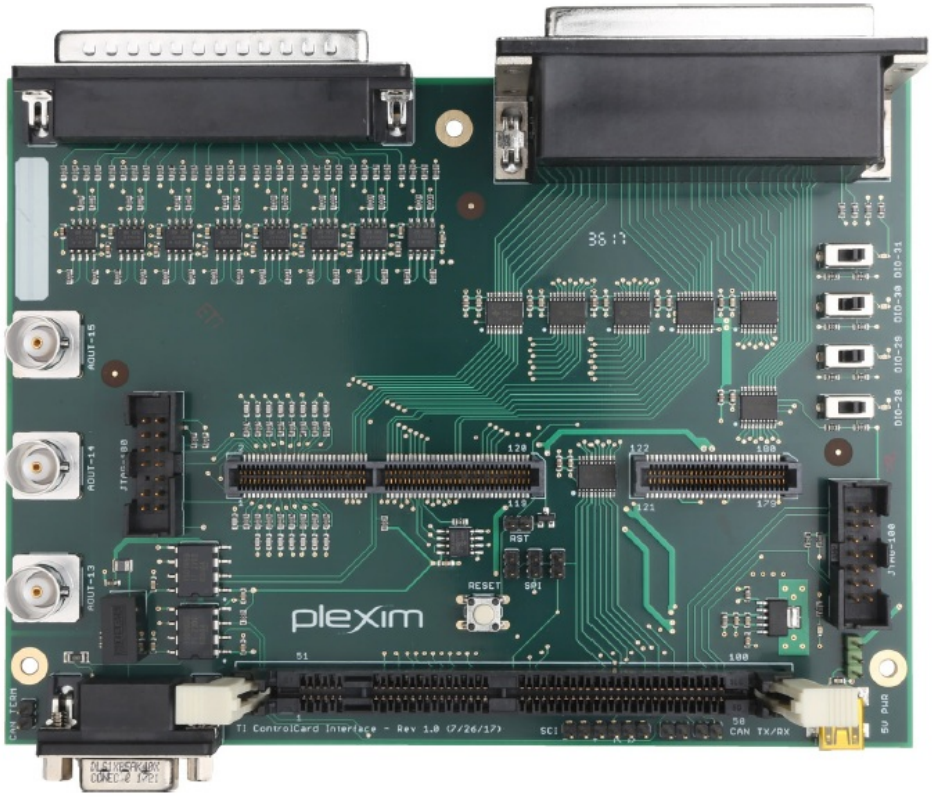

Figure 2.1: RT Box controlCARD Interface Board

Onboard Voltage Supply

Power to the controlCARD interface board can be supplied in two ways, by selecting the appropriate jumper terminals on the bottom right corner of the board. One way is to supply power directly from the RT Box. The second is through an external source using the USB connector labeled 5V PWR . This al-lows the board to be used without the RT Box. The interface board contains a linear voltage regulator that steps down the 5 V supplied externally or by the RT Box to 3.3 V required by the controlCARD. A green LED on the lower right section of the board indicates power supply to the board.

Analog Output

All 16 analog outputs from the RT Box are routed to both 100-pin and 180-pin control card slots. It is possible to operate two cards at the same time, al-though the user must be aware that the sampling of one MCU could affect the measurements of the other. If both control card slots are populated, the ana-log signals must be shared by the controlCARDs. Three analog output channels AOUT-13 . . . AOOUT-15 are also accessible at the BNC connectors.

All 16 analog output signals are passed through a rail-to-rail CMOS operational amplifier signal conditioning circuit, as shown in Fig. 2.2, for scaling the volt-ages to 0 V and 3.3 V, and for protecting the inputs of the MCU from damage by over-voltage. This introduces a gain of 4.42 /6.8 (or 0.65) in between the analog output pins of the RT Box and the analog input pins of the controlCARD.

Additionally, each analog channel routed to the 180-pin controlCARD socket is buffered with a capacitor (2200 pF) against ground, to lower the source impedance of the channel so that the sample and hold capacitor of the MCU can be charged quickly. A small resistance (56 Ω) is also placed in series to stabilize the driving opamp circuit.

The 100-pin controlCARD socket is excluded from this step and receives analog output signals directly after signal conditioning, as these resistors and capacitors are already populated on the 100-pin controlCARDS.

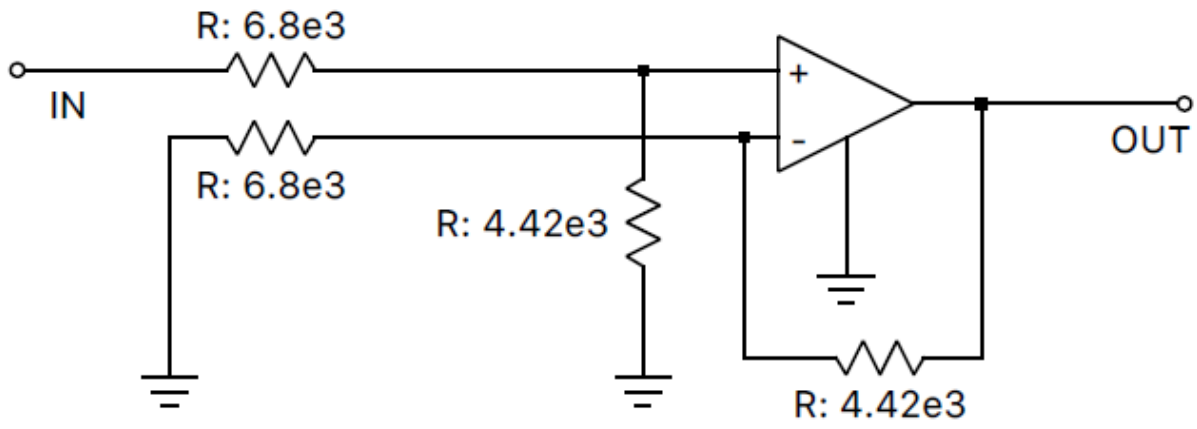

Figure 2.2: Analog Output Signal Conditioning Circuit

Digital I/O

Digital inputs DI0 . . . DI15 from the RT Box are connected to the 180-pin controlCARD socket. DI16 . . . DI31 are connected to the 100-pin controlCARD

socket. Digital inputs DI28 . . . 31 can also be set via four sliding switches pro-vided on the board labeled DIO-28 . . . DIO-31.

Digital outputs DO0 . . . DO7 are connected to the 100-pin controlCARD socket. DO11 . . . DO14, DO16 . . . 27 are connected to the 180-pin controlCARD socket. DO28 . . . DO31 are connected to four LEDs in the upper right section of the board labeled DIO-28 . . . DIO-31.
All the digital input and output signals are buffered through bus transceivers to protect the inputs of the MCU from voltages greater than 3.3 V.

DO15 is connected to the 180-pin controlCARDs MCU reset pin via RST jumper. If the jumper is set a low-level output at DO15 will reset the MCU. Do not set this jumper unless you wish to use this feature. Alternatively, the MCU can be reset using the push button labeled RESET.

CAN Communication

Two electrically isolated CAN transceivers provide CAN communication that can be accessed through a 9-pin D-SUB connector on the bottom left corner of the board. This allows communication among the controlCARDs, if populated together, as well as with external equipment.

Table 2.3 lists the pin assignments of the 9-pin D-SUB connector, 100-pin controlCARD and 180-pin controlCARD sockets.

Note CAN_L and CAN_H signals on pins 2 and 7 respectively on the 9-pin D-SUB connector can be terminated with a 120 Ω resistor using the jumper labeled CAN TERM located on the bottom left corner of the board.

JTAG Headers

Tables 2.4 and 2.5 list the pin assignments of JTAG headers for the 100-pin controlCARD labeled JTAG-100 and 180-pin controlCARD labeled JTAG-180 respectively.

100-pin	CAN Transceiver 1		9-pin connector	CAN Transceiver 2		180-pin
			1			
94	TX1	CAN_L	**2**	CAN_L	TX2	82
		GND	**3**	GND		
			4			
			5			
		GND	**6**	GND		
44	RX1	CAN_H	**7**	CAN_H	RX2	80
			8			
			9			

Table 2.3: CAN pin assignment

100-pin	Function	JTAG-100		Function	100-pin
49	TMS	**1**	**2**	TRST	99
97	TDI	**3**	**4**	GND	
	3 V	**5**	**6**	NC	
98	TDO	**7**	**8**	GND	
48	TCK	**9**	**10**	GND	
48	TCK	**11**	**12**	GND	
100	EMU0	**13**	**14**	EMU1	50

Table 2.4: JTAG-100 pin assignment

SCI Communication

Table 2.6 lists the pin assignments of the unshrouded connector labeled SCI for communication with older100-pin controlCARDs.

180-pin	Function	JTAG-180		Function	180-pin
3	TMS	**1**	**2**	TRST	4
8	TDI	**3**	**4**	GND	
	3 V	**5**	**6**	NC	
6	TDO	**7**	**8**	GND	
5	TCK	**9**	**10**	GND	
5	TCK	**11**	**12**	GND	
2	EMU0	**13**	**14**	EMU1	1

Table 2.5: JTAG-180 pin assignment

SCI	Function	100-pin
1	GND –	
2	NC	
3	VCC +	
4	TX <	43
5	RX >	93
6	NC	

Table 2.6: SCI pin assignment

Connectors

The following table contains the part numbers of the connectors and standoff assembly used on the controlCARD interface board. For dimensions of the front panel of the RT Box, refer to the RT Box manual.

Sl. No.	Manufacturer	Part Number	Description
1	Samtec Inc.	HSEC8-160-01-SM-DV-A	120-pin Female
2	Samtec Inc.	HSEC8-130-01-SM-DV-A	60-pin Female
3	Texas Instruments	TMDSDIM100CON5PK	100-pin Socket
4	Conec	DLS1XP5AK40X	9-pin D-Sub Male
5	TE's AMP Connectors	5104338-2	14-pin Header
6	3M	961106-6404-AR	6-pin Header
7	3M	961102-6404-AR	2-pin Header
8	Radiall	R141426161	BNC Connector
9	Assmann WSW Components	A-DS 37 A/KG-T4S	37-pin D-Sub Male
10	Assmann WSW Components	ASUB-277-37TP25	37-pin D-Sub Stacked
11	Harwin Inc.	R6396-02	Hex Standoff
12	Keystone Electronics	720	Bumper
13	APM Hexseal	RM3X8MM 2701	M3 Screw

Table 2.7: Connectors and standoff assembly

Appendix

Tables 3.1 and 3.2 provide more detailed information on the connectivity of the 180-pin controlCARD socket; table 3.4 provides more detailed information on the connectivity of the 100-pin controlCARD socket. For each controlCARD, the RT Box I/O is shown beside the controlCARD socket pins and the processor peripherals available at those pins.

TI F28379D ControlCard Pin Map

Function	RT Box	180-pin		RT Box	Function
JTAG-EMU1		**1**	**2**		JTAG-EMU0
JTAG-TMS		**3**	**4**		JTAG-TRSTn
JTAG-TCK		**5**	**6**		JTAG-TDO
		7	**8**		JTAG-TDI
ADC-A0	AO15	**9**	**10**		
ADC-A1	AO13	**11**	**12**	AO14	ADC-B0
		13	**14**	AO12	ADC-B1
ADC-A2	AO11	**15**	**16**		
ADC-A3	AO9	**17**	**18**	AO10	ADC-B2
		19	**20**	AO8	ADC-B3
ADC-A4	AO7	**21**	**22**		
ADC-A5	AO5	**23**	**24**	AO6	ADC-B4
ADCIN14	AO3	**25**	**26**	AO4	ADC-B5
ADCIN15	AO1	**27**	**28**	AO2	ADC-D0
		29	**30**	AO0	ADC-D1
	NC	**31 . . . 48**		NC	
PWM1A, GPIO-00	DI0	**49**	**50**	DI4	PWM3A, GPIO-04
PWM1B, GPIO-01	DI1	**51**	**52**	DI5	PWM3B, GPIO-05
PWM2A, GPIO-02	DI2	**53**	**54**	DI6	PWM4A, GPIO-06
PWM2B, GPIO-03	DI3	**55**	**56**	DI7	PWM4B, GPIO-07
PWM5A, GPIO-08	DI8	**57**	**58**	DI12	PWM7A, GPIO-12
PWM5B, GPIO-09	DI9	**59**	**60**	DI13	PWM7B, GPIO-13
PWM6A, GPIO-10	DI10	**61**	**62**	DO11	PWM8A, GPIO-14

Function	RT Box	180-pin		RT Box	Function
PWM6B, GPIO-11	DI11	**63**	**64**	DO12	PWM8B, GPIO-15
		65	**66**		
		67	**68**	DO13	QEP1A, GPIO-20
		69	**70**	DO14	QEP1B, GPIO-21
		71	**72**	DO27	QEP1S, GPIO-22
		73	**74**	DO26	QEP1I, GPIO-23
SPISIMOB, GPIO-24	DO25	**75**	**76**		
SPISOMIB, GPIO-25	DO24	**77**	**78**		
SPICLKB, GPIO-26	DO23	**79**	**80**		CANRXA, GPIO-30
SPISTEB, GPIO-27	DO22	**81**	**82**		CANTXA, GPIO-31
		83	**84**		
		85	**86**		
		87	**88**	DI14	GPIO-39
GPIO-40	DO21	**89**	**90**	DI15	GPIO-44
GPIO-41	DO20	**91**	**92**		
		93	**94**		
		95	**96**		
		97	**98**		
		99	**100**	DO19	QEP2A, GPIO-54
		101	**102**	DO18	QEP2B, GPIO-55
		103	**104**	DO17	QEP2S, GPIO-56
		105	**106**	DO16	QEP2I, GPIO-57
	NC	**107 . . . 118**		NC	
		119	**120**	DO15	XRSn
	NC	**121 . . . 180**		NC	

Function	RT Box	180-pin		RT Box	Function

Table 3.1: TI 28379D ControlCard pin map

TI F280049M controlCARD Pin Map

Function	RT Box	180-pin		RT Box	Function
JTAG-EMU1		**1**	**2**		JTAG-EMU0
JTAG-TMS		**3**	**4**		JTAG-TRSTn
JTAG-TCK		**5**	**6**		JTAG-TDO
		7	**8**		JTAG-TDI
ADC-A0, B15, C15, DACA	AO15	**9**	**10**		
ADC-A1, DACB	AO13	**11**	**12**	AO14	ADC-B0
		13	**14**	AO12	ADC-B1, A10, C10, PGA7_IN
ADC-A2, B6, PGA1_IN	AO11	**15**	**16**		
ADC-A3	AO9	**17**	**18**	AO10	ADC-B2, C6, PGA3_IN
		19	**20**	AO8	ADC-B3, VDAC
ADC-A4, B8, PGA2_IN	AO7	**21**	**22**		
ADC-A5	AO5	**23**	**24**	AO6	ADC-B4, C8, C3, PGA4_IN
ADC-A6, PGA5_IN	AO3	**25**	**26**	AO4	ADC-C0
ADC-A9	AO1	**27**	**28**	AO2	ADC-C1
		29	**30**	AO0	ADC-C2
	NC	**31 . . . 48**		NC	
PWM1A, GPIO-00	DI0	**49**	**50**	DI4	PWM3A, GPIO-04
PWM1B, GPIO-01	DI1	**51**	**52**	DI5	PWM3B, GPIO-05
PWM2A, GPIO-02	DI2	**53**	**54**	DI6	PWM4A, GPIO-06
PWM2B, GPIO-03	DI3	**55**	**56**	DI7	PWM4B, GPIO-07
PWM7A, GPIO-12	DI8	**57**	**58**	DI12	PWM5A, GPIO-37
PWM7B, GPIO-13	DI9	**59**	**60**	DI13	PWM6A, GPIO-35
PWM8A, GPIO-14	DI10	**61**	**62**	DO11	GPIO-39

Function	RT Box	180-pin		RT Box	Function
PWM8B, GPIO-15	DI11	**63**	**64**	DO12	GPIO-23
		65	**66**		
		67	**68**	DO13	QEP1A, GPIO-40
		69	**70**	DO14	QEP1B, GPIO-57
		71	**72**	DO27	QEP1S, GPIO-22
		73	**74**	DO26	QEP1I, GPIO-31
SPISIMOB, GPIO-24	DO25	**75**	**76**		
SPISOMIB, GPIO-25	DO24	**77**	**78**		
SPICLKB, GPIO-26	DO23	**79**	**80**		CANRXA, GPIO-30
SPISTEB, GPIO-27	DO22	**81**	**82**		CANTXA, GPIO-32
		83	**84**		
		85	**86**		
		87	**88**	DI14	NC
GPIO-18	DO21	**89**	**90**	DI15	NC
NC	DO20	**91**	**92**		
		93	**94**		
		95	**96**		
		97	**98**		
		99	**100**	DO19	QEP2A, GPIO-24
		101	**102**	DO18	QEP2B, GPIO-25
		103	**104**	DO17	NC
		105	**106**	DO16	NC
	NC	**107 . . . 118**		NC	
		119	**120**	DO15	XRSn
	NC	**121 . . . 180**		NC	

TI F28388D ControlCard Pin Map

Function	RT Box	180-pin		RT Box	Function
JTAG-EMU1		**1**	**2**		JTAG-EMU0
JTAG-TMS		**3**	**4**		JTAG-TRSTn
JTAG-TCK		**5**	**6**		JTAG-TDO
		7	**8**		JTAG-TDI
ADC-A0	AO15	**9**	**10**		
ADC-A1	AO13	**11**	**12**	AO14	ADC-B0
		13	**14**	AO12	ADC-B1
ADC-A2	AO11	**15**	**16**		
ADC-A3	AO9	**17**	**18**	AO10	ADC-B2
		19	**20**	AO8	ADC-B3
ADC-A4	AO7	**21**	**22**		
ADC-A5	AO5	**23**	**24**	AO6	ADC-B4
ADCIN14	AO3	**25**	**26**	AO4	ADC-B5
ADCIN15	AO1	**27**	**28**	AO2	ADC-D0
		29	**30**	AO0	ADC-D1
	NC	**31 . . . 48**		NC	
PWM1A, GPIO-00	DI0	**49**	**50**	DI4	PWM3A, GPIO-04
PWM1B, GPIO-01	DI1	**51**	**52**	DI5	PWM3B, GPIO-05
PWM2A, GPIO-02	DI2	**53**	**54**	DI6	PWM4A, GPIO-06
PWM2B, GPIO-03	DI3	**55**	**56**	DI7	PWM4B, GPIO-07
PWM5A, GPIO-08	DI8	**57**	**58**	DI12	PWM7A, GPIO-12
PWM5B, GPIO-09	DI9	**59**	**60**	DI13	PWM7B, GPIO-13
PWM6A, GPIO-10	DI10	**61**	**62**	DO11	PWM8A, GPIO-14

Function	RT Box	180-pin		RT Box	Function
PWM6B, GPIO-11	DI11	**63**	**64**	DO12	PWM8B, GPIO-15
		65	**66**		
		67	**68**	DO13	QEP1A, GPIO-20
		69	**70**	DO14	QEP1B, GPIO-21
		71	**72**	DO27	QEP1S, GPIO-22
		73	**74**	DO26	QEP1I, GPIO-23
SPISIMOB, GPIO-24	DO25	**75**	**76**		
SPISOMIB, GPIO-25	DO24	**77**	**78**		
SPICLKB, GPIO-26	DO23	**79**	**80**		CANRXA, GPIO-30
SPISTEB, GPIO-27	DO22	**81**	**82**		CANTXA, GPIO-31
		83	**84**		
		85	**86**		
		87	**88**	DI14	GPIO-39
GPIO-40	DO21	**89**	**90**	DI15	GPIO-125
GPIO-41	DO20	**91**	**92**		
		93	**94**		
		95	**96**		
		97	**98**		
		99	**100**	DO19	QEP2A, GPIO-54
		101	**102**	DO18	QEP2B, GPIO-55
		103	**104**	DO17	QEP2S, GPIO-56
		105	**106**	DO16	QEP2I, GPIO-57
	NC	**107 . . . 118**		NC	
		119	**120**	DO15	XRSn
	NC	**121 . . . 180**		NC	

TI F28335 controlCARD Pin Map

Function	RT Box	100-pin		RT Box	Function
V33D-ISO		**1**	**51**		V33D-ISO
		2	**52**		
		3	**53**		
		4	**54**		
		5	**55**		
GND-ISO		**6**	**56**		GND-ISO
ADCIN-B0	AO14	**7**	**57**	AO15	ADCIN-A0
GND		**8**	**58**		GND
ADCIN-B1	AO12	**9**	**59**	AO13	ADCIN-A1
GND		**10**	**60**		GND
ADCIN-B2	AO10	**11**	**61**	AO11	ADCIN-A2
GND		**12**	**62**		GND
ADCIN-B3	AO8	**13**	**63**	AO9	ADCIN-A3
GND		**14**	**64**		GND
ADCIN-B4	AO6	**15**	**65**	AO7	ADCIN-A4
		16	**66**		
ADCIN-B5	AO4	**17**	**67**	AO5	ADCIN-A5
		18	**68**		
ADCIN-B6	AO2	**19**	**69**	AO3	ADCIN-A6
		20	**70**		
ADCIN-B7	AO0	**21**	**71**	AO1	ADCIN-A7
		22	**72**		
GPIO-00, EPWM-1A	DI17	**23**	**73**	DI16	GPIO-01, EPWM-1B

Function	RT Box	100-pin		RT Box	Function
GPIO-02, EPWM-2A	DI19	**24**	**74**	DI18	GPIO-03, EPWM-2B
GPIO-04, EPWM-3A	DI21	**25**	**75**	DI20	GPIO-05, EPWM-3B, ECAP-1
GPIO-06, EPWM-4A	DI23	**26**	**76**	DI22	GPIO-07, EPWM-4B, ECAP-2
GND		**27**	**77**		+ 5 V
GPIO-08, EPWM-5A, CANTX- B	DI25	**28**	**78**	DI24	GPIO-09, EPWM-5B, SCITX- B, EC AP-3
GPIO-10, EPWM-6A, CANRX- B	DI27	**29**	**79**	DI26	GPIO-11, EPWM-6B, SCIRX- B, EC AP-4
GPIO-48, ECAP5	DI29	**30**	**80**	DI28	GPIO-49, ECAP6
		31	**81**		
		32	**82**		+ 5 V
		33	**83**	DO0	GPIO-13, TZ-2, CANRX-B
		34	**84**	DO5	GPIO-14, TZ-3, SCITX-B
GPIO-24, ECAP-1, EQEPA-2	DO6	**35**	**85**	DO7	GPIO-25, ECAP-2, EQEPB-2
GPIO-26, ECAP-3, EQEPI-2	DO4	**36**	**86**		
GND		**37**	**87**		+ 5 V
		38	**88**		
		39	**89**		
GPIO-20, EQEPA-1, CANTX- B	DO2	**40**	**90**	DO3	GPIO-21, EQEPB-1, CANRX- B
		41	**91**	DO1	GPIO-23, EQEPI-1, SCIRX-B
		42	**92**		+ 5 V
GPIO-28 , SCIRX-A		**43**	**93**		GPIO-29, SCITX-A
GPIO-30, CANRX-A		**44**	**94**		GPIO-31, CANTX-A
GPIO-32	DI31	**45**	**95**	DI30	GPIO-33
		46	**96**		+ 5 V

Function	RT Box	100-pin		RT Box	Function
GND		**47**	**97**		JTAG-TDI
JTAG-TCK		**48**	**98**		JTAG-TDO
JTAG-TMS		**49**	**99**		JTAG-TRSTn
JTAG-EMU1		**50**	**100**		JTAG-EMU0

Table 3.4: TI F28335 controlCARD pin map

Documents / Resources

	Plexim RT Box controlCARD Interface [pdf] User Manual 28335, 2837xD, F28M35, F28M36, RT Box controlCARD Interface, controlCARD Interface, Interface

References

- Electrical Engineering Software | Plexim
- Electrical Engineering Software | Plexim
- RT Box | Plexim
- RT Box ControlCard Interface | Plexim