CB34EX Hardware Manual

1 Revision History

1/7/2009	1.1	Updated to cover PCB revision 1.5. Changes include: Modified for DeviceNet compliance: • Replaced Philips CAN transceiver PCA82C251T (discontinued) with TI SN65HVD252D • Replaced terminal strip JP1 and plug with DeviceNet compatible gold version • Added CAN reverse wiring protection diode. • Added reset switch accessible through pinhole. • Removed JP3 slew rate selection for CAN bus
3/14/2011	1.2	Updated to cover PCB revisions up through 1.6. Revision 1.6 changes include: • Added second RS-485 port
5/8/2013	1.3	Updated document to combine manuals for PCB revisions 1.3, 1.5 and 1.6.

Contents

2 Documentation and Software

Please visit www.netburner.com/QuickStart to download the CB34EX software utilities and documentation, including the Secure Serial-To-Ethernet Users Manual for the pre-programmed factory application.

3 Overview

The CB34EX is a low cost, high performance Serial-to-Ethernet device that network enables both existing and new product designs with 10/100 Ethernet. It provides 2 serial ports that can be configured for CAN, RS-232 and RS-485. These signals can be routed to the 5-pin terminal strip or DB9 connector on the back panel of the device.

The CB34EX is pre-programmed with a dual Serial-to-Ethernet program providing TCP, UDP, SSL and SSH protocols for the RS-232 and RS-485 ports. Use of the CAN bus is application specific and a general purpose program is not possible. A NetBurner Network Development Kit (NNDK-CB34EX-KIT) is required for CAN operation.

With the NNDK-CB34EX-KIT development kit you can create additional dynamic web page content, filter serial and network data, or write completely new custom applications. The onboard web server provides easy device configuration via a standard web browser. Please visit www.netburner.com for more information.

4 Hardware Specifications

- 32-bit Freescale ColdFire MCF5234 processor, 147.5 MHz
- 10/100 Mbit/s RJ-45 Ethernet port with integrated magnetics and LEDs
- Link, speed/data, and power LEDs
- 2 general purpose LEDs on the side of the case
- 5 pin terminal strip and DB9 rear panel connector that can be configured in the following ways:
  - One RS-232 port and one RS-485 port
  - One RS-232 port and one CAN port
  - One RS-485 port and one CAN port
  - Two RS-485 ports, PCB revision 1.6 only. The DB9 connector is limited to half duplex, no echo in this configuration.
- 2 MB of flash memory
- 8 MB of SDRAM
- SD Flash card slot (rev 1.5 and later)
- External reset button (rev 1.5 and later)

- UL, CUL, and CE approvals
- DC input voltage: 8 V @ 230 mA to 24 V @ 80 mA
- Environmental operating temperature: -40°C to +85°C
- Weight: 5 ounces
- Dimensions: 4.2” x 3.25” x 1.0”

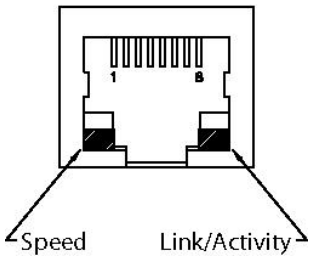
5 Power Connector

The power LED is illuminated while power is supplied. The power input connector is a standard 2.1-mm P5 type barrel jack. The center pin is positive and the outer shell is negative.

Pin	Signal
Center	8-24 VDC
Shell	GND

6 RJ-45 Connector

- Left LED: Ethernet speed of 10Mbit/s (off) or 100Mbit/s (on)
- Right LED: Link and activity

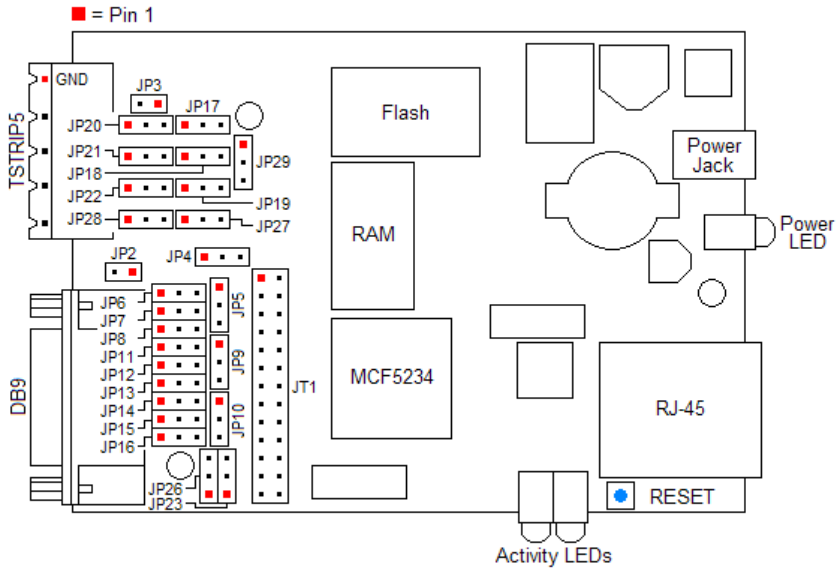


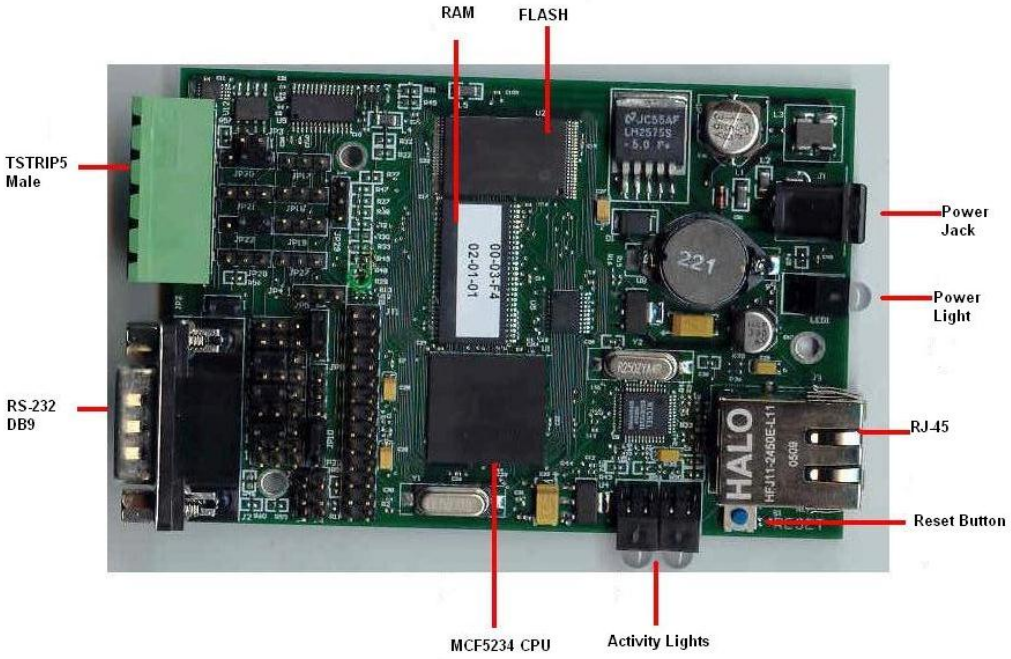
Pin	Signal	Pin	Signal
1	TX+	5	---
2	TX-	6	RX-
3	RX+	7	---
4	---	8	---

7 Device Configuration Options

The following sections describe the device configuration options for each revision of the CB34EX. The revision number is located on the circuit board next to the reset button and RJ-45 connector.

8 CB34EX Revision 1.3





8.1 Configuration Restrictions

- UART 0 RS-232 can not be used on DB9 and TSTRIP5 at the same time
- UART 1 RS-485 can not be used on DB9 and TSTRIP5 at the same time
- CAN can not be used on DB9 and TSTRIP5 at the same time

8.2 Connector Descriptions

DB9 Connector Descriptions

Pin	UART 0 RS-232	UART 1 RS-485	CAN
1	CD	---	---
2	RX	HD/FD TX-	CANL
3	TX	FD RX+	GND*
4	DTR	---	---
5	GND	GND	GND
6	DSR	FD RX-	GND*
7	RTS	HD/FD TX+	CANH
8	CTS	---	---
9	RI	PWRIN*	PWRIN*

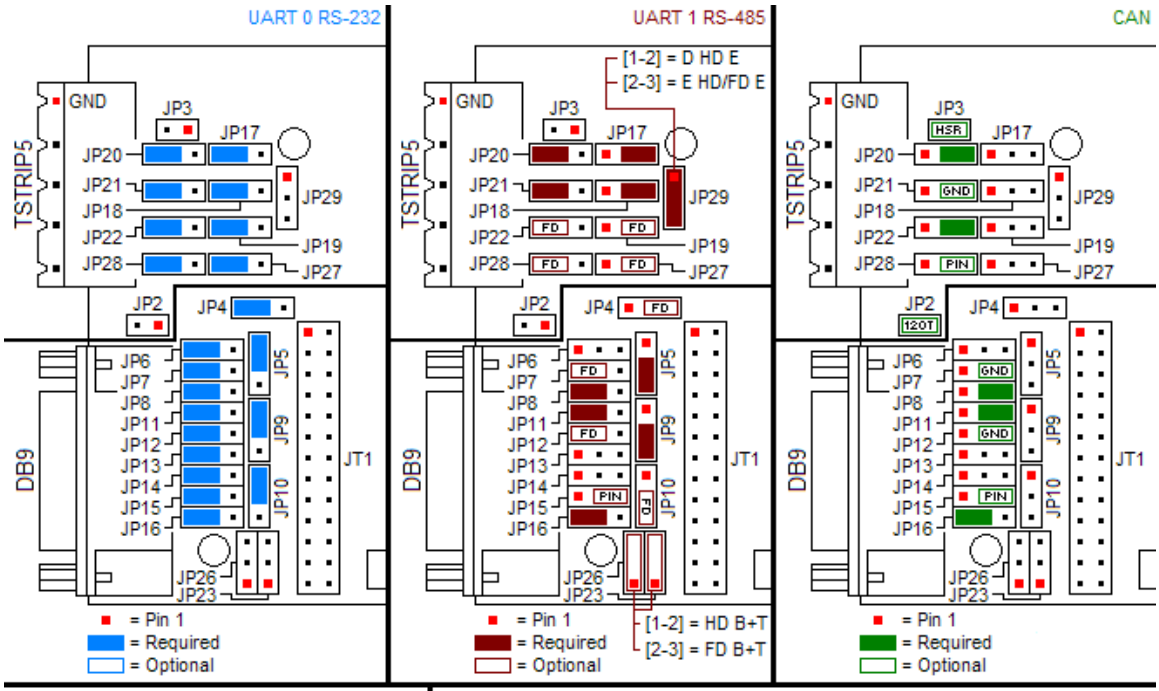
* Optional

TSTRIP5 Connector Descriptions

Pin	UART 0 RS-232	UART 1 RS-485	CAN
1	GND	GND	GND*
2	RX	HD/FD TX-	CANL
3	TX	HD/FD TX+	GND
4	RTS	FD RX-	CANH
5	CTS	FD RX+	PWRIN*

* Optional

8.3 Jumper Configuration



Key

PIN	= Power Input
FD	= Full-Duplex
D HD E	= Disable Half-Duplex Echo
E HD/FD E	= Enable Half/Full-Duplex Echo
HD B+T	= Half-Duplex Biasing and Termination
FD B+T	= Full-Duplex Biasing and Termination
GND	= Ground
HSR	= High Slew-Rate Control
120T	= 120-Ohm Termination

Notes

No one function can be used on both ports at the same time. For example, UART 0 RS-232 cannot be configured for both TSTRIP5 and DB9 at the same time.

JP23, JP26, and JP29 are used to configure RS-485, regardless of which interface is used. Please note that JP29 [2-3] is required for full-duplex operation.

JP2 and JP3 are used to configure CAN, regardless of which interface is used.

8.4 UART 0 RS-232 via DB9 (J2)

Jumper	Configuration	Description	DB9 Pin
JP4	Connect 1-2	Data Set Ready	6
JP5	Connect 1-2	Receive	2
JP6	Connect 1-2	Data Carrier Detect	1
JP7	Connect 1-2	Data Set Ready	6
JP8	Connect 1-2	Receive	2
JP9	Connect 1-2	Request to Send	7
JP10	Connect 1-2	Transmit	3
JP11	Connect 1-2	Request to Send	7
JP12	Connect 1-2	Transmit	3
JP13	Connect 1-2	Clear to Send	8
JP14	Connect 1-2	Data Terminal Ready	4
JP15	Connect 1-2	Ring Indicator	9
JP16	Connect 1-2	Ground	5

8.5 UART 1 RS-485 via DB9 (J2)

Jumper	Configuration	Description	DB9 Pin
JP4	Connect 2-3 (if using full-duplex)	Z / Rx -	6
JP5	Connect 2-3	B / Tx -	2
JP6	Disconnect		
JP7	Connect 1-2 (if using full-duplex)	Z / Rx -	6
JP8	Connect 1-2	B / Tx -	2
JP9	Connect 2-3	A / Tx +	7
JP10	Connect 2-3 (if using full-duplex)	Y / Rx +	3
JP11	Connect 1-2	A / Tx +	7
JP12	Connect 1-2 (if using full-duplex)	Y / Rx +	3
JP13	Disconnect		
JP14	Disconnect		
JP15	Connect 2-3 (optional)	Power Input	9
JP16	Connect 1-2	Ground	5
JP23 / JP26	Connect 1-2 (optional)	Half-Duplex Biasing and Termination	
	Connect 2-3 (optional)	Full-Duplex Biasing and Termination	
JP29	Connect 1-2	Disable Half-Duplex Echo	
	Connect 2-3	Enable Full or Half-Duplex Echo	

8.6 CAN via DB9 (J2)

Jumper	Configuration	Description	DB9 Pin
JP2	Connect (optional)	120-Ohm Termination	
JP3	Connect (optional)	High Slew-Rate Control	
JP4	Disconnect		
JP5	Disconnect		
JP6	Disconnect		
JP7	Connect 2-3 (optional)	Ground	6
JP8	Connect 2-3	CAN Low	2
JP9	Disconnect		
JP10	Disconnect		
JP11	Connect 2-3	CAN High	7
JP12	Connect 2-3 (optional)	Ground	3
JP13	Disconnect		
JP14	Disconnect		
JP15	Connect 2-3 (optional)	Power Input	9
JP16	Connect 1-2	Ground	5

8.7 UART 0 RS-232 via TSTRIP5 (JP1)

Jumper	Configuration	Description	TSTRIP5 Pin
JP17	Connect 1-2	Receive	2
JP18	Connect 1-2	Transmit	3
JP19	Connect 1-2	Request to Send	4
JP20	Connect 1-2	Receive	2
JP21	Connect 1-2	Transmit	3
JP22	Connect 1-2	Request to Send	4
JP27	Connect 1-2	Clear to Send	5
JP28	Connect 1-2	Clear to Send	5

8.8 UART 1 RS-485 via TSTRIP5 (JP1)

Jumper	Configuration	Description	TSTRIP5 Pin
JP17	Connect 2-3	B / Tx -	2
JP18	Connect 2-3	A / Tx +	3
JP19	Connect 2-3 (if using full-duplex)	Z / Rx -	4
JP20	Connect 1-2	B / Tx -	2
JP21	Connect 1-2	A / Tx +	3
JP22	Connect 1-2 (if using full-duplex)	Z / Rx -	4
JP27	Connect 2-3 (if using full-duplex)	Y / Rx +	5
JP28	Connect 1-2 (if using full-duplex)	Y / Rx +	5
JP23 / JP26	Connect 1-2 (optional)	Half-Duplex Biasing and Termination	
	Connect 2-3 (optional)	Full-Duplex Biasing and Termination	
JP29	Connect 1-2	Disable Half-Duplex Echo	
	Connect 2-3	Enable Full or Half-Duplex Echo	

8.9 CAN via TSTRIP5 (JP1)

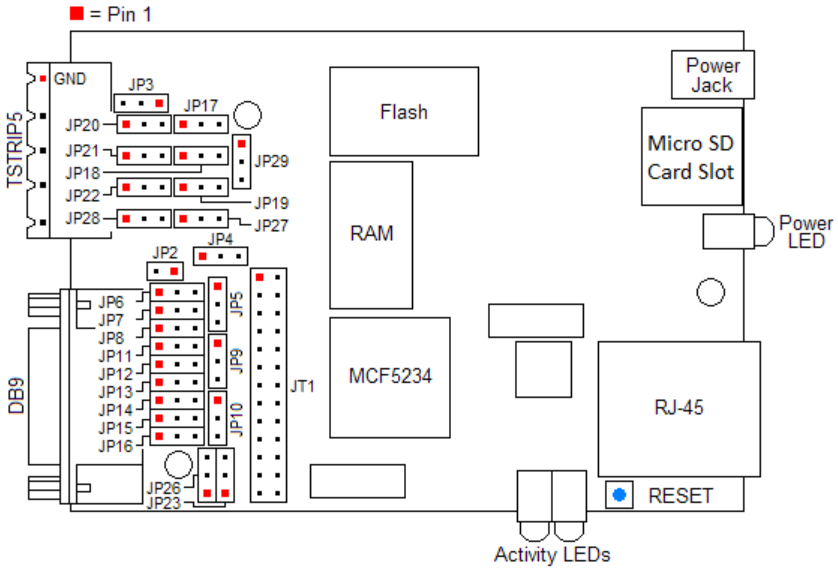
Jumper	Configuration	Description	TSTRIP5 Pin
JP2	Connect (optional)	120-Ohm Termination	
JP3	Connect (optional)	High Slew-Rate Control	
JP17	Disconnect		
JP18	Disconnect		
JP19	Disconnect		
JP20	Connect 2-3	CAN Low	2
JP21	Connect 2-3 (optional)	Ground	3
JP22	Connect 2-3	CAN High	4
JP27	Disconnect		
JP28	Connect 2-3 (optional)	Power Input	5

9 CB34EX Revision 1.5

CB34EX revision 1.5 adds a SD Flash card slot and external reset button.

Configuration is identical to revision 1.3 with the following exception: JP3 slew rate selection for CAN has been removed.

10 CB34EX Revision 1.6



10.1 Possible Configurations

The DB9 and TSTRIP5 connector ports can be configured in the following ways:

	DB9 Connector Mode	TSTRIP5 Connector Mode
Configuration 1*	UART 0 RS-232	UART 1 RS-485 Half/Full Duplex
Configuration 2	UART 0 RS-232	CAN
Configuration 3	UART 0 RS-485 Half Duplex	UART 1 RS-485 Half/Full Duplex
Configuration 4	UART 0 RS-485 Half Duplex	CAN
Configuration 5	UART 1 RS-485 Half/Full Duplex	UART 0 RS-232
Configuration 6	UART 1 RS-485 Half/Full Duplex	CAN
Configuration 7	CAN	UART 0 RS-232
Configuration 8	CAN	UART 1 RS-485 Half/Full Duplex

***UART 0 RS-232 on DB9 and UART 1 RS-485 Half Duplex No Echo on TSTRIP5 is the factory default configuration**

10.2 DB9 Connector Description

Pin	UART 0 RS-232	UART 0 RS-485	UART 1 RS-485	CAN
1	CD	TX-	---	---
2	RX	---	TX- (HD/FD)	CANL
3	TX	---	RX+ (FD)	GND*
4	DTR	---	---	---
5	GND	---	GND*	GND*
6	DSR	---	RX- (FD)	GND*
7	RTS	---	TX+ (HD/FD)	CANH
8	CTS	TX+	---	---
9	RI	---	Power Input (PIN)*	Power Input (PIN)*

***Optional pin usage provided that the jumpers are set for the pin**

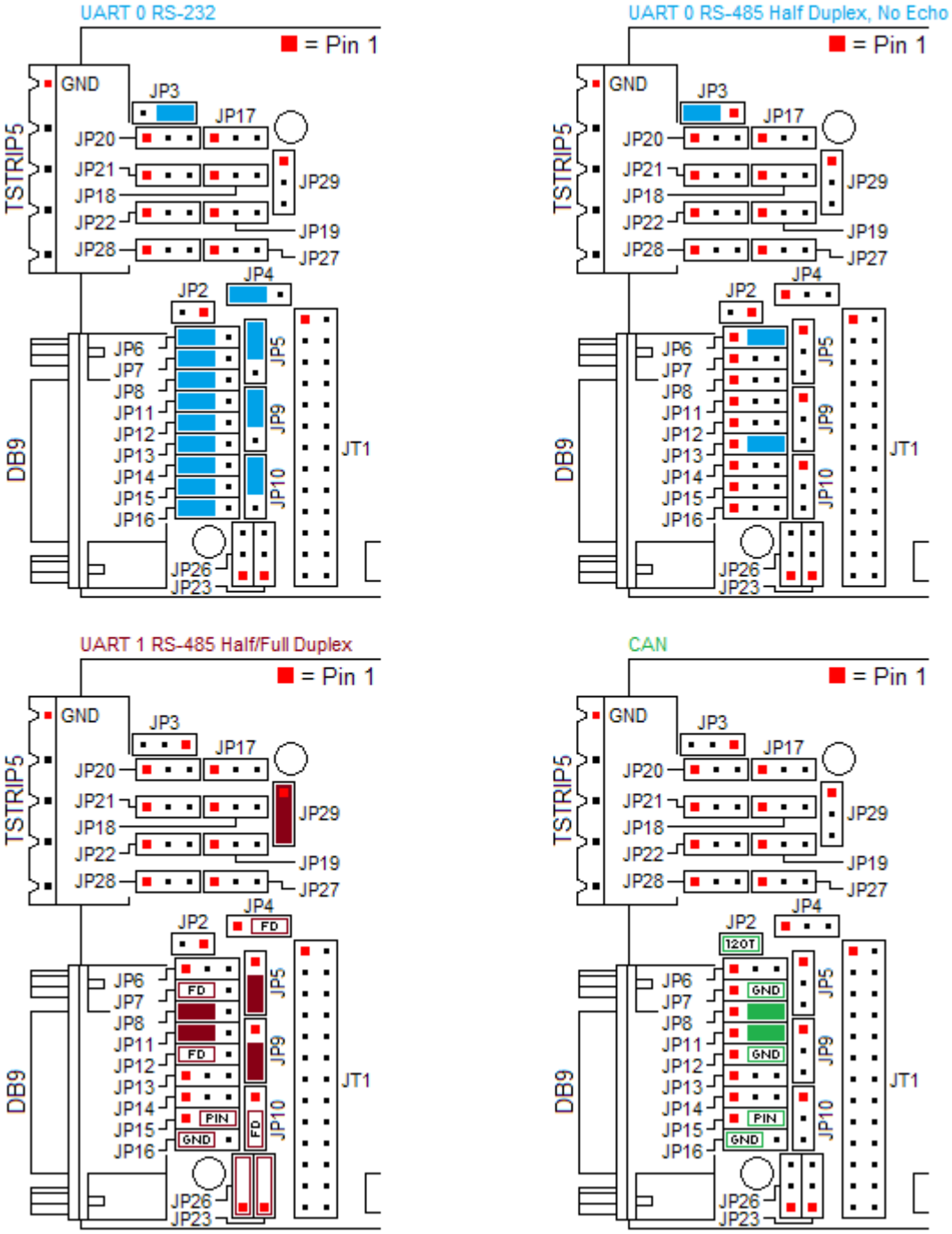
10.3 TSTRIP5 Connector Description

Pin	UART 0 RS-232	UART 1 RS-485	CAN
1	GND	GND	GND
2	RX	TX- (HD/FD)	CANL
3	TX	TX+ (HD/FD)	GND*
4	RTS	RX- (FD)	CANH
5	CTS	RX+ (FD)	Power Input (PIN)*

***Optional pin usage provided that the jumpers are set for the pin**

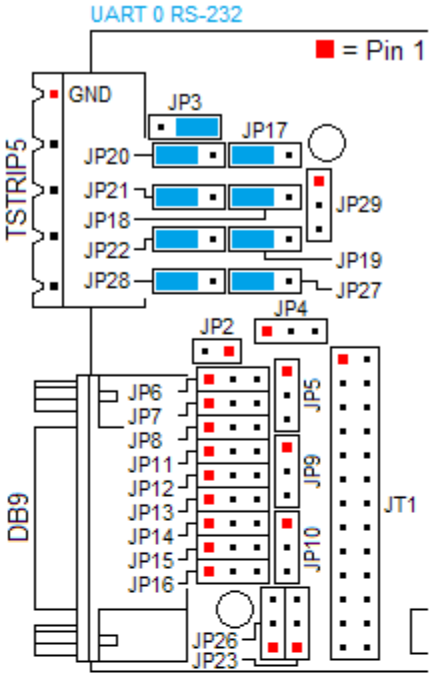
10.4 Jumper Configuration for DB9

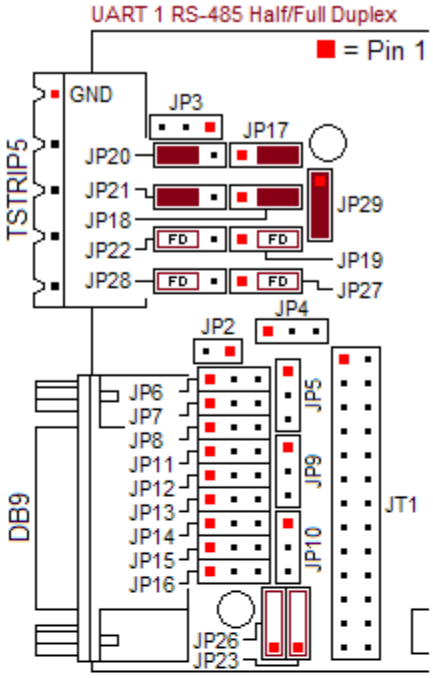
Note that required jumpers are indicated by solid-filled rectangles. Optional jumpers are indicated by non-filled rectangles. Abbreviation key for optional jumpers: FD = Full duplex mode; PIN = Power input; GND = Ground; 120T = 120-Ohm termination.

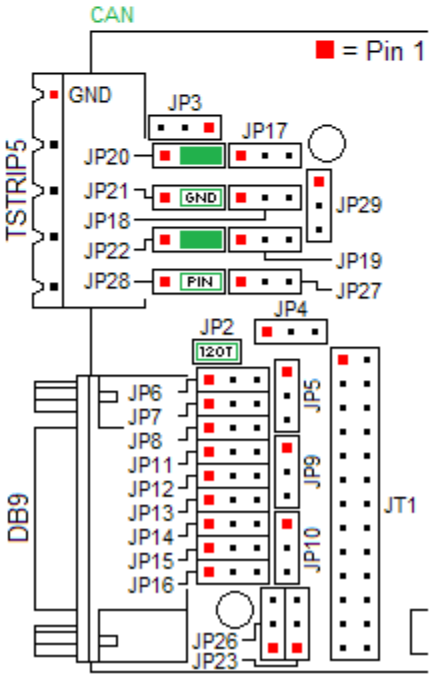


10.5 Jumper Configuration Modes for TSTRIP5

Note that required jumpers are indicated by solid-filled rectangles. Optional jumpers are indicated by non-filled rectangles. Abbreviation key for optional jumpers: FD = Full duplex mode; PIN = Power input; GND = Ground; 120T = 120-Ohm termination.







Additional UART 1 RS-485 jumper settings: for half duplex termination, set JP23[1-2] and JP26[1-2]. For full duplex termination, set JP23[2-3] and JP26[2-3]. To disable echo, set JP29[1-2]. To enable echo, set JP29[2-3].

10.6 Configuration Mode Pinout and Jumper Charts

UART 0 RS-232 via DB9 (J2)

Jumper	Configuration	Description	DB9 Pin
JP3	Connect 1-2	Route Rx from RS-232 Level Shifter	
JP4	Connect 1-2	Data Set Ready	6
JP5	Connect 1-2	Receive	2
JP6	Connect 1-2	Data Carrier Detect	1
JP7	Connect 1-2	Data Set Ready	6
JP8	Connect 1-2	Receive	2
JP9	Connect 1-2	Request to Send	7
JP10	Connect 1-2	Transmit	3
JP11	Connect 1-2	Request to Send	7
JP12	Connect 1-2	Transmit	3
JP13	Connect 1-2	Clear to Send	8
JP14	Connect 1-2	Data Terminal Ready	4
JP15	Connect 1-2	Ring Indicator	9
JP16	Connect 1-2	Ground	5

UART 0 RS-485 via DB9 (J2) – Half Duplex No Echo Only

Jumper	Configuration	Description	DB9 Pin
JP3	Connect 2-3	Route Rx from RS-485 Level Shifter	
JP4	Disconnect		
JP5	Disconnect		
JP6	Connect 2-3	B / Tx -	1
JP7	Disconnect		
JP8	Disconnect		
JP9	Disconnect		
JP10	Disconnect		
JP11	Disconnect		
JP12	Disconnect		
JP13	Connect 2-3	A / Tx +	8
JP14	Disconnect		
JP15	Disconnect		
JP16	Disconnect		

10.7 UART 1 RS-485 via DB9 (J2)

Jumper	Configuration	Description	DB9 Pin
JP4	Connect 2-3 (if using full-duplex)	Z / Rx -	6
JP5	Connect 2-3	B / Tx -	2
JP6	Disconnect		
JP7	Connect 1-2 (if using full-duplex)	Z / Rx -	6
JP8	Connect 1-2	B / Tx -	2
JP9	Connect 2-3	A / Tx +	7
JP10	Connect 2-3 (if using full-duplex)	Y / Rx +	3
JP11	Connect 1-2	A / Tx +	7
JP12	Connect 1-2 (if using full-duplex)	Y / Rx +	3
JP13	Disconnect		
JP14	Disconnect		
JP15	Connect 2-3 (optional)	Power Input	9
JP16	Connect 1-2 (optional)	Ground	5
JP23 / JP26	Connect 1-2 (optional)	Half-Duplex Biasing and Termination	
	Connect 2-3 (optional)	Full-Duplex Biasing and Termination	
JP29	Connect 1-2	Disable Half-Duplex Echo	
	Connect 2-3	Enable Full or Half-Duplex Echo	

10.8 CAN via DB9 (J2)

Jumper	Configuration	Description	DB9 Pin
JP2	Connect (optional)	120-Ohm Termination	
JP4	Disconnect		
JP5	Disconnect		
JP6	Disconnect		
JP7	Connect 2-3 (optional)	Ground	6
JP8	Connect 2-3	CAN Low	2
JP9	Disconnect		
JP10	Disconnect		
JP11	Connect 2-3	CAN High	7
JP12	Connect 2-3 (optional)	Ground	3
JP13	Disconnect		
JP14	Disconnect		
JP15	Connect 2-3 (optional)	Power Input	9
JP16	Connect 1-2 (optional)	Ground	5

10.9 UART 0 RS-232 via TSTRIP5 (JP1)

Jumper	Configuration	Description	TSTRIP5 Pin
JP3	Connect 1-2	Route Rx from RS-232 Level Shifter	
JP17	Connect 1-2	Receive	2
JP18	Connect 1-2	Transmit	3
JP19	Connect 1-2	Request to Send	4
JP20	Connect 1-2	Receive	2
JP21	Connect 1-2	Transmit	3
JP22	Connect 1-2	Request to Send	4
JP27	Connect 1-2	Clear to Send	5
JP28	Connect 1-2	Clear to Send	5

10.10 UART 1 RS-485 via TSTRIP5 (JP1)

Jumper	Configuration	Description	TSTRIP5 Pin
JP17	Connect 2-3	B / Tx -	2
JP18	Connect 2-3	A / Tx +	3
JP19	Connect 2-3 (if using full-duplex)	Z / Rx -	4
JP20	Connect 1-2	B / Tx -	2
JP21	Connect 1-2	A / Tx +	3
JP22	Connect 1-2 (if using full-duplex)	Z / Rx -	4
JP27	Connect 2-3 (if using full-duplex)	Y / Rx +	5
JP28	Connect 1-2 (if using full-duplex)	Y / Rx +	5
JP23 / JP26	Connect 1-2 (optional)	Half-Duplex Biasing and Termination	
	Connect 2-3 (optional)	Full-Duplex Biasing and Termination	
JP29	Connect 1-2	Disable Half-Duplex Echo	
	Connect 2-3	Enable Full or Half-Duplex Echo	

10.11 CAN via TSTRIP5 (JP1)

Jumper	Configuration	Description	TSTRIP5 Pin
JP2	Connect (optional)	120-Ohm Termination	
JP17	Disconnect		
JP18	Disconnect		
JP19	Disconnect		
JP20	Connect 2-3	CAN Low	2
JP21	Connect 2-3 (optional)	Ground	3
JP22	Connect 2-3	CAN High	4
JP27	Disconnect		
JP28	Connect 2-3 (optional)	Power Input	5

11 Memory Map

Memory Region	Address Range	Region Description
Undefined	0x00000000 – 0x01FFFFFF	Undefined area to catch null pointers
SDRAM	0x02000000 – 0x027FFFFF	8MB of SDRAM
Unused	0x02800000 – 0x1FFFFFFF	Available to programmer
VBR	0x20000000 – 0x200003FF	MCF5234 vector base register
RAMBAR	0x20000000 – 0x2000FFFF	MCF5234 internal SDRAM
Unused	0x20010000 – 0x3FFFFFFF	Available to programmer
IPSBAR	0x40000000 – 0x7FFFFFFF	MCF5234 internal device registers; these are accessible via sim structure defined in sim5234.h
Unused	0x80000000 – 0xFFBFFFFF	Available to programmer
Start of Flash	0xFFC00000	Start of 2MB of flash memory
Flash Monitor	0xFFC00000 – 0xFFC03FFF	Boot monitor
Monitor Params	0xFFC04000 – 0xFFC05FFF	Monitor parameter storage
User Params	0xFFC06000 – 0xFFC07FFF	User parameter storage
Application Code	0xFFC08000 – …	Compressed application code
End of Flash	0xFFDFFFFF	End of 2MB of flash memory

12 Life Support Disclaimer

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1. Life support devices or systems are devices or systems that (**a**) are intended for surgical implant into the body or (**b**) support or sustain life, and whose failure to perform, when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury to the user.

2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

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