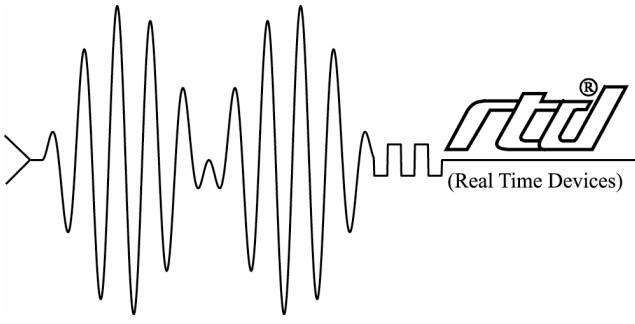
CM316
Dual Serial Port utilityModule

User's Manual



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"Accessing the Analog World"®

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Dual Serial Port utilityModule
User's Manual

RTD Embedded Technologies, INC.
103 Innovation Blvd.
State College, PA 16803-0906

Phone: +1-814-234-8087
FAX: +1-814-234-5218

E-mail
sales@rtd.com
techsupport@rtd.com

web site
http://www.rtd.com

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Chapter 1 INTRODUCTION

This manual gives information on the CM316 Dual Serial Synchronous/Asynchronous Port utilityModule. This module supports asynchronous (RS422/RS485/RS232) and synchronous byte and bit oriented data transfers, with jumper configurable IRQ lines, DMA lines and I/O addresses for your PC/104 applications.

CM316 Dual Serial Port utilityModule

The CM316 Dual Serial Port utilityModule was designed to provide two versatile serial synchronous/asynchronous ports to support the Real Time Devices cpuModules and other standard PC/104 processor modules.

Features

The following are major features of the CM316 utilityModule.

- Dual independent serial ports
- Synchronous communications
  - 1 Mbps transmit/receive operation
  - Byte Oriented
    - Monosynchronous
    - Bisynchronous
    - External Synchronous
  - Bit Oriented
    - SDLC/HDLC
- Asynchronous communications
  - five to eight bits per character
  - start, programmable stop and optional parity bit
  - 4 Mbps transmit/receive operation
- 4 byte transmit FIFO with programmable interrupt and DMA request levels
- 8 byte receive FIFO with programmable interrupt and DMA request levels
- Independent transmit and receive control
- Standard modem interface
- Jumper selectable to interrupt line, base address, RS232/RS422-485 mode per port
- Includes 64 different selectable I/O base addresses
- Extended temperature range: -40 to +85C
- Low power-consumption
- Single +5V power supply

Software Included

- Self-explanatory diagnostic program included

Connectors and Switches

External connectors provided are:

- CN1: PC/104 Bus (XT)
- CN2: PC/104 Bus (AT)
- JP7: First COM port
- JP6: Second COM port

Switches provided are:

- SW1: Base address selection

Recommended Cables

XK-CM66

General Specifications

- Dimensions: 3.8 x 3.9 x 0.6" (97 x 100 x 16 mm)
- Weight (mass): 3.0 ounces (85 grams)
- 6-layer PCB
- Operating conditions:
  Temperature: -40 - +85 degrees C
  Relative humidity: 0 - 95%, non-condensing
  Storage temperature: -55 to +125 degrees C

Configuring the utilityModule

The following sections contain information on configuring the utilityModule.

Please read this entire section before attempting to use the utilityModule!

Chapter 2 INSTALLING THE UTILITYMODULE

Since the utilityModule uses a PC/104 stackthrough bus, the only hardware installation you will do is placing the module to the PC/104 stack. To do this, you will connect the PC/104 bus connector with the matching connector of another module.

Recommended Procedure

We recommend you follow the procedure below to ensure that stacking of the modules does not damage connectors or electronics.

- Turn off power to the PC/104 system or stack.
- Select and install standoffs to properly position the utilityModule on the PC/104 stack.
- Touch a grounded metal part of the stack to discharge any buildup of static electricity.
- Remove the utilityModule from its anti-static bag.
- Check that keying pins in the PC/104 bus connector are properly positioned.
- Check the stacking order: make sure an XT bus card will not be placed between two AT bus cards, or it will interrupt the AT bus signals.
- Hold the utilityModule by its edges and orient it so the bus connector pins line up with the matching connector on the stack.
- Gently and evenly press the utilityModule onto the PC/104 stack.

CAUTION: Do not force the module onto the stack! Wiggling the module or applying too much force may damage it. If the module does not readily press into place, remove it, check for bent pins or out-of-place keying pins, and try again.

Connecting the utilityModule

The following sections describe connectors of the utilityModule.

Finding Pin 1 of Connectors

A white area silk-screened on the PC board indicates pin 1 of connectors. A square solder pad visible on the bottom of the PC board also indicates it.

Chapter 3 JUMPER / SWITCH CONFIGURATION

Locations

The figure below shows a **TOP** view of the board with connector and pin locations.

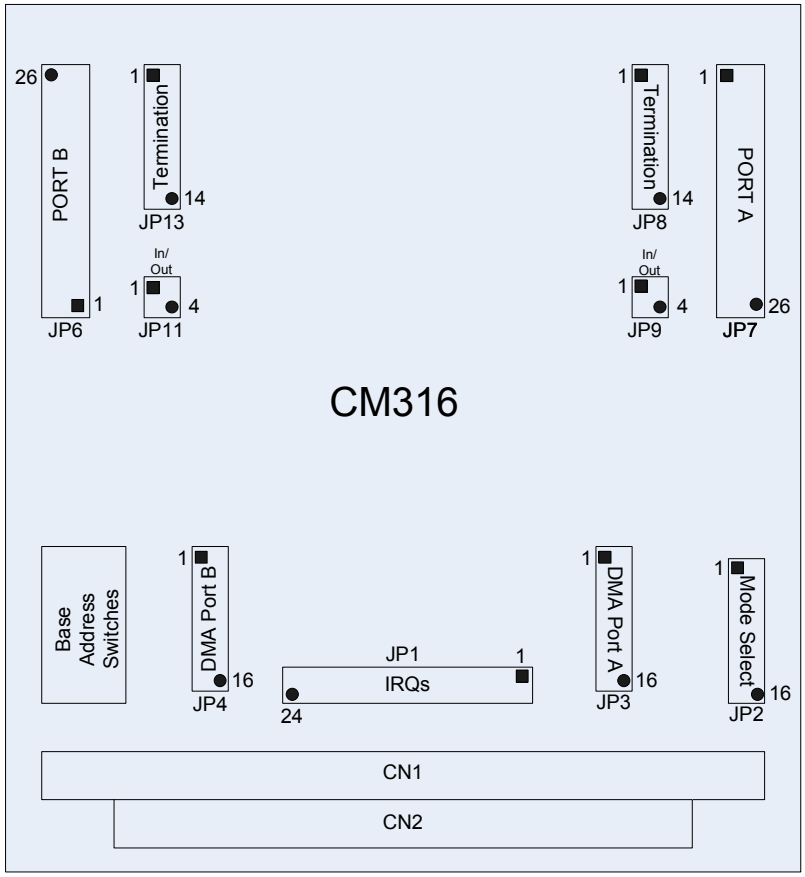

Figure 1 Connector Locations

Table 1 Connector /Jumper Description Table

Connector	Function	Size
CN1	PC/104 XT Bus	64 pin
CN2	PC/104 AT Bus	40 pin
JP1	Interrupt Requests	24 pin
JP2	Mode Select Switches	16 pin
JP3	DMA Port A (Tx / Rx)	16 pin
JP4	DMA Port B (Tx / Rx)	16 pin
JP6	Port B	26 pin
JP7	Port A	26 pin
JP8	Port A RS422 /485 Terminations	14 pin
JP9	Port A Sync TxC	4 pin
JP11	Port B Sync TxC	4 pin
JP13	Port B RS422 / 485 Terminations	14 pin

Base Address Switch settings

Table 2 Base address table for COM ports

SW6	SW5	SW4	SW3	SW2	SW1	Base Address (hex)			
						JP7 (Port A) Cmnd	JP7 (Port A) Data	JP6 (Port B) Cmnd	JP6 (Port B) Data
Closed	Closed	Closed	Closed	Closed	Closed	200	201	202	203
Closed	Closed	Closed	Closed	Closed	Open	208	209	20A	20B
Closed	Closed	Closed	Closed	Open	Closed	210	211	212	213
Closed	Closed	Closed	Closed	Open	Open	218	219	21A	21B
Closed	Closed	Closed	Open	Closed	Closed	220	221	222	223
Closed	Closed	Closed	Open	Closed	Open	228	229	22A	22B
Closed	Closed	Closed	Open	Open	Closed	230	231	232	233
Closed	Closed	Closed	Open	Open	Open	238	239	23A	23B
Closed	Closed	Open	Closed	Closed	Closed	240	241	242	243
Closed	Closed	Open	Closed	Closed	Open	248	249	24A	24B
Closed	Closed	Open	Closed	Open	Closed	250	251	252	253
Closed	Closed	Open	Closed	Open	Open	258	259	25A	25B
Closed	Closed	Open	Open	Closed	Closed	260	261	262	263
Closed	Closed	Open	Open	Closed	Open	268	269	26A	26B
Closed	Closed	Open	Open	Open	Closed	270	271	272	273
Closed	Closed	Open	Open	Open	Open	278	279	27A	27B
Closed	Open	Closed	Closed	Closed	Closed	280	281	282	283
Closed	Open	Closed	Closed	Closed	Open	288	289	28A	28B
Closed	Open	Closed	Closed	Open	Closed	290	291	292	293
Closed	Open	Closed	Closed	Open	Open	298	299	29A	29B
Closed	Open	Closed	Open	Closed	Closed	2A0	2A1	2A2	2A3
Closed	Open	Closed	Open	Closed	Open	2A8	2A9	2AA	2AB
Closed	Open	Closed	Open	Open	Closed	2B0	2B1	2B2	2B3
Closed	Open	Closed	Open	Open	Open	2B8	2B9	2BA	2BB
Closed	Open	Open	Closed	Closed	Closed	2C0	2C1	2C2	2C3
Closed	Open	Open	Closed	Closed	Open	2C8	2C9	2CA	2CB
Closed	Open	Open	Closed	Open	Closed	2D0	2D1	2D2	2D3
Closed	Open	Open	Closed	Open	Open	2D8	2D9	2DA	2DB
Closed	Open	Open	Open	Closed	Closed	2E0	2E1	2E2	2E3
Closed	Open	Open	Open	Closed	Open	2E8	2E9	2EA	2EB
Closed	Open	Open	Open	Open	Closed	2F0	2F1	2F2	2F3
Closed	Open	Open	Open	Open	Open	2F8	2F9	2FA	2FB
Open	Closed	Closed	Closed	Closed	Closed	300	301	302	303
Open	Closed	Closed	Closed	Closed	Open	308	309	30A	30B
Open	Closed	Closed	Closed	Open	Closed	310	311	312	313
Open	Closed	Closed	Closed	Open	Open	318	319	31A	31B

Open	Closed	Closed	Open	Closed	Closed	320	321	322	323
Open	Closed	Closed	Open	Closed	Open	328	329	32A	32B
Open	Closed	Closed	Open	Open	Closed	330	331	332	333
Open	Closed	Closed	Open	Open	Open	338	339	33A	33B
Open	Closed	Open	Closed	Closed	Closed	340	341	342	343
Open	Closed	Open	Closed	Closed	Open	348	349	34A	34B
Open	Closed	Open	Closed	Open	Closed	350	351	352	353
Open	Closed	Open	Closed	Open	Open	358	359	35A	35B
Open	Closed	Open	Open	Closed	Closed	360	361	362	363
Open	Closed	Open	Open	Closed	Open	368	369	36A	36B
Open	Closed	Open	Open	Open	Closed	370	371	372	373
Open	Closed	Open	Open	Open	Open	378	379	37A	37B
Open	Open	Closed	Closed	Closed	Closed	380	381	382	393
Open	Open	Closed	Closed	Closed	Open	388	389	38A	38B
Open	Open	Closed	Closed	Open	Closed	390	391	392	393
Open	Open	Closed	Closed	Open	Open	398	399	39A	39B
Open	Open	Closed	Open	Closed	Closed	3A0	3A1	3A2	3A3
Open	Open	Closed	Open	Closed	Open	3A8	3A9	3AA	3AB
Open	Open	Closed	Open	Open	Closed	3B0	3B1	3B2	3B3
Open	Open	Closed	Open	Open	Open	3B8	3B9	3BA	3BB
Open	Open	Open	Closed	Closed	Closed	3C0	3C1	3C2	3C3
Open	Open	Open	Closed	Closed	Open	3C8	3C9	3CA	3CB
Open	Open	Open	Closed	Open	Closed	3D0	3D1	3D2	3D3
Open	Open	Open	Closed	Open	Open	3D8	3D9	3DA	3DB
Open	Open	Open	Open	Closed	Closed	3E0	3E1	3E2	3E3
Open	Open	Open	Open	Closed	Open	3E8	3E9	3EA	3EB
Open	Open	Open	Open	Open	Closed	3F0	3F1	3F2	3F3
Open	Open	Open	Open	Open	Open	3F8	3F9	3FA	3FB

PC/104 Bus Connectors, CN1 and CN2

Connectors CN1 and CN2 provide PC/104 bus connections. CN1 carries XT bus signals, and CN2 carries additional signals for the AT bus. The signals on CN1 and CN2 conform to the IEEE P966 standard for the PC/104 bus.

The following tables list the connector pinouts:

Table 3 PC/104 XT Bus Connector

PC/104 XT Bus Connector, CN1		
Pin	**Row A**	**Row B**
1	IOCHCHK*	0V
2	SD7	RESETDRV
3	SD6	+5V
4	SD5	IRQ9
5	SD4	-5V
6	SD3	DRQ2
7	SD2	-12V
8	SD1	ENDXFR*
9	SD0	+12V
10	IOCHRDY	(KEYING PIN)
11	AEN	SMEMW*
12	SA19	SMEMR*
13	SA18	IOW*
14	SA17	IOR*
15	SA16	DACK3
16	SA15	DRQ3
17	SA14	DACK1*
18	SA13	DRQ1
19	SA12	REFRESH
20	SA11	SYSCLK
21	SA10	IRQ7
22	SA9	IRQ6
23	SA8	IRQ5
24	SA7	IRQ4
25	SA6	IRQ3
26	SA5	DACK2*
27	SA4	TC
28	SA3	BALE
29	SA2	+5V
30	SA1	OSC
31	SA0	0V
32	0V	0V

Table 4 PC/104 AT Bus Connector

PC/104 AT Bus Connector, CN2		
Pin	**Row C**	**Row D**
0	0V	0V
1	SBHE*	MEMCS16*
2	LA23	IOCS16*
3	LA22	IRQ10
4	LA21	IRQ11
5	LA20	IRQ12
6	LA19	IRQ15
7	LA18	IRQ14
8	LA17	DACK0*
9	MEMR*	DRQ0
10	MEMW*	DACK5*
11	SD8	DRQ5
12	SD9	DACK6*
13	SD10	DRQ6
14	SD11	DRQ6
15	SD12	DRQ7
16	SD13	+5V
17	SD14	MASTER*
18	SD15	0V
19	(KEYING PIN)	0V

Note: Two locations on the bus have mechanical keying pins to help prevent misconnection of the PC/104 bus. These keying pins are a part of the PC/104 standard, and we strongly recommend you leave them in place.

If you have other modules without keying pins, we suggest you modify them to include keying.

JP1 Interrupt Requests / Sharing

Interrupt sharing is a mechanism which allows different devices or different boards to share the same active high IRQ lines on the PC/104 bus, given that there is a interrupt sharing circuit associated with each device / board. The utilityModule provides interrupt-sharing circuits for the board; thus allowing sharing of each IRQ line with other boards.

Interrupt sharing in a PC/104 system requires one 1K pull-down resistor per IRQ line for all the devices that share the IRQ. Installing a ground jumper in the utilityModule will pull its associated IRQ line down with 1K resistor. When multiple boards are placed in a system care should be taken not to install the ground jumper on more than one board as this will reduce the pull down resistor value increasing the effective drive load, which in turn will keep devices from driving the IRQ line high. ***With one board installed in the system JP1 (23-24) must be jumpered since the driver is an open emitter type. For more than one board or for multiple IRQ sharing boards only one ground jumper needs to be installed for the system.***

Table 5 IRQ Jumpers

Description	Jumper Pins
IRQ 3	1-2
IRQ 4	3-4
IRQ 5	5-6
IRQ 6	7-8
IRQ 7	9-10
IRQ 9	11-12
IRQ 10	13-14
IRQ 11	15-16
IRQ 12	17-18
IRQ 14	19-20
IRQ 15	21-22
GND	23-24

JP2 Mode Select Switches

Table 6 Mode Jumpers

Description	Pins	Open	Shorted
Port A Serial Comm Mode	1-2	RS422 / 485	RS232
Port A Int / Ext Sync / TxClk	3-4	External	Internal
Port A Request To Send / Always	5-6	Always	RTS
14.7456MHz / 16.0000MHz	7-8	16MHz	14MHz
Port B Serial Comm Mode	9-10	RS422 / 485	RS232
Port B Int / Ext Sync / TxClk	11-12	External	Internal
Port B Request To Send / Always	13-14	Always	RTS
ESCC ZiLOG Rx Clock Source	15-16	Rx Clk	Tx Clk

Port x Serial Comm Mode

Makes appropriate port A or B either differential mode (RS422/485) or single ended mode (RS232).

Port x Int / Ext Sync and ESCC Transmit Clock

WARNING **WHEN SYNC OR TRANSMIT CLOCK SOURCE IS FROM THE EXTERNAL CONNECTOR (JP7 FOR PORT A, JP6 FOR PORT B) THE APPROPRIATE PIN ON THE ESCC SHOULD BE MADE AS AN INPUT TO AVOID DRIVER CONTENTION AND POSSIBLE DAMAGE TO THE BOARD.**

When left open the clock and sync source come from the appropriate connector (JP7 for Port A, JP6 for Port B). When shorted the ESCC is the source for the transmitter clock and sync signal and the appropriate pins at JP7 and JP6 become outputs.

Port x Request to Send /Always

The RS422/485 on board drivers have two physical enables and this jumper is used to enable one of these enables either always or with the request to send signal.

14.7456MHz / 16.0000MHz

This jumper is the clock source for the ESCC ZiLOG chip.

ESCC ZiLOG Rx Clock Source

This jumper determines whether the receive clock source for the ESCC is the transmitter clock (this may be onboard or external) or the receiver clock from the connector. See the table below for the list of options. **Care should be taken to NOT have an external driver on the connector in certain instances (see below table).**

Table 7 Jumpers Options for Port A clock sources

JP2			JP9	Description		
Pins 15-16	Pins 1-2	Pins 3-4	Pins 3-4			
RX CLK source	RS 422 /232	TX CLK source	To output connector	ESCC Rx source	ESCC Tx Source	Tx Conn Source
Closed	Closed	Open	Closed	Rx 232 Ext	Rx 232 Ext	Rx 232 Ext
Closed	Closed	Open	Open	Tx 232 Ext		None
Closed	Closed	Closed	Closed	Tx Loopback	None	Tx 232 USART
Closed	Closed	Closed	Open	Tx 232 Ext		None
Open	Closed	Closed	Closed	Rx 232 Ext		Tx 232 USART
Open	Closed	Closed	Open			None
Open	Closed	Open	Closed		Rx 232 Ext	Rx 232 Ext
Open	Closed	Open	Open			None
Closed	Open	Closed	Closed	Tx Loopback	None	Tx 422 USART
Closed	Open	Closed	Open	None		Partially driven Tx 422 USART
Open	Open	Closed	Closed	Rx 422 Ext		Tx 422 USART
Open	Open	Closed	Open			Partially driven Tx 422 USART
Open	Open	Open	Closed		Rx 422 Ext	None
Open	Open	Open	Open			
Closed	Open	Open	Closed	Tx 422 Ext		
Closed	Open	Open	Open			

Table 8 Jumpers Options for Port B clock sources

JP2			JP9	Description		
Pins 15-16	Pins 9-10	Pins 11-12	Pins 3-4			
RX CLK source	RS 422 /232	TX CLK source	To output connector	ESCC Rx source	ESCC Tx Source	Tx Conn Source
Closed	Closed	Open	Closed	Rx 232 Ext	Rx 232 Ext	Rx 232 Ext
Closed	Closed	Open	Open	Tx 232 Ext		None
Closed	Closed	Closed	Closed	Tx Loopback	None	Tx 232 USART
Closed	Closed	Closed	Open	Tx 232 Ext		None
Open	Closed	Closed	Closed	Rx 232 Ext		Tx 232 USART
Open	Closed	Closed	Open			None
Open	Closed	Open	Closed		Rx 232 Ext	Rx 232 Ext
Open	Closed	Open	Open			None
Closed	Open	Closed	Closed	Tx Loopback	None	Tx 422 USART
Closed	Open	Closed	Open	None		Partially driven Tx 422 USART
Open	Open	Closed	Closed	Rx 422 Ext		Tx 422 USART
Open	Open	Closed	Open			Partially driven Tx 422 USART
Open	Open	Open	Closed		Rx 422 Ext	None
Open	Open	Open	Open			
Closed	Open	Open	Closed	Tx 422 Ext		
Closed	Open	Open	Open			

JP3 – JP4 DMA Selects

DMA will only work when **NO** two channels are set to use the same DMA. That is to say that Port A and Port B both transmit and receive must be set to use different DMA requests and acknowledges. DMA does not work without jumpers installed.

Table 9 DMA Jumpers

Description		Jumper Pins
Port A (JP3)	Port B (JP4)	
Tx DMA 0	Tx DMA 0	1-2
Tx DMA 1	Tx DMA 1	3-4
Tx DMA 2	Tx DMA 2	5-6
Tx DMA 3	Tx DMA 3	7-8
Rx DMA 0	Rx DMA 0	9-10
Rx DMA 1	Rx DMA 1	11-12
Rx DMA 2	Rx DMA 2	13-14
Rx DMA 3	Rx DMA 3	15-16

JP6 – JP7 I/O Ports

Table 10 User I/O Ports A and B

Description		Signal		Pin
RS232	RS422 / 485	Port A	Port B	
Ground	Ground	GND	GND	1
	Transmit Data +	TXD+	TXD+	2
Transmit Data	Transmit Data -	TXD-	TXD-	3
Transmit Clock	Transmit Clock -	TXC-	TXC-	4
Receive Data	Receive Data -	RXD-	RXD-	5
	Receive Data +	RXD+	RXD+	6
Request To Send	Request To Send -	RTS-	RTS-	7
Receive Clock	Receive Clock -	RXC-	RXC-	8
Clear To Send	Clear To Send -	CTS-	CTS-	9
No Connect	No Connect	NC	NC	10
Data Set Ready	Data Set Ready -	DSR-	DSR-	11
	Request To Send +	RTS+	RTS+	12
Ground	Ground	GND	GND	13
Data Terminal Ready	Data Terminal Ready -	DTR-	DTR-	14
Data Carrier Detect	Data Carrier Detect -	DCD-	DCD-	15
No Connect	No Connect	NC	NC	16
	Receive Clock +	RXC+	RXC+	17
	Data Set Ready +	DSR+	DSR+	18
	Data Carrier Detect +	DCD+	DCD+	19
	Data Terminal Ready +	DTR+	DTR+	20
	Synchronization +	SYNC+	SYNC+	21
Synchronization	Synchronization -	SYNC-	SYNC-	22
	Transmit Clock +	TXC+	TXC+	23
No Connect	No Connect	NC	NC	24
	Clear To Send +	CTS+	CTS+	25
No Connect	No Connect	NC	NC	26

JP8 – JP13 RS422 / 485 Terminations

You can change the mode switch to set either port as RS422 or RS485 (See JP2). In this case, you must connect JP6 or JP7 to an RS422 or RS485 compatible device.

When using RS422 or RS485 mode, you can use the port in either half-duplex (two-wire) or full-duplex (four-wire) configurations. For half-duplex (2-wire) operation, you must connect RXD+ to TDX+, and connect RXD- to TXD-.

Note! These 120-ohm termination resistors are provided on the utilityModule. When these pins are jumpered a 120Ω Termination is placed in parallel across the + and – signals. Pins do **NOT** get shorted in RS232 Mode. Termination is usually necessary on all RS422 receivers and at the ends of the RS485 bus. If the termination resistors are required, they can be enabled by jumpering the corresponding bits on JP8 or JP13.

Table 11 Termination Jumpers

Description	Signal		Jumper Pins
	Port A	Port B	
Data Set Ready	DSR	DSR	1-2
Data Carrier Detect	DCD	DCD	3-4
Clear To Send	CTS	CTS	5-6
Receive Data	RxD	RxD	7-8
Synchronization	SYNC	SYNC	9-10
Receive Clock	RxC	RxC	11-12
Transmit Clock	TxC	TxC	13-14

JP9 – JP11 Sync / TxC source

The TxC jumper should be installed when the ZiLOG ESCC transmitter clock is configured as a source for driving the RxC clock pins in differential mode. The Sync jumper should be installed when the board is used as a source for the synchronization pulse (i.e. internal synchronization). These jumpers should not be installed in RS232 mode.

Table 12 Sync / Clk Jumpers

Description	Jumper Pins
Sync	1-2
TxC	3-4

Chapter 4 MEMORY MAP

The figure below shows the board memory map. Addresses are offsets from the Base Address which is determined by the switch settings (see Table 2):

Address Offset	Description
0x0	ESCC Command Register A
0x1	ESCC Data Register A
0x2	ESCC Command Register B
0x3	ESCC Data Register B
0x4	FPGA Status Register
0x400	FPGA Board ID Register
0x402	FPGA Board ID Reset

Table 13 CM316 Memory Map

0x0 – 0x3 ESCC Communications (Read / Write)

These registers access the ESCC chip. A read or write to the ESCC command register is done by first writing the address that you want to access on the ESCC to 0x0 port A / 0x2 port B and then reading or writing the data value to or from 0x0 port A / 0x2 port B. Both of these back to back operations are written to the command register. The data register is used to retrieve serial data from the ESCC FIFO. The user only has to do a read or write to 0x1 port A/ 0x3 port B with the required data value. For further information and the ESCC datasheet see the Zilog website.

0x4 FPGA Status (Read)

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
R	R	R	R	R	R	R	R	R	R	R	R	EB	EA	DSRB	DSRA

Bit 0: Data Set Ready Status of Port A
Bit 1: Data Set Ready Status of Port B
Bit 2: Port A Echo enabling
1: Echo Disabled (Rcvr data always 1) 0: Echo enabled (user will hear own Tx data during active RTS time)
Bit 3: Port B Echo enabling
1: Echo Disabled (Rcvr data always 1) 0: Echo enabled (user will hear own Tx data during active RTS time)
Bit 15-4: Reserved

0x400 Board ID Register (Read)

A byte or word accessible read shows the user the device, vendor and fpga board information.

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
D15	D14	D13	D12	D11	D10	D9	D8	D7	D6	D5	D4	D3	D2	D1	D0

Device ID: C316
Vendor ID: 1435
FPGA version xxxx

0x402 Board ID Reset (Read)

A read resets the board ID register counter.

Chapter 5 USING THE UTILITYMODULE

COM ports

The utilityModule features Zilog dual Enhanced Synchronous Communications Controller (ESCC) Z85230 part.

ZiLOG Documentation

Due to the complexity of the Zilog serial chip, it is impossible for us to reproduce all programming information in this manual. If you will be doing in-depth programming of the serial port controller, we suggest you obtain the Z85230 datasheet / apnotes from the manufacturer.

The Z85230 datasheet is available on-line in electronic format as an Adobe Acrobat (. PDF) file on the Zilog website:

www.zilog.com

You may also contact:

Zilog Worldwide Headquarters

532 Race Street

San Jose, CA 95126-3432

Or by phone/fax:

Phone: 408-558-8500

Fax: 408-558-8300

16 Mbps support

With 16 MHz clock input selected (JP2, 7-8 left open), the utilityModule is capable of provide data rates up to 16 Mbps using NRZ encoding in RS422/RS485 mode. Since RS232 standard restricts data rate to 20 Kbps, you might experience failure at higher data rate above 250 Kbps with 16 MHz clock select for the utilityModule.

Chapter 6 RETURN POLICY AND WARRANTY

Return Policy

If you wish to return a product to the factory for service, please follow this procedure:

Read the Limited Warranty to familiarize yourself with our warranty policy.

Contact the factory for a Return Merchandise Authorization (RMA) number.

Please have the following available:

- Complete board name
- Board serial number
- A detailed description of the board's behavior

List the name of a contact person, familiar with technical details of the problem or situation, **along with their phone and fax numbers, address, and e-mail address** (if available).

List your shipping address!!

Indicate the shipping method you would like used to return the product to you.
We will not ship by next-day service without your pre-approval.

Carefully package the product, using proper anti-static packaging.

Write the RMA number in large (1") letters on the outside of the package.

Return the package to:

RTD Embedded Technologies, Inc.
103 Innovation Blvd.
State College PA 16803-0906
USA

Limited Warranty

RTD Embedded Technologies, Inc. warrants the hardware and software products it manufactures and produces to be free from defects in materials and workmanship for one year following the date of shipment from RTD Embedded Technologies, INC. This warranty is limited to the original purchaser of product and is not transferable.

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RTD Embedded Technologies, Inc.
103 Innovation Blvd.
State College PA 16803-0906
USA
Our website: www.rtd.com