



Rockwell

RM 65 DATA SHEET

ADAPTER/BUFFER

RM 65

The RM 65 product line is designed for OEM and end user microcomputer applications requiring state-of-the-art performance, compact size, modular design and low cost. Software for RM 65 systems can be developed in R6500 Assembly Language, PL/65, BASIC and FORTH. Both BASIC and FORTH are available in ROM and can be incorporated into the user's system.

The RM 65 product line uses a motherboard interconnect concept and accepts any card in any slot. The 64-line RM 65 Bus offers memory addressing up to 128K bytes, high immunity to electrical noise and includes growth provisions for user functions. A selection of card cages provides packaging flexibility. RM 65 products may also be used with Rockwell's AIM 65 Microcomputer for product development and for a broad variety of portable or desktop microcomputer applications.

ORDERING INFORMATION

The Adapter/Buffer is available in an Edge Connector Version (RM65-7104) and a Eurocard version (RM65-7104E).

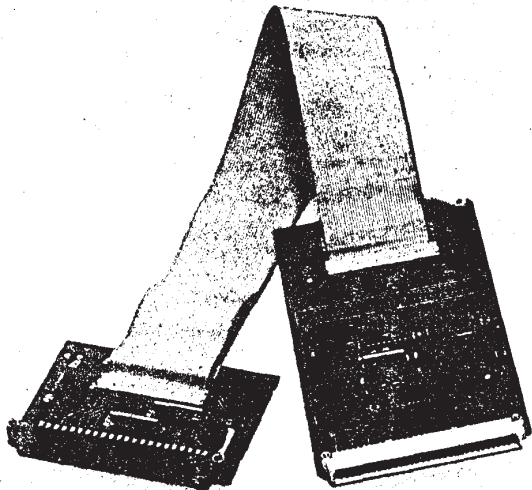
FEATURES

- RM 65 Bus Compatible
- Buffered address data and control lines
- Drives up to 15 modules
- Edge connector and Eurocard versions
- Fully assembled, tested and warranted

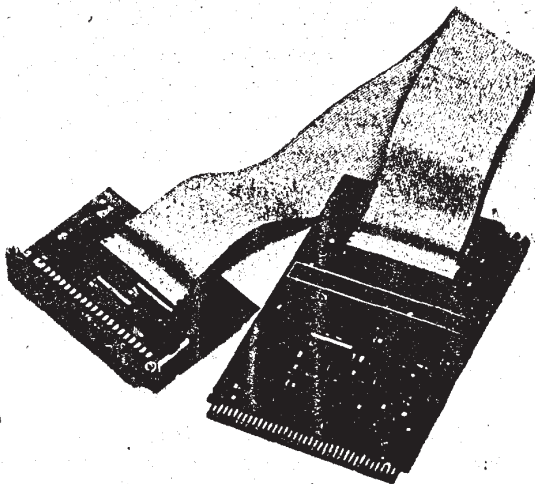
PRODUCT OVERVIEW

The Adapter/Buffer extends the RM 65 Bus from the AIM 65 Expansion Connector to a compatible motherboard that is situated up to 16 inches away. Included circuitry permits the Adapter/Buffer to drive up to 15 RM 65 Bus-compatible modules. (The similar Cable Driver Adapter/Buffer, Part Number RM65-7116, provides the same drive capability for applications in which the motherboard is up to six feet from the Expansion Connector.)

The Adapter/Buffer consists of an adapter module, a buffer module and two 16-inch interconnect cables. Both cables are flexible, so the motherboard may be installed in a wide variety of locations and orientations relative to the AIM 65.



**Eurocard Version
RM65-7104E**



**Edge Connector Version
RM65-7104**

ADAPTER/BUFFER

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FUNCTIONAL DESCRIPTION

The Adapter/Buffer consists of two modules and two interconnect cables. The Adapter module connects to the AIM 65 Expansion connector and the Buffer module connects to an RM 65 Bus motherboard receptacle.

The Adapter module transfers data, address and control lines from AIM 65 Expansion Connector to the interconnect cables. The eight data and 16 address lines are routed directly, without buffering. The read/write, clock, sync and reset AIM 65 output control lines are also routed directly through the Adapter. The ready, set overflow, interrupt request and non-maskable interrupt AIM 65 input lines are buffered on the module.

Two 16-inch 40 conductor flat ribbon cables connect the Adapter module to the Buffer module. The cables are mass terminated at each end, and are permanently attached to the interfacing module.

The Buffer module buffers and routes all interface signals between the interconnect cables and the RM 65 Bus connector.

The Data Transceivers invert and drive 8-bits of parallel data. During a write operation, data received from the cables are driven onto the RM 65 Bus. During a read operation, data received from the RM 65 Bus are driven onto the cables. The

bus active signal enables the Transceivers. When the bus float signal is active, the Transceivers are disabled.

The Address Buffers invert and transfer 16 parallel address lines from the interconnect cable to the RM 65 Bus. When the bus float signal is active, the Buffers are disabled.

Jumper E1 selects the source for the bank address line (BADR/) — either the buffer module or an external module. When the buffer module is the source (position A), the bank address line is held high to address Bank 0 (Lower 65K) on the Bus; this line is disabled when the bus float line is active. For an external source (position B), the bank address line is not used by the buffer module, and must be controlled by another module on the Bus.

The seven read/write, clock, sync and reset lines from the cables to the bus are buffered by the Control Drivers. All of these lines, except reset and phase 1, are disabled when the bus float line is active. The ready, set overflow, interrupt request and non-maskable lines from the bus to the interconnect cables are also buffered by the Control Drivers.

Jumper E2 selects the source for the DMA Terminate line (BDMT/) — either the buffer module or an external module. When the buffer module is the source (position A), the DMA terminate line is held high (inactive). For an external source (position B), the DMA terminate line is not used by the buffer module, and must be controlled by another module on the bus.

INSTALLATION

Installing the Adapter/Buffer

Before installing the module, ensure that it is not damaged and is free of grease, dirt, liquid or other foreign material.

- Before installing the Adapter/Buffer, turn off power to the AIM 65 and the interfacing RM 65 Bus motherboard.
- Configure Jumpers E1 and E2, per the Functional Description.
- Align the Adapter module connector J3 pin 1 with the AIM 65 Expansion Connector J3 pin 1.
- Plug the Adapter module onto the Expansion Connector. Press in firmly on the end of module until all pins are securely seated.
- Install connector P1 of the Buffer module into the desired slot on the mating RM 65 Bus motherboard.

CAUTION

RM 65 Bus connectors are keyed to prevent improper module connection. If the module does not insert into the receptacle with moderate pressure applied, check the orientation and connector alignment of the module. Forcing the module improperly into the receptacle may damage the receptacle and/or the module.

- Apply power to the AIM 65 and to the mating RM 65 Bus motherboard.

Removing the Adapter/Buffer

- Turn off power to the AIM 65 and to the RM 65 Bus motherboard.
- Lift up on the Buffer module ejector tab to release the module from the mating RM 65 Bus receptacle. Pull the module straight back until it is free from the card slot guides.
- Pull back on the Adapter module while moving it slightly from side to side until it is free from the AIM 65 Expansion Connector.

Buffer Module to RM 65 Bus Connector Pin Assignments

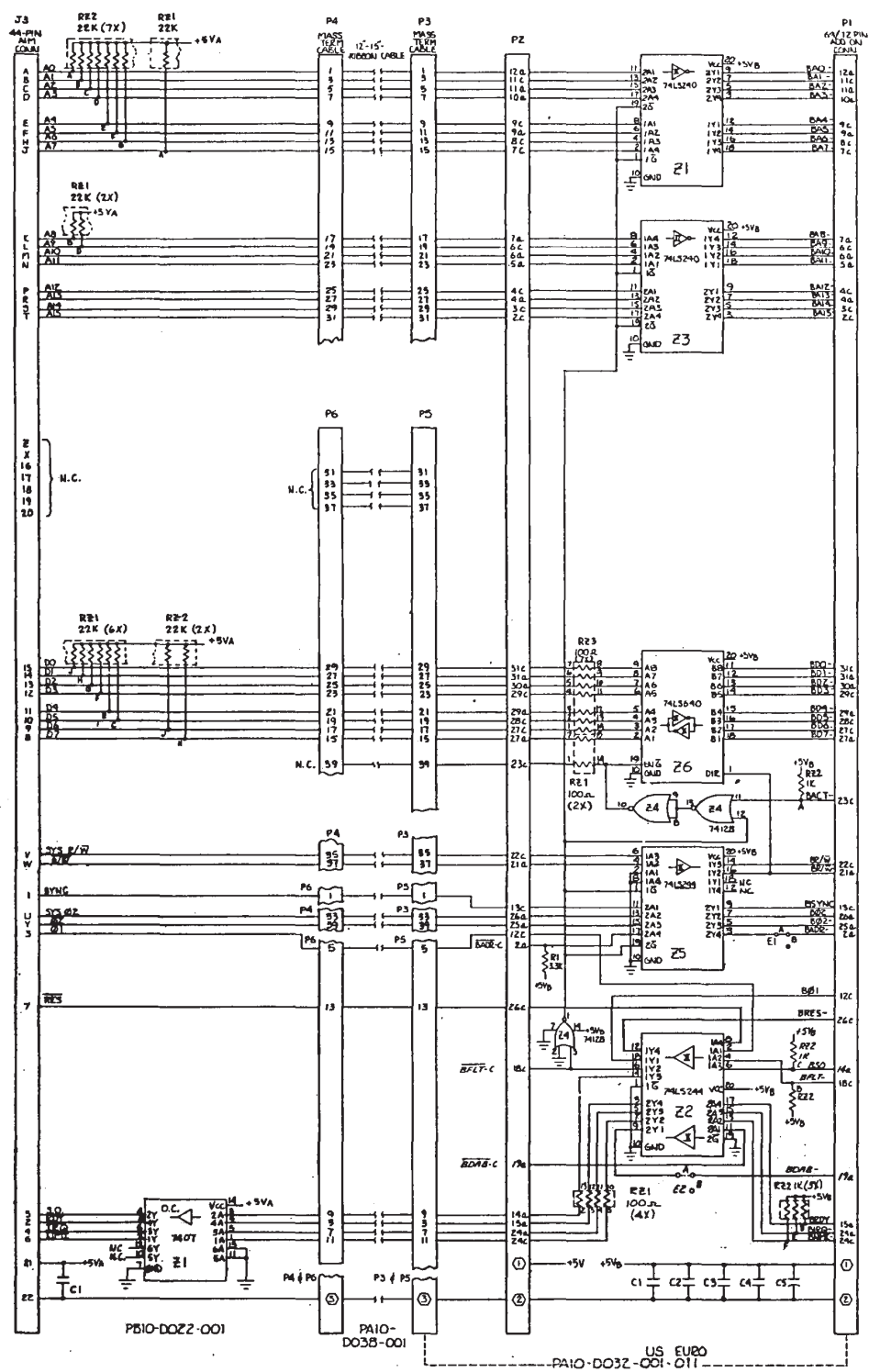
Bottom (Solder Side)				Top (Component Side)			
Signal Mnemonic	Signal Name	Input/Output	Pin	Pin	Signal Mnemonic	Signal Name	Input/Output
	Not Connected (See Note)		Wa	Wc		Not Connected (See Note)	
+5V	+5 Vdc Line (See Note)		Xa	Xc	+5V	+5 Vdc (See Note)	
GND	Ground		1a	1c	+5V	+5 Vdc	
BADR/	Buffered Bank Address	O	2a	2c	BA15/	Buffered Address Bit 15	O
GND	Ground		3a	3c	BA14/	Buffered Address Bit 14	O
BA13/	Buffered Address Bit 13	O	4a	4c	BA12/	Buffered Address Bit 12	O
BA11/	Buffered Address Bit 11	O	5a	5c	GND	Ground	
BA10/	Buffered Address Bit 10	O	6a	6c	BA9/	Buffered Address Bit 9	O
BA8/	Buffered Address Bit 8	O	7a	7c	BA7/	Buffered Address Bit 7	O
GND	Ground		8a	8c	BA6/	Buffered Address Bit 6	O
BA5/	Buffered Address Bit 5	O	9a	9c	BA4/	Buffered Address Bit 4	O
BA3/	Buffered Address Bit 3	O	10a	10c	GND	Ground	
BA2/	Buffered Address Bit 2	O	11a	11c	BA1/	Buffered Address Bit 1	O
BA0/	Buffered Address Bit 0	O	12a	12c	Bφ1	Buffered Phase 1 Clock	O
GND	Ground		13a	13c	BSYNC	Buffered Sync	O
BSO	Buffered Set Overflow	I	14a	14c	BDRQ1/	*Buffered DMA Request 1	
BRDY	Buffered Ready	I	15a	15c	GND	Ground	
	*User Spare 1		16a	16c	-12V/-V	*-12 Vdc/-V	
+12V/+V	*+12 Vdc/+V		17a	17c		*User Spare 2	
GND	Ground Line		18a	18c	BFLT/	Buffered Bus Float	I
BDMT/	Buffered DMA Terminate		19a	19c	Bφ0	*Buffered External Phase 0 Clock	
	*User Spare 3		20a	20c	GND	Ground	
BR/ \overline{W} /	Buffered Read/Write "Not"	O	21a	21c	BDRQ2/	*Buffered DMA Request 2	
	*System Spare		22a	22c	BR/ \overline{W}	Buffered Read/Write	O
GND	Ground		23a	23c	BACT/	Buffered Bus Active	I
BIRQ/	Buffered Interrupt Request	I	24a	24c	BNMI/	Buffered Non-Maskable Interrupt	I
Bφ2/	Buffered Phase 2 "Not" Clock	O	25a	25c	GND	Ground	
Bφ2	Buffered Phase 2 Clock	O	26a	26c	BRES/	Buffered Reset	O
BD7/	Buffered Data Bit 7	I/O	27a	27c	BD6/	Buffered Data Bit 6	I/O
GND	Ground		28a	28c	BD5/	Buffered Data Bit 5	I/O
BD4/	Buffered Data Bit 4	I/O	29a	29c	BD3/	Buffered Data Bit 3	I/O
BD2/	Buffered Data Bit 2	I/O	30a	30c	GND	Ground	
BD1/	Buffered Data Bit 1	I/O	31a	31c	BD0/	Buffered Data Bit 0	I/O
+5V	+5 Vdc		32a	32c	GND	Ground	
+5V	+5 Vdc (See Note)		Ya	Yc	+5V	+5 Vdc (See Note)	
	Not Connected (See Note)		Za	Zc		Not Connected (See Note)	

NOTE

Pins Wa, Wc, Xa, Xc, Ya, Yc, Za, Zc are not used on the Eurocard version.

*Not used on this module.

ADAPTER/BUFFER



**RM65
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ZONE		LTH	DESCRIPTION	DATE	APPROVED

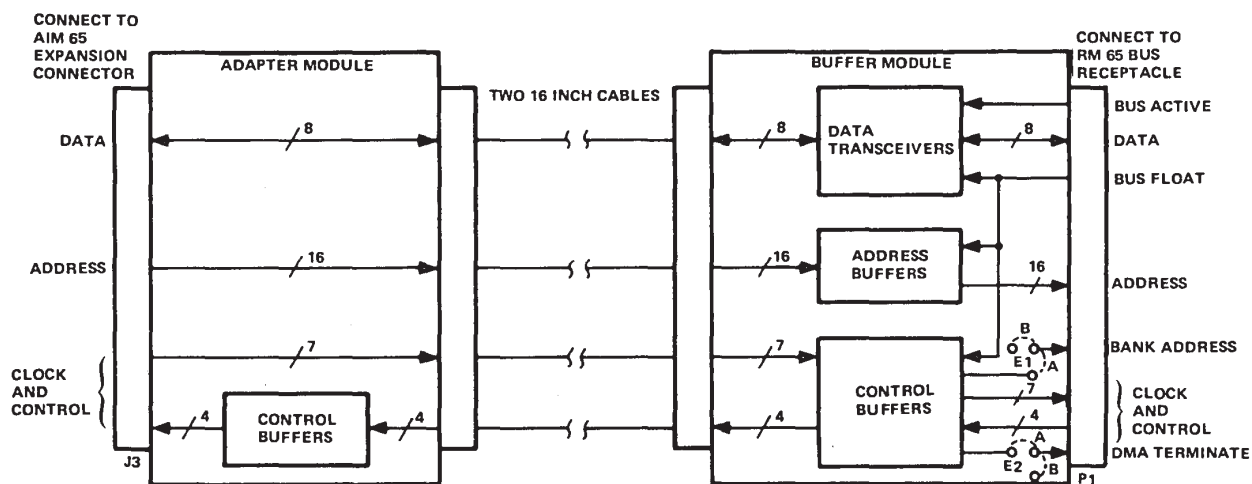
- ① PINS 1c, 32a, ON EURO CONNECTOR HUD PINS
2a, 1c, 2a, 1c, 32a, ON U.S. CONNECTOR SHALL BE TIED TO +5V
- ② PINS 1a, 2a, 5a, 10a, 13a, 15c, 18a, 20c, 23a, 25c, 28a, 30c, 32c,
SHALL BE TIED TO GND.
- ③ ALL EVEN NUMBER PINS (2 THRU 40) SHALL BE
TIED TO GND.
4. ALL CAPACITORS ARE .10UF 120%, 50V.

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DASH NO.	NEXT ASSY	USED ON
APPLICATION		

Adapter Module to AIM 65 Expansion Connector Pin Assignments							
Top (Component Side)				Bottom (Solder Side)			
Signal Mnemonic	Signal Name	Input/Output	Pin	Pin	Signal Mnemonic	Signal Name	Input/Output
SYNC	SYNC	I	1	A	A0	Address Bit 0	I
RDY	Ready	O	2	B	A1	Address Bit 1	I
$\emptyset 1$	Phase 1 Clock	I	3	C	A2	Address Bit 2	I
IRQ	Interrupt Request	O	4	D	A3	Address Bit 3	I
S.O.	Set Overflow	O	5	E	A4	Address Bit 4	I
NMI	Non-Maskable Interrupt	O	6	F	A5	Address Bit 5	I
RES	Reset	O	7	H	A6	Address Bit 6	I
D7	Data Bit 7	I/O	8	J	A7	Address Bit 7	I
D6	Data Bit 6	I/O	9	K	A8	Address Bit 8	I
D5	Data Bit 5	I/O	10	L	A9	Address Bit 9	I
D4	Data Bit 4	I/O	11	M	A10	Address Bit 10	I
D3	Data Bit 3	I/O	12	N	A11	Address Bit 11	I
D2	Data Bit 2	I/O	13	P	A12	Address Bit 12	I
D1	Data Bit 1	I/O	14	R	A13	Address Bit 13	I
D0	Data Bit 0	I/O	15	S	A14	Address Bit 14	I
-12V	*-12 Vdc		16	T	A15	Address Bit 15	I
+12V	*+12 Vdc		17	U	SYS $\emptyset 2$	System Phase 2 Clock	I
CS8	*Chip Select 8		18	V	SYS R/W	System Read/Write	I
CS9	*Chip Select 9		19	W	R/W	Read/Write "Not"	I
CSA	*Chip Select A		20	X	TEST	*Test	
+5V	+5 Vdc		21	Y	$\emptyset 2$	Phase 2 Clock "Not"	I
GND	Ground		22	Z	RAM R/W	*RAM Read/Write	

NOTE:
* = Not used on this module.



Adapter/Buffer Block Diagram

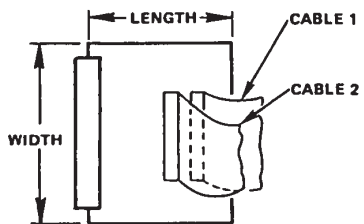
Adapter/Buffer Physical and Electrical Characteristics

Characteristics	Value	
Dimension (See Notes)		
Adapter Module		
Width	4.4 in. (111 mm)	
Length	2.6 in. (67 mm)	
Height	0.56 in. (14 mm)	
Buffer Module	Edge Connector	Eurocard
Width	3.9 in. (100 mm)	3.9 in. (100 mm)
Length	6.5 in. (164 mm)	6.3 in. (160 mm)
Height	0.56 in. (14 mm)	0.56 in. (14 mm)
Weight	6.9 oz. (195 g)	7.2 oz. (205 g)
Power		
Adapter Module	+5V \pm 5% 30 mA (0.15W) — Typical	
	50 mA (0.25W) — Maximum	
Buffer Module	+5V \pm 5% 190 mA (0.95W) — Typical	
	330 mA (1.7 W) — Maximum	
Environment		
Operating Temperature	0°C to 70°C	
Storage Temperature	–40°C to 85°C	
Relative Humidity	0% to 85% (without condensation)	
Propagation Time	20 ns — Maximum	
Interface Connectors		
AIM 65 Expansion Connector	22/44 — edge receptacle (0.156 in. centers)	
RM 65 Bus		
Edge Connector Version	72-pin edge connector (0.100 in. centers)	
Eurocard Version	64-pin plug (0.100 in. centers) per DIN 41612 (Row b is not installed)	
Interface Cables		
Number of Cables	Two	
Cable Length	16 inches	
Type	Flat ribbon	
Number of conductors per cable	40	
Wire Size	#28 AWG	

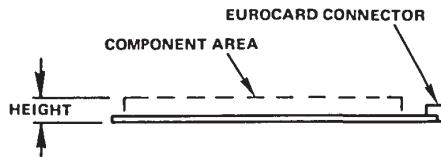
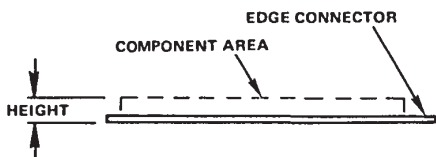
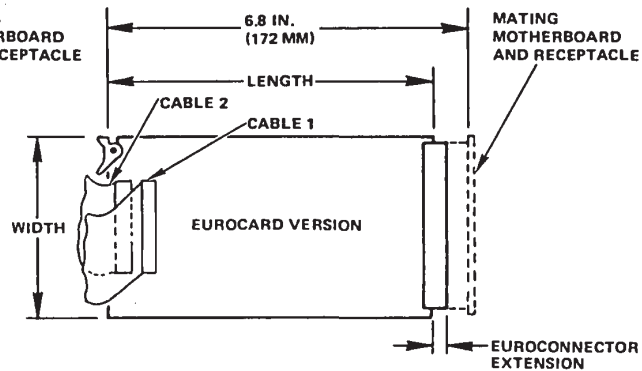
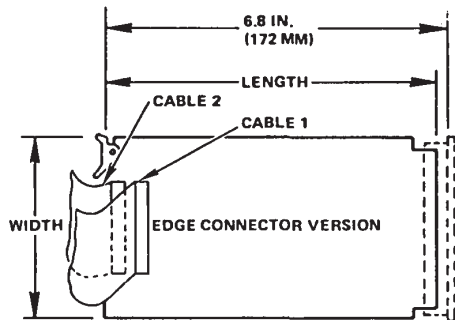
NOTES:

1. The height includes the maximum values for component height above the board surface (0.4 in. for populated modules), printed circuit board thickness (0.062 in.), and pin extension through the bottom of the module (0.1 in.)
2. The length does not include extensions beyond the edge of the module due to connectors or the module ejector.
3. The Eurocard dimensions conform to DIN 41612.

ADAPTER MODULE



BUFFER MODULE



Module Dimensions