

USER MANUAL

MODEL 3004
ECB Series
**Miniature Self-Powered
Elastic Clock Buffers**



PATTON
Electronics Co.



An ISO-9001
Certified
Company

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1.0 WARRANTY INFORMATION

Patton Electronics warrants all Model 3004-ECB components to be free from defects, and will—at our option—repair or replace the product should it fail within one year from the first date of shipment. This warranty is limited to defects in workmanship or materials, and does not cover customer damage, abuse or unauthorized modification. If this product fails or does not perform as warranted, your sole recourse shall be repair or replacement as described above. Under no condition shall **Patton Electronics** be liable for any damages incurred by the use of this product. These damages include, but are not limited to, the following: lost profits, lost savings and incidental or consequential damages arising from the use of or inability to use this product. **Patton Electronics** specifically disclaims all other warranties, expressed or implied, and the installation or use of this product shall be deemed an acceptance of these terms by the user.

1.1 RADIO AND TV INTERFERENCE

The Model 3004-ECB generates and uses radio frequency energy, and if not installed and used properly—that is, in strict accordance with the manufacturer's instructions—may cause interference to radio and television reception. The Model 3004-ECB has been tested and found to comply with the limits for a Class A computing device in accordance with the specifications in Subpart J of Part 15 of FCC rules, which are designed to provide reasonable protection from such interference in a commercial installation. However, there is no guarantee that interference will not occur in a particular installation. If the Model 3004-ECB does cause interference to radio or television reception, which can be determined by disconnecting the unit, the user is encouraged to try to correct the interference by one or more of the following measures: moving the computing equipment away from the receiver, re-orienting the receiving antenna and/or plugging the receiving equipment into a different AC outlet (such that the computing equipment and receiver are on different branches).

1.2 CE NOTICE

The CE symbol on your Patton Electronics equipment indicates that it is in compliance with the Electromagnetic Compatibility (EMC) directive of the Union European (EU). A Certificate of Compliance is available by contacting Technical Support.

1.3 SERVICE

All warranty and nonwarranty repairs must be returned freight prepaid and insured to Patton Electronics. All returns must have a Return Materials Authorization number on the outside of the shipping container. This number may be obtained from Patton Electronics Technical Services at:

telephone: **(301) 975-1007**
email: **support@patton.com**
web address: **http://www.patton.com**

NOTE: Packages received without an RMA number will not be accepted.

Patton Electronics' technical staff is also available to answer any questions that might arise concerning the installation or use of your Patton Model 3004-ECB. Technical Service hours: **8AM to 5PM EST, Monday through Friday.**

2.0 GENERAL INFORMATION

Thank you for your purchase of this Patton Electronics product. This product has been thoroughly inspected and tested and is warranted for One Year parts and labor. If any questions or problems arise during installation or use of this product, please do not hesitate to contact Patton Electronics Technical Services at (301) 975-1007.

2.1 FEATURES

- DCE to DCE connection
- Interface powered - No external power supply required
- Dual 512-bit, adaptive buffers
- Data rates up to 2.304 Mbps
- Available with male or female connectors and integral 6 foot cables
- Compact
- Easy to install
- Four models available:
 - 3004-ECB/V.35 - V.35 compatible. Male or female 34-pin V.35 connectors on 6 foot cables
 - 3004-ECB/530 - RS-422/V.11 compatible. Male or female 25-pin D-sub connectors on 6 foot cables
 - 3004-ECB/V.36 - RS-422/V.11 compatible. Male or female 37-pin D-sub connectors on 6 foot cables
 - 3004-ECB/X.21 - RS-422/V.11 compatible. Male or female 15-pin D-sub connectors on 6 foot cables

2.2 DESCRIPTION

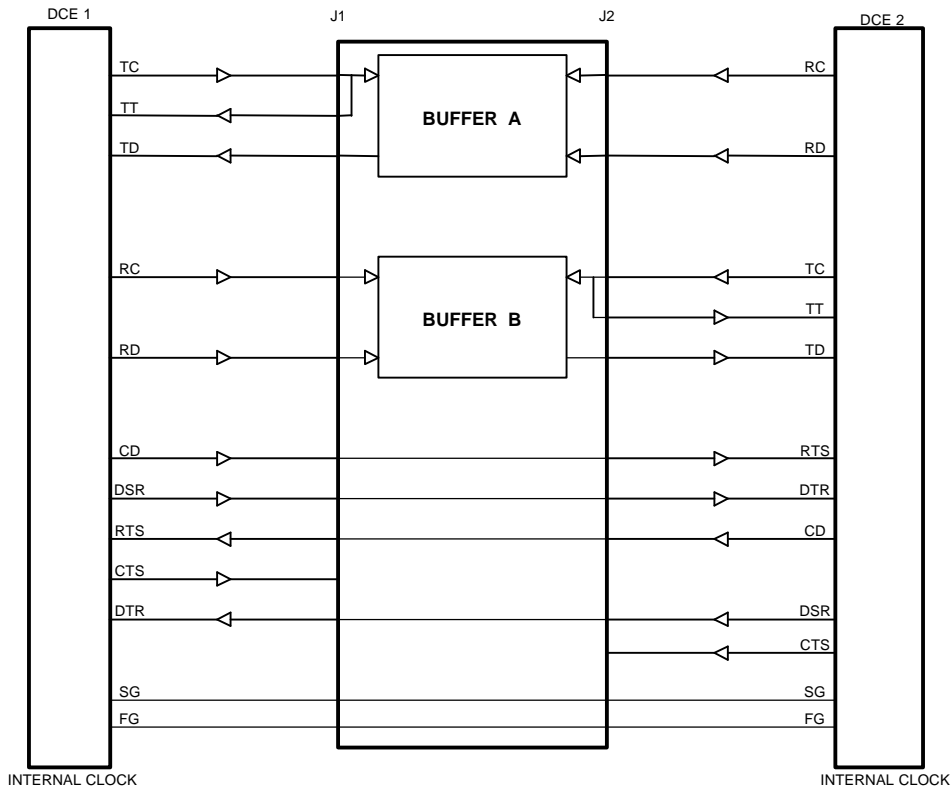
The Model 3004-ECB series are self-powered elastic buffers, which enable the connection of two independently clocked DCEs. When two internally clocked devices exchange data and cannot be clocked externally, the 3004-ECB is used as an interface between them. The Model 3004-ECB utilizes two buffers to reduce errors caused by clock drift between the two DCEs. All models employ adaptive buffer control. Internal buffers will automatically adjust to "almost full" in the case of underflow or to "almost empty" in case of overflow. All models perform the necessary "cross over" wiring connections between the two DCEs. Installation is easy and straightforward.

3.0 OPERATION

The receive clock of DCE 2 clocks data into buffer A. The transmit clock of DCE 1 clocks data out of buffer A.

The receive clock of DCE 1 clocks data into buffer B. The transmit clock of DCE 2 clocks data out of buffer B.

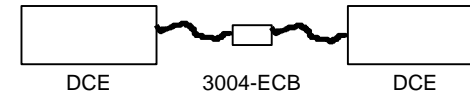
For the X.21 interface, both receive clock and transmit clock of each side are connected to the X.21 DCE's "Signal Timing".



Note: The buffers introduce transmission delay into the data paths between the DCEs. The control signals, however, are not buffered and are just wired through, as shown. This should be considered when using the 3004-ECB in applications where the data and control signals must have the same delay.

4.0 INSTALLATION

Installation is easy and straightforward. Simply connect each port of the 3004-ECB to one of the DCEs. There are no jumpers or switches to configure.



APPENDIX A
MODEL 3004-ECB SERIES
TECHNICAL SPECIFICATIONS

Connection:	DCE to DCE
Wiring:	Internal "cross-over" wiring
Transmission format:	Synchronous, transparent to protocol
Data rate:	Up to 2.304 Mbps
Functional interface:	3004-ECB/V.35- CCITT V.35 3004-ECB/530- EIA/RS-530 3004-ECB/V.36- EIA/RS-449 3004-ECB/X21- CCITT X.21
Electrical/Physical Interface:	3004-ECB/V.35 - V.35 compatible. Male or female 34-pin V.35 connectors on 6 foot cables. 3004-ECB/530 - RS-422/V.11 compatible. Male or female 25-pin D-sub connectors on 6 foot cables. 3004-ECB/V.36 - RS-422/V.11 compatible. Male or female 37-pin D-sub connectors on 6 foot cables. 3004-ECB/X.21- RS-422/V.11 compatible. Male or female 15-pin D-sub connectors on 6 foot cables.
DCE to DCE Buffering:	Two, adaptive-centering 512-bit buffers

APPENDIX A
MODEL 3004-ECB SERIES
TECHNICAL SPECIFICATIONS
(continued)

Powering:	Derived from data, clock and control signals. No external power required.
Environment:	0-60°C, 32-140°F, humidity up to 95%, non-condensing
Mark:	CE

APPENDIX B

**PATTON ELECTRONICS MODEL 3004 ECB/V.35
INTERFACE PIN ASSIGNMENT**

V.35 Interface

<u>Pin #</u>	<u>Signal</u>
A.....	FG (Frame Ground)
B.....	SGND (Signal Ground)
C	RTS (Request to Send)
D	CTS (Clear to Send)
E	DSR (Data Set Ready)
F.....	CD (Carrier Detect)
H	DTR (Data Terminal Ready)
P	TD(Transmit Data-A)
R	RD (Receive Data-A)
S	TD/ (Transmit Data-B)
T.....	RD/ (Receive Data-B)
U	XTC (External Transmit Clock-A)
V	RC(Receive Timing-A)
W	XTC/ (External Transmit Clock-B)
X	RC/ (Receive Timing-B)
Y	TC(Transmit Timing-A)
AA	TC/ (Transmit Timing-B)

APPENDIX C

**PATTON ELECTRONICS MODEL 3004 ECB/530
INTERFACE PIN ASSIGNMENT**

**RS-530 Interface Pin Description
(DB-25 Connector)**

<u>Pin #</u>	<u>Signal</u>
1	FG (Frame Ground)
2	TD (Transmit Data-A)
3	RD (Receive Data-A)
4	RTS (Request to Send-A)
5	CTS (Clear to Send-A)
6	DSR (Data Set Ready-A)
7	SGND (Signal Ground)
8	CD (Carrier Detect-A)
9	RC/ (Receive Timing-B)
10	CD/ (Carrier Detect-B)
11	XTC/ (External Transmit Clock-B)
12	TC/ (Transmit Timing-B)
13	CTS/ (Clear to Send-B)
14	TD/ (Transmit Data-B)
15	TC (Transmit Timing-A)
16	RD (Receive Data-B)
17	RC (Receive Timing-A)
19	RTS/ (Request to Send-B)
20	DTR (Data Terminal Ready-A)
22	DSR/ (Data Set Ready-B)
23	DTR/ (Data Terminal Ready-B)
24	XTC (External Transmit Clock-A)

APPENDIX D

**PATTON ELECTRONICS MODEL 3004-ECB/V.36
INTERFACE PIN ASSIGNMENT**

**RS-449 Interface Pin Description
(DB-37 Connector)**

<u>Pin #</u>	<u>Signal</u>
1	FG (Frame Ground)
4	TD (Transmit Data-A)
5	TC (Transmit Timing-A)
6	RD (Receive Data-A)
7	RTS (Request to Send-A)
8	RC (Receive Timing-A)
9	CTS (Clear to Send-A)
11	DM (Data Mode-A) (DSR-A)
12	TR (Terminal Ready-A) (DTR-A)
13	RR (Receiver Ready-A) (CD-A)
17	XTC (External Transmit Clock-A)
19	SGND (Signal Ground)
20	SGND (Signal Ground)
22	TD/ (Transmit Data-B)
23	TC/ (Transmit Timing-B)
24	RD (Receive Data-B)
25	RTS/ (Request to Send-B)
26	RC/ (Receive Timing-B)
27	CTS/ (Clear to Send-B)
37	SGND (Signal Ground)
29	DM (Data Mode-B) (DSR-B)
30	TR (Terminal Ready-B) (DTR-B)
31	RR (Receiver Ready-B) (CD-B)
35	XTC/ (External Transmit Clock-B)

APPENDIX E

**PATTON ELECTRONICS MODEL 3004-ECB/X.21
INTERFACE PIN ASSIGNMENT**

**X.21 Interface Pin Description
(DB-15 Connector)**

<u>Pin #</u>	<u>Signal</u>
1	FG (Frame Ground)
2	TD (Transmit Data-A)
3	C (Control-A)
4	R (Receive-A)
5	I (Indication-A)
6	S (Signal Timing-A)
8	SGND (Signal Ground)
9	T/ (Transmit-B)
10	C/ (Control-B)
11	R/ (Receive-B)
12	I/ (Indication-B)
13	S/ (Signal Timing-B)