

PRELIMINARY

**1782-JDB4 and 1782-JDB8
SmartMux-Lite™ / DeviceNet™
User's Manual**

-

Addendum for Counting Functions



Western Reserve Controls, Inc.

PRELIMINARY

Although every effort has been made to insure the accuracy of this document, all information is subject to change without notice. WRC takes no liability for any errors in this document or for direct, indirect, incidental or consequential damage resulting from the use of this manual.

Document PUB 10.0 Addendum
Rev 1.12
June 2000

Copyright © 2000 WRC

Western Reserve Controls, Inc.

1485 Exeter Road
Akron OH 44306
330-733-6662 (Phone)
330-733-6663 (FAX)
sales@wrcakron.com (Email)
<http://www.wrcakron.com> (Web)

SmartMux, SmartMux-Lite and WRC are trademarks of Western Reserve Controls.
DeviceNet is a trademark of the Open DeviceNet Vendor Association ("ODVA").
All other trademarks are property of their respective companies.

PRELIMINARY

A. Summary

The 1782-JDB4 and 1782-JDB8 SmartMux-Lite™ DeviceNet products are being updated to include counting functions. This addendum to the users manual describes the counting features and operation, which is incorporated into Version 2 of the products.

The 1782-JDB4 and 1782-JDB8 (collectively referred to as "JDBx" or SmartMux-Lite) have been updated to allow the option for you to select any or all of the first 3 channels (channels 0, 1 and/or 2) as counting inputs. Each channel operates as an independent 16-bit (2 byte)counter up to 2 kHz. Counting selections include:

- Up counting or down counting
- Positive or negative transition counting
- Change of state counting

These selections are made in the Parameter object, which is described below.

The count data is returned as a part of the poll response from the JDBx. This is described in detail below. Each of the counters current ON/OFF status is still reported in the poll response message.

In addition, each counter can be independently cleared upon command from the DeviceNet Master. This is done by setting the counters' respective bits in a one-byte datum value in the poll command message.

B. Basic Operation

The Parameter object is used to define the channels as instantaneous only inputs or as counter inputs. The Parameter Object is extended to allow setting up counters modes using instance:

- 7 = counter on channel 0
- 8 = counter on channel 1
- 9 = counter on channel 2

You can define the following modes, or actions, for these counters using the parameters:

- 0 = No Counter on this channel
- 1 = Count UP on positive transitions
- 2 = Count UP on negative transitions
- 3 = Count UP on ALL transitions
- 129 = 81 (hex) = Count DOWN on positive transitions
- 130 = 82 (hex) = Count DOWN on negative transitions
- 131 = 83 (hex) = Count DOWN on ALL transitions

The JDBx is defined with all counters off as default from the factory and parameters 7-9 are set to 0 (zero). In this case both the poll command and poll response lengths are set to 1 (one). Byte. As counters are defined by setting the parameters to the mode values above, the poll command size is changed to 2 bytes and the poll response size is incremented by 2 bytes for each counter defined.

PRELIMINARY

When a mode value is set in the parameter object to define a counter, the counter is set to zero. If the counter was not active when the mode value is set, the poll response length will be increased by 2. After setting 1 or more counters to be active, the user must use the Master device to deallocate, then re-allocate the connection before the poll response will be correct.

If any counter is active, the poll request message will require an additional byte to be sent. This byte contains the "clear counter flag", 1 bit per counter. This byte will be zero while the counter is operating. Any or all counters can be reset (cleared) during any poll command action. Each counter is preset to 0 (zero) upon activation.

Mode values, like the other parameters, are saved in non-volatile memory and are restored after a power cycle. On power up, counters are zeroed.

PRELIMINARY

C. Parameter Configuration

A JDBx Multiplexer is software-configured for several parameters. The table below defines the legal values and the default values for the I/O configuration selections available.

Table C-1 Configuration Parameters

Parameter	Param. Instance	Parameter Choices	Default Setting	Default Value
Outputs Enabled	1	Each Channel Disabled/Enabled	No Outputs Enabled	0
Change-of-State	2	Each Channel Disabled/Enabled	No COS Inputs Active	0
Output Fault Action	3	Hold Last State/Value	Fault Value	0
Output Fault Value	4	OFF/ON	Turn OFF	0
Output Idle Action	5	Hold Last State/Value	Idle Value	0
Output Idle Value	6	OFF/ON	Turn OFF	0
Counter Mode – Channel 0	7	0 = Inactive 1 = Count up, positive transitions 2 = Count up, negative transitions 3 = Count up, any transitions 129 (81 hex) = Count down, positive transitions 130 (82 hex) = Count down, negative transitions 131 (83 hex) = Count down, any transitions	Inactive	0
Counter Mode – Channel 1	8	Define action of the counter (Same as above)	Inactive	0
Counter Mode – Channel 2	9	Define action of the counter (Same as above)	Inactive	0

PRELIMINARY

Definitions of these parameters are as follows:

1. **Outputs Enabled:** A bit for each module position which determines whether the position will use output modules or input modules.
2. **Change-of-State:** A bit for each input position which will determine whether or not a changes in the value to that position will result in all the input data being sent immediately to the JDBx's master device.
3. **Output Fault Action:** Selection to determine whether each output will hold its last state or assume the value identified in the next parameter upon a device fault.
4. **Output Fault Value:** The value each output will assume after a Fault if hold last state is not selected.
5. **Output Idle Action:** Selection to determine whether each output will hold its last state or assume the value identified in the next parameter if an Idle Command is issued by the Master.
6. **Output Idle Value:** The value each output will assume upon an Idle Command if hold last state is not selected.
7. **Counter Mode:** Defines the counting action for counter at input channel 0.
8. **Counter Mode:** Defines the counting action for counter at input channel 1.
9. **Counter Mode:** Defines the counting action for counter at input channel 2.

PRELIMINARY

D. I/O Formats and Assembly Objects

D.1. Input Assembly

JDB4 Discrete Input Assembly Data Attribute Format

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Reserved				Input 3	Input 2	Input 1	Input 0
1	First Counter – low byte				(only if at least one (1) counter is active)			
2	First Counter – high byte				(only if at least one (1) counter is active)			
3	Second Counter – low byte				(only if at least two (2) counters are active)			
4	Second Counter – high byte				(only if at least two (2) counters are active)			
5	Third Counter – low byte				(only if all three (3) counters are active)			
6	Third Counter – high byte				(only if all three (3) counters are active)			

Table D-1 JDB8 Discrete Input Assembly Data Attribute Format

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Input 7	Input 6	Input 5	Input 4	Input 3	Input 2	Input 1	Input 0
1	First Counter – low byte				(only if at least one (1) counter is active)			
2	First Counter – high byte				(only if at least one (1) counter is active)			
3	Second Counter – low byte				(only if at least two (2) counters are active)			
4	Second Counter – high byte				(only if at least two (2) counters are active)			
5	Third Counter – low byte				(only if all three (3) counters are active)			
6	Third Counter – high byte				(only if all three (3) counters are active)			

The poll response sizes are:

- 0 bytes – no counters active
- 3 bytes – 1 counter active
- 5 bytes – 2 counters active
- 7 bytes – 3 counters active

D.2. Output Assembly Object

PRELIMINARY

Table D-2 JDB4 Command Assembly

Table D-3

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	0 (reserved)				Output 3	Output 2	Output 1	Output 0
1	0 (reserved)					Ctr 2 Reset Flag	Ctr 1 Reset Flag	Ctr 0 Reset Flag

Table D-4 JDB8 Command Assembly

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Output 7	Output 6	Output 5	Output 4	Output 3	Output 2	Output 1	Output 0
1	0 (reserved)					Ctr 2 Reset Flag	Ctr 1 Reset Flag	Ctr 0 Reset Flag