Installation Instructions

Original Instructions

Allen-Bradley
by ROCKWELL AUTOMATION

FLEX I/O Digital DC Output Modules

Catalog Numbers 1794-OB8, 1794-OB8EP, 1794-OB16, 1794-OB16P, 1794-OB32P

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Summary of Changes

This publication contains the following new or updated information. This list includes substantive updates only and is not intended to reflect all changes.

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Rockwell Automation

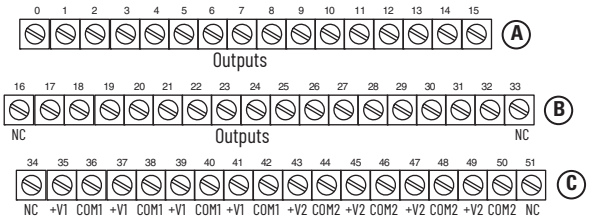
Connect Wiring for 1794-OB32P

1. Connect individual output wiring (Output 0...15) to numbered terminals on the 0...15 row (A) as indicated in Table 3.
2. Connect the associated power to the +V1 terminal (35, 37, 39, or 41) on the 34...51 row (C) as indicated in Table 3.
3. Connect the associated output common (-V1) for Output 0...15 to COM1 (terminal 36, 38, 40, or 42) on the 34...51 row (C).
4. Connect individual output wiring (Output 16...31) to numbered terminals on the 16...33 row (B) as indicated in Table 3.
5. Connect the associated power to the +V2 terminal (43, 45, 47, or 49) on the 34...51 row (C) as indicated in Table 3.
6. Connect the associated output common (-V2) for Output 16...31 to COM2 (terminals 44, 46, 48, or 50) on the 34...51 row (C).
7. If continuing power to the next terminal base, connect a jumper from terminal 35, 37, 39, or 41 (+V1) and 43, 45, 37, or 49 (+V2) on this base unit to the power terminal on the next base unit.
8. If continuing output common return to the next base unit, connect a jumper from terminal 36, 38, 40, or 42 (COM1) and 44, 46, 48, or 50 (COM2) on this base unit to common on the next base unit. See the installation instructions for the terminal base unit.

IMPORTANT Total current draw through terminal base connection is limited to 10 A. Separate power connections to each terminal base may be necessary.

Figure 3 - Connect Wiring for 1794-TB32 and 1794-TB32S

+V1 = Terminals 35, 37, 39 and 41
+V2 = Terminals 43, 45, 47 and 49
COM1 = Terminals 36, 38, 40 and 42
COM2 = Terminals 44, 46, 48 and 50
NC = No connections (terminals 16, 33, 34 and 51)



(1794-TB32 shown)

Table 3 - Wiring Connections for the 1794-OB32P Module
Use with a 1794-TB32 or 1794-TB32S Terminal Base

Output	Output Terminal	Common	Power
Output 0	A-0	Connect common to terminals 36, 38, 40, and 42	Connect power to terminals 35, 37, 39, and 41
Output 1	A-1		
Output 2	A-2		
Output 3	A-3		
Output 4	A-4		
Output 5	A-5		
Output 6	A-6		
Output 7	A-7		
Output 8	A-8		
Output 9	A-9		
Output 10	A-10		
Output 11	A-11		
Output 12	A-12		
Output 13	A-13		
Output 14	A-14		
Output 15	A-15		
Output 16	B-17	Connect common to terminals 44, 46, 48, and 50	Connect power to terminals 43, 45, 47, and 49
Output 17	B-18		
Output 18	B-19		
Output 19	B-20		
Output 20	B-21		
Output 21	B-22		
Output 22	B-23		
Output 23	B-24		
Output 24	B-25		
Output 25	B-26		
Output 26	B-27		
Output 27	B-28		
Output 28	B-29		
Output 29	B-30		
Output 30	B-31		
Output 31	B-32		

Table 3 - Wiring Connections for the 1794-OB32P Module (Continued)
Use with a 1794-TB32 or 1794-TB32S Terminal Base

Output	Output Terminal	Common	Power
For Outputs 0...15, use +V1 and COM1			
+V1 DC power	Power terminals 35, 37, 39, and 41		
COM1 DC Return	Common terminals 36, 38, 40, and 42		
For Outputs 16...31, use +V2 and COM2			
+V2 DC power	Power terminals 43, 45, 47, and 49		
COM2 DC Return	Common terminals 44, 46, 48, and 50		

Configure Your 1794-OB8EP Output Module

Configure your output module by setting bits in the configuration word.

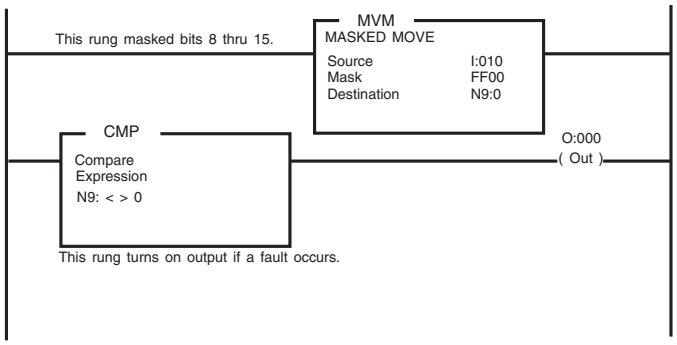
Table 4 - Image Table Memory Map for 1794-OB8EP

Dec	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Oct	**17**	**16**	**15**	**14**	**13**	**12**	**11**	**10**	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**0**
Read	F7	F6	F5	F4	F3	F2	F1	F0	Reserved(1)							
Write	Not used							FR	07	06	05	04	03	02	01	00
Where:	O = Output – 00 corresponds to output 0, 01 corresponds to output 1, and so on. F = Overload fault bit – 1 = fault present; 0 = no fault FR = Fault reset bit – 1 = reset output; 0 = no change															

(1) The unused lower byte in read word 1 floats during operation. Do not use this byte for fault status. See Program the 1794-OB8EP Module.

Program the 1794-OB8EP Module

If your program automatically checks for fault bits, bits 8...15 of read word 1 must be masked. This is a sample program for a module at rack address 1, group 0. Add similar rungs to your program.



Reset a Fault on the 1794-OB8EP – You can reset the faults three ways: Press the fault reset button on the front of the module; or toggle the output reset bit (write word 1, bit 08); or cycle backplane power.

Use the Reset Button on the 1794-OB8EP – When you press the reset button, the fault indicator for the faulted output turns off for about 1.2 s. After the delay, the faulted output attempts to turn on. If the external condition causing the fault is corrected, the output will remain on, the fault indicator is off, and the status indicator is on.

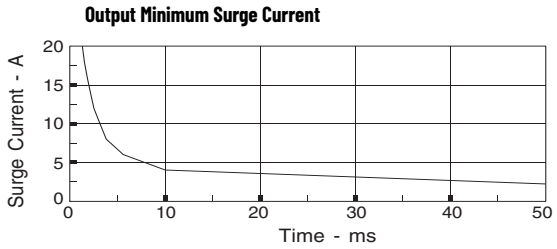
Configure Your 1794-OB8, 1794-OB16, 1794-OB16P, and 1794-OB32P Output Modules

Configure your output module by setting bits in the configuration word (Word 3).

Table 5 - Image Table Memory Map for 1794-OB8, 1794-OB16, 1794-OB16P, and 1794-OB32

Dec	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Oct	**17**	**16**	**15**	**14**	**13**	**12**	**11**	**10**	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**0**
Read	Not used															
Write	015	014	013	012	011	010	09	08	07	06	05	04	03	02	01	00
Write **1794-OB32P** only	031	030	029	028	027	026	025	024	023	022	021	020	019	018	017	016
Where:	O = Output – 00 corresponds to output 0, 01 corresponds to output 1, and so on. **1794-OB8** uses outputs 0...7; 1**794-OB16 and 1794-OB16P** use outputs 0...15; **1794-OB32P** uses outputs 0...31.															

Figure 4 - Surge Current for 1794-OB8EP



Specifications – 1794-OB16 and 1794-OB16P

Attribute	1794-OB16	1794-OB16P
Number of outputs	16, current, sourcing	
Recommended terminal base unit	1794-TB2,1794-TB3,1794-TB3S, 1794-TB3K, 1794-TB3SK	
On-state voltage, min	10V DC	
On-state voltage, nom	24V DC	
On-state voltage, max	31.2V DC (see Figure 5)	
Output current rating	8.0 A (16 outputs @ 0.5 A)	
On-state current, min per channel	1.0 mA	
On-state current, max per channel	500 mA	
On-state voltage drop, max	0.5V DC	
Surge current, repeatable every 2 seconds	2 A for 50 ms	1.5 A for 50 ms
Off-state leakage current, max	0.5 mA	
Isolation voltage	50V (continuous), Basic Insulation Type Tested at 850V DC for 1 s between user and system No isolation between individual channels	50V (continuous), Basic Insulation Type Type tested at 2121V DC for 60 s, between field side and system No isolation between individual channels
Output signal delay Off to On On to Off	 0.5 ms 1.0 ms	
Flexbus current	80 mA @ 5V DC	60 mA @ 5V DC
Power dissipation, max	5.3 W @ 31.2V DC	5.0 W @ 31.2V DC
Thermal dissipation, max	18.1 BTU/hr @ 31.2V DC	17.0 BTU/hr @ 31.2V DC
Fusing	Module outputs are not fused. Fusing is recommended. If fusing is desired, you must provide external fusing. Use SAN-O MQ4-800mA fuses.	Outputs are electronically protected

Specifications – 1794-OB32P

Attribute	Value
Number of outputs	32, current, sourcing
Recommended terminal base unit	1794-TB32, 1794-TB32S
On-state voltage, min	10V DC
On-state voltage, nom	24V DC
On-state voltage, max	31.2V DC
Output current rating	14.0 A max per module (6 A total for channels 0…15; 8 A total for channels 16…31)
On-state current, min per channel	1.0 mA
On-state current, max per channel	500 mA
On-state voltage drop, max	0.5V DC
Surge current	2 A for 50 ms, repeatable every 2 seconds
Off-state leakage current, max	0.5 mA
Isolation voltage	50V (continuous), Basic Insulation Type Type tested at 850V DC for 60 s, between field side and system No isolation between individual channels
Output signal delay Off to On On to Off	 0.5 ms 1.0 ms
Flexbus current	80 mA @ 5V DC
Power dissipation, max	5.3 W @ 32.1V DC
Thermal dissipation, max	18.1 BTU/hr @ 31.2V DC
Fusing	Outputs are electronically protected.

General Specifications

Attribute	1794-OB8	1794-OB8EP	1794-OB16	1794-OB16P	1794-OB32P
Off-state voltage, max	31.2V DC				
Terminal base screw torque	Determined by the installed terminal base				
Keyswitch position	2				
Indicators (field side indication)	8 yellow status indicators	8 yellow status indicators 8 red fault indicators	16 yellow status indicators	16 yellow status indicators	32 yellow status indicators
External DC power supply voltage, nom	24V DC				
External DC power voltage range	19.2...31.2V DC (includes 5% AC ripple)	19.2...31.2V DC (includes 5% AC ripple)	19.2...31.2V DC (includes 5% AC ripple)	10...31.2V DC (includes 5% AC ripple)	10...31.2V DC (includes 5% AC ripple)
External DC power supply current	25 mA @ 24V DC (10...35 mA)	80 mA @ 24V DC	49 mA @ 24V DC (20...65 mA)	60 mA @ 24V DC (25...75 mA)	219 mA @ 24V DC (104 mA @ 10V DC; 278 mA @ 31.2V DC)
Wiring category[1]	2 - on signal ports				
Wire size	Determined by installed terminal base				
Dimensions, approx. (H x W x D) (with module installed)	94 x 94 x 69 mm (3.7 x 3.7 x 2.7 in.)				
Weight, approx.	73 g (2.57 oz.)	104 g (3.66 oz.)	78 g (2.75 oz.)	74 g (2.61 oz.)	85 g (2.99 oz.)
Enclosure type rating	None (open-style)				
North American temp code	T4A	T4A	T4A	T3C	T3C
UKEX/ATEX temp code	T4	T4	T4	T3	–
IECEx temp code	T4	T4	T4	T3	–

(1) Use this Conductor Category information for planning conductor routing. See the Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.

Environmental Specifications

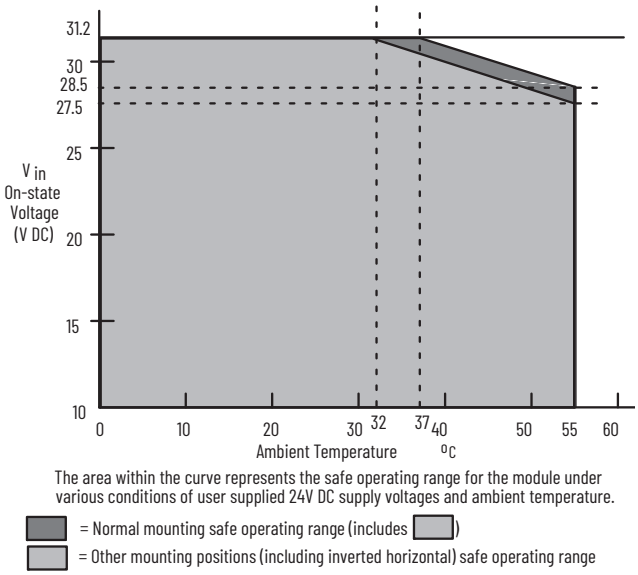
Attribute	Value
Temperature, operating	IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock): -20...+55 °C (-4...+131 °F) – **1794-OB8, 1794-OB8EP, 1794-OB16, 1794-OB16P** 0...55 °C (32...131 °F) – **1794-OB32P**
Temperature, surrounding air, max.	55 °C (131 °F)
Temperature, nonoperating	IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock): -40...+85 °C (-40...+185 °F)
Relative humidity	IEC 60068-2-30 (Test Db, Unpackaged Damp Heat): 5...95% non-condensing
Vibration	IEC60068-2-6 (Test Fc, Operating): 5 g @ 10...500 Hz
Shock, operating	IEC60068-2-27 (Test Ea, Unpackaged shock): 30 g
Shock, nonoperating	IEC60068-2-27 (Test Ea, Unpackaged shock): 50 g
Emissions	CISPR 11: Group 1, Class A (with appropriate enclosure)
ESD immunity	IEC 61000-4-2: 6 kV contact discharges 8 kV air discharges
Radiated RF immunity	IEC 61000-4-3: 10V/m with 1 kHz sine-wave 80% AM from 80...6000 MHz
EFT/B immunity	IEC 61000-4-4: ±2 kV @ 5 kHz on power ports – **1794-OB8, 1794-OB16, 1794-OB32P** ±3 kV @ 5 kHz on power ports – **1794-OB8EP, 1794-OB16P** ±2 kV @ 5 kHz on signal ports – **1794-OB8, 1794-OB16, 1794-OB32P** ±3 kV @ 5 kHz on signal ports – **1794-OB8EP, 1794-OB16P**
Surge transient immunity	IEC 61000-4-5: ±1 kV line-line(DM) and ±2 kV line-earth(CM) on signal ports
Conducted RF immunity	IEC 61000-4-6: 10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz

Certifications

Certifications (when product is marked)(1)	Value
c-UL-us	**For 1794-OB8, 1794-OB8EP, 1794-OB16, 1794-OB16P** UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584. UL Listed for Class I Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810. **For 1794-OB32P** UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E322657. UL Listed for Class I Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E334470.
UK and CE	UK Statutory Instrument 2016 No. 1091 and European Union 2014/30/EU EMC Directive, compliant with: EN 61326-1; Meas./Control/Lab., Industrial Requirements EN 61000-6-2; Industrial Immunity EN 61131-2; Programmable Controllers EN 61000-6-4; Industrial Emissions UK Statutory Instrument 2012 No. 3032 and European Union 2011/65/EU RoHS, compliant with: EN 63000; Technical documentation
Ex	UK Statutory Instrument 2016 No. 1107 and European Union 2014/34/EU ATEX Directive, compliant with: EN IEC 60079-0; General Requirements EN IEC 60079-7; Explosive Atmospheres, Protection "e" II 3 G Ex ec IIC T4 Gc – **1794-OB8, 1794-OB8EP, 1794-OB16** II 3 G Ex ec IIC T3 Gc – **1794-OB16P** DEMKO 14 ATEX 1342501X UL22UKEX2378X
IECEx	IECEx System, compliant with: IEC 60079-0; General Requirements IEC 60079-7; Explosive Atmospheres, Protection "e" Ex ec IIC T4 Gc – **1794-OB8, 1794-OB8EP, 1794-OB16** Ex ec IIC T3 Gc – **1794-OB16P** IECEx UL 14.0066X
TÜV	**For 1794-OB8EP, 1794-OB16, 1794-OB16P** TÜV Certified for Functional Safety: up to and including SIL 2
RCM	Australian Radiocommunications Act, compliant with: EN 61000-6-4; Industrial Emissions
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3
Morocco	Arrêté ministériel n° 6404-15 du 29 ramadan 1436
CCC	**For 1794-OB8, 1794-OB8EP, 1794-OB16, 1794-OB16P** CNCA-C23-01 强制性产品认证实施规则 防爆电气 CNCA-C23-01 CCC Implementation Rule Explosion-Proof Electrical Products 2020122309111829

(1) See the Product Certification link at rok.auto/certifications for Declarations of Conformity, Certificates, and other certification details.

Figure 5 - Derating Curve for 1794-OB16P



Normal Mounting - Horizontal