Installation Instructions

Original Instructions

Allen-Bradley
by ROCKWELL AUTOMATION

FLEX I/O 8 Output HART Analog Module

Catalog Number 1794-OE8H, Series B

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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Updated template	throughout
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Overview

The FLEX™ I/O output HART analog module can be used with ControlNet®, EtherNet/IP™, and Profibus-DP (1794-APBDV1 only) adapters. When using a series B module with a series B profile, you must have a ControlNet adapter with firmware revision 5.1 or later, or an EtherNet/IP adapter with firmware revision 4.2 or later.

For this scenario (series A profile with a series B Module), the data maps (input, configuration, and extended configuration) are designated as series A mode. All other data maps are for a series B module with a series B profile.

Only use the series A configuration when you replace a series A module with a series B module. If you access the series A configuration while using the module as a series B, unpredictable operation of the module may occur.

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ATTENTION: Read this document and the documents listed in the Additional Resources section about installation, configuration and operation of this equipment before you install, configure, operate or maintain this product. Users are required to familiarize themselves with installation and wiring instructions in addition to requirements of all applicable codes, laws, and standards.

Activities including installation, adjustments, putting into service, use, assembly, disassembly, and maintenance are required to be carried out by suitably trained personnel in accordance with applicable code of practice. If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

注意：在安装、配置、操作和维护本产品前，请阅读本文档以及 “ 其他资源 ” 部分列出的有关设备安装、配置和操作的相应文档。除了所有适用规范、法律和标准的相关要求之外，用户还必须熟悉安装和接线说明。

安装、调整、投运、使用、组装、拆卸和维护等各项操作必须由经过适当训练的专业人员按照适用的操作规范实施。

如果未按照制造商指定的方式使用该设备，则可能会损害设备提供的保护。

ATENCIÓN: Antes de instalar, configurar, poner en funcionamiento o realizar el mantenimiento de este producto, lea este documento y los documentos listados en la sección Recursos adicionales acerca de la instalación, configuración y operación de este equipo. Los usuarios deben familiarizarse con las instrucciones de instalación y cableado y con los requisitos de todos los códigos, leyes y estándares vigentes.

El personal debidamente capacitado debe realizar las actividades relacionadas a la instalación, ajustes, puesta en servicio, uso, ensamblaje, desensamblaje y mantenimiento de conformidad con el código de práctica aplicable. Si este equipo se usa de una manera no especificada por el fabricante, la protección provista por el equipo puede resultar afectada.

ATENÇÃO: Leia este e os demais documentos sobre instalação, configuração e operação do equipamento que estão na seção Recursos adicionais antes de instalar, configurar, operar ou manter este produto. Os usuários devem se familiarizar com as instruções de instalação e fiação além das especificações para todos os códigos, leis e normas aplicáveis.

É necessário que as atividades, incluindo instalação, ajustes, colocação em serviço, utilização, montagem, desmontagem e manutenção sejam realizadas por pessoal qualificado e especializado, de acordo com o código de prática aplicável.

Caso este equipamento seja utilizado de maneira não estabelecida pelo fabricante, a proteção fornecida pelo equipamento pode ficar prejudicada.

ВНИМАНИЕ: Перед тем как устанавливать, настраивать, эксплуатировать или обслуживать данное оборудование, прочитайте этот документ и документы, перечисленные в разделе «Дополнительные ресурсы». В этих документах изложены сведения об установке, настройке и эксплуатации данного оборудования. Пользователи обязаны ознакомиться с инструкциями по установке и прокладке соединений, а также с требованиями всех применимых норм, законов и стандартов.

Все действия, включая установку, наладку, ввод в эксплуатацию, использование, сборку, разборку и техническое обслуживание, должны выполняться обученным персоналом в соответствии с применимыми нормами и правилами.

Если оборудование используется не предусмотренным производителем образом, защита оборудования может быть нарушена.

注意：本製品を設置、構成、稼動または保守する前に、本書および本機器の設置、設定、操作についての参考資料の該当箇所に記載されている文書に目を通してください。ユーザは、すべての該当する条例、法律、規格の要件に加えて、設置および配線の手順に習熟している必要があります。

設置調整、運転の開始、使用、組立て、解体、保守を含む諸作業は、該当する実施規則に従って訓練を受けた適切な作業員が実行する必要があります。

本機器が製造メーカにより指定されていない方法で使用されている場合、機器により提供されている保護が損なわれる恐れがあります。

ACHTUNG: Lesen Sie dieses Dokument und die im Abschnitt „Weitere Informationen“aufgeführten Dokumente, die Informationen zu Installation, Konfiguration und Bedienung dieses Produkts enthalten, bevor Sie dieses Produkt installieren, konfigurieren, bedienen oder warten. Anwender müssen sich neben den Bestimmungen aller anwendbaren Vorschriften, Gesetze und Normen zusätzlich mit den Installations- und Verdrahtungsanweisungen vertraut machen.

Arbeiten im Rahmen der Installation, Anpassung, Inbetriebnahme, Verwendung, Montage, Demontage oder Instandhaltung dürfen nur durch ausreichend geschulte Mitarbeiter und in Übereinstimmung mit den anwendbaren Ausführungsvorschriften vorgenommen werden.

Wenn das Gerät in einer Weise verwendet wird, die vom Hersteller nicht vorgesehen ist, kann die Schutzfunktion beeinträchtigt sein.

ATTENTION : Lisez ce document et les documents listés dans la section Ressources complémentaires relatifs à l'installation, la configuration et le fonctionnement de cet équipement avant d'installer, configurer, utiliser ou entretenir ce produit. Les utilisateurs doivent se familiariser avec les instructions d'installation et de câblage en plus des exigences relatives aux codes, lois et normes en vigueur.

Les activités relatives à l'installation, le réglage, la mise en service, l'utilisation, l'assemblage, le démontage et l'entretien doivent être réalisées par des personnes formées selon le code de pratique en vigueur.

Si cet équipement est utilisé d'une façon qui n'a pas été définie par le fabricant, la protection fournie par l'équipement peut être compromise.

주의: 본 제품 설치, 설정, 작동 또는 유지 보수하기 전에 본 문서를 포함하여 설치, 설정 및 작동에 관한 참고 자료 섹션의 문서들을 반드시 읽고 숙지하십시오. 사용자는 모든 관련 규정, 법규 및 표준에서 요구하는 사항에 대해 반드시 설치 및 배선 지침을 숙지해야 합니다 .

설치 , 조정 , 가동 , 사용 , 조립 , 분해 , 유지보수 등 모든 작업은 관련 규정에 따라 적절한 교육을 받은 사용자를 통해서만 수행해야 합니다 .

본 장비를 제조사가 명시하지 않은 방법으로 사용하면 장비의 보호 기능이 손상될 수 있습니다 .

ATTENZIONE Prima di installare, configurare ed utilizzare il prodotto, o effettuare interventi di manutenzione su di esso, leggere il presente documento ed i documenti elencati nella sezione “Altre risorse”, riguardanti l'installazione, la configurazione ed il funzionamento dell'apparecchiatura. Gli utenti devono leggere e comprendere le istruzioni di installazione e cablaggio, oltre ai requisiti previsti dalle leggi, codici e standard applicabili.

Le attività come installazione, regolazioni, utilizzo, assemblaggio, disassemblaggio e manutenzione devono essere svolte da personale adeguatamente addestrato, nel rispetto delle procedure previste.

Qualora l'apparecchio venga utilizzato con modalità diverse da quanto previsto dal produttore, la sua funzione di protezione potrebbe venire compromessa.

DİKKAT: Bu ürünün kurulumu, yapılandırılması, işletilmesi veya bakımı öncesinde bu dokümanı ve bu ekipmanın kurulumu, yapılandırılması ve işletimi ile ilgili İlave Kaynaklar bölümünde yer listelenmiş dokümanları okuyun. Kullanıcılar yürürlükteki tüm yönetmelikler, yasalar ve standartların gereksinimlerine ek olarak kurulum ve kablolama talimatlarını da öğrenmek zorundadır.

Kurulum, ayarlama, hizmete alma, kullanma, parçaları birleştirme, parçaları sökme ve bakım gibi aktiviteler sadece uygun eğitimleri almış kişiler tarafından yürürlükteki uygulama yönetmeliklerine uygun şekilde yapılabilir.

Bu ekipman üretici tarafından belirlenmiş amacın dışında kullanılırsa, ekipman tarafından sağlanan koruma bozulabilir.

注意事項：在安裝、設定、操作或維護本產品前，請先閱讀此文件以及列於 「其他資源」章節中有關安裝、設定與操作此設備的文件。使用者必須熟悉安裝和配線指示，並符合所有法規、法律和標準要求。

包括安装、調整、交付使用、使用、組裝、拆卸和維護等動作都必須交由已經過適當訓練的人員進行，以符合適用的實作法規。

如果將設備用於非製造商指定的用途時，可能會造成設備所提供的保護功能受損。

POZOR: Než začnete instalovat, konfigurovat či provozovat tento výrobek nebo provádět jeho údržbu, přečtěte si tento dokument a dokumenty uvedené v části Dodatečné zdroje ohledně instalace, konfigurace a provozu tohoto zařízení. Uživatelé se museji vedle požadavků všech relevantních vyhlášek, zákonů a norem nutně seznámit také s pokyny pro instalaci a elektrické zapojení.

Činnosti zahrnující instalaci, nastavení, uvedení do provozu, užívání, montáž, demontáž a údržbu musí vykonávat vhodně proškolený personál v souladu s příslušnými prováděcími předpisy.

Pokud se toto zařízení používá způsobem neodpovídajícím specifikaci výrobce, může být narušena ochrana, kterou toto zařízení poskytuje.

UWAGA: Przed instalacją, konfiguracją, użytkowaniem lub konserwacją tego produktu należy przeczytać niniejszy dokument oraz wszystkie dokumenty wymienione w sekcji Dodatkowe źródła omawiające instalację, konfigurację i procedury użytkowania tego urządzenia. Użytkownicy mają obowiązek zapoznać się z instrukcjami dotyczącymi instalacji oraz oprzewodowania, jak również z obowiązującymi kodeksami, prawem i normami.

Działania obejmujące instalację, regulację, przekazanie do użytkowania, użytkowanie, montaż, demontaż oraz konserwację muszą być wykonywane przez odpowiednio przeszkolony personel zgodnie z obowiązującym kodeksem postępowania.

Jeśli urządzenie jest użytkowane w sposób inny niż określony przez producenta, zabezpieczenie zapewniane przez urządzenie może zostać ograniczone.

OBS! Läs detta dokument samt dokumentet, som står listat i avsnittet Övriga resurser, om installation, konfigurering och drift av denna utrustning innan du installerar, konfigurerar eller börjar använda eller utföra underhållsarbete på produkten. Användare måste bekanta sig med instruktioner för installation och kabeldragning, förutom krav enligt gällande koder, lagar och standarder.

Åtgärder som installation, justering, service, användning, montering, demontering och underhållsarbete måste utföras av personal med lämplig utbildning enligt lämpligt bruk.

Om denna utrustning används på ett sätt som inte anges av tillverkaren kan det hända att utrustningens skyddsanordningar försätts ur funktion.

LET OP: Lees dit document en de documenten die genoemd worden in de paragraaf Aanvullende informatie over de installatie, configuratie en bediening van deze apparatuur voordat u dit product installeert, configureert, bediend of onderhoudt. Gebruikers moeten zich vertrouwd maken met de installatie en de bedradingsinstructies, naast de vereisten van alle toepasselijke regels, wetten en normen.

Activiteiten zoals het installeren, afstellen, in gebruik stellen, gebruiken, monteren, demonteren en het uitvoeren van onderhoud mogen uitsluitend worden uitgevoerd door hiervoor opgeleid personeel en in overeenstemming met de geldende praktijkregels.

Indien de apparatuur wordt gebruikt op een wijze die niet is gespecificeerd door de fabrikant, dan bestaat het gevaar dat de beveiliging van de apparatuur niet goed werkt.

Rockwell Automation recognizes that some of the terms that are currently used in our industry and in this publication are not in alignment with the movement toward inclusive language in technology. We are proactively collaborating with industry peers to find alternatives to such terms and making changes to our products and content. Please excuse the use of such terms in our content while we implement these changes.

Environment and Enclosure

ATTENTION: This equipment is intended for use in a Pollution Degree 2 industrial environment, in overvoltage Category II applications (as defined in EN/IEC 60664-1), at altitudes up to 2000 m (6562 ft) without derating.
This equipment is not intended for use in residential environments and may not provide adequate protection to radio communication services in such environments.

This equipment is supplied as open-type equipment for indoor use. It must be mounted within an enclosure that is suitably designed for those specific environmental conditions that will be present and appropriately designed to prevent personal injury resulting from accessibility to live parts. The enclosure must have suitable flame-retardant properties to prevent or minimize the spread of flame, complying with a flame spread rating of 5VA or be approved for the application if nonmetallic. The interior of the enclosure must be accessible only by the use of a tool. Subsequent sections of this publication may contain more information regarding specific enclosure type ratings that are required to comply with certain product safety certifications.

In addition to this publication, see the following:

- Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1, for more installation requirements.
- NEMA Standard 250 and EN/IEC 60529, as applicable, for explanations of the degrees of protection provided by enclosures.

WARNING: If you insert or remove the module while backplane power is on, an electric arc can occur. This could cause an explosion in hazardous location installations.
Be sure that power is removed or the area is nonhazardous before proceeding.

ATTENTION: This product is grounded through the DIN rail to chassis ground. Use zinc-plated chromate-passivated steel DIN rail to assure proper grounding. The use of other DIN rail materials (for example, aluminum or plastic) that can corrode, oxidize, or are poor conductors, can result in improper or intermittent grounding. Secure DIN rail to mounting surface approximately every 200 mm (7.8 in.) and use end-anchors appropriately. Be sure to ground the DIN rail properly. See the Industrial Automation Wiring and Grounding Guidelines, Rockwell Automation publication 1770-4.1, for more information.

Preventing Electrostatic Discharge

ATTENTION: This equipment is sensitive to electrostatic discharge, which can cause internal damage and affect normal operation. Follow these guidelines when you handle this equipment:

- Touch a grounded object to discharge potential static.
- Wear an approved grounding wriststrap.
- Do not touch connectors or pins on component boards.
- Do not touch circuit components inside the equipment.
- Use a static-safe workstation, if available.
- Store the equipment in appropriate static-safe packaging when not in use.

ATTENTION: To comply with the CE Low Voltage Directive (LVD), all connected I/O must be powered from a source compliant with the following: Safety Extra Low Voltage (SELV) or Protected Extra Low Voltage (PELV).

North American Hazardous Location Approval

The following information applies when operating this equipment in hazardous locations.	**Informations sur l'utilisation de cet équipement en environnements dangereux.**
Products marked "CL I, DIV 2, GP A, B, C, D" are suitable for use in Class I Division 2 Groups A, B, C, D, Hazardous Locations and nonhazardous locations only. Each product is supplied with markings on the rating nameplate indicating the hazardous location temperature code. When combining products within a system, the most adverse temperature code (lowest "T" number) may be used to help determine the overall temperature code of the system. Combinations of equipment in your system are subject to investigation by the local Authority Having Jurisdiction at the time of installation.	Les produits marqués "CL I, DIV 2, GP A, B, C, D" ne conviennent qu'à une utilisation en environnements de Classe I Division 2 Groupes A, B, C, D dangereux et non dangereux. Chaque produit est livré avec des marquages sur sa plaque d'identification qui indiquent le code de température pour les environnements dangereux. Lorsque plusieurs produits sont combinés dans un système, le code de température le plus défavorable (code de température le plus faible) peut être utilisé pour déterminer le code de température global du système. Les combinaisons d'équipements dans le système sont sujettes à inspection par les autorités locales qualifiées au moment de l'installation.
WARNING: **Explosion Hazard –** • Do not disconnect equipment unless power has been removed or the area is known to be nonhazardous. • Do not disconnect connections to this equipment unless power has been removed or the area is known to be nonhazardous. Secure any external connections that mate to this equipment by using screws, sliding latches, threaded connectors, or other means provided with this product. • Substitution of components may impair suitability for Class I Division 2. • If this product contains batteries, they must only be changed in an area known to be nonhazardous.	**AVERTISSEMENT:** **Risque d'Explosion –** • Couper le courant ou s'assurer que l'environnement est classé non dangereux avant de débrancher l'équipement. • Couper le courant ou s'assurer que l'environnement est classé non dangereux avant de débrancher les connecteurs. Fixer tous les connecteurs externes reliés à cet équipement à l'aide de vis, loquets coulissants, connecteurs filetés ou autres moyens fournis avec ce produit. • La substitution de composants peut rendre cet équipement inadapté à une utilisation en environnement de Classe I Division 2. • S'assurer que l'environnement est classé non dangereux avant de changer les piles.

ATTENTION: For Class I Division 2 applications, use only Class I Division 2 Listed or Recognized accessories and modules that are approved for use within the FLEX I/O platform.

European Hazardous Location Approval

European Zone 2 Certification (The following applies when the product bears the Ex or EEx Marking.)
This equipment is intended for use in potentially explosive atmospheres as defined by European Union Directive 2014/34/EU and has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of Category 3 equipment intended for use in potentially explosive atmospheres, given in Annex II to this Directive.
Compliance with the Essential Health and Safety Requirements has been assured by compliance with EN 60079-15 and EN 60079-0.

ATTENTION: This equipment is not resistant to sunlight or other sources of UV radiation.

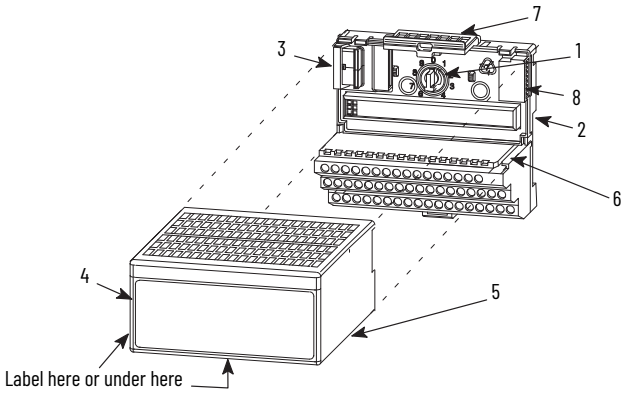
WARNING: Special Conditions for Safe Use:
- This equipment must be installed in an enclosure providing at least IP54 protection when applied in Zone 2 environments.
- This equipment shall be used within its specified ratings defined by Allen-Bradley.
- Provision shall be made to prevent the rated voltage from being exceeded by transient disturbances of more than 40% when applied in Zone 2 environments.
- This equipment must be used only with ATEX certified backplanes.
- Secure any external connections that mate to this equipment by using screws, sliding latches, threaded connectors, or other means provided with this product.
- Do not disconnect equipment unless power has been removed or the area is known to be nonhazardous.

Removal and Insertion Under Power

WARNING: When you insert or remove the module while backplane power is on, an electric arc can occur. This could cause an explosion in hazardous location installations.
Be sure that power is removed or the area is nonhazardous before proceeding.

Install the Module

Read this for information about how to install the module. The module must be used with a 1794-TB3G or 1794-TB3GS terminal base unit.



Component Identification

	Description		Description
1	Keyswitch	5	Alignment bar
2	Terminal base	6	Groove
3	Flexbus connector	7	Latching mechanism
4	Module	8	Connector cap plug

ATTENTION: During mounting of all devices, be sure that all debris (such as metal chips or wire strands) is kept from falling into the module. Debris that falls into the module could cause damage on power-up.

ATTENTION: Do not remove or replace a terminal base unit while power is applied. Interruption of the backplane can result in unintentional operation or machine motion.

IMPORTANT You must disable keying in your profile when replacing a series A module with a series B module.

To install the module on a FLEX I/O terminal base, reference the figure and complete the following.

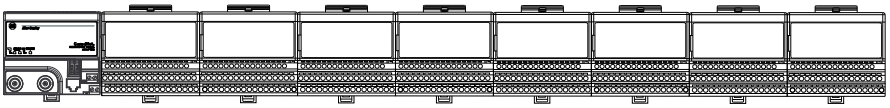
1. Rotate the keyswitch on the terminal base clockwise to position **4** as required for this type of module.

IMPORTANT Do not change the position of the keyswitch after wiring the terminal base unit.

2. Make sure the that Flexbus connector is pushed all the way to the left to connect with the neighboring terminal base or adapter.

IMPORTANT You cannot install the module unless the Flexbus connector is fully extended.

3. Make sure the pins on the bottom of the module are straight so that they align properly with the connector in the terminal base.
4. Position the module with its alignment bar aligned with the groove on the terminal base.
5. Press firmly and evenly to seat the module in the terminal base unit. The module is seated when the latching mechanism is locked into the module.

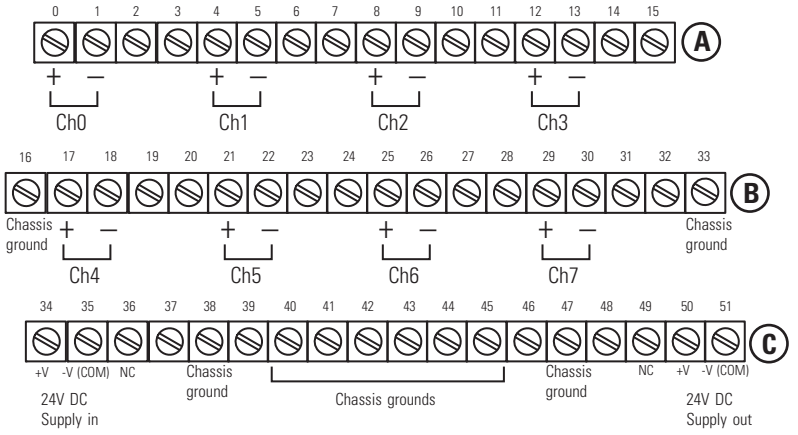


6. Remove the cap plug and attach another terminal base unit to the right of this terminal base unit if necessary.

Wire the Module

WARNING: If you connect or disconnect wiring while the field-side power is on, an electric arc can occur. This could cause an explosion in hazardous location installations.
Be sure that power is removed or the area is nonhazardous before proceeding.

Figure 1 - Module Wiring



+V = +24V DC = Terminals C-34 and C-50
-V = COM = Terminals C-35 and C-51
Chassis ground = Terminals B-16, B-33, C-38, C-40…45, and C-47
NC = No connection
For daisy chaining : Supply in = Terminals C-34 (+V) and C-35 (COM)
Supply out = Terminals C-50 (+V) and C-51 (COM)

(1794-TB3G shown)

To connect two-wire transmitter devices for 1794-TB3G and 1794-TB3GS bases, see Figure 1 and Table 1 and complete the following.

1. Connect the individual output wiring to (+) terminals (0, 4, 8, 12) on the 0…15 row (A), and on the 16…33 row (B) (terminals 17, 21, 25, 29) as indicated in Table 1.
2. Connect the associated output to the corresponding (-) terminal (1, 5, 9, 13) on the 0…15 row (A), and on the 16…33 row (B) (terminals 18, 22, 26, 30) for each input as indicated in Table 1.
3. Connect +V DC power to terminal 34 on the 34…51 row (C).
4. Connect -V to terminal 35 on the 34…51 row (C).
5. If continuing power to the next terminal base unit, connect a jumper from terminal 50 (+V DC) on this base unit to the +V DC terminal on the next terminal base unit.
   If continuing common to the next terminal base unit, connect a jumper from terminal 51 (-V common) on this base unit to the -V Common terminal on the next terminal base unit.

ATTENTION: The 1794-OE8H module shall be used only with listed Allen-Bradley® power supply (catalog number 1794-PS13) or Listed Class 2 source.

ATTENTION: To reduce susceptibility to noise, power analog modules and digital modules from separate power supplies.

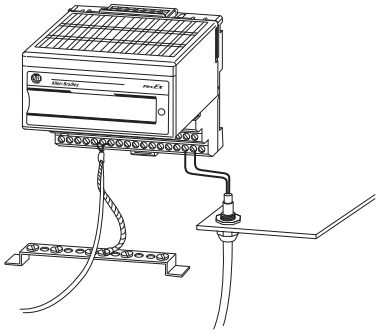
Table 1 - Wire Connections for the 1794-OE8H HART Analog Module

Output	Output +	Output -	Output	Output +	Output -
Output 0	A-0	A-1	Output 4	B-17	B-18
Output 1	A-4	A-5	Output 5	B-21	B-22
Output 2	A-8	A-9	Output 6	B-25	B-26
Output 3	A-12	A-13	Output 7	B-29	B-30
+V	Terminals C-34 and C-50				
-V	Terminals C-35 and C-51				
Terminals B-16, B-33, C-38, C-40, C-41, C-42, C-43, C-44, C-45, and C-47 are connected to chassis ground.					

ATTENTION: Do not remove or replace a terminal base unit while power is applied. Interruption of the backplane can result in unintentional operation or machine motion.

Ground the Module

All I/O wiring must use shielded wire. Shields must be terminated external to the module, such as busbars and shield-terminating feed-throughs.



Outputs

Each output can operate an analog field device. The channels in these modules are electrically connected to each other and have a common plus-line.

IMPORTANT When interconnecting several lines, you must consider the total accumulated power.

Figure 2 - 1794-OE8H Block Diagram

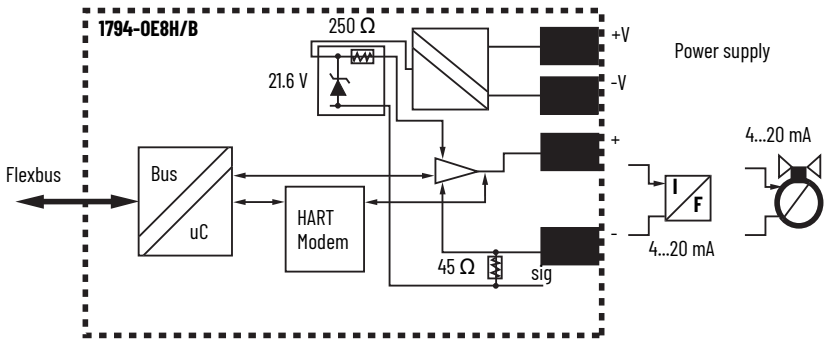


Figure 3 - Output Voltage/Currency Capability

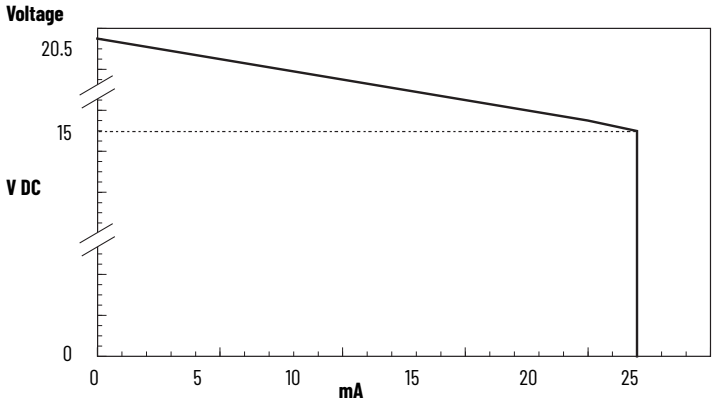


Table 2 - Input Map

Word	Bit															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
0	FA Ch7	FA Ch6	FA Ch5	FA Ch4	FA Ch3	FA Ch2	FA Ch1	FA Ch0	HR	Reserved			Diagnostic Status			
1	Reserved															
2	HCF Ch7	HCF Ch6	HCF Ch5	HCF Ch4	HCF Ch3	HCF Ch2	HCF Ch1	HCF Ch0	HF Ch7	HF Ch6	HF Ch5	HF Ch4	HF Ch3	HF Ch2	HF Ch1	HF Ch0
3	HP Ch7	HP Ch6	HP Ch5	HP Ch4	HP Ch3	HP Ch2	HP Ch1	HP Ch0	HC Ch7	HC Ch6	HC Ch5	HC Ch4	HC Ch3	HC Ch2	HC Ch1	HC Ch0
Where:	Ch = Channel FA = Fault HR = HART rebuilding HCF = HART current fault HF = HART communication fault HP = HART present HC = HART communication															

Table 3 - Output Map

Word	Bit															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
0	Reserved	FR	Reserved						DD Ch7	DD Ch6	DD Ch5	DD Ch4	DD Ch3	DD Ch2	DD Ch1	DD Ch0
1	Channel 0 Output Data															
2	Channel 1 Output Data															
3	Channel 2 Output Data															
4	Channel 3 Output Data															
5	Channel 4 Output Data															
6	Channel 5 Output Data															
7	Channel 6 Output Data															
8	Channel 7 Output Data															
Where:	Ch = Channel DD = Digital data FR = Fault reset															

Table 4 - Configuration Map

Word	Bit															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
0	LFM	VR	FE Ch7	FE Ch6	FE Ch5	FE Ch4	Byte Order Group B		HS LEDs	HSI	FE Ch3	FE Ch2	FE Ch1	FE Ch0	Byte Order Group A	
1	HD Ch7	HD Ch6	HD Ch5	HD Ch4	HD Ch3	HD Ch2	HD Ch1	HD Ch0	HHE Ch7	HHE Ch6	HHE Ch5	HHE Ch4	HHE Ch3	HHE Ch2	HHE Ch1	HHE Ch0
2	Data Format Ch3				Data Format Ch2				Data Format Ch1				Data Format Ch0			
3	Data Format Ch7				Data Format Ch6				Data Format Ch5				Data Format Ch4			
4	HART Read Back Threshold Ch1					FLE Ch1	AFM Ch1		HART Read Back Threshold Ch0					FLE Ch0	AFM Ch0	
5	HART Read Back Threshold Ch3					FLE Ch3	AFM Ch3		HART Read Back Threshold Ch2					FLE Ch2	AFM Ch2	

Table 4 - Configuration Map (Continued)

Word	Bit															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
6	HART Read Back Threshold Ch5					FLE Ch5	AFM Ch5		HART Read Back Threshold Ch4					FLE Ch4	AFM Ch04	
7	HART Read Back Threshold Ch7					FLE Ch7	AFM Ch7		HART Read Back Threshold Ch6					FLE Ch6	AFM Ch06	
8	DF Ch7	DF Ch6	DF Ch5	DF Ch4	DF Ch3	DF Ch2	DF Ch1	DF Ch0	DM Ch7	DM Ch6	DM Ch5	DM Ch4	DM Ch3	DM Ch2	DM Ch1	DM Ch0
9	Fault Value Ch0															
10	Fault Value Ch1															
11	Fault Value Ch2															
12	Fault Value Ch3															
13	Fault Value Ch4															
14	Fault Value Ch5															
15	Fault Value Ch6															
16	Fault Value Ch7															
17	HR Ch7	HR Ch6	HR Ch5	HR Ch4	HR Ch3	HR Ch2	HR Ch1	HR Ch0	HC Ch7	HC Ch6	HC Ch5	HC Ch4	HC Ch3	HC Ch2	HC Ch1	HC Ch0
Where:	LFM = Local fault mode FE = Fault enable HHE = HART handheld enable AFM = Analog fault mode DM = Digital mode HC = HART CMD 3 disable					VR = Verify replacement HD = HART disable FLE = Fault latch enabled DF = Digital fault mode HR = HART rebuild										

Table 5 - Byte Order Configuration

Byte Order Group B		Byte Order Group A		Description[1]
Bit 9	Bit 8	Bit 1	Bit 0	
0	0	0	0	Little-endian Format (Default) = All data entries are in true little-endian format.
1	0	1	0	Word Swap = Word swap only values requiring more than one word. For example: 32-bit float values
0	1	0	1	Byte Swap (reserved for future implementation) = Byte swap all words in the data table.
1	1	1	1	Big-endian Format (reserved for future implementation) = All data entries are in true big-endian format.

(1) All other combinations are invalid. Values revert to the last valid configuration (in case of original start-up this would be default configuration) and set module Diagnostic Status to "2" configuration failure.

Table 6 - Data Format - Write Words 2 and 3

Data Format	Bits				Format	Signal Range		User Range		Resolution
	15	14	13	12						
	11	10	9	8						
	7	6	5	4						
	3	2	1	0		LO	HI	LO	HI	
0	0	0	0	0	0...20 mA as Milliamps	0.00	22.00	0 (0.000 mA)	22000 (22.000 mA)	0.1% of 0...20 mA
1	0	0	0	1	0...20 mA as %	0.00	22.00	0 (0%)	11000 (110.00%)	0.2% of 0...20 mA
2	0	0	1	0	Not assigned					
3	0	0	1	1	0...20 mA as unsigned integer	0.00	20.00	0 (0.000 mA)	65535 (22.000 mA)	0.03% of 0...20 mA
4	0	1	0	0	4...20 mA as mA	2.00	22.00	2000 (2.000 mA)	22000 (22.000 mA)	0.01% of 4...20 mA
5	0	1	0	1	Not assigned					
6	0	1	1	0						
7	0	1	1	1	4...20 mA as unsigned integer	4.00	20.00	0 (4 mA)	65535 (20 mA)	0.03% of 4...20 mA
8	1	0	0	0	Not assigned					
9	1	0	0	1						
10	1	0	1	0						
11	1	0	1	1	0...20 mA as D/A count	0.00	22.00	0 (0 mA)	8000 (22 mA)	0.28% of 0...20 mA
12	1	1	0	0	Not assigned					
13	1	1	0	1	4...20 mA as %	3.00	21.00	-625 (-6.25%)	10625 (106.25%)	0.16% of 4...20 mA
14	1	1	1	0	4...20 mA as %	2.00	22.00	-1250 (-12.50%)	11250 (112.50%)	0.16% of 4...20 mA
15	1	1	1	1	Not assigned					

Cyclic HART Input Data

The HART input data holds the primary variables for the "live" HART device, and other information gathered during the normal HART scan. Additional "documentary" data is available through the pass-through message interface in the device information tables. For detailed definitions of pass through messages, see FLEX I/O HART Analog Modules User Manual, publication 1794-UM063.

IMPORTANT The HART Input Data for a channel may be zeros if HART communications are disabled for that channel. For more information on disabling HART communications, see the Disable HART communications and HART CMD 3 Disable functions in Table 4.

Table 7 - HART Input Data

Word	Bit															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
0	Reserved								Ch7 (HART Communication Status)	Ch6	Ch5	Ch4	Ch3	Ch2	Ch1	Ch0
1	Reserved															
2	Ch0 HART Field Device Status								Ch0 HART Communication Status							
3	Reserved								Ch0 HART Loop Status							
4 5	Ch0 HART Primary Value (IEEE 754-1985 Single-Precision 32 bit floating point)															
6 7	Ch0 HART Secondary Value (IEEE 754-1985 Single-Precision 32 bit floating point)															
8 9	Ch0 HART Tertiary Value (IEEE 754-1985 Single-Precision 32 bit floating point)															
10 11	Ch0 HART Fourth (Quaternary) Value (IEEE 754-1985 Single-Precision 32 bit floating point)															
12	Ch0 Secondary Value Units Code								Ch0 Primary Value Units Code							
13	Ch0 Fourth Value Units Code								Ch0 Tertiary Value Units Code							
14	Ch1 HART Field Device Status								Ch1 HART Communication Status							
15	Reserved								Ch1 HART Loop Status							
16 17	Ch1 HART Primary Value															
18 19	Ch1 HART Secondary Value															
20 21	Ch1 HART Teritiary Value															
22 23	Ch1 HART Fourth Value															
24	Ch1 HART Secondary Value Units Code								Ch1 HART Primary Value Units Code							
25	Ch1 HART Fourth Value								Ch1 HART Tertiary Value Units Code							
26	Ch2 HART Field Device Status								Ch2 HART Communication Status							
27	Reserved								Ch2 HART Loop Status							
28 29	Ch2 HART Primary Value															
30 31	Ch2 HART Secondary Value															
32 33	Ch 2 HART Tertiary Value															
34 35	Ch2 HART Fourth Value															
36	Ch2 HART Secondary Value Units Code								Ch2 HART Primary Value Units Code							
37	Ch2 HART Fourth Value								Ch2 HART Tertiary Value Units Code							
38	Ch3 HART Field Device Status								Ch3 HART Communication Status							
39	Reserved								Ch0 HART Loop Status							
40 41	Ch3 HART Primary Value															
42 43	Ch3 HART Secondary Value															
44 45	Ch3 HART Tertiary Value															

Table 7 - HART Input Data (Continued)

Word	Bit															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
46	Ch3 HART Fourth Value															
47																
48	Ch3 HART Secondary Value Units Code								Ch3 HART Primary Value Units Code							
49	Ch3 HART Fourth Value								Ch3 HART Tertiary Value Units Code							
50	Ch4 HART Field Device Status								Ch4 HART Communication Status							
51	Reserved								Ch4 HART Loop Status							
52	Ch4 HART Primary Value															
53																
54	Ch4 HART Secondary Value															
55																
56	Ch4 HART Tertiary Value															
57																
58	Ch4 HART Fourth Value															
59																
60	Ch4 HART Secondary Value Units Code								Ch4 HART Primary Value Units Code							
61	Ch4 HART Fourth Value								Ch4 HART Tertiary Value Units Code							
62	Ch5 HART Field Device Status								Ch5 HART Communication Status							
63	Reserved								Ch5 HART Loop Status							
64	Ch5 HART Primary Value															
65																
66	Ch5 Secondary Value															
67																
68	Ch5 Tertiary Value															
69																
70	Ch5 Fourth Value															
71																
72	Ch5 HART Secondary Value Units Code								Ch5 HART Primary Value Units Code							
73	Ch5 HART Fourth Value								Ch5 HART Tertiary Value Units Code							
74	Ch6 HART Field Device Status								Ch6 HART Communication Status							
75	Reserved								Ch6 HART Loop Status							
76	Ch6 HART Primary Value															
77																
78	Ch6 Secondary Value															
79																
80	Ch6 Tertiary Value															
81																
82	Ch6 Fourth Value															
83																
84	Ch6 HART Secondary Value Units Code								Ch6 HART Primary Value Units Code							
85	Ch6 HART Fourth Value								Ch6 HART Tertiary Value Units Code							
86	Ch7 HART Field Device Status								Ch7 HART Communication Status							
87	Reserved								Ch7 HART Loop Status							
88	Ch7 HART Primary Value															
89																
90	Ch7 Secondary Value															
91																
92	Ch7 Tertiary Value															
93																
94	Ch7 Fourth Value															
95																
96	Ch7 HART Secondary Value Units Code								Ch7 HART Primary Value Units Code							
97	Ch7 HART Fourth Value								Ch7 HART Tertiary Value Units Code							

Table 8 - HART Input Data Descriptions

Chn: HART CMD 3 Communication Status:	0: HART CMD 3 Communication Disabled or No Error	1: HART CMD 3 Communication Error between Adapter and Module
Chn: HART Communication Status (HART CMD 3 Response first status byte):	See the FLEX I/O HART Analog Modules User Manual, publication 1794-UM063	
Chn: HART Field Device Status (HART CMD 3 Response second status byte):	See the FLEX I/O HART Analog Modules User Manual, publication 1794-UM063	
Chn: HART Loop Status:		
Bit 0: HART Enable	0: Disabled	1: Enabled
Bit 1: Device Connected	0: Not connected	1: Connected
Bit 2: Response Error	0: No HART message failure	1: Response ended in error
Bit 3: CMD 48 Update	0: CMD 48 not updated	1: CMD 48 updated
Bit 4: HART Loop Tolerance Error	0: No HART current fault	1: HART current fault
Bit 5: HART Update	0: HART Device information not updated	1: HART Device information updated since last read
Bit 6: HART Message	0: No new message	1: HART user message queue has completed a message
Bit 7: (Reserved)		
Where:	PVA = The primary variable for this channel has been acquired. SVA = The secondary variable for this channel has been acquired. TVA = The tertiary variable for this channel has been acquired. FVA = The fourth (quaternary) variable for this channel has been acquired.	

Table 9 - HART Read Back Threshold

HART Read Back	Decimal Value	Bits				
		7	6	5	4	3
		15	14	13	12	11
Disabled	0	0	0	0	0	0
Not applicable[1]	1	0	0	0	0	1
Not applicable	2	0	0	0	1	0
Not applicable	3	0	0	0	1	1
Not applicable	4	0	0	1	0	0
5%	5	0	0	1	0	1
6%	6	0	0	1	1	0
7%	7	0	0	1	1	1
8%	8	0	1	0	0	0
9%	9	0	1	0	0	1
10%	10	0	1	0	1	0
...	...	...	...	...	...	...
30%	30	1	1	1	1	0
31%	31	1	1	1	1	1

(1) 1, 2, 3, and 4 are not applicable. Values between 1...4 lead the IOM to automatically use an internal value of 5%.

Table 10 - Configuration Map – Series A Mode

Config Word	Bit															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
0	LFM	Reserved	FM Ch2...3	FM Ch0...1	AFS Ch2...3		AFS Ch0...1		Data Format Ch2...3				Data Format Ch0...1			
1	LM Ch4...7	LM Ch0...3	FM Ch6...7	FM Ch4...5	AFS Ch6...7		AFS Ch4...5		Data Format Ch6...7				Data Format Ch4...5			
2	DFS Ch7	DFS Ch6	DFS Ch5	DFS Ch4	DFS Ch3	DFS Ch2	DFS Ch1	DFS Ch0	ADM Ch7	ADM Ch6	ADM Ch5	ADM Ch4	ADM Ch3	ADM Ch2	ADM Ch1	ADM Ch0
3	Analog Fault State Value Channel 0															
4	Analog Fault State Value Channel 1															
5	Analog Fault State Value Channel 2															
6	Analog Fault State Value Channel 3															
7	Analog Fault State Value Channel 4															
8	Analog Fault State Value Channel 5															
9	Analog Fault State Value Channel 6															
10	Analog Fault State Value Channel 7															
Where:	LFM = Local fault mode FM = Fault mode AFS = Analog fault state DFS = Digital fault state			Ch = Channel LM = Latch mode ADM = Analog/Digital mode												

The extended configuration data table is accessed (read/write) by using a MSG or CIO instruction. See Table 13 for more information.

Table 11 - Extended Configuration Data Table – Series A Mode

Config Word	Bit															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
0	PM Ch7	PM Ch6	PM Ch5	PM Ch4	PM Ch3	PM Ch2	PM Ch1	PM Ch0	SME Ch7	SME Ch6	SME Ch5	SME Ch4	SME Ch3	SME Ch2	SME Ch1	SME Ch0
1	Reserved			HART Read Back Threshold Ch4…7					HS LED	HS Inht	50/60 Hz	HART Read Back Threshold Ch0…3				
Where:	Ch = Channel SME = Secondary master enable HS Inht = HART status inhibit				PM = Primary master inhibit HS LED = HART status LEDs											

Table 12 - Secondary Master Enable (SME)/Primary Master Inhibit (PMI) – Series A Mode

	Bits[1]	1 (Default)	2	3	4
PMI	8, 9, 10, 11, 12, 13, 14, 15	0	0	1	1
SME	0, 1, 2, 3, 4, 5, 6, 7	0	1	0	1
HART Smooth Filter		Pulsed	On	Off	On
Rebuild		On	On	Off	Off
HART Read Back		On	On	Off	Off
Primary Master		On	On	Off	Off
Secondary Master		Off	On	Off	On

(1) Where: Ch 0 - Bits 0 and 8; Ch 1 - Bits 1 and 9; Ch 2 - Bits 2 and 10; Ch 3 - Bits 3 and 11; Ch 4 - Bits 4 and 12; Ch 5 - Bits 5 and 13; Ch 6 - Bits 6 and 14; Ch 7 - Bits 7 and 15

Table 13 - Field Descriptions

Parameter	Description
Analog/Digital Output Mode	Selects if the channel acts as a normal analog output or as a switched digital output. Analog Output mode will follow the Analog Data Format selected. Digital Output mode will output 0 mA = OFF, 22 mA = ON if the Fault mode is 0 = Disable Digital Output mode will output 2 mA = OFF, 22 mA = ON if the Fault mode is 1 = Wire-off fault detection enabled Range: 0 = Normal analog output, 1 = Switched digital output
Analog Output Data	Specifies the value of the analog output data to the module. Specific format is controlled by Module Data Format Control parameter. This data is used when the channel is in Analog Output mode.
Digital Output Data	Specifies the value of the digital output data to the module. This data is used when the channel is in digital output mode. Range: 0 = Output, 0 mA = OFF, 1 = 22 mA = ON if the fault mode is 0 = Disable 0 = Output, 2 mA = OFF, 1 = 22 mA = ON if the fault mode is 1 = Wire-off fault detection enabled
Global Reset	This bit acts to reset all outputs to accept normal system output data. It acts in conjunction with the Latch Retry parameter. If any channel faults occur, the Latch Retry parameter can be set to cause the fault to be latched and the output to go to its safe state value. This is an edge-triggered signal. It must first be set (1). Reset will then occur on the set-to-reset transition.
Analog Fault State	Determines how module reacts to faults when channel is used in Analog Normal mode. Range: 0 = Go to minimum value of data range, 1 = Go to maximum value of data range, 2 = Hold last state, or use analog fault state value.
Analog Fault State Value	Specifies the fault state value of the analog output data to the module. Specific format is controlled by Module Data Format Control parameter. This data is used when the channel is in Analog Output mode and the analog fault state is configured to use analog fault state value.
Digital Fault State	Determines how module reacts to faults when channel is used in digital mode. Range: 0 = Reset, 1 = Hold last state.
Fault Mode	Selects whether the channel pair fault detection is enabled or disabled. There is a 100 Hz (10 ms) filter for wire-off/lead-break detection. Range: 0 = Disable, 1 = Wire-off fault detection enabled
Latch Retry Mode	Latch Retry determines channel operation under wire-off fault conditions. These bits control the action of two channel groups - Channels 0…3 and channels 4…7. When a channel fault occurs, the channel fault alarm will be set (if enabled) and the safe state mode will be enabled. If retry is selected, the channel will periodically try to reestablish proper output. If latch is selected, the fault will be latched until a Global Reset is issued. Range: 0 = Retry, 1 = Latch
Local Fault Mode	This parameter determines how the Module Safe State will be used for bus communication and internal module faults. This parameter sets this characteristic for the module. Range: 0 = Fault states activated by bus communication faults, 1 = Fault states activated by any failure (for example, bus communications)
Fault Alarm (8 or 1 Bit Each)	Alarm signal for open wire channel fault, detected at < 2 mA. This alarm is disabled when a data format is selected which includes 0 mA. Range: 0 = Normal, 1 = Wire-off fault detected
HART Rebuild Flag (1 of 1 Bit)	During the time the system is rebuilding the HART table, the HART rebuild flag is set. Range: 0 = Normal, 1 = HART rebuilding
HART Read Back	When this bit is set (1), it indicates that HART communications are failing on the associated channel. Range: 0 = Normal, 1 = HART communication failure
HART Communication	Range: 0 = Normal, 1 = HART communication is currently occurring
HART Transmitter List	When this bit is set (1), it indicates that a HART field device was found during the rebuild sequence on the associated channel. Range: 0 = Transmitter was not found, 1 = HART transmitter was found

Table 13 - Field Descriptions (Continued)

Parameter	Description
Extended Configuration	Configuration additions are needed for HART communication. An extended configuration area is provided. This Extended Configuration table is configured by writing a CIO or MSG instruction with the following: Class = 0x7D Instance = Product location on Flexbus (Use 1 for the module located next to the adapter) Attribute = 0x65 Service = Set Attribute Single (0x10)
HART Status Indicators	When this bit is set (1), the indicators are used for HART diagnostic. Indicator behavior changes to show communication on HART. Each status indicator represents a HART loop. Flashing yellow indicates that communication is currently being processed. Solid yellow means that this device is in the transmitter list.
HART Status Inhibit	When this bit is set (1), the HART communication status is not shown in the realtime data table. The appropriate areas are cleared with zeroes. Range: 0 = Normal, 1 = Inhibit HART
50/60 Hz Filter	Range: 0 = 50 Hz, 1 = 60 Hz
HART Read Back Threshold	Delivers the percentage value (in steps of 1%) of the threshold for forcing the HART read back indication (input signal deviation HART/Analog) with a 31% maximum deviation. If there is no HART transmitter on the loop or the loop is not in the transmitter list, the function is switched off internally in the I/O module. Range: 0 = Disabled, 1...4 = Not supported from I/O module (set to 5 internally), 5...31 = Percentage threshold data (5...31%)

Cooperative Operation of the Adapter and the 1794-OE8H Output Module

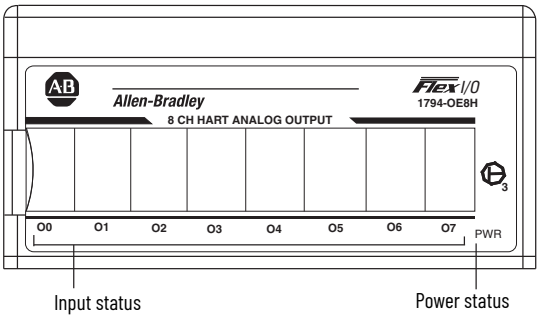
The ControlNet adapter, EtherNet/IP adapter, and the FlexLogix™ controllers convey the Run/Program (Idle) mode and Communication Fault status directly to the 1794-OE8H module. The 1794-OE8H module monitors this information and determines its own fault state actions according to your configuration. This allows for a more simplified approach to your connections. With regard to the Program mode behavior and Network Communication Fault, the 1794-OE8H module can be configured to:

- Set Analog Output to Minimum Value
- Set Analog Output to Maximum Value
- Hold Last Analog Value
- Go to User Programmable Analog Value
- Set Digital Output to Minimum Value
- Hold Last Digital Value

Repair

ATTENTION: This module is not field repairable. Any attempt to open the module will void the warranty. If repair is necessary, return the module to the factory.

Status Indicators



Interpret the Status Indicators

Status	Description
Flashing red	Channel fault - The channel 0 indicator turns red while the power-up check is running.
Steady green	Power is applied to the module.

Specifications

FLEX I/O 8 Output HART Analog Module - 1794-OE8H, Series B

Attribute	Value
Number of outputs	8 single-ended, non-isolated
Module base	1794-TB3G, 1794-TB3GS
Resolution	13 bits
Absolute accuracy	0.1% Full Scale @ 20 °C (68 °F)
Accuracy drift with temperature(1)	0.010% Full Scale for 0…55 °C (32…131 °F)
Functional data range	>15V @ 22 mA >22V @ 0 mA
Data format	Configurable
Step response to 99% of FS	4 ms
Conversion type	Sigma-delta
Update rate	See input update rate table
Output terminals	Terminals: 0…2; 4…6; 8…10; 12…14; 17…19; 21…23; 25…27; 29…31
Power supply Terminals 34/50 (+); 35/51 (-)	24V DC nominal using 1794-PS13 19.2…31.2V DC (includes 5% ripple)
Indicators	8 red fault indicators 8 yellow HART communication indicators 1 green power indicator
Isolation voltage	50V (continuous), Basic Insulation Type Routine tested at 850V DC for 1 s, between field side and system No isolation between individual channels
Voltage variation	IEC 61000-4-29: 10 ms interruption on DC supply ports
Flexbus current external input(2)	5V DC 80 mA 24V DC 190 mA
Power dissipation, max	6.1 W @ 31.2V DC
Enclosure type rating	None (open-style)
Terminal base screw torque	Determined by the installed terminal base
Wire size	Determined by the installed terminal base
Wiring category(3)	2 - on signal ports 2 - on power ports
Wire type	Shielded on signal ports
Thermal dissipation, max	20.8BTU/hr @ 31.2V DC
Keyswitch position	4
Dimensions (HxWxD), approx.	46.0 x 94.0 x 75.0 mm (1.8 x 3.7 x 2.95 in.)
Weight, approx.	200 g (7.05 oz)
North American temp code	T4A
ATEX temp code	T4

(1) Includes offset, gain, nonlinearity, and repeatability error terms
(2) If 24V DC is removed from the module, input resistance = 10 kΩ.
(3) 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)
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	IEC 60068-2-6 (Test Fc, Operating): 2 g @ 10…500 Hz
Shock, operating	IEC 60068-2-27 (Test Ea, Unpackaged Shock): 15 g
Shock, nonoperating	IEC 60068-2-27 (Test Ea, Unpackaged Shock): 15 g
Emissions	IEC 61000-6-4

Environmental Specifications (Continued)

Attribute	Value
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...2500 MHz 1V/m with 1 kHz sine-wave 80% AM from 2500...2700 MHz
EFT/B immunity	IEC 61000-4-4: ±2 kV at 5 kHz on power ports ±2 kV at 5 kHz on signal ports
Surge transient immunity	IEC 61000-4-5: ±1 kV line-line(DM) and ±2 kV line-earth(CM) on power ports ±2 kV line-earth(CM) on shielded ports
Conducted RF immunity	IEC 61000-4-6: 10V rms with 1 kHz sine-wave 80%AM from 150 kHz...80 MHz

Certifications

Certification (when product is marked)(1)	Value
c-UL-us	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.
CE and UKCA	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
RCM	Australian Radiocommunications Act, compliant with: EN 61000-6-4; Industrial Emissions
Ex	European Union 2014/34/EU ATEX Directive, compliant with: EN 60079-15; Potentially Explosive Atmospheres, Protection "n" (II 3 G Ex nA IIC T4 X) EN 60079-0; General Requirements (Zone 2)
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

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

Additional Resources

For more information on the products that are described in this publication, use these resources. You can view or download publications at rok.auto/literature.

Resources	Description
FLEX I/O and FLEX I/O-XT Selection Guide, publication 1794-SG002	Provides information on how to select FLEX I/O and FLEX I/O-XT™ adapters, terminal bases, I/O modules, and accessories.
FLEX I/O HART Analog Modules User Manual, publication 1794-UM063	Provides detailed information on how to use and configure your HART analog modules.
Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1	Provides general guidelines for installing a Rockwell Automation industrial system.
Product Certifications website, rok.auto/certifications	Provides declarations of conformity, certificates, and other certification details.

Rockwell Automation Support

Use these resources to access support information.

Technical Support Center	Find help with how-to videos, FAQs, chat, user forums, Knowledgebase, and product notification updates.	rok.auto/support
Local Technical Support Phone Numbers	Locate the telephone number for your country.	rok.auto/phonesupport
Technical Documentation Center	Quickly access and download technical specifications, installation instructions, and user manuals.	rok.auto/techdocs
Literature Library	Find installation instructions, manuals, brochures, and technical data publications.	rok.auto/literature
Product Compatibility and Download Center (PCDC)	Download firmware, associated files (such as AOP, EDS, and DTM), and access product release notes.	rok.auto/pcdc

Documentation Feedback

Your comments help us serve your documentation needs better. If you have any suggestions on how to improve our content, complete the form at rok.auto/docfeedback.

Waste Electrical and Electronic Equipment (WEEE)

At the end of life, this equipment should be collected separately from any unsorted municipal waste.

Rockwell Automation maintains current product environmental compliance information on its website at rok.auto/pec.

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