SIEMENS

SIMATIC

S7-1500

Módulo de entradas digitales DI 32x24VDC HF (6ES7521-1BL00-0AB0)

Manual de producto

Edición 07/2014

Answers for industry.

SIEMENS

SIMATIC

S7-1500/ET 200MP Módulo de entradas digitales DI 32x24VDC HF (6ES7521-1BL00-0AB0)

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07/2014

A5E03485937-AD

Notas jurídicas

Filosofía en la señalización de advertencias y peligros

Este manual contiene las informaciones necesarias para la seguridad personal así como para la prevención de daños materiales. Las informaciones para su seguridad personal están resaltadas con un triángulo de advertencia; las informaciones para evitar únicamente daños materiales no llevan dicho triángulo. De acuerdo al grado de peligro las consignas se representan, de mayor a menor peligro, como sigue.

⚠PELIGRO
Significa que, si no se adoptan las medidas preventivas adecuadas **se producirá** la muerte, o bien lesiones corporales graves.

⚠ADVERTENCIA
Significa que, si no se adoptan las medidas preventivas adecuadas **puede producirse** la muerte o bien lesiones corporales graves.

⚠PRECAUCIÓN
Significa que si no se adoptan las medidas preventivas adecuadas, pueden producirse lesiones corporales.

ATENCIÓN
Significa que si no se adoptan las medidas preventivas adecuadas, pueden producirse daños materiales.

Si se dan varios niveles de peligro se usa siempre la consigna de seguridad más estricta en cada caso. Si en una consigna de seguridad con triángulo de advertencia se alarma de posibles daños personales, la misma consigna puede contener también una advertencia sobre posibles daños materiales.

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El producto/sistema tratado en esta documentación sólo deberá ser manejado o manipulado por **personal cualificado** para la tarea encomendada y observando lo indicado en la documentación correspondiente a la misma, particularmente las consignas de seguridad y advertencias en ella incluidas. Debido a su formación y experiencia, el personal cualificado está en condiciones de reconocer riesgos resultantes del manejo o manipulación de dichos productos/sistemas y de evitar posibles peligros.

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Hemos comprobado la concordancia del contenido de esta publicación con el hardware y el software descritos. Sin embargo, como es imposible excluir desviaciones, no podemos hacernos responsable de la plena concordancia. El contenido de esta publicación se revisa periódicamente; si es necesario, las posibles las correcciones se incluyen en la siguiente edición.

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Prólogo

Finalidad de la documentación

El presente manual de producto complementa los siguientes manuales de sistema:

- Sistema de automatización S7-1500
- Sistema de periferia descentralizada ET 200MP

En estos manuales de sistema se describen las funciones que afectan a los sistemas de forma generalizada.

La información contenida en el presente manual de producto y en los manuales de sistema y de funciones permite poner en marcha los sistemas.

Cambios con respecto a la versión anterior

Con respecto a la versión anterior del manual de producto, se han realizado los siguientes cambios:

- Módulo integrado en el catálogo de hardware STEP 7 (TIA Portal) a partir de V13, Update 3 con las funciones:
  - Shared Input interna del módulo (MSI) para Shared Device
  - Submódulos configurables, p. ej., para Shared Device
- Anexo Open Source Software ampliado

Convenciones

El término "CPU" se refiere en lo sucesivo tanto a los módulos centrales del sistema de automatización S7-1500 como a los módulos de interfaz del sistema de periferia descentralizada ET 200MP.

Preste atención también a las notas marcadas del modo siguiente:

Nota

Una nota contiene información importante relativa al producto descrito en la documentación, al manejo de dicho producto o a aquella parte de la documentación a la que debe prestarse especial atención.

Información de seguridad

Siemens suministra productos y soluciones con funciones de seguridad industrial que contribuyen al funcionamiento seguro de instalaciones, soluciones, máquinas, equipos y redes. Dichas funciones son un componente importante de un sistema global de seguridad industrial. En consideración de lo anterior, los productos y soluciones de Siemens son objeto de mejoras continuas. Por ello, le recomendamos que se informe periódicamente sobre las actualizaciones de nuestros productos

Para el funcionamiento seguro de los productos y soluciones de Siemens, es preciso tomar medidas de protección adecuadas (como el concepto de protección de células) e integrar cada componente en un sistema de seguridad industrial integral que incorpore los últimos avances tecnológicos. También deben tenerse en cuenta los productos de otros fabricantes que se estén utilizando. Encontrará más información sobre seguridad industrial en (http://www.siemens.com/industrialsecurity).

Si desea mantenerse al día de las actualizaciones de nuestros productos, regístrese para recibir un boletín de noticias específico del producto que desee. Encontrará más información en (http://support.automation.siemens.com).

Software de código abierto

En el firmware del producto descrito se utiliza software de código abierto. El software de código abierto se entrega de forma gratuita. Nos hacemos responsables del Producto descrito, incluido el software de código abierto que contiene, de acuerdo con las condiciones vigentes para el Producto. Declinamos cualquier responsabilidad derivada del uso del software de código abierto más allá del flujo del programa previsto para nuestro producto, así como cualquier responsabilidad derivada de los daños causados por modificaciones del software.

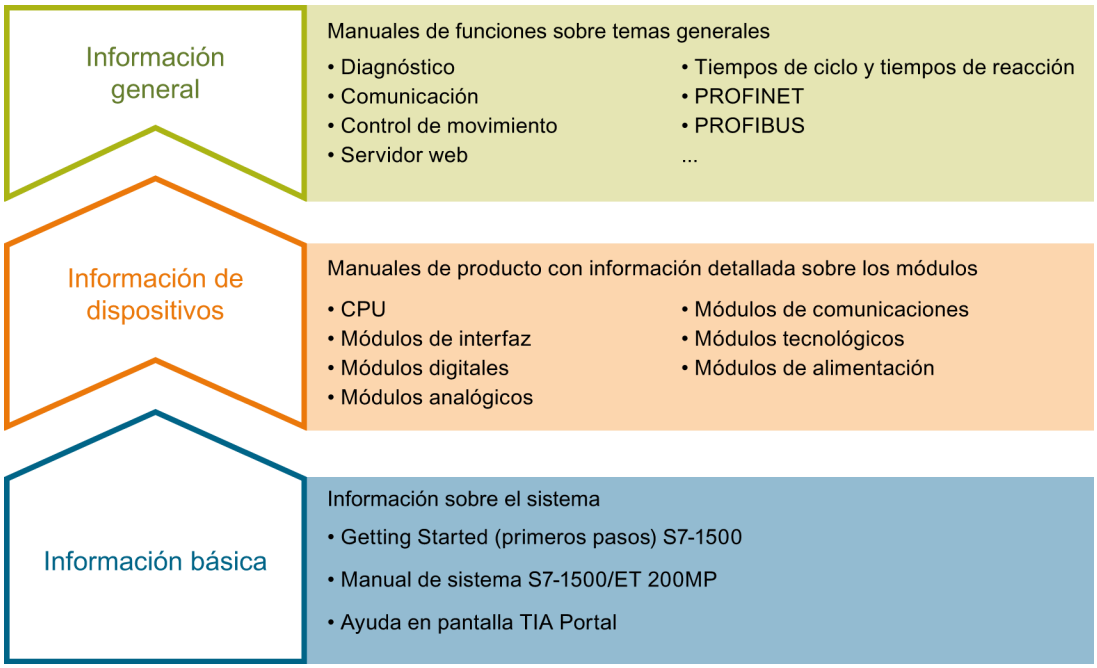
Por motivos legales estamos obligados a publicar las condiciones de licencia y las notas copyright en el texto original. Lea al respecto la información del anexo.

Índice

Guía de la documentación

1

La documentación del sistema de automatización SIMATIC S7-1500 y del sistema de periferia descentralizada SIMATIC ET 200MP se divide en tres partes.
Esta división le permite acceder específicamente al contenido que desee.



Información básica

En el manual de sistema y en Getting Started (primeros pasos) se describen detalladamente la configuración, el montaje, el cableado y la puesta en marcha de los sistemas SIMATIC S7-1500 y ET 200MP. La ayuda en pantalla de STEP 7 le presta asistencia a la hora de configurar y programar.

Información de dispositivos

Los manuales de producto contienen una descripción sintética de la información específica de los módulos, como características, esquemas de conexiones, curvas características o datos técnicos.

Información general

En los manuales de funciones encontrará descripciones exhaustivas sobre temas generales relacionados con los sistemas SIMATIC S7-1500 y ET 200MP, p. ej. diagnóstico, comunicación, control de movimiento, servidor web.

La documentación se puede descargar gratuitamente de Internet (http://www.automation.siemens.com/mcms/industrial-automation-systems-simatic/en/manual-overview/tech-doc-controllers/Pages/Default.aspx).

En la información del producto se documentan los cambios y ampliaciones de los manuales.

Manual Collection S7-1500/ET 200MP

La Manual Collection contiene la documentación completa del sistema de automatización SIMATIC S7-1500 y del sistema de periferia descentralizada ET 200MP recogida en un archivo.

Encontrará la Manual Collection en Internet (http://support.automation.siemens.com/WW/view/es/86140384).

My Documentation Manager

Con My Documentation Manager se combinan manuales enteros o partes de ellos para elaborar un manual propio.
Este manual se puede exportar como archivo PDF o en un formato editable.

Encontrará My Documentation Manager en Internet (http://support.automation.siemens.com/WW/view/es/38715968).

Aplicaciones & Tools

Aplicaciones & Tools le proporciona herramientas y ejemplos para resolver tareas de automatización. Las soluciones se representan como combinación de varios componentes del sistema; se evita centrarse en productos concretos.

Encontrará Aplicaciones & Tools en Internet (http://support.automation.siemens.com/WW/view/es/20208582).

Cesta de Compra CAx

La Cesta de Compra CAx permite acceder a datos de producto actuales para el sistema CAx o CAe.

Con solo unos clics configurará su propio paquete para descargar.

Puede elegir lo siguiente:

- Imágenes de producto, croquis acotados 2D, modelos 3D, esquemas de conexiones, archivos de macros EPLAN
- Manuales, curvas características, instrucciones de uso, certificados
- Datos característicos de productos

Encontrará la Cesta de Compra CAx en Internet (http://support.automation.siemens.com/WW/view/es/42455541).

Descripción del producto

2

2.1 Características

Referencia:

6ES7521-1BL00-0AB0

Vista del módulo

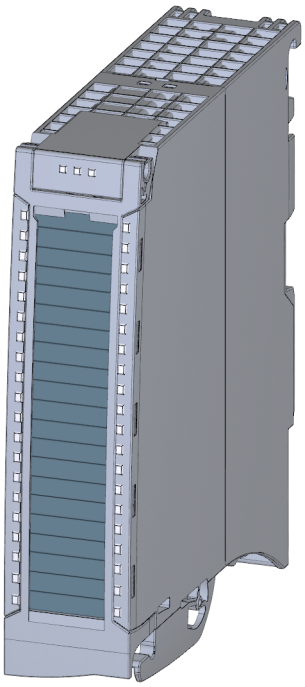


Figura 2-1 Vista del módulo DI 32x24VDC HF

Características

El módulo tiene las siguientes características técnicas:

- 32 entradas digitales, con aislamiento galvánico en grupos de 16
- Tensión nominal de entrada 24 V DC
- Retardo a la entrada parametrizable: 0,05 ms … 20 ms
- Diagnóstico parametrizable (por canal)
- Alarma de proceso parametrizable (por canal)
- Adecuado para interruptores y detectores de proximidad a 2, 3 o 4 hilos
- Hardware compatible con el módulo de entradas digitales DI 16x24VDC HF (6ES7521-1BH00-0AB0)

El módulo soporta las siguientes funciones:

Tabla 2- 1 Dependencias de la versión de las funciones del módulo

Función	Versión de firmware del módulo	Software de configuración	
		STEP 7 (TIA Portal)	Archivo GSD en STEP 7 (TIA Portal) a partir de V12 o STEP 7 a partir de V5.5 SP3
Actualización del firmware	a partir de V1.0.0	a partir de V12	X
Datos identificativos I&M0 a I&M3	a partir de V1.0.0	a partir de V12	X
Reparametrización en RUN	a partir de V1.0.0	a partir de V12	X
Modo isócrono	a partir de V1.0.0	a partir de V12	---
Shared Input interna del módulo (MSI)	a partir de V2.0.0	a partir de V13, Update 3 (solo PROFINET IO)	X (solo PROFINET IO)
Submódulos configurables/submódulos para Shared Device	a partir de V2.0.0	a partir de V13, Update 3 (solo PROFINET IO)	X (solo PROFINET IO)
Configurable detrás del módulo de interfaz IM 155-5 DP ST	a partir de V2.0.0	a partir de V13	X

El módulo puede configurarse con STEP 7 (TIA Portal) y con un archivo GSD.

Accesorios

Los siguientes accesorios se suministran con el módulo y también pueden pedirse como repuesto:

- Tiras rotulables
- Conector U
- Puerta frontal universal

Otros componentes

Los siguientes componentes deben pedirse por separado:

conector frontal incl. puentes y bridas para cables

Encontrará más información acerca de los accesorios en los manuales de sistema Sistema de automatización S7-1500 (http://support.automation.siemens.com/WW/view/es/59191792) y Sistema de periferia descentralizada ET 200MP (http://support.automation.siemens.com/WW/view/es/59193214).

Conexión

3

En el presente capítulo encontrará el diagrama de principio del módulo y diferentes opciones de conexión.

Encontrará información sobre cómo cablear el conector frontal, apantallar el cable, etc. en el manual de sistema Sistema de automatización S7-1500 (http://support.automation.siemens.com/WW/view/es/59191792) y en el manual de sistema Sistema de periferia descentralizada ET 200MP (http://support.automation.siemens.com/WW/view/es/59193214), capítulo Conexión.

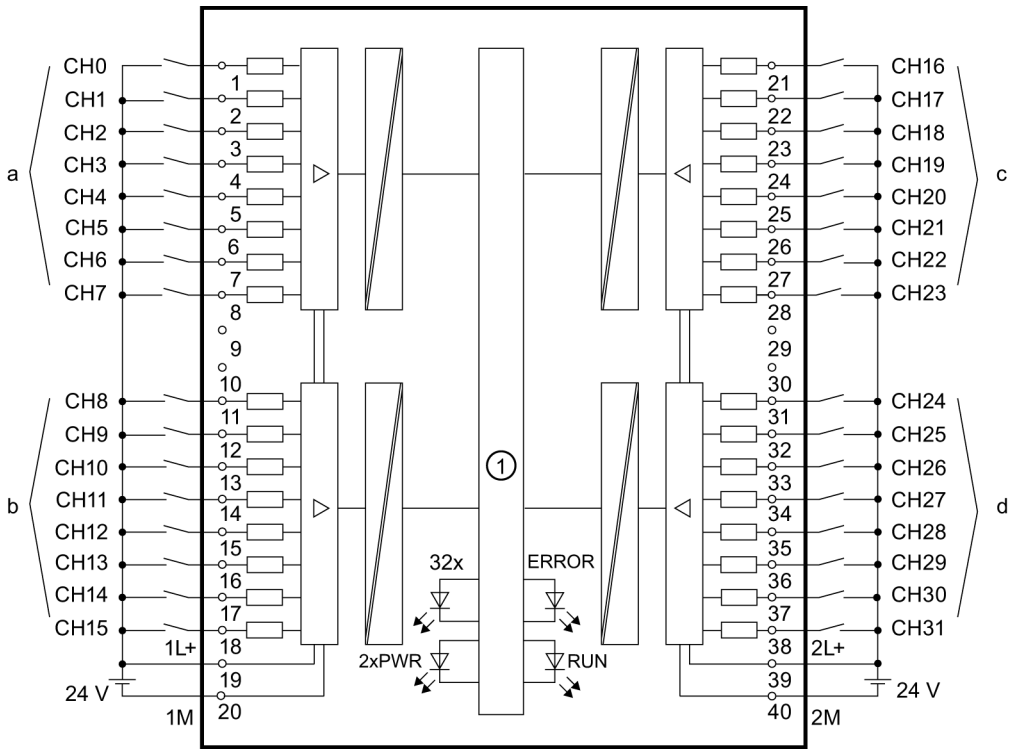
Abreviaturas utilizadas

Las abreviaturas utilizadas en las figuras significan lo siguiente:

xL+	Conexión para la tensión de alimentación
xM	Conexión para masa
CHx	Canal o indicador de estado del canal
PWRx	Indicador de tensión de alimentación (POWER)

Esquema eléctrico y esquema de principio

La siguiente figura muestra la forma de conectar el módulo y la asignación de los canales a las direcciones (desde byte de entrada a hasta byte de entrada d).



① Interfaz con el bus de fondo

Figura 3-1 Esquema de principio y asignación de pines

Cableado de los sensores con resistencia

Para detectar una rotura de hilo es necesario que, aun estando abiertos los contactos del sensor, fluya suficiente corriente en reposo. Por tanto, cablee los contactos del sensor con una resistencia de 25 kΩ ... 45 kΩ con 0,25 W.

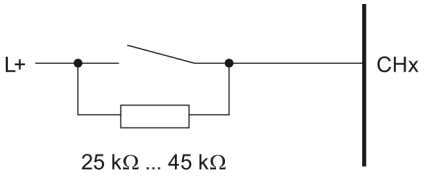


Figura 3-2 Cableado de los sensores con resistencia

Sugerencia: utilización de puentes

Si desea suministrar a los dos grupos de carga el mismo potencial (sin aislamiento galvánico), utilice los puentes suministrados con el conector frontal. De este modo se evita tener que cablear un borne con dos conductores.

Proceda del siguiente modo:

1. Aplique la tensión de alimentación de 24 V DC a los bornes 19 y 20.
2. Coloque los puentes entre los bornes 19 y 39 (xL+) y entre los bornes 20 y 40 (xM).
3. Utilice los bornes 39 y 40 para conectar en cadena el potencial con el siguiente módulo.

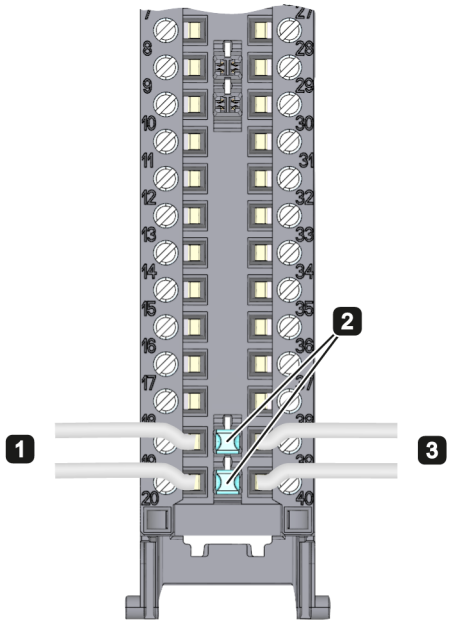


Figura 3-3 Utilización de puentes

Nota

Tenga en cuenta que no debe sobrepasarse la máx. intensidad conducible de 8 A por puente.

Parametrización y direccionamiento

4

4.1 Parámetros

Parámetros del DI 32x24VDC HF

Al parametrizar el módulo con STEP 7, se especifican las características del módulo mediante diferentes parámetros. Los parámetros ajustables figuran en la siguiente tabla. El rango efectivo de los parámetros ajustables depende del tipo de configuración. Son posibles las siguientes configuraciones:

- Operación centralizada con una CPU S7-1500
- Operación descentralizada con PROFINET IO en un sistema ET 200MP
- Operación descentralizada con PROFIBUS DP en un sistema ET 200MP

Al parametrizar el módulo en el programa de usuario, los parámetros se transfieren al módulo mediante registros con la instrucción WRREC (reparametrización en RUN); ver capítulo Parametrización y estructura de los registros de parámetros (Página 33)

Tabla 4- 1 Parámetros ajustables y su preajuste

Parámetro	Rango de valores	Ajuste estándar	Repara-metrización en RUN	Rango efectivo con software de configuración, p. ej., STEP 7 (TIA Portal)	
				Archivo GSD PROFINET IO	Archivo GSD PROFIBUS DP
Diagnóstico					
• Falta tensión de alimentación L+	Sí/No	No	Sí	Canal*	Grupo de canales**
• Rotura de hilo	Sí/No	No	Sí	Canal	Grupo de canales**
Retardo a la entrada	0,05 ms, 0,1 ms, 0,4 ms, 1,6 ms, 3,2 ms, 12,8 ms, 20 ms	3,2 ms; 0,05 ms (no modificable) en modo isócrono	Sí	Canal	Grupo de canales**

Parámetro	Rango de valores	Ajuste estándar	Repara-metrización en RUN	Rango efectivo con software de configuración, p. ej., STEP 7 (TIA Portal)	
				Archivo GSD PROFINET IO	Archivo GSD PROFIBUS DP
Alarma de proceso* **					
• Flanco ascendente	Sí/No	No	Sí	Canal	Canal
• Flanco descendente	Sí/No	No	Sí	Canal	Canal
• Flanco ascendente y descendente	Sí/No	No	Sí	Canal	Canal

* Si habilita el diagnóstico para varios canales, en caso de fallo de la tensión de alimentación recibirá una avalancha de avisos, puesto que cada canal habilitado detectará este fallo.

Puede evitar la avalancha de avisos habilitando el diagnóstico solo para un canal.

** Al reparametrizar en RUN, el rango efectivo puede ajustarse para cada canal.

*** En la configuración de 4 x 8 canales pueden configurarse como máximo 16 alarmas de proceso (canales 0 a 15).

4.2 Área de direcciones

En STEP 7, el módulo puede configurarse de diferentes maneras (ver la tabla siguiente). En función de la configuración se asignan direcciones adicionales/diferentes en la memoria imagen de proceso de las entradas.

Opciones de configuración de DI 32x24VDC HF

El módulo puede configurarse con STEP 7 (TIA Portal) o con un archivo GSD.

Si se configura el módulo a través de un archivo GSD, encontrará las configuraciones bajo diversos nombres abreviados/nombres de módulo.

Son posibles las configuraciones siguientes:

Tabla 4- 2 Opciones de configuración

Configuración	Nombre abreviado/ nombre del módulo en el archivo GSD	Software de configuración, p. ej., STEP 7 (TIA Portal)	
		Integrado en el catálogo de hardware STEP 7 (TIA Portal)	Archivo GSD en STEP 7 (TIA Portal) a partir de V12 o STEP 7 a partir de V5.5 SP3
1 x 32 canales sin información de calidad	DI 32x24VDC HF	a partir de V12	X
1 x 32 canales con información de calidad	DI 32x24VDC HF QI	a partir de V12	X
4 x 8 canales sin información de calidad	DI 32x24VDC HF S	a partir de V13, Update 3 (solo PROFINET IO)	X (solo PROFINET IO)
4 x 8 canales con información de calidad	DI 32x24VDC HF QI S	a partir de V13, Update 3 (solo PROFINET IO)	X (solo PROFINET IO)
1 x 32 canales con información de calidad para Shared Input interna del módulo con hasta 4 submódulos	DI 32x24VDC HF MSI	a partir de V13, Update 3 (solo PROFINET IO)	X (solo PROFINET IO)

Información de calidad (Quality Information, QI)

Las opciones siguientes siempre tienen activada la información de calidad:

- DI 32x24VDC HF QI
- DI 32x24VDC HF QI S
- DI 32x24VDC HF MSI

Cada canal tiene asignado un bit adicional de información de calidad. El bit de información de calidad indica si el valor digital leído es válido. (0 = el valor es erróneo).

Área de direcciones en la configuración como DI 32x24VDC HF de 32 canales

La siguiente figura muestra la asignación del área de direcciones en la configuración como módulo de 32 canales con información de calidad. La dirección inicial del módulo puede asignarse libremente. Las direcciones de los canales se derivan de dicha dirección inicial.

Las letras "a" a "d" están serigrafiadas en el módulo. "IB a" indica, p. ej., la dirección inicial del módulo, byte de entrada "a".

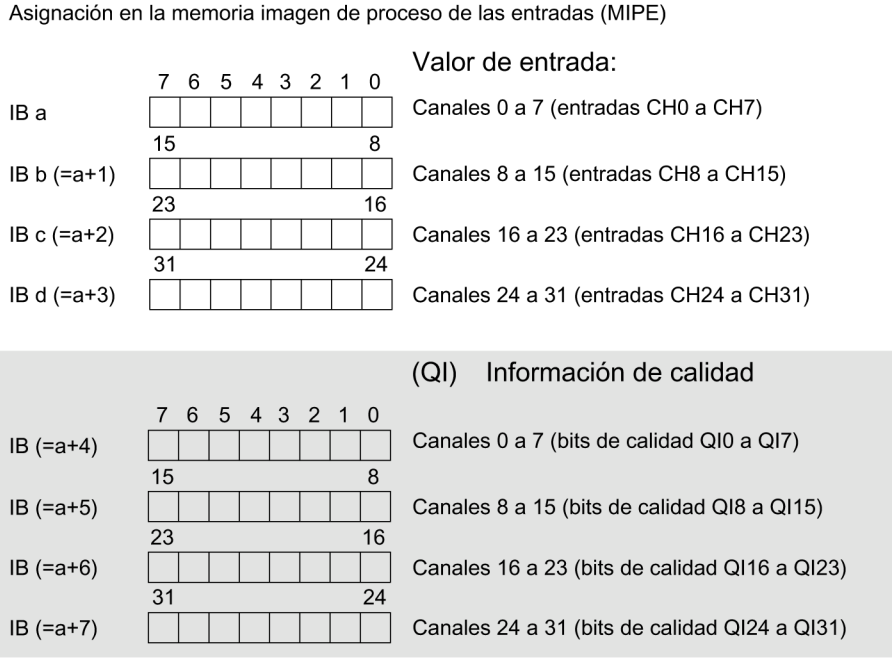


Figura 4-1 Área de direcciones en la configuración como DI 32x24VDC HF de 32 canales con información de calidad

Área de direcciones en la configuración como DI 32x24VDC HF QI S de 4 x 8 canales

En la configuración como módulo de 4 x 8 canales, los canales del módulo se reparten entre varios submódulos. Estos submódulos pueden asignarse a diferentes controladores IO si el módulo se utiliza en un Shared Device.

El número de submódulos disponibles depende del módulo de interfaz utilizado. Lea las indicaciones del manual de producto que corresponda al módulo de interfaz.

A diferencia de la configuración como módulo de 1 x 32 canales, cada uno de los cuatro submódulos posee una dirección inicial que se puede asignar libremente.

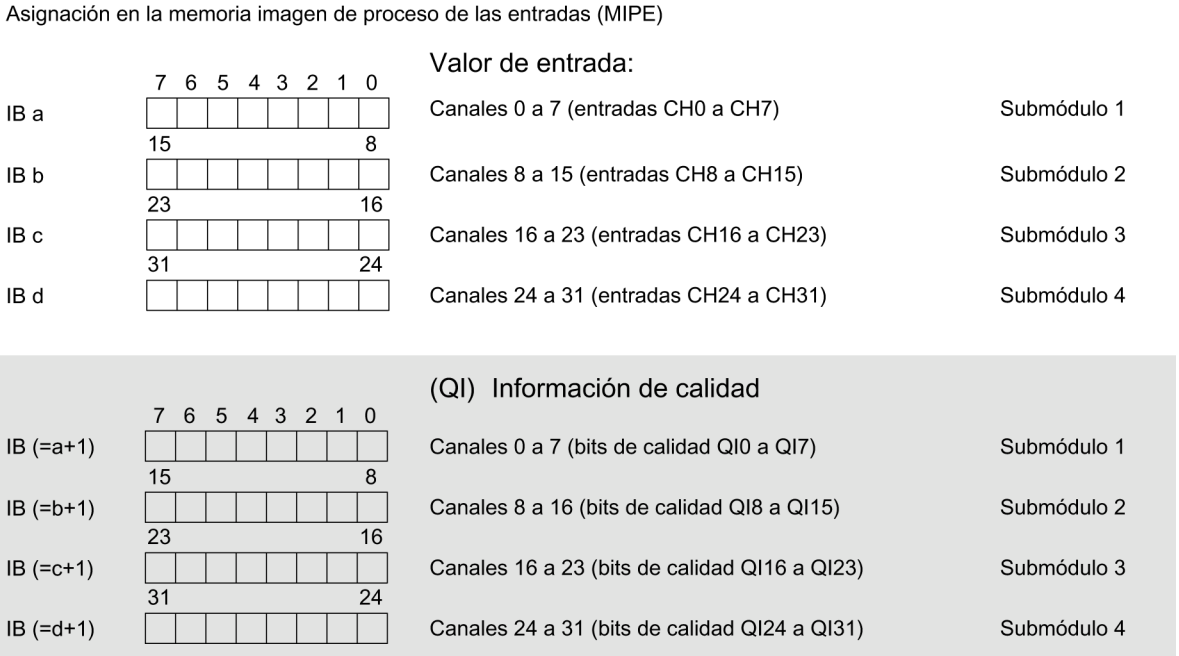


Figura 4-2 Área de direcciones en la configuración como DI 32x24VDC HF QI S de 4 x 8 canales

Área de direcciones en la configuración como DI 32x24VDC HF MSI de 1 x 32 canales

En la configuración del módulo de 1 x 32 canales (Shared Input interna del módulo, MSI), los canales 0 a 31 del módulo se copian en hasta 4 submódulos. Por lo tanto, los canales 0 a 31 tienen valores de entrada idénticos en los distintos submódulos. Estos submódulos pueden asignarse a hasta cuatro controladores IO si el módulo se utiliza en un Shared Device. Cada controlador IO puede tener acceso de lectura a los mismos canales.

El número de submódulos disponibles depende del módulo de interfaz utilizado. Lea las indicaciones del manual de producto que corresponda al módulo de interfaz.

Información de calidad (Quality Information, QI)

El significado de la información de calidad depende del submódulo en cuestión.

En el submódulo 1 (= submódulo base), la información de calidad 0 indica que el valor es erróneo.

En los submódulos 2 a 4 (= submódulos MSI), la información de calidad 0 indica que el valor es erróneo o que el submódulo base todavía no está parametrizado (no listo para funcionar).

La siguiente figura muestra la asignación del área de direcciones con los submódulos 1 y 2 y la información de calidad.

Asignación en la memoria imagen de proceso de las entradas (MIPE) para los submódulos 1 y 2

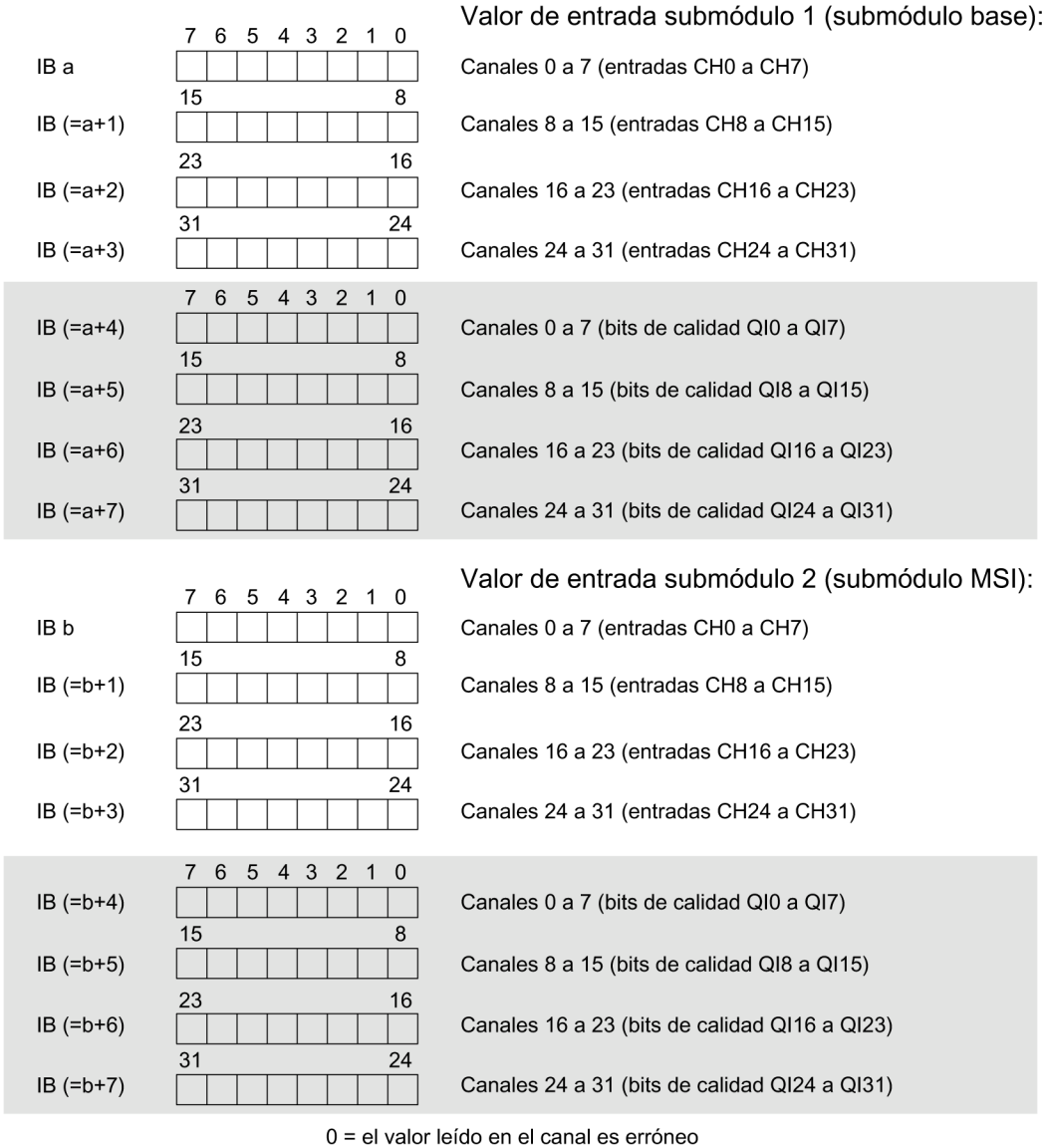


Figura 4-3 Área de direcciones en la configuración como DI 32x24VDC HF MSI de 1 x 32 canales

La siguiente figura muestra la asignación del área de direcciones con los submódulos 3 y 4 y la información de calidad.

Asignación en la memoria imagen de proceso de las entradas (MIPE) para los submódulos 3 y 4

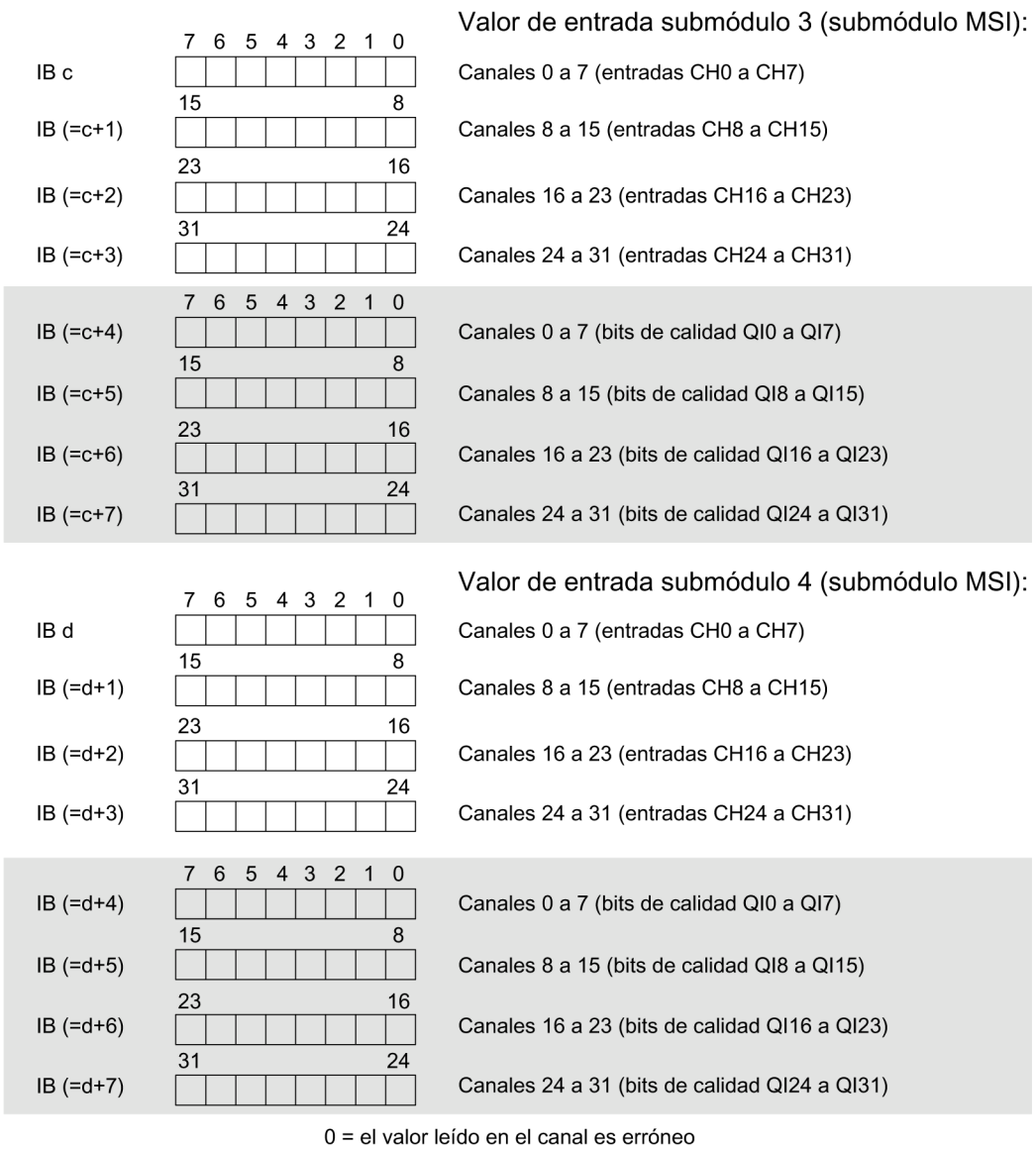


Figura 4-4 Área de direcciones en la configuración como DI 32x24VDC HF MSI de 1 x 32 canales

Alarmas y avisos de diagnóstico

5

5.1 Indicadores de estado y error

Indicadores LED

La siguiente figura muestra los indicadores LED (indicadores de estado y error) de DI 32x24VDC HF.

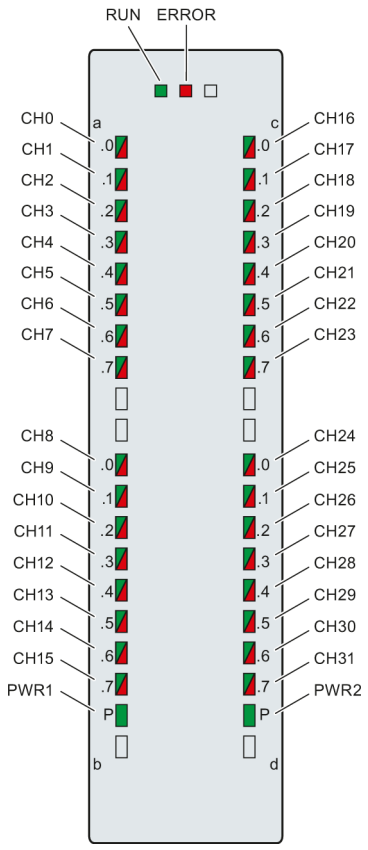


Figura 5-1 LED del módulo DI 32x24VDC HF

Significado de los indicadores LED

En las tablas siguientes se explica el significado de los indicadores de estado y error. Las soluciones para los avisos de diagnóstico se indican en el capítulo Avisos de diagnóstico (Página 27).

LED RUN y ERROR

Tabla 5- 1 Indicadores de estado y errorRUN y ERROR

LED		Significado	Solución
RUN	ERROR		
☐ apagado	☐ apagado	Tensión muy baja o nula en el bus de fondo	• Conecte la CPU y/o los módulos de alimentación del sistema. • Compruebe si están enchufados los conectores U. • Compruebe si no hay demasiados módulos enchufados.
☼ parpadea	☐ apagado	El módulo arranca y parpadea hasta que se parametrice correctamente.	---
■ encendido	☐ apagado	El módulo está parametrizado.	
■ encendido	☼ parpadea	Indica un error de módulo (al menos hay un error en un canal, p. ej. rotura de hilo).	Evalúe el diagnóstico y corrija el error (p. ej. rotura de hilo).
☼ parpadea	☼ parpadea	Hardware defectuoso	Sustituya el módulo.

LED PWR1 y PWR2

Tabla 5- 2 Indicador de estado PWR1 y PWR2

LED PWR1 / PWR2	Significado	Solución
☐ apagado	Tensión de alimentación L+ demasiado baja o nula	Comprobar tensión de alimentación L+.
■ encendido	Hay tensión de alimentación L+ y es correcta.	---

LED CHx

Tabla 5- 3 Indicador de estado CHx

LED CHx	Significado	Solución
□ apagado	0 = Estado de la señal de entrada	---
■ encendido	1 = Estado de la señal de entrada	---
■ encendido	Diagnóstico: Rotura de hilo	Comprobar el cableado. Con interruptores sencillos, desactivar diagnóstico o cablear contactos del sensor con una resistencia (25 kΩ … 45 kΩ).
	Tensión de alimentación L+ demasiado baja o nula	Comprobar tensión de alimentación L+.

5.2 Alarmas

El módulo de entradas digitales DI 32x24VDC HF admite alarmas de diagnóstico y de proceso.

Alarma de diagnóstico

El módulo genera una alarma de diagnóstico con los siguientes eventos:

- Falta tensión de alimentación L+
- Rotura de hilo

Alarma de proceso

El módulo genera una alarma de proceso con los siguientes eventos:

- Flanco ascendente
- Flanco descendente
- Flanco ascendente y descendente

Encontrará información detallada sobre el evento en el bloque de organización de la alarma de proceso, con la instrucción "RALRM" (leer información adicional de alarma) y en la ayuda en pantalla de STEP 7.

El canal del módulo que ha originado la alarma de proceso se registra en la información de arranque del bloque de organización. En la figura siguiente se muestra la asignación a los bits de la palabra doble de datos locales 8.

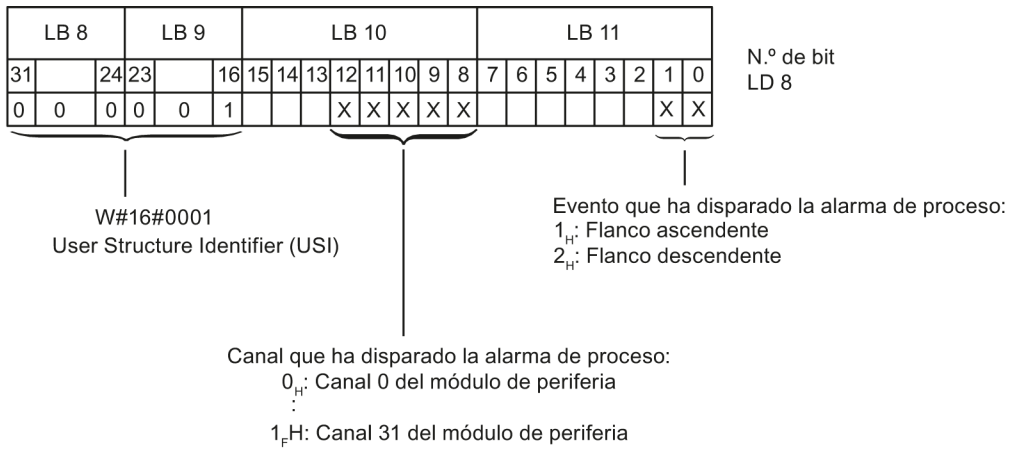


Figura 5-2 Información de arranque del bloque de organización

Estructura de la información adicional de alarma

Tabla 5- 4 Estructura del USI = W#16#0001

Nombre del bloque de datos		Contenido	Observación	Bytes
USI (User Structure Identifier)		W#16#0001	Información adicional de las alarmas de proceso del módulo de periferia	2
Le sigue el canal que ha disparado la alarma de proceso.				
	Canal	B#16#00 a B#16#1F	Número del canal que origina el evento (canal 0 a canal 31 del módulo)	1
A continuación le sigue el evento de error que ha disparado la alarma de proceso.				
	Evento	B#16#01	Flanco ascendente	1
		B#16#02	Flanco descendente	

5.3 Avisos de diagnóstico

Avisos de diagnóstico

Con cada evento de diagnóstico se emite un aviso de diagnóstico y en el módulo parpadea el ERROR-LED. Los avisos de diagnóstico pueden leerse, por ejemplo, en el búfer de diagnóstico de la CPU. Los códigos de error pueden evaluarse mediante el programa de usuario.

Si el módulo se utiliza de forma descentralizada en un sistema ET 200MP con PROFIBUS DP, se pueden leer datos de diagnóstico con la instrucción RDREC o RD_REC a través de los registros 0 y 1. Encontrará la estructura de los registros en Internet, en el "Manual de producto Módulo de interfaz IM 155-5 DP ST (6ES7155-5BA00-0AB0)".

Tabla 5- 5 Avisos de diagnóstico, su significado y soluciones posibles

Aviso de diagnóstico	Código de error	Significado	Soluciones posibles
Rotura de hilo	6_H	Cableado del sensor sujeto a impedancia demasiado alta	Utilizar otro tipo de sensor o cablear de forma diferente (emplear cables con una sección mayor, p. ej.)
		Interrupción del cable entre módulo y sensor	Restablecer la conexión
		Canal no cableado (abierto)	• Desactivar el diagnóstico • Cablear contactos del sensor con una resistencia de 25 kΩ ... 45 kΩ.
Falta tensión de carga	11_H	Falta la tensión de alimentación L+ del módulo	Conducir la tensión de alimentación L+ al módulo/canal
Alarma de proceso perdida	16_H	El módulo no puede enviar ninguna alarma por no haberse confirmado la alarma precedente; posible error de configuración	• Modificar el procesamiento de alarmas en la CPU y, en caso necesario, reparametrizar el módulo. • Este error persiste hasta que se hayan ajustado los nuevos parámetros en el módulo.

Datos técnicos

6

Datos técnicos del DI 32x24VDC HF

	6ES7521-1BL00-0AB0
Nombre del producto	DI 32x24VDC HF
Información general	
Versión de producto HW	E01
Versión de firmware	V2.0.0
Función del producto	
Datos I&M	Sí; IM0 a IM3
Ingeniería con	
STEP 7 TIA Portal configurable/integrado desde versión	V12.0/V12.0
STEP 7 configurable/integrado desde versión	V5.5 SP3 / -
Modo de operación	
MSI	Sí
Tensión de alimentación	
Tipo de tensión de alimentación	DC
Valor nominal (DC)	24 V
Rango admisible, límite inferior (DC)	20,4 V
Rango admisible, límite superior (DC)	28,8 V
Protección contra inversión de polaridad	Sí
Intensidad de entrada	
Consumo máx.	40 mA; (20 mA por grupo con alimentación de 24 V DC)
Potencia	
Potencia tomada del bus de fondo	1,1 W
Disipación	
Potencia disipada, típ.	4,2 W
Entradas digitales	
Número de entradas	32
Fuente/sumidero	Sumidero
Característica de entrada según IEC 61131, tipo 3	Sí
Tensión de entrada	
Tipo de tensión de entrada	DC
Valor nominal, DC	24 V
para señal "0"	-30 a +5 V
para señal "1"	11 a 30 V

	6ES7521-1BL00-0AB0
Tensión admisible a la entrada, máx.	30 V
Tensión admisible a la entrada, mín.	-30 V
Intensidad de entrada	
para señal "1", típ.	2,5 mA
Retardo a la entrada (a tensión nominal de entrada)	
para entradas estándar	
• parametrizable	Sí; 0,05 / 0,1 / 0,4 / 1,6 / 3,2 / 12,8 / 20 ms
• En transición "0" a "1", mín.	0,05 ms
• En transición "0" a "1", máx.	20 ms
• En transición "1" a "0", mín.	0,05 ms
• En transición "1" a "0", máx.	20 ms
para entradas de alarmas	
• parametrizable	Sí
Longitud de cable	
Longitud de cable apantallado, máx.	1000 m
Longitud de cable no apantallado, máx.	600 m
Sensores	
Sensores conectables	
Sensor a 2 hilos	Sí
• Intensidad permitida en reposo (sensor a 2 hilos), máx.	1,5 mA
Modo isócrono	
Modo isócrono (aplicación sincronizada hasta el borne)	Sí
Tiempo de filtro y procesamiento (TWE), mín.	80 µs; con tiempo de filtro de 50 µs
Tiempo de ciclo de bus (TDP), mín.	250 µs
Alarmas/diagnósticos/información de estado	
Alarmas	
Alarma de diagnóstico	Sí
Alarma de proceso	Sí
Avisos de diagnóstico	
Diagnóstico	Sí
Vigilancia de la tensión de alimentación	Sí
Rotura de hilo	Sí; a I < 350 µA
Cortocircuito	No
Actuación fusible	No
LED de diagnóstico	
LED RUN	Sí; LED verde
LED ERROR	Sí; LED rojo
Vigilancia de la tensión de alimentación	Sí; LED verde
Indicador de estado del canal	Sí; LED verde

	6ES7521-1BL00-0AB0
para diagnóstico de canales	Sí; LED rojo
para diagnóstico de módulo	Sí; LED rojo
Aislamiento galvánico	
Aislamiento galvánico de canales	
entre los canales	Sí
entre los canales, en grupos de	16
entre los canales y el bus de fondo	Sí
entre los canales y la alimentación de la electrónica	No
Diferencia de potencial admisible	
entre circuitos diferentes	75 V DC/60 V AC (aislamiento básico)
Aislamiento	
Aislamiento ensayado con	707 V DC (Type Test)
Operación descentralizada	
Arranque optimizado	Sí
Dimensiones	
Anchura	35 mm
Altura	147 mm
Profundidad	129 mm
Pesos	
Peso, aprox.	260 g

Tolerancias del retardo a la entrada parametrizable

Tabla 6- 1 Tolerancias del retardo a la entrada parametrizable

Retardo a la entrada	Rango de tolerancia
0,05 ms	43 µs a 57 µs
0,1 ms	86 µs a 114 µs
0,4 ms	344 µs a 456 µs
1,6 ms	1,5 ms a 1,9 ms
3,2 ms (predeterminado)	3 ms a 4 ms
12,8 ms	12 ms a 15 ms
20 ms	19 ms a 23 ms

Croquis acotado

A

Este anexo incluye el croquis acotado del módulo montado en un perfil soporte, así como un croquis acotado con tapa frontal abierta. Deben tenerse en cuenta las dimensiones al montar en armarios, salas de equipos, etc.

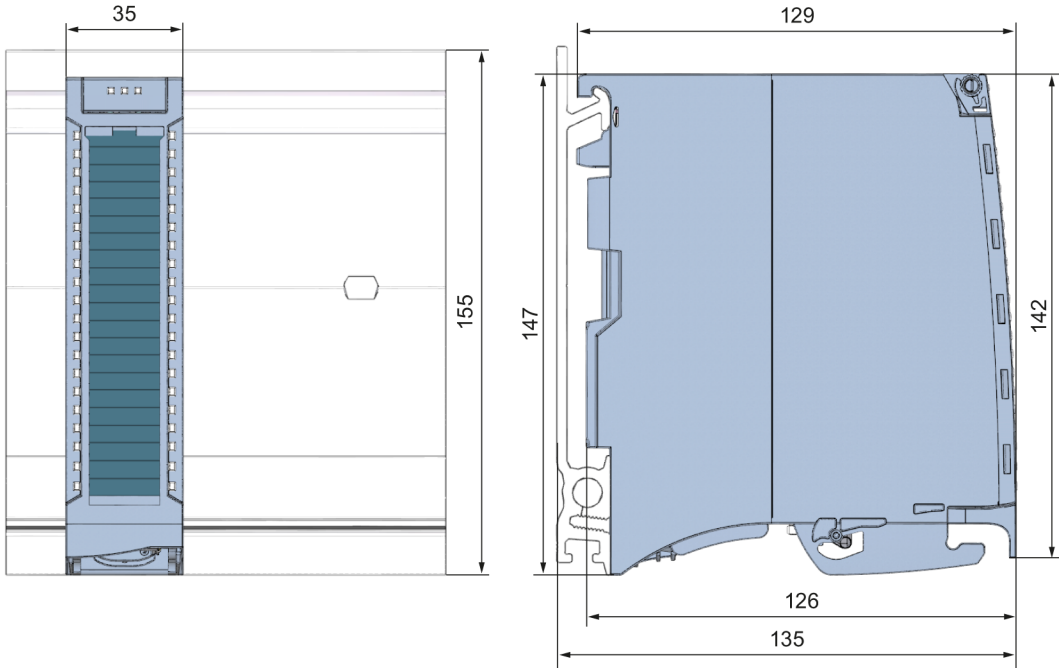


Figura A-1 Croquis acotado del módulo DI 32x24VDC HF

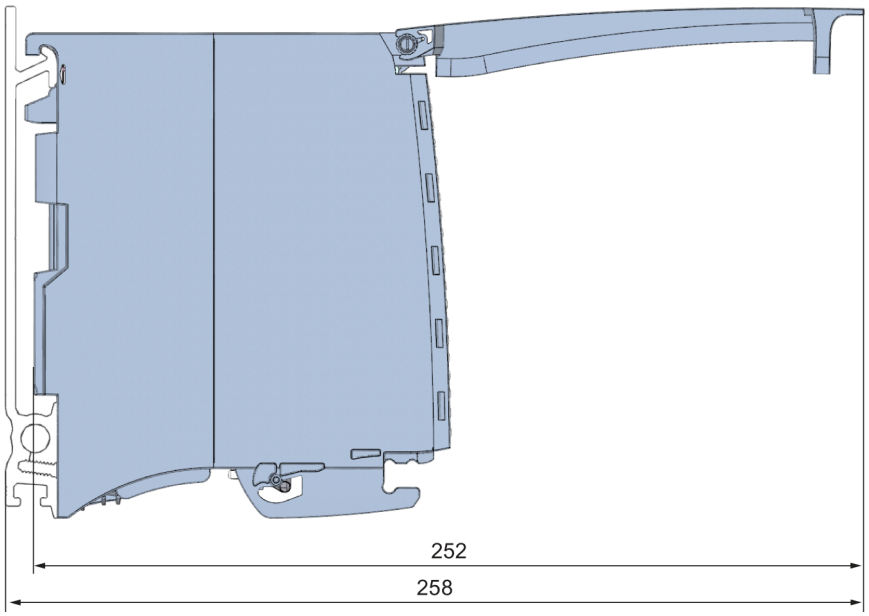


Figura A-2 Croquis acotado del módulo DI 32x24VDC HF, vista lateral con tapa frontal abierta

Registros de parámetros

B

B.1 Parametrización y estructura de los registros de parámetros

Los registros del módulo tienen una estructura idéntica, independientemente de que se configure el módulo con PROFIBUS DP o PROFINET IO.

Dependencias en la configuración con un archivo GSD

Al configurar el módulo con un archivo GSD, pueden surgir dependencias en el "Ajuste de los parámetros".

En este módulo no hay dependencias. Los distintos parámetros pueden combinarse entre sí sin restricciones.

Parametrización en el programa de usuario

La parametrización del módulo se puede modificar en RUN (p. ej., es posible modificar los valores para el retardo a la entrada de canales concretos sin que ello tenga efecto en los demás canales).

Modificación de parámetros en RUN

Los parámetros se transfieren al módulo mediante los registros 0 a 31 con la instrucción WRREC. Los parámetros ajustados con STEP 7 no se modifican en la CPU, es decir, los parámetros ajustados con STEP 7 vuelven a ser válidos tras un arranque.

El módulo comprueba la plausibilidad de los parámetros una vez que estos han sido transferidos.

Parámetro de salida STATUS

Si se producen errores al transferir los parámetros con la instrucción WRREC, el módulo seguirá funcionando con la parametrización utilizada hasta entonces. El parámetro de salida STATUS contiene no obstante el código de error correspondiente.

La instrucción WRREC y los códigos de error se describen en la ayuda en pantalla de STEP 7.

Funcionamiento del módulo aguas abajo de un módulo de interfaz PROFIBUS DP

Cuando el módulo funciona aguas abajo de un IM PROFIBUS DP, los registros de parámetros 0 y 1 no se pueden leer. Con los registros de parámetros 0 y 1 leídos se emiten los registros de diagnóstico 0 y 1. Puede obtener información adicional en el manual de producto del módulo de interfaz PROFIBUS DP, capítulo Alarmas en Internet (http://support.automation.siemens.com/WW/view/es/78324181).

Asignación de registro y canal

En la configuración de 1 x 32 canales, los parámetros se encuentran en los registros 0 a 31 y tienen la siguiente asignación:

- Registro 0 para canal 0
- Registro 1 para canal 1
- …
- Registro 30 para canal 30
- Registro 31 para canal 31

En la configuración de 4 x 8 canales, el módulo consta de 4 submódulos de ocho canales cada uno. Los parámetros para los canales se encuentran en los registros 0 a 7 y tienen la siguiente asignación:

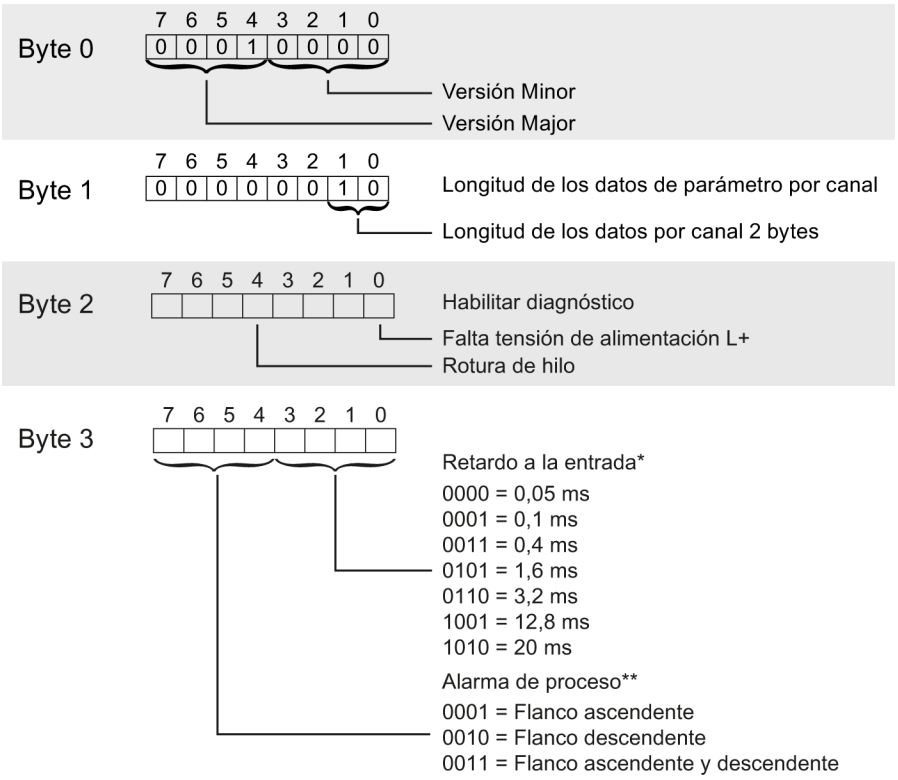
- Registros 0 a 7 para canales 0 a 7 (submódulo 1)
- Registros 0 a 7 para canales 8 a 15 (submódulo 2)
- Registros 0 a 7 para canales 16 a 23 (submódulo 3)
- Registros 0 a 7 para canales 24 a 31 (submódulo 4)

Al transferir los registros, debe direccionarse el submódulo correspondiente.

Estructura de un registro

La siguiente figura muestra como ejemplo la estructura del registro 0 para el canal 0. En el caso de los canales 1 a 31, la estructura es idéntica. Los valores en los bytes 0 y 1 son fijos y no deben modificarse.

Los parámetros se activan poniendo a "1" el bit correspondiente.



* 0,05 ms (no modificable) en modo isócrono

** Solo es posible activar las alarmas de proceso mediante un registro si el canal tiene asignado un OB de alarma de proceso en STEP 7

Figura B-1 Estructura del registro 0: bytes 0 a 3

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C

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