

**SIEMENS**



# SIMATIC

**S7-1500**

Módulo de salidas digitales DQ 16x24VDC/0.5A ST (6ES7522-1BH00-0AB0)

Manual de producto

Edición

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Answers for industry.

# SIEMENS

## SIMATIC

### S7-1500/ET 200MP Módulo de salidas digitales DQ 16x24 VDC/0.5A ST (6ES7522-1BH00-0AB0)

Manual de producto

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## 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.

 <b>PELIGRO</b>
Significa que, si no se adoptan las medidas preventivas adecuadas <b>se producirá</b> la muerte, o bien lesiones corporales graves.

 <b>ADVERTENCIA</b>
Significa que, si no se adoptan las medidas preventivas adecuadas <b>puede producirse</b> la muerte o bien lesiones corporales graves.

 <b>PRECAUCIÓN</b>
Significa que si no se adoptan las medidas preventivas adecuadas, pueden producirse lesiones corporales.

<b>ATENCIÓN</b>
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.

### Personal cualificado

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.

### Uso previsto o de los productos de Siemens

Considere lo siguiente:

 <b>ADVERTENCIA</b>
Los productos de Siemens sólo deberán usarse para los casos de aplicación previstos en el catálogo y la documentación técnica asociada. De usarse productos y componentes de terceros, éstos deberán haber sido recomendados u homologados por Siemens. El funcionamiento correcto y seguro de los productos exige que su transporte, almacenamiento, instalación, montaje, manejo y mantenimiento hayan sido realizados de forma correcta. Es preciso respetar las condiciones ambientales permitidas. También deberán seguirse las indicaciones y advertencias que figuran en la documentación asociada.

### Marcas registradas

Todos los nombres marcados con ® son marcas registradas de Siemens AG. Los restantes nombres y designaciones contenidos en el presente documento pueden ser marcas registradas cuya utilización por terceros para sus propios fines puede violar los derechos de sus titulares.

### Exención de responsabilidad

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.

# 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 Output interna del módulo (MSO) 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:

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### 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.

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## 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.

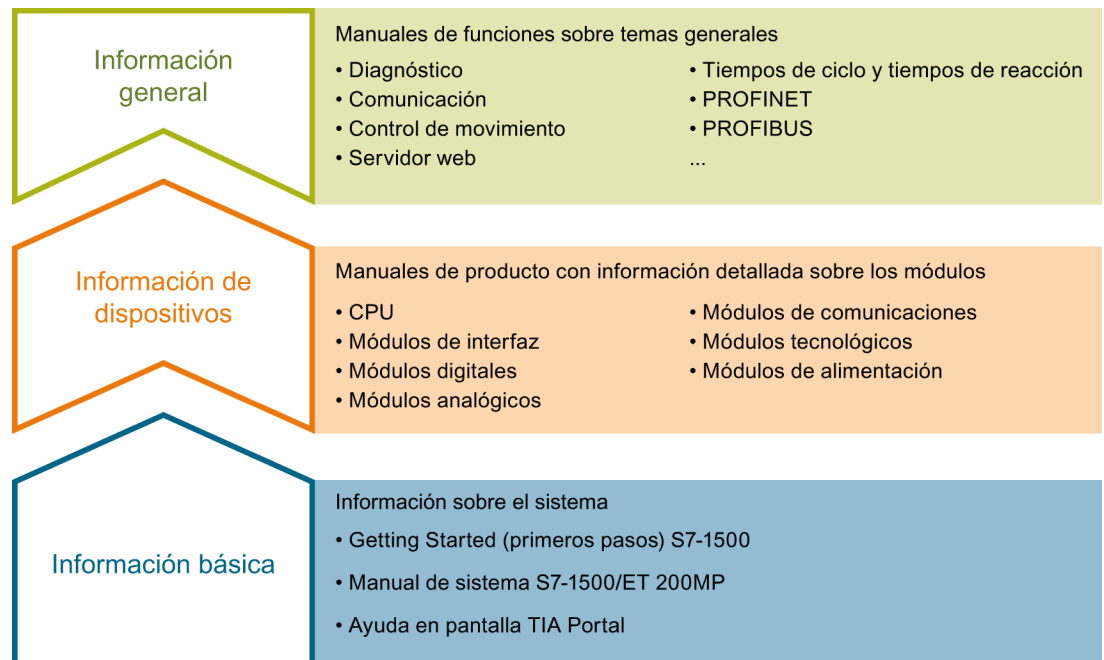
Por motivos legales estamos obligados a publicar las condiciones de licencia y las notas copyright en el texto original. Lea al respecto la información del anexo.

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## Guía de la documentación

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

### 2.1 Características

#### Referencia

6ES7522-1BH00-0AB0

#### Vista del módulo

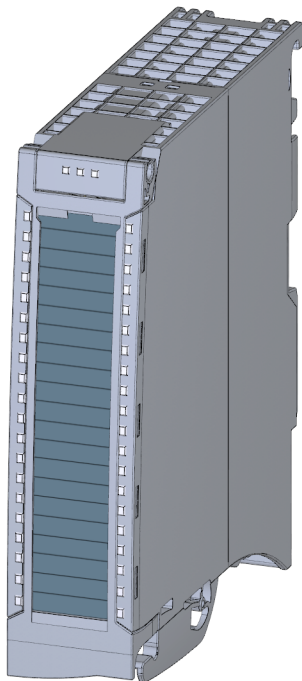


Figura 2-1 Vista del módulo DQ 16x24VDC/0.5A ST

2.1 Características

**Características**

El módulo tiene las siguientes características técnicas:

- 16 salidas digitales, con aislamiento galvánico en grupos de 8
- Tensión nominal de salida 24 V DC
- Intensidad nominal de salida 0,5 A por canal
- Valores sustitutivos parametrizables (por canal)
- Diagnóstico parametrizable (por grupo de canales)
- Adecuado para electroválvulas, contactores de corriente continua y lámparas de señalización

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 (TIAPortal)	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 Output interna del módulo (MSO)	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>).

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.

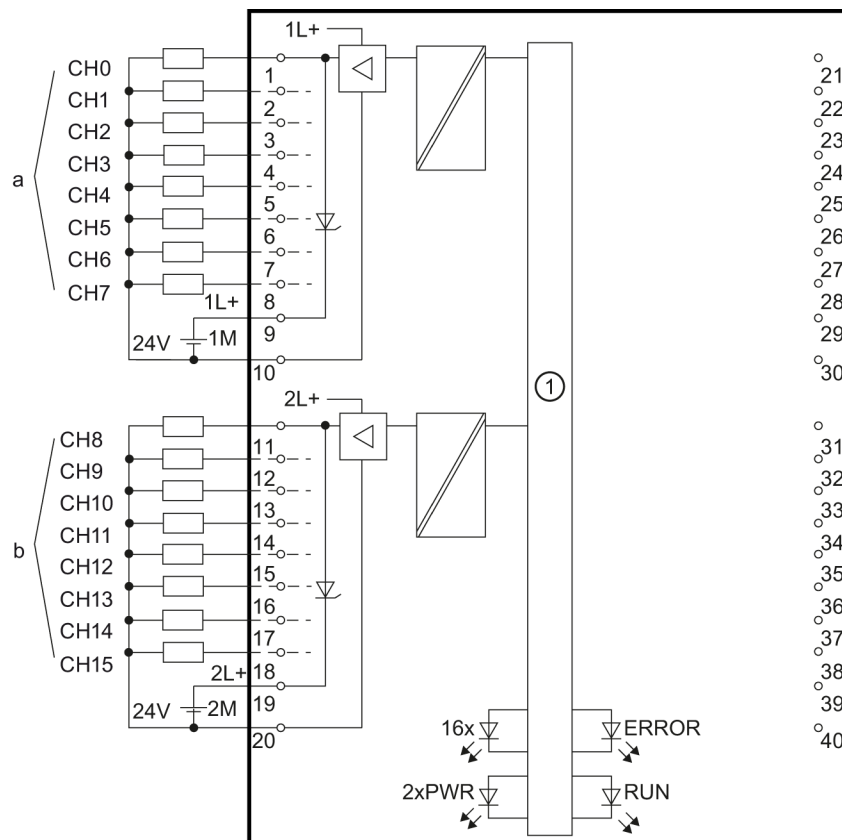
## Abreviaturas utilizadas

Las abreviaturas utilizadas en las figuras significan lo siguiente:

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

### Esquema de principio y asignación de pines

La siguiente figura muestra como ejemplo la asignación de pines y la asignación de los canales a las direcciones (byte de salida a y byte de salida b).



① Interfaz con el bus de fondo

Figura 3-1 Esquema de principio y asignación de pines

#### Nota

Al conectar la tensión de alimentación de 24 V, las salidas del módulo conducen una señal "1" durante aprox. 50  $\mu$ s según el circuito.

### 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 puentes entre los bornes
  - 9 y 29 (L+)
  - 10 y 30 (M)
  - 19 y 39 (L+)
  - 20 y 40 (M)
3. Tienda puentes entre los bornes 29 y 39, así como 30 y 40.
4. Utilice los bornes 19 y 20 para conectar en cadena el potencial con el siguiente módulo.

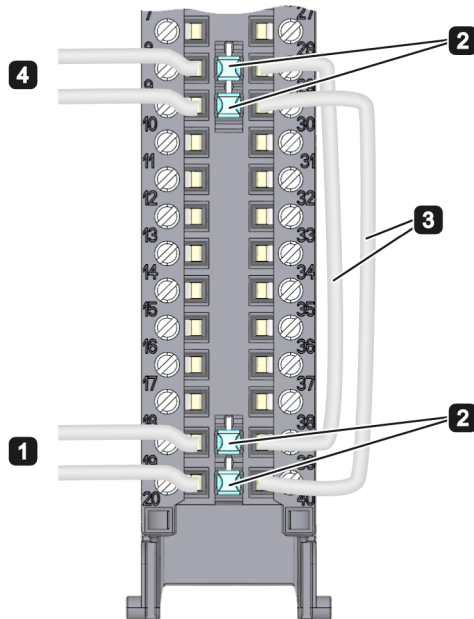


Figura 3-2 Utilización de puentes

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#### Nota

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

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## Parametrización y direccionamiento

### 4.1 Parámetros

#### Parámetros del DQ 16x24VDC/0.5 ST

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 32)

Tabla 4- 1 Parámetros ajustables y su preajuste

Parámetro	Rango de valores	Ajuste estándar	Reparametrización en RUN	Rango efectivo con software de configuración, p. ej., STEP 7 (TIA Portal)	
				Archivo GSD PROFINET IO	Archivo GSD PROFIBUS DP
<b>Diagnóstico</b>					
<ul style="list-style-type: none"> <li>• Falta tensión de alimentación L+</li> </ul>	Sí/No	No	Sí	Grupo de canales	Grupo de canales
<ul style="list-style-type: none"> <li>• Cortocircuito a M</li> </ul>	Sí/No	No	Sí	Grupo de canales	Grupo de canales
<b>Reacción a STOP de la CPU</b>	<ul style="list-style-type: none"> <li>• Desconectar</li> <li>• Mantener último valor</li> <li>• Aplicar valor sustitutivo 1</li> </ul>	Desconectar	Sí	Canal	Canal

## 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 o distintas en la memoria imagen de proceso de las salidas/entradas.

### Opciones de configuración de DQ 16x24VDC/0.5A ST

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 16 canales sin información de calidad	DQ 16x24VDC/0.5A ST	a partir de V12	X
1 x 16 canales con información de calidad	DQ 16x24VDC/0.5A ST QI	a partir de V12	X
2 x 8 canales sin información de calidad	DQ 16x24VDC/0.5A ST S	a partir de V13, Update 3 (solo PROFINET IO)	X (solo PROFINET IO)
2 x 8 canales con información de calidad	DQ 16x24VDC/0.5A ST S QI	a partir de V13, Update 3 (solo PROFINET IO)	X (solo PROFINET IO)
1 x 16 canales con información de calidad para Shared Output interna del módulo con hasta 4 submódulos	DQ 16x24VDC/0.5A ST MSO	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:

- DQ 16x24VDC/0.5A ST QI
- DQ 16x24VDC/0.5A ST S QI
- DQ 16x24VDC/0.5A ST MSO

Cada canal tiene asignado un bit adicional de información de calidad. El bit de información de calidad indica si el valor de salida especificado por el programa de usuario está realmente presente en el borne del módulo (0 = el valor es erróneo).

#### Particularidad en caso de cortocircuito a M

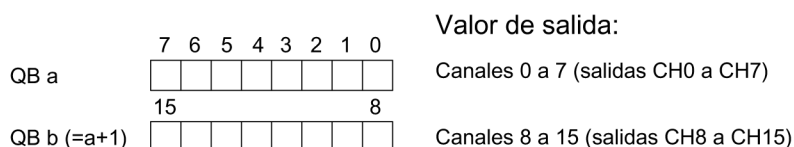
Si hay un canal cortocircuitado, se ponen a 0 todos los bits del correspondiente byte de entrada de estado del valor. El módulo notifica error en todos los canales del byte en cuestión.

### Área de direcciones en la configuración como DQ 16x24VDC/0.5A ST de 16 canales

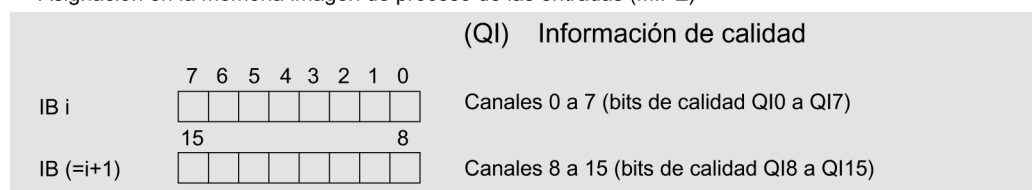
La siguiente figura muestra la asignación del área de direcciones en la configuración como módulo de 16 canales con información de calidad. La dirección inicial del módulo puede asignarse libremente. Las direcciones de los canales se derivan de dicha dirección inicial.

Las letras "a" a "d" están serigrafadas en el módulo. "QB a" indica p. ej., el byte de salida "a" de la dirección inicial del módulo.

Asignación en la memoria imagen de proceso de las salidas (MIPS)



Asignación en la memoria imagen de proceso de las entradas (MIPE)



0 = el valor leído en el canal es erróneo

Figura 4-1 Área de direcciones en la configuración como DQ 16x24VDC/0.5A ST de 16 canales con información de calidad

**Área de direcciones en la configuración como DQ 16x24VDC/0.5A ST S QI de 2 x 8 canales**

En la configuración como módulo de 2 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 del módulo de 1 x 16 canales, cada uno de los dos submódulos tiene una dirección inicial de libre asignación. Las direcciones para la correspondiente información de calidad de un submódulo también pueden asignarse a discreción.

Asignación en la memoria imagen de proceso de las salidas (MIPS)

		7 6 5 4 3 2 1 0	<b>Valor de salida:</b>						
QB a	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Canales 0 a 7 (salidas CH0 a CH7)	Submódulo 1
		15		8					
QB b	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Canales 8 a 15 (salidas CH8 a CH15)	Submódulo 2

Asignación en la memoria imagen de proceso de las entradas (MIPE)

			<b>(QI) Información de calidad</b>						
		7 6 5 4 3 2 1 0							
IB i	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Canales 0 a 7 (bits de calidad QI0 a QI7)	Submódulo 1
		15		8					
IB j	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Canales 8 a 15 (bits de calidad QI8 a QI15)	Submódulo 2

0 = el valor leído en el canal es erróneo

Figura 4-2 Área de direcciones en la configuración como DQ 32x24VDC/0.5A ST S QI de 2 x 8 canales con información de calidad

### Área de direcciones en la configuración como DQ 16x24VDC/0.5A ST MSO de 1 x 16 canales

Al configurar un módulo de 1 x 16 canales (Shared Output interna del módulo, MSO), los canales 0 a 15 del módulo se copian a varios submódulos. Así, los canales 0 a 15 están presentes con valores idénticos en distintos submódulos. Al usar el módulo en un Shared Device, dichos submódulos pueden asignarse a un total de cuatro controladores IO:

- El controlador IO al que está asignado el submódulo 1 tiene acceso de escritura a las salidas 0 a 15.
- Los controladores IO a los que están asignados los submódulos 2, 3 ó 4 tienen acceso de lectura a las salidas 0 a 15.

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 caso del submódulo 1 (= submódulo base), la información de calidad 0 indica que el valor es erróneo o que el controlador IO del submódulo base se encuentra en estado STOP.

En los submódulos 2 a 4 (= submódulos MSO), la información de calidad 0 indica que el valor es erróneo o que se ha producido uno de los siguientes errores:

- El submódulo base todavía no está parametrizado (no está listo para el funcionamiento).
- Se ha interrumpido la conexión entre el controlador IO y el submódulo base.
- El controlador IO del submódulo base se encuentra en el estado STOP o DESCONEXIÓN.



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

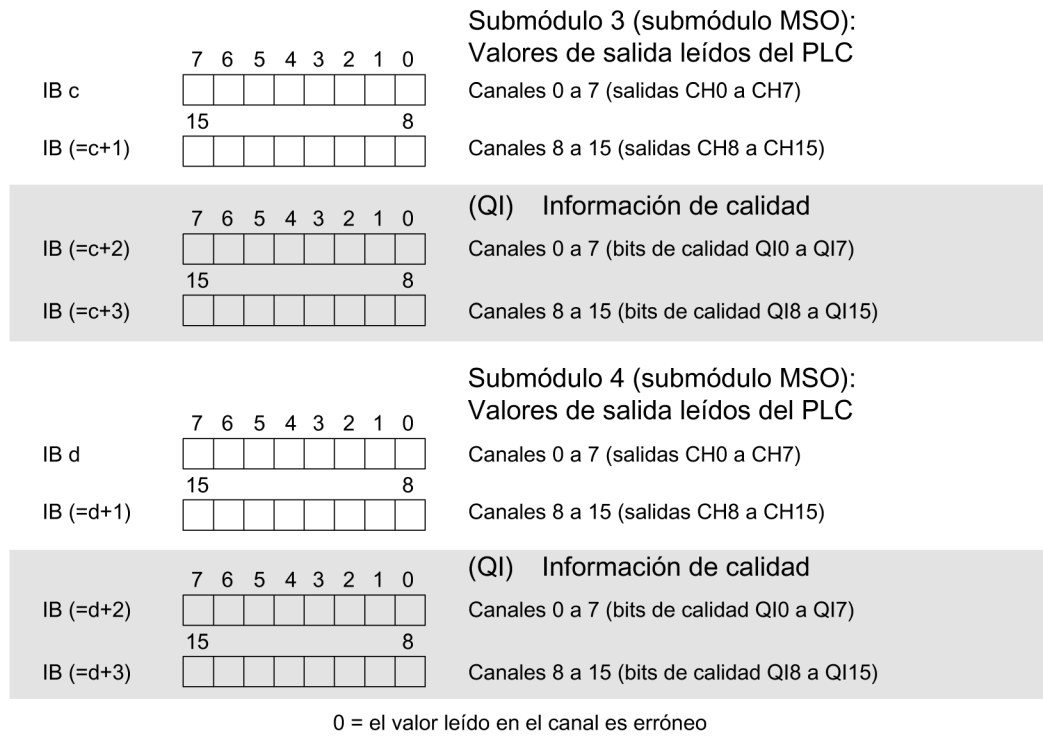


Figura 4-4 Área de direcciones en la configuración como DQ 16x24VDC/0.5A ST S MSO de 1 x 16 canales con información de calidad

## Alarmas y avisos de diagnóstico

### 5.1 Indicadores de estado y error

#### Indicadores LED

La siguiente figura muestra los indicadores LED (indicadores de estado y error) de DQ 16x24VDC/0.5A ST.

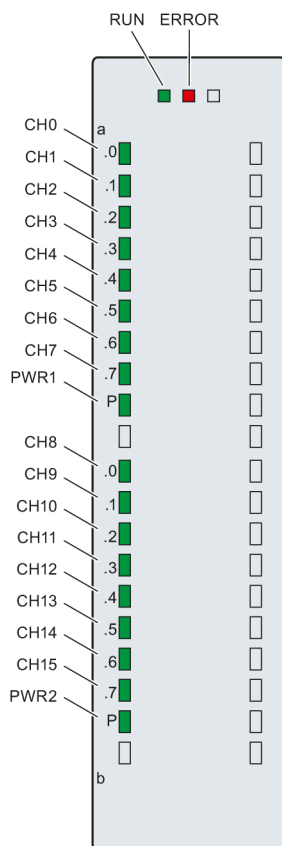












Figura 5-1 LED del módulo DQ 16x24VDC/0.5A ST

## 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 25).



## LED RUN y ERROR

Tabla 5- 1 Indicadores de estado y error RUN y ERROR

LED		Significado	Solución
RUN	ERROR		
 apagado	 apagado	Tensión muy baja o nula en el bus de fondo	<ul style="list-style-type: none"> <li>• Conecte la CPU y/o los módulos de alimentación del sistema.</li> <li>• Compruebe si están enchufados los conectores U.</li> <li>• Compruebe si hay demasiados módulos enchufados.</li> </ul>
 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 un error en un canal, p. ej. cortocircuito a masa).	Evalúe el diagnóstico y corrija el error (p. ej. compruebe los cables).
 parpadea	 parpadea	Hardware defectuoso	Sustituya el módulo.

## LED PWR1 y PWR2

Tabla 5- 2 Indicador de estado PWR1 y PWR2

LED PWRx	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 salida	---
■ encendido	1 = Estado de la señal de salida	---

## 5.2 Alarmas

El módulo de salidas digitales DQ 16x24VDC/0.5A ST admite la alarma de diagnóstico.

### Alarma de diagnóstico

El módulo genera una alarma de diagnóstico con estos eventos:

- Falta tensión de alimentación L+
- Cortocircuito a masa

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



## 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 LED ERROR. Los avisos de diagnóstico pueden leerse, p. ej., 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- 4 Avisos de diagnóstico, su significado y soluciones posibles

Aviso de diagnóstico	Código de error	Significado	Soluciones posibles
Cortocircuito a M	1H	Cortocircuito o sobrecarga en canal	Comprobar el cableado/actuador. Comprobar la temperatura ambiente.
Falta tensión de carga	11H	Falta la tensión de alimentación L+ del módulo	Conducir la tensión de alimentación L+ al módulo/canal

## Datos técnicos

### Datos técnicos del DQ 16x24VDC/0.5A ST

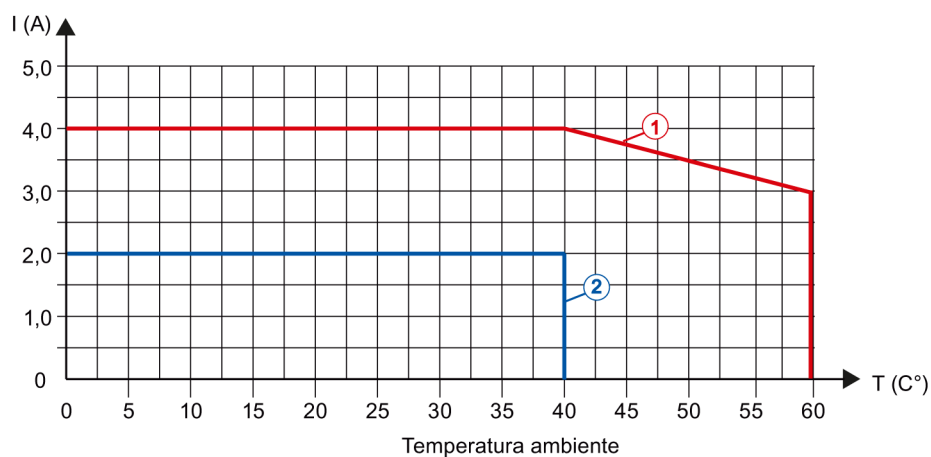
	6ES7522-1BH00-0AB0
Nombre del producto	DQ 16x24VDC/0,5A ST
<b>Información general</b>	
Versión de producto HW	E01
Versión de firmware	V2.0.0
<b>Función del producto</b>	
Datos I&M	Sí; IM0 a IM3
<b>Ingeniería con</b>	
STEP 7 TIA Portal configurable/integrado desde versión	V12.0/V12.0
STEP 7 configurable/integrado desde versión	V5.5 SP3 / -
<b>Modo de operación</b>	
MSO	Sí
<b>Tensión de alimentación</b>	
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; protegida internamente hasta 7 A por grupo
<b>Intensidad de entrada</b>	
Consumo máx.	30 mA
<b>Tensión de salida</b>	
Valor nominal (DC)	24 V
<b>Potencia</b>	
Potencia tomada del bus de fondo	1,1 W
<b>Disipación</b>	
Potencia disipada, típ.	2 W
<b>Salidas digitales</b>	
Tipo de salida digital	Transistor
Número de salidas	16
Fuente	Sí
Salidas digitales, parametrizables	Sí
Protección contra cortocircuitos	Sí; electrónica cíclica
<ul style="list-style-type: none"> <li>Umbral de respuesta, típ.</li> </ul>	1 A
Limitación de la tensión inductiva de corte a	L+ (-53 V)
Ataque de una entrada digital	Sí

<b>6ES7522-1BH00-0AB0</b>	
<b>Poder de corte de las salidas</b>	
con carga óhmica, máx.	0,5 A
con carga de lámparas, máx.	5 W
<b>Rango de resistencia de carga</b>	
Límite inferior	48 Ω
Límite superior	12 kΩ
<b>Tensión de salida</b>	
Tipo de tensión de salida	DC
para señal "1", mín.	L+ (-0,8 V)
<b>Intensidad de salida</b>	
para señal "1" valor nominal	0,5 A
para señal "1" rango admisible, máx.	0,5 A
para señal "0" corriente residual, máx.	0,5 mA
<b>Retardo a la salida con carga óhmica</b>	
"0" a "1", máx.	100 μs
"1" a "0", máx.	500 μs
<b>Conexión en paralelo de 2 salidas</b>	
para combinaciones lógicas	Sí
para aumentar la potencia	No
para mando redundante de una carga	Sí
<b>Frecuencia de conmutación</b>	
con carga óhmica, máx.	100 Hz
con carga inductiva, máx.	0,5 Hz; según IEC 947-5-1, 13 DC
con carga de lámparas, máx.	10 Hz
<b>Corriente total de las salidas</b>	
Corriente máx. por canal	0,5 A; (ver descripción adicional en el manual)
Corriente máx. por grupo	4 A; (ver descripción adicional en el manual)
Corriente máx. por módulo	8 A; (ver descripción adicional en el manual)
<b>Longitud de cable</b>	
Longitud de cable apantallado, máx.	1000 m
Longitud de cable no apantallado, máx.	600 m
<b>Modo isócrono</b>	
Modo isócrono (aplicación sincronizada hasta el borne)	Sí
Tiempo de procesamiento y activación (TWA), mín.	70 μs
Tiempo de ciclo de bus (TDP), mín.	250 μs

	6ES7522-1BH00-0AB0
<b>Alarmas/diagnósticos/información de estado</b>	
Valores sustitutivos aplicables	Sí
<b>Alarmas</b>	
Alarma de diagnóstico	Sí
<b>Avisos de diagnóstico</b>	
Diagnóstico	Sí
Vigilancia de la tensión de alimentación	Sí
Rotura de hilo	No
Cortocircuito	Sí
Actuación fusible	No
<b>LED de diagnóstico</b>	
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
para diagnóstico de canales	No
para diagnóstico de módulo	Sí; LED rojo
<b>Aislamiento galvánico</b>	
<b>Aislamiento galvánico de canales</b>	
entre los canales	No
entre los canales, en grupos de	8
entre los canales y el bus de fondo	Sí
<b>Diferencia de potencial admisible</b>	
entre circuitos diferentes	75 V DC/60 V AC (aislamiento básico)
<b>Aislamiento</b>	
Aislamiento ensayado con	707 V DC (Type Test)
<b>Operación descentralizada</b>	
Arranque optimizado	Sí
<b>Dimensiones</b>	
Anchura	35 mm
Altura	147 mm
Profundidad	129 mm
<b>Pesos</b>	
Peso, aprox.	230 g

### Reducción de potencia (derating) de la corriente total de las salidas (por grupo)

Las siguientes curvas de derating muestran la capacidad de carga de las salidas en función de la posición de montaje y la temperatura ambiente.



- ① Montaje horizontal
- ② Montaje vertical

Figura 6-1 Datos sobre la corriente total de las salidas (por grupo)

# 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.

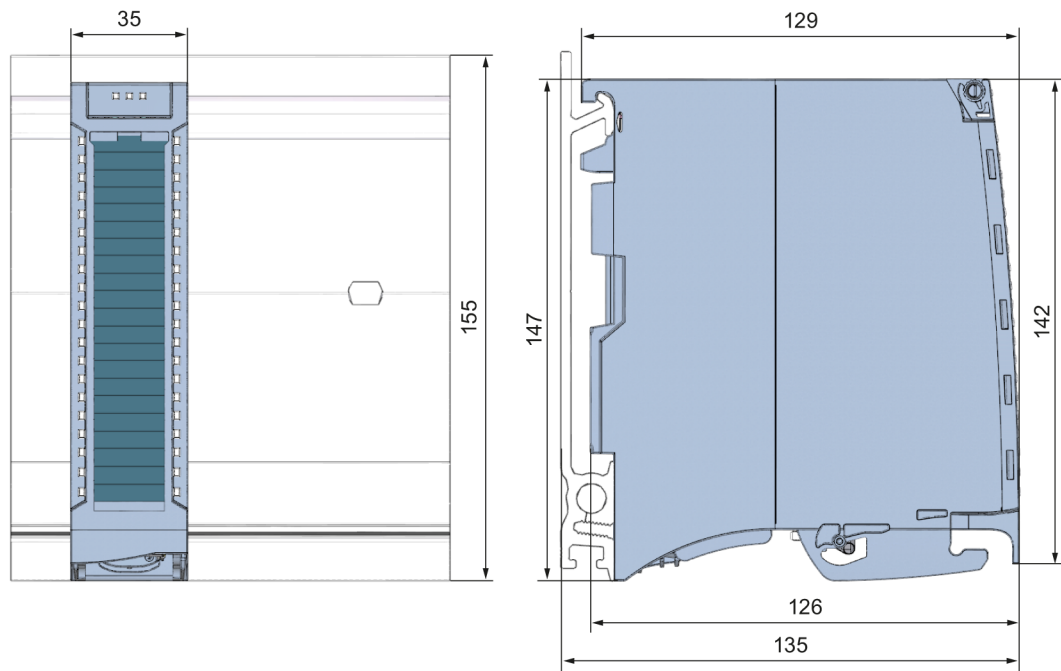


Figura A-1 Croquis acotado del módulo DQ 16x24VDC/0.5A ST

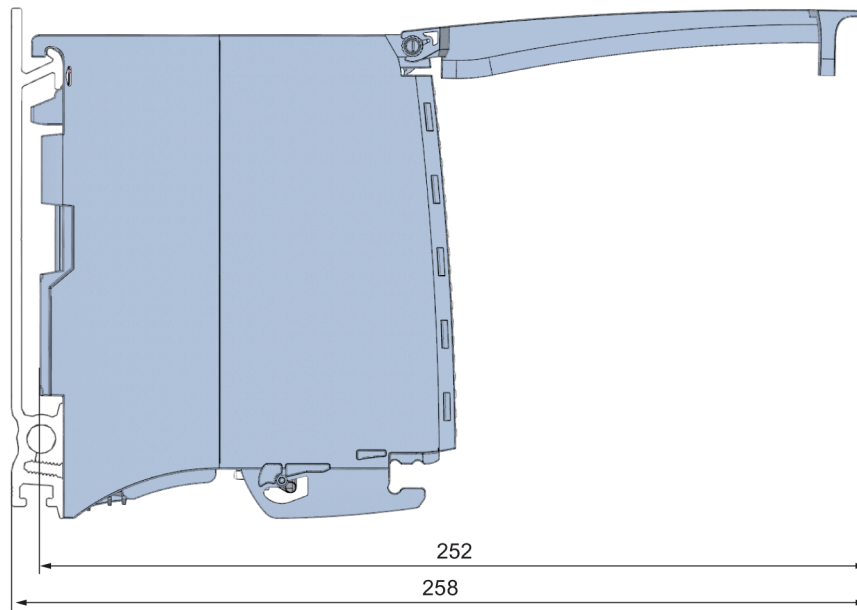


Figura A-2 Croquis acotado del módulo DQ 16x24VDC/0.5A ST, vista lateral con tapa frontal abierta

## Registros de parámetros

### 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

Tiene la posibilidad de cambiar la parametrización de los módulos en RUN (p. ej., la reacción a STOP de la CPU de canales concretos puede modificarse en RUN sin afectar a los demás canales).

#### Modificación de parámetros en RUN

Los parámetros se transfieren al módulo mediante los registros 64 a 78 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 16 canales, los parámetros se encuentran en los registros 64 a 79 y están asignados de la siguiente manera:

- Registro 64 para canal 0
- Registro 65 para canal 1
- ...
- Registro 78 para canal 14
- Registro 79 para canal 15

En la configuración de 2 x 8 canales, el módulo consta de 2 submódulos de ocho canales cada uno. Los parámetros para los canales se encuentran en los registros 64 a 71 y tienen la siguiente asignación:

- Registros 64 a 71 para los canales 0 a 7 (submódulo 1)
- Registros 64 a 71 para los canales 8 a 15 (submódulo 2)

Al transferir los registros, debe direccionarse el submódulo correspondiente.

### Estructura de un registro

La siguiente figura muestra como ejemplo la estructura del registro 64 para el canal 0. En el caso de los canales 1 a 15, 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.

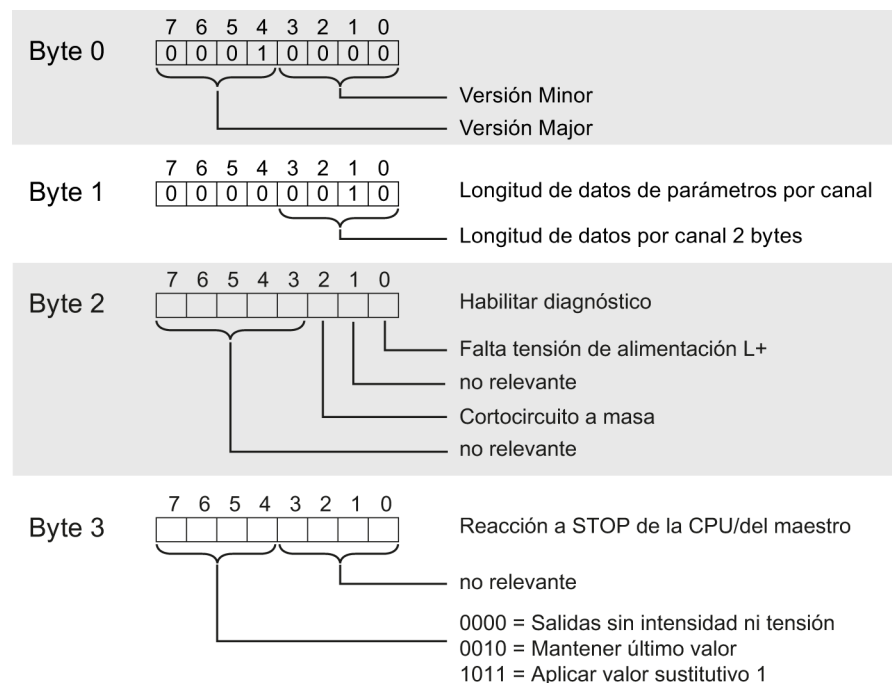


Figura B-1 Estructura del registro 64: bytes 0 a 3



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