

SIEMENS



SIMATIC

S7-1500 / ET 200MP

Módulo de salidas digitales DQ 16x24VDC/0.5A BA (6ES7522-1BH10-0AA0)

Manual de producto

Edición

09/2014

Answers for industry.

SIEMENS

SIMATIC

S7-1500/ET 200MP Módulo de salidas digitales DQ 16x24VDC/0.5A BA (6ES7522-1BH10-0AA0)

Manual de producto

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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.

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:

 ADVERTENCIA
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.

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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, el presente manual de producto incluye información más detallada sobre las funciones de los módulos, p. ej., a partir de qué versión de STEP 7 se soporta qué función.

Convenciones

El término "CPU" se refiere en lo sucesivo tanto a módulos centrales del sistema de automatización S7-1500 como a 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.

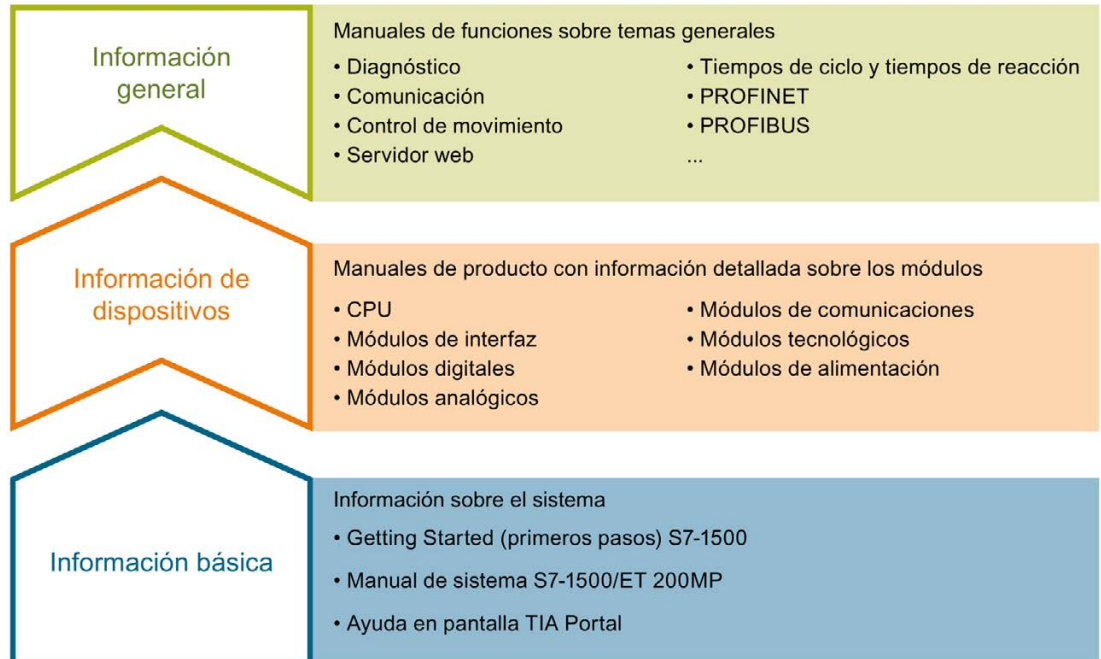
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Guía de la documentación

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

6ES7522-1BH10-0AA0

Vista del módulo

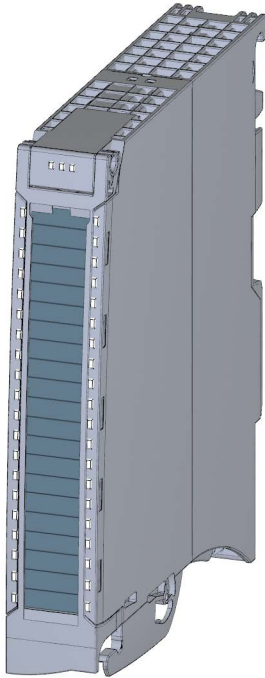


Figura 2-1 Vista del módulo DQ 16x24VDC/0.5A BA

Características

El módulo digital tiene las siguientes características técnicas:

- 16 salidas digitales, aisladas en grupos de 8
- Tensión nominal de salida 24 V DC
- Intensidad nominal de salida 0,5 A por canal
- 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 (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 V13	X
Datos de identificación I&M0 a I&M3	a partir de V1.0.0	a partir de V13	X
Shared Output interna del módulo (MSO)	a partir de V1.0.0	a partir de V13, Update 3 (solo PROFINET IO)	X (solo PROFINET IO)
Submódulos configurables/submódulos para Shared Device	a partir de V1.0.0	a partir de V13, Update 3 (solo PROFINET IO)	X (solo PROFINET IO)

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:

- Conector frontal (bornes push-in), incluidas las bridas
- Tiras rotulables
- Conectores en U
- Puerta frontal universal

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

3.1 Esquema eléctrico y esquema de principio

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

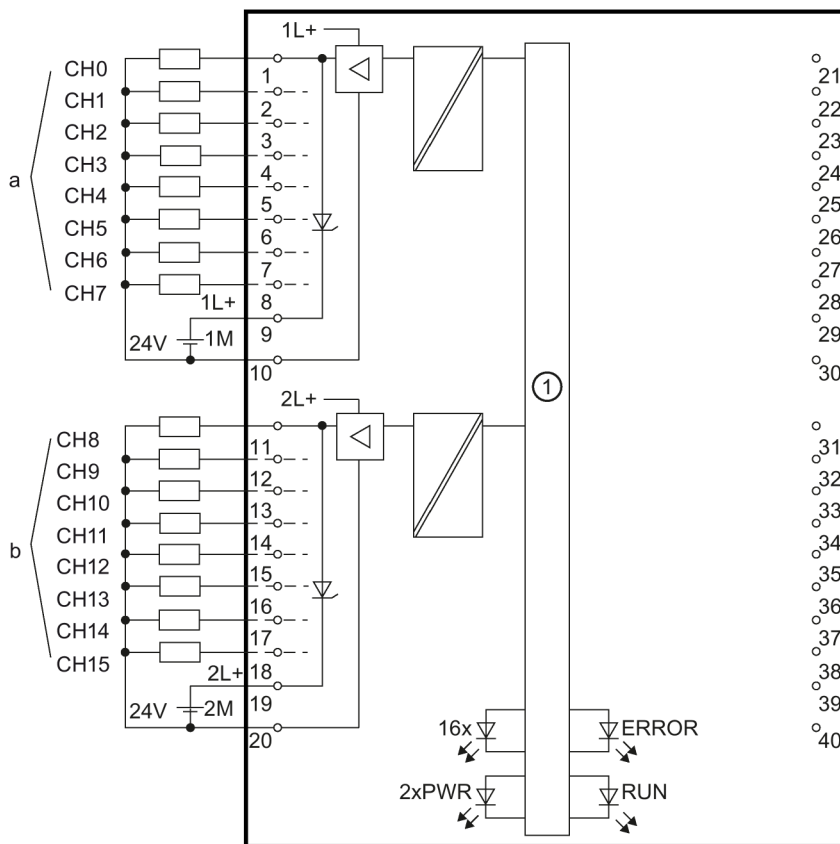
Encontrará información sobre cómo cablear el conector frontal, apantallar el cable, etc. en el manual de sistema Sistema de automatización S7-1500 (<http://support.automation.siemens.com/WW/view/es/59191792>) y en el manual de sistema Sistema de periferia descentralizada ET 200MP (<http://support.automation.siemens.com/WW/view/es/59193214>),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

Abreviaturas utilizadas

Significado de las abreviaturas utilizadas en la figura siguiente:

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

La siguiente figura muestra como ejemplo la asignación de conexiones 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 conexiones

Nota

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

Espacio de direcciones

4.1 Espacio de direcciones

En STEP 7, el módulo puede configurarse de diferentes maneras. 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 BA

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- 1 Opciones de configuración

Configuración	Nombre abreviado/nombre del módulo en el archivo GSD	Software de configuración, p. ej., con 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 BA	a partir de V13	X
2 x 8 canales sin información de calidad	DQ 16x24VDC/0.5A BAs	a partir de V13, Update 3 (solo PROFINET IO)	X (solo PROFINET IO)
1 x 16 canales con información de calidad para Shared Output interno del módulo con hasta 4 submódulos	DQ 16x24VDC/0.5A BAs MSO	a partir de V13, Update 3 (solo PROFINET IO)	X (solo PROFINET IO)

Espacio de direcciones en la configuración como DQ 16x24VDC/0.5A BA 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. Si el módulo se utiliza en un Shared Device, los 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 utilizables varía en función del módulo de interfaz utilizado. Lea las indicaciones del manual de producto del respectivo 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 1 indica que el valor de salida especificado por el programa de usuario es realmente el que se obtiene en el borne del módulo.

Causas posibles de una información de calidad = 0:

- El valor es erróneo porque falta tensión de alimentación, por ejemplo.
- El controlador IO del submódulo base está en estado STOP.

En los submódulos 2 a 4 (= submódulos MSO), la información de calidad 1 indica que el valor de salida especificado por el programa de usuario es realmente el que se obtiene en el borne del módulo.

Causas posibles de una información de calidad = 0:

- El valor es erróneo porque falta tensión de alimentación, por ejemplo.
- El controlador IO del submódulo base está en estado STOP.
- El submódulo base todavía no está configurado.

Avisos de diagnóstico

El módulo no dispone de diagnóstico parametrizable. Los avisos de diagnóstico no pueden emitirse, p. ej., con STEP 7 (TIA Portal).

5.1 Indicadores de estados y errores

Indicadores LED

La siguiente figura muestra los indicadores LED (indicadores de estados y errores) de DQ 16x24VDC/0.5A BA.

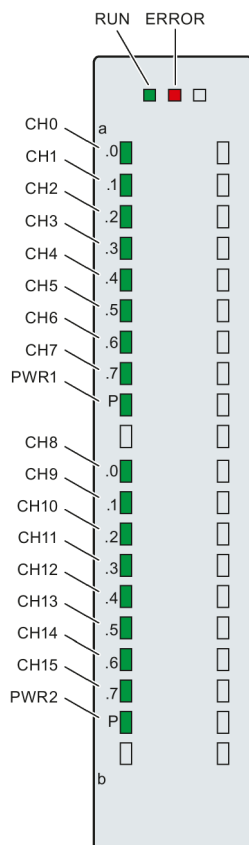










Figura 5-1 LED del módulo DQ 16x24VDC/0.5A BA

Significado de los indicadores LED

En las tablas siguientes se explica el significado de los indicadores de estados y errores.



LED RUN/ERROR

Tabla 5- 1 Indicadores de estados y errores RUN/ERROR

LED		Significado	Solución
RUN	ERROR		
 apagado	 apagado	Tensión muy baja o nula en el bus de fondo.	<ul style="list-style-type: none"> • Conecte la CPU y/o los módulos de alimentación del sistema. • Compruebe que estén enchufados los conectores U. • Compruebe si hay demasiados módulos enchufados.
 parpadea	 apagado	El módulo arranca.	---
 encendido	 apagado	El módulo está listo para el servicio.	
 parpadea	 parpadea	Hardware defectuoso.	Sustituya el módulo.



LED PWR1/PWR2

Tabla 5- 2 Indicador de estado PWR1/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.	---

Datos técnicos

Datos técnicos de DQ 16x24VDC/0.5A BA

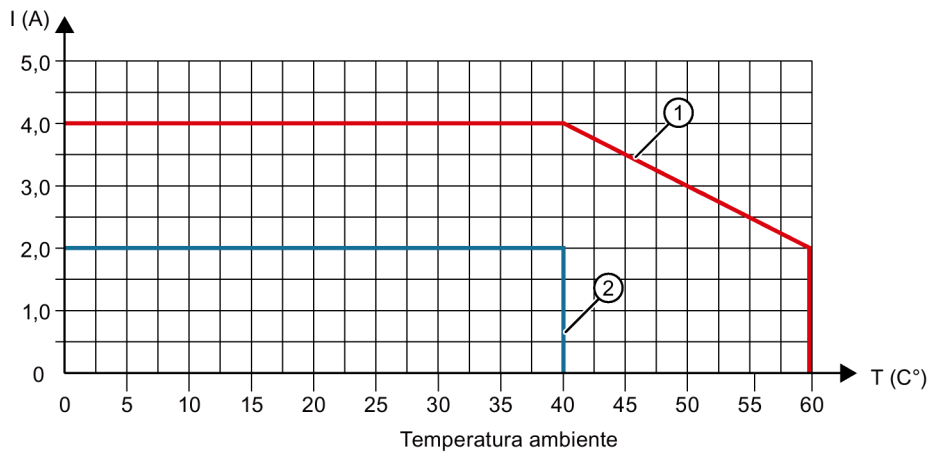
	6ES7522-1BH10-0AA0
Nombre del producto	DQ 16x24VDC/0.5A BA
Información general	
Versión de HW	E01
Versión de firmware	V1.0.0
Función del producto	
Datos I&M	Sí
Ingeniería con	
STEP 7 TIA Portal configurable/integrado desde versión	V13/V13
STEP 7 configurable/integrado desde versión	V5.5 SP3/-
Modo de operación	
MSO	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; protegida internamente hasta 7 A por grupo
Intensidad de entrada	
Consumo máx.	30 mA
Potencia	
Potencia tomada del bus de fondo	1,15 W
Potencia disipada	
Potencia disipada, típ.	2,2 W
Salidas digitales	
Tipo de salida digital	Transistor
Número de salidas	16
Salida tipo PNP	Sí
Salidas digitales, parametrizables	No
Protección contra cortocircuitos	Sí
• Umbral de respuesta, típ.	1 A
Limitación de la sobretensión inductiva de corte a	L+ (-53 V)
Control de una entrada digital	Sí

6ES7522-1BH10-0AA0	
Poder de corte de las salidas	
Con carga óhmica, máx.	0,5 A
Con carga de lámparas, máx.	5 W
Rango de resistencia de carga	
Límite inferior	48 Ω
Límite superior	12 kΩ
Tensión de salida	
Tipo de tensión de salida	DC
Para señal "1", mín.	L+ (-0,8 V)
Intensidad de salida	
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
Retardo a la salida con carga óhmica	
"0" a "1", máx.	100 μs
"1" a "0", máx.	500 μs
Conexión en paralelo de 2 salidas	
Para combinaciones lógicas	Sí
Para aumentar la potencia	No
Para control redundante de una carga	Sí
Frecuencia de conmutación	
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
Corriente total de las salidas	
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)
Longitud de cable	
Longitud de cable apantallado, máx.	1000 m
Longitud de cable no apantallado, máx.	600 m
Alarmas/diagnósticos/información de estado	
Valores sustitutivos aplicables	No
Alarmas	
Alarma de diagnóstico	No
Avisos de diagnóstico	
Diagnóstico	No
LED de diagnóstico	
LED RUN	Sí; LED verde
LED ERROR	Sí; LED rojo
LED MAINT	No
Vigilancia de la tensión de alimentación	Sí; LED verde
Indicador de estado del canal	Sí; LED verde

6ES7522-1BH10-0AA0	
Aislamiento galvánico	
Aislamiento galvánico de canales	
Entre los canales	No
Entre los canales, en grupos de	8
Entre los canales y el bus de fondo	Sí
Diferencia de potencial admisible	
Entre circuitos diferentes	75 V DC/60 V AC (aislamiento básico)
Aislamiento	
Aislamiento ensayado con	707 V DC (ensayo de tipo)
Operación descentralizada	
Arranque optimizado	Sí
Dimensiones	
Anchura	25 mm
Altura	147 mm
Profundidad	129 mm
Pesos	
Peso, aprox.	230 g
Otros	
Nota:	El suministro incluye conector frontal push-in de 40 polos

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. Las dimensiones deben tenerse en cuenta al montar el módulo en armarios, salas de distribución, etc.

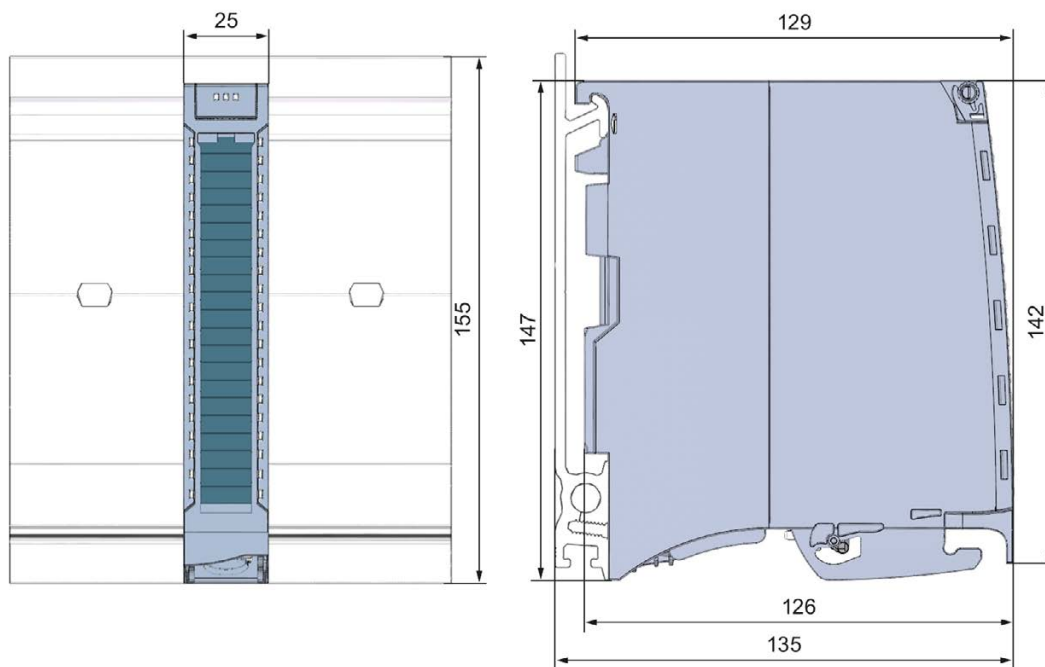


Figura A-1 Croquis acotado del módulo DQ 16x24VDC/0.5A BA

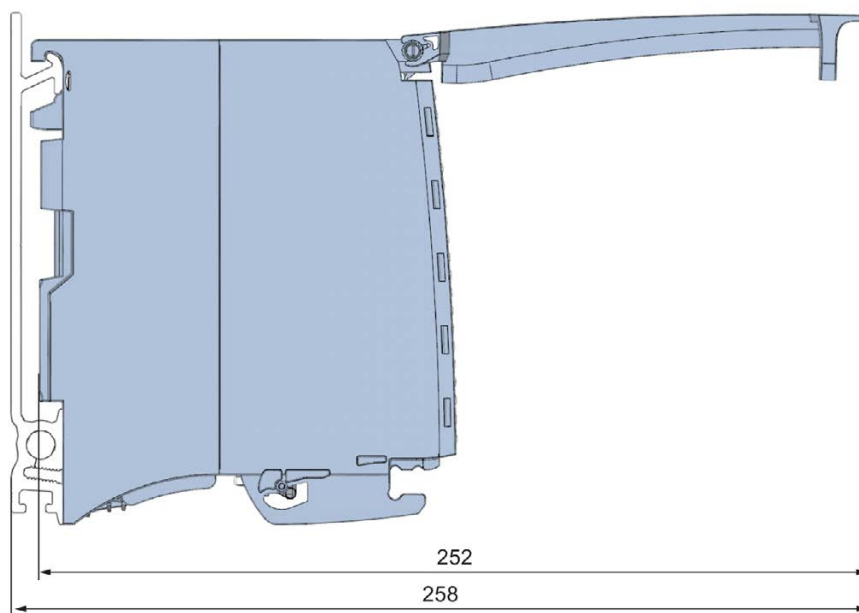


Figura A-2 Croquis acotado del módulo DQ 16x24VDC/0.5A BA, vista lateral con tapa frontal abierta

Open Source Software

B

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