

## Frequenzmessmodul DF20EX

### Weitere Unterlagen

Ergänzend zu diesem Dokument finden Sie im Internet unter [www.turck.com](http://www.turck.com) folgende Unterlagen:

- Datenblatt
- Handbuch excom – Remote I/O für eigensichere Stromkreise
- Zulassungen
- Konformitätserklärungen (aktuelle Version)

### Zu Ihrer Sicherheit

#### Bestimmungsgemäße Verwendung

Das Gerät ist ein Betriebsmittel in der Zündschutzart Ex ib IIC/Ex ia IIC und darf nur innerhalb des I/O-Systems excom für eigensichere Stromkreise mit den zugelassenen Modulträgern MT...-...G (PTB 00 ATEX 2194 U bzw. IECEx PTB 13.0040 U) eingesetzt werden.

Das Frequenz- und Zählermodul DF20EX ist entweder als Impulszähler von binären Eingangssignalen oder als Frequenzmesser von binären Impulsfolgen einsetzbar. An das Gerät können NAMUR-Sensoren gemäß EN 60947-5-6 oder mechanische Kontakte angeschlossen werden. Das Gerät ist für den Einsatz in Zone 1 geeignet. Die Zündschutzart der Ausgänge ist Ex ia IIC.

Jede andere Verwendung gilt als nicht bestimmungsgemäß. Für daraus resultierende Schäden übernimmt Turck keine Haftung.

#### Allgemeine Sicherheitshinweise

- Nur fachlich geschultes Personal darf das Gerät montieren, installieren, betreiben, einstellen und instand halten.
- Das Gerät erfüllt die EMV-Anforderungen für den industriellen Bereich. Bei Einsatz in Wohnbereichen Maßnahmen treffen, um Funkstörungen zu vermeiden.
- Nur Geräte miteinander kombinieren, die durch ihre technischen Daten für den gemeinsamen Einsatz geeignet sind.

#### Hinweise zum Ex-Schutz

- Bei Einsatz des Geräts in Ex-Kreisen muss der Anwender über Kenntnisse im Explosionsschutz (IEC/EN 60079-14 etc.) verfügen.
- Nationale und internationale Vorschriften für den Explosionsschutz beachten.
- Gerät nur innerhalb der zulässigen Betriebs- und Umgebungsbedingungen (siehe Technische Daten und Vorgaben durch die Ex-Zulassung) einsetzen.

Bei Einsatz in Zone 1 und Zone 2:

- Geräte in ein separat zugelassenes Gehäuse nach IEC/EN 60079-0 mit einer Schutzart mind. IP54 nach EN 60529 montieren.

Bei Einsatz im sicheren Bereich:

- Wenn Verschmutzungsgrad 2 nicht eingehalten wird: Gerät in ein Schutzgehäuse mind. IP54 einbauen.

### Produktbeschreibung

#### Geräteübersicht

Siehe Abb. 1: Geräteansicht, Abb. 2: Abmessungen

### Funktionen und Betriebsarten

Das Gerät verfügt über zwei Funktionsblöcke. Jeder Block hat einen Frequenz- oder Zählengang sowie drei Steuereingänge und Steuerausgänge. Die Ein- und Ausgänge sind untereinander nicht galvanisch getrennt. Alle Ein- und Ausgänge liegen auf einem gemeinsamen Potenzial. Am Ausgang steht bei 8 VDC ein Strom von 4 mA zur Verfügung.

In Abhängigkeit von der Betriebsart (Zähler oder Frequenzmesser) sind folgende Funktionen möglich:

- Impulse zählen
- Frequenz messen
- Zählrichtung bzw. Drehrichtung erkennen und anzeigen (statisch und dynamisch)
- Reset und Freigabe

Die max. Frequenz in der Betriebsart „Frequenzeingabe“ beträgt bei einem beschalteten Block 4 kHz, bei zwei beschalteten Blöcken jeweils 2 kHz.

#### Montieren

Mehrere Geräte können unmittelbar nebeneinander auf den Modulträger gesteckt werden. Ein Wechsel der Geräte ist auch während des laufenden Betriebs möglich.

- ▶ Montageort gegen Wärmestrahlung, schnelle Temperaturschwankungen, Staub, Schmutz, Feuchtigkeit und andere Umwelteinflüsse schützen.
- ▶ Gerät in die dafür vorgesehene Position auf dem Modulträger stecken und deutlich spürbar einrasten lassen.

#### Anschließen

Durch Aufstecken auf den Modulträger ist das Gerät mit der internen Energieversorgung und Datenkommunikation des Modulträgers verbunden. Zum Anschluss der Feldgeräte können Klemmenblöcke auf dem Modulträger in Schraubanschluss- oder Federzuganschlusstechnik verwendet werden.

- ▶ Feldgeräte gemäß „Wiring diagram“ anschließen.

#### In Betrieb nehmen

Durch Aufschalten der Versorgungsspannung am Modulträger ist das aufgesteckte Gerät sofort eingeschaltet. Bei der Inbetriebnahme muss das Verhalten der Ein- und Ausgänge einmalig über den Feldbus-Master konfiguriert werden und der Modulsteckplatz parametriert werden.

#### Betreiben

##### **i** HINWEIS

Für einen fehlerfreien Betrieb darf an den Eingängen oder Ausgängen der Funktionsblöcke A oder B keine Diagnosesmeldung anstehen. Für ungenutzte Kanäle muss die Leitungsüberwachung deaktiviert werden.

Das Gerät ist ein rein eigensicheres Betriebsmittel und kann daher während des laufenden Betriebs auf den Modulträger gesteckt oder gezogen werden.

## DF20EX Frequency Measurement Module

### Other documents

Besides this document the following material can be found on the Internet at [www.turck.com](http://www.turck.com):

- Data sheet
- excom manual — remote I/O for intrinsically safe circuits
- Approvals
- Declarations of conformity (current version)

### For your safety

#### Intended use

The device is classified as equipment in compliance with explosion protection type Ex ib IIC/Ex ia IIC and must only be used within the excom I/O system for intrinsically safe circuits which are used with the approved MT...-...G module racks (PTB 00 ATEX 2194 U or IECEx PTB 13.0040 U).

The DF20EX frequency and counter module can be used either as a pulse counter for binary input signals or as a frequency meter for binary pulse sequences. NAMUR sensors according to EN 60947-5-6 or mechanical contacts can be connected to the device. The device is suitable for operation in Zone 1. The explosion protection category of the outputs is Ex ia IIC.

Any other use is not in accordance with the intended use. Turck accepts no liability for any resulting damage.

#### General safety instructions

- The device may only be mounted, installed, operated, configured and maintained by professionally trained personnel.
- The device meets the EMC requirements for industrial areas. When used in residential areas, take measures to prevent spark faults.
- Only combine devices for which the technical data is suitable for joint use.

#### Notes on explosion protection

- When using the device in Ex circuits, the user must also have knowledge of explosion protection (IEC/EN 60079-14 etc.).
- Observe national and international regulations for explosion protection.
- Only use the device within the permissible operating and ambient conditions (see technical data and Ex approval specifications).

Use of devices in Zone 1 and Zone 2:

- Mount the devices in a separately approved enclosure in accordance with IEC/EN 60079-0 with a degree of protection of at least IP54 as per EN 60529.

When used in safe areas:

- If pollution degree 2 is not complied with: Install the device in a protective housing with a degree of protection of at least IP54.

### Product description

#### Device overview

See fig. 1: device view, fig. 2: dimensions

### Functions and operating modes

The device has two function blocks. Each block has one frequency or counter input as well as three control inputs and control outputs. The inputs and outputs are not galvanically isolated from each other. All inputs and outputs are at the same potential. 8 VDC with 4 mA of current is available at the output.

Depending on the operating mode (counter or frequency measurement), the following functions are available:

- Pulse counter
- Frequency measurement
- Detection and display of the count direction or the rotation direction (static and dynamic)
- Reset and release

The maximum frequency in the “frequency input” operating mode is 4 kHz for one connected block and 2 kHz for each of the two connected blocks.

#### Installing

Multiple devices can be inserted directly next to each other in a module rack. The devices can also be changed during operation.

- ▶ Protect the mounting location from radiated heat, sudden temperature fluctuations, dust, dirt, humidity and other ambient influences.
- ▶ Fit the device at the position intended for it on the rack and snap it fully into position.

#### Connection

When plugged into the module rack, the device is connected to the module rack’s internal power supply and data communication. Screw connection or spring type terminal blocks on the module rack can be used to connect the field devices.

- ▶ Connect the field devices in accordance with the “Wiring diagram”.

#### Commissioning

Connecting the power supply to the module rack switches on the inserted device instantly. As part of the commissioning process, the input and output behaviors must be configured once via the fieldbus master, and the module slot must be parameterized.

#### Operation

##### **i** NOTE

For error-free operation, no diagnostic message must be present at the inputs or outputs of function blocks A or B. Line monitoring must be deactivated for unused channels.

The device is a piece of equipment that is purely intrinsically safe and can therefore be plugged into or unplugged from the approved module rack during operation.

①

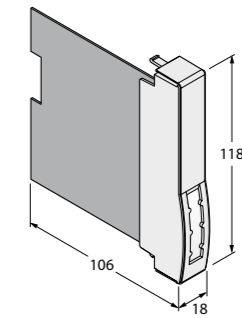


DF20EX  
Frequency Measurement Module  
Quick Start Guide  
Doc. no. 10000808

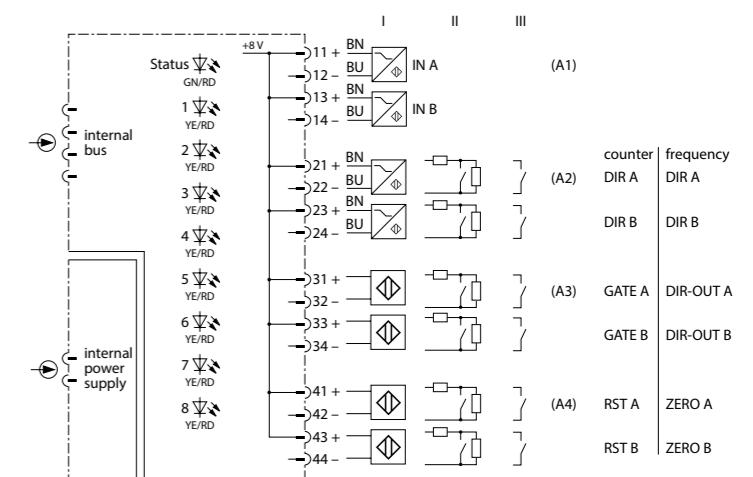
Additional information see



②



### Wiring diagram



## DE Kurzbetriebsanleitung

## LED-Anzeigen

LED	Anzeige	Bedeutung
Status	aus	keine Spannungsversorgung
	blinkt rot	Modul nicht für diesen Steckplatz konfiguriert
	grün	Spannungsversorgung und Kommunikation fehlerfrei
	blinkt grün (langsam: 0,5 Hz)	Modul noch nicht vom Gateway konfiguriert, wartet auf Konfigurationsdaten
	blinkt grün (1,0 Hz asym.)	Modul konfiguriert, noch kein Datenaustausch zwischen Modul und Master
Kanal	aus	Kanal nicht aktiv (nicht geschaltet)
1...8	gelb	Kanal aktiv (geschaltet)
	rot	Kanalfehler (Drahtbruch, Kurzschluss): Kanaldiagnose liegt vor

## Einstellen

Das Verhalten der Eingänge wird je nach übergeordnetem Feldbussystem über ein zugehöriges Konfigurationstool, FDT-Frame oder Webserver parametrisiert.

Für jeden Funktionsblock können im Zähl- und Frequenzmessmodus folgende Parameter eingestellt werden:

- Drahtbruchüberwachung
- Ersatzwertstrategie
- Richtungserkennung
- Entprellen
- Polarität (Richtungsumkehr)

## DF20EX F (Frequenzmesser)





- Messzyklus
- Mittelwert

## DF20EX P (Impulszähler)

- Rücksetzen des Zählers
- Flankenählung
- Freigabe (Klemme oder Host gesteuert)
- Messbereich

## Certification data | Technical data

## Approvals and markings


Approvals	
PTB 00 ATEX 2178	 II 2 (1) G Ex ib [ia Ga] IIC T4 Gb  II (1) D [Ex ia Da] IIIC
TÜV 21 UKEX 7054	
IECEx PTB 13.0041	Ex ib [ia Ga] IIC T4 Gb [Ex ia Da] IIIC
	인증서발급기관명: 한국산업안전보건공단 안전인증번호: 13-AV4BO-0133 안전한 사용을 위한 조건: 발급된 인증서 참조
FM18US0068X, FM18CA0033X	Class I, Division 2, Groups A, B, C, D; T4; Associated Nonincendive for Class I, Division 2, Groups A, B, C, D; NIFW; Associated Intrinsically Safe for Class I, II, III, Division 1, Groups A, B, C, D, E, F, G; Entity Class I Zone 1 AEx ib [ia], Group IIC; T4; Entity

Permissible ambient temperature range  $T_{amb}$ : -20...+70 °C

## Reparieren

Das Gerät ist nicht zur Reparatur durch den Benutzer vorgesehen. Sollte das Gerät defekt sein, nehmen Sie es außer Betrieb. Bei Rücksendung an Turck beachten Sie unsere Rücknahmebedingungen.

## Entsorgen

 Die Geräte müssen fachgerecht entsorgt werden und gehören nicht in den normalen Hausmüll.

## EN Quick Start Guide

## LEDs

LED	Indication	Meaning
Status	Off	No power supply
	Red flashing	Module not configured for current slot
	Green	Power supply and communication fault free
	Green flashing (slow: 0.5 Hz)	Module not yet configured by the gateway, awaiting configuration data
	Green flashing (1.0 Hz asym.)	Module configured; no data exchange yet between the module and the master
Channel	Off	Channel not active (not switched)
1...8	Yellow	Channel active (switched)
	Red	Channel error (wire-break detection, short circuit): Channel diagnostics available

## Setting

The behavior of the inputs is parameterized via an associated configuration tool, FDT frame or web server, depending on the higher-level fieldbus system.

The following parameters can be set for each function block in the counter and frequency measurement modes:

- Wire-break monitoring
- Failsafe mode
- Direction detection
- Debouncing
- Polarity (reversal of direction)

## DF20EX F (frequency meter)

- Measuring cycle
- Average value


## DF20EX P (pulse counter)

- Counter reset
- Edge counting
- Release (terminal or host-controlled)
- Measuring range

## Repair

The device must not be repaired by the user. The device must be decommissioned if it is faulty. Observe our return acceptance conditions when returning the device to Turck.

## Disposal

 The devices must be disposed of correctly and must not be included in general household garbage.

## Declarations of conformity

EU-Konformitätserklärung Nr. UK Declaration of Conformity No. 5001-4M  
EU Declaration of Conformity No.:

TURCK

Wir / We Hans Turck GmbH & Co. KG  
Witzlebenstr. 7, 45472 Mülheim an der Ruhr, Germany

erklären in alleiniger Verantwortung, dass das Produkt declare under our sole responsibility that the product



## Frequenzmessmodul / Frequency Measurement Module

## Digitales I/O-Modul / Digital I/O Module

für das / for the: Remote – I/O – System excom®

Typ / Type: **DF20EX** ID: **6884061**  
**DM80EX** ID: **6884006**

Ex-Kennzeichnung / Ex-marking:

Gas / gas  II 2 (1) G Ex ib [ia Ga] IIC T4 Gb or Ex ib [ia Ga] IIC T4  
Staub / dust  II (1) D [Ex ia Da] IIIC or [Ex ia] IIIC

auf die in der von uns in Verkehr gebrachten Ausführung sich diese Erklärung bezieht, den Anforderungen der folgenden EU-Richtlinien und den Anforderungen der folgenden UK- Statutory Instruments durch Einhaltung der folgenden harmonisierten / designierten Normen genügen:

to which this declaration relates in the configuration placed on the market by us, are in conformity with the requirements of the following EU-directives and the requirements of the following UK Statutory Instruments by compliance with the following harmonized / designated standards:

**Richtlinie / Directive EMC** **EMC SI\* and part. sign. changes\*\*** **2014 / 30 / EU SI 2016/1081** **26. Feb. 2014**  
EN 61326-1:2013

**Richtlinie / Directive ATEX** **ATEX SI\* and part. sign. changes\*\*** **2014 / 34 / EU SI 2016/1107** **26. Feb. 2014**  
EN IEC 60079-0:2018 EN 60079-11:2012

**Richtlinie / Directive RoHS** **RoHS SI\* and part. sign. changes** **2011 / 85 / EU SI 2012/3032** **08. Jun. 2011 and SI 2019/188**  
EN IEC 63000:2018

\*: SI = Statutory Instrument \*\*: SI 2019/696, SI 2020/1460

Weitere Normen, Bemerkungen / additional standards, remarks:

Die aufgeführten benannten Stellen haben die Konformitätsbewertung durchgeführt und Zertifikate ausgestellt: The listed notified bodies have carried out conformity assessment and issued certificates:

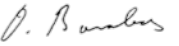
**EU-Baumusterprüfbescheinigung (Modul B)** / EU-type examination certificate (module B): **PTB 00 ATEX 2178**  
ausgestellt von / issued by: Physikalisch Technische Bundesanstalt, Kenn-Nr. / ID no.: 0102  
Bundesallee 100, 38116 Braunschweig, Germany

**Zertifizierung des QS-Systems (Modul D)** / Certification of the QS-system (module D):  
ausgestellt von / issued by: Physikalisch Technische Bundesanstalt, Kenn-Nr. / ID no.: 0102  
Bundesallee 100, 38116 Braunschweig, Germany

**UK-Baumusterprüfbescheinigung** / UK-type examination certificate : **TÜV 21 UKEX 7054**  
ausgestellt von / issued by: TÜV Rheinland Industrie Service GmbH, Kenn-Nr. / ID no.: 0035  
Alfredstraße 81, 45130 Essen, Germany

**UK Erklärung zur Qualitätssicherung** / UKCA Quality Assurance Notification:  
ausgestellt von / issued by: Eurofins E&E CML Limited, Kenn-Nr. / ID no.: 2503,  
New Port Road, Ellesmere Port CH65 4LZ, United Kingdom

Mülheim, den 02.05.2022



i.V. O. Barabas, Zulassungsbeauftragter /  
Certification Representative  
Name, Funktion und Unterschrift des Befugten /  
Name, function and signature of authorized person

Ort und Datum der Ausstellung /  
Place and date of issue  
FM 7.3-12

09.11.21

## Electrical data

Terminal connections see wiring diagram			
Field circuits	Max. values per channel:		
Max. output voltage $U_o$	≤ 9.6 V		
Max. output current $I_o$	≤ 44 mA		
Max output power $P_o$	≤ 106 mW		
Characteristic	Linear		
Internal inductance $L_i$ / capacitance $C_i$	Negligibly small		
External inductance $L_o$ / capacitance $C_o$	<b>IIC</b>	<b>IIB</b>	
	$L_o$	$C_o$	$C_o$
	2.0 mH	0.9 µF	5.1 µF
	1.0 mH	1.1 µF	6.1 µF
	0.5 mH	1.3 µF	7.3 µF
	0.2 mH	1.7 µF	9.6 µF
	0.1 mH	2 µF	12 µF

## Technical data

Type designation	DF20EX
ID	6884061
Supply voltage	Via module rack, central power supply
Power consumption	≤ 1.0 W
Galvanic isolation	Galvanic isolation from the supply voltage and the internal bus acc. to IEC/EN 60079-11. The channels and function blocks are not galvanically isolated from each other.
Number of channels	2-channel
Input circuits	Intrinsically safe acc. to IEC/EN 60079-11
No-load voltage	8 VDC
Short-circuit current	4 mA
Switching threshold on/off	Typ. 1.8 mA/typ. 1.4 mA
Switching frequency	≤ 4000 Hz
Short-circuit	< 367 Ω
Wire-break	< 2.0 mA
Max. measurement tolerance under EMC influence	≤ 0.1 % with shielded signal cable ≤ 1.0 % with unshielded signal cable
Connection mode	Module, plugged on rack
Protection class	IP20
Relative humidity	≤ 93 % at 40 °C acc. to EN 60068-2-78
EMC	Acc. to EN 61326-1 Acc. to NAMUR NE21

## Module de mesure de fréquence DF20EX

## Documents supplémentaires

Vous trouverez les documents suivants contenant des informations complémentaires à la présente notice sur notre site Web [www.turck.com](http://www.turck.com) :

- Fiche technique
- Manuel de l'excom – Système E/S déporté pour circuits à sécurité électrique intrinsèque
- Homologations
- Déclarations de conformité (version actuelle)

## Pour votre sécurité

## Utilisation conforme

L'appareil est un équipement appartenant au mode de protection Ex ib IIC/Ex ia IIIC et ne peut être utilisé qu'au sein du système E/S excom pour des circuits à sécurité électrique intrinsèque avec les supports de modules autorisés MT...-...G (PTB 00 ATEX 2194 U et IECEx PTB 13.0040 U).

Le module de fréquence et de comptage DF20EX peut être utilisé comme compteur d'impulsions pour les signaux d'entrée binaires ou comme fréquencesmètre pour les séquences d'impulsions binaires. Des détecteurs NAMUR suivant EN 60947-5-6 ou des contacteurs mécaniques peuvent être raccordés à l'appareil. L'appareil est destiné à une utilisation en zone 1. Le mode de protection des sorties est Ex ia IIC. Toute autre utilisation est considérée comme non conforme. La société Turck décline toute responsabilité en cas de dommages causés par une utilisation non conforme.

## Consignes de sécurité générales

- Seul un personnel qualifié est habilité à monter, installer, utiliser, configurer et entretenir l'appareil.
- L'appareil répond aux exigences CEM pour le domaine industriel. Lorsqu'il est utilisé dans des zones résidentielles, prenez des mesures pour éviter les interférences radio.
- Ne raccordez des appareils entre eux que si leurs caractéristiques techniques le permettent.

## Indications relatives à la protection contre les explosions

- En cas d'utilisation de l'appareil dans des zones à risque d'explosion, vous devez en outre disposer des connaissances requises en matière de protection contre les explosions (CEI/EN 60079-14, etc.).
- Respectez les consignes nationales et internationales relatives à la protection contre les explosions.
- Utilisez l'appareil uniquement dans un environnement et dans les conditions de fonctionnement autorisés (voir les caractéristiques techniques et les directives imposées par l'homologation Ex).

Utilisation en zone 1 et en zone 2 :

- Montez les appareils dans un boîtier séparé homologué conformément à la norme CEI/EN 60079-0 et avec un indice de protection IP54 minimum, conformément à la norme EN 60529.

Utilisation en zone sécurisée :

- Si le degré de pollution 2 n'est pas respecté : Installez l'appareil dans un boîtier de protection d'indice IP54 minimum.

## Description du produit

## Aperçu de l'appareil

Voir fig. 1 : Vue de l'appareil, fig. 2 : Dimensions

## Fonctions et modes de fonctionnement

L'appareil dispose de deux blocs fonctionnels. Chaque bloc est pourvu d'une entrée de fréquence ou de comptage, ainsi que de trois entrées et sorties de commande. Les entrées et sorties ne sont pas séparées galvaniquement l'une de l'autre. Toutes les entrées et sorties reposent sur un potentiel commun. A la sortie, un courant de 4 mA est disponible à 8 VDC.

Selon le mode de fonctionnement (compteur ou fréquence-mètre), les fonctions suivantes sont disponibles :

- Comptage des impulsions
- Mesure de la fréquence
- Reconnaissance et affichage du sens de comptage ou du sens de rotation (statique et dynamique)
- Réinitialisation et déblocage

La fréquence max. en mode de fonctionnement « entrée de fréquence » est de 4 kHz pour un bloc branché et de respectivement 2 kHz pour 2 blocs branchés.

## Montage

Plusieurs appareils peuvent être branchés directement en parallèle sur le support de module. Un changement d'appareils est également possible pendant le fonctionnement.

- ▶ Protégez la zone de montage contre les rayonnements thermiques, les variations rapides de température, la poussière, l'humidité et d'autres facteurs ambiants.
- ▶ Branchez l'appareil dans la position prévue à cet effet sur le support de module et emboîtez-le jusqu'à enclenchement.

## Raccordement

Lors de sa fixation sur le support de module, l'appareil est connecté à l'alimentation interne et à la communication de données du support de module. Pour le raccordement des appareils de terrain, des borniers reposant sur une méthode à vis ou à ressort peuvent être employés sur le support de module.

- ▶ Raccordez les appareils de terrain conformément au schéma de câblage (« Wiring diagram »).

## Mise en service

Lors de l'activation de la tension d'alimentation sur le support de module, l'appareil branché est immédiatement mis sous tension. Lors de la mise en service, le comportement des entrées et sorties doit être configuré une seule fois via le maître bus de terrain et l'emplacement du module doit être paramétré.

## Fonctionnement

## REMARQUE

Pour un fonctionnement sans erreur, aucun message de diagnostic ne doit être présent aux entrées ou sorties des blocs fonctionnels A ou B. La surveillance de câbles doit être désactivée pour les canaux inutilisés.

L'appareil est un pur dispositif à sécurité intrinsèque et peut donc être branché ou débranché du support de module en cours de fonctionnement.

## Módulo de medição de frequência DF20EX

## Outros documentos

Além deste documento, o seguinte material pode ser encontrado na Internet em [www.turck.com](http://www.turck.com):

- Folha de dados
- Manual do excom – terminais de E/S remotos para circuitos intrinsecamente seguros
- Homologações
- Declarações de conformidade (versão atual)

## Para sua segurança

## Finalidade de uso

O dispositivo é classificado como equipamento em conformidade com o tipo de proteção contra explosão Ex ib IIC/Ex ia IIIC e só deve ser usado dentro do sistema de E/S excom para circuitos intrinsecamente seguros usados com os racks de módulos MT...-...G aprovados (PTB 00 ATEX 2194 U ou IECEx PTB 13.0040 U).

O módulo de frequência e contador DF20EX pode ser usado como um contador de pulsos para sinais de entrada binários ou como um medidor de frequência para sequências de pulso binário. O dispositivo pode ser conectado a sensores NAMUR de acordo com a EN 60947-5-6 ou a contatos mecânicos. O dispositivo também é adequado para uso na Zona 1. A categoria de proteção contra explosões é Ex ia IIC. Qualquer outro uso está fora de concordância com o uso pretendido. A Turck se exime de qualquer responsabilidade por danos resultantes.

## Instruções gerais de segurança

- O dispositivo só pode ser montado, instalado, operado, configurado e mantido por pessoal profissionalmente treinado.
- Os dispositivos atendem os requisitos da EMC em áreas industriais. Havendo uso em áreas residenciais, tome medidas para evitar falhas de ignição.
- Somente combine dispositivos nos quais os dados técnicos são adequados para uso conjunto.

## Notas de proteção contra explosão

- Ao usar o dispositivo em circuitos Ex, o usuário deverá ter conhecimento prático sobre proteção contra explosões (IEC/EN 60079-14, etc.).
- Observe os regulamentos nacionais e internacionais para proteção contra explosão.
- Use o dispositivo somente em condições ambientais e de operação permitidas (consulte os dados técnicos e os requisitos de homologação Ex).

Uso dos dispositivos nas Zonas 1 e 2:

- Monte os dispositivos em um gabinete separado aprovado de acordo com a IEC/EN 60079-0, com um grau de proteção de, pelo menos, IP54 de acordo com a EN 60529.

Quando usado em áreas seguras:

- Se o grau de poluição 2 não estiver em conformidade com: Instale o dispositivo em um gabinete com um tipo de proteção de pelo menos IP54.

## Descrição do produto

## Visão geral do produto

Veja a fig. 1: Visão do dispositivo, fig. 2: Dimensões

## Funções e modos de operação

O dispositivo tem dois blocos de funções. Cada bloco tem uma entrada de frequência ou contador, bem como três entradas de controle e saídas de controle. As entradas e saídas não são galvanicamente isoladas umas das outras. Todas as entradas e saídas estão no mesmo potencial. 8 VCC com 4 mA de corrente está disponível na saída.

Dependendo do modo de funcionamento (medição do contador ou da frequência), estão disponíveis as seguintes funções:

- Contador de pulsos
- Medição de frequência
- Detecção e exibição da direção da contagem ou da direção de rotação (estática e dinâmica)
- Reiniciar e liberar

A frequência máxima no modo de operação de "entrada de frequência" é 4 kHz para um bloco conectado e 2 kHz para cada um dos dois blocos conectados.

## Instalação

Vários dispositivos podem ser inseridos diretamente um ao lado do outro em um rack de módulo. Também é possível alterar os dispositivos durante a operação.

- ▶ Proteja o local de montagem contra irradiação de calor, alterações de temperatura repentinas, poeira, sujeira, umidade e outras influências ambientais.
- ▶ Insira o dispositivo na posição designada no rack, e encaixe-o totalmente na posição.

## Conexão

Quando conectado ao rack de módulo, o dispositivo é conectado à alimentação e aos dados internos do rack de módulo. É possível usar blocos terminais de conexão por parafusos ou por mola para conectar os dispositivos de campo.

- ▶ Conecte os dispositivos de campo de acordo com o "Wiring diagram".

## Comissionamento

Conectar a fonte de alimentação ao rack do módulo liga o dispositivo conectado instantaneamente. Como parte do processo de comissionamento, os comportamentos de entrada e saída devem ser parametrizados uma vez via fieldbus principal, e o slot do módulo deve ser parametrizado.

## Operação

## NOTA

Para uma operação sem erros, nenhuma mensagem de diagnóstico deve estar presente nas entradas ou saídas dos blocos de função A ou B. O monitoramento de linha deve ser desativado para canais não utilizados.

O dispositivo é um equipamento que é puro e intrinsecamente seguro e, logo, pode ser conectado ou desconectado do rack de módulo aprovado durante a operação.

①

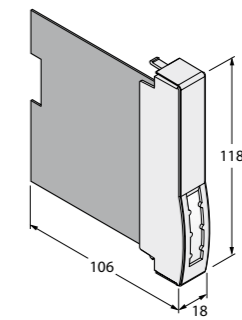


DF20EX  
Frequency Measurement Module  
Quick Start Guide  
Doc. no. 10000808

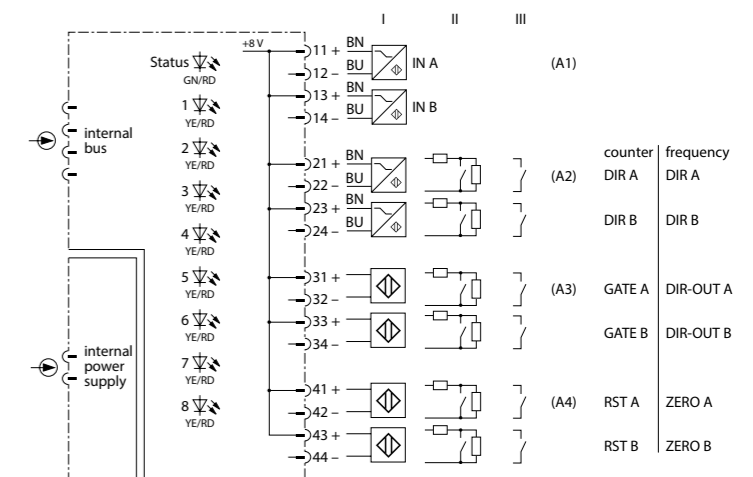
Additional information see



②



## Wiring diagram





## FR Guide d'utilisation rapide

## Affichage LED

LED	Indication	Signification
Status	Eteinte	Pas d'alimentation en tension
	Clignote rouge	Module non configuré pour cet emplacement
	Vert	Alimentation et communication sans défaut
	Clignote vert (lent : 0,5 Hz)	Module pas encore configuré par la passerelle, en attente de données de configuration
	Clignote vert (1,0 Hz asym.)	Module configuré, pas encore de partage de données entre le module et le maître
Canaux	Eteinte	Canal non actif (non connecté)
1...8	Jaune	Canal actif (connecté)
	Rouge	Erreur au niveau du canal (rupture de câble, court-circuit) : Diagnostic des canaux effectué

## Réglages

Selon le système de bus de terrain de niveau supérieur, le comportement des entrées est paramétré à l'aide d'un outil de configuration associé, d'un cadre FDT ou d'un serveur Web.

Pour chaque bloc fonctionnel, les paramètres suivants peuvent être réglés dans les modes de comptage et de mesure de fréquence :

- Surveillance de rupture de câble
- Stratégie de valeur de remplacement
- Détection de la direction
- Anti-rebond
- Polarité (inversion de sens)

## DF20EX F (fréquence)

- Cycle de mesure
- Valeur moyenne


## DF20EX P (compteur d'impulsions)

- Réinitialisation du compteur
- Comptage des flancs
- Déblocage (borne ou hôte contrôlé)
- Plage de mesure

## Réparation

L'appareil ne peut pas être réparé par l'utilisateur. En cas de dysfonctionnement, mettez l'appareil hors tension. En cas de retour à Turck, veuillez respecter les conditions de reprise.

## Mise au rebut

 Les appareils doivent être mis au rebut de manière appropriée et ne doivent pas être éliminés avec les ordures ménagères.

## PT Guia de Início Rápido

## LEDs

LED	Indicação	Significado
Status	Desligado	Sem alimentação de energia
	Vermelho piscando	Módulo não configurado para a porta atual
	Verde	Fonte de alimentação e comunicação livres de erros
	Verde piscando (lento: 0,5 Hz)	Módulo ainda não configurado pelo gateway, aguardando dados de configuração
	Verde piscando (1,0 Hz assim.)	Módulo configurado, não há ainda a troca de dados entre o módulo e o mestre
Canais	Desligado	Canal inativo (não ligado)
1...8	Amarelo	Canal ativo (ligado)
	Vermelho	Erro de canal (detecção de rompimento de fio, curto-circuito): Diagnóstico de canal disponível

## Configuração

O comportamento das entradas é parametrizado por meio de uma ferramenta de configuração associada, FDT frame ou servidor web, dependendo do sistema fieldbus de nível superior. Os seguintes parâmetros podem ser definidos para cada bloco de funções nos modos de medição de contador e frequência:

- Monitoramento de ruptura de fio
- Estratégia de valor substituto
- Detecção da direção
- Debouncing
- Polaridade (inversão de direção)

## DF20EX F (medidor de frequência)

- Ciclo de medição
- Valor médio


## DF20EX P (contador de pulsos)

- Redefinição do contador
- Contagem de arestas
- Liberação (controlada por terminal ou host)
- Intervalo de medição

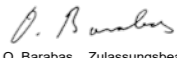
## Reparo

O dispositivo não deve ser reparado pelo usuário. O dispositivo deverá ser desativado caso esteja com defeito. Observe nossas condições para aceitação de devolução ao devolver o dispositivo à Turck.

## Descarte





 Os dispositivos devem ser descartados corretamente e não em um lixo doméstico normal.

## Declarations of conformity

EU-Konformitätserklärung Nr. UK Declaration of Conformity No. 5001-4M EU Declaration of Conformity No.:		TURCK	
Wir / We	Hans Turck GmbH & Co. KG Witzlebenstr. 7, 45472 Mülheim an der Ruhr, Germany		
erklären in alleiniger Verantwortung, dass das Produkt declare under our sole responsibility that the product			
<b>Frequenzmessmodul / Frequency Measurement Module</b> <b>Digitales I/O-Modul / Digital I/O Module</b>			
für das / for the: Remote – I/O – System excom®			
Typ / Type:	<b>DF20EX</b> <b>DM80EX</b>	ID: <b>6884061</b> ID: <b>6884006</b>	
Ex-Kennzeichnung / Ex-marking:			
Gas / gas	☉ II 2 (1) G	Ex ib [ia Ga] IIC T4 Gb	or Ex ib [ia Ga] IIC T4
Staub / dust	☉ II (1) D	[Ex ia Da] IIIC	or [Ex ia] IIIC
auf die in der von uns in Verkehr gebrachten Ausführung sich diese Erklärung bezieht, den Anforderungen der folgenden EU-Richtlinien und den Anforderungen der folgenden UK- Statutory Instruments durch Einhaltung der folgenden harmonisierten / designierten Normen genügen: to which this declaration relates in the configuration placed on the market by us, are in conformity with the requirements of the following EU-directives and the requirements of the following UK Statutory Instruments by compliance with the following harmonized / designated standards:			
<b>Richtlinie / Directive EMC SI* and part. sign. changes**</b>	<b>2014 / 30 / EU SI 2016/1081</b>	<b>26. Feb. 2014</b>	
EN 61326-1:2013			
<b>Richtlinie / Directive ATEX SI* and part. sign. changes**</b>	<b>2014 / 34 / EU SI 2016/1107</b>	<b>26. Feb. 2014</b>	
EN IEC 60079-0:2018 EN 60079-11:2012			
<b>Richtlinie / Directive RoHS SI* and part. sign. changes</b>	<b>2011 / 85 / EU SI 2012/3052</b>	<b>08. Jun. 2011 and SI 2019/188</b>	
EN IEC 63000:2018			
*: SI = Statutory Instrument **: SI 2019/696, SI 2020/1460			
Weitere Normen, Bemerkungen / additional standards, remarks:			
Die aufgeführten benannten Stellen haben die Konformitätsbewertung durchgeführt und Zertifikate ausgestellt: The listed notified bodies have carried out conformity assessment and issued certificates:			
<b>EU-Baumusterprüfbescheinigung (Modul B) / EU-type examination certificate (module B): PTB 00 ATEX 2178</b> ausgestellt von / issued by: Physikalisch Technische Bundesanstalt, Kenn-Nr. / ID no.: 0102 Bundesallee 100, 38116 Braunschweig, Germany			
<b>Zertifizierung des QS-Systems (Modul D) / Certification of the QS-system (module D):</b> ausgestellt von / issued by: Physikalisch Technische Bundesanstalt, Kenn-Nr. / ID no.: 0102 Bundesallee 100, 38116 Braunschweig, Germany			
<b>UK-Baumusterprüfbescheinigung / UK-type examination certificate : TÜV 21 UKEX 7054</b> ausgestellt von / issued by: TÜV Rheinland Industrie Service GmbH, Kenn-Nr. / ID no.: 0035 Alfredstraße 81, 45130 Essen, Germany			
<b>UK Erklärung zur Qualitätssicherung / UKCA Quality Assurance Notification:</b> ausgestellt von / issued by: Eurofins E&E CML Limited, Kenn-Nr. / ID no.: 2503, New Port Road, Ellesmere Port CH65 4LZ, United Kingdom			
Mülheim, den 02.05.2022			
	i.V. O. Barabas, Zulassungsbeauftragter / Certification Representative		
Ort und Datum der Ausstellung / Place and date of issue	Name, Funktion und Unterschrift des Befugten / Name, function and signature of authorized person		
FM 7.3-12	09.11.21		

## Certification data | Technical data

## Approvals and markings

Approvals	
PTB 00 ATEX 2178	☉ II 2 (1) G Ex ib [ia Ga] IIC T4 Gb ☉ II (1) D [Ex ia Da] IIIC
 TÜV 21 UKEX 7054 	
IECEx PTB 13.0041	Ex ib [ia Ga] IIC T4 Gb [Ex ia Da] IIIC
	인증서발급기관명: 한국산업안전보건공단 안전인증번호: 13-AV4BO-0133 안전한 사용을 위한 조건: 발급된 인증서 참조
FM18US0068X, FM18CA0033X	Class I, Division 2, Groups A, B, C, D; T4; Associated Nonincendive for Class I, Division 2, Groups A, B, C, D; NIFW; Associated Intrinsically Safe for Class I, II, III, Division 1, Groups A, B, C, D, E, F, G; Entity Class I Zone 1 AEx ib [ia], Group IIC; T4; Entity
	

Permissible ambient temperature range T<sub>amb</sub>: -20...+70 °C

## Electrical data

Terminal connections see wiring diagram			
Field circuits	Max. values per channel:		
Max. output voltage U <sub>o</sub>	≤ 9.6 V		
Max. output current I <sub>o</sub>	≤ 44 mA		
Max output power P <sub>o</sub>	≤ 106 mW		
Characteristic	Linear		
Internal inductance L <sub>i</sub> / capacitance C <sub>i</sub>	Negligibly small		
External inductance L <sub>o</sub> / capacitance C <sub>o</sub>	<b>IIC</b>	<b>IIB</b>	
	L <sub>o</sub>	C <sub>o</sub>	C <sub>o</sub>
	2.0 mH	0.9 µF	5.1 µF
	1.0 mH	1.1 µF	6.1 µF
	0.5 mH	1.3 µF	7.3 µF
	0.2 mH	1.7 µF	9.6 µF
	0.1 mH	2 µF	12 µF

## Technical data

Type designation	DF20EX
ID	6884061
Supply voltage	Via module rack, central power supply
Power consumption	≤ 1.0 W
Galvanic isolation	Galvanic isolation from the supply voltage and the internal bus acc. to IEC/EN 60079-11. The channels and function blocks are not galvanically isolated from each other.
Number of channels	2-channel
Input circuits	Intrinsically safe acc. to IEC/EN 60079-11
No-load voltage	8 VDC
Short-circuit current	4 mA
Switching threshold on/off	Typ. 1.8 mA/typ. 1.4 mA
Switching frequency	≤ 4000 Hz
Short-circuit	< 367 Ω
Wire-break	< 2.0 mA
Max. measurement tolerance under EMC influence	≤ 0.1 % with shielded signal cable ≤ 1.0 % with unshielded signal cable
Connection mode	Module, plugged on rack
Protection class	IP20
Relative humidity	≤ 93 % at 40 °C acc. to EN 60068-2-78
EMC	Acc. to EN 61326-1 Acc. to NAMUR NE21

**ZH** 快速入门指南

## DF20EX频率测量模块

### 其他文档

除了本文档之外,还可在www.turck.com网站上查看以下资料:

- 数据表
- excom手册 — 本安电路的远程I/O
- 认证
- 合规声明(最新版本)

### 安全须知

#### 预期用途

该装置归类为符合防爆类别Ex ib IIC/Ex ia IIIC的设备,只能在excom I/O系统中用于本安电路,这些电路与经认证的MT...G模块机架(PTB 00 ATEX 2194 U或IECEX PTB 13.0040 U)一起使用。

DF20EX频率和计数器模块可以用作二进制输入信号的脉冲计数器,或者用作二进制脉冲序列的频率计。符合EN 60947-5-6标准的NAMUR传感器或机械式触点可以连接到该装置。该装置适合在危险1区中运行。输出端的防爆类别是Ex ia IIC。

任何其他用途都不属于预期用途。图尔克公司不会对此导致的任何损坏承担责任。

### 一般安全须知

- 该装置的组装、安装、操作、配置和维护只能由经过专业培训的人员执行。
- 该装置符合工业区的EMC要求。在住宅区使用时,请采取相应的措施以防止火花故障。
- 仅当技术数据支持装置联用时,才能组合使用装置。

### 防爆说明

- 将本装置应用到防爆电路时,用户还必须具有防爆知识(IEC/EN 60079-14等)。
- 请遵守国内和国际防爆法规。
- 仅在允许的工作条件 and 环境条件下使用本装置(参见技术数据和防爆认证规格)。

在危险1区和2区中使用该装置:

- 将装置安装在经过单独认证(符合IEC/EN 60079-0标准)且防护等级至少为IP54(依据EN 60529标准)的外壳内。

在安全区域中使用时:

- 如果不符合污染等级2:应将该装置安装在防护等级至少为IP54的保护外壳内。

### 产品描述

#### 装置概览

见图1:装置视图,图2:尺寸

### 功能和工作模式

该装置有两个功能块。每个功能块都有一个频率或计数器输入以及三个控制输入和控制输出。输入和输出之间非完全电隔离。所有输入和输出都具有相同的电势。输出处提供8 VDC、4 mA电流。

根据操作模式(计数器或频率测量),可以使用以下功能:

- 脉冲计数器
- 频率测量
- 检测并显示计数方向或旋转方向(静态和动态)
- 重置并释放

在“频率输入”操作模式下,当连接了一个功能块时,该功能块的最大频率为4 kHz;当连接了两个功能块时,其中任何一个功能块的最大频率为2 kHz。

### 安装

可将多台装置直接毗邻安装在一个模块机架中。此外,还可在运行过程中更换装置。

- 应使安装位置免受辐射热、温度骤变、灰尘、污垢、潮湿和其他的环境影响。
- 将该装置安装在机架上的预期位置,然后将其完全卡入到位。

### 连接

插入模块机架中时,该装置将连接至模块机架的内部电源和数据通信部分。模块机架上的螺钉连接或弹簧式接线板可用于连接现场装置。

- 按照“Wiring diagram”连接现场装置。

### 调试

将电源连接到模块机架会立即开启插入的装置。作为调试过程的一部分,必须通过现场总线主站配置一次输入和输出行为,并且必须对模块插槽进行参数设定。

### 运行

#### 注意

为了实现无差错操作,功能块A或B的输入或输出处不能显示任何诊断信息。对于未使用的通道,必须禁用线路监测功能。

该装置是一款纯本安设备,因此可在运行期间在经认证的模块机架上进行热插拔。

### LED

LED	指示	含义
Status	熄灭	无电源
	呈红色闪烁	未针对当前插槽配置模块
	绿灯	电源和通信正常运行
	呈绿色闪烁	尚未通过网关配置模块,正在等待配置数据
	呈绿色闪烁(1.0 Hz非对称)	模块已配置;模块和主设备之间尚未进行数据交换
通道	熄灭	通道未激活(未切换)
1...8	黄灯	通道激活(已切换)
	红灯	通道错误(断线检测、短路):通道诊断可用

### 设置

根据不同的高级别现场总线系统,通过相关的配置工具、FDT帧或Web服务器对输入行为进行参数设定。

可在计数器和频率测量模式下为每个功能块设置以下参数:

- 断线监测
- 替代值策略
- 方向检测
- 去抖
- 极性(方向反转)

### DF20EX F(频率计)

- 测量周期
- 平均值

### DF20EX P(脉冲计数器)

- 计数器复位
- 边缘计数
- 释放(终端或主机控制)
- 测量范围

**KO** 빠른 시작 가이드

## DF20EX 주파수 측정 모듈

### 추가 문서

이 문서 외에도 다음과 같은 자료를 인터넷(www.turck.com)에서 확인할 수 있습니다.

- 데이터 시트
- excom 매뉴얼 — 본질 안전 회로용 원격 I/O
- 인증
- 적합성 선언(현재 버전)

### 사용자 안전 정보

#### 사용 목적

이 장치는 폭발 방지 타입 Ex ib IIC/Ex ia IIIC를 준수하는 장비로 분류되며, 승인된 MT...G 모듈 랙(PTB 00 ATEX 2194 U 또는 IECEx PTB 13.0040 U)과 함께 사용되는 본질 안전 회로용 excom I/O 시스템 내에서만 사용되어야 합니다. DF20EX 주파수 및 카운터 모듈은 바이너리 입력 신호의 펄스 카운터로 사용하거나 바이너리 펄스 시퀀스에 대한 주파수 미터로 사용할 수 있습니다. EN 60947-5-6 규격 NAMUR 센서 또는 기계식 접점을 장치에 연결할 수 있습니다. 이 장치는 1종 위험 지역에서 작동하기에 적합합니다. 출력의 폭발 보호 카테고리 Ex ia IIC입니다.

기타 다른 방식으로 사용하는 것은 사용 목적을 따르지 않는 것입니다. 터크는 그로 인한 손상에 대해 어떠한 책임도 지지 않습니다.

### 일반 안전 지침

- 전문적인 훈련을 받은 숙련된 기술자만이 이 장치의 조립, 설치, 작동, 구성 및 유지보수를 수행해야 합니다.
- 이 장치는 산업 분야의 EMC 요구 사항을 충족합니다. 주거 지역에서 사용하는 경우 스파크 고장을 방지하기 위한 조치를 취하십시오.
- 기술 데이터가 공동 사용에 적합한 장치만 조합하십시오.

### 폭발 방지 참고 사항

- 폭발 위험 회로에서 이 장치를 사용할 경우 사용자는 폭발 방지(KS C IEC 60079-14 등)에 대한 지식이 있어야 합니다.
- 폭발 방지에 관한 국내 및 국제 규정을 준수하십시오.
- 허용되는 작동 및 주변 조건 내에서만 장치를 사용하십시오(기술 데이터 및 방폭 인증서 사양 참조).

1종 및 2종 위험 지역 내 장치 사용:

- EN 60529에 따라 보호 등급이 IP54 이상인 IEC/EN 60079-0 규격의 별도 승인 외함에 장치를 설치하십시오.

안전 지역에서 사용할 경우:

- 오염도 2를 준수하지 않을 경우: IP54 이상의 보호 등급이 있는 보호 하우징에 장치를 설치하십시오.

### 제품 설명

#### 장치 개요

그림 1: 장치 도면, 그림 2: 치수

### 기능 및 작동 모드

장치에는 2개의 기능 블록이 있습니다. 각 블록에는 1개의 주파수 또는 카운터 입력과 3개의 제어 입력 및 제어 출력이 있습니다. 입력 및 출력은 상호 간에 갈바닉 절연 처리되지 않습니다. 모든 입력 및 출력은 동일한 포텐셜에 있습니다. 8 VDC 및 4 mA의 전류는 출력에서 사용할 수 있습니다.

작동 모드(카운터 또는 주파수 측정)에 따라 다음 기능을 사용할 수 있습니다.

- 펄스 카운터
- 주파수 측정
- 카운터 방향 또는 회전 방향의 감지 및 표시(정적 및 동적)
- 재설정 및 해제

“주파수 입력” 작동 모드에서 최대 주파수는 연결된 블록이 1개면 개당 4 kHz이고, 연결된 블록이 2개면 개당 2 kHz입니다.

### 설치

여러 장치를 서로 맞닿게 모듈 랙에 삽입할 수 있습니다. 또한 작동 중에 장치를 변경할 수 있습니다.

- 설치 장소를 복사열과 갑작스러운 온도 변화, 먼지, 흙, 습도, 기타 주변 영향 요소로부터 보호하십시오.
- 장치를 랙의 의도한 위치에 장착하고 제자리에 완전히 끼우십시오.

### 연결

모듈 랙에 연결하면 장치가 모듈 랙의 내부 파워 서플라이 및 데이터 통신에 연결됩니다. 모듈 랙에서 나사 연결 또는 스프링 터미널 블록을 사용하여 필드 장치를 연결할 수 있습니다.

- “Wiring diagram”에 따라 필드 장치를 연결하십시오.

### 시운전

파워 서플라이를 모듈 랙에 연결하면 삽입된 장치의 스위치가 즉시 켜집니다. 시운전 프로세스의 일환으로 필드버스 마스터를 통해 입력 및 출력 동작을 한 번 구성해야 하며 모듈 슬롯을 매개 변수화해야 합니다.

### 작동

#### 참고

오류 없는 작동을 위해서는 기능 블록 A 또는 B의 입력 또는 출력 시 진단 메시지가 없어야 합니다. 사용되지 않는 채널에서는 라인 모니터링을 비활성화해야 합니다.

이 장치는 순수한 본질 안전 장비이므로 작동 중에 승인된 모듈 랙에 연결하거나 분리할 수 있습니다.

### LED

LED	표시	의미
Status	꺼짐	파워 서플라이 없음
	적색 점멸	모듈이 현재 슬롯에 대해 구성되지 않음
	녹색	파워 서플라이 및 통신 올바르게 작동 중
	녹색 점멸	모듈이 아직 게이트웨이에 의해 구 성되지 않음, 구성 데이터 대기 중
	녹색 점멸(1.0 Hz 비대칭)	모듈이 구성됨, 모듈과 마스터 사이(1.0 Hz 비대칭)에 아직 데이터 교환 없음
채널	꺼짐	채널 비활성(전환되지 않음)
1...8	황색	채널 활성(전환됨)
	적색	채널 오류(단선 감지, 단락): 채널 진단 있음

### 설정

입력 동작은 상위 레벨의 필드버스 시스템에 따라 관련 구성 도구, FDT 프레임 또는 웹 서버를 통해 매개 변수화됩니다.

카운터 및 주파수 측정 모드에서 각 기능 블록에 대해 다음 매개 변수를 설정할 수 있습니다.

- 단선 모니터링
- 대체값 전략
- 방향 감지
- 디바운싱
- 극성(방향 역전)

### DF20EX F(주파수 미터)

- 측정 사이클
- 평균값

### DF20EX P(펄스 카운터)

- 카운터 재설정
- 엣지 카운팅
- 해제(터미널 또는 호스트 제어)
- 측정 범위

①

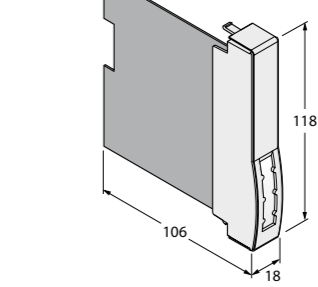


**DF20EX**  
Frequency Measurement Module  
Quick Start Guide  
Doc. no. 10000808

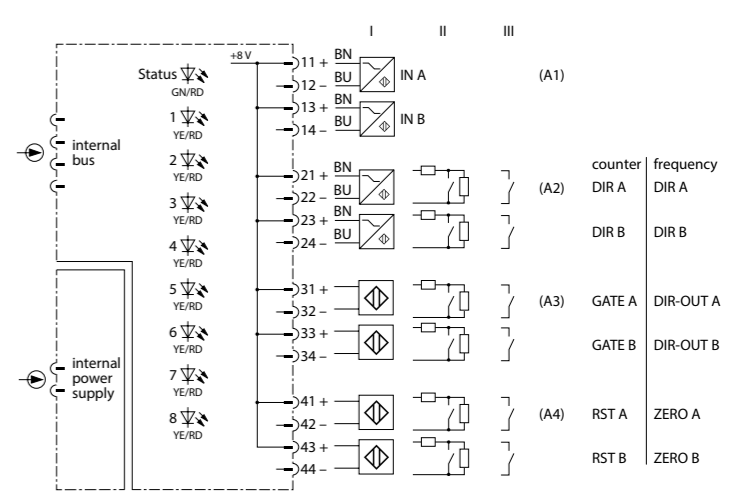
Additional information see



②



### Wiring diagram




## ZH 快速入门指南

## 维修

用户不得维修该装置。如果出现故障, 必须停用该装置。如果要将该装置送给图尔克公司维修, 请遵从我们的返修验收条件。

## 废弃处理


 必须正确地弃置本装置, 不得将其混入普通的生活垃圾中。

## KO 빠른 시작 가이드

## 수리

이 장치는 사용자가 수리할 수 없습니다. 이 장치에 고장이 발생한 경우 설치 해체해야 합니다. 장치를 터크에 반품할 경우, 반품 승인 조건을 준수해 주십시오.

## 폐기

 이 장치는 올바른 방법으로 폐기해야 하며 일반적인 가정 폐기물과 함께 배출해서는 안 됩니다.

## Declarations of conformity

**EU-Konformitätserklärung Nr.**  
**UK Declaration of Conformity No. 5001-4M**  
EU Declaration of Conformity No.:



Wir / We Hans Turck GmbH & Co. KG  
Witzlebenstr. 7, 45472 Mülheim an der Ruhr, Germany

erklären in alleiniger Verantwortung, dass das Produkt  
declare under our sole responsibility that the product

**Frequenzmessmodul / Frequency Measurement Module**

**Digitales I/O-Modul / Digital I/O Module**

für das / for the: Remote – I/O – System excom®

Typ / Type: **DF20EX** ID: **6884061**  
**DM80EX** ID: **6884006**

Ex-Kennzeichnung / Ex-marking:

Gas / gas Ⓜ II 2 (1) G Ex ib [ia Ga] IIC T4 Gb or Ex ib [ia Ga] IIC T4  
Staub / dust Ⓜ II (1) D [Ex ia Da] IIIC or [Ex ia] IIIC

auf die in der von uns in Verkehr gebrachten Ausführung sich diese Erklärung bezieht, den Anforderungen der  
folgenden EU-Richtlinien und den Anforderungen der folgenden UK- Statutory Instruments durch Einhaltung der  
folgenden harmonisierten / designierten Normen genügen:

to which this declaration relates in the configuration placed on the market by us, are in conformity with the requirements of  
the following EU-directives and the requirements of the following UK Statutory Instruments by compliance with the following  
harmonized / designated standards:

**Richtlinie / Directive EMC** **2014 / 30 / EU** **26. Feb. 2014**  
**EMC SI\* and part. sign. changes\*\*** **SI 2016/1081**  
EN 61326-1:2013

**Richtlinie / Directive ATEX** **2014 / 34 / EU** **26. Feb. 2014**  
**ATEX SI\* and part. sign. changes\*\*** **SI 2016/1107**  
EN IEC 60079-0:2018 EN 60079-11:2012

**Richtlinie / Directive RoHS** **2011 / 85 / EU** **08. Jun. 2011**  
**RoHS SI\* and part. sign. changes** **SI 2012/3032** **and SI 2019/188**  
EN IEC 63000:2018

\*: SI = Statutory Instrument \*\*: SI 2019/696, SI 2020/1460

Weitere Normen, Bemerkungen / additional standards, remarks:

Die aufgeführten benannten Stellen haben die Konformitätsbewertung durchgeführt und Zertifikate ausgestellt:  
The listed notified bodies have carried out conformity assessment and issued certificates:

**EU-Baumusterprüfbescheinigung (Modul B)** / EU-type examination certificate (module B): **PTB 00 ATEX 2178**  
ausgestellt von / issued by: Physikalisch Technische Bundesanstalt, Kenn-Nr. / ID no.: 0102  
Bundesallee 100, 38116 Braunschweig, Germany

**Zertifizierung des QS-Systems (Modul D)** / Certification of the QS-system (module D):  
ausgestellt von / issued by: Physikalisch Technische Bundesanstalt, Kenn-Nr. / ID no.: 0102  
Bundesallee 100, 38116 Braunschweig, Germany

**UK-Baumusterprüfbescheinigung** / UK-type examination certificate : **TÜV 21 UKEX 7054**  
ausgestellt von / issued by: TÜV Rheinland Industrie Service GmbH, Kenn-Nr. / ID no.: 0035  
Alfredstraße 81, 45130 Essen, Germany

**UK Erklärung zur Qualitätssicherung** / UKCA Quality Assurance Notification:  
ausgestellt von / issued by: Eurofins E&E CML Limited, Kenn-Nr. / ID no.: 2503,  
New Port Road, Ellesmere Port CH65 4LZ, United Kingdom

Mülheim, den 02.05.2022





  
i.V. O. Barabas, Zulassungsbeauftragter /  
Certification Representative  
Name, Funktion und Unterschrift des Befugten /  
Name, function and signature of authorized person

Ort und Datum der Ausstellung /  
Place and date of issue  
FM 7.3-12

09.11.21

## Certification data | Technical data

## Approvals and markings

Approvals	
PTB 00 ATEX 2178	Ⓜ II 2 (1) G Ex ib [ia Ga] IIC T4 Gb Ⓜ II (1) D [Ex ia Da] IIIC
 TÜV 21 UKEX 7054	
	
IECEx PTB 13.0041	Ex ib [ia Ga] IIC T4 Gb [Ex ia Da] IIIC
	인증서발급기관명: 한국산업안전보건공단 안전인증번호: 13-AV4BO-0133 안전한 사용을 위한 조건: 발급된 인증서 참조
FM18US0068X, FM18CA0033X	Class I, Division 2, Groups A, B, C, D; T4; Associated Nonincendive for Class I, Division 2, Groups A, B, C, D; NIFW; Associated Intrinsically Safe for Class I, II, III, Division 1, Groups A, B, C, D, E, F, G; Entity Class I Zone 1 AEx ib [ia], Group IIC; T4; Entity
	

Permissible ambient temperature range T<sub>amb</sub>: -20...+70 °C

## Electrical data

Terminal connections see wiring diagram			
Field circuits	Max. values per channel:		
Max. output voltage U <sub>o</sub>	≤ 9.6 V		
Max. output current I <sub>o</sub>	≤ 44 mA		
Max output power P <sub>o</sub>	≤ 106 mW		
Characteristic	Linear		
Internal inductance L <sub>i</sub> / capacitance C <sub>i</sub>	Negligibly small		
External inductance L <sub>o</sub> / capacitance C <sub>o</sub>		<b>IIC</b>	<b>IIB</b>
	L <sub>o</sub>	C <sub>o</sub>	C <sub>o</sub>
	2.0 mH	0.9 µF	5.1 µF
	1.0 mH	1.1 µF	6.1 µF
	0.5 mH	1.3 µF	7.3 µF
	0.2 mH	1.7 µF	9.6 µF
	0.1 mH	2 µF	12 µF

## Technical data

Type designation	DF20EX
ID	6884061
Supply voltage	Via module rack, central power supply
Power consumption	≤ 1.0 W
Galvanic isolation	Galvanic isolation from the supply voltage and the internal bus acc. to IEC/EN 60079-11. The channels and function blocks are not galvanically isolated from each other.
Number of channels	2-channel
Input circuits	Intrinsically safe acc. to IEC/EN 60079-11
No-load voltage	8 VDC
Short-circuit current	4 mA
Switching threshold on/off	Typ. 1.8 mA/typ. 1.4 mA
Switching frequency	≤ 4000 Hz
Short-circuit	< 367 Ω
Wire-break	< 2.0 mA
Max. measurement tolerance under EMC influence	≤ 0.1 % with shielded signal cable ≤ 1.0 % with unshielded signal cable
Connection mode	Module, plugged on rack
Protection class	IP20
Relative humidity	≤ 93 % at 40 °C acc. to EN 60068-2-78
EMC	Acc. to EN 61326-1 Acc. to NAMUR NE21