DIS CONFIGURATOR SET CAN

Manual

2020/12/1 V1.0

Abstract DIS configurator set for QG65D/QG76D CANopen series

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About DIS configurator set CAN

DIS configurator set CAN is a set of configuration tools for configuring following sensors:

• QG65D/QG76D CANopen series

The configuration set consists of a configuration kit and PC software. The configuration kit can be ordered separately, and the software can be downloaded from our website.

The tool also displays live inclination data from the sensor. The configurator runs best in full HD display mode (1920x1080p)

System Requirements

- A vacant USB port (USB 1.1, USB 2.0 or USB 3.0) at the computer or at a self-powered USB hub connected to the computer.
- Operating system: Windows 10

ZINDo not use a USB extension cable to connect the PCANUSB adapter to the computer. The use of an extension cable does not comply with the USB specification and can lead to malfunction of the adapter.

Configuration kit

The DIS configurator set CAN comprises:

- Item 1: USB-CAN dongle. (Peak USB-CAN IPEH Interface adaptor)
- Item 2: CAN power box with power adapter connection
- Item 3: 0.3 m CAN cable for connecting the sensor
- Item 4: Power adaptor.



Figure 1 - Connection of QG65D configurator

The USB-CAN dongle (item 1) provides the communication between USB and CAN interface. Note that DIS has modified the Peak USB-CAN IPEH Interface adaptor to forward a 5 V power supply to the CAN power box (item 2). If a standard (unmodified) Peak USB-CAN adaptor is used, the included power adaptor (item 4) must be used.

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The CAN power box (item 2) provides the voltage supply to the sensor devices. When only 1 or 2 sensors are connected, sensors can be powered via the USB-CAN dongle (item 1) by the 5 V USB power. If more than 2 sensors are connected, then the power adapter (item 4) must be used instead. This power adapter can support up to 32 Dynamic Inclinometers from DIS sensors.



Figure 2 - Power adapter for the CAN power box

The CAN power box is also equipped with a switch to control the internal CAN bus termination resistor within the CAN power box. The label clearly shows "on" and "off".



Figure 3 - CAN power box

Two LEDs on the CAN power box indicate the power status. The green LED (connection indication) will be lit when it is connected correctly to the PC. The red LED (current overload indication) will be lit when the USB port is overloaded (max. 250 mA) to protect your PC or laptop. If you use the power adapter to supply the CAN power box, then the internal power supply and the current overload protection are disabled.

If the configurator is not used 'stand-alone' (i.e. only configurator + DIS sensor) but is connected to a powered CAN bus system, then this CAN bus system must be powered with Vcc > 20 V dc. Otherwise, the USB / DIS configurator will have to supply power to the entire CAN system chain, which can potentially harm the PC and connected items.

DIS configurator set CAN will supply 18Vdc on Vcc and Gnd to the connected CAN systems/CAN sensors. Connecting sensors from other brands could potentially harm the equipment.

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DIS configurator set CAN may be used in an ambient temperature range of +10 °C to +50 °C without power adapter, or 0 °C to +40 °C with power adaptor.

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PC software

The PC software and a detailed manual can be download from the <u>DIS website</u> free of charge. The software provides a portal for both sensor configuration and live data monitoring.

Installation guide

This PC software can only be installed in Windows 10.



Figure 4 – Installation wizard.

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Click the desktop icon to start the programme.

The software window contains both information of the pc software and the sensor information.

DIS Configurator Diamond DIS Configurator Vers Configuration & Data visualisation	sion: 1.0.5.4058 Teo update available	PC application version	DIS		- O ×
Communication channel Protocol Baudrate CAN Bas CANOpen 200 Killot ~ ~ Communication Communication (Communication Communication	Q Scan PreOperational H-series) Serial no. N/A ultpFunction mod0x00-inclination (CIA11 Config chargeNev 23 2020 12:30:33	a)	Overview of the connected	d sensors	
Selected device Vector d 0.05 Star Propersional Product code Vertical 360° Inclusion Error register 0.081 Vectors Till Error Networkmanagement Pro-Operational Pro-Operational Pro-Operational Stor Error Vectors Stor Error Vectors Error Vectors	General Trev behaviour Node id (hes.) 0. (2) Baudrate 280 M Startup behaviour Presi Tarmination resister Databack Heartbeat (m) 2000	ileur TPDO Indination	nfiguration pannel h 4 tabs	Apph	anges value Vere value Const DCF configuration ListedCCC Liste

Figure 5 - Start page configuration software

PC Software update

The version of the PC software is shown on the top of the window. The software can detect if updates are available.



Version: 1.0.4.4042 Update









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Click the

, a summary of all the updates will show in a pop-up window.

	_		×
- 🗧 🌐 Found Updates for DIS.Configurator			
Update Summary			
DIS.Configurator			
Update size: 55.68 MB			
New Features			
 Added DIS logo to topbar 			
Added obfuscation to code			
Fixed Bugs			
Renamed Restore			
Move update-button to left of screen where version info is			
1	lext	Can	cel

Figure 8 - Update summary

Next

Click

to download the new installatioin.





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	4	🐣 Installing Ur	idates for DIS (Configurator	-		×
э		a stalling of		configurator			
		installing U	Juales				
		Downloading (9	05 MB of 55.68 M	B, 16% complete)			
ie							_
					Next	Cano	el

Figure 9 - status bar

🗟 DIS.Configurator Setup	×
oc d	Welcome to the Prerequisites Setup Wizard
	The setup has determined that some of the prerequisites needed to run DIS.Configurator are missing. This wizard will assist you in getting and installing those prerequisites. Click "Next" to continue or "Cancel" to exit the Setup Wizard.
	< Back Next > Cancel

Figure 10 - setup wizard

The Peak Driver is included in the setup program to ensure your computer has the latest USB driver for the CAN communication, do not uncheck it to prevent driver problems.





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Prerequisites			S
Select which prerequisites w	vili de installed		
Name Peak Driver	Required	Found	Action Install
Advanced Installer	< <u>B</u> ack	Next >	Cancel

Figure 11 - Peak Driver

After the PEAK driver is installed, the Configuration software setup wizard will start. Follow the wizard to finish the installation for the new update.

🛃 DIS.Configurator Setup		×
	Welcome to the DIS.Configurator Setup Wizard The Setup Wizard will install DIS.Configurator on your computer. Click "Next" to continue or "Cancel" to exit the Setup Wizard.	
	< <u>B</u> ack <u>Next</u> Cancel	

Figure 12 - Setup Wizard start page.





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General steps for the sensor configuration

Follow the steps to configure your sensor. After the changes are saved to the sensor, it will be automatically restarted by the pc application.



Figure 13 - General steps for the sensor configuration

When the button "Scan" is clicked, the software will scan the CAN bus and match the baudrate that your sensor is configured with.

DIS Configurator Dis Configurator Diamond DIS Configur Configuration & Data visuali	ator Version 1.05.4038 results relation	- O ×
Communication channel Protocol B CAN Bus CANOpen 21 CAN Bus CANOpen 21 Dis Sensors Dynam Product Vertical 360° Voltamine (Fast mod Firmmare V0.3.0 - Aug 18 2020 1	udrate O KBU/c Pre/Garrations/ Ic Incline (H-seriel) 0 (DIS Default/Function mode/br00 inclination (CLA10) Config theoretieve 21 2020 12:10:13	
DIS	0x05 • PreOperational DIS Sensors Dynamic Inclino (H-series)	
Product Profile Hardware Firmware	Vertical 360° Serial no. N/A 1 - Dynamic (Fast mode) (DIS Default)Function mod/0x00 -Inclination (CiA410) V8.00 Config changeNov 23 2020 12:30:33 V0.3.0 - Aug 18 2020 14:50:53 V0.3.0 V0.3.0 V0.3.0	

Figure 14 - Sensor overview



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Name	Description	Example
Product	Product code showing the measuring axis and	Vertical 360° - 1 axis with
	the range. (object 1018 _h)	measuring range 360°
		Horizontal plane 2x ±90° - 2 axis,
		measuring range ±90°
Serial No.	Batch number. (object 1018h)	77542822h= 2002004-002d
Profile	Application profile name (object 3004h)	Profile 1 – Dynamic (fast mode)
Function mode	Function mode (object 3007 _h)	Inclination (CiA410)
Hardware	Sensor hardware platform version (object 1009 _h)	V8.00
Config change	The last date and time when the configuration is	000034A4 = Nov 23 2020
	changed (object 1020 _h)	02AF28FD = 12:30:33
Firmware	Software of the sensor (object 100A _h)	V0.3.0
	Table 1 – Sensor overview	

When multiple sensors (with the same baudrate) are connected, all of them will be recognized and listed in the sensor overview. However, it is only possible to configure one at a time. Select the sensor you want to configure and follow the general steps in Figure 13.

Comm	ommunication dawnel Protocol Baudrate CAN Bus CANOpen 250 KBC; v X					
Pro Pro Han Firr	Ox01 DIS Sensors QGxxD CANopen (H duct Vertical 360° 1 - Dynamic (Fast mode) (DIS Default durare VA.00 muare V0.3.2 - Nov 25 2020 10:31:55	Operational ight acc.) Solid Inc. N/A i Function mode Bod9 Analisation (GA110) Config change New 27 2020 15:44:31	0x03 • Operational Dis Sensors Qicco CANopen (Hip acc) Senior CANopen (Hip acc) Poduct Vertical 360" Senior NGA Poduct Vertical 360" Senior NGA Poduct Vertical 360" Senior NGA Product Vertical 360" Senior NGA Product Vertical 360" Config dange Dec 02 2020 995249 Firmane V8.3.2 - Nov 25 2020 103155 Config dange Dec 02 2020 995249		0x02 0x02 Dist Sensors QGxxD CANepen (High and a construction of the c	
Configuration	Selected device Node id 6x81 State Operational Product code Versital 300° Incination 8:0.59 Error register 0x81 Manufacturer status register 0x0000	General Error behaviour 1PD0 Node (d (tex.) 0x (0) Backets 250 (Bibly = Backets can only to Startup behaviour Startup behaviour Operational - Termination resistor Termination resistor	Inclination output	Overview of changes Setting Current value N	ier value	

Figure 15 - Multiple sensors

 $\angle !$ It is not allowed to connect multiple sensors with different baudrate or sensors with the same Node ID. This will cause the CAN bus communication error.

Check if the internal termination resistor is enabled before you connect your sensor to the configurator. If the sensor is not terminated correctly, the pc software will fail to read the senor.



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Parameter tabs

General parameters

Configure Node ID, Baudrate, Start-up behaviour, Termination resistor and Heartbeat in this tab.

General	Error behaviour TPDO Inclination output
Node id (hex.)	0x 02
Baudrate	250 KBit/s 🔗 Baudrate can only be changed with one sensor connected
Startup behaviour	Operational ~
Termination resistor	Disabled v
Heartbeat (ms)	2000

Figure 16 – Tab General

In CAN network, all masters and slaves communicate with the same baudrate. Therefore, it is not allowed to change the baudrate when multiple sensors are connected to prevent communication errors.

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Error behaviour

Error behaviour is defined in 8.1.10 Object 1029h Error behaviour in the user manual QG65D CANopen Dynamic Inclinometer.

General	Error behaviour	TPDO	Inclination output			
General communication error settings						
Error behaviour		Switches to Pre-operational	~			
Manufacturer speci	fic error settings					
Error behaviour	2	Switches to Pre-operational	*			
	E	Frror masks :				
		X Cross Tilt Error				
		Y Cross Tilt Error				
		X Out Of Range				
		Y Out Of Range				
] Temperature Under Reach				
		Temperature Over Reach				
		Actual Power Error				
		Since Last Reset Power Err	or			
	~	Z Eeprom Error				
		Flash Error				
	~	Sensor Error				
	~	Watchdog Error				
	~	I Error Handler				
	~	Z Send Emergency				

Figure 17 - Tab Error behaviour

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TPDO

The communication parameters and mapping parameters of the TPDOs can be configured in this tab. TPDO is explained in the following chapters in the user manual QG65D CANopen Dynamic Inclinometer.

- 6.6 Output format
- 7.3 PDO (Reading sensor output)
- 8.1.11 Object 1800h, 1801h TPDO Communication parameter
- 8.1.12 Object 1A00h, 1A01h TPDO Mapping parameter

Gene	eral	Error behaviour	PDO	Inclination output]
TPDO1 Tr	ansmission			TPDO2 Tr	ansmission
Transmissio	n type Event	-mode v		Transmissio	n type Event-mode v
Event time ((ms) 100			Event time (ms) 100
Automatic TPDO Mapping (TPDO Presets) Function mode 0x00 -Inclination (CiA410) v					
Manual TI	PDO1 mappi	ng		Manual TI	PDO2 mapping
Enabled	✓			Enabled	
Object 1	60100010 : Inc	lination X	~	Object 1	64010110 : X Acceleration [mg] max range $\pm 16~{\scriptstyle \odot}$
Object 2	60200010 : Inc	lination Y	~	Object 2	64010210 : Y Acceleration [mg] max range $$ ±16 $$ $$ \sim
Object 3	00000000 : <n< td=""><td>ione></td><td>~</td><td>Object 3</td><td>64010310 : Z Acceleration [mg] max range $\pm 16~\vee$</td></n<>	ione>	~	Object 3	64010310 : Z Acceleration [mg] max range $\pm 16~\vee$
Object 4	00000000 : <n< td=""><td>ione></td><td>~</td><td>Object 4</td><td>00000000 : <none> v</none></td></n<>	ione>	~	Object 4	00000000 : <none> v</none>

Figure 18 - Tab TPDO

To customize the outputs, please first select function mode 0xFF – User defined TPDO-mapping, then check the Enable box to enable the TPDO.

Automatic TPDO Mapping (TPDO Presets) Function mode 0xFF - User defined TPDO-mapping Manual TPDO1 mapping Manual TPDO2 mapping Enabled Image: Comparison of the second second

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Inclination output

In this tab, all parameters related to the inclination measurement can be configured.

General	Error behaviour	TPDO	Inclination output			
Zeroing	🗘 Zero					
Inversion X inclination	Disabled	,				
Inversion Y inclination	Disabled	1				
Application profile						
Selected Application Profil	le 1 - Dynamic (Fast n	node) (DIS Default 🤟				
Output Filter (ms)	0					
Moving average filter TPE	0					
Moving average filter TPD	0					
Application Profile Defa	aults					

Figure 20 - Tab Inclination output





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Sensor configuration

How do I zero the sensor?

Configuration panel \rightarrow Tab Inclination output \rightarrow Zeroing

Zeroing

🗘 Zero

Figure 21 – zero adjustment

Set the sensor at a new zero position. Click the blue button "zero". The sensor will be immediately zero adjusted without a click of "apply".

How do I change the TPDO communication parameters such as TPDO event time?

Configuration panel \rightarrow Tab TPDO \rightarrow TPDO Transmission type

Configuration panel \rightarrow Tab TPDO \rightarrow Event time

TPDO1 Transmi	ssion	TPDO2 Transmission		
Transmission type	Event-mode v	Transmission type	Event-mode v	
Event time (ms)	100	Event time (ms)	100	

How do I change the CAN parameters such as Node ID and baudrate, etc?

Configuration panel \rightarrow Tab General \rightarrow

Node id (hex.)	0x 02
Baudrate	250 KBit/s v

To prevent communication	errors, Changing	g Baudrate is disabled when multiple sensors are connected.
Baudrate	250 KBit/s 🛛 🗸	Baudrate can only be changed with one sensor connected

How do I turn on/off the internal termination resistor?

Configuration panel \rightarrow Tab General \rightarrow Termination resistor

Termination resistor	Disabled v
	Disabled
Heartbeat (ms)	Enabled

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How do I inverse the output direction?

Configuration panel \rightarrow Tab Inclination output \rightarrow Inversion

Inversion X inclination

Inversion Y inclination

Disabled	`
Disabled	





Figure 22 - DIS default measuring direction

If the inversion is enabled, the measuring direction will be inverted (± inverted).

How do I restore the factory default settings?

Configuration panel \rightarrow Load factory default settings \rightarrow Load



Figure 23 - Load factory default settings

<u>Li</u>Do not execute "Load factory default settings" to a sensor when multiple sensors are connected. The default settings might be duplicate with another connected sensor, which may result in communication errors.





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Where can I select application profile?

Configuration panel \rightarrow Tab Inclination output \rightarrow Application profile

Application profile

Selected Application Profile	1 - Dynamic (Fast mode) (DIS Default 🤟
	0 - Static
Output Filter (ms)	1 - Dynamic (Fast mode) (DIS Default)
Moving average filter TPDO	2 - Dynamic (Slow mode)
. .	3 - Dynamic (Platform leveling)
Moving average filter TPDO	2 0

Application profile is explained in 6 .5 Application profiles in the user manual QG65D CANopen Dynamic Inclinometer. How do I set the filters to improve the inclination output?

Configuration panel \rightarrow Tab Inclination output \rightarrow Application profile

Application profile

Selected Application Profile 1 -	Dynan	nic (Fast mode) (DIS Default 🤟
Output Filter (ms)	0]
Moving average filter TPDO1	0	Output Filter
Moving average filter TPDO2	0	1st order LPF filter on the sensor slope output (angle)
Application Profile Defaults		Value range: any value (in ms) between 0ms (off) and 10000ms.
		A higher filter time value results in a smoother reaction on peaks/accelerations, but also a slower reaction on actual movements.

Figure 24 – Output filter

Application profile

Selected Application Profile 1 -	Dyna	mic (Fast mode) (DIS Default ~
Output Filter (ms)	0	
Moving average filter TPDO1	0	
Moving average filter TPDO2	0	Moving average
Application Profile Defaults		Moving average filter on the sensor slope output (angle),
		Value range: between 0 (off) and 10
		A higher value results in less noise and a smoother reaction on peaks/accelerations, but also a slower reaction on actual movements.

Figure 25 - Moving average filters.

Output filter and moving average filter are explained in 6.3.3. Digital filters in the user manual QG65D CANopen Dynamic Inclinometer.





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How do I configure the sensor error behaviour?

Configuration panel → Tab Error behaviour

General communication error settings

Error behaviour

Switches to Pre-operational v

Manufacturer specific error settings

Error behaviour



The error behaviour is explained in 8.1.10. Object 1029h Error behaviour in the user manual QG65D CANopen Dynamic Inclinometer.

How do I customise the sensor output?

Configuration panel \rightarrow Tab TPDO \rightarrow Manual TPDO mapping

- 1. Select function mode "0xFF User defined TPDO-mapping".
- 2. Select the output for each object for the TPDO message.

Automatic TPDO Mapping (TPDO Presets)

Function mode		0xFF - User defined TPDO-	mapping	*	
Manual TPDO1 mapping				Manual T	PDO2 mapping
Enabled	\checkmark			Enabled	
Object 1	60100010 : Inclinatio	on X	v	Object 1	64010110 : X Acceleration [mg] max range $\pm 16 \sim$
Object 2	60200010 : Inclinatio	on Y	~	Object 2	64010210 : Y Acceleration [mg] max range $\pm 16 \sim$
Object 3	00000000: <none></none>		*	Object 3	64010310 : Z Acceleration [mg] max range $\pm 16 \lor$
Object 4	00000000: <none></none>		¥	Object 4	00000000 : <none> v</none>

Figure 26 - TPDO mapping

Sensor outputs are defined in 8.3.4 Object 6401h Sensor outputs in the user manual QG65D CANopen Dynamic Inclinometer.



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Inclination live data

Only inclination output can be live monitored with the configuration software.



To get to your clipboard history at any time, press **Windows logo key** + **V**. You can also **paste** and **pin** frequently used items by choosing an individual item from your clipboard menu.

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Click Copy data

to save the output data to the clipboard.

Node : 01 - Longitudinal	^
200	
200	
66.83	
68.49	
68.1	
72.95	
79.51	
88.96	
95.85	
91.81	
86.25	
72.77	
56.69	
13.15	
-11.42	
-57.47	
-68.36	
-65.09	
-48.7	
-27.05	
-14.54	
10.32	
25.64	
42.64	
R3 Δ1	~

Figure 28 - output data

	500	v	Datapoints
_	25		
	50		
	100		
	250		
l	500		

The maximum mount of the recent datapoints can be selected by

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