

Modbus for multi purpose IO module IO 270

CIU 251

Functional profile and user manual



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1. Introduction

The CIU 251 consists of a CIM 250 module and an IO 270 multipurpose I/O module mounted in a CIU box. See fig. 1. The IO 270 adds I/O features to the functionality of the "standard" CIU 250. See fig. 2. This functional profile describes the additional Modbus registers relating to the IO 270.

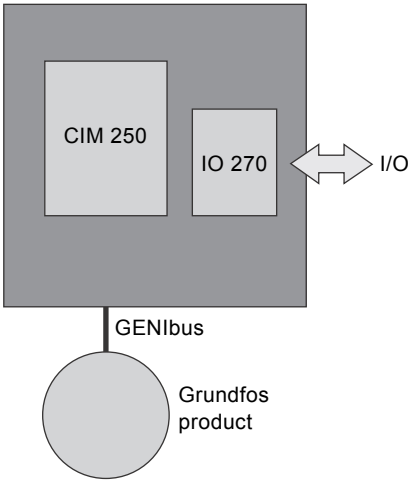


Fig. 1 CIM 250 and IO 270 built into a CIU 251 and connected to a Grundfos product via GENIbus

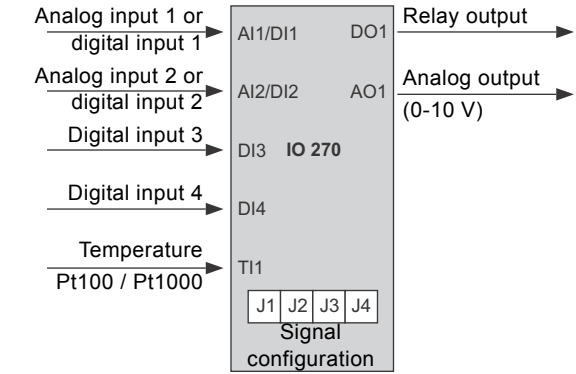


Fig. 2 IO 270 I/O signals. Jumpers are used to configure analog input signal types and selection between AI1/DI1 and AI2/DI2.

The tables below show how to configure the analog and digital inputs using jumpers J1-J4. It also gives an overview of the options. Details as how to connect sensors, relays, etc., and the layout of the terminals can be found in the installation and operating instructions "Multi-purpose IO module in CIU 27X", which is the IO 270 hardware manual.

Selection AI1 / DI1		
J1	J2	Signal
Open	Open	Analog 0-10 V
Open	Closed	Analog 0-20 mA
Closed	Open	Analog 4-20 mA
Closed	Closed	Digital (default)

Selection AI2 / DI2		
J3	J4	Signal
Open	Open	Analog 0-10 V
Open	Closed	Analog 0-20 mA
Closed	Open	Analog 4-20 mA
Closed	Closed	Digital (default)

2. Modbus register mapping

2.1 CIU 251 register blocks

Register	Description	Module/device
00001	CIM configuration	Related to the CIM module
00021	CIM status	
00030	GENIpro device family/type/version	
00101	Device control	Device data area of the connected Grundfos product
00201	Device status	
00301	Device data	
00701	Device alarm simulation	
00801	Name register area	Not supported by all products
01001	GENIpro request telegram	Reserved for GENIpro communication via Modbus
01101	GENIpro reply telegram	
01201	IO 270 control	Related to the IO 270 module related (covered by this manual)
01211	IO 270 status	
01221	IO 270 data	

2.2 IO 270 registers

Address	Modbus name	Scale	Modbus description
Control			
1201	IO270_SetAnalogOutput	0.1 %	Control of analog output value (Value change triggered)
01202	IO270_SetRelayOutput	Bool	Control of output relay (Value change triggered) Bit Description 0 0 = Open relay, 1 = Closed relay
01203	IO270_LevelShiftCountControl	Bits	Reset of digital input shift counters and level duration counters (Rising edge triggered). Bit Description 0 0 = No action, 1 = Clear DI1 duration counters 1 0 = No action, 1 = Clear DI1 shift counter 2 0 = No action, 1 = Clear DI2 duration counters 3 0 = No action, 1 = Clear DI2 shift counter 4 0 = No action, 1 = Clear DI3 duration counters 5 0 = No action, 1 = Clear DI3 shift counter 6 0 = No action, 1 = Clear DI4 duration counters 7 0 = No action, 1 = Clear DI4 shift counter
Status			
01211	IO270_AnalogIn1Fault	Bits	Sensor faults, analog input 1 Bit Description 0 0 = No fault, 1 = Signal current too high (> 20 mA) 1 0 = No fault, 1 = Signal current too low (< 4 mA) 2 0 = No fault, 1 = Signal voltage too high 3 0 = No fault, 1 = Sensor power supply fault
01212	IO270_AnalogIn2Fault	Bits	Sensor faults, analog input 2 Bit Description 0 0 = No fault, 1 = Signal current too high (> 20 mA) 1 0 = No fault, 1 = Signal current too low (< 4 mA) 2 0 = No fault, 1 = Signal voltage too high 3 0 = No fault, 1 = Sensor power supply fault
01213	IO270_TempInStatus	Bits	Sensor faults, temperature Bit Description 0 0 = No fault, 1 = No sensor 1 0 = No fault, 1 = Short-circuit 2 0 = No fault, 1 = PT1000 sensor connected 3 0 = No fault, 1 = PT100 sensor connected

Address	Modbus name	Scale	Modbus description
Data			
01221	IO270_DigitalInputs	Bits	Values of digital inputs
			Bit Description
			0 Value of DI1, 0: DI1 opened, 1: DI1 closed
			1 Value of DI2, 0: DI2 opened, 1: DI2 closed
			2 Value of DI3, 0: DI3 opened, 1: DI3 closed
			3 Value of DI4, 0: DI4 opened, 1: DI4 closed
01222	IO270_Temperature	0.01 K	PT temperature sensor value. Will equal 0xFFFF if no PT sensor connected
01223	IO270_AnalogInput1	0.1 %	Value of analog input 1. Will equal 0xFFFF if AI1 not selected on jumpers
01224	IO270_AnalogInput2	0.1 %	Value of analog input 2. Will equal 0xFFFF if AI2 not selected on jumpers
01225	IO270_RelayOut	Bool	Status of Output relay
01226	IO270_DI1ShiftHighCounterHI	Unscaled	Number of DI1 level shifts from low to high (DI1 being opened)
01227	IO270_DI1ShiftHighCounterLO		
01228	IO270_DI2ShiftHighCounterHI	Unscaled	Number of DI2 level shifts from low to high (DI2 being opened)
01229	IO270_DI2ShiftHighCounterLO		
01230	IO270_DI3ShiftHighCounterHI	Unscaled	Number of DI3 level shifts from low to high (DI3 being opened)
01231	IO270_DI3ShiftHighCounterLO		
01232	IO270_DI4ShiftHighCounterHI	Unscaled	Number of DI4 level shifts from low to high (DI4 being opened)
01233	IO270_DI4ShiftHighCounterLO		
01234	IO270_DI1ShiftLowCounterHI	Unscaled	Number of DI1 level shifts from high to low (DI1 being closed)
01235	IO270_DI1ShiftLowCounterLO		
01236	IO270_DI2ShiftLowCounterHI	Unscaled	Number of DI2 level shifts from high to low (DI2 being closed)
01237	IO270_DI2ShiftLowCounterLO		
01238	IO270_DI3ShiftLowCounterHI	Unscaled	Number of DI3 level shifts from high to low (DI3 being closed)
01239	IO270_DI3ShiftLowCounterLO		
01240	IO270_DI4ShiftLowCounterHI	Unscaled	Number of DI4 level shifts from high to low (DI4 being closed)
01241	IO270_DI4ShiftLowCounterLO		
01242	IO270_DI1HighDurationTotalHI	1 min	Total duration of DI1 high level (opened)
01243	IO270_DI1HighDurationTotalLO		
01244	IO270_DI1HighDurationSinceLastHI	1 min	Duration of DI1 high level since last shift
01245	IO270_DI1HighDurationSinceLastLO		
01246	IO270_DI2HighDurationTotalHI	1 min	Total duration of DI2 high level (opened)
01247	IO270_DI2HighDurationTotalLO		
01248	IO270_DI2HighDurationSinceLastHI	1 min	Duration of DI2 high level since last shift
01249	IO270_DI2HighDurationSinceLastLO		
01250	IO270_DI3HighDurationTotalHI	1 min	Total duration of DI3 high level (opened)
01251	IO270_DI3HighDurationTotalLO		
01252	IO270_DI3HighDurationSinceLastHI	1 min	Duration of DI3 high level since last shift
01253	IO270_DI3HighDurationSinceLastLO		
01254	IO270_DI4HighDurationTotalHI	1 min	Total duration of DI4 high level (opened)
01255	IO270_DI4HighDurationTotalLO		
01256	IO270_DI4HighDurationSinceLastHI	1 min	Duration of DI4 high level since last shift
01257	IO270_DI4HighDurationSinceLastLO		
01258	IO270_DI1LowDurationTotalHI	1 min	Total duration of DI1 low level (closed)
01259	IO270_DI1LowDurationTotalLO		
01260	IO270_DI1LowDurationSinceLastHI	1 min	Duration of DI1 low level since last shift
01261	IO270_DI1LowDurationSinceLastLO		
01262	IO270_DI2LowDurationTotalHI	1 min	Total duration of DI2 low level (closed)
01263	IO270_DI2LowDurationTotalLO		
01264	IO270_DI2LowDurationSinceLastHI	1 min	Duration of DI2 low level since last shift
01265	IO270_DI2LowDurationSinceLastLO		
01266	IO270_DI3LowDurationTotalHI	1 min	Total duration of DI3 low level (closed)
01267	IO270_DI3LowDurationTotalLO		
01268	IO270_DI3LowDurationSinceLastHI	1 min	Duration of DI3 low level since last shift
01269	IO270_DI3LowDurationSinceLastLO		
01270	IO270_DI4LowDurationTotalHI	1 min	Total duration of DI4 low level (closed)
01271	IO270_DI4LowDurationTotalLO		
01272	IO270_DI4LowDurationSinceLastHI	1 min	Duration of DI4 low level since last shift
01273	IO270_DI4LowDurationSinceLastLO		

Subject to alterations.

Argentina

Bombas GRUNDFOS de Argentina S.A.
Ruta Panamericana km. 37.500 Centro
Industrial Garin
1619 Garin Pcia. de B.A.
Phone: +54-3327 414 444
Telefax: +54-3327 45 3190

Australia

GRUNDFOS Pumps Pty. Ltd.
P.O. Box 2040
Regency Park
South Australia 5942
Phone: +61-8-8461-4611
Telefax: +61-8-8340 0155

Austria

GRUNDFOS Pumpen Vertrieb Ges.m.b.H.
Grundfosstraße 2
A-5082 Grödig/Salzburg
Tel.: +43-6246-883-0
Telefax: +43-6246-883-30

Belgium

N.V. GRUNDFOS Bellux S.A.
Boommesteinweg 81-83
B-2630 Aartselaar
Tél.: +32-3-870 7300
Télécopie: +32-3-870 7301

Belarus

Представительство ГРУНДФОС в
Минске
220125, Минск
ул. Шафарьянская, 11, оф. 56, 5Ц
«Порт»
Тел.: +7 (375 17) 286 39 72/73
Факс: +7 (375 17) 286 39 71
E-mail: minsk@grundfos.com

Bosna and Herzegovina

GRUNDFOS Sarajevo
Zmaja od Bosne 7-7A,
BH-71000 Sarajevo
Phone: +387 33 592 480
Telefax: +387 33 590 465
www.ba.grundfos.com
e-mail: grundfos@bih.net.ba

Brazil

BOMBAS GRUNDFOS DO BRASIL
Av. Humberto de Alencar Castelo Branco,
630
CEP 09850 - 300
São Bernardo do Campo - SP
Phone: +55-11 4393 5533
Telefax: +55-11 4343 5015

Bulgaria

Grundfos Bulgaria EOOD
Slatina District
Iztochna Tangenta street no. 100
BG - 1592 Sofia
Tel. +359 2 49 22 200
Fax. +359 2 49 22 201
email: bulgaria@grundfos.bg

Canada

GRUNDFOS Canada Inc.
2941 Brighton Road
Oakville, Ontario
L6H 6C9
Phone: +1-905 829 9533
Telefax: +1-905 829 9512

China

GRUNDFOS Pumps (Shanghai) Co. Ltd.
50/F Maxdo Center No. 8 XingYi Rd.
Hongqiao development Zone
Shanghai 200336
PRC
Phone: +86 21 612 252 22
Telefax: +86 21 612 253 33

Croatia

GRUNDFOS CROATIA d.o.o.
Buzinski prilaz 38, Buzin
HR-10010 Zagreb
Phone: +385 1 6595 400
Telefax: +385 1 6595 499
www.hr.grundfos.com

Czech Republic

GRUNDFOS s.r.o.
Čajkovského 21
779 00 Olomouc
Phone: +420-585-716 111
Telefax: +420-585-716 299

Denmark

GRUNDFOS DK A/S
Martin Bachs Vej 3
DK-8850 Bjerringbro
Tlf.: +45-87 50 50 50
Telefax: +45-87 50 51 51
E-mail: info_GDK@grundfos.com
www.grundfos.com/DK

Estonia

GRUNDFOS Pumps Eesti OÜ
Peterburi tee 92G
11415 Tallinn
Tel: + 372 606 1690
Fax: + 372 606 1691

Finland

OY GRUNDFOS Pumput AB
Mestarintie 11
FIN-01730 Vantaa
Phone: +358-(0)207 889 900
Telefax: +358-(0)207 889 550

France

Pompes GRUNDFOS Distribution S.A.
Parc d'Activités de Chesnes
57, rue de Malacombe
F-38290 St. Quentin Fallavier (Lyon)
Tél.: +33-4 74 82 15 15
Télécopie: +33-4 74 94 10 51

Germany

GRUNDFOS GMBH
Schlüterstr. 33
40699 Erkrath
Tel.: +49-(0) 211 929 69-0
Telefax: +49-(0) 211 929 69-3799
e-mail: infoservice@grundfos.de
Service in Deutschland:
e-mail: kundendienst@grundfos.de

HILGE GmbH & Co. KG

Hilgestrasse 37-47
55292 Bodenheim/Rhein
Germany
Tel.: +49 6135 75-0
Telefax: +49 6135 1737
e-mail: hilge@hilge.de

Greece

GRUNDFOS Hellas A.E.B.E.
20th km. Athinon-Markopoulou Av.
P.O. Box 71
GR-19002 Peania
Phone: +0030-210-66 83 400
Telefax: +0030-210-66 46 273

Hong Kong

GRUNDFOS Pumps (Hong Kong) Ltd.
Unit 1, Ground floor
Siu Wai Industrial Centre
29-33 Wing Hong Street &
68 King Lam Street, Cheung Sha Wan
Kowloon
Phone: +852-27861706 / 27861741
Telefax: +852-27858664

Hungary

GRUNDFOS Hungária Kft.
Park u. 8
H-2045 Törökbálint,
Phone: +36-23 511 110
Telefax: +36-23 511 111

India

GRUNDFOS Pumps India Private Limited
118 Old Mahabalipuram Road
Thoraiakkam
Chennai 600 096
Phone: +91-44 2496 6800

Indonesia

PT GRUNDFOS Pompa
Jl. Rawa Sumur III, Blok III / CC-1
Kawasan Industri, Pulogadung
Jakarta 13930
Phone: +62-21-460 6909
Telefax: +62-21-460 6910 / 460 6901

Ireland

GRUNDFOS (Ireland) Ltd.
Unit A, Merrywell Business Park
Ballymount Road Lower
Dublin 12
Phone: +353-1-4089 800
Telefax: +353-1-4089 830

Italy

GRUNDFOS Pompe Italia S.r.l.
Via Gran Sasso 4
I-20060 Truccazzano (Milano)
Tel.: +39-02-95838112
Telefax: +39-02-95309290 / 95838461

Japan

GRUNDFOS Pumps K.K.
Gotanda Metalion Bldg., 5F,
5-21-15, Higashi-gotanda
Shiagawa-ku, Tokyo
141-0022 Japan
Phone: +81 35 448 1391
Telefax: +81 35 448 9619

Korea

GRUNDFOS Pumps Korea Ltd.
6th Floor, Aju Building 679-5
Yeoksam-dong, Kangnam-ku, 135-916
Seoul, Korea
Phone: +82-2-5317 600
Telefax: +82-2-5633 725

Latvia

SIA GRUNDFOS Pumps Latvia
Deglava biznesa centrs
Augusta Deglava ielā 60, LV-1035, Rīga,
Tālr.: + 371 714 9640, 7 149 641
Fakss: + 371 914 9646

Lithuania

GRUNDFOS Pumps UAB
Smolensko g. 6
LT-03201 Vilnius
Tel: + 370 52 395 430
Fax: + 370 52 395 431

Malaysia

GRUNDFOS Pumps Sdn. Bhd.
7 Jalan Peguam U1/25
Glenmarie Industrial Park
40150 Shah Alam
Selangor
Phone: +60-3-5569 2922
Telefax: +60-3-5569 2866

Mexico

Bombas GRUNDFOS de México S.A. de
C.V.
Boulevard TLC No. 15
Parque Industrial Stiva Aeropuerto
Apodaca, N.L. 66600
Phone: +52-81-8144 4000
Telefax: +52-81-8144 4010

Netherlands

GRUNDFOS Netherlands
Veluwezoom 35
1326 AE Almere
Postbus 22015
1302 CA ALMERE
Tel.: +31-88-478 6336
Telefax: +31-88-478 6332
E-mail: info_gnl@grundfos.com

New Zealand

GRUNDFOS Pumps NZ Ltd.
17 Beatrice Tinsley Crescent
North Harbour Industrial Estate
Albany, Auckland
Phone: +64-9-415 3240
Telefax: +64-9-415 3250

Norway

GRUNDFOS Pumper A/S
Strømsveien 344
Postboks 235, Leirdal
N-1011 Oslo
Tlf.: +47-22 90 47 00
Telefax: +47-22 32 21 50

Poland

GRUNDFOS Pompy Sp. z o.o.
ul. Klonowa 23
Baranowo k. Poznania
PL-62-081 Przeźmierowo
Tel: (+48-61) 650 13 00
Fax: (+48-61) 650 13 50

Portugal

Bombas GRUNDFOS Portugal, S.A.
Rua Calvet de Magalhães, 241
Apartado 1079
P-2770-153 Paço de Arcos
Tel.: +351-21-440 76 00
Telefax: +351-21-440 76 90

Romania

GRUNDFOS Pompe România SRL
Bd. Biruintei, nr 103
Pantelimon county Ilfov
Phone: +40 21 200 4100
Telefax: +40 21 200 4101
E-mail: romania@grundfos.ro

Russia

ООО Грундфос Россия
109544, г. Москва, ул. Школьная, 39-41,
стр. 1
Тел. (+7) 495 564-88-00 (495) 737-30-00
Факс (+7) 495 564 88 11
E-mail grundfos.moscow@grundfos.com

Serbia

Grundfos Srbija d.o.o.
Omladinskih brigada 90b
11070 Novi Beograd
Phone: +381 11 2258 740
Telefax: +381 11 2281 769
www.rs.grundfos.com

Singapore

GRUNDFOS (Singapore) Pte. Ltd.
25 Jalan Tukang
Singapore 619264
Phone: +65-6681 9688
Telefax: +65-6681 9689

Slovakia

GRUNDFOS s.r.o.
Prievozská 4D
821 09 BRATISLAVA
Phona: +421 2 5020 1426
sk.grundfos.com

Slovenia

GRUNDFOS d.o.o.
Šlandrova 8b, SI-1231 Ljubljana-Črnuče
Phone: +386 31 718 808
Telefax: +386 (0)1 5680 619
E-mail: slovenia@grundfos.si

South Africa

GRUNDFOS (PTY) LTD
Corner Mountjoy and George Allen Roads
Wilbart Ext. 2
Bedfordview 2008
Phone: (+27) 11 579 4800
Fax: (+27) 11 455 6066
E-mail: lsmart@grundfos.com

Spain

Bombas GRUNDFOS España S.A.
Camino de la Fuentecilla, s/n
E-28110 Algete (Madrid)
Tel.: +34-91-848 8800
Telefax: +34-91-628 0465

Sweden

GRUNDFOS AB
Box 333 (Lunnagårdsgatan 6)
431 24 Mölndal
Tel.: +46 31 332 23 000
Telefax: +46 31 331 94 60

Switzerland

GRUNDFOS Pumpen AG
Bruggacherstrasse 10
CH-8117 Fällanden/ZH
Tel.: +41-44-806 8111
Telefax: +41-44-806 8115

Taiwan

GRUNDFOS Pumps (Taiwan) Ltd.
7 Floor, 219 Min-Chuan Road
Taichung, Taiwan, R.O.C.
Phone: +886-4-2305 0868
Telefax: +886-4-2305 0878

Thailand

GRUNDFOS (Thailand) Ltd.
92 Chaloom Phrakiat Rama 9 Road,
Dokmai, Pravej, Bangkok 10250
Phone: +66-2-725 8999
Telefax: +66-2-725 8998

Turkey

GRUNDFOS POMPA San. ve Tic. Ltd. Sti.
Gebze Organize Sanayi Bölgesi
İhsan dede Caddesi,
2. yol 200. Sokak No. 204
41490 Gebze/ Kocaeli
Phone: +90 - 262-679 7979
Telefax: +90 - 262-679 7905
E-mail: satis@grundfos.com

Ukraine

Бізнес Центр Європа
Столичне шосе, 103
м. Київ, 03131, Україна
Телефон: (+38 044) 237 04 00
Факс: (+38 044) 237 04 01
E-mail: ukraine@grundfos.com

United Arab Emirates

GRUNDFOS Gulf Distribution
P.O. Box 16768
Jebel Ali Free Zone
Dubai
Phone: +971 4 8815 166
Telefax: +971 4 8815 136

United Kingdom

GRUNDFOS Pumps Ltd.
Grovebury Road
Leighton Buzzard/Beds. LU7 4TL
Phone: +44-1525-850000
Telefax: +44-1525-850011

U.S.A.

GRUNDFOS Pumps Corporation
17100 West 118th Terrace
Olathe, Kansas 66061
Phone: +1-913-227-3400
Telefax: +1-913-227-3500

Uzbekistan

Grundfos Tashkent, Uzbekistan The Repre-
sentative Office of Grundfos Kazakhstan in
Uzbekistan
38a, Oybek street, Tashkent
Телефон: (+998) 71 150 3290 / 71 150
3291
Факс: (+998) 71 150 3292

Addresses Revised 21.05.2014

98470828 1114
ECM: 1146539

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