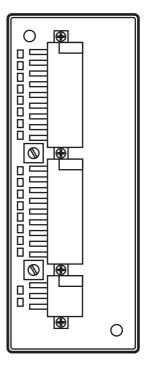


Device manual CabinetModule Input/output module

CR2014

UK





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This device manual applies to devices as from the production status CR2014 $\ensuremath{\textbf{AF}}$

1 Preliminary note

Technical data, approvals, accessories and further information at www.ifm.com.

Instruction

 \rightarrow Cross-reference



Important note

Non-compliance can result in malfunctions or interference.



Information

Supplementary note

2 Safety instructions

This description is part of the unit. It contains texts and drawings concerning the correct handling of the controller and must be read before installation or use.

Observe the information of the description. Non-observance of the notes, operation which is not in accordance with use as prescribed below, wrong installation or handling can result in serious harm concerning the safety of persons and plant.

The device may only be installed, connected and commissioned by qualified personnel.

Disconnect the device externally before doing any work on it. If necessary, also disconnect separately supplied output load circuits.

If the device is not supplied by the mobile on-board system (12/24 V battery operation), it must be ensured that the external voltage is generated and supplied according to the criteria for safety extra-low voltage (SELV) as this voltage is supplied without further measures to the connected controller, the sensors and the actuators.

The wiring of all signals in connection with the SELV circuit of the device must also comply with the SELV criteria (safety extra-low voltage, safe electrical separation from other electric circuits). If the supplied SELV voltage is externally grounded (SELV becomes PELV), the responsibility lies with the user and the respective national installation regulations must be complied with. All statements in this manual refer to the device the SELV voltage of which is not grounded.

The connection terminals may only be supplied with the signals indicated in the technical data and/or on the device label and only the approved accessories of ifm electronic may be connected.

According to the technical specifications below the device can be operated in a wide operating temperature range. Because of the additional internal heating the housing walls can have high perceptible temperatures when touched in hot environments. In case of malfunctions or uncertainties please contact the manufacturer. Tampering with the device can lead to serious risks for the safety of persons and plant. It is not permitted and leads to the exclusion of any liability and warranty claims.

3 Functions and features

The device enables decentralised evaluation of sensor signals and decentralised triggering of actuators and proportional valves.

WARNING

The device is not approved for safety tasks with respect to the protection of persons.

3.1 CAN communication

- The device supports binary/analogue inputs/outputs and is therefore classified in the device class "I/O module" to CiA DS 401.
- As regards the input/output functions, the device can be configured and it supports the following functions:
 - analogue inputs
 - binary inputs
 - binary outputs
 - PWM outputs
- There are 1 server SDO and 4 default PDOs according to CiA DS 401.The PDO mapping can be changed (dynamic PDO mapping). The default identifiers are assigned according to the "predefined connection set".
- The COB IDs of the PDOs as well as the transmission type (synch/asynch) of the individual PDOs can be configured.
- The device expects a synch object. The CAN identifier of the synch object can be configured.
- The device supports "node guarding" and "heartbeat". The "guard time", the "life time factor" and the "heartbeat time" can be configured.
- The device generates an emergency object. The COB ID of the EMCY object can be configured.
- The device stores the last error. The error code of the corresponding emergency object is stored.
- The device supports a reset function, i.e. the assignment of the parameters to the factory default settings on request.
 Factory default settings (→ 7.3 Communication profiles; Idx 1000 to 1FFF) and (→ 7.4 Manufacturer-specific profiles; Idx 2000 to 6FFF)

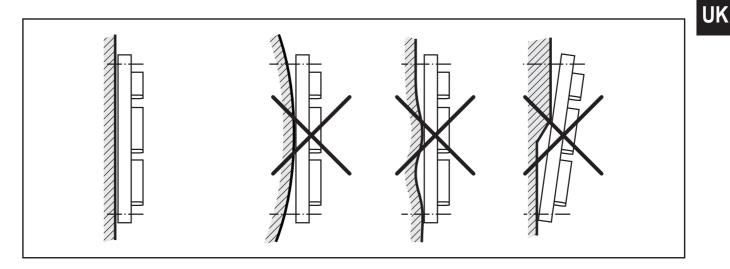
4 Mounting

4.1 Mounting location

The device is to be mounted in a dry and enclosed environment (e.g. control panel of the driver's cab, separate control boxes, etc.).

ATTENTION

The housing must not be exposed to any torsion forces or mechanical stress.

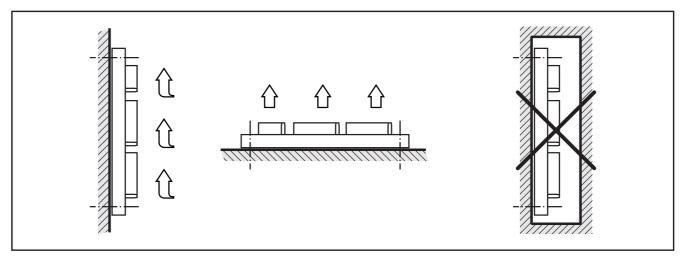


4.2 Fixing

- Fix the device using 2 M4 x L screws via transversely arranged bore holes. Tighten the screws alternately crosswise.
 - Tightening torque: 1.5 Nm
 - Mounting position: as required
 - Hole dimensions: $(\rightarrow 8.1 \text{ Dimensions, mechanics, electronics})$

4.3 Cooling

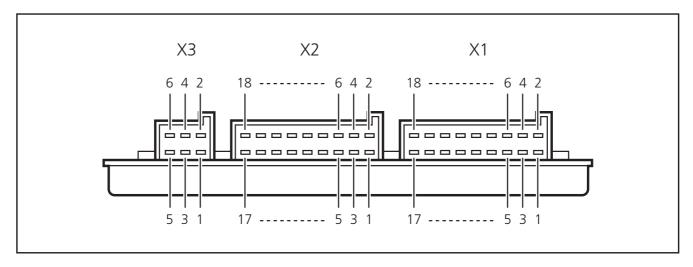
As the internal heating of the electronics is conducted away via the housing, ensure sufficient heat dissipation.



5 Electrical connection

5.1 Connectors

The supply cables and inputs/outputs are connected via AMP crimp connectors on the front of the device.



Pin connection (\rightarrow 8.4 Wiring)

You can find more information about the available connector accessories at: www.ifm.com \rightarrow Data sheet direct \rightarrow CR2014 \rightarrow Accessories

5.2 Fuses

To protect the whole system (wiring and device) the individual electric circuits must be protected with max. 8 A.

6 Set-up

6.1 PLC configuration in CODESYS 2.3

Parameter setting of the device functions and of the CAN interface is directly done from the application programmed with CODESYS 2.3. To do so, the "Electronic Data Sheet" (EDS) is integrated via the CODESYS PLC configuration.

III PLC Configuration	
CR0020 Configuration V05 CR0020 Configuration V05 CR0020, CANopen Master[VAR] CR0020,	CAN parameters Receive PDO-Mapping Send PDO-Mapping Service Data Objects Image: Constraint of the con
AT %QW35: INT; (* analog AT %QW36: INT; (* analog B64 Can-Input AT %IW32: UINT; (* chan AT %IW33: UINT; (* chan AT %IW34: UINT; (* chan AT %IW35: UINT; (* chan	Node guard Info I Nodeguarding Guard COB-ID: Guard DB-ID: \$NODEID + 0x00000700 Guard time (ms): 0 Life time factor: 0 Heartbeat settings Image: Comparison of the settings
<	 Activate heartbeat generation Heartbeat producer time: 0 ms Activate heartbeat gonsumer Emergency telegram ✓ Emergency

CODESYS dialogue "PLC configuration" (example)

For a description of the setting and application of the "PLC configuration" dialogue see the CODESY manual and the CODESYS online help.

6.2 PLC configuration in CODESYS 3.5

The "Electronic Data Sheet" (EDS) is installed in the [Device Repository]. Proceed as follows in the main menu:

- Click on [Tools] / [Device Repository].
- Select [Fieldbuses] / [CiA CANopen] / [CiA Remote Device] and click on [Install].
- Select EDS file and click on [Open].
- In CODESYS 3.5 the devices are integrated as CiA remote devices in the device tree under a [CANopen_Manager] element.

```
    Communication (Communication)
    Ethernet (Ethernet)
```

- GAN (CAN)
 - GANbus (CANbus)
 - GANopen_Manager (CANopen_Manager)

🕑 System_R360_I_O_CompactModuleMetal_CR2033 (System R360: I/O CompactModuleMetal CR2033)

The CANopen communication is configured via the CODESYS configuration editor.

6.2.1 Heartbeat configuration

The function [Reset Node] must be activated on the tab [General] so that the device applies the parameters set for heartbeat monitoring of the CANopen Manager.

General	General
PDOs	Node ID: 1 SDO Channels (1/1 active)
SDOs	Enable Expert Settings Optional Device
CANopen I/O Mapping	Enable Sync Producing No Initialisation Reset Node: Sub:001
Status	
Information	✓ Nodeguarding
	Enable Nodeguarding
	Guard Time (ms): 0 Producer Time (ms): 200
	Life Time Factor: 0 + Heartbeat Consuming (1/1 active)
	A Emergency
	Enable Emergency Enable TIME Producing
	COB-ID: \$NODEID+16#80 COB-ID (Hex): 16# 100
	Enable TIME Consuming
	✓ Checks at Startup
	Check Vendor ID Check Product Number Check Revision Number

UK

6.2.2 SyncMonitoring

To activate the device-internal monitoring of the Sync cycle, the monitoring time has to be written into the object directory entry 0x1006. This is possible by supplementing the SDO list in the CANopen configurator or during the operating time via the function block COP_SDOwrite.

General	🕂 Add	SDO 🛛	🖉 Edit 🔀 Dele	ete 🕆 Move	e Up 👲 Move	Down					
PDOs	Line	Index	x:Subindex Name		Value		Bit length	Abort if error		Jump to line if error	Next
SDOs	1	-	00C:16#00	0C:16#00 Set Guardtime		16#0000000 16					0
CANISSIS I/O Manaina	2	16#1	Select Item f	from Objec	t Directory						×
CANOpen I/O Mapping	3	16#1									
Status	4	16#1	Index:Sub	index	Name		AccessType	Туре	Defa	ault	^
Information	5	16#1	■ 16#10		Pre-defined	error field	/ lecessitype	iype	Den		
Information	6	16#1		05:16#00		NC message	RW	UDINT	16#8	80000080	-
	7	16#1		06:16#00		ation cycle period	RW	UDINT	0		
	8	16#1		0C:16#00	Guard time		RW	UINT	0		-
	9	16#1		0D:16#00	Life time fa		RW	USINT	0		-
	10	16#1	■ 16#10		Store para			0.51141	0		
	11	16#1	■ 16#10			fault parameters					
	12	16#1		14:16#00		CY message	RW	UDINT	¢NO	DEID+16#00000080	-
	13	16#1	16#10			heartbeat time	KVV	ODINI	φivO	DEID+16#00000080	-
	14	16#1		17:16#00		eartbeat time	RW	UINT	0		
	15	16#1	16#10				RVV	UINI	0		
	16	16#1				PDO parameter					-
	17	16#1	16#14			DO parameter					
	18	16#1	■ 16#18			PDO parameter					
	19	16#1	■ 16#18	01	2. transmit	PDO parameter					×
	20	16#1	<							>	
	21	16#1	Name:	Uni	nown Object						
SDOs CANopen I/O Mapping Status Information	22	16#1	Index:	164	±1006	A Dit lor	ngth: 8				
			Index:	10#	1006		igtn: o			T	
	SDO T	imeout	SubIndex:	16#	ŧO	Value	: 10000þ			OK Cancel	
essages - Total 0 error(s). 0 war	nina(s), (0 mess.								Cancer	

The monitoring time is indicated in microseconds [µs].

COP_SDOwrite						
-xExecute BOOL	BOOL xDone					
eChannel ifmDevice.CAN_CHANNEL	BOOL xError					
usiNode USINT	ifmTypes.DIAG_INFO eDiaginfo					
uiIndex UINT						
usiSubIndex USINT						
pData POINTER TO USINT						
udiLen UDINT						
Timeout TIME						

6.3 Electronic Data Sheet

The EDS contains the description of all parameters and I/O data of the device in a format defined by CANopen. The EDS files are provided for all CANopen slaves by ifm electronic.

The EDS files are available at www.ifm.com.

7 Parameter setting

7.1 Automatic saving

Automatic saving of the communication and device parameters can be activated or deactivated by means of the "save parameter" entry (object directory, index 1010, S-ldx 01).

• Value 0x00:

There is no automatic saving. Changed parameters are only valid until the device is switched off or until the next reset.

• Value 0x01:

Changed parameters will be saved if the string "save" is written in S-Idx 01. Otherwise changed parameters are only valid until the device is switched off or until the next reset.

• Value 0x02:

Changed parameters are saved automatically.

7.2 Restoring the factory setting

With the function "restore" (object directory, index 1011, subindex 01) the factory default values can be restored (except for the baud rate and the node ID). They become valid with the next power on.

7.3 Communication profiles; Idx 1000 to 1FFF

Parameters	Index in object directory	Default value (factory preset)	Change saved automatically	Change effective
COB ID Synch Object	1005 00	0x80	adjustable	after PreOp
Communication Cycle	1006 00	0x00 (Off)	adjustable	immediately
Guard Time	100C 00	0x00 (Off)	adjustable	immediately
Life Time Factor	100D 00	0x00	adjustable	immediately
Save Parameter	1010 01	0x02 (AutoSave ON)	yes	immediately
COB-ID EMCY	1014 00	0x80 + node ID	adjustable	after a reset
Consumer Heartbeat Time	1016 01	0x00 (Off)	adjustable	immediately
Producer Heartbeat Time	1017 00	0x00 (Off)	adjustable	immediately
COB-ID Rx PDO 1	1400 01	0x200 + node ID	adjustable	after PreOp
Trans Type Rx PDO 1	1400 02	0x01 (synchronous)	adjustable	immediately
COB-ID Rx PDO 2	1401 01	0x300 + node ID	adjustable	after PreOp
Trans Type Rx PDO 2	1401 02	0x01 (synchronous)	adjustable	immediately
COB-ID Tx PDO 1	1800 01	0x180 + node ID	adjustable	after PreOp
Trans Type Tx PDO 1	1800 02	0xFF (asynchronous)	adjustable	immediately
Inhibit Timer Tx PDO 1	1800 03	0x0000	adjustable	immediately
Event Timer Tx PDO 1	1800 05	0x00	adjustable	immediately
COB-ID Tx PDO 2	1801 01	0x280 + node ID	adjustable	after PreOp
Trans Type Tx PDO 2	1801 02	0x01 (synchronous)	adjustable	immediately
Inhibit Timer Tx PDO 2	1801 03	0x0000	adjustable	immediately
Event Timer Tx PDO 2	1801 05	0x00	adjustable	immediately

The life time factor 0 is interpreted as 1. The first guard protocol is interpreted as "start guarding" even if guarding is not yet active at that time (guard time = 0). Object directory (\rightarrow 11)

7.4 Manufacturer-specific profiles; Idx 2000 to 6FFF

Parameters	Index in object directory	Default value (factory preset)	Change saved automatically	Change effective
Config. channel 1	2000 01	0x01 (Bin IN)		
Config. channel 2	2000 02	0x01 (Bin IN)		
Config. channel 3	2000 03	0x01 (Bin IN)		
Config. channel 4	2000 04	0x01 (Bin IN)		
Config. channel 5	2000 05	0x03 (Ana IN absolute)		
Config. channel 6	2000 06	0x03 (Ana IN absolute)		
Config. channel 7	2000 07	0x02 (Bin OUT + read back input)		
Config. channel 8	2000 08	0x02 (Bin OUT + read back input)		
Config. channel 9	2000 09	0x01 (Bin IN)	adjustable	after PreOp
Config. channel 10	2000 0A	0x01 (Bin IN)	_	
Config. channel 11	2000 0B	0x01 (Bin IN)		
Config. channel 12	2000 0C	0x01 (Bin IN)		
Config. channel 13	2000 0D	0x03 (Ana IN absolute)		
Config. channel 14	2000 0E	0x03 (Ana IN absolute)		
Config. channel 15	2000 0F	0x02 (Bin OUT + read back input)		
Config. channel 16	2000 10	0x02 (Bin OUT + read back input)		
PWM frequency	2001 00	0x64 (100 Hz)	adjustable	after PreOp
Node ID *	20F0, 20F1	0x20 (0d32)	yes	after a reset
Baud rate *	20F2, 20F3	0x04 (125 Kbit/s)	yes	after a reset
Autostart	20F4	0x00 (Off)	adjustable	immediately

Entries in the object directory indexes 20F0/20F1 and/or 20F2/20F3 are only valid if the rotary switches for baud rate and/or node ID are in the position "F".

*) Observe rotary switch position!

Position and coding of the rotary switches (\rightarrow 8.2 Connecting, operating and display elements)

7.5 EMCY objects

The following error codes are supported according to DSP-301 and DSP-401:

EMCY code	Error reg	Additional code	Description
0x6100	0x11	0x00	"Internal Software": overflow of an Rx queue; e.g. frequency of the Rx PDOs too high only external reset via an entry in 1003 00
0x6101	0x11	0x00	"Internal Software": overflow of a Tx queue; e.g. device does not communicate with the bus only external reset via an entry in 1003 00
0x8100	0x11	0x00	"Monitoring" (guarding error) no guard object is received for "guard time" x "life time factor" reset with the next communication
0x8120	0x11	0x00	"Communication" (CAN error passive) CAN controller has passed into the CAN error passive state
0x8200	0x11	0x00	"Monitoring" (synch error) for "communication cycle" no synch object is received; only in OPERATIONAL reset with the next synch OBJ or PREOP

7.6 Boot-up message

The module sends a boot-up message after application of the supply voltage or after a reset, to inform a CANopen master in the network about its presence or a restart.

To ensure the compatibility with older device versions, a boot-up message is sent in accordance with CANopen specifications DS-301 V3 and V4.

8 Technical data

8.1 Dimensions, mechanics, electronics

CR2014	
CabinetModule	
I/O module digital and analogue for R 360 system	
16 inputs/outputs	
CANopen interface	
1032 V DC	
Application	Connection of operating and display elements to CAN bus to be installed in driver's cabs, control panels or control boxes
Structure	PCB without housing (for mechanical protection potted in a potting tub)
Dimensions (I x w x h)	163 x 63 x 29 ^{±1} mm
Installation	via 2 transversely arranged bore holes
Protection	IPO0 (PCB without housing), to EN60529
Possible I/O-configurations (also see wiring)	8 digital inputs 4 analogue inputs 2 digital inputs/outputs (to be configured via CANopen) 2 digital inputs/outputs, analogue outputs (to be configured via CANopen)
Inputs, digital	for positive-switching sensor signals, switches or pushbuttons
nputs, analogue	absolute, conversion of input voltage (05 V) in 10-bit value
Outputs	for triggering pilot lights etc.
Connections Inputs/outputs Operating voltage and CAN bus	AMP crimp connector, to be clipped into place and thus vibration-resistant, protected against reverse polarity 2 plugs, 18 poles 1 plug, 6 poles
Operating voltage U _B	1032 V DC
Current consumption	\leq 100 mA, without load (external fuse with max. 5 A)
Operating/storage temperature	-40+85°C / -40+85°C
Controller	16 bits Fujitsu MB90F543
Interface	CAN interface 2.0 B, ISO 11898
Baud rate	20 Kbits/s1 Mbit/s (default setting 125 Kbits/s) adjustable via rotary switches or CANopen object directory
Controller	16 bits Fujitsu MB90F543
Communication profile	CANopen, CiA DS 301 version 4, CiA DS 401 version 2.1
Programming system	from CoDeSys 2.3 via EDS
Node ID (default)	hex 20 (= dec 32) adjustable via rotary switch (114) or CANopen object directory (1127)
Status LED	CANopen: 2 LEDs (green, red) Inputs/outputs: 16 LEDs (yellow)
Accessories (to be ordered separately)	Order no. EC2053 Plug set for CabinetModules, wirable, consisting of: AMP crimp housing, 1 x 6 poles, 2x18 poles incl. crimp contacts (Junior Power Timer)

8.2 Connecting, operating and display elements

CR2014	Technical data					
Operating and indicating elements Connector	Rotary switch hex-coded S1 S2 Baud rate Node ID LEDs AMP Crimp connector					
Hex-code switch coding	Switch S1 Baud rate	Position 0 1 2 3 4 5 6 7 8E F	Description 1000 Kbits/s 800 kBits/s 500 Kbit/s 250 Kbit/s 125 Kbit/s 100 Kbit/s 50 Kbit/s 20 Kbit/s not defined adjustment via object directory (default)			
	S2 Node-ID	0 1E F	not defined 114 adjustment via object directory (default)			
Operating states (LEDs)	LED PWR (green)	State OFF ON 1 x ON 2.5 Hz	Description no supply voltage module in stand-by mode CANopen status: PREOPERATIONAL / PREPARED outputs = OFF module in stop mode CANopen status: STOP outputs = OFF module active CANopen status: OPERATIONAL outputs are updated			
	DIA (red)	OFF ON 1 x ON 2 x ON 3 x ON	communication OK communication disturbed, CAN bus OFF communication disturbed: • CAN error warning level exceeded • node guard / heartbeat error (if node guarding / heartbeat is activated) • no synch objects (if synch monitoring is activated)			
	IN (yellow) OUT (yellow)	OFF ON OFF ON	input not switched input switched binary output not switched (OFF) analogue output: PWM preset value < 1% measuring range binary output switched (ON) analogue output: PWM preset value > 2% measuring range			

8.3 Characteristics of the inputs/outputs, test standards and regulations

CR2014	Characteristics of the inputs / outputs							
Inputs								
Channels 14, channels 912	• 8 inputs for positive sensor signals For each input the pins $+U_B$ and Bin INx are available							
Channels 78, channels 1516	 4 inputs for positive sensor signals Can be used as an alternative to the 4 outputs. For input and output one pin is available (double configuration). The inputs can be used to read back the output signals. 							
	Current consumption $I_{IN} = 4 \text{ mA}$ (for U $_B = 10 \text{ V}$) $I_{IN} = 17 \text{ mA}$ (for U $_B = 30 \text{ V}$)Switching thresholdsHIGH = 8 VLOW = 2.5 VSwitching frequency25 Hz max.(for ti = tp)							
Channels 56, channels 1314	• 4 inputs							
	for absolute value measurement 05 VFor each input the pins Ana INx and GND are availableInput resistancetyp. 720 k Ω Resolution10 bitsAccuracytyp. ± 2 LSB							
Outputs								
Channels 7, 15	• 2 positive-switching outputs; short-circuit and overload protected;							
	 the supply voltage U_B is switched without additional fuse. The output states can be read back (see inputs). For each input the pins Bin OUTx and GND are available. ▲ When inductive loads are switched, free-wheeling diodes must be connected in parallel with the load! Switching current max. 500 mA 							
Channels 8, 16	• 2 PWM outputs (high side), variable frequency							
	PWM frequency20250 HzPulse duty factor01000 ‰Resolution1 ‰Switching currentmax. 500 mA							
Immunity to conducted interference	Test standards and regulations to ISO 7637-2, pulses 2a, 3a, 3b, 4, severity level 4, function state A to ISO 7637-2, pulse 5, severity level 3, function state A							
Immunity to interfering fields	to ISO 7637-2, pulse 1, 2b, severity level 4, function state C to UN/ECE-R10 at 100V/m (E1 type approval)							
Interference emission	and EN 61000-6-2: 2005 (CE) to UN/ECE-R10 (E1 type approval) and EN 61000-6-3: 2007 (CE)							
Tests for railway applications	EN 50155 clause 12.2 mechanical/climatic tests							
	EN 50121-3-2 EMC noise emission and noise immunity							
	additional information on request							
ifm electronic amh • Friedrichstraße 1 • 45128 Fc	see We reserve the right to make technical alterations without prior potical CR2014 / page 3 25.04.20							

ifm electronic gmbh • Friedrichstraße 1 • 45128 Essen We reserve the right to make technical alterations without prior notice!

8.4 Wiring

ew of the unit										
		Х3	X2		X1					
		6 4 2 18 6 4 2 18 6 4 2								
			_	- - -		_)				
		531	17	5 3 1 17	5 3	1				
• • • •										
iring										
	Plug	1			_					
	Pin	Potential		puts	Out					
	1 2	channel 1 +U _B	Bin IN 1	_	-	_				
	3	channel 2 +U _B	Bin IN 2	-	-	_				
	5	channel 3	Bin IN 3	-	-	-				
	67	+U _B channel 4	Bin IN 4	_	-	_				
	8	+U _B +U _B								
	10	+U _B channel 5		Ana IN 5						
	12	channel 6	_	Ana IN 6	_	_				
	13	GND GND								
	15	channel 7 GND	Bin IN 7	-	Bin OUT 7					
	17	channel 8	Bin IN 8	-	Bin OUT 8	PWM 8				
	18 Plug 2	GND								
	1	channel 9	Bin IN 9	_	_	_				
	23	+U _B channel 10	Bin IN 10			_				
	4	+U _B				_				
	5	channel 11 +U _B	Bin IN 11	-	_	_				
	7	channel 12 +U _B	Bin IN 12	-	-	-				
	9	+U _B								
	10	+U _B channel 13	_	Ana IN 13	_	_				
	12	channel 14 GND	-	Ana IN 14	-	-				
	14	GND								
	15 16	channel 15 GND	Bin IN 15	-	Bin OUT 15					
	17	channel 16 GND	Bin IN 16	-	Bin OUT 16	PWM 16				
	Plug									
	1	+U _B								
	23	GND +U _B								
	4	GND								
	5	CAN_L CAN_H								
		1								

17

9 Maintenance, repair and disposal

- Do not open the housing, as the device does not contain any components which must be maintained by the user. The device must only be repaired by the manufacturer.
- Dispose of the device in accordance with the national environmental regulations.

10 Approvals/standards

Test standards and regulations (\rightarrow 8 Technical data)

The CE Declaration of Conformity and the E1 approval are available at: www.ifm.com

11 Object directory

11.1 Communication profiles; Idx 1000 to 1FFF

Index 1000	S-ldx	Name	Туре		Default	Description
	0	device type	ro	u32	0x000F0191	I/O-module profile DS401 digital/analogue inputs/outputs
1001	0	error register	ro	u8	0x00	
1003	0	pre-definded error field	rw	u8	0x00	up to 4 entries in error history supported error history can be deleted by writing '0' to this entry
	1	error history	ro	u32	0x00000000	
	2	error history	ro	u32	0x00000000	
	3	error history	ro	u32	0x00000000	
	4	error history	ro	u32	0x00000000	
1005	0	COB ID SYNC	rw	u32	0x0000080	
1006	0	communication cycle period	rw	u32	0x00000000	max. time between 2 synch objects in µs; useful resolution = 1ms
1008	0	device name	ro	str	CR2014	
1009	0	HW Version	ro	str	HW Vx.x	
100A	0	SW Version	ro	str	SW Vx.x	
100C	0	guard time	rw	u16	0x0000	time in ms within this time the module expects a "node guarding" of the network master 0 = node guarding deactivated
100D	0	life time factor	rw	u8	0x00	if no "node guarding" is received for "guard time" x "life time", the module generates an EMCY the result form "guard time" x "life time" must be between 0 and 65535
1010	0	number of save options	ro	u8	0x01	
	1	save parameter	rw	u32	0x0000002	0x0000000 = no save 0x00000001 = saving all parameters after the string 'save' is written to this entry 0x00000002 = auto save
1011	0	number of restore options	ro	u8	0x01	
	1	restore default parameter	rw	u32	0x0000001	restore all parameters to default value after next reset if the string 'load' is written to this entry
1014	0	COB ID EMCY	rw	u32	0x40000080 + NodelD	module generates EMCY messages (bit 30 = 1)

Index	S-ldx	Name	пе Туре		Default	Description
1016	0	number of monitored devices	ro	u8	0x01	
	1	consumer heartbeat time	rw	u32	0x0000000	heartbeat monitoring time for node n monitoring of only one node is supported 0x0nntttt = monitoring time [ms] 0x0nntttt = node number (if nn or tttt = 0, no monitoring is carried out)
1017	0	producer heartbeat time	rw	u16	0x0000	time interval [ms] where the module generates a producer heartbeat
1018	0	number of identity objects	ro	u8	0x04	
	1	vendor ID	ro	u32	0x0069666D	
1400	0	highest numbered subindex Receive PDO 1	ro	u8	0x02	
	1	COB ID Receive PDO 1	rw	u32	0x00000200 + NodeID	PDO is valid (bit 31 = 0)
	2	transmission type Rec PDO 1	rw	u8	0x01	0x010xF0 = synch cyclic 0xFE0xFF = asynch (immediately)
1401	0	highest numbered subindex Receive PDO 2	ro	u8	0x02	
	1	COB ID Receive PDO 2	rw	u32	0x00000300 + NodeID	PDO is valid (bit 31 = 0)
	2	transmission type Rec PDO 2	rw	u8	0x01	0x010xF0 = synch cyclic 0xFE0xFF = asynch (immediately)
1600	0	number of application objects linked with Rec PDO 1	rw	u8	0x01	
	1	1st mapping object Rec PDO 1	rw	u32	0x08010062	index 6200, subindex 1, 8 bits
	2	2nd mapping object Rec PDO 1	rw	u32	0x0000000	no object
	3	3rd mapping object Rec PDO 1	rw	u32	0x00000000	no object
	4	4th mapping object Rec PDO 1	rw	u32	0x0000000	no object

Index	S-ldx	Name	Туре		Default	Description
	5	5th mapping object Rec PDO 1	rw	u32	0x0000000	no object
	6	6th mapping object Rec PDO 1	rw	u32	0x0000000	no object
	7	7th mapping object Rec PDO 1	rw	u32	0x00000000	no object
	8	8th mapping object Rec PDO 1	rw	u32	0x00000000	no object
1601	0	number of application objects linked with Rec PDO 2	rw	u8	0x02	
	1	1st mapping object Rec PDO 2	rw	u32	0x10011464	index 6414 subindex 1, 16 bits
	2	2nd mapping object Rec PDO 2	rw	u32	0x10021464	index 6414 subindex 2, 16 bits
	3	3rd mapping object Rec PDO 2	rw	u32	0x0000000	no object
	4	4th mapping object Rec PDO 2	rw	u32	0x0000000	no object
	5	5th mapping object Rec PDO 2	rw	u32	0x0000000	no object
	6	6th mapping object Rec PDO 2	rw	u32	0x00000000	no object
	7	7th mapping object Rec PDO 2	rw	u32	0x00000000	no object
	8	8th mapping object Rec PDO 2	rw	u32	0x0000000	no object
1800	0	highest numbered subindex Transmit PDO 1	ro	u8	0x05	
	1	COB ID Transmit PDO 1	rw	u32	0x00000180 + NodeID	PDO is valid (bit 31 = 0)

Index	S-ldx	Name	Туре		Default	Description	
	2	transmission type Trans PDO 1	rw	u8	0xFF	0x010xF0 = synch cyclic 0xFE0xFF = asynch (immediately)	
	3	inhibit timer Trans PDO 1	rw	u16	0x0000	min. interval for transmission (in 100µs)	
	5	event timer Trans PDO 1	rw	u16	0x0000	max transfer break in trans type "asynch" (065535ms) when this time has elapsed the PDO is transferred even if the appl. event has not occurred	
1801	0	highest numbered subindex Transmit PDO 2	ro	u8	0x05		
	1	COB ID Transmit PDO 2	rw	u32	0x00000280 + NodeID	PDO is valid (bit 31 = 0)	
	2	transmission type Trans PDO 2	rw	u8	0x01	0x010xF0 = synch cyclic 0xFE0xFF = asynch (immediately)	
	3	inhibit timer Trans PDO 2	rw	u16	0x0000	min. interval for transmission (in 100µs)	
	5	event timer Trans PDO 2	rw	u16	0x0000	max transfer break in trans type "asynch" (065535ms) when this time has elapsed the PDO is transferred even if the appl. event has not occurred	
1A00	0	number of application objects linked with Trans PDO 1	rw	u8	0x01		
	1	1st mapping object Trans PDO 1	rw	u32	0x10010061	index 6100, subindex 1, 16 bits	
	2	2nd mapping object Trans PDO 1	rw	u32	0x0000000	no object	
	3	3rd mapping object Trans PDO 1	rw	u32	0x00000000	no object	
	4	4th mapping object Trans PDO 1	rw	u32	0x0000000	no object	
	5	5th mapping object Trans PDO 1	rw	u32	0x0000000	no object	

Index	S-ldx	Name	Туре		Default	Description
	6	6th mapping object Trans PDO 1	rw	u32	0x0000000	no object
	7	7th mapping object Trans PDO 1	rw	u32	0x0000000	no object
	8	8th mapping object Trans PDO 1	rw	u32	0x0000000	no object
1A01	0	number of application objects linked with Trans PDO 2	rw	u8	0x04	
	1	1st mapping object Trans PDO 2	rw	u32	0x10010164	index 6401, subindex 1, 16 bits
	2	2nd mapping object Trans PDO 2	rw	u32	0x10020164	index 6401, subindex 2, 16 bits
	3	3rd mapping object Trans PDO 2	rw	u32	0x10030164	index 6401, subindex 3, 16 bits
	4	4th mapping object Trans PDO 2	rw	u32	0x10040164	index 6401, subindex 4, 16 bits
	5	5th mapping object Trans PDO 2	rw	u32	0x0000000	no object
	6	6th mapping object Trans PDO 2	rw	u32	0x00000000	no object
	7	7th mapping object Trans PDO 2	rw	u32	0x00000000	no object
	8	8th mapping object Trans PDO 2	rw	u32	0x00000000	no object

11.2 Manufacturer-specific profiles; Idx 2000 to 6FFF

Index	S-ldx	Name	Туре		Default	Description
2000	0	number of IOs	ro	u8	0x10	
	1	configuration channel 1	rw	u8	0x01	0x00 = off 0x01 = binary input
	2	configuration channel 2	rw	u8	0x01	0x00 = off 0x01 = binary input
	3	configuration channel 3	rw	u8	0x01	0x00 = off 0x01 = binary input
	4	configuration channel 4	rw	u8	0x01	0x00 = off 0x01 = binary input
	5	configuration channel 5	rw	u8	0x03	0x00 = off 0x03 = analog input absolute (voltage 05 V; 0x000xFF)
	6	configuration channel 6	rw	u8	0x03	0x00 = off 0x03 = analog input absolute (voltage 05 V; 0x000xFF)
	7	configuration channel 7	rw	u8	0x02	0x00 = off 0x01 = binary input 0x02 = binary output + read back input
	8	configuration channel 8	rw	u8	0x02	0x00 = off 0x01 = binary input 0x02 = binary output + read back input 0x04 = analogue output (PWM 20250 Hz)
	9	configuration channel 9	rw	u8	0x01	0x00 = off 0x01 = binary input
	А	configuration channel 10	rw	u8	0x01	0x00 = off 0x01 = binary input
	В	configuration channel 11	rw	u8	0x01	0x00 = off 0x01 = binary input
	С	configuration channel 12	rw	u8	0x01	0x00 = off 0x01 = binary input
	D	configuration channel 13	rw	u8	0x03	0x00 = off 0x03 = analog input absolute (voltage 05 V; 0x000xFF)
	E	configuration channel 14	rw	u8	0x03	0x00 = off 0x03 = analog input absolute (voltage 05 V; 0x000xFF)
	F	configuration channel 15	rw	u8	0x02	0x00 = off 0x01 = binary input 0x02 = binary output + read back input
	10	configuration channel 16	rw	u8	0x02	0x00 = off 0x01 = binary input 0x02 = binary output + read back input 0x04 = analogue output (PWM 20250 Hz)

Index	S-ldx	Name	Туре		Default	Description
2001	0	PWM frequency	rw	u8	0x64	20250 Hz PWM frequency for channel 8 and 16
20F0	0	CANopen node ID	rw	u8	0x20	1127
20F1	0	CANopen node ID	rw	u8	0x20	The entries 20F0/20F1 must always contain identical values. The new entries are valid after a reset (switching the module off/on). Values outside the permissible ranges will be rejected.
20F2	0	CAN baud rate	rw	u8	0x03	0 = 1000 Kbaud 1 = 500 Kbaud 2 = 250 Kbaud 3 = 125 Kbaud 4 = 100 Kbaud 5 = 50 Kbaud 6 = 20 Kbaud
20F3	0	CAN baud rate	rw	u8	0x03	The entries 20F2/20F3 must always contain identical values. The new entries are valid after a reset (switching the module off/on). Values outside the permissible ranges will be rejected.
20F4	0	auto start	rw	u16	0x00	Time after reaching Preoperational State to change to Operational State. 05000 ms 0 = auto start deactivated
2500	0	number of 8bit user variables	ro	u8	0x0A	Idx 25002530 = range which can be freely used for costumer specific entries
	1	8bit user variable 1	rw	u8		
	2	8bit user variable 2	rw	u8		
	3	8bit user variable 3	rw	u8		
	4	8bit user variable 4	rw	u8		
	5	8bit user variable 5	rw	u8		
	6	8bit user variable 6	rw	u8		
	7	8bit user variable 7	rw	u8		
	8	8bit user variable 8	rw	u8		
	9	8bit user variable 9	rw	u8		

Index	S-ldx	Name	Туре		Default	Description	
	A	8bit user variable 10	rw	u8			
2510	0	number of 16bit user variables	ro	u8	0x0A	Idx 25002530 = range which can be freely used for costumer specific entries	
	1	16bit user variable 1	rw	u16			
	2	16bit user variable 2	rw	u16			
	3	16bit user variable 3	rw	u16			
	4	16bit user variable 4	rw	u16			
	5	16bit user variable 5	rw	u16			
	6	16bit user variable 6	rw	u16			
	7	16bit user variable 7	rw	u16			
	8	16bit user variable 8	rw	u16			
	9	16bit user variable 9	rw	u16			
	A	16bit user variable 10	rw	u16			
2520	0	number of 32bit user variables	ro	u8	0x0A	Idx 25002530 = range which can be freely used for costumer specific entries	
	1	32bit user variable 1	rw	u32			
	2	32bit user variable 2	rw	u32			
	3	32bit user variable 3	rw	u32			
	4	32bit user variable 4	rw	u32			
	5	32bit user variable 5	rw	u32			
	6	32bit user variable 6	rw	u32			
	7	32bit user variable 7	rw	u32			
	8	32bit user variable 8	rw	u32			
	9	32bit user variable 9	rw	u32			

Index	S-ldx	Name	Туре		Default	Description
	A	32bit user variable 10	rw	u32		
2530	0	number of user strings	ro	u8	0x02	Idx 25002530 = range which can be freely used for costumer specific entries
	1	user string 1	rw	str		16 characters
	2	user string 2	rw	str		16 characters
6100	0	number of binary inputs (16bit)	ro	u8	0x01	
	1	binary inputs	ro	u8	-	bits 015: binary inputs channel 116
6200	0	number of binary outputs (8bit)	ro	u8	0x01	
	1	binary outputs	WO	u8	0x00	0b0000 0001 = channel 7 0b0000 0010 = channel 8 0b0000 0100 = channel 15 0b0000 1000 = channel 16
6401	0	number of analogue inputs	ro	u8	0x04	
	1	analogue input channel 5	ro	s16	-	for configuration absolute measurement -> 0x00000x03FF
	2	analogue input channel 6	ro	s16	-	(see above)
	3	analogue input channel 13	ro	s16	-	(see above)
	4	analogue input channel 14	ro	s16	-	(see above)
6414	0	number of analogue outputs (ifm specific)	ro	u8	0x02	
	1	analogue output channel 8	WO	u16	0x0000	01000 per mille
	2	analogue output channel 16	WO	u16	0x0000	01000 per mille