

KNOCKDETECT

Assembly instructions



09/08/2021 – Version 2.1



I. General information

Type of document	Assembly instructions
Version of document	2.1
Date	09.08.2021
Complementary documents	<ul style="list-style-type: none"> • Operating instructions KNOCKDETECT • Engine types KNOCKDETECT

II. Revision

Revision	Date	Modification
1.0	09.12.2013	Initial draft
1.0.29	27.03.2014	Corrections
1.2	05.10.2015	Adjustments and additions
1.3	25.01.2016	Corrections Variant C added
1.4	13.05.2016	New engine data added
1.5	16.06.2016	Adjustments and additions
1.6	27.06.2016	New engine data added
1.7	07.07.2016	New engine data added
1.8	26.01.2017	New engine data added
1.9	19.12.2017	New engine data added
2.0	08.04.2019	New engine data added
2.1	08.09.2021	Engine types transferred to separate document

These instructions have been created with great care. Nevertheless, we cannot guarantee the accuracy of the information presented. Errors excepted.

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III. Important note

The KNOCKDETECT is meant as a tool to detect and analyse abnormal operating conditions. The setting of the parameters and the various reaction chains should only be carried out by trained personnel. However, it is not possible to foresee all circumstances that might pose a danger. Thus, the KNOCKDETECT recognizes engine knocking within the scope of possibilities, but not compulsory.

IV. Product identification

1. Manufacturer

MIS Industrie Systeme GmbH & Co. KG
Lohwiese 7
86937 Scheuring
GERMANY

Tel: +49 8195 998 400 200
Fax: +49 8195 998 400 222

Email: support@mibtec.de
Web: www.mibtec.de

2. Type identification

Device KNOCKDETECT (MODCON001B001.xxxx.yyyy.zzzz.hhh):
Device KNOCKDETECT (MODCON001C001.xxxx.yyyy.zzzz.hhh):



Power cable

Item number: -----, power cable, 2m

Version: MODCON020B230



Trigger cable

Item number: 2010031-4, trigger cable, 4m
2010031-6, trigger cable, 6m

Version: MODCON040B271

Version: MODCON060B271



Sensor cable

Item number: 2010030-4, sensor cable, 4m
2010030-6, sensor cable, 6m

Version: MODCON040B270
Version: MODCON060B270



Knock sensor

Item number: 2010010, knock sensor

Version: MODCON001B017



3. Warranty

In particular, the following actions will void the warranty and guarantee claims and exclude liability claims:

- Opening the device
- Non-compliance with the installation and operating instructions
- Non-compliance with the maintenance and cleaning requirements

4. Scope of delivery

- KNOCKDETECT
- 1 power cable with approx. 2m length
- 1 trigger cable with a length of 4m or 6m
- 2 or 4 sensor cables with a length of 4m or 6m
- 2 or 4 knock sensors
- Assembly instructions KNOCKDETECT
- Operating instructions KNOCKDETECT

V. Product specification

1. Function and scope of application

The KNOCK DETECT is a measurement system for online monitoring of stationary gas engines. The intended use is the detection of knocking noises from the combustion process.

2. Safety instructions

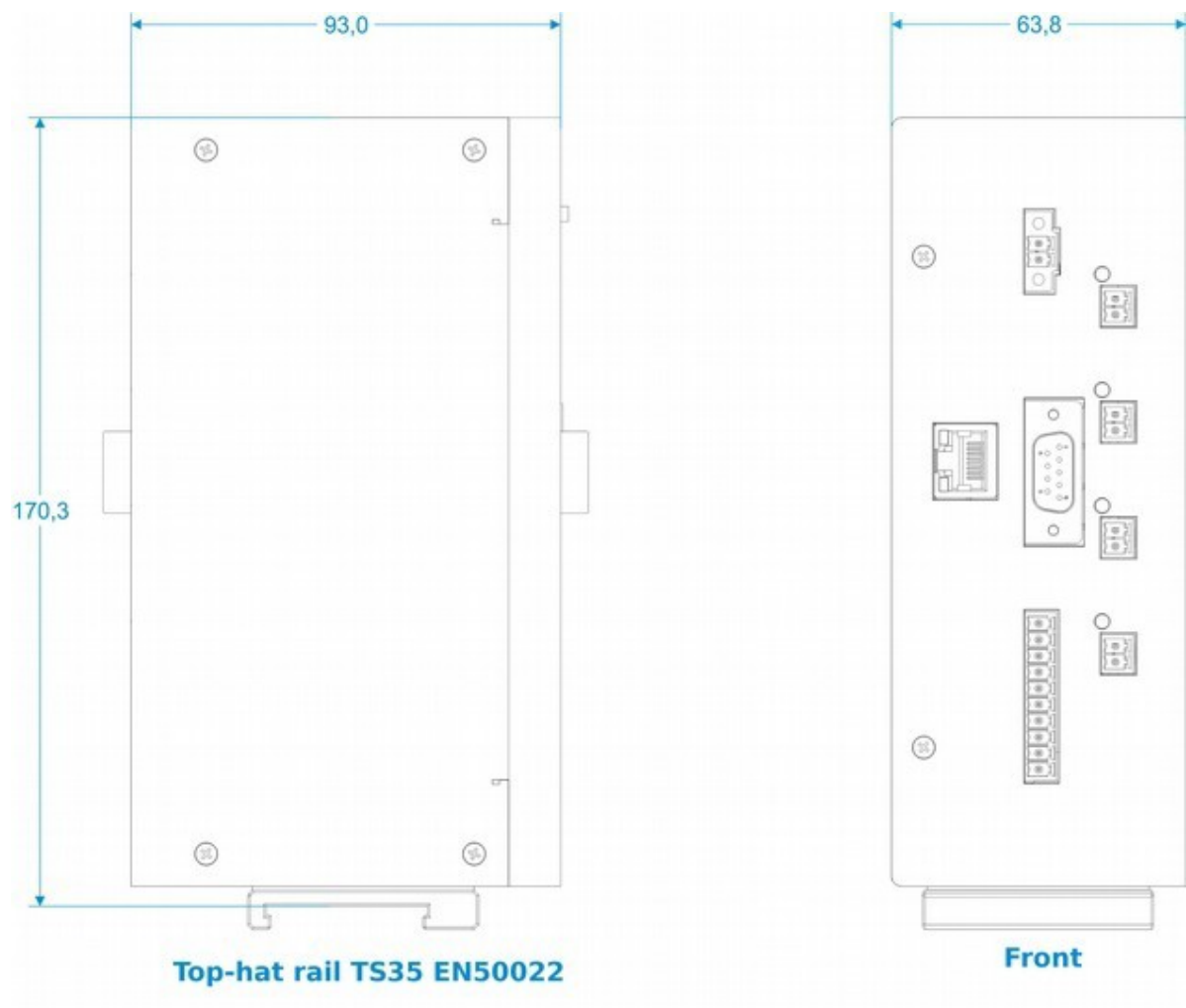


Caution!

- Please read the operating instructions carefully before commissioning!
- Operate the device only in the intended supply voltage range.
- Operate the device only within the intended temperature range.
- Operate the device only within a closed control cabinet.
- Keep the device away from liquids.

3. Dimensions

KNOCKDETECT



All dimensions are in mm!

4. Technical specifications

Product data

Designation KNOCKDETECT

Processor

CPU Texas instruments: Sitara AM3359AZCZ100, 1GHz

Storage

RAM 512MB DDR3L SDRAM@800MHz

FLASH 2048MB Embedded MMC FLash

Removable disk MicroSD Card up to 32GB

Display

Size 2,4" (61,5mm) diagonal

Technology OLED

Brightness 80cd/m²

Colour depth monochrome, amber

Resolution 124x64

Interfaces

Network 1x 10/100Mbit/s Ethernet, RJ45, Modbus TCP

USB 1x 480 Mbit/s, USB 2.0 Host (Type A)

Serial 1x RS232 (Rx Tx), galvanically isolated from the power supply

Fieldbus (depends on hardware) 1x RS485, full-duplex, galvanically isolated from the power supply,

1x CANopen, 1x Profibus

Binary inputs 2x 4 digital inputs, switching with positive voltage toward reference mass, (L: 0-6V, H: 10-36V, galvanically isolated by optocouplers, each 4 with common mass

Binary outputs 2x 4 digital outputs, 0-36V, AC/DC, 100mA, short-circuit-proof, galvanically isolated, each 4 outputs with common return conductor

Input ignition 1x 200-500Vpeak

Inputs knock sensor 4x knock sensor MODCON125B017

Special features

Signaller 1x, programmable

Power monitor integrated power supply monitoring

Failure bridging approx. 50ms @ 24V DC

Watchdog programmable Watchdog

Electrical data

Power supply 10-36V DC, reverse polarity protection

Power consumption approx. 8W (@24V DC)

Environmental conditions

Operation temperature -10..+60°C

Stock temperature -20..+70°C

Humidity 95%, non-condensing

Tightness

Housing IP20

Dimensions

With mounting base (TS35) 175 x 93 x 64mm (without plug)

Weight approx. 940g

5. Environmental protection

All parts of the KNOCKDETECT are made of high-quality, recyclable materials. Return any equipment you no longer need to the manufacturer or dispose of it at your local recycling centre.



The housing consists mainly of:

Sheet steel, aluminium and a small amount of plexiglass.

The circuit board has been assembled in compliance with **ROHS** and is soldered completely lead-free.

6. Directives applied

- Low Voltage Directive 2006/95/EC
- EMC Directive 2004/108/EC

VI. Preparing the device

1. Safety measures before assembly and commissioning



Caution!

- Read the assembly instructions carefully!
- Shut down the gas engine before assembly and secure the engine control unit against restarting!
- All work must be performed by a qualified electrician!
- Turn off the power supply of the control cabinet.
- Check the previous measure!
- Secure the voltage supply against unintentional switching.
- Wire the power supply only with appropriate cross-sections (0.5mm² – 0.75mm²).
- Only secure the circuit for the KNOCKDETECT with an appropriate circuit breaker.
- Do not plug in the power plug until you have checked the voltage level!
- Turn on the supply voltage.
- Check the level of the voltage (10-36V DC).

2. Remarks on integration into the existing electrical wiring

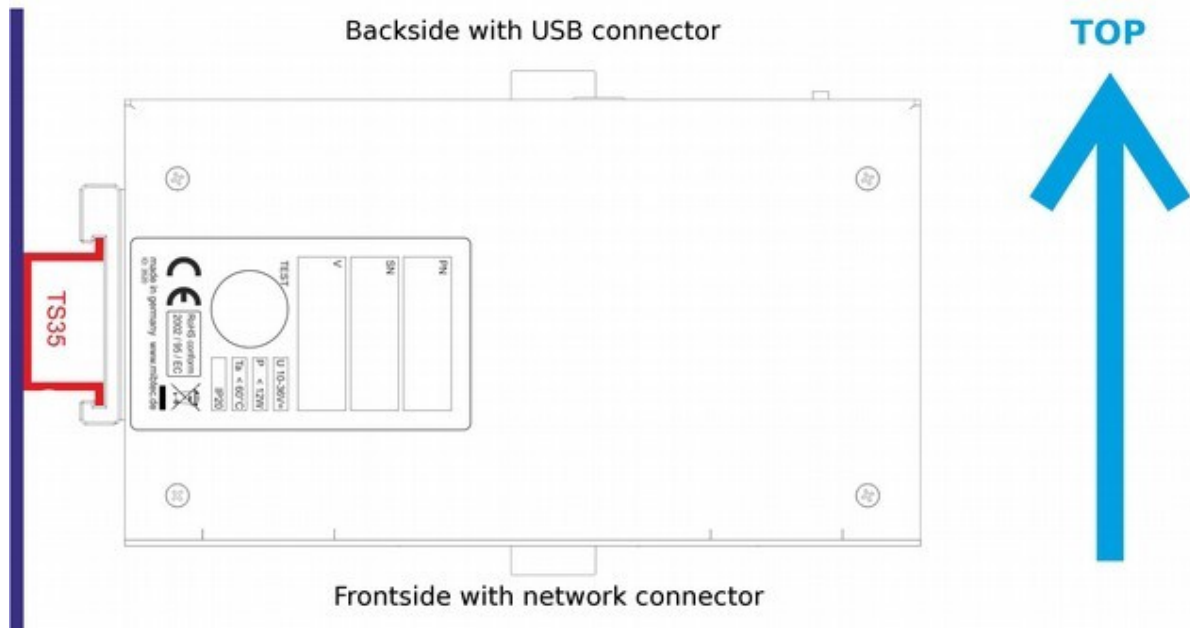


Caution!

- Lay a separate supply cable directly from the power source to the device.
- Don't attach the power supply of the device parallel to other consumers (e.g. contactors, relays or valves)!
- The engagement foot is insulated from the housing. Ensure that the housing has no electrical connection to system ground!
- The analogue 0-20mA outputs are in relation to the system ground! You can only use them to control inputs which are galvanically isolated or use the same ground reference as the device.
- The digital inputs and outputs are grouped (each 4 ports). Each group of 4 shares its own return conductor.
- Maximum switching voltage is 36 V DC at 100mA!
- Do not lay the sensor cables parallel to power cables.

3. Installation instructions

The device is designed for horizontal installation in a closed control cabinet.

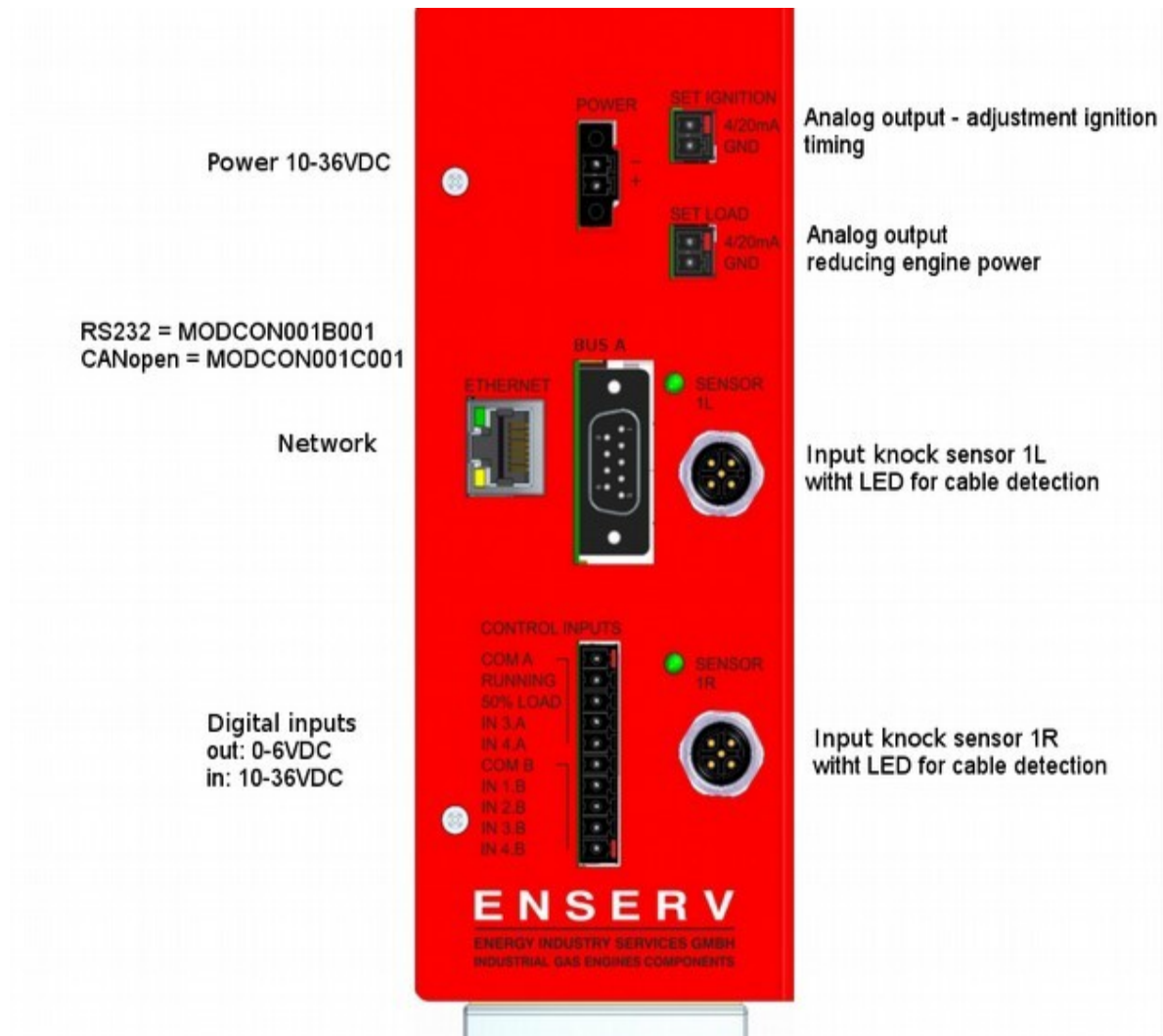


Caution!

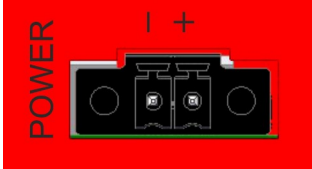
- Do not install the device near heat sources (e.g. in the exhaust air area of a frequency converter or other power units).
- Do not install the device near power supplies or transformers. The magnetic field could interfere with the sensitive sensor inputs.
- Mount the device free from vibration (i.e. not directly on the engine, but in a control cabinet on a decoupled engine mount).

4. Pin assignments

a) Location and pin assignment of the plugs on the front



The power supply input

POWER (2-pole CombiCon, Phoenix-Contact no.: 1937499)		
Pin number	Signal	View
-	POWER -	
+	POWER +	

- Counterpart: Phoenix Contact no.: 1830366

Via this connection, the device is provided with the necessary operating voltage.

The unit is designed for a supply voltage in the range of 10 to 36V DC (direct voltage).

The connection is polarity protected!

The power consumption is below 8W.

Due to the internal switching power supply, the current consumption varies in proportion to the supply voltage.

Observe the general regulations for setting up low voltage switchgear!



Caution!

- Use connection strands with a diameter of at least 0,5mm² (AWG22) or 0,75mm² (AWG19) together with wire end ferrules.
- Use a suitable circuit breaker for the power supply.
- Pay attention to the correct voltage level (10-36V DC).
- The power supply plug must be secured by screwing.

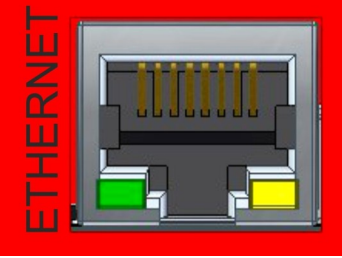
- Pins without description are not occupied – please keep these pins free!
- Counterpart: 9 pole D-Sub plug

Version: MODCON001B001 = RS232
Version: MODCON001C001 = CANopen

At pin 5, the reference ground of the RS232 connection is present. This ground (and all data lines) is galvanically isolated from the supply voltage of the unit.

The case of the plug is connected to the system ground over a high frequency capacitor.

Ethernet

ETH 0 (RJ-45)		
Pin number	Signal	View
1	TX+	
2	TX-	
3	RX+	
4	TXT	
5	TXT	
6	RX-	
7	RXT	
8	RXT	

- Counterpart: RJ-45 – 8P8C

The Ethernet interface is used to connect the KNOCKDETECT with a PC and simultaneously with a Modbus TCP master.

The device is parametrized via this connection using of the web pages of the integrated web server. an external system control can read out the measurement data via Modbus TCP protocol.

The register assignment (Modbus TCP) can be found in the appendix.

The Ethernet interface is galvanically isolated from the supply voltage.

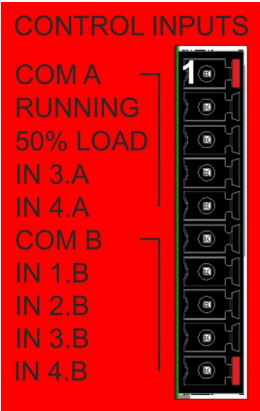
The maximum bitrate is 100Mbit/s.

The assignment of the RJ45 socket complies with the worldwide standard (EIA/TIA 568B) for the acceptance of 8P8C plugs.

The case of the plug is connected to the system ground via a high frequency capacitor.

Please use only Ethernet cables that meet at least CAT5 requirements.

Digital inputs

CONTROL INPUTS (10-pole CombiCon plug, Phoenix-Contact no.: 1937570)		
Pin number	Signal	View
1	COM A – Common GND	
2	RUNNING – Engine is running and connected to the grid	
3	50% LOAD – Engine at 50% load	
4	IN 3.A – Reserve	
5	IN 4.A – Reserve	
6	COM B – Common GND	
7	IN 1.B – Reserve	
8	IN 2.B – Reserve	
9	IN 3.B – Reserve	
10	IN 4.B – Reserve	

- Counterpart: Phoenix-Contact no.: 1840447
- Coding: Pin 1 + Pin 10

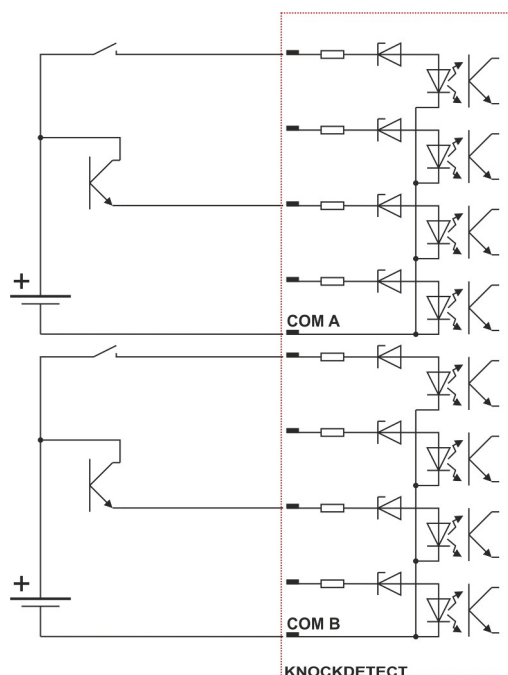
All digital inputs of the KNOCKDETECT are equipped with optocouplers and are galvanically isolated from the supply voltage.

4 inputs each form a group. Each group shares a return conductor (COM-A or COM-B). Both groups are completely separated from each other.

The inputs of a group switch on with a positive voltage of at least 10V over GND.

Below a voltage difference of 6V compared to GND, the respective input is switched off.

At 24V DC, a current of approx. 10mA flows per input.



Caution!

- Do not apply voltages over 36V DC!
- Use connection strands with a diameter of at least 0,5mm² (AWG22) or 0,75mm² (AWG19) together with wire end ferrules.

The signals have the following meaning:

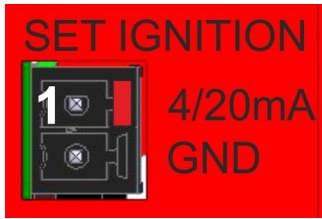
RUNNING:

The control can be informed that the engine runs stably (e.g. after the successful synchronization to the grid), and the evaluation can be activated.

50% LOAD:

This input serves the same purpose as the input RUNNING.

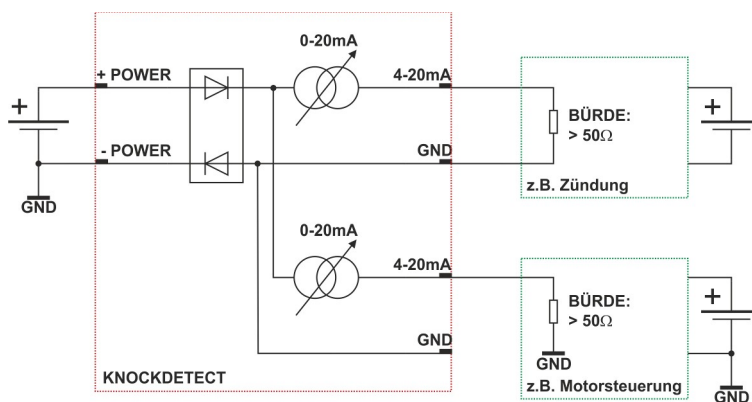
Analogue output for adjusting the ignition timing

SET IGNITION (2-pole CombiCon, Phoenix-Contact no.: 1937499)		
Pin number	Signal	View
1	0(4) - 20mA	
2	GND	

- Suitable counterpart: Phoenix Contact no.: 1830366
- Coding: Pin 1

You can set the ignition timing of your ignition system analogue via this output. Please refer to the description of the ignition system to determine the required scaling.

The output provides a current between 0 and 20mA with reference to GND.



Via the web interface you can set any configurations (eg. 0-20mA, 4-20mA, 3-11mA, 20-0mA).

The output is short-circuit-proof.

For correct operation (e.g. modulation up to + 20mA), a maximum load of 40Ω per volt (supply voltage) is permissible.


This means for 24V supply voltage a maximum resistance of approximately 960Ω, and for 12V of approx. 480Ω. At higher values, the maximum current of 20mA is no longer reached. Values below this do not pose a problem – however, loads below 50Ω cause higher losses in the driver.



Caution!

- Do not feed any voltage into this interface!
- Use connection strands with a diameter of at least 0,5mm² or 0,75mm² together with wire end ferrules.
- Pay attention to the correct voltage level (10-36V DC).

Analogue output for adjusting the engine power

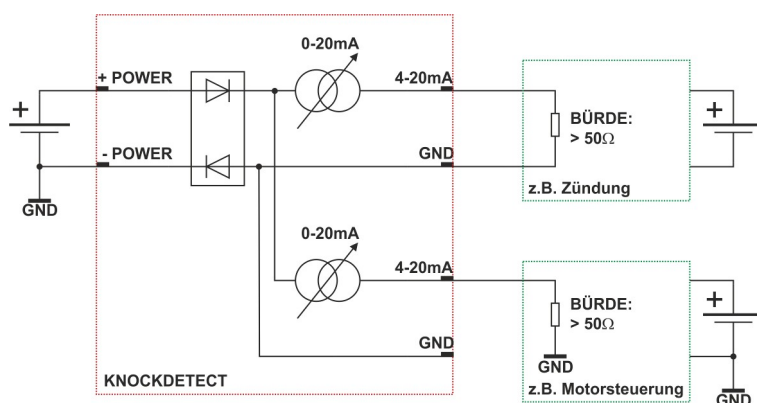
SETLOAD (2-pole CombiCon, Phoenix-Contact no.: 1937499)		
Pin number	Signal	View
1	0(4) - 20mA	
2	GND	

- Suitable counterpart: Phoenix Contact no.: 1830366
- Coding: Pin 1

You can reduce the power output of your engine analogue via this output. Please refer to the description of the power controller to determine the required scaling.

The output provides a current between 0 and 20mA with reference to GND.

Two possible connection variants are shown in the circuit diagram:



Via the web interface you can set any configurations (eg. 0-20mA, 4-20mA, 3-11mA, 20-0mA).

The output is short-circuit-proof.

For correct operation (e.g. modulation up to + 20mA), a maximum load of 40Ω per volt (supply voltage) is permissible.


This means for 24V supply voltage a maximum resistance of approximately 960Ω, and for 12V of approx. 480Ω. At higher values, the maximum current of 20mA is no longer reached. Values below this do not pose a problem – however, loads below 50Ω cause higher losses in the driver.



Caution!

- Do not feed any voltage into this interface!
- Use connection strands with a diameter of at least 0,5mm² or 0,75mm² together with wire end ferrules.
- Pay attention to the correct voltage level (10-36V DC).

Sensor interfaces 1L / 1R

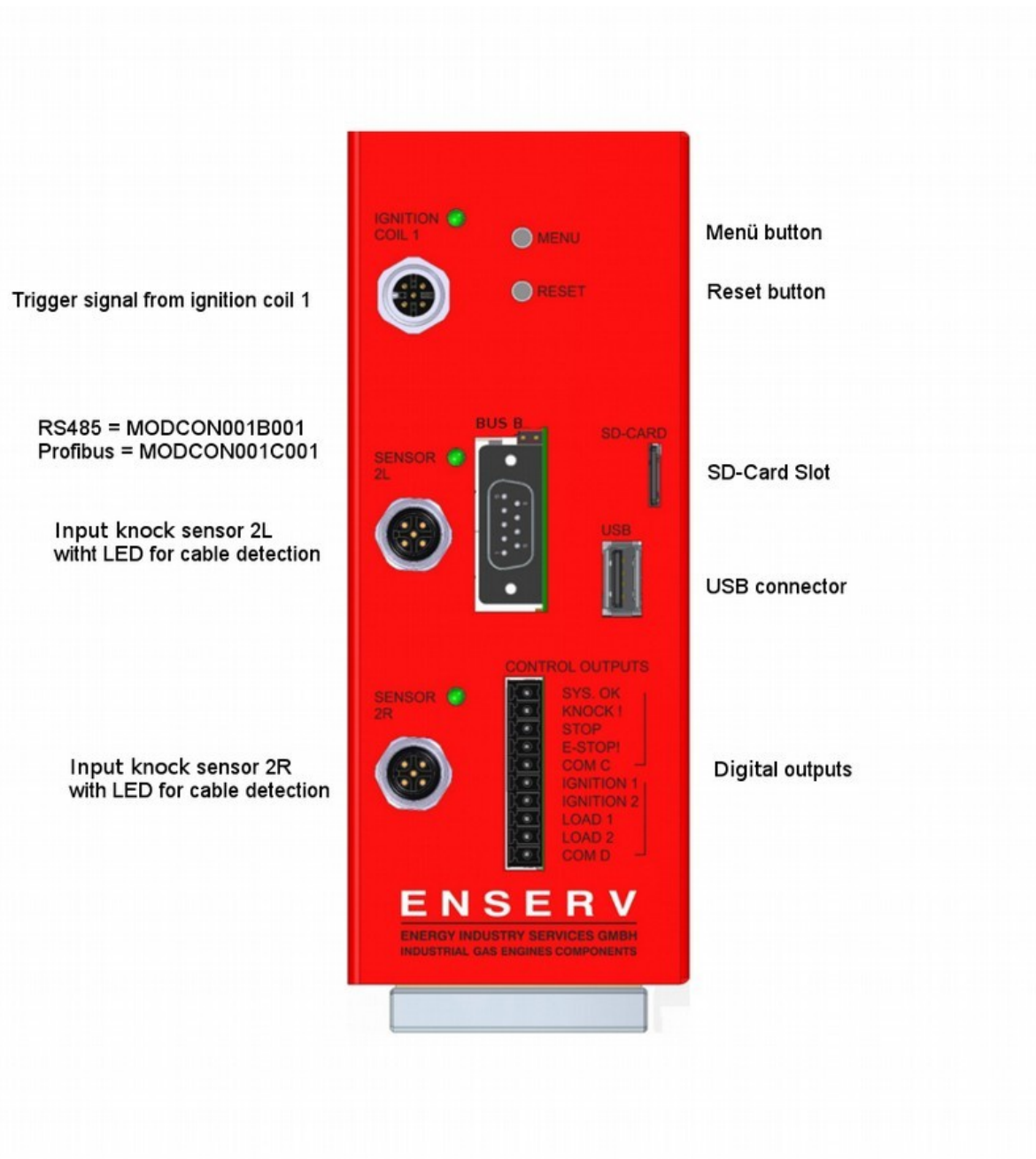
SENSOR 1L / SENSOR 1R (M12, female, 5-pole)		
Pin number	Signal	View
1	S+	
2	S-	
3	C-CODE	
4	C-CODE	
5		

- Pins without description are not occupied – please keep these pins free!


The sensors are connected to the sensor interfaces 1L and 1R (depending on the software settings).

Please use only the original cables supplied to connect the sensors. These cables are specially shielded and have a coded connector.

b) Location and pin assignment of the plugs on the rear

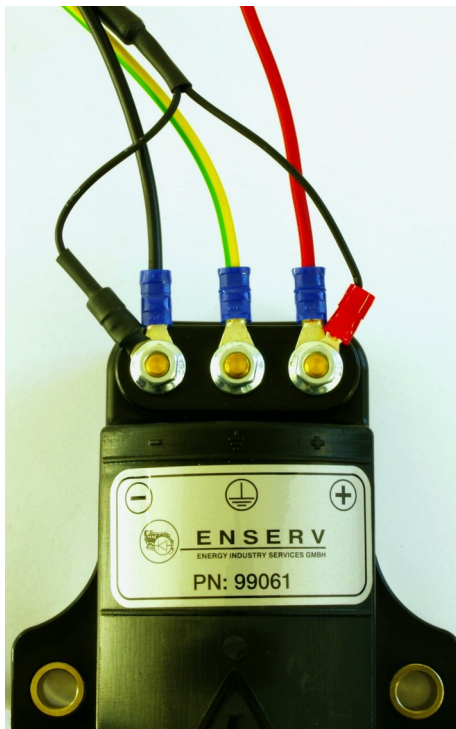


Trigger signal input (control of ignition coil 1)

IGNITION COIL 1 (M12, male, 5-pole)		
Pin number	Signal	View
1	S+	
2	S-	
3	C-CODE	
4	C-CODE	
5		

- Pins without description are not occupied – please keep these pins free!

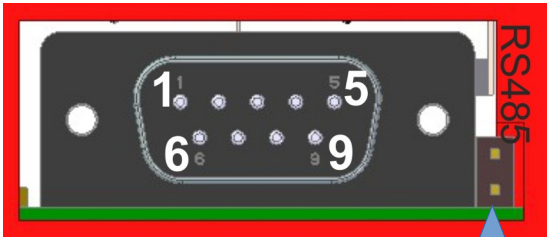
The trigger cable is connected in parallel to the ignition side of ignition coil 1.

**Caution!**

- Pay attention to the polarity of the ignition coil!
- The red cable lug should be connected to the + pole of the ignition coil, the black cable lug to the – pole!

For your own safety, please use only the original cables supplied for connecting the ignition coil. Voltage peaks of up to 400V can be reached!

RS485 Modbus RTU or Profibus interface for data communication

COM B = RS485 (9-pole D-Sub plug) or Profibus (9-pole D-Sub plug)			
Pin number	Signal RS485	Signal Profibus	View
1	RS485 RX/TX- (B)		
2	RS485 RX/TX+ (A)		
3		Profibus-A	
4			
5	GND	GND	
6			
7			
8		Profibus-B	
9			

- Pins without description are not occupied – please keep these pins free!
- Counterpart: 9-pole D-SUB socket

Jumper
Only version B

The RS485 interface is used for communication with a Modbus RTU master or with Profibus.

Version: MODCON001B001 = RS485

Version: MODCON001C001 = Profibus

This interface is galvanically isolated from the supply voltage of the device.


The case of the plug is connected to the system ground over a high frequency capacitor.

If the device is installed as an end point in the bus system, a 120Ω terminating resistor must be set between pin 1 and pin 2.

From version 1.1 of the KNOCKDETECT, this resistor is integrated and can be set via jumper.

Please, use only high quality, shielded and twisted pair data cables (e.g. LAPP UNITRONIC-BUS LD, 1x2x0,22) with 100-120Ω wave impedance!

Sensor interfaces 2L / 2R

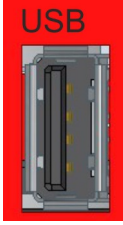
SENSOR 2L / SENSOR 2R (M12, female, 5-pole)		
Pin number	Signal	View
1	TX+	
2	TX-	
3	RX+	
4	TXT	
5		

- Pins without description are not occupied – please keep these pins free!

The sensors are connected to the sensor interfaces 2L and 2R (depending on the software settings).

Please use only the original cables supplied to connect the sensors. These cables are specially shielded and have a coded connector.

USB interface


USB (4-pole USB-plug type A)		
Pin number	Signal	View
1	+5V	
2	DM	
3	DP	
4	GND	

The USB interface is intended for future extensions (e.g. for storing data on an external USB stick).

The USB interface is not galvanically isolated!

The assignment corresponds to the international standard.
Devices with a current consumption of up to 300 mA can be supplied.

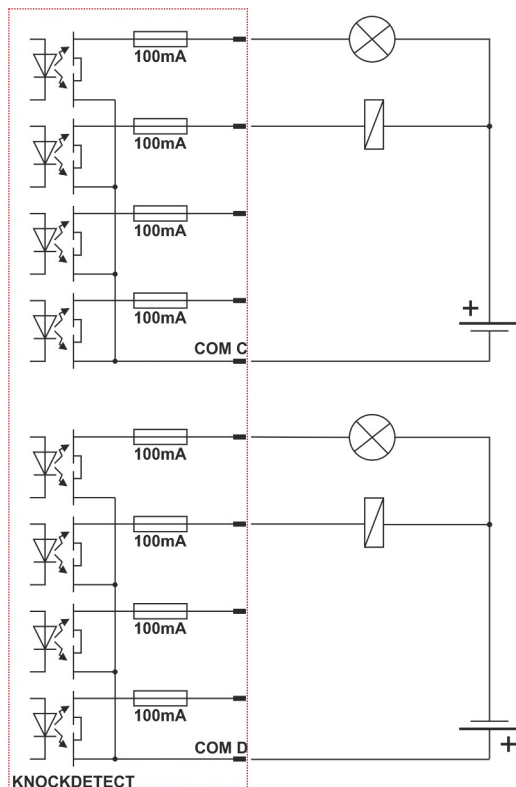
Digital Outputs

CONTROL OUTPUTS (10-pole CombiCon plug, Phoenix-Contact no.: 1937570)		
Pin number	Signal	View
10	SYS. OK	
9	KNOCK!	
8	STOP	
7	E-STOP!	
6	COM C – Return conductor 7-10	
5	IGNITION 1	
4	IGNITION 2	
3	LOAD 1	
2	LOAD 2	
1	COM D – Return conductor 2-5	

- Suitable counterpart: Phoenix-Contact no.: 1840447

Bidirectional semiconductor relays are used for the digital outputs of the KNOCKDETECT. These relays are equipped with integrated short circuit protection (> 100 mA).

The circuit diagram shows two possible wiring variants:



The semiconductor relay can switch positive or negative voltages. Thus, the user can freely choose whether to use the + pole or the - pole for switching.

4 outputs each form a group. Each group shares a return conductor (COM-C or COM-D). The return conductors COM C and COM D aren't connected to each other.

The permitted switching voltage is up to 36 VDC.
The maximum current is 100 mA per output.

After a short circuit, the respective output switches off completely! To reactivate it, remove the short circuit, de-energise the circuit and disconnect the unit from the power supply.
When restarting, the output driver checks the circuit and – if the values are within the permissible range – enables it again.

All outputs are galvanically isolated from the supply voltage about optocouplers.

**Caution!**

- Use connection strands with a diameter of at least 0,5mm² or 0,75mm² together with wire end ferrules.
- Pay attention to the correct voltage level (10-36V DC).

The meaning of the signals in detail:**SYS OK:**

This output is closed when the system is set up correctly. and adjusted.

KNOCK!:

The output is closed when a knocking event has been detected.

STOP:

This output is closed when the number of knocks is within the set limits of this output.

E-STOP:

This output is closed when the number of knocks is within the set limits of this output.

IGNITION1:

This output is closed when the number of knocks is within the set limits of this output. It is used to adjust the ignition timing by digital signal.

IGNITION2:

This output is closed when the number of knocks is within the set limits of this output. It is used to adjust the ignition timing by digital signal.

LOAD1:

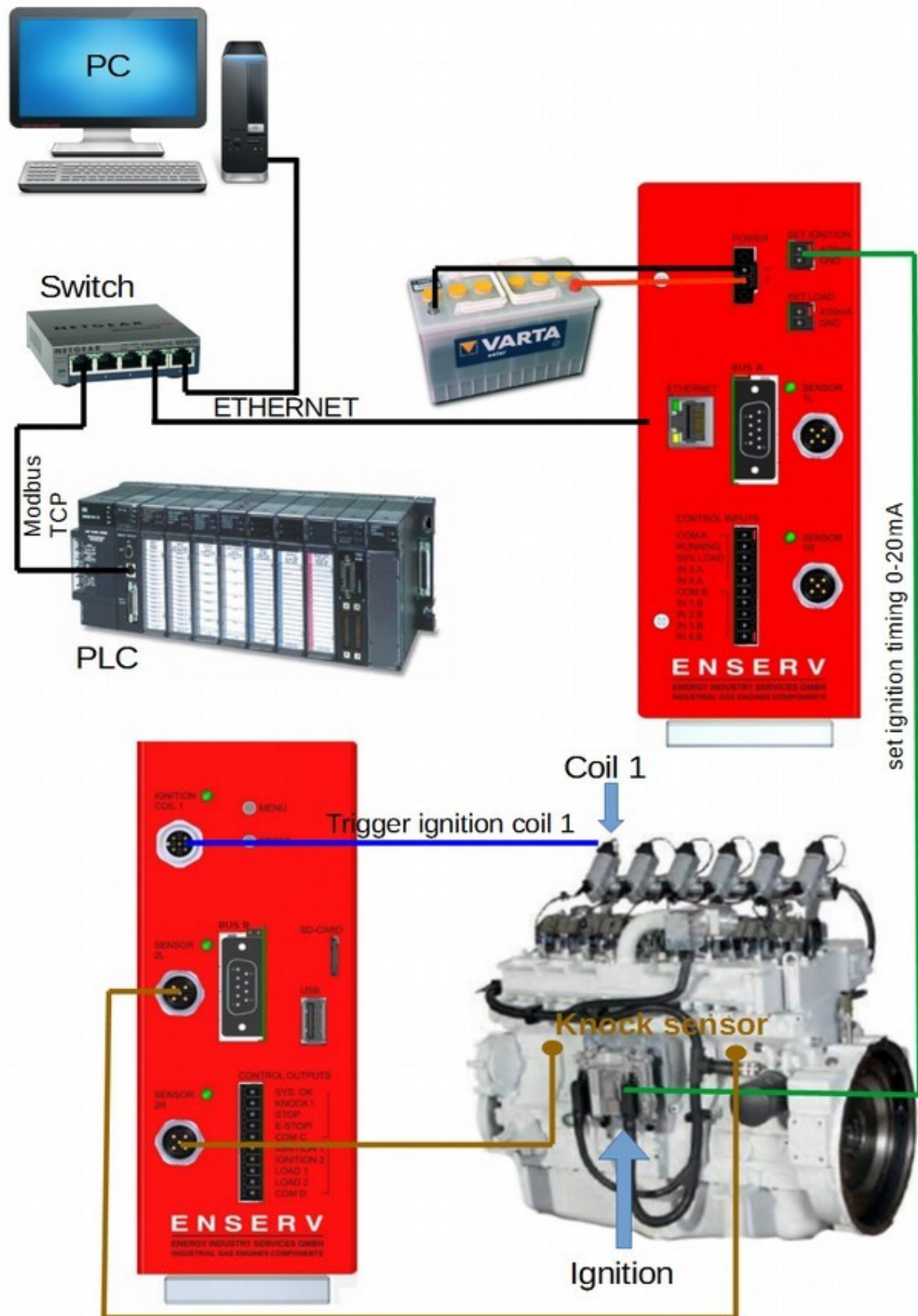
This output is closed when the number of knocks is within the set limits of this output. It is used to adjust the engine power by digital signal.

LOAD2:

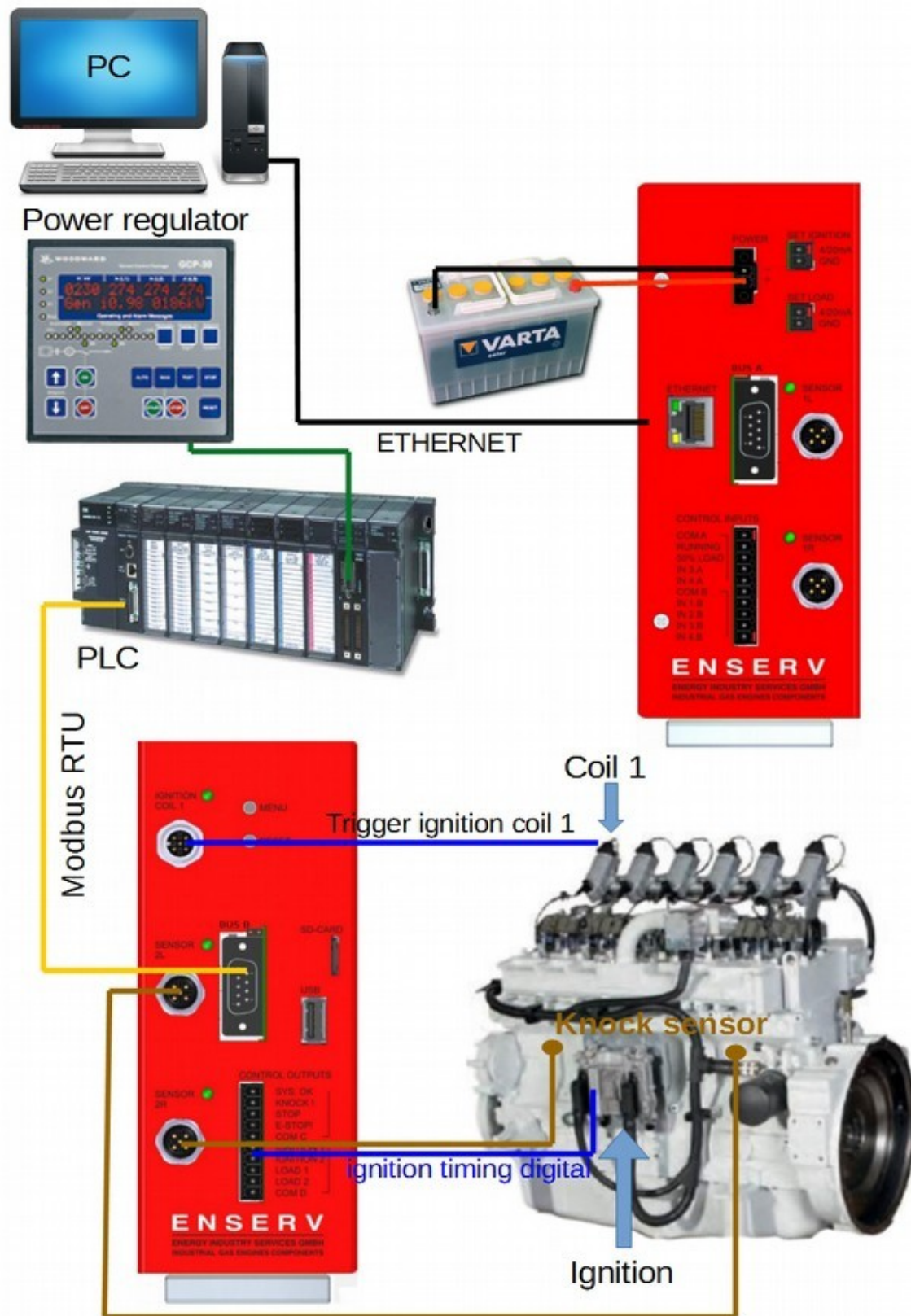
This output is closed when the number of knocks is within the set limits of this output. It is used to adjust the engine power by digital signal.

VII.Examples for the setup of the system

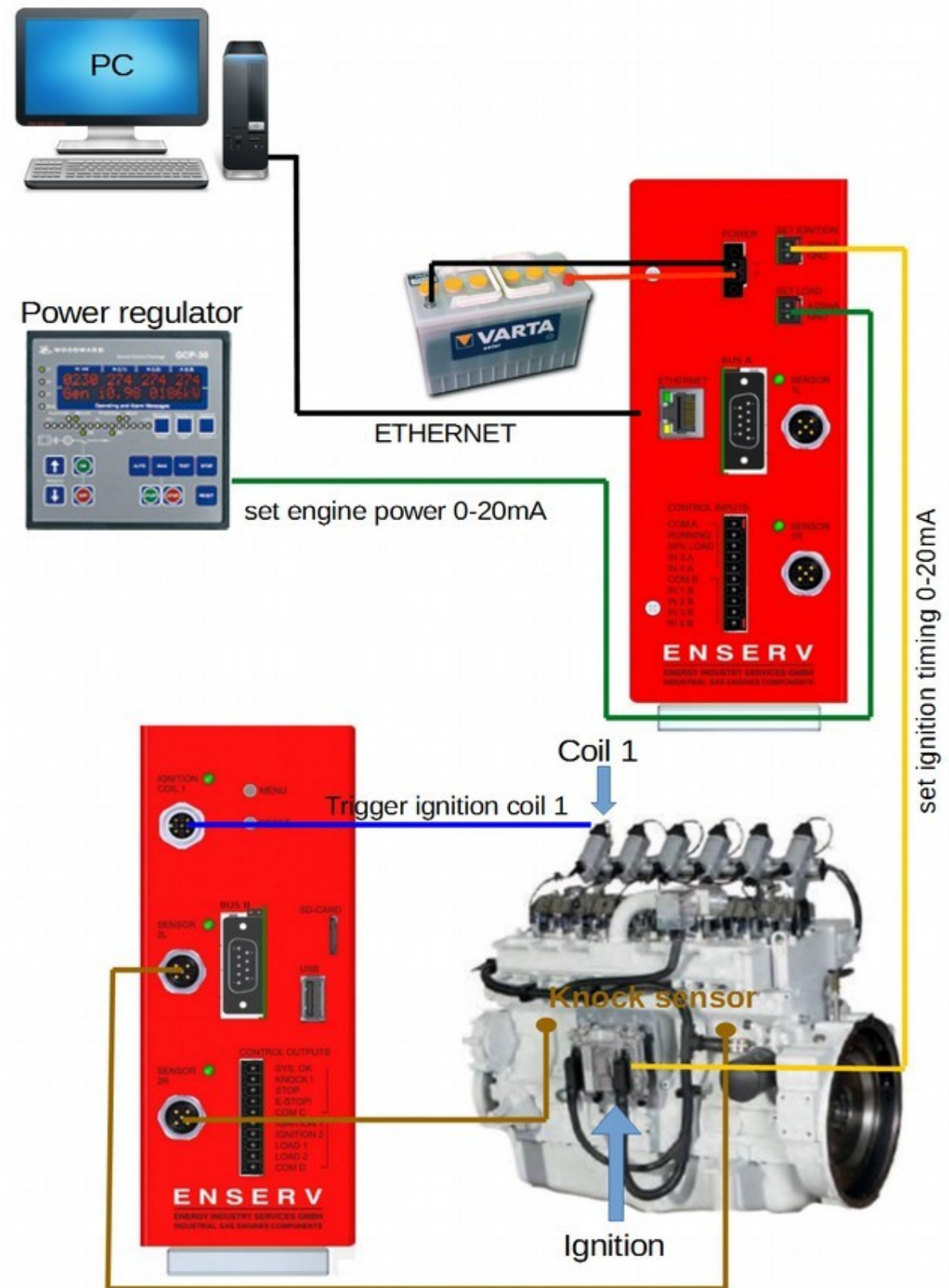
1. System set-up with PC and PLC control (data coupling via Modbus TCP)



2. System set-up with PC and PLC control (data coupling via Modbus RTU)



3. System set-up with PC and power controller (analogue interface 0-20mA)



VIII. Sensor assembly and sensor position

Please observe the following rules when installing the knock sensors.

Installation instructions:

- The entire ring surface of the sensor must rest firmly on the engine block.
- The contact surface must be polished and free of varnish.
- The contact surface must be flat and without grooves.
- The screws must be screwed into the block at least 6 threads deep.
- The bolt should be secured against loosening with a chemical thread locker (e.g. LOCTITE).
- The sensor must be tightened with 22Nm (+/-2Nm / 16ft.lbs. +/- 1.5ft.lbs).
- The nut for fastening the sensor to the screw bolt should be self-locking or secured with a chemical thread locker (e.g. LOCTITE).
- A washer should be used between sensor and nut in accordance with DIN 125 (or equivalent).

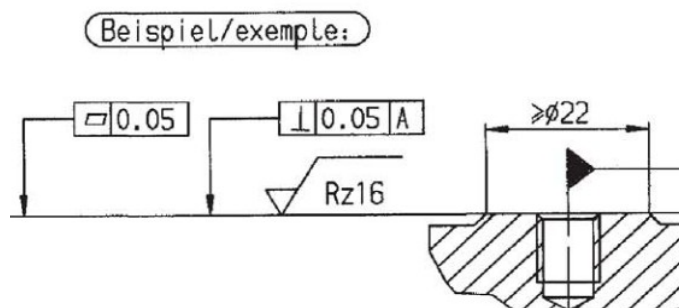


Caution!

Be sure to check the strength of the thread in your engine block!

1. Information from the manufacturer (BOSCH) on preparing the contact surface

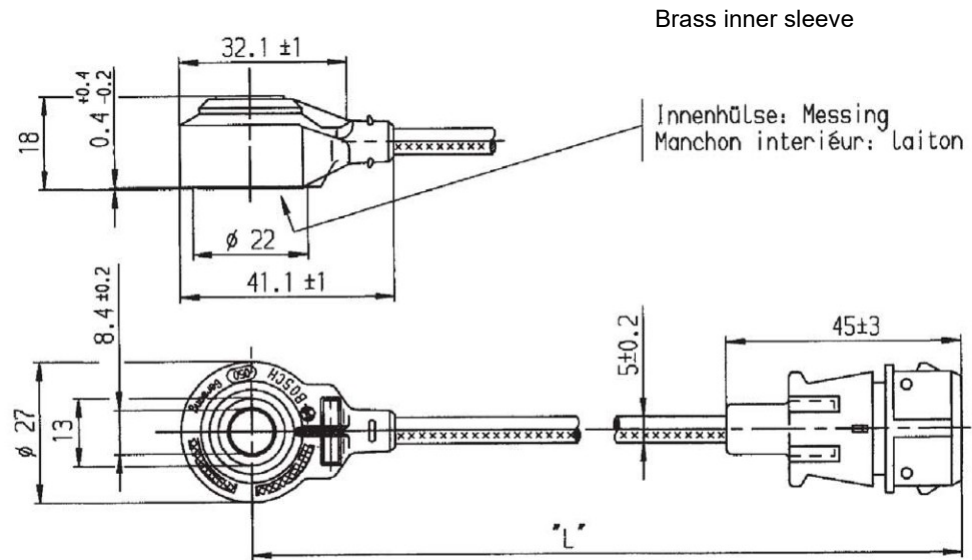
Example:



The sensor must only rest on its metal surfaces. Do not use lock washers.

The bearing surface should be machined rotationally symmetrical to the threaded hole.

2. Dimensions of the sensor



All dimensions are in mm!

3. Adapters for sensor mounting

Depending on the engine type and installation position, you need different bolt adapters to mount the sensors.

Please check on the engine block which thread directly has been cut at the installation locations! There are frequently changes in the current series of the manufacturers.

Fastening bolt type 7

Item number: 2010047 Version: (M8x1.25)



Bolt adapter type 0

Item number: 2010040 Version: (M8x1.25 - M10x1.5)



Bolt adapter type 5

Item number: 2010045 Version: (M8x1.25 - M12x1.75)



Bolt adapter type 6

Item number: 2010046 Version: (M8x1.25 - M14x2.0)



Bolt adapter type 1

(Fine thread e.g. Mitsubishi Motor)

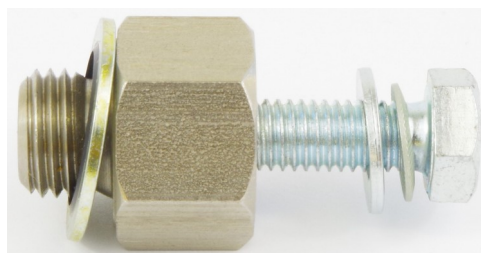
Item number: 2010041 Version: (M8x1.25 - M12x1.25)



Bolt adapter type 4

For fastening in cooling water bores (MAN V8 + V12)

Item number: 2010044 Version: (M8x1.25 - M14x2.0)



4. Sensor positions

The sensor position is not decisive for the assignment of the knocking signal to the individual cylinders.

The system analyses the frequency spectrum of the signal using a fast Fourier analysis and measures the time offset to the trigger signal.

This method is much more accurate than assigning knocking events via a sensor on each cylinder head, since these sensors always register the noise of neighbouring cylinders as well. Extremely loud single events can therefore not be correctly assigned.

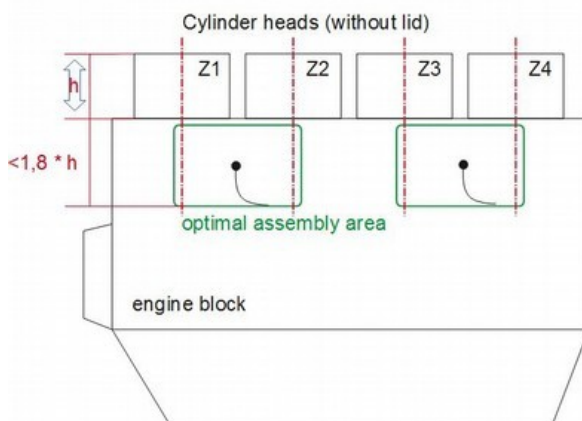
This cannot happen with the KNOCKDETECT analysis method. Here, only the time window calculated for the respective cylinder is taken into account.

This makes it possible to specify the exact angle before or after TDC, at which the fault has occurred.

A reasonable positioning is based on the following rules:

- The sensor position must be on the engine block – only there is the sound distribution sufficiently uniform.
- For maximum sensitivity, the sensor position should be as close as possible to the sound source. So, for example, at the middle height of the piston stroke.
- The position of the sensor should be centred between the cylinders to be monitored. From four cylinders on, two sensors are recommended.
- Do not mount the sensor too close to the turbocharger and exhaust pipe (heat radiation)!
- Do not mount the sensor on cooling or oil channels with high liquid flow!
- Do not mount the sensor directly on the cylinder heads!
- Do not mount the sensor on attachments (mixture cooler, oil filter housing etc.)!
- When routing the cable, ensure sufficiently large bending radii and avoid sharp edges!
- Do not mount the cables along pressure hoses!
- Attach the sensor cables with cable ties to appropriate fixtures on the engine block!
- Pay attention to properly tighten the cables – cables must not swing!
- Do not mount the cables parallel to ignition cables or control cables of the ignition coils!

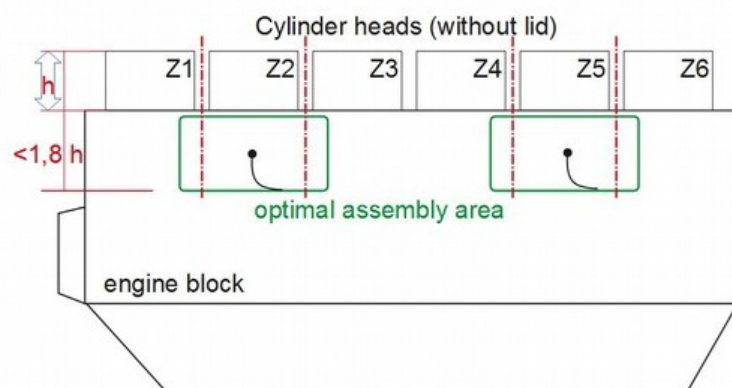
Possible sensor positions for 4 cylinders in line:



The ideal sensor position is within the areas marked in green.

h refers to the height of the cylinder heads without valve covers.

Possible sensor positions for 6 cylinders in line:



In V-engines, the sensors are mounted on both sides of the cylinders, as in an in-line engine.

Select the sensor positions according to the number of cylinders in each row of cylinders.



Caution!

Deviations from the drawn ideal areas are possible, but need to be tested.

5. Sensor positions of already measured engines

The engines that have already been measured and their sensor positions can be found in a separate document on the engine types. As an example, the sensor positions of the engine types ...

- **MAN 47 KW E0834E312**
- **MAN 54 KW E0834E302** and
- **MAN 68 KW E0834LE302** are indicated with red arrows.

Type

MAN 47KW E0834E312 Change

2 Sensors

16 Ignition timing (° BTDC)

0 Signal threshold selection

5200 Signal threshold 0

5200 Signal threshold 1

20 Signal filter

50 Signal gain

2000 Ignition threshold

50 Ignition gain

500 Post filter

Save

Rechts hinten

IX. Maintenance and cleaning

To clean the surface of the device, please use a slightly damp cloth and a cleaner suitable for the care of plastic (plexiglass) and painted surfaces.

In every case, you should carry out a compatibility test on an inconspicuous spot beforehand.



Caution!

- Do not use harsh cleaners!
- Never clean the device wet or with compressed air!

X. Procedure in case of malfunction

There are no user-replaceable parts installed in the KNOCKDETECT.

In case of malfunction, please assess the error using the following table and contact the manufacturer, stating the error pattern and error code.

The contact details can be found on page 5 in these instructions.

Error code	Communication error
1000	Communication: RS232 connection faulty
1001	Communication: RS485 connection faulty
1002	Communication: Ethernet connection faulty
1003	Communication: USB connection faulty
1004	Communication: CAN connection faulty
1008	Communication: SDCardSlot defect
1009	Communication: Profibus connection faulty
	Display
1200	Display: permanently black
1201	Display: permanently yellow
1203	Display: flickers
1204	Display: pixel or line errors
1205	Display: mechanically defective
1241	Time indication: faulty
	Device
1300	Device: no function
1301	Device: short circuit occurs
1302	Device: overheated
1306	Component loose inside the unit
1307	Housing: damaged
1308	Input defective
1311	Device: moisture damage
1312	Device: dirty
1399	Device: check-up required
	Operation
1420	Button: defective
	Software
1800	Software: update required
1801	Software: error
1802	Software: error after update

XI. Validity of these instructions

These instructions are valid for units of the type:

KNOCKDETECT (MODCON001B001 and MODCON001C001)

XII. EC Declaration of Conformity

EG-Konformitätserklärung
EC Declaration of Conformity

Hersteller:
Manufacturer: MIS Industrie Systeme GmbH & Co. KG
Lohwiese 7
86937 Scheuring

Produktbezeichnung: Industrierechner zur Klopfüberwachung von Gasmotoren
Productdescription: *Industrial CPU for Knock-Observation of Gasengines*

Typ:
Type: KNOCKDETECT

Das bezeichnete Produkt stimmt in der von uns in Verkehr gebrachten Ausführung mit den Vorschriften folgender Europäischer Richtlinien überein:

The product described above in the form as delivered is in conformity with the provisions of the following European Directives:

Richtlinie:
Directive:

2006/95/EG Niederspannungs-Richtlinie

Richtlinie des Europäischen Parlaments und des Rates zur Angleichung der Rechtsvorschriften der Mitgliedstaaten betreffend elektrische Betriebsmittel zur Verwendung innerhalb bestimmter Spannungsgrenzen
Directive of the European Parliament and of the Council on the harmonisation of the laws of Member States relating to electrical equipment designed for use within certain voltage limits

2004/108/EG EMV

Richtlinie des Rates zur Angleichung der Rechtsvorschriften der Mitgliedstaaten über die elektromagnetische Verträglichkeit
Council Directive on the approximation of the laws of the Member States relating to electromagnetic compatibility

Jahr der Anbringung
der CE-Kennzeichnung:
Year of CE Marking: 2013

Ausstellungsdatum:
Release Date: 1.10.2013

MIS Industrie Systeme GmbH & Co. KG