MIC4-ZS – IGNITION CONTROLLER

ADDITION TO THE OPERATING MANUAL

MIC4-ZS
MOTORTECH IGNITION CONTROLLER

MOTORTECH Ignition Controllers
P/N 01.10.039-EN | Rev. 08/2016

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1 GENERAL INFORMATION

Read through this manual carefully before use and become familiar with the product. Installation and start-up should not be carried out before reading and understanding this document. Keep this Manual readily available so that you can reference it as needed.

Read the operating manual of the ignition controller

Read and understand the complete documentation of the ignition controller prior to the start-up of the MIC4-ZS. This consists of the MIC4 operating manual and the addition to the operating manual for the MIC4-ZS.

1.1 What Is the Purpose of this Manual?

This Manual serves as an aid for the installation and operation of the product and supports the technical staff with all operating and maintenance tasks to be performed. Furthermore, this manual is aimed at preventing dangers to life and health of the user and third parties.

1.2 Who Is this Manual Targeted to?

This Manual provides a code of conduct for personnel tasked with the setup, operation, maintenance, and repair of stationary engines. A certain level of technical knowledge with respect to the operation of stationary engines and basic knowledge of the electronic components used are necessary. Persons who are merely authorized to operate the stationary engine are to be trained by the operating company and explicitly informed of the potential hazards.

1.3 What Symbols Are Used in the Manual?

The following symbols are used in this manual and must be observed:

Notice

This symbol indicates important notices for the user. Follow these. In addition, this symbol is used for overviews that give you a summary of the necessary work steps.

Warning

This symbol indicates warnings for possible risks of property damage or risks to health. Read these warning notices carefully and take the mentioned precautionary measures.

Danger

This symbol indicates warnings for danger to life, especially due to high voltage. Read these warning notices carefully and take the mentioned precautionary measures.

2 SAFETY INSTRUCTIONS

2.1 General Safety Instructions

The following safety instructions must be followed in the area in which the device is operated:

High voltage! Danger to life!

While the engine is running, the area around the ignition system especially holds the risk of danger due to high voltage. The following parts should therefore not be touched or removed unless explicitly stated otherwise:

- Ignition coils and caps
- Wires of the high voltage circuit
- In- and output wiring of the ignition controller
- Pickups and their wiring

Danger to persons with pacemakers!

Electromagnetic impulses in the wiring of the ignition system may exceed the permissible limits of pacemakers. Persons with pacemakers must therefore not be present in the vicinity of the ignition system being operated. Mark the operating location of the ignition system with the corresponding standardized warning symbol.

MOTORTECH equipment is manufactured as state of the art and therefore safe and reliable to operate. Nevertheless the equipment can cause risks or damage can occur, if the following instructions are not complied with:

- The gas engine must only be operated by trained and authorized personnel.
- Operate the equipment only within the parameters specified in the technical data.
- Use the equipment correctly and for its intended use only.
- Never apply force.
- For all work such as installation, conversion, adaptation, maintenance, and repair, all equipment must be disconnected from the mains and secured against unintentional reactivation.
- Perform only such maintenance and repair work as is described in this operating manual, and follow the instructions given while working. For maintenance of the equipment, only use spare parts supplied by MOTORTECH. Further work must only be performed by personnel authorized by MOTORTECH. Non-compliance with the instructions will void any warranties for the proper function of the equipment as well as the responsibility for the validity of the certifications.
- Safety devices must not be dismounted or disabled.
- Avoid all activities that can impair the function of the equipment.

- Operate the equipment only while it is in proper condition.
- Investigate all changes detected while operating the gas engine or ignition system.
- Ensure compliance with all laws, directives and regulations applicable to the operation of your system, including such not expressly stated herein.
- If the system is not entirely tight and sealed, gas may escape and result in explosion hazard. Upon completion of all assembly works, always check the system's tightness.
- Always ensure adequate ventilation of the engine compartment.
- Ensure a safe position at the gas engine.

2.2 Special Safety Instructions for the Device

Danger to life! Hazardous residual voltage!

After stopping the ignition, there is dangerous residual voltage for up to three minutes in the ignition system. Do not touch any components of the ignition kit during this time.

Explosion hazard!

When the system is powered up, do not remove any connectors unless the system is not located in a potentially explosive atmosphere.

Explosion hazard!

The replacement of parts or assemblies can impair compliance with CSA Class I, Division 2 (Group C, D), T4.

Explosion hazard!

Never remove the equipment while the device is connected to a power source unless the system is not located in an explosive environment.

2 SAFETY INSTRUCTIONS

Explosion hazard!

Do not remove or replace the fuse while the equipment is live.

Risk of burning!

The surfaces of the system may heat up to high temperatures.

Operational safety!

All connector screws and screw joints must be adequately tightened.

Risk of destruction!

Magnetic fields and heat occur when welding, which may damage or destroy the MIC4-ZS. Therefore, pay attention to the following when welding:

– Disconnect all electrical connections to the MIC4-ZS prior to welding.
– Protect the MIC4-ZS against direct contact with the welding unit and magnetic fields, sparks and liquid metal.

3 INTENDED USE

3.1 Functional Description

With the ignition controller, you replace a TEM-ZS1 or TEM-ZS3 ignition controller from MWM/DEUTZ® in just a few steps. You may continue to use the existing wiring. All relevant functions of the TEM system remain available.

Apart from the functions and properties described in this instruction, the MIC4-ZS corresponds to a regular MIC4 from MOTORTECH and can be used as such if necessary.

Deviating pin assignment

The assignment of the input and output connector of the MIC4-ZS deviates from the assignment of a regular MIC4. Note the deviating pin assignment if you would like to use the MIC4-ZS like a regular MIC4. (See section *Wiring of the Device* on page 16.)

3.2 Applications

The ignition controller MIC4-ZS is suitable for operation with MWM®-/ DEUTZ® gas engines with 8, 12 or 16 cylinders and suitable TEM controls from MWM®-/ DEUTZ®.

The MIC4-ZS can also be used like a regular MIC4 from MOTORTECH if necessary.

To configure the MIC4-ZS, you need the configuration software MICT (version 2.13 or higher). To operate the MIC4-ZS, you need special ignition coils from MOTORTECH.

4 BASIC PROCEDURE

Proceed as follows:

1. Before the conversion, determine the exact ignition timing of the existing system and make note of this.
2. Remove the existing ignition controller and mount the MIC4-ZS (see *Replacing the Ignition Controller* on page 11).
3. Connect the existing harnesses to the MIC4-ZS (see *Replacing the Ignition Controller* on page 11).
4. If necessary, replace the spark plugs and ignition cables (see *Replacing Spark Plugs and Ignition Cables* on page 14).
5. Replace the ignition coils (see *Replacing the Ignition Coils* on page 15).
6. Establish the power supply to the ignition controller (see *Start-up* on page 19).
7. Connect a computer to the ignition controller via USB.
8. Configure the ignition controller (see *Start-up* on page 19).

5 INSTALLATION INSTRUCTIONS

Notice

You can use the existing wiring with power supply, spark plugs, pick-up leads and TEM control system for the MIC4-ZS and the matching ignition coils from MOTORTECH. Therefore, do not disassemble the wiring. Remove only those components from the wiring that you would like to replace.

5.1 Replacing the Ignition Controller

Replace the TEM-ZS1/TEM-ZS3 with the MIC4-ZS as follows:

Removing the TEM-ZS1/TEM-ZS3

Remove the TEM-ZS1/TEM-ZS3 as follows:

1. Switch the engine off.
2. Disconnect the power supply of the TEM-ZS1/TEM-ZS3 and the TEM control system.
3. Disconnect the TEM-ZS1/TEM-ZS3 by removing the military style connector from the wiring.
4. Remove the TEM-ZS1/TEM-ZS3. Also remove the associated vibration dampers.
   - ▸ The TEM-ZS1/TEM-ZS3 is removed.

Installing the MIC4-ZS

Install the MIC4-ZS using the components from the enclosed mounting kit as follows:

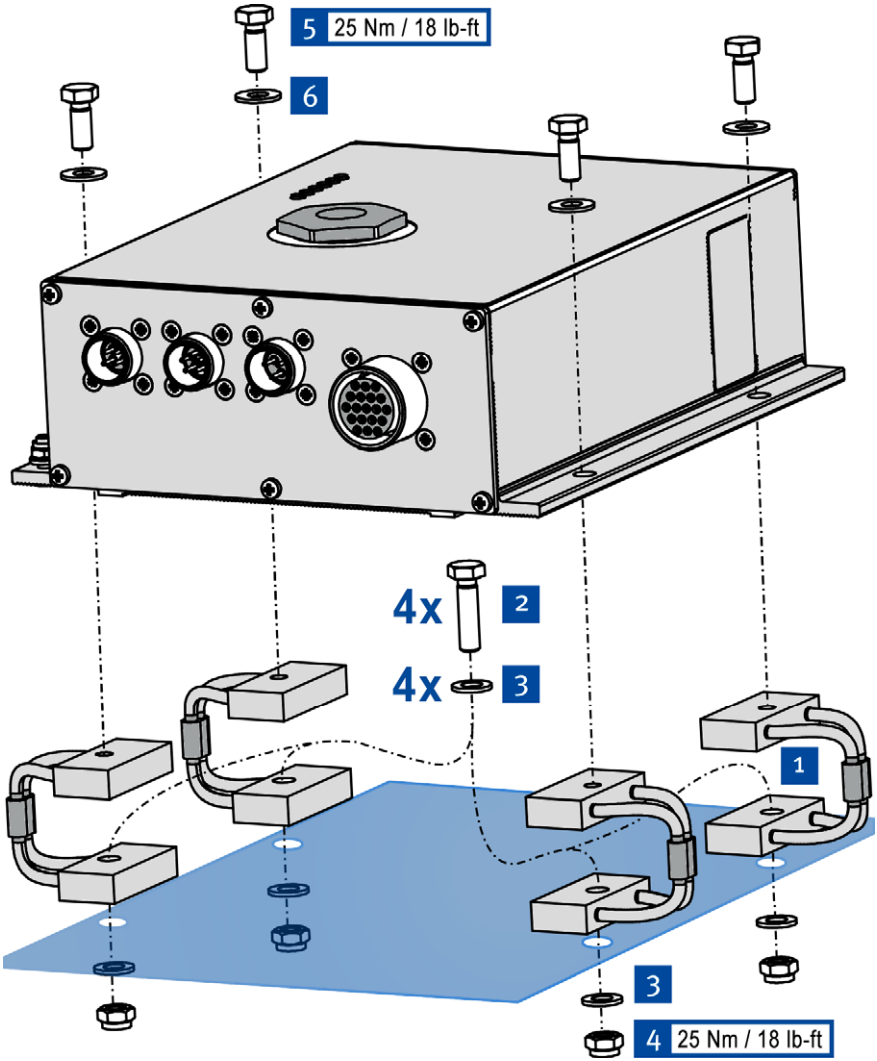
Risk of destruction!

Incorrectly installed vibration dampers may not offer a sufficient level of protection for the ignition controller. During the installation observe the following information:

- Align the vibration dampers exactly as shown in the figure.
- The wires of the vibration dampers must not contact other components after the installation is completed.
- Observe the stated tightening torques.

1. Mount the four vibration dampers [1] to the positions on the mounting plate on which the vibration dampers of the TEM-ZS1/TEM-ZS3 were previously attached. For this purpose, use four screws M8x30 [2], eight washers M8 [3] and four lock nuts M8 [4].

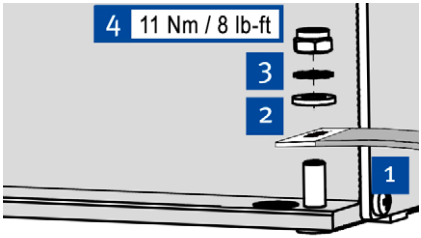
2. Attach the ignition controller to the vibration dampers. To do this, use four screws M8x20 5 and four rim lock washers M8 6. Bend the vibration damper in the position shown.



► The product is installed.

Assembling the Ground Strap

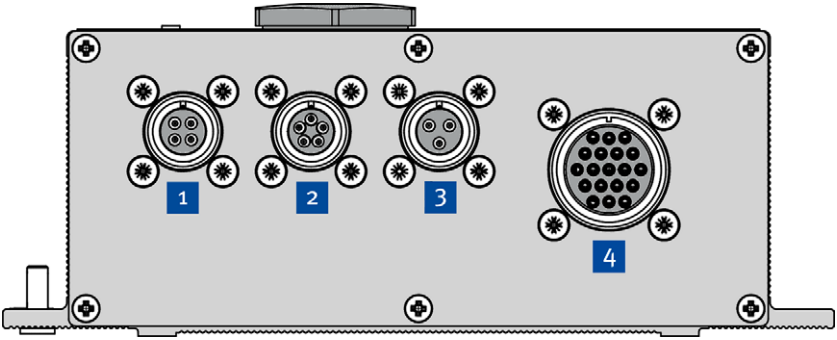
Ground the MIC4-ZS as follows:



1. Fasten the ground strap 1 to the MIC4-ZS ground pin. To do so, use one washer M6 2, one tooth lock washer A6 3 and one lock nut M6 4.
2. Connect the ground strap to one of the sides suitable for grounding.
   - ▸ The MIC4-ZS is grounded.

Wire the MIC4-ZS

Connect the military style connector to the existing wiring with the matching connections on the MIC4-ZS. The connections correspond to those of the TEM-ZS1/TEM-ZS3.



1 RS485 / TEM control system
2 Pickup
3 Power supply
4 Output connector

Risk of destruction

Unsuitable ignition coils generate a high voltage that is too high or too low for the spark plugs used. This may damage spark plugs and the engine.

Therefore, only use the MIC4-ZS with suitable ignition coils from MOTORTECH.

5.2 Replacing Spark Plugs and Ignition Cables

Depending on the engine type, it may be useful to replace the spark plugs as part of the conversion to an MIC4-ZS.

Higher gas consumption is possible.

If you replace the prechamber spark plugs with spark plugs with J-type electrodes, it is possible that the engine's gas consumption will increase.

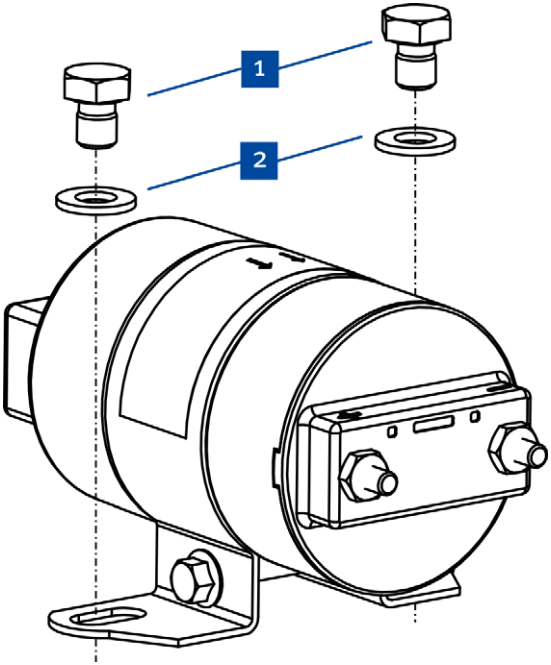
Replace the spark plugs and ignition cables with the spark plug extensions as follows:

1. Ensure that the power supply of the ignition controller is disconnected.
2. Remove the ignition cables and the spark plug extensions.
3. Remove the spark plugs.
4. Insert the new spark plugs. To do this, also read the documentation of the engine and the spark plugs.
5. Attach the new spark plug extensions to the spark plugs.
   - ▸ The spark plugs and ignition cables with the spark plug extensions are installed.

5.3 Replacing the Ignition Coils

Replace the existing ignition coils with the supplied ignition coils from MOTORTECH as follows:

1. Ensure that the power supply of the ignition controller is disconnected.
2. Separate the stepper motor driver from the supply voltage.
3. Remove the ignition coils.
4. Install the ignition coils from MOTORTECH in place of the old ignition coils. For installation, you need two M8 screws 1 and two M8 washers 2 per ignition coil.



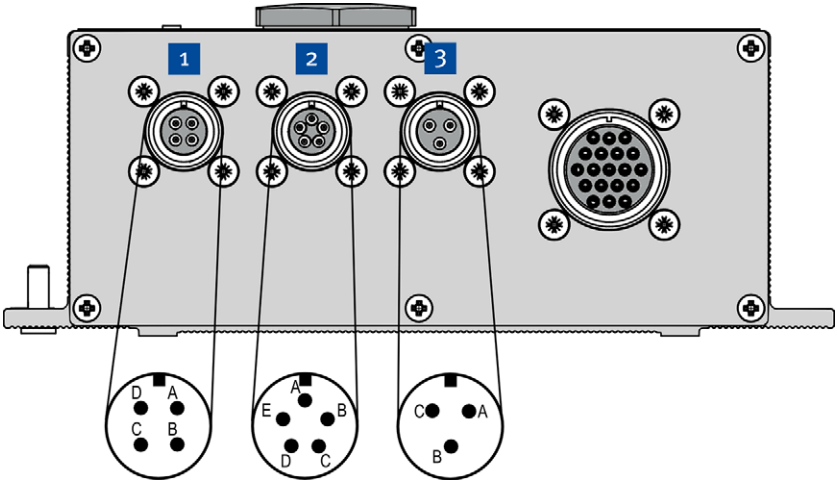
5. Connect the new ignition coils to the ignition controller. Use the existing cables for this purpose.
6. Attach the ignition cables to the ignition coils.
   - ▸ The ignition coils are installed.

6 WIRING OF THE DEVICE

This chapter provides information on the pole assignment of the connections on the MIC4-ZS. The pole assignment corresponds to that of the TEM-ZS1/TEM-ZS3.

6.1 Input Connector

The MIC4-ZS has three input connectors:



Input connector (external view)

The tables provide information on the pole assignment of the input connector.

1 RS-485

Pole	Output
A	Rx/Tx Low
B	Rx/Tx High
C	Ground
D	Shield

2 Pickup

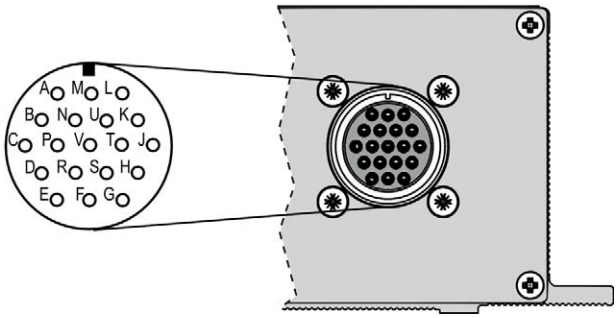
Pole	Output	Speed
A	PU2 Signal	Crankshaft
B	PU2 Com	Crankshaft
C	PU1 Signal	Camshaft
D	PU1 Com	Camshaft
E	Shield	

3 Power Supply

Pole	Output
A	24 V
B	Ground
C	Shield

6.2 Output Connector

The MIC4-ZS has one output connector for the ignition coils.



19 pole output connector (outside view)

The table provides information on the pole assignment of the output connector for the ignition coils.

Pole	Output
A	Output A1
B	Output B1
C	Output A2
D	Output B2
E	Output A3
F	Output B3
G	Output not assigned
H	Output not assigned
J	Ground

Pole	Output
K	Output A4
L	Output B4
M	Output A5
N	Output B5
P	Output A6
R	Output B6
S	Output A7
T	Output B7
U	Output A8
V	Output B8

7 OPERATION

7.1 Start-up

Risk of destruction!

An improper device configuration may lead to damage to the ignition kit and the engine. Do not start the engine unless you are certain that the MIC4-ZS is configured correctly.

Device Configuration

The MIC4-ZS is configured using the configuration software MICT and data that is transmitted from the TEM control system to the device.

A distinction is made in this instruction between base configuration, initial configuration and customer configuration:

- Base configuration: Configuration with which devices of the type MIC4-ZS are delivered.
- Initial configuration: Base configuration into which parameters from the TEM control system were incorporated.
- Customer configuration: Initial configuration to which changes were made with the help of the MICT.

Changes to the device configuration require a restart of the TEM control system

If you change an initial or customer configuration and load it again into the MIC4-ZS, the engine type designation in the MIC4-ZS is set to *invalid*. The MIC4-ZS must receive the engine type from the TEM control system again. So that the TEM control system sends the engine type, it has to be restarted.

Initial Start-up of the MIC4-ZS

Start the system after installation as follows:

1. Perform a restart of the TEM control system.
   - ▸ The MIC4-ZS starts and receives the required parameters from the TEM control. (Ignition coil type and nominal speed of the engine are not received.)
   - ▸ An initial configuration is automatically created in the MIC4-ZS with the data of the base configuration and the data received from the TEM control system.
2. Start the MICT (version 2.13 or higher) and load the initial configuration from the MIC4-ZS into the MICT.

3. Save the initial configuration.
4. Check whether all parameters are set according to the requirements of your engine. (Information on the firing order and firing angles can be found in section *Engine Type Designation, Firing Order, Ignition Angle* on page 22.)
5. Change the ignition coil type and nominal speed of the engine if necessary.
6. Save the settings.
   - ▸ You have created a customer configuration.
7. Load your customer configuration from the MICT into the MIC4-ZS.
   - ▸ The engine type designation is automatically set to *invalid* in the MIC4-ZS (see section *Engine Type Designation, Firing Order, Ignition Angle* on page 22).
8. Perform a restart of the TEM control system.
   - ▸ The MIC4-ZS starts and receives the necessary parameters from the TEM control system.
   - ▸ The received parameters (e. g. engine type designation) are automatically adopted in the customer configuration.
9. Load the customer configuration from the MIC4-ZS into the MICT.
10. Check whether all parameters are set according to the requirements of your engine.
    - ▸ If all of the parameters are correct, you can perform the ZS reset calibration.

ZS Reset Calibration

You have to perform a reset calibration the first time you start the engine with the MIC4-ZS. This way you optimize global ignition timing.

Risk of destruction!

An improper device configuration may lead to damage to the ignition kit and the engine. Do not start the engine unless you are certain that the MIC4-ZS is configured correctly.

Runtime adjustments are implemented directly

All runtime adjustments are carried out directly without input confirmation and are preserved even when the MIC4-ZS is restarted.

Changes to the configuration in the device are only visible in the main window of the MICT after the configuration is again uploaded from the device.

Balancing of the cylinders via the TEM control system

During the *ZS reset calibration*, take into consideration the fact that the TEM control system performs an individual balancing of the cylinders if the *Cylinder Balancing* function is enabled there.

1. Start the engine via the TEM control system.
2. Use the button  in the toolbar to open the *ZS runtime adjustments*.
3. Use a timing light (e. g. ScopeLite from MOTORTECH) to determine the ignition timing of the first cylinder in the firing order.
4. Adjust the reset point until the ignition timing displayed by the timing light corresponds to the desired value (see documentation of the engine).
   - ▸ The modified reset calibration will be saved in the MIC4-ZS.

"Regular" runtime adjustments are overwritten by the TEM control system

Only change the reset point in the window *ZS Runtime Adjustments*.

Do not change the reset point in the view *Reset* in the window *Runtime Adjustments* (see section *Runtime adjustments -› Reset* in the MIC4 operating manual). This value is overwritten again by the TEM control system.

7.2 Shutdown

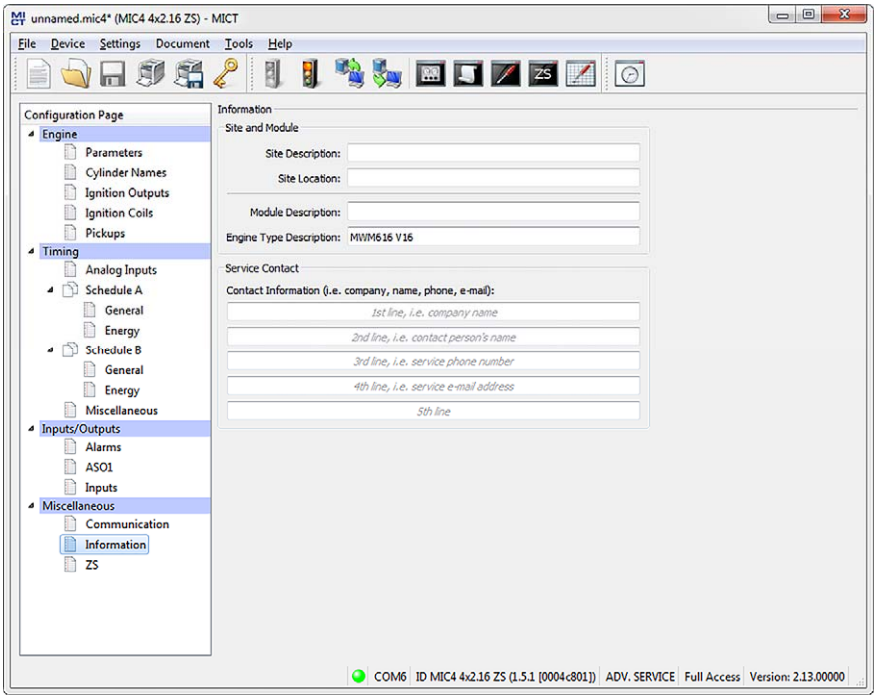
The ignition controller is shut down by disconnecting it from the power supply.

7.3 Engine Type Designation, Firing Order, Ignition Angle

The MIC4-ZS obtains the engine type designation, firing order and ignition angle from the TEM control system.

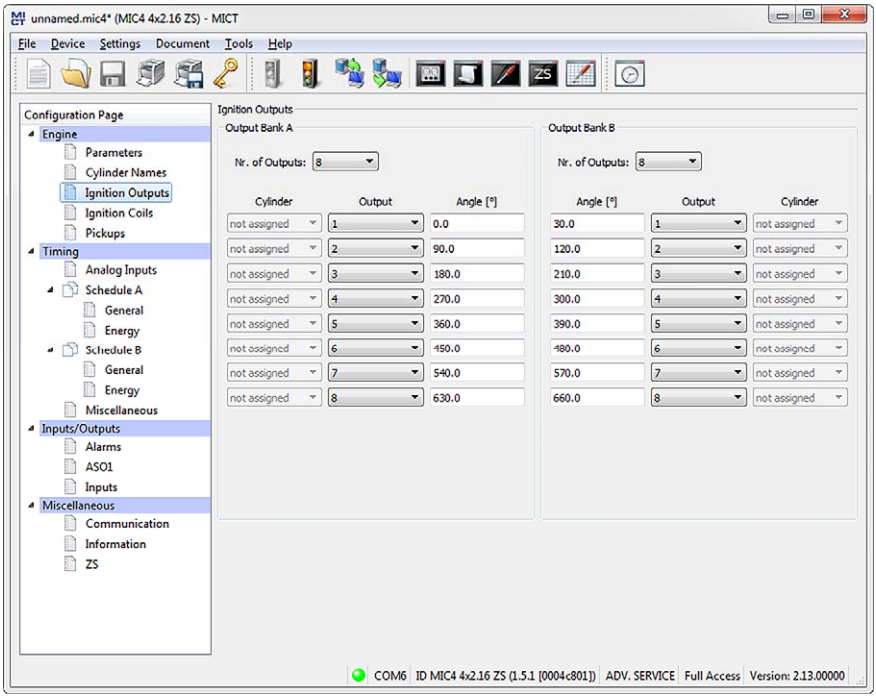
Engine Type

The engine type designation obtained from the TEM control system is shown in the view *Miscellaneous -› Information* under the item *Engine Type Designation*. The entry *invalid* in this field refers to the fact that no data has been obtained by the TEM control system after a configuration with the MICT.



Firing Order and Ignition Angle

The firing order and ignition angle depend on the engine type designation. You can view them in the view *Engine -› Ignition Outputs*.



7 OPERATION

The following tables provide information on the firing orders of compatible engines:

MWM-440 (283 Events on the Crankshaft)

Type	Firing Angle	Output connector	Cylinder	MIC outputs
L6	120°	A-B-C-D-E-F	A1-A5-A3-A6-A2-A4	A1-B1-A2-B2-A3-B3
L8	90°	A-B-C-D-E-F-K-L	A1-A3-A7-A5-A8-A6-A2-A4	A1-B1-A2-B2-A3-B3-A4-B4

MWM-441 (259 Events on the Crankshaft)

Type	Firing Angle	Output connector	Cylinder	MIC outputs
V12	75°–450°	A-B-C-D-E-F-K-L-M-N-P-R	A1-B5-A5-B3-A3-B6-A6-B2-A2-B4-A4-B1	A1-B1-A2-B2-A3-B3-A4-B4-A5-B5-A6-B6
V16	45°	A-B-C-D-E-F-K-L-M-N-P-R-S-T-U-V	A1-B3-A3-B7-A7-B5-A5-B8-A8-B6-A6-B2-A2-B4-A4-B1	A1-B1-A2-B2-A3-B3-A4-B4-A5-B5-A6-B6-A7-B7-A8-B8

MWM-616 (178 Events on the Crankshaft)

Type	Firing Angle	Output connector	Cylinder	MIC outputs
V8	120°–60°	A-C-D-F-K-M-N-R	A1-B2-A3-B1-A4-B3-A2-B4	A1-A2-B2-B3-A4-A5-B5-B6
V12	60°	A-B-C-D-E-F-K-L-M-N-P-R	A1-B5-A5-B3-A3-B6-A6-B2-A2-B4-A4-B1	A1-B1-A2-B2-A3-B3-A4-B4-A5-B5-A6-B6
V16	30°–60°	A-B-C-D-E-F-K-L-M-N-P-R-S-T-U-V	A1-B3-A3-B7-A7-B5-A5-B8-A8-B6-A6-B2-A2-B4-A4-B1	A1-B1-A2-B2-A3-B3-A4-B4-A5-B5-A6-B6-A7-B7-A8-B8

MWM-620/1 (218 Events on the Crankshaft)

Type	Firing Angle	Output connector	Cylinder	MIC outputs
V8	90°	A-C-E-K-M-P-S-U	A1-B4-A4-B1-B3-A3-B2-A2	A1-A2-A3-A4-A5-A6-A7-A8
V12	30°–90°	A-B-C-D-E-F-K-L-M-N-P-R	A1-B2-A5-B4-A3-B1-A6-B5-A2-B3-A4-B6	A1-B1-A2-B2-A3-B3-A4-B4-A5-B5-A6-B6
V16	45°	A-B-C-D-E-F-K-L-M-N-P-R-S-T-U-V	A1-B6-A3-B5-A4-B7-A2-B8-B3-A8-B4-A6-B2-A5-B1-A7	A1-B1-A2-B2-A3-B3-A4-B4-A5-B5-A6-B6-A7-B7-A8-B8

MWM-620/2 (218 Events on the Crankshaft)

Type	Firing Angle	Output connector	Cylinder	MIC outputs
V12	30°–90°	A-B-C-D-E-F-K-L-M-N-P-R	A1-B2-A5-B4-A3-B1-A6-B5-A2-B3-A4-B6	A1-B1-A2-B2-A3-B3-A4-B4-A5-B5-A6-B6
V16	45°	A-B-C-D-E-F-K-L-M-N-P-R-S-T-U-V	A1-B2-A6-B5-A8-B7-A3-A7-B6-A4-B8-A2-B3-A5-B1-B4	A1-B1-A2-B2-A3-B3-A4-B4-A5-B5-A6-B6-A7-B7-A8-B8

MWM-632 (306 Events on the Crankshaft)

Type	Firing Angle	Output connector	Cylinder	MIC outputs
V12	75°–45°	A-B-C-D-E-F-K-L-M-N-P-R	A1-B5-A5-B3-A3-B6-A6-B2-A2-B4-A4-B1	A1-B1-A2-B2-A3-B3-A4-B4-A5-B5-A6-B6
V16	45°	A-B-C-D-E-F-K-L-M-N-P-R-S-T-U-V	A1-B3-A3-B7-A7-B5-A5-B8-A8-B6-A6-B2-A2-B4-A4-B1	A1-B1-A2-B2-A3-B3-A4-B4-A5-B5-A6-B6-A7-B7-A8-B8

AI Test A (180 Events on the Crankshaft)

Type	Firing Angle	Output connector	Cylinder	MIC outputs
V8	120°–60°	A-C-D-F-K-M-N-R	A1-B2-A3-B1-A4-B3-A2-B4	A1-A2-B2-B3-A4-A5-B5-B6
V12	60°	A-B-C-D-E-F-K-L-M-N-P-R	A1-A2-A3-A4-A5-A6-B1-B2-B3-B4-B5-B6	A1-B1-A2-B2-A3-B3-A4-B4-A5-B5-A6-B6
V16	45°	A-B-C-D-E-F-K-L-M-N-P-R-S-T-U-V	A1-A2-A3-A4-A5-A6-A7-A8-B1-B2-B3-B4-B5-B6-B7-B8	A1-B1-A2-B2-A3-B3-A4-B4-A5-B5-A6-B6-A7-B7-A8-B8

AI Test B (108 Events on the Crankshaft)

Type	Firing Angle	Output connector	Cylinder	MIC outputs
V8	120°–60°	A-C-D-F-K-M-N-R	A1-B2-A3-B1-A4-B3-A2-B4	A1-A2-B2-B3-A4-A5-B5-B6
V12	60°	A-B-C-D-E-F-K-L-M-N-P-R	A1-A2-A3-A4-A5-A6-B1-B2-B3-B4-B5-B6	A1-B1-A2-B2-A3-B3-A4-B4-A5-B5-A6-B6
V16	45°	A-B-C-D-E-F-K-L-M-N-P-R-S-T-U-V	A1-A2-A3-A4-A5-A6-A7-A8-B1-B2-B3-B4-B5-B6-B7-B8	A1-B1-A2-B2-A3-B3-A4-B4-A5-B5-A6-B6-A7-B7-A8-B8

7.4 Using the MIC4-ZS Like a Regular MIC4

The MIC4-ZS can be used like a regular MIC4 from MOTORTECH. The following points must be observed in this case:

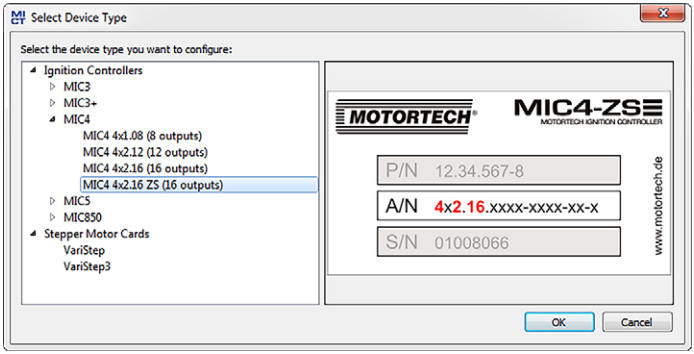
- The assignment of the input and output connectors of the MIC4-ZS (see section *Wiring of the Device* on page 16) does not correspond to the assignment of the regular MIC4.
- In the *Device Type Selection* of the MICT, you nevertheless have to select the device type *MIC4-ZS* if you would like to create a new device setup.
- In the view *Miscellaneous* -› *Communication* in the MICT, you have to disable the RS 485 mode *ZS*.

8 ADDITIONAL FUNCTIONS IN THE MICT

For the configuration of the MIC4-ZS, the configuration software MICT (version 2.13 or higher) offers additional functions that are described in this chapter.

8.1 Device Type Selection

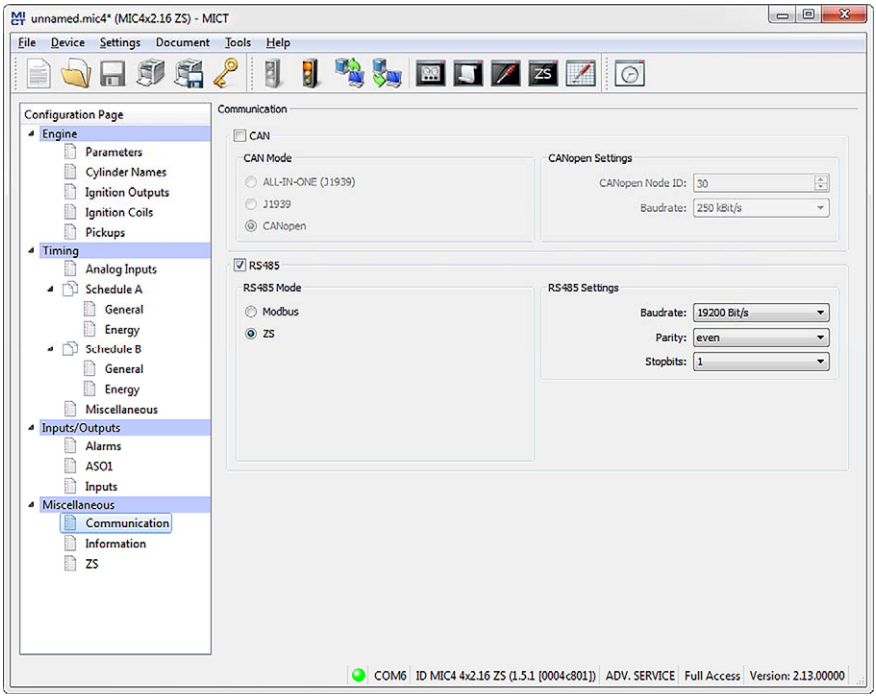
In the device type selection under *Ignition Controllers* -› *MIC4*, the MIC4-ZS is available when you are creating a new device configuration.



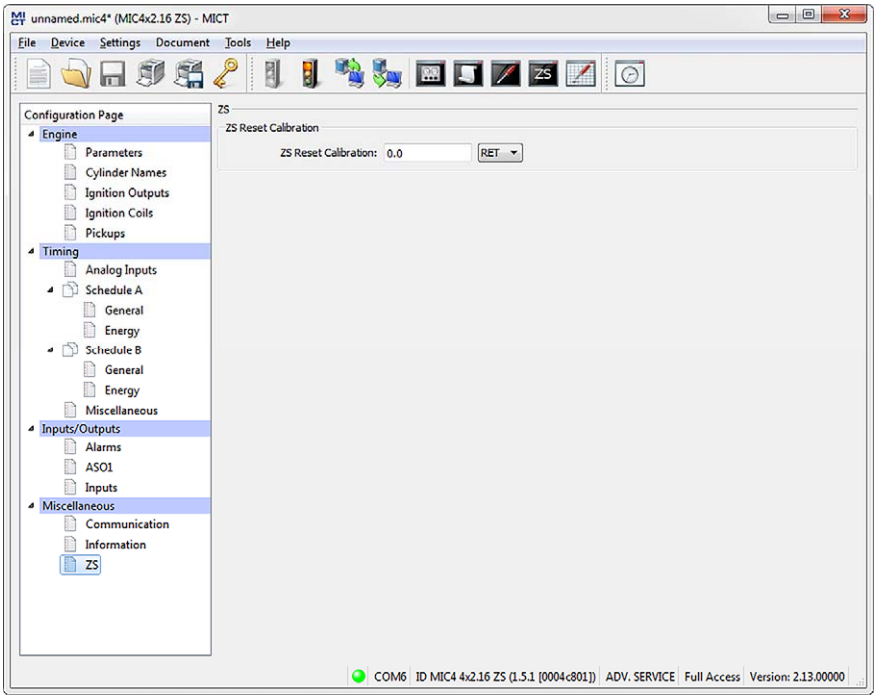
8.2 Configuration Pages

The MICT offers the following additional functions for the configuration of MIC4-ZS ignition controllers:

On the configuration page *Miscellaneous – Communication*, the RS485 mode *ZS* is available.



Once the RS485 mode *ZS* is chosen on the configuration page *Miscellaneous – Communication*, the *ZS reset calibration* is available to you on the configuration page *Miscellaneous – ZS*.

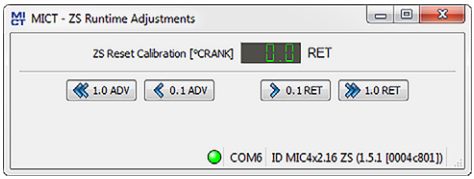


You can adjust the reset point in °KW.

8.3 Runtime Adjustments

When your MICT is connected to an MIC4-ZS, an additional symbol is available to you in the toolbar:

Click on the symbol in order to open the *ZS Runtime Adjustments*.



You can adjust the reset point in °KW with the engine running.

"Regular" runtime adjustments are overwritten by the TEM control system

Only change the reset point in the window *ZS Runtime Adjustments*.

Do not change the reset point in the view *Reset* in the window *Runtime Adjustments* (see section *Runtime adjustments -› Reset* in the MIC4 operating manual). This value is overwritten again by the TEM control system.

Runtime adjustments are implemented directly

All runtime adjustments are carried out directly without input confirmation and are preserved even when the MIC4-ZS is restarted.

Changes to the configuration in the device are only visible in the main window of the MICT after the configuration is again uploaded from the device.

Balancing of the cylinders via the TEM control system

During the *ZS reset calibration*, take into consideration the fact that the TEM control system performs an individual balancing of the cylinders if the *Cylinder Balancing* function is enabled there.

9 CONTACT MOTORTECH

9.1 Customer Service Information

You can reach our customer service during business hours at the following phone and fax number, or by email:

Phone: +49 5141 93 99 0

Fax: +49 5141 93 99 99

Email: service@motortech.de

9.2 Returning Equipment for Repair / Inspection

To return the device for repair and inspection, obtain a return form and return number from MOTORTECH.

Fill out the return form completely. The completely filled out return form guarantees fast, uncomplicated processing of your repair order.

Send the device and the return form to one of the two addresses below or to the nearest MOTORTECH representative:

MOTORTECH GmbH
Hogrevestr. 21-23
29223 Celle

Germany

Phone: +49 5141 93 99 0
Fax: +49 5141 93 99 98

www.motortech.de
motortech@motortech.de

MOTORTECH Americas, LLC
1400 Dealers Avenue, Suite A
New Orleans, LA 70123

USA

Phone: +1 504 355 4212
Fax: +1 504 355 4217

www.motortechamericas.com
info@motortechamericas.com

9.3 Instructions for Packaging the Equipment

For return shipment, equipment should be packaged as follows:

- Use packaging material that does not damage the equipment surfaces.
- Wrap the equipment with sturdy materials and stabilize it inside the packaging.
- Use sturdy adhesive film to seal the packaging.

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