

MIC3+CEC/MIC3+CATDI – Ignition Controller

Quick Start Guide



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MIC3+CEC
MOTORTECH IGNITION CONTROLLER

MIC3+CATDI
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1 General Information

1.1 What Is the Purpose of this Quick Start Guide?

This quick start guide 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.

The quick start guide is an addition to the complete operating manual of the ignition controller and all other applied devices. Above all, the safety instructions included in these manuals must be observed under all circumstances.

1.2 Who Is this Quick Start Guide Targeted to?

The quick start guide provides a code of conduct for personnel tasked with the setup, operation, maintenance, and repair of gas engines. A certain level of technical knowledge with respect to the operation of gas engines and basic knowledge of electronic ignition systems are necessary. Persons who are only authorized to operate the gas engine shall be trained by the operating company and shall be expressly instructed concerning potential hazards.

1.3 What Symbols Are Used in the Quick Start Guide?

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



Example

This symbol indicates examples, which point out necessary handling steps and techniques. In addition, you receive additional information from the examples, which will increase your knowledge.



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.



Risk of Injury

The pins on the output connector of the ignition controller are live during operation. Therefore, the ignition controller must only be operated when the output connector is attached.



General Information

- Use the MIC₃+CEC and MIC₃+CATDI only for the engines listed in the software menu.
- Notice the ignition timing and energy settings and the installed ignition coils.
- In addition to the quick start guide, also pay attention the extended operating manuals for the applied devices.

3 Intended Use

3.1 Functional Description

The ignition controller can replace one of the following ignition controllers in just a few steps: CAT® Digital Ignition or WAUKESHA® Custom Engine Control. You may continue to use the existing wiring and ignition coils. All functions of the existing ignition system remain available. CATERPILLAR® and WAUKESHA® detonation control systems are not supported. In order to apply a detonation control system, you must install a DetCon2o from MOTORTECH.

3.2 Application

The ignition controller MIC₃+CATDI is suitable for operation with the following CATERPILLAR® gas engines:

G3304, G3306, G3406, G3408, G3412

The ignition controller MIC₃+CEC is suitable for operation with the following CATERPILLAR® gas engines:

F18, H24, L36, F2895, F3521, L5108, L5790, L7042

The configuration of the ignition controller is carried out via a menu on the storage device that is supplied with the ignition controller.

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 MIC3+ (see *Installation of the Ignition Controller* on page 9).
3. Wire the ignition controller by reconnecting the existing harnesses (see *Wiring* on page 11).
4. *Optional:* Connect the PowerView3 (see *Wiring the PowerView3* on page 14).
5. Connect the ignition controller's power supply.
6. Connect a computer to the ignition controller via USB.
7. Configure the ignition controller (see *Configuration of the Ignition Controller* on page 17).
8. On the ignition controller, set the ignition timing determined prior to replacing the ignition controller (see *Adjusting the Ignition Timing* on page 21).

5 Installation Instructions

5.1 Unpacking

Unpack the equipment, taking care not to damage it, and ensure that the operating manual is always stored with the ignition controller and is easily accessible. Check the contents for completeness and verify that the device type meets your application requirements.

Scope of Supply

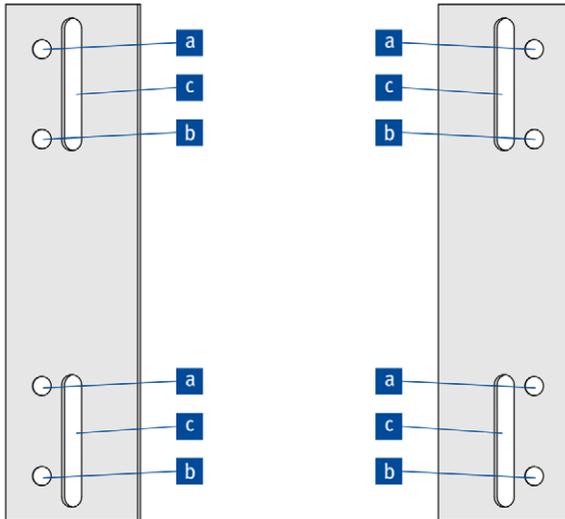
The scope of supply of the ignition controller consists of the following components:

- Ignition controller
- Installation set incl. four vibration dampers
- Two fixing bars
- Ground strap
- Storage device (USB flash drive) with configuration software for the ignition controller
- USB interface cable for connecting the ignition controller to a computer
- Connector for connecting a PowerView3
- 120 Ω terminating resistor for the CAN bus
- Quick start guide MIC3+CEC/MIC3+CATDI
- Operating manual MIC3+

5 Installation Instructions

5.2 Installation of the Ignition Controller

Construction of the Fixing Bars

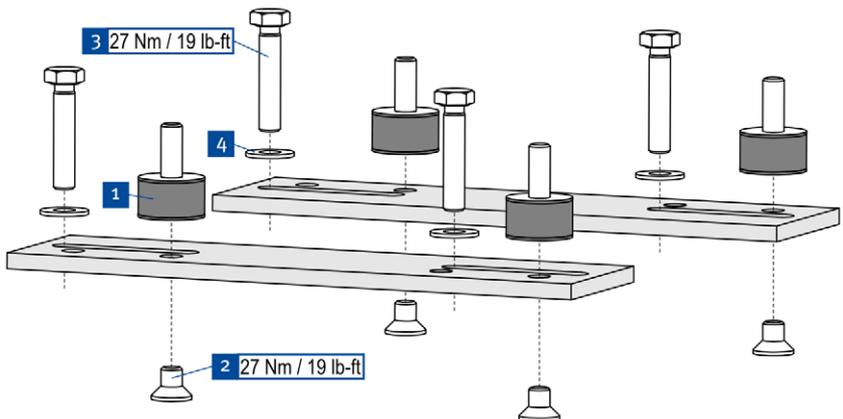


The drawing on the left shows the bracket arrangement for the installation of the ignition controller. The holes are used as follows:

- Four holes **a** or four holes **b** for the vibration dampers, on top of which the ignition controller is mounted.
- Four slotted holes **c** for the installation of the brackets on the engine frame.

The two alternative positions and the slotted holes make an adjustment to the engine's individual conditions possible.

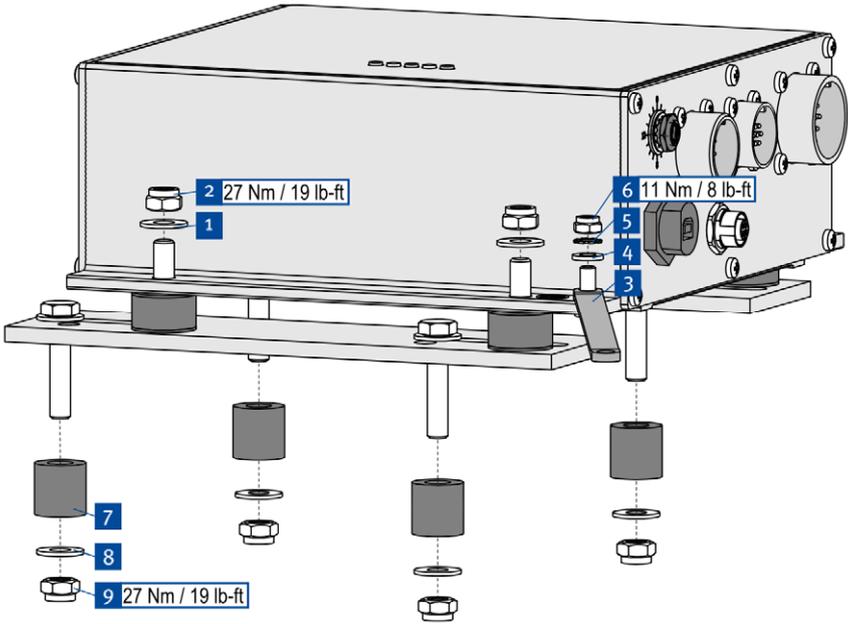
Mounting



1. Mount the four vibration dampers **1** on the brackets, using the hexagon socket head cap screws M8 **2** (two positions are possible – see above).
2. Place the mounting screws M8 **3** and the rim lock washers M8 **4** for the installation on the engine frame into the designated slotted holes.

5 Installation Instructions

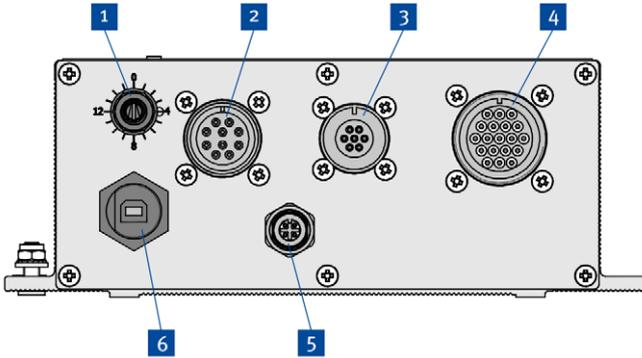
3. Place the ignition controller onto the vibration dampers.



4. Attach the vibration dampers to the ignition controller, using one rim lock washer M8 **1** and one lock nut M8 **2** each.
5. Fasten the ground strap **3** to the ignition controller ground pin. To do so, use one washer M6 **4**, one tooth lock washer A6 **5** and one poly lock nut M6 **6**.
6. Connect the ground strap to one of the sides suitable for grounding.
7. To mount the brackets, slide the spacer sleeves **7** over the mounting screws, and then screw the brackets to the engine frame, using four rim lock washers M8 **8** and four lock nuts M8 **9**.

6 Wiring

Positions of the Connectors (Example Figure: MIC3+ CEC, 12 Outputs)

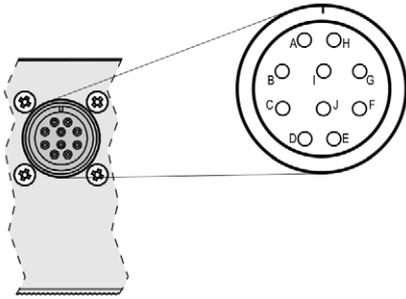


Item no.	Function
1	Ignition timing switch
2	10-pole input connector (e.g. analog current signal)
3	6- or 7-pole input connector (e.g. supply voltage, pickup signal)
4	10- or 19-pole output connector
5	CAN connector for connecting the PowerView3
6	USB connector for connecting a computer

6 Wiring

6.1 Wiring Inputs

10-Pole Input Connector

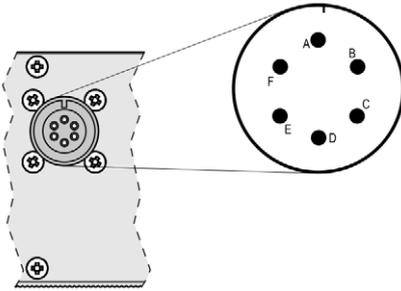


outside view

Pole	Pole assignment
A	ASO+
B	ASO-
C	Timing I in+
D	Not used
E	Timing I in-
F	Analog Power
G	Not used
H	Not used
I	Not used
J	Not used

6 Wiring

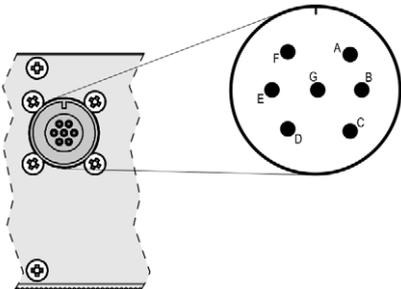
6-Pole Input Connector (MIC3+ CATDI)



outside view

Pin	Pin assignment
A	Pickup1 Signal
B	Pickup1 Power
C	Pickup1 GND
D	Go/NoGo +
E	L +
F	L -

7-Pole Input Connector (MIC3+ CEC)



outside view

6 Wiring

Pin	Pin assignment
A	Pickup1 Signal
B	Pickup1 Power
C	Pickup1 GND
D	Not used
E	L +
F	L -
G	Go/NoGo +

6.2 Wiring the PowerView3

Connector (front view)



Connection of the CAN Cable

The CAN cable supplied with the PowerView3 is connected to the connector supplied with the ignition controller as follows:

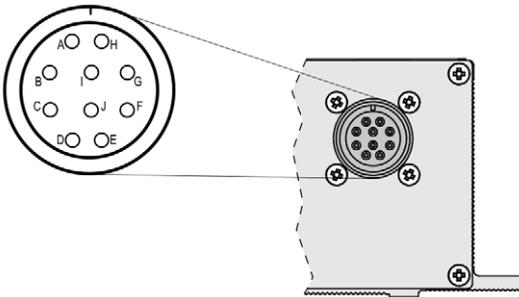
Pin of the Connector	Wire color	Assignment
1	Brown	CAN Low
2	Green	Ground CAN
3	White	CAN High
4	Yellow	Not assigned

6.3 Wiring the DetCon20

If you want to use the DetCon20 detonation control system from MOTORTECH, you need a correspondingly manufactured harness. The ignition controller's auxiliary synchronization output (ASO) provides the signal required for transmitting the ignition timing of the first cylinder. The signal is provided via pin A (ASO+) and pin B (ASO-) of the 10-pole output connector. For further wiring and the necessary settings in the MICT, pay attention to the operating manuals for DetCon20 and MIC3+.

6.4 Wiring Ignition Outputs

10-Pole Output Connector (8 Ignition Outputs)

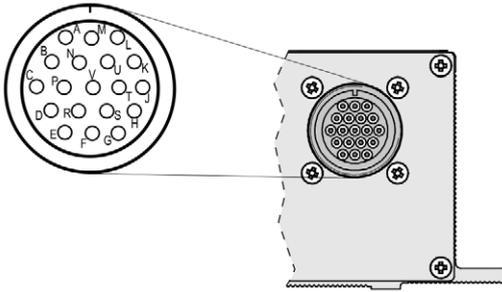


outside view

Pin	Pin assignment
A	Ignition output A1
B	Ignition output A2
C	Ignition output A3
D	Ignition output A4
E	Ignition output A5
F	Ignition output A6
G	Not used
H	Ignition output A7
I	Ignition output A8
J	Ground

6 Wiring

19-Pole Output Connector (12 Ignition Outputs)



outside view

Pin	Pin assignment
A	Ignition output A1
B	Ignition output A2
C	Ignition output A3
D	Ignition output A4
E	Ignition output A5
F	Ignition output A6
G	Not used
H	Not used
J	Ground
K	Ignition output A7
L	Ignition output A8
M	Ignition output A9
N	Ignition output A10
P	Ignition output A11
R	Ignition output A12
S	Not used
T	Not used
U	Not used
V	Not used

7.1 Configuration

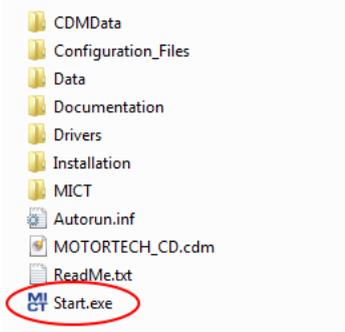


Installing the USB Drivers

In order to create a connection between the MICT and a connected ignition controller, you need USB drivers. These must be installed on the computer on which the MICT is started.

The USB drivers are on the supplied storage device and can be installed via the menu. Start the file *Start.exe* on the storage device. Start the installation routine of the USB driver via *Software -> USB Drivers -> Install USB Drivers*. Follow the instructions of the installation routine.

1. Start the menu by double-clicking the file *start.exe* on the USB flash drive.

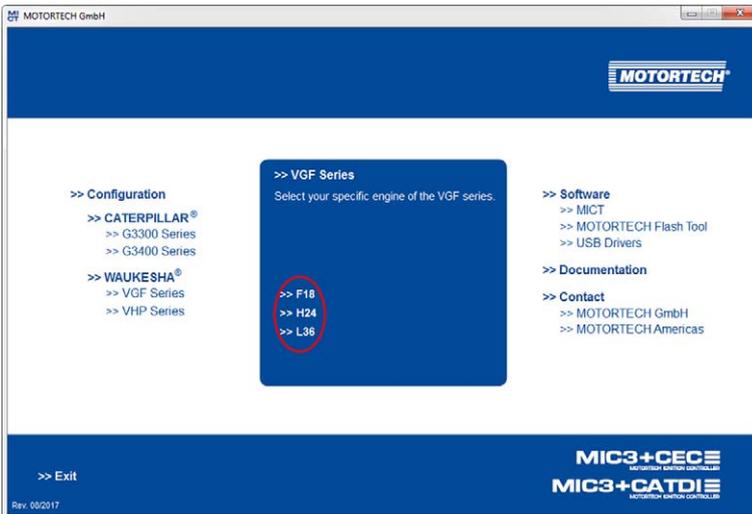


7 Configuration of the Ignition Controller

2. Select the desired engine manufacturer, and click on the desired engine series.



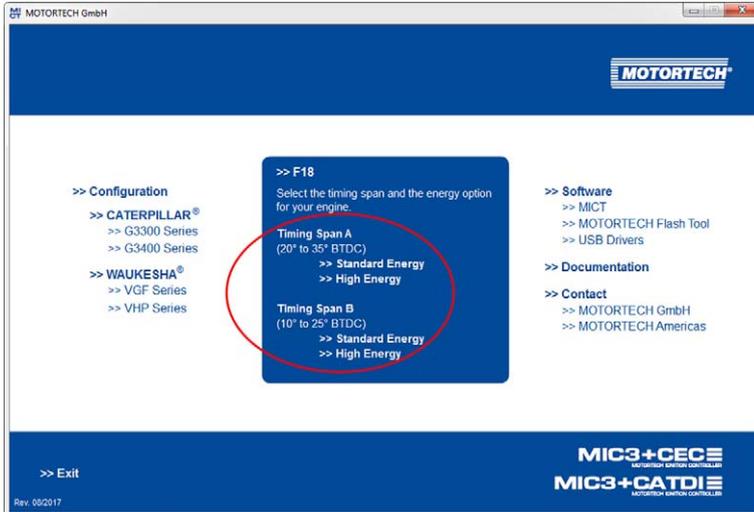
3. Click on the desired engine type.



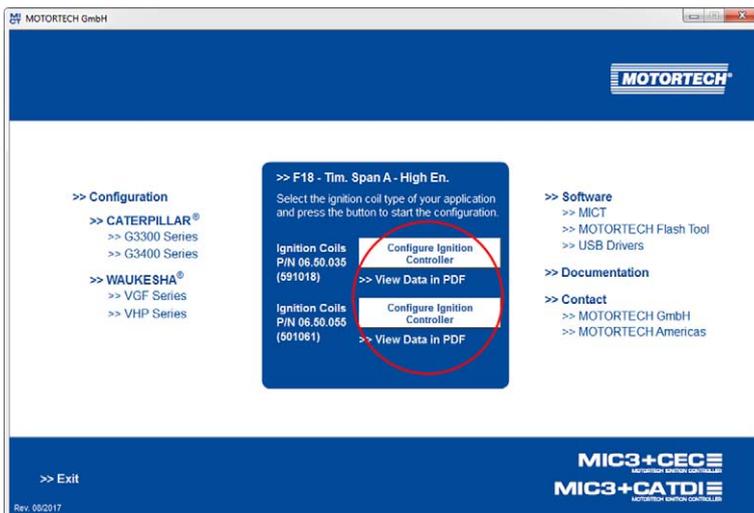
7 Configuration of the Ignition Controller



4. Select the desired settings for ignition timing and energy. With the option *High Energy*, a longer spark duration and a higher spark intensity are set for regular operation. You find the exact values in the PDF files for the configuration files.

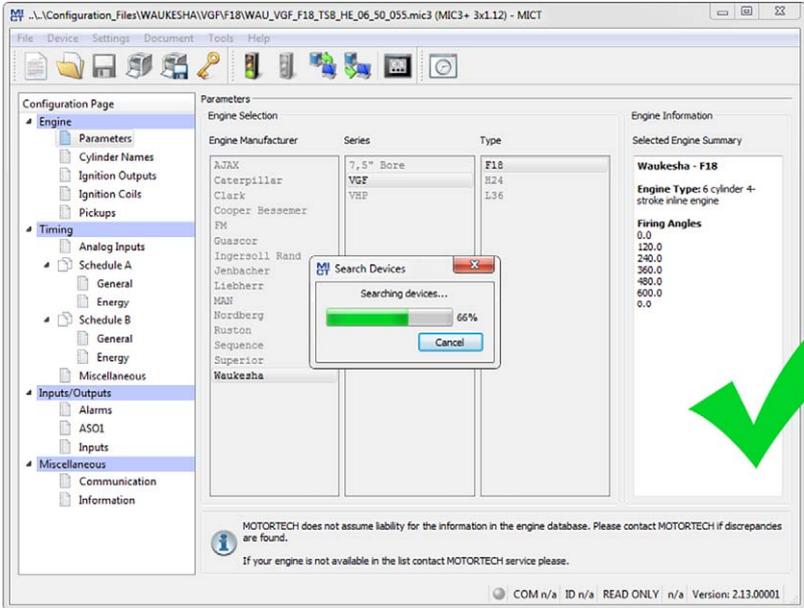


5. Select the installed ignition coils and configure the ignition controller via the button *Configure Ignition Controller* right next to it. You can display the complete configuration data via the link *View Data in PDF*.



7 Configuration of the Ignition Controller

- ▶ The MICT starts and the corresponding configuration is downloaded to the ignition controller. If applicable, the database is updated via an active Internet connection. Updates must be confirmed with *OK*.



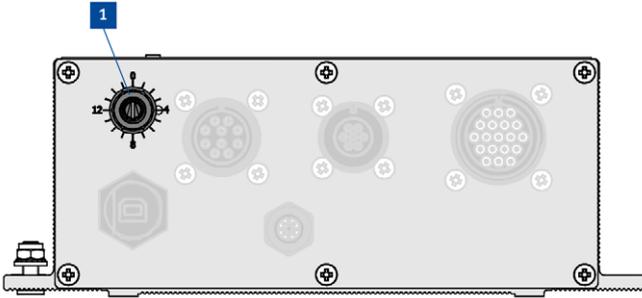
- ▶ If it is not possible to create a connection to the ignition controller, although a USB cable has been properly installed, you should check if the USB drivers are installed on the connected computer (see information box at the beginning of this section).

7.2 Final Inspection

The configuration has been successfully downloaded to the device if the MICT does not display any error messages and the *Status* LED on the ignition controller is flashing green. If no error message is displayed or the *Status* LED lights up red, an error has occurred. In this case, start the MICT at *MICT\bin\MICT.exe* on the storage device. For additional information on troubleshooting, read the operating manual of your ignition controller.

7.3 Adjusting the Ignition Timing

Following a successful configuration of the ignition controller, the ignition timing determined prior to replacing the ignition controller must again be set. This is done, using the ignition timing switch **1** at the lower side of the device.



Setting the Timing

Prior to replacing the ignition controller, an ignition timing of 13° BTDC was determined. During the configuration *Timing Span B* (10° to 25° BTDC) was selected. After the configuration, ignition timing is set to 10° BTDC. Use the ignition timing switch on the device to set the missing three degrees: Starting at position zero, turn the switch three clicks clockwise.

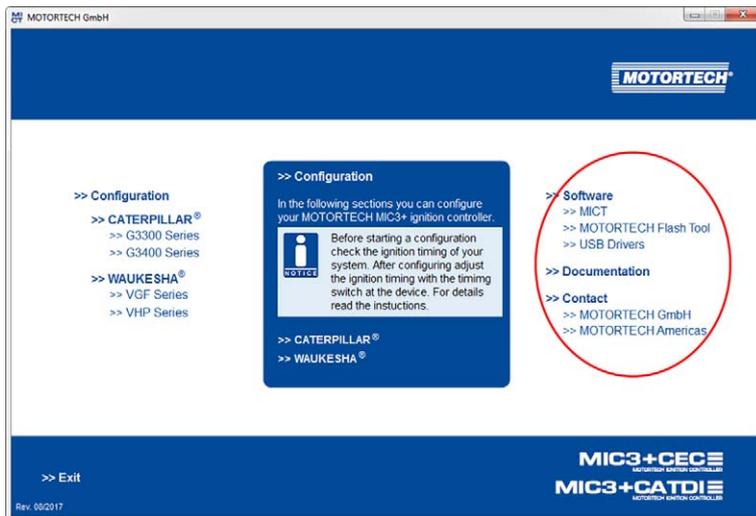
Once the ignition timing has been set, it should be checked with timing light.

8 Additional Information on the Storage Device

In addition to the described possibilities, the supplied storage device contains the following information and software:

- Directory *Documentation*
Operating manual MIC₃+ and quick start guide MIC₃+CEC/MIC₃+CATDI
- Directory *Installation*
Installation files for the MICT and the MOTORTECH Flash Tool
- Directory *Drivers*
USB drivers required for creating a connection between the MICT and the ignition controller.

The additional information and the installation routines for the software can also be accessed via the menu. For this, use the navigation tree on the right.





● **MOTORTECH GmbH**
Hogrevestr. 21-23
29223 Celle
Germany
Phone: +49 (5141) 93 99 0
Fax: +49 (5141) 93 99 99
www.motortech.de
sales@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

● **MOTORTECH Shanghai Co. Ltd.**
Room 1018 Enterprise Square,
No. 228 Meiyuan Road,
Zhabei District
200070 Shanghai, China
Phone: +86 (21) 6380 7338
www.motortechshanghai.com
info@motortechshanghai.com