

MCE/CFE18 Manual



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1 Description and scope of delivery

Thank you for purchasing your MCE18. With the CANchecked Multifunction Can Bus Extension, you can feed additional sensors to your Can Bus and thus serve as an Input/Output Expander. The MCE18 does not have an internal mapper and places the measured sensor voltages directly on the data bus.

This manual applies equally to its sister product, the CFE18.

There are three versions of the MCE18, some of which differ in terms of functionality and pinout. The safest way to find out which version you own is to take a look at the revision number on the back of the board. To do this, loosen the four screws that hold the back plate, then remove the board and read the revision on it.

In Chapters 2 you will find the assignment of the revision number to the variant of the MCE18. For version 3 devices, this is engraved on the case (V3).

This guide explains how to operate and handle your MCE18. In addition to connecting and updating, this guide also covers the connection and operation of our "Device Setup Software" (*DSS*).

In the box you will not only find the MCE18, but also the following items are included:

- The Quickstart Guide
- one AMP Superseal connector (TE 4-1437290-0)
- 36x AMP Superseal pins for self-crimping 1.0 20AWG (TE 3-1447221-4)
- Three 2.54 mm jumpers

Your MCE18 itself has a status LED, an AMP Superseal connector and a MicroUSB port on the board (version 3). This is not accessible without disassembling the unit and usually does not have to be used by the customer. The MicroUSB on the board is redundant to the USB pinout of the AMP connector, which all versions have.

The digital inputs can optionally be equipped with an internal pull-up resistor (20-50 kOhm). The setting is done in the DSS. You can find more information about this in chapters 4.

On the back of the board you can attach three jumpers (by default they are not mounted).

Jumper 1: Can Bus Termination 120 Ohm (all versions)

Jumper 2: AIN 1 (all versions), AIN 2 (V1 and V2 only) 1 kOhm

Jumper 3 AIN 6 (all versions), AIN 7 (V1 and V2 only) 1 kOhm

Terms associated with the MCE18 are shown in italics in this guide for better understanding.

The following illustration shows the dimensions of the MCE18.



2 Connection of the plugs

To operate your MCE18, only four wires are needed:

- 12 volt on-board voltage, ideally ignition plus -> Pin 1
- Vehicle Mass -> Pin 2
- Can High (*CanH*) -> Pin 26
- Can Low (*CanL*) -> Pin 27

The wires of CanH and CanL always act as twisted wires in order to minimize interfering signals.



The MCE18 has analog inputs (AIN – analog input), digital inputs (DIN – digital input) and digital outputs (AUX – auxiliary output). The inputs are placed on the Can bus as 0-1023 ADC values. An internal mapping of the values has not yet been implemented.

The power supply to operate the analog sensors can also be realized directly via the MCE18. During operation, 5V is applied to the corresponding pins, and you can obtain the sensor ground via the "S-GND". The maximum current of 0.5 amps should not be exceeded.

Verification and setup are done through the DSS.

The *DSS* must be downloaded and installed for use. The download is free of charge at <u>https://www.canchecked.de/downloads-category/dss-display-setup-software/</u>. The *DSS* is available for Win32, Win64 and MacOS.

The following manual only partially covers V1 devices. These can NOT be connected to the DSS. V2 and V3 devices can be connected to the DSS without any problems.

3 Updating with the CANchecked Updater

The MCE18 can be flashed with the CANchecked MFD15 Updater from our website. Before running the updater, the driver must be installed properly.

The driver can be downloaded from the Siliconlabs website:

https://www.silabs.com/developers/usb-to-uart-bridge-vcp-drivers

The update file and updater can be downloaded from our website:

MCE18 - Multifunction Can Bus Extension > Displays for Engine Management (canchecked.de)

To connect the MCE18 to the PC via USB, the 4 wires of a USB cable must be pinned into the Superseal connector. As of board revision 0.8b, there is a redundant microUSB port on the board. To get to it, the MCE18 must be disassembled.



With this pinout you can pin the USB cable to the Superseal connector yourself:

Illustration 1: USB Cable Colors

٠	Red:	USB 5V	->	Pin 5
٠	Green:	USB Data+	->	Pin 6
•	White:	USB Data	->	Pin 7
•	Black:	USB GND	->	Pin 8

A TTL adapter is required for flashing the CFE18.

One possible device is a "UART TTL - CP2102". It is important that this has "DTR". The adapter must be wired to the CFE18 as follows:

- 5V -> 5V
- GND -> GND
- RX -> TX
- TX -> RX
- DTR -> DTR

Once the MCE18 is properly wired and plugged in, it will appear as a COM port in Windows Device Manager as well as in the Updater. If this is not the case, please check the COM port and make sure the driver is installed successfully. For the update process, it is important that the MCE18 is only powered via USB and does not get 12V.

Once you have started the updater, the baud rate should be set to **125000**. Click on "Select Flash Hexfile" to select the previously downloaded hex file. Then, you need to click on "Start Bootloader". Now the software connects to the MCE18, as soon as the button turns green, you have to press the "Program Flash" button. Now the "Progress" bar runs through. After clicking on "Exit Bootloader" you can disconnect the device and you are done with the update.

4 Connecting to the DSS

You can configure your MCE18 via the DSS.

You can download the *DSS* free of charge from our website at <u>www.canchecked.de/dss/</u>. This is available for both PC and Mac. On our website you will find a quick guide on how to download and install it. You can also find the **driver** you need for **Windows 7** here. Once you have installed the *DSS*, you can run it, you should be able to see the following home screen and click on the CANchecked logo to get to the selection field of the device to be connected.



Illustration 2: DSS Startup

Here you click on the selection field for addon (below) and now you will get to the tab overview. If you are not yet connected, only the Connection tab is available. To connect, click on the corresponding COM port and then press "connect". After a successful connection, the following tabs are available:

- Connection
- Settings
- Live Value

4.1 Settings/Default stream

After you have connected your MCE18 to the DSS, you can configure the settings for the Can Transmit under Setup. Here you can find the MCE18 settings and the configuration of the standard protocol.

MCE18 Settings					
setup your MCE18 addon module					
protocol standard	•	select protocol (default = standard)			
can transmit rate 50 Hz 🔹		default 50 Hz			
can speed 500kbps	•	select can bus speed (default 500kbps)			
data CAN config ID 70A		can bus id in HEX for configuring the MCE18 via can bus data (default 0x70A)			
Standard protocol					
data CAN TX ID 700	0001	can bus id in HEX for sending data (default 700)			
data CAN RX ID 640		can bus id in HEX for receiving data (default 640)			

You can set the transfer rate, the Can Bus speed, and the addresses for sending and receiving the Can Bus messages. As always, the Can Bus speed is identical in ECU and MCE18. In the following table you will find the exact addresses of the individual inputs and outputs in the standard protocol.

Byte	0	1	2	3	4	5	6	7
ТΧ	AIN0	0-1023	AIN1	0-1023	AIN2	0-1023	AIN3	0-1023
Base								
ID								
ТΧ	AIN4	0-1023	AIN5	0-1023	AIN6	0-1023	AIN7	0-1023
Base								
ID +1				-				
ТΧ	AIN8	0-1023	Bit	Bit	Ethanol	Bit	internal	version
Base			masked	masked	Temp	masked	Temp	
ID +2			DIN0-7	AUX1-3		Freq		
						Enabled		
ТХ	FreqIn1	0-60000	FreqIn2	0-60000	FreqIn3	0-60000	FreqIn4	0-60000
Base								
ID +3								

Furthermore, you can also configure the 20-50 kOhm software pullups for the digital and analog inputs in Settings. You can switch between OFF and ACTIVE. The MCE18 has 7 DIN and the CFE18 has 8 DIN.

If the internal pull-up is activated, the digital input should be switched to ground. If it is not activated, the input can be switched to 5 or 12V. The "HIGH" state corresponds to a 1 on the Can bus.

➡ DIN softwa	re pullup (20-50K)	● AIN softwa	are pullup (20-50K)	
select whether you n	eed a pullup resistor (default OFF)	select whether you need a pullup resistor (default OFF)		
DIN0 pullup	OFF T	AIN0 pullup	OFF T	
DIN1 pullup	OFF T	AIN1 pullup	OFF •	
DIN2 pullup	OFF V	AIN2 pullup	OFF •	
DIN3 pullup		AIN3 pullup	OFF •	
		AIN4 pullup	OFF •	
	OFF +	AIN5 pullup	OFF 🔻	
DIN5 pullup	OFF •	AIN6 pullup	OFF •	
DIN6 pullup	OFF •	AIN7 pullup	OFF •	
DIN7 pullup	OFF •	AIN8 pullup	OFF •	

Furthermore, under the item AIN smoothing you will find the possibility to calm your analog inputs.

The switching outputs (AUX) have the following states:

- byte 0: AUX1 (0=off | 1=ON)
- byte 1: AUX1 (0=off | 1=ON)
- byte 2: AUX1 (0=off | 1=ON)

● AIN smoothing				
smooth your analogue inputs - highe	er number = slower a	nd smoother value - default 160 (0-249)		
AIN0 smooth factor	160			
AIN1 smooth factor	160			
AIN2 smooth factor	160			
AIN3 smooth factor	160			
AIN4 smooth factor	160			
AIN5 smooth factor	160			
AIN6 smooth factor	160			
AIN7 smooth factor	160			
AIN8 smooth factor	160			

Under Frequency Input you can change some inputs to a frequency input. The maximum input frequency is 65kHz. You can adjust the damping in different levels or select the ethanol sensor (DIN6 only).



4.2 LiveData

Under the LiveData tab you will find the current measured values and statuses of your inputs and outputs. By clicking on the + icon, you can expand the individual inputs and outputs to view the values.

5 Connection Guides

5.1 Haltech

Please activate the Haltech Box to be emulated in the DSS:

- IO-A 4 analog inputs, 4 switching inputs (ON/OFF), 3 switching outputs (ON/OFF)
- IO-B 4 analog inputs, 4 switching inputs (ON/OFF), 3 switching outputs (ON/OFF)
- IO-A+B 8 Analog Inputs, 4 Switching Inputs (ON/OFF), 3 Switching Outputs (ON/OFF)

Furthermore, you must set the CAN bus speed to 1 Mbit/s, as usual with Haltech.

MCE18 Se	ttings		
setup your MCE18	addon module		
protocol	Haltech IO B	•	select protocol (default = standard)
can transmit rate	50 Hz 🔻		default 50 Hz
can speed	1Mbps 🔻		select can bus speed (default 500kbps)
data CAN config ID 70A			can bus id in HEX for configuring the MCE18 via can bus data (default 0x70A)

In the table below you will find an assignment of the MCE18 pins to the pins of the IO boxes.

MCE18 Pin	IO-A	IO-B	IO-A+B
A0	AV1	AV1	IO-A AV1
A1	AV2	AV2	IO-A AV2
A2	AV3	AV3	IO-A AV3
A3	AV4	AV4	IO-A AV4
A4	-	-	IO-B AV1
A5	-	-	IO-B AV2
A6	-	-	IO-B AV3
A7	-	-	IO-B AV4
A8	-	-	-
D0	DP1	DP1	IO-A DP1
D1	DP2	DP2	IO-A DP2
D2	DP3	DP3	IO-A DP3
D3	DP4	DP4	IO-A DP4
D4	-	-	IO-B DP1
D5	-	-	IO-B DP2
D6	-	-	IO-B DP3
D7	-	-	IO-B DP4
AUX1	DPO1	DPO1	IO-A DPO1
AUX2	DPO2	DPO2	IO-A DPO2
AUX3	DPO3	DPO3	IO-A DPO3
D6 Frequency*	DP1 freq	DP1 freq	IO-A DP1 freq

*D6 Frequency: The duty cycle is still determined by the digital input (ON/OFF)

Then it continues in the Haltech NSP software. Here are the steps to be taken:

In the drop-down menu, activate the port to which the IO box will be connected.



Then select the expander box you want to emulate (use the same setting as in the DSS).

File Edit Setup Tools Logging Prefere	File Edit Setup Tools Logging Preferences Help				
= ⊑(?) ∃ @ [₀ E			F 🖬 🛱 🗗		
Enable/Disable Functions (F4)	Main Idle Control Boost Contr	ol Diagnostics Trigger Setup	+ Add New Page (Ctrl+Shift		
Q 🛛 🗙 🗴					
Vehicle Information	0 -	1,4 0,0	1 im -10		
Favourites					
Elite 1500 ECU V3.09.2 - Release	Trig Errs				
Engine Configuration	No Errors				
Sensors					
Fuel Tuning		None V	DIC Severity		
Ignition Tuning	WBC-2 (Box D)				
Engine Functions			Dynamometer		
Electrical					
Transmission	DTC Severity	None	Dyno		
Vehicle Functions					
Generics	Input/Output Expander Boxes		Thermocouple Amplifier I		
Haltech CAN System			mennocoupic Ampiner		
Vehicle CAN System	l/O Expander 12 (Box A)		TCA-2 (Box A)		
Datalog	Description		Description		
I/O Expander Box A					
I/O Expander Box B	DTC Severity	None			
Octo Thermocouple Amplifier Box	💽 I/O Expander 12 (Box B)		TCA-2 (Box B)		
Halteen CAN Supported Dash	Description		Description		
	DTC Severity	None			
	Pace Expansion Modules		TCA-4 (Box A)		
	Race Expansion Modules		Description		

Then all you have to do is check whether your Haltech ECU correctly recognizes the MCE18 as an expander (Status: connected, Firmware: 1.23.0).

💋 Haltech NSP - test bench					
File Edit Setup Tools Logging Preferences Help					
≡ ⊑ (?)] @ [⊕ [$\mathbf{D} \square \square \square \square \square \square \square \square \blacksquare \blacksquare \blacksquare \square \blacksquare \square \blacksquare \blacksquare \blacksquare \blacksquare \square \square \square \blacksquare \blacksquare$				
Enable/Disable Functions (F4)	Main Idle Control Boost Control Diagnostics Trigger Setup + Ac				
x	RPM RPM F-Load kPa TPS % GenSens				
Vehicle Information Favourites Elite 1500 ECU V3.09.2 - Release Engine Configuration Sensors Fuel Tuning Ignition Tuning Ignition Tuning Engine Functions Electrical Transmission Vehicle Functions Generics Haltech CAN System Vehicle CAN System Vehicle CAN System Datalog I/O Expander Box A I/O Expander Box A	0 -1,4 0,0 Out				
Octo Thermocouple Amplifier Box Haltech CAN Supported Dash					
	Haltech NSP - test bench ile Edit Setup Tools Logging Prefe Enable/Disable Functions (F4) K Vehicle Information Favourites Elite 1500 ECU V3.09.2 - Release Engine Configuration Sensors Fuel Tuning Ignition Tuning Engine Functions Electrical Transmission Vehicle Functions Generics Haltech CAN System Vehicle CAN System Vehicle CAN System Vehicle CAN System Datalog VO Expander Box A VO Expander Box A VO Expander Box B Octo Thermocouple Amplifier Box Haltech CAN Supported Dash				

The "Active State" is ignored fort he output configuration. The output will only be switched to ground, when it's active.

5.2 ECUmaster

Please activate the Can Switchboard V3 in the DSS. As always, the Can Bus speed is identical in ECU and MCE.

● MCE18 Set	ttings		
setup your MCE18 a	addon module		
protocol	EMUv3	•	select protocol (default = standard)
can transmit rate	50 Hz 🔻		default 50 Hz
can speed	500kbps 🔻		select can bus speed (default 500kbps)
data CAN config ID 70A			can bus id in HEX for configuring the MCE18 via can bus data (default 0x70A)

With the Can Bus Data Format version 3, the EMU supports more analog inputs via Can Bus. Up to 8 analogue inputs can be sent to the control unit. To do this, please activate the ECM switch board in the EMU software under "CAN, Serial". To do this, please tick the box and select "CSB V3 0x640" as the CSB type. Furthermore, the checkmarks for the individual AINs must be set. As usual, all changes are written to the ECU using the "make permanent" button.

📃 CAN, Serial - ECM switch boa	rd 🗖 🗖 🔀
ECM switch board	
Enable	
CSB Туре	CSB V3 0x640
Enable debouncing	
Enable Ain#1 (@AIN CAN#1)	
Enable Ain#2 (@AIN CAN#2)	✓
Enable Ain#3 (@AIN CAN#3)	✓
Enable Ain#4 (@AIN CAN#4)	✓
Enable Ain#5 (@AIN CAN#5)	✓
Enable Ain#6 (@AIN CAN#6)	✓
Enable Ain#7 (@AIN CAN#7)	✓
Enable Ain#8 (@AIN CAN#8)	

MCE18 Pin	ECM switch board
A0	CAN Analog In #1
A1	CAN Analog In #2
A2	CAN Analog In #3
A3	CAN Analog In #4
A4	CAN Analog In #5
A5	CAN Analog In #6
A6	CAN Analog In #7
A7	CAN Analog In #8
A8	unused

5.3 LinkECU

Please activate the standard protocol in the DSS. As always, the Can Bus speed must be set identically in the ECU and MCE. The CAN TX ID remains set to 0x700 by default.

In the Link software under "ECU Controls" => "CAN Setup" activate four "Receive User Streams" with different CAN IDs:

🖴 CAN Setup				-		×
Mode Streams Test Calculator	CAN Devices Custom CAN File					
CAN Configuration CAN Module CAN 1	Mode User Defined V	Bit Rate 500 kbit/s V	OBD OFF OISO 15765	5 on CAN	1	
Data Channel 2: Receive User Stream 1 2: Receive User Stream 2 3: Receive User Stream 3 4: Receive User Stream 4 5: OFF 6: OFF 7: OFF 8: OFF 9: OFF 10: OFF	Mode Receive User Stream 1	▼	CAN ID ID (decimal) 1792	Form. No Ex	at ormal tended	
		Help	pply	Ok	Can	cel

- Stream 1: 1792
- Stream 2: 1793
- Stream 3: 1794
- Stream 4: 1795

In the "Streams" tab, import the .lcs files provided by us for the respective streams via "Load Stream":

🔮 CAN Setup				-		×
Mode Streams Te: Stream 1 Stream 2 Frame 1 Stream 3 Frame 1 Stream 4 Stream 4 Stream 5 Stream 6 Stream 7 Stream 8 Stream 9 Stream 10	Stream Add Frame Load S Delete Frames Save S Parameter	Custom CAN File	e ID Position ID (None > 2000 Byte Or Type	decimal) Multi	Add Delete Divider	Offset
0 1 2 3 1 5 6 7 8 9 10	11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 1 1 2 13 14 15 16 17 18 19 20 21 22 23 24 25 1 2 2	26 27 28 29 30 31 32 33 34 35 36 3 4	<u>37 38 39 40 41 42 43 44 45 46 47 48</u> 5	6	5 56 57 58 59 60 7	0 61 62 63
		H	lelp Apply	Ok		Cancel

You can find the streams here:

https://www.canchecked.de/downloads/mce18-multifunction-can-bus-extension/

If you want to connect the ethanol sensor to the MCE18, activate the ethanol option on frequency input 1. You will find the temperature as "Can Freq 8" and the ethanol content as "Can Freq 1" Make sure to subtract 50 from the ethanol content (Streams => Stream 4 => Frame 1 => "Can Freq 1" => Offset = -50).

	\oplus ×
CAN An 1	0.000
CAN An 2	0.000
CAN An 3	0.000
CAN An 4	0.000
CAN An 5	0.000
CAN An 6	0.000
CAN An 7	0.000
CAN An 8	0.000
CAN DI 1	Inactive
CAN DI 2	Inactive
CAN DI 3	Inactive
CAN DI 4	Inactive
CAN DI 5	Inactive
CAN DI 6	Inactive
CAN DI 7	Inactive
CAN Freq 1 (Hz)	50.0
CAN Freq 2 (Hz)	0.0
CAN Freq 3 (Hz)	0.0
CAN Freq 4 (Hz)	0.0
CAN Freq 8 (Hz)	24.0

To calibrate an analog input for your sensor, use "Multiplier", "Divider" and "Offset".

The CANchecked fuel/oil pressure sensor (0 to 10bar/1000kpa) is used as an example - a value in kpa is generated here:

- Multiplier: 1250
- Divider: 1023
- Offset: -125

5.4 Motec (BETA!)

Change the protocol to "Motec E888". By default, the Can Bus data is transmitted with 0xF0. If you want to connect two MCE18 in the Can Bus, change the "data CAN TX ID" of the second device to 0xF8 and you can use both devices in parallel.

Change the transmission speed to 200Hz.

Follow the Motec E888 instructions for setup. Here is the pinout:

MCE18 Pin	E888
A0	AV1
A1	AV2
A2	AV3
A3	AV4
A4	AV5
A5	AV6
A6	AV7
A7	AV8
A8	TC1 (0.001 scaling)
Freq1 (D6)	Freq1
Freq2 (AIN1)	Freq2
Freq3 (AIN2)	Freq3
Freq4 (AIN7)	Freq4
EthanolTemp	TC8
D0	Dig1
D1	Dig2
D2	Dig3
D3	Dig4
D4	Dig5
D5	Dig6

5.5 MaxxECU

Please enable the standard protocol in the DSS. As always, the Can Bus speed is identical in ECU and MCE.

All further steps to use the MCE18 with your MaxxECU can be found in the MaxxECU Help:

https://www.maxxecu.com/webhelp/can-external_devices-canchecked_mce18.html.

When you want to use the outputs of the MCE18, define a "Can Output" under "CAN Bus" => "CAN Outputs". You might need your own variables. When the variable is 1, the output is active. When 0, the outputs is inactive. Set all variables to "unsigned 8 bit"

MaxxECU MTune DISCONNECTED			
	OFFI INF		
	OFFLINE		
ECU Tuning Shortcuts	CAN Output 1		
Idle control	CAN output Value 1		
Motorsport	Enable	2 Enable V	
🖬 - Speed/Gear		NCE19 AUX	
📮 CAN Bus	Description	MCE 18 AUX	
CAN settings	CAN Bus	? CAN 1 ~	
CAN OBD2 input	CAN Message ID Type	? Standard 🗸	
g- CAN Tools	CAN Message ID	2 0x640	
CAN Inputs	Endine	a Little endian	
CAN Outputs	Chulan		
CAN Output 1 (MCE 18 AUX)	Values in this package	? 3 ~	
	Message rate	? 10Hz ∨	
CAN Output 4			
CAN Output 5	Data value 1		
CAN Output 6	Туре	7 Variable - unsigned 8 bit ~	
CAN Output 7	Variable	BPM	
CAN Output 8	Valiable		
CAN Output 9	Offset	? Output = (Indata*Multiplier/Divider) + Offset	
CAN Output 10	Multiplier	? 1	
	Divider	? 1	
	Data value 2		
	Туре	Variable - unsigned 8 bit 🗸	
Longer Real Time Shortoute	Variable	BPM	
	Vanable		
search value E-throttle N	Offset	0 Output = (Indata*Multiplier/Divider) + Offset	
-Analog Inputs E-throttle N	Multiplier	1	
User AIN1 IAT input v User AIN2 TPS input v	Divider	1	
User AIN5 USER AIN			
User AINO USER AIN User AIN7 USER AIN	Data value 3		
User AIN8 USER AIN	Туре	Variable - unsigned 8 bit \sim	
CLT input voltage USER AIN	Variable	BPM	
E-throttle Mod AIN1 voltage			
	Unset	Output = (Indata' Multiplier/Divider) + Offset	
General Tuning Idle Boost WT	E-Throttle		
RPM AIN on TPS in Main pedal position	on Throttle position La	ambda Coolant temp Intake air temp Total fuel trim	

5.6 Others

Please enable the standard protocol in the DSS. As always, the Can Bus speed is identical in ECU and MCE.

5.7 CANchecked Data Display

To connect the MCE18 to one of our displays, the MCE18_v3.TRI must be loaded on the display or added to your active TRI/TRX. The MCE18 only sends the 0-1023 ADC values to the Can Bus, these must be mapped to the actual measured values in the data display accordingly. Initcalc and Initoffset are used for linear sensors (BST01, FLP01, TCC01 etc.):

$$Initcalc = \frac{(value \ at \ 0 \ Volt) - (value \ at \ 5 \ Volt)}{1023}$$

Initoffset = -(1023 * Initcalc - (value at 5 Volt))

Non-linear sensors such as our NTCO1 must be mapped by using usertables. To do this, a usertable must first be created as a sensor in the TRI Editor and then filled in the DSS settings. The usertable for our NTCO1 looks like this:



For non-brand sensors, these values must be measured by the customer. A pot of boiling water and an external thermometer are best suited for this purpose. It should be noted that both the X and Y axes must be ascending.

6 FAQ

In this chapter, recurring questions are collected, and solutions are offered.

6.1 Does the MCE18 come pre-configured

The MCE18 comes with our standard configuration. This is described in chapters 4.1 described. It is possible to change these default values with the DSS.

6.2 My inputs influence each other

With versions 1 and 2, it can happen that unused analog inputs change with changes to adjacent inputs. This behavior is normal. If this is not desired, it can be avoided by wiring the unused inputs to ground.

6.3 Unable to connect to DSS

If you can't connect your MCE to the DSS despite wiring the USB correctly, there could be two other reasons. The first cause is the lack of the appropriate driver. You can find the information about this in chapters 4. If the driver is up-to-date and the COM port is correctly detected, the cause is probably different. Cause two: The firmware on your MCE18 is outdated and does not yet support a DSS connection. In this case, an update of your firmware is necessary. The corresponding steps are described in chapter 4 described.

6.4 How to Choose the Right Offset, Multiplier, Divider and Resolution

The analog inputs provide 10bit resolution and thus values from 0 to 1023. The value must be converted in the control unit. All values are "unsigned little endian"

Example 1:

Value to display: AIN1 Voltage 0-5V Can ID: 0x700 Byte0+1 Multiplier: 5; Divisor: 1023; Offset: 0

or

Multiplier: (5/1023=) 0.004887585533; Divisor: 1; Offset 0

Example 2:

Value to be displayed: AIN7 TCC01 Thermocouple Converter Type K 0-1250 Degree Celsius Can ID: 0x702 Byte6+7 Multiplier: 1250; Divisor: 1023; Offset: 0

or

Multiplier: (1250/1023=) 1.2218963832; Divisor: 1; Offset: 0

You are also welcome to download and use our tool: <u>https://www.canchecked.de/updater/maxxecu-sensor-calculation.xlsx</u>

6.5 How do I connect speed inputs?

The MCE18 is not designed for the connection of speed inputs. However, it has 4 frequency inputs for ethanol, turbospeed or Hall sensors. How do I change the Can Bus settings?

Changing the Can Bus settings is done via the DSS. The detailed process is described in chapter 4.1.

6.6 How do I change the Can Bus settings?

The Can Bus settings are changed via the DSS. The detailed process is described in chapter 4.1.

6.7 Can I put 12V on the DIN

On CFE18 and MCE18, no 12V may be added to the digital inputs.

6.8 Supports the MCE18 29 bit can IDs

An integration of 29 bit Can IDs has not yet taken place.

6.9 At what rate is the data recorded?

Different sampling rates are possible on the MCE18. You can adjust the frequency from 5 to 250 Hz. A sampling rate of 50 Hz is recommended to minimize the Can Bus load.

6.10 How to connect a Flexfuelsensor

Connect the flex fuel sensor with the signal to DIN 6. Ground and 5V can be taken directly from the MCE18. An external resistor is not necessary, it is sufficient to activate the internal pull-up under Settings. A frequency of 50 Hz corresponds to 0% ethanol. A frequency of 150Hz is 100% ethanol. The multiplier for the conversion is 1 and the offset is -50. The temperature read out from the Flex Fuel sensor is also supported, transmitted via Can Bus and visible in the DSS.

6.11 Where do I connect ground switches?

Groundswitches can be connected to the digital inputs. To do this, please activate the internal pullup in the DSS.

7 Document Changelog

Rev 1.0 – initial Version for Firmware 0.9

- Rev 1.1 FreqIn added
- Rev 1.2 Updated EMU and FAQ
- Rev 1.3 Updated FlexFuel FAQ
- Rev 1.4 Added Display Mapping