

TLE8082ES + TLE8080EM

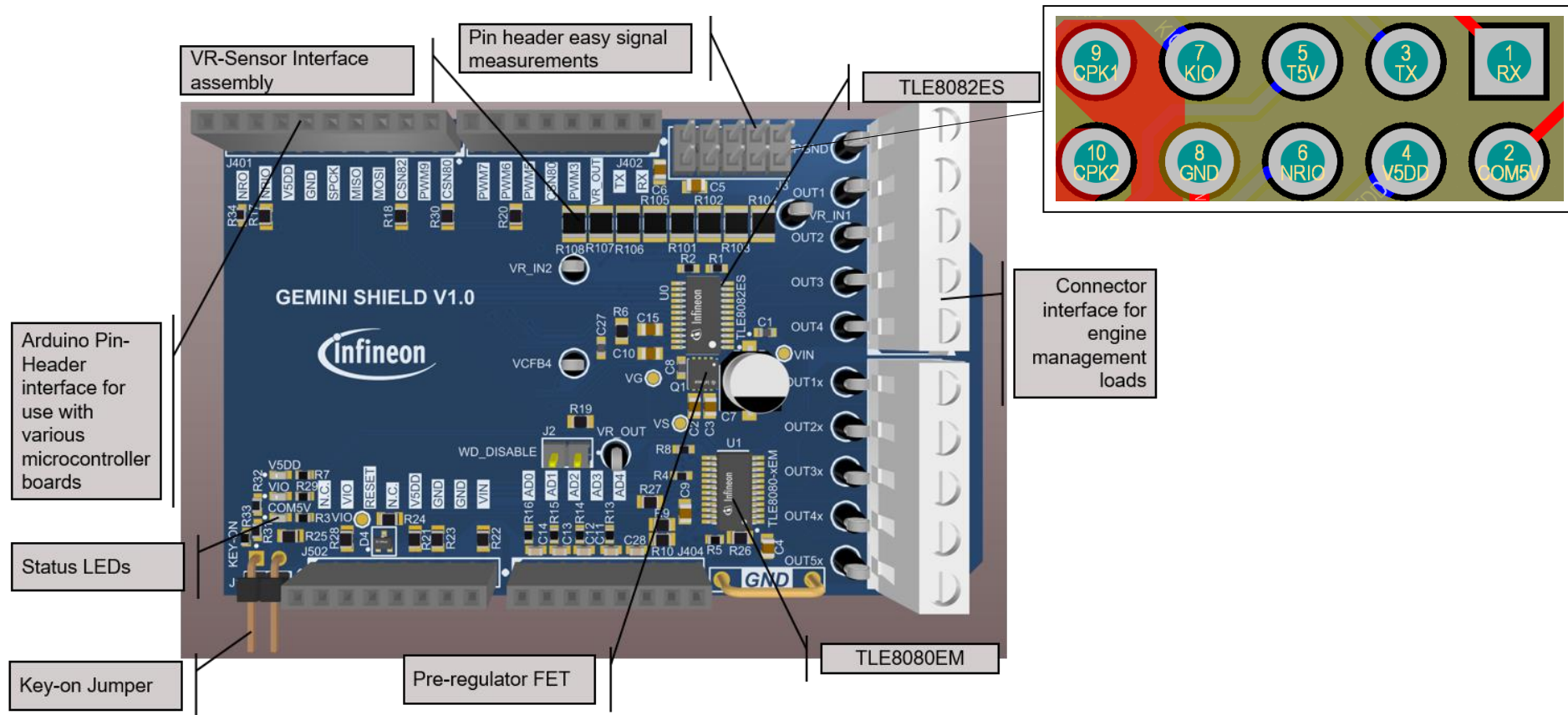
Evaluation board

Getting Started



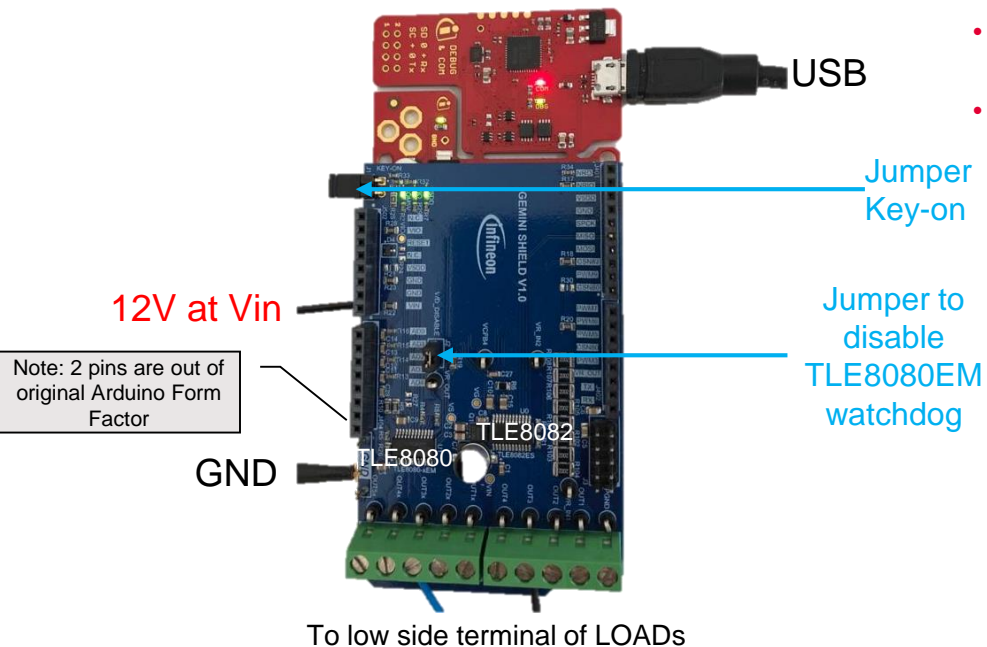
Evaluation board

Overview

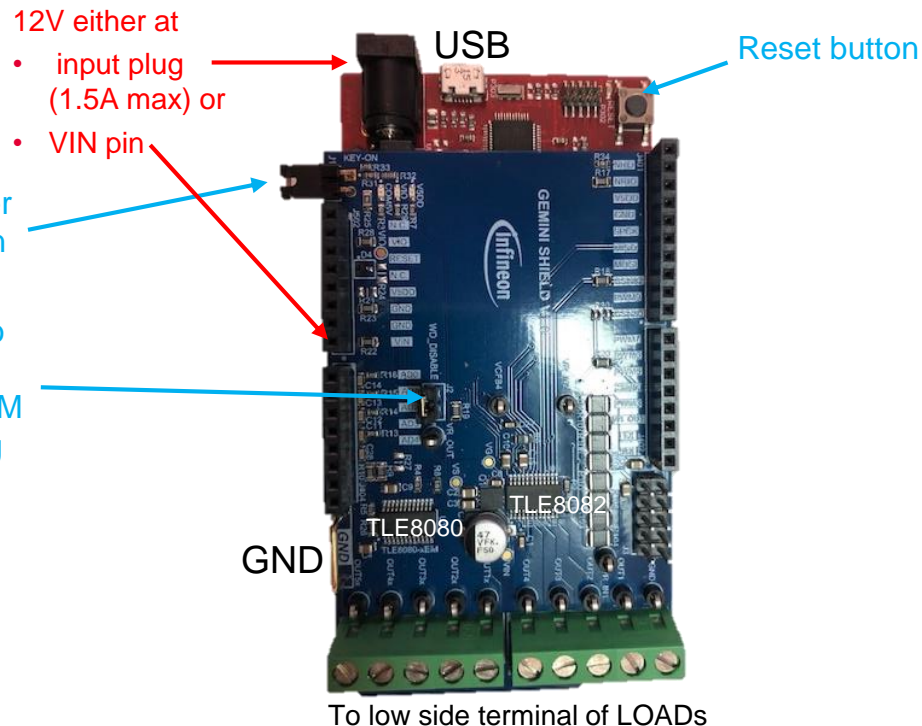


An Arduino Sketch is available for two different setups

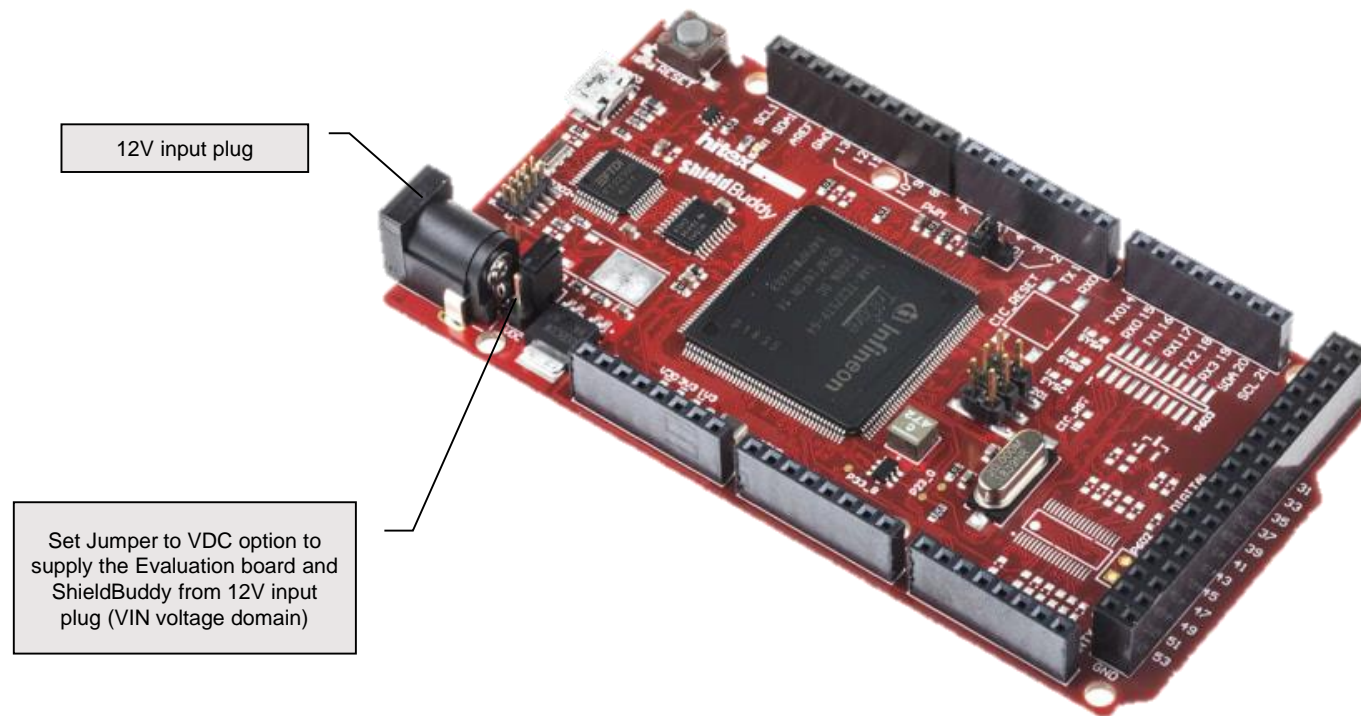
XMC microcontroller board setup



Aurix ShieldBuddy setup



NOTE for ShieldBuddy setup



XMC microcontroller Software environment

- › Obtain the official Arduino IDE or any other Arduino IDE you prefer e.g. Visual Studio Code incl. [PlatformIO](#)
 - *Note: this guide and the UM refer to the Standard Arduino IDE*
- › Integrate the XMC platforms to your Arduino IDE, see [link](#)

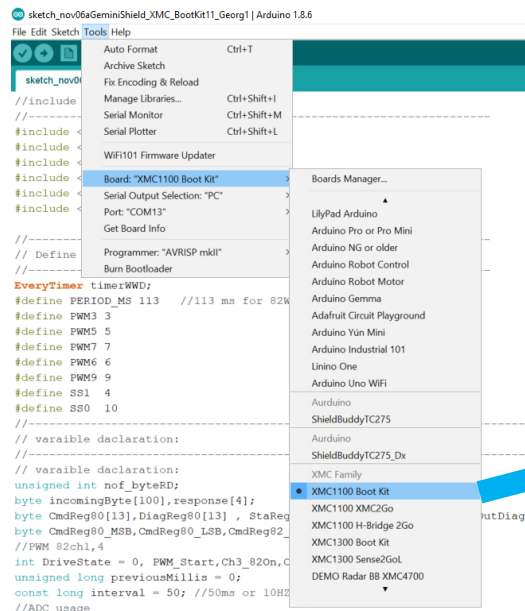
Aurix ShieldBuddy Software Environment

- › Obtain the official [Arduino IDE](#) or any other Arduino IDE you prefer e.g. Visual Studio Code incl. [PlatformIO](#)
 - *Note: this guide and the UM refer to the Standard Arduino IDE*

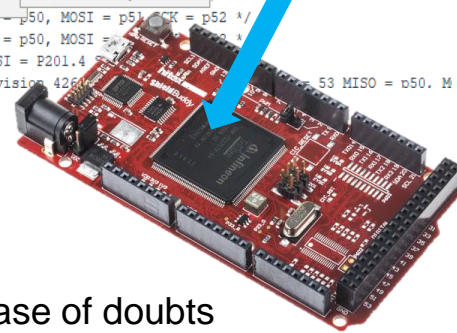
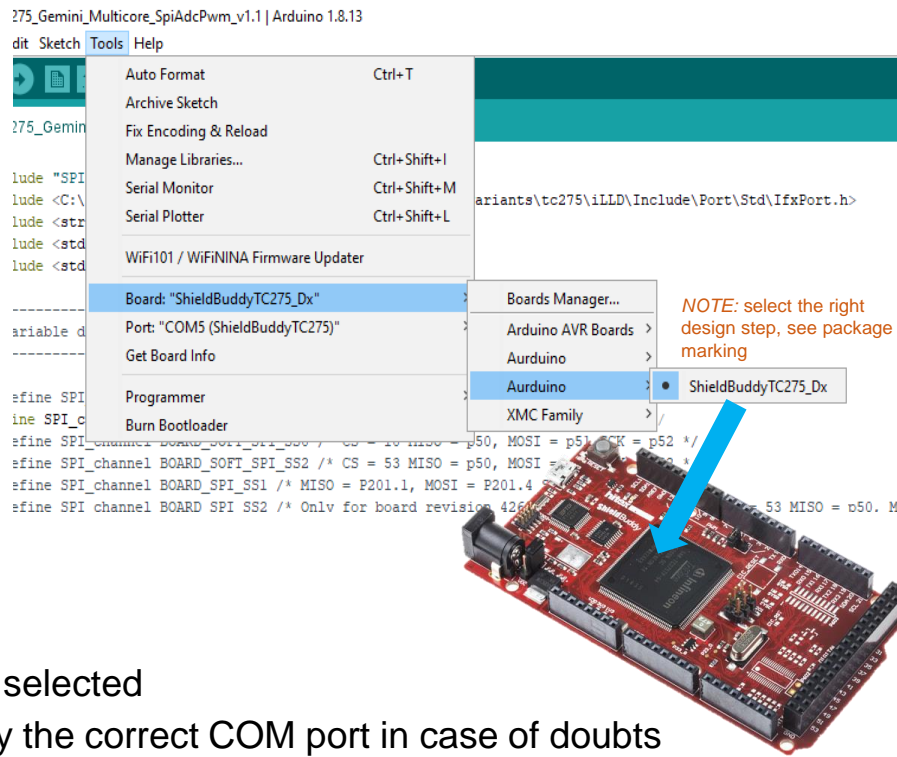
- › If not done already, please install
 - the [FreeEntryToolchain](#) to use Aurix microcontrollers
 - the [ShieldBuddy](#) platform to integrate the ShieldBuddy to your Arduino IDE
 - *Note: Further details can be found in the ShieldBuddy [getting started](#) guide*

Select the right target board setup

XMC microcontroller board setup



Aurix ShieldBuddy setup



NOTE: select the right design step, see package marking

ShieldBuddyTC275_Dx

ShieldBuddyTC275_Dx

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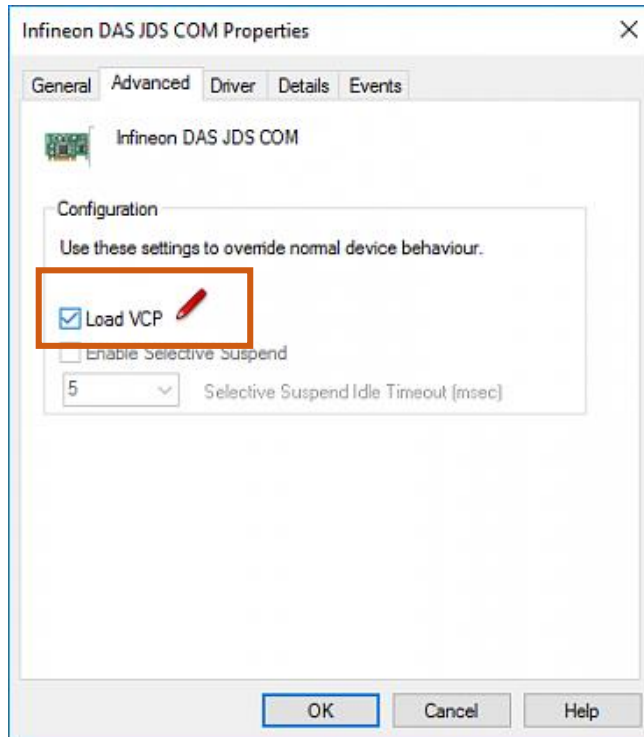
ShieldBuddyTC275_Dx

> Please take care that the correct COM port has been selected

> NOTE: check the Windows device manager to identify the correct COM port in case of doubts

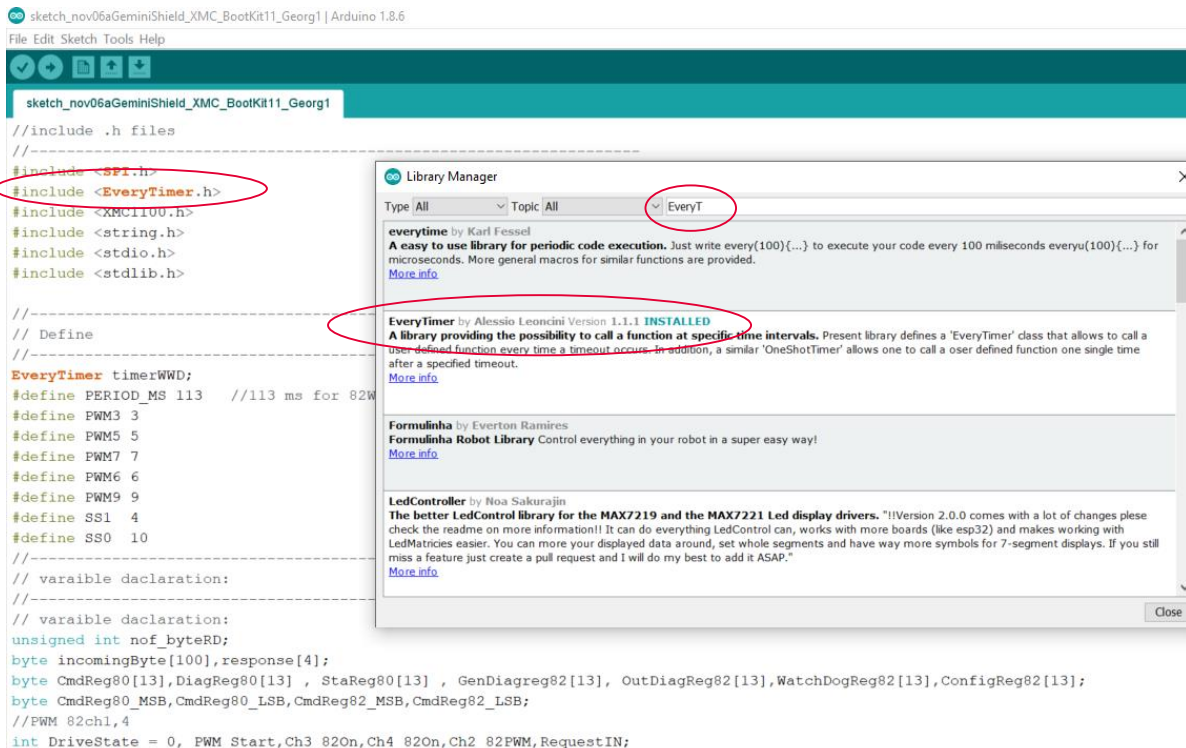
Info note for ShieldBuddy

If your PC does not detect the ShieldBuddy as COM port, select following option in your Windows device manager



Library needed to be included before compile/download

Install the EveryTimer Library (Tools → Manage Libraries) to use the XMC sketch



The screenshot shows the Arduino IDE interface. The sketch file is named 'sketch_nov06aGeminiShield_XMC_BootKit11_Georg1'. The sketch code includes several headers, with `#include <EveryTimer.h>` circled in red. The Library Manager window is open, showing a list of libraries. The 'EveryTimer' library by Alessio Leoncini, version 1.1.1, is highlighted with a red circle and marked as 'INSTALLED'. The description for 'EveryTimer' states: 'A library providing the possibility to call a function at specific time intervals. Present library defines a 'EveryTimer' class that allows to call a user defined function every time a timeout occurs. In addition, a similar 'OneShotTimer' allows one to call a user defined function one single time after a specified timeout.'

```

sketch_nov06aGeminiShield_XMC_BootKit11_Georg1
File Edit Sketch Tools Help

sketch_nov06aGeminiShield_XMC_BootKit11_Georg1

//include .h files
//-----
#include <SPI.h>
#include <EveryTimer.h>
#include <XMC1100.h>
#include <string.h>
#include <stdio.h>
#include <stdlib.h>

//-----
// Define
//-----
EveryTimer timerWWD;
#define PERIOD_MS 113 //113 ms for 82W
#define PWM3 3
#define PWM5 5
#define PWM7 7
#define PWM6 6
#define PWM9 9
#define SS1 4
#define SS0 10

//-----
// variable declaration:
//-----
// variable declaration:
unsigned int nof_byteRD;
byte incomingByte[100],response[4];
byte CmdReg80[13],DiagReg80[13] , StaReg80[13] , GenDiagreg82[13], OutDiagReg82[13],WatchDogReg82[13],ConfigReg82[13];
byte CmdReg80_MSB,CmdReg80_LSB,CmdReg82_MSB,CmdReg82_LSB;
//PWM 82ch1,4
int DriveState = 0, PWM_Start,Ch3_82On,Ch4_82On,Ch2_82PWM,RequestIN;
  
```

Library Manager

Type: All Topic: All EveryT

everytime by Karl Fessel
A easy to use library for periodic code execution. Just write every(100){...} to execute your code every 100 milliseconds every(100){...} for microseconds. More general macros for similar functions are provided.
[More info](#)

EveryTimer by Alessio Leoncini Version 1.1.1 **INSTALLED**
A library providing the possibility to call a function at specific time intervals. Present library defines a 'EveryTimer' class that allows to call a user defined function every time a timeout occurs. In addition, a similar 'OneShotTimer' allows one to call a user defined function one single time after a specified timeout.
[More info](#)

Formulinha by Everton Ramires
Formulinha Robot Library Control everything in your robot in a super easy way!
[More info](#)

LedController by Noa Sakurajin
The better LedControl library for the MAX7219 and the MAX7221 Led display drivers. "If Version 2.0.0 comes with a lot of changes please check the readme on more information!! It can do everything LedControl can, works with more boards (like esp32) and makes working with LedMatrices easier. You can more your displayed data around, set whole segments and have way more symbols for 7-segment displays. If you still miss a feature just create a pull request and I will do my best to add it ASAP."
[More info](#)

Close

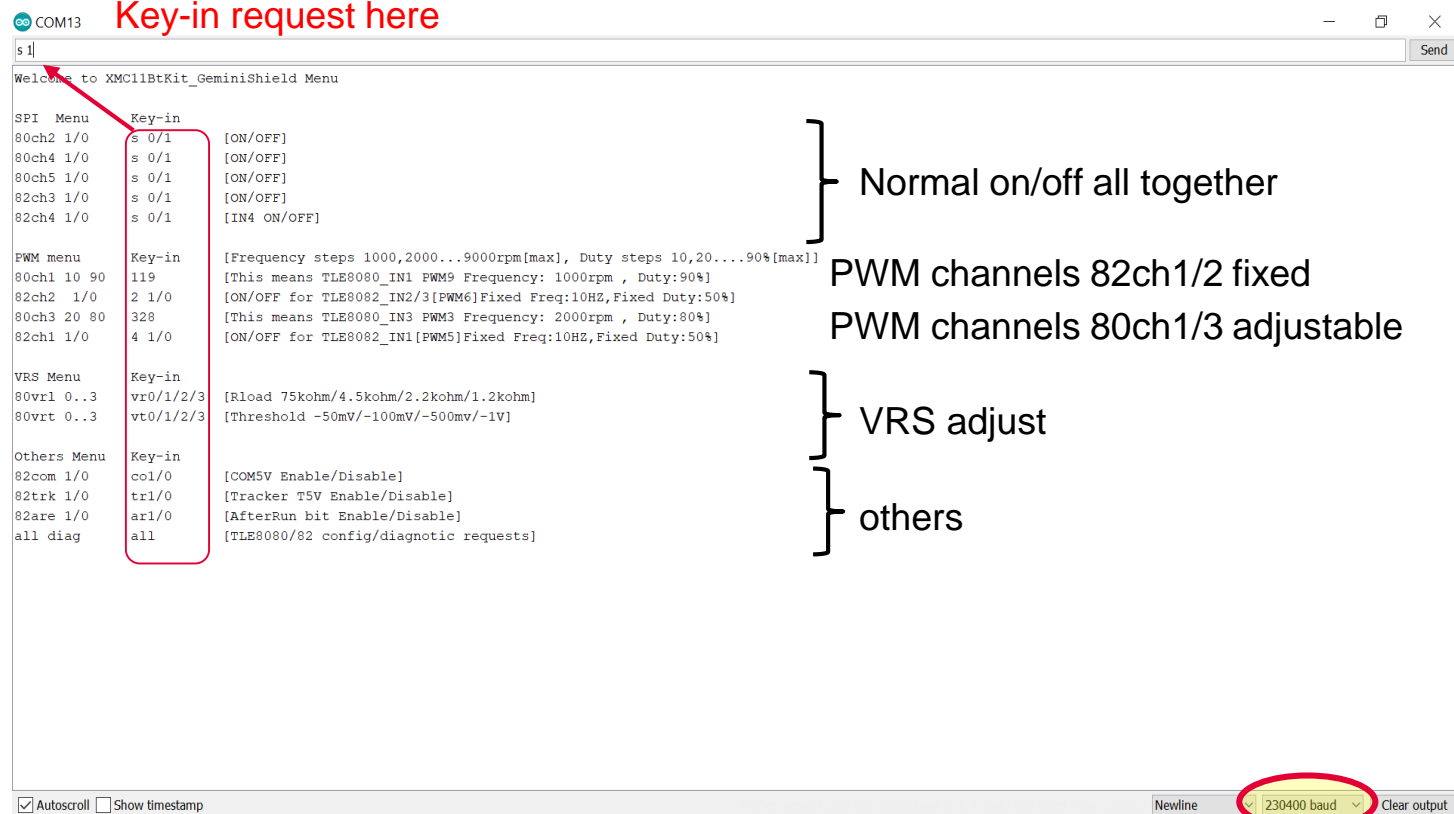
Main Menu of XMC Script

Open serial monitor and upload Arduino script

Guide

1. Select the correct COM port under "Tools"
2. Open "Serial monitor" under "Tools"
3. Select correct Baud rate (see lower right corner)
 - XMC: 230400 Baud
4. Upload Sketch under Sketch upload
5. Overview as shown on the right pops up
6. Send "s 1" to the terminal to switch on according output stages of TLE8080/2

Main Menu XMC



COM13 **Key-in request here**

Welcome to XMC11BtKit_GeminiShield Menu

Menu	Key-in	Description
SPI Menu		
80ch2 1/0	s 0/1	[ON/OFF]
80ch4 1/0	s 0/1	[ON/OFF]
80ch5 1/0	s 0/1	[ON/OFF]
82ch3 1/0	s 0/1	[ON/OFF]
82ch4 1/0	s 0/1	[IN4 ON/OFF]
PWM menu		
80chl 10 90	119	[Frequency steps 1000,2000...9000rpm[max], Duty steps 10,20...90%[max]]
82ch2 1/0	2 1/0	[This means TLE8080_IN1 PWM9 Frequency: 1000rpm , Duty:90%]
80ch3 20 80	328	[ON/OFF for TLE8082_IN2/3[PWM6]Fixed Freq:10HZ,Fixed Duty:50%]
82chl 1/0	4 1/0	[This means TLE8080_IN3 PWM3 Frequency: 2000rpm , Duty:80%]
		[ON/OFF for TLE8082_IN1[PWM5]Fixed Freq:10HZ,Fixed Duty:50%]
VRS Menu		
80vrl 0..3	vr0/1/2/3	[Rload 75kohm/4.5kohm/2.2kohm/1.2kohm]
80vrt 0..3	vt0/1/2/3	[Threshold -50mV/-100mV/-500mv/-1V]
Others Menu		
82com 1/0	col/0	[COM5V Enable/Disable]
82trk 1/0	trl/0	[Tracker T5V Enable/Disable]
82are 1/0	arl/0	[AfterRun bit Enable/Disable]
all diag	all	[TLE8080/82 config/diagnostic requests]

Normal on/off all together

PWM channels 82ch1/2 fixed

PWM channels 80ch1/3 adjustable

VRS adjust

others

Autoscroll ☐ Show timestamp

Newline ☒ 230400 baud ☐ Clear output

Main Menu of ShieldBuddy Script

Open serial monitor and upload Arduino script

Guide

1. Select the correct COM port under “Tools”
2. Open “Serial monitor” under “Tools”
3. Select correct Baud rate (see lower right corner)
 - ShieldBuddy: 115200 Baud
4. Upload Sketch under Sketch → Upload
5. Reset the ShieldBuddy (Reset button)
6. Overview as shown on the right pops up
7. Example: Send “82com 0” to deactivate the communication supply domain of TLE8082

Main Menu XMC

82com 0 **Key-in request here** Send

ASC 115200 Init done.
Please choose Newline as end marker!

Welcome to ShieldBuddy_GeminiShield Menu

PWM menu	[Frequency:10,20...80HZ, Duty:10,20...90%]
80ch1 10 90	[This means TLE8080_IN1 PWM9 Frequency: 10HZ , Duty:90%]
80ch3 20 80	[This means TLE8080_IN3 PWM3 Frequency: 20HZ , Duty:80%]
82ch1 30 70	[This means TLE8082_IN1 PWM5 Frequency: 30HZ , Duty:70%]
82ch3 50 50	[This means TLE8082_IN3 PWM6 Frequency: 50HZ , Duty:50%]
SPI ON/OFF Menu	
80ch2 1/0	[ON/OFF]
80ch4 1/0	[ON/OFF]
80ch5 1/0	[ON/OFF]
82ch2 1/0	[ON/OFF]
82ch4 1/0	[IN4 ON/OFF]
VRS Menu	
80vrl 0/1/2/3	[Rload 75kohm/4.5kohm/2.2kohm/1.2kohm]
80vrt 0/1/2/3	[Threshold -50mV/-100mV/-500mV/-1V]
COM5V/Tracker/AferRun Menu	
82com 1/0	[COM5V ON/OFF]
82trk 1/0	[Tracker output T5 ON/OFF]
82are 1/0	[AfterRun Enable bit ON/OFF]
all diag	[TLE8080/82 diagnostic requests]

Enter command:

☒ Autoscroll ☐ Show timestamp Newline 115200 baud Clear output

Configure your own PWM signal to switch the output stages of TLE8080/82

Set the status of the output stages

VRS menu for TLE8080

Supply and Afterrun configuration
Diagnosis readout

Read registers of TLE8080/82

COM13

SPI Menu	Key-in	
80ch2 1/0	s 0/1	[ON/OFF]
80ch4 1/0	s 0/1	[ON/OFF]
80ch5 1/0	s 0/1	[ON/OFF]
82ch3 1/0	s 0/1	[ON/OFF]
82ch4 1/0	s 0/1	[IN4 ON/OFF]
PWM menu	Key-in	[Frequency steps 1000,2000...9000rpm[max], Duty steps 10]
80chl 10 90	119	[This means TLE8080_IN1 PWM9 Frequency: 1000rpm , Duty:9]
82ch2 1/0	2 1/0	[ON/OFF for TLE8082_IN2/3[PWM6]Fixed Freq:10HZ,Fixed Dut
80ch3 20 80	328	[This means TLE8080_IN3 PWM3 Frequency: 2000rpm , Duty:8]
82chl 1/0	4 1/0	[ON/OFF for TLE8082_IN1[PWM5]Fixed Freq:10HZ,Fixed Duty:
VRS Menu	Key-in	
80vr1 0..3	vr0/1/2/3	[Rload 75kohm/4.5kohm/2.2kohm/1.2kohm]

80 Command Register															
VR_T1	VR_T0	VR_L1	VR_L0									CTR5	CTR4	CTR2	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
80 Diagnostic Register															
CH45OT	CH5_OC	CH5_OL	CH4_OC	CH4_OL	CH3_OT	CH3_OC	CH3_OL	CH2_OT	CH2_OC	CH1_OT	CH1_OC	CH1_OL			
0	0	1	0	1	0	0	0	0	0	0	0	1			
80 Status Register															
WD_DIS	WD_TO									ST5	ST4	ST3	ST2	ST1	
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
82 Configuration Register															
								COM5VEN	T5VEN	AE	DRV4	SEL23	DRV23	DRV1	
1	0	0	0	0	0	0	0	1	1	0	0	0	0	0	
82 General Diagnosis Register															
	KEY	O3STAT	NRIORES	WDRES	V5VIOV	V5VIUV	COM5VOT	COM5VOV	COM5VUV	T5VOT	T5VOV	T5VUV			
0	1	0	0	1	0	0	0	0	0	0	0	0			
82 OutputStage Diagnosis Register															
	O4OT		O4DIA	O3OT	O3DIA		O2OT		O2DIA	O1OT	O1DIA				
1	0	1	0	0	0	0	0	1	0	0	1	0			
82 WatchDog Register															
	EC	EC	EC	WDTO	WDCE	WDERR	WDOW		WDPeriod Config	WD Check Cmd					
0	0	0	0	0	0	0	0	0	1	1	0	0			
[AD0] The COM5V ADC value is 1023 4.99 Volts															
[AD1] The T5V ADC value is 1023 4.99 Volts															
[AD2] The V5DD ADC value is 1023 4.99 Volts															
[AD3] The CF4 ADC value is 1023 4.99 Volts															
[AD4] The KEYON ADC value is 1023 4.99 Volts															

The EC bitfield should read as 000b for successful servicing

SW package basic

- › TLE8080EM watchdog (WD) has been disabled on HW (with jumper)
- › TLE8082ES window watchdog (WWD) is being serviced continuously via SPI (mandatory for its channel(s) activation and to put device into AfterRun state successfully)
- › XMC setup: TLE8082ES Channel 1/2 default operation parameters are
 - duty cycle: 50%
 - Frequency: 10Hz
 - The user can directly change the parameter in the Arduino code, if needed (see variable declaration)



Part of your life. Part of tomorrow.