

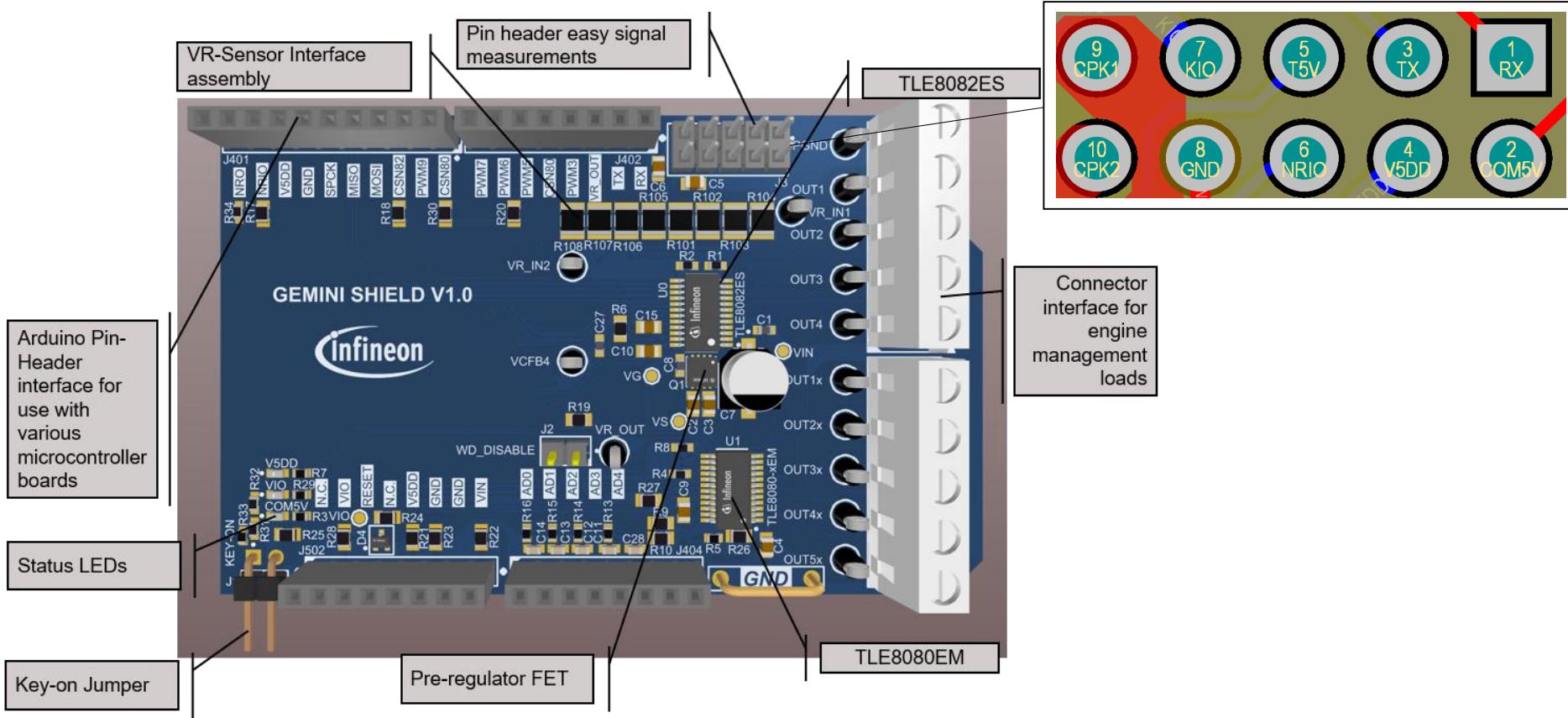
TLE8082ES + TLE8080EM

Evaluation board

Getting Started

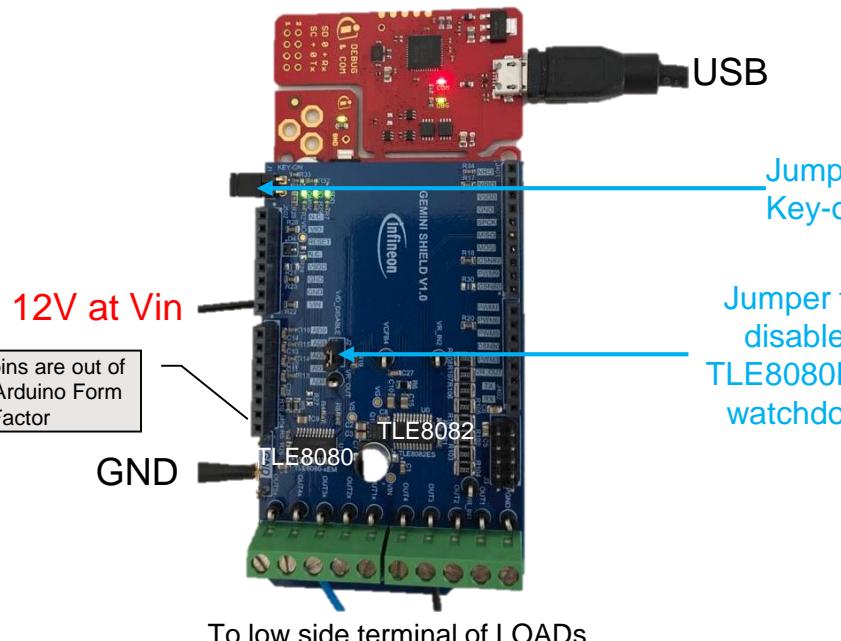


Evaluation board Overview

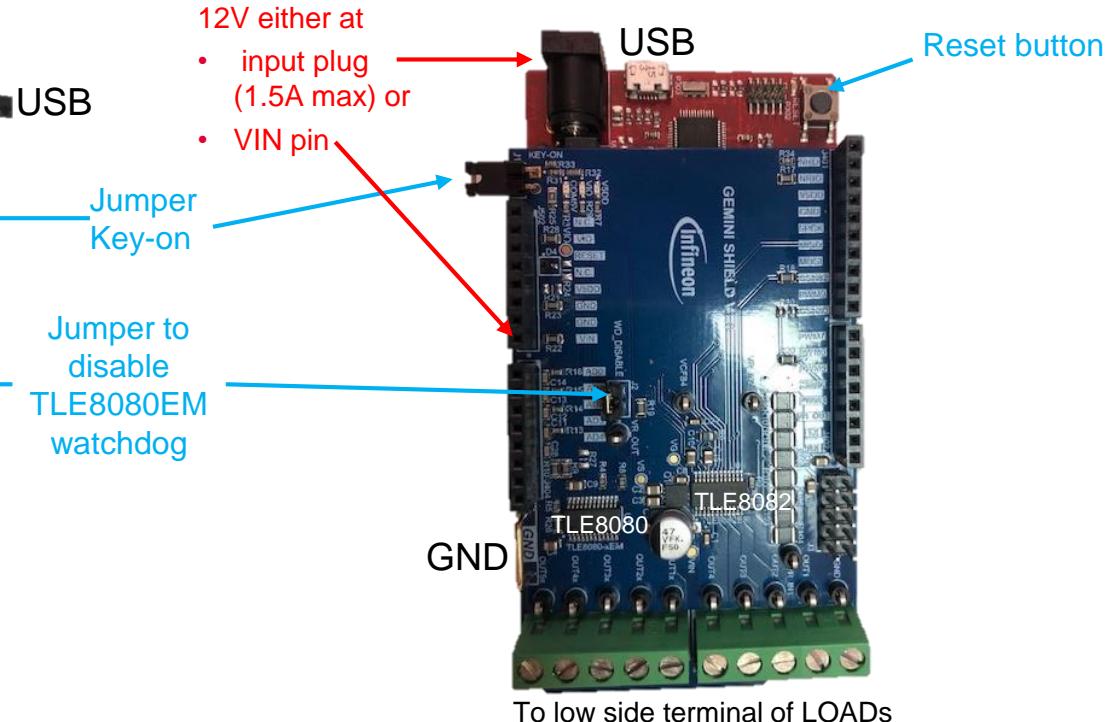


An Arduino Sketch is available for two different setups

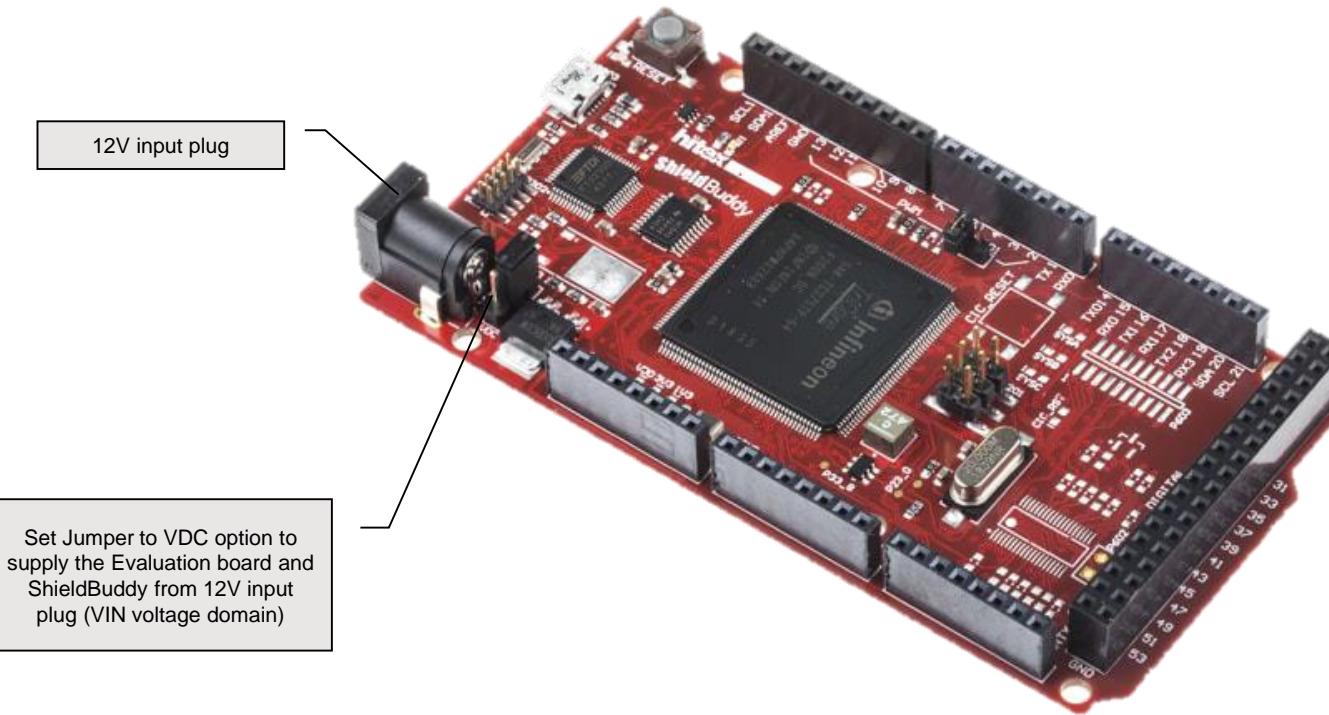
XMC microcontroller board setup



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](#)

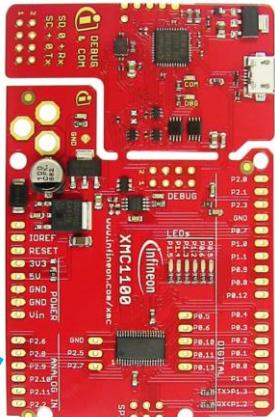
Aurix ShieldBuddy Software Environment

- › 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

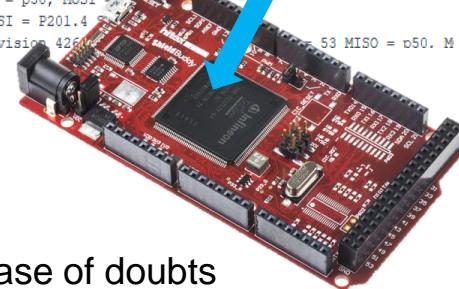
XMC microcontroller board setup

```
sketch_nova6GeminiShield_XMC_BootKit11_Georg1 | Arduino 1.8.6
File Edit Sketch Tools Help
Auto Format Ctrl+T
Archive Sketch
Fix Encoding & Reload
Manage Libraries... Ctrl+Shift+I
Serial Monitor Ctrl+Shift+M
Serial Plotter Ctrl+Shift+L
WiFi101 Firmware Updater
Board: "XMC1100 Boot Kit" Boards Manager...
Serial Output Selection: "PC"
Port: "COM13"
Get Board Info
Programmer: "AVRISP mkII"
Burn Bootloader
EveryTimer time=rWD;
#define PERIOD_MS 113 //113 ms for 82K
#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 ncf_byteRD;
byte byteIncomingByte[100], response[4];
byte CmdReq0[13], DiagReq0[13], StaReq0[13];
byte CmdReq0_MSB, CmdReq0_LSB, CmdReq0_B2[13];
// PWM 82ch1,4
int DriveState = 0, PWM_Start, Ch3_82On, Ch4_82On;
unsigned long previousMillis = 0;
const long interval = 50; //50ms or 10HZ
XMC1100 Boot Kit
XMC1100 XC2Go
XMC1100 H-Bridge 2Go
XMC1300 Boot Kit
XMC1300 SenseGol
DEMO Radar BB XMC4700
XMC Family
XMC1100 Boot Kit
XMC1100 XC2Go
XMC1100 H-Bridge 2Go
XMC1300 Boot Kit
XMC1300 SenseGol
DEMO Radar BB XMC4700
```



Aurix ShieldBuddy setup

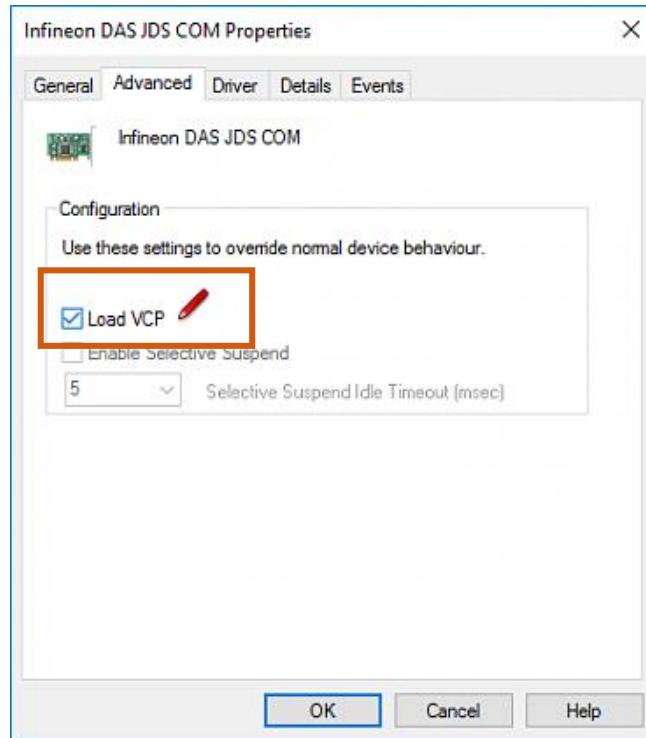
NOTE: select the right design step, see pack marking



- › 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

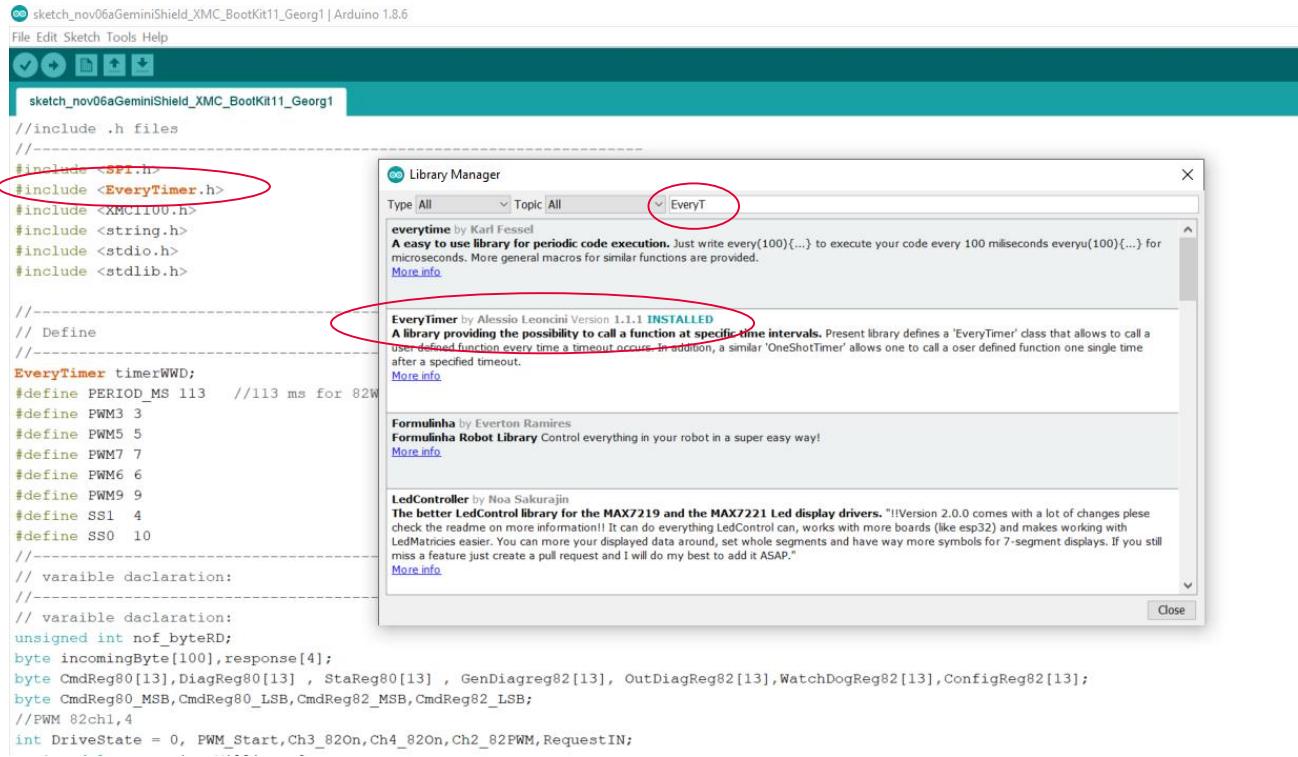
Info note for ShieldBuddy

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



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

Key-in request here

COM13

s 1

Welcome to XMC11BtKit_GeminiShield Menu

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

80ch1 10 90	119	[Frequency steps 1000,2000...9000rpm[max], Duty steps 10,20....90%[max]] [This means TLE8080_IN1 PWM9 Frequency: 1000rpm , Duty:90%]
80ch2 1/0	2 1/0	[ON/OFF for TLE8082_IN2/3[PWM6]Fixed Freq:10HZ,Fixed Duty:50%]
80ch3 20 80	328	[This means TLE8080_IN3 PWM3 Frequency: 2000rpm , Duty:80%]
80ch1 1/0	4 1/0	[ON/OFF for TLE8082_IN1[PWM5]Fixed Freq:10HZ,Fixed Duty:50%]

VRS Menu Key-in

80vr1 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 Key-in

82com 1/0	co1/0	[COM5V Enable/Disable]
82trk 1/0	tr1/0	[Tracker T5V Enable/Disable]
82are 1/0	ar1/0	[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

Key-in request here

82com 0

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

80 Command Register		
VR_T1	VR_T0	
0	0	
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]
80ch3 1/0	s 0/1	[ON/OFF]
80ch4 1/0	s 0/1	[IN4 ON/OFF]
PWM menu	Key-in	[Frequency steps 1000,2000...9000rpm[max], Duty steps 10]
80ch1 10 90	119	[This means TLE8080_IN1 PWM9 Frequency: 1000rpm , Duty:9]
80ch2 1/0	2 1/0	[ON/OFF for TLE8082_IN2/3[PWM6]Fixed Freq:10HZ,Fixed Duty]
80ch3 20 80	328	[This means TLE8080_IN3 PWM3 Frequency: 2000rpm , Duty:8]
80ch1 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	[Load 75kohm/4.5kohm/2.2kohm/1.2kohm]
.....
80 Diagnostic Register		
CH450T	CH5_OC	
0	0	
80 Status Register		
WD_DIS	WD_TO	
1	0	

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.