Board Setup

The Evaluation Environment consist of two boards
- TLF35584 Evaluation Board (green)
  - TLF35584 IC and all external components
  - Pin headers (soldered) to connect it
- TLF-AURIX Companion Board (red)
  - Fully equipped with connector and firmware
  - Needs USB cable (Type B) for connection to your PC/Notebook

- GUI is available to be run on the PC, which is communicating with an attached Companion board to control and monitor the TLF35584 (ask FAE for the files)
Board Setup – Voltage Selection
TLF35584QVVS1 (QUC=5V)

› Please verify the variant of TLF35584 used (check marking) against the configuration on the Companion Board

› VS1/5V:
  – Open JP400
  – Open JP300
Board Setup – Voltage Selection
TLF35584QVVS2 (QUC=3.3V)

› Please verify the variant of TLF35584 used (check marking) against the configuration on the Companion Board
› VS2/3.3V:
   – Close JP400
   – Close JP300
Board Setup – AURIX Supply and PORST (1)

- The Companion Board offers the possibility to supply the AURIX by the TLF35584 directly or by the Companion Board (USB)
- Supply by TLF35584:
  - Set JP402(VADC) to “QVR”
  - Set JP401(VEXT) to “QUC”
  - Close JP404 (PORST = ROT)
The Companion Board offers the possibility to supply the AURIX by the TLF35584 directly or by the Companion Board (USB)

Supply by Companion Board (USB):
- Set JP402(VADC) to “3.3V” or “5V” according to the setting of JP300 & JP 400 (Slide 3-4)
- Set JP401(VEXT) to “3.3V” or “5V” according to the setting of JP300 & JP 400 (Slide 3-4)
- Open JP404 (PORST != ROT)

* Only 3.3V option is shown in the picture!
How to get it up and running (1)

› Before connecting the Companion Board to your PC!
› Start the GUI by executing the file “TLF_Demonstrator_V2.1.exe” from the GUI-files
  – GUI will come up showing “not connected” and appearing grey
How to get it up and running (2)

› Ensure that the AURIX Firmware update to V2R2 has been done or simply redo it
  - Refer to the file
    “TLF35584-Evaluation-Environment_Firmware-Update.pdf”
  - Otherwise the Companion Board cannot properly communicate with the TLF35584 C-Step Silicon

› Ensure that the TLF35584 Evaluation Board (green) is equipped with a B/C-Step silicon
  - Check the marking on the IC
    - A-Step: “35584VS1” (5V) or “35584VS2” (3V3)
    - B-Step:
      - Line 1: “35584”
      - Line 2: “VS1” (5V) or “VS2” (3V3)
    - C-Step:
      - Line 1: “TLF35584”
      - Line 2: “VS1” (5V) or “VS2” (3V3)
How to get it up and running (3)

› Make sure that the Evaluation and Companion Board are properly interconnected as visible on slide 7 (and right)

› Connect the Companion Board to an USB-Port of your PC using the USB cable (Type B)
  - Drivers should install automatically
  - Some LEDs on the bottom left corner should start flashing (XMC is running and communicates with the GUI)
    - GUI shows “connected” (red circle)
    - Status monitor shows “unknown” as TLF35584 is still unsupplied (blue circle)
  - The XMC microcontroller is only used for PC interface, instruction of AURIX and silent monitoring of the SPI
  - All communication and function towards TLF35584 is only done by AURIX!
How to get it up and running (4)

- Connect a power supply to the TLF Evaluation Board
  - Use Banana-Jack connectors “GND” (black) and “BATP” (red one in the middle)
  - $V_{\text{Bat}}$ of 12V and a current limit of at least 1A
  - Switch it ON to apply the input voltage

- GUI:
  - State diagram gets active and shows the TLF35584 in INIT state (red circle)
  - Measurement of output voltages of shows all LDOs being started (blue circle)
  - Check also LEDs on TLF35584 Evaluation board for status
How to get it up and running (5)

› The TLF35584 is up and running
  - All LDOs are kept ON and state is INIT
  - Default configuration is active

› The AURIX microcontroller is up and running
  - Service of window watchdog and ERR monitoring is done according to the default configuration of the TLF35584
Using the GUI to control TLF35584 and AURIX (1)

- The ribbon “Output Configuration & State machine”
  - A green “state-box” indicates the current state of TLF35584
  - LDOs can be switched ON and OFF using the checkbox in the respective state, the configuration is taken over when the respective apply button is pressed (e.g. red circle)
    - Output voltages can be read from the status monitor (Blue circle)
  - A green arrows indicates a possible state transition
    - E.g. INIT to NORMAL
    - A pre selection of the LDO configuration for the next state can be done before the request (green circle)
Using the GUI to control TLF35584 and AURIX (2)

- The ribbon “Output Configuration & State machine”
  - “Global” settings are used independently from state
  - Configuration for the Standby-LDO
  - Configurations for the movements into SLEEP and STANDBY (Delay time and Current Monitor)
    - Please mind the check-box for the current monitor is related to the option of the TLF35584 to shorten the transition time based on the current of the µC. In SLEEP it is mandatory to be below the current threshold, otherwise the TLF35584 will move to WAKE state.
  - Wake up timer
Using the GUI to configure supervision functions (1)

› The ribbon “Supervision Configuration”
  - Offers possibility to configure the Watchdogs and Error Monitoring
    - Active functions
    - Window sizes
    - Error thresholds
  - The AURIX will change its service functions accordingly
  - Failure Injection by
    - Missing trigger events
    - Modification of functional watchdog response table
    - Alternated ERR signal frequency
  - Use the “Apply” button to send changed configuration (red circle)
Using the GUI to monitor the SPI and Failure-Events (1)

- The ribbon “SPI Logger”
  - All communication between AURIX and TLF35584 is logged and stored in this ribbon
  - The list can be cleared and stored by the respective buttons
  - The button “Start” or “Stop Measurement” (red circle) can be used to pause logging and measurements
  - Interrupts will be logged and partially interpreted
  - The “Command Line” is not supported yet.
Using the GUI to manually write and read registers

› The ribbon “TLF Registers”
  - All registers of the TLF35584 (C-step) are accessible for reading and writing manually
  - “Read all” button to update all in one step (red circle)
  - Be aware that this write commands are purely delivered to the TLF35584
    - AURIX will not change for instance watchdog service settings
    - Possible faulty service or reaction has to be considered!
Further Information

- Further information can be found in the following documents:
  - Datasheet (C14-Step):
    TLF35584-Data-Sheet-20-Infineon.pdf

- Please mind the current Evaluation Environment is valid for the C-Step silicon of TLF35584 just after the firmware update of the Companion Boards AURIX microcontroller!
  - For information’s please refer to
    TLF35584-Evaluation-Environment_Firmware-Update.pdf
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