



This application note describes the use of the **Secure CMOS** and the **OEM Failsafe Defaults** customer specific BIOS settings available.

For having full functionality setup control of the **Secure CMOS** and the **OEM Failsafe Defaults** functions a software **Tool Package** (Secure\_CMOS\_-\_OEM\_Failsafe\_Defaults) is required. The **Tool Package** contains the files: read.bat, write.bat, writeoem.bat, and BF.exe.

The **Secure CMOS** and the **OEM Failsafe defaults** define two different approaches for securing the CMOS / BIOS settings. What approach to be used depends on the actual application.

## Secure CMOS

The boards include an onboard EEPROM that can be used to store a secure CMOS image. The BIOS settings are stored in the RTC CMOS area in the chipset, but by Enabling the Secure CMOS option (in the BIOS Exit menu) a copy of the BIOS settings from the RTC CMOS area is stored into the onboard EEPROM of the board.

In case the:

- RTC CMOS BIOS settings are lost,
- CMOS becomes corrupted (checksum fail)
- <Esc>-key is pressed during POST

... the BIOS settings are loaded from the EEPROM to the RTC CMOS at BIOS POST. This will secure the user from experiencing problems at battery failure or CMOS corruptions.

If the customer enters the BIOS and selects a different setting with the **Secure CMOS** enabled, the new setting will be stored in the EEPROM.

In case of battery failure, CMOS corruption or <Esc>-key is pressed during POST; the CMOS settings will be re-loaded to the RTC CMOS area.

The "Load Optimal Defaults" setting and "Failsafe Defaults" in the BIOS Exit menu will continue to load the Kontron defined BIOS settings and not the Secure CMOS Setup BIOS defaults with the Secure CMOS enabled. Loading these values will disable the **Secure CMOS** enabled BIOS setting.

To handle the implementation of the **Secure CMOS** in a production setup, the following sequence should be followed:

### Creating Master BIOS including BIOS settings:

- 1.) Setup required BIOS settings on a master MB.
- 2.) Enable **Secure CMOS** in Exit BIOS menu
- 3.) Save and Exit BIOS
- 4.) Boot in DOS with **Tool Package** available.
- 5.) Run "bf read MastBIOS.rom 0 80000". (This will copy the Master-BIOS to a file MastBIOS.rom).
- 6.) Run "read.bat". (This will create a file "eprom.bin" with current BIOS settings).

### Copying Master BIOS including BIOS settings to Target MB:

With the BIOS ROM file (\*.rom) and the "eprom.bin" file, the BIOS including BIOS settings can be copied onto another board automatically by use of the following sequence:

- 1.) Boot target board in DOS with **Tool Package** and the "eprom.bin" file available.
- 2.) Run "bf write MastBIOS.rom 0". (Write the Master-BIOS to the Target MB).
- 3.) Run "write.bat". (This writes the eprom.bin BIOS settings to the onboard EEPROM of the target MB).
- 4.) At next boot the target MB will have BIOS including BIOS settings (incl. Secure CMOS setting) exactly as the master MB.

Notes: The filename MastBIOS.rom can be changed to another name if required.  
It might be more convenient to implement bat-files (READBIOS.BAT and WRITBIOS.BAT) to respectively read and write the BIOS.



## OEM Failsafe Defaults

The **OEM Failsafe Defaults** works equivalent to the Secure CMOS; the RTC CMOS is stored in the onboard EEPROM.

In case of:

- Battery failure
- CMOS corruption
- <ESC>-key is pressed during POST,
- "Load Failsafe Defaults" is selected in the BIOS Exit menu

... the original BIOS settings located in the EEPROM will be copied to the RTC CMOS area. This secures that an end-customer has a defined set of BIOS settings that will always work.

If a customer enters the BIOS and select a different setting with the **OEM Failsafe Defaults** enabled, the new BIOS setting will only be stored in the RTC CMOS.

If e.g. a specific Panel is selected in the **OEM Failsafe Defaults** and the end-customer change the BIOS setup to no panel, the situation can be solved by the customer pressing <Esc>-key during POST to load the originally defined **OEM Failsafe Defaults**.

With the **OEM Failsafe Defaults** enabled, the "Load Optimal Defaults" setting in the BIOS Exit menu will be hidden.

To handle the **OEM Failsafe Defaults** in a production setup, the following sequences should be followed:

### Creating Master BIOS including BIOS settings:

- 1.) Setup required BIOS settings on a master MB.
- 2.) Enable **Secure CMOS** in Exit BIOS menu
- 3.) Save and Exit BIOS
- 4.) Boot in DOS with **Tool Package** available.
- 5.) Run "bf read MastBIOS.rom 0 80000". (This will copy the Master-BIOS to a file MastBIOS.rom).
- 6.) Run "read.bat". This will create a file "eprom.bin" with the current BIOS settings.

### Making the master board having the "OEM Failsafe Defaults" activated

(Only for testing **OEM Failsafe Defaults** on master board)

- 1.) Boot in DOS with **Tool Package** available.
- 2.) Run "writeoem.bat". (This will set the selected BIOS settings as Failsafe Defaults and remove the **Secure CMOS** option completely from the BIOS setup menu).
- 3.) Reboot the board.

### Copying Master BIOS including BIOS settings to Target MB and activate OEM Failsafe Defaults:

- 1.) Boot target MB in DOS with **Tool Package**, MastBIOS.rom and the "eprom.bin" file available.
- 2.) Run "bf write MastBIOS.rom 0". (Write the Master-BIOS to the Target MB).
- 3.) Run "writeoem.bat". (This will set the selected BIOS settings as Failsafe Defaults and remove the **Secure CMOS** option completely from the BIOS setup menu).
- 4.) At next boot the target MB will have BIOS including BIOS settings **OEM Failsafe Defaults** exactly as the master MB.

### Clearing the OEM Failsafe Defaults:

To remove the **OEM Failsafe Defaults** function and re-establish the **Secure CMOS** function, follow the sequence:

- 1.) Boot in DOS with **Tool Package** available.
- 2.) Run "clearoem.bat".
- 3.) At next boot the board will have the "Secure CMOS" option available and BIOS settings can be changed/ updated.

Notes: The filename MastBIOS.rom can be changed to another name if required.

It might be more convenient to implement bat-files (READBIOS.BAT and WRITBIOS.BAT) to respectively read and write the BIOS.