



---

**TECHNICAL MEMO**  
**L1-DSP RECOVERY**

---

*Making* **Wireless**

## Table of Contents

Table of Contents .....	ii
Plan Approvals .....	iii
<b>1. Introduction .....</b>	<b>1</b>
<b>2. Principles .....</b>	<b>1</b>
2.1. Generic overview .....	1
2.2. TCS5.x applicability .....	1
<b>3. Architecture .....</b>	<b>1</b>
3.1. Global architecture .....	1
3.2. DSP recovery info .....	2
3.2.1 <i>Non Critical error</i> .....	2
3.2.2 <i>Critical error</i> .....	3
3.2.3 <i>Fatal error</i> .....	4

## Plan Approvals

REV	DATE
Draft	1 <sup>st</sup> July 2005
1.0	17 <sup>th</sup> July 2005



## 1. Introduction

This document describes L1-DSP recovery design.

The aim of the L1-DSP recovery is to restart properly the system when the DSP seems to be crashed (due to internal DSP error, or a bad L1 management)

## 2. Principles

### 2.1. Generic overview

The purpose of DSP Recovery is to provide some debug information regarding DSP failures. If a DSP error occurs, it is outputted by the MCU in the L1 trace (see L1D\_SE\_TM080.doc).

Both “Diagnose module” and “Recovery module” actions are based on DSP inputs: Several events (DSP errors) are logged in the DSP/MCU communication interface. Several levels of error criticality are defined and permit to know when DSP recovery is needed.

### 2.2. TCS5.x applicability

DSP recovery is applicable to all DSP modem modules.

## 3. Architecture

### 3.1. Global architecture

The architecture is based on an interaction between DSP, MCU L1 and Protocol Stack (PS):

- MCU L1 analyzes DSP recovery info.
- DSP may recover itself but in some case, MCU-L1 is asked to reset DSP, reload DSP code, and reboot the modem L1-MCU.

### 3.2. DSP recovery info

The DSP inputs (events) are available in a circular diagnose buffer, in a shared memory (MCU-DSP).

Each event is constituted of an identifier and associated data.

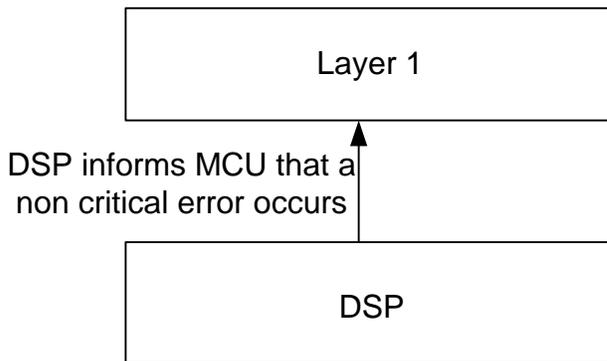
The event ID gives the error group, sub-group, and criticality of the event as shown hereafter.

The Criticality is declined as:

- **Non-critical error** detected, but does not compromise the SW integrity. DSP is taking specific actions if required
- **Critical error** detected that requires a DSP recovery: DSP self-reset, or goes in infinite loop. This is determined by “dsp\_recovery\_mode” variable defined in MCU/DSP interface at initialization, cf L1D\_SE\_TM080.doc. Only auto-reset mode will be exposed in the present document. In case the DSP goes in infinite loop, the user has to manually restart the code (for issue investigation).
- **Fatal error** detected that requires an MCU recovery of DSP (DSP re-install)

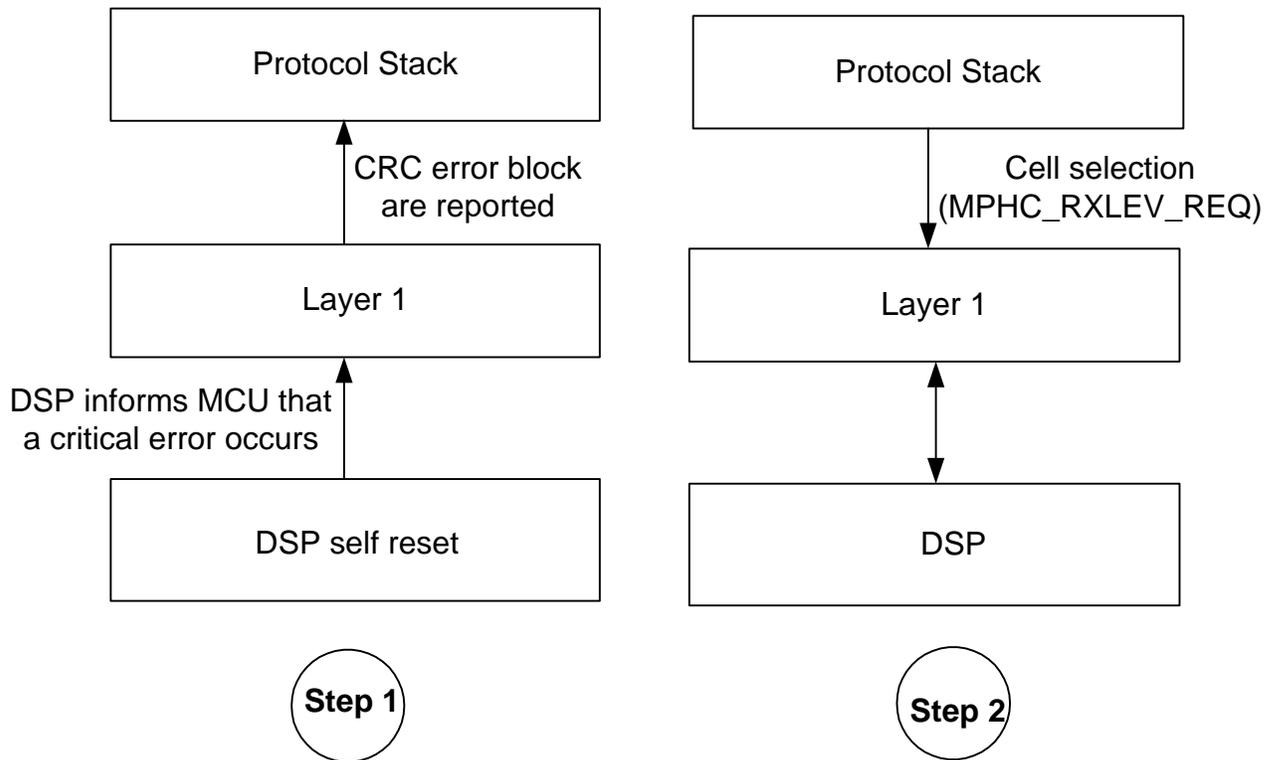
Please see the L1D\_SE\_TM080.doc for a complete description of these errors.

#### 3.2.1 Non Critical error



This error has no impact on a Protocol Stack point of view. DSP is the only component to take any action if required

3.2.2 Critical error

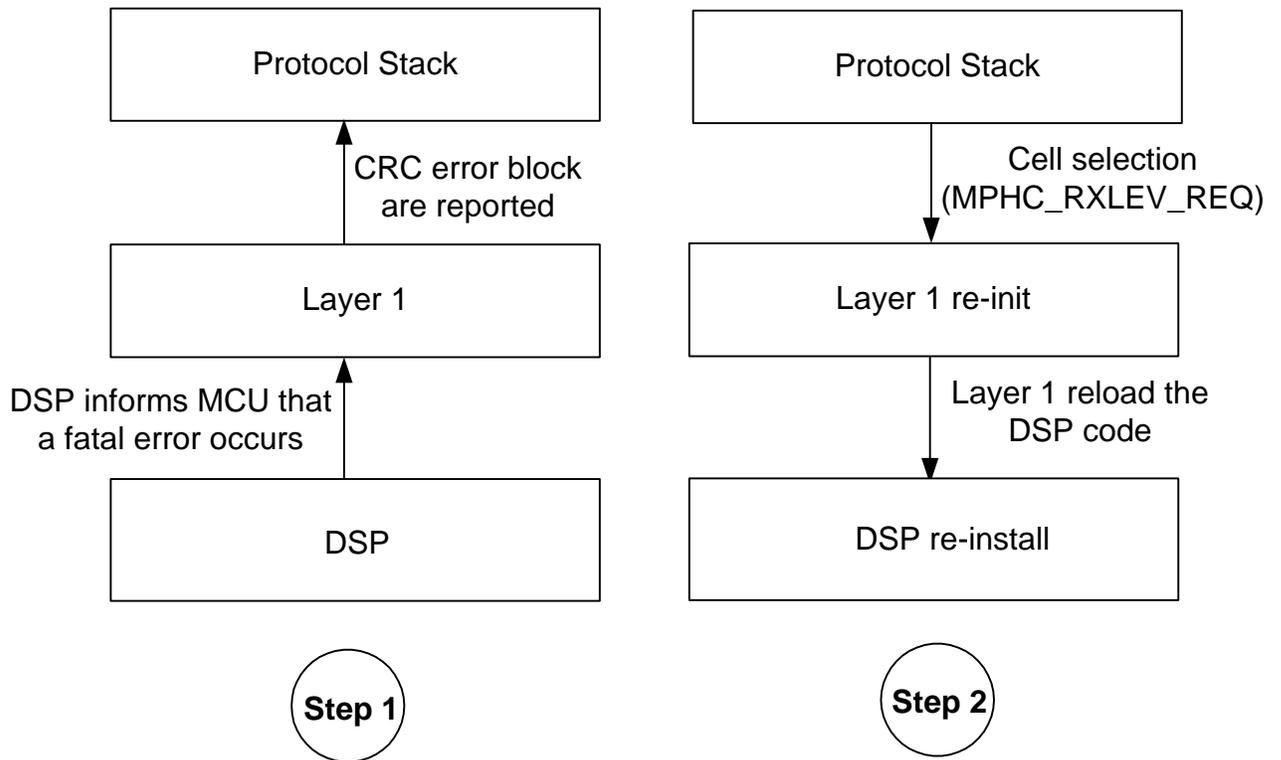


**Step 1:** The L2 link is broken (blocks are reported with CRC errors). The DSP is reported a critical error, then DSP is resetting itself (RESET OP CODE).

Note: at this stage, in case the number of critical error reported exceed a threshold, please go to 3.2.3 Fatal error, step 2

**Step 2:** Protocol stack ask for a cell selection (MPHC\_RXLEV\_REQ), then normal mode operation is resumed.

3.2.3 Fatal error



**Step 1** : The DSP is reported a fatal error, the L2 link is broken.

**Step 2** : When the L1 receives a MPHC\_RXLEV\_REQ :

- the modem is reinit (ABB, TPU drivers and all MCU variables GSM+GPRS)
- the DSP is reloaded and restarted.

Then, normal operation is resumed.