

## Application Note

### DLCD\_ADC

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## 1. Preface

This application note describes sample software DLCD\_ADC using LCD display control circuit (DLCD). This document helps the user check operation of a product under development and develop its program.

## 2. Technical Term

Term/Abbreviation	Definition
ADC	Analog to Digital Converter
BSP	Board Support Package
CG	Clock Control and Operation Mode
LCD	Liquid Crystal Display
Timer	T32A:32-bit Timer Event Counter

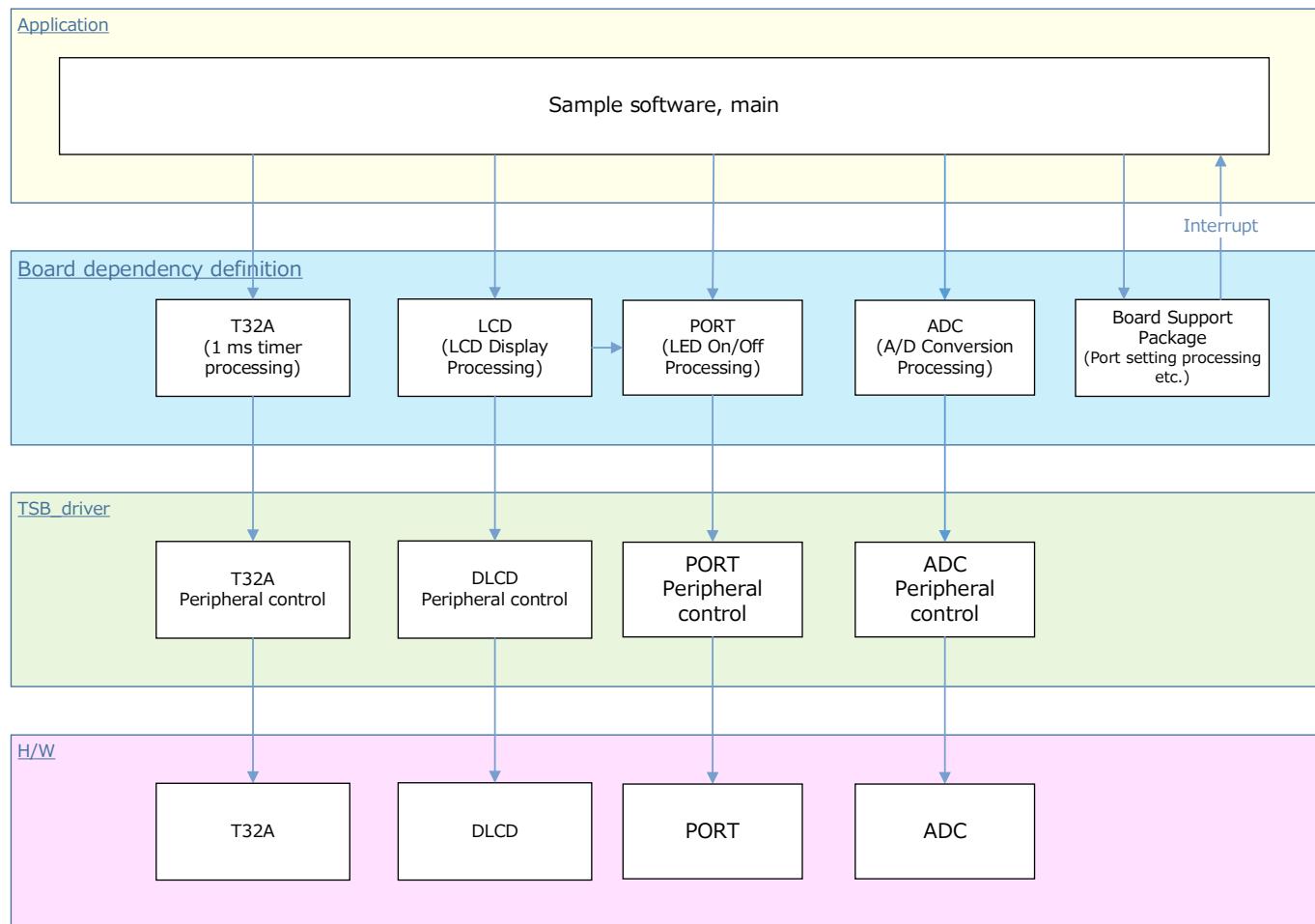
## 3. Reference Document

Document	Notes
Data sheet	Refer to the data sheet of MCU to be used.
Reference manual	Refer to the reference manual of each IP to be used.
Application note MCU User Guide	Refer to the MCU user guide to be used.

## 4. Target Sample Program

Sample Program	Outline
DLCD_ADC	Sample program measures voltage after a certain time has elapsed and displays a string on the segment.

## 5. Configuration Diagram



## 6. Sample Program: ADC\_NTC\_Monitor

This is a sample software that performs A/D conversion of the measured voltage every 100ms and displays the converted value as an 8-digit number on the LCD.

### 6.1. Outlines of Operation

Uses an interval timer to measure the voltage of a variable resistor and display a string on the segment.

### 6.2. Function to Use

The functions to use are as follows:

For the Port assignment of each BSP channel, refer to the MCU user guide.

IP	Channel	Objective
ADC	BSP_VR_1	Variable resistor for voltage measurement
DLCD	BSP_DLCD_1	For displaying measured values
T32A	BSP_T32A_TIMER_1	Interval timer

### 6.3. Interrupt to Use

Interrupt	Outlines
INTT32A00AC	T32A Timer A Timer counter increment every 1ms
INTADACNT	ADC continuous conversion interrupt

### 6.4. Configuration

Configuration setting.

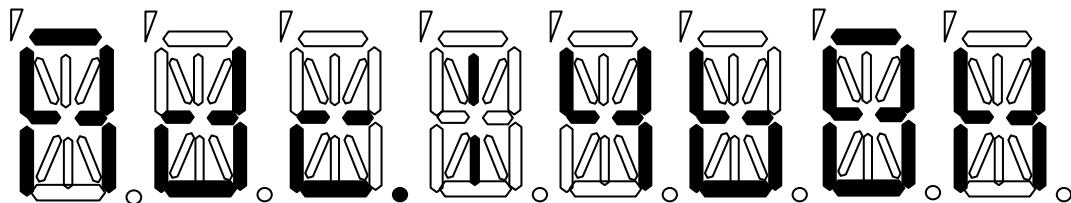
Configuration	Soft Definition Name	Current Value (Defaults)	Description
Timer A	CFG_OUTPUT_INTERVAL	100	ADconversion interval(unit: ms)
LCD operating clock	CFG_DLCD_CLOCK	DLCD_CLOCK_FS	LCD operating clock Refer to dlcd_a.h for configuration values
Non-bias driving method	CFG_DLCD_DUTY	DLCDCR2_DUTY_4COM_1_6	Refer to dlcd_a.h file for non-bias driving method settings
Control method	DLCD_CONTSEL	DLCD_CONTSEL_FRAME	Switchable between 0 (frame length control method) and 1 (time-division control method)

### 6.5. Example of Terminal Emulator Output

None

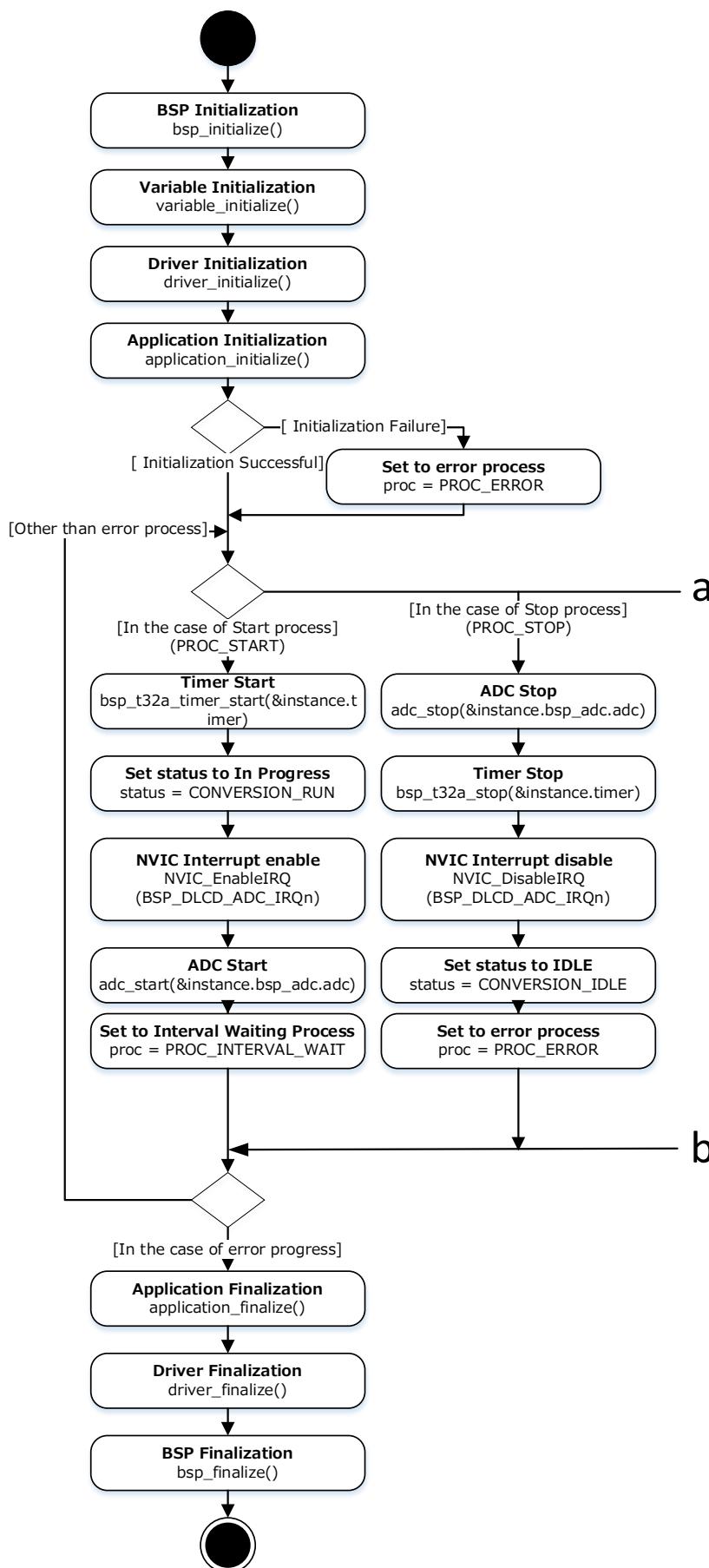
## 6.6. LCD Display Example

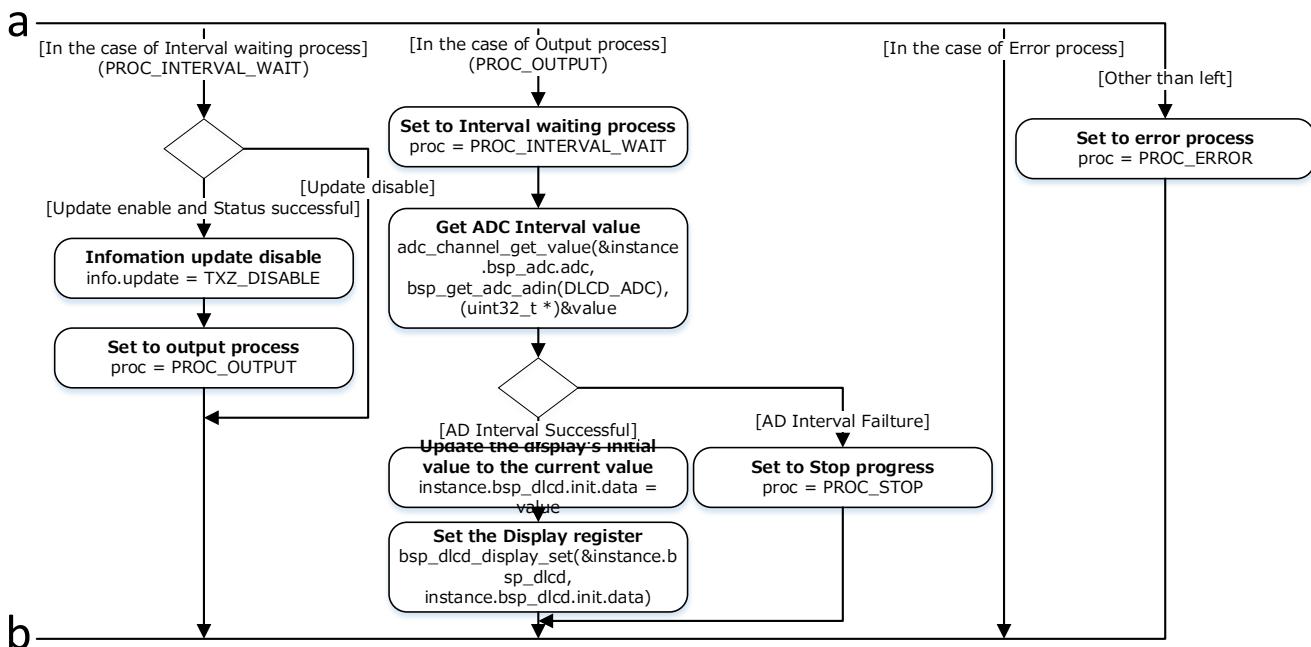
When the AD conversion value '0x4B8' is displayed, the screen will appear as shown below ('Adc.:4b8H' is displayed).



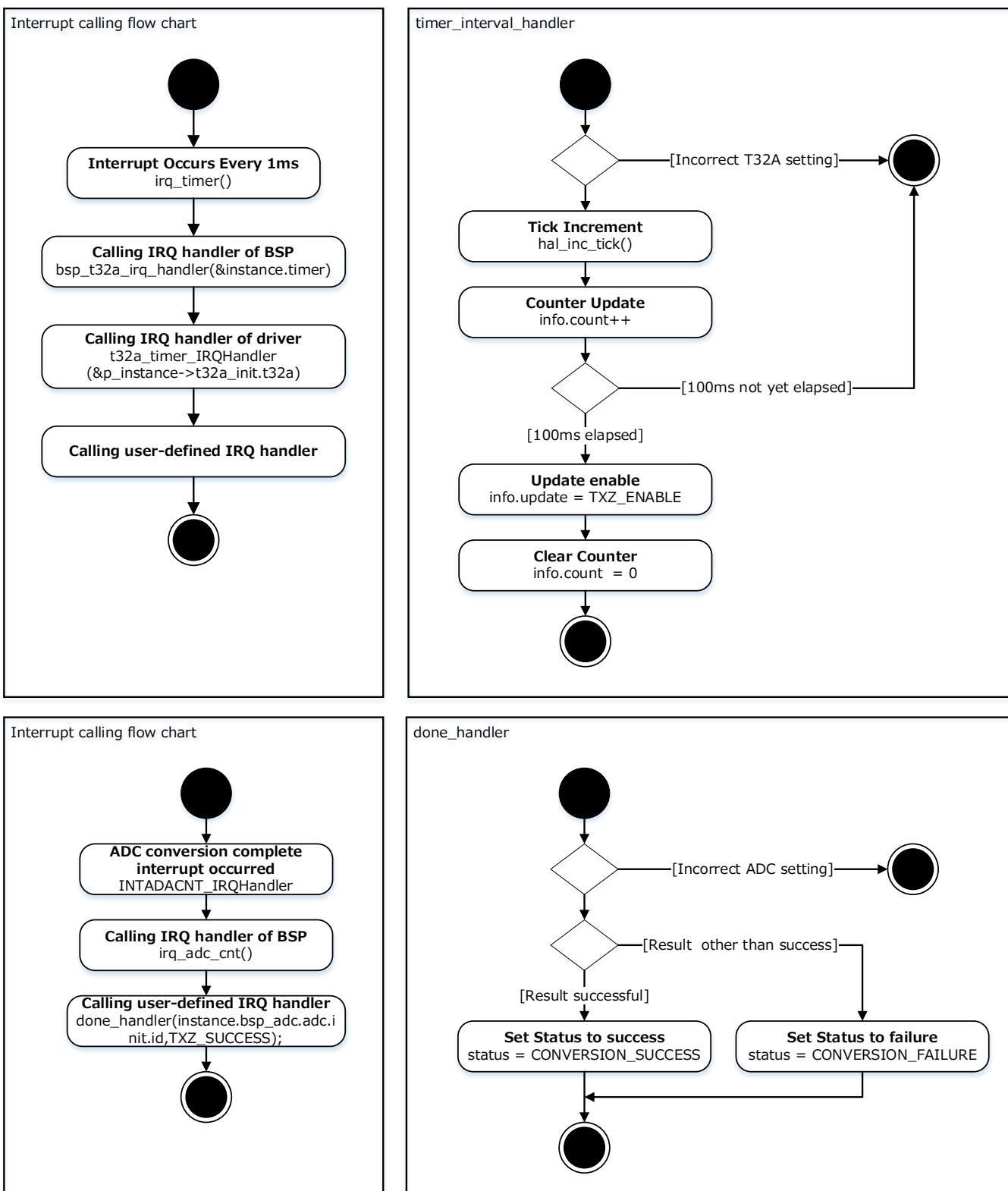
## 7. Activity diagram

### 7.1. main





## 7.2. Interrupt



## 8. Revision History

Revision	Date	Description
1.0	2025-10-30	First release

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