## User Guide for using the toolkit

Procedure for using the toolkit to generate a program based on an example including a keypad (input) and 7-segment display (output).

The program generated by the MCA is called **VP.c** and it must be compiled by the Keil compiler (or similar) into a .hex program before you can download it to the ADuC832 microprocessor.

- Connect the hardware modules Connect the seven segment display and the keypad to ports of the ADuC832
- Execute the VP.exe program (the toolkit)
   In the first screen, select the Experience User item, as shown in Figure 1. The "First time user" mode will provide you additional information to guide you through the process.

💀 Identification 👘 🔲 🗖 🔀
First time user
Experienced user

**Figure 1 The User selection interface** 

3. Select the **output device** (seven segment display) and define the Port and Pin used by the device, as shown in Figure 2. After the configuration of the output device, you must select "Confirm" and then "Finish".

🖷 Module - Physical Loc	ation			
Output Module Loudspeaker LEDS DCmotor Discription: Show details Discription: It is used to show the result from calculater The device can show 2 digit number. Port 0 00000111 Port 1 0000000 Port 3 000000 Port 3 00000 Port 3 0000 Port 3 00000 Port 3 0000 Port 3 0000 Port 3 00000 Port 3 00000 Port 3 00000 Por	Port 2 3 Port and Pin microprocessor configuration Pin least significant bit connectio cupies selected pin N to pin N + 2 d process.	Pin 3 4 5 6 7 2 2 set Finish	Function: Digit=0 Digit=1 Digit=2 Digit=3 Digit=4 Digit=5 Digit=5 Digit=6 Digit=7 Digit=8 Digit=9	Location set: SevenSegment Port 0 Pin 0-2

**Figure 2 Define the output device** 

4. Select the input device (keypad) and define the Port and Pin used by the device, as shown in Figure 3. Similar to Step 3, first select "Confirm" and followed by "Finish".

🐱 Module - Physical Loc	ation			
Input Module           Keypad           Switch         IRsensor           Discription:         Show details           Number of pin required = 7, the module oc It provides multiple inputs.         Only input devices can be connected with           Port 0 00000111         Port 1 0000000           Port 3 0000000         Port 3 0000000	Port 0 2 3 Port and Pin microprocessor configure Pin least significant bit cor cupies selected pin N to pin the same port.	Pin 1 2 3 4 5 6 7 nnection N + 6 Reset Finish	Function: 1 2 3 4 5 6 7 8 9 0 Num Star	Location set: Delete from selected

## **Figure 3 Configuring the input device**

5. You can just "**click finish**" for the Set Main Function , as shown in Figure 4. The Set Main function allows you to define the initial condition of the system.

🖶 Default	program -	used for periodic acti 🔳 🗖 🔀
O Wait for	ms	OK (for the mechanical functions selected before to take time to finish)
		Function supported by current selected device Double click to program
<ul> <li>Output control</li> </ul>	SevenSegment	
Procedures:		Program code:
Delete from sel	lected procedure	
Insert before se	elected procedure	Reset Finish

**Figure 4 Set Main function interface** 

6. Now use the Set Input Device Function to relate input device (keypad) and the output device (7-segment display), as shown in figures 5 and 6. First, you must select which input device to be applied in your program, in this case - the keypad which has 10 inputs so you must also pick which key to use, as shown in Figure 5. In the next step, as shown in Figure 6, you can select which output device to use when the key is being pressed as well as defining the corresponding action to perform. When you complete the action, select "Finish".

If you want to program functions for other keys then just repeat Step 6.

😬 Inp	out Module				
		Function supported by curre Double click to program	ent selected device	Function programmed before Double click to re-program	Procedure of the selected programmed function:
Intput	Keypad	2 3 4 5 6 7 8 9		Keypad1	
			Finish	)	



😬 Keypad	11 - for	output control	and advance inp	ut contro	bl	
					Procedure:	Program code:
Output control	🔘 Wait for	ms Ok	(for the mechanical functions selected before to take time to	o finish)	SevenSegment Digit=0	p0 = 0x0;
	Function supported by current selected device Double click to program					
	💿 Output	SevenSegment	Digit=0 Digit=1 Digit=2 Digit=3			
			Digit=4 Digit=5 Digit=6			
			Digit=7			SevenSegmentDigit=0
Extra	Microproces	sor do nothing to wait for —	aumported by ourrowt colocited de	uico		p0 = 0x0;
control	Keypad	Function	supported by current selected de			
	21			O AND		
				O OR		
				🔿 End		
				Set	Delete from selected procedure	ן י ו
	L		J		Insert before selected procedure	Reset Finish

Figure 6 Relating the input to the output

7. Finally, press the **Generate file** button, as shown in Figure 7, and the VP.C program will be created according to the configuration of the input and output devices in the above steps.

🖩 M	otivating Combinab	le Assembly	
File	Help		
	1) Set Output Device		undo
	2) Set Input Device		
	3) Set Main Function		
	4) Set Input Device Function		
	5) Generate File	Get the program file from previous setting	

Figure 7 Creating the C program