

ADAM2 Single Remocon MCU

IDE User's Manual V1.0

S/W Integrated Development Environment

- Assembler***
- Simulator***
- Code Wizard***

1. ADAM2 IDE (Integrated Development Environment)

1.1 Introduction

ADAM2 IDE is a S/W development tool that integrate Editor, Assembler, Simulator, Code Wizard into one program.

It is possible to develop Remocon program without any other S/W and any other H/W equipment like oscilloscope or keymatrix board etc.

CodeWizard generate fully operational Remocon program.

All the things above is integrated in IDE environment.

1.2 Feature

- Real Time Simulation for all ADAM2X MCU series
- Fully Support Symbolic Level Debugging and Source Label Debugging
- Real KeyMatrix Simulation
- Convenient Scope view for Remout Signal
- CodeWizard automatically generate ROM code which is full operational
- Support various Clock Frequency
- Support Embbed Editor for with Syntax Highlight
- Support Line Assemble
- Support Unlimited PC break and RAM break
- No problem at Window XP/Vista environment

1.3 Program Structure

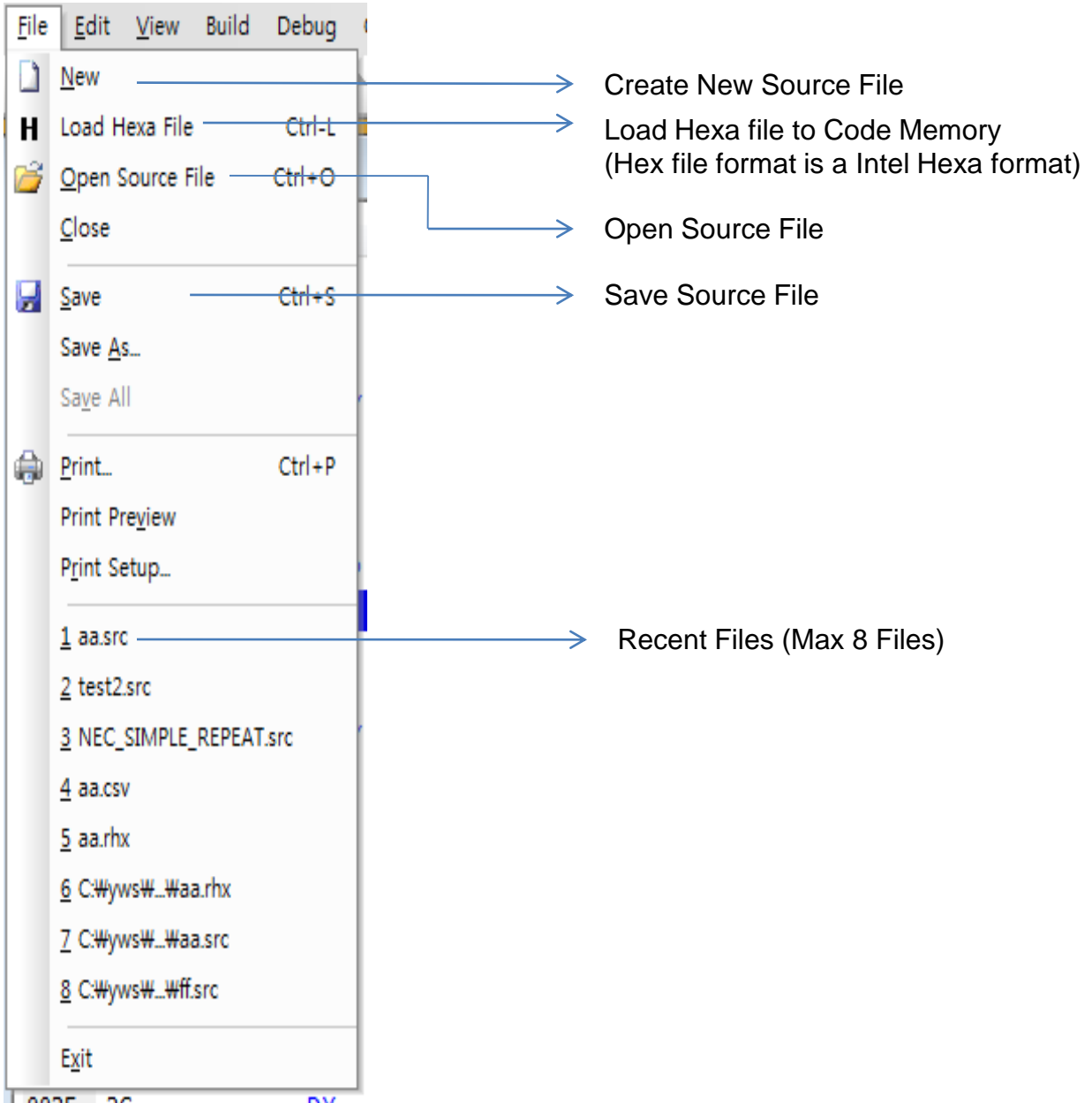
The screenshot displays the M2 Assembler/Simulator interface with several windows and callouts:

- Menu:** Located at the top left, containing File, Edit, View, Build, Debug, Config, Wizard, Window, and Help.
- ToolBar:** Located below the menu, containing various icons for file operations and simulation control.
- Disasm Window:** A table showing assembly code with columns for Address, Code, Label, and Comment. The first few lines are:

Addr	Code	Label	
0000	3C	Reset	
0001	4F		
0003	0D		
0007	60	CLEAR	LMIIY 0
000F	5F		YNEI 15
001F	87	BR	CLEAR
003F	ED	MAIN	CAL LOWZ
003E	06		STOP
003D	00		NOP
003B	3C	DB	LXI 0
0037	44		LYI STAT
002F	60		LMIIY 0
001E	4F		LYI 15
003C	0D		SO
0039	44	KEY	LYI STAT
0033	36		REM 1
0027	35		REM 2
000E	18		LPBI 1
001D	81	BR	KEYSCANSTART
003A	D8	DACOM	CAL DACOM1
0035	2C		DY
002B	70		ALEI 0
0016	98	BR	DACOM1
002C	0F		RTN
0018	21	DACOM1	LAM
0030	2B		IY
0021	2B		IY
0002	01		EORM
0005	0F		RTN
- Register Window:** Shows the state of registers A, B, X, Y, A, ST, WDT, K, R, D, ROUT, PMR, F, F, 000, 0, 1.
- RAM Dump Window:** Shows a memory dump for address 0x00, with values 00 05 F B 00 00 00 30 3 and 10 01 23 45 67 89 A B C D E F.
- KeyMatrix Window:** A grid representing a keyboard matrix with keys K0-K3, R0-R3, and GND.
- Source Window:** Shows the source code for 'aa.src', including comments and assembly instructions like EQU, POINT, STROBE, KEYTIME, COUNT, BANG, CC6L, CC6H, CC7L, CC7H, NEWDTL, NEWDTH, BACKL, BACKH, OLDL, OLDH, and BLANK.
- Scope Window:** A timing diagram showing a square wave pulse. Below the diagram, it reads: Pulse Width = 0 Code (0.000 msec) (fOSC = 3.640MHz), L_Pos=0, R_Pos=0.
- Running Information:** Located at the bottom status bar, showing Disasm Level Debug, STOP Mode, EXE Time = 50962 Cycle (000,672,026 used), Ln 1, Col 1, and CAP, NUM.

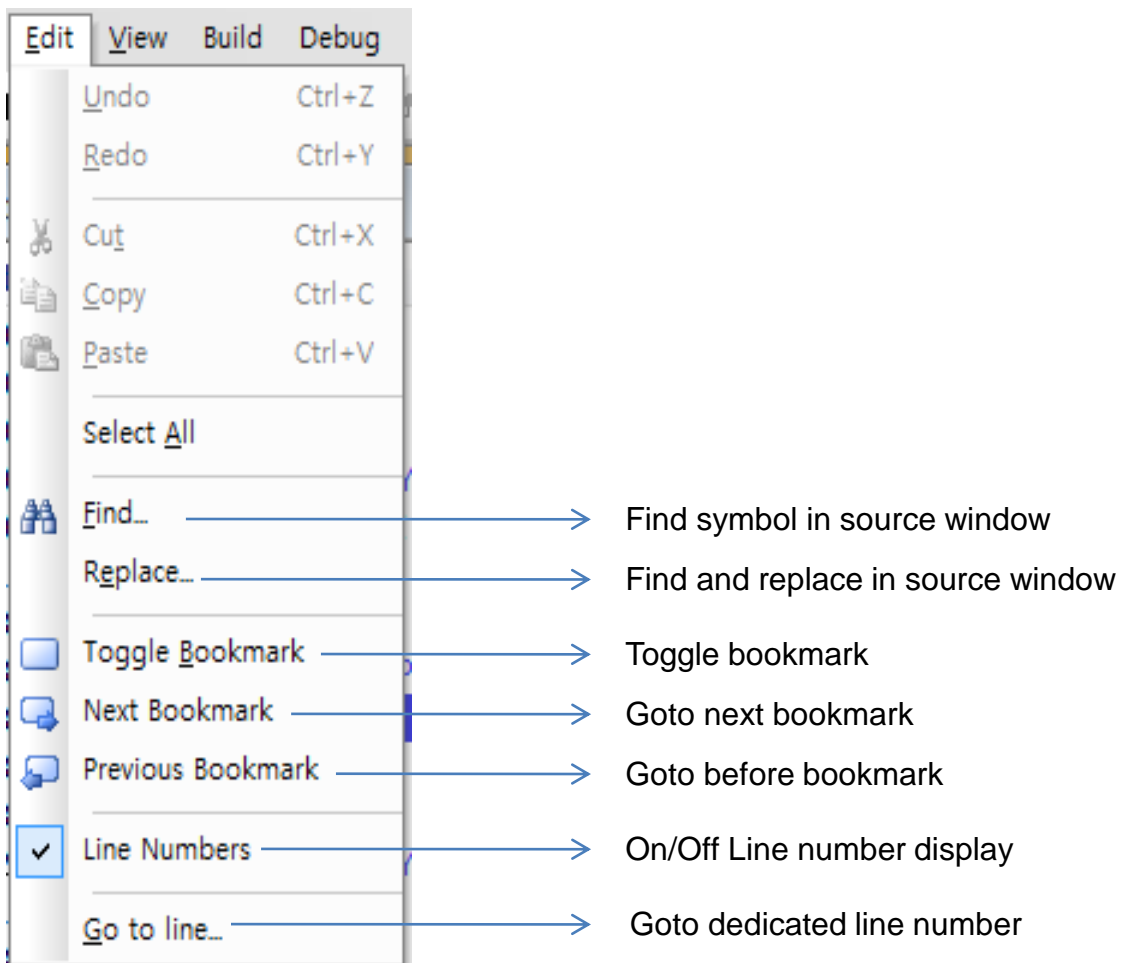
2. Menu Description

2.1 File Menu



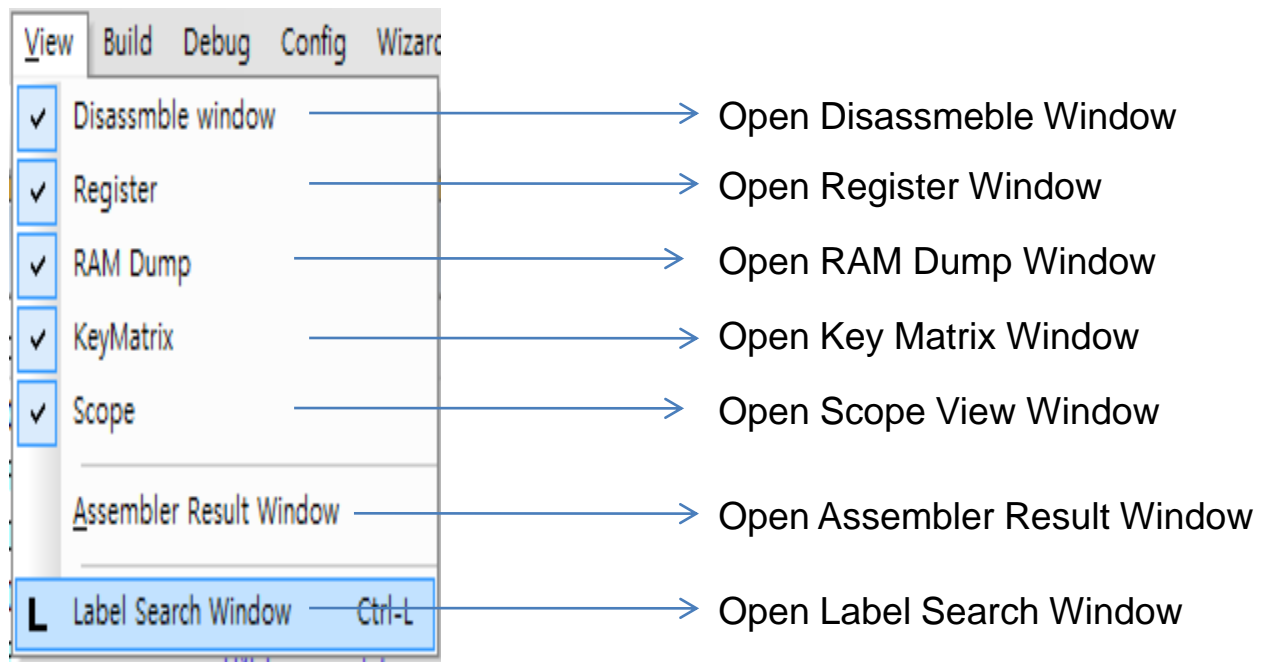
2.2 Edit Menu

Edit menu is for functions of embedded Editor.
It support search/replace and book mark functions.
Embedded editor support syntax highlight also.



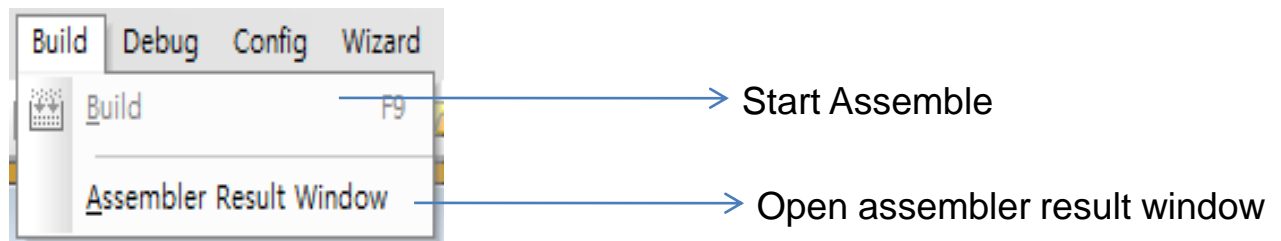
2.3 View Menu

Open various function windows.



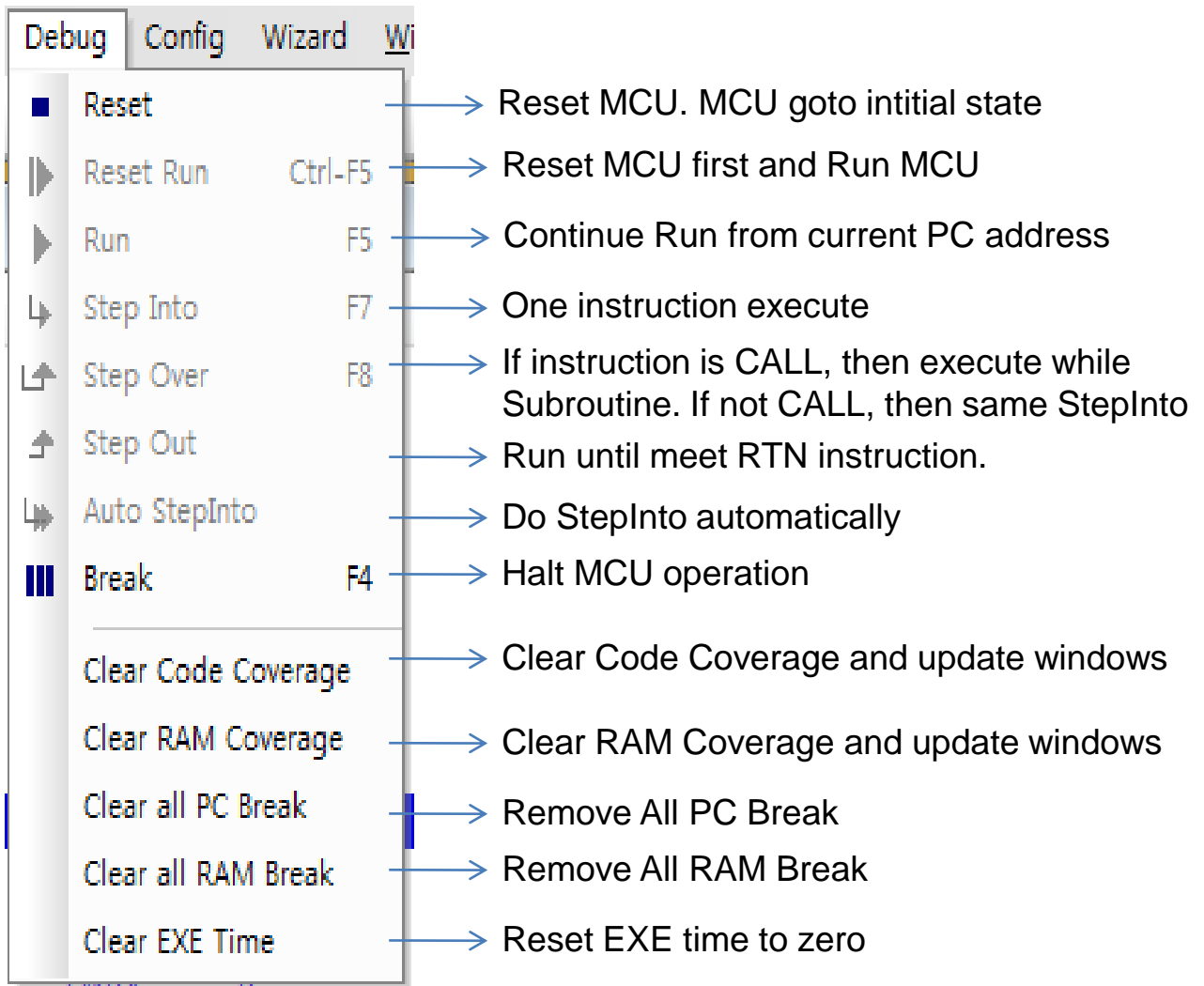
2.4 Build Menu

Start Assembler and open result window



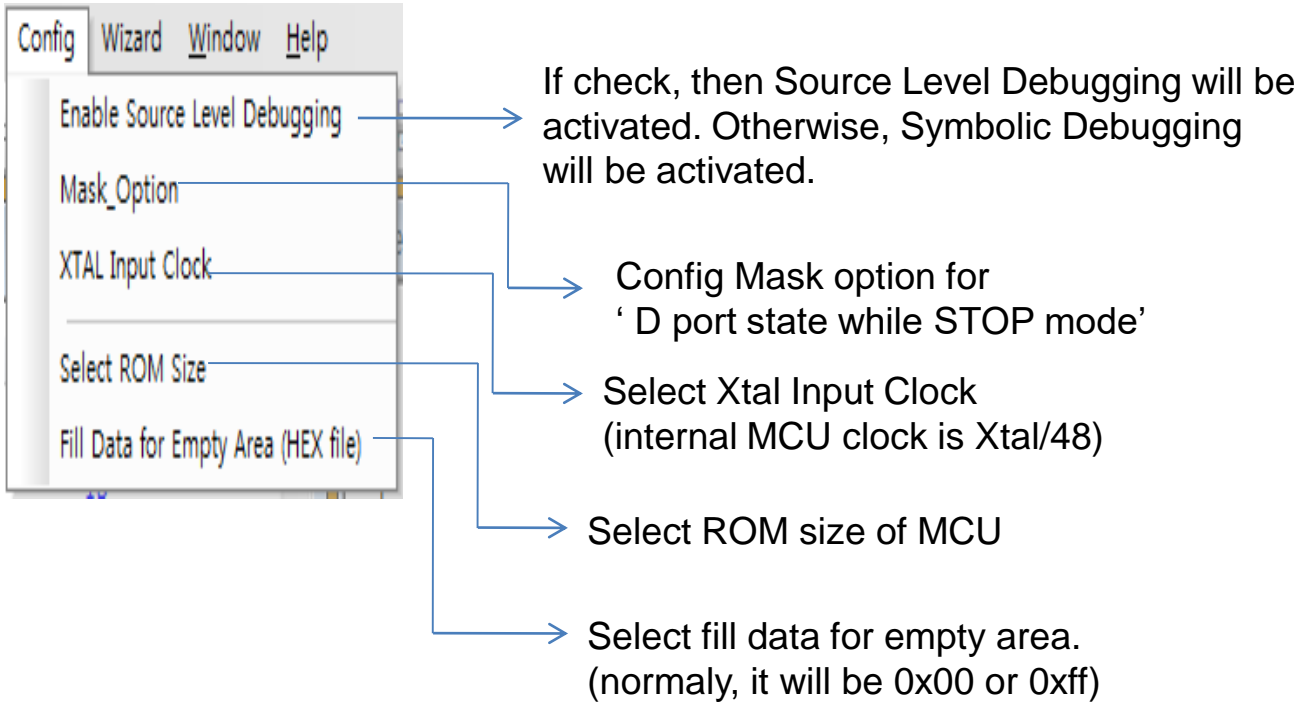
2.5 Debug Menu

Menu for debugging operations.



2.6 Config Menu

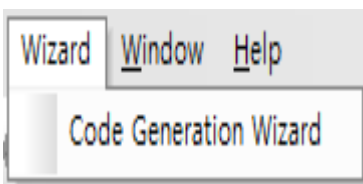
Select various options.



2.7 Wizard Menu

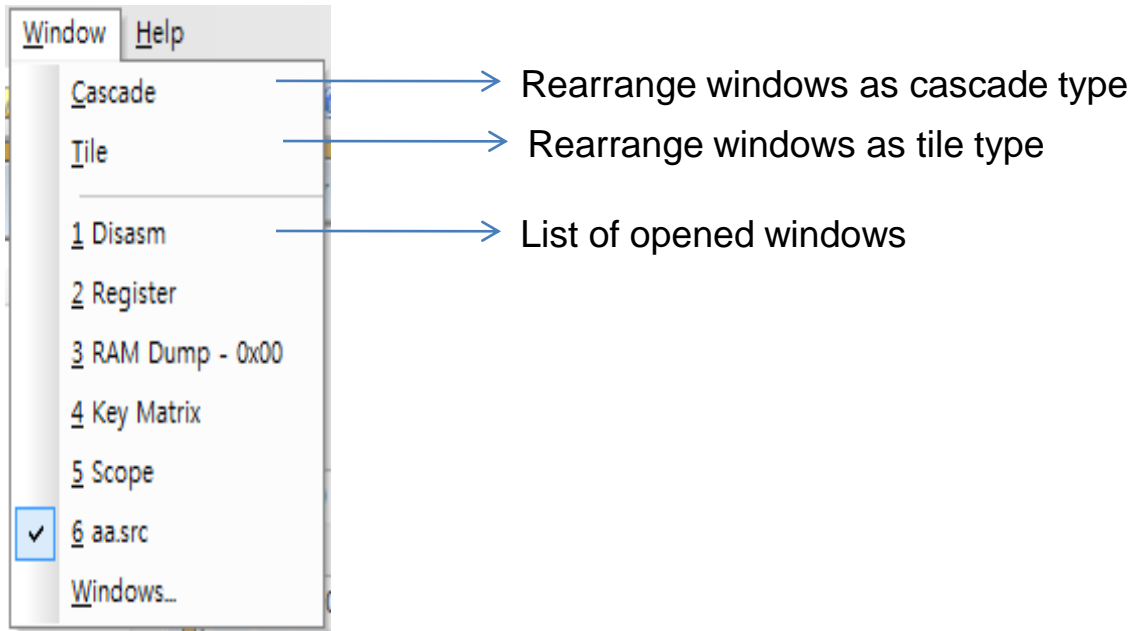
Open Wizard windows.

In Wizard windows, you can generate full operation ROM Code automatically.



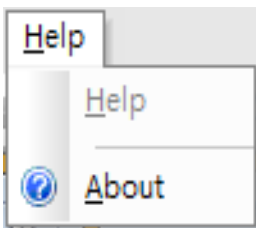
2.7 Window Menu

Manipulate windows arrangement style.



2.7 HelpMenu

Open Help window and display About message



3. Function Windows

3.1 Source Edit Window

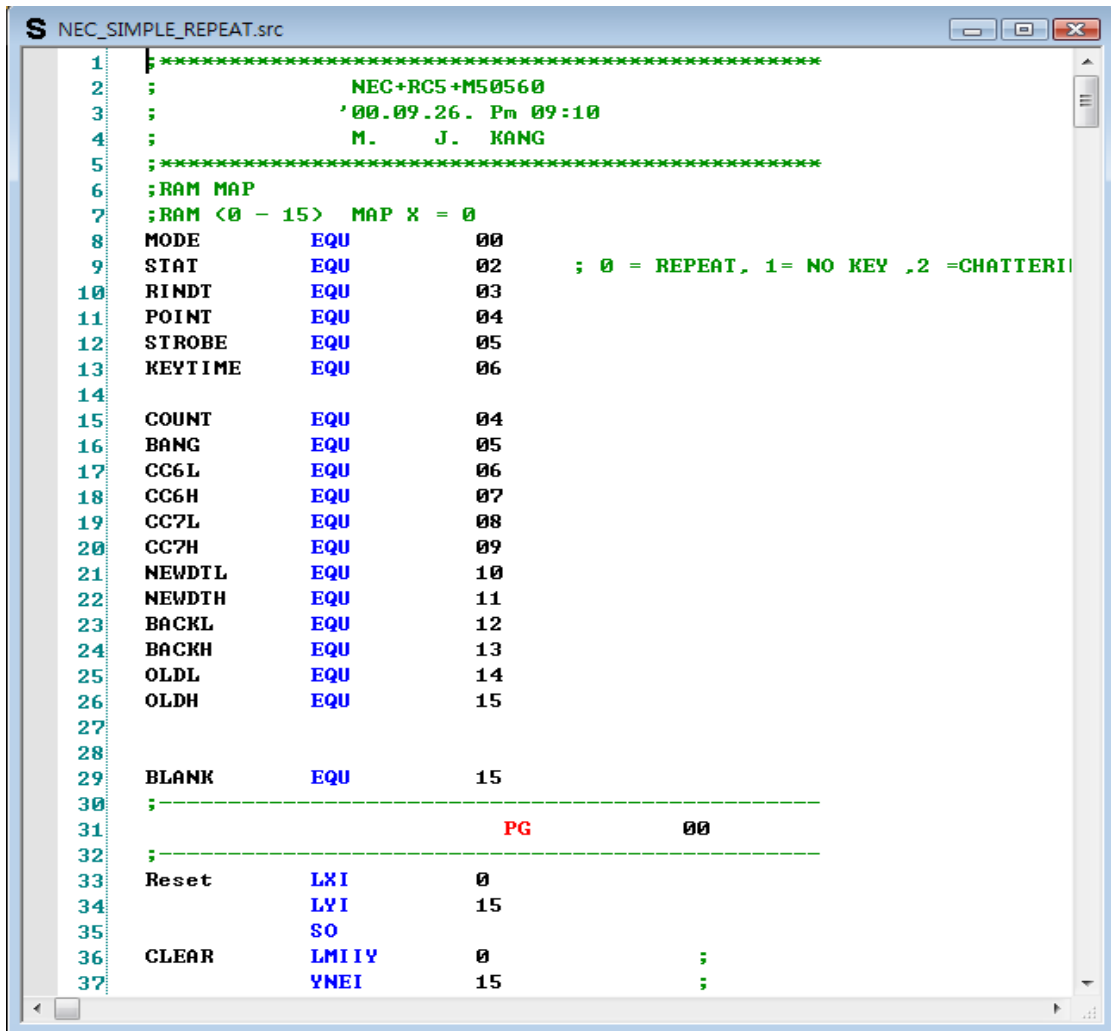
ADAM2 IDE have embedded editor.

It is possible to edit source code in this editor, and compile it in IDE.

Editor support Syntax Highlight, BookMark, and symbol search.

Also it is possible to Source Level Debug in this window.

For simple solution, only one source file can be opened at one time.



```
S NEC_SIMPLE_REPEAT.src
1  ;*****
2  ;          NEC+RC5+M50560
3  ;          '00.09.26. Pm 09:10
4  ;          M.    J.  KANG
5  ;*****
6  ;RAM MAP
7  ;RAM <0 - 15>  MAP X = 0
8  MODE          EQU          00
9  STAT          EQU          02      ; 0 = REPEAT, 1= NO KEY ,2 =CHATTERI
10 RINDT        EQU          03
11 POINT        EQU          04
12 STROBE       EQU          05
13 KEYTIME      EQU          06
14
15 COUNT        EQU          04
16 BANG         EQU          05
17 CC6L         EQU          06
18 CC6H         EQU          07
19 CC7L         EQU          08
20 CC7H         EQU          09
21 NEWDTL       EQU          10
22 NEWDTH       EQU          11
23 BACKL        EQU          12
24 BACKH        EQU          13
25 OLDL         EQU          14
26 OLDH         EQU          15
27
28
29 BLANK        EQU          15
30 ;-----
31 ;                      PG          00
32 ;-----
33 Reset        LXI          0
34              LYI          15
35              SO
36 CLEAR        LMIY         0      ;
37              YNEI         15    ;
```

3.2 Disassemble Window

Disasm window is used for debugging user code as symbolic level.

It is possible to step by step debug and set PC break point.

Also line assemble is possible.

Executed instruction is displayed blue color, and unexecuted instruction is displayed black color.

Mouse Handling

Left Mouse Click : Move Cursor

Left Mouse Double Click : Toggle PC Break Point

Right Mouse Click : Line Assemble

The screenshot shows the Disasm window with the following table of instructions:

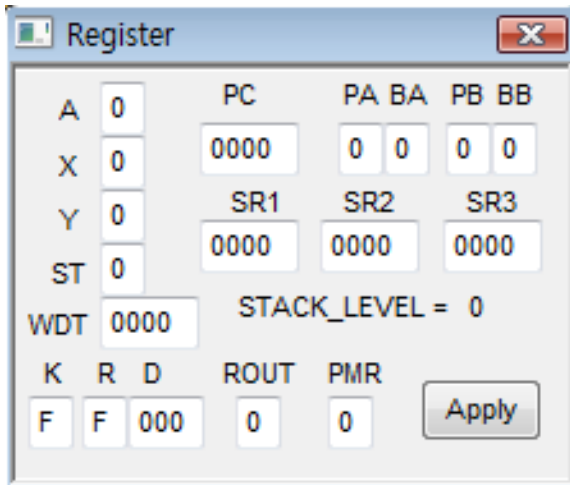
Addr	Co...	Label	Inst	Opr
0000	3C	Reset	LXI	0
0001	4F		LYI	15
0003	0D		SO	
0007	60	CLEAR	LMIY	0
000F	5F		YNEI	15
001F	87		BR	CLEAR
003F	ED	MAIN	CAL	LOWZ
003E	06		STOP	
003D	00		NOP	
003B	3C	DB	LXI	0
0037	44		LYI	STAT
002F	60		LMIY	0
001E	4F		LYI	15
003C	0D		SO	
0039	44	KEY	LYI	STAT
0033	36		REM	1
0027	35		REM	2
000E	18		LPBI	1
001D	81		BR	KEYSCANSTART
003A	D8	DACOM	CAL	DACOM1
0035	2C		DY	
002B	70		ALEI	0
0016	98		BR	DACOM1
002C	0F		RTN	
0018	21	DACOM1	LAM	
0030	2B		IY	
0021	2B		IY	

Annotations in the image:

- Executed instructions (Blue): Points to the instruction at address 0003 (SO).
- Current PC address: Points to the instruction at address 0003 (SO).
- PC Break Line: Points to the instruction at address 003B (DB).
- Can Line Assemble: Points to the 'Apply' button in the context menu.
- Symbolic level debugging: Points to the instruction at address 001D (BR KEYSCANSTART).
- Unexecuted instructions (Black): Points to the instruction at address 002B (ALEI).

3.3 Register Window

Disasm window is used for monitoring MCU registers and I/O port value. It is possible to edit new value and apply it to MCU registers and I/O port.



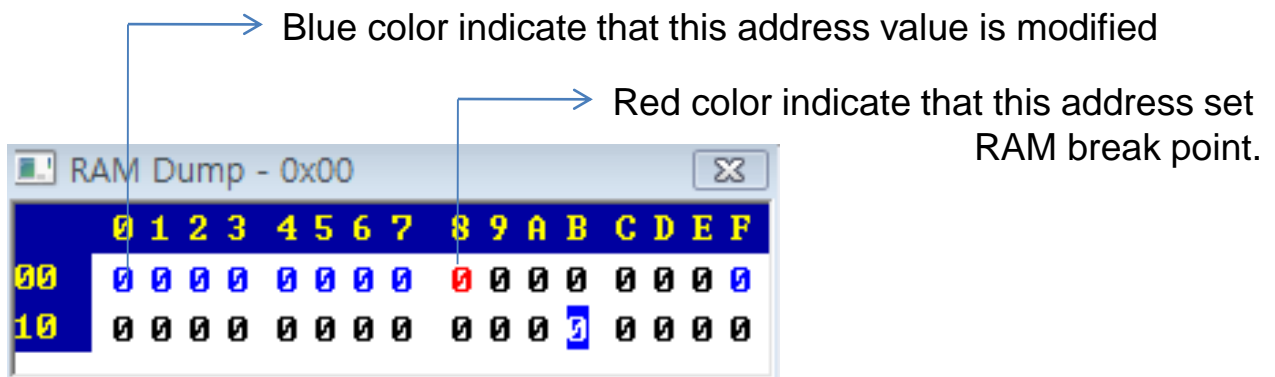
3.4 RAM Dump Window

RAM dump window is used for monitoring internal RAM memory. It is possible to edit new value and apply it to memory. Also RAM break function is possible.

Mouse Action

Left Click : Move Cursor

Left Double Click : Toggle RAM Break Point



3.5 KeyMatrix Window

KeyMatrix window simulate H/W key matrix board in real time.

Press Key button act like real H/W key.

It is possible to press key and no button up and move other postion.

It will act like press double in real H/W key matrix.

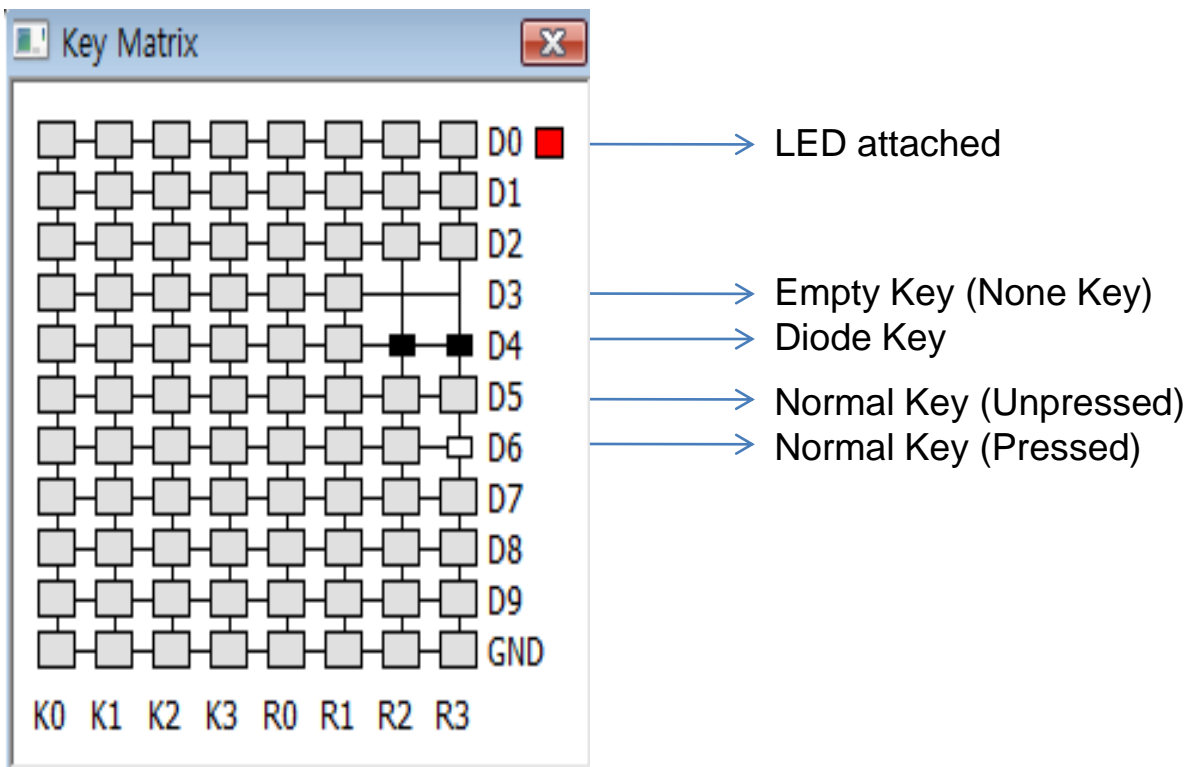
Also setup each key property as normal, empty or diode key.

It is possible to LED display at each D port by following method.

→Locate Mouse to D port display area and press right mouse button.

It is possible to set each key property by follwing method.

→ Locate Mouse to each key area and press right mouse button.



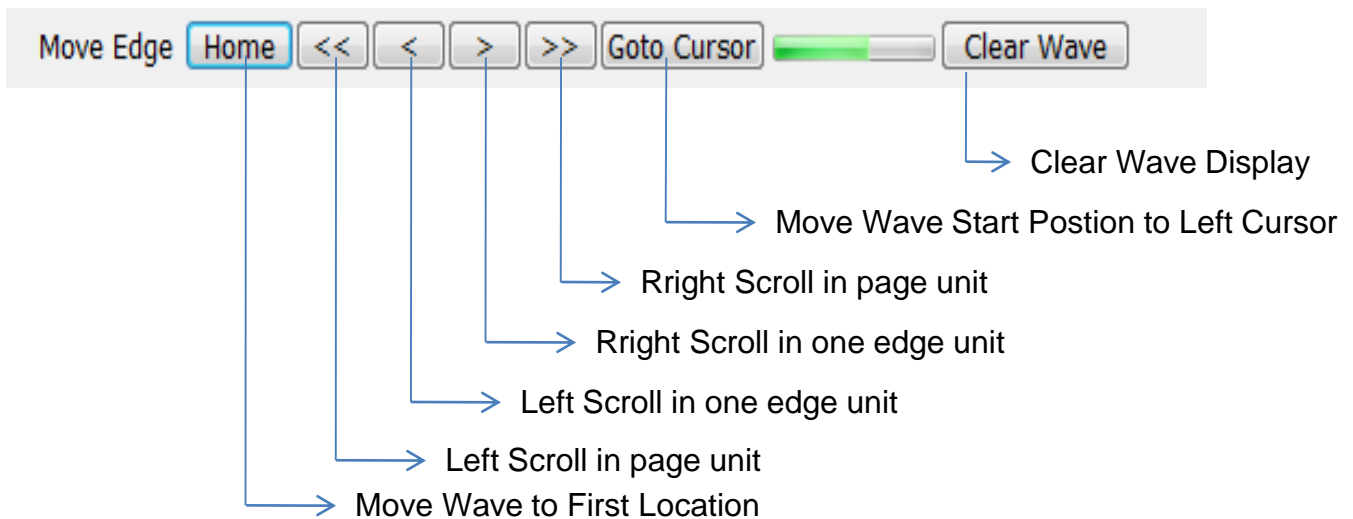
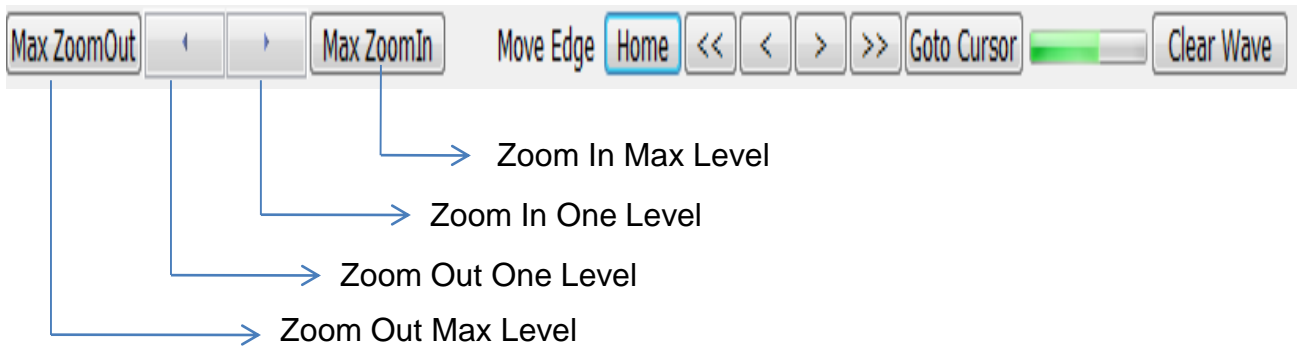
3.6 Scope Window

In Scope Window, you can view Remout signal as graphically.
It is dedicated remocon signal, so it is very simple debug remocon wave.

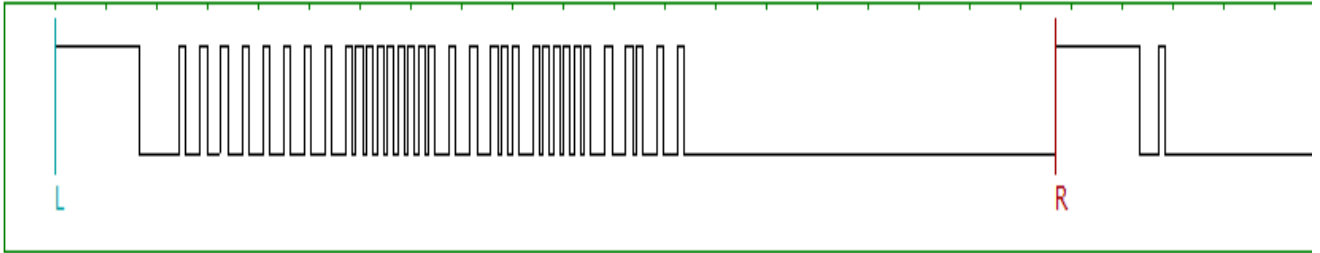
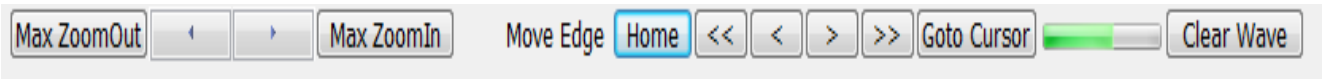
It can display about 3 second wave data in case $f_{OSC}=3.64\text{MHz}$)
By Zoom In / Zoom Out button, you can view wave conviniently.
By Left Cursor/Right Cursor, you can calculate pulse width of signal.
By MoveEdge, you can explore output wave.

Mouse Action

Left Click: Move Left Cursor
Right Click: Move Right Cursor



< Measure pulse width >



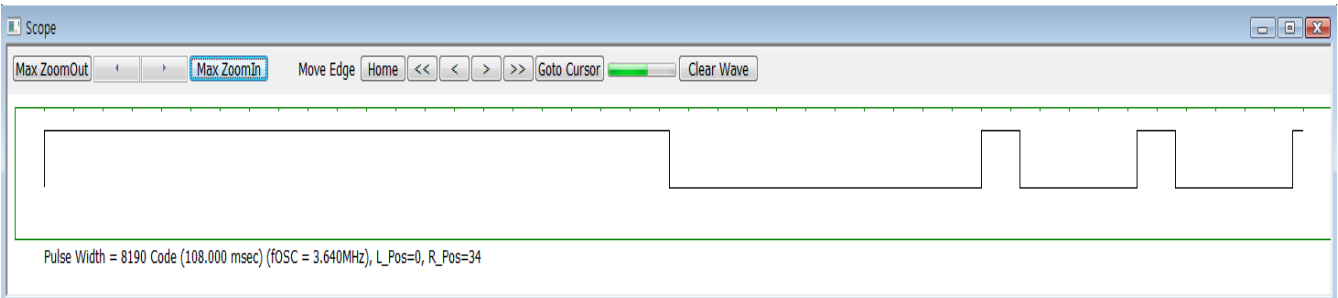
Pulse Width = 8190 Code (108.000 msec) (fOSC = 3.640MHz), L_Pos=0, R_Pos=34

Measure pulse width by just click left cursor and right cursor button

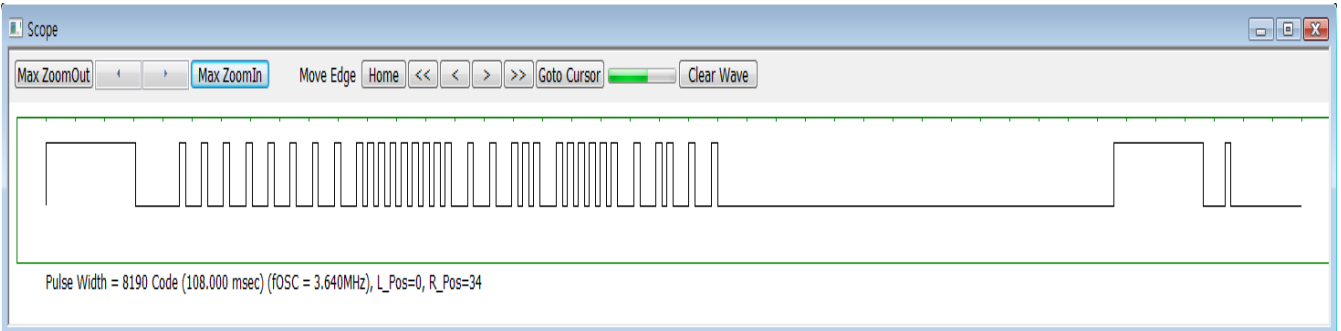
< Max Zoom Out >



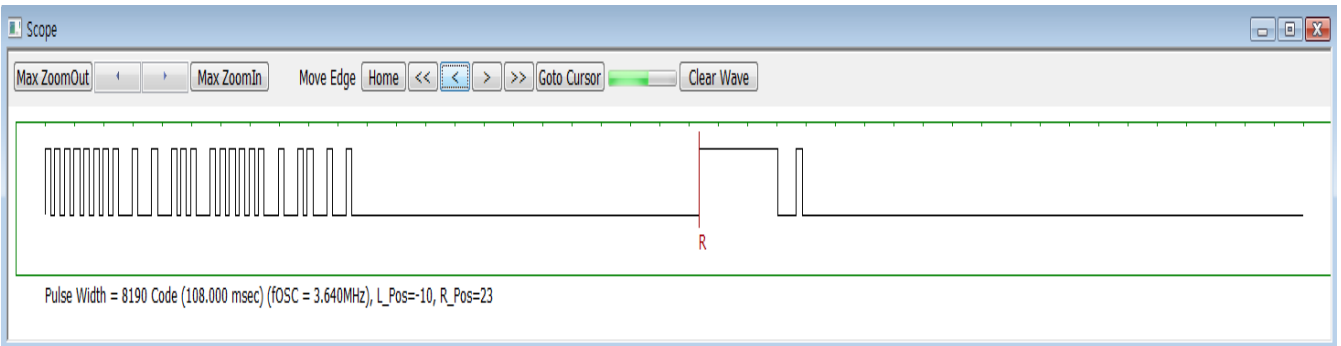
< Max Zoom In >



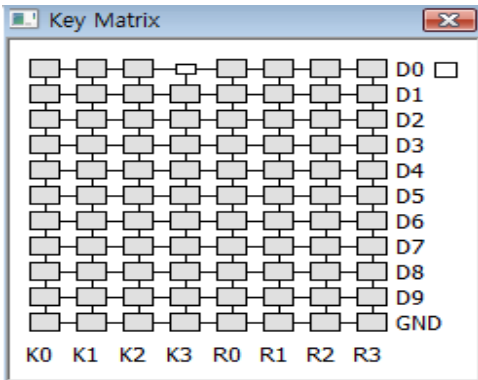
< Normal Zoom >



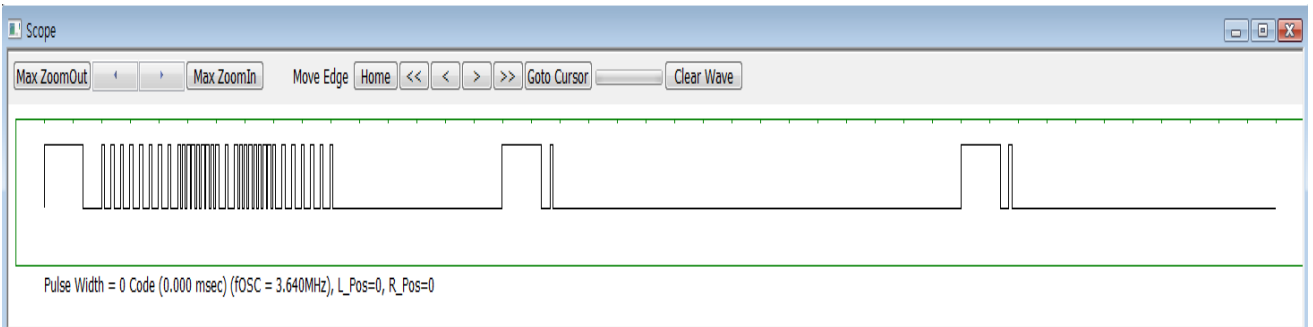
< Explore Waveform >



< Example >



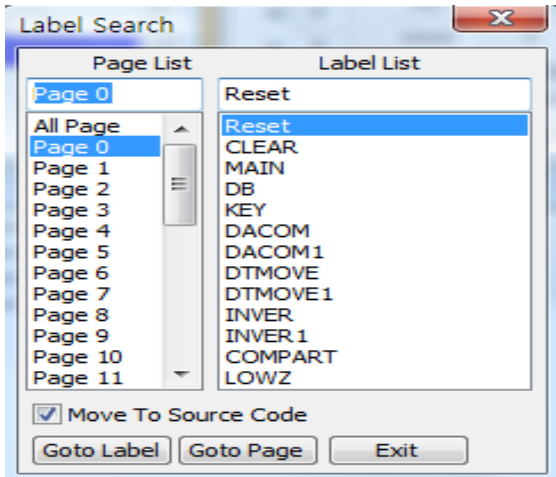
- D0/K3 Key Press
- Waveform Output



3. 7 Label Search Window

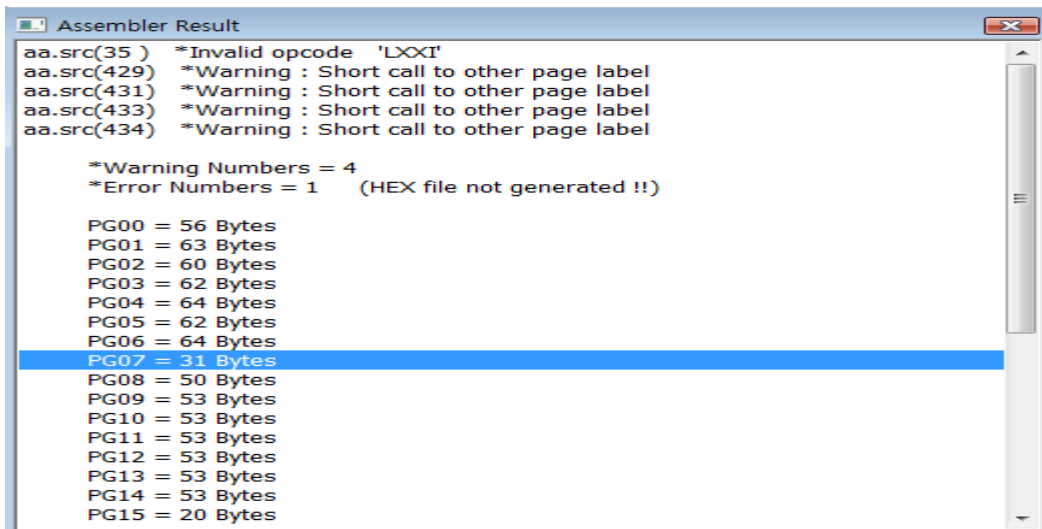
In Label search window, you can goto label defined position.
And can goto page start address.
If check 'Move to Source Code' button, then goto source file line also.
Else, only goto disassemble window.

Mouse Action
Left Button Double Click : goto Label defined line



3. 8 Assembler Result Window

This window display the message of assembler output result.
If there is error or warning, click the error line.
Source window will be highlighted at the error line, you can correct the error line directly.



4. Code Wizard

In Code Wizard, you can generate fully operational remocon rom code. Record Custom code, Key Value and select D port option. And press 'Generate' button, then ROM code will be generated

The screenshot shows the Code Wizard application window with the following components and annotations:

- Key and Receiver Grid:** A table with columns K0-K3, R0-R3 and rows D0-D9, GND. Each cell contains a hex code (FF00) and a value (00-57). Annotations point to the D0-D9 checkboxes and the hex values, stating: "Check each D port line, Checked line will be enabled", "Custom Code of each Key", and "Key Code of each key".
- Custom Code List:** A list with entries FF00 Custom0, FF01 Custom1, FF02 Custom2, and FF03 Custom3. An annotation points to this list: "Setup four multi custom code".
- D Port state at Stop Mode:** Four checkboxes for D4, D5, D6, and D7. An annotation points to this section: "Checked line will be disabled".
- Indicator LED:** Radio buttons for None, D4, D5, D6, and D7. An annotation points to this section: "Select indicator LED port".
- REMOCON FORMAT:** A dropdown menu currently set to "NEC_SIMPLE_REPEAT.fmt". An annotation points to it: "Select remocon output format".
- Buttons:** "Generate", "Load", and "Exit" buttons. An annotation points to the "Load" button: "Load wizard environment file. (file format is Excel CSV format) (So, editing it in Excel is possible)".
- Final Action:** An annotation points to the "Generate" button: "Start code generation. *.RHX file will be generated."