MPLAB X + CCS C コンパイラ・チュートリアル

全て必要なものはMPLAB X に既にビルトインされています。

Plug-in は必要ですがMPLAB X に含まれていますのでダウンロードもインストールもMPLAB X 内のブラ ウザーにより操作されます。*MPLABX 2.20現在

* 基本的にはMPLAB 8.xxx以前の様にCCS 社からダウンロードしてプラグインをインストールする必要は 有りませんが、MPLAB Xのインストールの問題等で、上手く統合されない場合はCCSのダウンロード・ペー ジよりMPLAB® X IDE Plug-in をダウンロードして下さい。

 $http://www.ccsinfo.com/downloads/setup_mplabx_plugin.exe$

** ここでは Program Files (x86)¥PICCC¥Examples の中にある EX_SQW.Cというサンプル・ファイルをデス クトップの"CCS Working folder"に置いて、そのコンパイルを例として説明しています。インストール終了後、 アイコンをクリックして立ち上げます。※そのまま Examples に有るものはコンパイル出来ません。



Tools -> Plugins をクリックします。



次の画面が現れます。Available Pluginsのタブをクリックして見て下さい。

	Plugins	
Jpdates Available Plugins (17) D	ownloaded Installed (26) Settings	
<u>R</u> eload Catalog		Search:
Update Name	Category 🔻	
<u>U</u> pdate		
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下の画面に変わります。

Ínstall	Name	Category ₹	Source	
	dsPIC Filter Designer	MPLAB Plugin	-	aspic Filter Designer
	DMCI PCLint PCWer Monitor ELFViewer MPLABX KeeLoq Plugin ECAN Bit Rate Calculator MPLABØ Code Configurator Proteus VSM Viewer Graphics Display Designer X MemoryStarterkit dsPICWorks RTOS Viewer (FreeRTOS) PBP Tool Chain PicBasic Language Syntax COS C Compiler SDCC Toolchain	MPLAB Plugin MPLAB Plugin Tools Tools Tools Tools	ቝ፟፟፟፟፟፟ቝ፟፟ቚ፟ቝ፟ቚ፟ቝ፟ቚ፟ቝ፟ቝ፟ቝ፟ቝ፟ቝ	Image: Community Contributed Plugin Version: 1.2 Author: Microchip Technology Inc. Date: 14/05/21 Source: Microchip Plugins Homepage: http://www.microchip.com Plugin Description The dsPIC Filter Designer Plug-in integrates dsPIC Filter Designer application and lets the user to design the filter

タブの Available Plugins の CCS C Compiler にチェックを入れてから下の画面のように右下の Install をクリックしてインストールします。

Install Name Category ♥ Source CCS C Compiler dsPIC Filter Designer MPLAB Plugin Image: Community Contributed Plugin Image: Community Contributed Plugin POLint MPLAB Plugin Image: Community Contributed Plugin Image: Community Contributed Plugin Power Monitor MPLAB Plugin Image: Community Contributed Plugin Image: Community Contributed Plugin Power Monitor MPLAB Plugin Image: Community Contributed Plugin Image: Community Contributed Plugin Power Monitor MPLAB Plugin Image: Community Contributed Plugin Image: Community Contributed Plugin MPLABX KeeLog Plugin MPLAB Plugin Image: Community Contributed Plugin Image: Community Contributed Plugin MPLABV KeeLog Plugin MPLAB Plugin Image: Community Communi	100.00			112	
dsPIC Filter Designer MPLAB Plugin DMCI MPLAB Plugin POLint MPLAB Plugin Power Monitor MPLAB Plugin Power Monitor MPLAB Plugin ELFViewer MPLAB Plugin MPLABX KeeLog Plugin MPLAB Plugin MPLABX KeeLog Plugin MPLAB Plugin MPLABWer MPLAB Plugin MPLABWer MPLAB Plugin MPLABWer MPLAB Plugin MPLABWer MPLAB Plugin Graphics Usplay Designer X MPLAB Plugin MemoryStarterkit MPLAB Plugin GSPICWorks MPLAB Plugin RTOS Viewer (FreeRTOS) MPLAB Plugin Pip Tool Chain Tools VOCS Compiler Tools SDCC Toolchain Tools	Install	Name	Category ₹	Source	CCS C Compiler
□ DMCI MPLAB Plugin Image: Community Contributed Plugin □ POLint MPLAB Plugin Image: Community Contributed Plugin □ POLint MPLAB Plugin Image: Community Contributed Plugin □ Power Monitor MPLAB Plugin Image: Community Contributed Plugin □ Power Monitor MPLAB Plugin Image: Community Contributed Plugin □ Power Monitor MPLAB Plugin Image: Community Contributed Plugin □ MPLABX KeeLoq Plugin Image: Community Contributed Plugin □ Proteus VSM Viewer MPLAB Plugin Image: http://www.cosinfo.com/ □ Graphics Display Designer X MPLAB Plugin Image: http://www.cosinfo.com/ □ Graphics Display Designer X MPLAB Plugin Image: http://www.cosinfo.com/ □ MemoryStarterkit MPLAB Plugin Image: http://www.cosinfo.com/ □ MemoryStarterkit MPLAB Plugin Image: http://www.cosinfo.com/ □ Ply Tool Chain Tools Image: http		dsPIC Filter Designer	MPLAB Plugin		
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dsPICWorks MPLAB Plugin RTOS Viewer (FreeRTOS) MPLAB Plugin PBP Tool Chain Tools V CCS of Compiler Tools SDCC Toolchain Tools		MemoryStarterkit	MPLAB Plugin		CCS provides a complete integrated tool suite for developing and debugging
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SDCC Toolchain Tools allowing access to hardware reatures directly from C and we include ready to run examples and tested peripheral drivers allow developers to quickly start their project.	~	CCS C Compiler	Tools	00	and standard C operators. Our built-in functions are specific to PIC MCU registers
		SDCC Toolchain	Tools	W	examples and tested peripheral drivers allow developers to quickly start their project.

Installをクリックしますと次の画面が現れます。

K	1	Plugin Insta	iller	×
Velcome to the The installer will do	Plugin Installer wnload, verify and the	en install the se	lected plugins.	
The following plu	gins will be installed:			
ccs c c	ompiler [1.57]			
				2221

Next>をクリックしますと次の画面が現れます。

n order to continue issociated with the	with the installation, you need to agree with all of the particular plugins.	e license agreements
CCS C Compiler Li	cense Agreement	^
OFTWARE LICEN	SE AGREEMENT	
I. License – Cust	om Computer Services ("CCS")	
rants you a licens "Licensed Materia	e to use the software program Is") on a single-user computer.	
Use of the License payment of addition	d Materials on a network requires nal fees.	
. Applications Sc	oftware - Derivative programs you	
reate using the lic Applications Softwa Agreement,	rensed materials, identified as are, are not subject to this	
). Warranty - CCS	S warrants the media to be free	

I accept the terms in all of the license agreements にチェックを入れて Install をクリック

<u>•</u>	The following plugins are signed but not trusted:
	CCS C Compiler
	warning: installing untrusted plugins is potentially insecure. Use unsigned or untrusted plugins at your own risk.

Continue をクリックしますと、以下の画面になり、MPLAB X を再起動が要求されますので、再起動して下さい。

K		Plugin Ins	taller		×
Restart applicat Restart application	ion to complete to finish plugin in	e installation Istallation.			
The Plugin Instal CCS C Compiler	er has successful	lly installed the fo	ollowing plugins:		
Restart Now					
O Restart Later					
			<u> </u>	Cancel	<u>H</u> elp

Finish をクリックすると再度、MPLAB X が自動的に再起動されます。



確認のために再度, Tools -> Plugins -> Installed をクリックしますと下記の画面で CCS C Compiler が プラグインされていることを確認出来ます。

					Plugins
odates	Available Plugins (21) ownload	led Installed (26)	Settings		Search
Select	Name	Category ₹	Acti	- 17	
	Trant (Brazen)	Date IDF			CCS C Compiler
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H	IDE Platform	Base IDE Base IDE	ě		Plugin Description
H	Spellohacker Figlish Dictionaries	Base IDE Base IDE	ě		CCS provides a complete integrated tool suite for developing and debugging
H	Hudson	Base IDE	õ		embedded applications running on Microchip PIC MCUs and dsPIC DSCs. The intelligent code optimizing CCS C compiler frees developers to concentrate or desire functionality instead of builds the background MCU and the provide a start.
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H	toolchainCommon	MPLAB IDE	õ		allowing access to hardware features directly from C and we include ready to run
П	toolchainMPASMWIN	MPLAB IDE	Ø		project
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	toolchainC30	MPLAB IDE	0		
	toolchainC32	MPLAB IDE	0		
	toolchainC18	MPLAB IDE	0		
	toolchainVC39	MPLAR IDE	0	Y	

ここからソース・ファイルを選択し、コンパイルをする手順を説明します。

最初の画面の File を右クリックしますと下記の New Project が選択出来るようになります。



Steps	Choose Project	
1. Choose Project 2	Categories: Microchip Embedded Other Embedded D- Categories Samples	Projects: Standalone Project Existing MPLAB IDE v8 Project Prebuilt (Hex, Loadable Image) Project User Makefile Project Library Project
	Description: Creates a new standalone ap project.	plication project. It uses an IDE-generated makefile to build your

Next をクリックしますと次の画面が現れますので、Deviceからドロップ・ダウンでターゲットのデバイス・ファミリ

ーを選択して下さい。PIC16F877AはMid-Range 8-bit MCUsです。

K	New Project	×
<u>Steps</u>	Select Device	
 Choose Project Select Device Select Header Select Tool Select Plugin Board Select Compiler Select Project Name and Folder 	Family: All Families Device: Recently Used Baseline 8-bit MCUs (PIC10/12/16) Mid-Range 8-bit MCUs (PIC18) Advanced 8-bit MCUs (PIC18) 16-bit MCUs (PIC24) 16-bit DSCs (dsPIC33)	
	< <u>B</u> ack Next > <u>F</u> inist	n Cancel <u>H</u> elp

×		New Project ×
Steps	Select Devi	ce
 Choose Project Select Device Select Tool Select Plugin Board Select Compiler Select Project Name and Folder 	Family: Device:	J-Range 8-bit MCUs (PIC12/16/MCP) ✓ PIC16F876A PIC16F876A PIC16F877A PIC16F882 PIC16F883 PIC16F884 PIC16F884 PIC16F884 PIC16F884
		K Next > Finish Cancel Help

Select Tool では CCS C コンパイラーのためには単に Simulator を選択して Next をクリックして下さい。

×	New Project	×
Steps 1. Choose Project 2. Select Device 3	Select Tool Hardware Tools Hardware Tools OPICkit2 OPICkit3 O	
	KDE PIC24F 1 SkDE PIC24F 1 SkDE PIC32	Ţ
<u>ppl</u> fi	< Back Next > Einis	h Cancel <u>H</u> elp

下の画面が現れますので、次ページの様に CCS C Compiler[C:¥PROGRA..を選択して下さい。

K	New Project	×
Steps 1. Choose Project 2. Select Device 3. Select Tool 5. Select Plugin Board 6. Select Compiler 7. Select Project Name and Folder	Select Compiler CCS C Compile	
ale and the second second second		

×	New Project	×
 Steps 1. Choose Project 2. Select Device 3. Select Header 4. Select Tool 5. Select Plugin Board 6. Select Compiler 7. Select Project Name and Folder 	Select Compiler Compiler Toolchains CCS C Compiler COS C Compiler HI-TECH PICC (None found) mpasm Mompasm Mompasm (v5.56) [C:¥Program Files (x86)¥Microchip¥MPLABX¥mpasmx] XC8 (None found)	
MPLABX		
	< <u>B</u> ack Next > Einish Cancel	<u>H</u> elp



任意のプロジェクト名を入力して Finish をクリックして下さい。

×		New Project	×
Steps	Select Project Nam	and Folder	
 Choose Project Select Device Select Header Select Tool Select Plugin Board Select Compiler Select Project Name and Folder 	Project Name: Project Location: Project Folder: Overwrite existin Also delete source Set as main proje Use project locat Encoding: ISO-88	test C#UsersDowner#MPLABXProjects C#UsersPowner#MPLABXProjects¥testX re project. cest cest cest cest <t< th=""><th>wse</th></t<>	wse
n'n n'n / unin n nin n'	#*	< <u>B</u> ack Next > Einish Cancel	Help

画面が次の様に変わりますので Source Files にカーソルを移動して右クリックします。



Add Existing Item…をクリックしますと次の様な画面になりますので、ここでドロップ・ダウンを使って任意の ソースの場所を選択して下さい。

		Select Item		
参照:	🔒 CCS Working fold r		v 🤌 📁 🛄	
Examples Examples 最近使った項 ネットワーク PC	ISF23K22.mc ISF23K22.mcs ISF23K22.mcs EX_SQW.C main.c main.h MINI877A_MOD.cc MINI877A_MOD.cc MINI877A_MOD.cc MINI877A_MOD.ce MINI877A_MOD.ee MINI877A_MOD.le MINI877A_MOD.ls MINI877A_MOD.s MINI877A_MOD.s MINI877A_MOD.s MINI877A_MOD.s MINI877A_MOD.s	MINI877A_MOD.xsym Setup_ccsload5.006.exe Setup_ccsload5.exe test.mcp test.mcs test.mcw spjt of rr sym ex t TA ym e		Store path a: Auto Relative Absolute
	ファイル名: ファイルのタイプ: オバアの	7≂∕ II.		Select 取省

Select をクリックしますと下記の画面になります。

×	MPLAB X IDE v2.10 - test : default	- 🗆 🗙
Eile Edit View Navigate Source Refactor	<u>R</u> un <u>D</u> ebug Tea <u>m</u> <u>T</u> ools <u>W</u> indow <u>H</u> elp	
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	Getting Started	What's New & Tutorials
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	MPLAB IDE v8 Users - IMPORTANT	MPLAB Code Configurator
Navientor 🔍 × test - Dashboard	Take a Tour	Microchip Libraries for Applic:
	Download Compilers and Assemblers	Minute Videos
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≺No View Available>	Tasks	₽ ×
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<u> </u>	Kno tasks> in all opened projects	

Source Files にカーソルを持って行き、ダブルクリックしますと、以下の画面の様にソースファイルが表示されます。下記の画面で Compile Files をクリックしますとコンパイルされます。

EX_SQW.C を選択し、Select ボタンをクリック



次の画面の Source files にカーソルを持って行き、ダブルクリックします。



ダブルクリックしますと次の画面になります。



EX_SQW.C にカーソルを移動の上、右クリックしますと下の画面になります。



ここで Compile File をクリックしますと一瞬、コンパイル中の画面が出て、以下の様に Build Successful となります。



CLEAN SUCCESSFUL (total time: 63ms)

gnumkdir -p build/default/production/_ext/1241248044

gnumkdir -p dist/default/production

```
"C:¥PROGRA~2¥PICC¥CCSCON.exe" out="build/default/production¥_ext¥1241248044"
"../../Desktop/CCS Working folder/EX_SQW.C" +FM +DF +CC +Y=9 +EA +DF +LN +T +A
+M +J +EA +Z -P #__16F877A=1
```

Memory usage: ROM=2% RAM=2% - 3%

0 Errors, 0 Warnings.

Build Successful.

BUILD SUCCESSFUL (total time: 562ms)

以上の要領でコンパイルが出来たことになります。