XVU Pulse Signal programming

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1. Pulse signal configuration

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Items / Eléments / Element / Elementos / Elementi / 项目 / 項目	Requirements / Exigences / Anforderungen / Requisitos Requisiti / 要求 / 要件
PLC I/O Output Rated Voltage/Current / Tension/courant nominal(e) de la sortie I/O de l'automate / SPS E/A – Ausgangsnennspannung/-strom / E/S del PLC Corriente/tensión nominal de salida / Corrente/tensione nominale di uscita I/O del PLC / PLC I/O 输出额定电压/ 电流 / PLC I/O 出力定格電圧 / 電流	24 Vdc / 1 A
PLC Type / Type d'automate / SPS-Typ / Tipo de PLC / Tipo di PLC / PLC 类型 / PLC タイプ	Transistor / Transistor / Transistor / Transistor / Transistor / 晶体管 / トランジスタ
Wire Size / Calibre de fil / Drahtstärke / Tamaño del conductor / Dimensione dei fili / 缆线尺寸 / ワイ ヤサイズ	AWG 22 for signal cable and DC24V; / AWG 22 pour le câble de signal et 24V CC; / AWG 22 für Signalkabel und 24 VDC; / AWG 22 para cable de señal y 24 V CC; / AWG 22 per cavo segnale e DC24V; /用于信号电缆和 DC24V 配置的 AWG 22; / 信号ケーブルと DC24V には AWG 22;

User can use PLC general output or PWM port to generate pulse signal to control XVUC29P / XVUC9VP, recommendation as below:

L'utilisateur peut utiliser la sortie générale de l'automate ou le port PWM pour générer un signal d'impulsion qui contrôle les unités XVUC29P / XVUC9VP, selon les recommandations ci-dessous :

Der Benutzer kann den allgemeinen SPS-Ausgang bzw. den PWM-Anschluss für die Erzeugung eines Impulssignals zur Steuerung des XVUC29P/XVUC9VP verwenden. Siehe nachstehende Empfehlung:

El usuario puede utilizar una salida general del PLC o un puerto PWM para generar señales de pulso para controlar
XVUC29P/XVUC9VP, tal como se muestra a continuación:

L'utente può utilizzare l'uscita generale del PLC o la porta PWM per generare il segnale d'impulsi per controllare l'XVUC29P / XVUC9VP; rispettare le seguenti raccomandazioni:

用户可以使用 PLC 常规输出或 PWM 端口来生成脉冲信号，以控制 XVUC29P / XVUC9VP，如下建议所示：

ユーザーはPLC 一般出力または PWM ポートを使用して、XVUC29P / XVUC9VP を制御するパルス信号を生成することができます。 以下を推奨します：

Items / Eléments / Element / Elementos Elementi / 项目 / 項目	Requirements / Exigences / Anforderungen / Requisitos / Requisiti / 要求 / 要件	Remark / Remarque / Anmerkung / Observación / Nota 备注 / 備考
Fast Cycle (for Schneider PLC) Cycle rapide (automate Schneider) Schneller Zyklus (für Steuerungen von Schneider) Ciclo rápido (para PLC de Schneider) Ciclo veloce (per PLC Schneider) 快速循环（适用于 Schneider PLC） 高速サイクル (シュナイダー PLC)	Recommend to use fast cycle to output for Schneider PLC / Recommander l'utilisation du cycle rapide pour la sortie sur l'automate Schneider Für Steuerungen von Schneider wird die Verwendung des schnellen Ausgangszyklus empfohlen. Se recomienda el uso del ciclo rápido a la salida del PLC de Schneider. Si raccomanda di usare un ciclo veloce sull'uscita dei PLC Schneider. 建议对 Schneider PLC シュナイダー PLC 用の出力には高速サイクルの使用を推奨します	TME200C16U and M241 are tested with fast cycle. Le TME200C16U et le M241 sont testés avec un cycle rapide. TME200C16U und M241 wurden mit schnellem Zyklus getestet. TME200C16U y M241 se prueban con ciclo rápido. TME200C16U e l'M241 sono testati per un ciclo veloce. TME200C16U 和 M241 已经过快速循环测试。 TME200C16U および M241 は高速サイクルでテストされます。
Immediately Update I/O and Interrupt Cycle Mise à jour immédiate des E/S et cycle d'interruption Sofortige E/A-Aktualisierung und Interruptzyklus Actualización inmediata de E/S y ciclo de interrupt I/O ad aggiornamento immediato e ciclo Interrupt 立即更新 I/O 和中断循环	Recommend to use immediately Update I/O and enable, and must put it in the Interrupt cycle For non-Schneider PLC(*) Recommander l'utilisation et l'activation de Mise à jour immédiate des E/S, et le configurer obligatoirement en mode Cycle d'interruption pour l'automate non Schneider (*) Für Nicht-Schneider-Steuerungen wird empfohlen, die E/A sofort zu aktualisieren und zu aktivieren und die SPS in den Interruptzyklus zu setzen.(*) Se recomienda utilizar inmediatamente la actualización de E/S y habilitar, y se debe poner en el ciclo de interrupt para PLC(*) que no sean de Schneider. Per i PLC non-Schneider è consigliato l'utilizzo dell'I/O ad aggiornamento immediato con la funzione Enable e i PLC devono avere un ciclo di Interrupt.(*) 建议使用立即更新 I/O 并启用且必须使其进入中 断循环（适用于	Several non Schneider PLCs(*) have been tested with immediately update and interrupt cycle. Plusieurs automates non Schneider (*) ont été testés avec la mise à jour immédiate et le cycle d'interruption. Mehrere Nicht-Schneider PLCs(*) getestet wurden mit sofort aktualisieren und Zyklus zu unterbrechen. Se han probado diversos PLC(*) que no son de Schneider con actualización inmediata y ciclo de interrupt. Numerosi PLC(*) non Schneider sono stati testati con un aggiornamento immediato e ciclo di Interrupt. 多个非 Schneider PLC(*) 已经过立即更新和中断循环 测试。

直ちに I/O を更新」と中断サイクル	非 Schneider PLC）(*) 「直ちに I/O を更新」の使用と有効化を推奨します。シュナイダー以外の PLC(*) は中断サイクルモードにしてください。	シュナイダー以外の PLC(*) のいくつかが、「直ちに更新」と中断サイクルでテスト済みです。
PWM Port Port PWM PWM-Anschluss Puerto PWM Porta PWM PWM 端口 PWM ポート	2Hz Frequency in output Fréquence de 2 Hz en sortie 2-Hz-Ausgangsfrequenz Frecuencia de 2 Hz en la salida Frequenza di 2Hz in uscita 输出频率为 2Hz 出力周波数 2Hz	See Note(**) Step: 1 ms, 2 ms, 5 ms, Or 10 ms. Voir la remarque (**) Mesure : 1 ms, 2 ms, 5 ms ou 10 ms. Siehe Hinweis (**) Schritt: 1 ms, 2 ms, 5 ms oder 10 ms. Consulte la nota (**). Paso: 1 ms, 2 ms, 5 ms o 10 ms. Vedere nota (**) Passo: 1 ms, 2 ms, 5 ms o 10 ms. 请参见注 (**) 步长：1 毫秒、2 毫秒、5 毫秒或 10 毫秒。 注意 (**) を参照 ステップ：1 ms、2 ms、5 ms、または 10 ms

Note(*)
For non-Schneider PLC, the PLC can use Immediately Update I/O in Interrupt Cycle to simulate the PWM pulse. Not all of non-Schneider PLC can output the defined PWM waveform, it depends on PLC's capability. If PLC cannot output the defined PWM waveform, I2S Rally Voice and I2S Rally Multicolor cannot support this kind of PLC.
Note(**)
If users use standard PWM port to output defined PWM signal, this standard PWM port should have the capability to support 2Hz operating frequency. And recommend 10ms as a step, and Minimum Step: 1ms.

Remarque (*)
L'automate non Schneider peut utiliser Mise à jour automatique des E/S en mode Cycle d'interruption pour simuler l'impulsion PWM. Tous les automates non Schneider ne peuvent pas générer la forme d'onde PWM définie. Cette capacité dépend des caractéristiques de chaque automate. Si l'automate ne peut pas générer la forme d'onde PWM définie, il n'est pas pris en charge par les unités I2S Rally Voice et I2S Rally Multicolor.
Remarque (**)
Si des utilisateurs emploient le port PWM standard pour générer le signal PWM défini, ce port doit prendre en charge la fréquence d'exploitation de 2 Hz. Pas recommandé : 10 ms. Pas minimum : 1 ms.

Hinweis (*)
Bei Nicht-Schneider-Steuerungen kann die SPS den Befehl zur sofortigen E/A-Aktualisierung im Interruptzyklus verwenden, um den PWM-Impuls zu simulieren. Nicht alle Nicht-Schneider-SPS unterstützen die Ausgabe der definierten PWM-Wellenform. Das ist von der Kapazität der jeweiligen Steuerung abhängig. Wenn eine SPS die definierte PWM-Wellenform nicht ausgeben kann, wird diese SPS weder vom Tongeber I2S Rally Voice noch vom Multi-LED-Modul I2S Rally Multicolor unterstützt.
Hinweis (**)
Wenn zur Ausgabe des definierten PWM-Signals ein PWM-Standardanschluss verwendet wird, muss dieser PWM-Standardanschluss Unterstützung für eine Betriebsfrequenz von 2 Hz bieten. Empfohlener Schritt: 10 ms. Mindestschritt: 1 ms.

Nota (*)
Para PLC que no sean de Schneider, el PLC puede utilizar la actualización inmediata de E/S en ciclo de interrupt para simular el pulso PWM. No todos los PLC que no son de Schneider pueden emitir la forma de onda PWM definida; depende de la capacidad del PLC. Si el PLC no puede emitir la forma de onda PWM definida, I2S Rally Voice e I2S Rally Multicolor no admitirán este tipo de PLC.
Nota (**)
Si los usuarios utilizan un puerto PWM estándar para emitir la señal PWM definida, este puerto PWM estándar debe tener la capacidad de admitir 2 Hz de frecuencia de funcionamiento. Paso recomendado: 10 ms. Paso mínimo: 1 ms.

Nota(*)
Per i PLC non-Schneider, il PLC può usare l'I/O ad aggiornamento immediato in un ciclo Interrupt per simulare l'impulso PWM. Non tutti i PLC non-Schneider possono produrre la forma d'onda PWM definita, ciò dipende dalle capacità del PLC. Se il PLC non può produrre la forma d'onda PWM definita, I2S Rally Voice e I2S Rally Multicolor non possono supportare con questo tipo di PLC.
Nota(**)
Se gli utilizzatori si avvalgono della porta PWM standard per produrre il segnale PWM definito, questa porta standard PWM dovrebbe avere le capacità di supportare la frequenza di funzionamento a 2Hz. E si raccomanda 10ms per un passo con un passo minimo di: 1ms.

注(*)
非 Schneider PLC 可以使用在中断循环中立即更新 I/O 以输出 PWM 脉冲。并非所有非 Schneider PLC 都可以输出定义的 PWM 波形，这取决于 PLC 的容量。 如果 PLC 不能输出定义的 PWM 波形，则 I2S Rally Voice 和 I2S Rally Multicolor 无法支持这 种 PLC。
注(**)
如果用户使用标准 PWM 端口输出定义的 PWM 信号，则此标准 PWM 端口应能够支持 2Hz 的工 作频率。建议步长为 10 毫秒，最小步长为1 毫秒。

注意 (*)
シュナイダー以外の PLC の場合は、「直ちに I/O を更新」を中断サイクルで使用して PWM パルスを出力きます。シュナイダー以外の PLC の場合、性能によっては定義済みの PWM 波形を出力できな いものもあります。PLC が定義済みの PWM 波形を出力できない場合は、I2S Rally Voice および I2S Rally Multicolor はこ 種の PLC をサポートできません。
注意 (**)
定義済み PWM 信号の出力に標準 PWM ポートを使用する場合、この標準 PWM ポートには 2 Hz の動作周数をサポートする機能が必要です。また、1 ステップとして 10 ms を推奨します。最小ステップは 1ms です。

1-2 Tested PLCs

Brand	Range
Schneider Electric	TME200C16U, M221, M241
Siemens	6ES7 211-0AA23-0XB0
Mitsubishi	FX1S-10MT-001
Omron	CP1E-E10DT-A
Delta	DVP10EC00T3
Panasonic	FP0R-C16T

1-3 Tested configuration on PLCs

PLC

DC 24V PNP output

PWM signal

DC 24V NPN output

Pulse signal modules		Wiring	
		Synchronization	No Synchronization
	Configuration 1 Voice only 1 layer only	Connection to 1 fast output	Connection to 1 fast output
	Configuration 2 Multicolor only 1-4 layers	Connection to 1 fast output Connection to 1 fast output Connection to 1 or 2 fast outputs Connection to 1, 2 or 3 fast outputs	Connection to 1 fast output Connection to 2 fast outputs Connection to 3 fast outputs Connection to 4 fast outputs
	Configuration 3 Voice + Multicolor With combination of: 1+1 1+2 1+3	Connection to 1 fast output Connection to 1 or 2 fast outputs Connection to 1, 2 or 3 fast outputs	Connection to 2 fast outputs Connection to 3 fast outputs Connection to 4 fast outputs
	Configuration 4 Voice + Multicolor + Single LED With combination of: 1+1+1 1+2+1 1+1+2	Connection to 1 fast output Connection to 1 or 2 fast outputs Connection to 1 fast output	Connection to 2 fast outputs Connection to 3 fast outputs Connection to 2 fast outputs
	Configuration 5 Voice + Single LED With combination of: 1+1 1+2 1+3	Connection to 1 fast output Connection to 1 fast output Connection to 1 fast output	Connection to 1 fast output Connection to 1 fast output Connection to 1 fast output
	Configuration 6 Multicolor + Single LED With combination of: 1+1 1+2 1+3 2+1 2+2 3+1	Connection to 1 fast output Connection to 1 fast output Connection to 1 fast output Connection to 1 fast output Connection to 1 fast output Connection to 1 or 2 fast outputs	Connection to 1 fast output Connection to 1 fast output Connection to 1 fast output Connection to 2 fast outputs Connection to 2 fast outputs Connection to 3 fast outputs

2. XVU Pulse Signal program summary

When you are programming for M241 or M258, you can use our specific function blocks to simplify your programming. Please refer to section 3. "Specific function blocks for XVU Pulse Signal".

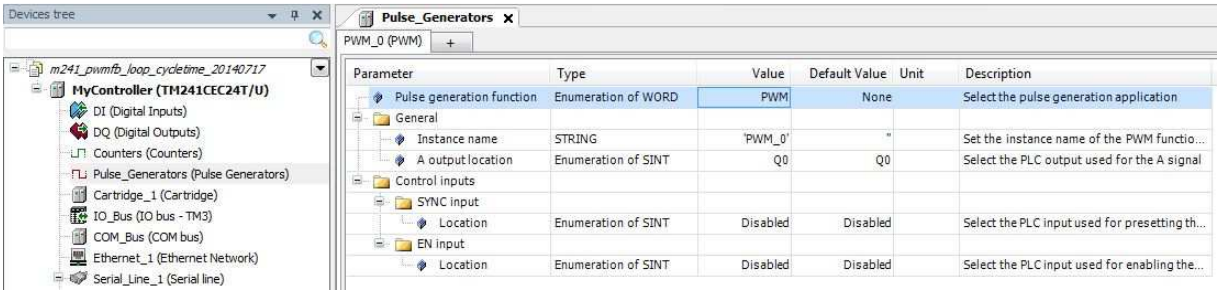
Please refer to annex (section 4) in order to verify command list and corresponding duty cycle of each command.

2-1 For Schneider Electric M258/M241/M218 which are programmed by SoMachine

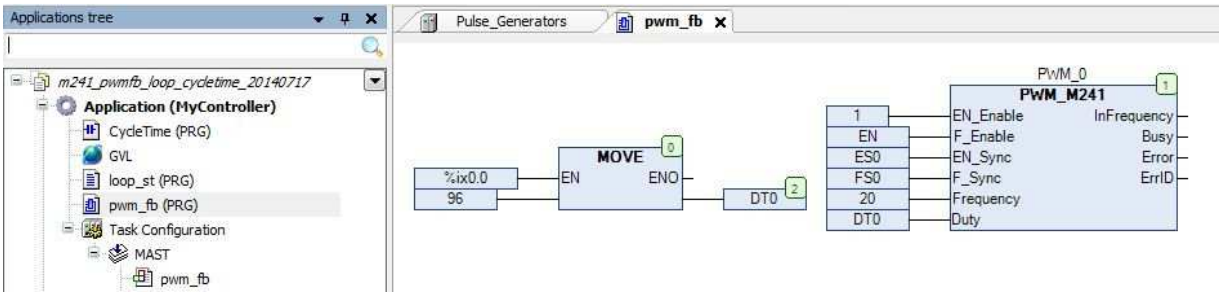
If there is at least one standard PWM output available (and 2Hz is supported), mode (1) of programming described below is recommended to use.

If there is no standard PWM output available, but timer interrupt and at least one normal transmitter output are available. Mode (2) of programming described below is recommended to use.

(1) By using the standard PWM output and the PWM function block



PWM function in Pulse_Generators page need be enabled with proper parameters;



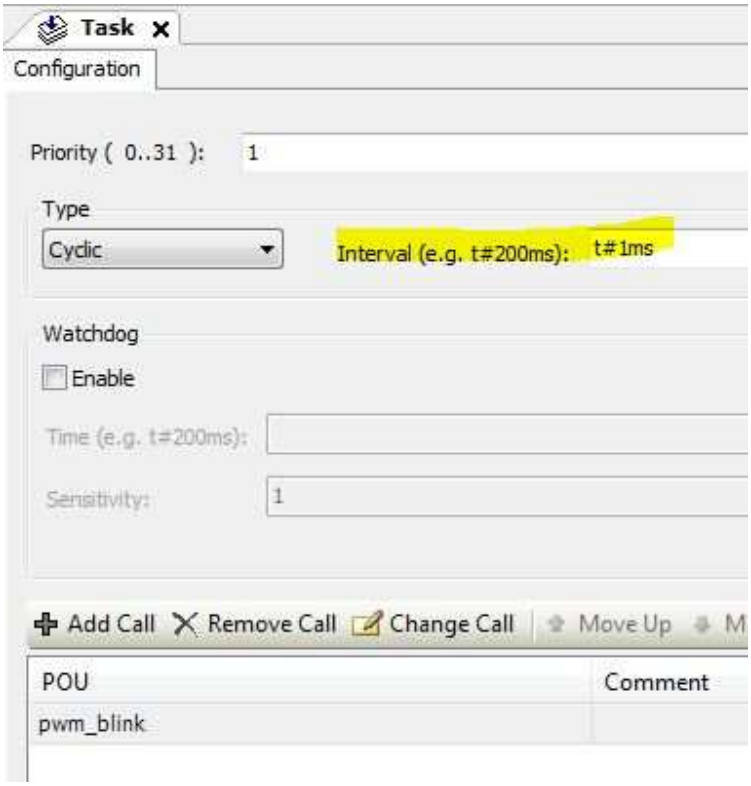
%ix0.0 is used to write a value for the duty cycle of the PWM signal, which means to control the output command for XVU pulse signal;

More than one MOVE function block could be added to write different value for the duty cycle of the PWM signal, and so that to realize different XVU pulse signal commands;

The variable 'EN' could be used to stop the PWM signal output, which will turn off the XVU pulse signal module;

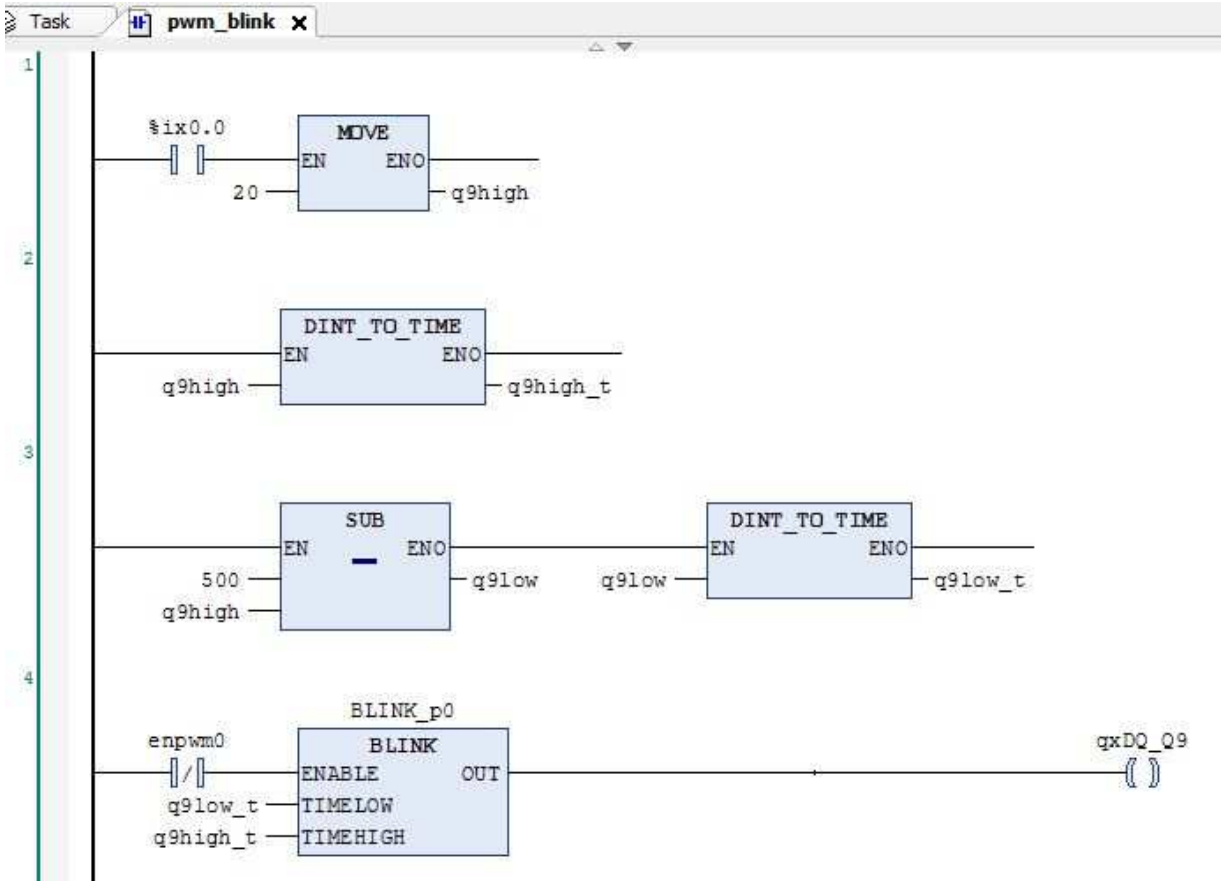
%ix0.0 and 'EN' could be substituted by other PLC input coil (%ix) or BOOL type variables, etc, according to users' specific application and real condition;

(2) By using the normal transmitter output and the POU in the Task



The program for generating PWM signals should be added in the Task of Cyclic type;

The Interval of the Cyclic Task should be the smaller the better;



%ix0.0 is used to write a value for the ON time of the PWM signal, which means to control the output command for XVU pulse signal;

More than one MOVE function block could be added to write different value for the duty cycle of the PWM signal, and so that to realize different XVU pulse signal commands;

The variable ‘enpwm0’ is used to stop the PWM signal output, which will turn off the XVU pulse signal module;

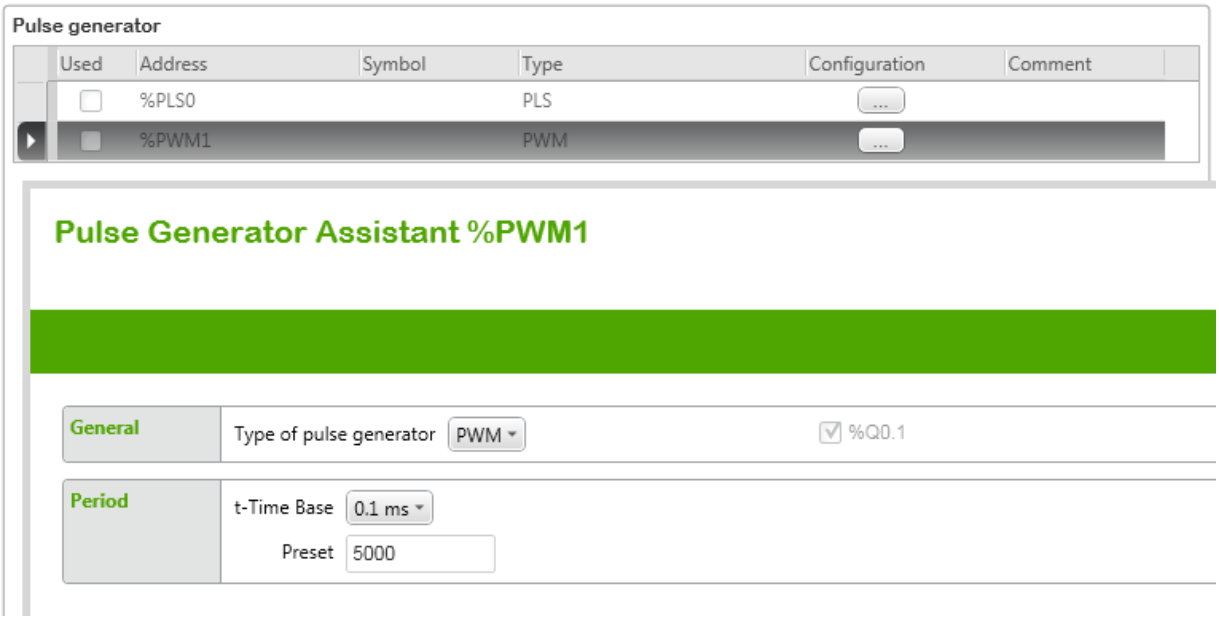
%ix0.0 and ‘enpwm0’ could be substituted by other PLC input coil (%ix) or BOOL type variable, etc, according to users’ specific application and real condition;

2-2 For Schneider Electric M221/M100/M200 which are programmed by SoMachine Basic

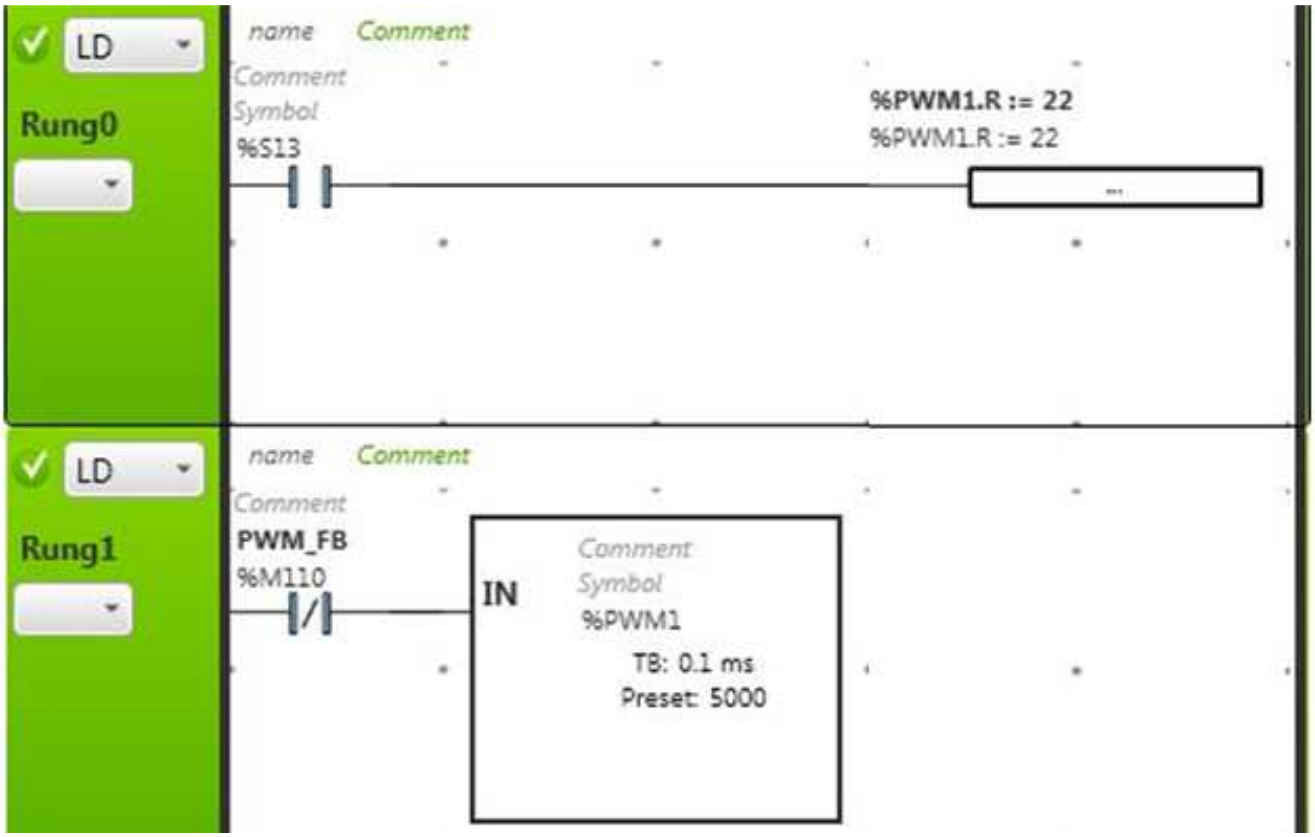
If there is at least one standard PWM output available (and 2Hz is supported), mode (1) of programming described below is recommended to use.

If there are no standard PWM outputs available, but timer interrupt and at least one normal transmitter output are available. Mode (2) of programming described below is recommended to use.

(1) By using the standard PWM output and the PWM function block



PWM function in Pulse generator page need be enabled with proper parameters;



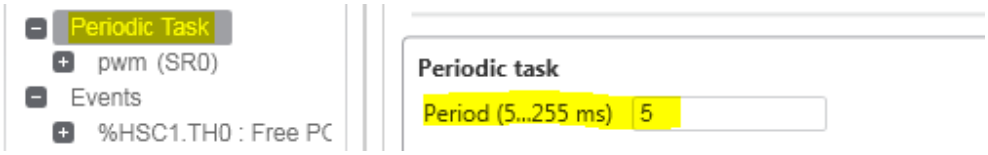
%S13 is used to write a value for the duty cycle of the PWM signal, which means to control the output command for XVU pulse signal;

More than one rung similar like Rung0 could be added to write different value for the duty cycle of the PWM signal, and so that to realize different XVU pulse signal commands;

%M110 could be used to stop the PWM signal output, which will turn off the XVU pulse signal module;

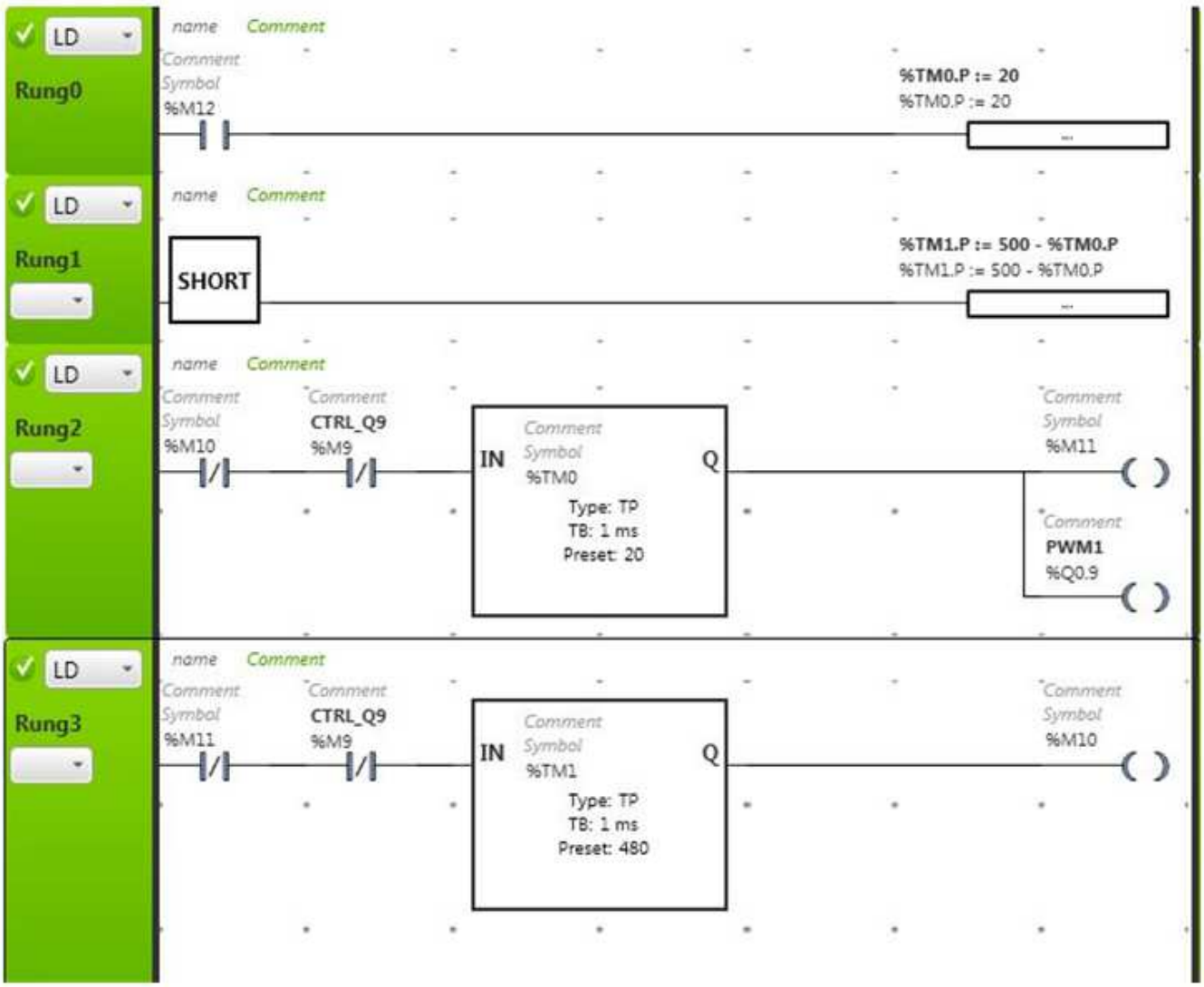
%S13 and %M110 could be substituted by other memory bit (%M) or PLC input coil (%I), etc, according to users' specific application and real condition;

(2) By using the normal transmitter output and the POU in Periodic task



The program for generating PWM signals should be added in the Periodic Task;

The Period of the Periodic Task should be the smaller the better;



%M12 is used to write a value for the ON time of the PWM signal, which means to control the output command for XVU pulse signal;

More than one rung similar like Rung0 could be added to write different value for the ON time of the PWM signal, and so that to realize different XVU pulse signal commands;

%M9 is used to stop the PWM signal output, which will turn off the XVU pulse signal module;

%M12 and %M9 could be substituted by other memory bit (%M) or PLC input coil (%I), etc, according to users' specific application and real condition;

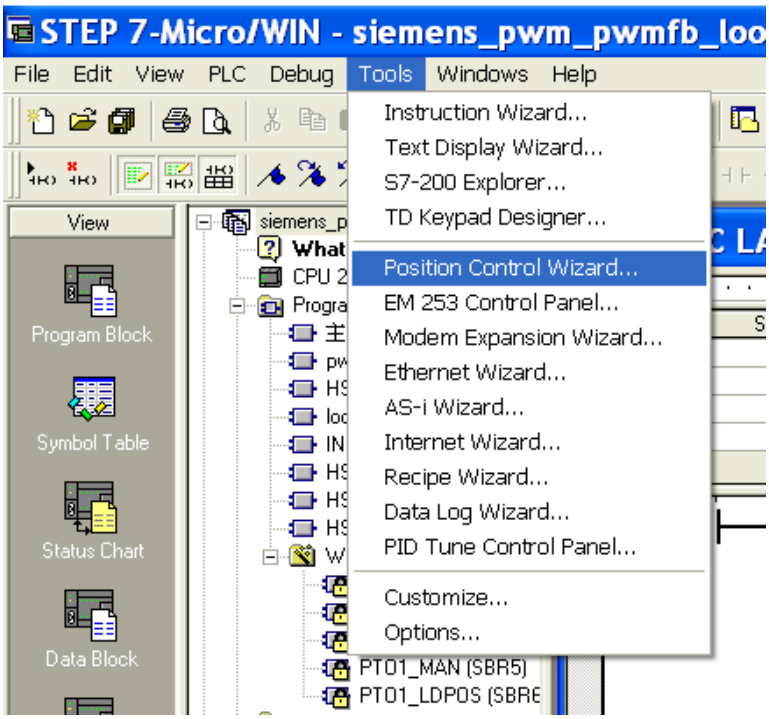
2-3 For Siemens CPU 221 which is programmed by STEP 7-MicroWIN

If there is at least one standard PWM output available (and 2Hz is supported), mode (1) of programming described below is recommended to use.

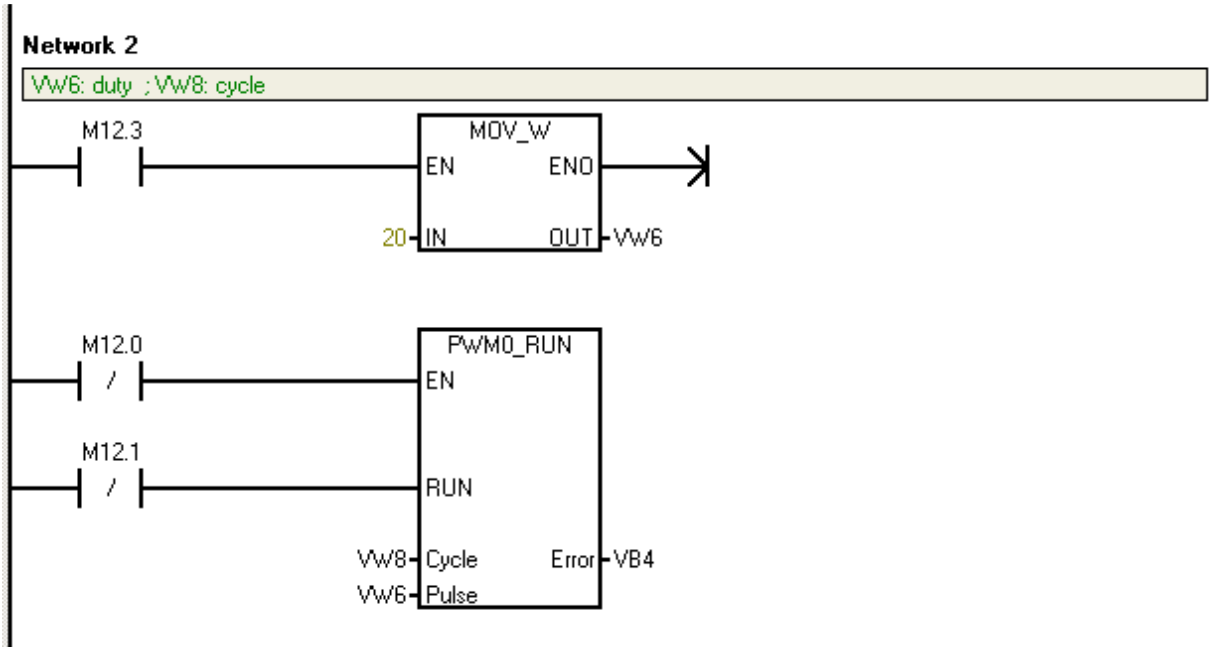
If there are no standard PWM outputs available, but timer interrupt and at least one normal transmitter output are available. Mode (2) of programming described below is recommended to use.

If there are no standard PWM outputs and timer interrupt can be used, while there are at least two 10ms (or 1ms) base timers, and 1 normal transmitter output is available. Mode (3) of programming described below is recommended to use. Mode (3) is influenced by user program, only under condition of lower PLC cycle is suggested (According to the test, when program cycle is bigger than 10ms, the PWM signal generated by 6ES7 221-0AA23-0XB0 makes a serious error and leads to misjudgment of XVU pulse signal).

(1) By using the standard PWM output and the PWM function block



First enable the PWM function block.



Example program is shown above.

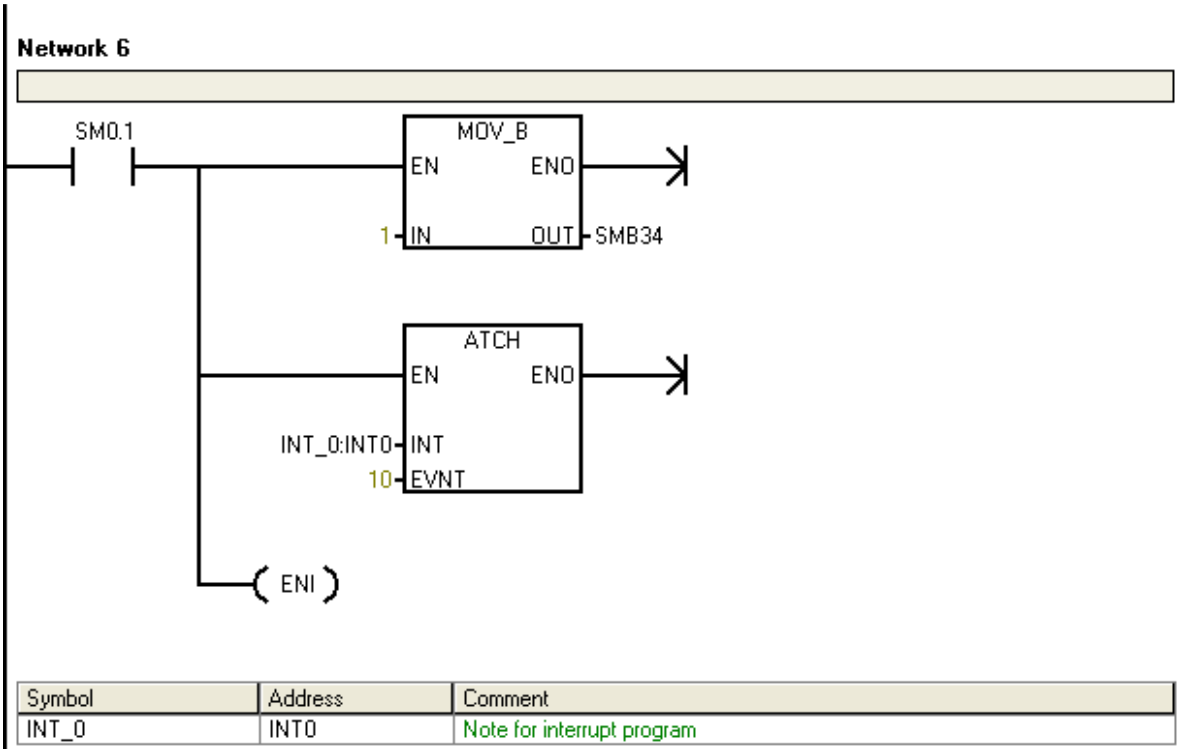
M12.3 is used to write a value for the duty cycle of the PWM signal, which means to control the output command for XVU pulse signal;

More than one MOVE function block could be added to write different value for the ON time of the PWM signal, and so that to realize different XVU pulse signal commands;

M12.0 could be used to stop the PWM signal output, which will turn off the XVU pulse signal module;

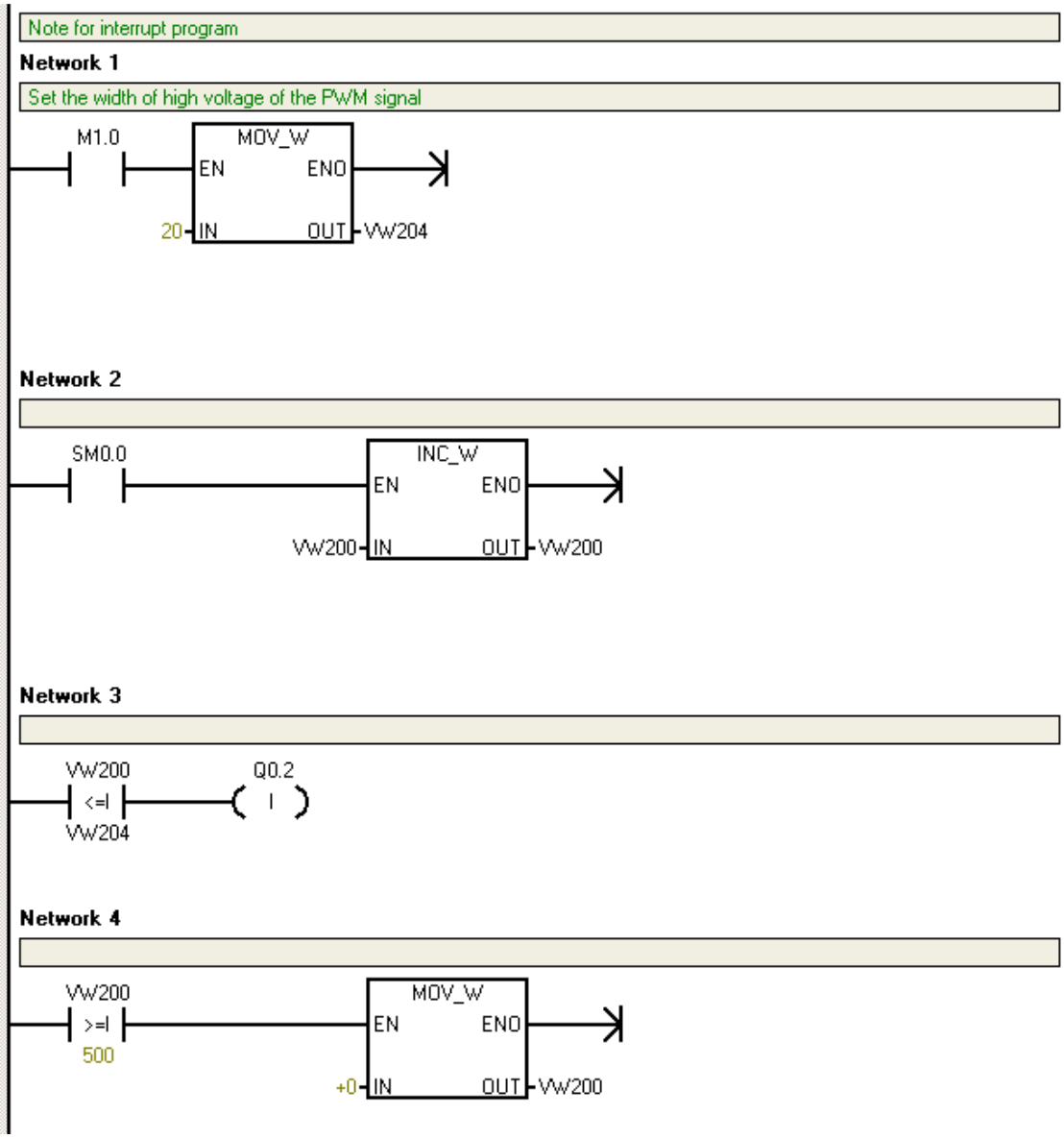
M12.3 and M12.0 could be substituted by other PLC input coils, internal registers or BOOL type variables, etc, according to users' specific application and real condition;

(2) By using the normal transmitter output and the timer interrupt



Symbol	Address	Comment
INT_0	INT0	Note for interrupt program

Interrupt function need to be enabled firstly. The time for the timer should be small. For example: 2ms



M1.0 is used to write a value for the duty cycle of the PWM signal, which means to control the output command for XVU pulse signal;

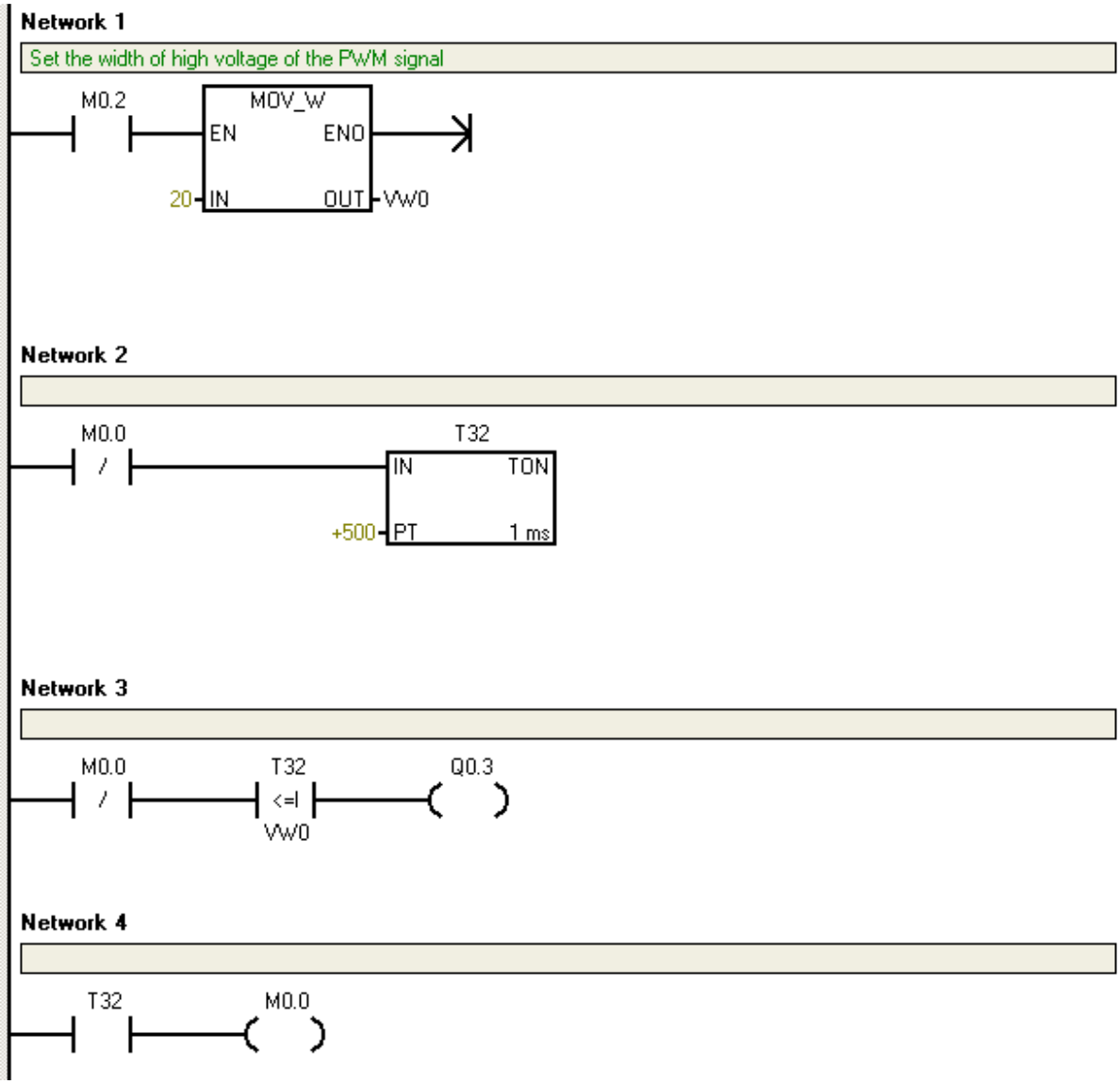
More than one MOVE could be added to write different value for the duty cycle of the PWM signal, and so that to realize different XVU pulse signal commands;

Write value 0 for the duty cycle of the PWM signal to stop the PWM signal output, which will turn off the XVU pulse signal module;

PWM output coils signed in the interrupt program must be set to ‘Immediately Refresh’, to make sure the precision of PWM output signal.

M1.0 could be substituted by other memory bits or PLC input coils, etc, according to users’ specific application and real condition; Q0.2 could also be substituted by other output coils.

(3) By using Timer and normal transmitter output



Example program is shown above.

M0.2 is used to write a value for the ON time of the PWM signal, which means to control the output command for XVU pulse signal;

More than one MOVE could be added to write different value for the ON time of the PWM signal, and so that to realize different XVU pulse signal commands;

M0.0 is used to stop the PWM signal output, which will turn off the XVU pulse signal module;

M0.2 and M0.0 could be substituted by other memory bits or PLC input coils, etc, according to users' specific application and real condition; Q0.3 could also be substituted by other output coils.

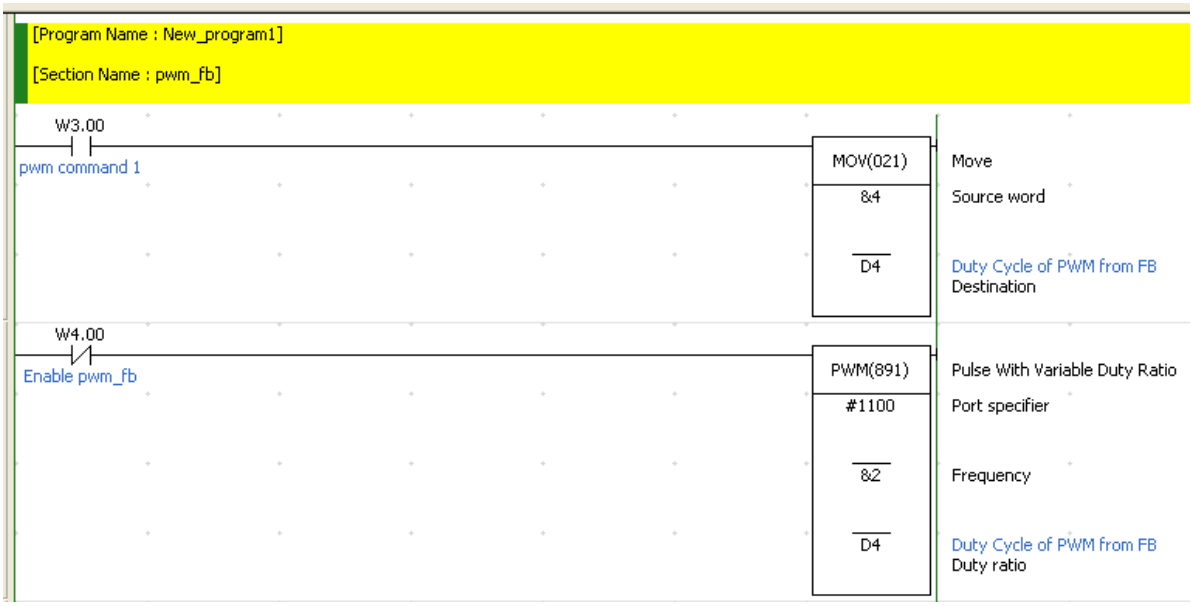
2-4 For Omron CP1E which is programmed by CX-Programmer

If there is at least one standard PWM output available (and 2Hz is supported), mode (1) of programming described below is recommended to use.

If there are no standard PWM outputs available, but timer interrupt and at least one normal transmitter output are available. Mode (2) of programming described below is recommended to use.

If there are no standard PWM outputs and timer interrupt can be used, while there are at least two 10ms (or 1ms) base timers, and 1 normal transmitter output is available. Mode (3) of programming described below is recommended to use. Mode (3) is influenced by user program, only under condition of lower PLC cycle is suggested (According to the test, when program cycle is bigger than 9ms, the PWM signal generated by CP1E-E10DT-A makes a serious error and leads to misjudgment of XVU pulse signal).

(1) By using the standard PWM output and the PWM function block



Example program is shown above.

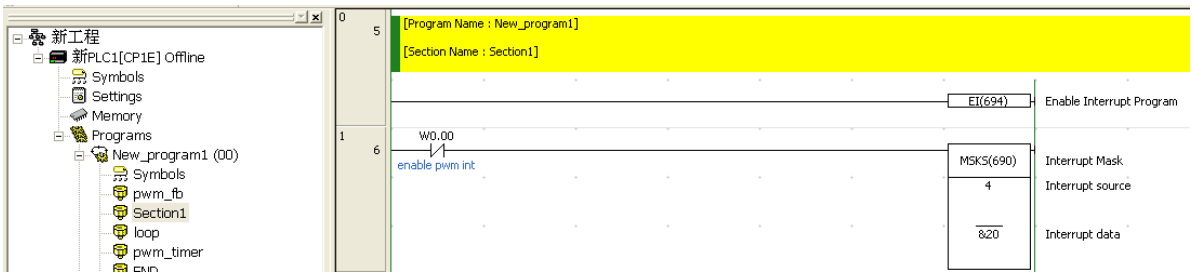
W3.00 is used to write a value for the duty cycle of the PWM signal, which means to control the output command for XVU pulse signal;

More than one MOVE function block could be added to write different value for the ON time of the PWM signal, and so that to realize different XVU pulse signal commands;

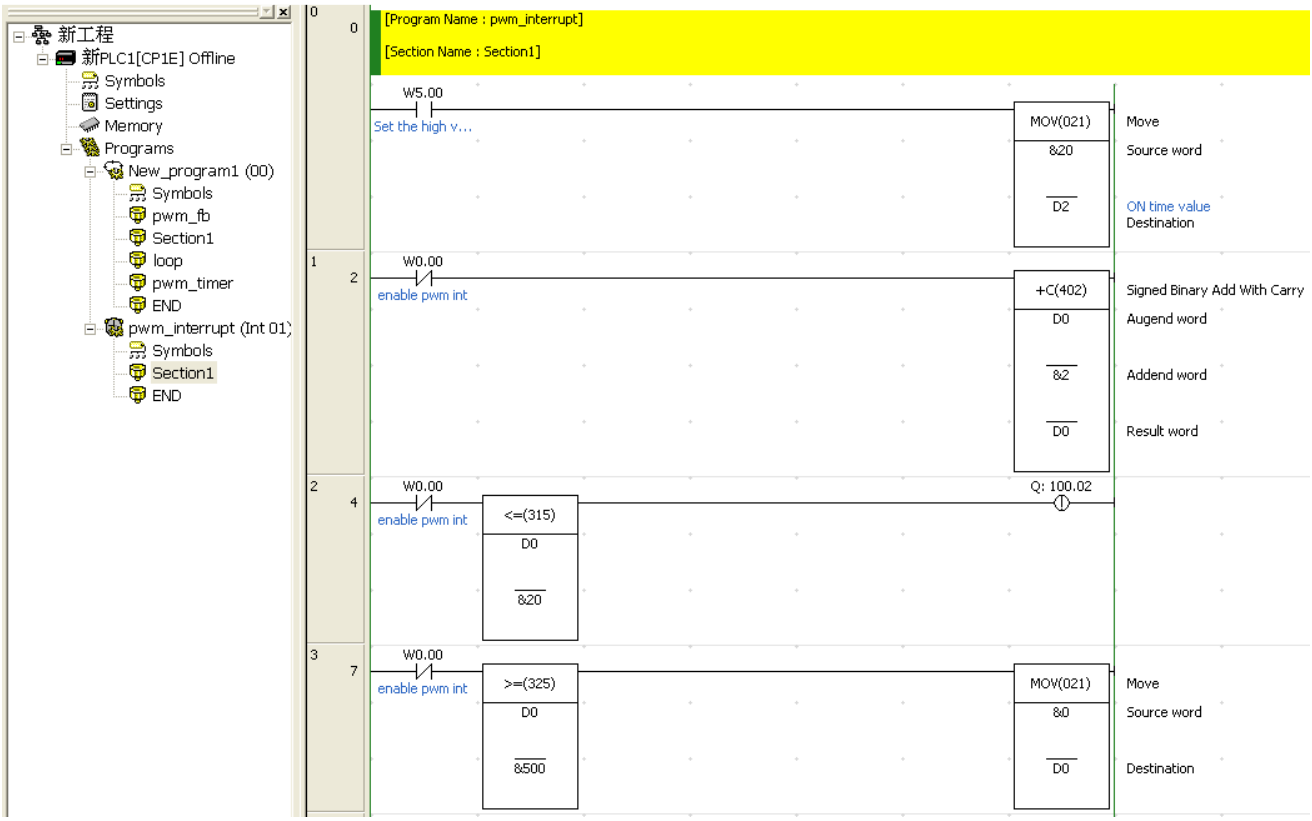
W4.00 could be used to stop the PWM signal output, which will turn off the XVU pulse signal module;

W3.00 and W4.00 could be substituted by other PLC input coil or work bits, etc, according to users' specific application and real condition;

(2) By using the normal transmitter output and the timer interrupt



Interrupt function need to be enabled firstly. The time for the timer should be small.



Example program is shown above.

W5.00 is used to write a value for the duty cycle of the PWM signal, which means to control the output command for XVU pulse signal;

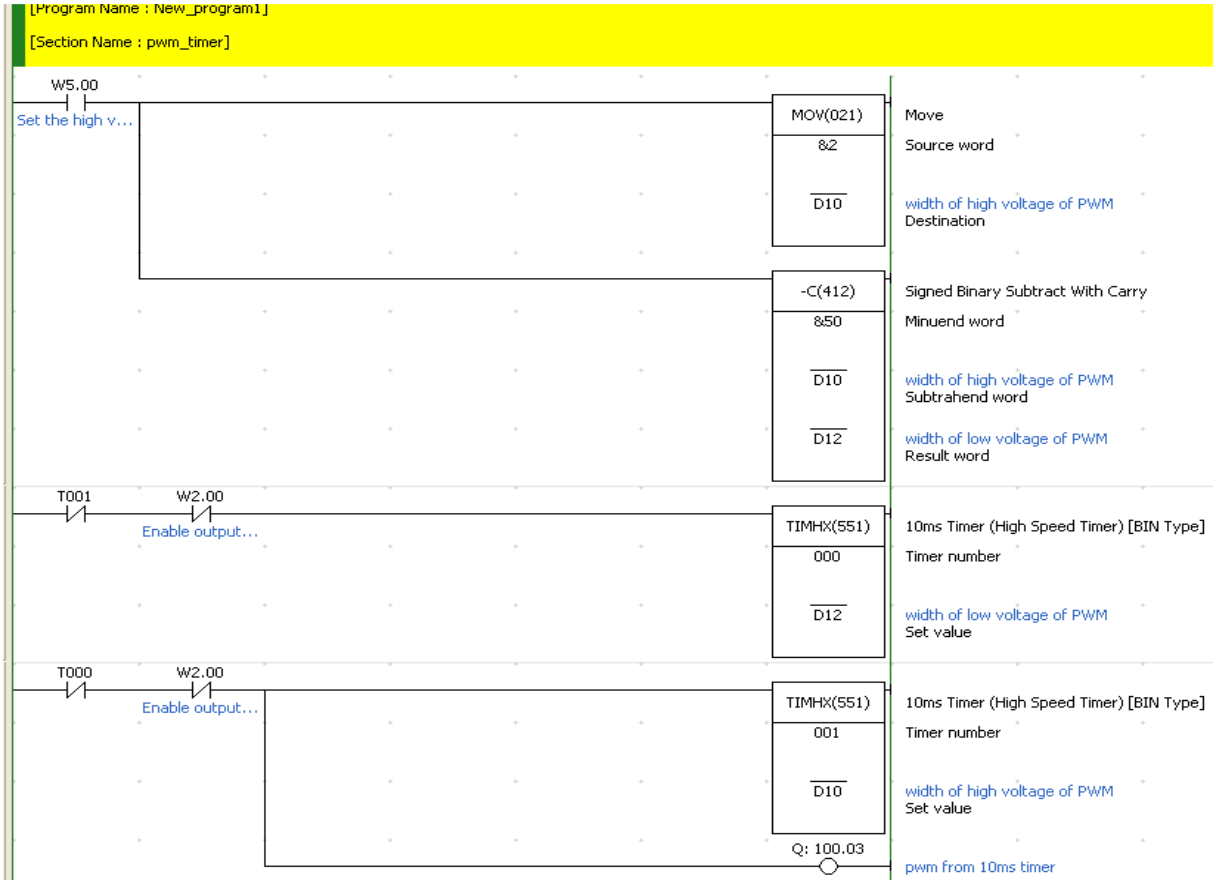
More than one MOVE could be added to write different value for the duty cycle of the PWM signal, and so that to realize different XVU pulse signal commands;

W0.00 could be used to stop the PWM signal output, which will turn off the XVU pulse signal module;

PWM output coils signed in the interrupt program must be set to ‘Immediately Refresh’, to make sure the precision of PWM output signal.

W5.00 and W0.00 could be substituted by other memory bit or PLC input coil, etc, according to users’ specific application and real condition; Q100.02 could also be substituted by other output coils.

(3) By using Timer and normal transmitter output



Example program is shown above.

W5.00 is used to write a value for the ON time of the PWM signal, which means to control the output command for XVU pulse signal;

More than one MOVE could be added to write different value for the ON time of the PWM signal, and so that to realize different XVU pulse signal commands;

W2.00 is used to stop the PWM signal output, which will turn off the XVU pulse signal module;

W5.00 and W2.00 could be substituted by other memory bit or PLC input coil, etc, according to users' specific application and real condition; Q100.03 could also be substituted by other output coils.

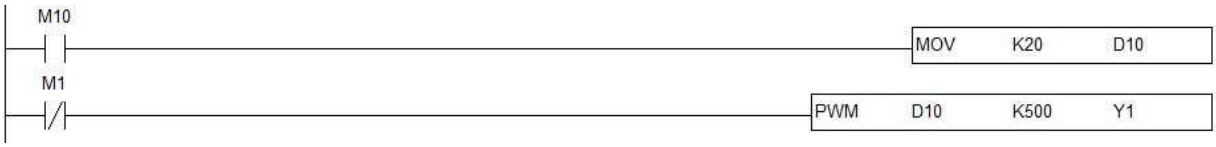
2-5 For Delta DVP EC which is programmed by WPsoft

If there is at least one standard PWM output available (and 2Hz is supported), mode (1) of programming described below is recommended to use.

If there are no standard PWM outputs available, but timer interrupt and at least one normal transmitter output are available. Mode (2) of programming described below is recommended to use.

If there are no standard PWM outputs and timer interrupt can be used, while there are at least two 10ms (or 1ms) base timers, and 1 normal transmitter output is available. Mode (3) of programming described below is recommended to use. Mode (3) is influenced by user program, only under condition of lower PLC cycle is suggested.

(1) By using the standard PWM output and the PWM function block



Example program is shown above.

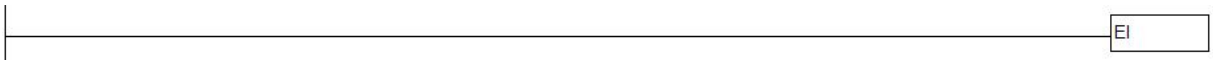
M10 is used to write a value for the duty cycle of the PWM signal, which means to control the output command for XVU pulse signal;

More than one MOVE function block could be added to write different value for the ON time of the PWM signal, and so that to realize different XVU pulse signal commands;

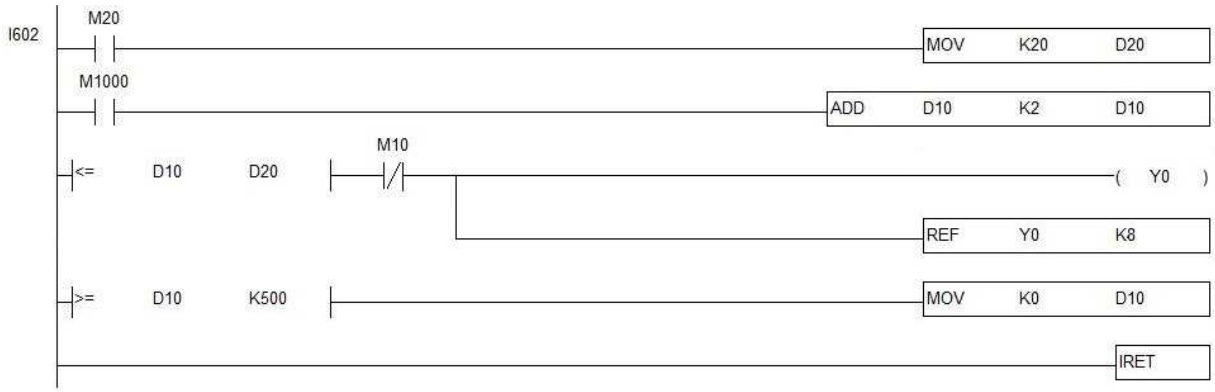
M1 could be used to stop the PWM signal output, which will turn off the XVU pulse signal module;

M10 and M1 could be substituted by other PLC input coil or work bits, etc, according to users' specific application and real condition;

(2) By using the normal transmitter output and the timer interrupt



Interrupt function need to be enabled firstly. The time for timer should be small.



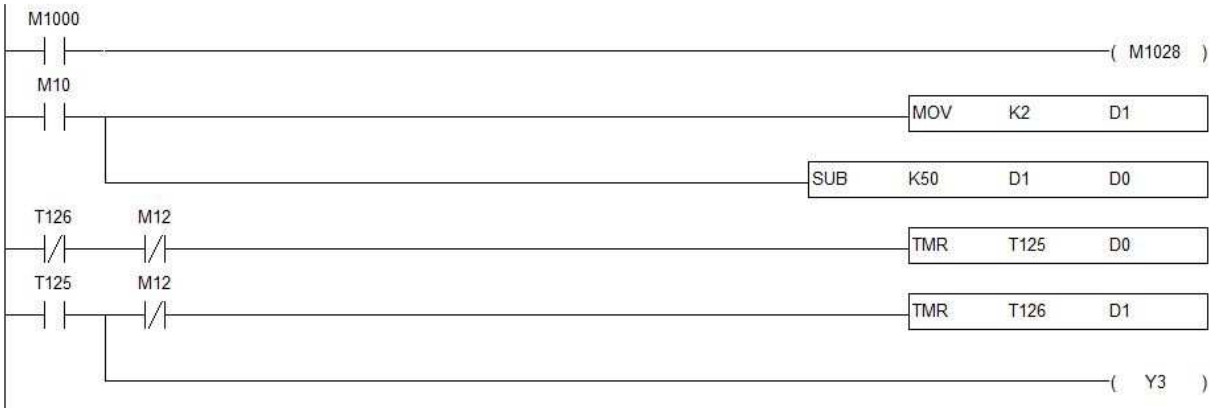
M20 is used to write a value for the duty cycle of the PWM signal, which means to control the output command for XVU pulse signal;

More than one MOVE could be added to write different value for the duty cycle of the PWM signal, and so that to realize different XVU pulse signal commands;

M10 could be used to stop the PWM signal output, which will turn off the XVU pulse signal module;

M20 and M10 could be substituted by other memory bit or PLC input coil, etc, according to users' specific application and real condition; Y0 could also be substituted by other output coils.

(3) By using Timer and normal transmitter output



Example program is shown above.

M10 is used to write a value for the ON time of the PWM signal, which means to control the output command for XVU pulse signal;

More than one MOVE could be added to write different value for the ON time of the PWM signal, and so that to realize different XVU pulse signal commands;

M12 is used to stop the PWM signal output, which will turn off the XVU pulse signal module;

M10 and M12 could be substituted by other memory bit or PLC input coil, etc, according to users' specific application and real condition; Y3 could also be substituted by other output coils.

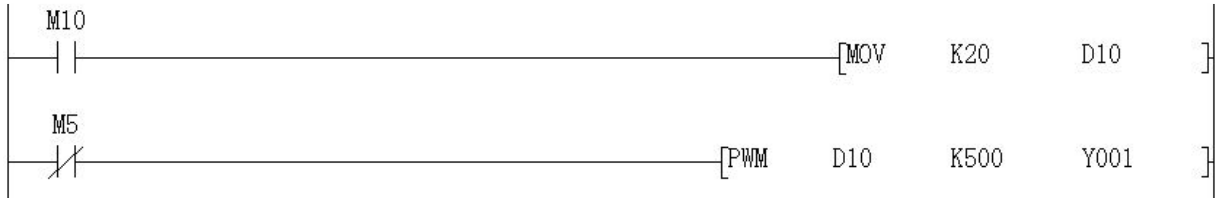
2-6 For Mitsubishi FX1S which is programmed by GX Developer

If there is at least one standard PWM output available (and 2Hz is supported), mode (1) of programming described below is recommended to use.

If there are no standard PWM outputs available, but timer interrupt and at least one normal transmitter output are available. Mode (2) of programming described below is recommended to use.

If there are no standard PWM outputs and timer interrupt can be used, while there are at least two 10ms (or 1ms) base timers, and 1 normal transmitter output is available. Mode (3) of programming described below is recommended to use. Mode (3) is influenced by user program, only under condition of lower PLC cycle is suggested.

(1) By using the standard PWM output and the PWM function block



Example program is shown above.

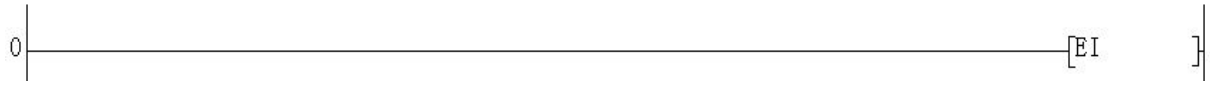
M10 is used to write a value for the duty cycle of the PWM signal, which means to control the output command for XVU pulse signal;

More than one MOVE function block could be added to write different value for the ON time of the PWM signal, and so that to realize different XVU pulse signal commands;

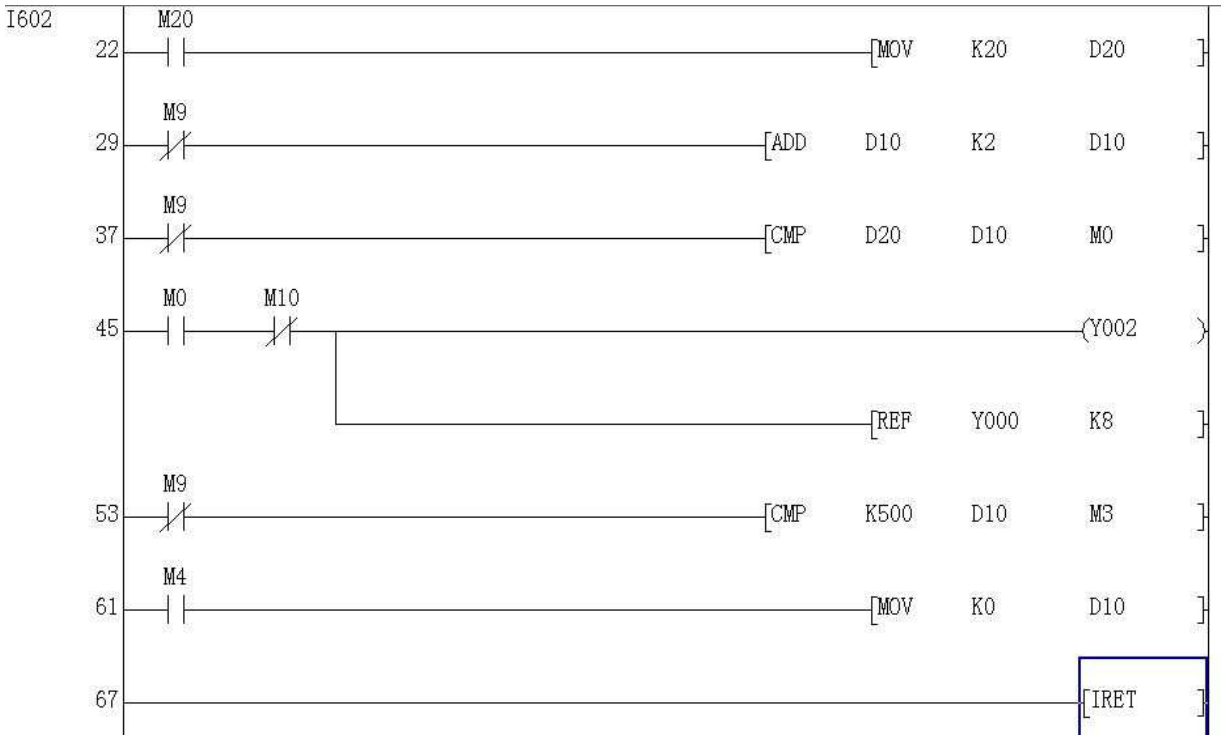
M5 could be used to stop the PWM signal output, which will turn off the XVU pulse signal module;

M10 and M5 could be substituted by other PLC input coil or work bits, etc, according to users' specific application and real condition;

(2) By using the normal transmitter output and the timer interrupt



Interrupt function need to be enabled firstly. The time for timer should be small.



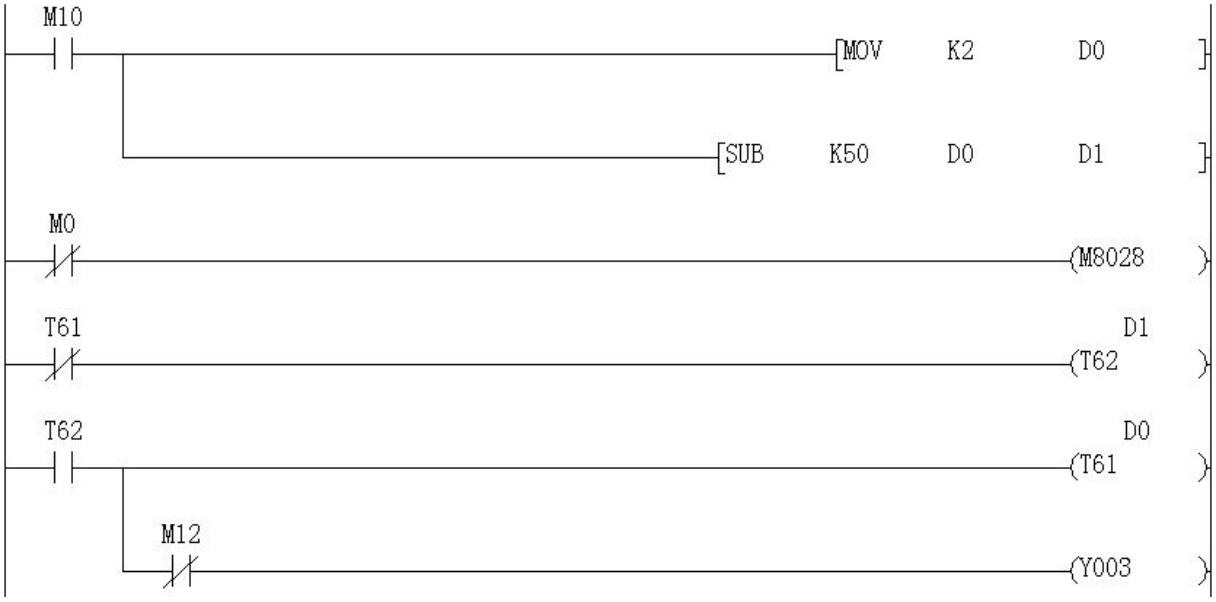
M20 is used to write a value for the duty cycle of the PWM signal, which means to control the output command for XVU pulse signal;

More than one MOVE could be added to write different value for the duty cycle of the PWM signal, and so that to realize different XVU pulse signal commands;

M10 could be used to stop the PWM signal output, which will turn off the XVU pulse signal module;

M20 and M10 could be substituted by other memory bit or PLC input coil, etc, according to users' specific application and real condition; Y0 could also be substituted by other output coils.

(3) By using Timer and normal transmitter output



Example program is shown above.

M10 is used to write a value for the ON time of the PWM signal, which means to control the output command for XVU pulse signal;

More than one MOVE could be added to write different value for the ON time of the PWM signal, and so that to realize different XVU pulse signal commands;

M12 is used to stop the PWM signal output, which will turn off the XVU pulse signal module;

M10 and M12 could be substituted by other memory bit or PLC input coil, etc, according to users' specific application and real condition; Y003 could also be substituted by other output coils.

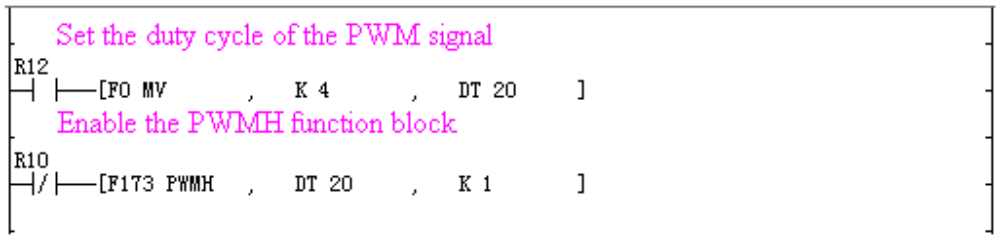
2-7 For Panasonic FR0R which is programmed by FPWIN GW

If there is at least one standard PWM output available (and 2Hz is supported), mode (1) of programming described below is recommended to use.

If there are no standard PWM outputs available, but timer interrupt and at least one normal transmitter output are available. Mode (2) of programming described below is recommended to use.

If there are no standard PWM outputs and timer interrupt can be used, while there are at least two 10ms (or 1ms) base timers, and 1 normal transmitter output is available. Mode (3) of programming described below is recommended to use. Mode (3) is influenced by user program, only under condition of lower PLC cycle is suggested.

(1) By using the standard PWM output and the PWMH function block



R12 is used to write a value for the duty cycle of the PWM signal, which means to control the output command for XVU pulse signal;

More than one MOVE function block could be added to write different value for the ON time of the PWM signal, and so that to realize different XVU pulse signal commands;

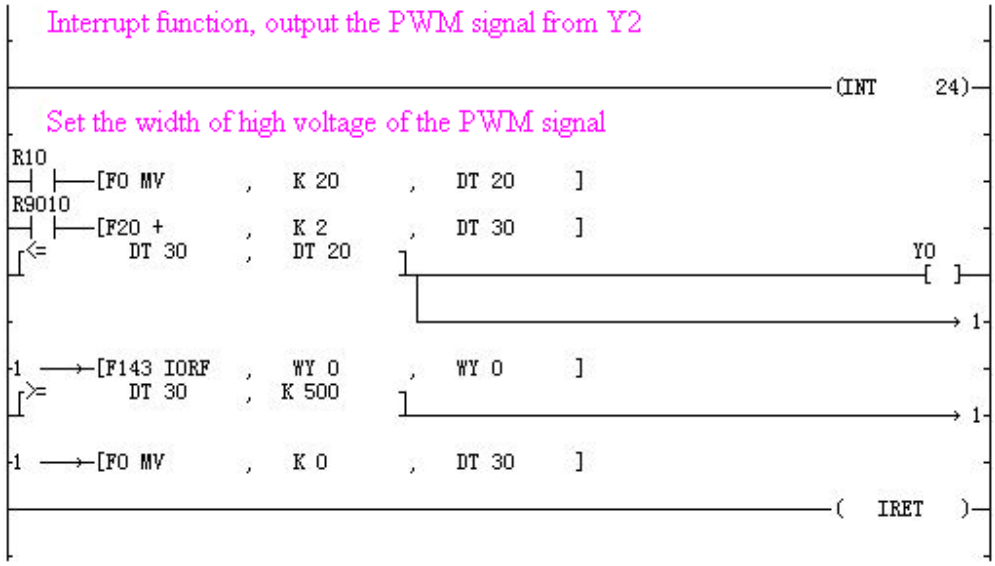
R10 could be used to stop the PWM signal output, which will turn off the XVU pulse signal module;

R12 and R10 could be substituted by other PLC input coil or work bits, etc, according to users' specific application and real condition;

Cycle of PWM signal is set by the PWMH function block. (Cycle support and code of different types of PLC makes a difference.)

(2) By using the normal transmitter output and the timer interrupt

Interrupt function need to be enabled firstly. The time for timer should be small.



R10 is used to write a value for the duty cycle of the PWM signal, which means to control the output command for XVU pulse signal;

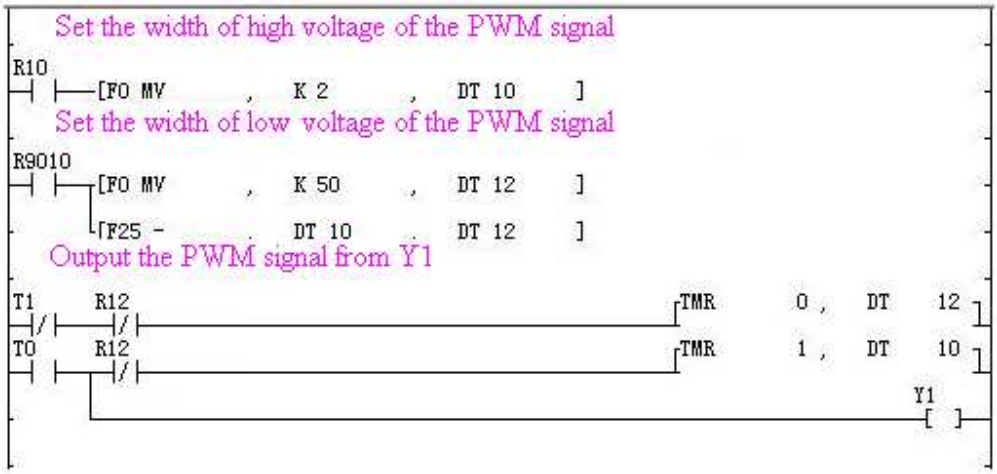
More than one MOVE could be added to write different value for the duty cycle of the PWM signal, and so that to realize different XVU pulse signal commands;

Write value 0 for the duty cycle of the PWM signal to stop the PWM signal output, which will turn off the XVU pulse signal module;

PWM output coils signed in the interrupt program must be set to 'Immediately Refresh', to make sure the precision of PWM output signal.

R10 could be substituted by other memory bit or PLC input coil, etc, according to users' specific application and real condition; Y0 could also be substituted by other output coils (The function of 'Immediately Refresh' is supported by different output coils for different types of PLC).

(3) By using Timer and normal transmitter output



Example program is shown above.

R10 is used to write a value for the ON time of the PWM signal, which means to control the output command for XVU pulse signal;

More than one MOVE could be added to write different value for the ON time of the PWM signal, and so that to realize different XVU pulse signal commands;

R12 is used to stop the PWM signal output, which will turn off the XVU pulse signal module;

R10 and R12 could be substituted by other memory bits or PLC input coils, etc, according to users' specific application and real condition; Y1 could also be substituted by other output coils.

3. Specific function blocks for XVU Pulse Signal

3-1 How to install the Libraries

The libraries are only available for the controller M241 and M258 on Schneider-electic.com.
It is compatible with SoMachine v4.1 and SoMachine v3.1.

SoMachine v4.1

The XVUP libraries for SoMachine v4.1 support two controllers M241 and M258 (simulated). We recommend you to use these libraries.

- XVUP Modules for M241_SoM41.compiled-library
- XVUP Modules for M258_SoM41_Simulated.compiled-library

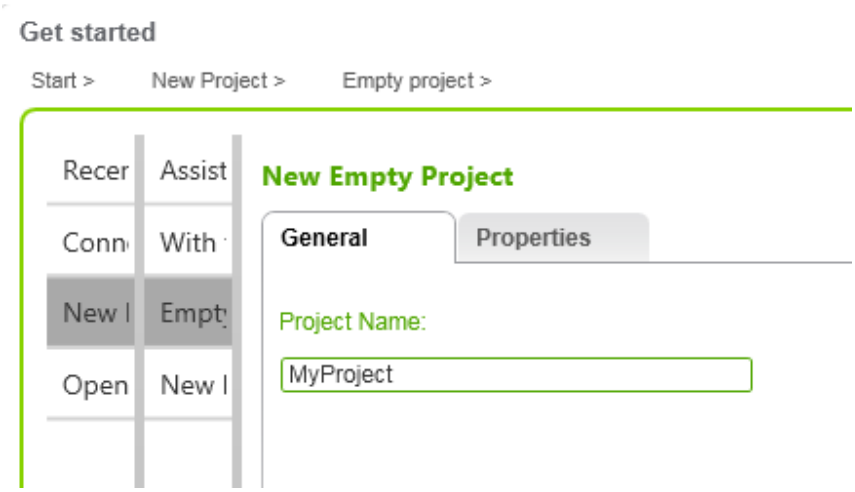
SoMachine v3.1

There is a corresponding XVUP library for M258 (simulated) for SoMachine v3.1.

- XVUP Modules for M258_SoM31_Simulated.compiled-library

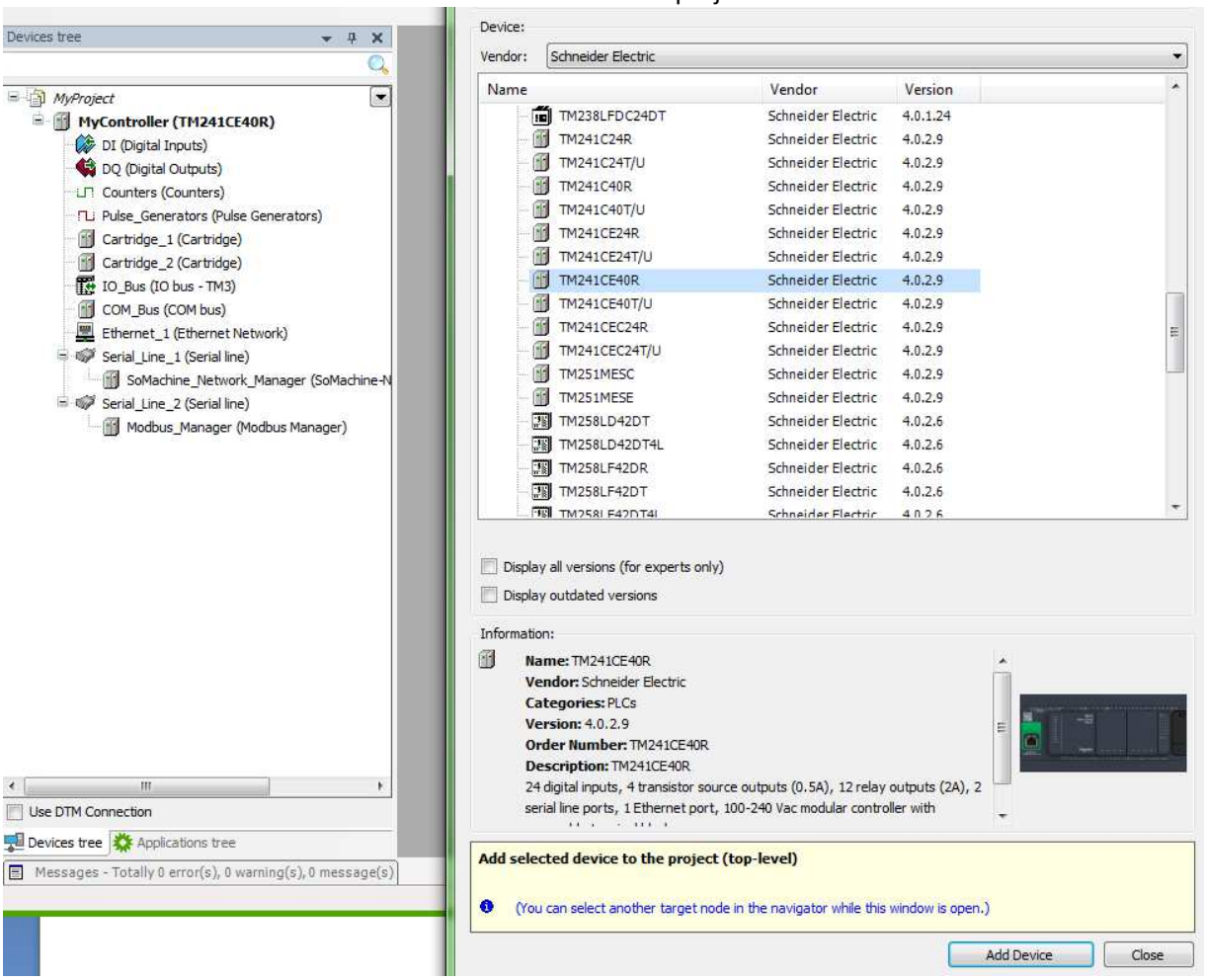
How to Install (SoMachine v4.1)

1. Open SoMachine v4.1 and create a new empty project. (Or open your existing project.)

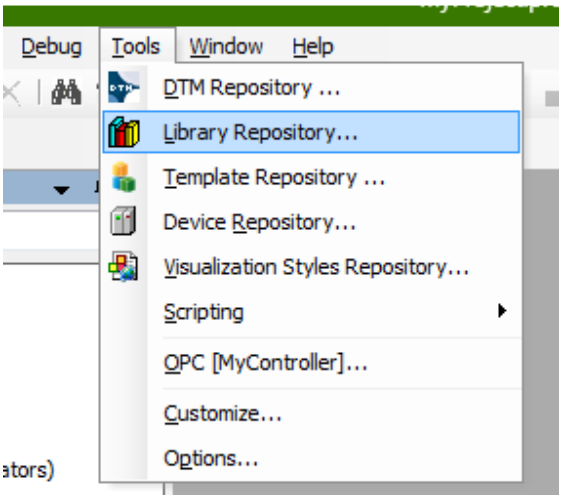


2. Enter the Logical Builder.

3. Add a new M241 controller if this is a new created project.

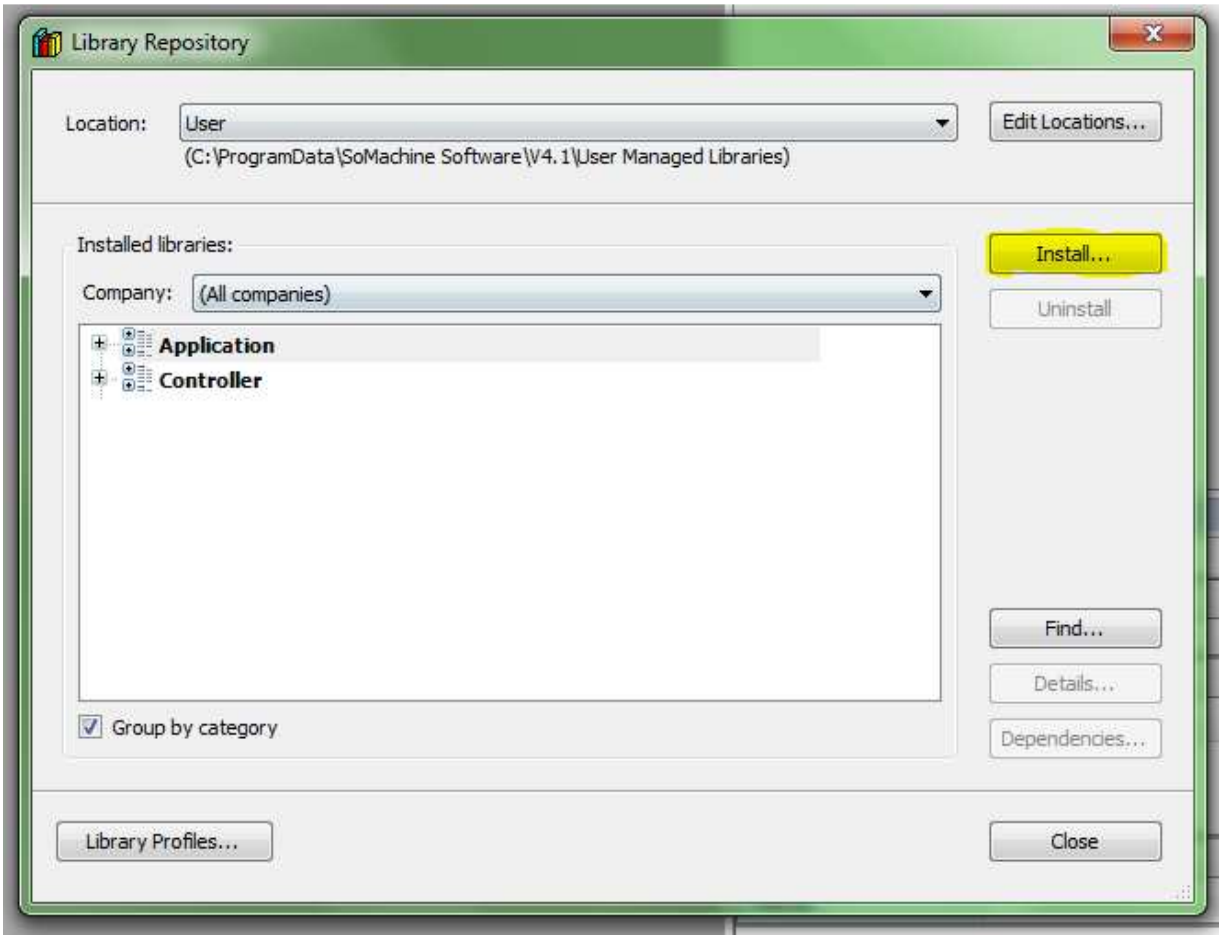


4. Open the menu and enter the Library Repository.
(This step only needs to be done one time.)

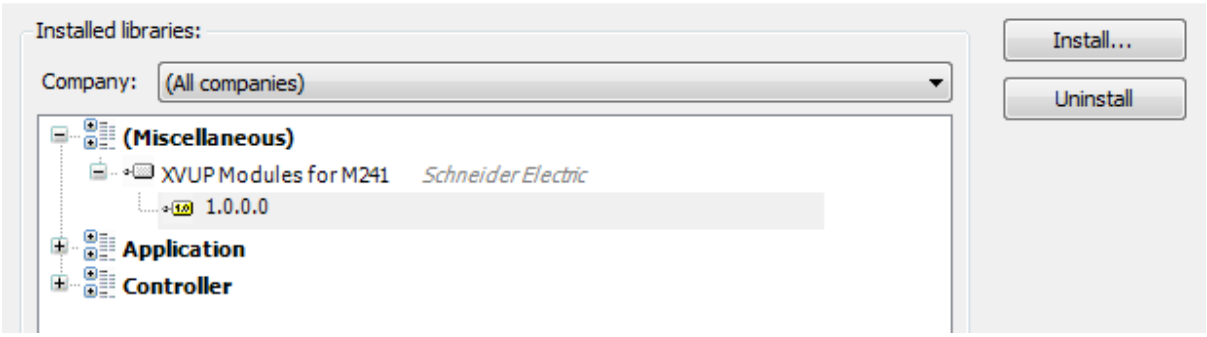


5. Browse and add the library to the Repository.
(This step only needs to be done one time.)

Click the install button and browse the "XVUP Modules for M241_SoM41.compiled-library" file.

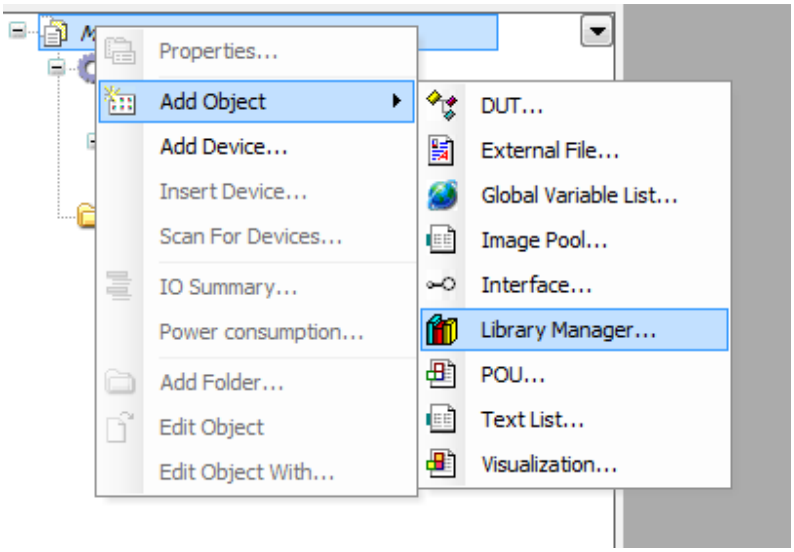


If it succeeds, you will find it in the "Miscellaneous" tree.

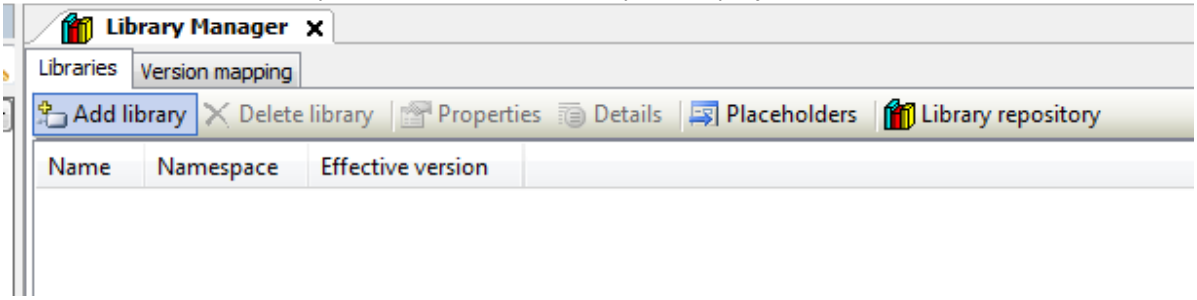


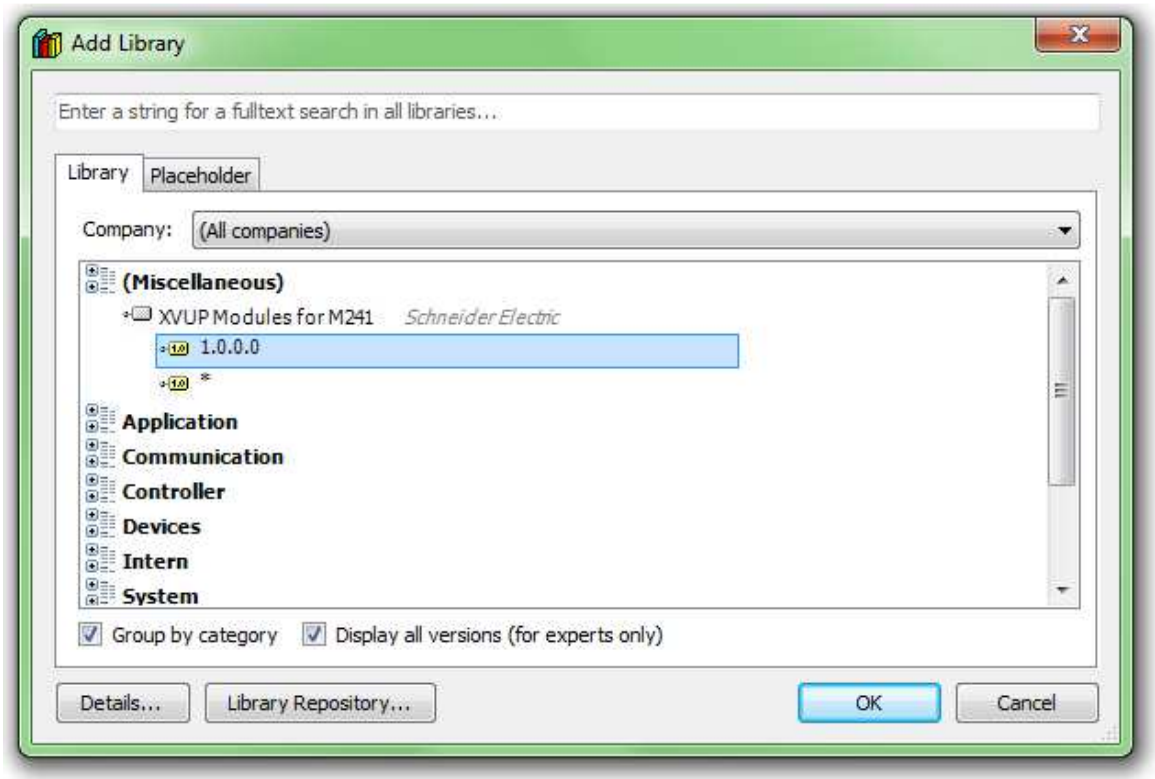
6. Import the library into the project.

Switch to the Application trees tab, right click on the project name and add a Library Manager to the project.

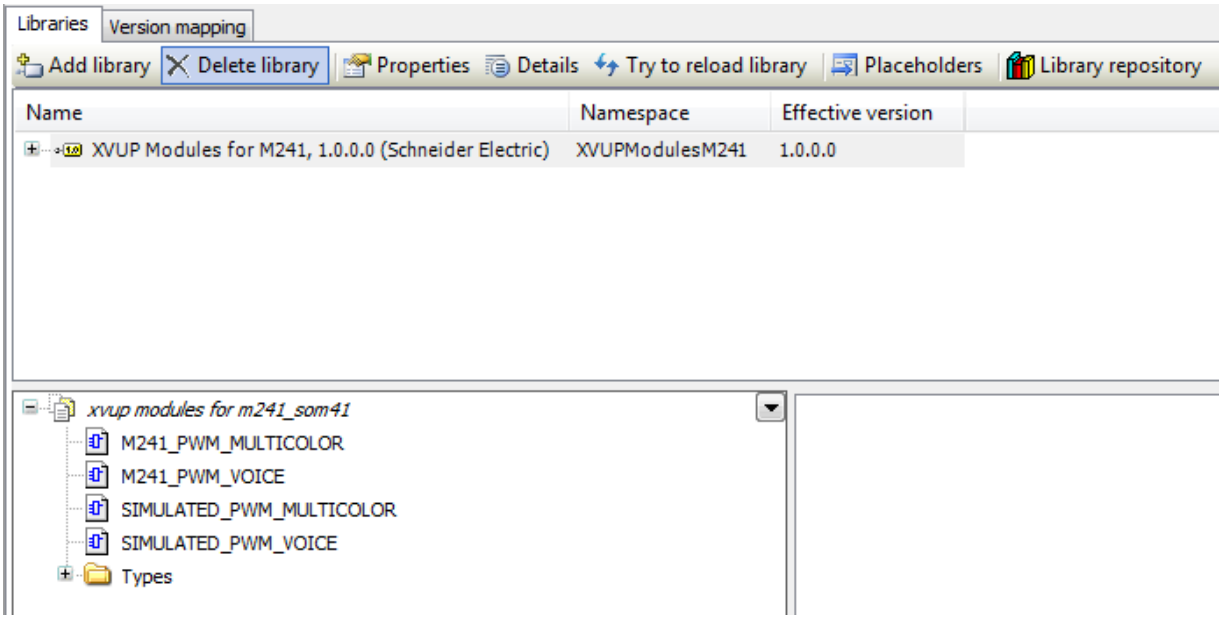


7. Click on “Add library” button to add the library to the project.





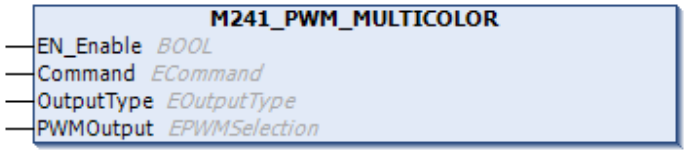
8. Once done, you will find the library and four imported function blocks.



3-2 Function block

M241_PWM_MULTICOLOR

This function block is used for XVU Multi-Color module. It uses the build-in PWM module in M241 controller. You have to firstly enable and configure PWM of the controller.



Name	Type	Initial	Comment
EN_Enable	BOOL	FALSE	Set TRUE to enable the function block.
Command	ECommand	TurnOff	PLC output commands
OutputType	EOutputType	Source	Select Source (Default) or Sink type output.
PWMOutput	EPWMSelection	Q0_PWM00	Select standard PWM output. Please enable

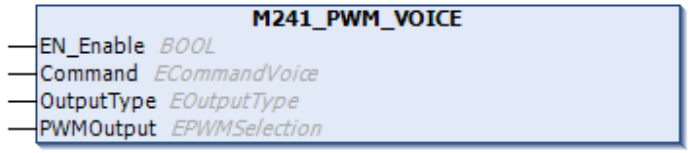
The definition of Command of this function block:

ENUM ECommand

Name	Type	Address	Initial	Comment
TurnOff	INT		0	
SteadyRed	INT		1	
SteadyOrange	INT		2	
SteadyGreen	INT			
SteadyBlue	INT			
FlashingRed	INT			
FlashingOrange	INT			
FlashingGreen	INT			
FlashingBlue	INT			
BlinkingRed	INT			
BlinkingOrange	INT			
BlinkingGreen	INT			
BlinkingBlue	INT			
RotatingRed	INT			
RotatingOrange	INT			
RotatingGreen	INT			
RotatingBlue	INT		16	
TurnOff_	INT		17	

M241_PWM_VOICE

This function block is used for XVU Voice module. It uses the build-in PWM module in M241 controller. You have to firstly enable and configure PWM of the controller.



Name	Type	Initial	Comment
EN_Enable	BOOL	FALSE	Set TRUE to enable the function block.
Command	ECommandVoice	TurnOffMp3	PLC output commands
OutputType	EOutputType	Source	Select Source (Default) or Sink type output.
PWMOutput	EPWMSelection	Q0_PWM00	Select standard PWM output. Please enable

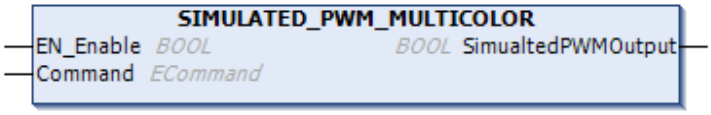
The definition of Command of this function block:

ENUM ECommandVoice

Name	Type	Initial	Comment
TurnOffMp3	INT	0	
PlayChannel_1	INT	1	
PlayChannel_2	INT		
PlayChannel_3	INT		
PlayChannel_4	INT		
PlayChannel_5	INT		
PlayChannel_6	INT		
PlayChannel_7	INT		
PlayChannel_8	INT		
PlayChannel_9	INT		
PlayChannel_10	INT		
PlayChannel_11	INT		
PlayChannel_12	INT		
PlayChannel_13	INT		
PlayChannel_14	INT		
PlayChannel_15	INT		
PlayChannel_16	INT	16	
TurnOffMp3_	INT	17	

SIMULATED_PWM_MULTICOLOR

This function block is used for XVU Multi-Color module. It uses the timers to simulate the PWM pulses.



Name	Type	Initial	Comment
EN_Enable	BOOL	FALSE	Set TRUE to enable the function block.
Command	ECommand	TurnOff	PLC output commands
SimualtedPWMOutput	BOOL		Simulated PWM Output.

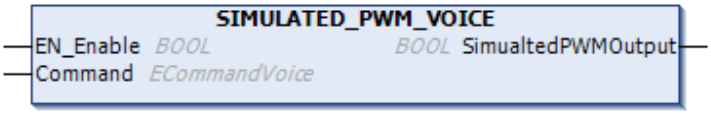
The definition of Command of this function block:

ENUM ECommand

Name	Type	Address	Initial	Comment
TurnOff	INT		0	
SteadyRed	INT		1	
SteadyOrange	INT		2	
SteadyGreen	INT			
SteadyBlue	INT			
FlashingRed	INT			
FlashingOrange	INT			
FlashingGreen	INT			
FlashingBlue	INT			
BlinkingRed	INT			
BlinkingOrange	INT			
BlinkingGreen	INT			
BlinkingBlue	INT			
RotatingRed	INT			
RotatingOrange	INT			
RotatingGreen	INT			
RotatingBlue	INT		16	
TurnOff_	INT		17	

SIMULATED_PWM_VOICE

This function block is used for XVU Voice module. It uses the timers to simulate the PWM pulses.



Name	Type	Initial	Comment
EN_Enable	BOOL	FALSE	Set TRUE to enable the function block.
Command	ECommandVoice	TurnOffMp3	PLC output commands
SimualtedPWMOutput	BOOL		Simulated PWM Output.

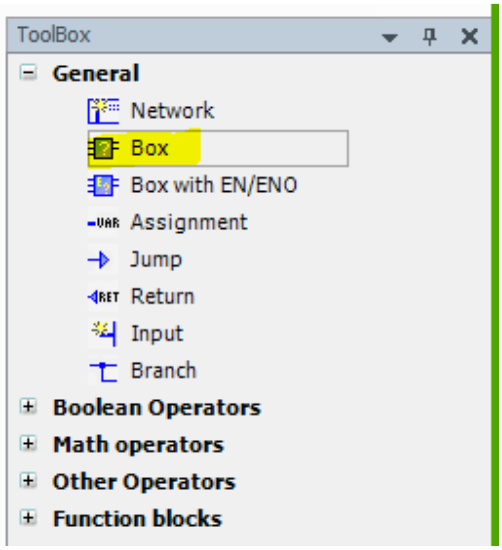
The definition of Command of this function block:

ENUM ECommandVoice

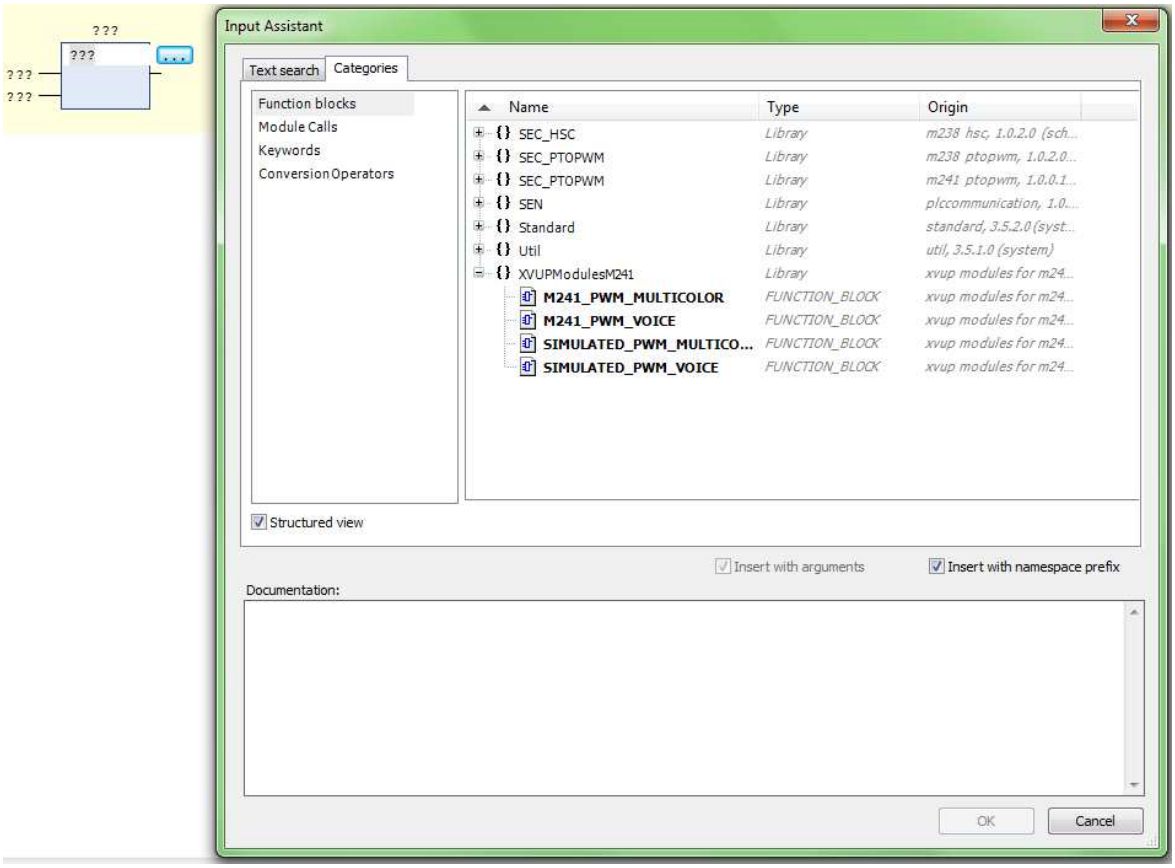
Name	Type	Initial	Comment
TurnOffMp3	INT	0	
PlayChannel_1	INT	1	
PlayChannel_2	INT		
PlayChannel_3	INT		
PlayChannel_4	INT		
PlayChannel_5	INT		
PlayChannel_6	INT		
PlayChannel_7	INT		
PlayChannel_8	INT		
PlayChannel_9	INT		
PlayChannel_10	INT		
PlayChannel_11	INT		
PlayChannel_12	INT		
PlayChannel_13	INT		
PlayChannel_14	INT		
PlayChannel_15	INT		
PlayChannel_16	INT	16	
TurnOffMp3_	INT	17	

3-3 How to use

You could use the imported function blocks by the box component in Logical Builder which is very similar to the usage of other function blocks.

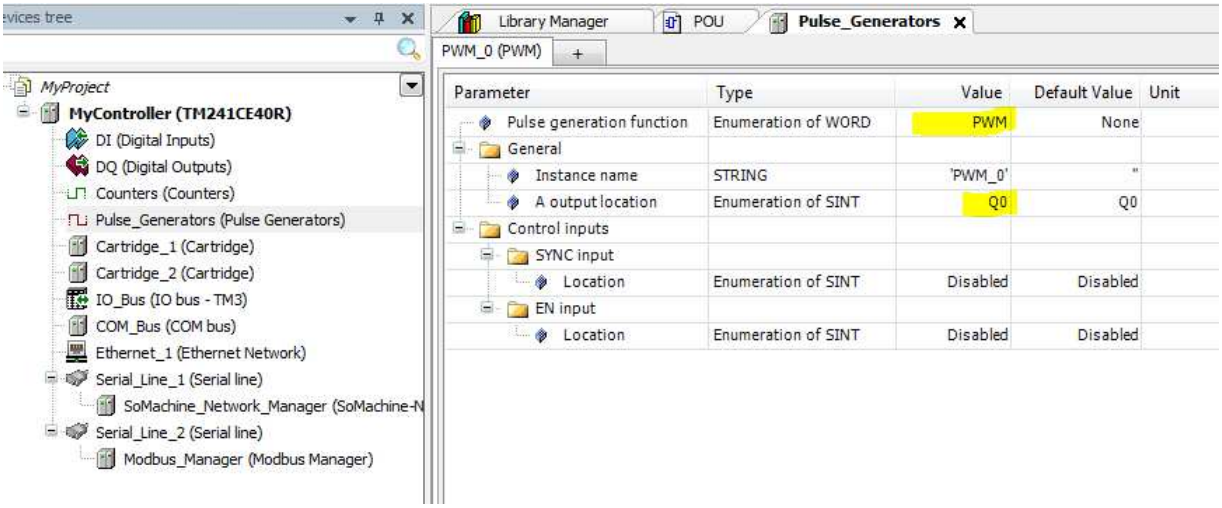


Select the function block you will use.



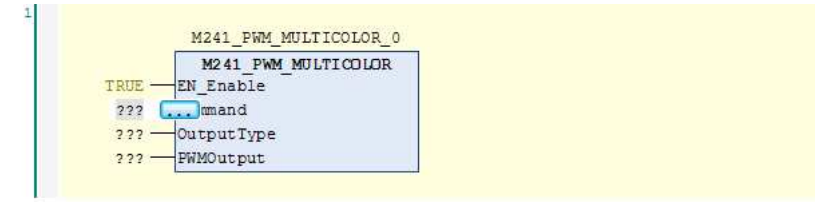
Sample to use M241_PWM_MULTICOLOR

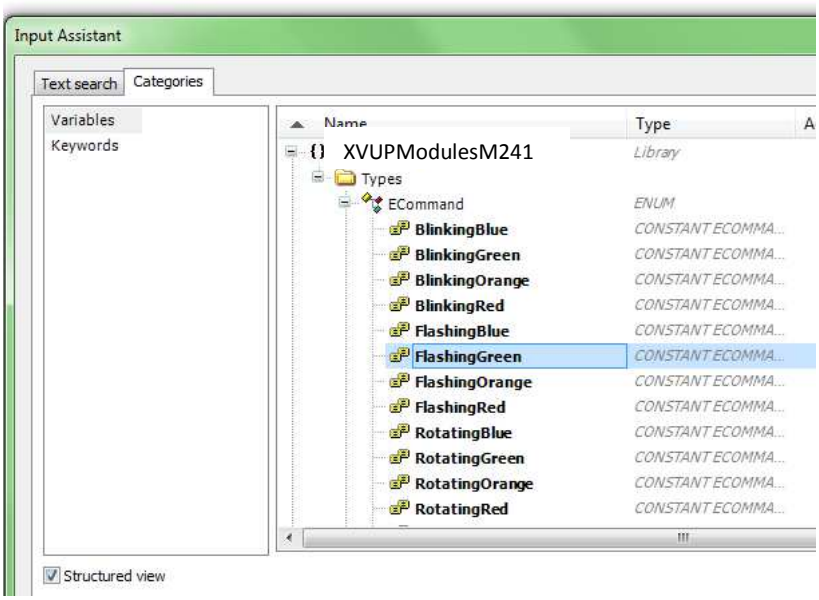
1. Enable the PWM module in M241 controller.



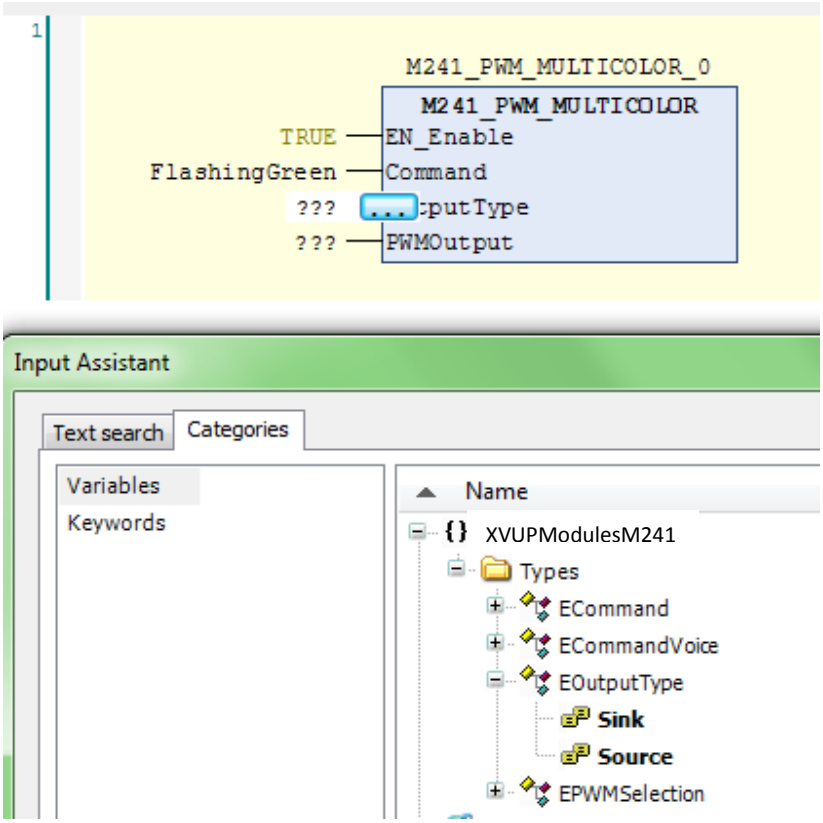
2. Set the value for all input pins.

Select your PWM command. It will generate different duty-ratios of PWM pulses to display different colors.

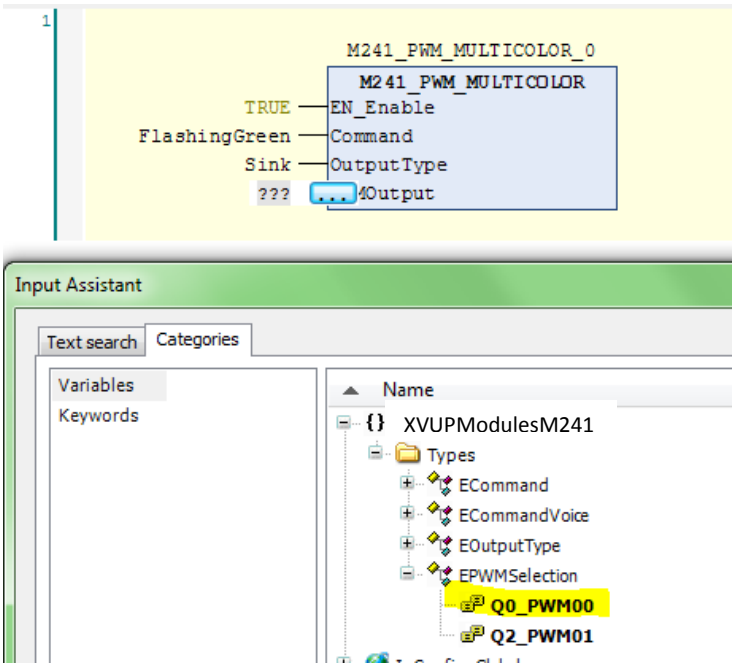




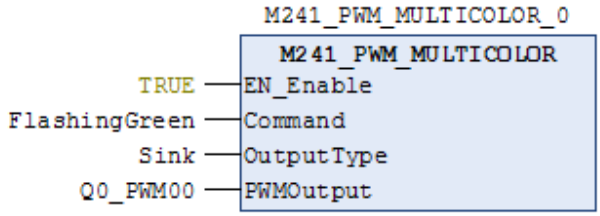
Select the output type: Sink or Source.



Select the Output pin; it must be the same as what was set in the first step.



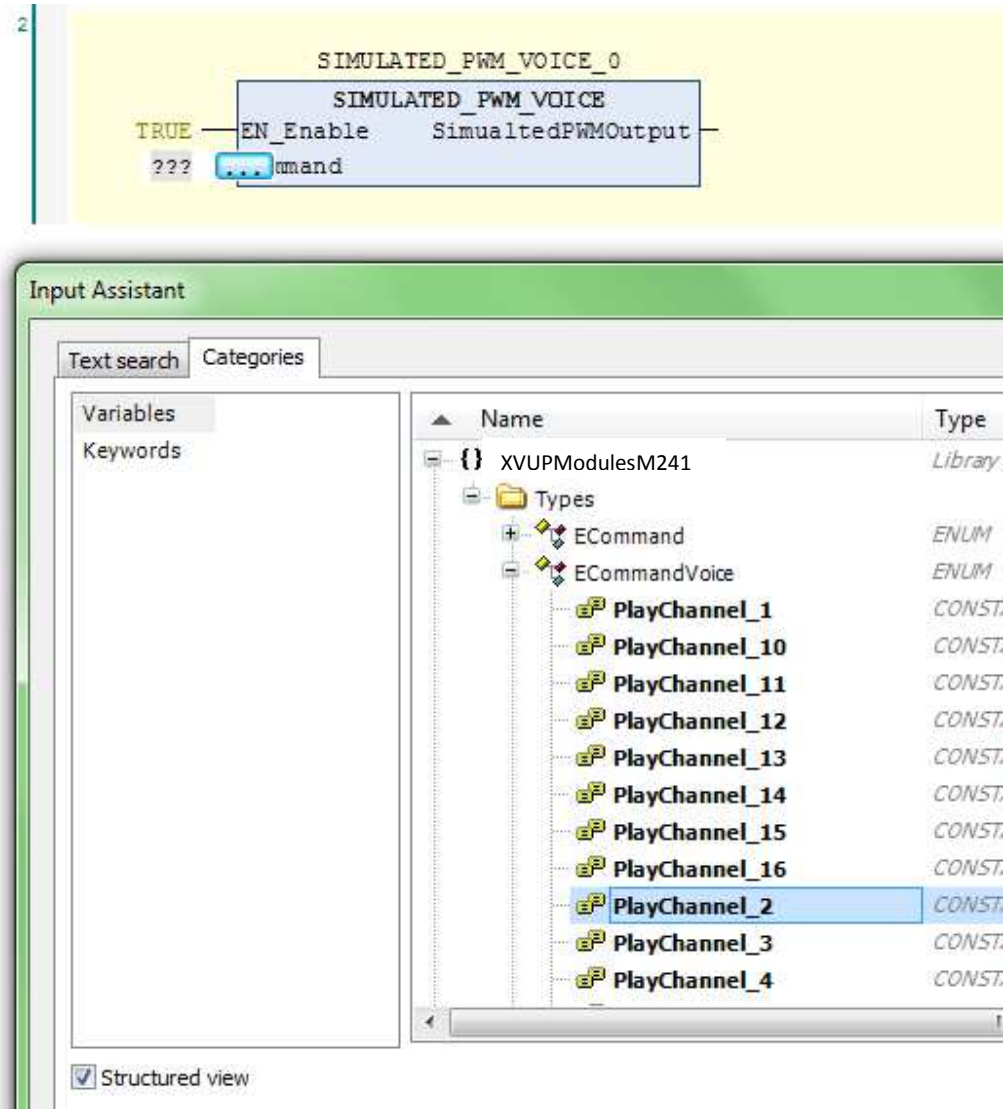
3. Once done, you could run the application to test.



Sample to use SIMULATED_PWM_VOICE

1. Set the value for all input pins.

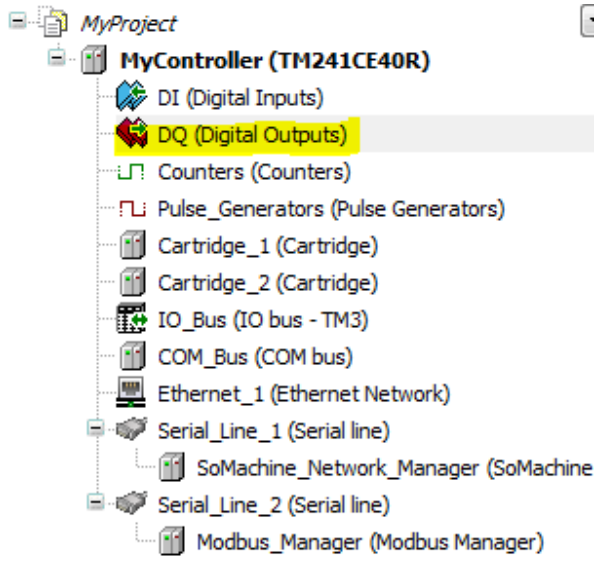
Select your PWM command. It will generate different duty-ratios of PWM pulses to play different voices.



2. Select the interface to output.

Please make sure the output pin is free to use.

You could check it below.

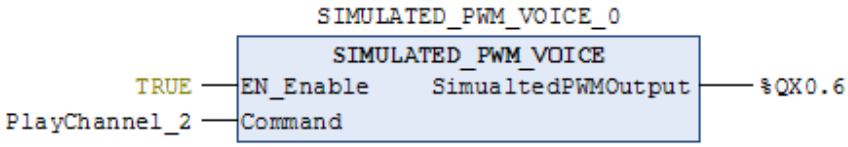


I/O Mapping | I/O Configuration

Channels

Variable	Channel	Address	Type	Description
Outputs				
qwDQ_QW0	QW0	%QW0	WORD	
	Q0	%QX0.0	BOOL	Fast output, Push/Pull
	Q1	%QX0.1	BOOL	Fast output, Push/Pull
	Q2	%QX0.2	BOOL	Fast output, Push/Pull
	Q3	%QX0.3	BOOL	Fast output, Push/Pull
	Q4	%QX0.4	BOOL	Relay output
	Q5	%QX0.5	BOOL	Relay output
	Q6	%QX0.6	BOOL	Relay output
	Q7	%QX0.7	BOOL	Relay output
	Q8	%QX1.0	BOOL	Relay output
	Q9	%QX1.1	BOOL	Relay output
	Q10	%QX1.2	BOOL	Relay output
	Q11	%QX1.3	BOOL	Relay output
	Q12	%QX1.4	BOOL	Relay output
	Q13	%QX1.5	BOOL	Relay output
	Q14	%QX1.6	BOOL	Relay output
	Q15	%QX1.7	BOOL	Relay output
qbDQ_QB1	QB1	%QB2	BYTE	

3. Once done, you could run the application to test.



3-4 Constrains

For usage of SoMachine, please refer to the user manual of SoMachine.
If you simultaneously import equal to or more than two XVUP libraries into one project, you have to enable the "namespace" to avoid name conflict. Please refer to the user manual of SoMachine.

4. Annex

4-1 PLC programming guide / Guide de programmation de l'automate / SPS-Programmierhandbuch / Guía de programación PLC / Guida di programmazione PLC / PLC 编程指南/ PLC プログラミングガイド

The Input Circuit ON-State & OFF-State Time Durée du circuit d'entrée avec l'état activé (ON) et désactivé (OFF) Zeit für den Eingabekreisstatus (EIN und AUS) Tiempo del circuito de entrada en estado activado y desactivado Ora stato ON e stato OFF circuito di ingresso 输入电路“开”状态和“关”状态时间 入力回路オン状態とオフ状態の時間		XVUC9VP / XVUC29P Input Command Commande d'entrée Eingabebefehl Comando de entrada Comando di ingress 输入命令 入力コマンド
ON-State (ms) (*)	OFF-State (ms) (*)	
0	500	Turn Off (**)
20	480	Command 1
50	450	Command 2
80	420	Command 3
110	390	Command 4
140	360	Command 5
170	330	Command 6
200	300	Command 7
230	270	Command 8
260	240	Command 9
290	210	Command 10
320	180	Command 11
350	150	Command 12
380	120	Command 13
410	90	Command 14
440	60	Command 15
470	30	Command 16
500	0	Turn Off (**)

(*)

ON-State Tolerance: +20 ms, -5 ms.
Tolérance pour l'état ON : +20 ms, -5 ms.
Toleranz des EIN-Zustands: +20 ms, -5 ms.
Tolerancia del estado activado: +20 ms, -5 ms.
Tolleranza stato ON: +20 ms, -5 ms.
“开”状态容差： +20 ms, -5 ms.
オン状態の公差： +20 ms, -5 ms.

OFF-State Tolerance: +20 ms, -5 ms.
Tolérance pour l'état OFF : +20 ms, -5 ms.
Toleranz des AUS-Zustands: +20 ms, -5 ms.
Tolerancia del estado desactivado: +20 ms, -5 ms.
Tolleranza stato OFF: +20 ms, -5 ms.
“关”状态容差： +20 ms, -5 ms.
オフ状態の公差： +20 ms, -5 ms.

(**)

In turn off Mode, it should be totally either High level or Low level.
Pour que le module soit éteint, le circuit d'impulsion doit etre totalement ON ou OFF
Im Abschaltmodus sollte nur High- oder nur Low-Pegel vorhanden sein.
En modalidad de apagado, debe estar en alto nivel o bajo nivel completamente.
In modalità di spegnimento, dovrebbe essere completamente un livello Alto o un livello Basso.
在关闭模式下，它应该是完全高电平或完全低电平。
電源オフモードの場合は、高レベルまたは低レベルのどちらかに統一されている必要があります。

4-2 Pulse signal multicolor LED unit normal operation / Fonctionnement normal du module à DEL multicolore à signal d'impulsion / Mehrfarbiges Impulssignal-LED-Modul: Normalbetrieb / Funcionamiento normal de la unidad LED multicolor de señal de pulsos / Funzionamento normale dell'unità a LED multicolore a segnale d'impulso / 脉冲信号多色LED 单元正常运行/ パルス信号マルチカラー LED ユニットの通常動作

PLC commands Commandes de l'automate SPS-Befehle Comandos del PLC Comandi del PLC PLC 命令 PLC コマンド	Pulse signal multicolor LED Output Sortie du module à DEL multicolore à signal d'impulsion Ausgabe der mehrfarbigen Impulssignal-LED-Module Salida del LED multicolor de señal de pulsos Uscita a LED multicolore a segnale d'impulsi 脉冲信号多色 LED 输出 パルス信号マルチカラー LED 出力
CMD 1	Steady + Red / Fixe + rouge / Permanent + Rot / Fijo + rojo / Continuo + Rosso / 常亮 + 红色 / 連続点灯 + 赤
CMD 2	Steady + Orange / Fixe + orange / Permanent + Orange / Fijo + naranja / Continuo + Arancione / 常亮 + 橙色 / 連続点灯 + 橙
CMD 3	Steady + Green / Fixe + vert / Permanent + Grün / Fijo + verde / Continuo + Verde / 常亮 + 绿色 / 連続点灯 + 緑
CMD 4	Steady + Blue / Fixe + bleu / Permanent + Blau / Fijo + azul / Continuo + Blu / 常亮 + 蓝色 / 連続点灯 + 青
CMD 5	Flashing 3 times + Red / 3 clignotements rapides + rouge / 3-maliges schnelles Blinken + Rot / Parpadea 3 veces + rojo / 3 lampeggi consecutivi + rosso / 闪烁 3 次 + 红色 / 3 回フラッシュ + 赤
CMD 6	Flashing 3 times + Orange / 3 clignotements rapides + orange / 3-maliges schnelles Blinken + Orange / Parpadea 3 veces + naranja / 3 lampeggi consecutivi + arancione / 闪烁 3 次 + 橙色 / 3 回フラッシュ + 橙
CMD 7	Flashing 3 times + Green / 3 clignotements rapides + vert / 3-maliges schnelles Blinken + Grün / Parpadea 3 veces + verde / 3 lampeggi consecutivi + verde / 闪烁 3 次 + 绿色 / 3 回フラッシュ + 緑
CMD 8	Flashing 3 times + Blue / 3 clignotements rapides + bleu / 3-maliges schnelles Blinken + Blau / Parpadea 3 veces + azul / 3 lampeggi consecutivi + blu / 闪烁 3 次 + 蓝色 / 3 回フラッシュ + 青
CMD 9	Blinking + Red / Clignotement lent + rouge / Blinken + Rot / Intermitente + rojo / Sfarfallio + rosso / 闪光 + 红色 / ブリンク + 赤
CMD 10	Blinking + Orange / Clignotement lent + orange / Blinken + Orange / Intermitente + naranja / Sfarfallio + arancione / 闪光 + 橙色 / ブリンク + 橙
CMD 11	Blinking + Green / Clignotement lent + vert / Blinken + Grün / Intermitente + verde / Sfarfallio + verde / 闪光 + 绿色 / ブリンク + 緑
CMD 12	Blinking + Blue / Clignotement lent + bleu / Blinken + Blau / Intermitente + azul / Sfarfallio + blu /闪光 + 蓝色 / ブリンク + 青
CMD 13	Rotating + Red / Rotation + rouge / Rotieren + Rot / Rotación + rojo / Rotazionale + rosso / 旋转 + 红色 / 循環 + 赤
CMD 14	Rotating + Orange / Rotation + orange / Rotieren + Orange / Rotación + naranja / Rotazionale + arancione 旋转 + 橙色 / 循環 + 橙
CMD 15	Rotating + Green / Rotation + vert / Rotieren + Grün / Rotación + verde / Rotazionale + verde / 旋转 + 绿色 / 循環 + 緑
CMD 16	Rotating + Blue / Rotation + bleu / Rotieren + Blau / Rotación + azul / Rotazionale + blu / 旋转 + 蓝色 / 循環 + 青

4-3 Pulse signal sound unit normal operation / Fonctionnement normal du module sonore à signal d'impulsion / Impulssignal-Tongeber: Normalbetrieb / Funcionamiento normal de la unidad de sonido de señal de pulsos / Funzionamento normale dell'unità audio a segnale d'impulso / 脉冲信号发声单元正常运行/ パルス信号サウンドユニットの通常動作

PLC commands Commandes de l'automate SPS-Befehle Comandos del PLC Comandi del PLC PLC 命令 PLC コマンド	Pulse signal sound Output Sortie du module sonore à signal d'impulsion Ausgabe der Impulssignal-Tongeber Salida de sonido de señal de pulsos Uscita audio del segnale d'impulso 脉冲信号发声输出 パルス信号音出力
CMD 1	Play Channel.1 MP3
CMD 2	Play Channel.2 MP3
CMD 3	Play Channel.3 MP3
CMD 4	Play Channel.4 MP3
CMD 5	Play Channel.5 MP3
CMD 6	Play Channel.6 MP3
CMD 7	Play Channel.7 MP3
CMD 8	Play Channel.8 MP3
CMD 9	Play Channel.9 MP3
CMD 10	Play Channel.10 MP3
CMD 11	Play Channel.11 MP3
CMD 12	Play Channel.12 MP3
CMD 13	Play Channel.13 MP3
CMD 14	Play Channel.14 MP3
CMD 15	Play Channel.15 MP3
CMD 16	Play Channel.16 MP3