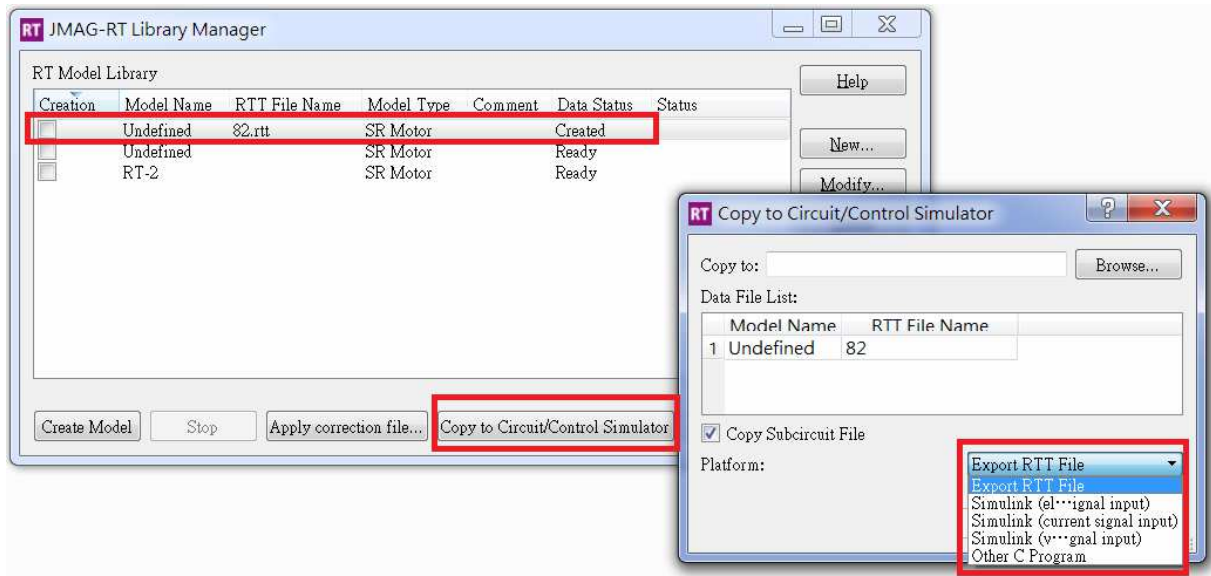


## 勢流科技/ 技術工程部

在 JMAG-RT 裡，除了可將 JMAG-RT 模型資料輸出為 rtt 檔案(\*.rtt)  
不同種類的模型分別可輸出成不同格式的檔案給外部電路/控制模擬軟體，如下圖示

- Three-phase PM synchronous motor ([Simulink](#), [PSIM](#), [Programs in C](#))
- Two-phase stepping motor ([Simulink](#), [PSIM](#), [Programs in C](#))
- Linear solenoid ([Simulink](#), [PSIM](#), [Programs in C](#))
- Linear synchronous motor ([Simulink](#), [PSIM](#), [Programs in C](#))
- SR motor ([Simulink](#))
- Induction motor ([Simulink](#))

Ex: 以 SR motor 為例，可輸出給外部電路/控制模擬的檔案格式如下 (RTT, Simulink, C Program)





而輸出成 Simulink 格式的檔案又細分如下，如下圖示 (以 3 相 PMSM 為例)

\*.rtt : 包含馬達的電感以及轉矩資料

RT\_simulink.dll (32bit)

RT\_simulink.mexw64 (64bit) :

於 Simulink 用來載入 JMAG-RT 模型的檔案，可分別給 32 及 64 位元電腦使用

JMAG\_RT\_pmsm.mdl : 將 3 相 PMSM 指定為 JMAG-RT 模型 (電子訊號輸入)

JMAG\_RT\_pmsm\_Vin.mdl : 將 3 相 PMSM 指定為 JMAG-RT 模型 (電壓訊號輸入)

JMAG\_RT\_pmsm\_Iin.mdl : 將 3 相 PMSM 指定為 JMAG-RT 模型 (電流訊號輸入)

\*.pa : 若於[RT Correction]標籤頁內有指定修正參係數時，會產生此修正檔(會與.rtt 的檔名相同)

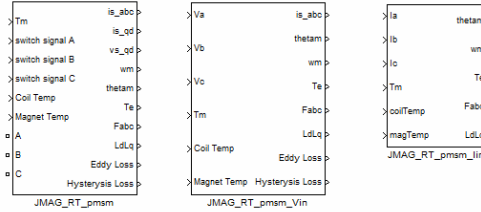
The files required for a simulation with Simulink are listed in the table below.

File name	Description
JMAG-RT model data file (*.rtt)	Contains the inductance and torque data of a motor.
RT_simulink.dll (32bit), RT_Simulink.mexw64 (64bit)	Required to use a JMAG-RT model in Simulink.
JMAG_RT_pmsm.mdl	Specifies a three-phase PM synchronous motor for the JMAG-RT model (electric signal input). This file is exported when [Simulink (electric signal input)] is selected for [Platform] in the [Copy to Circuit/Control Simulator] dialog box.
JMAG_RT_pmsm_Vin.mdl	Specifies a three-phase PM synchronous motor for the JMAG-RT model (voltage signal input). This file is exported when [Simulink (voltage signal input)] is selected for [Platform] in the [Copy to Circuit/Control Simulator] dialog box.
JMAG_RT_pmsm_Iin.mdl	Specifies a three-phase PM synchronous motor for the JMAG-RT model (current signal input). This file is exported when [Simulink (current signal input)] is selected for [Platform] in the [Copy to Circuit/Control Simulator] dialog box.
Torque correction point sequence file (*.pa)	Copied when the correction point sequence for the current dependent torque is specified in the [RT Correction] tab of JMAG-RT Library Manager after a JMAG-RT model is created (after the FEM analysis using JMAG-RT). The same file name as the JMAG-RT model data file (*.rtt) is used.  *This file name is used in the JMAG-RT model data file (*.rtt) and cannot be changed.

## JMAG\_RT\_pmsm.mdl、JMAG\_RT\_pmsm\_Vin.mdl、JMAG\_RT\_pmsm\_Iin.mdl 檔案於 Simulink 內的 I/O 說明如下 (Ex: JMAG\_RT\_pmsm.mdl 的 I/O 說明)

### Input/Output of JMAG model block

The input/output of a JMAG-RT model block for a three-phase PM synchronous motor is indicated in the table below.



- The temperature during motor drive is calculated as zero, when the terminal of the S-Function block has no connection. Clear the [Use\_Temperature\_Correction] setting for block on a JMAG-RT model when temperature correction is not run.

### Electric signal input

Block	Input	Output	Input/Output
JMAG_RT_pmsm	<ul style="list-style-type: none"> <li>Tm: Load torque (N*m)</li> <li>switch signal A: Switch signal of A-phase (On: 1, Off: 0)</li> <li>switch signal B: Switch signal of B-phase (On: 1, Off: 0)</li> <li>switch signal C: Switch signal of C-phase (On: 1, Off: 0)</li> <li>coilTemp: Coil temperature (K)</li> <li>magTemp: Magnet temperature (K)</li> </ul>	<ul style="list-style-type: none"> <li>is_abc: Three-phase current (ia, ib, ic) (A)</li> <li>is_qd: dq-axis current (is_q, is_d) (A)</li> <li>vs_qd: dq-axis voltage (is_q, is_d) (V)</li> <li>wm: Revolution speed (rad/s)</li> <li>thetam: Rotation angle (rad)</li> <li>Te: Output torque (N*m)</li> <li>Fabc:</li> </ul> <p>For a Spatial Harmonic Model, total Flux Linkage in Coil (Wb). This value includes the magnetic flux caused by the magnet and the current flowing in a coil.</p> <p>For an Ld, Lq model, Flux Linkage in each coil (Wb) caused by the magnet in no-load.</p> <ul style="list-style-type: none"> <li>LdLq: d/q-axis inductance (H)</li> <li>Eddy: Eddy current loss (W)</li> <li>Hys: Hysteresis loss (W)</li> </ul>	<ul style="list-style-type: none"> <li>A: A-phase terminal</li> <li>B: B-phase terminal</li> <li>C: C-phase terminal</li> </ul>

而輸出成 PSIM 格式的檔案如下，如下圖示 (以 3 相 PMSM 為例)

\*.rtt : 包含馬達的電感以及轉矩資料

RT\_DLL\_32\_10.dll :

RT\_DLL\_64\_10.dll :

用於 PSIM 的 MagCoupler-RT 選項，可分別給 32 及 64 位元電腦使用

Netlist XML file(\*.xml) : 定義 3 相 PMSM 的 JMAG-RT 模型與 MagCoupler-RT 的 PMSM Machine block 之間的介面

\*.pa : 若於[RT Correction]標籤頁內有指定修正參係數時，會產生此修正檔(會與.rtt 的檔名相同)

The files required for a simulation with PSIM are listed in the following table.

File name	Description
JMAG-RT model data file (*.rtt)	Contains the inductance and torque data of a model.
RT_DLL_32_10.dll, RT_DLL_64_10.dll	Used by the MagCoupler-RT option of PSIM
Netlist XML file (*.xml)	Defines the interfaces between the JMAG-RT model of a three-phase PM synchronous motor and the MagCoupler-RT PMSM Machine block.
Torque correction point sequence file (*.pa)	Copied when the correction point sequence of the current dependent torque is specified in the [RT Correction] tab of the JMAG-RT Library Manager. The same file name as the JMAG-RT model data file (*.rtt) is used. * This file name cannot be changed because it is used by the JMAG-RT model data file.

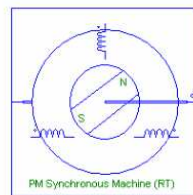
Netlist XML file(\*.xml) 檔案的 I/O 說明如下

#### Input/Output of JMAG-RT model block

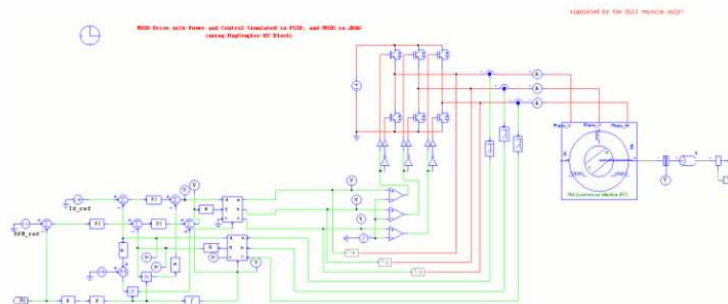
The input/output of the MagCoupler-RT PMSM Machine block can be set using the electric node and the rotor shaft node.

Electric node	Rotor shaft node
Connects to a phase terminal of the main circuit	Connects to a mechanical module of PSIM

• For more information, see the PSIM Users Manual.



MagCoupler-RT PMSM Machine block





而輸出成 C Program 格式的檔案如下，如下圖示

\*.rtt : 包含馬達的電感以及轉矩資料

JMAGRT\_DLL.dll : 使用 C 語言執行模擬的動態連結程式庫

The following files are required to run a simulation using a program in C.

File name	Description
JMAG-RT model data file (*.rtt)	Contains the inductance and torque data of a motor. This file is exported to the directory specified in the [Copy to Circuit/Control Simulator] dialog box of the JMAG-RT Library Manager.
JMAGRT_DLL.dll	Contains a dynamic link library for running a simulation using a program in C. For information about the directory where this file is stored, see " <a href="#">Flow of Simulations Using Programs in C.</a> "

\* For more information about simulations using programs in C, see "[Running Simulations Using Programs in C.](#)"